

gclib  
2.4.1

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# Chapter 1

## Galil Communications Library (gclib)

The Galil Communications Library (gclib) is a thread-safe C API that allows users to connect to and communicate with Galil controllers. Galil provides multiple wrappers around gclib, allowing for use in C++, Python, Java, C#, Visual Basic, or LabVIEW projects.

### 1.1 Installation

All languages require the underlying C library to be installed.

Windows Linux

#### Note

gcaps is a service that is included in the gclib and gdk installers. It allows multiple gclib clients to share a single controller connection, which can be especially useful for unsolicited data.

### 1.2 Quickstart

Follow the instructions to build a simple example program using gclib.

- **C/C++**

- **Windows**

1. Install CMake.
2. Install one of the supported compilers:
  - \* MSVC 14.0 (Visual Studio 2015) or later
  - \* MinGW 8.1 or later
3. Compile and run the Hello World example:

```
> cmake -S "%GCLIB_ROOT%\examples\c" -B build
> cd build
> cmake --build .
> .\hello-world.exe
gclib version is 2.4.1
Hello World!
```

- **Linux**

1. Install CMake and gcc.

RHEL / CentOS Stream / Fedora / Rocky	Ubuntu / Debian / Raspberry Pi OS
\$ sudo dnf install cmake gcc	\$ sudo apt install cmake gcc

## 2. Compile and run the Hello World program:

```
$ cmake -S /usr/share/gclib/examples/c -B build
$ cd build
$ cmake --build .
$ ./hello-world
gclib version is 2.4.1
Hello World!
```

### • Python

#### – Windows

```
> py -m pip install https://www.galil.com/sw/pub/python/gclib-1.0.1-py3-none-any.whl
> copy "%GCLIB_ROOT%\examples\python\*" .
> py
>> import gclib
>> gclib.py().GVersion()
'py.2.4.1 2.4.1'
```

#### – Linux

```
$ python3 -m venv gclib
$ source gclib/bin/activate
(gclib) $ pip install https://www.galil.com/sw/pub/python/gclib-1.0.1-py3-none-any.whl
(gclib) $ cp /usr/share/gclib/examples/python/* .
(gclib) $ python
>> import gclib
>> gclib.py().GVersion()
'py.2.4.1 2.4.1'
```

- **Java** To compile Java programs, ensure the JDK is installed, as the JRE does not provide a Java compiler.

#### – Windows

```
> curl -O https://www.galil.com/sw/pub/java/gclib-java-1.0.0.tar
> tar -xvf gclib-java-1.0.0.tar
> cd gclib-java-1.0.0
> set CLASSPATH=.;.*\lib\*
> robocopy "%GCLIB_ROOT%\examples\java" examples
> javac examples\* -d .
> java HelloWorld
gclib version is 2.4.1 2.4.1
Hello World!
```

#### – Linux

```
$ curl -O https://www.galil.com/sw/pub/java/gclib-java-1.0.0.tar
$ tar -xvf gclib-java-1.0.0.tar
$ cd gclib-java-1.0.0
$ export CLASSPATH=.*\lib\*
$ javac /usr/share/gclib/examples/java/* -d .
$ java HelloWorld
gclib version is 2.4.1 2.4.1
Hello World!
```

### • C#

```
> curl -O https://www.galil.com/sw/pub/dotnet/gclib-dotnet.1.0.0.nupkg
> dotnet nuget add source %cd% --name gclib
> robocopy /e "%GCLIB_ROOT%\examples\cs" examples
> cd examples
> dotnet run --project HelloWorld
gclib version is 2.4.1 2.4.1
Hello World!
```

### • VB

```
> curl -O https://www.galil.com/sw/pub/dotnet/gclib-dotnet.1.0.0.nupkg
> dotnet nuget add source %cd% --name gclib
> robocopy /e "%GCLIB_ROOT%\examples\vb" examples
> cd examples
> dotnet run --project HelloWorld
gclib version is 2.4.1 2.4.1
Hello World!
```

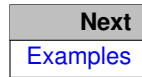
### • LabVIEW

#### Download

1. Right click the downloaded file and choose "Add to VIPM Library".

2. Choose "Add To Library & Install" when prompted.
3. Search for `gclib` in the package list, then double click on it to bring up the package info.
  - To see all available functions, click "Show in Palettes"
  - To see all example VIs, click "Show Examples"

Looking for older versions?





# Chapter 2

## Examples

### 2.1 Controller Addresses

A core feature of gclib is the ability to connect to a controller over ethernet, serial, or PCI, using a single connection API.

- **C/C++** Use `gclib_addresses()` to see the different addresses that are available.

#### – Code

```
#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    char addresses[1024];

    gclib_addresses(addresses, sizeof(addresses));
    printf("Address, Model, Serial\n%s\n", addresses);
}
```

#### – Output

```
> .\addresses.exe
Address, Model, Serial
192.168.0.40, DMC4040 Rev 1.3i, 10601
COM5, DMC-41x3
GALILPCI0
```

If using an ethernet controller that doesn't have an IP address yet, it will show up in `gclib_ip_requests()`. Use `gclib_assign_ip()` to give the controller an IP. If successful, the controller will begin showing up in `gclib_addresses()` under the new address.

#### – Code

```
#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    char result[1024];

    gclib_ip_requests(result, sizeof(result));
    printf("Address, Model, Serial\n%s\n", result);

    gclib_assign_ip("00:50:4C:20:29:69", "192.168.0.40");
}
```

#### – Output

```
> .\ip-requests.exe
Address, Model, Serial
00:50:4C:20:29:69, DMC4000, 10601
```

- **Python**

Use `gclib.py.GAddresses()` to see the different addresses that are available.

```
>>> import gclib
>>> gclib.py().GAddresses()
{'192.168.0.40': 'DMC4040 Rev 1.3i', 'GALILPCI1': '', 'COM5': ''}
```

If using an ethernet controller that doesn't have an IP address yet, it will show up in `gclib.py.GIpRequests()`.

Use `gclib.py.GAssign()` to give the controller an IP. If successful, the controller will begin showing up in `gclib.py.GAddresses()` under the new address.

```
>>> gclib.py().GIpRequests()
{'DMC4000-10601': '00:50:4C:20:29:69'}
>>> gclib.py().GAssign('192.168.0.40', '00:50:4C:20:29:69')
```

- **Java** Use `gclibjava.GclibJava.GAddresses()` to see the different addresses that are available.

- **Code**

```
import gclibjava.*;

public class Addresses {
    public static void main(String[] args) throws GclibJavaException {
        System.out.println(String.format(new GclibJava().GAddresses()));
    }
}
```

- **Output**

```
> java Addresses
192.168.0.40, DMC4040 Rev 1.3i, 192.168.0.1, Ethernet
GALILPCI1
COM5
```

If using an ethernet controller that doesn't have an IP address yet, it will show up in `gclibjava.GclibJava.GIpRequest`

Use `gclibjava.GclibJava.GAssign()` to give the controller an IP. If successful, the controller will begin showing up in `gclibjava.GclibJava.GAddresses()` under the new address.

- **Code**

```
import gclibjava.*;

public class IpRequests {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava gclib = new GclibJava();
        System.out.println(gclib.GIpRequests());
        gclib.GAssign("192.168.0.40", "00:50:4C:20:29:69");
    }
}
```

- **Output**

```
> java IpRequests
DMC4000, 10601, 00:50:4C:20:29:69, Ethernet, 192.168.0.1, 0.0.0.0
```

- **C#** Use `gclib.GAddresses()` to see the different addresses that are available.

- **Code**

```
string[] addresses = new gclib().GAddresses();
System.Console.WriteLine(string.Join("\n", addresses));
```

- **Output**

```
> dotnet run --project Addresses
192.168.0.40, DMC4040 Rev 1.3i, 192.168.0.1, Ethernet
GALILPCI1
COM5
```

If using an ethernet controller that doesn't have an IP address yet, it will show up in `gclib.GIpRequests()`.

Use `gclib.GAssign()` to give the controller an IP. If successful, the controller will begin showing up in `gclib.GAddresses()` under the new address.

- **Code**

```
gclib connection = new gclib();
string[] ipRequests = connection.GIpRequests();
System.Console.WriteLine(string.Join("\n", ipRequests));
connection.GAssign("192.168.0.40", "00:50:4C:20:29:69");
```

- **Output**

```
> dotnet run --project IpRequests
DMC4000, 10601, 00:50:4C:20:29:69, Ethernet, 192.168.0.1, 0.0.0.0
```

- **VB** Use `Gclib.GAddresses()` to see the different addresses that are available.

- **Code**

```
Module Program
    Sub Main(args As string())
        System.Console.WriteLine(string.Join(Environment.NewLine, new Gclib().GAddresses()))
    End Sub
End Module
```

- **Output**

```
> dotnet run --project Addresses
192.168.0.40, DMC4040 Rev 1.3i, 192.168.0.1, Ethernet
GALILPCI1
COM5
```

If using an ethernet controller that doesn't have an IP address yet, it will show up in `Gclib.GIpRequests()`. Use `Gclib.GAssign()` to give the controller an IP. If successful, the controller will begin showing up in `Gclib.GAddresses()` under the new address.

- **Code**

```
Module Program
    Sub Main(args As String())
        Dim Gclib As new Gclib()
        System.Console.WriteLine(string.Join(Environment.NewLine, Gclib.GIpRequests()))
        Gclib.GAssign("192.168.0.40", "00:50:4C:20:29:69")
    End Sub
End Module
```

- **Output**

```
> dotnet run IpRequests
DMC4000, 10601, 00:50:4C:20:29:69, Ethernet, 192.168.0.1, 0.0.0.0
```

- **LabVIEW** Use `G Addresses` to see the different addresses that are available.

`Addresses.vi`

- **Front Panel**

- **Block Diagram**

If using an ethernet controller that doesn't have an IP address yet, it will show up in `G Ip Requests`. Use `G Assign` to give the controller an IP. If successful, the controller will begin showing up in `G Addresses` under the new address. `IP Requests.vi`

- **Front Panel**

- **Block Diagram**

## 2.2 Connection Management

- **C/C++** To use a controller with gclib, first pass the address to `gclib_open()` to receive a handle to the connection, which will be used in all gclib calls which operate on that connection. After you are done, close the connection with `gclib_close()`.

**Note**

If you need to change the baud rate, call `gclib_set_baud_rate()` after `gclib_open()`.

- **Code**

```
#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h = 0;
    char address[32], revision[1024];
    uint32_t serial;

    gclib_open(&h, argv[1]);
    gclib_address(h, address, sizeof(address));
    gclib_revision_information(h, revision, sizeof(revision));
    gclib_serial_number(h, &serial);
    printf("Address: %s\nRevision: %s\nSerial: %i\n", address, revision, serial);
    gclib_close(&h);
}
```

### – Output

```
> .\connection.exe 192.168.0.40
Address: 192.168.0.40
Revision: DMC4040 Rev 1.3i
Serial: 10601
```

### Attention

If the program exits before calling `gclib_close()`, the controller may be left in an inconsistent state.

- **Python** To use a controller with gclib, first create a `gclib.py()` object, then pass an address to `gclib.py.GOpen()`.

```
>>> connection = gclib.py()
>>> connection.GOpen('192.168.0.40')
```

Now we can use `gclib.py.GInfo()` to show basic info about the open connection.

```
>>> connection.GInfo()
192.168.0.40, DMC4040 Rev 1.3i, 10601
```

After you are done with the connection, close it with `gclib.py.GClose()`.

```
>>> connection.GClose()
```

### Attention

If the program exits before calling `gclib.py.GClose()`, the controller may be left in an inconsistent state.

- **Java** To use a controller with gclib, first create a `gclibjava.GclibJava()` object, then pass an address to `gclibjava.GclibJava.GOpen()`. After you are done, close the connection with `gclibjava.GclibJava.GClose()`.

### – Code

```
import gclibjava.*;

public class Connection {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);
        System.out.println(connection.GInfo());
        connection.GClose();
    }
}
```

### – Output

```
> java Connection 192.168.0.40
192.168.0.40, DMC4040 Rev 1.3i, 10601
```

### Attention

If the program exits before calling `GClose()`, the controller may be left in an inconsistent state.

- **C#** To use a controller with gclib, first create a `gclib()` object, then pass an address to `gclib.GOpen()`. After you are done, close the connection with `gclib.GClose()`.

### – Code

```
gclib connection = new gclib();
connection.GOpen(args[0]);
System.Console.WriteLine(connection.GInfo());
connection.GClose();
```

### – Output

```
> dotnet run --project Connection 192.168.0.40
192.168.0.40, DMC4040 Rev 1.3i, 10601
```



**Attention**

If the program exits before calling `gclib.GClose()`, the controller may be left in an inconsistent state.

- **VB** To use a controller with gclib, first create a `Gclib()` object, then pass an address to `Gclib.GOpen()`. After you are done, close the connection with `Gclib.GClose()`.

**– Code**

```
Module Program
    Sub Main(args As String())
        Dim connection As new Gclib()
        connection.GOpen(args(0))
        System.Console.WriteLine(connection.GInfo())
        connection.GClose()
    End Sub
End Module
```

**– Output**

```
> dotnet run --project Connection 192.168.0.40
192.168.0.40, DMC4040 Rev 1.3i, 10601
```

**Attention**

If the program exits before calling `Gclib.GClose()`, the controller may be left in an inconsistent state.

- **LabVIEW** To use a controller with gclib, first pass the address to `G Open` to receive a handle to the connection. This handle will be used in future library calls such as `G Info`, which we use to display some information about the open connection. After you are done, close the connection with `G Close`.

Connection.vi

**– Front Panel****– Block Diagram****Attention**

If the program exits before calling `G Close`, the controller may be left in an inconsistent state.

## 2.3 Commands

- **C/C++** To issue commands, use `gclib_command()` with an open connection. The following example uses `gclib_command()` to implement a basic terminal.

**– Code**

```
#include <gclibo.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h = NULL;
    char command[80];
    char response[1024];

    gclib_open(&h, argv[1]);
    gclib_revision_information(h, response, sizeof(response));
    printf("Connected to %s. Press %s to exit.\n:", response,
#ifdef WIN32
        "Ctrl+Z then Enter"
#else
        "Ctrl+D"
#endif
    );
    while (fgets(command, sizeof(command), stdin)) {
        gclib_command(h, command, response, sizeof(response));
        printf("%s%s:", response, strlen(response) ? "\n" : "");
    }
    gclib_close(&h);
    printf("\n");
    return 0;
}
```

### – Output

```
> .\commands.exe 192.168.0.40
Connected to DMC4040 Rev 1.3i. Press Ctrl+Z then Enter to exit.
:MG "Hello World"
Hello World
:^Z
```

- **Python** To issue commands, use `gclib.py.GCommand()` with an open connection.

```
>>> connection.GOpen('192.168.0.40')
>>> connection.GCommand('Hello World')
'Hello World'
```

- **Java** To issue commands, use `gclibjava.GclibJava.GCommand()` with an open connection. The following example uses `gclibjava.GclibJava.GCommand()` to implement a basic terminal.

### – Code

```
import gclibjava.*;

import java.util.NoSuchElementException;
import java.util.Scanner;

public class Commands {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);
        System.out.println(connection.GInfo());
        System.out.print(":");
        Scanner scanner = new Scanner(System.in);
        try {
            while (true) {
                String result = connection.GCommand(scanner.nextLine());
                System.out.print(result.equals(":") ? result : result + "\r\n:");
            }
        } catch (NoSuchElementException e) {}
        scanner.close();
        connection.GClose();
    }
}
```

### – Output

```
> java Commands 192.168.0.40
Connected to 192.168.0.40, DMC4040 Rev 1.3i, 10601
Use Ctrl+C to exit.
:MG "Hello World"
Hello World
:^C
```

- **C#** To issue commands, use `gclib.GCommand()` with an open connection. The following example uses `gclib.GCommand()` to implement a basic terminal.

### – Code

```
gclib connection = new gclib();
connection.GOpen(args[0]);
System.Console.WriteLine(connection.GInfo());
System.Console.Write(':');
while (true) {
    string result = connection.GCommand(System.Console.ReadLine());
    System.Console.Write(result.Length == 0 ? ":" : result + "\r\n:");
}
connection.GClose();
```

### – Output

```
> dotnet run --project Commands 192.168.0.40
Connected to 192.168.0.40, DMC4040 Rev 1.3i, 10601
Use Ctrl+C to exit.
:MG "Hello World"
Hello World
:^C
```

- **VB** To issue commands, use `Gclib.GCommand()` with an open connection. The following example uses `Gclib.GCommand()` to implement a basic terminal.

### – Code

```
Module Program
    Sub Main(args As String())
        Dim connection As new Gclib()
        connection.GOpen(args(0))
        System.Console.WriteLine(connection.GInfo())
```

```

        System.Console.Write(":")
    While (true)
        Dim result As String = connection.GCommand(System.Console.ReadLine())
        System.Console.Write(If(result.Length = 0, ":", result + Environment.NewLine + ":"))
    End While
    connection.GClose()
End Sub
End Module

```

#### – Output

```

> dotnet run --project Commands 192.168.0.40
Connected to 192.168.0.40, DMC4040 Rev 1.3i, 10601
Use Ctrl+C to exit.
:MG "Hello World"
Hello World
:^C

```

- **LabVIEW** To issue commands, use G Command with an open connection.

Commands.vi

#### – Front Panel

#### – Block Diagram

## 2.4 Errors

- **C/C++** All gclib functions provide a `gclib_result` value to indicate the error, with zero (`GCLIB_SUCCESS`) indicating success. Use `gclib_error()` to get a string description of the error.

#### – Code

```

#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h;
    char buf[128];

    gclib_open(&h, argv[1]);

    gclib_result ret = gclib_command(h, "invalid", NULL, 0);
    if (ret == GCLIB_COMMAND_ERROR) {
        printf("Error: %s\n", gclib_error(h));
        gclib_command(h, "TC1", buf, sizeof(buf));
        printf("TC1 returned: %s\n", buf);
    }

    gclib_close(&h);
}

```

#### – Output

```

> .\errors.exe 192.168.0.40
Command "invalid" caused error code 1
TC1 returned: 1 Unrecognized command

```

- **Python** If a gclib call is unsuccessful, a `gclib.GclibError` will be thrown with a description of the error.

```

>>> connection.GCommand('invalid')
Traceback (most recent call last):
...
gclib.GclibError: question mark returned by controller

```

- **Java** If a gclib call is unsuccessful, a `gclibjava.GclibJavaException()` will be thrown with the error code and description.

#### – Code

```

import gclibjava.*;

public class Errors {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);
    }
}

```

```

        try {
            connection.GCommand("invalid");
        } catch (GclibJavaException e) {
            System.out.println(String.format("Command 'invalid' returned %d: %s",
e.getErrorCode(), e.getMessage()));
        }
        connection.GClose();
    }
}

```

#### – Output

```

> java Errors 192.168.0.40
Command "invalid" returned -10000: "question mark returned by controller"

```

- **C#** If a gclib call is unsuccessful, an exception will be thrown with the error code and description.

#### – Code

```

gclib connection = new gclib();
connection.GOpen(args[0]);
try {
    System.Console.WriteLine(connection.GCommand("invalid"));
} catch (System.Exception e) {
    System.Console.WriteLine("Command 'invalid' returned " + e.Message);
}
connection.GClose();

```

#### – Output

```

> dotnet run --project Errors 192.168.0.40
Command "invalid" returned -10000: "question mark returned by controller"

```

- **VB** If a gclib call is unsuccessful, an exception will be thrown with the error code and description.

#### – Code

```

Module Program
    Sub Main(args As String())
        Dim connection As new Gclib()
        connection.GOpen(args(0))
        Try
            connection.GCommand("invalid")
        Catch e As System.Exception
            System.Console.WriteLine("Command 'invalid' returned " + e.Message)
        End Try
        connection.GClose()
    End Sub
End Module

```

#### – Output

```

> dotnet run --project Errors 192.168.0.40
Command "invalid" returned -10000: "question mark returned by controller"

```

- **LabVIEW** Standard error chaining is supported by gclib. See [gclib\\_errors.h](#) for a full list of error codes. Errors.vi

#### – Front Panel

#### – Block Diagram

## 2.5 Program & Arrays

- **C/C++** Use [gclib\\_program\(\)](#) to get the controller's program, and use [gclib\\_set\\_program\(\)](#) to set it.

#### – Code

```

#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h;

```

```

char program[1024];

gclib_open(&h, argv[1]);

gclib_set_program(h,
    "#AUTO\n"
    "MG \"Hello World\"\n"
    "EN", NULL);
gclib_program(h, program, sizeof(program));
printf("%s\n", program);

gclib_close(&h);
}

```

#### – Output

```

> .\program.exe 192.168.0.40
MG "Hello World"

```

Use `gclib_array()` to get an array from the controller, and use `gclib_set_array()` to set it. Use the start and end arguments to transfer only a subset of the array.

#### – Code

```

#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h;
    char array[128];

    gclib_open(&h, argv[1]);
    gclib_command(h, "DM test[5]", NULL, 0);

    gclib_set_array(h, "test", "1,2,3,4,5", 0, 4);
    gclib_array(h, "test", array, sizeof(array), 1, 3);
    printf("%s\n", array);

    gclib_command(h, "DA test[5]", NULL, 0);
    gclib_close(&h);
}

```

#### – Output

```

> .\arrays.exe 192.168.0.40
2.0000, 3.0000, 4.0000

```

- **Python** Use `gclib.py.GProgramUpload()` to get the controller's program, and use `gclib.py.GProgramDownload()` to set it.

```

>>> connection.GProgramDownload('MG "Hello World"')
>>> connection.GProgramUpload()
'MG "Hello World"'

```

Use `gclib.py.GArrayUpload()` and `gclib.py.GArrayDownload()` similarly for arrays. Use the first and last arguments to transfer only part of the array.

```

>>> connection.GCommand('DM test[5]')
>>> connection.GArrayDownload('test', 0, 4, [1, 2, 3, 4, 5])
>>> connection.GArrayUpload('test', 1, 3)
[2.0, 3.0, 4.0]

```

- **Java** Use `gclibjava.GclibJava.GProgramUpload()` to get the controller's program, and use `gclibjava.GclibJava.GProgramDownload()` to set it. See the [gclib Program Preprocessor](#) for advanced usage.

#### – Code

```

import gclibjava.*;

public class Program {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);
        connection.GProgramDownload("MG \"Hello World\"");
        System.out.println(connection.GProgramUpload());
        connection.GClose();
    }
}

```

#### – Output

```

> java Program 192.168.0.40
MG "Hello World"

```

Use `gclibjava.GclibJava.GArrayUpload()` to get an array from the controller, and use `gclibjava.GclibJava.GArrayDownload()` to set it.

#### – Code

```
import gclibjava.*;

public class Arrays {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);
        connection.GCommand("DM test[5]");
        connection.GArrayDownload("test", java.util.Arrays.asList(1.0, 2.0, 3.0, 4.0, 5.0));
        System.out.println(connection.GArrayUpload("test"));
        connection.GClose();
    }
}
```

#### – Output

```
> java Arrays 192.168.0.40
2.0000, 3.0000, 4.0000
```

- **C#** Use `gclib.GProgramUpload()` to get the controller's program, and use `gclib.GProgramDownload()` to set it. See the [gclib Program Preprocessor](#) for advanced usage.

#### – Code

```
gclib connection = new gclib();
connection.GOpen(args[0]);
connection.GProgramDownload("MG \"Hello World\"");
System.Console.WriteLine(connection.GProgramUpload());
connection.GClose();
```

#### – Output

```
> dotnet run --project Program 192.168.0.40
MG "Hello World"
```

Use `gclib.GArrayUpload()` to get an array from the controller, and use `gclib.GArrayDownload()` to set it.

#### – Code

```
gclib connection = new gclib();
connection.GOpen(args[0]);
connection.GCommand("DM test[5]");
List<double> test = new List<double>{1, 2, 3, 4, 5};
connection.GArrayDownload("test", ref test);
System.Console.WriteLine(string.Join(", ", connection.GArrayUpload("test")));
connection.GClose();
```

#### – Output

```
> dotnet run --project Arrays 192.168.0.40
2.0000, 3.0000, 4.0000
```

- **VB** Use `Gclib.GProgramUpload()` to get the controller's program, and use `Gclib.GProgramDownload()` to set it. See the [gclib Program Preprocessor](#) for advanced usage.

#### – Code

```
Module Program
    Sub Main(args As String())
        Dim connection As Gclib = new Gclib()
        connection.GOpen(args(0))
        connection.GCommand("DM test[5]")
        connection.GProgramDownload("MG ""Hello World""")
        System.Console.WriteLine(connection.GProgramUpload())
        connection.GClose()
    End Sub
End Module
```

#### – Output

```
> dotnet run --project Program 192.168.0.40
MG "Hello World"
```

Use `Gclib.GArrayUpload()` to get an array from the controller, and use `Gclib.GArrayDownload()` to set it.

### – Code

```
Module Program
  Sub Main(args As String())
    Dim connection As Gclib = new Gclib()
    connection.GOpen(args(0))
    connection.GCommand("DM test[5]")
    connection.GArrayDownload("test", new List(Of Double)({1, 2, 3, 4, 5}))
    System.Console.WriteLine(string.Join(", ", connection.GArrayUpload("test")))
    connection.GClose()
  End Sub
End Module
```

### – Output

```
> dotnet run --project Arrays 192.168.0.40
2.0000, 3.0000, 4.0000
```

- **LabVIEW** Use **G Program Upload** to get the controller's program, and use **G Program Download** to set it. See the [gclib Program Preprocessor](#) for advanced usage.

Program.vi

### – Front Panel

### – Block Diagram

Use **G Array Upload** to get an array from the controller, and use **G Array Download** to set it.

- Use the `first` and `last` inputs to transfer only part of the array.

Arrays.vi

### – Front Panel

### – Block Diagram

## 2.6 Unsolicited Data

- **C/C++** The unsolicited data API can be used in blocking mode or callback mode.

Blocking mode is simpler to use, but has tradeoffs. If you want unsolicited data as soon as it arrives, you must block the thread to wait for it, which may not be ideal. If you want to keep the thread running, then you must periodically check for queued unsolicited data, which can add unwanted latency.

Callback mode allows your thread to stay running while enabling immediate response to unsolicited data. When data arrives, your callback function will be invoked on a separate, dedicated thread. Due to this, callback mode can be more complicated to use if you are not familiar with thread synchronization.

- **Blocking** For synchronous usage, subscribe without providing a callback or user data pointer.

```
gclib_subscribe_messages(h, NULL, NULL);
```

Once subscribed, you can then wait a specified amount of time for unsolicited data to arrive.

```
// Time out if message doesn't arrive within one second
gclib_message(h, message_buf, sizeof(message_buf), 1000);
```

### \* Code

```
#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    gclib_handle h;
    char buf[32];

    gclib_open(&h, argv[1]);

    gclib_subscribe_messages(h, NULL, NULL);
    gclib_subscribe_interrupts(h, NULL, NULL);
```

```

gclib_subscribe_data_records(h, NULL, NULL);

gclib_set_interrupts(h, GCLIB_PROGRAM_STOPPED, 0, 0);
gclib_set_data_records(h, 8);

gclib_set_program(h, "MG \"Hello World\"; EN", NULL);
gclib_command(h, "XQ", NULL, 0);

gclib_message(h, buf, sizeof(buf), -1);
printf("Got message: %s\n", buf);

gclib_interrupt_t interrupt;
gclib_interrupt(h, &interrupt, -1);
printf("Got interrupt status byte: %i\n", interrupt.status);

gclib_data_record_handle data_record;
gclib_data_record(h, &data_record, -1);
printf("Got data record, sample %i\n", gclib_data_record_sample(data_record));

gclib_set_data_records(h, 0);
gclib_close(&h);
}

```

#### \* Output

```

> .\unsolicited.exe 192.168.0.40
Got message Hello World
Got data record, sample 39306
Got interrupt 240

```

- **Callback** For asynchronous usage, subscribe with a callback function and an arbitrary data pointer (which can be NULL). Each time unsolicited data arrives, your callback will be invoked and the pointer will be passed to it.

```

void handle_message(void*, const char* message) {
    printf("Message received: %s", message);
};

gclib_subscribe_messages(h, handle_message, NULL);

```

#### Attention

The callback will be invoked on a separate thread. Be sure to protect any shared data!

#### \* Code

```

#include <gclib.h>
#include <stdio.h>
#include "sleep.h"

void handle_message(void* user_data, const char* message) {
    printf("Got message: %s\n", message);
}

void handle_interrupt(void* user_data, gclib_interrupt_t interrupt) {
    printf("Got interrupt status byte: %i\n", interrupt.status);
}

void handle_data_record(void* user_data, gclib_data_record_handle data_record) {
    printf("Got data record, sample %i\n", gclib_data_record_sample(data_record));
}

int main(int argc, char* argv[]) {
    gclib_handle h;
    gclib_open(&h, argv[1]);

    gclib_subscribe_messages(h, handle_message, NULL);
    gclib_subscribe_interrupts(h, handle_interrupt, NULL);
    gclib_subscribe_data_records(h, handle_data_record, NULL);

    gclib_set_interrupts(h, GCLIB_PROGRAM_STOPPED, 0, 0);
    gclib_set_data_records(h, 200);

    char buf[16];
    gclib_set_program(h, "WT 100; MG \"Hello World\"; EN", NULL);
    gclib_command(h, "XQ", NULL, 0);

    msleep(300);
    gclib_close(&h);
}

```

#### \* Output

```

> .\callback.exe 192.168.0.40
Got message Hello World
Got data record, sample 39306
Got interrupt 240

```

For a full list of data record fields, see the [Data Record API](#).



**Note**

Controllers with default settings will not generate interrupts or data records. Use `gclib_set_interrupts()` and `gclib_set_data_records()` to configure your controller if needed.

- **Python**

```
>>> connection.GClose()
>>> connection.GOpen('192.168.0.40 --subscribe ALL')
```

Use `gclib.py.GMessage()` to get unsolicited messages from the controller, and `gclib.py.GInterrupt()` to get event interrupts. If there is no data available, these methods will block up to five seconds before timing out.

```
>>> connection.GProgramDownload('MG "Hello World"; UI0; EN')
>>> connection.GCommand('XQ')
"
>>> connection.GMessage()
'Hello World\r\n'
>>> connection.GInterrupt()
240
```

- **Java** Use `gclibjava.GclibJava.GMessage()` to get unsolicited messages from the controller, `gclibjava.GclibJava.GInterrupt()` to get event interrupts, and `gclibjava.GclibJava.GRecord()` to get data records. If there is no data available, these methods will block up to five seconds before timing out.

- **Code**

```
import gclibjava.*;

public class Unsolicited {
    public static void main(String[] args) throws GclibJavaException {
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);

        connection.GProgramDownload("MG \"Hello World\"; UI0; EN");
        connection.GCommand("XQ");

        System.out.println("Got message " + connection.GMessage());
        System.out.println("Got interrupt " + connection.GInterrupt());

        connection.GClose();
    }
}
```

- **Output**

```
> java Unsolicited "192.168.0.40 --subscribe ALL"
Got message Hello World
Got data record 39306
Got interrupt 240
```

- **C#** Use `gclib.GMessage()` to get unsolicited messages from the controller, `gclib.GInterrupt()` to get event interrupts, and `gclib.GRecord()` to get data records. If there is no data available, these methods will block up to five seconds before timing out.

- **Code**

```
using Galil;
Gclib connection = new Gclib();

connection.GOpen(args[0] + " --subscribe ALL");
connection.GProgramDownload("MG \"Hello World\"; UI0; EN");
connection.GCommand("XQ");
System.Console.Write("Got message " + connection.GMessage());
System.Console.WriteLine("Got interrupt " + connection.GInterrupt());

connection.GCommand("DR8");
System.Console.WriteLine("Got data record " +
    connection.GRecord<Gclib.GDataRecord4000>(true).sample_number);
connection.GCommand("DR0");
connection.GClose();
```

- **Output**

```
> dotnet run --project Unsolicited 192.168.0.40
Got message Hello World
Got data record 39306
Got interrupt 240
```

- **VB** Use `Gcplib.GMessage()` to get unsolicited messages from the controller, `Gcplib.GInterrupt()` to get event interrupts, and `Gcplib.GRecord()` to get data records. If there is no data available, these methods will block up to five seconds before timing out.

#### – Code

```
Module Program
    Sub Main(args As String())
        Dim connection As new Gcplib()

        connection.GOpen(args(0) + " --subscribe ALL")
        connection.GProgramDownload("MG ""Hello World""; UI0; EN")
        connection.GCommand("XQ")
        System.Console.WriteLine("Got message " + connection.GMessage())
        System.Console.WriteLine("Got interrupt {0}", connection.GInterrupt().ToString())

        connection.GCommand("DR8")
        System.Console.WriteLine("Got data record {0}", connection.GRecord(Of
Gcplib.GDataRecord4000)(true).sample_number)
        connection.GCommand("DR0")
        connection.GClose()
    End Sub
End Module
```

#### – Output

```
> dotnet run --project Unsolicited 192.168.0.40
Got message Hello World
Got data record 39306
Got interrupt 240
```

- **LabVIEW** Use `G Message` to get unsolicited messages from the controller, `G Interrupt` to get event interrupts, and `G Record` to get data records. If there is no data available, these methods will block up to five seconds before timing out.

For `G Record`, note that memory must be allocated using the 'Initialize Array' node to store the data record packet. This memory space is filled with the information in the data record packet and then parsed using the 'Index Array' and 'Join Numbers' nodes.

Unsolicited.vi

#### – Front Panel

#### – Block Diagram

## 2.7 Galil Connect

Galil Connect allows `gcplib` to issue commands through a remote `gcaps` server. This makes debugging closed or distant systems much easier.

- **C/C++** On the device hosting the remote `gcaps` server, use `gcplib_set_published()`.

#### – Code

```
#include <gcplib.h>
#include <stdio.h>
#include <stdbool.h>

int main(int argc, char* argv[]) {
    gcplib_set_published(argv[1]);
    printf("Published remote gcaps server \"%s\"\n", argv[1]);
}
```

#### – Output

```
> .\server.exe pi
Published remote gcaps server "pi"
```

On the client, use `gcplib_list_servers()` to view all available `gcaps` servers. Pass a server name to `gcplib_set_server()` for future `gcplib` calls to be routed through that `gcaps` server. When done, pass `NULL` to `gcplib_set_server()` to disconnect from the remote `gcaps` server.

**– Code**

```
#include <gclib.h>
#include <stdio.h>

int main(int argc, char* argv[]) {
    char buf[1024];
    gclib_handle h;

    gclib_list_servers(buf, sizeof(buf));
    printf("Available servers:\n%s\n", buf);
    gclib_set_server(argv[1]);

    gclib_addresses(buf, sizeof(buf));
    printf("\nAddresses reported by %s:\n%s", argv[1], buf);
    gclib_open(&h, argv[2]);
    gclib_revision_information(h, buf, sizeof(buf));
    printf("\nConnected to %s\n", buf);
    gclib_close(&h);

    gclib_set_server(NULL);
}
```

**– Output**

```
> .\client.exe pi COM5
Available servers:
pi

Addresses reported by pi:
COM5

Connected to COM5, DMC31010 Rev 1.4f, 12345
```

**• Python**

On the device hosting the remote gcaps server (in this example a Raspberry Pi), use `gclib.py.GPublishServer()`.

```
>>> connection.GPublishServer('pi', True, True)
```

On the client, use `gclib.py.GListServers()` to view all available gcaps servers. Pass a server name to `gclib.py.GSetServer()` for future gclib calls to be routed through that gcaps server. When done, pass the special string "Local" to `gclib.py.GSetServer()` to disconnect from the remote gcaps server.

```
>>> connection.GListServers()
'pi'
>>> connection.GSetServer('pi')
>>> connection.GAddresses()
{'COM5': ''}
>>> connection.GOpen("COM5")
>>> connection.GInfo()
'COM5, DMC31010 Rev 1.4f, 12345'
>>> connection.GClose()
>>> connection.GSetServer('Local')
```

- **Java** On the device hosting the remote gcaps server (in this example a Raspberry Pi), use `gclibjava.GclibJava.GPublishServer()`.

**– Code**

```
import gclibjava.*;

public class Server {
    public static void main(String[] args) throws GclibJavaException {
        new GclibJava().GPublishServer(args[0], 1, 1);
        System.out.println("Published remote gcaps server " + args[0]);
    }
}
```

**– Output**

```
> java Server pi
Published gcaps server "pi"
```

On the client, use `gclibjava.GclibJava.GListServers()` to view all available gcaps servers. Pass a server name to `gclibjava.GclibJava.GSetServer()` for future gclib calls to be routed through that gcaps server. When done, pass the special string "Local" to `gclibjava.GclibJava.GSetServer()` to disconnect from the remote gcaps server.

**– Code**

```
import gclibjava.*;

public class Client {
    public static void main(String[] args) throws GclibJavaException {
```

```

        GclibJava connection = new GclibJava();
        System.out.println(connection.GListServers());
        connection.GSetServer(args[0]);

        System.out.println("Addresses reported by pi: " + connection.GAddresses());
        connection.GOpen(args[1]);
        System.out.println(connection.GInfo());
        connection.GClose();

        connection.GSetServer("Local");
    }
}

```

#### – Output

```

> java Client pi COM5
Available servers:
pi

Addresses reported by pi:
COM5

Connected to COM5, DMC31010 Rev 1.4f, 12345

```

- **C#** On the device hosting the remote gcaps server (in this example a Raspberry Pi), use `gclib.GPublishServer()`.

#### – Code

```

gclib connection = new gclib();
connection.GPublishServer(args[0], true, true);
System.Console.WriteLine("Published remote gcaps server " + args[0]);

```

#### – Output

```

> dotnet run --project Server pi
Published gcaps server "pi"

```

On the client, use `gclib.GListServers()` to view all available gcaps servers. Pass a server name to `gclib.GSetServer()` for future gclib calls to be routed through that gcaps server.

#### – Code

```

gclib connection = new gclib();
System.Console.WriteLine("Available servers:" + Environment.NewLine +
    string.Join(Environment.NewLine, connection.GListServers()));
connection.GSetServer(args[0]);
System.Console.WriteLine(Environment.NewLine + "Addresses reported by pi: " + Environment.NewLine +
    string.Join(Environment.NewLine, connection.GAddresses()));
connection.GOpen(args[1]);
System.Console.WriteLine(Environment.NewLine + "Connected to " + connection.GInfo());
connection.GSetServer("Local");

```

#### – Output

```

> dotnet run --project Client pi COM5
Available servers:
pi

Addresses reported by pi:
COM5

Connected to COM5, DMC31010 Rev 1.4f, 12345

```

- **VB** On the device hosting the remote gcaps server (in this example a Raspberry Pi), use `Gclib.GPublishServer()`.

#### – Code

```

Module Program
    Sub Main(args As String())
        Dim connection As new Gclib()
        connection.GPublishServer(args(0), true, true)
        System.Console.WriteLine("Published remote gcaps server " + args(0))
    End Sub
End Module

```

#### – Output

```

> dotnet run --project Server pi
Published gcaps server "pi"

```

On the client, use `Gclib.GListServers()` to view all available gcaps servers. Pass a server name to `Gclib.GSetServer()` for future gclib calls to be routed through that gcaps server.

### – Code

```
Module Program
    Sub Main(args As String())
        Dim connection As new Gclib()
        System.Console.WriteLine("Available servers: " + Environment.NewLine +
String.Join(Environment.NewLine, connection.GListServers()))
        connection.GSetServer(args(0))
        System.Console.WriteLine(Environment.NewLine + "Addresses reported by pi: " +
Environment.NewLine + String.Join(Environment.NewLine, connection.GAddresses()))
        connection.GOpen(args(1))
        System.Console.WriteLine(Environment.NewLine + "Connected to " + connection.GInfo())
        connection.GSetServer("Local")
    End Sub
End Module
```

### – Output

```
> dotnet run --project Client pi COM5
Available servers:
pi

Addresses reported by pi:
COM5

Connected to COM5, DMC31010 Rev 1.4f, 12345
```

- **LabVIEW** On the device hosting the remote gcaps server (in this example a Raspberry Pi), use `G Publish Server`.

Server.vi

### – Front Panel

### – Block Diagram

On the client, use `G List Servers` to view all available gcaps servers. Pass a server name to `G Set Server` for future `gclib` calls to be routed through that gcaps server. When done, pass the special string "Local" to `G Set Server` to disconnect from the remote gcaps server.

Client.vi

### – Front Panel

### – Block Diagram

## 2.8 Example Project: Record and Replay

This project contains two example programs.

- **C/C++** The 'Record' example uses `RA` in continuous mode along with `GArrayUpload()` to allow recording movement for an arbitrary amount of time. It produces a file with the recorded positions of all axes.

### – Code

```
#include <gclib.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include "sleep.h"

void check(gclib_result ret, gclib_handle h) {
    char error[128];
    if (ret == GCLIB_SUCCESS) {
        return;
    } else if (ret == GCLIB_COMMAND_ERROR) {
        gclib_command(h, "TC1", error, sizeof(error));
        printf("%s\n", error);
    }
}
```

```

    }

    fprintf(stderr, "Error %i: %s\n", ret, gclib_error(h));
    gclib_close(&h);
    exit(ret);
}

int main(int argc, char* argv[]) {
    if (argc != 3) {
        fprintf(stderr, "Usage: record.exe ADDRESS SECONDS\n");
        return 1;
    }

    char* buf = (char*)malloc(16384);

    gclib_result ret = GCLIB_SUCCESS;
    union GDataRecord record;
    size_t bytesReturned;

    gclib_handle h = NULL;
    if (gclib_open(&h, argv[1]) != GCLIB_SUCCESS) {
        fprintf(stderr, "Failed to open connection to controller");
        exit(1);
    }

    char arrayName[5];
    sprintf(arrayName, "posA");

    gclib_command(h, "MO", NULL, 0);
    gclib_command(h, "DM posA[1000]", NULL, 0);
    gclib_command(h, "RA posA[]", NULL, 0);
    gclib_command(h, "RD _TPA", NULL, 0);
    gclib_command(h, "RC 1,-1000", NULL, 0);

    size_t start = 0, end;
    char* positions = (char*)malloc(16384);
    char* token;
    int count;
    time_t startTime = time(NULL);
    FILE* file = fopen("positions.txt", "w");
    while (difftime(time(NULL), startTime) < atof(argv[2])) {
        msleep(500);
        gclib_command(h, "MG_RD", buf, 16384);
        end = atoi(buf);
        check(gclib_array(h, arrayName, positions, 16384, start, end < start ? 0 : end), h);
        printf("%zu\n", strlen(positions));
        if (end < start) {
            check(gclib_array(h, arrayName, buf, 16384, 0, end), h);
            printf("%zu\n", strlen(buf));
            strcat(positions, " ");
            strcat(positions, buf);
        }
        count = end - start;
        if (end < start)
            count += 1000;
        for (int i = 0; i < count; i++) {
            token = strtok(i == 0 ? positions : NULL, " ");
            if (token == NULL)
                break;
            fprintf(file, "%s", token);
            fputc('\n', file);
        }
        start = end;
    }
    fclose(file);

    gclib_command(h, "RC 0", NULL, 0);
    gclib_close(&h);
}

```

### – Output

```
> .\record.exe 192.168.0.40 5
```

The 'Replay' example uses the file produced by 'Record' along with **CM** to accurately reproduce the recorded movement. Note that all axes must be properly set up for motion.

### – Code

```

#include <gclib.h>
#include <stdio.h>
#include <stdlib.h>
#include "sleep.h"

void check(gclib_result ret, gclib_handle h) {
    char error[128];
    if (ret == GCLIB_SUCCESS)

```

```

        return;
    if (ret == GCLIB_COMMAND_ERROR) {
        gclib_command(h, "TC1", error, sizeof(error));
        printf("%s\n", error);
    }
    fprintf(stderr, "Error %i: %s\n", ret, gclib_error(h));
    gclib_close(&h);
    exit(ret);
}

int main(int argc, char* argv[]) {
    if (argc != 2) {
        fprintf(stderr, "Usage: replay.exe ADDRESS\n");
        return 0;
    }

    char* buf = (char*)malloc(16384);

    GCon h = NULL;
    if (gclib_open(&h, argv[1]) != GCLIB_SUCCESS) {
        fprintf(stderr, "Failed to open connection to controller");
        exit(1);
    }

    gclib_command(h, "MG_CM", NULL, 0);
    int contourSpace = atof(buf);

    gclib_command(h, "SH A", NULL, 0);
    gclib_command(h, "CM A", NULL, 0);
    gclib_command(h, "DT -1", NULL, 0);

    FILE* f = fopen("positions.txt", "r");
    if (f == NULL) {
        fprintf(stderr, "Failed to open positions.txt");
        return 1;
    }

    int lastPosition;
    int position;
    fgets(buf, 16384, f);
    lastPosition = atof(buf);
    while (fgets(buf, 16384, f)) {
        position = atof(buf);
        sprintf(buf, "CD %i", position - lastPosition);
        lastPosition = position;
        if (gclib_command(h, buf, NULL, 0) == GCLIB_COMMAND_ERROR) {
            check(gclib_command(h, "MG_TC", buf, 16384), h);
            if ((int)atof(buf) == 32) {
                gclib_command(h, "MG_DT", buf, 16384);
                if ((int)atof(buf) == -1)
                    gclib_command(h, "DT 1", NULL, 0);
                msleep(100);
            }
        }
    }

    do {
        gclib_command(h, "MG_CM", buf, 0);
    } while ((int)atof(buf) < contourSpace);
    fclose(f);

    gclib_command(h, "CD 0=0", NULL, 0);
    gclib_command(h, "MO", NULL, 0);
    gclib_close(&h);
}

```

#### – Output

```
> .\replay.exe 192.168.0.40
```

- **Python** The 'Record' example uses [RA](#) in continuous mode along with `gclib.py.GProgramUpload()` to allow recording movement for an arbitrary amount of time. It produces a file with the recorded positions of all axes.

#### – Code

```

import gclib
import sys
import time

def main():
    if (len(sys.argv) != 3):
        print(f"Usage: record.py ADDRESS SECONDS", file=sys.stderr)
        return

    connection = gclib.py()

```

```

try:
    connection.GOpen(sys.argv[1])

    connection.GCommand('MO')
    connection.GCommand('DM posA[1000]')
    connection.GCommand('RA posA[]')
    connection.GCommand('RD _TPA')
    connection.GCommand('RC 1,-1000') # Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

    start = 0
    end = -1
    positions = None
    startTime = time.time()
    f = open("positions.txt", "w")
    while (time.time() - startTime < float(sys.argv[2])):
        time.sleep(0.5); # Assumes TM1000
        end = int(float(connection.GCommand("MG_RD")))
        positions = connection.GArrayUpload('posA', start, -1 if end < start else end)
        if end < start:
            positions += connection.GArrayUpload('posA', 0, end)
        for i in range(end - start if end > start else 1000 - start + end):
            f.write(str(positions[i]) + '\n')
        start = end
    f.close()
except gclib.GclibError as e:
    print(e)
connection.GCommand("RC 0")
connection.GClose()

if __name__ == '__main__':
    main()

```

### – Output

```
> python record.py 192.168.0.40 5
```

The 'Replay' example uses the file produced by 'Record' along with **CM** to accurately reproduce the recorded movement. Note that all axes must be properly set up for motion.

### – Code

```

import gclib
import sys
import time

def main():
    if len(sys.argv) != 2:
        print(f'Usage: replay.py ADDRESS', file=sys.stderr)
        return 1

    connection = gclib.py()
    try:
        connection.GOpen(sys.argv[1])
        connection.GCommand('SH A')
        connection.GCommand('CM A')
        connection.GCommand('DT -1')

        contourSpace = int(float(connection.GCommand('MG_CM')))

        f = open("positions.txt", "r")

        lastPosition = None
        for line in f.read().splitlines():
            position = int(float(line))
            if lastPosition:
                movement = position - lastPosition
                try:
                    connection.GCommand(f'CD {str(movement)}')
                except gclib.GclibError:
                    if (connection.GCommand('TC1') != '32 Segment buffer full'):
                        raise
                    if (int(float(connection.GCommand('MG_DT'))) == -1):
                        connection.GCommand('DT 1')
                        time.sleep(0.1)
            lastPosition = position
        f.close()

        while int(float(connection.GCommand('MG_CM'))) < contourSpace:
            time.sleep(0.5)

    except gclib.GclibError as e:
        print(e)
    except OSError:
        print('Failed to open positions.txt')
    connection.GCommand('CD 0=0')
    connection.GCommand('MO')

```



```
connection.GClose()

if __name__ == '__main__':
    main()
```

#### – Output

```
> python replay.py 192.168.0.40
```

- **Java** The 'Record' example uses **RA** in continuous mode along with `gclibjava.GclibJava.GProgramUpload()` to allow recording movement for an arbitrary amount of time. It produces a file with the recorded positions of all axes.

#### – Code

```
import gclibjava.*;

import java.util.NoSuchElementException;
import java.util.Scanner;
import java.util.List;
import java.util.ArrayList;
import java.util.Collections;
import java.io.FileWriter;
import java.io.IOException;

public class Record {
    public static void main(String[] args) throws GclibJavaException, IOException,
        InterruptedException {
        if (args.length != 2) {
            System.out.println("Usage: Record ADDRESS SECONDS");
            return;
        }
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);

        connection.GCommand("MO");
        connection.GCommand("DM posA[1000]");
        connection.GCommand("RA posA[]");
        connection.GCommand("RD _TPA");
        connection.GCommand("RC 1,-1000"); // Assuming TM1000, record at 2ms intervals (1ms on
        DMC30010 / EDD37010 / RIO47000)

        List<Double> array = new ArrayList<Double>();
        long startTime = System.currentTimeMillis();
        short start = 0, end;

        try (FileWriter fw = new FileWriter("positions.txt")) {
            while (System.currentTimeMillis() - startTime < Float.parseFloat(args[1]) * 1000) {
                Thread.sleep(500);
                end = (short)Float.parseFloat(connection.GCommand("MG_RD"));
                array = connection.GArrayUpload("posA", start, end < start ? (short)-1 : end);
                if (end < start) {
                    array.addAll(connection.GArrayUpload("posA", 0, end));
                }
                for (int i = 0; i < (end > start ? end - start : 1000 - start + end); i++) {
                    fw.write(array.get(i).toString() + System.lineSeparator());
                }
                start = end;
            }
        }
        connection.GCommand("RC 0");
        connection.GClose();
    }
}
```

#### – Output

```
> java record 192.168.0.40 5
```

The 'Replay' example uses the file produced by 'Record' along with **CM** to accurately reproduce the recorded movement. Note that all axes must be properly set up for motion.

#### – Code

```
import gclibjava.*;

import java.util.NoSuchElementException;
import java.util.Scanner;
import java.util.List;
import java.util.ArrayList;
import java.util.Collections;
import java.io.FileReader;
import java.io.BufferedReader;
import java.io.IOException;
```

```

import java.io.FileNotFoundException;

public class Replay {
    public static void main(String[] args) throws GclibJavaException, IOException,
        InterruptedException {
        if (args.length != 1) {
            System.out.println("Usage: Replay ADDRESS");
            System.exit(1);
        }
        GclibJava connection = new GclibJava();
        connection.GOpen(args[0]);

        connection.GCommand("SH A");
        connection.GCommand("CM A");
        connection.GCommand("DT -1");

        int contourSpace = (int)Float.parseFloat(connection.GCommand("MG_CM"));

        long startTime = System.currentTimeMillis();
        try (BufferedReader br = new BufferedReader(new FileReader("positions.txt"))) {
            String line = br.readLine();
            Float position;
            Float lastPosition = null;
            String movement;
            while (line != null) {
                position = Float.parseFloat(line);
                if (lastPosition == null) {
                    lastPosition = position;
                    continue;
                }
                movement = String.valueOf((int)(position - lastPosition));
                try {
                    connection.GCommand("CD " + movement);
                } catch (GclibJavaException e) {
                    if (!e.getErrorCode() == -10000 &&
                        connection.GCommand("TC1").startsWith("32"))
                        throw e;
                    if ((int)Float.parseFloat(connection.GCommand("MG_DT")) == -1)
                        connection.GCommand("DT 1");
                    Thread.sleep(500);
                }
                lastPosition = position;
                line = br.readLine();
            }
        } catch (FileNotFoundException e) {
            System.out.println("Failed to open positions.txt");
            System.exit(1);
        }

        while ((int)Float.parseFloat(connection.GCommand("MG_CM")) < contourSpace)
            Thread.sleep(500);

        connection.GCommand("CD 0=0");
        connection.GCommand("MO");
        connection.GClose();
    }
}

```

### – Output

```
> java replay 192.168.0.40
```

- **C#** The 'Record' example uses **RA** in continuous mode along with **Gclib.GProgramUpload()** to allow recording movement for an arbitrary amount of time. It produces a file with the recorded positions of all axes.

### – Code

```

if (args.Length != 2) {
    System.Console.WriteLine("Usage: record.exe ADDRESS SECONDS");
    return 1;
}

gclib connection = new gclib();
try {
    connection.GOpen(args[0]);

    connection.GCommand("MO");
    connection.GCommand("DM posA[1000]");
    connection.GCommand("RA posA[]");
    connection.GCommand("RD _TPA");
    connection.GCommand("RC 1,-1000"); // Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

    List<double> positions = new List<double>();
    int startTime = DateTime.Now.Second;
    short start = 0, end;
    using (StreamWriter file = new StreamWriter("positions.txt")) {

```

```

        while (DateTime.Now.Second - startTime < float.Parse(args[1])) {
            System.Threading.Thread.Sleep(500);
            end = (short)float.Parse(connection.GCommand("MG_RD"));
            positions = connection.GArrayUpload("posA", start, end < start ? (short)-1 : end);
            if (end < start)
                positions.AddRange(connection.GArrayUpload("posA", 0, end));
            for (int i = 0; i < (end > start ? end - start : 1000 - start + end); i++)
                file.WriteLine(positions[i].ToString());
            start = end;
        }
    }
} catch (System.Exception e) {
    if (e.Message.StartsWith("-10000"))
        System.Console.WriteLine(connection.GCommand("TC1"));
    else
        System.Console.WriteLine(e.Message);
}
connection.GCommand("RC 0");
connection.GClose();
return 0;

```

### – Output

```
> dotnet run --project Record 192.168.0.40 5
```

The 'Replay' example uses the file produced by 'Record' along with **CM** to accurately reproduce the recorded movement. Note that all axes must be properly set up for motion.

### – Code

```

if (args.Length != 1) {
    System.Console.WriteLine("Usage: record.exe ADDRESS");
    return 1;
}

gclib connection = new gclib();
try {
    connection.GOpen(args[0]);

    connection.GCommand("SH A");
    connection.GCommand("CM A");
    connection.GCommand("DT -1"); // Assuming TM1000, record at 2ms intervals (1ms on DMC30010 /
    EDD37010 / RIO47000)

    int contourSpace = (int)float.Parse(connection.GCommand("MG_CM"));

    int startTime = DateTime.Now.Second;
    try {
        using (StreamReader sr = new StreamReader("positions.txt")) {
            string? line = sr.ReadLine();
            int position;
            int? lastPosition = null;
            while (line != null) {
                position = int.Parse(line);
                if (lastPosition == null) {
                    lastPosition = position;
                    continue;
                }
                try {
                    connection.GCommand($"CD {position - lastPosition}");
                } catch (System.Exception e) {
                    if (!(e.Message.StartsWith("-10000") &&
connection.GCommand("TC1").StartsWith("32")))
                        throw;
                    if ((int)float.Parse(connection.GCommand("MG_DT")) == -1)
                        connection.GCommand("DT 1");
                    System.Threading.Thread.Sleep(500);
                }
                lastPosition = position;
                line = sr.ReadLine();
            }
        }
    } catch (System.Exception) {
        Console.WriteLine("Failed to open positions.txt");
    }
    while ((int)float.Parse(connection.GCommand("MG_CM")) < contourSpace)
        System.Threading.Thread.Sleep(500);
} catch (System.Exception e) {
    if (e.Message.StartsWith("-10000"))
        System.Console.WriteLine(connection.GCommand("TC1"));
    else
        System.Console.WriteLine(e.Message);
}
connection.GCommand("CD 0=0");
connection.GCommand("MO");
connection.GClose();
return 0;

```

### – Output

```
> dotnet run --project Replay 192.168.0.40
```

- **VB** The 'Record' example uses **RA** in continuous mode along with **GcLib.GProgramUpload()** to allow recording movement for an arbitrary amount of time. It produces a file with the recorded positions of all axes.

### – Code

```
Module Program
    Function Main(args As String()) As Integer
        If args.Length <> 2
            System.Console.WriteLine("Usage: record.exe ADDRESS SECONDS")
            Return 1
        End If

        Dim connection As new gcLib()
        Try
            connection.GOpen(args(0))

            connection.GCommand("MO")
            connection.GCommand("DM posA[1000]")
            connection.GCommand("RA posA[]")
            connection.GCommand("RD _TPA")
            connection.GCommand("RC 1,-1000") ' Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

            Dim positions As List(Of Double)
            Dim startTime As Date = Now
            Dim endTime As Date = DateAdd("s", Single.Parse(args(1)), startTime)
            Dim first As Short = 0
            Dim last As Short
            first = 0
            Using writer As System.IO.StreamWriter = New System.IO.StreamWriter("positions.txt")
                While Now < endTime
                    System.Threading.Thread.Sleep(500)
                    last = Single.Parse(connection.GCommand("MG_RD"))
                    positions = connection.GArrayUpload("posA", first, If(last < first, -1,
last))

                    If (last < first)
                        positions.AddRange(connection.GArrayUpload("posA", 0, last))
                    End If
                    For i = 0 To If(last > first, last - first, 1000 - first + last)
                        writer.WriteLine(positions(i).ToString())
                    Next
                    first = last
                End While
            End Using
            Catch e As System.Exception
                If e.Message.StartsWith("-10000")
                    System.Console.WriteLine(connection.GCommand("TC1"))
                Else
                    System.Console.WriteLine(e.Message)
                End If
            End Try
            connection.GCommand("RC 0")
            connection.GClose()
            Return 0
        End Try
    End Function
End Module
```

### – Output

```
> dotnet run --project record 192.168.0.40 5
```

The 'Replay' example uses the file produced by 'Record' along with **CM** to accurately reproduce the recorded movement. Note that all axes must be properly set up for motion.

### – Code

```
Module Program
    Function Main(args As String()) As Integer
        If args.Length <> 1
            System.Console.WriteLine("Usage: record.exe ADDRESS")
            Return 1
        End If

        Dim connection As new gcLib()
        Try
            connection.GOpen(args(0))

            connection.GCommand("SH A")
            connection.GCommand("CM A")
```

```

        connection.GCommand("DT -1") ' Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

Dim contourSpace As Integer = Single.Parse(connection.GCommand("MG_CM"))

Dim startTime As Integer = DateTime.Now.Second
Try
    Using sr As System.IO.StreamReader = new System.IO.StreamReader("positions.txt")
        Dim line As String = sr.ReadLine()
        Dim position As Integer
        Dim lastPosition As Integer? = Nothing
        While line <> Nothing
            position = Integer.Parse(line)
            If lastPosition Is Nothing
                lastPosition = position
            Continue While
        End If
        Try
            connection.GCommand($"CD {position - lastPosition}")
        Catch E As System.Exception
            If Not (E.Message.StartsWith("-10000") And
connection.GCommand("TC1").StartsWith("32"))
                Throw
            End If
            If CType(Single.Parse(connection.GCommand("MG_DT")), Integer) = -1
                connection.GCommand("DT 1")
            End If
            System.Threading.Thread.Sleep(500)
        End Try
        lastPosition = position
        line = sr.ReadLine()
    End While
End Using
Catch E As System.Exception
    Console.WriteLine("Failed to open positions.txt")
    Console.WriteLine(e.Message)
End Try

While CType(Single.Parse(connection.GCommand("MG_CM")), Integer) < contourSpace
    System.Threading.Thread.Sleep(500)
End While

Catch e As System.Exception
    If (e.Message.StartsWith("-10000"))
        System.Console.WriteLine(connection.GCommand("TC1"))
    Else
        System.Console.WriteLine(e.Message)
    End If
End Try
connection.GCommand(String.Format("CD 0=0"))
connection.GCommand("MO")
connection.GClose()
Return 0
End Function
End Module

```

### – Output

```
> dotnet run --project replay 192.168.0.40
```



## Chapter 3

# GalilTools

To provide maximum compatibility, gclib ships with an open source wrapper implementation of the GCL (GalilTools Communication Library). Users wanting to upgrade to gclib that have source built on Galil.h can use this wrapper to minimize source changes. This wrapper is also indicated for users that want the same function calls as Galil.h, but don't want the usage of `QT` as in galil1.dll.

**This wrapper is intended for existing applications already using the library distributed with GalilTools (galil1.dll) or the previous STL library (galil2.dll). New applications should be written with gclib.**

### 3.1 Windows

#### 3.1.1 Compile galil2.dll with MSVC 2013

The following instructions were performed on *Visual Studio Professional 2013* and can be extended to other Visual Studio versions. For brevity, the instructions assume the default installation location of **C:\Program Files (x86)\Galil\gclib** and a build type of **x86 (win32)**.

#### 3.1.2 Launch the compiler command prompt

- Open *VS2013 x86 Native Tools Command Prompt*.
- Navigate to a convenient, writable location, e.g. *C:\temp*.

#### 3.1.3 Set an environment variable for the base path

```
C:\temp>set base=C:\Program Files (x86)\Galil\gclib
```

#### 3.1.4 Compile the source code

**Note the quotes.**

```
C:\temp>cl -c "%base%\source\wrappers\gcl\*.cpp" -I "%base%\include" -EHsc -MD
```

#### 3.1.5 Link the source code

**Note the quotes.**

```
C:\temp>link /DLL gcl_datarecord.obj gcl_galil.obj "%base%\lib\dynamic\x86\gclib.lib" "%base%\lib\dynamic\x86\
```

The output files *galil2.dll* and *galil2.lib* can now be used in a project using the GCL.

### 3.1.6 Test

Help the loader find the right dlls.

```
C:\temp>set PATH=%PATH%;%BASE%\dll\x86
```

Link the simple example.

```
C:\temp>link gcl_simple.obj "%base%\lib\dynamic\x86\gclib.lib" "%base%\lib\dynamic\x86\gclibo.lib" galil2.lib
```

Run the example.

```
C:\temp>simple.exe
Galil2.dll wrapper, gclib 106.75.180
10.1.3.169, DMC4020 Rev 1.2c, 291
```

---

## 3.2 Linux

### 3.2.1 Copy files

```
$ cp -r /usr/share/gclib/src/wrappers/gcl .
$ cd gcl
$ ls
Galil.h          gcl_galil.cpp  gcl_simple.cpp
gcl_datarecord.cpp gcl_galil.h    makefile
```

### 3.2.2 Make and install

```
$ make
gcl open source wrapper for gclib
  Compiling wrapper, libgalil.so.2.0
g++ -c -fPIC -std=c++11 gcl_datarecord.cpp gcl_galil.cpp
  Linking wrapper into shared library.
g++ -shared -o libgalil.so.2.0 *.o -Wl,-soname=libgalil.so.2
strip --strip-unneeded libgalil.so.2.0
  Cleaning up.
$ sudo make install
Installing libgalil.so.2.0
install -m 755 libgalil.so.2.0 /usr/lib
install -m 644 Galil.h /usr/lib
ldconfig
ln -s /usr/lib/libgalil.so.2 /usr/lib/libgalil.so
$ make clean
Cleaning project...
```

### 3.2.3 Test

```
$ g++ gcl_simple.cpp -lgalil -lgclib -lgclibo -o simple
$ ./simple
Galil2.dll wrapper, gclib 95.71.164
10.1.3.169, DMC4020 Rev 1.2c, 291
```



## Chapter 4

# License

- gclib is licensed under the [MIT-0 License](#).
- gclib and gcaps use [OpenSSL](#), which is licensed under the [Apache 2.0 License](#).
  - The Java wrapper uses [JNA](#), which is also licensed under the [Apache 2.0 License](#).
- This documentation uses the [doxygen-awesome-css](#) theme, which is covered by the [MIT License](#).



## Chapter 5

# Program Preprocessor

gclib's program downloader provides a preprocessor for DMC code. The preprocessor modifies the program prior to download providing a number of language features not present in native DMC code. The preprocessor is invoked in the following two ways.

1. With both `GProgramDownload()` and `GProgramDownloadFile()` via the `preprocessor` argument. Downloading code with null for the preprocessor argument uses defaults.
2. From within DMC code via in-band preprocessor directives.

---

### 5.1 The `preprocessor` argument

`GProgramDownload()` and `GProgramDownloadFile()` can be called with a string passed to the `preprocessor` argument. The program will be modified based on this string prior to download. See *Preprocessor Options* below for syntax.

---

### 5.2 In-band Operation

DMC code can be written with special markup to signal the preprocessor to take actions prior to download. For example, the following program will invoke the in-band preprocessor. The specifics are described below.

```
## Author: Zaphod Beeblebrox
## Project: Total Perspective Vortex
//the above 4 hashmarks enable the preprocessor
##option "--min 4" //use a minimum of level four compression
REM REM-style comments are supported at all times
PRA=1000
BGA
AMA
EN
```

#### 5.2.1 The REM Comment

Lines beginning with the string `REM` are removed prior to download. `REM` comments are always removed regardless of whether the other preprocessor options are enabled or not.

#### 5.2.2 Double Hash

Most preprocessor statements begin with a double hash, `##`. When proceeded by a space, the double hash acts like a `REM` comment.

When proceeded by a character other than space, `##` is interpreted as a preprocessor directive. For example, see `##option` below.

#### Note

Double hash lines are removed from the program only when the preprocessor is enabled with a quad hash.

### 5.2.3 Quad Hash to enable

In order to enable the in-band preprocessor, the first two lines of the DMC program must start with a double hash. This syntax of using two lines with double hashmarks is called a *quad hash*.

Content may follow the hash marks. For example, a good code writing style is to use double hash comments as a comment header showing author, project name, etc.

### 5.2.4 C-style comments

With the preprocessor enabled, C-style comments may be used with the `//` prefix. These comments are very similar to `REM` comments. The primary advantage of using this comment over `REM` is that `//` comments may occur anywhere in a line. This is helpful for line comments such as the following.

```
SIA= 1,25,25,0<4>1 //SSI 25 bits total, all single turn, no status
```

Strings containing `//` are not interpreted as comments.

#### Note

`//` comments are removed from the program only when the preprocessor is enabled with a quad hash.

### 5.2.5 Preprocessor Directives

#### Note

Directives are only followed when the preprocessor is enabled with a quad hash.

#### 5.2.5.1 `##option`

The `option` directive allows passing switches directly to the preprocessor with the same syntax as the `preprocessor` argument in `GProgramDownload()` and `GProgramDownloadFile()`. The syntax of the `option` directive is the following.

```
##option "{preprocessor switches}"
```

For example, the following line will disable compression in the program.

```
##option "--max 0"
```

See *Preprocessor Options* below for other switches.

#### 5.2.5.2 `##include`

The `include` directive provides a way to include the contents of another DMC file in the current program. This is useful for reusing code such as automatic subroutines, homing operations, or controller initialization routines.

The contents of the file will be inserted in place of the `include` line. The insertion occurs prior to code compression.

The syntax of the `include` directive is the following.

```
##include "{filename}"
```

For example,

```
##include "c:\galil\initialize.dmc"
```

```
##include "homing.dmc"
```

To write more portable code, use the `include` directive with just the file name, no absolute path. The path to find the file on the system is set depending on usage.

1. In the *Galil Design Kit*, specify the include path in GDK's *settings* with the `--search` or `-I` switch as defined below.
2. When downloading code via `GProgramDownload()` or `GProgramDownloadFile()`, use the `--search` or `-I` switch in the `preprocessor` argument.
3. Finally, if the file is in the executable search path, the file will be found. However, one of the previous two options is more reliable.

#### 5.2.5.3 `##gclib`

*Galil Design Kit* uses the `##gclib` directive in *GDK Macros*. `gclib` ignores this directive.

### 5.2.6 In-band Support

In addition to gclib, *Galil Design Kit* supports the preprocessor. Proper preprocessor usage will be colored in the Editor's syntax highlighter. If the quad hash is not present, preprocessor syntax will be colored differently to indicate improper usage.

The preprocessor is not supported in software prior to GDK/gclib. DMC code downloads using the in-band preprocessor in prior generation software (e.g. GalilTools or SmartTerm) will fail with a TC code of 61, *Duplicate or bad label*.

---

## 5.3 Preprocessor Options

### 5.3.1 Compression, `--min`, `--max`

- Default uses minimum compression needed to fit the program.
- `--max n` provides compression up to and including level *n*. Only the necessary compression will be performed up to level *n*.
- `--min n` will compress at least up to and including *n*. *n* defined as with `--max`.

#### 5.3.1.1 Compression Levels, *n*

- Level 0 (mandatory)
  1. Remove lines beginning with REM.
  2. Remove trailing semicolons.
    - (a) Comment blank lines with '.
    - (b) Remove white space (space/tab) in front of # (label declarations).
    - (c) Remove white space after commands.
    - (d) Line ends changed to carriage return.
    - (e) Replace leading tabs with double space.
    - (f) Replace non-leading tabs with single space.
  3. A backslash (\) character on a line other than a preprocessor line will result in an error.
- Level 1
  1. Remove unnecessary spaces. Strings, comments ('), and no-ops (NO) are not changed.
- Level 2
  1. Remove comments (') but not no-ops (NO).
- Level 3
  1. Remove no-ops (NO).
- Level 4
  1. Break apart compound lines that are too long.
  2. Compact lines of code to maximize line usage.
  3. Use backtick to support long lines where applicable.

### 5.3.2 Code insertion, `--insert`

- Default begins at line zero and overwrites anything present.
- `--insert arg` invokes the insert option of the firmware's *DL* command. *arg* can be one of the following.
  1. Line number, e.g. 100. Program insertion will occur on the line after the line specified.
  2. Variable name, e.g. `myvar`. Program insertion will occur on the line after the line equal to the value of the variable.

- 3. Label callout, e.g. `#mylabel`. Program insertion will occur on the line after the label.
- 4. A lone `#` symbol. Program insertion will occur on the line after the last line in the program buffer.
- Compression directives `--max` and `--min` are followed.
  - All original code following the point of insertion is cleared.
  - Not all products support the `--insert` operation, e.g. DMC-30010. See the `DI` command for support.

#### Warning

It is the user's responsibility to ensure that the code will fit in the inserted location. The preprocessor will not check line numbers when executing the `--insert` option.

### 5.3.3 Include Search Paths, `--search`, `-I`

- The `##include` directive will attempt to open its string argument directly. The open will succeed if the argument is the absolute path, or if the argument is in the executable's path, e.g. in the same directory.
- `--search path` allows the user to specify a directory or directories to be searched for the `include` file in case the first open fails.
  - For historical reasons, `-I` is shorthand for `--search`.
- Multiple directories may be specified with multiple `-I` directives.
- For in-band code, `-I` must be specified prior to the include.
- A common use for `-I` is to specify only the filename in the DMC source code and use the `preprocessor` argument during download to specify the path to the files. This allows the files to be moved without a change to source code.
- Search order
  1. The `##include` argument is checked first as-is.
  2. Then each `-I` argument in the `preprocessor` argument, in the order specified.
  3. Then `##option` directives in the DMC file, in the order specified.
- If the search path contains spaces, enclose the path in double quotes, escaped with a backslash. See example below.

#### 5.3.3.1 In-band Example

```
##option "-I /code/dmc/homing"
##option "-I \"/code/dmc/other code\"/"
##include "auto.dmc"
//executable's directory will be checked
//then c:\code\dmc\homing
//then c:\code\dmc\other code
```

### 5.3.4 Macro Definition, `--define`, `-D`

- `--define` provides a way to substitute one token for another. This is useful for writing code that is generic until program download. Wherever the token is found in code, it is substituted by the replacement. The replacement occurs right before code compression.
- `-D` is shorthand for `--define`.
- The token should consist of a starting backslash character, followed by upper or lower case alphanumeric characters, underscores, and an ending backslash.
- The common usage for this feature is to write code with a token, and then call the program download with the `-D` switch.

In this example, an axis is defined at download time. Specifying the following for the preprocessor argument

```
--define \ax\:A
```

would cause the following code

```
SH\ax\  
JG\ax\=1000  
BG\ax\  
to be downloaded as
```

to be downloaded as

```
SHA  
JGA=1000  
BGA
```

This causes the *A* axis to be addressed.

#### Note

The macro `\pid\` is reserved for exclusive use by GDK.

### 5.3.5 Conditional Directives, `--ifdef`, `--ifndef`

To specify a preprocessor directive should be executed only if a macro is defined, use `--ifdef`.

```
##option "--ifdef \minify\ --min 4" //maximally compress code if minify macro set
```

To specify a preprocessor directive should be executed only if a macro is NOT defined, use `--ifndef`.

```
##option "--ifndef \axis\ -D \axis\:A" //Default to axis A
```

## 5.4 GDK Support

- See the `preprocessor` text box in the *Editor* settings page to set the desired preprocessor setting for developing in GDK's editor.





## Chapter 6

# Deprecated List

**Member `GAddresses` (`GStringOut` addresses, `GSize` addresses\_len)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_addresses()` instead.

**Member `GArrayDownload` (`GCon` g, const `GStringIn` array\_name, `GOption` first, `GOption` last, `GStringIn` buffer)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_set_array()` instead.

**Member `GArrayDownloadFile` (`GCon` g, `GStringIn` file\_path)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release.

**Member `GArrayUpload` (`GCon` g, const `GStringIn` array\_name, `GOption` first, `GOption` last, `GOption` delim, `GBufOut` buffer, `GSize` buffer\_len)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_array()` instead.

**Member `GArrayUploadFile` (`GCon` g, `GStringIn` file\_path, `GStringIn` names)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release.

**Member `GAssign` (`GStringIn` ip, `GStringIn` mac)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_assign_ip()` instead.

**Member `GClose` (`GCon` g)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_close()` instead.

**Member `GCmd` (`GCon` g, `GStringIn` command)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release.

**Member `GCmdD` (`GCon` g, `GStringIn` command, double \*value)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release.

**Member `GCmdI` (`GCon` g, `GStringIn` command, int \*value)**

This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release.

**Member GCmdT** (**GCon** g, **GCStringIn** command, **GCStringOut** trimmed\_response, **GSize** response\_len, **GCStringOut** \*front)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

**Member GCommand** (**GCon** g, **GCStringIn** command, **GBufOut** buffer, **GSize** buffer\_len, **GSize** \*bytes\_↵ returned)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_command\(\)](#) instead.

**Member GError** (**GReturn** rc, **GCStringOut** error, **GSize** error\_len)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

**Member GFirmwareDownload** (**GCon** g, **GCStringIn** filepath)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_firmware\(\)](#) instead.

**Member GInfo** (**GCon** g, **GCStringOut** info, **GSize** info\_len)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_address\(\)](#), [gclib\\_revision\\_information\(\)](#), and [gclib\\_serial\\_number\(\)](#) instead.

**Member GInterrupt** (**GCon** g, **GStatus** \*status\_byte)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_interrupt\(\)](#) instead.

**Member GIpRequests** (**GCStringOut** requests, **GSize** requests\_len)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_ip\\_requests\(\)](#) instead.

**Member GListServers** (**GCStringOut** servers, **GSize** servers\_len)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_list\\_servers\(\)](#) instead.

**Member GMessage** (**GCon** g, **GCStringOut** buffer, **GSize** buffer\_len)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_message\(\)](#) instead.

**Member GMotionComplete** (**GCon** g, **GCStringIn** axes)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

**Member GOpen** (**GCStringIn** connection\_string, **GCon** \*g)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_open\(\)](#) instead.

**Member GProgramDownload** (**GCon** g, **GCStringIn** program, **GCStringIn** preprocessor)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_program\(\)](#) instead.

**Member GProgramDownloadFile** (**GCon** g, **GCStringIn** file\_path, **GCStringIn** preprocessor)

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

**Member GProgramUpload (GCon g, GBufOut buffer, GSize buffer\_len)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_program()` instead.

**Member GProgramUploadFile (GCon g, GCStringIn file\_path)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

**Member GPublishServer (GCStringIn name, GOption publish, GOption save)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_set_published()` instead.

**Member GRead (GCon g, GBufOut buffer, GSize buffer\_len, GSize \*bytes\_read)**

This function only exists for ABI compatibility, and will be removed in a future gclib version.

**Member GRecord (GCon g, union GDataRecord \*record, GOption method)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_data_record()` instead.

**Member GRecordRate (GCon g, double period\_ms)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_set_data_records()` instead.

**Member GRemoteConnections (GCStringOut connections, GSize connections\_length)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

**Member GServerStatus (GCStringOut status, GSize status\_len)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_server()` instead.

**Member GSetServer (GCStringIn server\_name)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_set_server()` instead.

**Member GSetupDownloadFile (GCon g, GCStringIn file\_path, GOption options, GCStringOut info, GSize info\_len)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

**Member GSleep (unsigned int timeout\_ms)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

**Member GTimeout (GCon g, short timeout\_ms)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

**Member GUtility (GCon g, GOption request, GMemory memory1, GMemory memory2)**

This function only exists for ABI compatibility, and will be removed in a future gclib version.

**Member GVersion (GCStringOut ver, GSize ver\_len)**

This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_version()` and `gclib_gcaps_version()` instead.

**Member [GWaitForBool](#) ([GCon](#) g, [GCStringIn](#) predicate, int trials)**

This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

**Member [GWrite](#) ([GCon](#) g, [GBufIn](#) buffer, [GSize](#) buffer\_len)**

This function only exists for ABI compatibility, and will be removed in a future gclib version.

# Chapter 7

## Topic Index

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## Chapter 8

# Namespace Index

### 8.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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## Chapter 9

# Hierarchical Index

### 9.1 Class Hierarchy

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# Chapter 10

## Class Index

### 10.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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<a href="#">gclib.GDataRecord2103</a>	
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<a href="#">GDataRecord2103</a>	
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# Chapter 11

## File Index

### 11.1 File List

Here is a list of all files with brief descriptions:

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# Chapter 12

## Topic Documentation

### 12.1 .NET (C# / VB)

#### Topics

- [Connection](#)  
*Discover available controllers and open connections.*
- [Controller](#)  
*Manage a Galil controller.*
- [Galil Connect](#)  
*Host or connect to a remote gcaps instance.*

#### Functions

- string [gclib.GVersion](#) ()  
*Used to get the gclib version.*

#### 12.1.1 Detailed Description

#### 12.1.2 Function Documentation

##### 12.1.2.1 GVersion()

```
string gclib.GVersion () [inline]
```

Used to get the gclib version.

#### Returns

The library version, e.g. "104.73.179". A null string indicates an error was returned from the library.

Wrapper around gclib [GVersion\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵\\_8h.html#a1784b39416b77af20efc98a05f8ce475](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_8h.html#a1784b39416b77af20efc98a05f8ce475)

Definition at line 616 of file [gclib.cs](#).

#### 12.1.3 Connection

Discover available controllers and open connections.

#### Classes

- class [gclib](#)  
*Provides a class that binds to gclib's unmanaged dll.*

## Functions

- `string[] gclib.GAddresses ()`  
*Return a string array of available connection addresses.*
- `void gclib.GAssign (string ip, string mac)`  
*Assigns IP address over the Ethernet to a controller at a given MAC address.*
- `void gclib.GClose ()`  
*Used to close a connection to Galil hardware.*
- `string gclib.GInfo ()`  
*Provides a useful connection string.*
- `string[] gclib.GIpRequests ()`  
*Provides a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- `void gclib.GOpen (string address)`  
*Used to open a connection to Galil hardware.*
- `void gclib.GTimeout (Int16 timeout_ms)`  
*Set the timeout of communication transactions.*

### 12.1.3.1 Detailed Description

Discover available controllers and open connections.

### 12.1.3.2 Function Documentation

#### 12.1.3.2.1 GAddresses()

```
string[] gclib.GAddresses () [inline]
```

Return a string array of available connection addresses.

#### Returns

String array containing all available Galil Ethernet controllers, PCI controllers, and COM ports.

Wrapper around `gclib.GAddresses()`, [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←\\_8h.html#a6a6114683ed5749519b64f19512c24d6](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←_8h.html#a6a6114683ed5749519b64f19512c24d6) An empty array is returned on error.

Definition at line 79 of file `gclib.cs`.

#### 12.1.3.2.2 GAssign()

```
void gclib.GAssign (
    string ip,
    string mac) [inline]
```

Assigns IP address over the Ethernet to a controller at a given MAC address.

#### Parameters

<i>ip</i>	The ip address to assign. The hardware should not yet have an IP address.
<i>mac</i>	The MAC address of the hardware.

Wrapper around `gclib.GAssign()`, [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←\\_8h.html#acc996b7c22cfed8e5573d096ef1ab759](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←_8h.html#acc996b7c22cfed8e5573d096ef1ab759)

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than <code>G_NO_ERROR</code> is received from <code>gclib</code> .
-------------------------	--

Definition at line 206 of file `gclib.cs`.



**12.1.3.2.3 GClose()**

```
void gclib.GClose () [inline]
```

Used to close a connection to Galil hardware.

Wrapper around gclib [GClose\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a24a437bcde9637b0db4b94176563a052), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a24a437bcde9637b0db4b94176563a052](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a24a437bcde9637b0db4b94176563a052) Be sure to call [GClose\(\)](#) whenever a connection is finished.

Definition at line 222 of file [gclib.cs](#).

**12.1.3.2.4 GInfo()**

```
string gclib.GInfo () [inline]
```

Provides a useful connection string.

Wrapper around gclib [GInfo\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a08abfcff8a1a85a01987859473167518), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a08abfcff8a1a85a01987859473167518](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a08abfcff8a1a85a01987859473167518)

**Returns**

String containing connection information, e.g. "192.168.0.43, DMC4020 Rev 1.2c, 291". A null string indicates an error was returned from the library.

Definition at line 333 of file [gclib.cs](#).

**12.1.3.2.5 GIpRequests()**

```
string[] gclib.GIpRequests () [inline]
```

Provides a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.

**Returns**

Each line of the returned data will be of the form "model, serial\_number, mac".

Wrapper around gclib [GIpRequests\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a0afb4c82642a4ef86f997c39a5518952), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a0afb4c82642a4ef86f997c39a5518952](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a0afb4c82642a4ef86f997c39a5518952) An empty array is returned on error. Call will take roughly 5 seconds to return.

Definition at line 377 of file [gclib.cs](#).

**12.1.3.2.6 GOpen()**

```
void gclib.GOpen (
    string address) [inline]
```

Used to open a connection to Galil hardware.

**Parameters**

<i>address</i>	Address string including any connection switches. See gclib documentation for <a href="#">GOpen()</a> .
----------------	---

Wrapper around gclib [GOpen\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aef4aec8a85630eed029b7a46aea7db54), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#aef4aec8a85630eed029b7a46aea7db54](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aef4aec8a85630eed029b7a46aea7db54)

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 439 of file [gclib.cs](#).

**12.1.3.2.7 GTimeout()**

```
void gclib.GTimeout (
    Int16 timeout_ms) [inline]
```

Set the timeout of communication transactions.

Use -1 to set the original timeout from [GOpen\(\)](#).

**Parameters**

<code>timeout_ms</code>	New timeout in milliseconds.
-------------------------	------------------------------

Wrapper around gclib [GTimeout\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_8h.html#a179aa2d1b8e2227944cc06a7ceaf5640), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵\\_8h.html#a179aa2d1b8e2227944cc06a7ceaf5640](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_8h.html#a179aa2d1b8e2227944cc06a7ceaf5640)

Definition at line 605 of file [gclib.cs](#).

**12.1.4 Controller**

Manage a Galil controller.

**Topics**

- [Communication](#)  
*Send commands.*
- [Memory](#)  
*Manage controller memory, such as program and arrays.*
- [Unsolicited Data](#)  
*Receive messages and interrupts.*

**Functions**

- void [gclib.GMotionComplete](#) (string axes)  
*Blocking call that returns once all axes specified have completed their motion.*

**12.1.4.1 Detailed Description**

Manage a Galil controller.

**12.1.4.2 Function Documentation****12.1.4.2.1 GMotionComplete()**

```
void gclib.GMotionComplete (
    string axes) [inline]
```

Blocking call that returns once all axes specified have completed their motion.

**Parameters**

<code>axes</code>	A string containing a multiple-axes mask. Every character in the string should be a valid argument to MG_BGm, i.e. XYZWABCDEFHST.
-------------------	---

Wrapper around gclib [GMotionComplete\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_8h.html#a19c220879442987970706444197f397a), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵\\_8h.html#a19c220879442987970706444197f397a](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_8h.html#a19c220879442987970706444197f397a)

**Exceptions**

<code>System.Exception</code>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------------	---

Definition at line 421 of file [gclib.cs](#).

**12.1.4.3 Communication**

Send commands.

## Functions

- string [gclib.GCommand](#) (string Command, bool Trim=true)  
*Used for command-and-response transactions.*
- Int16 [gclib.GCmdI](#) (string Command)  
*Used for command-and-response transactions.*
- double [gclib.GCmdD](#) (string Command)  
*Used for command-and-response transactions.*

### 12.1.4.3.1 Detailed Description

Send commands.

### 12.1.4.3.2 Function Documentation

#### 12.1.4.3.2.1 GCommand()

```
string gclib.GCommand (
    string Command,
    bool Trim = true) [inline]
```

Used for command-and-response transactions.

#### Parameters

<i>Command</i>	The command to send to the controller. Do not append a carriage return. Use only ASCII-based commands.
<i>Trim</i>	If true, the response will be trimmed of the trailing colon and any leading or trailing whitespace.

#### Returns

The command's response.

Wrapper around [gclib.GCommand\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a5ac031e76efc965affdd73a1bec084a8](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5ac031e76efc965affdd73a1bec084a8)

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 241 of file [gclib.cs](#).

#### 12.1.4.3.2.2 GCmdI()

```
Int16 gclib.GCmdI (
    string Command) [inline]
```

Used for command-and-response transactions.

#### Parameters

<i>Command</i>	The command to send to the controller. Do not append a carriage return. Use only ASCII-based commands.
----------------	--

#### Returns

The command's response parsed as an integer.

Wrapper around [gclib.GCmdI\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a5ac031e76efc965affdd73a1bec084a8](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5ac031e76efc965affdd73a1bec084a8)

Definition at line 273 of file [gclib.cs](#).

#### 12.1.4.3.2.3 GCmdD()

```
double gclib.GCmdD (
    string Command) [inline]
```

Used for command-and-response transactions.

##### Parameters

<i>Command</i>	The command to send to the controller. Do not append a carriage return. Use only ASCII-based commands.
----------------	--

##### Returns

The command's response parsed as a double.

Wrapper around gclib [GCmdD\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5ac031e76efc965affdd73a1bec084a8), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a5ac031e76efc965affdd73a1bec084a8](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5ac031e76efc965affdd73a1bec084a8)  
Definition at line 287 of file [gclib.cs](#).

#### 12.1.4.4 Memory

Manage controller memory, such as program and arrays.

##### Functions

- void [gclib.GArrayDownload](#) (string array\_name, ref List< double > data, Int16 first=-1, Int16 last=-1)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- void [gclib.GArrayDownloadFile](#) (string Path)  
*Allows downloading of a program array file to the controller.*
- List< double > [gclib.GArrayUpload](#) (string array\_name, Int16 first=-1, Int16 last=-1)  
*Uploads array data from the controller's array table.*
- void [gclib.GArrayUploadFile](#) (string Path, string Names)  
*Allows uploading of a program array file from the controller to an array CSV file.*
- void [gclib.GFirmwareDownload](#) (string filepath)  
*Upgrade firmware.*
- void [gclib.GProgramDownload](#) (string program, string preprocessor="")  
*Allows downloading of a DMC program from a string buffer.*
- void [gclib.GProgramDownloadFile](#) (string file\_path, string preprocessor="")  
*Allows downloading of a DMC program from file.*
- string [gclib.GProgramUpload](#) ()  
*Allows uploading of a DMC program to a string.*
- void [gclib.GProgramUploadFile](#) (string file\_path)  
*Allows uploading of a DMC program to a file.*
- string[] [gclib.GSetupDownloadFile](#) (string path, Int32 options)  
*Allows downloading of a Galil compressed backup (gcb) file to the controller.*

##### 12.1.4.4.1 Detailed Description

Manage controller memory, such as program and arrays.

#### 12.1.4.4.2 Function Documentation

##### 12.1.4.4.2.1 GArrayDownload()

```
void gclib.GArrayDownload (  
    string array_name,  
    ref List< double > data,  
    Int16 first = -1,  
    Int16 last = -1) [inline]
```

Downloads array data to a pre-dimensioned array in the controller's array table.

## Parameters

<i>array_name</i>	String containing the name of the array to download. Must match the array name used in DM.
<i>data</i>	A list of doubles, to be downloaded.
<i>first</i>	The first element of the array for sub-array downloads.
<i>last</i>	The last element of the array for sub-array downloads.

Wrapper around gclib [GArrayDownload\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a6ea5ae6d167675e4c27ccfaf2f240f8a), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a6ea5ae6d167675e4c27ccfaf2f240f8a](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a6ea5ae6d167675e4c27ccfaf2f240f8a) The array must already exist on the controller, see DM and LA.

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 104 of file [gclib.cs](#).

**12.1.4.4.2.2 GArrayDownloadFile()**

```
void gclib.GArrayDownloadFile (
    string Path) [inline]
```

Allows downloading of a program array file to the controller.

## Parameters

<i>Path</i>	The full filepath of the array csv file.
-------------	--

Wrapper around gclib [GArrayDownload\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a14b448ab8c7e6cf495865af301be398e), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a14b448ab8c7e6cf495865af301be398e](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a14b448ab8c7e6cf495865af301be398e)

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 132 of file [gclib.cs](#).

**12.1.4.4.2.3 GArrayUpload()**

```
List< double > gclib.GArrayUpload (
    string array_name,
    Int16 first = -1,
    Int16 last = -1) [inline]
```

Uploads array data from the controller's array table.

## Parameters

<i>array_name</i>	String containing the name of the array to upload.
<i>first</i>	The first element of the array for sub-array uploads.
<i>last</i>	The last element of the array for sub-array uploads.

## Returns

The desired array as a list of doubles.

Wrapper around gclib [GArrayUpload\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#af215806ec26ba06ed3f174ebeeafa7a7), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#af215806ec26ba06ed3f174ebeeafa7a7](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#af215806ec26ba06ed3f174ebeeafa7a7)

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 153 of file [gclib.cs](#).

**12.1.4.4.2.4 GArrayUploadFile()**

```
void gclib.GArrayUploadFile (
    string Path,
    string Names) [inline]
```

Allows uploading of a program array file from the controller to an array CSV file.

## Parameters

<i>Path</i>	The full filepath of the array csv file to save.
<i>Names</i>	A space separated list of the array names to upload. A null string uploads all arrays in the array table (LA).

Wrapper around gclib [GArrayUpload\(\)](#). [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#af215806ec26ba06ed3f174ebeeafa7a7](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#af215806ec26ba06ed3f174ebeeafa7a7)

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 187 of file [gclib.cs](#).

**12.1.4.4.2.5 GFWareDownload()**

```
void gclib.GFWareDownload (
    string filepath) [inline]
```

Upgrade firmware.

## Parameters

<i>filepath</i>	The full filepath of the firmware hex file.
-----------------	---

Wrapper around gclib [GFWareDownload\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a1878a2285ff17897fa4fb20182ba6fdf](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a1878a2285ff17897fa4fb20182ba6fdf)

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 318 of file [gclib.cs](#).

**12.1.4.4.2.6 GProgramDownload()**

```
void gclib.GProgramDownload (
    string program,
    string preprocessor = "") [inline]
```

Allows downloading of a DMC program from a string buffer.

## Parameters

<i>program</i>	The program to download.
----------------	--------------------------

<i>preprocessor</i>	Preprocessor directives. Use nullstring for none.
---------------------	---

Wrapper around gclib [GProgramDownload\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aca19b2dd0537ff458e3c8afe3acfeb), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#aca19b2dd0537ff458e3c8afe3acfeb](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aca19b2dd0537ff458e3c8afe3acfeb)

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 460 of file [gclib.cs](#).

#### 12.1.4.4.2.7 GProgramDownloadFile()

```
void gclib.GProgramDownloadFile (
    string file_path,
    string preprocessor = "") [inline]
```

Allows downloading of a DMC program from file.

#### Parameters

<i>file_path</i>	The full filepath of the DMC file.
<i>preprocessor</i>	Preprocessor directives. Use nullstring for none.

Wrapper around gclib [GProgramDownloadFile\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a8e44e2e321df9e7b8c538bf2d640633f), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a8e44e2e321df9e7b8c538bf2d640633f](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a8e44e2e321df9e7b8c538bf2d640633f)

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 479 of file [gclib.cs](#).

#### 12.1.4.4.2.8 GProgramUpload()

```
string gclib.GProgramUpload () [inline]
```

Allows uploading of a DMC program to a string.

Wrapper around gclib [GProgramUpload\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a80a653ce387a2bd16bde2793c6de77e9), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a80a653ce387a2bd16bde2793c6de77e9](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a80a653ce387a2bd16bde2793c6de77e9)

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 496 of file [gclib.cs](#).

#### 12.1.4.4.2.9 GProgramUploadFile()

```
void gclib.GProgramUploadFile (
    string file_path) [inline]
```

Allows uploading of a DMC program to a file.

#### Parameters

<i>file_path</i>	The full filepath of the DMC file to save.
------------------	--

Wrapper around gclib [GProgramUploadFile\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a38c5565afc11762fa19d37fbaa3c9aa3), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a38c5565afc11762fa19d37fbaa3c9aa3](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a38c5565afc11762fa19d37fbaa3c9aa3)



**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 518 of file [gclib.cs](#).

**12.1.4.4.2.10 GSetupDownloadFile()**

```
string[] gclib.GSetupDownloadFile (
    string path,
    Int32 options) [inline]
```

Allows downloading of a Galil compressed backup (gcb) file to the controller.

**Parameters**

<i>path</i>	The full filepath of the gcb file.
<i>options</i>	A bit mask indicating which sectors of the gcb file to restore to the controller.

**Returns**

The controller information stored in the gcb file.

Wrapper around gclib [GSetupDownloadFile\(\)](#),

If options is specified as 0, the return string will have a number appended corresponding to a bit mask of the available gcb sectors

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 658 of file [gclib.cs](#).

**12.1.4.5 Unsolicited Data**

Receive messages and interrupts.

**Functions**

- byte [gclib.GInterrupt](#) ()  
*Provides access to PCI and UDP interrupts from the controller.*
- string [gclib.GMessage](#) ()  
*Provides access to unsolicited messages.*
- T [gclib.GRecord< T >](#) (bool async)  
*Used for retrieving data records from the controller.*
- void [gclib.GRecordRate](#) (double period\_ms)  
*Sets the asynchronous data record to a user-specified period via DR.*

**12.1.4.5.1 Detailed Description**

Receive messages and interrupts.

**12.1.4.5.2 Function Documentation****12.1.4.5.2.1 GInterrupt()**

```
byte gclib.GInterrupt () [inline]
```

Provides access to PCI and UDP interrupts from the controller.

**Returns**

The status byte from the controller. Zero will be returned if a status byte is not read.

Wrapper around gclib [GInterrupt\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5bcf802404a96343e7593d247b67f132), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a5bcf802404a96343e7593d247b67f132](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a5bcf802404a96343e7593d247b67f132) -s ALL or -s EI must be specified in the address argument of [GOpen\(\)](#) to receive interrupts.  
Definition at line 354 of file [gclib.cs](#).

**12.1.4.5.2.2 GMessage()**

```
string gclib.GMessage () [inline]
```

Provides access to unsolicited messages.

**Returns**

String containing all messages received by controller.

Wrapper around gclib [GMessage\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aabc5eaa09ddec55ab8ee048b916cbcd), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#aabc5eaa09ddec55ab8ee048b916cbcd](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#aabc5eaa09ddec55ab8ee048b916cbcd) An empty string is returned on error. -s ALL or -s MG must be specified in the address argument of [GOpen\(\)](#) to receive messages.  
Definition at line 399 of file [gclib.cs](#).

**12.1.4.5.2.3 GRecord< T >()**

```
T gclib.GRecord< T > (
    bool async) [inline]
```

Used for retrieving data records from the controller.

**Returns**

A struct containing the information from the retrieved data record.

**Parameters**

<i>async</i>	False to user QR, True to use DR.
--------------	-----------------------------------

Wrapper around gclib [GRecord\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a1f39cd57dcfa55d065c972a020b1f8ee), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#a1f39cd57dcfa55d065c972a020b1f8ee](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#a1f39cd57dcfa55d065c972a020b1f8ee) To use async, -s ALL or -s DR must be specified in the address argument of [GOpen\(\)](#), and the records must be started via DR or RecordRate().

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

**Type Constraints**

**T**: *struct*

**T**: [GDataRecord](#)

Definition at line 565 of file [gclib.cs](#).

**12.1.4.5.2.4 GRecordRate()**

```
void gclib.GRecordRate (
    double period_ms) [inline]
```

Sets the asynchronous data record to a user-specified period via DR.

**Parameters**

<i>period_ms</i>	Period, in milliseconds, to set up for the asynchronous data record.
------------------	--

Wrapper around gclib [GRecordRate\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←\\_8h.html#ada86dc9d33ac961412583881963a1b8a](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo←_8h.html#ada86dc9d33ac961412583881963a1b8a) Takes TM and product type into account and sets the DR period to the period requested by the user, if possible.

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 588 of file [gclib.cs](#).

### 12.1.5 Galil Connect

Host or connect to a remote gcaps instance.

#### Functions

- void [gclib.GSetServer](#) (string server\_name)  
*Connects gclib to a new gcaps server.*
- string [gclib.GServerStatus](#) ()  
*Retrieves the name of your local gcaps server and whether or not it is currently published.*
- string[] [gclib.GListServers](#) ()  
*Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- void [gclib.GPublishServer](#) (string server\_name, bool publish, bool save)  
*Publishes or removes local gcaps server from the network.*
- string[] [gclib.GRemoteConnections](#) ()  
*Returns a list of IP Addresses that currently have an open connection to your hardware.*

#### 12.1.5.1 Detailed Description

Host or connect to a remote gcaps instance.

#### 12.1.5.2 Function Documentation

##### 12.1.5.2.1 GSetServer()

```
void gclib.GSetServer (
    string server_name) [inline]
```

Connects gclib to a new gcaps server.

#### Parameters

<i>server_name</i>	Name of the server to connect.
--------------------	--------------------------------

Wrapper around gclib [GSetServer\(\)](#), Call GSetServer("Local") to connect gclib back to local gcaps server

#### Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 690 of file [gclib.cs](#).

**12.1.5.2.2 GServerStatus()**

```
string gclib.GServerStatus () [inline]
```

Retrieves the name of your local gcaps server and whether or not it is currently published.

**Returns**

A string in the form "<server\_name>, <isPublished>"

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 706 of file [gclib.cs](#).

**12.1.5.2.3 GListServers()**

```
string[] gclib.GListServers () [inline]
```

Retrieves a list of gcaps servers that are advertising themselves on the local network.

**Returns**

A list of available gcaps server names

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 722 of file [gclib.cs](#).

**12.1.5.2.4 GPublishServer()**

```
void gclib.GPublishServer (
    string server_name,
    bool publish,
    bool save) [inline]
```

Publishes or removes local gcaps server from the network.

**Parameters**

<i>server_name</i>	Name to publish server under.
<i>publish</i>	True=publish server, False=remove server.
<i>save</i>	Save this configuration for future server reboots.

**Exceptions**

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 745 of file [gclib.cs](#).

**12.1.5.2.5 GRemoteConnections()**

```
string[] gclib.GRemoteConnections () [inline]
```

Returns a list of IP Addresses that currently have an open connection to your hardware.

**Returns**

Returns a list of IP Addresses that currently have an open connection to your hardware.

## Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 759 of file [gclib.cs](#).

## 12.2 C

## Topics

- [Connection](#)  
*Discover available controllers and open connections*
- [Controller](#)  
*Manage a Galil controller*

## Classes

- struct [gclib\\_interrupt\\_t](#)  
*An interrupt generated by the controller.*

## Typedefs

- typedef struct Context \* [gclib\\_handle](#)  
*A handle to an open connection given by [gclib\\_open\(\)](#) for use in future API calls.*
- typedef struct DataRecord \* [gclib\\_data\\_record\\_handle](#)  
*A handle to a data record, for use in [Data Record](#) API calls.*
- typedef enum [gclib\\_result](#) [gclib\\_result](#)  
*All gclib function return values.*
- typedef enum [gclib\\_interrupt\\_type](#) [gclib\\_interrupt\\_type](#)  
*All interrupt status types.*
- typedef struct [gclib\\_interrupt\\_t](#) [gclib\\_interrupt\\_t](#)  
*An interrupt generated by the controller.*
- typedef enum [gclib\\_digital\\_input\\_flags](#) [gclib\\_digital\\_input\\_flags](#)  
*Flags to enable or disable [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) interrupts per digital input, for use in [gclib\\_set\\_interrupts\(\)](#).*
- typedef enum [gclib\\_axis\\_flags](#) [gclib\\_axis\\_flags](#)  
*Flags for building an axis mask, for example in [gclib\\_set\\_interrupts\(\)](#).*

## Enumerations

- enum [gclib\\_result](#) {  
    [GCLIB\\_SUCCESS](#) , [GCLIB\\_INVALID\\_ARGUMENT](#) , [GCLIB\\_INTERNAL\\_ERROR](#) , [GCLIB\\_TIMEOUT](#) ,  
    [GCLIB\\_COMMAND\\_ERROR](#) , [GCLIB\\_BUFFER\\_TOO\\_SMALL](#) , [GCLIB\\_NOT\\_CONNECTED](#) , [GCLIB\\_NOT\\_SUBSCRIBED](#)  
}
- enum [gclib\\_interrupt\\_type](#) {  
    [GCLIB\\_NO\\_INTERRUPTS](#) = 0 , [GCLIB\\_USER\\_INTERRUPT](#) = 0 , [GCLIB\\_MOTION\\_COMPLETE](#) = 1 << 0  
    , [GCLIB\\_ALL\\_AXES\\_MOTION\\_COMPLETE](#) = 1 << 8 ,  
    [GCLIB\\_EXCESS\\_POSITION\\_ERROR](#) = 1 << 9 , [GCLIB\\_LIMIT\\_SWITCH](#) = 1 << 10 , [GCLIB\\_WATCHDOG\\_TIMER](#)  
    = 1 << 11 , [GCLIB\\_PROGRAM\\_STOPPED](#) = 1 << 13 ,  
    [GCLIB\\_COMMAND\\_DONE](#) = 1 << 14 , [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) = 1 << 15 , [GCLIB\\_ALL\\_INTERRUPTS](#)  
    = (1 << 16) - 1 }  
*All interrupt status types.*

- enum `gclib_digital_input_flags` {  
`GCLIB_NO_DIGITAL_INPUTS` = 0 , `GCLIB_DIGITAL_INPUT_1` = 1 << 0 , `GCLIB_DIGITAL_INPUT_2` = 1 << 1 , `GCLIB_DIGITAL_INPUT_3` = 1 << 2 ,  
`GCLIB_DIGITAL_INPUT_4` = 1 << 3 , `GCLIB_DIGITAL_INPUT_5` = 1 << 4 , `GCLIB_DIGITAL_INPUT_6` = 1 << 5 , `GCLIB_DIGITAL_INPUT_7` = 1 << 6 ,  
`GCLIB_DIGITAL_INPUT_8` = 1 << 7 , `GCLIB_ALL_DIGITAL_INPUTS` = (1 << 8) - 1 }  
*Flags to enable or disable `GCLIB_DIGITAL_INPUT_LOW` interrupts per digital input, for use in `gclib_set_interrupts()`.*
- enum `gclib_axis_flags` {  
`GCLIB_NO_AXES` = 0 , `GCLIB_AXIS_A` = 1 << 0 , `GCLIB_AXIS_B` = 1 << 1 , `GCLIB_AXIS_C` = 1 << 2 ,  
`GCLIB_AXIS_D` = 1 << 3 , `GCLIB_AXIS_E` = 1 << 4 , `GCLIB_AXIS_F` = 1 << 5 , `GCLIB_AXIS_G` = 1 << 6 ,  
`GCLIB_AXIS_H` = 1 << 7 , `GCLIB_ALL_AXES` = (1 << 8) - 1 }  
*Flags for building an axis mask, for example in `gclib_set_interrupts()`.*

## Functions

- `gclib_result gclib_version` (char \*version, size\_t len)  
*Get library version.*
- `gclib_result gclib_gcaps_version` (char \*gcaps\_version, size\_t len)  
*Get library version used by current gcaps server.*

## Variables

- `gclib_interrupt_type gclib_interrupt_t::type`
- char `gclib_interrupt_t::axis`  
*If type is `GCLIB_MOTION_COMPLETE`, holds the axis that triggered the interrupt.*
- `uint8_t gclib_interrupt_t::digital_input`  
*If type is `GCLIB_DIGITAL_INPUT_LOW`, holds the digital input that triggered the interrupt.*
- `uint8_t gclib_interrupt_t::user_interrupt`  
*If type is `GCLIB_USER_INTERRUPT`, holds the user input that was triggered.*
- union {  
char `gclib_interrupt_t::axis`  
*If type is `GCLIB_MOTION_COMPLETE`, holds the axis that triggered the interrupt.*  
`uint8_t gclib_interrupt_t::digital_input`  
*If type is `GCLIB_DIGITAL_INPUT_LOW`, holds the digital input that triggered the interrupt.*  
`uint8_t gclib_interrupt_t::user_interrupt`  
*If type is `GCLIB_USER_INTERRUPT`, holds the user input that was triggered.*  
};
- `uint8_t gclib_interrupt_t::status`  
*The raw status byte generated by the controller. See the [EI command reference](#) for all possible values.*

## 12.2.1 Detailed Description

## 12.2.2 Typedef Documentation

### 12.2.2.1 gclib\_handle

typedef struct Context\* `gclib_handle`

A handle to an open connection given by `gclib_open()` for use in future API calls.

Definition at line 23 of file `gclib.h`.

### 12.2.2.2 gclib\_data\_record\_handle

typedef struct DataRecord\* `gclib_data_record_handle`

A handle to a data record, for use in [Data Record](#) API calls.

Definition at line 25 of file `gclib.h`.

### 12.2.2.3 gclib\_result

```
typedef enum gclib_result gclib_result
```

All gclib function return values.

See [gclib\\_error\(\)](#) for a more detailed error string.

### 12.2.2.4 gclib\_interrupt\_type

```
typedef enum gclib_interrupt_type gclib_interrupt_type
```

All interrupt status types.

Used in [gclib\\_set\\_interrupts\(\)](#) to configure which interrupts should be generated by the controller, and in [gclib\\_interrupt\\_t](#) once an interrupt has been read from the controller.

### 12.2.2.5 gclib\_interrupt\_t

```
typedef struct gclib_interrupt_t gclib_interrupt_t
```

An interrupt generated by the controller.

### 12.2.2.6 gclib\_digital\_input\_flags

```
typedef enum gclib_digital_input_flags gclib_digital_input_flags
```

Flags to enable or disable [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) interrupts per digital input, for use in [gclib\\_set\\_interrupts\(\)](#).

### 12.2.2.7 gclib\_axis\_flags

```
typedef enum gclib_axis_flags gclib_axis_flags
```

Flags for building an axis mask, for example in [gclib\\_set\\_interrupts\(\)](#).

## 12.2.3 Enumeration Type Documentation

### 12.2.3.1 gclib\_result

```
enum gclib_result
```

All gclib function return values.

See [gclib\\_error\(\)](#) for a more detailed error string.

#### Enumerator

GCLIB_SUCCESS	
GCLIB_INVALID_ARGUMENT	
GCLIB_INTERNAL_ERROR	
GCLIB_TIMEOUT	
GCLIB_COMMAND_ERROR	
GCLIB_BUFFER_TOO_SMALL	
GCLIB_NOT_CONNECTED	
GCLIB_NOT_SUBSCRIBED	

Definition at line 29 of file [gclib.h](#).

### 12.2.3.2 gclib\_interrupt\_type

```
enum gclib_interrupt_type
```

All interrupt status types.

Used in [gclib\\_set\\_interrupts\(\)](#) to configure which interrupts should be generated by the controller, and in [gclib\\_interrupt\\_t](#) once an interrupt has been read from the controller.

#### Enumerator

GCLIB_NO_INTERRUPTS	
---------------------	--

## Enumerator

GCLIB_USER_INTERRUPT	
GCLIB_MOTION_COMPLETE	
GCLIB_ALL_AXES_MOTION_COMPLETE	
GCLIB_EXCESS_POSITION_ERROR	Must be reenabled with <code>gclib_set_interrupts()</code> after occurrence.
GCLIB_LIMIT_SWITCH	Must be reenabled with <code>gclib_set_interrupts()</code> after each occurrence.
GCLIB_WATCHDOG_TIMER	
GCLIB_PROGRAM_STOPPED	If multiple threads are running, this interrupt is only triggered when all threads are finished.
GCLIB_COMMAND_DONE	
GCLIB_DIGITAL_INPUT_LOW	Must be reenabled with <code>gclib_set_interrupts()</code> after each occurrence.
GCLIB_ALL_INTERRUPTS	

Definition at line 41 of file [gclib.h](#).

### 12.2.3.3 gclib\_digital\_input\_flags

enum [gclib\\_digital\\_input\\_flags](#)

Flags to enable or disable `GCLIB_DIGITAL_INPUT_LOW` interrupts per digital input, for use in `gclib_set_interrupts()`.

## Enumerator

GCLIB_NO_DIGITAL_INPUTS	
GCLIB_DIGITAL_INPUT_1	
GCLIB_DIGITAL_INPUT_2	
GCLIB_DIGITAL_INPUT_3	
GCLIB_DIGITAL_INPUT_4	
GCLIB_DIGITAL_INPUT_5	
GCLIB_DIGITAL_INPUT_6	
GCLIB_DIGITAL_INPUT_7	
GCLIB_DIGITAL_INPUT_8	
GCLIB_ALL_DIGITAL_INPUTS	

Definition at line 65 of file [gclib.h](#).

### 12.2.3.4 gclib\_axis\_flags

enum [gclib\\_axis\\_flags](#)

Flags for building an axis mask, for example in `gclib_set_interrupts()`.

## Enumerator

GCLIB_NO_AXES	
GCLIB_AXIS_A	
GCLIB_AXIS_B	
GCLIB_AXIS_C	
GCLIB_AXIS_D	
GCLIB_AXIS_E	
GCLIB_AXIS_F	
GCLIB_AXIS_G	
GCLIB_AXIS_H	



GCLIB_ALL_AXES	
----------------	--

Definition at line 78 of file [gclib.h](#).

## 12.2.4 Function Documentation

### 12.2.4.1 gclib\_version()

```
gclib_result gclib_version (
    char * version,
    size_t len)
```

Get library version.

#### Parameters

<i>version</i>	Output buffer for gclib library version.
<i>len</i>	Length of output buffer.

#### Returns

[GCLIB\\_BUFFER\\_TOO\\_SMALL](#) if output does not fit in buffer.

### 12.2.4.2 gclib\_gcaps\_version()

```
gclib_result gclib_gcaps_version (
    char * gcaps_version,
    size_t len)
```

Get library version used by current gcaps server.

#### Parameters

<i>gcaps_version</i>	Output buffer for gcaps library version.
<i>len</i>	Length of output buffer.

#### Returns

[GCLIB\\_NOT\\_CONNECTED](#) if unable to reach gcaps

## 12.2.5 Variable Documentation

### 12.2.5.1 type

```
gclib_interrupt_type gclib_interrupt_t::type
```

Definition at line 56 of file [gclib.h](#).

### 12.2.5.2 axis [1/2]

```
char gclib_interrupt_t::axis
```

If type is [GCLIB\\_MOTION\\_COMPLETE](#), holds the axis that triggered the interrupt.

Definition at line 58 of file [gclib.h](#).

### 12.2.5.3 [] [2/2]

```
char { ... }::axis
```

If type is [GCLIB\\_MOTION\\_COMPLETE](#), holds the axis that triggered the interrupt.

Definition at line 58 of file [gclib.h](#).

#### 12.2.5.4 digital\_input [1/2]

```
uint8_t gclib_interrupt_t::digital_input
```

If type is [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#), holds the digital input that triggered the interrupt.

Definition at line 59 of file [gclib.h](#).

#### 12.2.5.5 [] [2/2]

```
uint8_t { ... } ::digital_input
```

If type is [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#), holds the digital input that triggered the interrupt.

Definition at line 59 of file [gclib.h](#).

#### 12.2.5.6 user\_interrupt [1/2]

```
uint8_t gclib_interrupt_t::user_interrupt
```

If type is [GCLIB\\_USER\\_INTERRUPT](#), holds the user input that was triggered.

Definition at line 60 of file [gclib.h](#).

#### 12.2.5.7 [] [2/2]

```
uint8_t { ... } ::user_interrupt
```

If type is [GCLIB\\_USER\\_INTERRUPT](#), holds the user input that was triggered.

Definition at line 60 of file [gclib.h](#).

#### 12.2.5.8 [union]

```
union { ... } gclib_interrupt_t
```

#### 12.2.5.9 status

```
uint8_t gclib_interrupt_t::status
```

The raw status byte generated by the controller. See the [EI command reference](#) for all possible values.

Definition at line 62 of file [gclib.h](#).

### 12.2.6 Connection

Discover available controllers and open connections

#### Topics

- [Galil Connect](#)

*Connect to or host a remote gcaps server.*

#### Typedefs

- typedef enum [gclib\\_connection\\_t](#) [gclib\\_connection\\_t](#)  
*Connection type, as returned by [gclib\\_connection\\_type\(\)](#).*

#### Enumerations

- enum [gclib\\_connection\\_t](#) { [GCLIB\\_ETHERNET](#) = 1 , [GCLIB\\_SERIAL](#) , [GCLIB\\_PCI](#) }  
*Connection type, as returned by [gclib\\_connection\\_type\(\)](#).*

#### Functions

- [gclib\\_result gclib\\_addresses](#) (char \*addresses, size\_t len)  
*Show address, model, and serial of detected controllers, where available.*
- [gclib\\_result gclib\\_ip\\_requests](#) (char \*ip\_requests, size\_t len)  
*Show MAC address, model, and serial of all controllers requesting IP addresses, comma-separated.*

- `gclib_result gclib_assign_ip` (const char \*mac, const char \*ip)  
*Assign IP to a controller.*
- void `gclib_force_gcaps` (bool on)  
*Force future library calls to use either gcaps or direct connections.*
- `gclib_result gclib_open` (`gclib_handle` \*h, const char \*address)  
*Open a connection to a controller.*
- `gclib_result gclib_set_baud_rate` (`gclib_handle` h, size\_t baud\_rate)  
*Set baud rate of serial connection.*
- `gclib_result gclib_close` (`gclib_handle` \*h)  
*Close connection to controller.*
- const char \* `gclib_error` (`gclib_handle` h)  
*Get library error string.*
- `gclib_result gclib_address` (`gclib_handle` h, char \*address, size\_t len)  
*Get connection address.*
- `gclib_result gclib_connection_type` (`gclib_handle` h, `gclib_connection_t` \*type)  
*Get connection type.*

### 12.2.6.1 Detailed Description

Discover available controllers and open connections

### 12.2.6.2 Typedef Documentation

#### 12.2.6.2.1 `gclib_connection_t`

typedef enum `gclib_connection_t` `gclib_connection_t`  
Connection type, as returned by `gclib_connection_type()`.

### 12.2.6.3 Enumeration Type Documentation

#### 12.2.6.3.1 `gclib_connection_t`

enum `gclib_connection_t`  
Connection type, as returned by `gclib_connection_type()`.

Enumerator

GCLIB_ETHERNET	
GCLIB_SERIAL	
GCLIB_PCI	

Definition at line 276 of file `gclib.h`.

### 12.2.6.4 Function Documentation

#### 12.2.6.4.1 `gclib_addresses()`

```
gclib_result gclib_addresses (
    char * addresses,
    size_t len)
```

Show address, model, and serial of detected controllers, where available. Detected controllers are newline-separated. Each line is comma-separated. Available information by connection type:

- Ethernet connections show address, model, and serial.
- USB connections show address and model.
- Serial and PCI connections show address only.

Example output:

```
192.168.0.40, DMC4040 Rev 1.3i, 10601
COM5, DMC-41x3
GALILPCI0
```

Parameters

<i>addresses</i>	Output buffer
<i>len</i>	Length of output buffer

Returns

[`GCLIB\_BUFFER\_TOO\_SMALL`](#) if output does not fit in buffer.

#### 12.2.6.4.2 `gclib_ip_requests()`

```
gclib_result gclib_ip_requests (
    char * ip_requests,
    size_t len)
```

Show MAC address, model, and serial of all controllers requesting IP addresses, comma-separated.

Use [`gclib\_assign\_ip\(\)`](#) to assign an IP address to controllers returned by this method.

Example output:

```
00:50:4c:20:29:69, DMC4000, 10601
00:50:4c:58:12:34, DMC2105, 4660
```

Parameters

<i>ip_requests</i>	Output buffer. Example output:
<i>len</i>	Length of output buffer

Returns

[`GCLIB\_BUFFER\_TOO\_SMALL`](#) if output does not fit in buffer.

#### 12.2.6.4.3 `gclib_assign_ip()`

```
gclib_result gclib_assign_ip (
    const char * mac,
    const char * ip)
```

Assign IP to a controller.

Parameters

<i>mac</i>	The MAC address of the controller requesting an IP. Provided by <a href="#"><code>gclib_ip_requests()</code></a> .
<i>ip</i>	The IP address to assign. Pass <code>NULL</code> to assign a random IP.

Returns

[`GCLIB\_INVALID\_ARGUMENT`](#) if MAC or IP is invalid, or if assigned IP puts controller in an unreachable subnet.

#### 12.2.6.4.4 `gclib_force_gcaps()`

```
void gclib_force_gcaps (
    bool on)
```

Force future library calls to use either gcaps or direct connections.

The default behavior of gclib is to prefer gcaps, but fall back to direct operations when gcaps is not running. This method allows disabling the default behavior process-wide, but cannot be undone.

## Parameters

<i>on</i>	If <code>true</code> , all future <code>gclib</code> calls will fail if gcaps not found, rather than falling back to direct operations. If <code>false</code> , gcaps will not be used for any future <code>gclib</code> calls.
-----------	---

**12.2.6.4.5 gclib\_open()**

```
gclib_result gclib_open (
    gclib_handle * h,
    const char * address)
```

Open a connection to a controller.

Opens a connection through gcaps, if available. Otherwise, a direct connection will be opened. If fallback is not desirable, see `gclib_force_gcaps()`.

If opening a serial connection, the baud rate will default to 115200. Call `gclib_set_baud_rate()` if necessary before attempting communications.

## Parameters

<i>h</i>	Handle that will be needed for future <code>gclib</code> calls operating on this controller.
<i>address</i>	Address of controller, obtained from <code>gclib_addresses()</code> .

## Returns

`GCLIB_NOT_CONNECTED` if unable to open connection.

**12.2.6.4.6 gclib\_set\_baud\_rate()**

```
gclib_result gclib_set_baud_rate (
    gclib_handle h,
    size_t baud_rate)
```

Set baud rate of serial connection.

## Parameters

<i>h</i>	Handle to an open connection.
<i>baud_rate</i>	Baud rate to use for serial connection.

## Returns

`GCLIB_NOT_CONNECTED` if unable to communicate with controller after setting baud rate.

**12.2.6.4.7 gclib\_close()**

```
gclib_result gclib_close (
    gclib_handle * h)
```

Close connection to controller.

## Parameters

<i>h</i>	Handle to an open connection. Will be set to <code>NULL</code> on success.
----------	--

## Returns

`GCLIB_INVALID_ARGUMENT` if *h* does not appear to be a valid handle to an open connection.

#### 12.2.6.4.8 gclib\_error()

```
const char * gclib_error (  
    gclib_handle h)
```

Get library error string.

##### Warning

The string returned is an internal error string, which may change between releases.

##### Parameters

<i>h</i>	Handle to an open connection.
----------	-------------------------------

##### Returns

The last error string generated by the library.

#### 12.2.6.4.9 gclib\_address()

```
gclib_result gclib_address (  
    gclib_handle h,  
    char * address,  
    size_t len)
```

Get connection address.

##### Parameters

<i>h</i>	Handle to an open connection.
<i>address</i>	Output buffer for connection address.
<i>len</i>	Size of output buffer.

##### Returns

[GCLIB\\_BUFFER\\_TOO\\_SMALL](#) if output does not fit in buffer.

#### 12.2.6.4.10 gclib\_connection\_type()

```
gclib_result gclib_connection_type (  
    gclib_handle h,  
    gclib_connection_t * type)
```

Get connection type.

##### Parameters

<i>h</i>	Handle to an open connection.
<i>type</i>	Will be set to the type of the connection.

##### Returns

[GCLIB\\_INVALID\\_ARGUMENT](#) if *h* does not refer to an open connection.

#### 12.2.6.5 Galil Connect

Connect to or host a remote gcaps server.

## Functions

- [gclib\\_result gclib\\_list\\_servers](#) (char \*servers, size\_t len)  
*List available gcaps servers separated by newline.*
- [gclib\\_result gclib\\_server](#) (char \*name, size\_t len)  
*Current gcaps server.*
- [gclib\\_result gclib\\_set\\_server](#) (const char \*name)  
*Set gcaps server.*
- [gclib\\_result gclib\\_published](#) (char \*name, size\_t len)  
*Provides published status of local gcaps server.*
- [gclib\\_result gclib\\_set\\_published](#) (const char \*name)  
*Set published status of local gcaps server.*

### 12.2.6.5.1 Detailed Description

Connect to or host a remote gcaps server.

While connected, applicable gclib functions will run on the remote gcaps server. This can be useful for accessing closed or distant systems.

### 12.2.6.5.2 Function Documentation

#### 12.2.6.5.2.1 gclib\_list\_servers()

```
gclib_result gclib_list_servers (
    char * servers,
    size_t len)
```

List available gcaps servers separated by newline.

#### Parameters

<i>servers</i>	Output buffer.
<i>len</i>	Length of output buffer.

#### Returns

[GCLIB\\_BUFFER\\_TOO\\_SMALL](#) if output does not fit in buffer.

#### 12.2.6.5.2.2 gclib\_server()

```
gclib_result gclib_server (
    char * name,
    size_t len)
```

Current gcaps server.

If connected to the local gcaps server, returns an empty string.

#### Parameters

<i>name</i>	Output buffer.
<i>len</i>	Length of output buffer.

#### Returns

[GCLIB\\_BUFFER\\_TOO\\_SMALL](#) if output does not fit in buffer.

#### 12.2.6.5.2.3 gclib\_set\_server()

```
gclib_result gclib_set_server (  
    const char * name)
```

Set gcaps server.



## Parameters

<i>name</i>	Name of gcaps server, obtained from <code>gclib_list_servers()</code> . Pass <code>NULL</code> to use the local gcaps server.
-------------	---

## Returns

`GCLIB_INVALID_ARGUMENT` if *name* does not appear to be a valid server.

**12.2.6.5.2.4 gclib\_published()**

```
gclib_result gclib_published (
    char * name,
    size_t len)
```

Provides published status of local gcaps server.

## Parameters

<i>name</i>	If published, will contain name of local gcaps server. <code>NULL</code> otherwise.
<i>len</i>	Length of <i>name</i> buffer.

## Returns

`GCLIB_NOT_CONNECTED` if unable to reach gcaps.

**12.2.6.5.2.5 gclib\_set\_published()**

```
gclib_result gclib_set_published (
    const char * name)
```

Set published status of local gcaps server.

## Parameters

<i>name</i>	Name of server to publish. If <code>NULL</code> , server will be unpublished.
-------------	---

## Returns

`GCLIB_NOT_CONNECTED` if unable to reach gcaps.

**12.2.7 Controller**

Manage a Galil controller

**Topics**

- [Data Record](#)  
*Used to get values from a data record handle.*
- [Memory](#)  
*Manage controller firmware, program, and arrays.*
- [Unsolicited Data](#)  
*Get unsolicited messages, interrupts, or data records, in blocking or callback mode.*

## Functions

- `gclib_result gclib_revision_information (gclib_handle h, char *rev_info, size_t len)`  
*Get revision information ( $^R^V$ ) from controller.*
- `gclib_result gclib_serial_number (gclib_handle h, uint32_t *serial_number)`  
*Get serial number from controller.*
- `gclib_result gclib_command (gclib_handle h, const char *command, char *buf, size_t len)`  
*Issues a command to the controller and provides the response.*
- `void gclib_set_compat ()`
- `gclib_result gclib_set_timeout (gclib_handle h, size_t timeout)`

### 12.2.7.1 Detailed Description

Manage a Galil controller

### 12.2.7.2 Function Documentation

#### 12.2.7.2.1 gclib\_revision\_information()

```
gclib_result gclib_revision_information (
    gclib_handle h,
    char * rev_info,
    size_t len)
```

Get revision information ( $^R^V$ ) from controller.

#### Parameters

<i>h</i>	Handle to an open connection.
<i>rev_info</i>	Output buffer for revision information.
<i>len</i>	Size of output buffer.

#### Returns

- `GCLIB_INVALID_ARGUMENT` if handle is NULL.
- `GCLIB_NOT_CONNECTED` if not connected.
- `GCLIB_BUFFER_TOO_SMALL` if output does not fit in buffer.

#### 12.2.7.2.2 gclib\_serial\_number()

```
gclib_result gclib_serial_number (
    gclib_handle h,
    uint32_t * serial_number)
```

Get serial number from controller.

#### Parameters

<i>h</i>	Handle to an open connection.
<i>serial_number</i>	Will be set to the serial number of the controller, or 0 on failure.

#### Returns

`GCLIB_INTERNAL_ERROR` if serial number could not be retrieved.

### 12.2.7.2.3 gclib\_command()

```
gclib_result gclib_command (
    gclib_handle h,
    const char * command,
    char * buf,
    size_t len)
```

Issues a command to the controller and provides the response.

Note that a single command cannot be longer than 80 characters, similar to a program line.

#### Parameters

<i>h</i>	Handle to an open connection.
<i>command</i>	Command to be sent to the controller. Will be terminated with a carriage return.
<i>buf</i>	Output buffer for controller response.
<i>len</i>	Length of output buffer.

#### Returns

- `GCLIB_TIMEOUT` if no response is received from the controller.
- `GCLIB_COMMAND_ERROR` if the controller responds with ?
- `GCLIB_BUFFER_TOO_SMALL` if the command response cannot fit in the provided buffer.

### 12.2.7.2.4 gclib\_set\_compat()

```
void gclib_set_compat ()
```

### 12.2.7.2.5 gclib\_set\_timeout()

```
gclib_result gclib_set_timeout (
    gclib_handle h,
    size_t timeout)
```

### 12.2.7.3 Data Record

Used to get values from a data record handle.

#### Topics

- [Amp](#)  
*Amp error statuses.*
- [Axis](#)  
*Axis-specific values, such as position or torque.*
- [Coordinated Move](#)  
*Coordinated move values, relevant for LM and CM modes of motion.*

#### Typedefs

- typedef enum [gclib\\_mode\\_of\\_motion\\_t](#) [gclib\\_mode\\_of\\_motion\\_t](#)  
*The controller's current mode of motion, given by `gclib_data_record_mode_of_motion()`.*
- typedef enum [gclib\\_ethernet\\_status\\_t](#) [gclib\\_ethernet\\_status\\_t](#)  
*The current status of an ethernet handle, given by `gclib_data_record_ethernet_status()`.*

## Enumerations

- enum `gclib_mode_of_motion_t` {  
`GCLIB_NO_MOTION`, `GCLIB_CONTOUR`, `GCLIB_POSITION_ABSOLUTE`, `GCLIB_POSITION_RELATIVE`,  
`GCLIB_FIND_EDGE`, `GCLIB_FIND_INDEX`, `GCLIB_HOME`, `GCLIB_VECTOR_MOVE`,  
`GCLIB_LINEAR_MOVE` = `GCLIB_VECTOR_MOVE` }

The controller's current mode of motion, given by `gclib_data_record_mode_of_motion()`.

- enum `gclib_ethernet_status_t` {  
`HANDLE_FREE` = 0, `UDP_SLAVE` = 1, `TCP_SLAVE` = 2, `UDP_MASTER` = -1,  
`TCP_MASTER` = -2, `ESTABLISHING_UDP` = -5, `ESTABLISHING_TCP` = -6 }

The current status of an ethernet handle, given by `gclib_data_record_ethernet_status()`.

## Functions

- uint16\_t `gclib_data_record_sample` (`gclib_data_record_handle` h)  
The sample in which this data record was generated.
- bool `gclib_data_record_input` (`gclib_data_record_handle` h, size\_t index)  
Get an input.
- bool `gclib_data_record_output` (`gclib_data_record_handle` h, size\_t index)  
Get an output.
- uint8\_t `gclib_data_record_input_bank` (`gclib_data_record_handle` h, size\_t index)  
Get a bank of inputs.
- uint8\_t `gclib_data_record_output_bank` (`gclib_data_record_handle` h, size\_t index)  
Get a bank of outputs.
- uint8\_t `gclib_data_record_error_code` (`gclib_data_record_handle` h)  
Get the error code.
- uint32\_t `gclib_data_record_contour_segment_count` (`gclib_data_record_handle` h)  
Get the contour segment count.
- uint16\_t `gclib_data_record_contour_buffer_available` (`gclib_data_record_handle` h)  
Get remaining contour buffer.
- bool `gclib_data_record_thread_running` (`gclib_data_record_handle` h, size\_t thread)  
Returns true if a given thread is running.
- `gclib_ethernet_status_t` `gclib_data_record_ethernet_status` (`gclib_data_record_handle` h, char handle)  
Get ethernet handle status.
- `gclib_result` `gclib_data_record_bytes` (`gclib_data_record_handle` h, char \*data\_record, size\_t len)  
Copy data record to user buffer.

### 12.2.7.3.1 Detailed Description

Used to get values from a data record handle.

For obtaining data records, see `gclib_subscribe_data_records()`.

### 12.2.7.3.2 Typedef Documentation

#### 12.2.7.3.2.1 `gclib_mode_of_motion_t`

```
typedef enum gclib_mode_of_motion_t gclib_mode_of_motion_t
```

The controller's current mode of motion, given by `gclib_data_record_mode_of_motion()`.

#### 12.2.7.3.2.2 `gclib_ethernet_status_t`

```
typedef enum gclib_ethernet_status_t gclib_ethernet_status_t
```

The current status of an ethernet handle, given by `gclib_data_record_ethernet_status()`.

### 12.2.7.3.3 Enumeration Type Documentation

#### 12.2.7.3.3.1 `gclib_mode_of_motion_t`

enum `gclib_mode_of_motion_t`

The controller's current mode of motion, given by `gclib_data_record_mode_of_motion()`.

##### Enumerator

GCLIB_NO_MOTION	
GCLIB_CONTOUR	
GCLIB_POSITION_ABSOLUTE	
GCLIB_POSITION_RELATIVE	
GCLIB_FIND_EDGE	
GCLIB_FIND_INDEX	
GCLIB_HOME	
GCLIB_VECTOR_MOVE	
GCLIB_LINEAR_MOVE	

Definition at line 601 of file `gclib.h`.

#### 12.2.7.3.3.2 `gclib_ethernet_status_t`

enum `gclib_ethernet_status_t`

The current status of an ethernet handle, given by `gclib_data_record_ethernet_status()`.

##### Enumerator

HANDLE_FREE	
UDP_SLAVE	
TCP_SLAVE	
UDP_MASTER	
TCP_MASTER	
ESTABLISHING_UDP	
ESTABLISHING_TCP	

Definition at line 614 of file `gclib.h`.

### 12.2.7.3.4 Function Documentation

#### 12.2.7.3.4.1 `gclib_data_record_sample()`

```
uint16_t gclib_data_record_sample (
    gclib_data_record_handle h)
```

The sample in which this data record was generated.

#### 12.2.7.3.4.2 `gclib_data_record_input()`

```
bool gclib_data_record_input (
    gclib_data_record_handle h,
    size_t index)
```

Get an input.

Generally, controllers have 8 inputs and outputs per axis bank.

##### Note

Inputs are active low, meaning this function returns `true` if current is NOT flowing.

## Parameters

<i>h</i>	A data record handle.
<i>index</i>	The index of the input to check. Starts at 1.

## Returns

true if input is active.

**12.2.7.3.4.3 gclib\_data\_record\_output()**

```
bool gclib_data_record_output (
    gclib_data_record_handle h,
    size_t index)
```

Get an output.

**12.2.7.3.4.4 gclib\_data\_record\_input\_bank()**

```
uint8_t gclib_data_record_input_bank (
    gclib_data_record_handle h,
    size_t index)
```

Get a bank of inputs.

**12.2.7.3.4.5 gclib\_data\_record\_output\_bank()**

```
uint8_t gclib_data_record_output_bank (
    gclib_data_record_handle h,
    size_t index)
```

Get a bank of outputs.

**12.2.7.3.4.6 gclib\_data\_record\_error\_code()**

```
uint8_t gclib_data_record_error_code (
    gclib_data_record_handle h)
```

Get the error code.

**12.2.7.3.4.7 gclib\_data\_record\_contour\_segment\_count()**

```
uint32_t gclib_data_record_contour_segment_count (
    gclib_data_record_handle h)
```

Get the contour segment count.

**12.2.7.3.4.8 gclib\_data\_record\_contour\_buffer\_available()**

```
uint16_t gclib_data_record_contour_buffer_available (
    gclib_data_record_handle h)
```

Get remaining contour buffer.

**12.2.7.3.4.9 gclib\_data\_record\_thread\_running()**

```
bool gclib_data_record_thread_running (
    gclib_data_record_handle h,
    size_t thread)
```

Returns true if a given thread is running.

**12.2.7.3.4.10 gclib\_data\_record\_ethernet\_status()**

```
gclib_ethernet_status_t gclib_data_record_ethernet_status (
    gclib_data_record_handle h,
    char handle)
```

Get ethernet handle status.

**Parameters**

<i>h</i>	data record handle.
<i>handle</i>	The ethernet handle to check, A - H.

**Returns**

[gclib\\_ethernet\\_status\\_t](#) The ethernet handle status.

**12.2.7.3.4.11 gclib\_data\_record\_bytes()**

```
gclib_result gclib_data_record_bytes (
    gclib_data_record_handle h,
    char * data_record,
    size_t len)
```

Copy data record to user buffer.

Useful if your device has a nonstandard data record.

**Parameters**

<i>h</i>	data record handle.
<i>data_record</i>	pointer to user buffer.
<i>len</i>	size of user buffer.

**Returns**

[GCLIB\\_BUFFER\\_TOO\\_SMALL](#) if output does not fit in buffer.

**12.2.7.3.5 Amp**

Amp error statuses.

**Functions**

- bool [gclib\\_data\\_record\\_over\\_current](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns over current status.*
- bool [gclib\\_data\\_record\\_over\\_voltage](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns over voltage status.*
- bool [gclib\\_data\\_record\\_over\\_temp](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns over temperature status.*
- bool [gclib\\_data\\_record\\_under\\_voltage](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns under voltage status.*
- bool [gclib\\_data\\_record\\_electronic\\_lock\\_out](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns electronic lockout (ELO) status for a bank.*

**12.2.7.3.5.1 Detailed Description**

Amp error statuses.

Amp errors are latched, and will need to be cleared with [AZ](#) once the underlying issue has been resolved. See the [command reference](#) for details.

### 12.2.7.3.5.2 Function Documentation

#### **gclib\_data\_record\_over\_current()**

```
bool gclib_data_record_over_current (
    gclib_data_record_handle h,
    size_t amp)
```

Returns over current status.

#### **gclib\_data\_record\_over\_voltage()**

```
bool gclib_data_record_over_voltage (
    gclib_data_record_handle h,
    size_t amp)
```

Returns over voltage status.

#### **gclib\_data\_record\_over\_temp()**

```
bool gclib_data_record_over_temp (
    gclib_data_record_handle h,
    size_t amp)
```

Returns over temperature status.

#### **gclib\_data\_record\_under\_voltage()**

```
bool gclib_data_record_under_voltage (
    gclib_data_record_handle h,
    size_t amp)
```

Returns under voltage status.

#### **gclib\_data\_record\_electronic\_lock\_out()**

```
bool gclib_data_record_electronic_lock_out (
    gclib_data_record_handle h,
    size_t amp)
```

Returns electronic lockout (ELO) status for a bank.

### 12.2.7.3.6 Axis

Axis-specific values, such as position or torque.

#### **Functions**

- bool [gclib\\_data\\_record\\_motor\\_off](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Get motor off status.*
- bool [gclib\\_data\\_record\\_latch\\_armed](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Get latch armed.*
- bool [gclib\\_data\\_record\\_final\\_deceleration](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true when axis is in final deceleration.*
- bool [gclib\\_data\\_record\\_stopping](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis is stopping.*
- bool [gclib\\_data\\_record\\_slewing](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis is slewing.*
- [gclib\\_mode\\_of\\_motion\\_t](#) [gclib\\_data\\_record\\_mode\\_of\\_motion](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the mode of motion being profiled.*
- bool [gclib\\_data\\_record\\_negative\\_direction\\_move](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis velocity is negative.*
- bool [gclib\\_data\\_record\\_moving](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)



- Returns true if motion is being profiled.*
- int `gclib_data_record_home_phase` (`gclib_data_record_handle` h, char axis)  
*Returns home phase when in `GCLIB_HOME` mode.*
- bool `gclib_data_record_stepper_mode` (`gclib_data_record_handle` h, char axis)  
*Returns true if axis is configured as a stepper motor.*
- bool `gclib_data_record_home_input` (`gclib_data_record_handle` h, char axis)  
*Returns the state of the home input.*
- bool `gclib_data_record_reverse_limit` (`gclib_data_record_handle` h, char axis)  
*Returns the state of the reverse limit.*
- bool `gclib_data_record_forward_limit` (`gclib_data_record_handle` h, char axis)  
*Returns the state of the forward limit.*
- bool `gclib_data_record_latch_input` (`gclib_data_record_handle` h, char axis)  
*Returns the state of the latch input.*
- bool `gclib_data_record_latch_occurred` (`gclib_data_record_handle` h, char axis)  
*Returns whether the latch was triggered.*
- uint8\_t `gclib_data_record_stop_code` (`gclib_data_record_handle` h, char axis)  
*Returns a code indicating why the motor has stopped. See the [SC command reference](#) for details.*
- int32\_t `gclib_data_record_reference_position` (`gclib_data_record_handle` h, char axis)  
*Returns the reference position.*
- int32\_t `gclib_data_record_position` (`gclib_data_record_handle` h, char axis)  
*Returns the position.*
- int32\_t `gclib_data_record_position_error` (`gclib_data_record_handle` h, char axis)  
*Returns the position error.*
- int32\_t `gclib_data_record_aux_position` (`gclib_data_record_handle` h, char axis)  
*Returns the auxiliary position.*
- int32\_t `gclib_data_record_velocity` (`gclib_data_record_handle` h, char axis)  
*Returns the velocity.*
- double `gclib_data_record_torque` (`gclib_data_record_handle` h, char axis)  
*Returns the torque.*
- double `gclib_data_record_analog_input` (`gclib_data_record_handle` h, char axis)  
*Returns the analog input.*
- uint8\_t `gclib_data_record_halls` (`gclib_data_record_handle` h, char axis)  
*Returns the hall state.*
- int32\_t `gclib_data_record_variable` (`gclib_data_record_handle` h, char axis)  
*Returns the value of a user variable for an axis.*
- bool `gclib_data_record_hall_error` (`gclib_data_record_handle` h, char axis)  
*Returns true if the amplifier for this axis has triggered a hall error.*
- bool `gclib_data_record_peak_current` (`gclib_data_record_handle` h, char axis)  
*Returns true if the amplifier for this axis has triggered a peak current error.*

### 12.2.7.3.6.1 Detailed Description

Axis-specific values, such as position or torque.

### 12.2.7.3.6.2 Function Documentation

#### `gclib_data_record_motor_off()`

```
bool gclib_data_record_motor_off (
    gclib_data_record_handle h,
    char axis)
```

Get motor off status.

**gclib\_data\_record\_latch\_armed()**

```
bool gclib_data_record_latch_armed (
    gclib_data_record_handle h,
    char axis)
```

Get latch armed.

**gclib\_data\_record\_final\_deceleration()**

```
bool gclib_data_record_final_deceleration (
    gclib_data_record_handle h,
    char axis)
```

Returns true when axis is in final deceleration.

**gclib\_data\_record\_stopping()**

```
bool gclib_data_record_stopping (
    gclib_data_record_handle h,
    char axis)
```

Returns true if axis is stopping.

**gclib\_data\_record\_slewing()**

```
bool gclib_data_record_slewing (
    gclib_data_record_handle h,
    char axis)
```

Returns true if axis is slewing.

**gclib\_data\_record\_mode\_of\_motion()**

```
gclib_mode_of_motion_t gclib_data_record_mode_of_motion (
    gclib_data_record_handle h,
    char axis)
```

Returns the mode of motion being profiled.

**gclib\_data\_record\_negative\_direction\_move()**

```
bool gclib_data_record_negative_direction_move (
    gclib_data_record_handle h,
    char axis)
```

Returns true if axis velocity is negative.

**gclib\_data\_record\_moving()**

```
bool gclib_data_record_moving (
    gclib_data_record_handle h,
    char axis)
```

Returns true if motion is being profiled.

**gclib\_data\_record\_home\_phase()**

```
int gclib_data_record_home_phase (
    gclib_data_record_handle h,
    char axis)
```

Returns home phase when in [GCLIB\\_HOME](#) mode.

**gclib\_data\_record\_stepper\_mode()**

```
bool gclib_data_record_stepper_mode (  
    gclib_data_record_handle h,  
    char axis)
```

Returns true if axis is configured as a stepper motor.

**gclib\_data\_record\_home\_input()**

```
bool gclib_data_record_home_input (  
    gclib_data_record_handle h,  
    char axis)
```

Returns the state of the home input.

**gclib\_data\_record\_reverse\_limit()**

```
bool gclib_data_record_reverse_limit (  
    gclib_data_record_handle h,  
    char axis)
```

Returns the state of the reverse limit.

**gclib\_data\_record\_forward\_limit()**

```
bool gclib_data_record_forward_limit (  
    gclib_data_record_handle h,  
    char axis)
```

Returns the state of the forward limit.

**gclib\_data\_record\_latch\_input()**

```
bool gclib_data_record_latch_input (  
    gclib_data_record_handle h,  
    char axis)
```

Returns the state of the latch input.

**gclib\_data\_record\_latch\_occurred()**

```
bool gclib_data_record_latch_occurred (  
    gclib_data_record_handle h,  
    char axis)
```

Returns whether the latch was triggered.

**gclib\_data\_record\_stop\_code()**

```
uint8_t gclib_data_record_stop_code (  
    gclib_data_record_handle h,  
    char axis)
```

Returns a code indicating why the motor has stopped. See the [SC command reference](#) for details.

**gclib\_data\_record\_reference\_position()**

```
int32_t gclib_data_record_reference_position (  
    gclib_data_record_handle h,  
    char axis)
```

Returns the reference position.

**gclib\_data\_record\_position()**

```
int32_t gclib_data_record_position (
    gclib_data_record_handle h,
    char axis)
```

Returns the position.

**gclib\_data\_record\_position\_error()**

```
int32_t gclib_data_record_position_error (
    gclib_data_record_handle h,
    char axis)
```

Returns the position error.

**gclib\_data\_record\_aux\_position()**

```
int32_t gclib_data_record_aux_position (
    gclib_data_record_handle h,
    char axis)
```

Returns the auxiliary position.

**gclib\_data\_record\_velocity()**

```
int32_t gclib_data_record_velocity (
    gclib_data_record_handle h,
    char axis)
```

Returns the velocity.

**gclib\_data\_record\_torque()**

```
double gclib_data_record_torque (
    gclib_data_record_handle h,
    char axis)
```

Returns the torque.

**gclib\_data\_record\_analog\_input()**

```
double gclib_data_record_analog_input (
    gclib_data_record_handle h,
    char axis)
```

Returns the analog input.

**gclib\_data\_record\_halls()**

```
uint8_t gclib_data_record_halls (
    gclib_data_record_handle h,
    char axis)
```

Returns the hall state.

**gclib\_data\_record\_variable()**

```
int32_t gclib_data_record_variable (
    gclib_data_record_handle h,
    char axis)
```

Returns the value of a user variable for an axis.

**gclib\_data\_record\_hall\_error()**

```
bool gclib_data_record_hall_error (
    gclib_data_record_handle h,
    char axis)
```

Returns true if the amplifier for this axis has triggered a hall error.

**gclib\_data\_record\_peak\_current()**

```
bool gclib_data_record_peak_current (
    gclib_data_record_handle h,
    char axis)
```

Returns true if the amplifier for this axis has triggered a peak current error.

**12.2.7.3.7 Coordinated Move**

Coordinated move values, relevant for LM and CM modes of motion.

**Functions**

- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_segment\\_count](#) (gclib\_data\_record\_handle h, char plane)  
*Returns the segment count for the current move.*
- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_status](#) (gclib\_data\_record\_handle h, char plane)  
*Returns the coordinated move status word.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_final\\_deceleration](#) (gclib\_data\_record\_handle h, char plane)  
*Returns true if in final deceleration.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_stopping](#) (gclib\_data\_record\_handle h, char plane)  
*Returns true if stopping.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_slewing](#) (gclib\_data\_record\_handle h, char plane)  
*Returns true if slewing.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_moving](#) (gclib\_data\_record\_handle h, char plane)  
*Returns true if moving.*
- int32\_t [gclib\\_data\\_record\\_coordinated\\_move\\_distance](#) (gclib\_data\_record\_handle h, char plane)  
*Returns the distance covered in the current move.*
- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_buffer\\_available](#) (gclib\_data\_record\_handle h, char plane)  
*Returns the available buffer space.*

**12.2.7.3.7.1 Detailed Description**

Coordinated move values, relevant for LM and CM modes of motion.

**12.2.7.3.7.2 Function Documentation****gclib\_data\_record\_coordinated\_move\_segment\_count()**

```
uint16_t gclib_data_record_coordinated_move_segment_count (
    gclib_data_record_handle h,
    char plane)
```

Returns the segment count for the current move.

**gclib\_data\_record\_coordinated\_move\_status()**

```
uint16_t gclib_data_record_coordinated_move_status (
    gclib_data_record_handle h,
    char plane)
```

Returns the coordinated move status word.

**gclib\_data\_record\_coordinated\_move\_final\_deceleration()**

```
bool gclib_data_record_coordinated_move_final_deceleration (
    gclib_data_record_handle h,
    char plane)
```

Returns true if in final deceleration.

**gclib\_data\_record\_coordinated\_move\_stopping()**

```
bool gclib_data_record_coordinated_move_stopping (
    gclib_data_record_handle h,
    char plane)
```

Returns true if stopping.

**gclib\_data\_record\_coordinated\_move\_slewing()**

```
bool gclib_data_record_coordinated_move_slewing (
    gclib_data_record_handle h,
    char plane)
```

Returns true if slewing.

**gclib\_data\_record\_coordinated\_move\_moving()**

```
bool gclib_data_record_coordinated_move_moving (
    gclib_data_record_handle h,
    char plane)
```

Returns true if moving.

**gclib\_data\_record\_coordinated\_move\_distance()**

```
int32_t gclib_data_record_coordinated_move_distance (
    gclib_data_record_handle h,
    char plane)
```

Returns the distance covered in the current move.

**gclib\_data\_record\_coordinated\_move\_buffer\_available()**

```
uint16_t gclib_data_record_coordinated_move_buffer_available (
    gclib_data_record_handle h,
    char plane)
```

Returns the available buffer space.

**12.2.7.4 Memory**

Manage controller firmware, program, and arrays.

**Functions**

- [gclib\\_result gclib\\_program](#) ([gclib\\_handle](#) h, char \*program, size\_t len)  
*Get the controller's current program.*
- [gclib\\_result gclib\\_set\\_program](#) ([gclib\\_handle](#) h, const char \*program, const char \*insert)  
*Set the program on the controller.*
- [gclib\\_result gclib\\_array](#) ([gclib\\_handle](#) h, const char \*name, char \*buf, size\_t len, size\_t start, size\_t end)  
*Get an array from the controller.*
- [gclib\\_result gclib\\_set\\_array](#) ([gclib\\_handle](#) h, const char \*name, const char \*buf, size\_t start, size\_t end)  
*Set an array on the controller.*
- [gclib\\_result gclib\\_set\\_firmware](#) ([gclib\\_handle](#) h, const char \*file\_path)  
*Set the firmware on the controller.*

#### 12.2.7.4.1 Detailed Description

Manage controller firmware, program, and arrays.

#### 12.2.7.4.2 Function Documentation

##### 12.2.7.4.2.1 `gclib_program()`

```
gclib_result gclib_program (
    gclib_handle h,
    char * program,
    size_t len)
```

Get the controller's current program.

##### Parameters

<i>h</i>	Handle to an open connection.
<i>program</i>	Output buffer for program.
<i>len</i>	Length of output buffer.

##### Returns

`GCLIB_BUFFER_TOO_SMALL` if program does not fit in buffer.

##### 12.2.7.4.2.2 `gclib_set_program()`

```
gclib_result gclib_set_program (
    gclib_handle h,
    const char * program,
    const char * insert)
```

Set the program on the controller.

##### Parameters

<i>h</i>	Handle to an open connection.
<i>program</i>	Program to write to controller memory. Lines may be separated by <code>\r</code> , <code>\r\n</code> , or <code>\n</code> .
<i>insert</i>	Either a line number or a label name to start downloading from.

##### Returns

`GCLIB_INVALID_ARGUMENT` if program is not accepted by controller (for example, if a program is already running).

##### 12.2.7.4.2.3 `gclib_array()`

```
gclib_result gclib_array (
    gclib_handle h,
    const char * name,
    char * buf,
    size_t len,
    size_t start,
    size_t end)
```

Get an array from the controller.

##### Parameters

<i>h</i>	Handle to an open connection.
----------	-------------------------------

## Parameters

<i>name</i>	Array name on controller.
<i>buf</i>	Output buffer for comma-separated array values.
<i>len</i>	Length of output buffer.
<i>start</i>	Index to start reading array.
<i>end</i>	Index to stop reading array.

## Returns

[GCLIB\\_INVALID\\_ARGUMENT](#) if array does not exist on controller.

**12.2.7.4.2.4 gclib\_set\_array()**

```
gclib_result gclib_set_array (
    gclib_handle h,
    const char * name,
    const char * buf,
    size_t start,
    size_t end)
```

Set an array on the controller.

Array will be automatically dimensioned unless one of the following is true:

- Start or end are nonzero
- Controller is currently recording arrays
- Modbus array write is enabled

## Parameters

<i>h</i>	Handle to open connection.
<i>name</i>	Array name on controller (will be dimensioned if not present).
<i>buf</i>	Array buffer. Elements may be separated by <code>,</code> , <code>\r</code> , or <code>\r\n</code> . Do not use spaces.
<i>start</i>	Index to start writing over an existing array. Leave 0 to
<i>end</i>	Index to stop writing over an existing array.

## Returns

[GCLIB\\_INVALID\\_ARGUMENT](#) if array does not exist but cannot be automatically dimensioned, or start / end are invalid for array.

**12.2.7.4.2.5 gclib\_set\_firmware()**

```
gclib_result gclib_set_firmware (
    gclib_handle h,
    const char * file_path)
```

Set the firmware on the controller.

## Parameters

<i>h</i>	Handle to open connection.
<i>file_path</i>	Path to firmware file.

## Returns

[GCLIB\\_INVALID\\_ARGUMENT](#) if firmware file cannot be opened, or is rejected by the controller.



### 12.2.7.5 Unsolicited Data

Get unsolicited messages, interrupts, or data records, in blocking or callback mode.

#### Functions

- `gclib_result gclib_set_interrupts` (`gclib_handle` h, `gclib_interrupt_type` interrupt\_mask, `gclib_axis_flags` motion\_complete\_axes, `gclib_digital_input_flags` digital\_inputs)  
*Configure which interrupts will be generated by the controller.*
- `gclib_result gclib_set_data_records` (`gclib_handle` h, `size_t` period\_ms)  
*Configure controller data records.*
- `gclib_result gclib_subscribe_messages` (`gclib_handle` h, `void`(callback)(`void` \*user\_data, `const` `char` \*message), `void` \*user\_data)  
*Subscribe to unsolicited messages.*
- `gclib_result gclib_subscribe_interrupts` (`gclib_handle` h, `void`(callback)(`void` \*user\_data, `gclib_interrupt_t` interrupt), `void` \*user\_data)  
*Subscribe to interrupts.*
- `gclib_result gclib_subscribe_data_records` (`gclib_handle` h, `void`(callback)(`void` \*user\_data, `gclib_data_record_handle` data\_record), `void` \*user\_data)  
*Subscribe to data records.*
- `gclib_result gclib_subscribe_progress` (`gclib_handle` h, `void`(callback)(`void` \*user\_data, `size_t` current, `size_t` max), `void` \*user\_data)  
*Subscribe to progress for `gclib_set_program()`, `gclib_set_array()`, and `gclib_set_firmware()`.*
- `gclib_result gclib_unsubscribe` (`gclib_handle` h, `void` \*callback)  
*Unsubscribe from messages, interrupts, data records, or progress.*
- `gclib_result gclib_message` (`gclib_handle` h, `char` \*message, `size_t` len, `int` timeout)  
*Get a queued unsolicited message, or wait up to `timeout` ms for one to arrive.*
- `gclib_result gclib_interrupt` (`gclib_handle` h, `gclib_interrupt_t` \*interrupt, `int` timeout)  
*Get a queued interrupt, or wait up to `timeout` ms for one to arrive.*
- `gclib_result gclib_data_record` (`gclib_handle` h, `gclib_data_record_handle` \*data\_record, `int` timeout)  
*Get a queued data record, or wait up to `timeout` ms for one to arrive.*

#### 12.2.7.5.1 Detailed Description

Get unsolicited messages, interrupts, or data records, in blocking or callback mode.

##### 12.2.7.5.1.1 Blocking Mode

Blocking mode is simpler to use, but has tradeoffs. If you want unsolicited data as soon as it arrives, you must block the thread to wait for it, which may not be ideal. If you want to keep the thread running, then you must periodically check for queued unsolicited data, which can add unwanted latency.

To subscribe in blocking mode, simply do not pass a callback or data pointer when you subscribe. These methods will begin queueing any unsolicited data sent by the controller.

```
gclib_subscribe_messages(h, NULL, NULL);
gclib_subscribe_interrupts(h, NULL, NULL);
gclib_subscribe_data_records(h, NULL, NULL);
```

##### 12.2.7.5.1.2 Callback Mode

Callback mode allows your thread to stay running while enabling immediate response to unsolicited data. When data arrives, your callback function will be invoked on a separate, dedicated thread. Due to this, callback mode can be more complicated to use if you are not familiar with thread synchronization.

To subscribe in callback mode, pass a callback function and an optional data pointer when you subscribe. When unsolicited data arrives, your callback will be invoked and passed the data pointer. Use this to allow the callback function access to any data it needs, and to allow data to persist between callbacks.

```
void handle_message(void* user_data, const char* message) {
    printf("Message received: %s\n", message);
}
```

```

void handle_interrupt(void* user_data, gclib_interrupt_t interrupt) {
    printf("Interrupt received, type %i, raw status byte %i": interrupt.type, interrupt.status);
}
void handle_data_record(void* user_data, gclib_data_record_handle data_record) {
    printf("Data record received, sample %i", gclib_data_record_sample(data_record));
}

gclib_subscribe_messages(h, handle_messages, user_data);
gclib_subscribe_interrups(h, handle_interrups, user_data);
gclib_subscribe_data_records(h, handle_data_records, user_data);

```

## User Data

The user data pointer can be used to pass arbitrary data to the callback function. The following example uses a struct to provide the callback access to the gclib handle itself, a count to increment when messages are received, and an atomic bool to signal when the program is ready to exit. Note that the handle is safe to use concurrently, and the count doesn't need to be atomic (since it is only used in the callback thread). As soon as the tenth message is received, the program is stopped and the connection is closed from the callback method, and the main thread is signaled to exit.

```

#include <gclib.h>
#include <stdio.h>
#include <stdatomic.h>
#include "sleep.h"

struct context {
    gclib_handle h; // gclib is thread-safe
    int count; // Only used in the callback thread
    atomic_bool done; // Used in both threads
};

void handle_message(void* user_data, const char* message) {
    struct context* ctx = user_data;
    ctx->count = ctx->count + 1;
    printf("Received message #%i at TIME %i\n", ctx->count, (int)atof(message));
    if (ctx->count == 10) {
        gclib_command(ctx->h, "ST", NULL, 0);
        gclib_close(&ctx->h);
        ctx->done = true;
    }
};

int main(int argc, char* argv[]) {
    struct context ctx = {NULL, 0, 0};
    gclib_open(&ctx.h, argv[1]);
    gclib_subscribe_messages(ctx.h, handle_message, &ctx);
    gclib_set_program(ctx.h, "#msg\nMGTIME\nWT100\nJP#msg\nEN", NULL);
    gclib_command(ctx.h, "XQ", NULL, 0);
    while (!ctx.done) {
        msleep(100 * 1000); // Do work
    }
}

```

## 12.2.7.5.2 Function Documentation

### 12.2.7.5.2.1 gclib\_set\_interrups()

```

gclib_result gclib_set_interrups (
    gclib_handle h,
    gclib_interrupt_type interrupt_mask,
    gclib_axis_flags motion_complete_axes,
    gclib_digital_input_flags digital_inputs)

```

Configure which interrupts will be generated by the controller.

By default, the controller will not generate any interrupts.

Controllers can be configured to send only an exact list of desired interrupts, to avoid unnecessary processing and network traffic.

Example usage:

```

gclib_set_interrups(h, GCLIB_ALL_INTERRUPTS, 0, 0); // Enable all interrupts.
gclib_set_interrups(h,
    GCLIB_MOTION_COMPLETE | GCLIB_DIGITAL_INPUT_LOW, // Only enable two interrupts
    GCLIB_AXIS_A | GCLIB_AXIS_F, // Only trigger GCLIB_MOTION_COMPLETE on axis A or F
    GCLIB_DIGITAL_INPUT_1 | GCLIB_DIGITAL_INPUT_4); // Only trigger GCLIB_DIGITAL_INPUT_LOW on digital input
    1 and 4.
gclib_set_interrups(h, 0, 0, 0); // Disable interrupts

```

See `gclib_subscribe_interrups()` to enable receiving interrupts from the controller.

## Parameters

<i>h</i>	Handle to an open connection.
<i>interrupt_mask</i>	Bitmask of desired interrupts. Use <a href="#">GCLIB_NO_INTERRUPTS</a> (0) to disable interrupts. Note that User Interrupts cannot be disabled.
<i>axis_mask</i>	When <a href="#">GCLIB_MOTION_COMPLETE</a> is in <i>interrupt_mask</i> , this axis mask controls which axes will trigger a <a href="#">GCLIB_MOTION_COMPLETE</a> interrupt. If 0, all axes will be selected.
<i>digital_input_mask</i>	When <a href="#">GCLIB_DIGITAL_INPUT_LOW</a> is in <i>interrupt_mask</i> , this bitmask selects which digital inputs will trigger an interrupt. If 0, all digital inputs will be selected.

## Returns

[GCLIB\\_TIMEOUT](#) if no response from controller after configuring interrupts.

12.2.7.5.2.2 [gclib\\_set\\_data\\_records\(\)](#)

```
gclib_result gclib_set_data_records (
    gclib_handle h,
    size_t period_ms)
```

Configure controller data records.

By default, data records are not sent by the controller.

See [gclib\\_subscribe\\_data\\_records\(\)](#) to enable receiving data records from the controller.

## Parameters

<i>h</i>	Handle to an open connection.
<i>period_ms</i>	Period between data records. Pass 0 to disable data records.

## Returns

[GCLIB\\_TIMEOUT](#) if no response from controller after configuring data records.

12.2.7.5.2.3 [gclib\\_subscribe\\_messages\(\)](#)

```
gclib_result gclib_subscribe_messages (
    gclib_handle h,
    void(callback)(void *user_data, const char *message) ,
    void * user_data)
```

Subscribe to unsolicited messages.

This method registers a callback to be run every time an unsolicited message is received from the controller.

## Note

The callback will be invoked on a separate, dedicated thread. Be careful when accessing any shared state.

When a callback is not provided, messages are instead queued for later retrieval by [gclib\\_message\(\)](#).

On ethernet connections, a handle is opened for unsolicited data (if not already open) and the controller is configured to use it for messages.

## Parameters

<i>h</i>	Handle to an open connection.
<i>callback</i>	Pass a callback function to get messages asynchronously, or <code>NULL</code> if you would like to use the <a href="#">gclib_message()</a> blocking API.
<i>user_data</i>	An arbitrary pointer that will be passed to your callback function. Can be used to provide state that persists between callbacks.

**Returns**

[GCLIB\\_NOT\\_SUBSCRIBED](#) if unable to subscribe to messages.

**12.2.7.5.2.4 gclib\_subscribe\_interrupts()**

```
gclib_result gclib_subscribe_interrupts (
    gclib_handle h,
    void(callback)(void *user_data, gclib_interrupt_t interrupt) ,
    void * user_data)
```

Subscribe to interrupts.

This method registers a callback to be run every time an interrupt is received from the controller. See [gclib\\_set\\_interrupts\(\)](#) to enable and configure controller interrupts.

**Note**

The callback will be invoked on a separate, dedicated thread. Be careful when accessing any shared state.

When a callback is not provided, interrupts are instead queued for later retrieval by [gclib\\_interrupt\(\)](#). On ethernet connections, a handle is opened for unsolicited data (if not already open) and the controller is configured to use it for interrupts.

**Parameters**

<i>h</i>	Handle to an open connection.
<i>callback</i>	Pass a callback function to get interrupts asynchronously, or <code>NULL</code> if you would like to use the <a href="#">gclib_interrupt()</a> blocking API.
<i>user_data</i>	An arbitrary pointer that will be passed to your callback function. Can be used to provide state that persists between callbacks.

**Returns**

[GCLIB\\_NOT\\_SUBSCRIBED](#) if unable to subscribe to interrupts.

**12.2.7.5.2.5 gclib\_subscribe\_data\_records()**

```
gclib_result gclib_subscribe_data_records (
    gclib_handle h,
    void(callback)(void *user_data, gclib_data_record_handle data_record) ,
    void * user_data)
```

Subscribe to data records.

This method registers a callback to be run every time a data record is received from the controller. See [gclib\\_set\\_data\\_records\(\)](#) to enable data records and configure how often they will be generated by the controller.

**Note**

The callback will be invoked on a separate, dedicated thread. Be careful when accessing any shared state.

When a callback is not provided, data records are instead queued for later retrieval by [gclib\\_data\\_record\(\)](#). On ethernet connections, a handle is opened for unsolicited data (if not already open) and the controller is configured to use it for data records.

**Parameters**

<i>h</i>	Handle to an open connection.
<i>callback</i>	Pass a callback function to get data records asynchronously, or <code>NULL</code> if you would like to use the <a href="#">gclib_data_record()</a> blocking API.
<i>user_data</i>	An arbitrary pointer that will be passed to your callback function. Can be used to provide state that persists between callbacks.

## Returns

`GCLIB_NOT_SUBSCRIBED` if unable to subscribe to data records.

**12.2.7.5.2.6 gclib\_subscribe\_progress()**

```
gclib_result gclib_subscribe_progress (
    gclib_handle h,
    void(callback)(void *user_data, size_t current, size_t max) ,
    void * user_data)
```

Subscribe to progress for `gclib_set_program()`, `gclib_set_array()`, and `gclib_set_firmware()`.

## Note

The callback will be invoked on a separate, dedicated thread. Be careful when accessing any shared state.

## Parameters

<i>h</i>	Handle to an open connection.
<i>callback</i>	A callback function that will get called anytime part of a large write is completed.
<i>user_data</i>	An arbitrary pointer that will be passed to your callback function. Can be used to provide state that persists between callbacks.

## Returns

`GCLIB_INVALID_ARGUMENT` if **callback** is `NULL`.

**12.2.7.5.2.7 gclib\_unsubscribe()**

```
gclib_result gclib_unsubscribe (
    gclib_handle h,
    void * callback)
```

Unsubscribe from messages, interrupts, data records, or progress.

## Parameters

<i>h</i>	Handle to an open connection.
<i>callback</i>	The callback function that was previously used to subscribe. If <code>NULL</code> , all subscriptions will be cleared.

## Returns

`GCLIB_INVALID_ARGUMENT` if **callback** doesn't match any existing subscription.

**12.2.7.5.2.8 gclib\_message()**

```
gclib_result gclib_message (
    gclib_handle h,
    char * message,
    size_t len,
    int timeout)
```

Get a queued unsolicited message, or wait up to `timeout` ms for one to arrive.

## Parameters

<i>h</i>	Handle to an open connection.
<i>message</i>	Output buffer for the message.
<i>len</i>	Length of output buffer.
<i>timeout</i>	Timeout value in milliseconds. If <code>-1</code> , wait forever.

## Returns

- `GCLIB_TIMEOUT` if no message arrives for `timeout` ms.
- `GCLIB_BUFFER_TOO_SMALL` if output does not fit in buffer.

**12.2.7.5.2.9 gclib\_interrupt()**

```
gclib_result gclib_interrupt (
    gclib_handle h,
    gclib_interrupt_t * interrupt,
    int timeout)
```

Get a queued interrupt, or wait up to `timeout` ms for one to arrive.

## Parameters

<i>h</i>	Handle to an open connection.
<i>interrupt</i>	Output interrupt.
<i>timeout</i>	Timeout value in milliseconds. If <code>-1</code> , wait forever.

## Returns

`GCLIB_TIMEOUT` if no interrupt arrives after `timeout` ms.

**12.2.7.5.2.10 gclib\_data\_record()**

```
gclib_result gclib_data_record (
    gclib_handle h,
    gclib_data_record_handle * data_record,
    int timeout)
```

Get a queued data record, or wait up to `timeout` ms for one to arrive.

The returned handle remains valid until the next call to `gclib_data_record()`.

## Parameters

<i>h</i>	Handle to an open connection.
<i>data_record</i>	Output data record handle.
<i>timeout</i>	Timeout value in milliseconds. If <code>-1</code> , wait forever.

## Returns

`GCLIB_TIMEOUT` if no data record arrives after `timeout` ms.

**12.3 C (Legacy)**

For backwards compatibility with gclib 2.2.1 and below.

## Topics

- [Connection](#)  
*Discover available controllers and open connections.*
- [Controller](#)  
*Manage a Galil controller.*
- [Galil Connect](#)  
*Host or connect to a remote gcaps instance.*

## Functions

- [GCLIB\\_DEPRECATED](#) void [GSleep](#) (unsigned int timeout\_ms)
- [GCLIB\\_DEPRECATED](#) GReturn GVersion (GCStringOut ver, GSize ver\_len)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_VERSION](#) and [G\\_UTIL\\_GCAPS\\_VERSION](#) to provide the library and gcaps version numbers.*
- [GCLIB\\_DEPRECATED](#) void GError (GReturn rc, GCStringOut error, GSize error\_len)  
*Provides a human-readable description string for return codes.*

### 12.3.1 Detailed Description

For backwards compatibility with gclib 2.2.1 and below.

### 12.3.2 Function Documentation

#### 12.3.2.1 GSleep()

```
GCLIB\_DEPRECATED void GSleep (
    unsigned int timeout_ms)
```

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

##### Parameters

<i>timeout_ms</i>	The timeout, in milliseconds, to block before returning.
-------------------	--

See [GWaitForBool\(\)](#) for an example.

#### 12.3.2.2 GVersion()

```
GCLIB\_DEPRECATED GReturn GVersion (
    GCStringOut ver,
    GSize ver_len)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_VERSION](#) and [G\\_UTIL\\_GCAPS\\_VERSION](#) to provide the library and gcaps version numbers.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_version\(\)](#) and [gclib\\_gcaps\\_version\(\)](#) instead.

##### Parameters

<i>ver</i>	Buffer to hold the output string. Buffer will be null terminated, even if the data must be truncated to do so.
<i>ver_len</i>	Length of buffer.

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

The version number of gclib is provided first. If the gcaps server can be found, its version will be provided after a space.

Example with gcaps version.

```
154.190.329 1.0.0.82
```

Example with gclib version only.

```
154.190.329
```

##### Note

[GVersion\(\)](#) will take up to 1 second to look for gcaps.

### 12.3.2.3 GError()

```
GCLIB_DEPRECATED void GError (
    GReturn rc,
    GCStringOut error,
    GSize error_len)
```

Provides a human-readable description string for return codes.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

#### Parameters

<i>rc</i>	The return code to lookup.
<i>error</i>	The buffer to fill with the error text. Buffer will be null terminated, even if the data must be truncated to do so.
<i>error_len</i>	The length of the error buffer.

## 12.3.3 Connection

Discover available controllers and open connections.

### Functions

- [GCLIB\\_DEPRECATED GReturn GOpen](#) (GCStringIn connection\_string, GCon \*g)  
*Open a connection to a Galil Controller.*
- [GCLIB\\_DEPRECATED GReturn GClose](#) (GCon g)  
*Closes a connection to a Galil Controller.*
- [GCLIB\\_DEPRECATED GReturn GAddresses](#) (GCStringOut addresses, GSize addresses\_len)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_ADDRESSES](#) or [G\\_UTIL\\_ADDRESSES](#) to provide a listing of all available connection addresses.*
- [GCLIB\\_DEPRECATED GReturn GInfo](#) (GCon g, GCStringOut info, GSize info\_len)  
*Uses [GUtility\(\)](#) and [G\\_UTIL\\_INFO](#) to provide a useful connection string.*
- [GCLIB\\_DEPRECATED GReturn GTimeout](#) (GCon g, short timeout\_ms)  
*Uses [GUtility\(\)](#) and [G\\_UTIL\\_TIMEOUT\\_OVERRIDE](#) to set the library timeout.*
- [GCLIB\\_DEPRECATED GReturn GIpRequests](#) (GCStringOut requests, GSize requests\_len)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_IPREQUEST](#) or [G\\_UTIL\\_IPREQUEST](#) to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- [GCLIB\\_DEPRECATED GReturn GAssign](#) (GCStringIn ip, GCStringIn mac)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_ASSIGN](#) or [G\\_UTIL\\_ASSIGN](#) to assign an IP address over the Ethernet to a controller at a given MAC address.*

### 12.3.3.1 Detailed Description

Discover available controllers and open connections.

### 12.3.3.2 Function Documentation

#### 12.3.3.2.1 GOpen()

```
GCLIB_DEPRECATED GReturn GOpen (
    GCStringIn connection_string,
    GCon * g)
```

Open a connection to a Galil Controller.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_open\(\)](#) instead.



## Parameters

<i>connection_string</i>	Null-terminated connection string. See table below.
<i>g</i>	Pointer to user's <a href="#">GCon</a> variable. On success, the library will fill the user's variable with the handle to use for the rest of the connection. A valid <i>g</i> value is nonzero.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

address switch	Meaning	Arguments (default), other options	Examples
--address	<b>Simple address to hardware</b>	<i>IP address, PCI, COM port</i>	--address COM1
-a	shorthand for --address	See <i>Address Ranges</i> below	-a GALILPCI1
{no switch}	--address is implicit for any lone token		192.168.0.42
--baud	<b>Baud rate</b>	(115200), <i>valid baud...</i>	COM2 --baud 19200
-b	shorthand for --baud		COM3 -b 38400
--command	<b>Command-and-response socket protocol</b>	(TCP), UDP	192.168.0.42 --command TCP
-c	shorthand for --command		192.168.0.42 -c UDP
--direct	<b>Connect directly to hardware instead of via gcaps</b>		-a GALILPCI2 --direct
-d	shorthand for --direct		GALILPCI2 -d
--subscribe	<b>Subscribe to messages, data records, and/or interrupts</b>	(NONE), MG, DR, EI, ALL	192.168.0.42 --subscribe MG
-s	shorthand for --subscribe		192.168.0.42 -s DR -s EI
--timeout	<b>timeout in ms</b>	(5000), <i>0-65535</i>	192.168.0.42 --timeout 5000
-t	shorthand for --timeout		GALILPCI2 -t 500
--unsolicited	<b>Unsolicited socket protocol</b>	(UDP), NONE	192.168.0.42 --unsolicited NONE
-u	shorthand for --unsolicited		192.168.1.42 -u UDP
<b>The following address switches are deprecated and will be unavailable starting July 1st, 2020.</b>			
--p1	<b>Primary port for command-and-response traffic</b>	(23), <i>valid port number</i>	192.168.0.42 --p1 5000
--p2	<b>Secondary port for unsolicited traffic</b>	(60007), <i>valid port number</i>	192.168.0.42 --p2 5000

Operating System	Address Range	Notes
Windows	COM1 - COM256	RS232 and USB-to-serial
Linux	/dev/ttyS0 - /dev/ttyS255	RS232
Linux	/dev/ttyUSB0 - /dev/ttyUSB255	USB-to-serial, e.g. DMC-4103
Windows	GALILPCI1 - GALILPCI8	PCI

Linux	/dev/galilpci0 - /dev/galilpci7	PCI
-------	---------------------------------	-----

When connecting to a network device, if the command-and-response socket is opened successfully but the unsolicited socket fails, [GOpen\(\)](#) will still complete successfully. This allows connection to a Galil controller when only one Ethernet handle is available. Unsolicited traffic will not be accessible in this case.

#### 12.3.3.2.2 GClose()

```
GCLIB_DEPRECATED GReturn GClose (
    GCon g)
```

Closes a connection to a Galil Controller.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_close\(\)](#) instead.

#### Attention

*gclib* requires that [GClose\(\)](#) be called whenever a program is finished with a controller. This includes when a program closes. A rule of thumb is that for every [GOpen\(\)](#) call on a given connection, a [GClose\(\)](#) call should be found on every code path. Failing to call [GClose\(\)](#) may cause controller resources to not be released or can hang the process if there are outstanding asynchronous operations.

#### Parameters

<i>g</i>	Connection's handle.
----------	----------------------

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.3.2.3 GAddresses()

```
GCLIB_DEPRECATED GReturn GAddresses (
    GStringOut addresses,
    GSize addresses_len)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_ADDRESSES](#) or [G\\_UTIL\\_ADDRESSES](#) to provide a listing of all available connection addresses.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_addresses\(\)](#) instead.

#### Note

Serial ports are listed, e.g. COM1. Upon open, it may be necessary to specify a baud rate for the controller, e.g. `--baud 19200`. Default baud is 115200. See [GOpen\(\)](#).

#### Parameters

<i>addresses</i>	Buffer to hold the output string. Buffer will be null terminated, even if the data must be truncated to do so. See below for more information.
<i>addresses_len</i>	Length of buffer.

**Returns**

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

If gcaps is available, the listing will come from the server via [G\\_UTIL\\_GCAPS\\_ADDRESSES](#). In the absence of the server, gclib will use [G\\_UTIL\\_ADDRESSES](#) to generate the list.

- Ethernet controllers will be listed as *ip\_address, revision\_report, network\_adapter\_name, network\_adapter↵\_ip\_address*. If an IP address is unreachable via ping, the address will be in parentheses.
- PCI controllers will be listed by their identifier, e.g. GALILPCI1.
- Serial ports will be listed by their identifier, e.g. COM1.

```
10.1.3.91, DMC4020 Rev 1.2e, LAN, 10.1.3.10
192.168.0.63, DMC4040 Rev 1.2f, Static, 192.168.0.41
(192.0.0.42), RIO47102 Rev 1.1j, Static, 192.168.0.41
GALILPCI1
COM1
COM2
```

**Note**

[GAddresses\(\)](#) will take up to 1 second to look for gcaps.

**12.3.3.2.4 GInfo()**

```
GCLIB_DEPRECATED GReturn GInfo (
    GCon g,
    GCStringOut info,
    GSize info_len)
```

Uses [GUtility\(\)](#) and [G\\_UTIL\\_INFO](#) to provide a useful connection string.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_address\(\)](#), [gclib\\_revision\\_information\(\)](#), and [gclib\\_serial\\_number\(\)](#) instead.

**Parameters**

<i>g</i>	Connection's handle.
<i>info</i>	Buffer to hold the output string. Buffer will be null terminated, even if the data must be truncated to do so.
<i>info_len</i>	Length of buffer.

**Returns**

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

The response is *address, revision\_report, serial\_number*. For example:

```
COM2, RIO47102 Rev 1.1j, 37290
```

**12.3.3.2.5 GTimeout()**

```
GCLIB_DEPRECATED GReturn GTimeout (
    GCon g,
    short timeout_ms)
```

Uses [GUtility\(\)](#) and [G\\_UTIL\\_TIMEOUT\\_OVERRIDE](#) to set the library timeout.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

## Parameters

<i>g</i>	Connection's handle.
<i>timeout_ms</i>	The value to be used for the timeout. Use <code>G_USE_INITIAL_TIMEOUT</code> to set the timeout back to the initial <code>GOpen()</code> value, <code>--timeout</code> .

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

**12.3.3.2.6 GIpRequests()**

```
GCLIB_DEPRECATED GReturn GIpRequests (
    GCStringOut requests,
    GSize requests_len)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_IPREQUEST](#) or [G\\_UTIL\\_IPREQUEST](#) to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_ip\\_requests\(\)](#) instead.

## Parameters

<i>requests</i>	The buffer to hold the list of requesting controllers. Data will be null terminated, even if the data must be truncated to do so. See below for more information.
<i>requests_len</i>	The length of the requests buffer.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

[GIpRequests\(\)](#) will block up to 5 seconds while listening for requests.

If gcaps is available, the listing will come from the server via [G\\_UTIL\\_GCAPS\\_IPREQUEST](#). In the absence of the server, gclib will use [G\\_UTIL\\_IPREQUEST](#) to generate the list. [GIpRequests\(\)](#) will take up to 1 second to look for gcaps. When not using gcaps, Linux/OS X users must be root to use [GIpRequests\(\)](#) and have UDP access to bind and listen on port 67.

Each line of the returned data will be of the form *model, serial\_number, MAC\_address, network\_adapter\_name, network\_adapter\_ip\_address, remembered\_ip\_assignment*. See [GAssign\(\)](#) for more information about remembered IP assignments. The following is an example output.

```
DMC2000, 34023, 00:50:4C:00:84:E7, enp5s0, 192.168.42.92, 192.168.42.200
DMC2105, 7, 00:50:4C:58:00:07, enp5s0, 192.168.42.92, 0.0.0.0
DMC2105, 13, 00:50:4C:58:00:0D, enp5s0, 192.168.42.92, 0.0.0.0
```

**12.3.3.2.7 GAssign()**

```
GCLIB_DEPRECATED GReturn GAssign (
    GCStringIn ip,
    GCStringIn mac)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_ASSIGN](#) or [G\\_UTIL\\_ASSIGN](#) to assign an IP address over the Ethernet to a controller at a given MAC address.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_assign\\_ip\(\)](#) instead.

## Parameters

<i>ip</i>	The null-terminated ip address to assign. The hardware should not yet have an IP address.
<i>mac</i>	The null-terminated MAC address of the hardware.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

On Linux and Mac, the desired IP address will be pinged prior to the assignment. If the ping is returned, [GAssign\(\)](#) will return [G\\_GCLIB\\_UTILITY\\_IP\\_TAKEN](#).

If gcaps is available, the assign will be performed from the server via [G\\_UTIL\\_GCAPS\\_ASSIGN](#). gcaps will remember the assignment and will automatically assign the desired IP address should the controller ever request one again, e.g. after a controller master reset. To clear the remembered IP address from gcaps, call [GAssign\(\)](#) with a blank string in place of the ip address. To remove all remembered ip addresses, specify a blank string for the mac address.

In the absence of the server, gclib will use [G\\_UTIL\\_ASSIGN](#) to assign. [GAssign\(\)](#) will take up to 1 second to look for gcaps. When not using gcaps, Linux/OS X users must be root to use [GAssign\(\)](#) and have UDP access to send on port 68.

### 12.3.4 Controller

Manage a Galil controller.

## Topics

- [Communication](#)  
*Send commands.*
- [Memory](#)  
*Manage controller memory, such as program and arrays.*
- [Unsolicited Data](#)  
*Receive messages, interrupts, and data records.*

## Functions

- [GCLIB\\_DEPRECATED GReturn GWaitForBool](#) ([GCon](#) g, [GCStringIn](#) predicate, int trials)  
*Blocking call that returns when the controller evaluates the predicate as true.*
- [GCLIB\\_DEPRECATED GReturn GMotionComplete](#) ([GCon](#) g, [GCStringIn](#) axes)  
*Blocking call that returns once all axes specified have completed their motion.*

#### 12.3.4.1 Detailed Description

Manage a Galil controller.

#### 12.3.4.2 Function Documentation

##### 12.3.4.2.1 GWaitForBool()

```
GCLIB_DEPRECATED GReturn GWaitForBool (
    GCon g,
    GCStringIn predicate,
    int trials)
```

Blocking call that returns when the controller evaluates the predicate as true.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

Polls the message command (MG) to check the value of predicate. Polling will continue until the controller responds with a nonzero value or the number of polling trials is reached.

The amount of time until the function fails with [G\\_GCLIB\\_POLLING\\_FAILED](#) is roughly (trials \* [POLLINGINTERVAL](#)) milliseconds.

## Parameters

<i>g</i>	Connection's handle.
<i>predicate</i>	A null-terminated string containing the predicate to be polled. The predicate will be enclosed in parentheses and used in the command <code>MG (predicate)</code> to return the value.
<i>trials</i>	The number of polling cycles to perform looking for a nonzero value. Use -1 to poll indefinitely.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

See [GMotionComplete\(\)](#) for an example.

## 12.3.4.2.2 GMotionComplete()

```
GCLIB_DEPRECATED GReturn GMotionComplete (
    GCon g,
    GCStringIn axes)
```

Blocking call that returns once all axes specified have completed their motion.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

## Note

This function uses a profiled motion indicator, not the position of the encoder. E.G. see the difference between AM (profiled) and MC (encoder-based).

Although using the `_BGm` operand is the most generally compatible method, there are higher-performance ways to check for motion complete by using the data record, or interrupts. See examples `x_dr_motioncomplete()` and `x_ei_motioncomplete()`.

## Parameters

<i>g</i>	Connection's handle.
<i>axes</i>	A null-terminated string containing a multiple-axes mask. Every character in the string should be a valid argument to <code>MG_BGm</code> , i.e. XYZWABCEFGHST.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

## 12.3.4.3 Communication

Send commands.

## Functions

- [GCLIB\\_DEPRECATED GReturn GCommand](#) ([GCon](#) g, [GCStringIn](#) command, [GBufOut](#) buffer, [GSize](#) buffer\_len, [GSize](#) \*bytes\_returned)  
*Performs a command-and-response transaction on the connection.*
- [GCLIB\\_DEPRECATED GReturn GCmd](#) ([GCon](#) g, [GCStringIn](#) command)  
*Wrapper around GCommand for use when the return value is not desired.*
- [GCLIB\\_DEPRECATED GReturn GCmdT](#) ([GCon](#) g, [GCStringIn](#) command, [GCStringOut](#) trimmed\_response, [GSize](#) response\_len, [GCStringOut](#) \*front)  
*Wrapper around GCommand that trims the response.*
- [GCLIB\\_DEPRECATED GReturn GCmdI](#) ([GCon](#) g, [GCStringIn](#) command, int \*value)  
*Wrapper around GCommand that provides the return value of a command parsed into an int.*
- [GCLIB\\_DEPRECATED GReturn GCmdD](#) ([GCon](#) g, [GCStringIn](#) command, double \*value)  
*Wrapper around GCommand that provides the return value of a command parsed into a double.*

### 12.3.4.3.1 Detailed Description

Send commands.

### 12.3.4.3.2 Function Documentation

#### 12.3.4.3.2.1 GCommand()

```
GCLIB_DEPRECATED GReturn GCommand (
    GCon g,
    GCStringIn command,
    GBufOut buffer,
    GSize buffer_len,
    GSize * bytes_returned)
```

Performs a *command-and-response* transaction on the connection.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_command\(\)](#) instead.

#### Parameters

<i>g</i>	Connection's handle.
<i>command</i>	Null-terminated command string to send to the controller. The library will append a carriage return to the command string.
<i>buffer</i>	Buffer for the response. Will be filled with the response from the controller. The data will be null terminated unless the function returns <code>G_BAD_LOST_DATA</code> due to the buffer being too small to hold the data.
<i>buffer_len</i>	The size of the response buffer.
<i>bytes_returned</i>	The size of the data returned from the controller. This does not include null termination. This argument may be null if the value is not desired.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.3.2.2 GCmd()

```
GCLIB_DEPRECATED GReturn GCmd (
    GCon g,
    GCStringIn command)
```

Wrapper around `GCommand` for use when the return value is not desired.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

The returned data is still checked for error, e.g. ? or timeout, but is not brought out through the prototype.

#### Parameters

<i>g</i>	Connection's handle.
<i>command</i>	Null-terminated command string to send to the controller.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.3.2.3 GCmdT()

```
GCLIB_DEPRECATED GReturn GCmdT (
    GCon g,
    GCStringIn command,
    GCStringOut trimmed_response,
    GSize response_len,
    GCStringOut * front)
```

Wrapper around GCommand that trims the response.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

For use when the return value is desired, is ASCII (not binary), and the response should be trimmed of trailing colon, whitespace, and optionally leading space.

##### Parameters

<i>g</i>	Connection's handle.
<i>command</i>	Null-terminated command string to send to the controller.
<i>trimmed_response</i>	The trimmed response from the controller. Trailing space is trimmed by null terminating any trailing spaces, carriage returns, or line feeds.
<i>response_len</i>	The length of the trimmed_response buffer.
<i>front</i>	If non-null, upon return *front will point to the first non-space character in trimmed_response. This allows trimming the front of the string without modifying the user's buffer pointer, which may be allocated on the heap.

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.3.2.4 GCmdI()

```
GCLIB_DEPRECATED GReturn GCmdI (
    GCon g,
    GCStringIn command,
    int * value)
```

Wrapper around GCommand that provides the return value of a command parsed into an int.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

Use this function to get most values including TP, RP, TE, Digital I/O states, etc.

##### Parameters

<i>g</i>	Connection's handle.
<i>command</i>	Null-terminated command string to send to the controller.
<i>value</i>	Pointer to an int that will be filled with the return value.

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.



### 12.3.4.3.2.5 GCmdD()

```
GCLIB_DEPRECATED GReturn GCmdD (
    GCon g,
    GCStringIn command,
    double * value)
```

Wrapper around GCommand that provides the return value of a command parsed into a double.

**Deprecated** This function is part of the deprecated C (Legacy) API, which will be removed in a future release.

Use this function to retrieve the full Galil 4.2 range, e.g. for a variable value with fractional data, or the value of an Analog input or Output.

#### Parameters

<i>g</i>	Connection's handle.
<i>command</i>	Null-terminated command string to send to the controller.
<i>value</i>	Pointer to a double that will be filled with the return value.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

### 12.3.4.4 Memory

Manage controller memory, such as program and arrays.

#### Functions

- [GCLIB\\_DEPRECATED GReturn GProgramDownload](#) (GCon g, GCStringIn program, GCStringIn preprocessor)  
*Downloads a program to the controller's program buffer.*
- [GCLIB\\_DEPRECATED GReturn GProgramUpload](#) (GCon g, GBufOut buffer, GSize buffer\_len)  
*Uploads a program from the controller's program buffer.*
- [GCLIB\\_DEPRECATED GReturn GArrayDownload](#) (GCon g, const GCStringIn array\_name, GOption first, GOption last, GCStringIn buffer)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- [GCLIB\\_DEPRECATED GReturn GArrayUpload](#) (GCon g, const GCStringIn array\_name, GOption first, GOption last, GOption delim, GBufOut buffer, GSize buffer\_len)  
*Uploads array data from the controller's array table.*
- [GCLIB\\_DEPRECATED GReturn GFirmwareDownload](#) (GCon g, GCStringIn filepath)  
*Upgrade firmware.*
- [GCLIB\\_DEPRECATED GReturn GProgramDownloadFile](#) (GCon g, GCStringIn file\_path, GCStringIn preprocessor)  
*Program download from file.*
- [GCLIB\\_DEPRECATED GReturn GProgramUploadFile](#) (GCon g, GCStringIn file\_path)  
*Program upload to file.*
- [GCLIB\\_DEPRECATED GReturn GArrayDownloadFile](#) (GCon g, GCStringIn file\_path)  
*Array download from file.*
- [GCLIB\\_DEPRECATED GReturn GArrayUploadFile](#) (GCon g, GCStringIn file\_path, GCStringIn names)  
*Array upload to file.*
- [GCLIB\\_DEPRECATED GReturn GSetupDownloadFile](#) (GCon g, GCStringIn file\_path, GOption options, GCStringOut info, GSize info\_len)  
*Download a saved controller configuration from a file.*

#### 12.3.4.4.1 Detailed Description

Manage controller memory, such as program and arrays.

#### 12.3.4.4.2 Function Documentation

##### 12.3.4.4.2.1 GProgramDownload()

```
GCLIB_DEPRECATED GReturn GProgramDownload (
    GCon g,
    GCStringIn program,
    GCStringIn preprocessor)
```

Downloads a program to the controller's program buffer.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_program\(\)](#) instead.

##### Parameters

<i>g</i>	Connection's handle.
<i>program</i>	Null-terminated program for download.
<i>preprocessor</i>	Options string for preprocessing the program before sending it to the controller. Null allows the library to use defaults for the download. See the <a href="#">Program Preprocessor</a> documentation for options.

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

##### 12.3.4.4.2.2 GProgramUpload()

```
GCLIB_DEPRECATED GReturn GProgramUpload (
    GCon g,
    GBufOut buffer,
    GSize buffer_len)
```

Uploads a program from the controller's program buffer.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_program\(\)](#) instead.

##### Parameters

<i>g</i>	Connection's handle.
<i>buffer</i>	Buffer to receive the controller's program. The data will be null terminated unless function returns <code>G_BAD_LOST_DATA</code> due to the buffer being too small to hold the data.
<i>buffer_len</i>	The length of the receive buffer.

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.3 GArrayDownload()

```
GCLIB_DEPRECATED GReturn GArrayDownload (
    GCon g,
    const GCStringIn array_name,
    GOption first,
    GOption last,
    GCStringIn buffer)
```

Downloads array data to a pre-dimensioned array in the controller's array table.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_array\(\)](#) instead.

#### Warning

The array must already exist on the controller and be sufficient dimension to hold the desired array data, e.g. via DM.

#### Parameters

<i>g</i>	Connection's handle.
<i>array_name</i>	Null-terminated string containing the name of the array to download. Must match the array name used in DM.
<i>first</i>	The first element of the array for sub-array downloads. <code>G_BOUNDS</code> to omit.
<i>last</i>	The last element of the array for sub-array downloads. <code>G_BOUNDS</code> to omit.
<i>buffer</i>	Buffer containing the null-terminated data to be sent to the controller. The array data may be separated with <i>carriage return</i> , <i>carriage return + line feed</i> , or a <i>comma</i> . No spaces.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.4 GArrayUpload()

```
GCLIB_DEPRECATED GReturn GArrayUpload (
    GCon g,
    const GCStringIn array_name,
    GOption first,
    GOption last,
    GOption delim,
    GBufOut buffer,
    GSize buffer_len)
```

Uploads array data from the controller's array table.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_array\(\)](#) instead.

#### Parameters

<i>g</i>	Connection's handle.
<i>array_name</i>	Null-terminated string containing the name of the array to upload.
<i>first</i>	The first element of the array for sub-array uploads. <code>G_BOUNDS</code> to omit.
<i>last</i>	The last element of the array for sub-array uploads. <code>G_BOUNDS</code> to omit.
<i>delim</i>	Sets the delimiter between array elements in the returned data, <code>G_CR</code> specifies carriage return, <code>G_COMMA</code> specifies comma.

<i>buffer</i>	Buffer to receive the uploaded data. The data will be null terminated unless function returns <code>G_BAD_LOST_DATA</code> due to the buffer being too small to hold the data.
<i>buffer_len</i>	The length of the receive buffer.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.5 GFirmwareDownload()

```
GCLIB_DEPRECATED GReturn GFirmwareDownload (
    GCon g,
    GCStringIn filepath)
```

Upgrade firmware.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_firmware\(\)](#) instead.

#### Parameters

<i>g</i>	Connection's handle.
<i>filepath</i>	The full file path to the Galil-supplied firmware hex file. See <a href="http://www.galil.com/downloads/firmware">http://www.galil.com/downloads/firmware</a>

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.6 GProgramDownloadFile()

```
GCLIB_DEPRECATED GReturn GProgramDownloadFile (
    GCon g,
    GCStringIn file_path,
    GCStringIn preprocessor)
```

Program download from file.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

#### Parameters

<i>g</i>	Connection's handle.
<i>file_path</i>	Null-terminated string containing the path to the program file.
<i>preprocessor</i>	Options string for preprocessing the program before sending it to the controller. See <a href="#">GProgramDownload()</a> .

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.7 GProgramUploadFile()

```
GCLIB_DEPRECATED GReturn GProgramUploadFile (
    GCon g,
    GCStringIn file_path)
```

Program upload to file.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

## Parameters

<i>g</i>	Connection's handle.
<i>file_path</i>	Null-terminated string containing the path to the program file, file will be overwritten if it exists.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

**12.3.4.4.2.8 GArrayDownloadFile()**

```
GCLIB_DEPRECATED GReturn GArrayDownloadFile (  
    GCon g,  
    GCStringIn file_path)
```

Array download from file.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

Downloads a csv file containing array data at *file\_path*. If the arrays don't exist, they will be dimensioned.

## Parameters

<i>g</i>	Connection's handle.
<i>file_path</i>	Null-terminated string containing the path to the array file.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

**12.3.4.4.2.9 GArrayUploadFile()**

```
GCLIB_DEPRECATED GReturn GArrayUploadFile (  
    GCon g,  
    GCStringIn file_path,  
    GCStringIn names)
```

Array upload to file.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

Uploads the entire controller array table or a subset and saves the data as a csv file specified by *file\_path*.

## Parameters

<i>g</i>	Connection's handle.
<i>file_path</i>	Null-terminated string containing the path to the array file, file will be overwritten if it exists.
<i>names</i>	Null-terminated string containing the arrays to upload, delimited with space. "" or null uploads all arrays listed in LA.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.4.4.2.10 GSetupDownloadFile()

```
GCLIB_DEPRECATED GReturn GSetupDownloadFile (
    GCon g,
    GCStringIn file_path,
    GOption options,
    GCStringOut info,
    GSize info_len)
```

Download a saved controller configuration from a file.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

##### Parameters

<i>g</i>	Connection's handle.
<i>file_path</i>	Null-terminated string containing the path to the gcb file.
<i>options</i>	Bit mask to determine what configuration data to download. See below for all options.
<i>info</i>	Optional pointer to a buffer to store the controller info. If no info is needed, specify as NULL.
<i>info_len</i>	Length of optional info buffer. If no info is needed, specify as NULL.

##### Returns

The success status or error code of the function. If the options parameter is set to 0, the return value will be a bit mask indicating which sectors in the specified GCB are not empty. Otherwise, see [gclib\\_errors.h](#) for possible error values.

##### Note

By default, [GSetupDownloadFile\(\)](#) will stop immediately if an error is encountered downloading data. This can be overridden in the options parameter. For example, you may want to override the error if you have a backup from an 8-axis controller and want to restore the parameters for the first 4 axes to a 4-axis controller.

If both info and info\_len are not NULL, the controller information will be provided regardless of the options parameter. The options parameter is a bit mask. If options is set to 0, [GSetupDownloadFile\(\)](#) will return a bit mask indicating which sectors in the specified GCB are not empty. The following contains a list of all currently available options:

Bit	Value	Function	Description
1	0x0002	Restore parameters	<b>KPA, KIA, KDA</b> , etc...
3	0x0008	Restore variables	Variables are listed by the <b>LV</b> command
4	0x0010	Restore arrays	Arrays are listed by the <b>LA</b> command
5	0x0020	Restore program	The program is listed by the <b>LS</b> command
31	0x8000	Ignore errors	Ignore invalid parameter errors and continue restoring data. <a href="#">GSetupDownloadFile()</a> will still stop immediately if a connection issue or other fatal error is encountered

##### Usage example:

```
GCon g;
GOption opt = 0;

GCStringOut info;
GSize info_len = 4096;

GReturn rc = G`
// Call GSetupDownloadFile() with options set to 0 so we can get the non-empty sector bit mask
opt = GSetupDownloadFile(g, "C:\\path\\to\\gcb\\file.gcb", 0, NULL, NULL);

info = (GCStringOut)malloc(sizeof(GCStringOut) * info_len);

// Call GSetupDownloadFile() with the bit mask returned in the previous function call
```

```
rc = GSetupDownloadFile(g, "C:\\path\\to\\gcb\\file.gcb", opt, info, info_len);
printf("Info:\\n\\n%s", info);
GClose(g);
free(info);
return rc;
```

#### 12.3.4.5 Unsolicited Data

Receive messages, interrupts, and data records.

##### Functions

- **GCLIB\_DEPRECATED GReturn GRecord** (GCon g, union GDataRecord \*record, GOption method)  
*Provides a fresh copy of the controller's data record. Data is cast into a union, GDataRecord.*
- **GCLIB\_DEPRECATED GReturn GMessage** (GCon g, GCStringOut buffer, GSize buffer\_len)  
*Provides access to unsolicited messages from the controller.*
- **GCLIB\_DEPRECATED GReturn GInterrupt** (GCon g, GStatus \*status\_byte)  
*Provides access to PCI and UDP interrupts from the controller.*
- **GCLIB\_DEPRECATED GReturn GRecordRate** (GCon g, double period\_ms)  
*Sets the asynchronous data record to a user-specified period via DR.*

##### 12.3.4.5.1 Detailed Description

Receive messages, interrupts, and data records.

##### 12.3.4.5.2 Function Documentation

###### 12.3.4.5.2.1 GRecord()

```
GCLIB_DEPRECATED GReturn GRecord (
    GCon g,
    union GDataRecord * record,
    GOption method)
```

Provides a fresh copy of the controller's data record. Data is cast into a union, GDataRecord.

**Deprecated** This function is part of the deprecated C (Legacy) API, which will be removed in a future release. Use `gclib_data_record()` instead.

##### Parameters

<i>g</i>	Connection's handle.
<i>record</i>	A pointer to the user's DataRecord union to hold the copy.
<i>method</i>	Determines the method for acquiring the data. <ul style="list-style-type: none"> <li>• G_QR: QR is used via command-and-response.</li> <li>• G_DR: DR is used for asynchronous acquisition.</li> </ul>

##### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

When using G\_DR, the asynchronous data record must already be set up.

- `-s DR` must be used in the **GOpen()** `address` string to subscribe to records. The driver will automatically set the second argument of DR, where applicable.

- `GRecordRate()` should be issued to set DR to an appropriate interval, *n*. The interval must be no faster than the rate at which `GRecord()` is called.
- If `GRecord()` is called more slowly than the data record rate, stale data will be returned until `GRecord()` has been called once for each record sent by the controller.

`GRecord()` will block until the data record is received, or the transaction times out.

#### Note

If this function is called with a timeout of zero and the `G_DR` method, a non-blocking read is performed. If a data record has been processed since the last time the function was called, this data will be returned. If there is not a processed data record, but there is data waiting in the socket or PCI FIFO, one read will be performed to process the waiting data. If new data is still not found after these two attempts, `G_GCLIB_↵NON_BLOCKING_READ_EMPTY` will be returned.

#### 12.3.4.5.2.2 GMessage()

```
GCLIB_DEPRECATED GReturn GMessage (
    GCon g,
    GCStringOut buffer,
    GSize buffer_len)
```

Provides access to unsolicited messages from the controller.

**Deprecated** This function is part of the deprecated `C (Legacy)` API, which will be removed in a future release. Use `gclib_message()` instead.

To use this function, `-s MG` must be used in the `GOpen()` `address` string to subscribe to messages. Unsolicited bytes must be flagged by the high-bit setting, `CW 1`. The driver will automatically set this when subscribing to messages. The user should not overwrite this setting.

Unsolicited messages are data generated by the controller that are not in response to a command, a data record, or an interrupt. Examples follow.

1. Data generated by the `MG` command from embedded code. `MG` sent from the host is solicited.
2. Any command in an embedded program that returns data, e.g. `TP, RP, var=?`
3. A run time error in an embedded program, e.g. `?55 i=var`

#### Note

Messages are unframed byte streams. There is no guarantee that the user will get complete messages or single messages in a call to `GMessage()`. If multiple messages have been sent from the controller since the last call to `GMessage()`, they will all be placed in the buffer, separated by newline characters.

#### Parameters

<i>g</i>	Connection's handle.
<i>buffer</i>	The buffer to write the message data. The buffer will be null terminated.
<i>buffer_len</i>	The length of the user's buffer.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

`GMessage()` will block until a message is received, or the function times out.



**Note**

If this function is called with a timeout of zero, a non-blocking read is performed. If message data has been processed since the last time the function was called, this data will be returned. If there is no processed message data, but there is data waiting in the socket or PCI FIFO, one read will be performed to process the waiting data. If new data is still not found after these two attempts, `G_GCLIB_NON_BLOCKING_READ_EMPTY` will be returned.

**Warning**

When sending message streams through gcaps, the following non-printable bytes are illegal, `$00-$07` and `$10-$17`. These bytes may be routed to a third party device such as an HMI or display panel. See MG and CF.

**12.3.4.5.2.3 GInterrupt()**

```
GCLIB_DEPRECATED GReturn GInterrupt (
    GCon g,
    GStatus * status_byte)
```

Provides access to PCI and UDP interrupts from the controller.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use `gclib_interrupt()` instead.

Interrupts can be generated automatically by the firmware on important events via `EI` (Enable Interrupt) or by the user in embedded DMC code via `UI` (User Interrupt). To use this function, `-s EI` must be used in the [GOpen\(\)](#) address string to subscribe to interrupts.

**Parameters**

<i>g</i>	Connection's handle.
<i>status_byte</i>	A pointer to a <a href="#">GStatus</a> to receive the status byte.

**Returns**

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

[GInterrupt\(\)](#) will block until an interrupt is received, or the function times out.

**Note**

If this function is called with a timeout of zero, a non-blocking read is performed. If interrupt data is waiting in the interrupt queue, the oldest byte will be popped off the queue. If there is no interrupt data queued, but there is data waiting in the socket or PCI FIFO, one read will be performed to process the waiting data. If new data is still not found after these two attempts, `G_GCLIB_NON_BLOCKING_READ_EMPTY` will be returned.

**12.3.4.5.2.4 GRecordRate()**

```
GCLIB_DEPRECATED GReturn GRecordRate (
    GCon g,
    double period_ms)
```

Sets the asynchronous data record to a user-specified period via `DR`.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use `gclib_set_data_records()` instead.

Takes TM and product type into account and sets the `DR` period to the period requested by the user, if possible.

## Parameters

<i>g</i>	Connection's handle.
<i>period_ms</i>	Period, in milliseconds, to set up for the asynchronous data record.

## Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

### 12.3.5 Galil Connect

Host or connect to a remote gcaps instance.

## Functions

- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GSetServer](#) ([GCStringIn](#) server\_name)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SET\\_SERVER](#) to set the new active server.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GListServers](#) ([GCStringOut](#) servers, [GSize](#) servers\_len)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_LIST\\_SERVERS](#) to provide a list of all available gcaps services on the local network.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GPublishServer](#) ([GCStringIn](#) name, [GOption](#) publish, [GOption](#) save)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_PUBLISH\\_SERVER](#) to publish local gcaps server to the local network.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GServerStatus](#) ([GCStringOut](#) status, [GSize](#) status\_len)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SERVER\\_STATUS](#) to get information on the local server name and if it is published to the local network.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GRemoteConnections](#) ([GCStringOut](#) connections, [GSize](#) connections\_length)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_REMOTE\\_CONNECTIONS](#) to get a list of remote addresses connected to the local server.*

#### 12.3.5.1 Detailed Description

Host or connect to a remote gcaps instance.

#### 12.3.5.2 Function Documentation

##### 12.3.5.2.1 GSetServer()

```
GCLIB_DEPRECATED GReturn GSetServer (
    GCStringIn server_name)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SET\\_SERVER](#) to set the new active server.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_server\(\)](#) instead.

## Note

This function is only available on Windows 10 and Linux.

## Parameters

<i>server_name</i>	The name of the server to set as your new active server.
--------------------	--

Use this function in conjunction with [GListServers\(\)](#). Choose a name received from [GListServers\(\)](#) to set as your new active server.

After setting a new active server, all gclib calls will route through that new active server, unless explicitly noted otherwise.

To set your active server back to your local server, simply pass "Local" to [GSetServer\(\)](#):

### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.5.2.2 GListServers()

```
GCLIB_DEPRECATED GReturn GListServers (  
    GCStringOut servers,  
    GSize servers_len)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_LIST\\_SERVERS](#) to provide a list of all available gcaps services on the local network.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_list\\_servers\(\)](#) instead.

### Note

This function is only available on Windows 10 and Linux.

### Parameters

<i>servers</i>	The buffer to hold the list of available gcaps servers
<i>servers_len</i>	The length of the servers buffer

This function is used to find a list of available gcaps servers that have made themselves "Discoverable". The list of available servers are separated by a newline '\n' character.

### Attention

This function will always use your local gcaps server, regardless of which server you have set as your active server.

### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.5.2.3 GPublishServer()

```
GCLIB_DEPRECATED GReturn GPublishServer (  
    GCStringIn name,  
    GOption publish,  
    GOption save)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_PUBLISH\\_SERVER](#) to publish local gcaps server to the local network.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_set\\_published\(\)](#) instead.

### Note

This function is only available on Windows 10 and Linux.

### Parameters

<i>name</i>	The name of the server to publish or remove
<i>publish</i>	Option to publish or remove server from network
<i>save</i>	Option to save this configuration for future reboots

---

This function is used to make your local gcaps server "Discoverable" or "Invisible"

publish Option:

Set to 1 to publish server to the network and make "Discoverable"

Set to 0 to remove server from the network and make "Invisible"

save Option:

Set to 1 to save the configuration for future reboots of the server

Set to 0 to use this configuration once, and not overwrite previous server settings

#### Attention

This function will always use your local gcaps server, regardless of which server you have set as your active server.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

#### 12.3.5.2.4 GServerStatus()

```
GCLIB_DEPRECATED GReturn GServerStatus (  
    GCStringOut status,  
    GSize status_len)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SERVER\\_STATUS](#) to get information on the local server name and if it is published to the local network.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release. Use [gclib\\_server\(\)](#) instead.

#### Note

This function is only available on Windows 10 and Linux.

#### Parameters

<i>status</i>	The buffer to hold the status of the local gcaps server
<i>status_len</i>	The length of the status buffer

This function is used to find the status of your local gcaps server. Use this function to determine the name your server is currently using, and whether or not your gcaps server is currently set to "Discoverable" or "Invisible"

The status buffer will be filled in the form of "[Server Name], [Discoverable]"

For example, for a server with the name "Example Server" that is set to "Discoverable", the status buffer would contain "Example Server, true".

#### Attention

This function will always use your local gcaps server, regardless of which server you have set as your active server.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

### 12.3.5.2.5 GRemoteConnections()

```
GCLIB_DEPRECATED GReturn GRemoteConnections (
    GCStringOut connections,
    GSize connections_length)
```

Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_REMOTE\\_CONNECTIONS](#) to get a list of remote addresses connected to the local server.

**Deprecated** This function is part of the deprecated [C \(Legacy\)](#) API, which will be removed in a future release.

#### Note

This function is only available on Windows 10 and Linux.

#### Parameters

<i>connections</i>	The buffer to hold the list of remote IP addresses currently connected to your hardware
<i>connections_len</i>	The length of the connections buffer

This function is used to find a list of IP Addresses of machines that currently have open connections to your local hardware. If another user sets your local server as their active server, and then opens a connection to your hardware, their IP Address will appear in this list.

The list of IP addresses are separated by a newline '\n' character.

#### Attention

This function will always use your local gcaps server, regardless of which server you have set as your active server.

#### Returns

The success status or error code of the function. See [gclib\\_errors.h](#) for possible values.

## 12.4 Java

### Topics

- [Connection](#)  
*Discover available controllers and open connections.*
- [Controller](#)  
*Manage a Galil controller.*
- [Galil Connect](#)  
*Host or connect to a remote gcaps instance.*

### Functions

- void [gclibjava.GclibJava.GSleep](#) (int timeout\_ms)  
*Uses [GUtility\(\)](#) and [G\\_UTIL\\_SLEEP](#) to provide a blocking sleep call which can be useful for timing-based chores.*
- String [gclibjava.GclibJava.GVersion](#) () throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), [G\\_UTIL\\_VERSION](#) and [G\\_UTIL\\_GCAPS\\_VERSION](#) to provide the library and gcaps version numbers.*

### 12.4.1 Detailed Description

### 12.4.2 Function Documentation

#### 12.4.2.1 GSleep()

```
void gclibjava.GclibJava.GSleep (  
    int timeout_ms) [inline]
```

Uses [GUtility\(\)](#) and G\_UTIL\_SLEEP to provide a blocking sleep call which can be useful for timing-based chores. In [GclibJava](#), this is primarily a debugging call.

## Parameters

<code>timeout_ms</code>	Sleep time in milliseconds.
-------------------------	-----------------------------

Definition at line 552 of file [GclibJava.java](#).

## 12.4.2.2 GVersion()

`String gclibjava.GclibJava.GVersion ()` throws [GclibJavaException](#) [inline]

Uses [GUtility\(\)](#), `G_UTIL_VERSION` and `G_UTIL_GCAPS_VERSION` to provide the library and gcaps version numbers.

## Returns

A String containing the version, e.g. 189.224.370 1.0.0.125

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 579 of file [GclibJava.java](#).

## 12.4.3 Connection

Discover available controllers and open connections.

## Functions

- void [gclibjava.GclibJava.GClose \(\)](#)  
*Closes a connection to a Galil Controller.*
- void [gclibjava.GclibJava.GOpen](#) (String address) throws [GclibJavaException](#)  
*Open a connection to a Galil Controller.*
- String [gclibjava.GclibJava.GAddresses \(\)](#) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), `G_UTIL_GCAPS_ADDRESSES` or `G_UTIL_ADDRESSES` to provide a listing of all available connection addresses.*
- void [gclibjava.GclibJava.GAssign](#) (String ipAddress, String macAddress) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), `G_UTIL_GCAPS_ASSIGN` or `G_UTIL_ASSIGN` to assign an IP address over the Ethernet to a controller at a given MAC address.*
- String [gclibjava.GclibJava.GInfo \(\)](#) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#) and `G_UTIL_INFO` to provide a useful connection string.*
- String [gclibjava.GclibJava.GIpRequests \(\)](#) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), `G_UTIL_GCAPS_IPREQUEST` or `G_UTIL_IPREQUEST` to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- void [gclibjava.GclibJava.GTimeout](#) (short timeout\_ms) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#) and `G_UTIL_TIMEOUT_OVERRIDE` to set the library timeout.*

## 12.4.3.1 Detailed Description

Discover available controllers and open connections.

## 12.4.3.2 Function Documentation

## 12.4.3.2.1 GClose()

`void gclibjava.GclibJava.GClose ()` [inline]

Closes a connection to a Galil Controller.

Definition at line 204 of file [GclibJava.java](#).

#### 12.4.3.2.2 GOpen()

```
void gclibjava.GclibJava.GOpen (
    String address) throws GclibJavaException [inline]
```

Open a connection to a Galil Controller.

##### Parameters

<i>address</i>	address string. See <a href="#">GOpen()</a> for details.
----------------	--

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 301 of file [GclibJava.java](#).

#### 12.4.3.2.3 GAddresses()

```
String gclibjava.GclibJava.GAddresses () throws GclibJavaException [inline]
```

Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_ADDRESSES or G\_UTIL\_ADDRESSES to provide a listing of all available connection addresses.

##### Returns

String containing the available addresses.

10.1.3.91, DMC4020 Rev 1.2e, LAN, 10.1.3.10 192.168.0.63, DMC4040 Rev 1.2f, Static, 192.168.0.41 (192.0.0.42), RIO47102 Rev 1.1j, Static, 192.168.0.41 10.1., RIO47102 Rev 1.1j, Static, 192.168.0.41 GALILPCI1 COM1 COM2

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 409 of file [GclibJava.java](#).

#### 12.4.3.2.4 GAssign()

```
void gclibjava.GclibJava.GAssign (
    String ipAddress,
    String macAddress) throws GclibJavaException [inline]
```

Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_ASSIGN or G\_UTIL\_ASSIGN to assign an IP address over the Ethernet to a controller at a given MAC address.

##### Parameters

<i>ipAddress</i>	The IP address to assign.
<i>macAddress</i>	The MAC address of the hardware.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 469 of file [GclibJava.java](#).



#### 12.4.3.2.5 GInfo()

String gclibjava.GclibJava.GInfo () throws [GclibJavaException](#) [inline]

Uses [GUtility\(\)](#) and G\_UTIL\_INFO to provide a useful connection string.

##### Returns

A String containing the info, e.g. 192.168.0.42, DMC30010 Rev 1.2i, 6969

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 482 of file [GclibJava.java](#).

#### 12.4.3.2.6 GIpRequests()

String gclibjava.GclibJava.GIpRequests () throws [GclibJavaException](#) [inline]

Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_IPREQUEST or G\_UTIL\_IPREQUEST to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.

##### Returns

String containing hardware requesting IP addresses.

DMC4000, 291, 00:50:4C:20:01:23, LAN, 10.1.3.10 RIO47000, 37290, 00:50:4C:28:91:AA, Static, 192.168.0.41

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 499 of file [GclibJava.java](#).

#### 12.4.3.2.7 GTimeout()

void gclibjava.GclibJava.GTimeout (   
 short timeout\_ms) throws [GclibJavaException](#) [inline]

Uses [GUtility\(\)](#) and G\_UTIL\_TIMEOUT\_OVERRIDE to set the library timeout.

##### Parameters

<i>timeout_ms</i>	The value to be used for the timeout. Use -1 to set the timeout back to the initial <a href="#">GOpen()</a> value, -timeout.
-------------------	--

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 565 of file [GclibJava.java](#).

### 12.4.4 Controller

Manage a Galil controller.

##### Topics

- [Memory](#)  
Manage controller memory, such as program and arrays.
- [Unsolicited Data](#)  
Receive messages and interrupts.

## Functions

- String [gclibjava.GclibJava.GCommand](#) (String command) throws [GclibJavaException](#)  
*Performs a command-and-response transaction on the connection.*

### 12.4.4.1 Detailed Description

Manage a Galil controller.

### 12.4.4.2 Function Documentation

#### 12.4.4.2.1 GCommand()

```
String gclibjava.GclibJava.GCommand (
    String command) throws GclibJavaException [inline]
```

Performs a command-and-response transaction on the connection.

#### Parameters

<i>command</i>	command string to send to the controller. The library will append a carriage return to the command string.
----------------	--

#### Returns

The response from the controller.

#### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 220 of file [GclibJava.java](#).

### 12.4.4.3 Memory

Manage controller memory, such as program and arrays.

## Functions

- void [gclibjava.GclibJava.GArrayDownload](#) (String arrayName, List< Double > data) throws [GclibJavaException](#)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- void [gclibjava.GclibJava.GArrayDownload](#) (String arrayName, List< Double > data, int first, int last) throws [GclibJavaException](#)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- List< Double > [gclibjava.GclibJava.GArrayUpload](#) (String arrayName) throws [GclibJavaException](#)  
*Uploads array data from the controller's array table.*
- List< Double > [gclibjava.GclibJava.GArrayUpload](#) (String arrayName, int first, int last) throws [GclibJavaException](#)  
*Uploads array data from the controller's array table.*
- void [gclibjava.GclibJava.GFirmwareDownload](#) (String filePath) throws [GclibJavaException](#)  
*Upgrade firmware.*
- void [gclibjava.GclibJava.GProgramDownload](#) (String program, String preprocessor) throws [GclibJavaException](#)  
*Downloads a program to the controller's program buffer.*
- void [gclibjava.GclibJava.GProgramDownload](#) (String program) throws [GclibJavaException](#)  
*Downloads a program using default preprocessor options.*
- String [gclibjava.GclibJava.GProgramUpload](#) () throws [GclibJavaException](#)  
*Uploads a program from the controller's program buffer.*

- void [gclibjava.GclibJava.GArrayDownloadFile](#) (String filePath) throws [GclibJavaException](#)  
*Array download from file.*
- void [gclibjava.GclibJava.GArrayUploadFile](#) (String filePath, String names) throws [GclibJavaException](#)  
*Array upload to file.*
- void [gclibjava.GclibJava.GArrayUploadFile](#) (String filePath) throws [GclibJavaException](#)  
*Overload of GArrayUploadFile to upload all arrays.*
- void [gclibjava.GclibJava.GProgramDownloadFile](#) (String filePath, String preprocessor) throws [GclibJavaException](#)  
*Program download from file.*
- void [gclibjava.GclibJava.GProgramDownloadFile](#) (String filePath) throws [GclibJavaException](#)  
*Overload of GProgramDownloadFile to use default preprocessor options.*
- void [gclibjava.GclibJava.GProgramUploadFile](#) (String filePath) throws [GclibJavaException](#)  
*Program upload to file.*

#### 12.4.4.3.1 Detailed Description

Manage controller memory, such as program and arrays.

#### 12.4.4.3.2 Function Documentation

##### 12.4.4.3.2.1 GArrayDownload() [1/2]

```
void gclibjava.GclibJava.GArrayDownload (
    String arrayName,
    List< Double > data) throws GclibJavaException [inline]
```

Downloads array data to a pre-dimensioned array in the controller's array table.

##### Parameters

<i>arrayName</i>	String containing the name of the array to download. Must match the array name used in DM.
<i>data</i>	List containing the array data. The length of data may not be larger than the array dimensioned.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 110 of file [GclibJava.java](#).

##### 12.4.4.3.2.2 GArrayDownload() [2/2]

```
void gclibjava.GclibJava.GArrayDownload (
    String arrayName,
    List< Double > data,
    int first,
    int last) throws GclibJavaException [inline]
```

Downloads array data to a pre-dimensioned array in the controller's array table.

##### Parameters

<i>arrayName</i>	String containing the name of the array to download. Must match the array name used in DM.
<i>data</i>	List containing the array data. The length of data may not be larger than the array dimensioned.
<i>first</i>	Index of array to begin downloading to.
<i>last</i>	Index of array to end downloading.

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 132 of file [GclibJava.java](#).

**12.4.4.3.2.3 GArrayUpload() [1/2]**

```
List< Double > gclibjava.GclibJava.GArrayUpload (
    String arrayName) throws GclibJavaException [inline]
```

Uploads array data from the controller's array table.

## Parameters

<i>arrayName</i>	String containing the name of the array to upload.
------------------	--

## Returns

A List of Doubles, containing the array data.

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 150 of file [GclibJava.java](#).

**12.4.4.3.2.4 GArrayUpload() [2/2]**

```
List< Double > gclibjava.GclibJava.GArrayUpload (
    String arrayName,
    int first,
    int last) throws GclibJavaException [inline]
```

Uploads array data from the controller's array table.

## Parameters

<i>arrayName</i>	String containing the name of the array to upload.
<i>first</i>	Index of array to begin uploading.
<i>last</i>	Index of array to end uploading.

## Returns

A List of Doubles, containing the array data.

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 182 of file [GclibJava.java](#).

**12.4.4.3.2.5 GFirmwareDownload()**

```
void gclibjava.GclibJava.GFirmwareDownload (
    String filePath) throws GclibJavaException [inline]
```

Upgrade firmware.

## Parameters

<i>filePath</i>	The full file path to the Galil-supplied firmware hex file. See <a href="http://www.galil.com/downloads/firmware">http://www.galil.com/downloads/firmware</a>
-----------------	---

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 243 of file [GclibJava.java](#).

**12.4.4.3.2.6 GProgramDownload() [1/2]**

```
void gclibjava.GclibJava.GProgramDownload (
    String program,
    String preprocessor) throws GclibJavaException [inline]
```

Downloads a program to the controller's program buffer.

## Parameters

<i>program</i>	Program for download.
<i>preprocessor</i>	Options string for preprocessing the program before sending it to the controller.

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 321 of file [GclibJava.java](#).

**12.4.4.3.2.7 GProgramDownload() [2/2]**

```
void gclibjava.GclibJava.GProgramDownload (
    String program) throws GclibJavaException [inline]
```

Downloads a program using default preprocessor options.

## Parameters

<i>program</i>	Program for download.
----------------	-----------------------

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 332 of file [GclibJava.java](#).

**12.4.4.3.2.8 GProgramUpload()**

```
String gclibjava.GclibJava.GProgramUpload () throws GclibJavaException [inline]
```

Uploads a program from the controller's program buffer.

## Returns

The uploaded program.

**Exceptions**

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 344 of file [GclibJava.java](#).

**12.4.4.3.2.9 GArrayDownloadFile()**

```
void gclibjava.GclibJava.GArrayDownloadFile (
    String filePath) throws GclibJavaException [inline]
```

Array download from file.

Downloads a csv file containing array data at file\_path. If the arrays don't exist, they will be dimensioned.

**Parameters**

<i>filePath</i>	String containing the path to the array file.
-----------------	---

**Exceptions**

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 423 of file [GclibJava.java](#).

**12.4.4.3.2.10 GArrayUploadFile() [1/2]**

```
void gclibjava.GclibJava.GArrayUploadFile (
    String filePath,
    String names) throws GclibJavaException [inline]
```

Array upload to file.

Uploads the entire controller array table or a subset and saves the data as a csv file specified by file\_path.

**Parameters**

<i>filePath</i>	String containing the path to the array file. File will be overwritten if it exists.
<i>names</i>	String containing the arrays to upload, delimited with space. "" uploads all arrays listed in LA.

**Exceptions**

<a href="#">gclibjava.GclibJavaException</a>	If an error is generated by gclib.
--	------------------------------------

Definition at line 441 of file [GclibJava.java](#).

**12.4.4.3.2.11 GArrayUploadFile() [2/2]**

```
void gclibjava.GclibJava.GArrayUploadFile (
    String filePath) throws GclibJavaException [inline]
```

Overload of GArrayUploadFile to upload all arrays.

**Parameters**

<i>filePath</i>	String containing the path to the array file. File will be overwritten if it exists.
-----------------	--

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 454 of file [GclibJava.java](#).

**12.4.4.3.2.12 GProgramDownloadFile() [1/2]**

```
void gclibjava.GclibJava.GProgramDownloadFile (
    String filePath,
    String preprocessor) throws GclibJavaException [inline]
```

Program download from file.

## Parameters

<i>filePath</i>	String containing the path to the program file.
<i>preprocessor</i>	Options string for preprocessing the program before sending it to the controller.

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 514 of file [GclibJava.java](#).

**12.4.4.3.2.13 GProgramDownloadFile() [2/2]**

```
void gclibjava.GclibJava.GProgramDownloadFile (
    String filePath) throws GclibJavaException [inline]
```

Overload of GProgramDownloadFile to use default preprocessor options.

## Parameters

<i>filePath</i>	String containing the path to the program file.
-----------------	---

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 526 of file [GclibJava.java](#).

**12.4.4.3.2.14 GProgramUploadFile()**

```
void gclibjava.GclibJava.GProgramUploadFile (
    String filePath) throws GclibJavaException [inline]
```

Program upload to file.

## Parameters

<i>filePath</i>	String containing the path to the program file, file will be overwritten if it exists.
-----------------	--

## Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 539 of file [GclibJava.java](#).

#### 12.4.4.4 Unsolicited Data

Receive messages and interrupts.

##### Functions

- byte [gclibjava.GclibJava.GInterrupt](#) () throws [GclibJavaException](#)  
*Provides access to PCI and UDP interrupts from the controller.*
- String [gclibjava.GclibJava.GMessage](#) () throws [GclibJavaException](#)  
*Provides access to unsolicited messages from the controller.*

##### 12.4.4.4.1 Detailed Description

Receive messages and interrupts.

##### 12.4.4.4.2 Function Documentation

###### 12.4.4.4.2.1 GInterrupt()

```
byte gclibjava.GclibJava.GInterrupt () throws GclibJavaException [inline]
```

Provides access to PCI and UDP interrupts from the controller.

Interrupts can be generated automatically by the firmware on important events via EI (Enable Interrupt) or by the user in embedded DMC code via UI (User Interrupt). To use this function, -s EI must be used in the [GOpen\(\)](#) address string to subscribe to interrupts.

##### Returns

The status byte of the interrupt.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 260 of file [GclibJava.java](#).

###### 12.4.4.4.2.2 GMessage()

```
String gclibjava.GclibJava.GMessage () throws GclibJavaException [inline]
```

Provides access to unsolicited messages from the controller.

To use this function, -s MG must be used in the [GOpen\(\)](#) address string to subscribe to messages. Unsolicited bytes must be flagged by the high-bit setting, CW 1. The driver will automatically set this when subscribing to messages. The user should not overwrite this setting.

Unsolicited messages are data generated by the controller that are not in response to a command, a data record, or an interrupt.

[GMessage\(\)](#) will block until a message is received, or the function times out.

Messages are unframed byte streams. There is no guarantee that the user will get complete messages or single messages in a call to [GMessage\(\)](#).

##### Returns

the message received.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 288 of file [GclibJava.java](#).



### 12.4.5 Galil Connect

Host or connect to a remote gcaps instance.

#### Functions

- void [gclibjava.GclibJava.GSetServer](#) (String server\_name) throws [GclibJavaException](#)  
*Connects gclib to a new gcaps server.*
- String [gclibjava.GclibJava.GServerStatus](#) () throws [GclibJavaException](#)  
*Retrieves the name of your local gcaps server and whether or not it is currently published Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- String [gclibjava.GclibJava.GListServers](#) () throws [GclibJavaException](#)  
*Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- void [gclibjava.GclibJava.GPublishServer](#) (String server\_name, int publish, int save) throws [GclibJavaException](#)  
*Publishes or removes local gcaps server from the network.*
- String [gclibjava.GclibJava.GRemoteConnections](#) () throws [GclibJavaException](#)  
*Returns a list of IP Addresses that currently have an open connection to your hardware.*

#### 12.4.5.1 Detailed Description

Host or connect to a remote gcaps instance.

#### 12.4.5.2 Function Documentation

##### 12.4.5.2.1 GSetServer()

```
void gclibjava.GclibJava.GSetServer (
    String server_name) throws GclibJavaException [inline]
```

Connects gclib to a new gcaps server.

#### Parameters

<code>server_name</code>	Name to publish server under.
--------------------------	-------------------------------

#### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 592 of file [GclibJava.java](#).

##### 12.4.5.2.2 GServerStatus()

```
String gclibjava.GclibJava.GServerStatus () throws GclibJavaException [inline]
```

Retrieves the name of your local gcaps server and whether or not it is currently published Retrieves a list of gcaps servers that are advertising themselves on the local network.

#### Returns

A string in the form "<server\_name>, <isPublished>"

#### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 605 of file [GclibJava.java](#).

#### 12.4.5.2.3 GListServers()

`String gclibjava.GclibJava.GListServers ()` throws [GclibJavaException](#) [inline]

Retrieves a list of gcaps servers that are advertising themselves on the local network.

##### Returns

A list of available gcaps server names.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 618 of file [GclibJava.java](#).

#### 12.4.5.2.4 GPublishServer()

```
void gclibjava.GclibJava.GPublishServer (
    String server_name,
    int publish,
    int save) throws GclibJavaException [inline]
```

Publishes or removes local gcaps server from the network.

##### Parameters

<i>server_name</i>	Name to publish server under.
<i>publish</i>	True=publish server, False=remove server.
<i>save</i>	Save this configuration for future server reboots.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 633 of file [GclibJava.java](#).

#### 12.4.5.2.5 GRemoteConnections()

`String gclibjava.GclibJava.GRemoteConnections ()` throws [GclibJavaException](#) [inline]

Returns a list of IP Addresses that currently have an open connection to your hardware.

##### Returns

a list of IP Addresses that currently have an open connection to your hardware.

##### Exceptions

<a href="#">GclibJavaException</a>	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 645 of file [GclibJava.java](#).

## 12.5 Python

### Topics

- [Connection](#)

*Discover available controllers and open connections.*

- [Controller](#)  
*Manage a Galil controller.*
- [Galil Connect](#)  
*Host or connect to a remote gcaps instance.*

## Classes

- class [gclib.GclibError](#)  
*Error class for non-zero gclib return codes.*

## Functions

- [gclib.py.GSleep](#) (self, val)  
*Provides a blocking sleep call which can be useful for timing-based chores.*
- [gclib.py.GVersion](#) (self)  
*Provides the gclib version number.*

### 12.5.1 Detailed Description

### 12.5.2 Function Documentation

#### 12.5.2.1 GSleep()

```
gclib.py.GSleep (
    self,
    val)
```

Provides a blocking sleep call which can be useful for timing-based chores.  
Definition at line 167 of file [gclib.py](#).

#### 12.5.2.2 GVersion()

```
gclib.py.GVersion (
    self)
```

Provides the gclib version number.  
Please include the output of this function on all support cases.  
Definition at line 175 of file [gclib.py](#).

### 12.5.3 Connection

Discover available controllers and open connections.

## Functions

- [gclib.py.GOpen](#) (self, address)  
*Opens a connection a galil controller.*
- [gclib.py.GClose](#) (self)  
*Closes a connection to a Galil Controller.*
- [gclib.py.GInfo](#) (self)  
*Provides a useful connection string.*
- [gclib.py.GIpRequests](#) (self)  
*Provides a dictionary of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- [gclib.py.GAssign](#) (self, ip, mac)  
*Assigns IP address over the Ethernet to a controller at a given MAC address.*
- [gclib.py.GAddresses](#) (self)  
*Provides a dictionary of all available connection addresses.*
- [gclib.py.GTimeout](#) (self, timeout)

*Set the library timeout.*

- `gclib.py.timeout` (self)

*Convenience property read access to timeout value.*

- `gclib.py.timeout` (self, timeout)

*Convenience property write access to timeout value.*

### 12.5.3.1 Detailed Description

Discover available controllers and open connections.

### 12.5.3.2 Function Documentation

#### 12.5.3.2.1 GOpen()

```
gclib.py.GOpen (
    self,
    address)
```

Opens a connection a galil controller.

See the gclib docs for address string formatting.

Definition at line 135 of file `gclib.py`.

#### 12.5.3.2.2 GClose()

```
gclib.py.GClose (
    self)
```

Closes a connection to a Galil Controller.

Definition at line 145 of file `gclib.py`.

#### 12.5.3.2.3 GInfo()

```
gclib.py.GInfo (
    self)
```

Provides a useful connection string.

Please include the output of this function on all support cases.

Definition at line 219 of file `gclib.py`.

#### 12.5.3.2.4 GIpRequests()

```
gclib.py.GIpRequests (
    self)
```

Provides a dictionary of all Galil controllers requesting IP addresses via BOOT-P or DHCP.

Returns a dictionary mapping 'model-serial' --> 'mac address' e.g. {'DMC4000-783': '00:50:4c:20:03:0f', 'DMC4103-9998': '00:50:4c:38:27:0e'}

Linux/OS X users must be root to use `GIpRequests()` and have UDP access to bind and listen on port 67.

Definition at line 227 of file `gclib.py`.

#### 12.5.3.2.5 GAssign()

```
gclib.py.GAssign (
    self,
    ip,
    mac)
```

Assigns IP address over the Ethernet to a controller at a given MAC address.

Linux/OS X users must be root to use `GAssign()` and have UDP access to send on port 68.

Definition at line 247 of file `gclib.py`.

### 12.5.3.2.6 GAddresses()

```
gclib.py.GAddresses (
    self)
```

Provides a dictionary of all available connection addresses.

Returns a dictionary mapping 'address' -> 'revision reports', where possible e.g. {}

Definition at line 258 of file [gclib.py](#).

### 12.5.3.2.7 GTimeout()

```
gclib.py.GTimeout (
    self,
    timeout)
```

Set the library timeout.

Set to -1 to use the initial library timeout, as specified in GOpen.

Definition at line 374 of file [gclib.py](#).

### 12.5.3.2.8 timeout() [1/2]

```
gclib.py.timeout (
    self)
```

Convenience property read access to timeout value.

If -1, gclib uses the initial library timeout, as specified in GOpen.

Definition at line 385 of file [gclib.py](#).

### 12.5.3.2.9 timeout() [2/2]

```
gclib.py.timeout (
    self,
    timeout)
```

Convenience property write access to timeout value.

Set to -1 to use the initial library timeout, as specified in GOpen.

Definition at line 392 of file [gclib.py](#).

## 12.5.4 Controller

Manage a Galil controller.

### Topics

- [Memory](#)  
*Manage controller memory, such as program and arrays.*
- [Unsolicited Data](#)  
*Receive messages and interrupts.*

### Functions

- [gclib.py.GCommand](#) (self, command)  
*Performs a command-and-response transaction on the connection.*
- [gclib.py.GMotionComplete](#) (self, axes)  
*Blocking call that returns once all axes specified have completed their motion.*

### 12.5.4.1 Detailed Description

Manage a Galil controller.

### 12.5.4.2 Function Documentation

#### 12.5.4.2.1 GCommand()

```
gclib.py.GCommand (
    self,
    command)
```

Performs a command-and-response transaction on the connection.

Trims the response.

Definition at line 155 of file [gclib.py](#).

#### 12.5.4.2.2 GMotionComplete()

```
gclib.py.GMotionComplete (
    self,
    axes)
```

Blocking call that returns once all axes specified have completed their motion.

Definition at line 419 of file [gclib.py](#).

### 12.5.4.3 Memory

Manage controller memory, such as program and arrays.

#### Functions

- [gclib.py.GProgramDownload](#) (self, program, preprocessor="")  
*Downloads a program to the controller's program buffer.*
- [gclib.py.GProgramUpload](#) (self)  
*Uploads a program from the controller's program buffer.*
- [gclib.py.GProgramDownloadFile](#) (self, file\_path, preprocessor="")  
*Program download from file.*
- [gclib.py.GProgramUploadFile](#) (self, file\_path)  
*Program upload to file.*
- [gclib.py.GArrayDownload](#) (self, name, first, last, array\_data)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- [gclib.py.GArrayUploadFile](#) (self, file\_path, names=[])  
*Uploads the entire controller array table or a subset and saves the data as a csv file specified by file\_path.*
- [gclib.py.GArrayDownloadFile](#) (self, file\_path)  
*Downloads a csv file containing array data at file\_path.*
- [gclib.py.GArrayUpload](#) (self, name, first, last)  
*Uploads array data from the controller's array table.*
- [gclib.py.GFirmwareDownload](#) (self, file\_path)  
*Upgrade firmware.*
- [gclib.py.GSetupDownloadFile](#) (self, file\_path, options)  
*Downloads specified sectors from a Galil compressed backup (gcb) file to a controller.*

#### 12.5.4.3.1 Detailed Description

Manage controller memory, such as program and arrays.

### 12.5.4.3.2 Function Documentation

#### 12.5.4.3.2.1 GProgramDownload()

```
gclib.py.GProgramDownload (
    self,
```

```
program,  
preprocessor = "")
```

Downloads a program to the controller's program buffer.

See the [gclib docs](#) for preprocessor options.

Definition at line 277 of file [gclib.py](#).

#### 12.5.4.3.2.2 GProgramUpload()

```
gclib.py.GProgramUpload (  
    self)
```

Uploads a program from the controller's program buffer.

Definition at line 289 of file [gclib.py](#).

#### 12.5.4.3.2.3 GProgramDownloadFile()

```
gclib.py.GProgramDownloadFile (  
    self,  
    file_path,  
    preprocessor = "")
```

Program download from file.

See the [gclib docs](#) for preprocessor options.

Definition at line 298 of file [gclib.py](#).

#### 12.5.4.3.2.4 GProgramUploadFile()

```
gclib.py.GProgramUploadFile (  
    self,  
    file_path)
```

Program upload to file.

Definition at line 309 of file [gclib.py](#).

#### 12.5.4.3.2.5 GArrayDownload()

```
gclib.py.GArrayDownload (  
    self,  
    name,  
    first,  
    last,  
    array_data)
```

Downloads array data to a pre-dimensioned array in the controller's array table.

array\_data should be a list of values (e.g. int or float)

Definition at line 318 of file [gclib.py](#).

#### 12.5.4.3.2.6 GArrayUploadFile()

```
gclib.py.GArrayUploadFile (  
    self,  
    file_path,  
    names = [])
```

Uploads the entire controller array table or a subset and saves the data as a csv file specified by file\_path.

names is optional and should be a list of array names on the controller.

Definition at line 333 of file [gclib.py](#).

#### 12.5.4.3.2.7 GArrayDownloadFile()

```
gclib.py.GArrayDownloadFile (  
    self,  
    file_path)
```

Downloads a csv file containing array data at file\_path.

Definition at line 350 of file [gclib.py](#).

#### 12.5.4.3.2.8 GArrayUpload()

```
gclib.py.GArrayUpload (
    self,
    name,
    first,
    last)
```

Uploads array data from the controller's array table.

Definition at line 360 of file [gclib.py](#).

#### 12.5.4.3.2.9 GFirmwareDownload()

```
gclib.py.GFirmwareDownload (
    self,
    file_path)
```

Upgrade firmware.

Definition at line 400 of file [gclib.py](#).

#### 12.5.4.3.2.10 GSetupDownloadFile()

```
gclib.py.GSetupDownloadFile (
    self,
    file_path,
    options)
```

Downloads specified sectors from a Galil compressed backup (gcb) file to a controller.

Returns a dictionary with the controller information stored in the gcb file. If options is specified as 0, an additional "options" key will be in the dictionary indicating the info sectors available in the gcb

Definition at line 437 of file [gclib.py](#).

### 12.5.4.4 Unsolicited Data

Receive messages and interrupts.

#### Functions

- [gclib.py.GMessage](#) (self)  
*Provides access to unsolicited messages from the controller.*
- [gclib.py.GInterrupt](#) (self)  
*Provides access to PCI and UDP interrupts from the controller.*

#### 12.5.4.4.1 Detailed Description

Receive messages and interrupts.

#### 12.5.4.4.2 Function Documentation

##### 12.5.4.4.2.1 GMessage()

```
gclib.py.GMessage (
    self)
```

Provides access to unsolicited messages from the controller.

Definition at line 410 of file [gclib.py](#).

##### 12.5.4.4.2.2 GInterrupt()

```
gclib.py.GInterrupt (
    self)
```

Provides access to PCI and UDP interrupts from the controller.

Definition at line 428 of file [gclib.py](#).



### 12.5.5 Galil Connect

Host or connect to a remote gcaps instance.

#### Functions

- [gclib.py.GServerStatus](#) (self)  
*Provides the local server name and whether it is published to the local network.*
- [gclib.py.GSetServer](#) (self, server\_name)  
*Set the new active server.*
- [gclib.py.GListServers](#) (self)  
*Provide a list of all available gcaps servers on the local network.*
- [gclib.py.GPublishServer](#) (self, server\_name, publish, save)  
*Publish local gcaps server to the network.*
- [gclib.py.GRemoteConnections](#) (self)  
*Shows all remote addresses that are connected to the local server.*

#### 12.5.5.1 Detailed Description

Host or connect to a remote gcaps instance.

#### 12.5.5.2 Function Documentation

##### 12.5.5.2.1 GServerStatus()

```
gclib.py.GServerStatus (  
    self)
```

Provides the local server name and whether it is published to the local network.  
Definition at line 182 of file [gclib.py](#).

##### 12.5.5.2.2 GSetServer()

```
gclib.py.GSetServer (  
    self,  
    server_name)
```

Set the new active server.  
Definition at line 189 of file [gclib.py](#).

##### 12.5.5.2.3 GListServers()

```
gclib.py.GListServers (  
    self)
```

Provide a list of all available gcaps servers on the local network.  
Definition at line 197 of file [gclib.py](#).

##### 12.5.5.2.4 GPublishServer()

```
gclib.py.GPublishServer (  
    self,  
    server_name,  
    publish,  
    save)
```

Publish local gcaps server to the network.  
Definition at line 204 of file [gclib.py](#).

#### 12.5.5.2.5 GRemoteConnections()

```
gclib.py.GRemoteConnections (  
    self)
```

Shows all remote addresses that are connected to the local server.

Definition at line 212 of file [gclib.py](#).

# Chapter 13

## Namespace Documentation

### 13.1 gclib Namespace Reference

#### Classes

- class [GclibError](#)  
*Error class for non-zero gclib return codes.*
- interface [GDataRecord](#)
- struct [GDataRecord1802](#)  
*Data record struct for DMC-1802 controllers.*
- struct [GDataRecord1806](#)  
*Data record struct for DMC-1806 controller.*
- struct [GDataRecord2103](#)  
*Data record struct for DMC-2103 controllers.*
- struct [GDataRecord30000](#)  
*Data record struct for DMC-30010 controllers.*
- struct [GDataRecord4000](#)  
*Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.*
- struct [GDataRecord47000\\_ENC](#)  
*Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.*
- struct [GDataRecord47162](#)  
*Data record struct for RIO-47162.*
- struct [GDataRecord47300\\_24EX](#)  
*Data record struct for RIO-47300 with 24EX I/O daughter board.*
- struct [GDataRecord47300\\_ENC](#)  
*Data record struct for RIO-47300. Includes encoder fields.*
- struct [GDataRecord52000](#)  
*Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.*
- class [py](#)  
*Represents a single Python connection to a Galil Controller or PLC.*

#### Functions

- [\\_rc](#) (return\_code)  
*Checks return codes from gclib and raises a python error if result is exceptional.*

### 13.1.1 Function Documentation

#### 13.1.1.1 `_rc()`

```
gclib._rc (
    return_code) [protected]
```

Checks return codes from gclib and raises a python error if result is exceptional.

Definition at line 100 of file [gclib.py](#).

## 13.2 Package gclibjava

### Classes

- class [GclibJava](#)
- class [GclibJavaException](#)

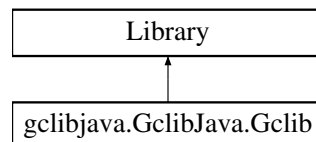
# Chapter 14

## Class Documentation

### 14.1 gclibjava.GclibJava.Gclib Interface Reference

The JNA interface to the gclib library.

Inheritance diagram for gclibjava.GclibJava.Gclib:



#### Public Member Functions

- `int GArrayDownload` (Pointer g, String arrayName, int first, int last, String buffer)
- `int GArrayUpload` (Pointer g, String arrayName, int first, int last, int delim, byte[] response, int len)
- `int GCommand` (Pointer g, String command, byte[] response, int len, IntByReference bytesReturned)
- `int GClose` (Pointer g)
- `int GFirmwareDownload` (Pointer g, String filePath)
- `int GInterrupt` (Pointer g, ByteByReference statusByte)
- `int GMessage` (Pointer g, byte[] response, int len)
- `int GOpen` (String address, PointerByReference g)
- `int GProgramDownload` (Pointer g, String program, String preprocessor)
- `int GProgramUpload` (Pointer g, byte[] response, int len)

#### Public Attributes

- `Gclib INSTANCE`
- `Gclib SYNC_INSTANCE`

#### 14.1.1 Detailed Description

The JNA interface to the gclib library.

[http://galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html](http://galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html)

Definition at line 73 of file `GclibJava.java`.

#### 14.1.2 Member Function Documentation

##### 14.1.2.1 GArrayDownload()

```
int gclibjava.GclibJava.Gclib.GArrayDownload (  
    Pointer g,  
    String arrayName,
```

```
int first,  
int last,  
String buffer)
```

#### 14.1.2.2 GArrayUpload()

```
int gclibjava.GclibJava.Gclib.GArrayUpload (  
    Pointer g,  
    String arrayName,  
    int first,  
    int last,  
    int delim,  
    byte[] response,  
    int len)
```

#### 14.1.2.3 GCommand()

```
int gclibjava.GclibJava.Gclib.GCommand (  
    Pointer g,  
    String command,  
    byte[] response,  
    int len,  
    IntByReference bytesReturned)
```

#### 14.1.2.4 GClose()

```
int gclibjava.GclibJava.Gclib.GClose (  
    Pointer g)
```

#### 14.1.2.5 GFirmwareDownload()

```
int gclibjava.GclibJava.Gclib.GFirmwareDownload (  
    Pointer g,  
    String filePath)
```

#### 14.1.2.6 GInterrupt()

```
int gclibjava.GclibJava.Gclib.GInterrupt (  
    Pointer g,  
    ByteByReference statusByte)
```

#### 14.1.2.7 GMessage()

```
int gclibjava.GclibJava.Gclib.GMessage (  
    Pointer g,  
    byte[] response,  
    int len)
```

#### 14.1.2.8 GOpen()

```
int gclibjava.GclibJava.Gclib.GOpen (  
    String address,  
    PointerByReference g)
```

#### 14.1.2.9 GProgramDownload()

```
int gclibjava.GclibJava.Gclib.GProgramDownload (  
    Pointer g,  
    String program,  
    String preprocessor)
```

### 14.1.2.10 GProgramUpload()

```
int gclibjava.GclibJava.Gclib.GProgramUpload (
    Pointer g,
    byte[] response,
    int len)
```

## 14.1.3 Member Data Documentation

### 14.1.3.1 INSTANCE

[Gclib](#) gclibjava.GclibJava.Gclib.INSTANCE

**Initial value:**

```
= (Gclib)
    Native.loadLibrary("gclib",
        Gclib.class)
```

Definition at line 74 of file [GclibJava.java](#).

### 14.1.3.2 SYNC\_INSTANCE

[Gclib](#) gclibjava.GclibJava.Gclib.SYNC\_INSTANCE

**Initial value:**

```
= (Gclib)
    Native.synchronizedLibrary(INSTANCE)
```

Definition at line 82 of file [GclibJava.java](#).

The documentation for this interface was generated from the following file:

- [GclibJava.java](#)

## 14.2 gclib Class Reference

Provides a class that binds to gclib's unmanaged dll.

### Public Member Functions

- string[] [GAddresses](#) ()  
*Return a string array of available connection addresses.*
- void [GArrayDownload](#) (string array\_name, ref List< double > data, Int16 first=-1, Int16 last=-1)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- void [GArrayDownloadFile](#) (string Path)  
*Allows downloading of a program array file to the controller.*
- List< double > [GArrayUpload](#) (string array\_name, Int16 first=-1, Int16 last=-1)  
*Uploads array data from the controller's array table.*
- void [GArrayUploadFile](#) (string Path, string Names)  
*Allows uploading of a program array file from the controller to an array CSV file.*
- void [GAssign](#) (string ip, string mac)  
*Assigns IP address over the Ethernet to a controller at a given MAC address.*
- void [GClose](#) ()  
*Used to close a connection to Galil hardware.*
- string [GCommand](#) (string Command, bool Trim=true)  
*Used for command-and-response transactions.*
- Int16 [GCmdI](#) (string Command)  
*Used for command-and-response transactions.*
- double [GCmdD](#) (string Command)  
*Used for command-and-response transactions.*
- void [GFirmwareDownload](#) (string filepath)  
*Upgrade firmware.*

- string [GInfo](#) ()  
*Provides a useful connection string.*
- byte [GInterrupt](#) ()  
*Provides access to PCI and UDP interrupts from the controller.*
- string[] [GIpRequests](#) ()  
*Provides a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- string [GMessage](#) ()  
*Provides access to unsolicited messages.*
- void [GMotionComplete](#) (string axes)  
*Blocking call that returns once all axes specified have completed their motion.*
- void [GOpen](#) (string address)  
*Used to open a connection to Galil hardware.*
- void [GProgramDownload](#) (string program, string preprocessor="")  
*Allows downloading of a DMC program from a string buffer.*
- void [GProgramDownloadFile](#) (string file\_path, string preprocessor="")  
*Allows downloading of a DMC program from file.*
- string [GProgramUpload](#) ()  
*Allows uploading of a DMC program to a string.*
- void [GProgramUploadFile](#) (string file\_path)  
*Allows uploading of a DMC program to a file.*
- byte[] [GRead](#) ()  
*Performs a read on the connection.*
- T [GRecord](#)< T > (bool async)  
*Used for retrieving data records from the controller.*
- void [GRecordRate](#) (double period\_ms)  
*Sets the asynchronous data record to a user-specified period via DR.*
- void [GTimeout](#) (Int16 timeout\_ms)  
*Set the timeout of communication transactions.*
- string [GVersion](#) ()  
*Used to get the gclib version.*
- void [GWrite](#) (string buffer)  
*Performs a write on the connection.*
- string[] [GSetupDownloadFile](#) (string path, Int32 options)  
*Allows downloading of a Galil compressed backup (gcb) file to the controller.*
- void [GSetServer](#) (string server\_name)  
*Connects gclib to a new gcaps server.*
- string [GServerStatus](#) ()  
*Retrieves the name of your local gcaps server and whether or not it is currently published.*
- string[] [GListServers](#) ()  
*Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- void [GPublishServer](#) (string server\_name, bool publish, bool save)  
*Publishes or removes local gcaps server from the network.*
- string[] [GRemoteConnections](#) ()  
*Returns a list of IP Addresses that currently have an open connection to your hardware.*

## Public Attributes

- [argtypes](#)
- [restype](#)



### Protected Attributes

- `_gclib` = `WinDLL(find_library('gclib.dll'))`
- `_gclibo` = `WinDLL(find_library('gclibo.dll'))`
- `str _gclib_path` = `'/Applications/gclib/dylib/gclib.0.dylib'`
- `str _gclibo_path` = `'/Applications/gclib/dylib/gclibo.0.dylib'`
- `_GReturn` = `c_int`
- `_GCon` = `c_void_p`
- `_GCon_ptr` = `POINTER(_GCon)`
- `_GSize` = `c_ulong`
- `_GSize_ptr` = `POINTER(_GSize)`
- `_GCStringIn` = `c_char_p`
- `_GCStringOut` = `c_char_p`
- `_GOption` = `c_int`
- `_GStatus` = `c_ubyte`
- `_GStatus_ptr` = `POINTER(_GStatus)`
- `str _enc` = `"ASCII"`
- `int _buf_size` = `500000`
- `_error_buf` = `create_string_buffer(128)`

### 14.2.1 Detailed Description

Provides a class that binds to gclib's unmanaged dll.

Wraps each call and provides a more user-friendly interface for use in C#.

The Gclib class assumes the default installation of gclib, "C:\Program Files (x86)\Galil\gclib\". If the dlls are elsewhere, change the path strings `GclibDllPath_`, and `GcliboDllPath_`.

Definition at line 58 of file [gclib.cs](#).

### 14.2.2 Member Function Documentation

#### 14.2.2.1 GRead()

```
byte[] gclib.GRead () [inline]
```

Performs a read on the connection.

Returns

String containing the read data, or a nullstring if nothing was read or an error occurred.

Wrapper around gclib [GRead\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#adab6ec79b7e1bc7f0266684dd3434923](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#adab6ec79b7e1bc7f0266684dd3434923)

Definition at line 534 of file [gclib.cs](#).

#### 14.2.2.2 GWrite()

```
void gclib.GWrite (
    string buffer) [inline]
```

Performs a write on the connection.

Parameters

<i>buffer</i>	The user's write buffer. To send a Galil command, a terminating carriage return is usually required.
---------------	--

Wrapper around gclib [GWrite\(\)](#), [http://www.galil.com/sw/pub/all/doc/gclib/html/gclib\\_8h.html#abe28ebaecd5b3940adf4e145d40e5456](http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#abe28ebaecd5b3940adf4e145d40e5456)

Exceptions

<i>System.Exception</i>	Will throw an exception if anything other than <code>G_NO_ERROR</code> is received from gclib.
-------------------------	--

Definition at line 637 of file [gclib.cs](#).

### 14.2.3 Member Data Documentation

#### 14.2.3.1 `_gclib`

```
gclib._gclib = WinDLL(find_library('gclib.dll')) [protected]
```

Definition at line 29 of file [gclib.py](#).

#### 14.2.3.2 `_gclibo`

```
gclib._gclibo = WinDLL(find_library('gclibo.dll')) [protected]
```

Definition at line 30 of file [gclib.py](#).

#### 14.2.3.3 `_gclib_path`

```
str gclib._gclib_path = '/Applications/gclib/dylib/gclib.0.dylib' [protected]
```

Definition at line 39 of file [gclib.py](#).

#### 14.2.3.4 `_gclibo_path`

```
str gclib._gclibo_path = '/Applications/gclib/dylib/gclibo.0.dylib' [protected]
```

Definition at line 40 of file [gclib.py](#).

#### 14.2.3.5 `_GReturn`

```
gclib._GReturn = c_int [protected]
```

Definition at line 49 of file [gclib.py](#).

#### 14.2.3.6 `_GCon`

```
gclib._GCon = c_void_p [protected]
```

Definition at line 50 of file [gclib.py](#).

#### 14.2.3.7 `_GCon_ptr`

```
gclib._GCon_ptr = POINTER(_GCon) [protected]
```

Definition at line 51 of file [gclib.py](#).

#### 14.2.3.8 `_GSize`

```
gclib._GSize = c_ulong [protected]
```

Definition at line 52 of file [gclib.py](#).

#### 14.2.3.9 `_GSize_ptr`

```
gclib._GSize_ptr = POINTER(_GSize) [protected]
```

Definition at line 53 of file [gclib.py](#).

#### 14.2.3.10 `_GCStringIn`

```
gclib._GCStringIn = c_char_p [protected]
```

Definition at line 54 of file [gclib.py](#).

#### 14.2.3.11 `_GCStringOut`

```
gclib._GCStringOut = c_char_p [protected]
```

Definition at line 55 of file [gclib.py](#).

#### 14.2.3.12 `_GOption`

```
gclib._GOption = c_int [protected]
```

Definition at line 56 of file [gclib.py](#).

#### 14.2.3.13 \_GStatus

`gclib._GStatus = c_ubyte [protected]`

Definition at line 57 of file [gclib.py](#).

#### 14.2.3.14 \_GStatus\_ptr

`gclib._GStatus_ptr = POINTER(_GStatus) [protected]`

Definition at line 58 of file [gclib.py](#).

#### 14.2.3.15 argtypes

`gclib.argtypes`

Definition at line 62 of file [gclib.py](#).

#### 14.2.3.16 restype

`gclib.restype`

Definition at line 78 of file [gclib.py](#).

#### 14.2.3.17 \_enc

`str gclib._enc = "ASCII" [protected]`

Definition at line 96 of file [gclib.py](#).

#### 14.2.3.18 \_buf\_size

`int gclib._buf_size = 500000 [protected]`

Definition at line 97 of file [gclib.py](#).

#### 14.2.3.19 \_error\_buf

`gclib._error_buf = create_string_buffer(128) [protected]`

Definition at line 98 of file [gclib.py](#).

The documentation for this class was generated from the following files:

- [gclib.cs](#)
- [gclib.py](#)

## 14.3 gclib\_interrupt\_t Struct Reference

An interrupt generated by the controller.

```
#include <gclib.h>
```

### Public Attributes

- [gclib\\_interrupt\\_type](#) type
- union {
  - char [gclib\\_interrupt\\_t::axis](#)  
If type is [GCLIB\\_MOTION\\_COMPLETE](#), holds the axis that triggered the interrupt.
  - uint8\_t [gclib\\_interrupt\\_t::digital\\_input](#)  
If type is [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#), holds the digital input that triggered the interrupt.
  - uint8\_t [gclib\\_interrupt\\_t::user\\_interrupt](#)  
If type is [GCLIB\\_USER\\_INTERRUPT](#), holds the user input that was triggered.
- uint8\_t [status](#)  
The raw status byte generated by the controller. See the [EI command reference](#) for all possible values.

### 14.3.1 Detailed Description

An interrupt generated by the controller.

Definition at line 55 of file [gclib.h](#).

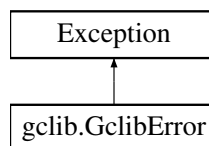
The documentation for this struct was generated from the following file:

- [gclib.h](#)

## 14.4 gclib.GclibError Class Reference

Error class for non-zero gclib return codes.

Inheritance diagram for gclib.GclibError:



### 14.4.1 Detailed Description

Error class for non-zero gclib return codes.

Definition at line 107 of file [gclib.py](#).

The documentation for this class was generated from the following file:

- [gclib.py](#)

## 14.5 gclibjava.GclibJava Class Reference

### Classes

- interface [Gclib](#)  
*The JNA interface to the gclib library.*
- interface [Gclibo](#)  
*The JNA interface to the open source, gclibo library.*

### Public Member Functions

- [GclibJava](#) ()  
*Constructor adds gclib to JNA's path.*
- void [GArrayDownload](#) (String arrayName, List< Double > data) throws [GclibJavaException](#)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- void [GArrayDownload](#) (String arrayName, List< Double > data, int first, int last) throws [GclibJavaException](#)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- List< Double > [GArrayUpload](#) (String arrayName) throws [GclibJavaException](#)  
*Uploads array data from the controller's array table.*
- List< Double > [GArrayUpload](#) (String arrayName, int first, int last) throws [GclibJavaException](#)  
*Uploads array data from the controller's array table.*
- void [GClose](#) ()  
*Closes a connection to a Galil Controller.*
- String [GCommand](#) (String command) throws [GclibJavaException](#)  
*Performs a command-and-response transaction on the connection.*
- void [GFirmwareDownload](#) (String filePath) throws [GclibJavaException](#)  
*Upgrade firmware.*
- byte [GInterrupt](#) () throws [GclibJavaException](#)

- Provides access to PCI and UDP interrupts from the controller.*
- String [GMessage \(\)](#) throws [GclibJavaException](#)  
*Provides access to unsolicited messages from the controller.*
- void [GOpen](#) (String address) throws [GclibJavaException](#)  
*Open a connection to a Galil Controller.*
- void [GProgramDownload](#) (String program, String preprocessor) throws [GclibJavaException](#)  
*Downloads a program to the controller's program buffer.*
- void [GProgramDownload](#) (String program) throws [GclibJavaException](#)  
*Downloads a program using default preprocessor options.*
- String [GProgramUpload](#) () throws [GclibJavaException](#)  
*Uploads a program from the controller's program buffer.*
- String [GAddresses](#) () throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_ADDRESSES or G\_UTIL\_ADDRESSES to provide a listing of all available connection addresses.*
- void [GArrayDownloadFile](#) (String filePath) throws [GclibJavaException](#)  
*Array download from file.*
- void [GArrayUploadFile](#) (String filePath, String names) throws [GclibJavaException](#)  
*Array upload to file.*
- void [GArrayUploadFile](#) (String filePath) throws [GclibJavaException](#)  
*Overload of GArrayUploadFile to upload all arrays.*
- void [GAssign](#) (String ipAddress, String macAddress) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_ASSIGN or G\_UTIL\_ASSIGN to assign an IP address over the Ethernet to a controller at a given MAC address.*
- String [GInfo](#) () throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#) and G\_UTIL\_INFO to provide a useful connection string.*
- String [GIpRequests](#) () throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), G\_UTIL\_GCAPS\_IPREQUEST or G\_UTIL\_IPREQUEST to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- void [GProgramDownloadFile](#) (String filePath, String preprocessor) throws [GclibJavaException](#)  
*Program download from file.*
- void [GProgramDownloadFile](#) (String filePath) throws [GclibJavaException](#)  
*Overload of GProgramDownloadFile to use default preprocessor options.*
- void [GProgramUploadFile](#) (String filePath) throws [GclibJavaException](#)  
*Program upload to file.*
- void [GSleep](#) (int timeout\_ms)  
*Uses [GUtility\(\)](#) and G\_UTIL\_SLEEP to provide a blocking sleep call which can be useful for timing-based chores.*
- void [GTimeout](#) (short timeout\_ms) throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#) and G\_UTIL\_TIMEOUT\_OVERRIDE to set the library timeout.*
- String [GVersion](#) () throws [GclibJavaException](#)  
*Uses [GUtility\(\)](#), G\_UTIL\_VERSION and G\_UTIL\_GCAPS\_VERSION to provide the library and gcaps version numbers.*
- void [GSetServer](#) (String server\_name) throws [GclibJavaException](#)  
*Connects gclib to a new gcaps server.*
- String [GServerStatus](#) () throws [GclibJavaException](#)  
*Retrieves the name of your local gcaps server and whether or not it is currently published Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- String [GListServers](#) () throws [GclibJavaException](#)  
*Retrieves a list of gcaps servers that are advertising themselves on the local network.*
- void [GPublishServer](#) (String server\_name, int publish, int save) throws [GclibJavaException](#)  
*Publishes or removes local gcaps server from the network.*
- String [GRemoteConnections](#) () throws [GclibJavaException](#)  
*Returns a list of IP Addresses that currently have an open connection to your hardware.*

### Protected Member Functions

- void [finalize](#) () throws Throwable  
*The last line of defense to close connection.*

#### 14.5.1 Detailed Description

Definition at line 36 of file [GclibJava.java](#).

#### 14.5.2 Constructor & Destructor Documentation

##### 14.5.2.1 GclibJava()

```
gclibjava.GclibJava.GclibJava () [inline]
```

Constructor adds gclib to JNA's path.

Definition at line 45 of file [GclibJava.java](#).

#### 14.5.3 Member Function Documentation

##### 14.5.3.1 finalize()

```
void gclibjava.GclibJava.finalize () throws Throwable [inline], [protected]
```

The last line of defense to close connection.

Do NOT rely on [finalize\(\)](#), call [GCclose\(\)](#) explicitly.

#### Exceptions

<a href="#">Throwable</a>	super can throw.
---------------------------	------------------

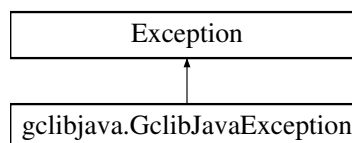
Definition at line 56 of file [GclibJava.java](#).

The documentation for this class was generated from the following file:

- [GclibJava.java](#)

## 14.6 gclibjava.GclibJavaException Class Reference

Inheritance diagram for gclibjava.GclibJavaException:



### Public Member Functions

- [GclibJavaException](#) (int errorCode, String message)
- int [getErrorCode](#) ()

#### 14.6.1 Detailed Description

Definition at line 6 of file [GclibJavaException.java](#).

## 14.6.2 Constructor & Destructor Documentation

### 14.6.2.1 GclibJavaException()

```
gclibjava.GclibJavaException.GclibJavaException (
    int errorCode,
    String message) [inline]
```

Definition at line 8 of file [GclibJavaException.java](#).

## 14.6.3 Member Function Documentation

### 14.6.3.1 getErrorCode()

```
int gclibjava.GclibJavaException.getErrorCode () [inline]
```

Definition at line 12 of file [GclibJavaException.java](#).

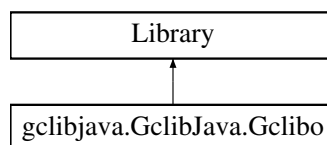
The documentation for this class was generated from the following file:

- [GclibJavaException.java](#)

## 14.7 gclibjava.GclibJava.Gclibo Interface Reference

The JNA interface to the open source, gclibo library.

Inheritance diagram for gclibjava.GclibJava.Gclibo:



### Public Member Functions

- int [GAddresses](#) (byte[] response, int len)
- int [GArrayDownloadFile](#) (Pointer g, String filePath)
- int [GArrayUploadFile](#) (Pointer g, String filePath, String names)
- int [GAssign](#) (String ip, String mac)
- void [GError](#) (int rc, byte[] response, int len)
- int [GInfo](#) (Pointer g, byte[] response, int len)
- int [GIpRequests](#) (byte[] response, int len)
- int [GProgramDownloadFile](#) (Pointer g, String filePath, String preprocessor)
- int [GProgramUploadFile](#) (Pointer g, String filePath)
- void [GSleep](#) (int timeout\_ms)
- int [GTimeout](#) (Pointer g, short timeout\_ms)
- int [GVersion](#) (byte[] response, int len)
- int [GSetServer](#) (String server\_name)
- int [GServerStatus](#) (byte[] response, int len)
- int [GListServers](#) (byte[] response, int len)
- int [GPublishServer](#) (String server\_name, int publish, int save)
- int [GRemoteConnections](#) (byte[] response, int len)

### Public Attributes

- [Gclibo INSTANCE](#)
- [Gclibo SYNC\\_INSTANCE](#)

### 14.7.1 Detailed Description

The JNA interface to the open source, gclibo library.

[http://galil.com/sw/pub/all/doc/gclib/html/gclibo\\_8h.html](http://galil.com/sw/pub/all/doc/gclib/html/gclibo_8h.html)

Definition at line 358 of file [GclibJava.java](#).

### 14.7.2 Member Function Documentation

#### 14.7.2.1 GAddresses()

```
int gclibjava.GclibJava.Gclibo.GAddresses (
    byte[] response,
    int len)
```

#### 14.7.2.2 GArrayDownloadFile()

```
int gclibjava.GclibJava.Gclibo.GArrayDownloadFile (
    Pointer g,
    String filePath)
```

#### 14.7.2.3 GArrayUploadFile()

```
int gclibjava.GclibJava.Gclibo.GArrayUploadFile (
    Pointer g,
    String filePath,
    String names)
```

#### 14.7.2.4 GAssign()

```
int gclibjava.GclibJava.Gclibo.GAssign (
    String ip,
    String mac)
```

#### 14.7.2.5 GError()

```
void gclibjava.GclibJava.Gclibo.GError (
    int rc,
    byte[] response,
    int len)
```

#### 14.7.2.6 GInfo()

```
int gclibjava.GclibJava.Gclibo.GInfo (
    Pointer g,
    byte[] response,
    int len)
```

#### 14.7.2.7 GIpRequests()

```
int gclibjava.GclibJava.Gclibo.GIpRequests (
    byte[] response,
    int len)
```

#### 14.7.2.8 GProgramDownloadFile()

```
int gclibjava.GclibJava.Gclibo.GProgramDownloadFile (
    Pointer g,
    String filePath,
    String preprocessor)
```



#### 14.7.2.9 GProgramUploadFile()

```
int gclibjava.GclibJava.Gclibo.GProgramUploadFile (
    Pointer g,
    String filePath)
```

#### 14.7.2.10 GSleep()

```
void gclibjava.GclibJava.Gclibo.GSleep (
    int timeout_ms)
```

#### 14.7.2.11 GTimeout()

```
int gclibjava.GclibJava.Gclibo.GTimeout (
    Pointer g,
    short timeout_ms)
```

#### 14.7.2.12 GVersion()

```
int gclibjava.GclibJava.Gclibo.GVersion (
    byte[] response,
    int len)
```

#### 14.7.2.13 GSetServer()

```
int gclibjava.GclibJava.Gclibo.GSetServer (
    String server_name)
```

#### 14.7.2.14 GServerStatus()

```
int gclibjava.GclibJava.Gclibo.GServerStatus (
    byte[] response,
    int len)
```

#### 14.7.2.15 GListServers()

```
int gclibjava.GclibJava.Gclibo.GListServers (
    byte[] response,
    int len)
```

#### 14.7.2.16 GPublishServer()

```
int gclibjava.GclibJava.Gclibo.GPublishServer (
    String server_name,
    int publish,
    int save)
```

#### 14.7.2.17 GRemoteConnections()

```
int gclibjava.GclibJava.Gclibo.GRemoteConnections (
    byte[] response,
    int len)
```

### 14.7.3 Member Data Documentation

#### 14.7.3.1 INSTANCE

[Gclibo](#) gclibjava.GclibJava.Gclibo.INSTANCE

**Initial value:**

```
= (Gclibo)
    Native.loadLibrary("gclibo",
```

[Gclibo.class](#))

Definition at line 359 of file [GclibJava.java](#).

### 14.7.3.2 SYNC\_INSTANCE

[Gclibo](#) [gclibjava.GclibJava.Gclibo.SYNC\\_INSTANCE](#)

**Initial value:**

```
= (Gclibo)
    Native.synchronizedLibrary(INSTANCE)
```

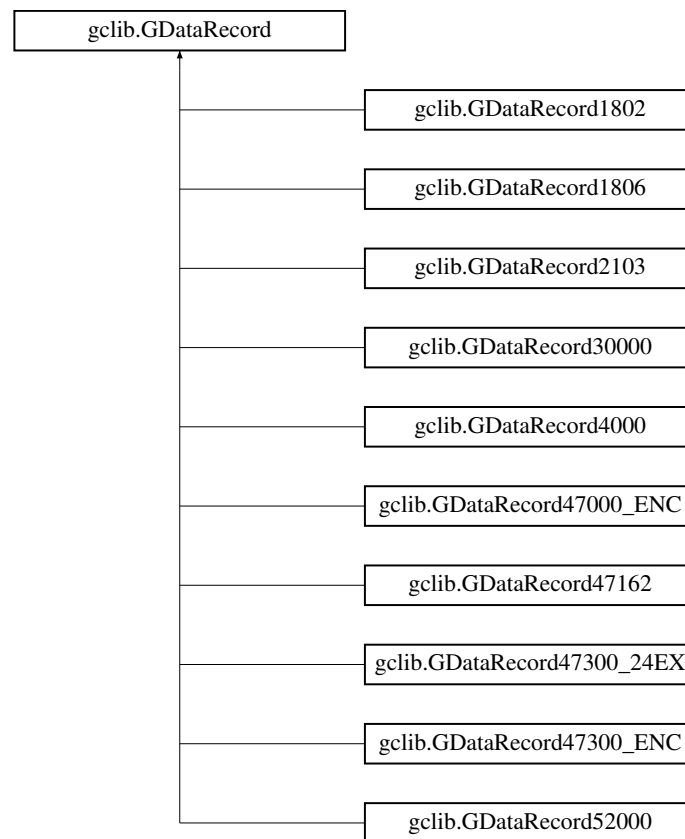
Definition at line 367 of file [GclibJava.java](#).

The documentation for this interface was generated from the following file:

- [GclibJava.java](#)

## 14.8 gclib.GDataRecord Interface Reference

Inheritance diagram for gclib.GDataRecord:



### Public Member Functions

- `byte[] byte\_array ()`  
*Returns the data record as a byte array and allows for access to individual bytes.*

### 14.8.1 Detailed Description

Definition at line 905 of file [gclib.cs](#).

## 14.8.2 Member Function Documentation

### 14.8.2.1 byte\_array()

```
byte[] gclib.GDataRecord.byte_array ()
```

Returns the data record as a byte array and allows for access to individual bytes.

Implemented in [gclib.GDataRecord1802](#), [gclib.GDataRecord1806](#), [gclib.GDataRecord2103](#), [gclib.GDataRecord30000](#), [gclib.GDataRecord4000](#), [gclib.GDataRecord47000\\_ENC](#), [gclib.GDataRecord47162](#), [gclib.GDataRecord47300\\_24EX](#), [gclib.GDataRecord47300\\_ENC](#), and [gclib.GDataRecord52000](#).

The documentation for this interface was generated from the following file:

- [gclib.cs](#)

## 14.9 GDataRecord Union Reference

Data record union, containing all structs and a generic byte array accessor.

```
#include <gclib_record.h>
```

### Public Attributes

- struct [GDataRecord4000 dmc4000](#)  
*The DMC-4000 data record.*
- struct [GDataRecord4000 dmc4103](#)  
*The DMC-4103 data record.*
- struct [GDataRecord4000 dmc50000](#)  
*The DMC-50000 data record.*
- struct [GDataRecord52000 dmc52000](#)  
*The DMC-52000 data record.*
- struct [GDataRecord30000 dmc30000](#)  
*The DMC-30000 data record.*
- struct [GDataRecord2103 dmc2103](#)  
*The DMC-21x3 data record.*
- struct [GDataRecord1806 dmc1806](#)  
*The DMC-1806 data record.*
- struct [GDataRecord1802 dmc1802](#)  
*The DMC-1802 data record.*
- struct [GDataRecord47000\\_ENC rio47000](#)  
*The RIO-471xx & 472xx data record, including encoder support.*
- struct [GDataRecord47300\\_ENC rio47300](#)  
*The RIO 473xx data record, including encoder support.*
- struct [GDataRecord47300\\_24EX rio47300\\_24ex](#)  
*The RIO 473xx data record, with 24EXOUT/24EXIN support.*
- struct [GDataRecord47162 rio47162](#)  
*The RIO 47162 data record.*
- unsigned char [byte\\_array](#) [GALILDATARECORDMAXLENGTH]  
*Generic byte array for offsets.*

### 14.9.1 Detailed Description

Data record union, containing all structs and a generic byte array accessor.

Named structs can be used to access typed data by name. Offsets into the data record can also be used by referencing the member `byte_array`.

```
//Getting the sample counter for the DMC-4000.
cout << data_record->dmc4000.sample_number << '\n'; //access by 4000 product
cout << * ((unsigned short *) (data_record->byte_array + 4)) << '\n'; //access by pointer arithmetic
```

Definition at line 1078 of file [gclib\\_record.h](#).

## 14.9.2 Member Data Documentation

### 14.9.2.1 dmc4000

`struct GDataRecord4000 GDataRecord::dmc4000`  
The DMC-4000 data record.  
Definition at line 1080 of file [gclib\\_record.h](#).

### 14.9.2.2 dmc4103

`struct GDataRecord4000 GDataRecord::dmc4103`  
The DMC-4103 data record.  
Definition at line 1081 of file [gclib\\_record.h](#).

### 14.9.2.3 dmc50000

`struct GDataRecord4000 GDataRecord::dmc50000`  
The DMC-50000 data record.  
Definition at line 1082 of file [gclib\\_record.h](#).

### 14.9.2.4 dmc52000

`struct GDataRecord52000 GDataRecord::dmc52000`  
The DMC-52000 data record.  
Definition at line 1084 of file [gclib\\_record.h](#).

### 14.9.2.5 dmc30000

`struct GDataRecord30000 GDataRecord::dmc30000`  
The DMC-30000 data record.  
Definition at line 1086 of file [gclib\\_record.h](#).

### 14.9.2.6 dmc2103

`struct GDataRecord2103 GDataRecord::dmc2103`  
The DMC-21x3 data record.  
Definition at line 1088 of file [gclib\\_record.h](#).

### 14.9.2.7 dmc1806

`struct GDataRecord1806 GDataRecord::dmc1806`  
The DMC-1806 data record.  
Definition at line 1090 of file [gclib\\_record.h](#).

### 14.9.2.8 dmc1802

`struct GDataRecord1802 GDataRecord::dmc1802`  
The DMC-1802 data record.  
Definition at line 1092 of file [gclib\\_record.h](#).

### 14.9.2.9 rio47000

`struct GDataRecord47000_ENC GDataRecord::rio47000`  
The RIO-471xx & 472xx data record, including encoder support.  
Definition at line 1094 of file [gclib\\_record.h](#).

### 14.9.2.10 rio47300

`struct GDataRecord47300_ENC GDataRecord::rio47300`  
The RIO 473xx data record, including encoder support.  
Definition at line 1095 of file [gclib\\_record.h](#).

**14.9.2.11 rio47300\_24ex**

```
struct GDataRecord47300_24EX GDataRecord::rio47300_24ex
```

The RIO 473xx data record, with 24EXOUT/24EXIN support.

Definition at line 1096 of file [gclib\\_record.h](#).

**14.9.2.12 rio47162**

```
struct GDataRecord47162 GDataRecord::rio47162
```

The RIO 47162 data record.

Definition at line 1097 of file [gclib\\_record.h](#).

**14.9.2.13 byte\_array**

```
unsigned char GDataRecord::byte_array[GALILDATARECORDMAXLENGTH]
```

Generic byte array for offsets.

Definition at line 1099 of file [gclib\\_record.h](#).

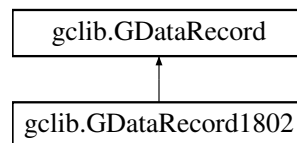
The documentation for this union was generated from the following file:

- [gclib\\_record.h](#)

**14.10 gclib.GDataRecord1802 Struct Reference**

Data record struct for DMC-1802 controllers.

Inheritance diagram for gclib.GDataRecord1802:

**Public Member Functions**

- [byte\[\]](#) [byte\\_array](#) ()  
*Returns the data record as a byte array and allows for access to individual bytes.*

**Public Attributes**

- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*

- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [UB error\\_code](#)  
*error code.*
- [UB general\\_status](#)  
*general status*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)

- A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SW axis\\_a\\_torque](#)  
*A axis torque.*
- [UB axis\\_a\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_a\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SW axis\\_b\\_torque](#)  
*B axis torque.*
- [UB axis\\_b\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_b\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*

- [SW axis\\_c\\_torque](#)  
*C axis torque.*
- [UB axis\\_c\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_c\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SW axis\\_d\\_torque](#)  
*D axis torque.*
- [UB axis\\_d\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_d\\_reserved\\_1](#)  
*Reserved.*

### 14.10.1 Detailed Description

Data record struct for DMC-1802 controllers.

The 18x2 Data record is the Same as 2103 except the following.

1. No header bytes. Software removes it from QR.
2. No analog in axis data.

Definition at line [1623](#) of file [gclib.cs](#).

### 14.10.2 Member Function Documentation

#### 14.10.2.1 `byte_array()`

```
byte[] gclib.GDataRecord1802.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.

Implements [gclib.GDataRecord](#).

Definition at line [1625](#) of file [gclib.cs](#).

### 14.10.3 Member Data Documentation

#### 14.10.3.1 `sample_number`

```
UW gclib.GDataRecord1802.sample_number
```

sample number.

Definition at line [1629](#) of file [gclib.cs](#).



### 14.10.3.2 input\_bank\_0

UB `gclib.GDataRecord1802.input_bank_0`  
general input bank 0 (inputs 1-8).  
Definition at line 1631 of file [gclib.cs](#).

### 14.10.3.3 input\_bank\_1

UB `gclib.GDataRecord1802.input_bank_1`  
general input bank 1 (inputs 9-16).  
Definition at line 1632 of file [gclib.cs](#).

### 14.10.3.4 input\_bank\_2

UB `gclib.GDataRecord1802.input_bank_2`  
general input bank 2 (inputs 17-24).  
Definition at line 1633 of file [gclib.cs](#).

### 14.10.3.5 input\_bank\_3

UB `gclib.GDataRecord1802.input_bank_3`  
general input bank 3 (inputs 25-32).  
Definition at line 1634 of file [gclib.cs](#).

### 14.10.3.6 input\_bank\_4

UB `gclib.GDataRecord1802.input_bank_4`  
general input bank 4 (inputs 33-40).  
Definition at line 1635 of file [gclib.cs](#).

### 14.10.3.7 input\_bank\_5

UB `gclib.GDataRecord1802.input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line 1636 of file [gclib.cs](#).

### 14.10.3.8 input\_bank\_6

UB `gclib.GDataRecord1802.input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line 1637 of file [gclib.cs](#).

### 14.10.3.9 input\_bank\_7

UB `gclib.GDataRecord1802.input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line 1638 of file [gclib.cs](#).

### 14.10.3.10 input\_bank\_8

UB `gclib.GDataRecord1802.input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 1639 of file [gclib.cs](#).

### 14.10.3.11 input\_bank\_9

UB `gclib.GDataRecord1802.input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 1640 of file [gclib.cs](#).

#### 14.10.3.12 output\_bank\_0

[UB](#) `gclib.GDataRecord1802.output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line [1642](#) of file [gclib.cs](#).

#### 14.10.3.13 output\_bank\_1

[UB](#) `gclib.GDataRecord1802.output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line [1643](#) of file [gclib.cs](#).

#### 14.10.3.14 output\_bank\_2

[UB](#) `gclib.GDataRecord1802.output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line [1644](#) of file [gclib.cs](#).

#### 14.10.3.15 output\_bank\_3

[UB](#) `gclib.GDataRecord1802.output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line [1645](#) of file [gclib.cs](#).

#### 14.10.3.16 output\_bank\_4

[UB](#) `gclib.GDataRecord1802.output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line [1646](#) of file [gclib.cs](#).

#### 14.10.3.17 output\_bank\_5

[UB](#) `gclib.GDataRecord1802.output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line [1647](#) of file [gclib.cs](#).

#### 14.10.3.18 output\_bank\_6

[UB](#) `gclib.GDataRecord1802.output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line [1648](#) of file [gclib.cs](#).

#### 14.10.3.19 output\_bank\_7

[UB](#) `gclib.GDataRecord1802.output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line [1649](#) of file [gclib.cs](#).

#### 14.10.3.20 output\_bank\_8

[UB](#) `gclib.GDataRecord1802.output_bank_8`  
general output bank 8 (outputs 65-72).  
Definition at line [1650](#) of file [gclib.cs](#).

#### 14.10.3.21 output\_bank\_9

[UB](#) `gclib.GDataRecord1802.output_bank_9`  
general output bank 9 (outputs 73-80).  
Definition at line [1651](#) of file [gclib.cs](#).

#### 14.10.3.22 error\_code

[UB](#) `gclib.GDataRecord1802.error_code`

error code.

Definition at line 1653 of file [gclib.cs](#).

#### 14.10.3.23 general\_status

[UB](#) `gclib.GDataRecord1802.general_status`

general status

Definition at line 1654 of file [gclib.cs](#).

#### 14.10.3.24 s\_plane\_segment\_count

[UW](#) `gclib.GDataRecord1802.s_plane_segment_count`

segment count of coordinated move for S plane.

Definition at line 1656 of file [gclib.cs](#).

#### 14.10.3.25 s\_plane\_move\_status

[UW](#) `gclib.GDataRecord1802.s_plane_move_status`

coordinated move status for S plane.

Definition at line 1657 of file [gclib.cs](#).

#### 14.10.3.26 s\_distance

[SL](#) `gclib.GDataRecord1802.s_distance`

distance traveled in coordinated move for S plane.

Definition at line 1658 of file [gclib.cs](#).

#### 14.10.3.27 t\_plane\_segment\_count

[UW](#) `gclib.GDataRecord1802.t_plane_segment_count`

segment count of coordinated move for T plane.

Definition at line 1660 of file [gclib.cs](#).

#### 14.10.3.28 t\_plane\_move\_status

[UW](#) `gclib.GDataRecord1802.t_plane_move_status`

Coordinated move status for T plane.

Definition at line 1661 of file [gclib.cs](#).

#### 14.10.3.29 t\_distance

[SL](#) `gclib.GDataRecord1802.t_distance`

distance traveled in coordinated move for T plane.

Definition at line 1662 of file [gclib.cs](#).

#### 14.10.3.30 axis\_a\_status

[UW](#) `gclib.GDataRecord1802.axis_a_status`

A axis status.

Definition at line 1664 of file [gclib.cs](#).

#### 14.10.3.31 axis\_a\_switches

[UB](#) `gclib.GDataRecord1802.axis_a_switches`

A axis switches.

Definition at line 1665 of file [gclib.cs](#).

#### 14.10.3.32 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord1802.axis_a_stop_code`

A axis stop code.

Definition at line 1666 of file [gclib.cs](#).

#### 14.10.3.33 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord1802.axis_a_reference_position`

A axis reference position.

Definition at line 1667 of file [gclib.cs](#).

#### 14.10.3.34 axis\_a\_motor\_position

[SL](#) `gclib.GDataRecord1802.axis_a_motor_position`

A axis motor position.

Definition at line 1668 of file [gclib.cs](#).

#### 14.10.3.35 axis\_a\_position\_error

[SL](#) `gclib.GDataRecord1802.axis_a_position_error`

A axis position error.

Definition at line 1669 of file [gclib.cs](#).

#### 14.10.3.36 axis\_a\_aux\_position

[SL](#) `gclib.GDataRecord1802.axis_a_aux_position`

A axis auxiliary position.

Definition at line 1670 of file [gclib.cs](#).

#### 14.10.3.37 axis\_a\_velocity

[SL](#) `gclib.GDataRecord1802.axis_a_velocity`

A axis velocity.

Definition at line 1671 of file [gclib.cs](#).

#### 14.10.3.38 axis\_a\_torque

[SW](#) `gclib.GDataRecord1802.axis_a_torque`

A axis torque.

Definition at line 1672 of file [gclib.cs](#).

#### 14.10.3.39 axis\_a\_reserved\_0

[UB](#) `gclib.GDataRecord1802.axis_a_reserved_0`

Reserved.

Definition at line 1673 of file [gclib.cs](#).

#### 14.10.3.40 axis\_a\_reserved\_1

[UB](#) `gclib.GDataRecord1802.axis_a_reserved_1`

Reserved.

Definition at line 1674 of file [gclib.cs](#).

#### 14.10.3.41 axis\_b\_status

[UW](#) `gclib.GDataRecord1802.axis_b_status`

B axis status.

Definition at line 1676 of file [gclib.cs](#).

#### 14.10.3.42 axis\_b\_switches

[UB](#) `gclib.GDataRecord1802.axis_b_switches`

B axis switches.

Definition at line 1677 of file [gclib.cs](#).

#### 14.10.3.43 axis\_b\_stop\_code

[UB](#) `gclib.GDataRecord1802.axis_b_stop_code`

B axis stop code.

Definition at line 1678 of file [gclib.cs](#).

#### 14.10.3.44 axis\_b\_reference\_position

[SL](#) `gclib.GDataRecord1802.axis_b_reference_position`

B axis reference position.

Definition at line 1679 of file [gclib.cs](#).

#### 14.10.3.45 axis\_b\_motor\_position

[SL](#) `gclib.GDataRecord1802.axis_b_motor_position`

B axis motor position.

Definition at line 1680 of file [gclib.cs](#).

#### 14.10.3.46 axis\_b\_position\_error

[SL](#) `gclib.GDataRecord1802.axis_b_position_error`

B axis position error.

Definition at line 1681 of file [gclib.cs](#).

#### 14.10.3.47 axis\_b\_aux\_position

[SL](#) `gclib.GDataRecord1802.axis_b_aux_position`

B axis auxiliary position.

Definition at line 1682 of file [gclib.cs](#).

#### 14.10.3.48 axis\_b\_velocity

[SL](#) `gclib.GDataRecord1802.axis_b_velocity`

B axis velocity.

Definition at line 1683 of file [gclib.cs](#).

#### 14.10.3.49 axis\_b\_torque

[SW](#) `gclib.GDataRecord1802.axis_b_torque`

B axis torque.

Definition at line 1684 of file [gclib.cs](#).

#### 14.10.3.50 axis\_b\_reserved\_0

[UB](#) `gclib.GDataRecord1802.axis_b_reserved_0`

Reserved.

Definition at line 1685 of file [gclib.cs](#).

#### 14.10.3.51 axis\_b\_reserved\_1

[UB](#) `gclib.GDataRecord1802.axis_b_reserved_1`

Reserved.

Definition at line 1686 of file [gclib.cs](#).

#### 14.10.3.52 axis\_c\_status

[UW](#) `gclib.GDataRecord1802.axis_c_status`

C axis status.

Definition at line 1688 of file [gclib.cs](#).

#### 14.10.3.53 axis\_c\_switches

[UB](#) `gclib.GDataRecord1802.axis_c_switches`

C axis switches.

Definition at line 1689 of file [gclib.cs](#).

#### 14.10.3.54 axis\_c\_stop\_code

[UB](#) `gclib.GDataRecord1802.axis_c_stop_code`

C axis stop code.

Definition at line 1690 of file [gclib.cs](#).

#### 14.10.3.55 axis\_c\_reference\_position

[SL](#) `gclib.GDataRecord1802.axis_c_reference_position`

C axis reference position.

Definition at line 1691 of file [gclib.cs](#).

#### 14.10.3.56 axis\_c\_motor\_position

[SL](#) `gclib.GDataRecord1802.axis_c_motor_position`

C axis motor position.

Definition at line 1692 of file [gclib.cs](#).

#### 14.10.3.57 axis\_c\_position\_error

[SL](#) `gclib.GDataRecord1802.axis_c_position_error`

C axis position error.

Definition at line 1693 of file [gclib.cs](#).

#### 14.10.3.58 axis\_c\_aux\_position

[SL](#) `gclib.GDataRecord1802.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1694 of file [gclib.cs](#).

#### 14.10.3.59 axis\_c\_velocity

[SL](#) `gclib.GDataRecord1802.axis_c_velocity`

C axis velocity.

Definition at line 1695 of file [gclib.cs](#).

#### 14.10.3.60 axis\_c\_torque

[SW](#) `gclib.GDataRecord1802.axis_c_torque`

C axis torque.

Definition at line 1696 of file [gclib.cs](#).

#### 14.10.3.61 axis\_c\_reserved\_0

[UB](#) `gclib.GDataRecord1802.axis_c_reserved_0`

Reserved.

Definition at line 1697 of file [gclib.cs](#).

#### 14.10.3.62 axis\_c\_reserved\_1

[UB](#) gclib.GDataRecord1802.axis\_c\_reserved\_1

Reserved.

Definition at line 1698 of file [gclib.cs](#).

#### 14.10.3.63 axis\_d\_status

[UW](#) gclib.GDataRecord1802.axis\_d\_status

D axis status.

Definition at line 1700 of file [gclib.cs](#).

#### 14.10.3.64 axis\_d\_switches

[UB](#) gclib.GDataRecord1802.axis\_d\_switches

D axis switches.

Definition at line 1701 of file [gclib.cs](#).

#### 14.10.3.65 axis\_d\_stop\_code

[UB](#) gclib.GDataRecord1802.axis\_d\_stop\_code

D axis stop code.

Definition at line 1702 of file [gclib.cs](#).

#### 14.10.3.66 axis\_d\_reference\_position

[SL](#) gclib.GDataRecord1802.axis\_d\_reference\_position

D axis reference position.

Definition at line 1703 of file [gclib.cs](#).

#### 14.10.3.67 axis\_d\_motor\_position

[SL](#) gclib.GDataRecord1802.axis\_d\_motor\_position

D axis motor position.

Definition at line 1704 of file [gclib.cs](#).

#### 14.10.3.68 axis\_d\_position\_error

[SL](#) gclib.GDataRecord1802.axis\_d\_position\_error

D axis position error.

Definition at line 1705 of file [gclib.cs](#).

#### 14.10.3.69 axis\_d\_aux\_position

[SL](#) gclib.GDataRecord1802.axis\_d\_aux\_position

D axis auxiliary position.

Definition at line 1706 of file [gclib.cs](#).

#### 14.10.3.70 axis\_d\_velocity

[SL](#) gclib.GDataRecord1802.axis\_d\_velocity

D axis velocity.

Definition at line 1707 of file [gclib.cs](#).

#### 14.10.3.71 axis\_d\_torque

[SW](#) gclib.GDataRecord1802.axis\_d\_torque

D axis torque.

Definition at line 1708 of file [gclib.cs](#).

### 14.10.3.72 axis\_d\_reserved\_0

UB [gclib.GDataRecord1802.axis\\_d\\_reserved\\_0](#)

Reserved.

Definition at line 1709 of file [gclib.cs](#).

### 14.10.3.73 axis\_d\_reserved\_1

UB [gclib.GDataRecord1802.axis\\_d\\_reserved\\_1](#)

Reserved.

Definition at line 1710 of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.11 GDataRecord1802 Struct Reference

```
#include <gclib_record.h>
```

### Public Attributes

- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)



- general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [UB error\\_code](#)  
*error code.*
- [UB general\\_status](#)  
*general status*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SW axis\\_a\\_torque](#)  
*A axis torque.*
- [UB axis\\_a\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_a\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*

- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SW axis\\_b\\_torque](#)  
*B axis torque.*
- [UB axis\\_b\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_b\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SW axis\\_c\\_torque](#)  
*C axis torque.*
- [UB axis\\_c\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_c\\_reserved\\_1](#)  
*Reserved.*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)

- D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SW axis\\_d\\_torque](#)  
*D axis torque.*
- [UB axis\\_d\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_d\\_reserved\\_1](#)  
*Reserved.*

### 14.11.1 Detailed Description

Data record struct for DMC-1802 controllers.

The 18x2 Data record is the Same as 2103 except the following.

1. No header bytes. Software removes it from QR.
2. No analog in axis data.

Definition at line [723](#) of file [gclib\\_record.h](#).

### 14.11.2 Member Data Documentation

#### 14.11.2.1 sample\_number

[UW](#) `GDataRecord1802::sample_number`

sample number.

Definition at line [728](#) of file [gclib\\_record.h](#).

#### 14.11.2.2 input\_bank\_0

[UB](#) `GDataRecord1802::input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line [730](#) of file [gclib\\_record.h](#).

#### 14.11.2.3 input\_bank\_1

[UB](#) `GDataRecord1802::input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line [731](#) of file [gclib\\_record.h](#).

#### 14.11.2.4 input\_bank\_2

[UB](#) `GDataRecord1802::input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line [732](#) of file [gclib\\_record.h](#).

#### 14.11.2.5 input\_bank\_3

[UB](#) `GDataRecord1802::input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line [733](#) of file [gclib\\_record.h](#).

#### 14.11.2.6 input\_bank\_4

[UB](#) `GDataRecord1802::input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line [734](#) of file [gclib\\_record.h](#).

#### 14.11.2.7 input\_bank\_5

[UB](#) `GDataRecord1802::input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line 735 of file [gclib\\_record.h](#).

#### 14.11.2.8 input\_bank\_6

[UB](#) `GDataRecord1802::input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line 736 of file [gclib\\_record.h](#).

#### 14.11.2.9 input\_bank\_7

[UB](#) `GDataRecord1802::input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line 737 of file [gclib\\_record.h](#).

#### 14.11.2.10 input\_bank\_8

[UB](#) `GDataRecord1802::input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 738 of file [gclib\\_record.h](#).

#### 14.11.2.11 input\_bank\_9

[UB](#) `GDataRecord1802::input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 739 of file [gclib\\_record.h](#).

#### 14.11.2.12 output\_bank\_0

[UB](#) `GDataRecord1802::output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line 741 of file [gclib\\_record.h](#).

#### 14.11.2.13 output\_bank\_1

[UB](#) `GDataRecord1802::output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line 742 of file [gclib\\_record.h](#).

#### 14.11.2.14 output\_bank\_2

[UB](#) `GDataRecord1802::output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line 743 of file [gclib\\_record.h](#).

#### 14.11.2.15 output\_bank\_3

[UB](#) `GDataRecord1802::output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line 744 of file [gclib\\_record.h](#).

#### 14.11.2.16 output\_bank\_4

[UB](#) `GDataRecord1802::output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line 745 of file [gclib\\_record.h](#).

#### 14.11.2.17 output\_bank\_5

[UB](#) GDataRecord1802::output\_bank\_5

general output bank 5 (outputs 41-48).

Definition at line 746 of file [gclib\\_record.h](#).

#### 14.11.2.18 output\_bank\_6

[UB](#) GDataRecord1802::output\_bank\_6

general output bank 6 (outputs 49-56).

Definition at line 747 of file [gclib\\_record.h](#).

#### 14.11.2.19 output\_bank\_7

[UB](#) GDataRecord1802::output\_bank\_7

general output bank 7 (outputs 57-64).

Definition at line 748 of file [gclib\\_record.h](#).

#### 14.11.2.20 output\_bank\_8

[UB](#) GDataRecord1802::output\_bank\_8

general output bank 8 (outputs 65-72).

Definition at line 749 of file [gclib\\_record.h](#).

#### 14.11.2.21 output\_bank\_9

[UB](#) GDataRecord1802::output\_bank\_9

general output bank 9 (outputs 73-80).

Definition at line 750 of file [gclib\\_record.h](#).

#### 14.11.2.22 error\_code

[UB](#) GDataRecord1802::error\_code

error code.

Definition at line 752 of file [gclib\\_record.h](#).

#### 14.11.2.23 general\_status

[UB](#) GDataRecord1802::general\_status

general status

Definition at line 753 of file [gclib\\_record.h](#).

#### 14.11.2.24 s\_plane\_segment\_count

[UW](#) GDataRecord1802::s\_plane\_segment\_count

segment count of coordinated move for S plane.

Definition at line 755 of file [gclib\\_record.h](#).

#### 14.11.2.25 s\_plane\_move\_status

[UW](#) GDataRecord1802::s\_plane\_move\_status

coordinated move status for S plane.

Definition at line 756 of file [gclib\\_record.h](#).

#### 14.11.2.26 s\_distance

[SL](#) GDataRecord1802::s\_distance

distance traveled in coordinated move for S plane.

Definition at line 757 of file [gclib\\_record.h](#).

#### 14.11.2.27 t\_plane\_segment\_count

[UW](#) `GDataRecord1802::t_plane_segment_count`  
segment count of coordinated move for T plane.  
Definition at line 759 of file [gclib\\_record.h](#).

#### 14.11.2.28 t\_plane\_move\_status

[UW](#) `GDataRecord1802::t_plane_move_status`  
Coordinated move status for T plane.  
Definition at line 760 of file [gclib\\_record.h](#).

#### 14.11.2.29 t\_distance

[SL](#) `GDataRecord1802::t_distance`  
distance traveled in coordinated move for T plane.  
Definition at line 761 of file [gclib\\_record.h](#).

#### 14.11.2.30 axis\_a\_status

[UW](#) `GDataRecord1802::axis_a_status`  
A axis status.  
Definition at line 763 of file [gclib\\_record.h](#).

#### 14.11.2.31 axis\_a\_switches

[UB](#) `GDataRecord1802::axis_a_switches`  
A axis switches.  
Definition at line 764 of file [gclib\\_record.h](#).

#### 14.11.2.32 axis\_a\_stop\_code

[UB](#) `GDataRecord1802::axis_a_stop_code`  
A axis stop code.  
Definition at line 765 of file [gclib\\_record.h](#).

#### 14.11.2.33 axis\_a\_reference\_position

[SL](#) `GDataRecord1802::axis_a_reference_position`  
A axis reference position.  
Definition at line 766 of file [gclib\\_record.h](#).

#### 14.11.2.34 axis\_a\_motor\_position

[SL](#) `GDataRecord1802::axis_a_motor_position`  
A axis motor position.  
Definition at line 767 of file [gclib\\_record.h](#).

#### 14.11.2.35 axis\_a\_position\_error

[SL](#) `GDataRecord1802::axis_a_position_error`  
A axis position error.  
Definition at line 768 of file [gclib\\_record.h](#).

#### 14.11.2.36 axis\_a\_aux\_position

[SL](#) `GDataRecord1802::axis_a_aux_position`  
A axis auxiliary position.  
Definition at line 769 of file [gclib\\_record.h](#).

**14.11.2.37 axis\_a\_velocity**

[SL](#) `GDataRecord1802::axis_a_velocity`

A axis velocity.

Definition at line 770 of file [gclib\\_record.h](#).

**14.11.2.38 axis\_a\_torque**

[SW](#) `GDataRecord1802::axis_a_torque`

A axis torque.

Definition at line 771 of file [gclib\\_record.h](#).

**14.11.2.39 axis\_a\_reserved\_0**

[UB](#) `GDataRecord1802::axis_a_reserved_0`

Reserved.

Definition at line 772 of file [gclib\\_record.h](#).

**14.11.2.40 axis\_a\_reserved\_1**

[UB](#) `GDataRecord1802::axis_a_reserved_1`

Reserved.

Definition at line 773 of file [gclib\\_record.h](#).

**14.11.2.41 axis\_b\_status**

[UW](#) `GDataRecord1802::axis_b_status`

B axis status.

Definition at line 775 of file [gclib\\_record.h](#).

**14.11.2.42 axis\_b\_switches**

[UB](#) `GDataRecord1802::axis_b_switches`

B axis switches.

Definition at line 776 of file [gclib\\_record.h](#).

**14.11.2.43 axis\_b\_stop\_code**

[UB](#) `GDataRecord1802::axis_b_stop_code`

B axis stop code.

Definition at line 777 of file [gclib\\_record.h](#).

**14.11.2.44 axis\_b\_reference\_position**

[SL](#) `GDataRecord1802::axis_b_reference_position`

B axis reference position.

Definition at line 778 of file [gclib\\_record.h](#).

**14.11.2.45 axis\_b\_motor\_position**

[SL](#) `GDataRecord1802::axis_b_motor_position`

B axis motor position.

Definition at line 779 of file [gclib\\_record.h](#).

**14.11.2.46 axis\_b\_position\_error**

[SL](#) `GDataRecord1802::axis_b_position_error`

B axis position error.

Definition at line 780 of file [gclib\\_record.h](#).

#### 14.11.2.47 axis\_b\_aux\_position

[SL](#) `GDataRecord1802::axis_b_aux_position`

B axis auxiliary position.

Definition at line 781 of file [gclib\\_record.h](#).

#### 14.11.2.48 axis\_b\_velocity

[SL](#) `GDataRecord1802::axis_b_velocity`

B axis velocity.

Definition at line 782 of file [gclib\\_record.h](#).

#### 14.11.2.49 axis\_b\_torque

[SW](#) `GDataRecord1802::axis_b_torque`

B axis torque.

Definition at line 783 of file [gclib\\_record.h](#).

#### 14.11.2.50 axis\_b\_reserved\_0

[UB](#) `GDataRecord1802::axis_b_reserved_0`

Reserved.

Definition at line 784 of file [gclib\\_record.h](#).

#### 14.11.2.51 axis\_b\_reserved\_1

[UB](#) `GDataRecord1802::axis_b_reserved_1`

Reserved.

Definition at line 785 of file [gclib\\_record.h](#).

#### 14.11.2.52 axis\_c\_status

[UW](#) `GDataRecord1802::axis_c_status`

C axis status.

Definition at line 787 of file [gclib\\_record.h](#).

#### 14.11.2.53 axis\_c\_switches

[UB](#) `GDataRecord1802::axis_c_switches`

C axis switches.

Definition at line 788 of file [gclib\\_record.h](#).

#### 14.11.2.54 axis\_c\_stop\_code

[UB](#) `GDataRecord1802::axis_c_stop_code`

C axis stop code.

Definition at line 789 of file [gclib\\_record.h](#).

#### 14.11.2.55 axis\_c\_reference\_position

[SL](#) `GDataRecord1802::axis_c_reference_position`

C axis reference position.

Definition at line 790 of file [gclib\\_record.h](#).

#### 14.11.2.56 axis\_c\_motor\_position

[SL](#) `GDataRecord1802::axis_c_motor_position`

C axis motor position.

Definition at line 791 of file [gclib\\_record.h](#).



**14.11.2.57 axis\_c\_position\_error**

[SL](#) GDataRecord1802::axis\_c\_position\_error

C axis position error.

Definition at line 792 of file [gclib\\_record.h](#).

**14.11.2.58 axis\_c\_aux\_position**

[SL](#) GDataRecord1802::axis\_c\_aux\_position

C axis auxiliary position.

Definition at line 793 of file [gclib\\_record.h](#).

**14.11.2.59 axis\_c\_velocity**

[SL](#) GDataRecord1802::axis\_c\_velocity

C axis velocity.

Definition at line 794 of file [gclib\\_record.h](#).

**14.11.2.60 axis\_c\_torque**

[SW](#) GDataRecord1802::axis\_c\_torque

C axis torque.

Definition at line 795 of file [gclib\\_record.h](#).

**14.11.2.61 axis\_c\_reserved\_0**

[UB](#) GDataRecord1802::axis\_c\_reserved\_0

Reserved.

Definition at line 796 of file [gclib\\_record.h](#).

**14.11.2.62 axis\_c\_reserved\_1**

[UB](#) GDataRecord1802::axis\_c\_reserved\_1

Reserved.

Definition at line 797 of file [gclib\\_record.h](#).

**14.11.2.63 axis\_d\_status**

[UW](#) GDataRecord1802::axis\_d\_status

D axis status.

Definition at line 799 of file [gclib\\_record.h](#).

**14.11.2.64 axis\_d\_switches**

[UB](#) GDataRecord1802::axis\_d\_switches

D axis switches.

Definition at line 800 of file [gclib\\_record.h](#).

**14.11.2.65 axis\_d\_stop\_code**

[UB](#) GDataRecord1802::axis\_d\_stop\_code

D axis stop code.

Definition at line 801 of file [gclib\\_record.h](#).

**14.11.2.66 axis\_d\_reference\_position**

[SL](#) GDataRecord1802::axis\_d\_reference\_position

D axis reference position.

Definition at line 802 of file [gclib\\_record.h](#).

**14.11.2.67 axis\_d\_motor\_position**

[SL](#) `GDataRecord1802::axis_d_motor_position`

D axis motor position.

Definition at line 803 of file [gclib\\_record.h](#).

**14.11.2.68 axis\_d\_position\_error**

[SL](#) `GDataRecord1802::axis_d_position_error`

D axis position error.

Definition at line 804 of file [gclib\\_record.h](#).

**14.11.2.69 axis\_d\_aux\_position**

[SL](#) `GDataRecord1802::axis_d_aux_position`

D axis auxiliary position.

Definition at line 805 of file [gclib\\_record.h](#).

**14.11.2.70 axis\_d\_velocity**

[SL](#) `GDataRecord1802::axis_d_velocity`

D axis velocity.

Definition at line 806 of file [gclib\\_record.h](#).

**14.11.2.71 axis\_d\_torque**

[SW](#) `GDataRecord1802::axis_d_torque`

D axis torque.

Definition at line 807 of file [gclib\\_record.h](#).

**14.11.2.72 axis\_d\_reserved\_0**

[UB](#) `GDataRecord1802::axis_d_reserved_0`

Reserved.

Definition at line 808 of file [gclib\\_record.h](#).

**14.11.2.73 axis\_d\_reserved\_1**

[UB](#) `GDataRecord1802::axis_d_reserved_1`

Reserved.

Definition at line 809 of file [gclib\\_record.h](#).

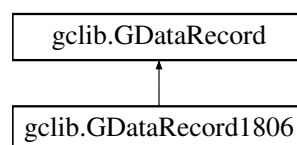
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

**14.12 gclib.GDataRecord1806 Struct Reference**

Data record struct for DMC-1806 controller.

Inheritance diagram for `gclib.GDataRecord1806`:



## Public Member Functions

- [byte\[\] byte\\_array \(\)](#)  
*Returns the data record as a byte array and allows for access to individual bytes.*

## Public Attributes

- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)

- Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*
- [SW reserved\\_12](#)  
*Reserved.*
- [SW reserved\\_14](#)  
*Reserved.*
- [UB reserved\\_16](#)  
*Reserved.*
- [UB reserved\\_17](#)  
*Reserved.*
- [UB reserved\\_18](#)  
*Reserved.*
- [UB reserved\\_19](#)  
*Reserved.*
- [UB reserved\\_20](#)  
*Reserved.*
- [UB reserved\\_21](#)  
*Reserved.*
- [UB reserved\\_22](#)  
*Reserved.*
- [UB reserved\\_23](#)  
*Reserved.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status.*
- [UL reserved\\_24](#)  
*Reserved.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*

- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_a\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_reserved\\_0](#)

- Reserved.*
- [UB axis\\_b\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_c\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*

- [UB axis\\_d\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_d\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SL axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UB axis\\_e\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_e\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)

- F axis analog input.*
- [UB axis\\_f\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_f\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UB axis\\_g\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_g\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_g\\_variable](#)  
*G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)  
*H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)  
*H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)  
*H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)  
*H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)  
*H axis velocity.*
- [SL axis\\_h\\_torque](#)  
*H axis torque.*



- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*
- [UB axis\\_h\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_h\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_h\\_variable](#)  
*H User-defined variable (ZA).*

### 14.12.1 Detailed Description

Data record struct for DMC-1806 controller.

The 18x6 Data record is the same as 4000 except the following.

1. No header bytes. Firmware strips it in DR. Software removes it from QR.
2. No Ethernet status (bytes 42-49).
3. No amplifier status (bytes 52-55).
4. No axis-specific hall input status.

Definition at line [1302](#) of file [gclib.cs](#).

### 14.12.2 Member Function Documentation

#### 14.12.2.1 `byte_array()`

```
byte[] gclib.GDataRecord1806.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.

Implements [gclib.GDataRecord](#).

Definition at line [1304](#) of file [gclib.cs](#).

### 14.12.3 Member Data Documentation

#### 14.12.3.1 `sample_number`

```
UW gclib.GDataRecord1806.sample_number
```

sample number.

Definition at line [1307](#) of file [gclib.cs](#).

#### 14.12.3.2 `input_bank_0`

```
UB gclib.GDataRecord1806.input_bank_0
```

general input bank 0 (inputs 1-8).

Definition at line [1309](#) of file [gclib.cs](#).

#### 14.12.3.3 `input_bank_1`

```
UB gclib.GDataRecord1806.input_bank_1
```

general input bank 1 (inputs 9-16).

Definition at line [1310](#) of file [gclib.cs](#).

#### 14.12.3.4 `input_bank_2`

```
UB gclib.GDataRecord1806.input_bank_2
```

general input bank 2 (inputs 17-24).

Definition at line [1311](#) of file [gclib.cs](#).

#### 14.12.3.5 input\_bank\_3

UB `gclib.GDataRecord1806.input_bank_3`  
general input bank 3 (inputs 25-32).  
Definition at line 1312 of file [gclib.cs](#).

#### 14.12.3.6 input\_bank\_4

UB `gclib.GDataRecord1806.input_bank_4`  
general input bank 4 (inputs 33-40).  
Definition at line 1313 of file [gclib.cs](#).

#### 14.12.3.7 input\_bank\_5

UB `gclib.GDataRecord1806.input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line 1314 of file [gclib.cs](#).

#### 14.12.3.8 input\_bank\_6

UB `gclib.GDataRecord1806.input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line 1315 of file [gclib.cs](#).

#### 14.12.3.9 input\_bank\_7

UB `gclib.GDataRecord1806.input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line 1316 of file [gclib.cs](#).

#### 14.12.3.10 input\_bank\_8

UB `gclib.GDataRecord1806.input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 1317 of file [gclib.cs](#).

#### 14.12.3.11 input\_bank\_9

UB `gclib.GDataRecord1806.input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 1318 of file [gclib.cs](#).

#### 14.12.3.12 output\_bank\_0

UB `gclib.GDataRecord1806.output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line 1320 of file [gclib.cs](#).

#### 14.12.3.13 output\_bank\_1

UB `gclib.GDataRecord1806.output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line 1321 of file [gclib.cs](#).

#### 14.12.3.14 output\_bank\_2

UB `gclib.GDataRecord1806.output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line 1322 of file [gclib.cs](#).

#### 14.12.3.15 output\_bank\_3

[UB](#) `gclib.GDataRecord1806.output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line [1323](#) of file [gclib.cs](#).

#### 14.12.3.16 output\_bank\_4

[UB](#) `gclib.GDataRecord1806.output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line [1324](#) of file [gclib.cs](#).

#### 14.12.3.17 output\_bank\_5

[UB](#) `gclib.GDataRecord1806.output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line [1325](#) of file [gclib.cs](#).

#### 14.12.3.18 output\_bank\_6

[UB](#) `gclib.GDataRecord1806.output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line [1326](#) of file [gclib.cs](#).

#### 14.12.3.19 output\_bank\_7

[UB](#) `gclib.GDataRecord1806.output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line [1327](#) of file [gclib.cs](#).

#### 14.12.3.20 output\_bank\_8

[UB](#) `gclib.GDataRecord1806.output_bank_8`  
general output bank 8 (outputs 65-72).  
Definition at line [1328](#) of file [gclib.cs](#).

#### 14.12.3.21 output\_bank\_9

[UB](#) `gclib.GDataRecord1806.output_bank_9`  
general output bank 9 (outputs 73-80).  
Definition at line [1329](#) of file [gclib.cs](#).

#### 14.12.3.22 reserved\_0

[SW](#) `gclib.GDataRecord1806.reserved_0`  
Reserved.  
Definition at line [1331](#) of file [gclib.cs](#).

#### 14.12.3.23 reserved\_2

[SW](#) `gclib.GDataRecord1806.reserved_2`  
Reserved.  
Definition at line [1332](#) of file [gclib.cs](#).

#### 14.12.3.24 reserved\_4

[SW](#) `gclib.GDataRecord1806.reserved_4`  
Reserved.  
Definition at line [1333](#) of file [gclib.cs](#).

**14.12.3.25 reserved\_6**

[SW](#) `gclib.GDataRecord1806.reserved_6`

Reserved.

Definition at line [1334](#) of file [gclib.cs](#).

**14.12.3.26 reserved\_8**

[SW](#) `gclib.GDataRecord1806.reserved_8`

Reserved.

Definition at line [1335](#) of file [gclib.cs](#).

**14.12.3.27 reserved\_10**

[SW](#) `gclib.GDataRecord1806.reserved_10`

Reserved.

Definition at line [1336](#) of file [gclib.cs](#).

**14.12.3.28 reserved\_12**

[SW](#) `gclib.GDataRecord1806.reserved_12`

Reserved.

Definition at line [1337](#) of file [gclib.cs](#).

**14.12.3.29 reserved\_14**

[SW](#) `gclib.GDataRecord1806.reserved_14`

Reserved.

Definition at line [1338](#) of file [gclib.cs](#).

**14.12.3.30 reserved\_16**

[UB](#) `gclib.GDataRecord1806.reserved_16`

Reserved.

Definition at line [1340](#) of file [gclib.cs](#).

**14.12.3.31 reserved\_17**

[UB](#) `gclib.GDataRecord1806.reserved_17`

Reserved.

Definition at line [1341](#) of file [gclib.cs](#).

**14.12.3.32 reserved\_18**

[UB](#) `gclib.GDataRecord1806.reserved_18`

Reserved.

Definition at line [1342](#) of file [gclib.cs](#).

**14.12.3.33 reserved\_19**

[UB](#) `gclib.GDataRecord1806.reserved_19`

Reserved.

Definition at line [1343](#) of file [gclib.cs](#).

**14.12.3.34 reserved\_20**

[UB](#) `gclib.GDataRecord1806.reserved_20`

Reserved.

Definition at line [1344](#) of file [gclib.cs](#).

**14.12.3.35 reserved\_21**

[UB](#) gclib.GDataRecord1806.reserved\_21

Reserved.

Definition at line 1345 of file [gclib.cs](#).

**14.12.3.36 reserved\_22**

[UB](#) gclib.GDataRecord1806.reserved\_22

Reserved.

Definition at line 1346 of file [gclib.cs](#).

**14.12.3.37 reserved\_23**

[UB](#) gclib.GDataRecord1806.reserved\_23

Reserved.

Definition at line 1347 of file [gclib.cs](#).

**14.12.3.38 error\_code**

[UB](#) gclib.GDataRecord1806.error\_code

error code.

Definition at line 1349 of file [gclib.cs](#).

**14.12.3.39 thread\_status**

[UB](#) gclib.GDataRecord1806.thread\_status

thread status.

Definition at line 1350 of file [gclib.cs](#).

**14.12.3.40 reserved\_24**

[UL](#) gclib.GDataRecord1806.reserved\_24

Reserved.

Definition at line 1351 of file [gclib.cs](#).

**14.12.3.41 contour\_segment\_count**

[UL](#) gclib.GDataRecord1806.contour\_segment\_count

Segment Count for Contour Mode.

Definition at line 1353 of file [gclib.cs](#).

**14.12.3.42 contour\_buffer\_available**

[UW](#) gclib.GDataRecord1806.contour\_buffer\_available

Buffer space remaining, Contour Mode.

Definition at line 1354 of file [gclib.cs](#).

**14.12.3.43 s\_plane\_segment\_count**

[UW](#) gclib.GDataRecord1806.s\_plane\_segment\_count

segment count of coordinated move for S plane.

Definition at line 1356 of file [gclib.cs](#).

**14.12.3.44 s\_plane\_move\_status**

[UW](#) gclib.GDataRecord1806.s\_plane\_move\_status

coordinated move status for S plane.

Definition at line 1357 of file [gclib.cs](#).

#### 14.12.3.45 s\_distance

[SL](#) `gclib.GDataRecord1806.s_distance`

distance traveled in coordinated move for S plane.

Definition at line [1358](#) of file [gclib.cs](#).

#### 14.12.3.46 s\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord1806.s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line [1359](#) of file [gclib.cs](#).

#### 14.12.3.47 t\_plane\_segment\_count

[UW](#) `gclib.GDataRecord1806.t_plane_segment_count`

segment count of coordinated move for T plane.

Definition at line [1361](#) of file [gclib.cs](#).

#### 14.12.3.48 t\_plane\_move\_status

[UW](#) `gclib.GDataRecord1806.t_plane_move_status`

Coordinated move status for T plane.

Definition at line [1362](#) of file [gclib.cs](#).

#### 14.12.3.49 t\_distance

[SL](#) `gclib.GDataRecord1806.t_distance`

distance traveled in coordinated move for T plane.

Definition at line [1363](#) of file [gclib.cs](#).

#### 14.12.3.50 t\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord1806.t_plane_buffer_available`

Buffer space remaining, T Plane.

Definition at line [1364](#) of file [gclib.cs](#).

#### 14.12.3.51 axis\_a\_status

[UW](#) `gclib.GDataRecord1806.axis_a_status`

A axis status.

Definition at line [1366](#) of file [gclib.cs](#).

#### 14.12.3.52 axis\_a\_switches

[UB](#) `gclib.GDataRecord1806.axis_a_switches`

A axis switches.

Definition at line [1367](#) of file [gclib.cs](#).

#### 14.12.3.53 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord1806.axis_a_stop_code`

A axis stop code.

Definition at line [1368](#) of file [gclib.cs](#).

#### 14.12.3.54 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord1806.axis_a_reference_position`

A axis reference position.

Definition at line [1369](#) of file [gclib.cs](#).

**14.12.3.55 axis\_a\_motor\_position**

[SL](#) `gclib.GDataRecord1806.axis_a_motor_position`

A axis motor position.

Definition at line [1370](#) of file [gclib.cs](#).

**14.12.3.56 axis\_a\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_a_position_error`

A axis position error.

Definition at line [1371](#) of file [gclib.cs](#).

**14.12.3.57 axis\_a\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_a_aux_position`

A axis auxiliary position.

Definition at line [1372](#) of file [gclib.cs](#).

**14.12.3.58 axis\_a\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_a_velocity`

A axis velocity.

Definition at line [1373](#) of file [gclib.cs](#).

**14.12.3.59 axis\_a\_torque**

[SL](#) `gclib.GDataRecord1806.axis_a_torque`

A axis torque.

Definition at line [1374](#) of file [gclib.cs](#).

**14.12.3.60 axis\_a\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_a_analog_in`

A axis analog input.

Definition at line [1375](#) of file [gclib.cs](#).

**14.12.3.61 axis\_a\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_a_reserved_0`

Reserved.

Definition at line [1376](#) of file [gclib.cs](#).

**14.12.3.62 axis\_a\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_a_reserved_1`

Reserved.

Definition at line [1377](#) of file [gclib.cs](#).

**14.12.3.63 axis\_a\_variable**

[SL](#) `gclib.GDataRecord1806.axis_a_variable`

A User-defined variable (ZA).

Definition at line [1378](#) of file [gclib.cs](#).

**14.12.3.64 axis\_b\_status**

[UW](#) `gclib.GDataRecord1806.axis_b_status`

B axis status.

Definition at line [1380](#) of file [gclib.cs](#).

#### 14.12.3.65 axis\_b\_switches

[UB](#) `gclib.GDataRecord1806.axis_b_switches`

B axis switches.

Definition at line [1381](#) of file [gclib.cs](#).

#### 14.12.3.66 axis\_b\_stop\_code

[UB](#) `gclib.GDataRecord1806.axis_b_stop_code`

B axis stop code.

Definition at line [1382](#) of file [gclib.cs](#).

#### 14.12.3.67 axis\_b\_reference\_position

[SL](#) `gclib.GDataRecord1806.axis_b_reference_position`

B axis reference position.

Definition at line [1383](#) of file [gclib.cs](#).

#### 14.12.3.68 axis\_b\_motor\_position

[SL](#) `gclib.GDataRecord1806.axis_b_motor_position`

B axis motor position.

Definition at line [1384](#) of file [gclib.cs](#).

#### 14.12.3.69 axis\_b\_position\_error

[SL](#) `gclib.GDataRecord1806.axis_b_position_error`

B axis position error.

Definition at line [1385](#) of file [gclib.cs](#).

#### 14.12.3.70 axis\_b\_aux\_position

[SL](#) `gclib.GDataRecord1806.axis_b_aux_position`

B axis auxiliary position.

Definition at line [1386](#) of file [gclib.cs](#).

#### 14.12.3.71 axis\_b\_velocity

[SL](#) `gclib.GDataRecord1806.axis_b_velocity`

B axis velocity.

Definition at line [1387](#) of file [gclib.cs](#).

#### 14.12.3.72 axis\_b\_torque

[SL](#) `gclib.GDataRecord1806.axis_b_torque`

B axis torque.

Definition at line [1388](#) of file [gclib.cs](#).

#### 14.12.3.73 axis\_b\_analog\_in

[UW](#) `gclib.GDataRecord1806.axis_b_analog_in`

B axis analog input.

Definition at line [1389](#) of file [gclib.cs](#).

#### 14.12.3.74 axis\_b\_reserved\_0

[UB](#) `gclib.GDataRecord1806.axis_b_reserved_0`

Reserved.

Definition at line [1390](#) of file [gclib.cs](#).



#### 14.12.3.75 axis\_b\_reserved\_1

[UB](#) gclib.GDataRecord1806.axis\_b\_reserved\_1

Reserved.

Definition at line 1391 of file [gclib.cs](#).

#### 14.12.3.76 axis\_b\_variable

[SL](#) gclib.GDataRecord1806.axis\_b\_variable

B User-defined variable (ZA).

Definition at line 1392 of file [gclib.cs](#).

#### 14.12.3.77 axis\_c\_status

[UW](#) gclib.GDataRecord1806.axis\_c\_status

C axis status.

Definition at line 1394 of file [gclib.cs](#).

#### 14.12.3.78 axis\_c\_switches

[UB](#) gclib.GDataRecord1806.axis\_c\_switches

C axis switches.

Definition at line 1395 of file [gclib.cs](#).

#### 14.12.3.79 axis\_c\_stop\_code

[UB](#) gclib.GDataRecord1806.axis\_c\_stop\_code

C axis stop code.

Definition at line 1396 of file [gclib.cs](#).

#### 14.12.3.80 axis\_c\_reference\_position

[SL](#) gclib.GDataRecord1806.axis\_c\_reference\_position

C axis reference position.

Definition at line 1397 of file [gclib.cs](#).

#### 14.12.3.81 axis\_c\_motor\_position

[SL](#) gclib.GDataRecord1806.axis\_c\_motor\_position

C axis motor position.

Definition at line 1398 of file [gclib.cs](#).

#### 14.12.3.82 axis\_c\_position\_error

[SL](#) gclib.GDataRecord1806.axis\_c\_position\_error

C axis position error.

Definition at line 1399 of file [gclib.cs](#).

#### 14.12.3.83 axis\_c\_aux\_position

[SL](#) gclib.GDataRecord1806.axis\_c\_aux\_position

C axis auxiliary position.

Definition at line 1400 of file [gclib.cs](#).

#### 14.12.3.84 axis\_c\_velocity

[SL](#) gclib.GDataRecord1806.axis\_c\_velocity

C axis velocity.

Definition at line 1401 of file [gclib.cs](#).

#### 14.12.3.85 axis\_c\_torque

[SL](#) `gclib.GDataRecord1806.axis_c_torque`

C axis torque.

Definition at line 1402 of file [gclib.cs](#).

#### 14.12.3.86 axis\_c\_analog\_in

[UW](#) `gclib.GDataRecord1806.axis_c_analog_in`

C axis analog input.

Definition at line 1403 of file [gclib.cs](#).

#### 14.12.3.87 axis\_c\_reserved\_0

[UB](#) `gclib.GDataRecord1806.axis_c_reserved_0`

Reserved.

Definition at line 1404 of file [gclib.cs](#).

#### 14.12.3.88 axis\_c\_reserved\_1

[UB](#) `gclib.GDataRecord1806.axis_c_reserved_1`

Reserved.

Definition at line 1405 of file [gclib.cs](#).

#### 14.12.3.89 axis\_c\_variable

[SL](#) `gclib.GDataRecord1806.axis_c_variable`

C User-defined variable (ZA).

Definition at line 1406 of file [gclib.cs](#).

#### 14.12.3.90 axis\_d\_status

[UW](#) `gclib.GDataRecord1806.axis_d_status`

D axis status.

Definition at line 1408 of file [gclib.cs](#).

#### 14.12.3.91 axis\_d\_switches

[UB](#) `gclib.GDataRecord1806.axis_d_switches`

D axis switches.

Definition at line 1409 of file [gclib.cs](#).

#### 14.12.3.92 axis\_d\_stop\_code

[UB](#) `gclib.GDataRecord1806.axis_d_stop_code`

D axis stop code.

Definition at line 1410 of file [gclib.cs](#).

#### 14.12.3.93 axis\_d\_reference\_position

[SL](#) `gclib.GDataRecord1806.axis_d_reference_position`

D axis reference position.

Definition at line 1411 of file [gclib.cs](#).

#### 14.12.3.94 axis\_d\_motor\_position

[SL](#) `gclib.GDataRecord1806.axis_d_motor_position`

D axis motor position.

Definition at line 1412 of file [gclib.cs](#).

**14.12.3.95 axis\_d\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_d_position_error`

D axis position error.

Definition at line [1413](#) of file [gclib.cs](#).

**14.12.3.96 axis\_d\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_d_aux_position`

D axis auxiliary position.

Definition at line [1414](#) of file [gclib.cs](#).

**14.12.3.97 axis\_d\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_d_velocity`

D axis velocity.

Definition at line [1415](#) of file [gclib.cs](#).

**14.12.3.98 axis\_d\_torque**

[SL](#) `gclib.GDataRecord1806.axis_d_torque`

D axis torque.

Definition at line [1416](#) of file [gclib.cs](#).

**14.12.3.99 axis\_d\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_d_analog_in`

D axis analog input.

Definition at line [1417](#) of file [gclib.cs](#).

**14.12.3.100 axis\_d\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_d_reserved_0`

Reserved.

Definition at line [1418](#) of file [gclib.cs](#).

**14.12.3.101 axis\_d\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_d_reserved_1`

Reserved.

Definition at line [1419](#) of file [gclib.cs](#).

**14.12.3.102 axis\_d\_variable**

[SL](#) `gclib.GDataRecord1806.axis_d_variable`

D User-defined variable (ZA).

Definition at line [1420](#) of file [gclib.cs](#).

**14.12.3.103 axis\_e\_status**

[UW](#) `gclib.GDataRecord1806.axis_e_status`

E axis status.

Definition at line [1422](#) of file [gclib.cs](#).

**14.12.3.104 axis\_e\_switches**

[UB](#) `gclib.GDataRecord1806.axis_e_switches`

E axis switches.

Definition at line [1423](#) of file [gclib.cs](#).

**14.12.3.105 axis\_e\_stop\_code**

[UB](#) `gclib.GDataRecord1806.axis_e_stop_code`

E axis stop code.

Definition at line [1424](#) of file [gclib.cs](#).

**14.12.3.106 axis\_e\_reference\_position**

[SL](#) `gclib.GDataRecord1806.axis_e_reference_position`

E axis reference position.

Definition at line [1425](#) of file [gclib.cs](#).

**14.12.3.107 axis\_e\_motor\_position**

[SL](#) `gclib.GDataRecord1806.axis_e_motor_position`

E axis motor position.

Definition at line [1426](#) of file [gclib.cs](#).

**14.12.3.108 axis\_e\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_e_position_error`

E axis position error.

Definition at line [1427](#) of file [gclib.cs](#).

**14.12.3.109 axis\_e\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_e_aux_position`

E axis auxiliary position.

Definition at line [1428](#) of file [gclib.cs](#).

**14.12.3.110 axis\_e\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_e_velocity`

E axis velocity.

Definition at line [1429](#) of file [gclib.cs](#).

**14.12.3.111 axis\_e\_torque**

[SL](#) `gclib.GDataRecord1806.axis_e_torque`

E axis torque.

Definition at line [1430](#) of file [gclib.cs](#).

**14.12.3.112 axis\_e\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_e_analog_in`

E axis analog input.

Definition at line [1431](#) of file [gclib.cs](#).

**14.12.3.113 axis\_e\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_e_reserved_0`

Reserved.

Definition at line [1432](#) of file [gclib.cs](#).

**14.12.3.114 axis\_e\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_e_reserved_1`

Reserved.

Definition at line [1433](#) of file [gclib.cs](#).

**14.12.3.115 axis\_e\_variable**

[SL](#) `gclib.GDataRecord1806.axis_e_variable`

E User-defined variable (ZA).

Definition at line [1434](#) of file [gclib.cs](#).

**14.12.3.116 axis\_f\_status**

[UW](#) `gclib.GDataRecord1806.axis_f_status`

F axis status.

Definition at line [1436](#) of file [gclib.cs](#).

**14.12.3.117 axis\_f\_switches**

[UB](#) `gclib.GDataRecord1806.axis_f_switches`

F axis switches.

Definition at line [1437](#) of file [gclib.cs](#).

**14.12.3.118 axis\_f\_stop\_code**

[UB](#) `gclib.GDataRecord1806.axis_f_stop_code`

F axis stop code.

Definition at line [1438](#) of file [gclib.cs](#).

**14.12.3.119 axis\_f\_reference\_position**

[SL](#) `gclib.GDataRecord1806.axis_f_reference_position`

F axis reference position.

Definition at line [1439](#) of file [gclib.cs](#).

**14.12.3.120 axis\_f\_motor\_position**

[SL](#) `gclib.GDataRecord1806.axis_f_motor_position`

F axis motor position.

Definition at line [1440](#) of file [gclib.cs](#).

**14.12.3.121 axis\_f\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_f_position_error`

F axis position error.

Definition at line [1441](#) of file [gclib.cs](#).

**14.12.3.122 axis\_f\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_f_aux_position`

F axis auxiliary position.

Definition at line [1442](#) of file [gclib.cs](#).

**14.12.3.123 axis\_f\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_f_velocity`

F axis velocity.

Definition at line [1443](#) of file [gclib.cs](#).

**14.12.3.124 axis\_f\_torque**

[SL](#) `gclib.GDataRecord1806.axis_f_torque`

F axis torque.

Definition at line [1444](#) of file [gclib.cs](#).

**14.12.3.125 axis\_f\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_f_analog_in`

F axis analog input.

Definition at line [1445](#) of file [gclib.cs](#).

**14.12.3.126 axis\_f\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_f_reserved_0`

Reserved.

Definition at line [1446](#) of file [gclib.cs](#).

**14.12.3.127 axis\_f\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_f_reserved_1`

Reserved.

Definition at line [1447](#) of file [gclib.cs](#).

**14.12.3.128 axis\_f\_variable**

[SL](#) `gclib.GDataRecord1806.axis_f_variable`

F User-defined variable (ZA).

Definition at line [1448](#) of file [gclib.cs](#).

**14.12.3.129 axis\_g\_status**

[UW](#) `gclib.GDataRecord1806.axis_g_status`

G axis status.

Definition at line [1450](#) of file [gclib.cs](#).

**14.12.3.130 axis\_g\_switches**

[UB](#) `gclib.GDataRecord1806.axis_g_switches`

G axis switches.

Definition at line [1451](#) of file [gclib.cs](#).

**14.12.3.131 axis\_g\_stop\_code**

[UB](#) `gclib.GDataRecord1806.axis_g_stop_code`

G axis stop code.

Definition at line [1452](#) of file [gclib.cs](#).

**14.12.3.132 axis\_g\_reference\_position**

[SL](#) `gclib.GDataRecord1806.axis_g_reference_position`

G axis reference position.

Definition at line [1453](#) of file [gclib.cs](#).

**14.12.3.133 axis\_g\_motor\_position**

[SL](#) `gclib.GDataRecord1806.axis_g_motor_position`

G axis motor position.

Definition at line [1454](#) of file [gclib.cs](#).

**14.12.3.134 axis\_g\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_g_position_error`

G axis position error.

Definition at line [1455](#) of file [gclib.cs](#).

**14.12.3.135 axis\_g\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_g_aux_position`

G axis auxiliary position.

Definition at line [1456](#) of file [gclib.cs](#).

**14.12.3.136 axis\_g\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_g_velocity`

G axis velocity.

Definition at line [1457](#) of file [gclib.cs](#).

**14.12.3.137 axis\_g\_torque**

[SL](#) `gclib.GDataRecord1806.axis_g_torque`

G axis torque.

Definition at line [1458](#) of file [gclib.cs](#).

**14.12.3.138 axis\_g\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_g_analog_in`

G axis analog input.

Definition at line [1459](#) of file [gclib.cs](#).

**14.12.3.139 axis\_g\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_g_reserved_0`

Reserved.

Definition at line [1460](#) of file [gclib.cs](#).

**14.12.3.140 axis\_g\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_g_reserved_1`

Reserved.

Definition at line [1461](#) of file [gclib.cs](#).

**14.12.3.141 axis\_g\_variable**

[SL](#) `gclib.GDataRecord1806.axis_g_variable`

G User-defined variable (ZA).

Definition at line [1462](#) of file [gclib.cs](#).

**14.12.3.142 axis\_h\_status**

[UW](#) `gclib.GDataRecord1806.axis_h_status`

H axis status.

Definition at line [1464](#) of file [gclib.cs](#).

**14.12.3.143 axis\_h\_switches**

[UB](#) `gclib.GDataRecord1806.axis_h_switches`

H axis switches.

Definition at line [1465](#) of file [gclib.cs](#).

**14.12.3.144 axis\_h\_stop\_code**

[UB](#) `gclib.GDataRecord1806.axis_h_stop_code`

H axis stop code.

Definition at line [1466](#) of file [gclib.cs](#).

**14.12.3.145 axis\_h\_reference\_position**

[SL](#) `gclib.GDataRecord1806.axis_h_reference_position`

H axis reference position.

Definition at line [1467](#) of file [gclib.cs](#).

**14.12.3.146 axis\_h\_motor\_position**

[SL](#) `gclib.GDataRecord1806.axis_h_motor_position`

H axis motor position.

Definition at line [1468](#) of file [gclib.cs](#).

**14.12.3.147 axis\_h\_position\_error**

[SL](#) `gclib.GDataRecord1806.axis_h_position_error`

H axis position error.

Definition at line [1469](#) of file [gclib.cs](#).

**14.12.3.148 axis\_h\_aux\_position**

[SL](#) `gclib.GDataRecord1806.axis_h_aux_position`

H axis auxiliary position.

Definition at line [1470](#) of file [gclib.cs](#).

**14.12.3.149 axis\_h\_velocity**

[SL](#) `gclib.GDataRecord1806.axis_h_velocity`

H axis velocity.

Definition at line [1471](#) of file [gclib.cs](#).

**14.12.3.150 axis\_h\_torque**

[SL](#) `gclib.GDataRecord1806.axis_h_torque`

H axis torque.

Definition at line [1472](#) of file [gclib.cs](#).

**14.12.3.151 axis\_h\_analog\_in**

[UW](#) `gclib.GDataRecord1806.axis_h_analog_in`

H axis analog input.

Definition at line [1473](#) of file [gclib.cs](#).

**14.12.3.152 axis\_h\_reserved\_0**

[UB](#) `gclib.GDataRecord1806.axis_h_reserved_0`

Reserved.

Definition at line [1474](#) of file [gclib.cs](#).

**14.12.3.153 axis\_h\_reserved\_1**

[UB](#) `gclib.GDataRecord1806.axis_h_reserved_1`

Reserved.

Definition at line [1475](#) of file [gclib.cs](#).

**14.12.3.154 axis\_h\_variable**

[SL](#) `gclib.GDataRecord1806.axis_h_variable`

H User-defined variable (ZA).

Definition at line [1476](#) of file [gclib.cs](#).

The documentation for this struct was generated from the following file:



- [gclib.cs](#)

## 14.13 GDataRecord1806 Struct Reference

Data record struct for DMC-1806 controller.

```
#include <gclib_record.h>
```

### Public Attributes

- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*

- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)  
*Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*
- [SW reserved\\_12](#)  
*Reserved.*
- [SW reserved\\_14](#)  
*Reserved.*
- [UB reserved\\_16](#)  
*Reserved.*
- [UB reserved\\_17](#)  
*Reserved.*
- [UB reserved\\_18](#)  
*Reserved.*
- [UB reserved\\_19](#)  
*Reserved.*
- [UB reserved\\_20](#)  
*Reserved.*
- [UB reserved\\_21](#)  
*Reserved.*
- [UB reserved\\_22](#)  
*Reserved.*
- [UB reserved\\_23](#)  
*Reserved.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status.*
- [UL reserved\\_24](#)  
*Reserved.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)

- segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_a\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*

- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_b\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_c\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)

- D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UB axis\\_d\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_d\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SL axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UB axis\\_e\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_e\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*

- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UB axis\\_f\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_f\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UB axis\\_g\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_g\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_g\\_variable](#)  
*G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)  
*H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)  
*H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)  
*H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)  
*H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)

- H axis velocity.*
- [SL axis\\_h\\_torque](#)  
*H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*
- [UB axis\\_h\\_reserved\\_0](#)  
*Reserved.*
- [UB axis\\_h\\_reserved\\_1](#)  
*Reserved.*
- [SL axis\\_h\\_variable](#)  
*H User-defined variable (ZA).*

### 14.13.1 Detailed Description

Data record struct for DMC-1806 controller.

The 18x6 Data record is the same as 4000 except the following.

1. No header bytes. Firmware strips it in DR. Software removes it from QR.
2. No Ethernet status (bytes 42-49).
3. No amplifier status (bytes 52-55).
4. No axis-specific hall input status.

Definition at line [405](#) of file [gclib\\_record.h](#).

### 14.13.2 Member Data Documentation

#### 14.13.2.1 sample\_number

[UW](#) `GDataRecord1806::sample_number`  
sample number.

Definition at line [409](#) of file [gclib\\_record.h](#).

#### 14.13.2.2 input\_bank\_0

[UB](#) `GDataRecord1806::input_bank_0`  
general input bank 0 (inputs 1-8).

Definition at line [411](#) of file [gclib\\_record.h](#).

#### 14.13.2.3 input\_bank\_1

[UB](#) `GDataRecord1806::input_bank_1`  
general input bank 1 (inputs 9-16).

Definition at line [412](#) of file [gclib\\_record.h](#).

#### 14.13.2.4 input\_bank\_2

[UB](#) `GDataRecord1806::input_bank_2`  
general input bank 2 (inputs 17-24).

Definition at line [413](#) of file [gclib\\_record.h](#).

#### 14.13.2.5 input\_bank\_3

[UB](#) `GDataRecord1806::input_bank_3`  
general input bank 3 (inputs 25-32).

Definition at line [414](#) of file [gclib\\_record.h](#).

#### 14.13.2.6 input\_bank\_4

[UB](#) `GDataRecord1806::input_bank_4`  
general input bank 4 (inputs 33-40).  
Definition at line [415](#) of file [gclib\\_record.h](#).

#### 14.13.2.7 input\_bank\_5

[UB](#) `GDataRecord1806::input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line [416](#) of file [gclib\\_record.h](#).

#### 14.13.2.8 input\_bank\_6

[UB](#) `GDataRecord1806::input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line [417](#) of file [gclib\\_record.h](#).

#### 14.13.2.9 input\_bank\_7

[UB](#) `GDataRecord1806::input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line [418](#) of file [gclib\\_record.h](#).

#### 14.13.2.10 input\_bank\_8

[UB](#) `GDataRecord1806::input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line [419](#) of file [gclib\\_record.h](#).

#### 14.13.2.11 input\_bank\_9

[UB](#) `GDataRecord1806::input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line [420](#) of file [gclib\\_record.h](#).

#### 14.13.2.12 output\_bank\_0

[UB](#) `GDataRecord1806::output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line [422](#) of file [gclib\\_record.h](#).

#### 14.13.2.13 output\_bank\_1

[UB](#) `GDataRecord1806::output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line [423](#) of file [gclib\\_record.h](#).

#### 14.13.2.14 output\_bank\_2

[UB](#) `GDataRecord1806::output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line [424](#) of file [gclib\\_record.h](#).

#### 14.13.2.15 output\_bank\_3

[UB](#) `GDataRecord1806::output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line [425](#) of file [gclib\\_record.h](#).



#### 14.13.2.16 output\_bank\_4

[UB](#) GDataRecord1806::output\_bank\_4

general output bank 4 (outputs 33-40).

Definition at line [426](#) of file [gclib\\_record.h](#).

#### 14.13.2.17 output\_bank\_5

[UB](#) GDataRecord1806::output\_bank\_5

general output bank 5 (outputs 41-48).

Definition at line [427](#) of file [gclib\\_record.h](#).

#### 14.13.2.18 output\_bank\_6

[UB](#) GDataRecord1806::output\_bank\_6

general output bank 6 (outputs 49-56).

Definition at line [428](#) of file [gclib\\_record.h](#).

#### 14.13.2.19 output\_bank\_7

[UB](#) GDataRecord1806::output\_bank\_7

general output bank 7 (outputs 57-64).

Definition at line [429](#) of file [gclib\\_record.h](#).

#### 14.13.2.20 output\_bank\_8

[UB](#) GDataRecord1806::output\_bank\_8

general output bank 8 (outputs 65-72).

Definition at line [430](#) of file [gclib\\_record.h](#).

#### 14.13.2.21 output\_bank\_9

[UB](#) GDataRecord1806::output\_bank\_9

general output bank 9 (outputs 73-80).

Definition at line [431](#) of file [gclib\\_record.h](#).

#### 14.13.2.22 reserved\_0

[SW](#) GDataRecord1806::reserved\_0

Reserved.

Definition at line [433](#) of file [gclib\\_record.h](#).

#### 14.13.2.23 reserved\_2

[SW](#) GDataRecord1806::reserved\_2

Reserved.

Definition at line [434](#) of file [gclib\\_record.h](#).

#### 14.13.2.24 reserved\_4

[SW](#) GDataRecord1806::reserved\_4

Reserved.

Definition at line [435](#) of file [gclib\\_record.h](#).

#### 14.13.2.25 reserved\_6

[SW](#) GDataRecord1806::reserved\_6

Reserved.

Definition at line [436](#) of file [gclib\\_record.h](#).

**14.13.2.26 reserved\_8**

[SW](#) `GDataRecord1806::reserved_8`

Reserved.

Definition at line [437](#) of file [gclib\\_record.h](#).

**14.13.2.27 reserved\_10**

[SW](#) `GDataRecord1806::reserved_10`

Reserved.

Definition at line [438](#) of file [gclib\\_record.h](#).

**14.13.2.28 reserved\_12**

[SW](#) `GDataRecord1806::reserved_12`

Reserved.

Definition at line [439](#) of file [gclib\\_record.h](#).

**14.13.2.29 reserved\_14**

[SW](#) `GDataRecord1806::reserved_14`

Reserved.

Definition at line [440](#) of file [gclib\\_record.h](#).

**14.13.2.30 reserved\_16**

[UB](#) `GDataRecord1806::reserved_16`

Reserved.

Definition at line [442](#) of file [gclib\\_record.h](#).

**14.13.2.31 reserved\_17**

[UB](#) `GDataRecord1806::reserved_17`

Reserved.

Definition at line [443](#) of file [gclib\\_record.h](#).

**14.13.2.32 reserved\_18**

[UB](#) `GDataRecord1806::reserved_18`

Reserved.

Definition at line [444](#) of file [gclib\\_record.h](#).

**14.13.2.33 reserved\_19**

[UB](#) `GDataRecord1806::reserved_19`

Reserved.

Definition at line [445](#) of file [gclib\\_record.h](#).

**14.13.2.34 reserved\_20**

[UB](#) `GDataRecord1806::reserved_20`

Reserved.

Definition at line [446](#) of file [gclib\\_record.h](#).

**14.13.2.35 reserved\_21**

[UB](#) `GDataRecord1806::reserved_21`

Reserved.

Definition at line [447](#) of file [gclib\\_record.h](#).

**14.13.2.36 reserved\_22**

[UB](#) GDataRecord1806::reserved\_22

Reserved.

Definition at line 448 of file [gclib\\_record.h](#).

**14.13.2.37 reserved\_23**

[UB](#) GDataRecord1806::reserved\_23

Reserved.

Definition at line 449 of file [gclib\\_record.h](#).

**14.13.2.38 error\_code**

[UB](#) GDataRecord1806::error\_code

error code.

Definition at line 451 of file [gclib\\_record.h](#).

**14.13.2.39 thread\_status**

[UB](#) GDataRecord1806::thread\_status

thread status.

Definition at line 452 of file [gclib\\_record.h](#).

**14.13.2.40 reserved\_24**

[UL](#) GDataRecord1806::reserved\_24

Reserved.

Definition at line 453 of file [gclib\\_record.h](#).

**14.13.2.41 contour\_segment\_count**

[UL](#) GDataRecord1806::contour\_segment\_count

Segment Count for Contour Mode.

Definition at line 455 of file [gclib\\_record.h](#).

**14.13.2.42 contour\_buffer\_available**

[UW](#) GDataRecord1806::contour\_buffer\_available

Buffer space remaining, Contour Mode.

Definition at line 456 of file [gclib\\_record.h](#).

**14.13.2.43 s\_plane\_segment\_count**

[UW](#) GDataRecord1806::s\_plane\_segment\_count

segment count of coordinated move for S plane.

Definition at line 458 of file [gclib\\_record.h](#).

**14.13.2.44 s\_plane\_move\_status**

[UW](#) GDataRecord1806::s\_plane\_move\_status

coordinated move status for S plane.

Definition at line 459 of file [gclib\\_record.h](#).

**14.13.2.45 s\_distance**

[SL](#) GDataRecord1806::s\_distance

distance traveled in coordinated move for S plane.

Definition at line 460 of file [gclib\\_record.h](#).

#### 14.13.2.46 s\_plane\_buffer\_available

[UW](#) `GDataRecord1806::s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 461 of file [gclib\\_record.h](#).

#### 14.13.2.47 t\_plane\_segment\_count

[UW](#) `GDataRecord1806::t_plane_segment_count`

segment count of coordinated move for T plane.

Definition at line 463 of file [gclib\\_record.h](#).

#### 14.13.2.48 t\_plane\_move\_status

[UW](#) `GDataRecord1806::t_plane_move_status`

Coordinated move status for T plane.

Definition at line 464 of file [gclib\\_record.h](#).

#### 14.13.2.49 t\_distance

[SL](#) `GDataRecord1806::t_distance`

distance traveled in coordinated move for T plane.

Definition at line 465 of file [gclib\\_record.h](#).

#### 14.13.2.50 t\_plane\_buffer\_available

[UW](#) `GDataRecord1806::t_plane_buffer_available`

Buffer space remaining, T Plane.

Definition at line 466 of file [gclib\\_record.h](#).

#### 14.13.2.51 axis\_a\_status

[UW](#) `GDataRecord1806::axis_a_status`

A axis status.

Definition at line 468 of file [gclib\\_record.h](#).

#### 14.13.2.52 axis\_a\_switches

[UB](#) `GDataRecord1806::axis_a_switches`

A axis switches.

Definition at line 469 of file [gclib\\_record.h](#).

#### 14.13.2.53 axis\_a\_stop\_code

[UB](#) `GDataRecord1806::axis_a_stop_code`

A axis stop code.

Definition at line 470 of file [gclib\\_record.h](#).

#### 14.13.2.54 axis\_a\_reference\_position

[SL](#) `GDataRecord1806::axis_a_reference_position`

A axis reference position.

Definition at line 471 of file [gclib\\_record.h](#).

#### 14.13.2.55 axis\_a\_motor\_position

[SL](#) `GDataRecord1806::axis_a_motor_position`

A axis motor position.

Definition at line 472 of file [gclib\\_record.h](#).

**14.13.2.56 axis\_a\_position\_error**

[SL](#) GDataRecord1806::axis\_a\_position\_error

A axis position error.

Definition at line 473 of file [gclib\\_record.h](#).

**14.13.2.57 axis\_a\_aux\_position**

[SL](#) GDataRecord1806::axis\_a\_aux\_position

A axis auxiliary position.

Definition at line 474 of file [gclib\\_record.h](#).

**14.13.2.58 axis\_a\_velocity**

[SL](#) GDataRecord1806::axis\_a\_velocity

A axis velocity.

Definition at line 475 of file [gclib\\_record.h](#).

**14.13.2.59 axis\_a\_torque**

[SL](#) GDataRecord1806::axis\_a\_torque

A axis torque.

Definition at line 476 of file [gclib\\_record.h](#).

**14.13.2.60 axis\_a\_analog\_in**

[UW](#) GDataRecord1806::axis\_a\_analog\_in

A axis analog input.

Definition at line 477 of file [gclib\\_record.h](#).

**14.13.2.61 axis\_a\_reserved\_0**

[UB](#) GDataRecord1806::axis\_a\_reserved\_0

Reserved.

Definition at line 478 of file [gclib\\_record.h](#).

**14.13.2.62 axis\_a\_reserved\_1**

[UB](#) GDataRecord1806::axis\_a\_reserved\_1

Reserved.

Definition at line 479 of file [gclib\\_record.h](#).

**14.13.2.63 axis\_a\_variable**

[SL](#) GDataRecord1806::axis\_a\_variable

A User-defined variable (ZA).

Definition at line 480 of file [gclib\\_record.h](#).

**14.13.2.64 axis\_b\_status**

[UW](#) GDataRecord1806::axis\_b\_status

B axis status.

Definition at line 482 of file [gclib\\_record.h](#).

**14.13.2.65 axis\_b\_switches**

[UB](#) GDataRecord1806::axis\_b\_switches

B axis switches.

Definition at line 483 of file [gclib\\_record.h](#).

#### 14.13.2.66 axis\_b\_stop\_code

[UB](#) `GDataRecord1806::axis_b_stop_code`

B axis stop code.

Definition at line [484](#) of file [gclib\\_record.h](#).

#### 14.13.2.67 axis\_b\_reference\_position

[SL](#) `GDataRecord1806::axis_b_reference_position`

B axis reference position.

Definition at line [485](#) of file [gclib\\_record.h](#).

#### 14.13.2.68 axis\_b\_motor\_position

[SL](#) `GDataRecord1806::axis_b_motor_position`

B axis motor position.

Definition at line [486](#) of file [gclib\\_record.h](#).

#### 14.13.2.69 axis\_b\_position\_error

[SL](#) `GDataRecord1806::axis_b_position_error`

B axis position error.

Definition at line [487](#) of file [gclib\\_record.h](#).

#### 14.13.2.70 axis\_b\_aux\_position

[SL](#) `GDataRecord1806::axis_b_aux_position`

B axis auxiliary position.

Definition at line [488](#) of file [gclib\\_record.h](#).

#### 14.13.2.71 axis\_b\_velocity

[SL](#) `GDataRecord1806::axis_b_velocity`

B axis velocity.

Definition at line [489](#) of file [gclib\\_record.h](#).

#### 14.13.2.72 axis\_b\_torque

[SL](#) `GDataRecord1806::axis_b_torque`

B axis torque.

Definition at line [490](#) of file [gclib\\_record.h](#).

#### 14.13.2.73 axis\_b\_analog\_in

[UW](#) `GDataRecord1806::axis_b_analog_in`

B axis analog input.

Definition at line [491](#) of file [gclib\\_record.h](#).

#### 14.13.2.74 axis\_b\_reserved\_0

[UB](#) `GDataRecord1806::axis_b_reserved_0`

Reserved.

Definition at line [492](#) of file [gclib\\_record.h](#).

#### 14.13.2.75 axis\_b\_reserved\_1

[UB](#) `GDataRecord1806::axis_b_reserved_1`

Reserved.

Definition at line [493](#) of file [gclib\\_record.h](#).

**14.13.2.76 axis\_b\_variable**

[SL](#) `GDataRecord1806::axis_b_variable`

B User-defined variable (ZA).

Definition at line [494](#) of file [gclib\\_record.h](#).

**14.13.2.77 axis\_c\_status**

[UW](#) `GDataRecord1806::axis_c_status`

C axis status.

Definition at line [496](#) of file [gclib\\_record.h](#).

**14.13.2.78 axis\_c\_switches**

[UB](#) `GDataRecord1806::axis_c_switches`

C axis switches.

Definition at line [497](#) of file [gclib\\_record.h](#).

**14.13.2.79 axis\_c\_stop\_code**

[UB](#) `GDataRecord1806::axis_c_stop_code`

C axis stop code.

Definition at line [498](#) of file [gclib\\_record.h](#).

**14.13.2.80 axis\_c\_reference\_position**

[SL](#) `GDataRecord1806::axis_c_reference_position`

C axis reference position.

Definition at line [499](#) of file [gclib\\_record.h](#).

**14.13.2.81 axis\_c\_motor\_position**

[SL](#) `GDataRecord1806::axis_c_motor_position`

C axis motor position.

Definition at line [500](#) of file [gclib\\_record.h](#).

**14.13.2.82 axis\_c\_position\_error**

[SL](#) `GDataRecord1806::axis_c_position_error`

C axis position error.

Definition at line [501](#) of file [gclib\\_record.h](#).

**14.13.2.83 axis\_c\_aux\_position**

[SL](#) `GDataRecord1806::axis_c_aux_position`

C axis auxiliary position.

Definition at line [502](#) of file [gclib\\_record.h](#).

**14.13.2.84 axis\_c\_velocity**

[SL](#) `GDataRecord1806::axis_c_velocity`

C axis velocity.

Definition at line [503](#) of file [gclib\\_record.h](#).

**14.13.2.85 axis\_c\_torque**

[SL](#) `GDataRecord1806::axis_c_torque`

C axis torque.

Definition at line [504](#) of file [gclib\\_record.h](#).

#### 14.13.2.86 axis\_c\_analog\_in

[UW](#) GDataRecord1806::axis\_c\_analog\_in

C axis analog input.

Definition at line 505 of file [gclib\\_record.h](#).

#### 14.13.2.87 axis\_c\_reserved\_0

[UB](#) GDataRecord1806::axis\_c\_reserved\_0

Reserved.

Definition at line 506 of file [gclib\\_record.h](#).

#### 14.13.2.88 axis\_c\_reserved\_1

[UB](#) GDataRecord1806::axis\_c\_reserved\_1

Reserved.

Definition at line 507 of file [gclib\\_record.h](#).

#### 14.13.2.89 axis\_c\_variable

[SL](#) GDataRecord1806::axis\_c\_variable

C User-defined variable (ZA).

Definition at line 508 of file [gclib\\_record.h](#).

#### 14.13.2.90 axis\_d\_status

[UW](#) GDataRecord1806::axis\_d\_status

D axis status.

Definition at line 510 of file [gclib\\_record.h](#).

#### 14.13.2.91 axis\_d\_switches

[UB](#) GDataRecord1806::axis\_d\_switches

D axis switches.

Definition at line 511 of file [gclib\\_record.h](#).

#### 14.13.2.92 axis\_d\_stop\_code

[UB](#) GDataRecord1806::axis\_d\_stop\_code

D axis stop code.

Definition at line 512 of file [gclib\\_record.h](#).

#### 14.13.2.93 axis\_d\_reference\_position

[SL](#) GDataRecord1806::axis\_d\_reference\_position

D axis reference position.

Definition at line 513 of file [gclib\\_record.h](#).

#### 14.13.2.94 axis\_d\_motor\_position

[SL](#) GDataRecord1806::axis\_d\_motor\_position

D axis motor position.

Definition at line 514 of file [gclib\\_record.h](#).

#### 14.13.2.95 axis\_d\_position\_error

[SL](#) GDataRecord1806::axis\_d\_position\_error

D axis position error.

Definition at line 515 of file [gclib\\_record.h](#).



**14.13.2.96 axis\_d\_aux\_position**

[SL](#) GDataRecord1806::axis\_d\_aux\_position

D axis auxiliary position.

Definition at line 516 of file [gclib\\_record.h](#).

**14.13.2.97 axis\_d\_velocity**

[SL](#) GDataRecord1806::axis\_d\_velocity

D axis velocity.

Definition at line 517 of file [gclib\\_record.h](#).

**14.13.2.98 axis\_d\_torque**

[SL](#) GDataRecord1806::axis\_d\_torque

D axis torque.

Definition at line 518 of file [gclib\\_record.h](#).

**14.13.2.99 axis\_d\_analog\_in**

[UW](#) GDataRecord1806::axis\_d\_analog\_in

D axis analog input.

Definition at line 519 of file [gclib\\_record.h](#).

**14.13.2.100 axis\_d\_reserved\_0**

[UB](#) GDataRecord1806::axis\_d\_reserved\_0

Reserved.

Definition at line 520 of file [gclib\\_record.h](#).

**14.13.2.101 axis\_d\_reserved\_1**

[UB](#) GDataRecord1806::axis\_d\_reserved\_1

Reserved.

Definition at line 521 of file [gclib\\_record.h](#).

**14.13.2.102 axis\_d\_variable**

[SL](#) GDataRecord1806::axis\_d\_variable

D User-defined variable (ZA).

Definition at line 522 of file [gclib\\_record.h](#).

**14.13.2.103 axis\_e\_status**

[UW](#) GDataRecord1806::axis\_e\_status

E axis status.

Definition at line 524 of file [gclib\\_record.h](#).

**14.13.2.104 axis\_e\_switches**

[UB](#) GDataRecord1806::axis\_e\_switches

E axis switches.

Definition at line 525 of file [gclib\\_record.h](#).

**14.13.2.105 axis\_e\_stop\_code**

[UB](#) GDataRecord1806::axis\_e\_stop\_code

E axis stop code.

Definition at line 526 of file [gclib\\_record.h](#).

#### 14.13.2.106 axis\_e\_reference\_position

[SL](#) `GDataRecord1806::axis_e_reference_position`

E axis reference position.

Definition at line 527 of file [gclib\\_record.h](#).

#### 14.13.2.107 axis\_e\_motor\_position

[SL](#) `GDataRecord1806::axis_e_motor_position`

E axis motor position.

Definition at line 528 of file [gclib\\_record.h](#).

#### 14.13.2.108 axis\_e\_position\_error

[SL](#) `GDataRecord1806::axis_e_position_error`

E axis position error.

Definition at line 529 of file [gclib\\_record.h](#).

#### 14.13.2.109 axis\_e\_aux\_position

[SL](#) `GDataRecord1806::axis_e_aux_position`

E axis auxiliary position.

Definition at line 530 of file [gclib\\_record.h](#).

#### 14.13.2.110 axis\_e\_velocity

[SL](#) `GDataRecord1806::axis_e_velocity`

E axis velocity.

Definition at line 531 of file [gclib\\_record.h](#).

#### 14.13.2.111 axis\_e\_torque

[SL](#) `GDataRecord1806::axis_e_torque`

E axis torque.

Definition at line 532 of file [gclib\\_record.h](#).

#### 14.13.2.112 axis\_e\_analog\_in

[UW](#) `GDataRecord1806::axis_e_analog_in`

E axis analog input.

Definition at line 533 of file [gclib\\_record.h](#).

#### 14.13.2.113 axis\_e\_reserved\_0

[UB](#) `GDataRecord1806::axis_e_reserved_0`

Reserved.

Definition at line 534 of file [gclib\\_record.h](#).

#### 14.13.2.114 axis\_e\_reserved\_1

[UB](#) `GDataRecord1806::axis_e_reserved_1`

Reserved.

Definition at line 535 of file [gclib\\_record.h](#).

#### 14.13.2.115 axis\_e\_variable

[SL](#) `GDataRecord1806::axis_e_variable`

E User-defined variable (ZA).

Definition at line 536 of file [gclib\\_record.h](#).

**14.13.2.116 axis\_f\_status**

[UW](#) GDataRecord1806::axis\_f\_status

F axis status.

Definition at line 538 of file [gclib\\_record.h](#).

**14.13.2.117 axis\_f\_switches**

[UB](#) GDataRecord1806::axis\_f\_switches

F axis switches.

Definition at line 539 of file [gclib\\_record.h](#).

**14.13.2.118 axis\_f\_stop\_code**

[UB](#) GDataRecord1806::axis\_f\_stop\_code

F axis stop code.

Definition at line 540 of file [gclib\\_record.h](#).

**14.13.2.119 axis\_f\_reference\_position**

[SL](#) GDataRecord1806::axis\_f\_reference\_position

F axis reference position.

Definition at line 541 of file [gclib\\_record.h](#).

**14.13.2.120 axis\_f\_motor\_position**

[SL](#) GDataRecord1806::axis\_f\_motor\_position

F axis motor position.

Definition at line 542 of file [gclib\\_record.h](#).

**14.13.2.121 axis\_f\_position\_error**

[SL](#) GDataRecord1806::axis\_f\_position\_error

F axis position error.

Definition at line 543 of file [gclib\\_record.h](#).

**14.13.2.122 axis\_f\_aux\_position**

[SL](#) GDataRecord1806::axis\_f\_aux\_position

F axis auxiliary position.

Definition at line 544 of file [gclib\\_record.h](#).

**14.13.2.123 axis\_f\_velocity**

[SL](#) GDataRecord1806::axis\_f\_velocity

F axis velocity.

Definition at line 545 of file [gclib\\_record.h](#).

**14.13.2.124 axis\_f\_torque**

[SL](#) GDataRecord1806::axis\_f\_torque

F axis torque.

Definition at line 546 of file [gclib\\_record.h](#).

**14.13.2.125 axis\_f\_analog\_in**

[UW](#) GDataRecord1806::axis\_f\_analog\_in

F axis analog input.

Definition at line 547 of file [gclib\\_record.h](#).

**14.13.2.126 axis\_f\_reserved\_0**

[UB](#) GDataRecord1806::axis\_f\_reserved\_0

Reserved.

Definition at line 548 of file [gclib\\_record.h](#).

**14.13.2.127 axis\_f\_reserved\_1**

[UB](#) GDataRecord1806::axis\_f\_reserved\_1

Reserved.

Definition at line 549 of file [gclib\\_record.h](#).

**14.13.2.128 axis\_f\_variable**

[SL](#) GDataRecord1806::axis\_f\_variable

F User-defined variable (ZA).

Definition at line 550 of file [gclib\\_record.h](#).

**14.13.2.129 axis\_g\_status**

[UW](#) GDataRecord1806::axis\_g\_status

G axis status.

Definition at line 552 of file [gclib\\_record.h](#).

**14.13.2.130 axis\_g\_switches**

[UB](#) GDataRecord1806::axis\_g\_switches

G axis switches.

Definition at line 553 of file [gclib\\_record.h](#).

**14.13.2.131 axis\_g\_stop\_code**

[UB](#) GDataRecord1806::axis\_g\_stop\_code

G axis stop code.

Definition at line 554 of file [gclib\\_record.h](#).

**14.13.2.132 axis\_g\_reference\_position**

[SL](#) GDataRecord1806::axis\_g\_reference\_position

G axis reference position.

Definition at line 555 of file [gclib\\_record.h](#).

**14.13.2.133 axis\_g\_motor\_position**

[SL](#) GDataRecord1806::axis\_g\_motor\_position

G axis motor position.

Definition at line 556 of file [gclib\\_record.h](#).

**14.13.2.134 axis\_g\_position\_error**

[SL](#) GDataRecord1806::axis\_g\_position\_error

G axis position error.

Definition at line 557 of file [gclib\\_record.h](#).

**14.13.2.135 axis\_g\_aux\_position**

[SL](#) GDataRecord1806::axis\_g\_aux\_position

G axis auxiliary position.

Definition at line 558 of file [gclib\\_record.h](#).

**14.13.2.136 axis\_g\_velocity**

[SL](#) GDataRecord1806::axis\_g\_velocity

G axis velocity.

Definition at line 559 of file [gclib\\_record.h](#).

**14.13.2.137 axis\_g\_torque**

[SL](#) GDataRecord1806::axis\_g\_torque

G axis torque.

Definition at line 560 of file [gclib\\_record.h](#).

**14.13.2.138 axis\_g\_analog\_in**

[UW](#) GDataRecord1806::axis\_g\_analog\_in

G axis analog input.

Definition at line 561 of file [gclib\\_record.h](#).

**14.13.2.139 axis\_g\_reserved\_0**

[UB](#) GDataRecord1806::axis\_g\_reserved\_0

Reserved.

Definition at line 562 of file [gclib\\_record.h](#).

**14.13.2.140 axis\_g\_reserved\_1**

[UB](#) GDataRecord1806::axis\_g\_reserved\_1

Reserved.

Definition at line 563 of file [gclib\\_record.h](#).

**14.13.2.141 axis\_g\_variable**

[SL](#) GDataRecord1806::axis\_g\_variable

G User-defined variable (ZA).

Definition at line 564 of file [gclib\\_record.h](#).

**14.13.2.142 axis\_h\_status**

[UW](#) GDataRecord1806::axis\_h\_status

H axis status.

Definition at line 566 of file [gclib\\_record.h](#).

**14.13.2.143 axis\_h\_switches**

[UB](#) GDataRecord1806::axis\_h\_switches

H axis switches.

Definition at line 567 of file [gclib\\_record.h](#).

**14.13.2.144 axis\_h\_stop\_code**

[UB](#) GDataRecord1806::axis\_h\_stop\_code

H axis stop code.

Definition at line 568 of file [gclib\\_record.h](#).

**14.13.2.145 axis\_h\_reference\_position**

[SL](#) GDataRecord1806::axis\_h\_reference\_position

H axis reference position.

Definition at line 569 of file [gclib\\_record.h](#).

**14.13.2.146 axis\_h\_motor\_position**

[SL](#) `GDataRecord1806::axis_h_motor_position`

H axis motor position.

Definition at line 570 of file [gclib\\_record.h](#).

**14.13.2.147 axis\_h\_position\_error**

[SL](#) `GDataRecord1806::axis_h_position_error`

H axis position error.

Definition at line 571 of file [gclib\\_record.h](#).

**14.13.2.148 axis\_h\_aux\_position**

[SL](#) `GDataRecord1806::axis_h_aux_position`

H axis auxiliary position.

Definition at line 572 of file [gclib\\_record.h](#).

**14.13.2.149 axis\_h\_velocity**

[SL](#) `GDataRecord1806::axis_h_velocity`

H axis velocity.

Definition at line 573 of file [gclib\\_record.h](#).

**14.13.2.150 axis\_h\_torque**

[SL](#) `GDataRecord1806::axis_h_torque`

H axis torque.

Definition at line 574 of file [gclib\\_record.h](#).

**14.13.2.151 axis\_h\_analog\_in**

[UW](#) `GDataRecord1806::axis_h_analog_in`

H axis analog input.

Definition at line 575 of file [gclib\\_record.h](#).

**14.13.2.152 axis\_h\_reserved\_0**

[UB](#) `GDataRecord1806::axis_h_reserved_0`

Reserved.

Definition at line 576 of file [gclib\\_record.h](#).

**14.13.2.153 axis\_h\_reserved\_1**

[UB](#) `GDataRecord1806::axis_h_reserved_1`

Reserved.

Definition at line 577 of file [gclib\\_record.h](#).

**14.13.2.154 axis\_h\_variable**

[SL](#) `GDataRecord1806::axis_h_variable`

H User-defined variable (ZA).

Definition at line 578 of file [gclib\\_record.h](#).

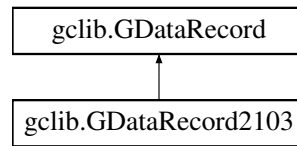
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

## 14.14 gclib.GDataRecord2103 Struct Reference

Data record struct for DMC-2103 controllers.

Inheritance diagram for gclib.GDataRecord2103:



### Public Member Functions

- [byte\[\] byte\\_array \(\)](#)  
*Returns the data record as a byte array and allows for access to individual bytes.*

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*

- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [UB error\\_code](#)  
*error code.*
- [UB general\\_status](#)  
*general status*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SW axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)



- A axis analog input.*
- [UW axis\\_b\\_status](#)
  - B axis status.*
- [UB axis\\_b\\_switches](#)
  - B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)
  - B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)
  - B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)
  - B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)
  - B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)
  - B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)
  - B axis velocity.*
- [SW axis\\_b\\_torque](#)
  - B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)
  - B axis analog input.*
- [UW axis\\_c\\_status](#)
  - C axis status.*
- [UB axis\\_c\\_switches](#)
  - C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)
  - C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)
  - C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)
  - C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)
  - C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)
  - C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)
  - C axis velocity.*
- [SW axis\\_c\\_torque](#)
  - C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)
  - C axis analog input.*
- [UW axis\\_d\\_status](#)
  - D axis status.*
- [UB axis\\_d\\_switches](#)
  - D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)
  - D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)
  - D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)
  - D axis motor position.*

- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SW axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SW axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SW axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UW axis\\_g\\_status](#)

- G axis status.*
- [UB axis\\_g\\_switches](#)
- G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)
- G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)
- G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)
- G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)
- G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)
- G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)
- G axis velocity.*
- [SW axis\\_g\\_torque](#)
- G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)
- G axis analog input.*
- [UW axis\\_h\\_status](#)
- H axis status.*
- [UB axis\\_h\\_switches](#)
- H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)
- H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)
- H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)
- H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)
- H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)
- H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)
- H axis velocity.*
- [SW axis\\_h\\_torque](#)
- H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)
- H axis analog input.*

### 14.14.1 Detailed Description

Data record struct for DMC-2103 controllers.  
Definition at line 1481 of file [gclib.cs](#).

### 14.14.2 Member Function Documentation

#### 14.14.2.1 `byte_array()`

```
byte[] gclib.GDataRecord2103.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line 1483 of file [gclib.cs](#).

### 14.14.3 Member Data Documentation

#### 14.14.3.1 header\_0

UB `gclib.GDataRecord2103.header_0`

1st Byte of Header.

Definition at line 1487 of file [gclib.cs](#).

#### 14.14.3.2 header\_1

UB `gclib.GDataRecord2103.header_1`

2nd Byte of Header.

Definition at line 1488 of file [gclib.cs](#).

#### 14.14.3.3 header\_2

UB `gclib.GDataRecord2103.header_2`

3rd Byte of Header.

Definition at line 1489 of file [gclib.cs](#).

#### 14.14.3.4 header\_3

UB `gclib.GDataRecord2103.header_3`

4th Byte of Header.

Definition at line 1490 of file [gclib.cs](#).

#### 14.14.3.5 sample\_number

UW `gclib.GDataRecord2103.sample_number`

sample number.

Definition at line 1492 of file [gclib.cs](#).

#### 14.14.3.6 input\_bank\_0

UB `gclib.GDataRecord2103.input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 1494 of file [gclib.cs](#).

#### 14.14.3.7 input\_bank\_1

UB `gclib.GDataRecord2103.input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 1495 of file [gclib.cs](#).

#### 14.14.3.8 input\_bank\_2

UB `gclib.GDataRecord2103.input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 1496 of file [gclib.cs](#).

#### 14.14.3.9 input\_bank\_3

UB `gclib.GDataRecord2103.input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 1497 of file [gclib.cs](#).

#### 14.14.3.10 input\_bank\_4

UB `gclib.GDataRecord2103.input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 1498 of file [gclib.cs](#).

#### 14.14.3.11 input\_bank\_5

UB `gclib.GDataRecord2103.input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line 1499 of file [gclib.cs](#).

#### 14.14.3.12 input\_bank\_6

UB `gclib.GDataRecord2103.input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line 1500 of file [gclib.cs](#).

#### 14.14.3.13 input\_bank\_7

UB `gclib.GDataRecord2103.input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line 1501 of file [gclib.cs](#).

#### 14.14.3.14 input\_bank\_8

UB `gclib.GDataRecord2103.input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 1502 of file [gclib.cs](#).

#### 14.14.3.15 input\_bank\_9

UB `gclib.GDataRecord2103.input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 1503 of file [gclib.cs](#).

#### 14.14.3.16 output\_bank\_0

UB `gclib.GDataRecord2103.output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line 1505 of file [gclib.cs](#).

#### 14.14.3.17 output\_bank\_1

UB `gclib.GDataRecord2103.output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line 1506 of file [gclib.cs](#).

#### 14.14.3.18 output\_bank\_2

UB `gclib.GDataRecord2103.output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line 1507 of file [gclib.cs](#).

#### 14.14.3.19 output\_bank\_3

UB `gclib.GDataRecord2103.output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line 1508 of file [gclib.cs](#).

#### 14.14.3.20 output\_bank\_4

UB `gclib.GDataRecord2103.output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line 1509 of file [gclib.cs](#).

#### 14.14.3.21 output\_bank\_5

[UB](#) `gclib.GDataRecord2103.output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line [1510](#) of file [gclib.cs](#).

#### 14.14.3.22 output\_bank\_6

[UB](#) `gclib.GDataRecord2103.output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line [1511](#) of file [gclib.cs](#).

#### 14.14.3.23 output\_bank\_7

[UB](#) `gclib.GDataRecord2103.output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line [1512](#) of file [gclib.cs](#).

#### 14.14.3.24 output\_bank\_8

[UB](#) `gclib.GDataRecord2103.output_bank_8`  
general output bank 8 (outputs 65-72).  
Definition at line [1513](#) of file [gclib.cs](#).

#### 14.14.3.25 output\_bank\_9

[UB](#) `gclib.GDataRecord2103.output_bank_9`  
general output bank 9 (outputs 73-80).  
Definition at line [1514](#) of file [gclib.cs](#).

#### 14.14.3.26 error\_code

[UB](#) `gclib.GDataRecord2103.error_code`  
error code.  
Definition at line [1516](#) of file [gclib.cs](#).

#### 14.14.3.27 general\_status

[UB](#) `gclib.GDataRecord2103.general_status`  
general status  
Definition at line [1517](#) of file [gclib.cs](#).

#### 14.14.3.28 s\_plane\_segment\_count

[UW](#) `gclib.GDataRecord2103.s_plane_segment_count`  
segment count of coordinated move for S plane.  
Definition at line [1519](#) of file [gclib.cs](#).

#### 14.14.3.29 s\_plane\_move\_status

[UW](#) `gclib.GDataRecord2103.s_plane_move_status`  
coordinated move status for S plane.  
Definition at line [1520](#) of file [gclib.cs](#).

#### 14.14.3.30 s\_distance

[SL](#) `gclib.GDataRecord2103.s_distance`  
distance traveled in coordinated move for S plane.  
Definition at line [1521](#) of file [gclib.cs](#).

#### 14.14.3.31 t\_plane\_segment\_count

[UW](#) `gclib.GDataRecord2103.t_plane_segment_count`  
segment count of coordinated move for T plane.  
Definition at line [1523](#) of file [gclib.cs](#).

#### 14.14.3.32 t\_plane\_move\_status

[UW](#) `gclib.GDataRecord2103.t_plane_move_status`  
Coordinated move status for T plane.  
Definition at line [1524](#) of file [gclib.cs](#).

#### 14.14.3.33 t\_distance

[SL](#) `gclib.GDataRecord2103.t_distance`  
distance traveled in coordinated move for T plane.  
Definition at line [1525](#) of file [gclib.cs](#).

#### 14.14.3.34 axis\_a\_status

[UW](#) `gclib.GDataRecord2103.axis_a_status`  
A axis status.  
Definition at line [1527](#) of file [gclib.cs](#).

#### 14.14.3.35 axis\_a\_switches

[UB](#) `gclib.GDataRecord2103.axis_a_switches`  
A axis switches.  
Definition at line [1528](#) of file [gclib.cs](#).

#### 14.14.3.36 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_a_stop_code`  
A axis stop code.  
Definition at line [1529](#) of file [gclib.cs](#).

#### 14.14.3.37 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_a_reference_position`  
A axis reference position.  
Definition at line [1530](#) of file [gclib.cs](#).

#### 14.14.3.38 axis\_a\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_a_motor_position`  
A axis motor position.  
Definition at line [1531](#) of file [gclib.cs](#).

#### 14.14.3.39 axis\_a\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_a_position_error`  
A axis position error.  
Definition at line [1532](#) of file [gclib.cs](#).

#### 14.14.3.40 axis\_a\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_a_aux_position`  
A axis auxiliary position.  
Definition at line [1533](#) of file [gclib.cs](#).

#### 14.14.3.41 axis\_a\_velocity

[SL](#) `gclib.GDataRecord2103.axis_a_velocity`

A axis velocity.

Definition at line 1534 of file [gclib.cs](#).

#### 14.14.3.42 axis\_a\_torque

[SW](#) `gclib.GDataRecord2103.axis_a_torque`

A axis torque.

Definition at line 1535 of file [gclib.cs](#).

#### 14.14.3.43 axis\_a\_analog\_in

[UW](#) `gclib.GDataRecord2103.axis_a_analog_in`

A axis analog input.

Definition at line 1536 of file [gclib.cs](#).

#### 14.14.3.44 axis\_b\_status

[UW](#) `gclib.GDataRecord2103.axis_b_status`

B axis status.

Definition at line 1538 of file [gclib.cs](#).

#### 14.14.3.45 axis\_b\_switches

[UB](#) `gclib.GDataRecord2103.axis_b_switches`

B axis switches.

Definition at line 1539 of file [gclib.cs](#).

#### 14.14.3.46 axis\_b\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_b_stop_code`

B axis stop code.

Definition at line 1540 of file [gclib.cs](#).

#### 14.14.3.47 axis\_b\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_b_reference_position`

B axis reference position.

Definition at line 1541 of file [gclib.cs](#).

#### 14.14.3.48 axis\_b\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_b_motor_position`

B axis motor position.

Definition at line 1542 of file [gclib.cs](#).

#### 14.14.3.49 axis\_b\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_b_position_error`

B axis position error.

Definition at line 1543 of file [gclib.cs](#).

#### 14.14.3.50 axis\_b\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_b_aux_position`

B axis auxiliary position.

Definition at line 1544 of file [gclib.cs](#).



#### 14.14.3.51 axis\_b\_velocity

[SL](#) `gclib.GDataRecord2103.axis_b_velocity`

B axis velocity.

Definition at line 1545 of file [gclib.cs](#).

#### 14.14.3.52 axis\_b\_torque

[SW](#) `gclib.GDataRecord2103.axis_b_torque`

B axis torque.

Definition at line 1546 of file [gclib.cs](#).

#### 14.14.3.53 axis\_b\_analog\_in

[UW](#) `gclib.GDataRecord2103.axis_b_analog_in`

B axis analog input.

Definition at line 1547 of file [gclib.cs](#).

#### 14.14.3.54 axis\_c\_status

[UW](#) `gclib.GDataRecord2103.axis_c_status`

C axis status.

Definition at line 1549 of file [gclib.cs](#).

#### 14.14.3.55 axis\_c\_switches

[UB](#) `gclib.GDataRecord2103.axis_c_switches`

C axis switches.

Definition at line 1550 of file [gclib.cs](#).

#### 14.14.3.56 axis\_c\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_c_stop_code`

C axis stop code.

Definition at line 1551 of file [gclib.cs](#).

#### 14.14.3.57 axis\_c\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_c_reference_position`

C axis reference position.

Definition at line 1552 of file [gclib.cs](#).

#### 14.14.3.58 axis\_c\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_c_motor_position`

C axis motor position.

Definition at line 1553 of file [gclib.cs](#).

#### 14.14.3.59 axis\_c\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_c_position_error`

C axis position error.

Definition at line 1554 of file [gclib.cs](#).

#### 14.14.3.60 axis\_c\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1555 of file [gclib.cs](#).

#### 14.14.3.61 axis\_c\_velocity

[SL](#) `gclib.GDataRecord2103.axis_c_velocity`

C axis velocity.

Definition at line 1556 of file [gclib.cs](#).

#### 14.14.3.62 axis\_c\_torque

[SW](#) `gclib.GDataRecord2103.axis_c_torque`

C axis torque.

Definition at line 1557 of file [gclib.cs](#).

#### 14.14.3.63 axis\_c\_analog\_in

[UW](#) `gclib.GDataRecord2103.axis_c_analog_in`

C axis analog input.

Definition at line 1558 of file [gclib.cs](#).

#### 14.14.3.64 axis\_d\_status

[UW](#) `gclib.GDataRecord2103.axis_d_status`

D axis status.

Definition at line 1560 of file [gclib.cs](#).

#### 14.14.3.65 axis\_d\_switches

[UB](#) `gclib.GDataRecord2103.axis_d_switches`

D axis switches.

Definition at line 1561 of file [gclib.cs](#).

#### 14.14.3.66 axis\_d\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_d_stop_code`

D axis stop code.

Definition at line 1562 of file [gclib.cs](#).

#### 14.14.3.67 axis\_d\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_d_reference_position`

D axis reference position.

Definition at line 1563 of file [gclib.cs](#).

#### 14.14.3.68 axis\_d\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_d_motor_position`

D axis motor position.

Definition at line 1564 of file [gclib.cs](#).

#### 14.14.3.69 axis\_d\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_d_position_error`

D axis position error.

Definition at line 1565 of file [gclib.cs](#).

#### 14.14.3.70 axis\_d\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_d_aux_position`

D axis auxiliary position.

Definition at line 1566 of file [gclib.cs](#).

**14.14.3.71 axis\_d\_velocity**

[SL](#) `gclib.GDataRecord2103.axis_d_velocity`

D axis velocity.

Definition at line 1567 of file [gclib.cs](#).

**14.14.3.72 axis\_d\_torque**

[SW](#) `gclib.GDataRecord2103.axis_d_torque`

D axis torque.

Definition at line 1568 of file [gclib.cs](#).

**14.14.3.73 axis\_d\_analog\_in**

[UW](#) `gclib.GDataRecord2103.axis_d_analog_in`

D axis analog input.

Definition at line 1569 of file [gclib.cs](#).

**14.14.3.74 axis\_e\_status**

[UW](#) `gclib.GDataRecord2103.axis_e_status`

E axis status.

Definition at line 1571 of file [gclib.cs](#).

**14.14.3.75 axis\_e\_switches**

[UB](#) `gclib.GDataRecord2103.axis_e_switches`

E axis switches.

Definition at line 1572 of file [gclib.cs](#).

**14.14.3.76 axis\_e\_stop\_code**

[UB](#) `gclib.GDataRecord2103.axis_e_stop_code`

E axis stop code.

Definition at line 1573 of file [gclib.cs](#).

**14.14.3.77 axis\_e\_reference\_position**

[SL](#) `gclib.GDataRecord2103.axis_e_reference_position`

E axis reference position.

Definition at line 1574 of file [gclib.cs](#).

**14.14.3.78 axis\_e\_motor\_position**

[SL](#) `gclib.GDataRecord2103.axis_e_motor_position`

E axis motor position.

Definition at line 1575 of file [gclib.cs](#).

**14.14.3.79 axis\_e\_position\_error**

[SL](#) `gclib.GDataRecord2103.axis_e_position_error`

E axis position error.

Definition at line 1576 of file [gclib.cs](#).

**14.14.3.80 axis\_e\_aux\_position**

[SL](#) `gclib.GDataRecord2103.axis_e_aux_position`

E axis auxiliary position.

Definition at line 1577 of file [gclib.cs](#).

#### 14.14.3.81 axis\_e\_velocity

[SL](#) `gclib.GDataRecord2103.axis_e_velocity`

E axis velocity.

Definition at line 1578 of file [gclib.cs](#).

#### 14.14.3.82 axis\_e\_torque

[SW](#) `gclib.GDataRecord2103.axis_e_torque`

E axis torque.

Definition at line 1579 of file [gclib.cs](#).

#### 14.14.3.83 axis\_e\_analog\_in

[UW](#) `gclib.GDataRecord2103.axis_e_analog_in`

E axis analog input.

Definition at line 1580 of file [gclib.cs](#).

#### 14.14.3.84 axis\_f\_status

[UW](#) `gclib.GDataRecord2103.axis_f_status`

F axis status.

Definition at line 1582 of file [gclib.cs](#).

#### 14.14.3.85 axis\_f\_switches

[UB](#) `gclib.GDataRecord2103.axis_f_switches`

F axis switches.

Definition at line 1583 of file [gclib.cs](#).

#### 14.14.3.86 axis\_f\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_f_stop_code`

F axis stop code.

Definition at line 1584 of file [gclib.cs](#).

#### 14.14.3.87 axis\_f\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_f_reference_position`

F axis reference position.

Definition at line 1585 of file [gclib.cs](#).

#### 14.14.3.88 axis\_f\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_f_motor_position`

F axis motor position.

Definition at line 1586 of file [gclib.cs](#).

#### 14.14.3.89 axis\_f\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_f_position_error`

F axis position error.

Definition at line 1587 of file [gclib.cs](#).

#### 14.14.3.90 axis\_f\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_f_aux_position`

F axis auxiliary position.

Definition at line 1588 of file [gclib.cs](#).

**14.14.3.91 axis\_f\_velocity**

[SL](#) `gclib.GDataRecord2103.axis_f_velocity`

F axis velocity.

Definition at line 1589 of file [gclib.cs](#).

**14.14.3.92 axis\_f\_torque**

[SW](#) `gclib.GDataRecord2103.axis_f_torque`

F axis torque.

Definition at line 1590 of file [gclib.cs](#).

**14.14.3.93 axis\_f\_analog\_in**

[UW](#) `gclib.GDataRecord2103.axis_f_analog_in`

F axis analog input.

Definition at line 1591 of file [gclib.cs](#).

**14.14.3.94 axis\_g\_status**

[UW](#) `gclib.GDataRecord2103.axis_g_status`

G axis status.

Definition at line 1593 of file [gclib.cs](#).

**14.14.3.95 axis\_g\_switches**

[UB](#) `gclib.GDataRecord2103.axis_g_switches`

G axis switches.

Definition at line 1594 of file [gclib.cs](#).

**14.14.3.96 axis\_g\_stop\_code**

[UB](#) `gclib.GDataRecord2103.axis_g_stop_code`

G axis stop code.

Definition at line 1595 of file [gclib.cs](#).

**14.14.3.97 axis\_g\_reference\_position**

[SL](#) `gclib.GDataRecord2103.axis_g_reference_position`

G axis reference position.

Definition at line 1596 of file [gclib.cs](#).

**14.14.3.98 axis\_g\_motor\_position**

[SL](#) `gclib.GDataRecord2103.axis_g_motor_position`

G axis motor position.

Definition at line 1597 of file [gclib.cs](#).

**14.14.3.99 axis\_g\_position\_error**

[SL](#) `gclib.GDataRecord2103.axis_g_position_error`

G axis position error.

Definition at line 1598 of file [gclib.cs](#).

**14.14.3.100 axis\_g\_aux\_position**

[SL](#) `gclib.GDataRecord2103.axis_g_aux_position`

G axis auxiliary position.

Definition at line 1599 of file [gclib.cs](#).

#### 14.14.3.101 axis\_g\_velocity

[SL](#) `gclib.GDataRecord2103.axis_g_velocity`

G axis velocity.

Definition at line 1600 of file [gclib.cs](#).

#### 14.14.3.102 axis\_g\_torque

[SW](#) `gclib.GDataRecord2103.axis_g_torque`

G axis torque.

Definition at line 1601 of file [gclib.cs](#).

#### 14.14.3.103 axis\_g\_analog\_in

[UW](#) `gclib.GDataRecord2103.axis_g_analog_in`

G axis analog input.

Definition at line 1602 of file [gclib.cs](#).

#### 14.14.3.104 axis\_h\_status

[UW](#) `gclib.GDataRecord2103.axis_h_status`

H axis status.

Definition at line 1604 of file [gclib.cs](#).

#### 14.14.3.105 axis\_h\_switches

[UB](#) `gclib.GDataRecord2103.axis_h_switches`

H axis switches.

Definition at line 1605 of file [gclib.cs](#).

#### 14.14.3.106 axis\_h\_stop\_code

[UB](#) `gclib.GDataRecord2103.axis_h_stop_code`

H axis stop code.

Definition at line 1606 of file [gclib.cs](#).

#### 14.14.3.107 axis\_h\_reference\_position

[SL](#) `gclib.GDataRecord2103.axis_h_reference_position`

H axis reference position.

Definition at line 1607 of file [gclib.cs](#).

#### 14.14.3.108 axis\_h\_motor\_position

[SL](#) `gclib.GDataRecord2103.axis_h_motor_position`

H axis motor position.

Definition at line 1608 of file [gclib.cs](#).

#### 14.14.3.109 axis\_h\_position\_error

[SL](#) `gclib.GDataRecord2103.axis_h_position_error`

H axis position error.

Definition at line 1609 of file [gclib.cs](#).

#### 14.14.3.110 axis\_h\_aux\_position

[SL](#) `gclib.GDataRecord2103.axis_h_aux_position`

H axis auxiliary position.

Definition at line 1610 of file [gclib.cs](#).

**14.14.3.111 axis\_h\_velocity**

[SL](#) `gclib.GDataRecord2103.axis_h_velocity`

H axis velocity.

Definition at line [1611](#) of file [gclib.cs](#).

**14.14.3.112 axis\_h\_torque**

[SW](#) `gclib.GDataRecord2103.axis_h_torque`

H axis torque.

Definition at line [1612](#) of file [gclib.cs](#).

**14.14.3.113 axis\_h\_analog\_in**

[UW](#) `gclib.GDataRecord2103.axis_h_analog_in`

H axis analog input.

Definition at line [1613](#) of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

**14.15 GDataRecord2103 Struct Reference**

Data record struct for DMC-2103 controllers.

```
#include <gclib_record.h>
```

**Public Attributes**

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)

- general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)
  - general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)
  - general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)
  - general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)
  - general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)
  - general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)
  - general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)
  - general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)
  - general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)
  - general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)
  - general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)
  - general output bank 9 (outputs 73-80).*
- [UB error\\_code](#)
  - error code.*
- [UB general\\_status](#)
  - general status*
- [UW s\\_plane\\_segment\\_count](#)
  - segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)
  - coordinated move status for S plane.*
- [SL s\\_distance](#)
  - distance traveled in coordinated move for S plane.*
- [UW t\\_plane\\_segment\\_count](#)
  - segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)
  - Coordinated move status for T plane.*
- [SL t\\_distance](#)
  - distance traveled in coordinated move for T plane.*
- [UW axis\\_a\\_status](#)
  - A axis status.*
- [UB axis\\_a\\_switches](#)
  - A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)
  - A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)
  - A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)
  - A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)
  - A axis position error.*



- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SW axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SW axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SW axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)

- D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SW axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SW axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*

- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SW axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SW axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)  
*H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)  
*H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)  
*H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)  
*H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)  
*H axis velocity.*
- [SW axis\\_h\\_torque](#)  
*H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*

### 14.15.1 Detailed Description

Data record struct for DMC-2103 controllers.  
Definition at line 582 of file [gclib\\_record.h](#).

## 14.15.2 Member Data Documentation

### 14.15.2.1 header\_0

[UB](#) `GDataRecord2103::header_0`

1st Byte of Header.

Definition at line 587 of file [gclib\\_record.h](#).

### 14.15.2.2 header\_1

[UB](#) `GDataRecord2103::header_1`

2nd Byte of Header.

Definition at line 588 of file [gclib\\_record.h](#).

### 14.15.2.3 header\_2

[UB](#) `GDataRecord2103::header_2`

3rd Byte of Header.

Definition at line 589 of file [gclib\\_record.h](#).

### 14.15.2.4 header\_3

[UB](#) `GDataRecord2103::header_3`

4th Byte of Header.

Definition at line 590 of file [gclib\\_record.h](#).

### 14.15.2.5 sample\_number

[UW](#) `GDataRecord2103::sample_number`

sample number.

Definition at line 592 of file [gclib\\_record.h](#).

### 14.15.2.6 input\_bank\_0

[UB](#) `GDataRecord2103::input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 594 of file [gclib\\_record.h](#).

### 14.15.2.7 input\_bank\_1

[UB](#) `GDataRecord2103::input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 595 of file [gclib\\_record.h](#).

### 14.15.2.8 input\_bank\_2

[UB](#) `GDataRecord2103::input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 596 of file [gclib\\_record.h](#).

### 14.15.2.9 input\_bank\_3

[UB](#) `GDataRecord2103::input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 597 of file [gclib\\_record.h](#).

### 14.15.2.10 input\_bank\_4

[UB](#) `GDataRecord2103::input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 598 of file [gclib\\_record.h](#).

#### 14.15.2.11 input\_bank\_5

[UB](#) `GDataRecord2103::input_bank_5`

general input bank 5 (inputs 41-48).

Definition at line 599 of file [gclib\\_record.h](#).

#### 14.15.2.12 input\_bank\_6

[UB](#) `GDataRecord2103::input_bank_6`

general input bank 6 (inputs 49-56).

Definition at line 600 of file [gclib\\_record.h](#).

#### 14.15.2.13 input\_bank\_7

[UB](#) `GDataRecord2103::input_bank_7`

general input bank 7 (inputs 57-64).

Definition at line 601 of file [gclib\\_record.h](#).

#### 14.15.2.14 input\_bank\_8

[UB](#) `GDataRecord2103::input_bank_8`

general input bank 8 (inputs 65-72).

Definition at line 602 of file [gclib\\_record.h](#).

#### 14.15.2.15 input\_bank\_9

[UB](#) `GDataRecord2103::input_bank_9`

general input bank 9 (inputs 73-80).

Definition at line 603 of file [gclib\\_record.h](#).

#### 14.15.2.16 output\_bank\_0

[UB](#) `GDataRecord2103::output_bank_0`

general output bank 0 (outputs 1-8).

Definition at line 605 of file [gclib\\_record.h](#).

#### 14.15.2.17 output\_bank\_1

[UB](#) `GDataRecord2103::output_bank_1`

general output bank 1 (outputs 9-16).

Definition at line 606 of file [gclib\\_record.h](#).

#### 14.15.2.18 output\_bank\_2

[UB](#) `GDataRecord2103::output_bank_2`

general output bank 2 (outputs 17-24).

Definition at line 607 of file [gclib\\_record.h](#).

#### 14.15.2.19 output\_bank\_3

[UB](#) `GDataRecord2103::output_bank_3`

general output bank 3 (outputs 25-32).

Definition at line 608 of file [gclib\\_record.h](#).

#### 14.15.2.20 output\_bank\_4

[UB](#) `GDataRecord2103::output_bank_4`

general output bank 4 (outputs 33-40).

Definition at line 609 of file [gclib\\_record.h](#).

#### 14.15.2.21 output\_bank\_5

[UB](#) `GDataRecord2103::output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line 610 of file [gclib\\_record.h](#).

#### 14.15.2.22 output\_bank\_6

[UB](#) `GDataRecord2103::output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line 611 of file [gclib\\_record.h](#).

#### 14.15.2.23 output\_bank\_7

[UB](#) `GDataRecord2103::output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line 612 of file [gclib\\_record.h](#).

#### 14.15.2.24 output\_bank\_8

[UB](#) `GDataRecord2103::output_bank_8`  
general output bank 8 (outputs 65-72).  
Definition at line 613 of file [gclib\\_record.h](#).

#### 14.15.2.25 output\_bank\_9

[UB](#) `GDataRecord2103::output_bank_9`  
general output bank 9 (outputs 73-80).  
Definition at line 614 of file [gclib\\_record.h](#).

#### 14.15.2.26 error\_code

[UB](#) `GDataRecord2103::error_code`  
error code.  
Definition at line 616 of file [gclib\\_record.h](#).

#### 14.15.2.27 general\_status

[UB](#) `GDataRecord2103::general_status`  
general status  
Definition at line 617 of file [gclib\\_record.h](#).

#### 14.15.2.28 s\_plane\_segment\_count

[UW](#) `GDataRecord2103::s_plane_segment_count`  
segment count of coordinated move for S plane.  
Definition at line 619 of file [gclib\\_record.h](#).

#### 14.15.2.29 s\_plane\_move\_status

[UW](#) `GDataRecord2103::s_plane_move_status`  
coordinated move status for S plane.  
Definition at line 620 of file [gclib\\_record.h](#).

#### 14.15.2.30 s\_distance

[SL](#) `GDataRecord2103::s_distance`  
distance traveled in coordinated move for S plane.  
Definition at line 621 of file [gclib\\_record.h](#).

#### 14.15.2.31 t\_plane\_segment\_count

[UW](#) GDataRecord2103::t\_plane\_segment\_count  
segment count of coordinated move for T plane.  
Definition at line 623 of file [gclib\\_record.h](#).

#### 14.15.2.32 t\_plane\_move\_status

[UW](#) GDataRecord2103::t\_plane\_move\_status  
Coordinated move status for T plane.  
Definition at line 624 of file [gclib\\_record.h](#).

#### 14.15.2.33 t\_distance

[SL](#) GDataRecord2103::t\_distance  
distance traveled in coordinated move for T plane.  
Definition at line 625 of file [gclib\\_record.h](#).

#### 14.15.2.34 axis\_a\_status

[UW](#) GDataRecord2103::axis\_a\_status  
A axis status.  
Definition at line 627 of file [gclib\\_record.h](#).

#### 14.15.2.35 axis\_a\_switches

[UB](#) GDataRecord2103::axis\_a\_switches  
A axis switches.  
Definition at line 628 of file [gclib\\_record.h](#).

#### 14.15.2.36 axis\_a\_stop\_code

[UB](#) GDataRecord2103::axis\_a\_stop\_code  
A axis stop code.  
Definition at line 629 of file [gclib\\_record.h](#).

#### 14.15.2.37 axis\_a\_reference\_position

[SL](#) GDataRecord2103::axis\_a\_reference\_position  
A axis reference position.  
Definition at line 630 of file [gclib\\_record.h](#).

#### 14.15.2.38 axis\_a\_motor\_position

[SL](#) GDataRecord2103::axis\_a\_motor\_position  
A axis motor position.  
Definition at line 631 of file [gclib\\_record.h](#).

#### 14.15.2.39 axis\_a\_position\_error

[SL](#) GDataRecord2103::axis\_a\_position\_error  
A axis position error.  
Definition at line 632 of file [gclib\\_record.h](#).

#### 14.15.2.40 axis\_a\_aux\_position

[SL](#) GDataRecord2103::axis\_a\_aux\_position  
A axis auxiliary position.  
Definition at line 633 of file [gclib\\_record.h](#).

#### 14.15.2.41 axis\_a\_velocity

[SL](#) `GDataRecord2103::axis_a_velocity`

A axis velocity.

Definition at line 634 of file [gclib\\_record.h](#).

#### 14.15.2.42 axis\_a\_torque

[SW](#) `GDataRecord2103::axis_a_torque`

A axis torque.

Definition at line 635 of file [gclib\\_record.h](#).

#### 14.15.2.43 axis\_a\_analog\_in

[UW](#) `GDataRecord2103::axis_a_analog_in`

A axis analog input.

Definition at line 636 of file [gclib\\_record.h](#).

#### 14.15.2.44 axis\_b\_status

[UW](#) `GDataRecord2103::axis_b_status`

B axis status.

Definition at line 638 of file [gclib\\_record.h](#).

#### 14.15.2.45 axis\_b\_switches

[UB](#) `GDataRecord2103::axis_b_switches`

B axis switches.

Definition at line 639 of file [gclib\\_record.h](#).

#### 14.15.2.46 axis\_b\_stop\_code

[UB](#) `GDataRecord2103::axis_b_stop_code`

B axis stop code.

Definition at line 640 of file [gclib\\_record.h](#).

#### 14.15.2.47 axis\_b\_reference\_position

[SL](#) `GDataRecord2103::axis_b_reference_position`

B axis reference position.

Definition at line 641 of file [gclib\\_record.h](#).

#### 14.15.2.48 axis\_b\_motor\_position

[SL](#) `GDataRecord2103::axis_b_motor_position`

B axis motor position.

Definition at line 642 of file [gclib\\_record.h](#).

#### 14.15.2.49 axis\_b\_position\_error

[SL](#) `GDataRecord2103::axis_b_position_error`

B axis position error.

Definition at line 643 of file [gclib\\_record.h](#).

#### 14.15.2.50 axis\_b\_aux\_position

[SL](#) `GDataRecord2103::axis_b_aux_position`

B axis auxiliary position.

Definition at line 644 of file [gclib\\_record.h](#).



**14.15.2.51 axis\_b\_velocity**

[SL](#) `GDataRecord2103::axis_b_velocity`

B axis velocity.

Definition at line 645 of file [gclib\\_record.h](#).

**14.15.2.52 axis\_b\_torque**

[SW](#) `GDataRecord2103::axis_b_torque`

B axis torque.

Definition at line 646 of file [gclib\\_record.h](#).

**14.15.2.53 axis\_b\_analog\_in**

[UW](#) `GDataRecord2103::axis_b_analog_in`

B axis analog input.

Definition at line 647 of file [gclib\\_record.h](#).

**14.15.2.54 axis\_c\_status**

[UW](#) `GDataRecord2103::axis_c_status`

C axis status.

Definition at line 649 of file [gclib\\_record.h](#).

**14.15.2.55 axis\_c\_switches**

[UB](#) `GDataRecord2103::axis_c_switches`

C axis switches.

Definition at line 650 of file [gclib\\_record.h](#).

**14.15.2.56 axis\_c\_stop\_code**

[UB](#) `GDataRecord2103::axis_c_stop_code`

C axis stop code.

Definition at line 651 of file [gclib\\_record.h](#).

**14.15.2.57 axis\_c\_reference\_position**

[SL](#) `GDataRecord2103::axis_c_reference_position`

C axis reference position.

Definition at line 652 of file [gclib\\_record.h](#).

**14.15.2.58 axis\_c\_motor\_position**

[SL](#) `GDataRecord2103::axis_c_motor_position`

C axis motor position.

Definition at line 653 of file [gclib\\_record.h](#).

**14.15.2.59 axis\_c\_position\_error**

[SL](#) `GDataRecord2103::axis_c_position_error`

C axis position error.

Definition at line 654 of file [gclib\\_record.h](#).

**14.15.2.60 axis\_c\_aux\_position**

[SL](#) `GDataRecord2103::axis_c_aux_position`

C axis auxiliary position.

Definition at line 655 of file [gclib\\_record.h](#).

#### 14.15.2.61 axis\_c\_velocity

[SL](#) `GDataRecord2103::axis_c_velocity`

C axis velocity.

Definition at line 656 of file [gclib\\_record.h](#).

#### 14.15.2.62 axis\_c\_torque

[SW](#) `GDataRecord2103::axis_c_torque`

C axis torque.

Definition at line 657 of file [gclib\\_record.h](#).

#### 14.15.2.63 axis\_c\_analog\_in

[UW](#) `GDataRecord2103::axis_c_analog_in`

C axis analog input.

Definition at line 658 of file [gclib\\_record.h](#).

#### 14.15.2.64 axis\_d\_status

[UW](#) `GDataRecord2103::axis_d_status`

D axis status.

Definition at line 660 of file [gclib\\_record.h](#).

#### 14.15.2.65 axis\_d\_switches

[UB](#) `GDataRecord2103::axis_d_switches`

D axis switches.

Definition at line 661 of file [gclib\\_record.h](#).

#### 14.15.2.66 axis\_d\_stop\_code

[UB](#) `GDataRecord2103::axis_d_stop_code`

D axis stop code.

Definition at line 662 of file [gclib\\_record.h](#).

#### 14.15.2.67 axis\_d\_reference\_position

[SL](#) `GDataRecord2103::axis_d_reference_position`

D axis reference position.

Definition at line 663 of file [gclib\\_record.h](#).

#### 14.15.2.68 axis\_d\_motor\_position

[SL](#) `GDataRecord2103::axis_d_motor_position`

D axis motor position.

Definition at line 664 of file [gclib\\_record.h](#).

#### 14.15.2.69 axis\_d\_position\_error

[SL](#) `GDataRecord2103::axis_d_position_error`

D axis position error.

Definition at line 665 of file [gclib\\_record.h](#).

#### 14.15.2.70 axis\_d\_aux\_position

[SL](#) `GDataRecord2103::axis_d_aux_position`

D axis auxiliary position.

Definition at line 666 of file [gclib\\_record.h](#).

**14.15.2.71 axis\_d\_velocity**

[SL](#) `GDataRecord2103::axis_d_velocity`

D axis velocity.

Definition at line 667 of file [gclib\\_record.h](#).

**14.15.2.72 axis\_d\_torque**

[SW](#) `GDataRecord2103::axis_d_torque`

D axis torque.

Definition at line 668 of file [gclib\\_record.h](#).

**14.15.2.73 axis\_d\_analog\_in**

[UW](#) `GDataRecord2103::axis_d_analog_in`

D axis analog input.

Definition at line 669 of file [gclib\\_record.h](#).

**14.15.2.74 axis\_e\_status**

[UW](#) `GDataRecord2103::axis_e_status`

E axis status.

Definition at line 671 of file [gclib\\_record.h](#).

**14.15.2.75 axis\_e\_switches**

[UB](#) `GDataRecord2103::axis_e_switches`

E axis switches.

Definition at line 672 of file [gclib\\_record.h](#).

**14.15.2.76 axis\_e\_stop\_code**

[UB](#) `GDataRecord2103::axis_e_stop_code`

E axis stop code.

Definition at line 673 of file [gclib\\_record.h](#).

**14.15.2.77 axis\_e\_reference\_position**

[SL](#) `GDataRecord2103::axis_e_reference_position`

E axis reference position.

Definition at line 674 of file [gclib\\_record.h](#).

**14.15.2.78 axis\_e\_motor\_position**

[SL](#) `GDataRecord2103::axis_e_motor_position`

E axis motor position.

Definition at line 675 of file [gclib\\_record.h](#).

**14.15.2.79 axis\_e\_position\_error**

[SL](#) `GDataRecord2103::axis_e_position_error`

E axis position error.

Definition at line 676 of file [gclib\\_record.h](#).

**14.15.2.80 axis\_e\_aux\_position**

[SL](#) `GDataRecord2103::axis_e_aux_position`

E axis auxiliary position.

Definition at line 677 of file [gclib\\_record.h](#).

#### 14.15.2.81 axis\_e\_velocity

[SL](#) `GDataRecord2103::axis_e_velocity`

E axis velocity.

Definition at line 678 of file [gclib\\_record.h](#).

#### 14.15.2.82 axis\_e\_torque

[SW](#) `GDataRecord2103::axis_e_torque`

E axis torque.

Definition at line 679 of file [gclib\\_record.h](#).

#### 14.15.2.83 axis\_e\_analog\_in

[UW](#) `GDataRecord2103::axis_e_analog_in`

E axis analog input.

Definition at line 680 of file [gclib\\_record.h](#).

#### 14.15.2.84 axis\_f\_status

[UW](#) `GDataRecord2103::axis_f_status`

F axis status.

Definition at line 682 of file [gclib\\_record.h](#).

#### 14.15.2.85 axis\_f\_switches

[UB](#) `GDataRecord2103::axis_f_switches`

F axis switches.

Definition at line 683 of file [gclib\\_record.h](#).

#### 14.15.2.86 axis\_f\_stop\_code

[UB](#) `GDataRecord2103::axis_f_stop_code`

F axis stop code.

Definition at line 684 of file [gclib\\_record.h](#).

#### 14.15.2.87 axis\_f\_reference\_position

[SL](#) `GDataRecord2103::axis_f_reference_position`

F axis reference position.

Definition at line 685 of file [gclib\\_record.h](#).

#### 14.15.2.88 axis\_f\_motor\_position

[SL](#) `GDataRecord2103::axis_f_motor_position`

F axis motor position.

Definition at line 686 of file [gclib\\_record.h](#).

#### 14.15.2.89 axis\_f\_position\_error

[SL](#) `GDataRecord2103::axis_f_position_error`

F axis position error.

Definition at line 687 of file [gclib\\_record.h](#).

#### 14.15.2.90 axis\_f\_aux\_position

[SL](#) `GDataRecord2103::axis_f_aux_position`

F axis auxiliary position.

Definition at line 688 of file [gclib\\_record.h](#).

**14.15.2.91 axis\_f\_velocity**

[SL](#) `GDataRecord2103::axis_f_velocity`

F axis velocity.

Definition at line 689 of file [gclib\\_record.h](#).

**14.15.2.92 axis\_f\_torque**

[SW](#) `GDataRecord2103::axis_f_torque`

F axis torque.

Definition at line 690 of file [gclib\\_record.h](#).

**14.15.2.93 axis\_f\_analog\_in**

[UW](#) `GDataRecord2103::axis_f_analog_in`

F axis analog input.

Definition at line 691 of file [gclib\\_record.h](#).

**14.15.2.94 axis\_g\_status**

[UW](#) `GDataRecord2103::axis_g_status`

G axis status.

Definition at line 693 of file [gclib\\_record.h](#).

**14.15.2.95 axis\_g\_switches**

[UB](#) `GDataRecord2103::axis_g_switches`

G axis switches.

Definition at line 694 of file [gclib\\_record.h](#).

**14.15.2.96 axis\_g\_stop\_code**

[UB](#) `GDataRecord2103::axis_g_stop_code`

G axis stop code.

Definition at line 695 of file [gclib\\_record.h](#).

**14.15.2.97 axis\_g\_reference\_position**

[SL](#) `GDataRecord2103::axis_g_reference_position`

G axis reference position.

Definition at line 696 of file [gclib\\_record.h](#).

**14.15.2.98 axis\_g\_motor\_position**

[SL](#) `GDataRecord2103::axis_g_motor_position`

G axis motor position.

Definition at line 697 of file [gclib\\_record.h](#).

**14.15.2.99 axis\_g\_position\_error**

[SL](#) `GDataRecord2103::axis_g_position_error`

G axis position error.

Definition at line 698 of file [gclib\\_record.h](#).

**14.15.2.100 axis\_g\_aux\_position**

[SL](#) `GDataRecord2103::axis_g_aux_position`

G axis auxiliary position.

Definition at line 699 of file [gclib\\_record.h](#).

#### 14.15.2.101 axis\_g\_velocity

[SL](#) `GDataRecord2103::axis_g_velocity`

G axis velocity.

Definition at line 700 of file [gclib\\_record.h](#).

#### 14.15.2.102 axis\_g\_torque

[SW](#) `GDataRecord2103::axis_g_torque`

G axis torque.

Definition at line 701 of file [gclib\\_record.h](#).

#### 14.15.2.103 axis\_g\_analog\_in

[UW](#) `GDataRecord2103::axis_g_analog_in`

G axis analog input.

Definition at line 702 of file [gclib\\_record.h](#).

#### 14.15.2.104 axis\_h\_status

[UW](#) `GDataRecord2103::axis_h_status`

H axis status.

Definition at line 704 of file [gclib\\_record.h](#).

#### 14.15.2.105 axis\_h\_switches

[UB](#) `GDataRecord2103::axis_h_switches`

H axis switches.

Definition at line 705 of file [gclib\\_record.h](#).

#### 14.15.2.106 axis\_h\_stop\_code

[UB](#) `GDataRecord2103::axis_h_stop_code`

H axis stop code.

Definition at line 706 of file [gclib\\_record.h](#).

#### 14.15.2.107 axis\_h\_reference\_position

[SL](#) `GDataRecord2103::axis_h_reference_position`

H axis reference position.

Definition at line 707 of file [gclib\\_record.h](#).

#### 14.15.2.108 axis\_h\_motor\_position

[SL](#) `GDataRecord2103::axis_h_motor_position`

H axis motor position.

Definition at line 708 of file [gclib\\_record.h](#).

#### 14.15.2.109 axis\_h\_position\_error

[SL](#) `GDataRecord2103::axis_h_position_error`

H axis position error.

Definition at line 709 of file [gclib\\_record.h](#).

#### 14.15.2.110 axis\_h\_aux\_position

[SL](#) `GDataRecord2103::axis_h_aux_position`

H axis auxiliary position.

Definition at line 710 of file [gclib\\_record.h](#).

**14.15.2.111 axis\_h\_velocity**

[SL](#) `GDataRecord2103::axis_h_velocity`

H axis velocity.

Definition at line 711 of file [gclib\\_record.h](#).

**14.15.2.112 axis\_h\_torque**

[SW](#) `GDataRecord2103::axis_h_torque`

H axis torque.

Definition at line 712 of file [gclib\\_record.h](#).

**14.15.2.113 axis\_h\_analog\_in**

[UW](#) `GDataRecord2103::axis_h_analog_in`

H axis analog input.

Definition at line 713 of file [gclib\\_record.h](#).

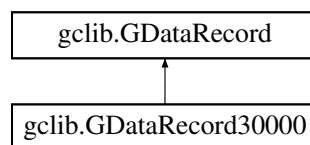
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

**14.16 gclib.GDataRecord30000 Struct Reference**

Data record struct for DMC-30010 controllers.

Inheritance diagram for `gclib.GDataRecord30000`:

**Public Member Functions**

- `byte[] byte\_array ()`  
Returns the data record as a byte array and allows for access to individual bytes.

**Public Attributes**

- [UB header\\_0](#)  
1st Byte of Header.
- [UB header\\_1](#)  
2nd Byte of Header.
- [UB header\\_2](#)  
3rd Byte of Header.
- [UB header\\_3](#)  
4th Byte of Header.
- [UW sample\\_number](#)  
sample number.
- [UB input\\_bank\\_0](#)  
general input bank 0 (inputs 1-8).
- [UB input\\_bank\\_1](#)  
general input bank 1 (inputs 9-16).
- [UB output\\_bank\\_0](#)  
general output bank 0 (outputs 1-8).

- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status.*
- [UW input\\_analog\\_2](#)  
*Analog input 2. 1 is in axis data, see axis\_a\_analog\_in.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*



### 14.16.1 Detailed Description

Data record struct for DMC-30010 controllers.  
Definition at line 1716 of file [gclib.cs](#).

### 14.16.2 Member Function Documentation

#### 14.16.2.1 byte\_array()

```
byte[] gclib.GDataRecord30000.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line 1718 of file [gclib.cs](#).

### 14.16.3 Member Data Documentation

#### 14.16.3.1 header\_0

[UB](#) [gclib.GDataRecord30000.header\\_0](#)  
1st Byte of Header.  
Definition at line 1722 of file [gclib.cs](#).

#### 14.16.3.2 header\_1

[UB](#) [gclib.GDataRecord30000.header\\_1](#)  
2nd Byte of Header.  
Definition at line 1723 of file [gclib.cs](#).

#### 14.16.3.3 header\_2

[UB](#) [gclib.GDataRecord30000.header\\_2](#)  
3rd Byte of Header.  
Definition at line 1724 of file [gclib.cs](#).

#### 14.16.3.4 header\_3

[UB](#) [gclib.GDataRecord30000.header\\_3](#)  
4th Byte of Header.  
Definition at line 1725 of file [gclib.cs](#).

#### 14.16.3.5 sample\_number

[UW](#) [gclib.GDataRecord30000.sample\\_number](#)  
sample number.  
Definition at line 1727 of file [gclib.cs](#).

#### 14.16.3.6 input\_bank\_0

[UB](#) [gclib.GDataRecord30000.input\\_bank\\_0](#)  
general input bank 0 (inputs 1-8).  
Definition at line 1729 of file [gclib.cs](#).

#### 14.16.3.7 input\_bank\_1

[UB](#) [gclib.GDataRecord30000.input\\_bank\\_1](#)  
general input bank 1 (inputs 9-16).  
Definition at line 1730 of file [gclib.cs](#).

#### 14.16.3.8 output\_bank\_0

[UB](#) `gclib.GDataRecord30000.output_bank_0`

general output bank 0 (outputs 1-8).

Definition at line 1732 of file [gclib.cs](#).

#### 14.16.3.9 output\_bank\_1

[UB](#) `gclib.GDataRecord30000.output_bank_1`

general output bank 1 (outputs 9-16).

Definition at line 1733 of file [gclib.cs](#).

#### 14.16.3.10 error\_code

[UB](#) `gclib.GDataRecord30000.error_code`

error code.

Definition at line 1735 of file [gclib.cs](#).

#### 14.16.3.11 thread\_status

[UB](#) `gclib.GDataRecord30000.thread_status`

thread status.

Definition at line 1736 of file [gclib.cs](#).

#### 14.16.3.12 input\_analog\_2

[UW](#) `gclib.GDataRecord30000.input_analog_2`

Analog input 2. 1 is in axis data, see `axis_a_analog_in`.

Definition at line 1738 of file [gclib.cs](#).

#### 14.16.3.13 output\_analog\_1

[UW](#) `gclib.GDataRecord30000.output_analog_1`

Analog output 1.

Definition at line 1740 of file [gclib.cs](#).

#### 14.16.3.14 output\_analog\_2

[UW](#) `gclib.GDataRecord30000.output_analog_2`

Analog output 2.

Definition at line 1741 of file [gclib.cs](#).

#### 14.16.3.15 amplifier\_status

[UL](#) `gclib.GDataRecord30000.amplifier_status`

Amplifier Status.

Definition at line 1743 of file [gclib.cs](#).

#### 14.16.3.16 contour\_segment\_count

[UL](#) `gclib.GDataRecord30000.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 1745 of file [gclib.cs](#).

#### 14.16.3.17 contour\_buffer\_available

[UW](#) `gclib.GDataRecord30000.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 1746 of file [gclib.cs](#).

#### 14.16.3.18 s\_plane\_segment\_count

[UW](#) `gclib.GDataRecord30000.s_plane_segment_count`  
segment count of coordinated move for S plane.  
Definition at line [1748](#) of file [gclib.cs](#).

#### 14.16.3.19 s\_plane\_move\_status

[UW](#) `gclib.GDataRecord30000.s_plane_move_status`  
coordinated move status for S plane.  
Definition at line [1749](#) of file [gclib.cs](#).

#### 14.16.3.20 s\_distance

[SL](#) `gclib.GDataRecord30000.s_distance`  
distance traveled in coordinated move for S plane.  
Definition at line [1750](#) of file [gclib.cs](#).

#### 14.16.3.21 s\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord30000.s_plane_buffer_available`  
Buffer space remaining, S Plane.  
Definition at line [1751](#) of file [gclib.cs](#).

#### 14.16.3.22 axis\_a\_status

[UW](#) `gclib.GDataRecord30000.axis_a_status`  
A axis status.  
Definition at line [1753](#) of file [gclib.cs](#).

#### 14.16.3.23 axis\_a\_switches

[UB](#) `gclib.GDataRecord30000.axis_a_switches`  
A axis switches.  
Definition at line [1754](#) of file [gclib.cs](#).

#### 14.16.3.24 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord30000.axis_a_stop_code`  
A axis stop code.  
Definition at line [1755](#) of file [gclib.cs](#).

#### 14.16.3.25 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord30000.axis_a_reference_position`  
A axis reference position.  
Definition at line [1756](#) of file [gclib.cs](#).

#### 14.16.3.26 axis\_a\_motor\_position

[SL](#) `gclib.GDataRecord30000.axis_a_motor_position`  
A axis motor position.  
Definition at line [1757](#) of file [gclib.cs](#).

#### 14.16.3.27 axis\_a\_position\_error

[SL](#) `gclib.GDataRecord30000.axis_a_position_error`  
A axis position error.  
Definition at line [1758](#) of file [gclib.cs](#).

#### 14.16.3.28 axis\_a\_aux\_position

[SL](#) `gclib.GDataRecord30000.axis_a_aux_position`

A axis auxiliary position.

Definition at line 1759 of file [gclib.cs](#).

#### 14.16.3.29 axis\_a\_velocity

[SL](#) `gclib.GDataRecord30000.axis_a_velocity`

A axis velocity.

Definition at line 1760 of file [gclib.cs](#).

#### 14.16.3.30 axis\_a\_torque

[SL](#) `gclib.GDataRecord30000.axis_a_torque`

A axis torque.

Definition at line 1761 of file [gclib.cs](#).

#### 14.16.3.31 axis\_a\_analog\_in

[UW](#) `gclib.GDataRecord30000.axis_a_analog_in`

A axis analog input.

Definition at line 1762 of file [gclib.cs](#).

#### 14.16.3.32 axis\_a\_halls

[UB](#) `gclib.GDataRecord30000.axis_a_halls`

A Hall Input Status.

Definition at line 1763 of file [gclib.cs](#).

#### 14.16.3.33 axis\_a\_reserved

[UB](#) `gclib.GDataRecord30000.axis_a_reserved`

Reserved.

Definition at line 1764 of file [gclib.cs](#).

#### 14.16.3.34 axis\_a\_variable

[SL](#) `gclib.GDataRecord30000.axis_a_variable`

A User-defined variable (ZA).

Definition at line 1765 of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.17 GDataRecord30000 Struct Reference

Data record struct for DMC-30010 controllers.

```
#include <gclib_record.h>
```

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*

- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status.*
- [UW input\\_analog\\_2](#)  
*Analog input 2. 1 is in axis data, see axis\_a\_analog\_in.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)

- A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*

### 14.17.1 Detailed Description

Data record struct for DMC-30010 controllers.  
Definition at line [814](#) of file [gclib\\_record.h](#).

### 14.17.2 Member Data Documentation

#### 14.17.2.1 header\_0

[UB](#) `GDataRecord30000::header_0`  
1st Byte of Header.  
Definition at line [819](#) of file [gclib\\_record.h](#).

#### 14.17.2.2 header\_1

[UB](#) `GDataRecord30000::header_1`  
2nd Byte of Header.  
Definition at line [820](#) of file [gclib\\_record.h](#).

#### 14.17.2.3 header\_2

[UB](#) `GDataRecord30000::header_2`  
3rd Byte of Header.  
Definition at line [821](#) of file [gclib\\_record.h](#).

#### 14.17.2.4 header\_3

[UB](#) `GDataRecord30000::header_3`  
4th Byte of Header.  
Definition at line [822](#) of file [gclib\\_record.h](#).

#### 14.17.2.5 sample\_number

[UW](#) `GDataRecord30000::sample_number`  
sample number.  
Definition at line [824](#) of file [gclib\\_record.h](#).

#### 14.17.2.6 input\_bank\_0

[UB](#) `GDataRecord30000::input_bank_0`  
general input bank 0 (inputs 1-8).  
Definition at line [826](#) of file [gclib\\_record.h](#).

### 14.17.2.7 input\_bank\_1

[UB](#) GDataRecord30000::input\_bank\_1

general input bank 1 (inputs 9-16).

Definition at line 827 of file [gclib\\_record.h](#).

### 14.17.2.8 output\_bank\_0

[UB](#) GDataRecord30000::output\_bank\_0

general output bank 0 (outputs 1-8).

Definition at line 829 of file [gclib\\_record.h](#).

### 14.17.2.9 output\_bank\_1

[UB](#) GDataRecord30000::output\_bank\_1

general output bank 1 (outputs 9-16).

Definition at line 830 of file [gclib\\_record.h](#).

### 14.17.2.10 error\_code

[UB](#) GDataRecord30000::error\_code

error code.

Definition at line 832 of file [gclib\\_record.h](#).

### 14.17.2.11 thread\_status

[UB](#) GDataRecord30000::thread\_status

thread status.

Definition at line 833 of file [gclib\\_record.h](#).

### 14.17.2.12 input\_analog\_2

[UW](#) GDataRecord30000::input\_analog\_2

Analog input 2. 1 is in axis data, see axis\_a\_analog\_in.

Definition at line 835 of file [gclib\\_record.h](#).

### 14.17.2.13 output\_analog\_1

[UW](#) GDataRecord30000::output\_analog\_1

Analog output 1.

Definition at line 837 of file [gclib\\_record.h](#).

### 14.17.2.14 output\_analog\_2

[UW](#) GDataRecord30000::output\_analog\_2

Analog output 2.

Definition at line 838 of file [gclib\\_record.h](#).

### 14.17.2.15 amplifier\_status

[UL](#) GDataRecord30000::amplifier\_status

Amplifier Status.

Definition at line 840 of file [gclib\\_record.h](#).

### 14.17.2.16 contour\_segment\_count

[UL](#) GDataRecord30000::contour\_segment\_count

Segment Count for Contour Mode.

Definition at line 842 of file [gclib\\_record.h](#).

#### 14.17.2.17 contour\_buffer\_available

[UW](#) `GDataRecord30000::contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 843 of file [gclib\\_record.h](#).

#### 14.17.2.18 s\_plane\_segment\_count

[UW](#) `GDataRecord30000::s_plane_segment_count`

segment count of coordinated move for S plane.

Definition at line 845 of file [gclib\\_record.h](#).

#### 14.17.2.19 s\_plane\_move\_status

[UW](#) `GDataRecord30000::s_plane_move_status`

coordinated move status for S plane.

Definition at line 846 of file [gclib\\_record.h](#).

#### 14.17.2.20 s\_distance

[SL](#) `GDataRecord30000::s_distance`

distance traveled in coordinated move for S plane.

Definition at line 847 of file [gclib\\_record.h](#).

#### 14.17.2.21 s\_plane\_buffer\_available

[UW](#) `GDataRecord30000::s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 848 of file [gclib\\_record.h](#).

#### 14.17.2.22 axis\_a\_status

[UW](#) `GDataRecord30000::axis_a_status`

A axis status.

Definition at line 850 of file [gclib\\_record.h](#).

#### 14.17.2.23 axis\_a\_switches

[UB](#) `GDataRecord30000::axis_a_switches`

A axis switches.

Definition at line 851 of file [gclib\\_record.h](#).

#### 14.17.2.24 axis\_a\_stop\_code

[UB](#) `GDataRecord30000::axis_a_stop_code`

A axis stop code.

Definition at line 852 of file [gclib\\_record.h](#).

#### 14.17.2.25 axis\_a\_reference\_position

[SL](#) `GDataRecord30000::axis_a_reference_position`

A axis reference position.

Definition at line 853 of file [gclib\\_record.h](#).

#### 14.17.2.26 axis\_a\_motor\_position

[SL](#) `GDataRecord30000::axis_a_motor_position`

A axis motor position.

Definition at line 854 of file [gclib\\_record.h](#).



**14.17.2.27 axis\_a\_position\_error**

[SL](#) `GDataRecord30000::axis_a_position_error`

A axis position error.

Definition at line [855](#) of file [gclib\\_record.h](#).

**14.17.2.28 axis\_a\_aux\_position**

[SL](#) `GDataRecord30000::axis_a_aux_position`

A axis auxiliary position.

Definition at line [856](#) of file [gclib\\_record.h](#).

**14.17.2.29 axis\_a\_velocity**

[SL](#) `GDataRecord30000::axis_a_velocity`

A axis velocity.

Definition at line [857](#) of file [gclib\\_record.h](#).

**14.17.2.30 axis\_a\_torque**

[SL](#) `GDataRecord30000::axis_a_torque`

A axis torque.

Definition at line [858](#) of file [gclib\\_record.h](#).

**14.17.2.31 axis\_a\_analog\_in**

[UW](#) `GDataRecord30000::axis_a_analog_in`

A axis analog input.

Definition at line [859](#) of file [gclib\\_record.h](#).

**14.17.2.32 axis\_a\_halls**

[UB](#) `GDataRecord30000::axis_a_halls`

A Hall Input Status.

Definition at line [860](#) of file [gclib\\_record.h](#).

**14.17.2.33 axis\_a\_reserved**

[UB](#) `GDataRecord30000::axis_a_reserved`

Reserved.

Definition at line [861](#) of file [gclib\\_record.h](#).

**14.17.2.34 axis\_a\_variable**

[SL](#) `GDataRecord30000::axis_a_variable`

A User-defined variable (ZA).

Definition at line [862](#) of file [gclib\\_record.h](#).

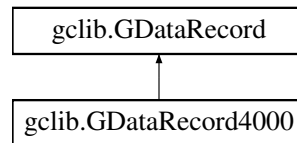
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

## 14.18 gclib.GDataRecord4000 Struct Reference

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.

Inheritance diagram for `gclib.GDataRecord4000`:



## Public Member Functions

- `byte[] byte\_array ()`  
*Returns the data record as a byte array and allows for access to individual bytes.*

## Public Attributes

- `UB header\_0`  
*1st Byte of Header.*
- `UB header\_1`  
*2nd Byte of Header.*
- `UB header\_2`  
*3rd Byte of Header.*
- `UB header\_3`  
*4th Byte of Header.*
- `UW sample\_number`  
*sample number.*
- `UB input\_bank\_0`  
*general input bank 0 (inputs 1-8).*
- `UB input\_bank\_1`  
*general input bank 1 (inputs 9-16).*
- `UB input\_bank\_2`  
*general input bank 2 (inputs 17-24).*
- `UB input\_bank\_3`  
*general input bank 3 (inputs 25-32).*
- `UB input\_bank\_4`  
*general input bank 4 (inputs 33-40).*
- `UB input\_bank\_5`  
*general input bank 5 (inputs 41-48).*
- `UB input\_bank\_6`  
*general input bank 6 (inputs 49-56).*
- `UB input\_bank\_7`  
*general input bank 7 (inputs 57-64).*
- `UB input\_bank\_8`  
*general input bank 8 (inputs 65-72).*
- `UB input\_bank\_9`  
*general input bank 9 (inputs 73-80).*
- `UB output\_bank\_0`  
*general output bank 0 (outputs 1-8).*
- `UB output\_bank\_1`  
*general output bank 1 (outputs 9-16).*
- `UB output\_bank\_2`  
*general output bank 2 (outputs 17-24).*
- `UB output\_bank\_3`  
*general output bank 3 (outputs 25-32).*
- `UB output\_bank\_4`

- general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)  
*Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*
- [SW reserved\\_12](#)  
*Reserved.*
- [SW reserved\\_14](#)  
*Reserved.*
- [UB ethernet\\_status\\_a](#)  
*Ethernet Handle A Status.*
- [UB ethernet\\_status\\_b](#)  
*Ethernet Handle B Status.*
- [UB ethernet\\_status\\_c](#)  
*Ethernet Handle C Status.*
- [UB ethernet\\_status\\_d](#)  
*Ethernet Handle D Status.*
- [UB ethernet\\_status\\_e](#)  
*Ethernet Handle E Status.*
- [UB ethernet\\_status\\_f](#)  
*Ethernet Handle F Status.*
- [UB ethernet\\_status\\_g](#)  
*Ethernet Handle G Status.*
- [UB ethernet\\_status\\_h](#)  
*Ethernet Handle H Status.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*

- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)

- B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_halls](#)  
*B Hall Input Status.*
- [UB axis\\_b\\_reserved](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_halls](#)  
*C Hall Input Status.*
- [UB axis\\_c\\_reserved](#)  
*Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*

- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UB axis\\_d\\_halls](#)  
*D Hall Input Status.*
- [UB axis\\_d\\_reserved](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
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- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
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*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
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*E axis analog input.*
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*E Hall Input Status.*
- [UB axis\\_e\\_reserved](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
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*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)

- F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UB axis\\_f\\_halls](#)  
*F Hall Input Status.*
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*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
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*G axis reference position.*
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*G axis motor position.*
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*G axis position error.*
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*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
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*G axis analog input.*
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*G Hall Input Status.*
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*Reserved.*
- [SL axis\\_g\\_variable](#)  
*G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*

- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
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*H axis reference position.*
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*H axis auxiliary position.*
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*H axis velocity.*
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*H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*
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*H Hall Input Status.*
- [UB axis\\_h\\_reserved](#)  
*Reserved.*
- [SL axis\\_h\\_variable](#)  
*H User-defined variable (ZA).*

### 14.18.1 Detailed Description

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.  
Definition at line 926 of file [gclib.cs](#).

### 14.18.2 Member Function Documentation

#### 14.18.2.1 `byte_array()`

```
byte[] gclib.GDataRecord4000.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.

Implements [gclib.GDataRecord](#).

Definition at line 928 of file [gclib.cs](#).

### 14.18.3 Member Data Documentation

#### 14.18.3.1 `header_0`

```
UB gclib.GDataRecord4000.header_0
```

1st Byte of Header.

Definition at line 931 of file [gclib.cs](#).

#### 14.18.3.2 `header_1`

```
UB gclib.GDataRecord4000.header_1
```

2nd Byte of Header.

Definition at line 932 of file [gclib.cs](#).

#### 14.18.3.3 `header_2`

```
UB gclib.GDataRecord4000.header_2
```

3rd Byte of Header.

Definition at line 933 of file [gclib.cs](#).



#### 14.18.3.4 header\_3

UB `gclib.GDataRecord4000.header_3`

4th Byte of Header.

Definition at line 934 of file [gclib.cs](#).

#### 14.18.3.5 sample\_number

UW `gclib.GDataRecord4000.sample_number`

sample number.

Definition at line 936 of file [gclib.cs](#).

#### 14.18.3.6 input\_bank\_0

UB `gclib.GDataRecord4000.input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 938 of file [gclib.cs](#).

#### 14.18.3.7 input\_bank\_1

UB `gclib.GDataRecord4000.input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 939 of file [gclib.cs](#).

#### 14.18.3.8 input\_bank\_2

UB `gclib.GDataRecord4000.input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 940 of file [gclib.cs](#).

#### 14.18.3.9 input\_bank\_3

UB `gclib.GDataRecord4000.input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 941 of file [gclib.cs](#).

#### 14.18.3.10 input\_bank\_4

UB `gclib.GDataRecord4000.input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 942 of file [gclib.cs](#).

#### 14.18.3.11 input\_bank\_5

UB `gclib.GDataRecord4000.input_bank_5`

general input bank 5 (inputs 41-48).

Definition at line 943 of file [gclib.cs](#).

#### 14.18.3.12 input\_bank\_6

UB `gclib.GDataRecord4000.input_bank_6`

general input bank 6 (inputs 49-56).

Definition at line 944 of file [gclib.cs](#).

#### 14.18.3.13 input\_bank\_7

UB `gclib.GDataRecord4000.input_bank_7`

general input bank 7 (inputs 57-64).

Definition at line 945 of file [gclib.cs](#).

#### 14.18.3.14 input\_bank\_8

UB `gclib.GDataRecord4000.input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 946 of file [gclib.cs](#).

#### 14.18.3.15 input\_bank\_9

UB `gclib.GDataRecord4000.input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 947 of file [gclib.cs](#).

#### 14.18.3.16 output\_bank\_0

UB `gclib.GDataRecord4000.output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line 949 of file [gclib.cs](#).

#### 14.18.3.17 output\_bank\_1

UB `gclib.GDataRecord4000.output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line 950 of file [gclib.cs](#).

#### 14.18.3.18 output\_bank\_2

UB `gclib.GDataRecord4000.output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line 951 of file [gclib.cs](#).

#### 14.18.3.19 output\_bank\_3

UB `gclib.GDataRecord4000.output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line 952 of file [gclib.cs](#).

#### 14.18.3.20 output\_bank\_4

UB `gclib.GDataRecord4000.output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line 953 of file [gclib.cs](#).

#### 14.18.3.21 output\_bank\_5

UB `gclib.GDataRecord4000.output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line 954 of file [gclib.cs](#).

#### 14.18.3.22 output\_bank\_6

UB `gclib.GDataRecord4000.output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line 955 of file [gclib.cs](#).

#### 14.18.3.23 output\_bank\_7

UB `gclib.GDataRecord4000.output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line 956 of file [gclib.cs](#).

#### 14.18.3.24 output\_bank\_8

[UB](#) `gclib.GDataRecord4000.output_bank_8`

general output bank 8 (outputs 65-72).

Definition at line 957 of file [gclib.cs](#).

#### 14.18.3.25 output\_bank\_9

[UB](#) `gclib.GDataRecord4000.output_bank_9`

general output bank 9 (outputs 73-80).

Definition at line 958 of file [gclib.cs](#).

#### 14.18.3.26 reserved\_0

[SW](#) `gclib.GDataRecord4000.reserved_0`

Reserved.

Definition at line 960 of file [gclib.cs](#).

#### 14.18.3.27 reserved\_2

[SW](#) `gclib.GDataRecord4000.reserved_2`

Reserved.

Definition at line 961 of file [gclib.cs](#).

#### 14.18.3.28 reserved\_4

[SW](#) `gclib.GDataRecord4000.reserved_4`

Reserved.

Definition at line 962 of file [gclib.cs](#).

#### 14.18.3.29 reserved\_6

[SW](#) `gclib.GDataRecord4000.reserved_6`

Reserved.

Definition at line 963 of file [gclib.cs](#).

#### 14.18.3.30 reserved\_8

[SW](#) `gclib.GDataRecord4000.reserved_8`

Reserved.

Definition at line 964 of file [gclib.cs](#).

#### 14.18.3.31 reserved\_10

[SW](#) `gclib.GDataRecord4000.reserved_10`

Reserved.

Definition at line 965 of file [gclib.cs](#).

#### 14.18.3.32 reserved\_12

[SW](#) `gclib.GDataRecord4000.reserved_12`

Reserved.

Definition at line 966 of file [gclib.cs](#).

#### 14.18.3.33 reserved\_14

[SW](#) `gclib.GDataRecord4000.reserved_14`

Reserved.

Definition at line 967 of file [gclib.cs](#).

#### 14.18.3.34 ethernet\_status\_a

[UB](#) `gclib.GDataRecord4000.ethernet_status_a`

Ethernet Handle A Status.

Definition at line 969 of file [gclib.cs](#).

#### 14.18.3.35 ethernet\_status\_b

[UB](#) `gclib.GDataRecord4000.ethernet_status_b`

Ethernet Handle B Status.

Definition at line 970 of file [gclib.cs](#).

#### 14.18.3.36 ethernet\_status\_c

[UB](#) `gclib.GDataRecord4000.ethernet_status_c`

Ethernet Handle C Status.

Definition at line 971 of file [gclib.cs](#).

#### 14.18.3.37 ethernet\_status\_d

[UB](#) `gclib.GDataRecord4000.ethernet_status_d`

Ethernet Handle D Status.

Definition at line 972 of file [gclib.cs](#).

#### 14.18.3.38 ethernet\_status\_e

[UB](#) `gclib.GDataRecord4000.ethernet_status_e`

Ethernet Handle E Status.

Definition at line 973 of file [gclib.cs](#).

#### 14.18.3.39 ethernet\_status\_f

[UB](#) `gclib.GDataRecord4000.ethernet_status_f`

Ethernet Handle F Status.

Definition at line 974 of file [gclib.cs](#).

#### 14.18.3.40 ethernet\_status\_g

[UB](#) `gclib.GDataRecord4000.ethernet_status_g`

Ethernet Handle G Status.

Definition at line 975 of file [gclib.cs](#).

#### 14.18.3.41 ethernet\_status\_h

[UB](#) `gclib.GDataRecord4000.ethernet_status_h`

Ethernet Handle H Status.

Definition at line 976 of file [gclib.cs](#).

#### 14.18.3.42 error\_code

[UB](#) `gclib.GDataRecord4000.error_code`

error code.

Definition at line 978 of file [gclib.cs](#).

#### 14.18.3.43 thread\_status

[UB](#) `gclib.GDataRecord4000.thread_status`

thread status

Definition at line 979 of file [gclib.cs](#).

#### 14.18.3.44 amplifier\_status

[UL](#) `gclib.GDataRecord4000.amplifier_status`

Amplifier Status.

Definition at line 980 of file [gclib.cs](#).

#### 14.18.3.45 contour\_segment\_count

[UL](#) `gclib.GDataRecord4000.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 982 of file [gclib.cs](#).

#### 14.18.3.46 contour\_buffer\_available

[UW](#) `gclib.GDataRecord4000.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 983 of file [gclib.cs](#).

#### 14.18.3.47 s\_plane\_segment\_count

[UW](#) `gclib.GDataRecord4000.s_plane_segment_count`

segment count of coordinated move for S plane.

Definition at line 985 of file [gclib.cs](#).

#### 14.18.3.48 s\_plane\_move\_status

[UW](#) `gclib.GDataRecord4000.s_plane_move_status`

coordinated move status for S plane.

Definition at line 986 of file [gclib.cs](#).

#### 14.18.3.49 s\_distance

[SL](#) `gclib.GDataRecord4000.s_distance`

distance traveled in coordinated move for S plane.

Definition at line 987 of file [gclib.cs](#).

#### 14.18.3.50 s\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord4000.s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 988 of file [gclib.cs](#).

#### 14.18.3.51 t\_plane\_segment\_count

[UW](#) `gclib.GDataRecord4000.t_plane_segment_count`

segment count of coordinated move for T plane.

Definition at line 990 of file [gclib.cs](#).

#### 14.18.3.52 t\_plane\_move\_status

[UW](#) `gclib.GDataRecord4000.t_plane_move_status`

Coordinated move status for T plane.

Definition at line 991 of file [gclib.cs](#).

#### 14.18.3.53 t\_distance

[SL](#) `gclib.GDataRecord4000.t_distance`

distance traveled in coordinated move for T plane.

Definition at line 992 of file [gclib.cs](#).

#### 14.18.3.54 t\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord4000.t_plane_buffer_available`

Buffer space remaining, T Plane.

Definition at line 993 of file [gclib.cs](#).

#### 14.18.3.55 axis\_a\_status

[UW](#) `gclib.GDataRecord4000.axis_a_status`

A axis status.

Definition at line 995 of file [gclib.cs](#).

#### 14.18.3.56 axis\_a\_switches

[UB](#) `gclib.GDataRecord4000.axis_a_switches`

A axis switches.

Definition at line 996 of file [gclib.cs](#).

#### 14.18.3.57 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord4000.axis_a_stop_code`

A axis stop code.

Definition at line 997 of file [gclib.cs](#).

#### 14.18.3.58 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord4000.axis_a_reference_position`

A axis reference position.

Definition at line 998 of file [gclib.cs](#).

#### 14.18.3.59 axis\_a\_motor\_position

[SL](#) `gclib.GDataRecord4000.axis_a_motor_position`

A axis motor position.

Definition at line 999 of file [gclib.cs](#).

#### 14.18.3.60 axis\_a\_position\_error

[SL](#) `gclib.GDataRecord4000.axis_a_position_error`

A axis position error.

Definition at line 1000 of file [gclib.cs](#).

#### 14.18.3.61 axis\_a\_aux\_position

[SL](#) `gclib.GDataRecord4000.axis_a_aux_position`

A axis auxiliary position.

Definition at line 1001 of file [gclib.cs](#).

#### 14.18.3.62 axis\_a\_velocity

[SL](#) `gclib.GDataRecord4000.axis_a_velocity`

A axis velocity.

Definition at line 1002 of file [gclib.cs](#).

#### 14.18.3.63 axis\_a\_torque

[SL](#) `gclib.GDataRecord4000.axis_a_torque`

A axis torque.

Definition at line 1003 of file [gclib.cs](#).

#### 14.18.3.64 axis\_a\_analog\_in

[UW](#) `gclib.GDataRecord4000.axis_a_analog_in`

A axis analog input.

Definition at line [1004](#) of file [gclib.cs](#).

#### 14.18.3.65 axis\_a\_halls

[UB](#) `gclib.GDataRecord4000.axis_a_halls`

A Hall Input Status.

Definition at line [1005](#) of file [gclib.cs](#).

#### 14.18.3.66 axis\_a\_reserved

[UB](#) `gclib.GDataRecord4000.axis_a_reserved`

Reserved.

Definition at line [1006](#) of file [gclib.cs](#).

#### 14.18.3.67 axis\_a\_variable

[SL](#) `gclib.GDataRecord4000.axis_a_variable`

A User-defined variable (ZA).

Definition at line [1007](#) of file [gclib.cs](#).

#### 14.18.3.68 axis\_b\_status

[UW](#) `gclib.GDataRecord4000.axis_b_status`

B axis status.

Definition at line [1009](#) of file [gclib.cs](#).

#### 14.18.3.69 axis\_b\_switches

[UB](#) `gclib.GDataRecord4000.axis_b_switches`

B axis switches.

Definition at line [1010](#) of file [gclib.cs](#).

#### 14.18.3.70 axis\_b\_stop\_code

[UB](#) `gclib.GDataRecord4000.axis_b_stop_code`

B axis stop code.

Definition at line [1011](#) of file [gclib.cs](#).

#### 14.18.3.71 axis\_b\_reference\_position

[SL](#) `gclib.GDataRecord4000.axis_b_reference_position`

B axis reference position.

Definition at line [1012](#) of file [gclib.cs](#).

#### 14.18.3.72 axis\_b\_motor\_position

[SL](#) `gclib.GDataRecord4000.axis_b_motor_position`

B axis motor position.

Definition at line [1013](#) of file [gclib.cs](#).

#### 14.18.3.73 axis\_b\_position\_error

[SL](#) `gclib.GDataRecord4000.axis_b_position_error`

B axis position error.

Definition at line [1014](#) of file [gclib.cs](#).

#### 14.18.3.74 axis\_b\_aux\_position

[SL](#) `gclib.GDataRecord4000.axis_b_aux_position`

B axis auxiliary position.

Definition at line [1015](#) of file [gclib.cs](#).

#### 14.18.3.75 axis\_b\_velocity

[SL](#) `gclib.GDataRecord4000.axis_b_velocity`

B axis velocity.

Definition at line [1016](#) of file [gclib.cs](#).

#### 14.18.3.76 axis\_b\_torque

[SL](#) `gclib.GDataRecord4000.axis_b_torque`

B axis torque.

Definition at line [1017](#) of file [gclib.cs](#).

#### 14.18.3.77 axis\_b\_analog\_in

[UW](#) `gclib.GDataRecord4000.axis_b_analog_in`

B axis analog input.

Definition at line [1018](#) of file [gclib.cs](#).

#### 14.18.3.78 axis\_b\_halls

[UB](#) `gclib.GDataRecord4000.axis_b_halls`

B Hall Input Status.

Definition at line [1019](#) of file [gclib.cs](#).

#### 14.18.3.79 axis\_b\_reserved

[UB](#) `gclib.GDataRecord4000.axis_b_reserved`

Reserved.

Definition at line [1020](#) of file [gclib.cs](#).

#### 14.18.3.80 axis\_b\_variable

[SL](#) `gclib.GDataRecord4000.axis_b_variable`

B User-defined variable (ZA).

Definition at line [1021](#) of file [gclib.cs](#).

#### 14.18.3.81 axis\_c\_status

[UW](#) `gclib.GDataRecord4000.axis_c_status`

C axis status.

Definition at line [1023](#) of file [gclib.cs](#).

#### 14.18.3.82 axis\_c\_switches

[UB](#) `gclib.GDataRecord4000.axis_c_switches`

C axis switches.

Definition at line [1024](#) of file [gclib.cs](#).

#### 14.18.3.83 axis\_c\_stop\_code

[UB](#) `gclib.GDataRecord4000.axis_c_stop_code`

C axis stop code.

Definition at line [1025](#) of file [gclib.cs](#).



#### 14.18.3.84 axis\_c\_reference\_position

[SL](#) `gclib.GDataRecord4000.axis_c_reference_position`

C axis reference position.

Definition at line 1026 of file [gclib.cs](#).

#### 14.18.3.85 axis\_c\_motor\_position

[SL](#) `gclib.GDataRecord4000.axis_c_motor_position`

C axis motor position.

Definition at line 1027 of file [gclib.cs](#).

#### 14.18.3.86 axis\_c\_position\_error

[SL](#) `gclib.GDataRecord4000.axis_c_position_error`

C axis position error.

Definition at line 1028 of file [gclib.cs](#).

#### 14.18.3.87 axis\_c\_aux\_position

[SL](#) `gclib.GDataRecord4000.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1029 of file [gclib.cs](#).

#### 14.18.3.88 axis\_c\_velocity

[SL](#) `gclib.GDataRecord4000.axis_c_velocity`

C axis velocity.

Definition at line 1030 of file [gclib.cs](#).

#### 14.18.3.89 axis\_c\_torque

[SL](#) `gclib.GDataRecord4000.axis_c_torque`

C axis torque.

Definition at line 1031 of file [gclib.cs](#).

#### 14.18.3.90 axis\_c\_analog\_in

[UW](#) `gclib.GDataRecord4000.axis_c_analog_in`

C axis analog input.

Definition at line 1032 of file [gclib.cs](#).

#### 14.18.3.91 axis\_c\_halls

[UB](#) `gclib.GDataRecord4000.axis_c_halls`

C Hall Input Status.

Definition at line 1033 of file [gclib.cs](#).

#### 14.18.3.92 axis\_c\_reserved

[UB](#) `gclib.GDataRecord4000.axis_c_reserved`

Reserved.

Definition at line 1034 of file [gclib.cs](#).

#### 14.18.3.93 axis\_c\_variable

[SL](#) `gclib.GDataRecord4000.axis_c_variable`

C User-defined variable (ZA).

Definition at line 1035 of file [gclib.cs](#).

#### 14.18.3.94 axis\_d\_status

[UW](#) `gclib.GDataRecord4000.axis_d_status`

D axis status.

Definition at line [1037](#) of file [gclib.cs](#).

#### 14.18.3.95 axis\_d\_switches

[UB](#) `gclib.GDataRecord4000.axis_d_switches`

D axis switches.

Definition at line [1038](#) of file [gclib.cs](#).

#### 14.18.3.96 axis\_d\_stop\_code

[UB](#) `gclib.GDataRecord4000.axis_d_stop_code`

D axis stop code.

Definition at line [1039](#) of file [gclib.cs](#).

#### 14.18.3.97 axis\_d\_reference\_position

[SL](#) `gclib.GDataRecord4000.axis_d_reference_position`

D axis reference position.

Definition at line [1040](#) of file [gclib.cs](#).

#### 14.18.3.98 axis\_d\_motor\_position

[SL](#) `gclib.GDataRecord4000.axis_d_motor_position`

D axis motor position.

Definition at line [1041](#) of file [gclib.cs](#).

#### 14.18.3.99 axis\_d\_position\_error

[SL](#) `gclib.GDataRecord4000.axis_d_position_error`

D axis position error.

Definition at line [1042](#) of file [gclib.cs](#).

#### 14.18.3.100 axis\_d\_aux\_position

[SL](#) `gclib.GDataRecord4000.axis_d_aux_position`

D axis auxiliary position.

Definition at line [1043](#) of file [gclib.cs](#).

#### 14.18.3.101 axis\_d\_velocity

[SL](#) `gclib.GDataRecord4000.axis_d_velocity`

D axis velocity.

Definition at line [1044](#) of file [gclib.cs](#).

#### 14.18.3.102 axis\_d\_torque

[SL](#) `gclib.GDataRecord4000.axis_d_torque`

D axis torque.

Definition at line [1045](#) of file [gclib.cs](#).

#### 14.18.3.103 axis\_d\_analog\_in

[UW](#) `gclib.GDataRecord4000.axis_d_analog_in`

D axis analog input.

Definition at line [1046](#) of file [gclib.cs](#).

**14.18.3.104 axis\_d\_halls**

[UB](#) gclib.GDataRecord4000.axis\_d\_halls

D Hall Input Status.

Definition at line [1047](#) of file [gclib.cs](#).

**14.18.3.105 axis\_d\_reserved**

[UB](#) gclib.GDataRecord4000.axis\_d\_reserved

Reserved.

Definition at line [1048](#) of file [gclib.cs](#).

**14.18.3.106 axis\_d\_variable**

[SL](#) gclib.GDataRecord4000.axis\_d\_variable

D User-defined variable (ZA).

Definition at line [1049](#) of file [gclib.cs](#).

**14.18.3.107 axis\_e\_status**

[UW](#) gclib.GDataRecord4000.axis\_e\_status

E axis status.

Definition at line [1051](#) of file [gclib.cs](#).

**14.18.3.108 axis\_e\_switches**

[UB](#) gclib.GDataRecord4000.axis\_e\_switches

E axis switches.

Definition at line [1052](#) of file [gclib.cs](#).

**14.18.3.109 axis\_e\_stop\_code**

[UB](#) gclib.GDataRecord4000.axis\_e\_stop\_code

E axis stop code.

Definition at line [1053](#) of file [gclib.cs](#).

**14.18.3.110 axis\_e\_reference\_position**

[SL](#) gclib.GDataRecord4000.axis\_e\_reference\_position

E axis reference position.

Definition at line [1054](#) of file [gclib.cs](#).

**14.18.3.111 axis\_e\_motor\_position**

[SL](#) gclib.GDataRecord4000.axis\_e\_motor\_position

E axis motor position.

Definition at line [1055](#) of file [gclib.cs](#).

**14.18.3.112 axis\_e\_position\_error**

[SL](#) gclib.GDataRecord4000.axis\_e\_position\_error

E axis position error.

Definition at line [1056](#) of file [gclib.cs](#).

**14.18.3.113 axis\_e\_aux\_position**

[SL](#) gclib.GDataRecord4000.axis\_e\_aux\_position

E axis auxiliary position.

Definition at line [1057](#) of file [gclib.cs](#).

**14.18.3.114 axis\_e\_velocity**

[SL](#) `gclib.GDataRecord4000.axis_e_velocity`

E axis velocity.

Definition at line [1058](#) of file [gclib.cs](#).

**14.18.3.115 axis\_e\_torque**

[SL](#) `gclib.GDataRecord4000.axis_e_torque`

E axis torque.

Definition at line [1059](#) of file [gclib.cs](#).

**14.18.3.116 axis\_e\_analog\_in**

[UW](#) `gclib.GDataRecord4000.axis_e_analog_in`

E axis analog input.

Definition at line [1060](#) of file [gclib.cs](#).

**14.18.3.117 axis\_e\_halls**

[UB](#) `gclib.GDataRecord4000.axis_e_halls`

E Hall Input Status.

Definition at line [1061](#) of file [gclib.cs](#).

**14.18.3.118 axis\_e\_reserved**

[UB](#) `gclib.GDataRecord4000.axis_e_reserved`

Reserved.

Definition at line [1062](#) of file [gclib.cs](#).

**14.18.3.119 axis\_e\_variable**

[SL](#) `gclib.GDataRecord4000.axis_e_variable`

E User-defined variable (ZA).

Definition at line [1063](#) of file [gclib.cs](#).

**14.18.3.120 axis\_f\_status**

[UW](#) `gclib.GDataRecord4000.axis_f_status`

F axis status.

Definition at line [1065](#) of file [gclib.cs](#).

**14.18.3.121 axis\_f\_switches**

[UB](#) `gclib.GDataRecord4000.axis_f_switches`

F axis switches.

Definition at line [1066](#) of file [gclib.cs](#).

**14.18.3.122 axis\_f\_stop\_code**

[UB](#) `gclib.GDataRecord4000.axis_f_stop_code`

F axis stop code.

Definition at line [1067](#) of file [gclib.cs](#).

**14.18.3.123 axis\_f\_reference\_position**

[SL](#) `gclib.GDataRecord4000.axis_f_reference_position`

F axis reference position.

Definition at line [1068](#) of file [gclib.cs](#).

**14.18.3.124 axis\_f\_motor\_position**

[SL](#) `gclib.GDataRecord4000.axis_f_motor_position`

F axis motor position.

Definition at line [1069](#) of file [gclib.cs](#).

**14.18.3.125 axis\_f\_position\_error**

[SL](#) `gclib.GDataRecord4000.axis_f_position_error`

F axis position error.

Definition at line [1070](#) of file [gclib.cs](#).

**14.18.3.126 axis\_f\_aux\_position**

[SL](#) `gclib.GDataRecord4000.axis_f_aux_position`

F axis auxiliary position.

Definition at line [1071](#) of file [gclib.cs](#).

**14.18.3.127 axis\_f\_velocity**

[SL](#) `gclib.GDataRecord4000.axis_f_velocity`

F axis velocity.

Definition at line [1072](#) of file [gclib.cs](#).

**14.18.3.128 axis\_f\_torque**

[SL](#) `gclib.GDataRecord4000.axis_f_torque`

F axis torque.

Definition at line [1073](#) of file [gclib.cs](#).

**14.18.3.129 axis\_f\_analog\_in**

[UW](#) `gclib.GDataRecord4000.axis_f_analog_in`

F axis analog input.

Definition at line [1074](#) of file [gclib.cs](#).

**14.18.3.130 axis\_f\_halls**

[UB](#) `gclib.GDataRecord4000.axis_f_halls`

F Hall Input Status.

Definition at line [1075](#) of file [gclib.cs](#).

**14.18.3.131 axis\_f\_reserved**

[UB](#) `gclib.GDataRecord4000.axis_f_reserved`

Reserved.

Definition at line [1076](#) of file [gclib.cs](#).

**14.18.3.132 axis\_f\_variable**

[SL](#) `gclib.GDataRecord4000.axis_f_variable`

F User-defined variable (ZA).

Definition at line [1077](#) of file [gclib.cs](#).

**14.18.3.133 axis\_g\_status**

[UW](#) `gclib.GDataRecord4000.axis_g_status`

G axis status.

Definition at line [1079](#) of file [gclib.cs](#).

**14.18.3.134 axis\_g\_switches**

[UB](#) `gclib.GDataRecord4000.axis_g_switches`

G axis switches.

Definition at line [1080](#) of file [gclib.cs](#).

**14.18.3.135 axis\_g\_stop\_code**

[UB](#) `gclib.GDataRecord4000.axis_g_stop_code`

G axis stop code.

Definition at line [1081](#) of file [gclib.cs](#).

**14.18.3.136 axis\_g\_reference\_position**

[SL](#) `gclib.GDataRecord4000.axis_g_reference_position`

G axis reference position.

Definition at line [1082](#) of file [gclib.cs](#).

**14.18.3.137 axis\_g\_motor\_position**

[SL](#) `gclib.GDataRecord4000.axis_g_motor_position`

G axis motor position.

Definition at line [1083](#) of file [gclib.cs](#).

**14.18.3.138 axis\_g\_position\_error**

[SL](#) `gclib.GDataRecord4000.axis_g_position_error`

G axis position error.

Definition at line [1084](#) of file [gclib.cs](#).

**14.18.3.139 axis\_g\_aux\_position**

[SL](#) `gclib.GDataRecord4000.axis_g_aux_position`

G axis auxiliary position.

Definition at line [1085](#) of file [gclib.cs](#).

**14.18.3.140 axis\_g\_velocity**

[SL](#) `gclib.GDataRecord4000.axis_g_velocity`

G axis velocity.

Definition at line [1086](#) of file [gclib.cs](#).

**14.18.3.141 axis\_g\_torque**

[SL](#) `gclib.GDataRecord4000.axis_g_torque`

G axis torque.

Definition at line [1087](#) of file [gclib.cs](#).

**14.18.3.142 axis\_g\_analog\_in**

[UW](#) `gclib.GDataRecord4000.axis_g_analog_in`

G axis analog input.

Definition at line [1088](#) of file [gclib.cs](#).

**14.18.3.143 axis\_g\_halls**

[UB](#) `gclib.GDataRecord4000.axis_g_halls`

G Hall Input Status.

Definition at line [1089](#) of file [gclib.cs](#).

**14.18.3.144 axis\_g\_reserved**

[UB](#) gclib.GDataRecord4000.axis\_g\_reserved

Reserved.

Definition at line 1090 of file [gclib.cs](#).

**14.18.3.145 axis\_g\_variable**

[SL](#) gclib.GDataRecord4000.axis\_g\_variable

G User-defined variable (ZA).

Definition at line 1091 of file [gclib.cs](#).

**14.18.3.146 axis\_h\_status**

[UW](#) gclib.GDataRecord4000.axis\_h\_status

H axis status.

Definition at line 1093 of file [gclib.cs](#).

**14.18.3.147 axis\_h\_switches**

[UB](#) gclib.GDataRecord4000.axis\_h\_switches

H axis switches.

Definition at line 1094 of file [gclib.cs](#).

**14.18.3.148 axis\_h\_stop\_code**

[UB](#) gclib.GDataRecord4000.axis\_h\_stop\_code

H axis stop code.

Definition at line 1095 of file [gclib.cs](#).

**14.18.3.149 axis\_h\_reference\_position**

[SL](#) gclib.GDataRecord4000.axis\_h\_reference\_position

H axis reference position.

Definition at line 1096 of file [gclib.cs](#).

**14.18.3.150 axis\_h\_motor\_position**

[SL](#) gclib.GDataRecord4000.axis\_h\_motor\_position

H axis motor position.

Definition at line 1097 of file [gclib.cs](#).

**14.18.3.151 axis\_h\_position\_error**

[SL](#) gclib.GDataRecord4000.axis\_h\_position\_error

H axis position error.

Definition at line 1098 of file [gclib.cs](#).

**14.18.3.152 axis\_h\_aux\_position**

[SL](#) gclib.GDataRecord4000.axis\_h\_aux\_position

H axis auxiliary position.

Definition at line 1099 of file [gclib.cs](#).

**14.18.3.153 axis\_h\_velocity**

[SL](#) gclib.GDataRecord4000.axis\_h\_velocity

H axis velocity.

Definition at line 1100 of file [gclib.cs](#).

**14.18.3.154 axis\_h\_torque**

[SL](#) `gclib.GDataRecord4000.axis_h_torque`

H axis torque.

Definition at line [1101](#) of file [gclib.cs](#).

**14.18.3.155 axis\_h\_analog\_in**

[UW](#) `gclib.GDataRecord4000.axis_h_analog_in`

H axis analog input.

Definition at line [1102](#) of file [gclib.cs](#).

**14.18.3.156 axis\_h\_halls**

[UB](#) `gclib.GDataRecord4000.axis_h_halls`

H Hall Input Status.

Definition at line [1103](#) of file [gclib.cs](#).

**14.18.3.157 axis\_h\_reserved**

[UB](#) `gclib.GDataRecord4000.axis_h_reserved`

Reserved.

Definition at line [1104](#) of file [gclib.cs](#).

**14.18.3.158 axis\_h\_variable**

[SL](#) `gclib.GDataRecord4000.axis_h_variable`

H User-defined variable (ZA).

Definition at line [1105](#) of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

**14.19 GDataRecord4000 Struct Reference**

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.

```
#include <gclib_record.h>
```

**Public Attributes**

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)



- general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)  
*Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*
- [SW reserved\\_12](#)  
*Reserved.*
- [SW reserved\\_14](#)  
*Reserved.*
- [UB ethernet\\_status\\_a](#)  
*Ethernet Handle A Status.*

- [UB ethernet\\_status\\_b](#)  
*Ethernet Handle B Status.*
- [UB ethernet\\_status\\_c](#)  
*Ethernet Handle C Status.*
- [UB ethernet\\_status\\_d](#)  
*Ethernet Handle D Status.*
- [UB ethernet\\_status\\_e](#)  
*Ethernet Handle E Status.*
- [UB ethernet\\_status\\_f](#)  
*Ethernet Handle F Status.*
- [UB ethernet\\_status\\_g](#)  
*Ethernet Handle G Status.*
- [UB ethernet\\_status\\_h](#)  
*Ethernet Handle H Status.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)

- A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_halls](#)  
*B Hall Input Status.*
- [UB axis\\_b\\_reserved](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*

- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_halls](#)  
*C Hall Input Status.*
- [UB axis\\_c\\_reserved](#)  
*Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UB axis\\_d\\_halls](#)  
*D Hall Input Status.*
- [UB axis\\_d\\_reserved](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)

- E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SL axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UB axis\\_e\\_halls](#)  
*E Hall Input Status.*
- [UB axis\\_e\\_reserved](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UB axis\\_f\\_halls](#)  
*F Hall Input Status.*
- [UB axis\\_f\\_reserved](#)  
*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*

- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UB axis\\_g\\_halls](#)  
*G Hall Input Status.*
- [UB axis\\_g\\_reserved](#)  
*Reserved.*
- [SL axis\\_g\\_variable](#)  
*G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)  
*H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)  
*H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)  
*H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)  
*H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)  
*H axis velocity.*
- [SL axis\\_h\\_torque](#)  
*H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*
- [UB axis\\_h\\_halls](#)  
*H Hall Input Status.*
- [UB axis\\_h\\_reserved](#)  
*Reserved.*
- [SL axis\\_h\\_variable](#)  
*H User-defined variable (ZA).*

### 14.19.1 Detailed Description

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.  
Definition at line 31 of file [gclib\\_record.h](#).

## 14.19.2 Member Data Documentation

### 14.19.2.1 header\_0

[UB](#) GDataRecord4000::header\_0

1st Byte of Header.

Definition at line 36 of file [gclib\\_record.h](#).

### 14.19.2.2 header\_1

[UB](#) GDataRecord4000::header\_1

2nd Byte of Header.

Definition at line 37 of file [gclib\\_record.h](#).

### 14.19.2.3 header\_2

[UB](#) GDataRecord4000::header\_2

3rd Byte of Header.

Definition at line 38 of file [gclib\\_record.h](#).

### 14.19.2.4 header\_3

[UB](#) GDataRecord4000::header\_3

4th Byte of Header.

Definition at line 39 of file [gclib\\_record.h](#).

### 14.19.2.5 sample\_number

[UW](#) GDataRecord4000::sample\_number

sample number.

Definition at line 41 of file [gclib\\_record.h](#).

### 14.19.2.6 input\_bank\_0

[UB](#) GDataRecord4000::input\_bank\_0

general input bank 0 (inputs 1-8).

Definition at line 43 of file [gclib\\_record.h](#).

### 14.19.2.7 input\_bank\_1

[UB](#) GDataRecord4000::input\_bank\_1

general input bank 1 (inputs 9-16).

Definition at line 44 of file [gclib\\_record.h](#).

### 14.19.2.8 input\_bank\_2

[UB](#) GDataRecord4000::input\_bank\_2

general input bank 2 (inputs 17-24).

Definition at line 45 of file [gclib\\_record.h](#).

### 14.19.2.9 input\_bank\_3

[UB](#) GDataRecord4000::input\_bank\_3

general input bank 3 (inputs 25-32).

Definition at line 46 of file [gclib\\_record.h](#).

### 14.19.2.10 input\_bank\_4

[UB](#) GDataRecord4000::input\_bank\_4

general input bank 4 (inputs 33-40).

Definition at line 47 of file [gclib\\_record.h](#).

#### 14.19.2.11 input\_bank\_5

[UB](#) `GDataRecord4000::input_bank_5`  
general input bank 5 (inputs 41-48).  
Definition at line 48 of file [gclib\\_record.h](#).

#### 14.19.2.12 input\_bank\_6

[UB](#) `GDataRecord4000::input_bank_6`  
general input bank 6 (inputs 49-56).  
Definition at line 49 of file [gclib\\_record.h](#).

#### 14.19.2.13 input\_bank\_7

[UB](#) `GDataRecord4000::input_bank_7`  
general input bank 7 (inputs 57-64).  
Definition at line 50 of file [gclib\\_record.h](#).

#### 14.19.2.14 input\_bank\_8

[UB](#) `GDataRecord4000::input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line 51 of file [gclib\\_record.h](#).

#### 14.19.2.15 input\_bank\_9

[UB](#) `GDataRecord4000::input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line 52 of file [gclib\\_record.h](#).

#### 14.19.2.16 output\_bank\_0

[UB](#) `GDataRecord4000::output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line 54 of file [gclib\\_record.h](#).

#### 14.19.2.17 output\_bank\_1

[UB](#) `GDataRecord4000::output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line 55 of file [gclib\\_record.h](#).

#### 14.19.2.18 output\_bank\_2

[UB](#) `GDataRecord4000::output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line 56 of file [gclib\\_record.h](#).

#### 14.19.2.19 output\_bank\_3

[UB](#) `GDataRecord4000::output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line 57 of file [gclib\\_record.h](#).

#### 14.19.2.20 output\_bank\_4

[UB](#) `GDataRecord4000::output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line 58 of file [gclib\\_record.h](#).



#### 14.19.2.21 output\_bank\_5

**UB** GDataRecord4000::output\_bank\_5  
general output bank 5 (outputs 41-48).  
Definition at line 59 of file [gclib\\_record.h](#).

#### 14.19.2.22 output\_bank\_6

**UB** GDataRecord4000::output\_bank\_6  
general output bank 6 (outputs 49-56).  
Definition at line 60 of file [gclib\\_record.h](#).

#### 14.19.2.23 output\_bank\_7

**UB** GDataRecord4000::output\_bank\_7  
general output bank 7 (outputs 57-64).  
Definition at line 61 of file [gclib\\_record.h](#).

#### 14.19.2.24 output\_bank\_8

**UB** GDataRecord4000::output\_bank\_8  
general output bank 8 (outputs 65-72).  
Definition at line 62 of file [gclib\\_record.h](#).

#### 14.19.2.25 output\_bank\_9

**UB** GDataRecord4000::output\_bank\_9  
general output bank 9 (outputs 73-80).  
Definition at line 63 of file [gclib\\_record.h](#).

#### 14.19.2.26 reserved\_0

**SW** GDataRecord4000::reserved\_0  
Reserved.  
Definition at line 65 of file [gclib\\_record.h](#).

#### 14.19.2.27 reserved\_2

**SW** GDataRecord4000::reserved\_2  
Reserved.  
Definition at line 66 of file [gclib\\_record.h](#).

#### 14.19.2.28 reserved\_4

**SW** GDataRecord4000::reserved\_4  
Reserved.  
Definition at line 67 of file [gclib\\_record.h](#).

#### 14.19.2.29 reserved\_6

**SW** GDataRecord4000::reserved\_6  
Reserved.  
Definition at line 68 of file [gclib\\_record.h](#).

#### 14.19.2.30 reserved\_8

**SW** GDataRecord4000::reserved\_8  
Reserved.  
Definition at line 69 of file [gclib\\_record.h](#).

#### 14.19.2.31 reserved\_10

[SW](#) `GDataRecord4000::reserved_10`

Reserved.

Definition at line 70 of file [gclib\\_record.h](#).

#### 14.19.2.32 reserved\_12

[SW](#) `GDataRecord4000::reserved_12`

Reserved.

Definition at line 71 of file [gclib\\_record.h](#).

#### 14.19.2.33 reserved\_14

[SW](#) `GDataRecord4000::reserved_14`

Reserved.

Definition at line 72 of file [gclib\\_record.h](#).

#### 14.19.2.34 ethernet\_status\_a

[UB](#) `GDataRecord4000::ethernet_status_a`

Ethernet Handle A Status.

Definition at line 74 of file [gclib\\_record.h](#).

#### 14.19.2.35 ethernet\_status\_b

[UB](#) `GDataRecord4000::ethernet_status_b`

Ethernet Handle B Status.

Definition at line 75 of file [gclib\\_record.h](#).

#### 14.19.2.36 ethernet\_status\_c

[UB](#) `GDataRecord4000::ethernet_status_c`

Ethernet Handle C Status.

Definition at line 76 of file [gclib\\_record.h](#).

#### 14.19.2.37 ethernet\_status\_d

[UB](#) `GDataRecord4000::ethernet_status_d`

Ethernet Handle D Status.

Definition at line 77 of file [gclib\\_record.h](#).

#### 14.19.2.38 ethernet\_status\_e

[UB](#) `GDataRecord4000::ethernet_status_e`

Ethernet Handle E Status.

Definition at line 78 of file [gclib\\_record.h](#).

#### 14.19.2.39 ethernet\_status\_f

[UB](#) `GDataRecord4000::ethernet_status_f`

Ethernet Handle F Status.

Definition at line 79 of file [gclib\\_record.h](#).

#### 14.19.2.40 ethernet\_status\_g

[UB](#) `GDataRecord4000::ethernet_status_g`

Ethernet Handle G Status.

Definition at line 80 of file [gclib\\_record.h](#).

#### 14.19.2.41 ethernet\_status\_h

[UB](#) GDataRecord4000::ethernet\_status\_h

Ethernet Handle H Status.

Definition at line 81 of file [gclib\\_record.h](#).

#### 14.19.2.42 error\_code

[UB](#) GDataRecord4000::error\_code

error code.

Definition at line 83 of file [gclib\\_record.h](#).

#### 14.19.2.43 thread\_status

[UB](#) GDataRecord4000::thread\_status

thread status

Definition at line 84 of file [gclib\\_record.h](#).

#### 14.19.2.44 amplifier\_status

[UL](#) GDataRecord4000::amplifier\_status

Amplifier Status.

Definition at line 85 of file [gclib\\_record.h](#).

#### 14.19.2.45 contour\_segment\_count

[UL](#) GDataRecord4000::contour\_segment\_count

Segment Count for Contour Mode.

Definition at line 87 of file [gclib\\_record.h](#).

#### 14.19.2.46 contour\_buffer\_available

[UW](#) GDataRecord4000::contour\_buffer\_available

Buffer space remaining, Contour Mode.

Definition at line 88 of file [gclib\\_record.h](#).

#### 14.19.2.47 s\_plane\_segment\_count

[UW](#) GDataRecord4000::s\_plane\_segment\_count

segment count of coordinated move for S plane.

Definition at line 90 of file [gclib\\_record.h](#).

#### 14.19.2.48 s\_plane\_move\_status

[UW](#) GDataRecord4000::s\_plane\_move\_status

coordinated move status for S plane.

Definition at line 91 of file [gclib\\_record.h](#).

#### 14.19.2.49 s\_distance

[SL](#) GDataRecord4000::s\_distance

distance traveled in coordinated move for S plane.

Definition at line 92 of file [gclib\\_record.h](#).

#### 14.19.2.50 s\_plane\_buffer\_available

[UW](#) GDataRecord4000::s\_plane\_buffer\_available

Buffer space remaining, S Plane.

Definition at line 93 of file [gclib\\_record.h](#).

#### 14.19.2.51 t\_plane\_segment\_count

[UW](#) GDataRecord4000::t\_plane\_segment\_count  
segment count of coordinated move for T plane.  
Definition at line 95 of file [gclib\\_record.h](#).

#### 14.19.2.52 t\_plane\_move\_status

[UW](#) GDataRecord4000::t\_plane\_move\_status  
Coordinated move status for T plane.  
Definition at line 96 of file [gclib\\_record.h](#).

#### 14.19.2.53 t\_distance

[SL](#) GDataRecord4000::t\_distance  
distance traveled in coordinated move for T plane.  
Definition at line 97 of file [gclib\\_record.h](#).

#### 14.19.2.54 t\_plane\_buffer\_available

[UW](#) GDataRecord4000::t\_plane\_buffer\_available  
Buffer space remaining, T Plane.  
Definition at line 98 of file [gclib\\_record.h](#).

#### 14.19.2.55 axis\_a\_status

[UW](#) GDataRecord4000::axis\_a\_status  
A axis status.  
Definition at line 100 of file [gclib\\_record.h](#).

#### 14.19.2.56 axis\_a\_switches

[UB](#) GDataRecord4000::axis\_a\_switches  
A axis switches.  
Definition at line 101 of file [gclib\\_record.h](#).

#### 14.19.2.57 axis\_a\_stop\_code

[UB](#) GDataRecord4000::axis\_a\_stop\_code  
A axis stop code.  
Definition at line 102 of file [gclib\\_record.h](#).

#### 14.19.2.58 axis\_a\_reference\_position

[SL](#) GDataRecord4000::axis\_a\_reference\_position  
A axis reference position.  
Definition at line 103 of file [gclib\\_record.h](#).

#### 14.19.2.59 axis\_a\_motor\_position

[SL](#) GDataRecord4000::axis\_a\_motor\_position  
A axis motor position.  
Definition at line 104 of file [gclib\\_record.h](#).

#### 14.19.2.60 axis\_a\_position\_error

[SL](#) GDataRecord4000::axis\_a\_position\_error  
A axis position error.  
Definition at line 105 of file [gclib\\_record.h](#).

#### 14.19.2.61 axis\_a\_aux\_position

[SL](#) `GDataRecord4000::axis_a_aux_position`

A axis auxiliary position.

Definition at line 106 of file [gclib\\_record.h](#).

#### 14.19.2.62 axis\_a\_velocity

[SL](#) `GDataRecord4000::axis_a_velocity`

A axis velocity.

Definition at line 107 of file [gclib\\_record.h](#).

#### 14.19.2.63 axis\_a\_torque

[SL](#) `GDataRecord4000::axis_a_torque`

A axis torque.

Definition at line 108 of file [gclib\\_record.h](#).

#### 14.19.2.64 axis\_a\_analog\_in

[UW](#) `GDataRecord4000::axis_a_analog_in`

A axis analog input.

Definition at line 109 of file [gclib\\_record.h](#).

#### 14.19.2.65 axis\_a\_halls

[UB](#) `GDataRecord4000::axis_a_halls`

A Hall Input Status.

Definition at line 110 of file [gclib\\_record.h](#).

#### 14.19.2.66 axis\_a\_reserved

[UB](#) `GDataRecord4000::axis_a_reserved`

Reserved.

Definition at line 111 of file [gclib\\_record.h](#).

#### 14.19.2.67 axis\_a\_variable

[SL](#) `GDataRecord4000::axis_a_variable`

A User-defined variable (ZA).

Definition at line 112 of file [gclib\\_record.h](#).

#### 14.19.2.68 axis\_b\_status

[UW](#) `GDataRecord4000::axis_b_status`

B axis status.

Definition at line 114 of file [gclib\\_record.h](#).

#### 14.19.2.69 axis\_b\_switches

[UB](#) `GDataRecord4000::axis_b_switches`

B axis switches.

Definition at line 115 of file [gclib\\_record.h](#).

#### 14.19.2.70 axis\_b\_stop\_code

[UB](#) `GDataRecord4000::axis_b_stop_code`

B axis stop code.

Definition at line 116 of file [gclib\\_record.h](#).

#### 14.19.2.71 axis\_b\_reference\_position

[SL](#) `GDataRecord4000::axis_b_reference_position`

B axis reference position.

Definition at line 117 of file [gclib\\_record.h](#).

#### 14.19.2.72 axis\_b\_motor\_position

[SL](#) `GDataRecord4000::axis_b_motor_position`

B axis motor position.

Definition at line 118 of file [gclib\\_record.h](#).

#### 14.19.2.73 axis\_b\_position\_error

[SL](#) `GDataRecord4000::axis_b_position_error`

B axis position error.

Definition at line 119 of file [gclib\\_record.h](#).

#### 14.19.2.74 axis\_b\_aux\_position

[SL](#) `GDataRecord4000::axis_b_aux_position`

B axis auxiliary position.

Definition at line 120 of file [gclib\\_record.h](#).

#### 14.19.2.75 axis\_b\_velocity

[SL](#) `GDataRecord4000::axis_b_velocity`

B axis velocity.

Definition at line 121 of file [gclib\\_record.h](#).

#### 14.19.2.76 axis\_b\_torque

[SL](#) `GDataRecord4000::axis_b_torque`

B axis torque.

Definition at line 122 of file [gclib\\_record.h](#).

#### 14.19.2.77 axis\_b\_analog\_in

[UW](#) `GDataRecord4000::axis_b_analog_in`

B axis analog input.

Definition at line 123 of file [gclib\\_record.h](#).

#### 14.19.2.78 axis\_b\_halls

[UB](#) `GDataRecord4000::axis_b_halls`

B Hall Input Status.

Definition at line 124 of file [gclib\\_record.h](#).

#### 14.19.2.79 axis\_b\_reserved

[UB](#) `GDataRecord4000::axis_b_reserved`

Reserved.

Definition at line 125 of file [gclib\\_record.h](#).

#### 14.19.2.80 axis\_b\_variable

[SL](#) `GDataRecord4000::axis_b_variable`

B User-defined variable (ZA).

Definition at line 126 of file [gclib\\_record.h](#).

#### 14.19.2.81 axis\_c\_status

[UW](#) GDataRecord4000::axis\_c\_status

C axis status.

Definition at line 128 of file [gclib\\_record.h](#).

#### 14.19.2.82 axis\_c\_switches

[UB](#) GDataRecord4000::axis\_c\_switches

C axis switches.

Definition at line 129 of file [gclib\\_record.h](#).

#### 14.19.2.83 axis\_c\_stop\_code

[UB](#) GDataRecord4000::axis\_c\_stop\_code

C axis stop code.

Definition at line 130 of file [gclib\\_record.h](#).

#### 14.19.2.84 axis\_c\_reference\_position

[SL](#) GDataRecord4000::axis\_c\_reference\_position

C axis reference position.

Definition at line 131 of file [gclib\\_record.h](#).

#### 14.19.2.85 axis\_c\_motor\_position

[SL](#) GDataRecord4000::axis\_c\_motor\_position

C axis motor position.

Definition at line 132 of file [gclib\\_record.h](#).

#### 14.19.2.86 axis\_c\_position\_error

[SL](#) GDataRecord4000::axis\_c\_position\_error

C axis position error.

Definition at line 133 of file [gclib\\_record.h](#).

#### 14.19.2.87 axis\_c\_aux\_position

[SL](#) GDataRecord4000::axis\_c\_aux\_position

C axis auxiliary position.

Definition at line 134 of file [gclib\\_record.h](#).

#### 14.19.2.88 axis\_c\_velocity

[SL](#) GDataRecord4000::axis\_c\_velocity

C axis velocity.

Definition at line 135 of file [gclib\\_record.h](#).

#### 14.19.2.89 axis\_c\_torque

[SL](#) GDataRecord4000::axis\_c\_torque

C axis torque.

Definition at line 136 of file [gclib\\_record.h](#).

#### 14.19.2.90 axis\_c\_analog\_in

[UW](#) GDataRecord4000::axis\_c\_analog\_in

C axis analog input.

Definition at line 137 of file [gclib\\_record.h](#).

#### 14.19.2.91 axis\_c\_halls

[UB](#) GDataRecord4000::axis\_c\_halls

C Hall Input Status.

Definition at line 138 of file [gclib\\_record.h](#).

#### 14.19.2.92 axis\_c\_reserved

[UB](#) GDataRecord4000::axis\_c\_reserved

Reserved.

Definition at line 139 of file [gclib\\_record.h](#).

#### 14.19.2.93 axis\_c\_variable

[SL](#) GDataRecord4000::axis\_c\_variable

C User-defined variable (ZA).

Definition at line 140 of file [gclib\\_record.h](#).

#### 14.19.2.94 axis\_d\_status

[UW](#) GDataRecord4000::axis\_d\_status

D axis status.

Definition at line 142 of file [gclib\\_record.h](#).

#### 14.19.2.95 axis\_d\_switches

[UB](#) GDataRecord4000::axis\_d\_switches

D axis switches.

Definition at line 143 of file [gclib\\_record.h](#).

#### 14.19.2.96 axis\_d\_stop\_code

[UB](#) GDataRecord4000::axis\_d\_stop\_code

D axis stop code.

Definition at line 144 of file [gclib\\_record.h](#).

#### 14.19.2.97 axis\_d\_reference\_position

[SL](#) GDataRecord4000::axis\_d\_reference\_position

D axis reference position.

Definition at line 145 of file [gclib\\_record.h](#).

#### 14.19.2.98 axis\_d\_motor\_position

[SL](#) GDataRecord4000::axis\_d\_motor\_position

D axis motor position.

Definition at line 146 of file [gclib\\_record.h](#).

#### 14.19.2.99 axis\_d\_position\_error

[SL](#) GDataRecord4000::axis\_d\_position\_error

D axis position error.

Definition at line 147 of file [gclib\\_record.h](#).

#### 14.19.2.100 axis\_d\_aux\_position

[SL](#) GDataRecord4000::axis\_d\_aux\_position

D axis auxiliary position.

Definition at line 148 of file [gclib\\_record.h](#).



**14.19.2.101 axis\_d\_velocity**

[SL](#) `GDataRecord4000::axis_d_velocity`

D axis velocity.

Definition at line 149 of file [gclib\\_record.h](#).

**14.19.2.102 axis\_d\_torque**

[SL](#) `GDataRecord4000::axis_d_torque`

D axis torque.

Definition at line 150 of file [gclib\\_record.h](#).

**14.19.2.103 axis\_d\_analog\_in**

[UW](#) `GDataRecord4000::axis_d_analog_in`

D axis analog input.

Definition at line 151 of file [gclib\\_record.h](#).

**14.19.2.104 axis\_d\_halls**

[UB](#) `GDataRecord4000::axis_d_halls`

D Hall Input Status.

Definition at line 152 of file [gclib\\_record.h](#).

**14.19.2.105 axis\_d\_reserved**

[UB](#) `GDataRecord4000::axis_d_reserved`

Reserved.

Definition at line 153 of file [gclib\\_record.h](#).

**14.19.2.106 axis\_d\_variable**

[SL](#) `GDataRecord4000::axis_d_variable`

D User-defined variable (ZA).

Definition at line 154 of file [gclib\\_record.h](#).

**14.19.2.107 axis\_e\_status**

[UW](#) `GDataRecord4000::axis_e_status`

E axis status.

Definition at line 156 of file [gclib\\_record.h](#).

**14.19.2.108 axis\_e\_switches**

[UB](#) `GDataRecord4000::axis_e_switches`

E axis switches.

Definition at line 157 of file [gclib\\_record.h](#).

**14.19.2.109 axis\_e\_stop\_code**

[UB](#) `GDataRecord4000::axis_e_stop_code`

E axis stop code.

Definition at line 158 of file [gclib\\_record.h](#).

**14.19.2.110 axis\_e\_reference\_position**

[SL](#) `GDataRecord4000::axis_e_reference_position`

E axis reference position.

Definition at line 159 of file [gclib\\_record.h](#).

**14.19.2.111 axis\_e\_motor\_position**

[SL](#) `GDataRecord4000::axis_e_motor_position`

E axis motor position.

Definition at line 160 of file [gclib\\_record.h](#).

**14.19.2.112 axis\_e\_position\_error**

[SL](#) `GDataRecord4000::axis_e_position_error`

E axis position error.

Definition at line 161 of file [gclib\\_record.h](#).

**14.19.2.113 axis\_e\_aux\_position**

[SL](#) `GDataRecord4000::axis_e_aux_position`

E axis auxiliary position.

Definition at line 162 of file [gclib\\_record.h](#).

**14.19.2.114 axis\_e\_velocity**

[SL](#) `GDataRecord4000::axis_e_velocity`

E axis velocity.

Definition at line 163 of file [gclib\\_record.h](#).

**14.19.2.115 axis\_e\_torque**

[SL](#) `GDataRecord4000::axis_e_torque`

E axis torque.

Definition at line 164 of file [gclib\\_record.h](#).

**14.19.2.116 axis\_e\_analog\_in**

[UW](#) `GDataRecord4000::axis_e_analog_in`

E axis analog input.

Definition at line 165 of file [gclib\\_record.h](#).

**14.19.2.117 axis\_e\_halls**

[UB](#) `GDataRecord4000::axis_e_halls`

E Hall Input Status.

Definition at line 166 of file [gclib\\_record.h](#).

**14.19.2.118 axis\_e\_reserved**

[UB](#) `GDataRecord4000::axis_e_reserved`

Reserved.

Definition at line 167 of file [gclib\\_record.h](#).

**14.19.2.119 axis\_e\_variable**

[SL](#) `GDataRecord4000::axis_e_variable`

E User-defined variable (ZA).

Definition at line 168 of file [gclib\\_record.h](#).

**14.19.2.120 axis\_f\_status**

[UW](#) `GDataRecord4000::axis_f_status`

F axis status.

Definition at line 170 of file [gclib\\_record.h](#).

**14.19.2.121 axis\_f\_switches**

[UB](#) GDataRecord4000::axis\_f\_switches

F axis switches.

Definition at line 171 of file [gclib\\_record.h](#).

**14.19.2.122 axis\_f\_stop\_code**

[UB](#) GDataRecord4000::axis\_f\_stop\_code

F axis stop code.

Definition at line 172 of file [gclib\\_record.h](#).

**14.19.2.123 axis\_f\_reference\_position**

[SL](#) GDataRecord4000::axis\_f\_reference\_position

F axis reference position.

Definition at line 173 of file [gclib\\_record.h](#).

**14.19.2.124 axis\_f\_motor\_position**

[SL](#) GDataRecord4000::axis\_f\_motor\_position

F axis motor position.

Definition at line 174 of file [gclib\\_record.h](#).

**14.19.2.125 axis\_f\_position\_error**

[SL](#) GDataRecord4000::axis\_f\_position\_error

F axis position error.

Definition at line 175 of file [gclib\\_record.h](#).

**14.19.2.126 axis\_f\_aux\_position**

[SL](#) GDataRecord4000::axis\_f\_aux\_position

F axis auxiliary position.

Definition at line 176 of file [gclib\\_record.h](#).

**14.19.2.127 axis\_f\_velocity**

[SL](#) GDataRecord4000::axis\_f\_velocity

F axis velocity.

Definition at line 177 of file [gclib\\_record.h](#).

**14.19.2.128 axis\_f\_torque**

[SL](#) GDataRecord4000::axis\_f\_torque

F axis torque.

Definition at line 178 of file [gclib\\_record.h](#).

**14.19.2.129 axis\_f\_analog\_in**

[UW](#) GDataRecord4000::axis\_f\_analog\_in

F axis analog input.

Definition at line 179 of file [gclib\\_record.h](#).

**14.19.2.130 axis\_f\_halls**

[UB](#) GDataRecord4000::axis\_f\_halls

F Hall Input Status.

Definition at line 180 of file [gclib\\_record.h](#).

**14.19.2.131 axis\_f\_reserved**

[UB](#) GDataRecord4000::axis\_f\_reserved  
Reserved.  
Definition at line 181 of file [gclib\\_record.h](#).

**14.19.2.132 axis\_f\_variable**

[SL](#) GDataRecord4000::axis\_f\_variable  
F User-defined variable (ZA).  
Definition at line 182 of file [gclib\\_record.h](#).

**14.19.2.133 axis\_g\_status**

[UW](#) GDataRecord4000::axis\_g\_status  
G axis status.  
Definition at line 184 of file [gclib\\_record.h](#).

**14.19.2.134 axis\_g\_switches**

[UB](#) GDataRecord4000::axis\_g\_switches  
G axis switches.  
Definition at line 185 of file [gclib\\_record.h](#).

**14.19.2.135 axis\_g\_stop\_code**

[UB](#) GDataRecord4000::axis\_g\_stop\_code  
G axis stop code.  
Definition at line 186 of file [gclib\\_record.h](#).

**14.19.2.136 axis\_g\_reference\_position**

[SL](#) GDataRecord4000::axis\_g\_reference\_position  
G axis reference position.  
Definition at line 187 of file [gclib\\_record.h](#).

**14.19.2.137 axis\_g\_motor\_position**

[SL](#) GDataRecord4000::axis\_g\_motor\_position  
G axis motor position.  
Definition at line 188 of file [gclib\\_record.h](#).

**14.19.2.138 axis\_g\_position\_error**

[SL](#) GDataRecord4000::axis\_g\_position\_error  
G axis position error.  
Definition at line 189 of file [gclib\\_record.h](#).

**14.19.2.139 axis\_g\_aux\_position**

[SL](#) GDataRecord4000::axis\_g\_aux\_position  
G axis auxiliary position.  
Definition at line 190 of file [gclib\\_record.h](#).

**14.19.2.140 axis\_g\_velocity**

[SL](#) GDataRecord4000::axis\_g\_velocity  
G axis velocity.  
Definition at line 191 of file [gclib\\_record.h](#).

**14.19.2.141 axis\_g\_torque**

[SL](#) GDataRecord4000::axis\_g\_torque

G axis torque.

Definition at line 192 of file [gclib\\_record.h](#).

**14.19.2.142 axis\_g\_analog\_in**

[UW](#) GDataRecord4000::axis\_g\_analog\_in

G axis analog input.

Definition at line 193 of file [gclib\\_record.h](#).

**14.19.2.143 axis\_g\_halls**

[UB](#) GDataRecord4000::axis\_g\_halls

G Hall Input Status.

Definition at line 194 of file [gclib\\_record.h](#).

**14.19.2.144 axis\_g\_reserved**

[UB](#) GDataRecord4000::axis\_g\_reserved

Reserved.

Definition at line 195 of file [gclib\\_record.h](#).

**14.19.2.145 axis\_g\_variable**

[SL](#) GDataRecord4000::axis\_g\_variable

G User-defined variable (ZA).

Definition at line 196 of file [gclib\\_record.h](#).

**14.19.2.146 axis\_h\_status**

[UW](#) GDataRecord4000::axis\_h\_status

H axis status.

Definition at line 198 of file [gclib\\_record.h](#).

**14.19.2.147 axis\_h\_switches**

[UB](#) GDataRecord4000::axis\_h\_switches

H axis switches.

Definition at line 199 of file [gclib\\_record.h](#).

**14.19.2.148 axis\_h\_stop\_code**

[UB](#) GDataRecord4000::axis\_h\_stop\_code

H axis stop code.

Definition at line 200 of file [gclib\\_record.h](#).

**14.19.2.149 axis\_h\_reference\_position**

[SL](#) GDataRecord4000::axis\_h\_reference\_position

H axis reference position.

Definition at line 201 of file [gclib\\_record.h](#).

**14.19.2.150 axis\_h\_motor\_position**

[SL](#) GDataRecord4000::axis\_h\_motor\_position

H axis motor position.

Definition at line 202 of file [gclib\\_record.h](#).

#### 14.19.2.151 axis\_h\_position\_error

[SL](#) `GDataRecord4000::axis_h_position_error`

H axis position error.

Definition at line 203 of file [gclib\\_record.h](#).

#### 14.19.2.152 axis\_h\_aux\_position

[SL](#) `GDataRecord4000::axis_h_aux_position`

H axis auxiliary position.

Definition at line 204 of file [gclib\\_record.h](#).

#### 14.19.2.153 axis\_h\_velocity

[SL](#) `GDataRecord4000::axis_h_velocity`

H axis velocity.

Definition at line 205 of file [gclib\\_record.h](#).

#### 14.19.2.154 axis\_h\_torque

[SL](#) `GDataRecord4000::axis_h_torque`

H axis torque.

Definition at line 206 of file [gclib\\_record.h](#).

#### 14.19.2.155 axis\_h\_analog\_in

[UW](#) `GDataRecord4000::axis_h_analog_in`

H axis analog input.

Definition at line 207 of file [gclib\\_record.h](#).

#### 14.19.2.156 axis\_h\_halls

[UB](#) `GDataRecord4000::axis_h_halls`

H Hall Input Status.

Definition at line 208 of file [gclib\\_record.h](#).

#### 14.19.2.157 axis\_h\_reserved

[UB](#) `GDataRecord4000::axis_h_reserved`

Reserved.

Definition at line 209 of file [gclib\\_record.h](#).

#### 14.19.2.158 axis\_h\_variable

[SL](#) `GDataRecord4000::axis_h_variable`

H User-defined variable (ZA).

Definition at line 210 of file [gclib\\_record.h](#).

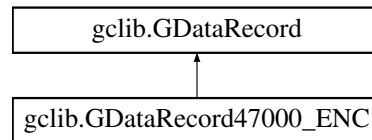
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

## 14.20 gclib.GDataRecord47000\_ENC Struct Reference

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.

Inheritance diagram for `gclib.GDataRecord47000_ENC`:



### Public Member Functions

- `byte[] byte\_array ()`  
*Returns the data record as a byte array and allows for access to individual bytes.*

### Public Attributes

- `UB header\_0`  
*1st Byte of Header.*
- `UB header\_1`  
*2nd Byte of Header.*
- `UB header\_2`  
*3rd Byte of Header.*
- `UB header\_3`  
*4th Byte of Header.*
- `UW sample\_number`  
*Sample number.*
- `UB error\_code`  
*Error code.*
- `UB general\_status`  
*General status.*
- `UW output\_analog\_0`  
*Analog output 0.*
- `UW output\_analog\_1`  
*Analog output 1.*
- `UW output\_analog\_2`  
*Analog output 2.*
- `UW output\_analog\_3`  
*Analog output 3.*
- `UW output\_analog\_4`  
*Analog output 4.*
- `UW output\_analog\_5`  
*Analog output 5.*
- `UW output\_analog\_6`  
*Analog output 6.*
- `UW output\_analog\_7`  
*Analog output 7.*
- `UW input\_analog\_0`  
*Analog input 0.*
- `UW input\_analog\_1`  
*Analog input 1.*
- `UW input\_analog\_2`  
*Analog input 2.*
- `UW input\_analog\_3`  
*Analog input 3.*
- `UW input\_analog\_4`

- Analog input 4.*
- [UW input\\_analog\\_5](#)
- Analog input 5.*
- [UW input\\_analog\\_6](#)
- Analog input 6.*
- [UW input\\_analog\\_7](#)
- Analog input 7.*
- [UW output\\_bank\\_0](#)
- Digital outputs 0-15;.*
- [UW input\\_bank\\_0](#)
- Digital inputs 0-15;.*
- [UL pulse\\_count\\_0](#)
- Pulse counter (see PC).*
- [SL zc\\_variable](#)
- ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)
- ZD User-defined variable (see ZD).*
- [SL encoder\\_0](#)
- Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_1](#)
- Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_2](#)
- Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_3](#)
- Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.20.1 Detailed Description

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.  
Definition at line 1770 of file [gclib.cs](#).

### 14.20.2 Member Function Documentation

#### 14.20.2.1 `byte_array()`

```
byte[] gclib.GDataRecord47000_ENC.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line 1772 of file [gclib.cs](#).

### 14.20.3 Member Data Documentation

#### 14.20.3.1 `header_0`

[UB](#) [gclib.GDataRecord47000\\_ENC.header\\_0](#)  
1st Byte of Header.  
Definition at line 1776 of file [gclib.cs](#).

#### 14.20.3.2 `header_1`

[UB](#) [gclib.GDataRecord47000\\_ENC.header\\_1](#)  
2nd Byte of Header.  
Definition at line 1777 of file [gclib.cs](#).



### 14.20.3.3 header\_2

[UB](#) `gclib.GDataRecord47000_ENC.header_2`

3rd Byte of Header.

Definition at line 1778 of file [gclib.cs](#).

### 14.20.3.4 header\_3

[UB](#) `gclib.GDataRecord47000_ENC.header_3`

4th Byte of Header.

Definition at line 1779 of file [gclib.cs](#).

### 14.20.3.5 sample\_number

[UW](#) `gclib.GDataRecord47000_ENC.sample_number`

Sample number.

Definition at line 1781 of file [gclib.cs](#).

### 14.20.3.6 error\_code

[UB](#) `gclib.GDataRecord47000_ENC.error_code`

Error code.

Definition at line 1782 of file [gclib.cs](#).

### 14.20.3.7 general\_status

[UB](#) `gclib.GDataRecord47000_ENC.general_status`

General status.

Definition at line 1783 of file [gclib.cs](#).

### 14.20.3.8 output\_analog\_0

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_0`

Analog output 0.

Definition at line 1785 of file [gclib.cs](#).

### 14.20.3.9 output\_analog\_1

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_1`

Analog output 1.

Definition at line 1786 of file [gclib.cs](#).

### 14.20.3.10 output\_analog\_2

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_2`

Analog output 2.

Definition at line 1787 of file [gclib.cs](#).

### 14.20.3.11 output\_analog\_3

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_3`

Analog output 3.

Definition at line 1788 of file [gclib.cs](#).

### 14.20.3.12 output\_analog\_4

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_4`

Analog output 4.

Definition at line 1789 of file [gclib.cs](#).

#### 14.20.3.13 output\_analog\_5

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_5`

Analog output 5.

Definition at line 1790 of file [gclib.cs](#).

#### 14.20.3.14 output\_analog\_6

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_6`

Analog output 6.

Definition at line 1791 of file [gclib.cs](#).

#### 14.20.3.15 output\_analog\_7

[UW](#) `gclib.GDataRecord47000_ENC.output_analog_7`

Analog output 7.

Definition at line 1792 of file [gclib.cs](#).

#### 14.20.3.16 input\_analog\_0

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_0`

Analog input 0.

Definition at line 1794 of file [gclib.cs](#).

#### 14.20.3.17 input\_analog\_1

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_1`

Analog input 1.

Definition at line 1795 of file [gclib.cs](#).

#### 14.20.3.18 input\_analog\_2

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_2`

Analog input 2.

Definition at line 1796 of file [gclib.cs](#).

#### 14.20.3.19 input\_analog\_3

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_3`

Analog input 3.

Definition at line 1797 of file [gclib.cs](#).

#### 14.20.3.20 input\_analog\_4

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_4`

Analog input 4.

Definition at line 1798 of file [gclib.cs](#).

#### 14.20.3.21 input\_analog\_5

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_5`

Analog input 5.

Definition at line 1799 of file [gclib.cs](#).

#### 14.20.3.22 input\_analog\_6

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_6`

Analog input 6.

Definition at line 1800 of file [gclib.cs](#).

#### 14.20.3.23 input\_analog\_7

[UW](#) `gclib.GDataRecord47000_ENC.input_analog_7`

Analog input 7.

Definition at line [1801](#) of file [gclib.cs](#).

#### 14.20.3.24 output\_bank\_0

[UW](#) `gclib.GDataRecord47000_ENC.output_bank_0`

Digital outputs 0-15;.

Definition at line [1803](#) of file [gclib.cs](#).

#### 14.20.3.25 input\_bank\_0

[UW](#) `gclib.GDataRecord47000_ENC.input_bank_0`

Digital inputs 0-15;.

Definition at line [1805](#) of file [gclib.cs](#).

#### 14.20.3.26 pulse\_count\_0

[UL](#) `gclib.GDataRecord47000_ENC.pulse_count_0`

Pulse counter (see PC).

Definition at line [1807](#) of file [gclib.cs](#).

#### 14.20.3.27 zc\_variable

[SL](#) `gclib.GDataRecord47000_ENC.zc_variable`

ZC User-defined variable (see ZC).

Definition at line [1808](#) of file [gclib.cs](#).

#### 14.20.3.28 zd\_variable

[SL](#) `gclib.GDataRecord47000_ENC.zd_variable`

ZD User-defined variable (see ZD).

Definition at line [1809](#) of file [gclib.cs](#).

#### 14.20.3.29 encoder\_0

[SL](#) `gclib.GDataRecord47000_ENC.encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line [1811](#) of file [gclib.cs](#).

#### 14.20.3.30 encoder\_1

[SL](#) `gclib.GDataRecord47000_ENC.encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line [1812](#) of file [gclib.cs](#).

#### 14.20.3.31 encoder\_2

[SL](#) `gclib.GDataRecord47000_ENC.encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line [1813](#) of file [gclib.cs](#).

#### 14.20.3.32 encoder\_3

[SL](#) `gclib.GDataRecord47000_ENC.encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line [1814](#) of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.21 GDataRecord47000\_ENC Struct Reference

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.

```
#include <gclib_record.h>
```

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*
- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*
- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*

- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)  
*Analog input 7.*
- [UW output\\_bank\\_0](#)  
*Digital outputs 0-15;.*
- [UW input\\_bank\\_0](#)  
*Digital inputs 0-15;.*
- [UL pulse\\_count\\_0](#)  
*Pulse counter (see PC).*
- [SL zc\\_variable](#)  
*ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)  
*ZD User-defined variable (see ZD).*
- [SL encoder\\_0](#)  
*Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_1](#)  
*Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_2](#)  
*Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_3](#)  
*Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.21.1 Detailed Description

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.  
Definition at line 866 of file [gclib\\_record.h](#).

### 14.21.2 Member Data Documentation

#### 14.21.2.1 header\_0

[UB](#) `GDataRecord47000_ENC::header_0`

1st Byte of Header.

Definition at line 871 of file [gclib\\_record.h](#).

#### 14.21.2.2 header\_1

[UB](#) `GDataRecord47000_ENC::header_1`

2nd Byte of Header.

Definition at line 872 of file [gclib\\_record.h](#).

#### 14.21.2.3 header\_2

[UB](#) `GDataRecord47000_ENC::header_2`

3rd Byte of Header.

Definition at line 873 of file [gclib\\_record.h](#).

#### 14.21.2.4 header\_3

[UB](#) `GDataRecord47000_ENC::header_3`

4th Byte of Header.

Definition at line 874 of file [gclib\\_record.h](#).

#### 14.21.2.5 sample\_number

[UW](#) `GDataRecord47000_ENC::sample_number`

Sample number.

Definition at line 876 of file [gclib\\_record.h](#).

#### 14.21.2.6 error\_code

[UB](#) `GDataRecord47000_ENC::error_code`

Error code.

Definition at line 877 of file [gclib\\_record.h](#).

#### 14.21.2.7 general\_status

[UB](#) `GDataRecord47000_ENC::general_status`

General status.

Definition at line 878 of file [gclib\\_record.h](#).

#### 14.21.2.8 output\_analog\_0

[UW](#) `GDataRecord47000_ENC::output_analog_0`

Analog output 0.

Definition at line 880 of file [gclib\\_record.h](#).

#### 14.21.2.9 output\_analog\_1

[UW](#) `GDataRecord47000_ENC::output_analog_1`

Analog output 1.

Definition at line 881 of file [gclib\\_record.h](#).

#### 14.21.2.10 output\_analog\_2

[UW](#) `GDataRecord47000_ENC::output_analog_2`

Analog output 2.

Definition at line 882 of file [gclib\\_record.h](#).

#### 14.21.2.11 output\_analog\_3

[UW](#) `GDataRecord47000_ENC::output_analog_3`

Analog output 3.

Definition at line 883 of file [gclib\\_record.h](#).

#### 14.21.2.12 output\_analog\_4

[UW](#) `GDataRecord47000_ENC::output_analog_4`

Analog output 4.

Definition at line 884 of file [gclib\\_record.h](#).

#### 14.21.2.13 output\_analog\_5

[UW](#) `GDataRecord47000_ENC::output_analog_5`

Analog output 5.

Definition at line 885 of file [gclib\\_record.h](#).

#### 14.21.2.14 output\_analog\_6

[UW](#) `GDataRecord47000_ENC::output_analog_6`

Analog output 6.

Definition at line 886 of file [gclib\\_record.h](#).

#### 14.21.2.15 output\_analog\_7

[UW](#) GDataRecord47000\_ENC::output\_analog\_7

Analog output 7.

Definition at line 887 of file [gclib\\_record.h](#).

#### 14.21.2.16 input\_analog\_0

[UW](#) GDataRecord47000\_ENC::input\_analog\_0

Analog input 0.

Definition at line 889 of file [gclib\\_record.h](#).

#### 14.21.2.17 input\_analog\_1

[UW](#) GDataRecord47000\_ENC::input\_analog\_1

Analog input 1.

Definition at line 890 of file [gclib\\_record.h](#).

#### 14.21.2.18 input\_analog\_2

[UW](#) GDataRecord47000\_ENC::input\_analog\_2

Analog input 2.

Definition at line 891 of file [gclib\\_record.h](#).

#### 14.21.2.19 input\_analog\_3

[UW](#) GDataRecord47000\_ENC::input\_analog\_3

Analog input 3.

Definition at line 892 of file [gclib\\_record.h](#).

#### 14.21.2.20 input\_analog\_4

[UW](#) GDataRecord47000\_ENC::input\_analog\_4

Analog input 4.

Definition at line 893 of file [gclib\\_record.h](#).

#### 14.21.2.21 input\_analog\_5

[UW](#) GDataRecord47000\_ENC::input\_analog\_5

Analog input 5.

Definition at line 894 of file [gclib\\_record.h](#).

#### 14.21.2.22 input\_analog\_6

[UW](#) GDataRecord47000\_ENC::input\_analog\_6

Analog input 6.

Definition at line 895 of file [gclib\\_record.h](#).

#### 14.21.2.23 input\_analog\_7

[UW](#) GDataRecord47000\_ENC::input\_analog\_7

Analog input 7.

Definition at line 896 of file [gclib\\_record.h](#).

#### 14.21.2.24 output\_bank\_0

[UW](#) GDataRecord47000\_ENC::output\_bank\_0

Digital outputs 0-15;.

Definition at line 898 of file [gclib\\_record.h](#).

#### 14.21.2.25 input\_bank\_0

[UW](#) `GDataRecord47000_ENC::input_bank_0`

Digital inputs 0-15;

Definition at line 900 of file [gclib\\_record.h](#).

#### 14.21.2.26 pulse\_count\_0

[UL](#) `GDataRecord47000_ENC::pulse_count_0`

Pulse counter (see PC).

Definition at line 902 of file [gclib\\_record.h](#).

#### 14.21.2.27 zc\_variable

[SL](#) `GDataRecord47000_ENC::zc_variable`

ZC User-defined variable (see ZC).

Definition at line 903 of file [gclib\\_record.h](#).

#### 14.21.2.28 zd\_variable

[SL](#) `GDataRecord47000_ENC::zd_variable`

ZD User-defined variable (see ZD).

Definition at line 904 of file [gclib\\_record.h](#).

#### 14.21.2.29 encoder\_0

[SL](#) `GDataRecord47000_ENC::encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 906 of file [gclib\\_record.h](#).

#### 14.21.2.30 encoder\_1

[SL](#) `GDataRecord47000_ENC::encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 907 of file [gclib\\_record.h](#).

#### 14.21.2.31 encoder\_2

[SL](#) `GDataRecord47000_ENC::encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 908 of file [gclib\\_record.h](#).

#### 14.21.2.32 encoder\_3

[SL](#) `GDataRecord47000_ENC::encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 909 of file [gclib\\_record.h](#).

The documentation for this struct was generated from the following file:

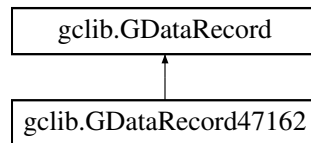
- [gclib\\_record.h](#)

## 14.22 gclib.GDataRecord47162 Struct Reference

Data record struct for RIO-47162.

Inheritance diagram for `gclib.GDataRecord47162`:





### Public Member Functions

- `byte[] byte\_array ()`  
*Returns the data record as a byte array and allows for access to individual bytes.*

### Public Attributes

- `UB header\_0`  
*1st Byte of Header.*
- `UB header\_1`  
*2nd Byte of Header.*
- `UB header\_2`  
*3rd Byte of Header.*
- `UB header\_3`  
*4th Byte of Header.*
- `UW sample\_number`  
*Sample number.*
- `UB error\_code`  
*Error code.*
- `UB general\_status`  
*General status.*
- `UW output\_analog\_0`  
*Analog output 0.*
- `UW output\_analog\_1`  
*Analog output 1.*
- `UW output\_analog\_2`  
*Analog output 2.*
- `UW output\_analog\_3`  
*Analog output 3.*
- `UW output\_analog\_4`  
*Analog output 4.*
- `UW output\_analog\_5`  
*Analog output 5.*
- `UW output\_analog\_6`  
*Analog output 6.*
- `UW output\_analog\_7`  
*Analog output 7.*
- `UW input\_analog\_0`  
*Analog input 0.*
- `UW input\_analog\_1`  
*Analog input 1.*
- `UW input\_analog\_2`  
*Analog input 2.*
- `UW input\_analog\_3`  
*Analog input 3.*
- `UW input\_analog\_4`

- Analog input 4.*
- [UW input\\_analog\\_5](#)
- Analog input 5.*
- [UW input\\_analog\\_6](#)
- Analog input 6.*
- [UW input\\_analog\\_7](#)
- Analog input 7.*
- [UB output\\_byte\\_0](#)
- Digital outputs 0-7.*
- [UB output\\_byte\\_1](#)
- Digital outputs 8-15.*
- [UB output\\_byte\\_2](#)
- Digital outputs 16-23.*
- [UB input\\_byte\\_0](#)
- Digital inputs 0-7.*
- [UB input\\_byte\\_1](#)
- Digital inputs 8-15.*
- [UB input\\_byte\\_2](#)
- Digital inputs 16-23.*
- [UB input\\_byte\\_3](#)
- Digital inputs 24-31.*
- [UB input\\_byte\\_4](#)
- Digital inputs 32-39.*
- [UL pulse\\_count\\_0](#)
- Pulse counter (see PC).*
- [SL zc\\_variable](#)
- ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)
- ZD User-defined variable (see ZD).*
- [SL encoder\\_0](#)
- Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_1](#)
- Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_2](#)
- Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_3](#)
- Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.22.1 Detailed Description

Data record struct for RIO-47162.  
Definition at line 1925 of file [gclib.cs](#).

### 14.22.2 Member Function Documentation

#### 14.22.2.1 `byte_array()`

```
byte[] gclib.GDataRecord47162.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line 1927 of file [gclib.cs](#).

## 14.22.3 Member Data Documentation

### 14.22.3.1 header\_0

UB `gclib.GDataRecord47162.header_0`

1st Byte of Header.

Definition at line 1930 of file [gclib.cs](#).

### 14.22.3.2 header\_1

UB `gclib.GDataRecord47162.header_1`

2nd Byte of Header.

Definition at line 1931 of file [gclib.cs](#).

### 14.22.3.3 header\_2

UB `gclib.GDataRecord47162.header_2`

3rd Byte of Header.

Definition at line 1932 of file [gclib.cs](#).

### 14.22.3.4 header\_3

UB `gclib.GDataRecord47162.header_3`

4th Byte of Header.

Definition at line 1933 of file [gclib.cs](#).

### 14.22.3.5 sample\_number

UW `gclib.GDataRecord47162.sample_number`

Sample number.

Definition at line 1935 of file [gclib.cs](#).

### 14.22.3.6 error\_code

UB `gclib.GDataRecord47162.error_code`

Error code.

Definition at line 1936 of file [gclib.cs](#).

### 14.22.3.7 general\_status

UB `gclib.GDataRecord47162.general_status`

General status.

Definition at line 1937 of file [gclib.cs](#).

### 14.22.3.8 output\_analog\_0

UW `gclib.GDataRecord47162.output_analog_0`

Analog output 0.

Definition at line 1939 of file [gclib.cs](#).

### 14.22.3.9 output\_analog\_1

UW `gclib.GDataRecord47162.output_analog_1`

Analog output 1.

Definition at line 1940 of file [gclib.cs](#).

### 14.22.3.10 output\_analog\_2

UW `gclib.GDataRecord47162.output_analog_2`

Analog output 2.

Definition at line 1941 of file [gclib.cs](#).

#### 14.22.3.11 output\_analog\_3

[UW](#) `gclib.GDataRecord47162.output_analog_3`

Analog output 3.

Definition at line 1942 of file [gclib.cs](#).

#### 14.22.3.12 output\_analog\_4

[UW](#) `gclib.GDataRecord47162.output_analog_4`

Analog output 4.

Definition at line 1943 of file [gclib.cs](#).

#### 14.22.3.13 output\_analog\_5

[UW](#) `gclib.GDataRecord47162.output_analog_5`

Analog output 5.

Definition at line 1944 of file [gclib.cs](#).

#### 14.22.3.14 output\_analog\_6

[UW](#) `gclib.GDataRecord47162.output_analog_6`

Analog output 6.

Definition at line 1945 of file [gclib.cs](#).

#### 14.22.3.15 output\_analog\_7

[UW](#) `gclib.GDataRecord47162.output_analog_7`

Analog output 7.

Definition at line 1946 of file [gclib.cs](#).

#### 14.22.3.16 input\_analog\_0

[UW](#) `gclib.GDataRecord47162.input_analog_0`

Analog input 0.

Definition at line 1948 of file [gclib.cs](#).

#### 14.22.3.17 input\_analog\_1

[UW](#) `gclib.GDataRecord47162.input_analog_1`

Analog input 1.

Definition at line 1949 of file [gclib.cs](#).

#### 14.22.3.18 input\_analog\_2

[UW](#) `gclib.GDataRecord47162.input_analog_2`

Analog input 2.

Definition at line 1950 of file [gclib.cs](#).

#### 14.22.3.19 input\_analog\_3

[UW](#) `gclib.GDataRecord47162.input_analog_3`

Analog input 3.

Definition at line 1951 of file [gclib.cs](#).

#### 14.22.3.20 input\_analog\_4

[UW](#) `gclib.GDataRecord47162.input_analog_4`

Analog input 4.

Definition at line 1952 of file [gclib.cs](#).

#### 14.22.3.21 input\_analog\_5

[UW](#) `gclib.GDataRecord47162.input_analog_5`

Analog input 5.

Definition at line 1953 of file [gclib.cs](#).

#### 14.22.3.22 input\_analog\_6

[UW](#) `gclib.GDataRecord47162.input_analog_6`

Analog input 6.

Definition at line 1954 of file [gclib.cs](#).

#### 14.22.3.23 input\_analog\_7

[UW](#) `gclib.GDataRecord47162.input_analog_7`

Analog input 7.

Definition at line 1955 of file [gclib.cs](#).

#### 14.22.3.24 output\_byte\_0

[UB](#) `gclib.GDataRecord47162.output_byte_0`

Digital outputs 0-7.

Definition at line 1957 of file [gclib.cs](#).

#### 14.22.3.25 output\_byte\_1

[UB](#) `gclib.GDataRecord47162.output_byte_1`

Digital outputs 8-15.

Definition at line 1958 of file [gclib.cs](#).

#### 14.22.3.26 output\_byte\_2

[UB](#) `gclib.GDataRecord47162.output_byte_2`

Digital outputs 16-23.

Definition at line 1959 of file [gclib.cs](#).

#### 14.22.3.27 input\_byte\_0

[UB](#) `gclib.GDataRecord47162.input_byte_0`

Digital inputs 0-7.

Definition at line 1961 of file [gclib.cs](#).

#### 14.22.3.28 input\_byte\_1

[UB](#) `gclib.GDataRecord47162.input_byte_1`

Digital inputs 8-15.

Definition at line 1962 of file [gclib.cs](#).

#### 14.22.3.29 input\_byte\_2

[UB](#) `gclib.GDataRecord47162.input_byte_2`

Digital inputs 16-23.

Definition at line 1963 of file [gclib.cs](#).

#### 14.22.3.30 input\_byte\_3

[UB](#) `gclib.GDataRecord47162.input_byte_3`

Digital inputs 24-31.

Definition at line 1964 of file [gclib.cs](#).

#### 14.22.3.31 input\_byte\_4

[UB](#) `gclib.GDataRecord47162.input_byte_4`

Digital inputs 32-39.

Definition at line 1965 of file [gclib.cs](#).

#### 14.22.3.32 pulse\_count\_0

[UL](#) `gclib.GDataRecord47162.pulse_count_0`

Pulse counter (see PC).

Definition at line 1967 of file [gclib.cs](#).

#### 14.22.3.33 zc\_variable

[SL](#) `gclib.GDataRecord47162.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1968 of file [gclib.cs](#).

#### 14.22.3.34 zd\_variable

[SL](#) `gclib.GDataRecord47162.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1969 of file [gclib.cs](#).

#### 14.22.3.35 encoder\_0

[SL](#) `gclib.GDataRecord47162.encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1971 of file [gclib.cs](#).

#### 14.22.3.36 encoder\_1

[SL](#) `gclib.GDataRecord47162.encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1972 of file [gclib.cs](#).

#### 14.22.3.37 encoder\_2

[SL](#) `gclib.GDataRecord47162.encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1973 of file [gclib.cs](#).

#### 14.22.3.38 encoder\_3

[SL](#) `gclib.GDataRecord47162.encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1974 of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.23 GDataRecord47162 Struct Reference

Data record struct for RIO-47162.

```
#include <gclib_record.h>
```

**Public Attributes**

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*
- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*
- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*
- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)  
*Analog input 7.*
- [UB output\\_byte\\_0](#)  
*Digital outputs 0-7.*
- [UB output\\_byte\\_1](#)

- Digital outputs 8-15.*
  - [UB output\\_byte\\_2](#)
  - Digital outputs 16-23.*
  - [UB input\\_byte\\_0](#)
  - Digital inputs 0-7.*
  - [UB input\\_byte\\_1](#)
  - Digital inputs 8-15.*
  - [UB input\\_byte\\_2](#)
  - Digital inputs 16-23.*
  - [UB input\\_byte\\_3](#)
  - Digital inputs 24-31.*
  - [UB input\\_byte\\_4](#)
  - Digital inputs 32-39.*
  - [UL pulse\\_count\\_0](#)
  - Pulse counter (see PC).*
  - [SL zc\\_variable](#)
  - ZC User-defined variable (see ZC).*
  - [SL zd\\_variable](#)
  - ZD User-defined variable (see ZD).*
  - [SL encoder\\_0](#)
  - Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
  - [SL encoder\\_1](#)
  - Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
  - [SL encoder\\_2](#)
  - Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
  - [SL encoder\\_3](#)
  - Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.23.1 Detailed Description

Data record struct for RIO-47162.

Definition at line 1015 of file [gclib\\_record.h](#).

### 14.23.2 Member Data Documentation

#### 14.23.2.1 header\_0

[UB](#) `GDataRecord47162::header_0`

1st Byte of Header.

Definition at line 1019 of file [gclib\\_record.h](#).

#### 14.23.2.2 header\_1

[UB](#) `GDataRecord47162::header_1`

2nd Byte of Header.

Definition at line 1020 of file [gclib\\_record.h](#).

#### 14.23.2.3 header\_2

[UB](#) `GDataRecord47162::header_2`

3rd Byte of Header.

Definition at line 1021 of file [gclib\\_record.h](#).



#### 14.23.2.4 header\_3

[UB](#) GDataRecord47162::header\_3

4th Byte of Header.

Definition at line [1022](#) of file [gclib\\_record.h](#).

#### 14.23.2.5 sample\_number

[UW](#) GDataRecord47162::sample\_number

Sample number.

Definition at line [1024](#) of file [gclib\\_record.h](#).

#### 14.23.2.6 error\_code

[UB](#) GDataRecord47162::error\_code

Error code.

Definition at line [1025](#) of file [gclib\\_record.h](#).

#### 14.23.2.7 general\_status

[UB](#) GDataRecord47162::general\_status

General status.

Definition at line [1026](#) of file [gclib\\_record.h](#).

#### 14.23.2.8 output\_analog\_0

[UW](#) GDataRecord47162::output\_analog\_0

Analog output 0.

Definition at line [1028](#) of file [gclib\\_record.h](#).

#### 14.23.2.9 output\_analog\_1

[UW](#) GDataRecord47162::output\_analog\_1

Analog output 1.

Definition at line [1029](#) of file [gclib\\_record.h](#).

#### 14.23.2.10 output\_analog\_2

[UW](#) GDataRecord47162::output\_analog\_2

Analog output 2.

Definition at line [1030](#) of file [gclib\\_record.h](#).

#### 14.23.2.11 output\_analog\_3

[UW](#) GDataRecord47162::output\_analog\_3

Analog output 3.

Definition at line [1031](#) of file [gclib\\_record.h](#).

#### 14.23.2.12 output\_analog\_4

[UW](#) GDataRecord47162::output\_analog\_4

Analog output 4.

Definition at line [1032](#) of file [gclib\\_record.h](#).

#### 14.23.2.13 output\_analog\_5

[UW](#) GDataRecord47162::output\_analog\_5

Analog output 5.

Definition at line [1033](#) of file [gclib\\_record.h](#).

#### 14.23.2.14 output\_analog\_6

[UW](#) `GDataRecord47162::output_analog_6`

Analog output 6.

Definition at line 1034 of file [gclib\\_record.h](#).

#### 14.23.2.15 output\_analog\_7

[UW](#) `GDataRecord47162::output_analog_7`

Analog output 7.

Definition at line 1035 of file [gclib\\_record.h](#).

#### 14.23.2.16 input\_analog\_0

[UW](#) `GDataRecord47162::input_analog_0`

Analog input 0.

Definition at line 1037 of file [gclib\\_record.h](#).

#### 14.23.2.17 input\_analog\_1

[UW](#) `GDataRecord47162::input_analog_1`

Analog input 1.

Definition at line 1038 of file [gclib\\_record.h](#).

#### 14.23.2.18 input\_analog\_2

[UW](#) `GDataRecord47162::input_analog_2`

Analog input 2.

Definition at line 1039 of file [gclib\\_record.h](#).

#### 14.23.2.19 input\_analog\_3

[UW](#) `GDataRecord47162::input_analog_3`

Analog input 3.

Definition at line 1040 of file [gclib\\_record.h](#).

#### 14.23.2.20 input\_analog\_4

[UW](#) `GDataRecord47162::input_analog_4`

Analog input 4.

Definition at line 1041 of file [gclib\\_record.h](#).

#### 14.23.2.21 input\_analog\_5

[UW](#) `GDataRecord47162::input_analog_5`

Analog input 5.

Definition at line 1042 of file [gclib\\_record.h](#).

#### 14.23.2.22 input\_analog\_6

[UW](#) `GDataRecord47162::input_analog_6`

Analog input 6.

Definition at line 1043 of file [gclib\\_record.h](#).

#### 14.23.2.23 input\_analog\_7

[UW](#) `GDataRecord47162::input_analog_7`

Analog input 7.

Definition at line 1044 of file [gclib\\_record.h](#).

#### 14.23.2.24 output\_byte\_0

[UB](#) GDataRecord47162::output\_byte\_0

Digital outputs 0-7.

Definition at line 1046 of file [gclib\\_record.h](#).

#### 14.23.2.25 output\_byte\_1

[UB](#) GDataRecord47162::output\_byte\_1

Digital outputs 8-15.

Definition at line 1047 of file [gclib\\_record.h](#).

#### 14.23.2.26 output\_byte\_2

[UB](#) GDataRecord47162::output\_byte\_2

Digital outputs 16-23.

Definition at line 1048 of file [gclib\\_record.h](#).

#### 14.23.2.27 input\_byte\_0

[UB](#) GDataRecord47162::input\_byte\_0

Digital inputs 0-7.

Definition at line 1050 of file [gclib\\_record.h](#).

#### 14.23.2.28 input\_byte\_1

[UB](#) GDataRecord47162::input\_byte\_1

Digital inputs 8-15.

Definition at line 1051 of file [gclib\\_record.h](#).

#### 14.23.2.29 input\_byte\_2

[UB](#) GDataRecord47162::input\_byte\_2

Digital inputs 16-23.

Definition at line 1052 of file [gclib\\_record.h](#).

#### 14.23.2.30 input\_byte\_3

[UB](#) GDataRecord47162::input\_byte\_3

Digital inputs 24-31.

Definition at line 1053 of file [gclib\\_record.h](#).

#### 14.23.2.31 input\_byte\_4

[UB](#) GDataRecord47162::input\_byte\_4

Digital inputs 32-39.

Definition at line 1054 of file [gclib\\_record.h](#).

#### 14.23.2.32 pulse\_count\_0

[UL](#) GDataRecord47162::pulse\_count\_0

Pulse counter (see PC).

Definition at line 1056 of file [gclib\\_record.h](#).

#### 14.23.2.33 zc\_variable

[SL](#) GDataRecord47162::zc\_variable

ZC User-defined variable (see ZC).

Definition at line 1057 of file [gclib\\_record.h](#).

#### 14.23.2.34 `zd_variable`

[SL](#) `GDataRecord47162::zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1058 of file [gclib\\_record.h](#).

#### 14.23.2.35 `encoder_0`

[SL](#) `GDataRecord47162::encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1060 of file [gclib\\_record.h](#).

#### 14.23.2.36 `encoder_1`

[SL](#) `GDataRecord47162::encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1061 of file [gclib\\_record.h](#).

#### 14.23.2.37 `encoder_2`

[SL](#) `GDataRecord47162::encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1062 of file [gclib\\_record.h](#).

#### 14.23.2.38 `encoder_3`

[SL](#) `GDataRecord47162::encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1063 of file [gclib\\_record.h](#).

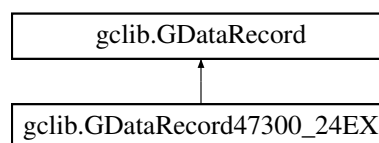
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

## 14.24 `gclib.GDataRecord47300_24EX` Struct Reference

Data record struct for RIO-47300 with 24EX I/O daughter board.

Inheritance diagram for `gclib.GDataRecord47300_24EX`:



### Public Member Functions

- `byte[] byte\_array ()`

*Returns the data record as a byte array and allows for access to individual bytes.*

### Public Attributes

- `UB header\_0`

*1st Byte of Header.*

- `UB header\_1`

*2nd Byte of Header.*

- `UB header\_2`

*3rd Byte of Header.*

- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*
- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*
- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*
- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)  
*Analog input 7.*
- [UW output\\_bank\\_0](#)  
*Digital outputs 0-15.*
- [UW output\\_bank\\_1](#)  
*Digital outputs 16-23.*
- [UW input\\_bank\\_0](#)  
*Digital inputs 0-15.*
- [UW input\\_bank\\_1](#)  
*Digital inputs 16-23.*
- [UL pulse\\_count\\_0](#)  
*Pulse counter (see PC)8.*
- [SL zc\\_variable](#)

- ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)  
*ZD User-defined variable (see ZD).*
- [UW output\\_bank\\_2](#)  
*Digital outputs 24-39. Data only valid for parts with 24EXOUT.*
- [UW output\\_back\\_3](#)  
*Digital outputs 40-47. Data only valid for parts with 24EXOUT.*
- [UW input\\_bank\\_2](#)  
*Digital inputs 24-39. Data only valid for parts with 24EXIN.*
- [UW input\\_bank\\_3](#)  
*Digital inputs 40-47. Data only valid for parts with 24EXIN.*

### 14.24.1 Detailed Description

Data record struct for RIO-47300 with 24EX I/O daughter board.  
Definition at line [1872](#) of file [gclib.cs](#).

### 14.24.2 Member Function Documentation

#### 14.24.2.1 byte\_array()

```
byte[] gclib.GDataRecord47300_24EX.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line [1874](#) of file [gclib.cs](#).

### 14.24.3 Member Data Documentation

#### 14.24.3.1 header\_0

```
UB gclib.GDataRecord47300_24EX.header_0
```

1st Byte of Header.  
Definition at line [1878](#) of file [gclib.cs](#).

#### 14.24.3.2 header\_1

```
UB gclib.GDataRecord47300_24EX.header_1
```

2nd Byte of Header.  
Definition at line [1879](#) of file [gclib.cs](#).

#### 14.24.3.3 header\_2

```
UB gclib.GDataRecord47300_24EX.header_2
```

3rd Byte of Header.  
Definition at line [1880](#) of file [gclib.cs](#).

#### 14.24.3.4 header\_3

```
UB gclib.GDataRecord47300_24EX.header_3
```

4th Byte of Header.  
Definition at line [1881](#) of file [gclib.cs](#).

#### 14.24.3.5 sample\_number

```
UW gclib.GDataRecord47300_24EX.sample_number
```

Sample number.  
Definition at line [1883](#) of file [gclib.cs](#).

#### 14.24.3.6 error\_code

[UB](#) `gclib.GDataRecord47300_24EX.error_code`

Error code.

Definition at line [1884](#) of file [gclib.cs](#).

#### 14.24.3.7 general\_status

[UB](#) `gclib.GDataRecord47300_24EX.general_status`

General status.

Definition at line [1885](#) of file [gclib.cs](#).

#### 14.24.3.8 output\_analog\_0

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_0`

Analog output 0.

Definition at line [1887](#) of file [gclib.cs](#).

#### 14.24.3.9 output\_analog\_1

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_1`

Analog output 1.

Definition at line [1888](#) of file [gclib.cs](#).

#### 14.24.3.10 output\_analog\_2

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_2`

Analog output 2.

Definition at line [1889](#) of file [gclib.cs](#).

#### 14.24.3.11 output\_analog\_3

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_3`

Analog output 3.

Definition at line [1890](#) of file [gclib.cs](#).

#### 14.24.3.12 output\_analog\_4

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_4`

Analog output 4.

Definition at line [1891](#) of file [gclib.cs](#).

#### 14.24.3.13 output\_analog\_5

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_5`

Analog output 5.

Definition at line [1892](#) of file [gclib.cs](#).

#### 14.24.3.14 output\_analog\_6

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_6`

Analog output 6.

Definition at line [1893](#) of file [gclib.cs](#).

#### 14.24.3.15 output\_analog\_7

[UW](#) `gclib.GDataRecord47300_24EX.output_analog_7`

Analog output 7.

Definition at line [1894](#) of file [gclib.cs](#).

#### 14.24.3.16 input\_analog\_0

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_0`

Analog input 0.

Definition at line 1896 of file [gclib.cs](#).

#### 14.24.3.17 input\_analog\_1

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_1`

Analog input 1.

Definition at line 1897 of file [gclib.cs](#).

#### 14.24.3.18 input\_analog\_2

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_2`

Analog input 2.

Definition at line 1898 of file [gclib.cs](#).

#### 14.24.3.19 input\_analog\_3

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_3`

Analog input 3.

Definition at line 1899 of file [gclib.cs](#).

#### 14.24.3.20 input\_analog\_4

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_4`

Analog input 4.

Definition at line 1900 of file [gclib.cs](#).

#### 14.24.3.21 input\_analog\_5

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_5`

Analog input 5.

Definition at line 1901 of file [gclib.cs](#).

#### 14.24.3.22 input\_analog\_6

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_6`

Analog input 6.

Definition at line 1902 of file [gclib.cs](#).

#### 14.24.3.23 input\_analog\_7

[UW](#) `gclib.GDataRecord47300_24EX.input_analog_7`

Analog input 7.

Definition at line 1903 of file [gclib.cs](#).

#### 14.24.3.24 output\_bank\_0

[UW](#) `gclib.GDataRecord47300_24EX.output_bank_0`

Digital outputs 0-15.

Definition at line 1905 of file [gclib.cs](#).

#### 14.24.3.25 output\_bank\_1

[UW](#) `gclib.GDataRecord47300_24EX.output_bank_1`

Digital outputs 16-23.

Definition at line 1906 of file [gclib.cs](#).



#### 14.24.3.26 input\_bank\_0

[UW](#) `gclib.GDataRecord47300_24EX.input_bank_0`

Digital inputs 0-15.

Definition at line 1908 of file [gclib.cs](#).

#### 14.24.3.27 input\_bank\_1

[UW](#) `gclib.GDataRecord47300_24EX.input_bank_1`

Digital inputs 16-23.

Definition at line 1909 of file [gclib.cs](#).

#### 14.24.3.28 pulse\_count\_0

[UL](#) `gclib.GDataRecord47300_24EX.pulse_count_0`

Pulse counter (see PC)8.

Definition at line 1911 of file [gclib.cs](#).

#### 14.24.3.29 zc\_variable

[SL](#) `gclib.GDataRecord47300_24EX.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1912 of file [gclib.cs](#).

#### 14.24.3.30 zd\_variable

[SL](#) `gclib.GDataRecord47300_24EX.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1913 of file [gclib.cs](#).

#### 14.24.3.31 output\_bank\_2

[UW](#) `gclib.GDataRecord47300_24EX.output_bank_2`

Digital outputs 24-39. Data only valid for parts with 24EXOUT.

Definition at line 1915 of file [gclib.cs](#).

#### 14.24.3.32 output\_bank\_3

[UW](#) `gclib.GDataRecord47300_24EX.output_bank_3`

Digital outputs 40-47. Data only valid for parts with 24EXOUT.

Definition at line 1916 of file [gclib.cs](#).

#### 14.24.3.33 input\_bank\_2

[UW](#) `gclib.GDataRecord47300_24EX.input_bank_2`

Digital inputs 24-39. Data only valid for parts with 24EXIN.

Definition at line 1918 of file [gclib.cs](#).

#### 14.24.3.34 input\_bank\_3

[UW](#) `gclib.GDataRecord47300_24EX.input_bank_3`

Digital inputs 40-47. Data only valid for parts with 24EXIN.

Definition at line 1919 of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.25 GDataRecord47300\_24EX Struct Reference

Data record struct for RIO-47300 with 24EX I/O daughter board.

```
#include <gclib_record.h>
```

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*
- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*
- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*
- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)

- Analog input 7.*
- [UW output\\_bank\\_0](#)  
*Digital outputs 0-15.*
- [UW output\\_bank\\_1](#)  
*Digital outputs 16-23.*
- [UW input\\_bank\\_0](#)  
*Digital inputs 0-15.*
- [UW input\\_bank\\_1](#)  
*Digital inputs 16-23.*
- [UL pulse\\_count\\_0](#)  
*Pulse counter (see PC)8.*
- [SL zc\\_variable](#)  
*ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)  
*ZD User-defined variable (see ZD).*
- [UW output\\_bank\\_2](#)  
*Digital outputs 24-39. Data only valid for parts with 24EXOUT.*
- [UW output\\_bank\\_3](#)  
*Digital outputs 40-47. Data only valid for parts with 24EXOUT.*
- [UW input\\_bank\\_2](#)  
*Digital inputs 24-39. Data only valid for parts with 24EXIN.*
- [UW input\\_bank\\_3](#)  
*Digital inputs 40-47. Data only valid for parts with 24EXIN.*

### 14.25.1 Detailed Description

Data record struct for RIO-47300 with 24EX I/O daughter board.  
Definition at line 964 of file [gclib\\_record.h](#).

### 14.25.2 Member Data Documentation

#### 14.25.2.1 header\_0

[UB](#) `GDataRecord47300_24EX::header_0`  
1st Byte of Header.  
Definition at line 969 of file [gclib\\_record.h](#).

#### 14.25.2.2 header\_1

[UB](#) `GDataRecord47300_24EX::header_1`  
2nd Byte of Header.  
Definition at line 970 of file [gclib\\_record.h](#).

#### 14.25.2.3 header\_2

[UB](#) `GDataRecord47300_24EX::header_2`  
3rd Byte of Header.  
Definition at line 971 of file [gclib\\_record.h](#).

#### 14.25.2.4 header\_3

[UB](#) `GDataRecord47300_24EX::header_3`  
4th Byte of Header.  
Definition at line 972 of file [gclib\\_record.h](#).

#### 14.25.2.5 sample\_number

[UW](#) `GDataRecord47300_24EX::sample_number`

Sample number.

Definition at line 974 of file [gclib\\_record.h](#).

#### 14.25.2.6 error\_code

[UB](#) `GDataRecord47300_24EX::error_code`

Error code.

Definition at line 975 of file [gclib\\_record.h](#).

#### 14.25.2.7 general\_status

[UB](#) `GDataRecord47300_24EX::general_status`

General status.

Definition at line 976 of file [gclib\\_record.h](#).

#### 14.25.2.8 output\_analog\_0

[UW](#) `GDataRecord47300_24EX::output_analog_0`

Analog output 0.

Definition at line 978 of file [gclib\\_record.h](#).

#### 14.25.2.9 output\_analog\_1

[UW](#) `GDataRecord47300_24EX::output_analog_1`

Analog output 1.

Definition at line 979 of file [gclib\\_record.h](#).

#### 14.25.2.10 output\_analog\_2

[UW](#) `GDataRecord47300_24EX::output_analog_2`

Analog output 2.

Definition at line 980 of file [gclib\\_record.h](#).

#### 14.25.2.11 output\_analog\_3

[UW](#) `GDataRecord47300_24EX::output_analog_3`

Analog output 3.

Definition at line 981 of file [gclib\\_record.h](#).

#### 14.25.2.12 output\_analog\_4

[UW](#) `GDataRecord47300_24EX::output_analog_4`

Analog output 4.

Definition at line 982 of file [gclib\\_record.h](#).

#### 14.25.2.13 output\_analog\_5

[UW](#) `GDataRecord47300_24EX::output_analog_5`

Analog output 5.

Definition at line 983 of file [gclib\\_record.h](#).

#### 14.25.2.14 output\_analog\_6

[UW](#) `GDataRecord47300_24EX::output_analog_6`

Analog output 6.

Definition at line 984 of file [gclib\\_record.h](#).

#### 14.25.2.15 output\_analog\_7

[UW](#) `GDataRecord47300_24EX::output_analog_7`

Analog output 7.

Definition at line 985 of file [gclib\\_record.h](#).

#### 14.25.2.16 input\_analog\_0

[UW](#) `GDataRecord47300_24EX::input_analog_0`

Analog input 0.

Definition at line 987 of file [gclib\\_record.h](#).

#### 14.25.2.17 input\_analog\_1

[UW](#) `GDataRecord47300_24EX::input_analog_1`

Analog input 1.

Definition at line 988 of file [gclib\\_record.h](#).

#### 14.25.2.18 input\_analog\_2

[UW](#) `GDataRecord47300_24EX::input_analog_2`

Analog input 2.

Definition at line 989 of file [gclib\\_record.h](#).

#### 14.25.2.19 input\_analog\_3

[UW](#) `GDataRecord47300_24EX::input_analog_3`

Analog input 3.

Definition at line 990 of file [gclib\\_record.h](#).

#### 14.25.2.20 input\_analog\_4

[UW](#) `GDataRecord47300_24EX::input_analog_4`

Analog input 4.

Definition at line 991 of file [gclib\\_record.h](#).

#### 14.25.2.21 input\_analog\_5

[UW](#) `GDataRecord47300_24EX::input_analog_5`

Analog input 5.

Definition at line 992 of file [gclib\\_record.h](#).

#### 14.25.2.22 input\_analog\_6

[UW](#) `GDataRecord47300_24EX::input_analog_6`

Analog input 6.

Definition at line 993 of file [gclib\\_record.h](#).

#### 14.25.2.23 input\_analog\_7

[UW](#) `GDataRecord47300_24EX::input_analog_7`

Analog input 7.

Definition at line 994 of file [gclib\\_record.h](#).

#### 14.25.2.24 output\_bank\_0

[UW](#) `GDataRecord47300_24EX::output_bank_0`

Digital outputs 0-15.

Definition at line 996 of file [gclib\\_record.h](#).

#### 14.25.2.25 output\_bank\_1

[UW](#) `GDataRecord47300_24EX::output_bank_1`

Digital outputs 16-23.

Definition at line 997 of file [gclib\\_record.h](#).

#### 14.25.2.26 input\_bank\_0

[UW](#) `GDataRecord47300_24EX::input_bank_0`

Digital inputs 0-15.

Definition at line 999 of file [gclib\\_record.h](#).

#### 14.25.2.27 input\_bank\_1

[UW](#) `GDataRecord47300_24EX::input_bank_1`

Digital inputs 16-23.

Definition at line 1000 of file [gclib\\_record.h](#).

#### 14.25.2.28 pulse\_count\_0

[UL](#) `GDataRecord47300_24EX::pulse_count_0`

Pulse counter (see PC)8.

Definition at line 1002 of file [gclib\\_record.h](#).

#### 14.25.2.29 zc\_variable

[SL](#) `GDataRecord47300_24EX::zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1003 of file [gclib\\_record.h](#).

#### 14.25.2.30 zd\_variable

[SL](#) `GDataRecord47300_24EX::zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1004 of file [gclib\\_record.h](#).

#### 14.25.2.31 output\_bank\_2

[UW](#) `GDataRecord47300_24EX::output_bank_2`

Digital outputs 24-39. Data only valid for parts with 24EXOUT.

Definition at line 1006 of file [gclib\\_record.h](#).

#### 14.25.2.32 output\_bank\_3

[UW](#) `GDataRecord47300_24EX::output_bank_3`

Digital outputs 40-47. Data only valid for parts with 24EXOUT.

Definition at line 1007 of file [gclib\\_record.h](#).

#### 14.25.2.33 input\_bank\_2

[UW](#) `GDataRecord47300_24EX::input_bank_2`

Digital inputs 24-39. Data only valid for parts with 24EXIN.

Definition at line 1009 of file [gclib\\_record.h](#).

#### 14.25.2.34 input\_bank\_3

[UW](#) `GDataRecord47300_24EX::input_bank_3`

Digital inputs 40-47. Data only valid for parts with 24EXIN.

Definition at line 1010 of file [gclib\\_record.h](#).

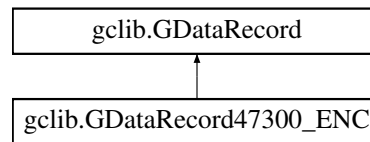
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

## 14.26 gclib.GDataRecord47300\_ENC Struct Reference

Data record struct for RIO-47300. Includes encoder fields.

Inheritance diagram for gclib.GDataRecord47300\_ENC:



### Public Member Functions

- [byte\[\] byte\\_array \(\)](#)  
*Returns the data record as a byte array and allows for access to individual bytes.*

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*
- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*

- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*
- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)  
*Analog input 7.*
- [UW output\\_bank\\_0](#)  
*Digital outputs 0-15;.*
- [UW output\\_bank\\_1](#)  
*Digital outputs 16-23;.*
- [UW input\\_bank\\_0](#)  
*Digital inputs 0-15;.*
- [UW input\\_bank\\_1](#)  
*Digital inputs 16-23;.*
- [UL pulse\\_count\\_0](#)  
*Pulse counter (see PC).*
- [SL zc\\_variable](#)  
*ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)  
*ZD User-defined variable (see ZD).*
- [SL encoder\\_0](#)  
*Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_1](#)  
*Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_2](#)  
*Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_3](#)  
*Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.26.1 Detailed Description

Data record struct for RIO-47300. Includes encoder fields.  
Definition at line 1820 of file [gclib.cs](#).

### 14.26.2 Member Function Documentation

#### 14.26.2.1 `byte_array()`

```
byte[] gclib.GDataRecord47300_ENC.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.

Implements [gclib.GDataRecord](#).

Definition at line 1822 of file [gclib.cs](#).



## 14.26.3 Member Data Documentation

### 14.26.3.1 header\_0

UB gclib.GDataRecord47300\_ENC.header\_0

1st Byte of Header.

Definition at line 1826 of file [gclib.cs](#).

### 14.26.3.2 header\_1

UB gclib.GDataRecord47300\_ENC.header\_1

2nd Byte of Header.

Definition at line 1827 of file [gclib.cs](#).

### 14.26.3.3 header\_2

UB gclib.GDataRecord47300\_ENC.header\_2

3rd Byte of Header.

Definition at line 1828 of file [gclib.cs](#).

### 14.26.3.4 header\_3

UB gclib.GDataRecord47300\_ENC.header\_3

4th Byte of Header.

Definition at line 1829 of file [gclib.cs](#).

### 14.26.3.5 sample\_number

UW gclib.GDataRecord47300\_ENC.sample\_number

Sample number.

Definition at line 1831 of file [gclib.cs](#).

### 14.26.3.6 error\_code

UB gclib.GDataRecord47300\_ENC.error\_code

Error code.

Definition at line 1832 of file [gclib.cs](#).

### 14.26.3.7 general\_status

UB gclib.GDataRecord47300\_ENC.general\_status

General status.

Definition at line 1833 of file [gclib.cs](#).

### 14.26.3.8 output\_analog\_0

UW gclib.GDataRecord47300\_ENC.output\_analog\_0

Analog output 0.

Definition at line 1835 of file [gclib.cs](#).

### 14.26.3.9 output\_analog\_1

UW gclib.GDataRecord47300\_ENC.output\_analog\_1

Analog output 1.

Definition at line 1836 of file [gclib.cs](#).

### 14.26.3.10 output\_analog\_2

UW gclib.GDataRecord47300\_ENC.output\_analog\_2

Analog output 2.

Definition at line 1837 of file [gclib.cs](#).

#### 14.26.3.11 output\_analog\_3

[UW](#) `gclib.GDataRecord47300_ENC.output_analog_3`

Analog output 3.

Definition at line 1838 of file [gclib.cs](#).

#### 14.26.3.12 output\_analog\_4

[UW](#) `gclib.GDataRecord47300_ENC.output_analog_4`

Analog output 4.

Definition at line 1839 of file [gclib.cs](#).

#### 14.26.3.13 output\_analog\_5

[UW](#) `gclib.GDataRecord47300_ENC.output_analog_5`

Analog output 5.

Definition at line 1840 of file [gclib.cs](#).

#### 14.26.3.14 output\_analog\_6

[UW](#) `gclib.GDataRecord47300_ENC.output_analog_6`

Analog output 6.

Definition at line 1841 of file [gclib.cs](#).

#### 14.26.3.15 output\_analog\_7

[UW](#) `gclib.GDataRecord47300_ENC.output_analog_7`

Analog output 7.

Definition at line 1842 of file [gclib.cs](#).

#### 14.26.3.16 input\_analog\_0

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_0`

Analog input 0.

Definition at line 1844 of file [gclib.cs](#).

#### 14.26.3.17 input\_analog\_1

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_1`

Analog input 1.

Definition at line 1845 of file [gclib.cs](#).

#### 14.26.3.18 input\_analog\_2

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_2`

Analog input 2.

Definition at line 1846 of file [gclib.cs](#).

#### 14.26.3.19 input\_analog\_3

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_3`

Analog input 3.

Definition at line 1847 of file [gclib.cs](#).

#### 14.26.3.20 input\_analog\_4

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_4`

Analog input 4.

Definition at line 1848 of file [gclib.cs](#).

#### 14.26.3.21 input\_analog\_5

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_5`

Analog input 5.

Definition at line 1849 of file [gclib.cs](#).

#### 14.26.3.22 input\_analog\_6

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_6`

Analog input 6.

Definition at line 1850 of file [gclib.cs](#).

#### 14.26.3.23 input\_analog\_7

[UW](#) `gclib.GDataRecord47300_ENC.input_analog_7`

Analog input 7.

Definition at line 1851 of file [gclib.cs](#).

#### 14.26.3.24 output\_bank\_0

[UW](#) `gclib.GDataRecord47300_ENC.output_bank_0`

Digital outputs 0-15;.

Definition at line 1853 of file [gclib.cs](#).

#### 14.26.3.25 output\_bank\_1

[UW](#) `gclib.GDataRecord47300_ENC.output_bank_1`

Digital outputs 16-23;.

Definition at line 1854 of file [gclib.cs](#).

#### 14.26.3.26 input\_bank\_0

[UW](#) `gclib.GDataRecord47300_ENC.input_bank_0`

Digital inputs 0-15;.

Definition at line 1856 of file [gclib.cs](#).

#### 14.26.3.27 input\_bank\_1

[UW](#) `gclib.GDataRecord47300_ENC.input_bank_1`

Digital inputs 16-23;.

Definition at line 1857 of file [gclib.cs](#).

#### 14.26.3.28 pulse\_count\_0

[UL](#) `gclib.GDataRecord47300_ENC.pulse_count_0`

Pulse counter (see PC).

Definition at line 1859 of file [gclib.cs](#).

#### 14.26.3.29 zc\_variable

[SL](#) `gclib.GDataRecord47300_ENC.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1860 of file [gclib.cs](#).

#### 14.26.3.30 zd\_variable

[SL](#) `gclib.GDataRecord47300_ENC.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1861 of file [gclib.cs](#).

#### 14.26.3.31 encoder\_0

[SL](#) `gclib.GDataRecord47300_ENC.encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1863 of file [gclib.cs](#).

#### 14.26.3.32 encoder\_1

[SL](#) `gclib.GDataRecord47300_ENC.encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1864 of file [gclib.cs](#).

#### 14.26.3.33 encoder\_2

[SL](#) `gclib.GDataRecord47300_ENC.encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1865 of file [gclib.cs](#).

#### 14.26.3.34 encoder\_3

[SL](#) `gclib.GDataRecord47300_ENC.encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 1866 of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

## 14.27 GDataRecord47300\_ENC Struct Reference

Data record struct for RIO-47300. Includes encoder fields.

```
#include <gclib_record.h>
```

### Public Attributes

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*Sample number.*
- [UB error\\_code](#)  
*Error code.*
- [UB general\\_status](#)  
*General status.*
- [UW output\\_analog\\_0](#)  
*Analog output 0.*
- [UW output\\_analog\\_1](#)  
*Analog output 1.*
- [UW output\\_analog\\_2](#)  
*Analog output 2.*
- [UW output\\_analog\\_3](#)  
*Analog output 3.*

- [UW output\\_analog\\_4](#)  
*Analog output 4.*
- [UW output\\_analog\\_5](#)  
*Analog output 5.*
- [UW output\\_analog\\_6](#)  
*Analog output 6.*
- [UW output\\_analog\\_7](#)  
*Analog output 7.*
- [UW input\\_analog\\_0](#)  
*Analog input 0.*
- [UW input\\_analog\\_1](#)  
*Analog input 1.*
- [UW input\\_analog\\_2](#)  
*Analog input 2.*
- [UW input\\_analog\\_3](#)  
*Analog input 3.*
- [UW input\\_analog\\_4](#)  
*Analog input 4.*
- [UW input\\_analog\\_5](#)  
*Analog input 5.*
- [UW input\\_analog\\_6](#)  
*Analog input 6.*
- [UW input\\_analog\\_7](#)  
*Analog input 7.*
- [UW output\\_bank\\_0](#)  
*Digital outputs 0-15;.*
- [UW output\\_bank\\_1](#)  
*Digital outputs 16-23;.*
- [UW input\\_bank\\_0](#)  
*Digital inputs 0-15;.*
- [UW input\\_bank\\_1](#)  
*Digital inputs 16-23;.*
- [UL pulse\\_count\\_0](#)  
*Pulse counter (see PC).*
- [SL zc\\_variable](#)  
*ZC User-defined variable (see ZC).*
- [SL zd\\_variable](#)  
*ZD User-defined variable (see ZD).*
- [SL encoder\\_0](#)  
*Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_1](#)  
*Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_2](#)  
*Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.*
- [SL encoder\\_3](#)  
*Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.*

### 14.27.1 Detailed Description

Data record struct for RIO-47300. Includes encoder fields.  
Definition at line 914 of file [gclib\\_record.h](#).

## 14.27.2 Member Data Documentation

### 14.27.2.1 header\_0

[UB](#) `GDataRecord47300_ENC::header_0`

1st Byte of Header.

Definition at line 919 of file [gclib\\_record.h](#).

### 14.27.2.2 header\_1

[UB](#) `GDataRecord47300_ENC::header_1`

2nd Byte of Header.

Definition at line 920 of file [gclib\\_record.h](#).

### 14.27.2.3 header\_2

[UB](#) `GDataRecord47300_ENC::header_2`

3rd Byte of Header.

Definition at line 921 of file [gclib\\_record.h](#).

### 14.27.2.4 header\_3

[UB](#) `GDataRecord47300_ENC::header_3`

4th Byte of Header.

Definition at line 922 of file [gclib\\_record.h](#).

### 14.27.2.5 sample\_number

[UW](#) `GDataRecord47300_ENC::sample_number`

Sample number.

Definition at line 924 of file [gclib\\_record.h](#).

### 14.27.2.6 error\_code

[UB](#) `GDataRecord47300_ENC::error_code`

Error code.

Definition at line 925 of file [gclib\\_record.h](#).

### 14.27.2.7 general\_status

[UB](#) `GDataRecord47300_ENC::general_status`

General status.

Definition at line 926 of file [gclib\\_record.h](#).

### 14.27.2.8 output\_analog\_0

[UW](#) `GDataRecord47300_ENC::output_analog_0`

Analog output 0.

Definition at line 928 of file [gclib\\_record.h](#).

### 14.27.2.9 output\_analog\_1

[UW](#) `GDataRecord47300_ENC::output_analog_1`

Analog output 1.

Definition at line 929 of file [gclib\\_record.h](#).

### 14.27.2.10 output\_analog\_2

[UW](#) `GDataRecord47300_ENC::output_analog_2`

Analog output 2.

Definition at line 930 of file [gclib\\_record.h](#).

#### 14.27.2.11 output\_analog\_3

[UW](#) GDataRecord47300\_ENC::output\_analog\_3

Analog output 3.

Definition at line 931 of file [gclib\\_record.h](#).

#### 14.27.2.12 output\_analog\_4

[UW](#) GDataRecord47300\_ENC::output\_analog\_4

Analog output 4.

Definition at line 932 of file [gclib\\_record.h](#).

#### 14.27.2.13 output\_analog\_5

[UW](#) GDataRecord47300\_ENC::output\_analog\_5

Analog output 5.

Definition at line 933 of file [gclib\\_record.h](#).

#### 14.27.2.14 output\_analog\_6

[UW](#) GDataRecord47300\_ENC::output\_analog\_6

Analog output 6.

Definition at line 934 of file [gclib\\_record.h](#).

#### 14.27.2.15 output\_analog\_7

[UW](#) GDataRecord47300\_ENC::output\_analog\_7

Analog output 7.

Definition at line 935 of file [gclib\\_record.h](#).

#### 14.27.2.16 input\_analog\_0

[UW](#) GDataRecord47300\_ENC::input\_analog\_0

Analog input 0.

Definition at line 937 of file [gclib\\_record.h](#).

#### 14.27.2.17 input\_analog\_1

[UW](#) GDataRecord47300\_ENC::input\_analog\_1

Analog input 1.

Definition at line 938 of file [gclib\\_record.h](#).

#### 14.27.2.18 input\_analog\_2

[UW](#) GDataRecord47300\_ENC::input\_analog\_2

Analog input 2.

Definition at line 939 of file [gclib\\_record.h](#).

#### 14.27.2.19 input\_analog\_3

[UW](#) GDataRecord47300\_ENC::input\_analog\_3

Analog input 3.

Definition at line 940 of file [gclib\\_record.h](#).

#### 14.27.2.20 input\_analog\_4

[UW](#) GDataRecord47300\_ENC::input\_analog\_4

Analog input 4.

Definition at line 941 of file [gclib\\_record.h](#).

#### 14.27.2.21 input\_analog\_5

[UW](#) `GDataRecord47300_ENC::input_analog_5`

Analog input 5.

Definition at line 942 of file [gclib\\_record.h](#).

#### 14.27.2.22 input\_analog\_6

[UW](#) `GDataRecord47300_ENC::input_analog_6`

Analog input 6.

Definition at line 943 of file [gclib\\_record.h](#).

#### 14.27.2.23 input\_analog\_7

[UW](#) `GDataRecord47300_ENC::input_analog_7`

Analog input 7.

Definition at line 944 of file [gclib\\_record.h](#).

#### 14.27.2.24 output\_bank\_0

[UW](#) `GDataRecord47300_ENC::output_bank_0`

Digital outputs 0-15;.

Definition at line 946 of file [gclib\\_record.h](#).

#### 14.27.2.25 output\_bank\_1

[UW](#) `GDataRecord47300_ENC::output_bank_1`

Digital outputs 16-23;.

Definition at line 947 of file [gclib\\_record.h](#).

#### 14.27.2.26 input\_bank\_0

[UW](#) `GDataRecord47300_ENC::input_bank_0`

Digital inputs 0-15;.

Definition at line 949 of file [gclib\\_record.h](#).

#### 14.27.2.27 input\_bank\_1

[UW](#) `GDataRecord47300_ENC::input_bank_1`

Digital inputs 16-23;.

Definition at line 950 of file [gclib\\_record.h](#).

#### 14.27.2.28 pulse\_count\_0

[UL](#) `GDataRecord47300_ENC::pulse_count_0`

Pulse counter (see PC).

Definition at line 952 of file [gclib\\_record.h](#).

#### 14.27.2.29 zc\_variable

[SL](#) `GDataRecord47300_ENC::zc_variable`

ZC User-defined variable (see ZC).

Definition at line 953 of file [gclib\\_record.h](#).

#### 14.27.2.30 zd\_variable

[SL](#) `GDataRecord47300_ENC::zd_variable`

ZD User-defined variable (see ZD).

Definition at line 954 of file [gclib\\_record.h](#).



**14.27.2.31 encoder\_0**

[SL](#) `GDataRecord47300_ENC::encoder_0`

Encoder channel 0. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 956 of file [gclib\\_record.h](#).

**14.27.2.32 encoder\_1**

[SL](#) `GDataRecord47300_ENC::encoder_1`

Encoder channel 1. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 957 of file [gclib\\_record.h](#).

**14.27.2.33 encoder\_2**

[SL](#) `GDataRecord47300_ENC::encoder_2`

Encoder channel 2. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 958 of file [gclib\\_record.h](#).

**14.27.2.34 encoder\_3**

[SL](#) `GDataRecord47300_ENC::encoder_3`

Encoder channel 3. Data only valid for parts with -BISS, -QUAD, or -SSI.

Definition at line 959 of file [gclib\\_record.h](#).

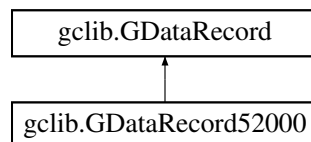
The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

**14.28 gclib.GDataRecord52000 Struct Reference**

Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.

Inheritance diagram for `gclib.GDataRecord52000`:

**Public Member Functions**

- `byte[] byte\_array ()`

*Returns the data record as a byte array and allows for access to individual bytes.*

**Public Attributes**

- `UB header\_0`

*1st Byte of Header.*

- `UB header\_1`

*2nd Byte of Header.*

- `UB header\_2`

*3rd Byte of Header.*

- `UB header\_3`

*4th Byte of Header.*

- `UW sample\_number`

*sample number.*

- `UB input\_bank\_0`

- general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*
- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)  
*Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*

- [SW reserved\\_12](#)  
*Reserved.*
- [UB ethercat\\_bank](#)  
*EtherCAT Bank Indicator.*
- [UB reserved\\_14](#)  
*Reserved.*
- [UB ethernet\\_status\\_a](#)  
*Ethernet Handle A Status.*
- [UB ethernet\\_status\\_b](#)  
*Ethernet Handle B Status.*
- [UB ethernet\\_status\\_c](#)  
*Ethernet Handle C Status.*
- [UB ethernet\\_status\\_d](#)  
*Ethernet Handle D Status.*
- [UB ethernet\\_status\\_e](#)  
*Ethernet Handle E Status.*
- [UB ethernet\\_status\\_f](#)  
*Ethernet Handle F Status.*
- [UB ethernet\\_status\\_g](#)  
*Ethernet Handle G Status.*
- [UB ethernet\\_status\\_h](#)  
*Ethernet Handle H Status.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)

- A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*
- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_halls](#)  
*B Hall Input Status.*
- [UB axis\\_b\\_reserved](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*

- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_halls](#)  
*C Hall Input Status.*
- [UB axis\\_c\\_reserved](#)  
*Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UB axis\\_d\\_halls](#)  
*D Hall Input Status.*
- [UB axis\\_d\\_reserved](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)

- E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SL axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UB axis\\_e\\_halls](#)  
*E Hall Input Status.*
- [UB axis\\_e\\_reserved](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UB axis\\_f\\_halls](#)  
*F Hall Input Status.*
- [UB axis\\_f\\_reserved](#)  
*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*

- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UB axis\\_g\\_halls](#)  
*G Hall Input Status.*
- [UB axis\\_g\\_reserved](#)  
*Reserved.*
- [SL axis\\_g\\_variable](#)  
*G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)  
*H axis status.*
- [UB axis\\_h\\_switches](#)  
*H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)  
*H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)  
*H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)  
*H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)  
*H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)  
*H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)  
*H axis velocity.*
- [SL axis\\_h\\_torque](#)  
*H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)  
*H axis analog input.*
- [UB axis\\_h\\_halls](#)  
*H Hall Input Status.*
- [UB axis\\_h\\_reserved](#)  
*Reserved.*
- [SL axis\\_h\\_variable](#)  
*H User-defined variable (ZA).*

### 14.28.1 Detailed Description

Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.  
Definition at line 1110 of file [gclib.cs](#).

### 14.28.2 Member Function Documentation

#### 14.28.2.1 `byte_array()`

```
byte[] gclib.GDataRecord52000.byte_array () [inline]
```

Returns the data record as a byte array and allows for access to individual bytes.  
Implements [gclib.GDataRecord](#).  
Definition at line 1112 of file [gclib.cs](#).

### 14.28.3 Member Data Documentation

#### 14.28.3.1 `header_0`

[UB](#) [gclib.GDataRecord52000.header\\_0](#)  
1st Byte of Header.  
Definition at line 1115 of file [gclib.cs](#).

#### 14.28.3.2 `header_1`

[UB](#) [gclib.GDataRecord52000.header\\_1](#)  
2nd Byte of Header.  
Definition at line 1116 of file [gclib.cs](#).

#### 14.28.3.3 `header_2`

[UB](#) [gclib.GDataRecord52000.header\\_2](#)  
3rd Byte of Header.  
Definition at line 1117 of file [gclib.cs](#).

#### 14.28.3.4 `header_3`

[UB](#) [gclib.GDataRecord52000.header\\_3](#)  
4th Byte of Header.  
Definition at line 1118 of file [gclib.cs](#).

#### 14.28.3.5 `sample_number`

[UW](#) [gclib.GDataRecord52000.sample\\_number](#)  
sample number.  
Definition at line 1120 of file [gclib.cs](#).

#### 14.28.3.6 `input_bank_0`

[UB](#) [gclib.GDataRecord52000.input\\_bank\\_0](#)  
general input bank 0 (inputs 1-8).  
Definition at line 1122 of file [gclib.cs](#).

#### 14.28.3.7 `input_bank_1`

[UB](#) [gclib.GDataRecord52000.input\\_bank\\_1](#)  
general input bank 1 (inputs 9-16).  
Definition at line 1123 of file [gclib.cs](#).



#### 14.28.3.8 input\_bank\_2

UB [gclib.GDataRecord52000.input\\_bank\\_2](#)

general input bank 2 (inputs 17-24).

Definition at line 1124 of file [gclib.cs](#).

#### 14.28.3.9 input\_bank\_3

UB [gclib.GDataRecord52000.input\\_bank\\_3](#)

general input bank 3 (inputs 25-32).

Definition at line 1125 of file [gclib.cs](#).

#### 14.28.3.10 input\_bank\_4

UB [gclib.GDataRecord52000.input\\_bank\\_4](#)

general input bank 4 (inputs 33-40).

Definition at line 1126 of file [gclib.cs](#).

#### 14.28.3.11 input\_bank\_5

UB [gclib.GDataRecord52000.input\\_bank\\_5](#)

general input bank 5 (inputs 41-48).

Definition at line 1127 of file [gclib.cs](#).

#### 14.28.3.12 input\_bank\_6

UB [gclib.GDataRecord52000.input\\_bank\\_6](#)

general input bank 6 (inputs 49-56).

Definition at line 1128 of file [gclib.cs](#).

#### 14.28.3.13 input\_bank\_7

UB [gclib.GDataRecord52000.input\\_bank\\_7](#)

general input bank 7 (inputs 57-64).

Definition at line 1129 of file [gclib.cs](#).

#### 14.28.3.14 input\_bank\_8

UB [gclib.GDataRecord52000.input\\_bank\\_8](#)

general input bank 8 (inputs 65-72).

Definition at line 1130 of file [gclib.cs](#).

#### 14.28.3.15 input\_bank\_9

UB [gclib.GDataRecord52000.input\\_bank\\_9](#)

general input bank 9 (inputs 73-80).

Definition at line 1131 of file [gclib.cs](#).

#### 14.28.3.16 output\_bank\_0

UB [gclib.GDataRecord52000.output\\_bank\\_0](#)

general output bank 0 (outputs 1-8).

Definition at line 1133 of file [gclib.cs](#).

#### 14.28.3.17 output\_bank\_1

UB [gclib.GDataRecord52000.output\\_bank\\_1](#)

general output bank 1 (outputs 9-16).

Definition at line 1134 of file [gclib.cs](#).

#### 14.28.3.18 output\_bank\_2

[UB](#) `gclib.GDataRecord52000.output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line [1135](#) of file [gclib.cs](#).

#### 14.28.3.19 output\_bank\_3

[UB](#) `gclib.GDataRecord52000.output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line [1136](#) of file [gclib.cs](#).

#### 14.28.3.20 output\_bank\_4

[UB](#) `gclib.GDataRecord52000.output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line [1137](#) of file [gclib.cs](#).

#### 14.28.3.21 output\_bank\_5

[UB](#) `gclib.GDataRecord52000.output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line [1138](#) of file [gclib.cs](#).

#### 14.28.3.22 output\_bank\_6

[UB](#) `gclib.GDataRecord52000.output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line [1139](#) of file [gclib.cs](#).

#### 14.28.3.23 output\_bank\_7

[UB](#) `gclib.GDataRecord52000.output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line [1140](#) of file [gclib.cs](#).

#### 14.28.3.24 output\_bank\_8

[UB](#) `gclib.GDataRecord52000.output_bank_8`  
general output bank 8 (outputs 65-72).  
Definition at line [1141](#) of file [gclib.cs](#).

#### 14.28.3.25 output\_bank\_9

[UB](#) `gclib.GDataRecord52000.output_bank_9`  
general output bank 9 (outputs 73-80).  
Definition at line [1142](#) of file [gclib.cs](#).

#### 14.28.3.26 reserved\_0

[SW](#) `gclib.GDataRecord52000.reserved_0`  
Reserved.  
Definition at line [1144](#) of file [gclib.cs](#).

#### 14.28.3.27 reserved\_2

[SW](#) `gclib.GDataRecord52000.reserved_2`  
Reserved.  
Definition at line [1145](#) of file [gclib.cs](#).

**14.28.3.28 reserved\_4**

[SW](#) `gclib.GDataRecord52000.reserved_4`

Reserved.

Definition at line 1146 of file [gclib.cs](#).

**14.28.3.29 reserved\_6**

[SW](#) `gclib.GDataRecord52000.reserved_6`

Reserved.

Definition at line 1147 of file [gclib.cs](#).

**14.28.3.30 reserved\_8**

[SW](#) `gclib.GDataRecord52000.reserved_8`

Reserved.

Definition at line 1148 of file [gclib.cs](#).

**14.28.3.31 reserved\_10**

[SW](#) `gclib.GDataRecord52000.reserved_10`

Reserved.

Definition at line 1149 of file [gclib.cs](#).

**14.28.3.32 reserved\_12**

[SW](#) `gclib.GDataRecord52000.reserved_12`

Reserved.

Definition at line 1150 of file [gclib.cs](#).

**14.28.3.33 ethercat\_bank**

[UB](#) `gclib.GDataRecord52000.ethercat_bank`

EtherCAT Bank Indicator.

Definition at line 1151 of file [gclib.cs](#).

**14.28.3.34 reserved\_14**

[UB](#) `gclib.GDataRecord52000.reserved_14`

Reserved.

Definition at line 1152 of file [gclib.cs](#).

**14.28.3.35 ethernet\_status\_a**

[UB](#) `gclib.GDataRecord52000.ethernet_status_a`

Ethernet Handle A Status.

Definition at line 1154 of file [gclib.cs](#).

**14.28.3.36 ethernet\_status\_b**

[UB](#) `gclib.GDataRecord52000.ethernet_status_b`

Ethernet Handle B Status.

Definition at line 1155 of file [gclib.cs](#).

**14.28.3.37 ethernet\_status\_c**

[UB](#) `gclib.GDataRecord52000.ethernet_status_c`

Ethernet Handle C Status.

Definition at line 1156 of file [gclib.cs](#).

#### 14.28.3.38 ethernet\_status\_d

[UB](#) `gclib.GDataRecord52000.ethernet_status_d`

Ethernet Handle D Status.

Definition at line 1157 of file [gclib.cs](#).

#### 14.28.3.39 ethernet\_status\_e

[UB](#) `gclib.GDataRecord52000.ethernet_status_e`

Ethernet Handle E Status.

Definition at line 1158 of file [gclib.cs](#).

#### 14.28.3.40 ethernet\_status\_f

[UB](#) `gclib.GDataRecord52000.ethernet_status_f`

Ethernet Handle F Status.

Definition at line 1159 of file [gclib.cs](#).

#### 14.28.3.41 ethernet\_status\_g

[UB](#) `gclib.GDataRecord52000.ethernet_status_g`

Ethernet Handle G Status.

Definition at line 1160 of file [gclib.cs](#).

#### 14.28.3.42 ethernet\_status\_h

[UB](#) `gclib.GDataRecord52000.ethernet_status_h`

Ethernet Handle H Status.

Definition at line 1161 of file [gclib.cs](#).

#### 14.28.3.43 error\_code

[UB](#) `gclib.GDataRecord52000.error_code`

error code.

Definition at line 1163 of file [gclib.cs](#).

#### 14.28.3.44 thread\_status

[UB](#) `gclib.GDataRecord52000.thread_status`

thread status

Definition at line 1164 of file [gclib.cs](#).

#### 14.28.3.45 amplifier\_status

[UL](#) `gclib.GDataRecord52000.amplifier_status`

Amplifier Status.

Definition at line 1165 of file [gclib.cs](#).

#### 14.28.3.46 contour\_segment\_count

[UL](#) `gclib.GDataRecord52000.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 1167 of file [gclib.cs](#).

#### 14.28.3.47 contour\_buffer\_available

[UW](#) `gclib.GDataRecord52000.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 1168 of file [gclib.cs](#).

#### 14.28.3.48 s\_plane\_segment\_count

[UW](#) `gclib.GDataRecord52000.s_plane_segment_count`  
segment count of coordinated move for S plane.  
Definition at line [1170](#) of file [gclib.cs](#).

#### 14.28.3.49 s\_plane\_move\_status

[UW](#) `gclib.GDataRecord52000.s_plane_move_status`  
coordinated move status for S plane.  
Definition at line [1171](#) of file [gclib.cs](#).

#### 14.28.3.50 s\_distance

[SL](#) `gclib.GDataRecord52000.s_distance`  
distance traveled in coordinated move for S plane.  
Definition at line [1172](#) of file [gclib.cs](#).

#### 14.28.3.51 s\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord52000.s_plane_buffer_available`  
Buffer space remaining, S Plane.  
Definition at line [1173](#) of file [gclib.cs](#).

#### 14.28.3.52 t\_plane\_segment\_count

[UW](#) `gclib.GDataRecord52000.t_plane_segment_count`  
segment count of coordinated move for T plane.  
Definition at line [1175](#) of file [gclib.cs](#).

#### 14.28.3.53 t\_plane\_move\_status

[UW](#) `gclib.GDataRecord52000.t_plane_move_status`  
Coordinated move status for T plane.  
Definition at line [1176](#) of file [gclib.cs](#).

#### 14.28.3.54 t\_distance

[SL](#) `gclib.GDataRecord52000.t_distance`  
distance traveled in coordinated move for T plane.  
Definition at line [1177](#) of file [gclib.cs](#).

#### 14.28.3.55 t\_plane\_buffer\_available

[UW](#) `gclib.GDataRecord52000.t_plane_buffer_available`  
Buffer space remaining, T Plane.  
Definition at line [1178](#) of file [gclib.cs](#).

#### 14.28.3.56 axis\_a\_status

[UW](#) `gclib.GDataRecord52000.axis_a_status`  
A axis status.  
Definition at line [1180](#) of file [gclib.cs](#).

#### 14.28.3.57 axis\_a\_switches

[UB](#) `gclib.GDataRecord52000.axis_a_switches`  
A axis switches.  
Definition at line [1181](#) of file [gclib.cs](#).

#### 14.28.3.58 axis\_a\_stop\_code

[UB](#) `gclib.GDataRecord52000.axis_a_stop_code`

A axis stop code.

Definition at line [1182](#) of file [gclib.cs](#).

#### 14.28.3.59 axis\_a\_reference\_position

[SL](#) `gclib.GDataRecord52000.axis_a_reference_position`

A axis reference position.

Definition at line [1183](#) of file [gclib.cs](#).

#### 14.28.3.60 axis\_a\_motor\_position

[SL](#) `gclib.GDataRecord52000.axis_a_motor_position`

A axis motor position.

Definition at line [1184](#) of file [gclib.cs](#).

#### 14.28.3.61 axis\_a\_position\_error

[SL](#) `gclib.GDataRecord52000.axis_a_position_error`

A axis position error.

Definition at line [1185](#) of file [gclib.cs](#).

#### 14.28.3.62 axis\_a\_aux\_position

[SL](#) `gclib.GDataRecord52000.axis_a_aux_position`

A axis auxiliary position.

Definition at line [1186](#) of file [gclib.cs](#).

#### 14.28.3.63 axis\_a\_velocity

[SL](#) `gclib.GDataRecord52000.axis_a_velocity`

A axis velocity.

Definition at line [1187](#) of file [gclib.cs](#).

#### 14.28.3.64 axis\_a\_torque

[SL](#) `gclib.GDataRecord52000.axis_a_torque`

A axis torque.

Definition at line [1188](#) of file [gclib.cs](#).

#### 14.28.3.65 axis\_a\_analog\_in

[UW](#) `gclib.GDataRecord52000.axis_a_analog_in`

A axis analog input.

Definition at line [1189](#) of file [gclib.cs](#).

#### 14.28.3.66 axis\_a\_halls

[UB](#) `gclib.GDataRecord52000.axis_a_halls`

A Hall Input Status.

Definition at line [1190](#) of file [gclib.cs](#).

#### 14.28.3.67 axis\_a\_reserved

[UB](#) `gclib.GDataRecord52000.axis_a_reserved`

Reserved.

Definition at line [1191](#) of file [gclib.cs](#).

**14.28.3.68 axis\_a\_variable**

[SL](#) `gclib.GDataRecord52000.axis_a_variable`

A User-defined variable (ZA).

Definition at line [1192](#) of file [gclib.cs](#).

**14.28.3.69 axis\_b\_status**

[UW](#) `gclib.GDataRecord52000.axis_b_status`

B axis status.

Definition at line [1194](#) of file [gclib.cs](#).

**14.28.3.70 axis\_b\_switches**

[UB](#) `gclib.GDataRecord52000.axis_b_switches`

B axis switches.

Definition at line [1195](#) of file [gclib.cs](#).

**14.28.3.71 axis\_b\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_b_stop_code`

B axis stop code.

Definition at line [1196](#) of file [gclib.cs](#).

**14.28.3.72 axis\_b\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_b_reference_position`

B axis reference position.

Definition at line [1197](#) of file [gclib.cs](#).

**14.28.3.73 axis\_b\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_b_motor_position`

B axis motor position.

Definition at line [1198](#) of file [gclib.cs](#).

**14.28.3.74 axis\_b\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_b_position_error`

B axis position error.

Definition at line [1199](#) of file [gclib.cs](#).

**14.28.3.75 axis\_b\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_b_aux_position`

B axis auxiliary position.

Definition at line [1200](#) of file [gclib.cs](#).

**14.28.3.76 axis\_b\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_b_velocity`

B axis velocity.

Definition at line [1201](#) of file [gclib.cs](#).

**14.28.3.77 axis\_b\_torque**

[SL](#) `gclib.GDataRecord52000.axis_b_torque`

B axis torque.

Definition at line [1202](#) of file [gclib.cs](#).

#### 14.28.3.78 `axis_b_analog_in`

[UW](#) `gclib.GDataRecord52000.axis_b_analog_in`

B axis analog input.

Definition at line [1203](#) of file [gclib.cs](#).

#### 14.28.3.79 `axis_b_halls`

[UB](#) `gclib.GDataRecord52000.axis_b_halls`

B Hall Input Status.

Definition at line [1204](#) of file [gclib.cs](#).

#### 14.28.3.80 `axis_b_reserved`

[UB](#) `gclib.GDataRecord52000.axis_b_reserved`

Reserved.

Definition at line [1205](#) of file [gclib.cs](#).

#### 14.28.3.81 `axis_b_variable`

[SL](#) `gclib.GDataRecord52000.axis_b_variable`

B User-defined variable (ZA).

Definition at line [1206](#) of file [gclib.cs](#).

#### 14.28.3.82 `axis_c_status`

[UW](#) `gclib.GDataRecord52000.axis_c_status`

C axis status.

Definition at line [1208](#) of file [gclib.cs](#).

#### 14.28.3.83 `axis_c_switches`

[UB](#) `gclib.GDataRecord52000.axis_c_switches`

C axis switches.

Definition at line [1209](#) of file [gclib.cs](#).

#### 14.28.3.84 `axis_c_stop_code`

[UB](#) `gclib.GDataRecord52000.axis_c_stop_code`

C axis stop code.

Definition at line [1210](#) of file [gclib.cs](#).

#### 14.28.3.85 `axis_c_reference_position`

[SL](#) `gclib.GDataRecord52000.axis_c_reference_position`

C axis reference position.

Definition at line [1211](#) of file [gclib.cs](#).

#### 14.28.3.86 `axis_c_motor_position`

[SL](#) `gclib.GDataRecord52000.axis_c_motor_position`

C axis motor position.

Definition at line [1212](#) of file [gclib.cs](#).

#### 14.28.3.87 `axis_c_position_error`

[SL](#) `gclib.GDataRecord52000.axis_c_position_error`

C axis position error.

Definition at line [1213](#) of file [gclib.cs](#).



**14.28.3.88 axis\_c\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1214 of file [gclib.cs](#).

**14.28.3.89 axis\_c\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_c_velocity`

C axis velocity.

Definition at line 1215 of file [gclib.cs](#).

**14.28.3.90 axis\_c\_torque**

[SL](#) `gclib.GDataRecord52000.axis_c_torque`

C axis torque.

Definition at line 1216 of file [gclib.cs](#).

**14.28.3.91 axis\_c\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_c_analog_in`

C axis analog input.

Definition at line 1217 of file [gclib.cs](#).

**14.28.3.92 axis\_c\_halls**

[UB](#) `gclib.GDataRecord52000.axis_c_halls`

C Hall Input Status.

Definition at line 1218 of file [gclib.cs](#).

**14.28.3.93 axis\_c\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_c_reserved`

Reserved.

Definition at line 1219 of file [gclib.cs](#).

**14.28.3.94 axis\_c\_variable**

[SL](#) `gclib.GDataRecord52000.axis_c_variable`

C User-defined variable (ZA).

Definition at line 1220 of file [gclib.cs](#).

**14.28.3.95 axis\_d\_status**

[UW](#) `gclib.GDataRecord52000.axis_d_status`

D axis status.

Definition at line 1222 of file [gclib.cs](#).

**14.28.3.96 axis\_d\_switches**

[UB](#) `gclib.GDataRecord52000.axis_d_switches`

D axis switches.

Definition at line 1223 of file [gclib.cs](#).

**14.28.3.97 axis\_d\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_d_stop_code`

D axis stop code.

Definition at line 1224 of file [gclib.cs](#).

**14.28.3.98 axis\_d\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_d_reference_position`

D axis reference position.

Definition at line [1225](#) of file [gclib.cs](#).

**14.28.3.99 axis\_d\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_d_motor_position`

D axis motor position.

Definition at line [1226](#) of file [gclib.cs](#).

**14.28.3.100 axis\_d\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_d_position_error`

D axis position error.

Definition at line [1227](#) of file [gclib.cs](#).

**14.28.3.101 axis\_d\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_d_aux_position`

D axis auxiliary position.

Definition at line [1228](#) of file [gclib.cs](#).

**14.28.3.102 axis\_d\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_d_velocity`

D axis velocity.

Definition at line [1229](#) of file [gclib.cs](#).

**14.28.3.103 axis\_d\_torque**

[SL](#) `gclib.GDataRecord52000.axis_d_torque`

D axis torque.

Definition at line [1230](#) of file [gclib.cs](#).

**14.28.3.104 axis\_d\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_d_analog_in`

D axis analog input.

Definition at line [1231](#) of file [gclib.cs](#).

**14.28.3.105 axis\_d\_halls**

[UB](#) `gclib.GDataRecord52000.axis_d_halls`

D Hall Input Status.

Definition at line [1232](#) of file [gclib.cs](#).

**14.28.3.106 axis\_d\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_d_reserved`

Reserved.

Definition at line [1233](#) of file [gclib.cs](#).

**14.28.3.107 axis\_d\_variable**

[SL](#) `gclib.GDataRecord52000.axis_d_variable`

D User-defined variable (ZA).

Definition at line [1234](#) of file [gclib.cs](#).

**14.28.3.108 axis\_e\_status**

[UW](#) `gclib.GDataRecord52000.axis_e_status`

E axis status.

Definition at line [1236](#) of file [gclib.cs](#).

**14.28.3.109 axis\_e\_switches**

[UB](#) `gclib.GDataRecord52000.axis_e_switches`

E axis switches.

Definition at line [1237](#) of file [gclib.cs](#).

**14.28.3.110 axis\_e\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_e_stop_code`

E axis stop code.

Definition at line [1238](#) of file [gclib.cs](#).

**14.28.3.111 axis\_e\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_e_reference_position`

E axis reference position.

Definition at line [1239](#) of file [gclib.cs](#).

**14.28.3.112 axis\_e\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_e_motor_position`

E axis motor position.

Definition at line [1240](#) of file [gclib.cs](#).

**14.28.3.113 axis\_e\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_e_position_error`

E axis position error.

Definition at line [1241](#) of file [gclib.cs](#).

**14.28.3.114 axis\_e\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_e_aux_position`

E axis auxiliary position.

Definition at line [1242](#) of file [gclib.cs](#).

**14.28.3.115 axis\_e\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_e_velocity`

E axis velocity.

Definition at line [1243](#) of file [gclib.cs](#).

**14.28.3.116 axis\_e\_torque**

[SL](#) `gclib.GDataRecord52000.axis_e_torque`

E axis torque.

Definition at line [1244](#) of file [gclib.cs](#).

**14.28.3.117 axis\_e\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_e_analog_in`

E axis analog input.

Definition at line [1245](#) of file [gclib.cs](#).

**14.28.3.118 axis\_e\_halls**

[UB](#) `gclib.GDataRecord52000.axis_e_halls`

E Hall Input Status.

Definition at line [1246](#) of file [gclib.cs](#).

**14.28.3.119 axis\_e\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_e_reserved`

Reserved.

Definition at line [1247](#) of file [gclib.cs](#).

**14.28.3.120 axis\_e\_variable**

[SL](#) `gclib.GDataRecord52000.axis_e_variable`

E User-defined variable (ZA).

Definition at line [1248](#) of file [gclib.cs](#).

**14.28.3.121 axis\_f\_status**

[UW](#) `gclib.GDataRecord52000.axis_f_status`

F axis status.

Definition at line [1250](#) of file [gclib.cs](#).

**14.28.3.122 axis\_f\_switches**

[UB](#) `gclib.GDataRecord52000.axis_f_switches`

F axis switches.

Definition at line [1251](#) of file [gclib.cs](#).

**14.28.3.123 axis\_f\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_f_stop_code`

F axis stop code.

Definition at line [1252](#) of file [gclib.cs](#).

**14.28.3.124 axis\_f\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_f_reference_position`

F axis reference position.

Definition at line [1253](#) of file [gclib.cs](#).

**14.28.3.125 axis\_f\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_f_motor_position`

F axis motor position.

Definition at line [1254](#) of file [gclib.cs](#).

**14.28.3.126 axis\_f\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_f_position_error`

F axis position error.

Definition at line [1255](#) of file [gclib.cs](#).

**14.28.3.127 axis\_f\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_f_aux_position`

F axis auxiliary position.

Definition at line [1256](#) of file [gclib.cs](#).

**14.28.3.128 axis\_f\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_f_velocity`

F axis velocity.

Definition at line [1257](#) of file [gclib.cs](#).

**14.28.3.129 axis\_f\_torque**

[SL](#) `gclib.GDataRecord52000.axis_f_torque`

F axis torque.

Definition at line [1258](#) of file [gclib.cs](#).

**14.28.3.130 axis\_f\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_f_analog_in`

F axis analog input.

Definition at line [1259](#) of file [gclib.cs](#).

**14.28.3.131 axis\_f\_halls**

[UB](#) `gclib.GDataRecord52000.axis_f_halls`

F Hall Input Status.

Definition at line [1260](#) of file [gclib.cs](#).

**14.28.3.132 axis\_f\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_f_reserved`

Reserved.

Definition at line [1261](#) of file [gclib.cs](#).

**14.28.3.133 axis\_f\_variable**

[SL](#) `gclib.GDataRecord52000.axis_f_variable`

F User-defined variable (ZA).

Definition at line [1262](#) of file [gclib.cs](#).

**14.28.3.134 axis\_g\_status**

[UW](#) `gclib.GDataRecord52000.axis_g_status`

G axis status.

Definition at line [1264](#) of file [gclib.cs](#).

**14.28.3.135 axis\_g\_switches**

[UB](#) `gclib.GDataRecord52000.axis_g_switches`

G axis switches.

Definition at line [1265](#) of file [gclib.cs](#).

**14.28.3.136 axis\_g\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_g_stop_code`

G axis stop code.

Definition at line [1266](#) of file [gclib.cs](#).

**14.28.3.137 axis\_g\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_g_reference_position`

G axis reference position.

Definition at line [1267](#) of file [gclib.cs](#).

**14.28.3.138 axis\_g\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_g_motor_position`

G axis motor position.

Definition at line 1268 of file [gclib.cs](#).

**14.28.3.139 axis\_g\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_g_position_error`

G axis position error.

Definition at line 1269 of file [gclib.cs](#).

**14.28.3.140 axis\_g\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_g_aux_position`

G axis auxiliary position.

Definition at line 1270 of file [gclib.cs](#).

**14.28.3.141 axis\_g\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_g_velocity`

G axis velocity.

Definition at line 1271 of file [gclib.cs](#).

**14.28.3.142 axis\_g\_torque**

[SL](#) `gclib.GDataRecord52000.axis_g_torque`

G axis torque.

Definition at line 1272 of file [gclib.cs](#).

**14.28.3.143 axis\_g\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_g_analog_in`

G axis analog input.

Definition at line 1273 of file [gclib.cs](#).

**14.28.3.144 axis\_g\_halls**

[UB](#) `gclib.GDataRecord52000.axis_g_halls`

G Hall Input Status.

Definition at line 1274 of file [gclib.cs](#).

**14.28.3.145 axis\_g\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_g_reserved`

Reserved.

Definition at line 1275 of file [gclib.cs](#).

**14.28.3.146 axis\_g\_variable**

[SL](#) `gclib.GDataRecord52000.axis_g_variable`

G User-defined variable (ZA).

Definition at line 1276 of file [gclib.cs](#).

**14.28.3.147 axis\_h\_status**

[UW](#) `gclib.GDataRecord52000.axis_h_status`

H axis status.

Definition at line 1278 of file [gclib.cs](#).

**14.28.3.148 axis\_h\_switches**

[UB](#) `gclib.GDataRecord52000.axis_h_switches`

H axis switches.

Definition at line [1279](#) of file [gclib.cs](#).

**14.28.3.149 axis\_h\_stop\_code**

[UB](#) `gclib.GDataRecord52000.axis_h_stop_code`

H axis stop code.

Definition at line [1280](#) of file [gclib.cs](#).

**14.28.3.150 axis\_h\_reference\_position**

[SL](#) `gclib.GDataRecord52000.axis_h_reference_position`

H axis reference position.

Definition at line [1281](#) of file [gclib.cs](#).

**14.28.3.151 axis\_h\_motor\_position**

[SL](#) `gclib.GDataRecord52000.axis_h_motor_position`

H axis motor position.

Definition at line [1282](#) of file [gclib.cs](#).

**14.28.3.152 axis\_h\_position\_error**

[SL](#) `gclib.GDataRecord52000.axis_h_position_error`

H axis position error.

Definition at line [1283](#) of file [gclib.cs](#).

**14.28.3.153 axis\_h\_aux\_position**

[SL](#) `gclib.GDataRecord52000.axis_h_aux_position`

H axis auxiliary position.

Definition at line [1284](#) of file [gclib.cs](#).

**14.28.3.154 axis\_h\_velocity**

[SL](#) `gclib.GDataRecord52000.axis_h_velocity`

H axis velocity.

Definition at line [1285](#) of file [gclib.cs](#).

**14.28.3.155 axis\_h\_torque**

[SL](#) `gclib.GDataRecord52000.axis_h_torque`

H axis torque.

Definition at line [1286](#) of file [gclib.cs](#).

**14.28.3.156 axis\_h\_analog\_in**

[UW](#) `gclib.GDataRecord52000.axis_h_analog_in`

H axis analog input.

Definition at line [1287](#) of file [gclib.cs](#).

**14.28.3.157 axis\_h\_halls**

[UB](#) `gclib.GDataRecord52000.axis_h_halls`

H Hall Input Status.

Definition at line [1288](#) of file [gclib.cs](#).

**14.28.3.158 axis\_h\_reserved**

[UB](#) `gclib.GDataRecord52000.axis_h_reserved`

Reserved.

Definition at line [1289](#) of file [gclib.cs](#).

**14.28.3.159 axis\_h\_variable**

[SL](#) `gclib.GDataRecord52000.axis_h_variable`

H User-defined variable (ZA).

Definition at line [1290](#) of file [gclib.cs](#).

The documentation for this struct was generated from the following file:

- [gclib.cs](#)

**14.29 GDataRecord52000 Struct Reference**

Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.

`#include <gclib_record.h>`

**Public Attributes**

- [UB header\\_0](#)  
*1st Byte of Header.*
- [UB header\\_1](#)  
*2nd Byte of Header.*
- [UB header\\_2](#)  
*3rd Byte of Header.*
- [UB header\\_3](#)  
*4th Byte of Header.*
- [UW sample\\_number](#)  
*sample number.*
- [UB input\\_bank\\_0](#)  
*general input bank 0 (inputs 1-8).*
- [UB input\\_bank\\_1](#)  
*general input bank 1 (inputs 9-16).*
- [UB input\\_bank\\_2](#)  
*general input bank 2 (inputs 17-24).*
- [UB input\\_bank\\_3](#)  
*general input bank 3 (inputs 25-32).*
- [UB input\\_bank\\_4](#)  
*general input bank 4 (inputs 33-40).*
- [UB input\\_bank\\_5](#)  
*general input bank 5 (inputs 41-48).*
- [UB input\\_bank\\_6](#)  
*general input bank 6 (inputs 49-56).*
- [UB input\\_bank\\_7](#)  
*general input bank 7 (inputs 57-64).*
- [UB input\\_bank\\_8](#)  
*general input bank 8 (inputs 65-72).*
- [UB input\\_bank\\_9](#)  
*general input bank 9 (inputs 73-80).*
- [UB output\\_bank\\_0](#)  
*general output bank 0 (outputs 1-8).*



- [UB output\\_bank\\_1](#)  
*general output bank 1 (outputs 9-16).*
- [UB output\\_bank\\_2](#)  
*general output bank 2 (outputs 17-24).*
- [UB output\\_bank\\_3](#)  
*general output bank 3 (outputs 25-32).*
- [UB output\\_bank\\_4](#)  
*general output bank 4 (outputs 33-40).*
- [UB output\\_bank\\_5](#)  
*general output bank 5 (outputs 41-48).*
- [UB output\\_bank\\_6](#)  
*general output bank 6 (outputs 49-56).*
- [UB output\\_bank\\_7](#)  
*general output bank 7 (outputs 57-64).*
- [UB output\\_bank\\_8](#)  
*general output bank 8 (outputs 65-72).*
- [UB output\\_bank\\_9](#)  
*general output bank 9 (outputs 73-80).*
- [SW reserved\\_0](#)  
*Reserved.*
- [SW reserved\\_2](#)  
*Reserved.*
- [SW reserved\\_4](#)  
*Reserved.*
- [SW reserved\\_6](#)  
*Reserved.*
- [SW reserved\\_8](#)  
*Reserved.*
- [SW reserved\\_10](#)  
*Reserved.*
- [SW reserved\\_12](#)  
*Reserved.*
- [UB ethercat\\_bank](#)  
*EtherCAT Bank Indicator.*
- [UB reserved\\_14](#)  
*Reserved.*
- [UB ethernet\\_status\\_a](#)  
*Ethernet Handle A Status.*
- [UB ethernet\\_status\\_b](#)  
*Ethernet Handle B Status.*
- [UB ethernet\\_status\\_c](#)  
*Ethernet Handle C Status.*
- [UB ethernet\\_status\\_d](#)  
*Ethernet Handle D Status.*
- [UB ethernet\\_status\\_e](#)  
*Ethernet Handle E Status.*
- [UB ethernet\\_status\\_f](#)  
*Ethernet Handle F Status.*
- [UB ethernet\\_status\\_g](#)  
*Ethernet Handle G Status.*
- [UB ethernet\\_status\\_h](#)

- Ethernet Handle H Status.*
- [UB error\\_code](#)  
*error code.*
- [UB thread\\_status](#)  
*thread status*
- [UL amplifier\\_status](#)  
*Amplifier Status.*
- [UL contour\\_segment\\_count](#)  
*Segment Count for Contour Mode.*
- [UW contour\\_buffer\\_available](#)  
*Buffer space remaining, Contour Mode.*
- [UW s\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for S plane.*
- [UW s\\_plane\\_move\\_status](#)  
*coordinated move status for S plane.*
- [SL s\\_distance](#)  
*distance traveled in coordinated move for S plane.*
- [UW s\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, S Plane.*
- [UW t\\_plane\\_segment\\_count](#)  
*segment count of coordinated move for T plane.*
- [UW t\\_plane\\_move\\_status](#)  
*Coordinated move status for T plane.*
- [SL t\\_distance](#)  
*distance traveled in coordinated move for T plane.*
- [UW t\\_plane\\_buffer\\_available](#)  
*Buffer space remaining, T Plane.*
- [UW axis\\_a\\_status](#)  
*A axis status.*
- [UB axis\\_a\\_switches](#)  
*A axis switches.*
- [UB axis\\_a\\_stop\\_code](#)  
*A axis stop code.*
- [SL axis\\_a\\_reference\\_position](#)  
*A axis reference position.*
- [SL axis\\_a\\_motor\\_position](#)  
*A axis motor position.*
- [SL axis\\_a\\_position\\_error](#)  
*A axis position error.*
- [SL axis\\_a\\_aux\\_position](#)  
*A axis auxiliary position.*
- [SL axis\\_a\\_velocity](#)  
*A axis velocity.*
- [SL axis\\_a\\_torque](#)  
*A axis torque.*
- [UW axis\\_a\\_analog\\_in](#)  
*A axis analog input.*
- [UB axis\\_a\\_halls](#)  
*A Hall Input Status.*
- [UB axis\\_a\\_reserved](#)  
*Reserved.*

- [SL axis\\_a\\_variable](#)  
*A User-defined variable (ZA).*
- [UW axis\\_b\\_status](#)  
*B axis status.*
- [UB axis\\_b\\_switches](#)  
*B axis switches.*
- [UB axis\\_b\\_stop\\_code](#)  
*B axis stop code.*
- [SL axis\\_b\\_reference\\_position](#)  
*B axis reference position.*
- [SL axis\\_b\\_motor\\_position](#)  
*B axis motor position.*
- [SL axis\\_b\\_position\\_error](#)  
*B axis position error.*
- [SL axis\\_b\\_aux\\_position](#)  
*B axis auxiliary position.*
- [SL axis\\_b\\_velocity](#)  
*B axis velocity.*
- [SL axis\\_b\\_torque](#)  
*B axis torque.*
- [UW axis\\_b\\_analog\\_in](#)  
*B axis analog input.*
- [UB axis\\_b\\_halls](#)  
*B Hall Input Status.*
- [UB axis\\_b\\_reserved](#)  
*Reserved.*
- [SL axis\\_b\\_variable](#)  
*B User-defined variable (ZA).*
- [UW axis\\_c\\_status](#)  
*C axis status.*
- [UB axis\\_c\\_switches](#)  
*C axis switches.*
- [UB axis\\_c\\_stop\\_code](#)  
*C axis stop code.*
- [SL axis\\_c\\_reference\\_position](#)  
*C axis reference position.*
- [SL axis\\_c\\_motor\\_position](#)  
*C axis motor position.*
- [SL axis\\_c\\_position\\_error](#)  
*C axis position error.*
- [SL axis\\_c\\_aux\\_position](#)  
*C axis auxiliary position.*
- [SL axis\\_c\\_velocity](#)  
*C axis velocity.*
- [SL axis\\_c\\_torque](#)  
*C axis torque.*
- [UW axis\\_c\\_analog\\_in](#)  
*C axis analog input.*
- [UB axis\\_c\\_halls](#)  
*C Hall Input Status.*
- [UB axis\\_c\\_reserved](#)

- Reserved.*
- [SL axis\\_c\\_variable](#)  
*C User-defined variable (ZA).*
- [UW axis\\_d\\_status](#)  
*D axis status.*
- [UB axis\\_d\\_switches](#)  
*D axis switches.*
- [UB axis\\_d\\_stop\\_code](#)  
*D axis stop code.*
- [SL axis\\_d\\_reference\\_position](#)  
*D axis reference position.*
- [SL axis\\_d\\_motor\\_position](#)  
*D axis motor position.*
- [SL axis\\_d\\_position\\_error](#)  
*D axis position error.*
- [SL axis\\_d\\_aux\\_position](#)  
*D axis auxiliary position.*
- [SL axis\\_d\\_velocity](#)  
*D axis velocity.*
- [SL axis\\_d\\_torque](#)  
*D axis torque.*
- [UW axis\\_d\\_analog\\_in](#)  
*D axis analog input.*
- [UB axis\\_d\\_halls](#)  
*D Hall Input Status.*
- [UB axis\\_d\\_reserved](#)  
*Reserved.*
- [SL axis\\_d\\_variable](#)  
*D User-defined variable (ZA).*
- [UW axis\\_e\\_status](#)  
*E axis status.*
- [UB axis\\_e\\_switches](#)  
*E axis switches.*
- [UB axis\\_e\\_stop\\_code](#)  
*E axis stop code.*
- [SL axis\\_e\\_reference\\_position](#)  
*E axis reference position.*
- [SL axis\\_e\\_motor\\_position](#)  
*E axis motor position.*
- [SL axis\\_e\\_position\\_error](#)  
*E axis position error.*
- [SL axis\\_e\\_aux\\_position](#)  
*E axis auxiliary position.*
- [SL axis\\_e\\_velocity](#)  
*E axis velocity.*
- [SL axis\\_e\\_torque](#)  
*E axis torque.*
- [UW axis\\_e\\_analog\\_in](#)  
*E axis analog input.*
- [UB axis\\_e\\_halls](#)  
*E Hall Input Status.*

- [UB axis\\_e\\_reserved](#)  
*Reserved.*
- [SL axis\\_e\\_variable](#)  
*E User-defined variable (ZA).*
- [UW axis\\_f\\_status](#)  
*F axis status.*
- [UB axis\\_f\\_switches](#)  
*F axis switches.*
- [UB axis\\_f\\_stop\\_code](#)  
*F axis stop code.*
- [SL axis\\_f\\_reference\\_position](#)  
*F axis reference position.*
- [SL axis\\_f\\_motor\\_position](#)  
*F axis motor position.*
- [SL axis\\_f\\_position\\_error](#)  
*F axis position error.*
- [SL axis\\_f\\_aux\\_position](#)  
*F axis auxiliary position.*
- [SL axis\\_f\\_velocity](#)  
*F axis velocity.*
- [SL axis\\_f\\_torque](#)  
*F axis torque.*
- [UW axis\\_f\\_analog\\_in](#)  
*F axis analog input.*
- [UB axis\\_f\\_halls](#)  
*F Hall Input Status.*
- [UB axis\\_f\\_reserved](#)  
*Reserved.*
- [SL axis\\_f\\_variable](#)  
*F User-defined variable (ZA).*
- [UW axis\\_g\\_status](#)  
*G axis status.*
- [UB axis\\_g\\_switches](#)  
*G axis switches.*
- [UB axis\\_g\\_stop\\_code](#)  
*G axis stop code.*
- [SL axis\\_g\\_reference\\_position](#)  
*G axis reference position.*
- [SL axis\\_g\\_motor\\_position](#)  
*G axis motor position.*
- [SL axis\\_g\\_position\\_error](#)  
*G axis position error.*
- [SL axis\\_g\\_aux\\_position](#)  
*G axis auxiliary position.*
- [SL axis\\_g\\_velocity](#)  
*G axis velocity.*
- [SL axis\\_g\\_torque](#)  
*G axis torque.*
- [UW axis\\_g\\_analog\\_in](#)  
*G axis analog input.*
- [UB axis\\_g\\_halls](#)

- G Hall Input Status.*
- [UB axis\\_g\\_reserved](#)
  - Reserved.*
- [SL axis\\_g\\_variable](#)
  - G User-defined variable (ZA).*
- [UW axis\\_h\\_status](#)
  - H axis status.*
- [UB axis\\_h\\_switches](#)
  - H axis switches.*
- [UB axis\\_h\\_stop\\_code](#)
  - H axis stop code.*
- [SL axis\\_h\\_reference\\_position](#)
  - H axis reference position.*
- [SL axis\\_h\\_motor\\_position](#)
  - H axis motor position.*
- [SL axis\\_h\\_position\\_error](#)
  - H axis position error.*
- [SL axis\\_h\\_aux\\_position](#)
  - H axis auxiliary position.*
- [SL axis\\_h\\_velocity](#)
  - H axis velocity.*
- [SL axis\\_h\\_torque](#)
  - H axis torque.*
- [UW axis\\_h\\_analog\\_in](#)
  - H axis analog input.*
- [UB axis\\_h\\_halls](#)
  - H Hall Input Status.*
- [UB axis\\_h\\_reserved](#)
  - Reserved.*
- [SL axis\\_h\\_variable](#)
  - H User-defined variable (ZA).*

### 14.29.1 Detailed Description

Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.  
Definition at line 214 of file [gclib\\_record.h](#).

### 14.29.2 Member Data Documentation

#### 14.29.2.1 header\_0

[UB](#) `GDataRecord52000::header_0`

1st Byte of Header.

Definition at line 219 of file [gclib\\_record.h](#).

#### 14.29.2.2 header\_1

[UB](#) `GDataRecord52000::header_1`

2nd Byte of Header.

Definition at line 220 of file [gclib\\_record.h](#).

#### 14.29.2.3 header\_2

[UB](#) `GDataRecord52000::header_2`

3rd Byte of Header.

Definition at line 221 of file [gclib\\_record.h](#).

#### 14.29.2.4 header\_3

[UB](#) `GDataRecord52000::header_3`

4th Byte of Header.

Definition at line 222 of file [gclib\\_record.h](#).

#### 14.29.2.5 sample\_number

[UW](#) `GDataRecord52000::sample_number`

sample number.

Definition at line 224 of file [gclib\\_record.h](#).

#### 14.29.2.6 input\_bank\_0

[UB](#) `GDataRecord52000::input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 226 of file [gclib\\_record.h](#).

#### 14.29.2.7 input\_bank\_1

[UB](#) `GDataRecord52000::input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 227 of file [gclib\\_record.h](#).

#### 14.29.2.8 input\_bank\_2

[UB](#) `GDataRecord52000::input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 228 of file [gclib\\_record.h](#).

#### 14.29.2.9 input\_bank\_3

[UB](#) `GDataRecord52000::input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 229 of file [gclib\\_record.h](#).

#### 14.29.2.10 input\_bank\_4

[UB](#) `GDataRecord52000::input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 230 of file [gclib\\_record.h](#).

#### 14.29.2.11 input\_bank\_5

[UB](#) `GDataRecord52000::input_bank_5`

general input bank 5 (inputs 41-48).

Definition at line 231 of file [gclib\\_record.h](#).

#### 14.29.2.12 input\_bank\_6

[UB](#) `GDataRecord52000::input_bank_6`

general input bank 6 (inputs 49-56).

Definition at line 232 of file [gclib\\_record.h](#).

#### 14.29.2.13 input\_bank\_7

[UB](#) `GDataRecord52000::input_bank_7`

general input bank 7 (inputs 57-64).

Definition at line 233 of file [gclib\\_record.h](#).

#### 14.29.2.14 input\_bank\_8

[UB](#) `GDataRecord52000::input_bank_8`  
general input bank 8 (inputs 65-72).  
Definition at line [234](#) of file [gclib\\_record.h](#).

#### 14.29.2.15 input\_bank\_9

[UB](#) `GDataRecord52000::input_bank_9`  
general input bank 9 (inputs 73-80).  
Definition at line [235](#) of file [gclib\\_record.h](#).

#### 14.29.2.16 output\_bank\_0

[UB](#) `GDataRecord52000::output_bank_0`  
general output bank 0 (outputs 1-8).  
Definition at line [237](#) of file [gclib\\_record.h](#).

#### 14.29.2.17 output\_bank\_1

[UB](#) `GDataRecord52000::output_bank_1`  
general output bank 1 (outputs 9-16).  
Definition at line [238](#) of file [gclib\\_record.h](#).

#### 14.29.2.18 output\_bank\_2

[UB](#) `GDataRecord52000::output_bank_2`  
general output bank 2 (outputs 17-24).  
Definition at line [239](#) of file [gclib\\_record.h](#).

#### 14.29.2.19 output\_bank\_3

[UB](#) `GDataRecord52000::output_bank_3`  
general output bank 3 (outputs 25-32).  
Definition at line [240](#) of file [gclib\\_record.h](#).

#### 14.29.2.20 output\_bank\_4

[UB](#) `GDataRecord52000::output_bank_4`  
general output bank 4 (outputs 33-40).  
Definition at line [241](#) of file [gclib\\_record.h](#).

#### 14.29.2.21 output\_bank\_5

[UB](#) `GDataRecord52000::output_bank_5`  
general output bank 5 (outputs 41-48).  
Definition at line [242](#) of file [gclib\\_record.h](#).

#### 14.29.2.22 output\_bank\_6

[UB](#) `GDataRecord52000::output_bank_6`  
general output bank 6 (outputs 49-56).  
Definition at line [243](#) of file [gclib\\_record.h](#).

#### 14.29.2.23 output\_bank\_7

[UB](#) `GDataRecord52000::output_bank_7`  
general output bank 7 (outputs 57-64).  
Definition at line [244](#) of file [gclib\\_record.h](#).



#### 14.29.2.24 output\_bank\_8

**UB** GDataRecord52000::output\_bank\_8  
general output bank 8 (outputs 65-72).  
Definition at line 245 of file [gclib\\_record.h](#).

#### 14.29.2.25 output\_bank\_9

**UB** GDataRecord52000::output\_bank\_9  
general output bank 9 (outputs 73-80).  
Definition at line 246 of file [gclib\\_record.h](#).

#### 14.29.2.26 reserved\_0

**SW** GDataRecord52000::reserved\_0  
Reserved.  
Definition at line 248 of file [gclib\\_record.h](#).

#### 14.29.2.27 reserved\_2

**SW** GDataRecord52000::reserved\_2  
Reserved.  
Definition at line 249 of file [gclib\\_record.h](#).

#### 14.29.2.28 reserved\_4

**SW** GDataRecord52000::reserved\_4  
Reserved.  
Definition at line 250 of file [gclib\\_record.h](#).

#### 14.29.2.29 reserved\_6

**SW** GDataRecord52000::reserved\_6  
Reserved.  
Definition at line 251 of file [gclib\\_record.h](#).

#### 14.29.2.30 reserved\_8

**SW** GDataRecord52000::reserved\_8  
Reserved.  
Definition at line 252 of file [gclib\\_record.h](#).

#### 14.29.2.31 reserved\_10

**SW** GDataRecord52000::reserved\_10  
Reserved.  
Definition at line 253 of file [gclib\\_record.h](#).

#### 14.29.2.32 reserved\_12

**SW** GDataRecord52000::reserved\_12  
Reserved.  
Definition at line 254 of file [gclib\\_record.h](#).

#### 14.29.2.33 ethercat\_bank

**UB** GDataRecord52000::ethercat\_bank  
EtherCAT Bank Indicator.  
Definition at line 255 of file [gclib\\_record.h](#).

#### 14.29.2.34 reserved\_14

[UB](#) `GDataRecord52000::reserved_14`

Reserved.

Definition at line 256 of file [gclib\\_record.h](#).

#### 14.29.2.35 ethernet\_status\_a

[UB](#) `GDataRecord52000::ethernet_status_a`

Ethernet Handle A Status.

Definition at line 258 of file [gclib\\_record.h](#).

#### 14.29.2.36 ethernet\_status\_b

[UB](#) `GDataRecord52000::ethernet_status_b`

Ethernet Handle B Status.

Definition at line 259 of file [gclib\\_record.h](#).

#### 14.29.2.37 ethernet\_status\_c

[UB](#) `GDataRecord52000::ethernet_status_c`

Ethernet Handle C Status.

Definition at line 260 of file [gclib\\_record.h](#).

#### 14.29.2.38 ethernet\_status\_d

[UB](#) `GDataRecord52000::ethernet_status_d`

Ethernet Handle D Status.

Definition at line 261 of file [gclib\\_record.h](#).

#### 14.29.2.39 ethernet\_status\_e

[UB](#) `GDataRecord52000::ethernet_status_e`

Ethernet Handle E Status.

Definition at line 262 of file [gclib\\_record.h](#).

#### 14.29.2.40 ethernet\_status\_f

[UB](#) `GDataRecord52000::ethernet_status_f`

Ethernet Handle F Status.

Definition at line 263 of file [gclib\\_record.h](#).

#### 14.29.2.41 ethernet\_status\_g

[UB](#) `GDataRecord52000::ethernet_status_g`

Ethernet Handle G Status.

Definition at line 264 of file [gclib\\_record.h](#).

#### 14.29.2.42 ethernet\_status\_h

[UB](#) `GDataRecord52000::ethernet_status_h`

Ethernet Handle H Status.

Definition at line 265 of file [gclib\\_record.h](#).

#### 14.29.2.43 error\_code

[UB](#) `GDataRecord52000::error_code`

error code.

Definition at line 267 of file [gclib\\_record.h](#).

#### 14.29.2.44 thread\_status

[UB](#) GDataRecord52000::thread\_status

thread status

Definition at line 268 of file [gclib\\_record.h](#).

#### 14.29.2.45 amplifier\_status

[UL](#) GDataRecord52000::amplifier\_status

Amplifier Status.

Definition at line 269 of file [gclib\\_record.h](#).

#### 14.29.2.46 contour\_segment\_count

[UL](#) GDataRecord52000::contour\_segment\_count

Segment Count for Contour Mode.

Definition at line 271 of file [gclib\\_record.h](#).

#### 14.29.2.47 contour\_buffer\_available

[UW](#) GDataRecord52000::contour\_buffer\_available

Buffer space remaining, Contour Mode.

Definition at line 272 of file [gclib\\_record.h](#).

#### 14.29.2.48 s\_plane\_segment\_count

[UW](#) GDataRecord52000::s\_plane\_segment\_count

segment count of coordinated move for S plane.

Definition at line 274 of file [gclib\\_record.h](#).

#### 14.29.2.49 s\_plane\_move\_status

[UW](#) GDataRecord52000::s\_plane\_move\_status

coordinated move status for S plane.

Definition at line 275 of file [gclib\\_record.h](#).

#### 14.29.2.50 s\_distance

[SL](#) GDataRecord52000::s\_distance

distance traveled in coordinated move for S plane.

Definition at line 276 of file [gclib\\_record.h](#).

#### 14.29.2.51 s\_plane\_buffer\_available

[UW](#) GDataRecord52000::s\_plane\_buffer\_available

Buffer space remaining, S Plane.

Definition at line 277 of file [gclib\\_record.h](#).

#### 14.29.2.52 t\_plane\_segment\_count

[UW](#) GDataRecord52000::t\_plane\_segment\_count

segment count of coordinated move for T plane.

Definition at line 279 of file [gclib\\_record.h](#).

#### 14.29.2.53 t\_plane\_move\_status

[UW](#) GDataRecord52000::t\_plane\_move\_status

Coordinated move status for T plane.

Definition at line 280 of file [gclib\\_record.h](#).

#### 14.29.2.54 t\_distance

[SL](#) `GDataRecord52000::t_distance`

distance traveled in coordinated move for T plane.

Definition at line 281 of file [gclib\\_record.h](#).

#### 14.29.2.55 t\_plane\_buffer\_available

[UW](#) `GDataRecord52000::t_plane_buffer_available`

Buffer space remaining, T Plane.

Definition at line 282 of file [gclib\\_record.h](#).

#### 14.29.2.56 axis\_a\_status

[UW](#) `GDataRecord52000::axis_a_status`

A axis status.

Definition at line 284 of file [gclib\\_record.h](#).

#### 14.29.2.57 axis\_a\_switches

[UB](#) `GDataRecord52000::axis_a_switches`

A axis switches.

Definition at line 285 of file [gclib\\_record.h](#).

#### 14.29.2.58 axis\_a\_stop\_code

[UB](#) `GDataRecord52000::axis_a_stop_code`

A axis stop code.

Definition at line 286 of file [gclib\\_record.h](#).

#### 14.29.2.59 axis\_a\_reference\_position

[SL](#) `GDataRecord52000::axis_a_reference_position`

A axis reference position.

Definition at line 287 of file [gclib\\_record.h](#).

#### 14.29.2.60 axis\_a\_motor\_position

[SL](#) `GDataRecord52000::axis_a_motor_position`

A axis motor position.

Definition at line 288 of file [gclib\\_record.h](#).

#### 14.29.2.61 axis\_a\_position\_error

[SL](#) `GDataRecord52000::axis_a_position_error`

A axis position error.

Definition at line 289 of file [gclib\\_record.h](#).

#### 14.29.2.62 axis\_a\_aux\_position

[SL](#) `GDataRecord52000::axis_a_aux_position`

A axis auxiliary position.

Definition at line 290 of file [gclib\\_record.h](#).

#### 14.29.2.63 axis\_a\_velocity

[SL](#) `GDataRecord52000::axis_a_velocity`

A axis velocity.

Definition at line 291 of file [gclib\\_record.h](#).

#### 14.29.2.64 axis\_a\_torque

[SL](#) `GDataRecord52000::axis_a_torque`

A axis torque.

Definition at line 292 of file [gclib\\_record.h](#).

#### 14.29.2.65 axis\_a\_analog\_in

[UW](#) `GDataRecord52000::axis_a_analog_in`

A axis analog input.

Definition at line 293 of file [gclib\\_record.h](#).

#### 14.29.2.66 axis\_a\_halls

[UB](#) `GDataRecord52000::axis_a_halls`

A Hall Input Status.

Definition at line 294 of file [gclib\\_record.h](#).

#### 14.29.2.67 axis\_a\_reserved

[UB](#) `GDataRecord52000::axis_a_reserved`

Reserved.

Definition at line 295 of file [gclib\\_record.h](#).

#### 14.29.2.68 axis\_a\_variable

[SL](#) `GDataRecord52000::axis_a_variable`

A User-defined variable (ZA).

Definition at line 296 of file [gclib\\_record.h](#).

#### 14.29.2.69 axis\_b\_status

[UW](#) `GDataRecord52000::axis_b_status`

B axis status.

Definition at line 298 of file [gclib\\_record.h](#).

#### 14.29.2.70 axis\_b\_switches

[UB](#) `GDataRecord52000::axis_b_switches`

B axis switches.

Definition at line 299 of file [gclib\\_record.h](#).

#### 14.29.2.71 axis\_b\_stop\_code

[UB](#) `GDataRecord52000::axis_b_stop_code`

B axis stop code.

Definition at line 300 of file [gclib\\_record.h](#).

#### 14.29.2.72 axis\_b\_reference\_position

[SL](#) `GDataRecord52000::axis_b_reference_position`

B axis reference position.

Definition at line 301 of file [gclib\\_record.h](#).

#### 14.29.2.73 axis\_b\_motor\_position

[SL](#) `GDataRecord52000::axis_b_motor_position`

B axis motor position.

Definition at line 302 of file [gclib\\_record.h](#).

#### 14.29.2.74 axis\_b\_position\_error

[SL](#) `GDataRecord52000::axis_b_position_error`

B axis position error.

Definition at line 303 of file [gclib\\_record.h](#).

#### 14.29.2.75 axis\_b\_aux\_position

[SL](#) `GDataRecord52000::axis_b_aux_position`

B axis auxiliary position.

Definition at line 304 of file [gclib\\_record.h](#).

#### 14.29.2.76 axis\_b\_velocity

[SL](#) `GDataRecord52000::axis_b_velocity`

B axis velocity.

Definition at line 305 of file [gclib\\_record.h](#).

#### 14.29.2.77 axis\_b\_torque

[SL](#) `GDataRecord52000::axis_b_torque`

B axis torque.

Definition at line 306 of file [gclib\\_record.h](#).

#### 14.29.2.78 axis\_b\_analog\_in

[UW](#) `GDataRecord52000::axis_b_analog_in`

B axis analog input.

Definition at line 307 of file [gclib\\_record.h](#).

#### 14.29.2.79 axis\_b\_halls

[UB](#) `GDataRecord52000::axis_b_halls`

B Hall Input Status.

Definition at line 308 of file [gclib\\_record.h](#).

#### 14.29.2.80 axis\_b\_reserved

[UB](#) `GDataRecord52000::axis_b_reserved`

Reserved.

Definition at line 309 of file [gclib\\_record.h](#).

#### 14.29.2.81 axis\_b\_variable

[SL](#) `GDataRecord52000::axis_b_variable`

B User-defined variable (ZA).

Definition at line 310 of file [gclib\\_record.h](#).

#### 14.29.2.82 axis\_c\_status

[UW](#) `GDataRecord52000::axis_c_status`

C axis status.

Definition at line 312 of file [gclib\\_record.h](#).

#### 14.29.2.83 axis\_c\_switches

[UB](#) `GDataRecord52000::axis_c_switches`

C axis switches.

Definition at line 313 of file [gclib\\_record.h](#).

#### 14.29.2.84 axis\_c\_stop\_code

[UB](#) GDataRecord52000::axis\_c\_stop\_code

C axis stop code.

Definition at line 314 of file [gclib\\_record.h](#).

#### 14.29.2.85 axis\_c\_reference\_position

[SL](#) GDataRecord52000::axis\_c\_reference\_position

C axis reference position.

Definition at line 315 of file [gclib\\_record.h](#).

#### 14.29.2.86 axis\_c\_motor\_position

[SL](#) GDataRecord52000::axis\_c\_motor\_position

C axis motor position.

Definition at line 316 of file [gclib\\_record.h](#).

#### 14.29.2.87 axis\_c\_position\_error

[SL](#) GDataRecord52000::axis\_c\_position\_error

C axis position error.

Definition at line 317 of file [gclib\\_record.h](#).

#### 14.29.2.88 axis\_c\_aux\_position

[SL](#) GDataRecord52000::axis\_c\_aux\_position

C axis auxiliary position.

Definition at line 318 of file [gclib\\_record.h](#).

#### 14.29.2.89 axis\_c\_velocity

[SL](#) GDataRecord52000::axis\_c\_velocity

C axis velocity.

Definition at line 319 of file [gclib\\_record.h](#).

#### 14.29.2.90 axis\_c\_torque

[SL](#) GDataRecord52000::axis\_c\_torque

C axis torque.

Definition at line 320 of file [gclib\\_record.h](#).

#### 14.29.2.91 axis\_c\_analog\_in

[UW](#) GDataRecord52000::axis\_c\_analog\_in

C axis analog input.

Definition at line 321 of file [gclib\\_record.h](#).

#### 14.29.2.92 axis\_c\_halls

[UB](#) GDataRecord52000::axis\_c\_halls

C Hall Input Status.

Definition at line 322 of file [gclib\\_record.h](#).

#### 14.29.2.93 axis\_c\_reserved

[UB](#) GDataRecord52000::axis\_c\_reserved

Reserved.

Definition at line 323 of file [gclib\\_record.h](#).

**14.29.2.94 axis\_c\_variable**

[SL](#) `GDataRecord52000::axis_c_variable`

C User-defined variable (ZA).

Definition at line [324](#) of file [gclib\\_record.h](#).

**14.29.2.95 axis\_d\_status**

[UW](#) `GDataRecord52000::axis_d_status`

D axis status.

Definition at line [326](#) of file [gclib\\_record.h](#).

**14.29.2.96 axis\_d\_switches**

[UB](#) `GDataRecord52000::axis_d_switches`

D axis switches.

Definition at line [327](#) of file [gclib\\_record.h](#).

**14.29.2.97 axis\_d\_stop\_code**

[UB](#) `GDataRecord52000::axis_d_stop_code`

D axis stop code.

Definition at line [328](#) of file [gclib\\_record.h](#).

**14.29.2.98 axis\_d\_reference\_position**

[SL](#) `GDataRecord52000::axis_d_reference_position`

D axis reference position.

Definition at line [329](#) of file [gclib\\_record.h](#).

**14.29.2.99 axis\_d\_motor\_position**

[SL](#) `GDataRecord52000::axis_d_motor_position`

D axis motor position.

Definition at line [330](#) of file [gclib\\_record.h](#).

**14.29.2.100 axis\_d\_position\_error**

[SL](#) `GDataRecord52000::axis_d_position_error`

D axis position error.

Definition at line [331](#) of file [gclib\\_record.h](#).

**14.29.2.101 axis\_d\_aux\_position**

[SL](#) `GDataRecord52000::axis_d_aux_position`

D axis auxiliary position.

Definition at line [332](#) of file [gclib\\_record.h](#).

**14.29.2.102 axis\_d\_velocity**

[SL](#) `GDataRecord52000::axis_d_velocity`

D axis velocity.

Definition at line [333](#) of file [gclib\\_record.h](#).

**14.29.2.103 axis\_d\_torque**

[SL](#) `GDataRecord52000::axis_d_torque`

D axis torque.

Definition at line [334](#) of file [gclib\\_record.h](#).



**14.29.2.104 axis\_d\_analog\_in**

[UW](#) GDataRecord52000::axis\_d\_analog\_in

D axis analog input.

Definition at line [335](#) of file [gclib\\_record.h](#).

**14.29.2.105 axis\_d\_halls**

[UB](#) GDataRecord52000::axis\_d\_halls

D Hall Input Status.

Definition at line [336](#) of file [gclib\\_record.h](#).

**14.29.2.106 axis\_d\_reserved**

[UB](#) GDataRecord52000::axis\_d\_reserved

Reserved.

Definition at line [337](#) of file [gclib\\_record.h](#).

**14.29.2.107 axis\_d\_variable**

[SL](#) GDataRecord52000::axis\_d\_variable

D User-defined variable (ZA).

Definition at line [338](#) of file [gclib\\_record.h](#).

**14.29.2.108 axis\_e\_status**

[UW](#) GDataRecord52000::axis\_e\_status

E axis status.

Definition at line [340](#) of file [gclib\\_record.h](#).

**14.29.2.109 axis\_e\_switches**

[UB](#) GDataRecord52000::axis\_e\_switches

E axis switches.

Definition at line [341](#) of file [gclib\\_record.h](#).

**14.29.2.110 axis\_e\_stop\_code**

[UB](#) GDataRecord52000::axis\_e\_stop\_code

E axis stop code.

Definition at line [342](#) of file [gclib\\_record.h](#).

**14.29.2.111 axis\_e\_reference\_position**

[SL](#) GDataRecord52000::axis\_e\_reference\_position

E axis reference position.

Definition at line [343](#) of file [gclib\\_record.h](#).

**14.29.2.112 axis\_e\_motor\_position**

[SL](#) GDataRecord52000::axis\_e\_motor\_position

E axis motor position.

Definition at line [344](#) of file [gclib\\_record.h](#).

**14.29.2.113 axis\_e\_position\_error**

[SL](#) GDataRecord52000::axis\_e\_position\_error

E axis position error.

Definition at line [345](#) of file [gclib\\_record.h](#).

**14.29.2.114 axis\_e\_aux\_position**

[SL](#) `GDataRecord52000::axis_e_aux_position`

E axis auxiliary position.

Definition at line [346](#) of file [gclib\\_record.h](#).

**14.29.2.115 axis\_e\_velocity**

[SL](#) `GDataRecord52000::axis_e_velocity`

E axis velocity.

Definition at line [347](#) of file [gclib\\_record.h](#).

**14.29.2.116 axis\_e\_torque**

[SL](#) `GDataRecord52000::axis_e_torque`

E axis torque.

Definition at line [348](#) of file [gclib\\_record.h](#).

**14.29.2.117 axis\_e\_analog\_in**

[UW](#) `GDataRecord52000::axis_e_analog_in`

E axis analog input.

Definition at line [349](#) of file [gclib\\_record.h](#).

**14.29.2.118 axis\_e\_halls**

[UB](#) `GDataRecord52000::axis_e_halls`

E Hall Input Status.

Definition at line [350](#) of file [gclib\\_record.h](#).

**14.29.2.119 axis\_e\_reserved**

[UB](#) `GDataRecord52000::axis_e_reserved`

Reserved.

Definition at line [351](#) of file [gclib\\_record.h](#).

**14.29.2.120 axis\_e\_variable**

[SL](#) `GDataRecord52000::axis_e_variable`

E User-defined variable (ZA).

Definition at line [352](#) of file [gclib\\_record.h](#).

**14.29.2.121 axis\_f\_status**

[UW](#) `GDataRecord52000::axis_f_status`

F axis status.

Definition at line [354](#) of file [gclib\\_record.h](#).

**14.29.2.122 axis\_f\_switches**

[UB](#) `GDataRecord52000::axis_f_switches`

F axis switches.

Definition at line [355](#) of file [gclib\\_record.h](#).

**14.29.2.123 axis\_f\_stop\_code**

[UB](#) `GDataRecord52000::axis_f_stop_code`

F axis stop code.

Definition at line [356](#) of file [gclib\\_record.h](#).

**14.29.2.124 axis\_f\_reference\_position**

[SL](#) GDataRecord52000::axis\_f\_reference\_position

F axis reference position.

Definition at line 357 of file [gclib\\_record.h](#).

**14.29.2.125 axis\_f\_motor\_position**

[SL](#) GDataRecord52000::axis\_f\_motor\_position

F axis motor position.

Definition at line 358 of file [gclib\\_record.h](#).

**14.29.2.126 axis\_f\_position\_error**

[SL](#) GDataRecord52000::axis\_f\_position\_error

F axis position error.

Definition at line 359 of file [gclib\\_record.h](#).

**14.29.2.127 axis\_f\_aux\_position**

[SL](#) GDataRecord52000::axis\_f\_aux\_position

F axis auxiliary position.

Definition at line 360 of file [gclib\\_record.h](#).

**14.29.2.128 axis\_f\_velocity**

[SL](#) GDataRecord52000::axis\_f\_velocity

F axis velocity.

Definition at line 361 of file [gclib\\_record.h](#).

**14.29.2.129 axis\_f\_torque**

[SL](#) GDataRecord52000::axis\_f\_torque

F axis torque.

Definition at line 362 of file [gclib\\_record.h](#).

**14.29.2.130 axis\_f\_analog\_in**

[UW](#) GDataRecord52000::axis\_f\_analog\_in

F axis analog input.

Definition at line 363 of file [gclib\\_record.h](#).

**14.29.2.131 axis\_f\_halls**

[UB](#) GDataRecord52000::axis\_f\_halls

F Hall Input Status.

Definition at line 364 of file [gclib\\_record.h](#).

**14.29.2.132 axis\_f\_reserved**

[UB](#) GDataRecord52000::axis\_f\_reserved

Reserved.

Definition at line 365 of file [gclib\\_record.h](#).

**14.29.2.133 axis\_f\_variable**

[SL](#) GDataRecord52000::axis\_f\_variable

F User-defined variable (ZA).

Definition at line 366 of file [gclib\\_record.h](#).

**14.29.2.134 axis\_g\_status**

[UW](#) `GDataRecord52000::axis_g_status`

G axis status.

Definition at line [368](#) of file [gclib\\_record.h](#).

**14.29.2.135 axis\_g\_switches**

[UB](#) `GDataRecord52000::axis_g_switches`

G axis switches.

Definition at line [369](#) of file [gclib\\_record.h](#).

**14.29.2.136 axis\_g\_stop\_code**

[UB](#) `GDataRecord52000::axis_g_stop_code`

G axis stop code.

Definition at line [370](#) of file [gclib\\_record.h](#).

**14.29.2.137 axis\_g\_reference\_position**

[SL](#) `GDataRecord52000::axis_g_reference_position`

G axis reference position.

Definition at line [371](#) of file [gclib\\_record.h](#).

**14.29.2.138 axis\_g\_motor\_position**

[SL](#) `GDataRecord52000::axis_g_motor_position`

G axis motor position.

Definition at line [372](#) of file [gclib\\_record.h](#).

**14.29.2.139 axis\_g\_position\_error**

[SL](#) `GDataRecord52000::axis_g_position_error`

G axis position error.

Definition at line [373](#) of file [gclib\\_record.h](#).

**14.29.2.140 axis\_g\_aux\_position**

[SL](#) `GDataRecord52000::axis_g_aux_position`

G axis auxiliary position.

Definition at line [374](#) of file [gclib\\_record.h](#).

**14.29.2.141 axis\_g\_velocity**

[SL](#) `GDataRecord52000::axis_g_velocity`

G axis velocity.

Definition at line [375](#) of file [gclib\\_record.h](#).

**14.29.2.142 axis\_g\_torque**

[SL](#) `GDataRecord52000::axis_g_torque`

G axis torque.

Definition at line [376](#) of file [gclib\\_record.h](#).

**14.29.2.143 axis\_g\_analog\_in**

[UW](#) `GDataRecord52000::axis_g_analog_in`

G axis analog input.

Definition at line [377](#) of file [gclib\\_record.h](#).

**14.29.2.144 axis\_g\_halls**

[UB](#) GDataRecord52000::axis\_g\_halls

G Hall Input Status.

Definition at line 378 of file [gclib\\_record.h](#).

**14.29.2.145 axis\_g\_reserved**

[UB](#) GDataRecord52000::axis\_g\_reserved

Reserved.

Definition at line 379 of file [gclib\\_record.h](#).

**14.29.2.146 axis\_g\_variable**

[SL](#) GDataRecord52000::axis\_g\_variable

G User-defined variable (ZA).

Definition at line 380 of file [gclib\\_record.h](#).

**14.29.2.147 axis\_h\_status**

[UW](#) GDataRecord52000::axis\_h\_status

H axis status.

Definition at line 382 of file [gclib\\_record.h](#).

**14.29.2.148 axis\_h\_switches**

[UB](#) GDataRecord52000::axis\_h\_switches

H axis switches.

Definition at line 383 of file [gclib\\_record.h](#).

**14.29.2.149 axis\_h\_stop\_code**

[UB](#) GDataRecord52000::axis\_h\_stop\_code

H axis stop code.

Definition at line 384 of file [gclib\\_record.h](#).

**14.29.2.150 axis\_h\_reference\_position**

[SL](#) GDataRecord52000::axis\_h\_reference\_position

H axis reference position.

Definition at line 385 of file [gclib\\_record.h](#).

**14.29.2.151 axis\_h\_motor\_position**

[SL](#) GDataRecord52000::axis\_h\_motor\_position

H axis motor position.

Definition at line 386 of file [gclib\\_record.h](#).

**14.29.2.152 axis\_h\_position\_error**

[SL](#) GDataRecord52000::axis\_h\_position\_error

H axis position error.

Definition at line 387 of file [gclib\\_record.h](#).

**14.29.2.153 axis\_h\_aux\_position**

[SL](#) GDataRecord52000::axis\_h\_aux\_position

H axis auxiliary position.

Definition at line 388 of file [gclib\\_record.h](#).

**14.29.2.154 axis\_h\_velocity**

[SL](#) `GDataRecord52000::axis_h_velocity`

H axis velocity.

Definition at line [389](#) of file [gclib\\_record.h](#).

**14.29.2.155 axis\_h\_torque**

[SL](#) `GDataRecord52000::axis_h_torque`

H axis torque.

Definition at line [390](#) of file [gclib\\_record.h](#).

**14.29.2.156 axis\_h\_analog\_in**

[UW](#) `GDataRecord52000::axis_h_analog_in`

H axis analog input.

Definition at line [391](#) of file [gclib\\_record.h](#).

**14.29.2.157 axis\_h\_halls**

[UB](#) `GDataRecord52000::axis_h_halls`

H Hall Input Status.

Definition at line [392](#) of file [gclib\\_record.h](#).

**14.29.2.158 axis\_h\_reserved**

[UB](#) `GDataRecord52000::axis_h_reserved`

Reserved.

Definition at line [393](#) of file [gclib\\_record.h](#).

**14.29.2.159 axis\_h\_variable**

[SL](#) `GDataRecord52000::axis_h_variable`

H User-defined variable (ZA).

Definition at line [394](#) of file [gclib\\_record.h](#).

The documentation for this struct was generated from the following file:

- [gclib\\_record.h](#)

**14.30 gclib.py Class Reference**

Represents a single Python connection to a Galil Controller or PLC.

**Public Member Functions**

- [\\_\\_init\\_\\_](#) (self)  
*Constructor for the Connection class.*
- [\\_\\_del\\_\\_](#) (self)  
*Destructor for the Connection class.*
- [GOpen](#) (self, address)  
*Opens a connection a galil controller.*
- [GClose](#) (self)  
*Closes a connection to a Galil Controller.*
- [GCommand](#) (self, command)  
*Performs a command-and-response transaction on the connection.*
- [GSleep](#) (self, val)  
*Provides a blocking sleep call which can be useful for timing-based chores.*

- [GVersion](#) (self)  
*Provides the gclib version number.*
- [GServerStatus](#) (self)  
*Provides the local server name and whether it is published to the local network.*
- [GSetServer](#) (self, server\_name)  
*Set the new active server.*
- [GListServers](#) (self)  
*Provide a list of all available gcaps servers on the local network.*
- [GPublishServer](#) (self, server\_name, publish, save)  
*Publish local gcaps server to the network.*
- [GRemoteConnections](#) (self)  
*Shows all remote addresses that are connected to the local server.*
- [GInfo](#) (self)  
*Provides a useful connection string.*
- [GIpRequests](#) (self)  
*Provides a dictionary of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
- [GAssign](#) (self, ip, mac)  
*Assigns IP address over the Ethernet to a controller at a given MAC address.*
- [GAddresses](#) (self)  
*Provides a dictionary of all available connection addresses.*
- [GProgramDownload](#) (self, program, preprocessor='')  
*Downloads a program to the controller's program buffer.*
- [GProgramUpload](#) (self)  
*Uploads a program from the controller's program buffer.*
- [GProgramDownloadFile](#) (self, file\_path, preprocessor='')  
*Program download from file.*
- [GProgramUploadFile](#) (self, file\_path)  
*Program upload to file.*
- [GArrayDownload](#) (self, name, first, last, array\_data)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- [GArrayUploadFile](#) (self, file\_path, names=[])  
*Uploads the entire controller array table or a subset and saves the data as a csv file specified by file\_path.*
- [GArrayDownloadFile](#) (self, file\_path)  
*Downloads a csv file containing array data at file\_path.*
- [GArrayUpload](#) (self, name, first, last)  
*Uploads array data from the controller's array table.*
- [GTimeout](#) (self, timeout)  
*Set the library timeout.*
- [timeout](#) (self)  
*Convenience property read access to timeout value.*
- [timeout](#) (self, timeout)  
*Convenience property write access to timeout value.*
- [GFirmwareDownload](#) (self, file\_path)  
*Upgrade firmware.*
- [GMessage](#) (self)  
*Provides access to unsolicited messages from the controller.*
- [GMotionComplete](#) (self, axes)  
*Blocking call that returns once all axes specified have completed their motion.*
- [GInterrupt](#) (self)  
*Provides access to PCI and UDP interrupts from the controller.*
- [GSetupDownloadFile](#) (self, file\_path, options)  
*Downloads specified sectors from a Galil compressed backup (gcb) file to a controller.*

## Protected Member Functions

- `_cc` (self)  
*Checks if connection is established, throws error if not.*

## Protected Attributes

- `_gcon` = `_GCon(0)`
- `_buf` = `create_string_buffer(_buf_size)`
- `int _timeout` = 5000

### 14.30.1 Detailed Description

Represents a single Python connection to a Galil Controller or PLC.  
Definition at line 113 of file [gclib.py](#).

### 14.30.2 Constructor & Destructor Documentation

#### 14.30.2.1 `__init__()`

```
gclib.py.__init__ (
    self)
```

Constructor for the Connection class.  
Initializes gclib's handle and read buffer.  
Definition at line 118 of file [gclib.py](#).

#### 14.30.2.2 `__del__()`

```
gclib.py.__del__ (
    self)
```

Destructor for the Connection class.  
Ensures close gets called to release Galil resource (Sockets, Kernel Driver, Com Port, etc).  
Definition at line 125 of file [gclib.py](#).

### 14.30.3 Member Function Documentation

#### 14.30.3.1 `_cc()`

```
gclib.py._cc (
    self) [protected]
```

Checks if connection is established, throws error if not.  
Definition at line 130 of file [gclib.py](#).

### 14.30.4 Member Data Documentation

#### 14.30.4.1 `_gcon`

```
gclib.py._gcon = _GCon(0) [protected]
```

Definition at line 120 of file [gclib.py](#).

#### 14.30.4.2 `_buf`

```
gclib.py._buf = create_string_buffer(_buf_size) [protected]
```

Definition at line 121 of file [gclib.py](#).

#### 14.30.4.3 `_timeout`

```
int gclib.py._timeout = 5000 [protected]
```

Definition at line 122 of file [gclib.py](#).

The documentation for this class was generated from the following file:



- [gclib.py](#)



# Chapter 15

## File Documentation

### 15.1 examples.md File Reference

### 15.2 gcl.md File Reference

### 15.3 license.md File Reference

### 15.4 preprocessor.md File Reference

### 15.5 /builds/software/gclib/doc/README.md File Reference

### 15.6 gclib.h File Reference

```
#include <string.h>
#include <stdlib.h>
#include <stdint.h>
#include <stdbool.h>
#include <stdarg.h>
#include "gclib_compat.h"
```

#### Classes

- struct [gclib\\_interrupt\\_t](#)  
*An interrupt generated by the controller.*

#### Typedefs

- typedef struct Context \* [gclib\\_handle](#)  
*A handle to an open connection given by [gclib\\_open\(\)](#) for use in future API calls.*
- typedef struct DataRecord \* [gclib\\_data\\_record\\_handle](#)  
*A handle to a data record, for use in [Data Record](#) API calls.*
- typedef enum [gclib\\_result](#) [gclib\\_result](#)  
*All gclib function return values.*
- typedef enum [gclib\\_interrupt\\_type](#) [gclib\\_interrupt\\_type](#)  
*All interrupt status types.*
- typedef struct [gclib\\_interrupt\\_t](#) [gclib\\_interrupt\\_t](#)  
*An interrupt generated by the controller.*
- typedef enum [gclib\\_digital\\_input\\_flags](#) [gclib\\_digital\\_input\\_flags](#)  
*Flags to enable or disable [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) interrupts per digital input, for use in [gclib\\_set\\_interrupts\(\)](#).*

- typedef enum [gclib\\_axis\\_flags](#) [gclib\\_axis\\_flags](#)  
*Flags for building an axis mask, for example in [gclib\\_set\\_interrupts\(\)](#).*
- typedef enum [gclib\\_connection\\_t](#) [gclib\\_connection\\_t](#)  
*Connection type, as returned by [gclib\\_connection\\_type\(\)](#).*
- typedef enum [gclib\\_mode\\_of\\_motion\\_t](#) [gclib\\_mode\\_of\\_motion\\_t](#)  
*The controller's current mode of motion, given by [gclib\\_data\\_record\\_mode\\_of\\_motion\(\)](#).*
- typedef enum [gclib\\_ethernet\\_status\\_t](#) [gclib\\_ethernet\\_status\\_t](#)  
*The current status of an ethernet handle, given by [gclib\\_data\\_record\\_ethernet\\_status\(\)](#).*

## Enumerations

- enum [gclib\\_result](#) {  
[GCLIB\\_SUCCESS](#), [GCLIB\\_INVALID\\_ARGUMENT](#), [GCLIB\\_INTERNAL\\_ERROR](#), [GCLIB\\_TIMEOUT](#),  
[GCLIB\\_COMMAND\\_ERROR](#), [GCLIB\\_BUFFER\\_TOO\\_SMALL](#), [GCLIB\\_NOT\\_CONNECTED](#), [GCLIB\\_NOT\\_SUBSCRIBED](#)  
}  
*All gclib function return values.*
- enum [gclib\\_interrupt\\_type](#) {  
[GCLIB\\_NO\\_INTERRUPTS](#) = 0, [GCLIB\\_USER\\_INTERRUPT](#) = 0, [GCLIB\\_MOTION\\_COMPLETE](#) = 1 << 0,  
[GCLIB\\_ALL\\_AXES\\_MOTION\\_COMPLETE](#) = 1 << 8,  
[GCLIB\\_EXCESS\\_POSITION\\_ERROR](#) = 1 << 9, [GCLIB\\_LIMIT\\_SWITCH](#) = 1 << 10, [GCLIB\\_WATCHDOG\\_TIMER](#)  
= 1 << 11, [GCLIB\\_PROGRAM\\_STOPPED](#) = 1 << 13,  
[GCLIB\\_COMMAND\\_DONE](#) = 1 << 14, [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) = 1 << 15, [GCLIB\\_ALL\\_INTERRUPTS](#)  
= (1 << 16) - 1 }  
*All interrupt status types.*
- enum [gclib\\_digital\\_input\\_flags](#) {  
[GCLIB\\_NO\\_DIGITAL\\_INPUTS](#) = 0, [GCLIB\\_DIGITAL\\_INPUT\\_1](#) = 1 << 0, [GCLIB\\_DIGITAL\\_INPUT\\_2](#) = 1  
<< 1, [GCLIB\\_DIGITAL\\_INPUT\\_3](#) = 1 << 2,  
[GCLIB\\_DIGITAL\\_INPUT\\_4](#) = 1 << 3, [GCLIB\\_DIGITAL\\_INPUT\\_5](#) = 1 << 4, [GCLIB\\_DIGITAL\\_INPUT\\_6](#) =  
1 << 5, [GCLIB\\_DIGITAL\\_INPUT\\_7](#) = 1 << 6,  
[GCLIB\\_DIGITAL\\_INPUT\\_8](#) = 1 << 7, [GCLIB\\_ALL\\_DIGITAL\\_INPUTS](#) = (1 << 8) - 1 }  
*Flags to enable or disable [GCLIB\\_DIGITAL\\_INPUT\\_LOW](#) interrupts per digital input, for use in [gclib\\_set\\_interrupts\(\)](#).*
- enum [gclib\\_axis\\_flags](#) {  
[GCLIB\\_NO\\_AXES](#) = 0, [GCLIB\\_AXIS\\_A](#) = 1 << 0, [GCLIB\\_AXIS\\_B](#) = 1 << 1, [GCLIB\\_AXIS\\_C](#) = 1 << 2,  
[GCLIB\\_AXIS\\_D](#) = 1 << 3, [GCLIB\\_AXIS\\_E](#) = 1 << 4, [GCLIB\\_AXIS\\_F](#) = 1 << 5, [GCLIB\\_AXIS\\_G](#) = 1 <<  
6,  
[GCLIB\\_AXIS\\_H](#) = 1 << 7, [GCLIB\\_ALL\\_AXES](#) = (1 << 8) - 1 }  
*Flags for building an axis mask, for example in [gclib\\_set\\_interrupts\(\)](#).*
- enum [gclib\\_connection\\_t](#) { [GCLIB\\_ETHERNET](#) = 1, [GCLIB\\_SERIAL](#), [GCLIB\\_PCI](#) }  
*Connection type, as returned by [gclib\\_connection\\_type\(\)](#).*
- enum [gclib\\_mode\\_of\\_motion\\_t](#) {  
[GCLIB\\_NO\\_MOTION](#), [GCLIB\\_CONTOUR](#), [GCLIB\\_POSITION\\_ABSOLUTE](#), [GCLIB\\_POSITION\\_RELATIVE](#)  
,  
[GCLIB\\_FIND\\_EDGE](#), [GCLIB\\_FIND\\_INDEX](#), [GCLIB\\_HOME](#), [GCLIB\\_VECTOR\\_MOVE](#),  
[GCLIB\\_LINEAR\\_MOVE](#) = [GCLIB\\_VECTOR\\_MOVE](#) }  
*The controller's current mode of motion, given by [gclib\\_data\\_record\\_mode\\_of\\_motion\(\)](#).*
- enum [gclib\\_ethernet\\_status\\_t](#) {  
[HANDLE\\_FREE](#) = 0, [UDP\\_SLAVE](#) = 1, [TCP\\_SLAVE](#) = 2, [UDP\\_MASTER](#) = -1,  
[TCP\\_MASTER](#) = -2, [ESTABLISHING\\_UDP](#) = -5, [ESTABLISHING\\_TCP](#) = -6 }  
*The current status of an ethernet handle, given by [gclib\\_data\\_record\\_ethernet\\_status\(\)](#).*

## Functions

- [gclib\\_result gclib\\_version](#) (char \*version, size\_t len)  
*Get library version.*
- [gclib\\_result gclib\\_gcaps\\_version](#) (char \*gcaps\_version, size\_t len)

- Get library version used by current gcaps server.*

  - [gclib\\_result gclib\\_addresses](#) (char \*addresses, size\_t len)

*Show address, model, and serial of detected controllers, where available.*

- [gclib\\_result gclib\\_ip\\_requests](#) (char \*ip\_requests, size\_t len)

*Show MAC address, model, and serial of all controllers requesting IP addresses, comma-separated.*

- [gclib\\_result gclib\\_assign\\_ip](#) (const char \*mac, const char \*ip)

*Assign IP to a controller.*

- [gclib\\_result gclib\\_list\\_servers](#) (char \*servers, size\_t len)

*List available gcaps servers separated by newline.*

- [gclib\\_result gclib\\_server](#) (char \*name, size\_t len)

*Current gcaps server.*

- [gclib\\_result gclib\\_set\\_server](#) (const char \*name)

*Set gcaps server.*

- [gclib\\_result gclib\\_published](#) (char \*name, size\_t len)

*Provides published status of local gcaps server.*

- [gclib\\_result gclib\\_set\\_published](#) (const char \*name)

*Set published status of local gcaps server.*

- void [gclib\\_force\\_gcaps](#) (bool on)

*Force future library calls to use either gcaps or direct connections.*

- [gclib\\_result gclib\\_open](#) ([gclib\\_handle](#) \*h, const char \*address)

*Open a connection to a controller.*

- [gclib\\_result gclib\\_set\\_baud\\_rate](#) ([gclib\\_handle](#) h, size\_t baud\_rate)

*Set baud rate of serial connection.*

- [gclib\\_result gclib\\_close](#) ([gclib\\_handle](#) \*h)

*Close connection to controller.*

- const char \* [gclib\\_error](#) ([gclib\\_handle](#) h)

*Get library error string.*

- [gclib\\_result gclib\\_address](#) ([gclib\\_handle](#) h, char \*address, size\_t len)

*Get connection address.*

- [gclib\\_result gclib\\_connection\\_type](#) ([gclib\\_handle](#) h, [gclib\\_connection\\_t](#) \*type)

*Get connection type.*

- [gclib\\_result gclib\\_revision\\_information](#) ([gclib\\_handle](#) h, char \*rev\_info, size\_t len)

*Get revision information ( $R^V$ ) from controller.*

- [gclib\\_result gclib\\_serial\\_number](#) ([gclib\\_handle](#) h, uint32\_t \*serial\_number)

*Get serial number from controller.*

- [gclib\\_result gclib\\_command](#) ([gclib\\_handle](#) h, const char \*command, char \*buf, size\_t len)

*Issues a command to the controller and provides the response.*

- [gclib\\_result gclib\\_set\\_interrupts](#) ([gclib\\_handle](#) h, [gclib\\_interrupt\\_type](#) interrupt\_mask, [gclib\\_axis\\_flags](#) motion\_complete\_axes, [gclib\\_digital\\_input\\_flags](#) digital\_inputs)

*Configure which interrupts will be generated by the controller.*

- [gclib\\_result gclib\\_set\\_data\\_records](#) ([gclib\\_handle](#) h, size\_t period\_ms)

*Configure controller data records.*

- [gclib\\_result gclib\\_subscribe\\_messages](#) ([gclib\\_handle](#) h, void(callback)(void \*user\_data, const char \*message), void \*user\_data)

*Subscribe to unsolicited messages.*

- [gclib\\_result gclib\\_subscribe\\_interrupts](#) ([gclib\\_handle](#) h, void(callback)(void \*user\_data, [gclib\\_interrupt\\_t](#) interrupt), void \*user\_data)

*Subscribe to interrupts.*

- [gclib\\_result gclib\\_subscribe\\_data\\_records](#) ([gclib\\_handle](#) h, void(callback)(void \*user\_data, [gclib\\_data\\_record\\_handle](#) data\_record), void \*user\_data)

*Subscribe to data records.*

- [gclib\\_result gclib\\_subscribe\\_progress](#) ([gclib\\_handle](#) h, void(callback)(void \*user\_data, size\_t current, size\_t max), void \*user\_data)  
*Subscribe to progress for [gclib\\_set\\_program\(\)](#), [gclib\\_set\\_array\(\)](#), and [gclib\\_set\\_firmware\(\)](#).*
- [gclib\\_result gclib\\_unsubscribe](#) ([gclib\\_handle](#) h, void \*callback)  
*Unsubscribe from messages, interrupts, data records, or progress.*
- [gclib\\_result gclib\\_message](#) ([gclib\\_handle](#) h, char \*message, size\_t len, int timeout)  
*Get a queued unsolicited message, or wait up to *timeout* ms for one to arrive.*
- [gclib\\_result gclib\\_interrupt](#) ([gclib\\_handle](#) h, [gclib\\_interrupt\\_t](#) \*interrupt, int timeout)  
*Get a queued interrupt, or wait up to *timeout* ms for one to arrive.*
- [gclib\\_result gclib\\_data\\_record](#) ([gclib\\_handle](#) h, [gclib\\_data\\_record\\_handle](#) \*data\_record, int timeout)  
*Get a queued data record, or wait up to *timeout* ms for one to arrive.*
- [gclib\\_result gclib\\_program](#) ([gclib\\_handle](#) h, char \*program, size\_t len)  
*Get the controller's current program.*
- [gclib\\_result gclib\\_set\\_program](#) ([gclib\\_handle](#) h, const char \*program, const char \*insert)  
*Set the program on the controller.*
- [gclib\\_result gclib\\_array](#) ([gclib\\_handle](#) h, const char \*name, char \*buf, size\_t len, size\_t start, size\_t end)  
*Get an array from the controller.*
- [gclib\\_result gclib\\_set\\_array](#) ([gclib\\_handle](#) h, const char \*name, const char \*buf, size\_t start, size\_t end)  
*Set an array on the controller.*
- [gclib\\_result gclib\\_set\\_firmware](#) ([gclib\\_handle](#) h, const char \*file\_path)  
*Set the firmware on the controller.*
- [uint16\\_t gclib\\_data\\_record\\_sample](#) ([gclib\\_data\\_record\\_handle](#) h)  
*The sample in which this data record was generated.*
- [bool gclib\\_data\\_record\\_input](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t index)  
*Get an input.*
- [bool gclib\\_data\\_record\\_output](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t index)  
*Get an output.*
- [uint8\\_t gclib\\_data\\_record\\_input\\_bank](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t index)  
*Get a bank of inputs.*
- [uint8\\_t gclib\\_data\\_record\\_output\\_bank](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t index)  
*Get a bank of outputs.*
- [uint8\\_t gclib\\_data\\_record\\_error\\_code](#) ([gclib\\_data\\_record\\_handle](#) h)  
*Get the error code.*
- [uint32\\_t gclib\\_data\\_record\\_contour\\_segment\\_count](#) ([gclib\\_data\\_record\\_handle](#) h)  
*Get the contour segment count.*
- [uint16\\_t gclib\\_data\\_record\\_contour\\_buffer\\_available](#) ([gclib\\_data\\_record\\_handle](#) h)  
*Get remaining contour buffer.*
- [bool gclib\\_data\\_record\\_thread\\_running](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t thread)  
*Returns true if a given thread is running.*
- [gclib\\_ethernet\\_status\\_t gclib\\_data\\_record\\_ethernet\\_status](#) ([gclib\\_data\\_record\\_handle](#) h, char handle)  
*Get ethernet handle status.*
- [gclib\\_result gclib\\_data\\_record\\_bytes](#) ([gclib\\_data\\_record\\_handle](#) h, char \*data\_record, size\_t len)  
*Copy data record to user buffer.*
- [bool gclib\\_data\\_record\\_motor\\_off](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Get motor off status.*
- [bool gclib\\_data\\_record\\_latch\\_armed](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Get latch armed.*
- [bool gclib\\_data\\_record\\_final\\_deceleration](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true when axis is in final deceleration.*
- [bool gclib\\_data\\_record\\_stopping](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis is stopping.*

- bool [gclib\\_data\\_record\\_slewing](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis is slewing.*
- [gclib\\_mode\\_of\\_motion\\_t gclib\\_data\\_record\\_mode\\_of\\_motion](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the mode of motion being profiled.*
- bool [gclib\\_data\\_record\\_negative\\_direction\\_move](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis velocity is negative.*
- bool [gclib\\_data\\_record\\_moving](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if motion is being profiled.*
- int [gclib\\_data\\_record\\_home\\_phase](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns home phase when in [GCLIB\\_HOME](#) mode.*
- bool [gclib\\_data\\_record\\_stepper\\_mode](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if axis is configured as a stepper motor.*
- bool [gclib\\_data\\_record\\_home\\_input](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the state of the home input.*
- bool [gclib\\_data\\_record\\_reverse\\_limit](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the state of the reverse limit.*
- bool [gclib\\_data\\_record\\_forward\\_limit](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the state of the forward limit.*
- bool [gclib\\_data\\_record\\_latch\\_input](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the state of the latch input.*
- bool [gclib\\_data\\_record\\_latch\\_occurred](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns whether the latch was triggered.*
- uint8\_t [gclib\\_data\\_record\\_stop\\_code](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns a code indicating why the motor has stopped. See the [SC command reference](#) for details.*
- int32\_t [gclib\\_data\\_record\\_reference\\_position](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the reference position.*
- int32\_t [gclib\\_data\\_record\\_position](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the position.*
- int32\_t [gclib\\_data\\_record\\_position\\_error](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the position error.*
- int32\_t [gclib\\_data\\_record\\_aux\\_position](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the auxiliary position.*
- int32\_t [gclib\\_data\\_record\\_velocity](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the velocity.*
- double [gclib\\_data\\_record\\_torque](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the torque.*
- double [gclib\\_data\\_record\\_analog\\_input](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the analog input.*
- uint8\_t [gclib\\_data\\_record\\_halls](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the hall state.*
- int32\_t [gclib\\_data\\_record\\_variable](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns the value of a user variable for an axis.*
- bool [gclib\\_data\\_record\\_hall\\_error](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if the amplifier for this axis has triggered a hall error.*
- bool [gclib\\_data\\_record\\_peak\\_current](#) ([gclib\\_data\\_record\\_handle](#) h, char axis)  
*Returns true if the amplifier for this axis has triggered a peak current error.*
- bool [gclib\\_data\\_record\\_over\\_current](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns over current status.*
- bool [gclib\\_data\\_record\\_over\\_voltage](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)  
*Returns over voltage status.*
- bool [gclib\\_data\\_record\\_over\\_temp](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)

- Returns over temperature status.*
- bool [gclib\\_data\\_record\\_under\\_voltage](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)
- Returns under voltage status.*
- bool [gclib\\_data\\_record\\_electronic\\_lock\\_out](#) ([gclib\\_data\\_record\\_handle](#) h, size\_t amp)
- Returns electronic lockout (ELO) status for a bank.*
- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_segment\\_count](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns the segment count for the current move.*
- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_status](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns the coordinated move status word.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_final\\_deceleration](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns true if in final deceleration.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_stopping](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns true if stopping.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_slewing](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns true if slewing.*
- bool [gclib\\_data\\_record\\_coordinated\\_move\\_moving](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns true if moving.*
- int32\_t [gclib\\_data\\_record\\_coordinated\\_move\\_distance](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns the distance covered in the current move.*
- uint16\_t [gclib\\_data\\_record\\_coordinated\\_move\\_buffer\\_available](#) ([gclib\\_data\\_record\\_handle](#) h, char plane)
- Returns the available buffer space.*
- void [gclib\\_set\\_compat](#) ()
- [gclib\\_result](#) [gclib\\_set\\_timeout](#) ([gclib\\_handle](#) h, size\_t timeout)

### 15.6.1 Detailed Description

Defines the interface for the Galil C Library (GCLIB).

Definition in file [gclib.h](#).

## 15.7 gclib.h

[Go to the documentation of this file.](#)

```

00001
00002
00003
00004 #pragma once
00005
00006 #ifdef __cplusplus
00007 extern "C" {
00008 #endif
00009
00010 #include <string.h>
00011 #include <stdlib.h>
00012 #include <stdint.h>
00013 #include <stdbool.h>
00014 #include <stdarg.h>
00015
00016 #include "gclib_compat.h"
00017
00018 #ifndef _WIN32
00019 #pragma GCC visibility push(default)
00020 #endif
00021
00022 typedef struct Context* gclib_handle;
00023 typedef struct DataRecord* gclib_data_record_handle;
00024
00025 typedef enum gclib_result {
00026     GCLIB_SUCCESS,
00027     GCLIB_INVALID_ARGUMENT,
00028     GCLIB_INTERNAL_ERROR,
00029     GCLIB_TIMEOUT,
00030     GCLIB_COMMAND_ERROR,
00031     GCLIB_BUFFER_TOO_SMALL,
00032     GCLIB_NOT_CONNECTED,
00033     GCLIB_NOT_SUBSCRIBED
00034 } gclib_result;

```



```

00041 typedef enum gclib_interrupt_type {
00042     GCLIB_NO_INTERRUPTS = 0,
00043     GCLIB_USER_INTERRUPT = 0, // Cannot be enabled or disabled
00044     GCLIB_MOTION_COMPLETE = 1 << 0,
00045     GCLIB_ALL_AXES_MOTION_COMPLETE = 1 << 8,
00046     GCLIB_EXCESS_POSITION_ERROR = 1 << 9,
00047     GCLIB_LIMIT_SWITCH = 1 << 10,
00048     GCLIB_WATCHDOG_TIMER = 1 << 11,
00049     GCLIB_PROGRAM_STOPPED = 1 << 13,
00050     GCLIB_COMMAND_DONE = 1 << 14,
00051     GCLIB_DIGITAL_INPUT_LOW = 1 << 15,
00052     GCLIB_ALL_INTERRUPTS = (1 << 16) - 1,
00053 } gclib_interrupt_type;
00055 typedef struct gclib_interrupt_t {
00056     gclib_interrupt_type type;
00057     union {
00058         char axis;
00059         uint8_t digital_input;
00060         uint8_t user_interrupt;
00061     };
00062     uint8_t status;
00063 } gclib_interrupt_t;
00065 typedef enum gclib_digital_input_flags {
00066     GCLIB_NO_DIGITAL_INPUTS = 0,
00067     GCLIB_DIGITAL_INPUT_1 = 1 << 0,
00068     GCLIB_DIGITAL_INPUT_2 = 1 << 1,
00069     GCLIB_DIGITAL_INPUT_3 = 1 << 2,
00070     GCLIB_DIGITAL_INPUT_4 = 1 << 3,
00071     GCLIB_DIGITAL_INPUT_5 = 1 << 4,
00072     GCLIB_DIGITAL_INPUT_6 = 1 << 5,
00073     GCLIB_DIGITAL_INPUT_7 = 1 << 6,
00074     GCLIB_DIGITAL_INPUT_8 = 1 << 7,
00075     GCLIB_ALL_DIGITAL_INPUTS = (1 << 8) - 1
00076 } gclib_digital_input_flags;
00078 typedef enum gclib_axis_flags {
00079     GCLIB_NO_AXES = 0,
00080     GCLIB_AXIS_A = 1 << 0,
00081     GCLIB_AXIS_B = 1 << 1,
00082     GCLIB_AXIS_C = 1 << 2,
00083     GCLIB_AXIS_D = 1 << 3,
00084     GCLIB_AXIS_E = 1 << 4,
00085     GCLIB_AXIS_F = 1 << 5,
00086     GCLIB_AXIS_G = 1 << 6,
00087     GCLIB_AXIS_H = 1 << 7,
00088     GCLIB_ALL_AXES = (1 << 8) - 1
00089 } gclib_axis_flags;
00090
00091
00098 gclib_result gclib_version(char* version, size_t len);
00099
00106 gclib_result gclib_gcaps_version(char* gcaps_version, size_t len);
00107
00111
00112
00132 gclib_result gclib_addresses(char* addresses, size_t len);
00133
00147 gclib_result gclib_ip_requests(char* ip_requests, size_t len);
00148
00157 gclib_result gclib_assign_ip(const char* mac, const char* ip);
00158
00164
00165
00172 gclib_result gclib_list_servers(char* servers, size_t len);
00173
00182 gclib_result gclib_server(char* name, size_t len);
00183
00191 gclib_result gclib_set_server(const char* name);
00192
00200 gclib_result gclib_published(char* name, size_t len);
00201
00207 gclib_result gclib_set_published(const char* name);
00208
00210
00211
00222 void gclib_force_gcaps(bool on);
00223
00237 gclib_result gclib_open(gclib_handle* h, const char* address);
00238
00246 gclib_result gclib_set_baud_rate(gclib_handle h, size_t baud_rate);
00247
00254 gclib_result gclib_close(gclib_handle* h);
00255
00265 const char* gclib_error(gclib_handle h);
00266
00274 gclib_result gclib_address(gclib_handle h, char* address, size_t len);
00276 typedef enum gclib_connection_t {
00277     GCLIB_ETHERNET = 1,

```

```

00278     GCLIB_SERIAL,
00279     GCLIB_PCI
00280 } gclib_connection_t;
00281
00288 gclib_result gclib_connection_type(gclib_handle h, gclib_connection_t* type);
00289
00294
00295
00306 gclib_result gclib_revision_information(gclib_handle h, char* rev_info, size_t len);
00307
00315 gclib_result gclib_serial_number(gclib_handle h, uint32_t* serial_number);
00316
00332 gclib_result gclib_command(gclib_handle h, const char* command, char* buf, size_t len);
00333
00334
00341
00342
00375 gclib_result gclib_set_interrupts(gclib_handle h, gclib_interrupt_type interrupt_mask,
    gclib_axis_flags motion_complete_axes, gclib_digital_input_flags digital_inputs);
00376
00389 gclib_result gclib_set_data_records(gclib_handle h, size_t period_ms);
00390
00413 gclib_result gclib_subscribe_messages(gclib_handle h, void(callback)(void* user_data, const char*
    message), void* user_data);
00414
00438 gclib_result gclib_subscribe_interrupts(gclib_handle h, void(callback)(void* user_data,
    gclib_interrupt_t interrupt), void* user_data);
00439
00463 gclib_result gclib_subscribe_data_records(gclib_handle h, void(callback)(void* user_data,
    gclib_data_record_handle data_record), void* user_data);
00464
00479 gclib_result gclib_subscribe_progress(gclib_handle h, void(callback)(void* user_data, size_t current,
    size_t max), void* user_data);
00480
00489 gclib_result gclib_unsubscribe(gclib_handle h, void* callback);
00490
00502 gclib_result gclib_message(gclib_handle h, char* message, size_t len, int timeout);
00503
00512 gclib_result gclib_interrupt(gclib_handle h, gclib_interrupt_t* interrupt, int timeout);
00513
00524 gclib_result gclib_data_record(gclib_handle h, gclib_data_record_handle* data_record, int timeout);
00525
00530
00531
00539 gclib_result gclib_program(gclib_handle h, char* program, size_t len);
00540
00550 gclib_result gclib_set_program(gclib_handle h, const char* program, const char* insert);
00551
00562 gclib_result gclib_array(gclib_handle h, const char* name, char* buf, size_t len, size_t start, size_t
    end);
00563
00580 gclib_result gclib_set_array(gclib_handle h, const char* name, const char* buf, size_t start, size_t
    end);
00581
00589 gclib_result gclib_set_firmware(gclib_handle h, const char* file_path);
00590
00592
00599
00601 typedef enum gclib_mode_of_motion_t {
00602     GCLIB_NO_MOTION,
00603     GCLIB_CONTOUR,
00604     GCLIB_POSITION_ABSOLUTE,
00605     GCLIB_POSITION_RELATIVE,
00606     GCLIB_FIND_EDGE,
00607     GCLIB_FIND_INDEX,
00608     GCLIB_HOME,
00609     GCLIB_VECTOR_MOVE,
00610     GCLIB_LINEAR_MOVE = GCLIB_VECTOR_MOVE
00611 } gclib_mode_of_motion_t;
00612
00614 typedef enum gclib_ethernet_status_t {
00615     HANDLE_FREE = 0,
00616     UDP_SLAVE = 1,
00617     TCP_SLAVE = 2,
00618     UDP_MASTER = -1,
00619     TCP_MASTER = -2,
00620     ESTABLISHING_UDP = -5,
00621     ESTABLISHING_TCP = -6
00622 } gclib_ethernet_status_t;
00623
00625 uint16_t gclib_data_record_sample(gclib_data_record_handle h);
00626
00638 bool gclib_data_record_input(gclib_data_record_handle h, size_t index);
00640 bool gclib_data_record_output(gclib_data_record_handle h, size_t index);
00642 uint8_t gclib_data_record_input_bank(gclib_data_record_handle h, size_t index);
00644 uint8_t gclib_data_record_output_bank(gclib_data_record_handle h, size_t index);
00646 uint8_t gclib_data_record_error_code(gclib_data_record_handle h);

```

```

00648 uint32_t gclib_data_record_contour_segment_count(gclib_data_record_handle h);
00650 uint16_t gclib_data_record_contour_buffer_available(gclib_data_record_handle h);
00652 bool gclib_data_record_thread_running(gclib_data_record_handle h, size_t thread);
00653
00660 gclib_ethernet_status_t gclib_data_record_ethernet_status(gclib_data_record_handle h, char handle);
00661
00671 gclib_result gclib_data_record_bytes(gclib_data_record_handle h, char* data_record, size_t len);
00675
00677 bool gclib_data_record_motor_off(gclib_data_record_handle h, char axis);
00679 bool gclib_data_record_latch_armed(gclib_data_record_handle h, char axis);
00681 bool gclib_data_record_final_deceleration(gclib_data_record_handle h, char axis);
00683 bool gclib_data_record_stopping(gclib_data_record_handle h, char axis);
00685 bool gclib_data_record_slewing(gclib_data_record_handle h, char axis);
00687 gclib_mode_of_motion_t gclib_data_record_mode_of_motion(gclib_data_record_handle h, char axis);
00689 bool gclib_data_record_negative_direction_move(gclib_data_record_handle h, char axis);
00691 bool gclib_data_record_moving(gclib_data_record_handle h, char axis);
00693 int gclib_data_record_home_phase(gclib_data_record_handle h, char axis);
00695 bool gclib_data_record_stepper_mode(gclib_data_record_handle h, char axis);
00697 bool gclib_data_record_home_input(gclib_data_record_handle h, char axis);
00699 bool gclib_data_record_reverse_limit(gclib_data_record_handle h, char axis);
00701 bool gclib_data_record_forward_limit(gclib_data_record_handle h, char axis);
00703 bool gclib_data_record_latch_input(gclib_data_record_handle h, char axis);
00705 bool gclib_data_record_latch_occurred(gclib_data_record_handle h, char axis);
00707 uint8_t gclib_data_record_stop_code(gclib_data_record_handle h, char axis);
00709 int32_t gclib_data_record_reference_position(gclib_data_record_handle h, char axis);
00711 int32_t gclib_data_record_position(gclib_data_record_handle h, char axis);
00713 int32_t gclib_data_record_position_error(gclib_data_record_handle h, char axis);
00715 int32_t gclib_data_record_aux_position(gclib_data_record_handle h, char axis);
00717 int32_t gclib_data_record_velocity(gclib_data_record_handle h, char axis);
00719 double gclib_data_record_torque(gclib_data_record_handle h, char axis);
00721 double gclib_data_record_analog_input(gclib_data_record_handle h, char axis);
00723 uint8_t gclib_data_record_halls(gclib_data_record_handle h, char axis);
00725 int32_t gclib_data_record_variable(gclib_data_record_handle h, char axis);
00727 bool gclib_data_record_hall_error(gclib_data_record_handle h, char axis);
00729 bool gclib_data_record_peak_current(gclib_data_record_handle h, char axis);
00736
00738 bool gclib_data_record_over_current(gclib_data_record_handle h, size_t amp);
00740 bool gclib_data_record_over_voltage(gclib_data_record_handle h, size_t amp);
00742 bool gclib_data_record_over_temp(gclib_data_record_handle h, size_t amp);
00744 bool gclib_data_record_under_voltage(gclib_data_record_handle h, size_t amp);
00746 bool gclib_data_record_electronic_lock_out(gclib_data_record_handle h, size_t amp);
00751
00753 uint16_t gclib_data_record_coordinated_move_segment_count(gclib_data_record_handle h, char plane);
00755 uint16_t gclib_data_record_coordinated_move_status(gclib_data_record_handle h, char plane);
00757 bool gclib_data_record_coordinated_move_final_deceleration(gclib_data_record_handle h, char plane);
00759 bool gclib_data_record_coordinated_move_stopping(gclib_data_record_handle h, char plane);
00761 bool gclib_data_record_coordinated_move_slewing(gclib_data_record_handle h, char plane);
00763 bool gclib_data_record_coordinated_move_moving(gclib_data_record_handle h, char plane);
00765 int32_t gclib_data_record_coordinated_move_distance(gclib_data_record_handle h, char plane);
00767 uint16_t gclib_data_record_coordinated_move_buffer_available(gclib_data_record_handle h, char plane);
00770
00771 // Undoc methods for gclibo
00772 void gclib_set_compat();
00773 gclib_result gclib_set_timeout(gclib_handle h, size_t timeout);
00774
00775 #ifdef __cplusplus
00776 }
00777 #endif
00778
00779 #ifndef _WIN32
00780 #pragma GCC visibility pop
00781 #endif
00782

```

## 15.8 gclib\_compat.h File Reference

```

#include "gclib_record.h"
#include "gclib_errors.h"

```

### Macros

- #define **GCLIB\_DEPRECATED**
- #define **G\_DR** 1
 

*Value for **GRecord()** method variable for acquiring a data record via DR mode.*
- #define **G\_QR** 0
 

*Value for **GRecord()** method variable for acquiring a data record via QR mode.*
- #define **G\_BOUNDS** -1

- For functions that take range options, e.g. [GArrayUpload\(\)](#), use this value for full range.

  - #define [G\\_CR](#) 0

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with carriage returns.
- #define [G\\_COMMA](#) 1

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with commas.
- #define [G\\_PUBLISH\\_SERVER](#) 1

For [GPublishServer\(\)](#), use this value to publish server to local network.
- #define [G\\_REMOVE\\_SERVER](#) 0

For [GPublishServer\(\)](#), use this value to remove server from local network.
- #define [G\\_USE\\_INITIAL\\_TIMEOUT](#) -1

For [GTimeout\(\)](#), use this value to use initial [GOpen\(\)](#) timeout (–timeout).
- #define [G\\_SMALL\\_BUFFER](#) 1024

Most reads from Galil are small. This value will easily hold most, e.g. TH, TZ, etc.
- #define [G\\_HUGE\\_BUFFER](#) 524288

Most reads from Galil hardware are small. This value will hold the largest array or program upload/download possible.
- #define [G\\_LINE\\_BUFFER](#) 80

For writes, via command interpreter, to the Galil.
- #define [G\\_UTIL\\_TIMEOUT](#) 1

[GUtility\(\)](#), Access to timeout.
- #define [G\\_UTIL\\_TIMEOUT\\_OVERRIDE](#) 2

[GUtility\(\)](#), read/write access to timeout override.
- #define [G\\_USE\\_INITIAL\\_TIMEOUT](#) -1

For [GTimeout\(\)](#), use this value to use initial [GOpen\(\)](#) timeout (–timeout).
- #define [G\\_UTIL\\_VERSION](#) 128

[GUtility\(\)](#), get a library version string.
- #define [G\\_UTIL\\_INFO](#) 129

[GUtility\(\)](#), get a connection info string.
- #define [G\\_UTIL\\_SLEEP](#) 130

[GUtility\(\)](#), specify an interval to sleep.
- #define [G\\_UTIL\\_ADDRESSES](#) 131

[GUtility\(\)](#), get a list of available connections.
- #define [G\\_UTIL\\_IPREQUEST](#) 132

[GUtility\(\)](#), get a list of hardware requesting IPs.
- #define [G\\_UTIL\\_ASSIGN](#) 133

[GUtility\(\)](#), assign IP addresses over the network.
- #define [G\\_UTIL\\_DEVICE\\_INITIALIZE](#) 134

[GUtility\(\)](#), sends CF, CW, EO etc. to initialize the connection. Useful after RS or other reset.
- #define [G\\_UTIL\\_PING](#) 135

[GUtility\(\)](#), uses ICMP ping to determine if an IP address is reachable and assigned.
- #define [G\\_UTIL\\_ERROR\\_CONTEXT](#) 136

[GUtility\(\)](#), provides additional error context, where available.
- #define [G\\_UTIL\\_GCAPS\\_HOST](#) 256
- #define [G\\_UTIL\\_GCAPS\\_VERSION](#) 257

[GUtility\(\)](#), get the version of the gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_KEEPA\\_LIVE](#) 258

[GUtility\(\)](#), Deprecated 20210119. No longer functional.
- #define [G\\_UTIL\\_GCAPS\\_ADDRESSES](#) 259

[GUtility\(\)](#), get a list of available connections from the gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_IPREQUEST](#) 260

[GUtility\(\)](#), get a list of hardware requesting IPs from the gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_ASSIGN](#) 261

- [GUtility\(\)](#), assign IP addresses over the network from the gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_PING](#) 262  
[GUtility\(\)](#), uses ICMP ping to determine if an IP address is reachable and assigned. Ping sent from the gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_LIST\\_SERVERS](#) 263  
[GUtility\(\)](#), get a list of all available gcaps servers on the local network.
- #define [G\\_UTIL\\_GCAPS\\_PUBLISH\\_SERVER](#) 264  
[GUtility\(\)](#), make local gcaps server discoverable by other gcaps servers on the local network.
- #define [G\\_UTIL\\_GCAPS\\_SET\\_SERVER](#) 265  
[GUtility\(\)](#), set the new active gcaps server.
- #define [G\\_UTIL\\_GCAPS\\_SERVER\\_STATUS](#) 266  
[GUtility\(\)](#), get information on the local server's name and if it is published to the local network.
- #define [G\\_UTIL\\_GCAPS\\_REMOTE\\_CONNECTIONS](#) 267  
[GUtility\(\)](#), get a list of remote addresses connected to local server.
- #define [G\\_UTIL\\_GCAPS\\_SERVER\\_INFO](#) 268
- #define [G\\_UTIL\\_GCAPS\\_ADDRESSES\\_GET\\_REMEMBERED](#) 269  
[GUtility\(\)](#), returns true if gcaps is remembering ip assignments.
- #define [G\\_UTIL\\_GCAPS\\_ADDRESSES\\_SET\\_REMEMBERED](#) 270  
[GUtility\(\)](#), sets if gcaps should remember ip assignments.

## Typedefs

- typedef int [GReturn](#)  
Every function returns a value of type [GReturn](#). See [gclib\\_errors.h](#) for possible values.
- typedef struct Context \* [GCon](#)  
Connection handle. Unique for each connection in process. Assigned a non-zero value in [GOpen\(\)](#).
- typedef unsigned int [GSize](#)  
Size of buffers, etc.
- typedef int [GOption](#)  
Option integer for various formatting, etc.
- typedef char \* [GCStringOut](#)  
C-string output from the library. Implies null-termination.
- typedef const char \* [GCStringIn](#)  
C-string input to the library. Implies null-termination.
- typedef char \* [GBufOut](#)  
Data output from the library. No null-termination implied. Returned values may be null-terminated, see function documentation for details.
- typedef const char \* [GBufIn](#)  
Data input to the library. No null-termination, function will have a [GSize](#) to indicate bytes to write .
- typedef unsigned char [GStatus](#)  
Interrupt status byte.
- typedef void \* [GMemory](#)  
Pointer to untyped memory for use in [GUtility\(\)](#).

## Functions

- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GOpen](#) ([GCStringIn](#) connection\_string, [GCon](#) \*g)  
Open a connection to a Galil Controller.
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GClose](#) ([GCon](#) g)  
Closes a connection to a Galil Controller.
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GCommand](#) ([GCon](#) g, [GCStringIn](#) command, [GBufOut](#) buffer, [GSize](#) buffer\_len, [GSize](#) \*bytes\_returned)  
Performs a command-and-response transaction on the connection.

- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GProgramDownload](#) ([GCon](#) g, [GCStringIn](#) program, [GCStringIn](#) preprocessor)  
*Downloads a program to the controller's program buffer.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GProgramUpload](#) ([GCon](#) g, [GBufOut](#) buffer, [GSize](#) buffer\_len)  
*Uploads a program from the controller's program buffer.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GArrayDownload](#) ([GCon](#) g, const [GCStringIn](#) array\_name, [GOption](#) first, [GOption](#) last, [GCStringIn](#) buffer)  
*Downloads array data to a pre-dimensioned array in the controller's array table.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GArrayUpload](#) ([GCon](#) g, const [GCStringIn](#) array\_name, [GOption](#) first, [GOption](#) last, [GOption](#) delim, [GBufOut](#) buffer, [GSize](#) buffer\_len)  
*Uploads array data from the controller's array table.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GRecord](#) ([GCon](#) g, union [GDataRecord](#) \*record, [GOption](#) method)  
*Provides a fresh copy of the controller's data record. Data is cast into a union, [GDataRecord](#).*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GMessage](#) ([GCon](#) g, [GCStringOut](#) buffer, [GSize](#) buffer\_len)  
*Provides access to unsolicited messages from the controller.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GInterrupt](#) ([GCon](#) g, [GStatus](#) \*status\_byte)  
*Provides access to PCI and UDP interrupts from the controller.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GFirmwareDownload](#) ([GCon](#) g, [GCStringIn](#) filepath)  
*Upgrade firmware.*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GRead](#) ([GCon](#) g, [GBufOut](#) buffer, [GSize](#) buffer\_len, [GSize](#) \*bytes\_read)  
*Does nothing and returns [G\\_GCLIB\\_ERROR](#).*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GWrite](#) ([GCon](#) g, [GBufIn](#) buffer, [GSize](#) buffer\_len)  
*Does nothing and returns [G\\_GCLIB\\_ERROR](#).*
- [GCLIB\\_DEPRECATED](#) [GReturn](#) [GUtility](#) ([GCon](#) g, [GOption](#) request, [GMemory](#) memory1, [GMemory](#) memory2)  
*Does nothing and returns [G\\_GCLIB\\_ERROR](#).*

## 15.8.1 Macro Definition Documentation

### 15.8.1.1 GCLIB\_DEPRECATED

```
#define GCLIB_DEPRECATED
```

Definition at line 35 of file [gclib\\_compat.h](#).

### 15.8.1.2 G\_DR

```
#define G_DR 1
```

Value for [GRecord\(\)](#) method variable for acquiring a data record via DR mode.  
Definition at line 50 of file [gclib\\_compat.h](#).

### 15.8.1.3 G\_QR

```
#define G_QR 0
```

Value for [GRecord\(\)](#) method variable for acquiring a data record via QR mode.  
Definition at line 51 of file [gclib\\_compat.h](#).

### 15.8.1.4 G\_BOUNDS

```
#define G_BOUNDS -1
```

For functions that take range options, e.g. [GArrayUpload\(\)](#), use this value for full range.  
Definition at line 52 of file [gclib\\_compat.h](#).

### 15.8.1.5 G\_CR

```
#define G_CR 0
```

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with carriage returns.  
Definition at line 53 of file [gclib\\_compat.h](#).

#### 15.8.1.6 G\_COMMA

```
#define G_COMMA 1
```

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with commas.

Definition at line 54 of file [gclib\\_compat.h](#).

#### 15.8.1.7 G\_PUBLISH\_SERVER

```
#define G_PUBLISH_SERVER 1
```

For [GPublishServer\(\)](#), use this value to publish server to local network.

Definition at line 55 of file [gclib\\_compat.h](#).

#### 15.8.1.8 G\_REMOVE\_SERVER

```
#define G_REMOVE_SERVER 0
```

For [GPublishServer\(\)](#), use this value to remove server from local network.

Definition at line 56 of file [gclib\\_compat.h](#).

#### 15.8.1.9 G\_USE\_INITIAL\_TIMEOUT [1/2]

```
#define G_USE_INITIAL_TIMEOUT -1
```

For [GTimeout\(\)](#), use this value to use initial [GOpen\(\)](#) timeout (–timeout).

[GUtility\(\)](#), for timeout override. Set [G\\_UTIL\\_TIMEOUT\\_OVERRIDE](#) to this value to use initial [GOpen\(\)](#) timeout (--timeout).

Definition at line 57 of file [gclib\\_compat.h](#).

#### 15.8.1.10 G\_SMALL\_BUFFER

```
#define G_SMALL_BUFFER 1024
```

Most reads from Galil are small. This value will easily hold most, e.g. TH, TZ, etc.

Definition at line 60 of file [gclib\\_compat.h](#).

#### 15.8.1.11 G\_HUGE\_BUFFER

```
#define G_HUGE_BUFFER 524288
```

Most reads from Galil hardware are small. This value will hold the largest array or program upload/download possible.

Definition at line 61 of file [gclib\\_compat.h](#).

#### 15.8.1.12 G\_LINE\_BUFFER

```
#define G_LINE_BUFFER 80
```

For writes, via command interpreter, to the Galil.

Definition at line 62 of file [gclib\\_compat.h](#).

#### 15.8.1.13 G\_UTIL\_TIMEOUT

```
#define G_UTIL_TIMEOUT 1
```

[GUtility\(\)](#), Access to timeout.

Definition at line 65 of file [gclib\\_compat.h](#).

#### 15.8.1.14 G\_UTIL\_TIMEOUT\_OVERRIDE

```
#define G_UTIL_TIMEOUT_OVERRIDE 2
```

[GUtility\(\)](#), read/write access to timeout override.

Definition at line 66 of file [gclib\\_compat.h](#).

#### 15.8.1.15 G\_USE\_INITIAL\_TIMEOUT [2/2]

```
#define G_USE_INITIAL_TIMEOUT -1
```

For [GTimeout\(\)](#), use this value to use initial [GOpen\(\)](#) timeout (`-timeout`).

[GUtility\(\)](#), for timeout override. Set `G_UTIL_TIMEOUT_OVERRIDE` to this value to use initial [GOpen\(\)](#) timeout (`--timeout`).

Definition at line 57 of file [gclib\\_compat.h](#).

#### 15.8.1.16 G\_UTIL\_VERSION

```
#define G_UTIL_VERSION 128
```

[GUtility\(\)](#), get a library version string.

Definition at line 68 of file [gclib\\_compat.h](#).

#### 15.8.1.17 G\_UTIL\_INFO

```
#define G_UTIL_INFO 129
```

[GUtility\(\)](#), get a connection info string.

Definition at line 69 of file [gclib\\_compat.h](#).

#### 15.8.1.18 G\_UTIL\_SLEEP

```
#define G_UTIL_SLEEP 130
```

[GUtility\(\)](#), specify an interval to sleep.

Definition at line 70 of file [gclib\\_compat.h](#).

#### 15.8.1.19 G\_UTIL\_ADDRESSES

```
#define G_UTIL_ADDRESSES 131
```

[GUtility\(\)](#), get a list of available connections.

Definition at line 71 of file [gclib\\_compat.h](#).

#### 15.8.1.20 G\_UTIL\_IPREQUEST

```
#define G_UTIL_IPREQUEST 132
```

[GUtility\(\)](#), get a list of hardware requesting IPs.

Definition at line 72 of file [gclib\\_compat.h](#).

#### 15.8.1.21 G\_UTIL\_ASSIGN

```
#define G_UTIL_ASSIGN 133
```

[GUtility\(\)](#), assign IP addresses over the network.

Definition at line 73 of file [gclib\\_compat.h](#).

#### 15.8.1.22 G\_UTIL\_DEVICE\_INITIALIZE

```
#define G_UTIL_DEVICE_INITIALIZE 134
```

[GUtility\(\)](#), sends CF, CW, EO etc. to initialize the connection. Useful after RS or other reset.

Definition at line 74 of file [gclib\\_compat.h](#).

#### 15.8.1.23 G\_UTIL\_PING

```
#define G_UTIL_PING 135
```

[GUtility\(\)](#), uses ICMP ping to determine if an IP address is reachable and assigned.

Definition at line 75 of file [gclib\\_compat.h](#).

#### 15.8.1.24 G\_UTIL\_ERROR\_CONTEXT

```
#define G_UTIL_ERROR_CONTEXT 136
```

[GUtility\(\)](#), provides additional error context, where available.

Definition at line 76 of file [gclib\\_compat.h](#).



#### 15.8.1.25 G\_UTIL\_GCAPS\_HOST

```
#define G_UTIL_GCAPS_HOST 256
```

Definition at line 78 of file [gclib\\_compat.h](#).

#### 15.8.1.26 G\_UTIL\_GCAPS\_VERSION

```
#define G_UTIL_GCAPS_VERSION 257
```

[GUtility\(\)](#), get the version of the gcaps server.

Definition at line 79 of file [gclib\\_compat.h](#).

#### 15.8.1.27 G\_UTIL\_GCAPS\_KEEPALIVE

```
#define G_UTIL_GCAPS_KEEPALIVE 258
```

[GUtility\(\)](#), Deprecated 20210119. No longer functional.

Definition at line 80 of file [gclib\\_compat.h](#).

#### 15.8.1.28 G\_UTIL\_GCAPS\_ADDRESSES

```
#define G_UTIL_GCAPS_ADDRESSES 259
```

[GUtility\(\)](#), get a list of available connections from the gcaps server.

Definition at line 81 of file [gclib\\_compat.h](#).

#### 15.8.1.29 G\_UTIL\_GCAPS\_IPREQUEST

```
#define G_UTIL_GCAPS_IPREQUEST 260
```

[GUtility\(\)](#), get a list of hardware requesting IPs from the gcaps server.

Definition at line 82 of file [gclib\\_compat.h](#).

#### 15.8.1.30 G\_UTIL\_GCAPS\_ASSIGN

```
#define G_UTIL_GCAPS_ASSIGN 261
```

[GUtility\(\)](#), assign IP addresses over the network from the gcaps server.

Definition at line 83 of file [gclib\\_compat.h](#).

#### 15.8.1.31 G\_UTIL\_GCAPS\_PING

```
#define G_UTIL_GCAPS_PING 262
```

[GUtility\(\)](#), uses ICMP ping to determine if an IP address is reachable and assigned. Ping sent from the gcaps server.

Definition at line 84 of file [gclib\\_compat.h](#).

#### 15.8.1.32 G\_UTIL\_GCAPS\_LIST\_SERVERS

```
#define G_UTIL_GCAPS_LIST_SERVERS 263
```

[GUtility\(\)](#), get a list of all available gcaps servers on the local network.

Definition at line 85 of file [gclib\\_compat.h](#).

#### 15.8.1.33 G\_UTIL\_GCAPS\_PUBLISH\_SERVER

```
#define G_UTIL_GCAPS_PUBLISH_SERVER 264
```

[GUtility\(\)](#), make local gcaps server discoverable by other gcaps servers on the local network.

Definition at line 86 of file [gclib\\_compat.h](#).

#### 15.8.1.34 G\_UTIL\_GCAPS\_SET\_SERVER

```
#define G_UTIL_GCAPS_SET_SERVER 265
```

[GUtility\(\)](#), set the new active gcaps server.

Definition at line 87 of file [gclib\\_compat.h](#).

### 15.8.1.35 G\_UTIL\_GCAPS\_SERVER\_STATUS

```
#define G_UTIL_GCAPS_SERVER_STATUS 266
```

[GUtility\(\)](#), get information on the local server's name and if it is published to the local network.

Definition at line 88 of file [gclib\\_compat.h](#).

### 15.8.1.36 G\_UTIL\_GCAPS\_REMOTE\_CONNECTIONS

```
#define G_UTIL_GCAPS_REMOTE_CONNECTIONS 267
```

[GUtility\(\)](#), get a list of remote addresses connected to local server.

Definition at line 89 of file [gclib\\_compat.h](#).

### 15.8.1.37 G\_UTIL\_GCAPS\_SERVER\_INFO

```
#define G_UTIL_GCAPS_SERVER_INFO 268
```

Definition at line 90 of file [gclib\\_compat.h](#).

### 15.8.1.38 G\_UTIL\_GCAPS\_ADDRESSES\_GET\_REMEMBERED

```
#define G_UTIL_GCAPS_ADDRESSES_GET_REMEMBERED 269
```

[GUtility\(\)](#), returns true if gcaps is remembering ip assignments.

Definition at line 91 of file [gclib\\_compat.h](#).

### 15.8.1.39 G\_UTIL\_GCAPS\_ADDRESSES\_SET\_REMEMBERED

```
#define G_UTIL_GCAPS_ADDRESSES_SET_REMEMBERED 270
```

[GUtility\(\)](#), sets if gcaps should remember ip assignments.

Definition at line 92 of file [gclib\\_compat.h](#).

## 15.8.2 Typedef Documentation

### 15.8.2.1 GReturn

```
typedef int GReturn
```

Every function returns a value of type [GReturn](#). See [gclib\\_errors.h](#) for possible values.

Definition at line 94 of file [gclib\\_compat.h](#).

### 15.8.2.2 GCon

```
typedef struct Context* GCon
```

Connection handle. Unique for each connection in process. Assigned a non-zero value in [GOpen\(\)](#).

Definition at line 95 of file [gclib\\_compat.h](#).

### 15.8.2.3 GSize

```
typedef unsigned int GSize
```

Size of buffers, etc.

Definition at line 96 of file [gclib\\_compat.h](#).

### 15.8.2.4 GOption

```
typedef int GOption
```

Option integer for various formatting, etc.

Definition at line 97 of file [gclib\\_compat.h](#).

### 15.8.2.5 GCStringOut

```
typedef char* GCStringOut
```

C-string output from the library. Implies null-termination.

Definition at line 98 of file [gclib\\_compat.h](#).

### 15.8.2.6 GCStringIn

```
typedef const char* GCStringIn
```

C-string input to the library. Implies null-termination.

Definition at line 99 of file [gclib\\_compat.h](#).

### 15.8.2.7 GBufOut

```
typedef char* GBufOut
```

Data output from the library. No null-termination implied. Returned values may be null-terminated, see function documentation for details.

Definition at line 100 of file [gclib\\_compat.h](#).

### 15.8.2.8 GBufIn

```
typedef const char* GBufIn
```

Data input to the library. No null-termination, function will have a [GSize](#) to indicate bytes to write .

Definition at line 101 of file [gclib\\_compat.h](#).

### 15.8.2.9 GStatus

```
typedef unsigned char GStatus
```

Interrupt status byte.

Definition at line 102 of file [gclib\\_compat.h](#).

### 15.8.2.10 GMemory

```
typedef void* GMemory
```

Pointer to untyped memory for use in [GUtility\(\)](#).

Definition at line 103 of file [gclib\\_compat.h](#).

## 15.8.3 Function Documentation

### 15.8.3.1 GRead()

```
GCLIB_DEPRECATED GReturn GRead (  
    GCon g,  
    GBufOut buffer,  
    GSize buffer_len,  
    GSize * bytes_read)
```

Does nothing and returns [G\\_GCLIB\\_ERROR](#).

**Deprecated** This function only exists for ABI compatibility, and will be removed in a future gclib version.

### 15.8.3.2 GWrite()

```
GCLIB_DEPRECATED GReturn GWrite (  
    GCon g,  
    GBufIn buffer,  
    GSize buffer_len)
```

Does nothing and returns [G\\_GCLIB\\_ERROR](#).

**Deprecated** This function only exists for ABI compatibility, and will be removed in a future gclib version.

### 15.8.3.3 GUtility()

```
GCLIB_DEPRECATED GReturn GUtility (
    GCon g,
    GOption request,
    GMemory memory1,
    GMemory memory2)
```

Does nothing and returns `G_GCLIB_ERROR`.

**Deprecated** This function only exists for ABI compatibility, and will be removed in a future gclib version.

## 15.9 gclib\_compat.h

[Go to the documentation of this file.](#)

```
00001
00022
00027 #ifndef GCLIB_COMPAT_H
00028 #define GCLIB_COMPAT_H
00029
00030 #ifdef _MSC_VER
00031 #define GCLIB_DEPRECATED __declspec(deprecated)
00032 #elif defined(__GNUC__) | defined(__clang__)
00033 #define GCLIB_DEPRECATED __attribute__((__deprecated__))
00034 #else
00035 #define GCLIB_DEPRECATED
00036 #endif
00037
00038 #include "gclib_record.h" // Galil data record structs and unions.
00039 #include "gclib_errors.h" // GReturn error code values and strings.
00040
00041 #ifdef __cplusplus
00042 extern "C" {
00043 #endif
00044
00045 #ifndef _WIN32
00046 #pragma GCC visibility push(default)
00047 #endif
00048
00049 // Constants for function arguments
00050 #define G_DR 1
00051 #define G_QR 0
00052 #define G_BOUNDS -1
00053 #define G_CR 0
00054 #define G_COMMA 1
00055 #define G_PUBLISH_SERVER 1
00056 #define G_REMOVE_SERVER 0
00057 #define G_USE_INITIAL_TIMEOUT -1
00058
00059 // Convenience constants
00060 #define G_SMALL_BUFFER 1024
00061 #define G_HUGE_BUFFER 524288
00062 #define G_LINE_BUFFER 80
00063
00064 // Constants for GUtility()
00065 #define G_UTIL_TIMEOUT 1
00066 #define G_UTIL_TIMEOUT_OVERRIDE 2
00067 #define G_USE_INITIAL_TIMEOUT -1
00068 #define G_UTIL_VERSION 128
00069 #define G_UTIL_INFO 129
00070 #define G_UTIL_SLEEP 130
00071 #define G_UTIL_ADDRESSES 131
00072 #define G_UTIL_IPREQUEST 132
00073 #define G_UTIL_ASSIGN 133
00074 #define G_UTIL_DEVICE_INITIALIZE 134
00075 #define G_UTIL_PING 135
00076 #define G_UTIL_ERROR_CONTEXT 136
00077
00078 #define G_UTIL_GCAPS_HOST 256
00079 #define G_UTIL_GCAPS_VERSION 257
00080 #define G_UTIL_GCAPS_KEEPALIVE 258
00081 #define G_UTIL_GCAPS_ADDRESSES 259
00082 #define G_UTIL_GCAPS_IPREQUEST 260
00083 #define G_UTIL_GCAPS_ASSIGN 261
00084 #define G_UTIL_GCAPS_PING 262
00085 #define G_UTIL_GCAPS_LIST_SERVERS 263
00086 #define G_UTIL_GCAPS_PUBLISH_SERVER 264
00087 #define G_UTIL_GCAPS_SET_SERVER 265
00088 #define G_UTIL_GCAPS_SERVER_STATUS 266
00089 #define G_UTIL_GCAPS_REMOTE_CONNECTIONS 267
00090 #define G_UTIL_GCAPS_SERVER_INFO 268
```

```

00091 #define G_UTIL_GCAPS_ADDRESSES_GET_REMEMBERED 269
00092 #define G_UTIL_GCAPS_ADDRESSES_SET_REMEMBERED 270
00093
00094 typedef int GReturn;
00095 typedef struct Context* GCon;
00096 typedef unsigned int GSize;
00097 typedef int GOption;
00098 typedef char* GCStringOut;
00099 typedef const char* GCStringIn;
00100 typedef char* GBufOut;
00101 typedef const char* GBufIn;
00102 typedef unsigned char GStatus;
00103 typedef void* GMemory;
00104
00106 GCLIB_DEPRECATED GReturn GOpen(GCStringIn connection_string, GCon* g);
00150
00152 GCLIB_DEPRECATED GReturn GClose(GCon g);
00166
00168 GCLIB_DEPRECATED GReturn GCommand(GCon g, GCStringIn command, GBufOut buffer, GSize buffer_len, GSize*
bytes_returned);
00182
00184 GCLIB_DEPRECATED GReturn GProgramDownload(GCon g, GCStringIn program, GCStringIn preprocessor);
00196
00198 GCLIB_DEPRECATED GReturn GProgramUpload(GCon g, GBufOut buffer, GSize buffer_len);
00208
00210 GCLIB_DEPRECATED GReturn GArrayDownload(GCon g, const GCStringIn array_name, GOption first, GOption
last, GCStringIn buffer);
00224
00226 GCLIB_DEPRECATED GReturn GArrayUpload(GCon g, const GCStringIn array_name, GOption first, GOption
last, GOption delim, GBufOut buffer, GSize buffer_len);
00240
00242 GCLIB_DEPRECATED GReturn GRecord(GCon g, union GDataRecord* record, GOption method);
00266
00268 GCLIB_DEPRECATED GReturn GMessage(GCon g, GCStringOut buffer, GSize buffer_len);
00299
00301 GCLIB_DEPRECATED GReturn GInterrupt(GCon g, GStatus* status_byte);
00320
00322 GCLIB_DEPRECATED GReturn GFirmwareDownload(GCon g, GCStringIn filepath);
00331
00333 GCLIB_DEPRECATED GReturn GRead(GCon g, GBufOut buffer, GSize buffer_len, GSize* bytes_read);
00339 GCLIB_DEPRECATED GReturn GWrite(GCon g, GBufIn buffer, GSize buffer_len);
00345 GCLIB_DEPRECATED GReturn GUtility(GCon g, GOption request, GMemory memory1, GMemory memory2);
00350
00351 #ifndef __cplusplus
00352 } //extern "C"
00353 #endif
00354
00355 #ifndef _WIN32
00356 #pragma GCC visibility pop
00357 #endif
00358
00359 #endif // GCLIB_COMPAT_H

```

## 15.10 gclib\_errors.h File Reference

### Macros

- #define [G\\_NO\\_ERROR](#) 0  
*Return value if function succeeded.*
- #define [G\\_NO\\_ERROR\\_S](#) "no error"
- #define [G\\_GCLIB\\_ERROR](#) -1  
*General library error. Indicates internal API caught an unexpected error. Contact Galil support if this error is returned, [softwaresupport@galil.com](mailto:softwaresupport@galil.com).*
- #define [G\\_GCLIB\\_ERROR\\_S](#) "gclib unexpected error"
- #define [G\\_GCLIB\\_UTILITY\\_ERROR](#) -2  
*An invalid request value was specified to GUtility.*
- #define [G\\_GCLIB\\_UTILITY\\_ERROR\\_S](#) "invalid request value or bad arguments were specified to [GUtility\(\)](#)"
- #define [G\\_GCLIB\\_UTILITY\\_IP\\_TAKEN](#) -3  
*The IP cannot be assigned because ping returned a reply.*
- #define [G\\_GCLIB\\_UTILITY\\_IP\\_TAKEN\\_S](#) "ip address is already taken by a device on the network"
- #define [G\\_GCLIB\\_NON\\_BLOCKING\\_READ\\_EMPTY](#) -4  
*GMessage, GInterrupt, and GRecord can be called with a zero timeout. If there wasn't data waiting in memory, this error is returned.*

- #define [G\\_GCLIB\\_NON\\_BLOCKING\\_READ\\_EMPTY\\_S](#) "data was not waiting for a zero-timeout read"
- #define [G\\_GCLIB\\_POLLING\\_FAILED](#) -5  
*GWaitForBool out of polling trials.*
- #define [G\\_GCLIB\\_POLLING\\_FAILED\\_S](#) "exit condition not met in specified polling period"
- #define [G\\_TIMEOUT](#) -1100  
*Operation timed out. Timeout is set by the `-timeout` option in [GOpen\(\)](#) and can be overridden by [GTimeout\(\)](#).*
- #define [G\\_TIMEOUT\\_S](#) "device timed out"
- #define [G\\_OPEN\\_ERROR](#) -1101  
*Device could not be opened. E.G. Serial port or PCI device already open.*
- #define [G\\_OPEN\\_ERROR\\_S](#) "device failed to open"
- #define [G\\_ALREADY\\_OPEN](#) -1111  
*Serial or PCI file has a flock placed on it, presumably by another gclib connection.*
- #define [G\\_ALREADY\\_OPEN\\_S](#) "Serial or PCI port already open"
- #define [G\\_READ\\_ERROR](#) -1103  
*Device read failed. E.G. Socket was closed by remote host. See [G\\_UTIL\\_GCAPS\\_KEEPALIVE](#).*
- #define [G\\_READ\\_ERROR\\_S](#) "device read error"
- #define [G\\_WRITE\\_ERROR](#) -1104  
*Device write failed. E.G. Socket was closed by remote host. See [G\\_UTIL\\_GCAPS\\_KEEPALIVE](#).*
- #define [G\\_WRITE\\_ERROR\\_S](#) "device write error"
- #define [G\\_INVALID\\_PREPROCESSOR\\_OPTIONS](#) -1204  
*GProgramDownload was called with a bad preprocessor directive.*
- #define [G\\_INVALID\\_PREPROCESSOR\\_OPTIONS\\_S](#) "preprocessor did not recognize options"
- #define [G\\_COMMAND\\_CALLED\\_WITH\\_ILLEGAL\\_COMMAND](#) -1106  
*GCommand() was called with an illegal command, e.g. ED, DL or QD.*
- #define [G\\_COMMAND\\_CALLED\\_WITH\\_ILLEGAL\\_COMMAND\\_S](#) "illegal command passed to command call"
- #define [G\\_DATA\\_RECORD\\_ERROR](#) -1107  
*Data record error, e.g. DR attempted on serial connection.*
- #define [G\\_DATA\\_RECORD\\_ERROR\\_S](#) "data record error"
- #define [G\\_UNSUPPORTED\\_FUNCTION](#) -1109  
*Function cannot be called on this bus. E.G. [GInterrupt\(\)](#) on serial.*
- #define [G\\_UNSUPPORTED\\_FUNCTION\\_S](#) "function not supported on this communication bus"
- #define [G\\_FIRMWARE\\_LOAD\\_NOT\\_SUPPORTED](#) -1110  
*Firmware is not supported on this bus, e.g. Ethernet for the DMC-21x3 series.*
- #define [G\\_FIRMWARE\\_LOAD\\_NOT\\_SUPPORTED\\_S](#) "firmware cannot be loaded on this communication bus to this hardware"
- #define [G\\_ARRAY\\_NOT\\_DIMENSIONED](#) -1200  
*Array operation was called on an array that was not in the controller's array table, see LA command.*
- #define [G\\_ARRAY\\_NOT\\_DIMENSIONED\\_S](#) "array not dimensioned on controller or wrong size"
- #define [G\\_CONNECTION\\_NOT\\_ESTABLISHED](#) -1201  
*Function was called with no connection.*
- #define [G\\_CONNECTION\\_NOT\\_ESTABLISHED\\_S](#) "connection to hardware not established"
- #define [G\\_ILLEGAL\\_DATA\\_IN\\_PROGRAM](#) -1202  
*Data to download not valid, e.g. \ in data.*
- #define [G\\_ILLEGAL\\_DATA\\_IN\\_PROGRAM\\_S](#) "illegal ASCII character in program"
- #define [G\\_UNABLE\\_TO\\_COMPRESS\\_PROGRAM\\_TO\\_FIT](#) -1203  
*Program preprocessor could not compress the program within the user's constraints.*
- #define [G\\_UNABLE\\_TO\\_COMPRESS\\_PROGRAM\\_TO\\_FIT\\_S](#) "program cannot be compressed to fit on the controller"
- #define [G\\_BAD\\_RESPONSE\\_QUESTION\\_MARK](#) -10000  
*Operation received a ?, indicating controller has a TC error.*
- #define [G\\_BAD\\_RESPONSE\\_QUESTION\\_MARK\\_S](#) "question mark returned by controller"

- `#define G_BAD_VALUE_RANGE -10002`  
*Bad value or range, e.g. `GCon` g variable passed to function was bad.*
- `#define G_BAD_VALUE_RANGE_S "value passed to function was bad or out of range"`
- `#define G_BAD_FULL_MEMORY -10003`  
*Not enough memory for an operation, e.g. all connections allowed for a process already taken.*
- `#define G_BAD_FULL_MEMORY_S "operation could not complete because of a memory error"`
- `#define G_BAD_LOST_DATA -10004`  
*Lost data, e.g. `GCommand()` response buffer was too small for the controller's response.*
- `#define G_BAD_LOST_DATA_S "data was lost due to buffer or fifo limitations"`
- `#define G_BAD_FILE -10005`  
*Bad file path, bad file contents, or bad write.*
- `#define G_BAD_FILE_S "file was not found, contents are invalid, or write failed"`
- `#define G_BAD_ADDRESS -10006`  
*Bad address.*
- `#define G_BAD_ADDRESS_S "a bad address was specified in open"`
- `#define G_BAD_FIRMWARE_LOAD -10008`  
*Bad firmware upgrade.*
- `#define G_BAD_FIRMWARE_LOAD_S "Firmware upgrade failed"`
- `#define G_GCAPS_OPEN_ERROR -20000`  
*gcaps connection couldn't open. Server is not running or is not reachable.*
- `#define G_GCAPS_OPEN_ERROR_S "gcaps connection could not be opened"`
- `#define G_GCAPS_SUBSCRIPTION_ERROR -20002`  
*GMessage(), GRecord(), GInterrupt() called on a connection without `--subscribe` switch.*
- `#define G_GCAPS_SUBSCRIPTION_ERROR_S "function requires subscription not specified in GOpen()"`

### 15.10.1 Detailed Description

Defines values for the Galil C Library return codes and error strings.

Definition in file [gclib\\_errors.h](#).

### 15.10.2 Macro Definition Documentation

#### 15.10.2.1 G\_NO\_ERROR

```
#define G_NO_ERROR 0
```

Return value if function succeeded.

Definition at line 9 of file [gclib\\_errors.h](#).

#### 15.10.2.2 G\_NO\_ERROR\_S

```
#define G_NO_ERROR_S "no error"
```

Definition at line 10 of file [gclib\\_errors.h](#).

#### 15.10.2.3 G\_GCLIB\_ERROR

```
#define G_GCLIB_ERROR -1
```

General library error. Indicates internal API caught an unexpected error. Contact Galil support if this error is returned, [softwaresupport@galil.com](mailto:softwaresupport@galil.com).

Definition at line 12 of file [gclib\\_errors.h](#).

#### 15.10.2.4 G\_GCLIB\_ERROR\_S

```
#define G_GCLIB_ERROR_S "gclib unexpected error"
```

Definition at line 13 of file [gclib\\_errors.h](#).

#### 15.10.2.5 G\_GCLIB\_UTILITY\_ERROR

```
#define G_GCLIB_UTILITY_ERROR -2
```

An invalid request value was specified to GUtility.

Definition at line 15 of file [gclib\\_errors.h](#).

#### 15.10.2.6 G\_GCLIB\_UTILITY\_ERROR\_S

```
#define G_GCLIB_UTILITY_ERROR_S "invalid request value or bad arguments were specified to  
GUtility() "
```

Definition at line 16 of file [gclib\\_errors.h](#).

#### 15.10.2.7 G\_GCLIB\_UTILITY\_IP\_TAKEN

```
#define G_GCLIB_UTILITY_IP_TAKEN -3
```

The IP cannot be assigned because ping returned a reply.

Definition at line 18 of file [gclib\\_errors.h](#).

#### 15.10.2.8 G\_GCLIB\_UTILITY\_IP\_TAKEN\_S

```
#define G_GCLIB_UTILITY_IP_TAKEN_S "ip address is already taken by a device on the network"
```

Definition at line 19 of file [gclib\\_errors.h](#).

#### 15.10.2.9 G\_GCLIB\_NON\_BLOCKING\_READ\_EMPTY

```
#define G_GCLIB_NON_BLOCKING_READ_EMPTY -4
```

GMessage, GInterrupt, and GRecord can be called with a zero timeout. If there wasn't data waiting in memory, this error is returned.

Definition at line 21 of file [gclib\\_errors.h](#).

#### 15.10.2.10 G\_GCLIB\_NON\_BLOCKING\_READ\_EMPTY\_S

```
#define G_GCLIB_NON_BLOCKING_READ_EMPTY_S "data was not waiting for a zero-timeout read"
```

Definition at line 22 of file [gclib\\_errors.h](#).

#### 15.10.2.11 G\_GCLIB\_POLLING\_FAILED

```
#define G_GCLIB_POLLING_FAILED -5
```

GWaitForBool out of polling trials.

Definition at line 24 of file [gclib\\_errors.h](#).

#### 15.10.2.12 G\_GCLIB\_POLLING\_FAILED\_S

```
#define G_GCLIB_POLLING_FAILED_S "exit condition not met in specified polling period"
```

Definition at line 25 of file [gclib\\_errors.h](#).

#### 15.10.2.13 G\_TIMEOUT

```
#define G_TIMEOUT -1100
```

Operation timed out. Timeout is set by the `-timeout` option in [GOpen\(\)](#) and can be overridden by [GTimeout\(\)](#).

Definition at line 27 of file [gclib\\_errors.h](#).

#### 15.10.2.14 G\_TIMEOUT\_S

```
#define G_TIMEOUT_S "device timed out"
```

Definition at line 28 of file [gclib\\_errors.h](#).



#### 15.10.2.15 G\_OPEN\_ERROR

```
#define G_OPEN_ERROR -1101
```

Device could not be opened. E.G. Serial port or PCI device already open.

Definition at line 30 of file [gclib\\_errors.h](#).

#### 15.10.2.16 G\_OPEN\_ERROR\_S

```
#define G_OPEN_ERROR_S "device failed to open"
```

Definition at line 31 of file [gclib\\_errors.h](#).

#### 15.10.2.17 G\_ALREADY\_OPEN

```
#define G_ALREADY_OPEN -1111
```

Serial or PCI file has a flock placed on it, presumably by another gclib connection.

Definition at line 33 of file [gclib\\_errors.h](#).

#### 15.10.2.18 G\_ALREADY\_OPEN\_S

```
#define G_ALREADY_OPEN_S "Serial or PCI port already open"
```

Definition at line 34 of file [gclib\\_errors.h](#).

#### 15.10.2.19 G\_READ\_ERROR

```
#define G_READ_ERROR -1103
```

Device read failed. E.G. Socket was closed by remote host. See [G\\_UTIL\\_GCAPS\\_KEEPAIVE](#).

Definition at line 36 of file [gclib\\_errors.h](#).

#### 15.10.2.20 G\_READ\_ERROR\_S

```
#define G_READ_ERROR_S "device read error"
```

Definition at line 37 of file [gclib\\_errors.h](#).

#### 15.10.2.21 G\_WRITE\_ERROR

```
#define G_WRITE_ERROR -1104
```

Device write failed. E.G. Socket was closed by remote host. See [G\\_UTIL\\_GCAPS\\_KEEPAIVE](#).

Definition at line 39 of file [gclib\\_errors.h](#).

#### 15.10.2.22 G\_WRITE\_ERROR\_S

```
#define G_WRITE_ERROR_S "device write error"
```

Definition at line 40 of file [gclib\\_errors.h](#).

#### 15.10.2.23 G\_INVALID\_PREPROCESSOR\_OPTIONS

```
#define G_INVALID_PREPROCESSOR_OPTIONS -1204
```

GProgramDownload was called with a bad preprocessor directive.

Definition at line 42 of file [gclib\\_errors.h](#).

#### 15.10.2.24 G\_INVALID\_PREPROCESSOR\_OPTIONS\_S

```
#define G_INVALID_PREPROCESSOR_OPTIONS_S "preprocessor did not recognize options"
```

Definition at line 43 of file [gclib\\_errors.h](#).

#### 15.10.2.25 G\_COMMAND\_CALLED\_WITH\_ILLEGAL\_COMMAND

```
#define G_COMMAND_CALLED_WITH_ILLEGAL_COMMAND -1106
```

[GCommand\(\)](#) was called with an illegal command, e.g. ED, DL or QD.

Definition at line 45 of file [gclib\\_errors.h](#).

#### 15.10.2.26 G\_COMMAND\_CALLED\_WITH\_ILLEGAL\_COMMAND\_S

```
#define G_COMMAND_CALLED_WITH_ILLEGAL_COMMAND_S "illegal command passed to command call"
```

Definition at line 46 of file [gclib\\_errors.h](#).

#### 15.10.2.27 G\_DATA\_RECORD\_ERROR

```
#define G_DATA_RECORD_ERROR -1107
```

Data record error, e.g. DR attempted on serial connection.  
Definition at line 48 of file [gclib\\_errors.h](#).

#### 15.10.2.28 G\_DATA\_RECORD\_ERROR\_S

```
#define G_DATA_RECORD_ERROR_S "data record error"
```

Definition at line 49 of file [gclib\\_errors.h](#).

#### 15.10.2.29 G\_UNSUPPORTED\_FUNCTION

```
#define G_UNSUPPORTED_FUNCTION -1109
```

Function cannot be called on this bus. E.G. [GInterrupt\(\)](#) on serial.  
Definition at line 51 of file [gclib\\_errors.h](#).

#### 15.10.2.30 G\_UNSUPPORTED\_FUNCTION\_S

```
#define G_UNSUPPORTED_FUNCTION_S "function not supported on this communication bus"
```

Definition at line 52 of file [gclib\\_errors.h](#).

#### 15.10.2.31 G\_FIRMWARE\_LOAD\_NOT\_SUPPORTED

```
#define G_FIRMWARE_LOAD_NOT_SUPPORTED -1110
```

Firmware is not supported on this bus, e.g. Ethernet for the DMC-21x3 series.  
Definition at line 54 of file [gclib\\_errors.h](#).

#### 15.10.2.32 G\_FIRMWARE\_LOAD\_NOT\_SUPPORTED\_S

```
#define G_FIRMWARE_LOAD_NOT_SUPPORTED_S "firmware cannot be loaded on this communication bus  
to this hardware"
```

Definition at line 55 of file [gclib\\_errors.h](#).

#### 15.10.2.33 G\_ARRAY\_NOT\_DIMENSIONED

```
#define G_ARRAY_NOT_DIMENSIONED -1200
```

Array operation was called on an array that was not in the controller's array table, see LA command.  
Definition at line 57 of file [gclib\\_errors.h](#).

#### 15.10.2.34 G\_ARRAY\_NOT\_DIMENSIONED\_S

```
#define G_ARRAY_NOT_DIMENSIONED_S "array not dimensioned on controller or wrong size"
```

Definition at line 58 of file [gclib\\_errors.h](#).

#### 15.10.2.35 G\_CONNECTION\_NOT\_ESTABLISHED

```
#define G_CONNECTION_NOT_ESTABLISHED -1201
```

Function was called with no connection.  
Definition at line 60 of file [gclib\\_errors.h](#).

#### 15.10.2.36 G\_CONNECTION\_NOT\_ESTABLISHED\_S

```
#define G_CONNECTION_NOT_ESTABLISHED_S "connection to hardware not established"
```

Definition at line 61 of file [gclib\\_errors.h](#).

**15.10.2.37 G\_ILLEGAL\_DATA\_IN\_PROGRAM**

```
#define G_ILLEGAL_DATA_IN_PROGRAM -1202
```

Data to download not valid, e.g. \ in data.

Definition at line 63 of file [gclib\\_errors.h](#).

**15.10.2.38 G\_ILLEGAL\_DATA\_IN\_PROGRAM\_S**

```
#define G_ILLEGAL_DATA_IN_PROGRAM_S "illegal ASCII character in program"
```

Definition at line 64 of file [gclib\\_errors.h](#).

**15.10.2.39 G\_UNABLE\_TO\_COMPRESS\_PROGRAM\_TO\_FIT**

```
#define G_UNABLE_TO_COMPRESS_PROGRAM_TO_FIT -1203
```

Program preprocessor could not compress the program within the user's constraints.

Definition at line 66 of file [gclib\\_errors.h](#).

**15.10.2.40 G\_UNABLE\_TO\_COMPRESS\_PROGRAM\_TO\_FIT\_S**

```
#define G_UNABLE_TO_COMPRESS_PROGRAM_TO_FIT_S "program cannot be compressed to fit on the controller"
```

Definition at line 67 of file [gclib\\_errors.h](#).

**15.10.2.41 G\_BAD\_RESPONSE\_QUESTION\_MARK**

```
#define G_BAD_RESPONSE_QUESTION_MARK -10000
```

Operation received a ?, indicating controller has a TC error.

Definition at line 69 of file [gclib\\_errors.h](#).

**15.10.2.42 G\_BAD\_RESPONSE\_QUESTION\_MARK\_S**

```
#define G_BAD_RESPONSE_QUESTION_MARK_S "question mark returned by controller"
```

Definition at line 70 of file [gclib\\_errors.h](#).

**15.10.2.43 G\_BAD\_VALUE\_RANGE**

```
#define G_BAD_VALUE_RANGE -10002
```

Bad value or range, e.g. [GCon](#) *g* variable passed to function was bad.

Definition at line 72 of file [gclib\\_errors.h](#).

**15.10.2.44 G\_BAD\_VALUE\_RANGE\_S**

```
#define G_BAD_VALUE_RANGE_S "value passed to function was bad or out of range"
```

Definition at line 73 of file [gclib\\_errors.h](#).

**15.10.2.45 G\_BAD\_FULL\_MEMORY**

```
#define G_BAD_FULL_MEMORY -10003
```

Not enough memory for an operation, e.g. all connections allowed for a process already taken.

Definition at line 75 of file [gclib\\_errors.h](#).

**15.10.2.46 G\_BAD\_FULL\_MEMORY\_S**

```
#define G_BAD_FULL_MEMORY_S "operation could not complete because of a memory error"
```

Definition at line 76 of file [gclib\\_errors.h](#).

**15.10.2.47 G\_BAD\_LOST\_DATA**

```
#define G_BAD_LOST_DATA -10004
```

Lost data, e.g. [GCommand\(\)](#) response buffer was too small for the controller's response.

Definition at line 78 of file [gclib\\_errors.h](#).

#### 15.10.2.48 G\_BAD\_LOST\_DATA\_S

#define G\_BAD\_LOST\_DATA\_S "data was lost due to buffer or fifo limitations"  
Definition at line 79 of file [gclib\\_errors.h](#).

#### 15.10.2.49 G\_BAD\_FILE

#define G\_BAD\_FILE -10005  
Bad file path, bad file contents, or bad write.  
Definition at line 81 of file [gclib\\_errors.h](#).

#### 15.10.2.50 G\_BAD\_FILE\_S

#define G\_BAD\_FILE\_S "file was not found, contents are invalid, or write failed"  
Definition at line 82 of file [gclib\\_errors.h](#).

#### 15.10.2.51 G\_BAD\_ADDRESS

#define G\_BAD\_ADDRESS -10006  
Bad address.  
Definition at line 84 of file [gclib\\_errors.h](#).

#### 15.10.2.52 G\_BAD\_ADDRESS\_S

#define G\_BAD\_ADDRESS\_S "a bad address was specified in open"  
Definition at line 85 of file [gclib\\_errors.h](#).

#### 15.10.2.53 G\_BAD\_FIRMWARE\_LOAD

#define G\_BAD\_FIRMWARE\_LOAD -10008  
Bad firmware upgrade.  
Definition at line 87 of file [gclib\\_errors.h](#).

#### 15.10.2.54 G\_BAD\_FIRMWARE\_LOAD\_S

#define G\_BAD\_FIRMWARE\_LOAD\_S "Firmware upgrade failed"  
Definition at line 88 of file [gclib\\_errors.h](#).

#### 15.10.2.55 G\_GCAPS\_OPEN\_ERROR

#define G\_GCAPS\_OPEN\_ERROR -20000  
gcaps connection couldn't open. Server is not running or is not reachable.  
Definition at line 90 of file [gclib\\_errors.h](#).

#### 15.10.2.56 G\_GCAPS\_OPEN\_ERROR\_S

#define G\_GCAPS\_OPEN\_ERROR\_S "gcaps connection could not be opened"  
Definition at line 91 of file [gclib\\_errors.h](#).

#### 15.10.2.57 G\_GCAPS\_SUBSCRIPTION\_ERROR

#define G\_GCAPS\_SUBSCRIPTION\_ERROR -20002  
[GMessage\(\)](#), [GRecord\(\)](#), [GInterrupt\(\)](#) called on a connection without `--subscribe` switch.  
Definition at line 93 of file [gclib\\_errors.h](#).

#### 15.10.2.58 G\_GCAPS\_SUBSCRIPTION\_ERROR\_S

#define G\_GCAPS\_SUBSCRIPTION\_ERROR\_S "function requires subscription not specified in [GOpen\(\)](#)"  
Definition at line 94 of file [gclib\\_errors.h](#).

## 15.11 gclib\_errors.h

[Go to the documentation of this file.](#)

```
00001
00006 #ifndef I_ODD3687F_47D0_454B_ADB2_CBAB0ED46FCE
00007 #define I_ODD3687F_47D0_454B_ADB2_CBAB0ED46FCE
00008
00009 #define G_NO_ERROR 0
00010 #define G_NO_ERROR_S "no error"
00011
00012 #define G_GCLIB_ERROR -1
00013 #define G_GCLIB_ERROR_S "gclib unexpected error"
00014
00015 #define G_GCLIB_UTILITY_ERROR -2
00016 #define G_GCLIB_UTILITY_ERROR_S "invalid request value or bad arguments were specified to GUtility()"
00017
00018 #define G_GCLIB_UTILITY_IP_TAKEN -3
00019 #define G_GCLIB_UTILITY_IP_TAKEN_S "ip address is already taken by a device on the network"
00020
00021 #define G_GCLIB_NON_BLOCKING_READ_EMPTY -4
00022 #define G_GCLIB_NON_BLOCKING_READ_EMPTY_S "data was not waiting for a zero-timeout read"
00023
00024 #define G_GCLIB_POLLING_FAILED -5
00025 #define G_GCLIB_POLLING_FAILED_S "exit condition not met in specified polling period"
00026
00027 #define G_TIMEOUT -1100
00028 #define G_TIMEOUT_S "device timed out"
00029
00030 #define G_OPEN_ERROR -1101
00031 #define G_OPEN_ERROR_S "device failed to open"
00032
00033 #define G_ALREADY_OPEN -1111
00034 #define G_ALREADY_OPEN_S "Serial or PCI port already open"
00035
00036 #define G_READ_ERROR -1103
00037 #define G_READ_ERROR_S "device read error"
00038
00039 #define G_WRITE_ERROR -1104
00040 #define G_WRITE_ERROR_S "device write error"
00041
00042 #define G_INVALID_PREPROCESSOR_OPTIONS -1204
00043 #define G_INVALID_PREPROCESSOR_OPTIONS_S "preprocessor did not recognize options"
00044
00045 #define G_COMMAND_CALLED_WITH_ILLEGAL_COMMAND -1106
00046 #define G_COMMAND_CALLED_WITH_ILLEGAL_COMMAND_S "illegal command passed to command call"
00047
00048 #define G_DATA_RECORD_ERROR -1107
00049 #define G_DATA_RECORD_ERROR_S "data record error"
00050
00051 #define G_UNSUPPORTED_FUNCTION -1109
00052 #define G_UNSUPPORTED_FUNCTION_S "function not supported on this communication bus"
00053
00054 #define G_FIRMWARE_LOAD_NOT_SUPPORTED -1110
00055 #define G_FIRMWARE_LOAD_NOT_SUPPORTED_S "firmware cannot be loaded on this communication bus to this hardware"
00056
00057 #define G_ARRAY_NOT_DIMENSIONED -1200
00058 #define G_ARRAY_NOT_DIMENSIONED_S "array not dimensioned on controller or wrong size"
00059
00060 #define G_CONNECTION_NOT_ESTABLISHED -1201
00061 #define G_CONNECTION_NOT_ESTABLISHED_S "connection to hardware not established"
00062
00063 #define G_ILLEGAL_DATA_IN_PROGRAM -1202
00064 #define G_ILLEGAL_DATA_IN_PROGRAM_S "illegal ASCII character in program"
00065
00066 #define G_UNABLE_TO_COMPRESS_PROGRAM_TO_FIT -1203
00067 #define G_UNABLE_TO_COMPRESS_PROGRAM_TO_FIT_S "program cannot be compressed to fit on the controller"
00068
00069 #define G_BAD_RESPONSE_QUESTION_MARK -10000
00070 #define G_BAD_RESPONSE_QUESTION_MARK_S "question mark returned by controller"
00071
00072 #define G_BAD_VALUE_RANGE -10002
00073 #define G_BAD_VALUE_RANGE_S "value passed to function was bad or out of range"
00074
00075 #define G_BAD_FULL_MEMORY -10003
00076 #define G_BAD_FULL_MEMORY_S "operation could not complete because of a memory error"
00077
00078 #define G_BAD_LOST_DATA -10004
00079 #define G_BAD_LOST_DATA_S "data was lost due to buffer or fifo limitations"
00080
00081 #define G_BAD_FILE -10005
00082 #define G_BAD_FILE_S "file was not found, contents are invalid, or write failed"
00083
00084 #define G_BAD_ADDRESS -10006
00085 #define G_BAD_ADDRESS_S "a bad address was specified in open"
00086
```

```

00087 #define G_BAD_FIRMWARE_LOAD -10008
00088 #define G_BAD_FIRMWARE_LOAD_S "Firmware upgrade failed"
00089
00090 #define G_GCAPS_OPEN_ERROR -20000
00091 #define G_GCAPS_OPEN_ERROR_S "gcaps connection could not be opened"
00092
00093 #define G_GCAPS_SUBSCRIPTION_ERROR -20002
00094 #define G_GCAPS_SUBSCRIPTION_ERROR_S "function requires subscription not specified in GOpen()"
00095
00096 #endif //I_ODD3687F_47D0_454B_ADB2_CBAB0ED46FCE

```

## 15.12 gclib\_record.h File Reference

```
#include <stdint.h>
```

### Classes

- struct [GDataRecord4000](#)  
*Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.*
- struct [GDataRecord52000](#)  
*Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.*
- struct [GDataRecord1806](#)  
*Data record struct for DMC-1806 controller.*
- struct [GDataRecord2103](#)  
*Data record struct for DMC-2103 controllers.*
- struct [GDataRecord1802](#)
- struct [GDataRecord30000](#)  
*Data record struct for DMC-30010 controllers.*
- struct [GDataRecord47000\\_ENC](#)  
*Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.*
- struct [GDataRecord47300\\_ENC](#)  
*Data record struct for RIO-47300. Includes encoder fields.*
- struct [GDataRecord47300\\_24EX](#)  
*Data record struct for RIO-47300 with 24EX I/O daughter board.*
- struct [GDataRecord47162](#)  
*Data record struct for RIO-47162.*
- union [GDataRecord](#)  
*Data record union, containing all structs and a generic byte array accessor.*

### Macros

- #define [GALILDATARECORDMAXLENGTH](#) 512  
*Max size for any Galil data record, equal to dual port ram size of PCI.*

### Typedefs

- typedef uint8\_t [UB](#)
- typedef uint16\_t [UW](#)
- typedef int16\_t [SW](#)
- typedef int32\_t [SL](#)
- typedef uint32\_t [UL](#)

#### 15.12.1 Detailed Description

Defines a union for data records. Each supported controller has a struct member in the union with named record types. Offsets into the data record can also be used by referencing the member `byte_array`. Definition in file [gclib\\_record.h](#).

## 15.12.2 Macro Definition Documentation

### 15.12.2.1 GALILDATARECORDMAXLENGTH

```
#define GALILDATARECORDMAXLENGTH 512
```

Max size for any Galil data record, equal to dual port ram size of PCI.

Definition at line 28 of file [gclib\\_record.h](#).

## 15.12.3 Typedef Documentation

### 15.12.3.1 UB

```
typedef uint8_t UB
```

Definition at line 12 of file [gclib\\_record.h](#).

### 15.12.3.2 UW

```
typedef uint16_t UW
```

Definition at line 13 of file [gclib\\_record.h](#).

### 15.12.3.3 SW

```
typedef int16_t SW
```

Definition at line 14 of file [gclib\\_record.h](#).

### 15.12.3.4 SL

```
typedef int32_t SL
```

Definition at line 15 of file [gclib\\_record.h](#).

### 15.12.3.5 UL

```
typedef uint32_t UL
```

Definition at line 16 of file [gclib\\_record.h](#).

## 15.13 gclib\_record.h

[Go to the documentation of this file.](#)

```
00001
00006
00007 #ifndef I_210405D9_D9EF_484F_8258_BB29A1BBA217
00008 #define I_210405D9_D9EF_484F_8258_BB29A1BBA217
00009
00010 //typedefs to keep the layout of the structs clean and matching the Galil user manual docs
00011 #include <stdint.h>
00012 typedef uint8_t UB; //unsigned byte
00013 typedef uint16_t UW; //unsigned word
00014 typedef int16_t SW; //signed word
00015 typedef int32_t SL; //signed long
00016 typedef uint32_t UL; //unsigned long
00017
00018 #if defined(_MSC_VER) || defined(__GNUC__) || defined(__BORLANDC__)
00019 #define PACKOK
00020 #endif
00021
00022 #ifdef PACKOK
00023 #pragma pack(1)
00024 #else
00025 #error "Need to set structure packing for compiler"
00026 #endif
00027
00028 #define GALILDATARECORDMAXLENGTH 512
00029
00031 struct GDataRecord4000
00032 {
00033
00034     /*Offset    type name      description*/
00035
00036     /*00*/      UB      header_0;
00037     /*01*/      UB      header_1;
```

```

00038      /*02*/      UB      header_2;
00039      /*03*/      UB      header_3;
00040
00041      /*04-05*/    UW      sample_number;
00042
00043      /*06*/      UB      input_bank_0;
00044      /*07*/      UB      input_bank_1;
00045      /*08*/      UB      input_bank_2;
00046      /*09*/      UB      input_bank_3;
00047      /*10*/      UB      input_bank_4;
00048      /*11*/      UB      input_bank_5;
00049      /*12*/      UB      input_bank_6;
00050      /*13*/      UB      input_bank_7;
00051      /*14*/      UB      input_bank_8;
00052      /*15*/      UB      input_bank_9;
00053
00054      /*16*/      UB      output_bank_0;
00055      /*17*/      UB      output_bank_1;
00056      /*18*/      UB      output_bank_2;
00057      /*19*/      UB      output_bank_3;
00058      /*20*/      UB      output_bank_4;
00059      /*21*/      UB      output_bank_5;
00060      /*22*/      UB      output_bank_6;
00061      /*23*/      UB      output_bank_7;
00062      /*24*/      UB      output_bank_8;
00063      /*25*/      UB      output_bank_9;
00064
00065      /*26-27*/    SW      reserved_0;
00066      /*28-29*/    SW      reserved_2;
00067      /*30-31*/    SW      reserved_4;
00068      /*32-33*/    SW      reserved_6;
00069      /*34-35*/    SW      reserved_8;
00070      /*36-37*/    SW      reserved_10;
00071      /*38-39*/    SW      reserved_12;
00072      /*40-41*/    SW      reserved_14;
00073
00074      /*42*/      UB      ethernet_status_a;
00075      /*43*/      UB      ethernet_status_b;
00076      /*44*/      UB      ethernet_status_c;
00077      /*45*/      UB      ethernet_status_d;
00078      /*46*/      UB      ethernet_status_e;
00079      /*47*/      UB      ethernet_status_f;
00080      /*48*/      UB      ethernet_status_g;
00081      /*49*/      UB      ethernet_status_h;
00082
00083      /*50*/      UB      error_code;
00084      /*51*/      UB      thread_status;
00085      /*52-55*/    UL      amplifier_status;
00086
00087      /*56-59*/    UL      contour_segment_count;
00088      /*60-61*/    UW      contour_buffer_available;
00089
00090      /*62-63*/    UW      s_plane_segment_count;
00091      /*64-65*/    UW      s_plane_move_status;
00092      /*66-69*/    SL      s_distance;
00093      /*70-71*/    UW      s_plane_buffer_available;
00094
00095      /*72-73*/    UW      t_plane_segment_count;
00096      /*74-75*/    UW      t_plane_move_status;
00097      /*76-79*/    SL      t_distance;
00098      /*80-81*/    UW      t_plane_buffer_available;
00099
00100      /*82-83*/    UW      axis_a_status;
00101      /*84*/      UB      axis_a_switches;
00102      /*85*/      UB      axis_a_stop_code;
00103      /*86-89*/    SL      axis_a_reference_position;
00104      /*90-93*/    SL      axis_a_motor_position;
00105      /*94-97*/    SL      axis_a_position_error;
00106      /*98-101*/   SL      axis_a_aux_position;
00107      /*102-105*/   SL      axis_a_velocity;
00108      /*106-109*/   SL      axis_a_torque;
00109      /*110-111*/   UW      axis_a_analog_in;
00110      /*112*/      UB      axis_a_halls;
00111      /*113*/      UB      axis_a_reserved;
00112      /*114-117*/   SL      axis_a_variable;
00113
00114      /*118-119*/   UW      axis_b_status;
00115      /*120*/      UB      axis_b_switches;
00116      /*121*/      UB      axis_b_stop_code;
00117      /*122-125*/   SL      axis_b_reference_position;
00118      /*126-129*/   SL      axis_b_motor_position;
00119      /*130-133*/   SL      axis_b_position_error;
00120      /*134-137*/   SL      axis_b_aux_position;
00121      /*138-141*/   SL      axis_b_velocity;
00122      /*142-145*/   SL      axis_b_torque;
00123      /*146-147*/   UW      axis_b_analog_in;
00124      /*148*/      UB      axis_b_halls;

```



```

00125      /*149*/      UB      axis_b_reserved;
00126      /*150-153*/ SL      axis_b_variable;
00127
00128      /*154-155*/ UW      axis_c_status;
00129      /*156*/      UB      axis_c_switches;
00130      /*157*/      UB      axis_c_stop_code;
00131      /*158-161*/ SL      axis_c_reference_position;
00132      /*162-165*/ SL      axis_c_motor_position;
00133      /*166-169*/ SL      axis_c_position_error;
00134      /*170-173*/ SL      axis_c_aux_position;
00135      /*174-177*/ SL      axis_c_velocity;
00136      /*178-181*/ SL      axis_c_torque;
00137      /*182-183*/ UW      axis_c_analog_in;
00138      /*184*/      UB      axis_c_halls;
00139      /*185*/      UB      axis_c_reserved;
00140      /*186-189*/ SL      axis_c_variable;
00141
00142      /*190-191*/ UW      axis_d_status;
00143      /*192*/      UB      axis_d_switches;
00144      /*193*/      UB      axis_d_stop_code;
00145      /*194-197*/ SL      axis_d_reference_position;
00146      /*198-201*/ SL      axis_d_motor_position;
00147      /*202-205*/ SL      axis_d_position_error;
00148      /*206-209*/ SL      axis_d_aux_position;
00149      /*210-213*/ SL      axis_d_velocity;
00150      /*214-217*/ SL      axis_d_torque;
00151      /*218-219*/ UW      axis_d_analog_in;
00152      /*220*/      UB      axis_d_halls;
00153      /*221*/      UB      axis_d_reserved;
00154      /*222-225*/ SL      axis_d_variable;
00155
00156      /*226-227*/ UW      axis_e_status;
00157      /*228*/      UB      axis_e_switches;
00158      /*229*/      UB      axis_e_stop_code;
00159      /*230-233*/ SL      axis_e_reference_position;
00160      /*234-237*/ SL      axis_e_motor_position;
00161      /*238-241*/ SL      axis_e_position_error;
00162      /*242-245*/ SL      axis_e_aux_position;
00163      /*246-249*/ SL      axis_e_velocity;
00164      /*250-253*/ SL      axis_e_torque;
00165      /*254-255*/ UW      axis_e_analog_in;
00166      /*256*/      UB      axis_e_halls;
00167      /*257*/      UB      axis_e_reserved;
00168      /*258-261*/ SL      axis_e_variable;
00169
00170      /*262-263*/ UW      axis_f_status;
00171      /*264*/      UB      axis_f_switches;
00172      /*265*/      UB      axis_f_stop_code;
00173      /*266-269*/ SL      axis_f_reference_position;
00174      /*270-273*/ SL      axis_f_motor_position;
00175      /*274-277*/ SL      axis_f_position_error;
00176      /*278-281*/ SL      axis_f_aux_position;
00177      /*282-285*/ SL      axis_f_velocity;
00178      /*286-289*/ SL      axis_f_torque;
00179      /*290-291*/ UW      axis_f_analog_in;
00180      /*292*/      UB      axis_f_halls;
00181      /*293*/      UB      axis_f_reserved;
00182      /*294-297*/ SL      axis_f_variable;
00183
00184      /*298-299*/ UW      axis_g_status;
00185      /*300*/      UB      axis_g_switches;
00186      /*301*/      UB      axis_g_stop_code;
00187      /*302-305*/ SL      axis_g_reference_position;
00188      /*306-309*/ SL      axis_g_motor_position;
00189      /*310-313*/ SL      axis_g_position_error;
00190      /*314-317*/ SL      axis_g_aux_position;
00191      /*318-321*/ SL      axis_g_velocity;
00192      /*322-325*/ SL      axis_g_torque;
00193      /*326-327*/ UW      axis_g_analog_in;
00194      /*328*/      UB      axis_g_halls;
00195      /*329*/      UB      axis_g_reserved;
00196      /*330-333*/ SL      axis_g_variable;
00197
00198      /*334-335*/ UW      axis_h_status;
00199      /*336*/      UB      axis_h_switches;
00200      /*337*/      UB      axis_h_stop_code;
00201      /*338-341*/ SL      axis_h_reference_position;
00202      /*342-345*/ SL      axis_h_motor_position;
00203      /*346-349*/ SL      axis_h_position_error;
00204      /*350-353*/ SL      axis_h_aux_position;
00205      /*354-357*/ SL      axis_h_velocity;
00206      /*358-361*/ SL      axis_h_torque;
00207      /*362-363*/ UW      axis_h_analog_in;
00208      /*364*/      UB      axis_h_halls;
00209      /*365*/      UB      axis_h_reserved;
00210      /*366-369*/ SL      axis_h_variable;
00211 }; //DataRecord4000

```

```

00212
00214 struct GDataRecord52000
00215 {
00216
00217     /*Offset    type name          description*/
00218
00219     /*00*/      UB    header_0;
00220     /*01*/      UB    header_1;
00221     /*02*/      UB    header_2;
00222     /*03*/      UB    header_3;
00223
00224     /*04-05*/    UW    sample_number;
00225
00226     /*06*/      UB    input_bank_0;
00227     /*07*/      UB    input_bank_1;
00228     /*08*/      UB    input_bank_2;
00229     /*09*/      UB    input_bank_3;
00230     /*10*/      UB    input_bank_4;
00231     /*11*/      UB    input_bank_5;
00232     /*12*/      UB    input_bank_6;
00233     /*13*/      UB    input_bank_7;
00234     /*14*/      UB    input_bank_8;
00235     /*15*/      UB    input_bank_9;
00236
00237     /*16*/      UB    output_bank_0;
00238     /*17*/      UB    output_bank_1;
00239     /*18*/      UB    output_bank_2;
00240     /*19*/      UB    output_bank_3;
00241     /*20*/      UB    output_bank_4;
00242     /*21*/      UB    output_bank_5;
00243     /*22*/      UB    output_bank_6;
00244     /*23*/      UB    output_bank_7;
00245     /*24*/      UB    output_bank_8;
00246     /*25*/      UB    output_bank_9;
00247
00248     /*26-27*/    SW    reserved_0;
00249     /*28-29*/    SW    reserved_2;
00250     /*30-31*/    SW    reserved_4;
00251     /*32-33*/    SW    reserved_6;
00252     /*34-35*/    SW    reserved_8;
00253     /*36-37*/    SW    reserved_10;
00254     /*38-39*/    SW    reserved_12;
00255     /*40*/      UB    ethercat_bank;
00256     /*41*/      UB    reserved_14;
00257
00258     /*42*/      UB    ethernet_status_a;
00259     /*43*/      UB    ethernet_status_b;
00260     /*44*/      UB    ethernet_status_c;
00261     /*45*/      UB    ethernet_status_d;
00262     /*46*/      UB    ethernet_status_e;
00263     /*47*/      UB    ethernet_status_f;
00264     /*48*/      UB    ethernet_status_g;
00265     /*49*/      UB    ethernet_status_h;
00266
00267     /*50*/      UB    error_code;
00268     /*51*/      UB    thread_status;
00269     /*52-55*/    UL    amplifier_status;
00270
00271     /*56-59*/    UL    contour_segment_count;
00272     /*60-61*/    UW    contour_buffer_available;
00273
00274     /*62-63*/    UW    s_plane_segment_count;
00275     /*64-65*/    UW    s_plane_move_status;
00276     /*66-69*/    SL    s_distance;
00277     /*70-71*/    UW    s_plane_buffer_available;
00278
00279     /*72-73*/    UW    t_plane_segment_count;
00280     /*74-75*/    UW    t_plane_move_status;
00281     /*76-79*/    SL    t_distance;
00282     /*80-81*/    UW    t_plane_buffer_available;
00283
00284     /*82-83*/    UW    axis_a_status;
00285     /*84*/      UB    axis_a_switches;
00286     /*85*/      UB    axis_a_stop_code;
00287     /*86-89*/    SL    axis_a_reference_position;
00288     /*90-93*/    SL    axis_a_motor_position;
00289     /*94-97*/    SL    axis_a_position_error;
00290     /*98-101*/   SL    axis_a_aux_position;
00291     /*102-105*/  SL    axis_a_velocity;
00292     /*106-109*/  SL    axis_a_torque;
00293     /*110-111*/  UW    axis_a_analog_in;
00294     /*112*/      UB    axis_a_halls;
00295     /*113*/      UB    axis_a_reserved;
00296     /*114-117*/  SL    axis_a_variable;
00297
00298     /*118-119*/  UW    axis_b_status;
00299     /*120*/      UB    axis_b_switches;

```

```

00300      /*121*/      UB      axis_b_stop_code;
00301      /*122-125*/ SL      axis_b_reference_position;
00302      /*126-129*/ SL      axis_b_motor_position;
00303      /*130-133*/ SL      axis_b_position_error;
00304      /*134-137*/ SL      axis_b_aux_position;
00305      /*138-141*/ SL      axis_b_velocity;
00306      /*142-145*/ SL      axis_b_torque;
00307      /*146-147*/ UW      axis_b_analog_in;
00308      /*148*/      UB      axis_b_halls;
00309      /*149*/      UB      axis_b_reserved;
00310      /*150-153*/ SL      axis_b_variable;
00311
00312      /*154-155*/ UW      axis_c_status;
00313      /*156*/      UB      axis_c_switches;
00314      /*157*/      UB      axis_c_stop_code;
00315      /*158-161*/ SL      axis_c_reference_position;
00316      /*162-165*/ SL      axis_c_motor_position;
00317      /*166-169*/ SL      axis_c_position_error;
00318      /*170-173*/ SL      axis_c_aux_position;
00319      /*174-177*/ SL      axis_c_velocity;
00320      /*178-181*/ SL      axis_c_torque;
00321      /*182-183*/ UW      axis_c_analog_in;
00322      /*184*/      UB      axis_c_halls;
00323      /*185*/      UB      axis_c_reserved;
00324      /*186-189*/ SL      axis_c_variable;
00325
00326      /*190-191*/ UW      axis_d_status;
00327      /*192*/      UB      axis_d_switches;
00328      /*193*/      UB      axis_d_stop_code;
00329      /*194-197*/ SL      axis_d_reference_position;
00330      /*198-201*/ SL      axis_d_motor_position;
00331      /*202-205*/ SL      axis_d_position_error;
00332      /*206-209*/ SL      axis_d_aux_position;
00333      /*210-213*/ SL      axis_d_velocity;
00334      /*214-217*/ SL      axis_d_torque;
00335      /*218-219*/ UW      axis_d_analog_in;
00336      /*220*/      UB      axis_d_halls;
00337      /*221*/      UB      axis_d_reserved;
00338      /*222-225*/ SL      axis_d_variable;
00339
00340      /*226-227*/ UW      axis_e_status;
00341      /*228*/      UB      axis_e_switches;
00342      /*229*/      UB      axis_e_stop_code;
00343      /*230-233*/ SL      axis_e_reference_position;
00344      /*234-237*/ SL      axis_e_motor_position;
00345      /*238-241*/ SL      axis_e_position_error;
00346      /*242-245*/ SL      axis_e_aux_position;
00347      /*246-249*/ SL      axis_e_velocity;
00348      /*250-253*/ SL      axis_e_torque;
00349      /*254-255*/ UW      axis_e_analog_in;
00350      /*256*/      UB      axis_e_halls;
00351      /*257*/      UB      axis_e_reserved;
00352      /*258-261*/ SL      axis_e_variable;
00353
00354      /*262-263*/ UW      axis_f_status;
00355      /*264*/      UB      axis_f_switches;
00356      /*265*/      UB      axis_f_stop_code;
00357      /*266-269*/ SL      axis_f_reference_position;
00358      /*270-273*/ SL      axis_f_motor_position;
00359      /*274-277*/ SL      axis_f_position_error;
00360      /*278-281*/ SL      axis_f_aux_position;
00361      /*282-285*/ SL      axis_f_velocity;
00362      /*286-289*/ SL      axis_f_torque;
00363      /*290-291*/ UW      axis_f_analog_in;
00364      /*292*/      UB      axis_f_halls;
00365      /*293*/      UB      axis_f_reserved;
00366      /*294-297*/ SL      axis_f_variable;
00367
00368      /*298-299*/ UW      axis_g_status;
00369      /*300*/      UB      axis_g_switches;
00370      /*301*/      UB      axis_g_stop_code;
00371      /*302-305*/ SL      axis_g_reference_position;
00372      /*306-309*/ SL      axis_g_motor_position;
00373      /*310-313*/ SL      axis_g_position_error;
00374      /*314-317*/ SL      axis_g_aux_position;
00375      /*318-321*/ SL      axis_g_velocity;
00376      /*322-325*/ SL      axis_g_torque;
00377      /*326-327*/ UW      axis_g_analog_in;
00378      /*328*/      UB      axis_g_halls;
00379      /*329*/      UB      axis_g_reserved;
00380      /*330-333*/ SL      axis_g_variable;
00381
00382      /*334-335*/ UW      axis_h_status;
00383      /*336*/      UB      axis_h_switches;
00384      /*337*/      UB      axis_h_stop_code;
00385      /*338-341*/ SL      axis_h_reference_position;
00386      /*342-345*/ SL      axis_h_motor_position;

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00387      /*346-349*/ SL      axis_h_position_error;
00388      /*350-353*/ SL      axis_h_aux_position;
00389      /*354-357*/ SL      axis_h_velocity;
00390      /*358-361*/ SL      axis_h_torque;
00391      /*362-363*/ UW      axis_h_analog_in;
00392      /*364*/ UB          axis_h_halls;
00393      /*365*/ UB          axis_h_reserved;
00394      /*366-369*/ SL      axis_h_variable;
00395 }; //DataRecord52000
00396
00398
00405 struct GDataRecord1806
00406 {
00407     /*Offset    type name          description*/
00408
00409     /*00-01*/ UW      sample_number;
00410
00411     /*02*/ UB          input_bank_0;
00412     /*03*/ UB          input_bank_1;
00413     /*04*/ UB          input_bank_2;
00414     /*05*/ UB          input_bank_3;
00415     /*06*/ UB          input_bank_4;
00416     /*07*/ UB          input_bank_5;
00417     /*08*/ UB          input_bank_6;
00418     /*09*/ UB          input_bank_7;
00419     /*10*/ UB          input_bank_8;
00420     /*11*/ UB          input_bank_9;
00421
00422     /*12*/ UB          output_bank_0;
00423     /*13*/ UB          output_bank_1;
00424     /*14*/ UB          output_bank_2;
00425     /*15*/ UB          output_bank_3;
00426     /*16*/ UB          output_bank_4;
00427     /*17*/ UB          output_bank_5;
00428     /*18*/ UB          output_bank_6;
00429     /*19*/ UB          output_bank_7;
00430     /*20*/ UB          output_bank_8;
00431     /*21*/ UB          output_bank_9;
00432
00433     /*22-23*/ SW      reserved_0;
00434     /*24-25*/ SW      reserved_2;
00435     /*26-27*/ SW      reserved_4;
00436     /*28-29*/ SW      reserved_6;
00437     /*30-31*/ SW      reserved_8;
00438     /*32-33*/ SW      reserved_10;
00439     /*34-35*/ SW      reserved_12;
00440     /*36-37*/ SW      reserved_14;
00441
00442     /*38*/ UB          reserved_16;
00443     /*39*/ UB          reserved_17;
00444     /*40*/ UB          reserved_18;
00445     /*41*/ UB          reserved_19;
00446     /*42*/ UB          reserved_20;
00447     /*43*/ UB          reserved_21;
00448     /*44*/ UB          reserved_22;
00449     /*45*/ UB          reserved_23;
00450
00451     /*46*/ UB          error_code;
00452     /*47*/ UB          thread_status;
00453     /*48-51*/ UL      reserved_24;
00454
00455     /*52-55*/ UL      contour_segment_count;
00456     /*56-57*/ UW      contour_buffer_available;
00457
00458     /*58-59*/ UW      s_plane_segment_count;
00459     /*60-61*/ UW      s_plane_move_status;
00460     /*62-65*/ SL      s_distance;
00461     /*66-67*/ UW      s_plane_buffer_available;
00462
00463     /*68-69*/ UW      t_plane_segment_count;
00464     /*70-71*/ UW      t_plane_move_status;
00465     /*72-75*/ SL      t_distance;
00466     /*76-77*/ UW      t_plane_buffer_available;
00467
00468     /*78-79*/ UW      axis_a_status;
00469     /*80*/ UB          axis_a_switches;
00470     /*81*/ UB          axis_a_stop_code;
00471     /*82-85*/ SL      axis_a_reference_position;
00472     /*86-89*/ SL      axis_a_motor_position;
00473     /*90-93*/ SL      axis_a_position_error;
00474     /*94-97*/ SL      axis_a_aux_position;
00475     /*98-101*/ SL     axis_a_velocity;
00476     /*102-105*/ SL     axis_a_torque;
00477     /*106-107*/ UW     axis_a_analog_in;
00478     /*108*/ UB          axis_a_reserved_0;
00479     /*109*/ UB          axis_a_reserved_1;
00480     /*110-113*/ SL     axis_a_variable;

```

```

00481
00482 /*114-115*/ UW axis_b_status;
00483 /*116*/ UB axis_b_switches;
00484 /*117*/ UB axis_b_stop_code;
00485 /*118-121*/ SL axis_b_reference_position;
00486 /*122-125*/ SL axis_b_motor_position;
00487 /*126-129*/ SL axis_b_position_error;
00488 /*130-133*/ SL axis_b_aux_position;
00489 /*134-137*/ SL axis_b_velocity;
00490 /*138-141*/ SL axis_b_torque;
00491 /*142-143*/ UW axis_b_analog_in;
00492 /*144*/ UB axis_b_reserved_0;
00493 /*145*/ UB axis_b_reserved_1;
00494 /*146-149*/ SL axis_b_variable;
00495
00496 /*150-151*/ UW axis_c_status;
00497 /*152*/ UB axis_c_switches;
00498 /*153*/ UB axis_c_stop_code;
00499 /*154-157*/ SL axis_c_reference_position;
00500 /*158-161*/ SL axis_c_motor_position;
00501 /*162-165*/ SL axis_c_position_error;
00502 /*166-169*/ SL axis_c_aux_position;
00503 /*170-173*/ SL axis_c_velocity;
00504 /*174-177*/ SL axis_c_torque;
00505 /*178-179*/ UW axis_c_analog_in;
00506 /*180*/ UB axis_c_reserved_0;
00507 /*181*/ UB axis_c_reserved_1;
00508 /*182-185*/ SL axis_c_variable;
00509
00510 /*186-187*/ UW axis_d_status;
00511 /*188*/ UB axis_d_switches;
00512 /*189*/ UB axis_d_stop_code;
00513 /*190-193*/ SL axis_d_reference_position;
00514 /*194-197*/ SL axis_d_motor_position;
00515 /*198-201*/ SL axis_d_position_error;
00516 /*202-205*/ SL axis_d_aux_position;
00517 /*206-209*/ SL axis_d_velocity;
00518 /*210-213*/ SL axis_d_torque;
00519 /*214-215*/ UW axis_d_analog_in;
00520 /*216*/ UB axis_d_reserved_0;
00521 /*217*/ UB axis_d_reserved_1;
00522 /*218-221*/ SL axis_d_variable;
00523
00524 /*222-223*/ UW axis_e_status;
00525 /*224*/ UB axis_e_switches;
00526 /*225*/ UB axis_e_stop_code;
00527 /*226-229*/ SL axis_e_reference_position;
00528 /*230-233*/ SL axis_e_motor_position;
00529 /*234-237*/ SL axis_e_position_error;
00530 /*238-241*/ SL axis_e_aux_position;
00531 /*242-245*/ SL axis_e_velocity;
00532 /*256-249*/ SL axis_e_torque;
00533 /*250-251*/ UW axis_e_analog_in;
00534 /*252*/ UB axis_e_reserved_0;
00535 /*253*/ UB axis_e_reserved_1;
00536 /*254-257*/ SL axis_e_variable;
00537
00538 /*258-259*/ UW axis_f_status;
00539 /*260*/ UB axis_f_switches;
00540 /*261*/ UB axis_f_stop_code;
00541 /*262-265*/ SL axis_f_reference_position;
00542 /*266-269*/ SL axis_f_motor_position;
00543 /*270-273*/ SL axis_f_position_error;
00544 /*274-277*/ SL axis_f_aux_position;
00545 /*278-281*/ SL axis_f_velocity;
00546 /*282-285*/ SL axis_f_torque;
00547 /*286-287*/ UW axis_f_analog_in;
00548 /*288*/ UB axis_f_reserved_0;
00549 /*289*/ UB axis_f_reserved_1;
00550 /*290-293*/ SL axis_f_variable;
00551
00552 /*294-295*/ UW axis_g_status;
00553 /*296*/ UB axis_g_switches;
00554 /*297*/ UB axis_g_stop_code;
00555 /*298-301*/ SL axis_g_reference_position;
00556 /*302-305*/ SL axis_g_motor_position;
00557 /*306-309*/ SL axis_g_position_error;
00558 /*310-313*/ SL axis_g_aux_position;
00559 /*314-317*/ SL axis_g_velocity;
00560 /*318-321*/ SL axis_g_torque;
00561 /*322-323*/ UW axis_g_analog_in;
00562 /*324*/ UB axis_g_reserved_0;
00563 /*325*/ UB axis_g_reserved_1;
00564 /*326-329*/ SL axis_g_variable;
00565
00566 /*330-331*/ UW axis_h_status;
00567 /*332*/ UB axis_h_switches;

```

```

00568      /*333*/      UB      axis_h_stop_code;
00569      /*334-337*/  SL      axis_h_reference_position;
00570      /*338-341*/  SL      axis_h_motor_position;
00571      /*342-345*/  SL      axis_h_position_error;
00572      /*346-349*/  SL      axis_h_aux_position;
00573      /*350-353*/  SL      axis_h_velocity;
00574      /*354-357*/  SL      axis_h_torque;
00575      /*358-359*/  UW      axis_h_analog_in;
00576      /*360*/      UB      axis_h_reserved_0;
00577      /*361*/      UB      axis_h_reserved_1;
00578      /*362-365*/  SL      axis_h_variable;
00579  }; //DataRecord1806
00580
00582  struct GDataRecord2103
00583  {
00584
00585      /*Offset      type name          description*/
00586
00587      /*00*/      UB      header_0;
00588      /*01*/      UB      header_1;
00589      /*02*/      UB      header_2;
00590      /*03*/      UB      header_3;
00591
00592      /*04-05*/  UW      sample_number;
00593
00594      /*06*/      UB      input_bank_0;
00595      /*07*/      UB      input_bank_1;
00596      /*08*/      UB      input_bank_2;
00597      /*09*/      UB      input_bank_3;
00598      /*10*/      UB      input_bank_4;
00599      /*11*/      UB      input_bank_5;
00600      /*12*/      UB      input_bank_6;
00601      /*13*/      UB      input_bank_7;
00602      /*14*/      UB      input_bank_8;
00603      /*15*/      UB      input_bank_9;
00604
00605      /*16*/      UB      output_bank_0;
00606      /*17*/      UB      output_bank_1;
00607      /*18*/      UB      output_bank_2;
00608      /*19*/      UB      output_bank_3;
00609      /*20*/      UB      output_bank_4;
00610      /*21*/      UB      output_bank_5;
00611      /*22*/      UB      output_bank_6;
00612      /*23*/      UB      output_bank_7;
00613      /*24*/      UB      output_bank_8;
00614      /*25*/      UB      output_bank_9;
00615
00616      /*26*/      UB      error_code;
00617      /*27*/      UB      general_status;
00618
00619      /*28-29*/  UW      s_plane_segment_count;
00620      /*30-31*/  UW      s_plane_move_status;
00621      /*32-35*/  SL      s_distance;
00622
00623      /*36-37*/  UW      t_plane_segment_count;
00624      /*38-39*/  UW      t_plane_move_status;
00625      /*40-43*/  SL      t_distance;
00626
00627      /*44-45*/  UW      axis_a_status;
00628      /*46*/      UB      axis_a_switches;
00629      /*47*/      UB      axis_a_stop_code;
00630      /*48-51*/  SL      axis_a_reference_position;
00631      /*52-55*/  SL      axis_a_motor_position;
00632      /*56-59*/  SL      axis_a_position_error;
00633      /*60-63*/  SL      axis_a_aux_position;
00634      /*64-67*/  SL      axis_a_velocity;
00635      /*68-69*/  SW      axis_a_torque;
00636      /*70-71*/  UW      axis_a_analog_in;
00637
00638      /*72-73*/  UW      axis_b_status;
00639      /*74*/      UB      axis_b_switches;
00640      /*75*/      UB      axis_b_stop_code;
00641      /*76-79*/  SL      axis_b_reference_position;
00642      /*80-83*/  SL      axis_b_motor_position;
00643      /*84-87*/  SL      axis_b_position_error;
00644      /*88-91*/  SL      axis_b_aux_position;
00645      /*92-95*/  SL      axis_b_velocity;
00646      /*96-97*/  SW      axis_b_torque;
00647      /*98-99*/  UW      axis_b_analog_in;
00648
00649      /*100-101*/ UW      axis_c_status;
00650      /*102*/      UB      axis_c_switches;
00651      /*103*/      UB      axis_c_stop_code;
00652      /*104-107*/ SL      axis_c_reference_position;
00653      /*108-111*/ SL      axis_c_motor_position;
00654      /*112-115*/ SL      axis_c_position_error;
00655      /*116-119*/ SL      axis_c_aux_position;

```

```

00656      /*120-123*/ SL   axis_c_velocity;
00657      /*124-125*/ SW   axis_c_torque;
00658      /*126-127*/ UW   axis_c_analog_in;
00659
00660      /*128-129*/ UW   axis_d_status;
00661      /*130*/ UB      axis_d_switches;
00662      /*131*/ UB      axis_d_stop_code;
00663      /*132-135*/ SL   axis_d_reference_position;
00664      /*136-139*/ SL   axis_d_motor_position;
00665      /*140-143*/ SL   axis_d_position_error;
00666      /*144-147*/ SL   axis_d_aux_position;
00667      /*148-151*/ SL   axis_d_velocity;
00668      /*152-153*/ SW   axis_d_torque;
00669      /*154-155*/ UW   axis_d_analog_in;
00670
00671      /*156-157*/ UW   axis_e_status;
00672      /*158*/ UB      axis_e_switches;
00673      /*159*/ UB      axis_e_stop_code;
00674      /*160-163*/ SL   axis_e_reference_position;
00675      /*164-167*/ SL   axis_e_motor_position;
00676      /*168-171*/ SL   axis_e_position_error;
00677      /*172-175*/ SL   axis_e_aux_position;
00678      /*176-179*/ SL   axis_e_velocity;
00679      /*180-181*/ SW   axis_e_torque;
00680      /*182-183*/ UW   axis_e_analog_in;
00681
00682      /*184-185*/ UW   axis_f_status;
00683      /*186*/ UB      axis_f_switches;
00684      /*187*/ UB      axis_f_stop_code;
00685      /*188-191*/ SL   axis_f_reference_position;
00686      /*192-195*/ SL   axis_f_motor_position;
00687      /*196-199*/ SL   axis_f_position_error;
00688      /*200-203*/ SL   axis_f_aux_position;
00689      /*204-207*/ SL   axis_f_velocity;
00690      /*208-209*/ SW   axis_f_torque;
00691      /*210-211*/ UW   axis_f_analog_in;
00692
00693      /*212-213*/ UW   axis_g_status;
00694      /*214*/ UB      axis_g_switches;
00695      /*215*/ UB      axis_g_stop_code;
00696      /*216-219*/ SL   axis_g_reference_position;
00697      /*220-223*/ SL   axis_g_motor_position;
00698      /*224-227*/ SL   axis_g_position_error;
00699      /*228-231*/ SL   axis_g_aux_position;
00700      /*232-235*/ SL   axis_g_velocity;
00701      /*236-237*/ SW   axis_g_torque;
00702      /*238-239*/ UW   axis_g_analog_in;
00703
00704      /*240-241*/ UW   axis_h_status;
00705      /*242*/ UB      axis_h_switches;
00706      /*243*/ UB      axis_h_stop_code;
00707      /*244-247*/ SL   axis_h_reference_position;
00708      /*248-251*/ SL   axis_h_motor_position;
00709      /*252-255*/ SL   axis_h_position_error;
00710      /*256-259*/ SL   axis_h_aux_position;
00711      /*260-263*/ SL   axis_h_velocity;
00712      /*264-265*/ SW   axis_h_torque;
00713      /*266-267*/ UW   axis_h_analog_in;
00714  }; //DataRecord2013
00715
00716
00717
00723  struct GDataRecord1802
00724  {
00725
00726      /*Offset   type name           description*/
00727
00728      /*00-01*/   UW      sample_number;
00729
00730      /*02*/      UB      input_bank_0;
00731      /*03*/      UB      input_bank_1;
00732      /*04*/      UB      input_bank_2;
00733      /*05*/      UB      input_bank_3;
00734      /*06*/      UB      input_bank_4;
00735      /*07*/      UB      input_bank_5;
00736      /*08*/      UB      input_bank_6;
00737      /*09*/      UB      input_bank_7;
00738      /*10*/      UB      input_bank_8;
00739      /*11*/      UB      input_bank_9;
00740
00741      /*12*/      UB      output_bank_0;
00742      /*13*/      UB      output_bank_1;
00743      /*14*/      UB      output_bank_2;
00744      /*15*/      UB      output_bank_3;
00745      /*16*/      UB      output_bank_4;
00746      /*17*/      UB      output_bank_5;
00747      /*18*/      UB      output_bank_6;
00748      /*19*/      UB      output_bank_7;

```

```

00749      /*20*/      UB      output_bank_8;
00750      /*21*/      UB      output_bank_9;
00751
00752      /*22*/      UB      error_code;
00753      /*23*/      UB      general_status;
00754
00755      /*24-25*/    UW      s_plane_segment_count;
00756      /*26-27*/    UW      s_plane_move_status;
00757      /*28-31*/    SL      s_distance;
00758
00759      /*32-33*/    UW      t_plane_segment_count;
00760      /*34-35*/    UW      t_plane_move_status;
00761      /*36-39*/    SL      t_distance;
00762
00763      /*40-41*/    UW      axis_a_status;
00764      /*42*/      UB      axis_a_switches;
00765      /*43*/      UB      axis_a_stop_code;
00766      /*44-47*/    SL      axis_a_reference_position;
00767      /*48-51*/    SL      axis_a_motor_position;
00768      /*52-55*/    SL      axis_a_position_error;
00769      /*56-59*/    SL      axis_a_aux_position;
00770      /*60-63*/    SL      axis_a_velocity;
00771      /*64-65*/    SW      axis_a_torque;
00772      /*66*/      UB      axis_a_reserved_0;
00773      /*67*/      UB      axis_a_reserved_1;
00774
00775      /*68-69*/    UW      axis_b_status;
00776      /*70*/      UB      axis_b_switches;
00777      /*71*/      UB      axis_b_stop_code;
00778      /*72-75*/    SL      axis_b_reference_position;
00779      /*76-79*/    SL      axis_b_motor_position;
00780      /*80-83*/    SL      axis_b_position_error;
00781      /*84-87*/    SL      axis_b_aux_position;
00782      /*88-91*/    SL      axis_b_velocity;
00783      /*92-93*/    SW      axis_b_torque;
00784      /*94*/      UB      axis_b_reserved_0;
00785      /*95*/      UB      axis_b_reserved_1;
00786
00787      /*96-97*/    UW      axis_c_status;
00788      /*98*/      UB      axis_c_switches;
00789      /*99*/      UB      axis_c_stop_code;
00790      /*100-103*/   SL      axis_c_reference_position;
00791      /*104-107*/   SL      axis_c_motor_position;
00792      /*108-111*/   SL      axis_c_position_error;
00793      /*112-115*/   SL      axis_c_aux_position;
00794      /*116-119*/   SL      axis_c_velocity;
00795      /*120-121*/   SW      axis_c_torque;
00796      /*122*/      UB      axis_c_reserved_0;
00797      /*123*/      UB      axis_c_reserved_1;
00798
00799      /*124-125*/   UW      axis_d_status;
00800      /*126*/      UB      axis_d_switches;
00801      /*127*/      UB      axis_d_stop_code;
00802      /*128-131*/   SL      axis_d_reference_position;
00803      /*132-135*/   SL      axis_d_motor_position;
00804      /*136-139*/   SL      axis_d_position_error;
00805      /*140-143*/   SL      axis_d_aux_position;
00806      /*144-147*/   SL      axis_d_velocity;
00807      /*148-149*/   SW      axis_d_torque;
00808      /*150*/      UB      axis_d_reserved_0;
00809      /*151*/      UB      axis_d_reserved_1;
00810
00811 }; //DataRecord1802
00812
00814 struct GDataRecord30000
00815 {
00816
00817     /*Offset    type name          description*/
00818
00819     /*00*/      UB      header_0;
00820     /*01*/      UB      header_1;
00821     /*02*/      UB      header_2;
00822     /*03*/      UB      header_3;
00823
00824     /*04-05*/    UW      sample_number;
00825
00826     /*06*/      UB      input_bank_0;
00827     /*07*/      UB      input_bank_1;
00828
00829     /*08*/      UB      output_bank_0;
00830     /*09*/      UB      output_bank_1;
00831
00832     /*10*/      UB      error_code;
00833     /*11*/      UB      thread_status;
00834
00835     /*12-13*/    UW      input_analog_2;
00836

```



```

00837      /*14-15*/   UW   output_analog_1;
00838      /*16-17*/   UW   output_analog_2;
00839
00840      /*18-21*/   UL   amplifier_status;
00841
00842      /*22-25*/   UL   contour_segment_count;
00843      /*26-27*/   UW   contour_buffer_available;
00844
00845      /*28-29*/   UW   s_plane_segment_count;
00846      /*30-31*/   UW   s_plane_move_status;
00847      /*32-35*/   SL   s_distance;
00848      /*36-37*/   UW   s_plane_buffer_available;
00849
00850      /*38-39*/   UW   axis_a_status;
00851      /*40*/      UB   axis_a_switches;
00852      /*41*/      UB   axis_a_stop_code;
00853      /*42-45*/   SL   axis_a_reference_position;
00854      /*46-49*/   SL   axis_a_motor_position;
00855      /*50-53*/   SL   axis_a_position_error;
00856      /*54-57*/   SL   axis_a_aux_position;
00857      /*58-61*/   SL   axis_a_velocity;
00858      /*62-65*/   SL   axis_a_torque;
00859      /*66-67*/   UW   axis_a_analog_in;
00860      /*68*/      UB   axis_a_halls;
00861      /*69*/      UB   axis_a_reserved;
00862      /*70-73*/   SL   axis_a_variable;
00863 }; //DataRecord30000
00864
00866 struct GDataRecord47000_ENC
00867 {
00868
00869      /*Offset   type name           description*/
00870
00871      /*00*/      UB   header_0;
00872      /*01*/      UB   header_1;
00873      /*02*/      UB   header_2;
00874      /*03*/      UB   header_3;
00875
00876      /*04-05*/   UW   sample_number;
00877      /*06*/      UB   error_code;
00878      /*07*/      UB   general_status;
00879
00880      /*08-09*/   UW   output_analog_0;
00881      /*10-11*/   UW   output_analog_1;
00882      /*12-13*/   UW   output_analog_2;
00883      /*14-15*/   UW   output_analog_3;
00884      /*16-17*/   UW   output_analog_4;
00885      /*18-19*/   UW   output_analog_5;
00886      /*20-21*/   UW   output_analog_6;
00887      /*22-23*/   UW   output_analog_7;
00888
00889      /*24-25*/   UW   input_analog_0;
00890      /*26-27*/   UW   input_analog_1;
00891      /*28-29*/   UW   input_analog_2;
00892      /*30-31*/   UW   input_analog_3;
00893      /*32-33*/   UW   input_analog_4;
00894      /*34-35*/   UW   input_analog_5;
00895      /*36-37*/   UW   input_analog_6;
00896      /*38-39*/   UW   input_analog_7;
00897
00898      /*40-41*/   UW   output_bank_0;
00899
00900      /*42-43*/   UW   input_bank_0;
00901
00902      /*44-47*/   UL   pulse_count_0;
00903      /*48-51*/   SL   zc_variable;
00904      /*52-55*/   SL   zd_variable;
00905
00906      /*56-59*/   SL   encoder_0;
00907      /*60-63*/   SL   encoder_1;
00908      /*64-67*/   SL   encoder_2;
00909      /*68-71*/   SL   encoder_3;
00910
00911 }; //GDataRecord47000_ENC
00912
00914 struct GDataRecord47300_ENC
00915 {
00916
00917      /*Offset   type name           description*/
00918
00919      /*00*/      UB   header_0;
00920      /*01*/      UB   header_1;
00921      /*02*/      UB   header_2;
00922      /*03*/      UB   header_3;
00923
00924      /*04-05*/   UW   sample_number;
00925      /*06*/      UB   error_code;

```

```

00926      /*07*/      UB      general_status;
00927
00928      /*08-09*/    UW      output_analog_0;
00929      /*10-11*/    UW      output_analog_1;
00930      /*12-13*/    UW      output_analog_2;
00931      /*14-15*/    UW      output_analog_3;
00932      /*16-17*/    UW      output_analog_4;
00933      /*18-19*/    UW      output_analog_5;
00934      /*20-21*/    UW      output_analog_6;
00935      /*22-23*/    UW      output_analog_7;
00936
00937      /*24-25*/    UW      input_analog_0;
00938      /*26-27*/    UW      input_analog_1;
00939      /*28-29*/    UW      input_analog_2;
00940      /*30-31*/    UW      input_analog_3;
00941      /*32-33*/    UW      input_analog_4;
00942      /*34-35*/    UW      input_analog_5;
00943      /*36-37*/    UW      input_analog_6;
00944      /*38-39*/    UW      input_analog_7;
00945
00946      /*40-41*/    UW      output_bank_0;
00947      /*42-43*/    UW      output_bank_1;
00948
00949      /*44-45*/    UW      input_bank_0;
00950      /*46-47*/    UW      input_bank_1;
00951
00952      /*48-51*/    UL      pulse_count_0;
00953      /*52-55*/    SL      zc_variable;
00954      /*56-59*/    SL      zd_variable;
00955
00956      /*60-63*/    SL      encoder_0;
00957      /*64-67*/    SL      encoder_1;
00958      /*68-71*/    SL      encoder_2;
00959      /*72-75*/    SL      encoder_3;
00960
00961 }; //GDataRecord47300_ENC
00962
00964 struct GDataRecord47300_24EX
00965 {
00966
00967      /*Offset      type name      description*/
00968
00969      /*00*/      UB      header_0;
00970      /*01*/      UB      header_1;
00971      /*02*/      UB      header_2;
00972      /*03*/      UB      header_3;
00973
00974      /*04-05*/    UW      sample_number;
00975      /*06*/      UB      error_code;
00976      /*07*/      UB      general_status;
00977
00978      /*08-09*/    UW      output_analog_0;
00979      /*10-11*/    UW      output_analog_1;
00980      /*12-13*/    UW      output_analog_2;
00981      /*14-15*/    UW      output_analog_3;
00982      /*16-17*/    UW      output_analog_4;
00983      /*18-19*/    UW      output_analog_5;
00984      /*20-21*/    UW      output_analog_6;
00985      /*22-23*/    UW      output_analog_7;
00986
00987      /*24-25*/    UW      input_analog_0;
00988      /*26-27*/    UW      input_analog_1;
00989      /*28-29*/    UW      input_analog_2;
00990      /*30-31*/    UW      input_analog_3;
00991      /*32-33*/    UW      input_analog_4;
00992      /*34-35*/    UW      input_analog_5;
00993      /*36-37*/    UW      input_analog_6;
00994      /*38-39*/    UW      input_analog_7;
00995
00996      /*40-41*/    UW      output_bank_0;
00997      /*42-43*/    UW      output_bank_1;
00998
00999      /*44-45*/    UW      input_bank_0;
01000      /*46-47*/    UW      input_bank_1;
01001
01002      /*48-51*/    UL      pulse_count_0;
01003      /*52-55*/    SL      zc_variable;
01004      /*56-59*/    SL      zd_variable;
01005
01006      /*60-61*/    UW      output_bank_2;
01007      /*62-63*/    UW      output_bank_3;
01008
01009      /*64-65*/    UW      input_bank_2;
01010      /*66-67*/    UW      input_bank_3;
01011
01012 }; //GDataRecord47300_24EX
01013

```

```

01015 struct GDataRecord47162
01016 {
01017     /*Offset    type name      description*/
01018
01019     /*00*/      UB    header_0;
01020     /*01*/      UB    header_1;
01021     /*02*/      UB    header_2;
01022     /*03*/      UB    header_3;
01023
01024     /*04-05*/   UW    sample_number;
01025     /*06*/      UB    error_code;
01026     /*07*/      UB    general_status;
01027
01028     /*08-09*/   UW    output_analog_0;
01029     /*10-11*/   UW    output_analog_1;
01030     /*12-13*/   UW    output_analog_2;
01031     /*14-15*/   UW    output_analog_3;
01032     /*16-17*/   UW    output_analog_4;
01033     /*18-19*/   UW    output_analog_5;
01034     /*20-21*/   UW    output_analog_6;
01035     /*22-23*/   UW    output_analog_7;
01036
01037     /*24-25*/   UW    input_analog_0;
01038     /*26-27*/   UW    input_analog_1;
01039     /*28-29*/   UW    input_analog_2;
01040     /*30-31*/   UW    input_analog_3;
01041     /*32-33*/   UW    input_analog_4;
01042     /*34-35*/   UW    input_analog_5;
01043     /*36-37*/   UW    input_analog_6;
01044     /*38-39*/   UW    input_analog_7;
01045
01046     /*40*/      UB    output_byte_0;
01047     /*41*/      UB    output_byte_1;
01048     /*42*/      UB    output_byte_2;
01049
01050     /*43*/      UB    input_byte_0;
01051     /*44*/      UB    input_byte_1;
01052     /*45*/      UB    input_byte_2;
01053     /*46*/      UB    input_byte_3;
01054     /*47*/      UB    input_byte_4;
01055
01056     /*48-51*/   UL    pulse_count_0;
01057     /*52-55*/   SL    zc_variable;
01058     /*56-59*/   SL    zd_variable;
01059
01060     /*60-63*/   SL    encoder_0;
01061     /*64-67*/   SL    encoder_1;
01062     /*68-71*/   SL    encoder_2;
01063     /*72-75*/   SL    encoder_3;
01064
01065 }; //GDataRecord47162
01066
01067
01078 union GDataRecord
01079 {
01080     struct GDataRecord4000 dmc4000;
01081     struct GDataRecord4000 dmc4103;
01082     struct GDataRecord4000 dmc50000;
01083
01084     struct GDataRecord52000 dmc52000;
01085
01086     struct GDataRecord30000 dmc30000;
01087
01088     struct GDataRecord2103 dmc2103;
01089
01090     struct GDataRecord1806 dmc1806;
01091
01092     struct GDataRecord1802 dmc1802;
01093
01094     struct GDataRecord47000_ENC rio47000;
01095     struct GDataRecord47300_ENC rio47300;
01096     struct GDataRecord47300_24EX rio47300_24ex;
01097     struct GDataRecord47162 rio47162;
01098
01099     unsigned char byte_array[GALILDATARECORDMAXLENGTH];
01100 };
01101
01102
01103 #ifndef PACKOK
01104 #pragma pack() //return pack to default
01105 #else
01106 #error "Need to return structure packing for compiler"
01107 #endif
01108
01109 #endif //I_210405D9_D9EF_484F_8258_BB29A1BBA217

```

## 15.14 gclibo.h File Reference

```
#include "gclib.h"
```

### Macros

- `#define MALLOCBUF G_HUGE_BUFFER`  
*Malloc used for large program and array uploads.*
- `#define MAXPROG MALLOCBUF`  
*Maximum size for a program.*
- `#define MAXARRAY MALLOCBUF`  
*Maximum size for an array table upload.*
- `#define POLLINGINTERVAL 100`  
*Interval, in milliseconds, for polling commands, e.g. `GWaitForBool()`.*
- `#define G_USE_GCAPS`  
*Use the GCAPS server in `GAddresses()`, `GAssign()`, `GlpRequests()`, and `GVersion()`. To avoid GCAPS, comment out this line and recompile, <http://galil.com/sw/pub/all/doc/gclib/html/gclibo.html>.*

### Functions

- `GCLIB_DEPRECATED` `void GSleep (unsigned int timeout_ms)`
- `GCLIB_DEPRECATED` `GReturn GVersion (GCStringOut ver, GSize ver_len)`  
*Uses `GUtility()`, `G_UTIL_VERSION` and `G_UTIL_GCAPS_VERSION` to provide the library and gcaps version numbers.*
- `GCLIB_DEPRECATED` `GReturn GAddresses (GCStringOut addresses, GSize addresses_len)`  
*Uses `GUtility()`, `G_UTIL_GCAPS_ADDRESSES` or `G_UTIL_ADDRESSES` to provide a listing of all available connection addresses.*
- `GCLIB_DEPRECATED` `GReturn GInfo (GCon g, GCStringOut info, GSize info_len)`  
*Uses `GUtility()` and `G_UTIL_INFO` to provide a useful connection string.*
- `GCLIB_DEPRECATED` `GReturn GTimeout (GCon g, short timeout_ms)`  
*Uses `GUtility()` and `G_UTIL_TIMEOUT_OVERRIDE` to set the library timeout.*
- `GCLIB_DEPRECATED` `GReturn GCmd (GCon g, GCStringIn command)`  
*Wrapper around `GCommand` for use when the return value is not desired.*
- `GCLIB_DEPRECATED` `GReturn GCmdT (GCon g, GCStringIn command, GCStringOut trimmed_response, GSize response_len, GCStringOut *front)`  
*Wrapper around `GCommand` that trims the response.*
- `GCLIB_DEPRECATED` `GReturn GCmdI (GCon g, GCStringIn command, int *value)`  
*Wrapper around `GCommand` that provides the return value of a command parsed into an int.*
- `GCLIB_DEPRECATED` `GReturn GCmdD (GCon g, GCStringIn command, double *value)`  
*Wrapper around `GCommand` that provides the return value of a command parsed into a double.*
- `GCLIB_DEPRECATED` `GReturn GWaitForBool (GCon g, GCStringIn predicate, int trials)`  
*Blocking call that returns when the controller evaluates the predicate as true.*
- `GCLIB_DEPRECATED` `GReturn GMotionComplete (GCon g, GCStringIn axes)`  
*Blocking call that returns once all axes specified have completed their motion.*
- `GCLIB_DEPRECATED` `GReturn GRecordRate (GCon g, double period_ms)`  
*Sets the asynchronous data record to a user-specified period via DR.*
- `GCLIB_DEPRECATED` `GReturn GProgramDownloadFile (GCon g, GCStringIn file_path, GCStringIn preprocessor)`  
*Program download from file.*
- `GCLIB_DEPRECATED` `GReturn GProgramUploadFile (GCon g, GCStringIn file_path)`  
*Program upload to file.*
- `GCLIB_DEPRECATED` `GReturn GArrayDownloadFile (GCon g, GCStringIn file_path)`

- Array download from file.*

  - [GCLIB\\_DEPRECATED GReturn GArrayUploadFile](#) ([GCon g](#), [GCStringIn](#) file\_path, [GCStringIn](#) names)

*Array upload to file.*

  - [GCLIB\\_DEPRECATED GReturn GIpRequests](#) ([GCStringOut](#) requests, [GSize](#) requests\_len)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_IPREQUEST](#) or [G\\_UTIL\\_IPREQUEST](#) to provide a list of all Galil controllers requesting IP addresses via BOOT-P or DHCP.*
  - [GCLIB\\_DEPRECATED GReturn GSetServer](#) ([GCStringIn](#) server\_name)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SET\\_SERVER](#) to set the new active server.*
  - [GCLIB\\_DEPRECATED GReturn GListServers](#) ([GCStringOut](#) servers, [GSize](#) servers\_len)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_LIST\\_SERVERS](#) to provide a list of all available gcaps services on the local network.*
  - [GCLIB\\_DEPRECATED GReturn GPublishServer](#) ([GCStringIn](#) name, [GOption](#) publish, [GOption](#) save)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_PUBLISH\\_SERVER](#) to publish local gcaps server to the local network.*
  - [GCLIB\\_DEPRECATED GReturn GServerStatus](#) ([GCStringOut](#) status, [GSize](#) status\_len)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_SERVER\\_STATUS](#) to get information on the local server name and if it is published to the local network.*
  - [GCLIB\\_DEPRECATED GReturn GRemoteConnections](#) ([GCStringOut](#) connections, [GSize](#) connections\_length)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_REMOTE\\_CONNECTIONS](#) to get a list of remote addresses connected to the local server.*
  - [GCLIB\\_DEPRECATED GReturn GAssign](#) ([GCStringIn](#) ip, [GCStringIn](#) mac)
 

*Uses [GUtility\(\)](#), [G\\_UTIL\\_GCAPS\\_ASSIGN](#) or [G\\_UTIL\\_ASSIGN](#) to assign an IP address over the Ethernet to a controller at a given MAC address.*
  - [GCLIB\\_DEPRECATED void GError](#) ([GReturn](#) rc, [GCStringOut](#) error, [GSize](#) error\_len)
 

*Provides a human-readable description string for return codes.*
  - [GCLIB\\_DEPRECATED GReturn GSetupDownloadFile](#) ([GCon g](#), [GCStringIn](#) file\_path, [GOption](#) options, [GCStringOut](#) info, [GSize](#) info\_len)
 

*Download a saved controller configuration from a file.*

## 15.14.1 Macro Definition Documentation

### 15.14.1.1 MALLOCBUF

```
#define MALLOCBUF G_HUGE_BUFFER
```

Malloc used for large program and array uploads.

Definition at line 13 of file [gclibo.h](#).

### 15.14.1.2 MAXPROG

```
#define MAXPROG MALLOCBUF
```

Maximum size for a program.

Definition at line 14 of file [gclibo.h](#).

### 15.14.1.3 MAXARRAY

```
#define MAXARRAY MALLOCBUF
```

Maximum size for an array table upload.

Definition at line 15 of file [gclibo.h](#).

### 15.14.1.4 POLLINGINTERVAL

```
#define POLLINGINTERVAL 100
```

Interval, in milliseconds, for polling commands, e.g. [GWaitForBool\(\)](#).

Definition at line 16 of file [gclibo.h](#).

### 15.14.1.5 G\_USE\_GCAPS

```
#define G_USE_GCAPS
```

Use the GCAPS server in [GAddresses\(\)](#), [GAssign\(\)](#), [GIpRequests\(\)](#), and [GVersion\(\)](#). To avoid GCAPS, comment out this line and recompile, <http://galil.com/sw/pub/all/doc/gclib/html/gclibo.html>. Definition at line 17 of file [gclibo.h](#).

## 15.15 gclibo.h

[Go to the documentation of this file.](#)

```
00001 #pragma once
00002
00003 #include "gclib.h"
00004
00005 #ifndef _WIN32
00006 #pragma GCC visibility push(default)
00007 #endif
00008
00009 #ifdef __cplusplus
00010 extern "C" {
00011 #endif
00012
00013 #define MALLOCBUF G_HUGE_BUFFER
00014 #define MAXPROG MALLOCBUF
00015 #define MAXARRAY MALLOCBUF
00016 #define POLLINGINTERVAL 100
00017 #define G_USE_GCAPS
00018
00019 GCLIB_DEPRECATED void GSleep(unsigned int timeout_ms);
00027
00029 GCLIB_DEPRECATED GReturn GVersion(GCStringOut ver, GSize ver_len);
00052
00054 GCLIB_DEPRECATED GReturn GAddresses(GCStringOut addresses, GSize addresses_len);
00085
00087 GCLIB_DEPRECATED GReturn GInfo(GCon g, GCStringOut info, GSize info_len);
00102
00103
00105 GCLIB_DEPRECATED GReturn GTimeout(GCon g, short timeout_ms);
00115
00116
00118 GCLIB_DEPRECATED GReturn GCmd(GCon g, GCStringIn command);
00131
00132
00134 GCLIB_DEPRECATED GReturn GCmdT(GCon g, GCStringIn command, GCStringOut trimmed_response, GSize
    response_len, GCStringOut* front);
00151
00152
00154 GCLIB_DEPRECATED GReturn GCmdI(GCon g, GCStringIn command, int* value);
00168
00169
00171 GCLIB_DEPRECATED GReturn GCmdD(GCon g, GCStringIn command, double* value);
00186
00188 GCLIB_DEPRECATED GReturn GWaitForBool(GCon g, GCStringIn predicate, int trials);
00211
00213 GCLIB_DEPRECATED GReturn GMotionComplete(GCon g, GCStringIn axes);
00229
00231 GCLIB_DEPRECATED GReturn GRecordRate(GCon g, double period_ms);
00244
00245
00247 GCLIB_DEPRECATED GReturn GProgramDownloadFile(GCon g, GCStringIn file_path, GCStringIn preprocessor);
00258
00259
00261 GCLIB_DEPRECATED GReturn GProgramUploadFile(GCon g, GCStringIn file_path);
00271
00272
00274 GCLIB_DEPRECATED GReturn GArrayDownloadFile(GCon g, GCStringIn file_path);
00287
00288
00290 GCLIB_DEPRECATED GReturn GArrayUploadFile(GCon g, GCStringIn file_path, GCStringIn names);
00304
00305
00307 GCLIB_DEPRECATED GReturn GIpRequests(GCStringOut requests, GSize requests_len);
00334
00336 GCLIB_DEPRECATED GReturn GSetServer(GCStringIn server_name);
00354
00356 GCLIB_DEPRECATED GReturn GListServers(GCStringOut servers, GSize servers_len);
00375
00377 GCLIB_DEPRECATED GReturn GPublishServer(GCStringIn name, GOption publish, GOption save);
00403
00405 GCLIB_DEPRECATED GReturn GServerStatus(GCStringOut status, GSize status_len);
00427
00428
```

```

00430 GCLIB_DEPRECATED GReturn GRemoteConnections(GCStringOut connections, GSize connections_length);
00452
00454 GCLIB_DEPRECATED GReturn GAssign(GCStringIn ip, GCStringIn mac);
00478
00480 GCLIB_DEPRECATED void GError(GReturn rc, GCStringOut error, GSize error_len);
00489
00491 GCLIB_DEPRECATED GReturn GSetupDownloadFile(GCon g, GCStringIn file_path, GOption options, GCStringOut
info, GSize info_len);
00549
00550 #ifdef __cplusplus
00551 } //extern "C"
00552 #endif
00553
00554 #ifndef _WIN32
00555 #pragma GCC visibility pop
00556 #endif

```

## 15.16 gclib.cs File Reference

### Classes

- class [gclib](#)  
*Provides a class that binds to gclib's unmanaged dll.*
- interface [gclib.GDataRecord](#)
- struct [gclib.GDataRecord4000](#)  
*Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.*
- struct [gclib.GDataRecord52000](#)  
*Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.*
- struct [gclib.GDataRecord1806](#)  
*Data record struct for DMC-1806 controller.*
- struct [gclib.GDataRecord2103](#)  
*Data record struct for DMC-2103 controllers.*
- struct [gclib.GDataRecord1802](#)  
*Data record struct for DMC-1802 controllers.*
- struct [gclib.GDataRecord30000](#)  
*Data record struct for DMC-30010 controllers.*
- struct [gclib.GDataRecord47000\\_ENC](#)  
*Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.*
- struct [gclib.GDataRecord47300\\_ENC](#)  
*Data record struct for RIO-47300. Includes encoder fields.*
- struct [gclib.GDataRecord47300\\_24EX](#)  
*Data record struct for RIO-47300 with 24EX I/O daughter board.*
- struct [gclib.GDataRecord47162](#)  
*Data record struct for RIO-47162.*

### Typedefs

- using [UB](#) = System.Byte
- using [UW](#) = System.UInt16
- using [SW](#) = System.Int16
- using [SL](#) = System.Int32
- using [UL](#) = System.UInt32
- using [GReturn](#) = System.Int32
- using [GCon](#) = System.IntPtr
- using [GSize](#) = System.UInt32
- using [GOption](#) = System.Int32
- using [GCStringOut](#) = System.Text.StringBuilder
- using [GCStringIn](#) = System.String
- using [GBufOut](#) = System.Text.StringBuilder
- using [GBufIn](#) = System.String
- using [GStatus](#) = System.Byte

## 15.16.1 Typedef Documentation

### 15.16.1.1 UB

using `UB` = System.Byte

Definition at line 34 of file [gclib.cs](#).

### 15.16.1.2 UW

using `UW` = System.UInt16

Definition at line 35 of file [gclib.cs](#).

### 15.16.1.3 SW

using `SW` = System.Int16

Definition at line 36 of file [gclib.cs](#).

### 15.16.1.4 SL

using `SL` = System.Int32

Definition at line 37 of file [gclib.cs](#).

### 15.16.1.5 UL

using `UL` = System.UInt32

Definition at line 38 of file [gclib.cs](#).

### 15.16.1.6 GReturn

using `GReturn` = System.Int32

Definition at line 40 of file [gclib.cs](#).

### 15.16.1.7 GCon

using `GCon` = System.IntPtr

Definition at line 41 of file [gclib.cs](#).

### 15.16.1.8 GSize

using `GSize` = System.UInt32

Definition at line 42 of file [gclib.cs](#).

### 15.16.1.9 GOption

using `GOption` = System.Int32

Definition at line 43 of file [gclib.cs](#).

### 15.16.1.10 GCStringOut

using `GCStringOut` = System.Text.StringBuilder

Definition at line 44 of file [gclib.cs](#).

### 15.16.1.11 GCStringIn

using `GCStringIn` = System.String

Definition at line 45 of file [gclib.cs](#).

### 15.16.1.12 GBufOut

using `GBufOut` = System.Text.StringBuilder

Definition at line 46 of file [gclib.cs](#).



**15.16.1.13 GBufIn**

using [GBufIn](#) = System.String

Definition at line 47 of file [gclib.cs](#).

**15.16.1.14 GStatus**

using [GStatus](#) = System.Byte

Definition at line 48 of file [gclib.cs](#).

**15.17 gclib.cs**

[Go to the documentation of this file.](#)

```

00001
00003
00025
00026 using System;
00027 using System.Collections.Generic;
00028 using System.Linq;
00029 using System.Text;
00030 using System.Threading.Tasks;
00031 using System.Runtime.InteropServices; //dll import
00032 using System.IO; //file.exists
00033
00034 using UB = System.Byte; //unsigned byte
00035 using UW = System.UInt16; //unsigned word
00036 using SW = System.Int16; //signed word
00037 using SL = System.Int32; //signed long
00038 using UL = System.UInt32; //unsigned long
00039
00040 using GReturn = System.Int32;
00041 using GCon = System.IntPtr;
00042 using GSize = System.UInt32;
00043 using GOption = System.Int32;
00044 using GCStringOut = System.Text.StringBuilder;
00045 using GCStringIn = System.String;
00046 using GBufOut = System.Text.StringBuilder;
00047 using GBufIn = System.String;
00048 using GStatus = System.Byte;
00049
00058 public class gclib
00059 {
00060     #region "C# wrappers of gclib C calls"
00061
00062     #region "Private properties"
00063     private const int BufferSize_ = 500000; //size of "char *" buffer. Big enough to fit entire 4000
program via UL/LS, or 24000 elements of array data.
00064     private GCStringOut Buffer_ = new System.Text.StringBuilder(BufferSize_); //used to pass a "char
*" to gclib.
00065     private byte[] ByteArray_ = new byte[512]; //byte array to hold data record and response to GRead
00066     private GCon ConnectionHandle_; //keep track of the gclib connection handle.
00067     private bool ConnectionStatus_ = false; //keep track of the status of gclib's connection
00068     #endregion
00069
00070
00079     public string[] GAddresses()
00080     {
00081         GReturn rc = DllGAddresses(Buffer_, BufferSize_);
00082         if (rc == G_NO_ERROR)
00083         {
00084             char[] delimiters = new char[] { '\r', '\n' };
00085             return Buffer_.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00086         }
00087         else
00088             return new string[0];
00089     }
00090
00091
00104     public void GArrayDownload(string array_name, ref List<double> data, Int16 first = -1, Int16 last
= -1)
00105     {
00106         System.Text.StringBuilder ArrayData = new System.Text.StringBuilder(BufferSize_); //for
converting to ASCII
00107         int len = data.Count();
00108         for (int i = 0; i <= len - 1; i++)
00109         {
00110             ArrayData.Append(data[i].ToString("F4")); //format to fixed point
00111             if (i < len - 1)
00112             {
00113                 ArrayData.Append(","); //delimiter

```

```

00114         }
00115     }
00116     GReturn rc = DllGArrayDownload(ConnectionHandle_, array_name, first, last,
ArrayData.ToString());
00117     if (!(rc == G_NO_ERROR))
00118     {
00119         throw new System.Exception(GError(rc));
00120     }
00121 }
00122
00132 public void GArrayDownloadFile(string Path)
00133 {
00134     GReturn rc = DllGArrayDownloadFile(ConnectionHandle_, Path);
00135     if (rc != G_NO_ERROR)
00136     {
00137         throw new System.Exception(GError(rc));
00138     }
00139 }
00140
00153 public List<double> GArrayUpload(string array_name, Int16 first = -1, Int16 last = -1)
00154 {
00155     List<double> array = new List<double>();
00156     GReturn rc = DllGArrayUpload(ConnectionHandle_, array_name, first, last, 1, Buffer_,
BufferSize_);
00157     //1 = comma delim
00158     if (!(rc == G_NO_ERROR))
00159     {
00160         throw new System.Exception(GError(rc));
00161     }
00162     char[] delimiters = new char[] { ',' };
00163
00164     string[] tokens = Buffer_.ToString().Split(delimiters,
System.StringSplitOptions.RemoveEmptyEntries);
00165     double value = 0;
00166     foreach (string s in tokens)
00167     {
00168         if (!double.TryParse(s, out value))
00169         {
00170             throw new System.Exception("Could not parse " + s + " into double");
00171         }
00172         array.Add(value);
00173     }
00174     return array;
00175 }
00176
00187 public void GArrayUploadFile(string Path, string Names)
00188 {
00189     GReturn rc = DllGArrayUploadFile(ConnectionHandle_, Path, Names);
00190     if (rc != G_NO_ERROR)
00191     {
00192         throw new System.Exception(GError(rc));
00193     }
00194 }
00195
00206 public void GAssign(string ip, string mac)
00207 {
00208     GReturn rc = DllGAssign(ip, mac);
00209     if (!(rc == G_NO_ERROR))
00210     {
00211         throw new System.Exception(GError(rc));
00212     }
00213 }
00214
00222 public void GClose()
00223 {
00224     if (ConnectionStatus_)
00225         DllGClose(ConnectionHandle_);
00226
00227     ConnectionStatus_ = false;
00228 }
00229
00241 public string GCommand(string Command, bool Trim = true)
00242 {
00243     GSize bytes_read = 0;
00244     GReturn rc = DllGCommand(ConnectionHandle_, Command, Buffer_, BufferSize_, ref bytes_read);
00245     if (rc != G_NO_ERROR)
00246     {
00247         throw new System.Exception(GError(rc));
00248     }
00249     if (Trim)
00250     {
00251         string r = Buffer_.ToString();
00252         if (r[r.Count() - 1] == ':')
00253         {
00254             r = r.Substring(0, r.Count() - 1);
00255         }
00256         return r.Trim();

```

```

00257     }
00258     else
00259     {
00260         return Buffer_.ToString();
00261     }
00262 }
00263
00273 public Int16 GCmdI(string Command)
00274 {
00275     return Convert.ToInt16(Convert.ToDouble(GCommand(Command)));
00276 }
00277
00287 public double GCmdD(string Command)
00288 {
00289     return Convert.ToDouble(GCommand(Command));
00290 }
00291
00303 private string GError(GReturn ErrorCode)
00304 {
00305     DllGError(ErrorCode, Buffer_, BufferSize_);
00306     return ErrorCode.ToString() + " " + Buffer_.ToString() + "\n";
00307 }
00308
00318 public void GFirmwareDownload(string filepath)
00319 {
00320     GReturn rc = DllGFirmwareDownload(ConnectionHandle_, filepath);
00321     if (rc != G_NO_ERROR)
00322     {
00323         throw new System.Exception(GError(rc));
00324     }
00325 }
00326
00333 public string GInfo()
00334 {
00335     GReturn rc = DllGInfo(ConnectionHandle_, Buffer_, BufferSize_);
00336     if (rc == G_NO_ERROR)
00337     {
00338         return Buffer_.ToString();
00339     }
00340     else
00341     {
00342         return "";
00343     }
00344 }
00345
00354 public byte GInterrupt()
00355 {
00356     byte StatusByte = 0;
00357     GReturn rc = DllGInterrupt(ConnectionHandle_, ref StatusByte);
00358     if (rc == G_NO_ERROR)
00359     {
00360         return StatusByte;
00361     }
00362     else
00363     {
00364         return 0;
00365     }
00366 }
00367
00377 public string[] GIpRequests()
00378 {
00379     GReturn rc = DllGIpRequests(Buffer_, BufferSize_);
00380     if (rc == G_NO_ERROR)
00381     {
00382         char[] delimiters = new char[] { '\r', '\n' };
00383         return Buffer_.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00384     }
00385     else
00386         return new string[0];
00387 }
00388
00399 public string GMessage()
00400 {
00401     GReturn rc = DllGMessage(ConnectionHandle_, Buffer_, BufferSize_);
00402     if (rc == G_NO_ERROR)
00403     {
00404         return Buffer_.ToString();
00405     }
00406     else
00407     {
00408         return "";
00409     }
00410 }
00411
00421 public void GMotionComplete(string axes)
00422 {

```

```

00423         GReturn rc = DllGMotionComplete(ConnectionHandle_, axes);
00424         if (rc == G_NO_ERROR)
00425         {
00426             throw new System.Exception(GError(rc));
00427         }
00428     }
00429
00439     public void GOpen(string address)
00440     {
00441         GReturn rc = DllGOpen(address, ref ConnectionHandle_);
00442         if (rc != G_NO_ERROR)
00443         {
00444             throw new System.Exception(GError(rc));
00445         }
00446         else
00447             ConnectionStatus_ = true;
00448     }
00449
00460     public void GProgramDownload(string program, string preprocessor = "")
00461     {
00462         GReturn rc = DllGProgramDownload(ConnectionHandle_, program, preprocessor);
00463         if (rc != G_NO_ERROR)
00464         {
00465             throw new System.Exception(GError(rc));
00466         }
00467     }
00468
00479     public void GProgramDownloadFile(string file_path, string preprocessor = "")
00480     {
00481         GReturn rc = DllGProgramDownloadFile(ConnectionHandle_, file_path, preprocessor);
00482         if (rc != G_NO_ERROR)
00483         {
00484             throw new System.Exception(GError(rc));
00485         }
00486     }
00487
00496     public string GProgramUpload()
00497     {
00498         GReturn rc = DllGProgramUpload(ConnectionHandle_, Buffer_, BufferSize_);
00499         if (rc != G_NO_ERROR)
00500         {
00501             throw new System.Exception(GError(rc));
00502         }
00503         else
00504         {
00505             return Buffer_.ToString();
00506         }
00507     }
00508
00518     public void GProgramUploadFile(string file_path)
00519     {
00520         GReturn rc = DllGProgramUploadFile(ConnectionHandle_, file_path);
00521         if (rc != G_NO_ERROR)
00522         {
00523             throw new System.Exception(GError(rc));
00524         }
00525     }
00526
00534     public byte[] GRead()
00535     {
00536         GSize read = 0;
00537         GReturn rc = DllGRead(ConnectionHandle_, ByteArray_, (uint)ByteArray_.Length, ref read);
00538         if (rc == G_NO_ERROR)
00539         {
00540             byte[] ReturnData = new byte[read];
00541             //create an array of the correct size
00542             for (GSize i = 0; i <= read - 1; i++)
00543             {
00544                 ReturnData[i] = ByteArray_[i];
00545                 //copy over the data
00546             }
00547             return ReturnData;
00548         }
00549         else
00550             return new byte[0];
00551     }
00552
00565     public T GRecord<T>(bool async)
00566         where T : struct, GDataRecord
00567     {
00568         ushort method = 0;
00569         if (async)
00570             method = 1;
00571
00572         GReturn rc = DllGRecord(ConnectionHandle_, ByteArray_, method);
00573         if (rc != G_NO_ERROR)
00574             throw new System.Exception(GError(rc));

```

```

00575
00576         return ByteArrayToDataRecord<T>(ByteArray_);
00577     }
00578
00588     public void GRecordRate(double period_ms)
00589     {
00590         GReturn rc = DllGRecordRate(ConnectionHandle_, period_ms);
00591         if (!(rc == G_NO_ERROR))
00592         {
00593             throw new System.Exception(GError(rc));
00594         }
00595     }
00596
00605     public void GTimeout(Int16 timeout_ms)
00606     {
00607         DllGTimeout(ConnectionHandle_, timeout_ms);
00608     }
00609
00616     public string GVersion()
00617     {
00618         GReturn rc = DllGVersion(Buffer_, BufferSize_);
00619         if (rc == G_NO_ERROR)
00620         {
00621             return Buffer_.ToString();
00622         }
00623         else
00624         {
00625             return "";
00626         }
00627     }
00628
00637     public void GWrite(string buffer)
00638     {
00639         GReturn rc = DllGWrite(ConnectionHandle_, buffer, (uint) buffer.Length);
00640         if (!(rc == G_NO_ERROR))
00641         {
00642             throw new System.Exception(GError(rc));
00643         }
00644     }
00645
00658     public string[] GSetupDownloadFile(string path, Int32 options)
00659     {
00660         GReturn rc = DllGSetupDownloadFile(ConnectionHandle_, path, options, Buffer_, BufferSize_);
00661
00662         string ret_buf = Buffer_.ToString();
00663         ret_buf = ret_buf.Replace("\r\n", " ", " ");
00664
00665         if (options != 0)
00666         {
00667             if (rc != G_NO_ERROR)
00668             {
00669                 throw new System.Exception(GError(rc));
00670             }
00671         }
00672         else
00673         {
00674             ret_buf += "\"options\", " + rc + "\n";
00675         }
00676
00677         char[] delimiters = new char[] { '\n' };
00678         return ret_buf.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00679     }
00680
00690     public void GSetServer(string server_name)
00691     {
00692         GReturn rc = DllGSetServer(server_name);
00693
00694         if (rc != G_NO_ERROR)
00695         {
00696             throw new System.Exception(GError(rc));
00697         }
00698     }
00699
00706     public string GServerStatus()
00707     {
00708         GReturn rc = DllGServerStatus(Buffer_, BufferSize_);
00709
00710         if (rc == G_NO_ERROR)
00711             return Buffer_.ToString();
00712         else
00713             throw new System.Exception(GError(rc));
00714     }
00715
00722     public string[] GListServers()
00723     {
00724         GReturn rc = DllGListServers(Buffer_, BufferSize_);
00725     }

```

```

00726         if(rc == G_NO_ERROR)
00727         {
00728             char[] delimiters = new char[] { '\n' };
00729             return Buffer_.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00730         }
00731         else
00732         {
00733             throw new System.Exception(GError(rc));
00734         }
00735     }
00736
00745     public void GPublishServer(string server_name, bool publish, bool save)
00746     {
00747         GReturn rc = DllGPublishServer(server_name, Convert.ToInt16(publish), Convert.ToInt16(save));
00748
00749         if (rc != G_NO_ERROR)
00750             throw new System.Exception(GError(rc));
00751     }
00752
00759     public string[] GRemoteConnections()
00760     {
00761         GReturn rc = DllGRemoteConnections(Buffer_, BufferSize_);
00762
00763         if(rc == G_NO_ERROR)
00764         {
00765             char[] delimiters = new char[] { '\n' };
00766             return Buffer_.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00767         }
00768         else
00769         {
00770             throw new System.Exception(GError(rc));
00771         }
00772     }
00773
00774     #endregion
00775
00776     #region "DLL Imports"
00777     //Import declarations for gclib functions. Functions are private to this class and are prefixed
    with "Dll" to distinguish from C# functions.
00778
00779     #region "Error Codes"
00784     private const Int32 G_NO_ERROR = 0;
00785     #endregion
00786
00787     [DllImport("gclibo", EntryPoint = "GAddresses", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00788     private static extern GReturn DllGAddresses(GCStringOut addresses, GSize addresses_len);
00789
00790     [DllImport("gclib", EntryPoint = "GArrayDownload", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00791     private static extern GReturn DllGArrayDownload(GCon g, GCStringIn array_name, GOption first,
    GOption last, GCStringIn buffer);
00792
00793     [DllImport("gclibo", EntryPoint = "GArrayDownloadFile", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00794     private static extern GReturn DllGArrayDownloadFile(GCon g, GCStringIn path);
00795
00796     [DllImport("gclib", EntryPoint = "GArrayUpload", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00797     private static extern GReturn DllGArrayUpload(GCon g, GCStringIn array_name, GOption first,
    GOption last, GOption delim, GCStringOut buffer, GSize bufferLength);
00798
00799     [DllImport("gclibo", EntryPoint = "GArrayUploadFile", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00800     private static extern GReturn DllGArrayUploadFile(GCon g, GCStringIn path, GCStringIn names);
00801
00802     [DllImport("gclibo", EntryPoint = "GAssign", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00803     private static extern GReturn DllGAssign(GCStringIn ip, GCStringIn mac);
00804
00805     [DllImport("gclib", EntryPoint = "GClose", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00806     private static extern GReturn DllGClose(GCon g);
00807
00808     [DllImport("gclib", EntryPoint = "GCommand", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00809     private static extern GReturn DllGCommand(GCon g, GCStringIn command, GCStringOut buffer, GSize
    bufferLength, ref GSize bytesReturned);
00810
00811     [DllImport("gclibo", EntryPoint = "GError", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00812     private static extern void DllGError(GReturn error_code, GCStringOut errorbuf, GSize error_len);
00813
00814     [DllImport("gclib", EntryPoint = "GFirmwareDownload", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00815     private static extern GReturn DllGFirmwareDownload(GCon g, GCStringIn path);
00816

```

```

00817     [DllImport("gclibo", EntryPoint = "GInfo", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00818     private static extern GReturn DllGInfo(GCon g, GCStringOut info, GSize infoLength);
00819
00820     [DllImport("gclib", EntryPoint = "GInterrupt", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00821     private static extern GReturn DllGInterrupt(GCon g, ref GStatus status_byte);
00822
00823     [DllImport("gclibo", EntryPoint = "GIpRequests", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00824     private static extern GReturn DllGIpRequests(GCStringOut requests, GSize requests_len);
00825
00826     [DllImport("gclib", EntryPoint = "GMessage", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00827     private static extern GReturn DllGMessage(GCon g, GCStringOut buffer, GSize bufferLength);
00828
00829     [DllImport("gclibo", EntryPoint = "GMotionComplete", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00830     private static extern GReturn DllGMotionComplete(GCon g, GCStringIn axes);
00831
00832     [DllImport("gclib", EntryPoint = "GOpen", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00833     private static extern GReturn DllGOpen(GCStringIn address, ref GCon g);
00834
00835     [DllImport("gclib", EntryPoint = "GProgramDownload", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00836     private static extern GReturn DllGProgramDownload(GCon g, GCStringIn program, GCStringIn
    preprocessor);
00837
00838     [DllImport("gclibo", EntryPoint = "GProgramDownloadFile", CharSet = CharSet.Ansi,
    CallingConvention = CallingConvention.StdCall)]
00839     private static extern GReturn DllGProgramDownloadFile(GCon g, GCStringIn path, GCStringIn
    preprocessor);
00840
00841     [DllImport("gclib", EntryPoint = "GProgramUpload", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00842     private static extern GReturn DllGProgramUpload(GCon g, GCStringOut buffer, GSize bufferLength);
00843
00844     [DllImport("gclibo", EntryPoint = "GProgramUploadFile", CharSet = CharSet.Ansi, CallingConvention
    = CallingConvention.StdCall)]
00845     private static extern GReturn DllGProgramUploadFile(GCon g, GCStringIn path);
00846
00847     [DllImport("gclib", EntryPoint = "GRead", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00848     private static extern GReturn DllGRead(GCon g, byte[] record, GSize buffer_len, ref GSize
    bytes_read);
00849
00850     [DllImport("gclib", EntryPoint = "GRecord", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00851     private static extern GReturn DllGRecord(GCon g, byte[] record, GOption method);
00852
00853     [DllImport("gclibo", EntryPoint = "GRecordRate", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00854     private static extern GReturn DllGRecordRate(GCon g, double period_ms);
00855
00856     [DllImport("gclibo", EntryPoint = "GTimeout", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00857     private static extern void DllGTimeout(GCon g, GOption timeoutMs);
00858
00859     [DllImport("gclibo", EntryPoint = "GVersion", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00860     private static extern GReturn DllGVersion(GCStringOut ver, GSize ver_len);
00861
00862     [DllImport("gclib", EntryPoint = "GWrite", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00863     private static extern GReturn DllGWrite(GCon g, GCStringIn buffer, GSize buffer_len);
00864
00865     [DllImport("gclibo", EntryPoint = "GSetupDownloadFile", CharSet = CharSet.Ansi, CallingConvention
    = CallingConvention.StdCall)]
00866     private static extern GReturn DllGSetupDownloadFile(GCon g, GCStringIn file_path, GOption options,
    GCStringOut info, GSize info_len);
00867
00868     [DllImport("gclibo", EntryPoint = "GSetServer", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00869     private static extern GReturn DllGSetServer(GCStringIn server_name);
00870
00871     [DllImport("gclibo", EntryPoint = "GServerStatus", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00872     private static extern GReturn DllGServerStatus(GCStringOut status, GSize status_len);
00873
00874     [DllImport("gclibo", EntryPoint = "GListServers", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00875     private static extern GReturn DllGListServers(GCStringOut servers, GSize servers_len);
00876
00877     [DllImport("gclibo", EntryPoint = "GPublishServer", CharSet = CharSet.Ansi, CallingConvention =
    CallingConvention.StdCall)]
00878     private static extern GReturn DllGPublishServer(GCStringIn name, GOption publish, GOption save);

```

```

00879
00880     [DllImport("gclibo", EntryPoint = "GRemoteConnections", CharSet = CharSet.Ansi, CallingConvention
= CallingConvention.StdCall)]
00881     private static extern GReturn DllGRemoteConnections(GCStringOut connections, GSize
connections_len);
00882
00883     #endregion
00884
00885     #region "Data Record"
00886
00887     private T ByteArrayToDataRecord<T>(byte[] array)
00888     where T : struct, GDataRecord
00889     {
00890         GCHandle handle = GCHandle.Alloc(array, GCHandleType.Pinned);
00891         try
00892         {
00893             return Marshal.PtrToStructure<T>(handle.AddrOfPinnedObject());
00894         }
00895         catch
00896         {
00897             return default(T);
00898         }
00899         finally
00900         {
00901             handle.Free();
00902         }
00903     }
00904
00905     public interface GDataRecord
00906     {
00907         byte[] byte_array();
00908     }
00909
00910     private static byte[] StructToByteArray(GDataRecord record) //Returns this DataRecord as a byte[]
00911     {
00912         int size = Marshal.SizeOf(record);
00913         byte[] arr = new byte[size];
00914
00915         IntPtr ptr = Marshal.AllocHGlobal(size);
00916         Marshal.StructureToPtr(record, ptr, true);
00917         Marshal.Copy(ptr, arr, 0, size);
00918         Marshal.FreeHGlobal(ptr);
00919         return arr;
00920     }
00921
00922
00923
00924     [StructLayout(LayoutKind.Sequential, Pack=1)]
00925     public struct GDataRecord4000 : GDataRecord
00926     {
00927         {
00928             public byte[] byte_array() { return StructToByteArray(this); }
00929             /*Offset    type name          description*/
00930
00931             /*00*/      public UB header_0;
00932             /*01*/      public UB header_1;
00933             /*02*/      public UB header_2;
00934             /*03*/      public UB header_3;
00935
00936             /*04-05*/   public UW sample_number;
00937
00938             /*06*/      public UB input_bank_0;
00939             /*07*/      public UB input_bank_1;
00940             /*08*/      public UB input_bank_2;
00941             /*09*/      public UB input_bank_3;
00942             /*10*/      public UB input_bank_4;
00943             /*11*/      public UB input_bank_5;
00944             /*12*/      public UB input_bank_6;
00945             /*13*/      public UB input_bank_7;
00946             /*14*/      public UB input_bank_8;
00947             /*15*/      public UB input_bank_9;
00948
00949             /*16*/      public UB output_bank_0;
00950             /*17*/      public UB output_bank_1;
00951             /*18*/      public UB output_bank_2;
00952             /*19*/      public UB output_bank_3;
00953             /*20*/      public UB output_bank_4;
00954             /*21*/      public UB output_bank_5;
00955             /*22*/      public UB output_bank_6;
00956             /*23*/      public UB output_bank_7;
00957             /*24*/      public UB output_bank_8;
00958             /*25*/      public UB output_bank_9;
00959
00960             /*26-27*/   public SW reserved_0;
00961             /*28-29*/   public SW reserved_2;
00962             /*30-31*/   public SW reserved_4;
00963             /*32-33*/   public SW reserved_6;
00964             /*34-35*/   public SW reserved_8;
00965             /*36-37*/   public SW reserved_10;

```



```

00966      /*38-39*/ public SW reserved_12;
00967      /*40-41*/ public SW reserved_14;
00968
00969      /*42*/ public UB ethernet_status_a;
00970      /*43*/ public UB ethernet_status_b;
00971      /*44*/ public UB ethernet_status_c;
00972      /*45*/ public UB ethernet_status_d;
00973      /*46*/ public UB ethernet_status_e;
00974      /*47*/ public UB ethernet_status_f;
00975      /*48*/ public UB ethernet_status_g;
00976      /*49*/ public UB ethernet_status_h;
00977
00978      /*50*/ public UB error_code;
00979      /*51*/ public UB thread_status;
00980      /*52-55*/ public UL amplifier_status;
00981
00982      /*56-59*/ public UL contour_segment_count;
00983      /*60-61*/ public UW contour_buffer_available;
00984
00985      /*62-63*/ public UW s_plane_segment_count;
00986      /*64-65*/ public UW s_plane_move_status;
00987      /*66-69*/ public SL s_distance;
00988      /*70-71*/ public UW s_plane_buffer_available;
00989
00990      /*72-73*/ public UW t_plane_segment_count;
00991      /*74-75*/ public UW t_plane_move_status;
00992      /*76-79*/ public SL t_distance;
00993      /*80-81*/ public UW t_plane_buffer_available;
00994
00995      /*82-83*/ public UW axis_a_status;
00996      /*84*/ public UB axis_a_switches;
00997      /*85*/ public UB axis_a_stop_code;
00998      /*86-89*/ public SL axis_a_reference_position;
00999      /*90-93*/ public SL axis_a_motor_position;
01000      /*94-97*/ public SL axis_a_position_error;
01001      /*98-101*/ public SL axis_a_aux_position;
01002      /*102-105*/ public SL axis_a_velocity;
01003      /*106-109*/ public SL axis_a_torque;
01004      /*110-111*/ public UW axis_a_analog_in;
01005      /*112*/ public UB axis_a_halls;
01006      /*113*/ public UB axis_a_reserved;
01007      /*114-117*/ public SL axis_a_variable;
01008
01009      /*118-119*/ public UW axis_b_status;
01010      /*120*/ public UB axis_b_switches;
01011      /*121*/ public UB axis_b_stop_code;
01012      /*122-125*/ public SL axis_b_reference_position;
01013      /*126-129*/ public SL axis_b_motor_position;
01014      /*130-133*/ public SL axis_b_position_error;
01015      /*134-137*/ public SL axis_b_aux_position;
01016      /*138-141*/ public SL axis_b_velocity;
01017      /*142-145*/ public SL axis_b_torque;
01018      /*146-147*/ public UW axis_b_analog_in;
01019      /*148*/ public UB axis_b_halls;
01020      /*149*/ public UB axis_b_reserved;
01021      /*150-153*/ public SL axis_b_variable;
01022
01023      /*154-155*/ public UW axis_c_status;
01024      /*156*/ public UB axis_c_switches;
01025      /*157*/ public UB axis_c_stop_code;
01026      /*158-161*/ public SL axis_c_reference_position;
01027      /*162-165*/ public SL axis_c_motor_position;
01028      /*166-169*/ public SL axis_c_position_error;
01029      /*170-173*/ public SL axis_c_aux_position;
01030      /*174-177*/ public SL axis_c_velocity;
01031      /*178-181*/ public SL axis_c_torque;
01032      /*182-183*/ public UW axis_c_analog_in;
01033      /*184*/ public UB axis_c_halls;
01034      /*185*/ public UB axis_c_reserved;
01035      /*186-189*/ public SL axis_c_variable;
01036
01037      /*190-191*/ public UW axis_d_status;
01038      /*192*/ public UB axis_d_switches;
01039      /*193*/ public UB axis_d_stop_code;
01040      /*194-197*/ public SL axis_d_reference_position;
01041      /*198-201*/ public SL axis_d_motor_position;
01042      /*202-205*/ public SL axis_d_position_error;
01043      /*206-209*/ public SL axis_d_aux_position;
01044      /*210-213*/ public SL axis_d_velocity;
01045      /*214-217*/ public SL axis_d_torque;
01046      /*218-219*/ public UW axis_d_analog_in;
01047      /*220*/ public UB axis_d_halls;
01048      /*221*/ public UB axis_d_reserved;
01049      /*222-225*/ public SL axis_d_variable;
01050
01051      /*226-227*/ public UW axis_e_status;
01052      /*228*/ public UB axis_e_switches;

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```

01053         /*229*/      public UB axis_e_stop_code;
01054         /*230-233*/    public SL axis_e_reference_position;
01055         /*234-237*/    public SL axis_e_motor_position;
01056         /*238-241*/    public SL axis_e_position_error;
01057         /*242-245*/    public SL axis_e_aux_position;
01058         /*246-249*/    public SL axis_e_velocity;
01059         /*250-253*/    public SL axis_e_torque;
01060         /*254-255*/    public UW axis_e_analog_in;
01061         /*256*/      public UB axis_e_halls;
01062         /*257*/      public UB axis_e_reserved;
01063         /*258-261*/    public SL axis_e_variable;
01064
01065         /*262-263*/    public UW axis_f_status;
01066         /*264*/      public UB axis_f_switches;
01067         /*265*/      public UB axis_f_stop_code;
01068         /*266-269*/    public SL axis_f_reference_position;
01069         /*270-273*/    public SL axis_f_motor_position;
01070         /*274-277*/    public SL axis_f_position_error;
01071         /*278-281*/    public SL axis_f_aux_position;
01072         /*282-285*/    public SL axis_f_velocity;
01073         /*286-289*/    public SL axis_f_torque;
01074         /*290-291*/    public UW axis_f_analog_in;
01075         /*292*/      public UB axis_f_halls;
01076         /*293*/      public UB axis_f_reserved;
01077         /*294-297*/    public SL axis_f_variable;
01078
01079         /*298-299*/    public UW axis_g_status;
01080         /*300*/      public UB axis_g_switches;
01081         /*301*/      public UB axis_g_stop_code;
01082         /*302-305*/    public SL axis_g_reference_position;
01083         /*306-309*/    public SL axis_g_motor_position;
01084         /*310-313*/    public SL axis_g_position_error;
01085         /*314-317*/    public SL axis_g_aux_position;
01086         /*318-321*/    public SL axis_g_velocity;
01087         /*322-325*/    public SL axis_g_torque;
01088         /*326-327*/    public UW axis_g_analog_in;
01089         /*328*/      public UB axis_g_halls;
01090         /*329*/      public UB axis_g_reserved;
01091         /*330-333*/    public SL axis_g_variable;
01092
01093         /*334-335*/    public UW axis_h_status;
01094         /*336*/      public UB axis_h_switches;
01095         /*337*/      public UB axis_h_stop_code;
01096         /*338-341*/    public SL axis_h_reference_position;
01097         /*342-345*/    public SL axis_h_motor_position;
01098         /*346-349*/    public SL axis_h_position_error;
01099         /*350-353*/    public SL axis_h_aux_position;
01100         /*354-357*/    public SL axis_h_velocity;
01101         /*358-361*/    public SL axis_h_torque;
01102         /*362-363*/    public UW axis_h_analog_in;
01103         /*364*/      public UB axis_h_halls;
01104         /*365*/      public UB axis_h_reserved;
01105         /*366-369*/    public SL axis_h_variable;
01106     }; //DataRecord4000
01107
01109     [StructLayout(LayoutKind.Sequential, Pack=1)]
01110     public struct GDataRecord52000 : GDataRecord
01111     {
01112         public byte[] byte_array() { return StructToByteArray(this); }
01113         /*Offset      type name      description*/
01114
01115         /*00*/      public UB header_0;
01116         /*01*/      public UB header_1;
01117         /*02*/      public UB header_2;
01118         /*03*/      public UB header_3;
01119
01120         /*04-05*/    public UW sample_number;
01121
01122         /*06*/      public UB input_bank_0;
01123         /*07*/      public UB input_bank_1;
01124         /*08*/      public UB input_bank_2;
01125         /*09*/      public UB input_bank_3;
01126         /*10*/      public UB input_bank_4;
01127         /*11*/      public UB input_bank_5;
01128         /*12*/      public UB input_bank_6;
01129         /*13*/      public UB input_bank_7;
01130         /*14*/      public UB input_bank_8;
01131         /*15*/      public UB input_bank_9;
01132
01133         /*16*/      public UB output_bank_0;
01134         /*17*/      public UB output_bank_1;
01135         /*18*/      public UB output_bank_2;
01136         /*19*/      public UB output_bank_3;
01137         /*20*/      public UB output_bank_4;
01138         /*21*/      public UB output_bank_5;
01139         /*22*/      public UB output_bank_6;
01140         /*23*/      public UB output_bank_7;

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```

01141      /*24*/      public UB output_bank_8;
01142      /*25*/      public UB output_bank_9;
01143
01144      /*26-27*/    public SW reserved_0;
01145      /*28-29*/    public SW reserved_2;
01146      /*30-31*/    public SW reserved_4;
01147      /*32-33*/    public SW reserved_6;
01148      /*34-35*/    public SW reserved_8;
01149      /*36-37*/    public SW reserved_10;
01150      /*38-39*/    public SW reserved_12;
01151      /*40*/      public UB ethercat_bank;
01152      /*41*/      public UB reserved_14;
01153
01154      /*42*/      public UB ethernet_status_a;
01155      /*43*/      public UB ethernet_status_b;
01156      /*44*/      public UB ethernet_status_c;
01157      /*45*/      public UB ethernet_status_d;
01158      /*46*/      public UB ethernet_status_e;
01159      /*47*/      public UB ethernet_status_f;
01160      /*48*/      public UB ethernet_status_g;
01161      /*49*/      public UB ethernet_status_h;
01162
01163      /*50*/      public UB error_code;
01164      /*51*/      public UB thread_status;
01165      /*52-55*/    public UL amplifier_status;
01166
01167      /*56-59*/    public UL contour_segment_count;
01168      /*60-61*/    public UW contour_buffer_available;
01169
01170      /*62-63*/    public UW s_plane_segment_count;
01171      /*64-65*/    public UW s_plane_move_status;
01172      /*66-69*/    public SL s_distance;
01173      /*70-71*/    public UW s_plane_buffer_available;
01174
01175      /*72-73*/    public UW t_plane_segment_count;
01176      /*74-75*/    public UW t_plane_move_status;
01177      /*76-79*/    public SL t_distance;
01178      /*80-81*/    public UW t_plane_buffer_available;
01179
01180      /*82-83*/    public UW axis_a_status;
01181      /*84*/      public UB axis_a_switches;
01182      /*85*/      public UB axis_a_stop_code;
01183      /*86-89*/    public SL axis_a_reference_position;
01184      /*90-93*/    public SL axis_a_motor_position;
01185      /*94-97*/    public SL axis_a_position_error;
01186      /*98-101*/   public SL axis_a_aux_position;
01187      /*102-105*/   public SL axis_a_velocity;
01188      /*106-109*/   public SL axis_a_torque;
01189      /*110-111*/   public UW axis_a_analog_in;
01190      /*112*/      public UB axis_a_halls;
01191      /*113*/      public UB axis_a_reserved;
01192      /*114-117*/   public SL axis_a_variable;
01193
01194      /*118-119*/   public UW axis_b_status;
01195      /*120*/      public UB axis_b_switches;
01196      /*121*/      public UB axis_b_stop_code;
01197      /*122-125*/   public SL axis_b_reference_position;
01198      /*126-129*/   public SL axis_b_motor_position;
01199      /*130-133*/   public SL axis_b_position_error;
01200      /*134-137*/   public SL axis_b_aux_position;
01201      /*138-141*/   public SL axis_b_velocity;
01202      /*142-145*/   public SL axis_b_torque;
01203      /*146-147*/   public UW axis_b_analog_in;
01204      /*148*/      public UB axis_b_halls;
01205      /*149*/      public UB axis_b_reserved;
01206      /*150-153*/   public SL axis_b_variable;
01207
01208      /*154-155*/   public UW axis_c_status;
01209      /*156*/      public UB axis_c_switches;
01210      /*157*/      public UB axis_c_stop_code;
01211      /*158-161*/   public SL axis_c_reference_position;
01212      /*162-165*/   public SL axis_c_motor_position;
01213      /*166-169*/   public SL axis_c_position_error;
01214      /*170-173*/   public SL axis_c_aux_position;
01215      /*174-177*/   public SL axis_c_velocity;
01216      /*178-181*/   public SL axis_c_torque;
01217      /*182-183*/   public UW axis_c_analog_in;
01218      /*184*/      public UB axis_c_halls;
01219      /*185*/      public UB axis_c_reserved;
01220      /*186-189*/   public SL axis_c_variable;
01221
01222      /*190-191*/   public UW axis_d_status;
01223      /*192*/      public UB axis_d_switches;
01224      /*193*/      public UB axis_d_stop_code;
01225      /*194-197*/   public SL axis_d_reference_position;
01226      /*198-201*/   public SL axis_d_motor_position;
01227      /*202-205*/   public SL axis_d_position_error;

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01228      /*206-209*/ public SL axis_d_aux_position;
01229      /*210-213*/ public SL axis_d_velocity;
01230      /*214-217*/ public SL axis_d_torque;
01231      /*218-219*/ public UW axis_d_analog_in;
01232      /*220*/ public UB axis_d_halls;
01233      /*221*/ public UB axis_d_reserved;
01234      /*222-225*/ public SL axis_d_variable;
01235
01236      /*226-227*/ public UW axis_e_status;
01237      /*228*/ public UB axis_e_switches;
01238      /*229*/ public UB axis_e_stop_code;
01239      /*230-233*/ public SL axis_e_reference_position;
01240      /*234-237*/ public SL axis_e_motor_position;
01241      /*238-241*/ public SL axis_e_position_error;
01242      /*242-245*/ public SL axis_e_aux_position;
01243      /*246-249*/ public SL axis_e_velocity;
01244      /*250-253*/ public SL axis_e_torque;
01245      /*254-255*/ public UW axis_e_analog_in;
01246      /*256*/ public UB axis_e_halls;
01247      /*257*/ public UB axis_e_reserved;
01248      /*258-261*/ public SL axis_e_variable;
01249
01250      /*262-263*/ public UW axis_f_status;
01251      /*264*/ public UB axis_f_switches;
01252      /*265*/ public UB axis_f_stop_code;
01253      /*266-269*/ public SL axis_f_reference_position;
01254      /*270-273*/ public SL axis_f_motor_position;
01255      /*274-277*/ public SL axis_f_position_error;
01256      /*278-281*/ public SL axis_f_aux_position;
01257      /*282-285*/ public SL axis_f_velocity;
01258      /*286-289*/ public SL axis_f_torque;
01259      /*290-291*/ public UW axis_f_analog_in;
01260      /*292*/ public UB axis_f_halls;
01261      /*293*/ public UB axis_f_reserved;
01262      /*294-297*/ public SL axis_f_variable;
01263
01264      /*298-299*/ public UW axis_g_status;
01265      /*300*/ public UB axis_g_switches;
01266      /*301*/ public UB axis_g_stop_code;
01267      /*302-305*/ public SL axis_g_reference_position;
01268      /*306-309*/ public SL axis_g_motor_position;
01269      /*310-313*/ public SL axis_g_position_error;
01270      /*314-317*/ public SL axis_g_aux_position;
01271      /*318-321*/ public SL axis_g_velocity;
01272      /*322-325*/ public SL axis_g_torque;
01273      /*326-327*/ public UW axis_g_analog_in;
01274      /*328*/ public UB axis_g_halls;
01275      /*329*/ public UB axis_g_reserved;
01276      /*330-333*/ public SL axis_g_variable;
01277
01278      /*334-335*/ public UW axis_h_status;
01279      /*336*/ public UB axis_h_switches;
01280      /*337*/ public UB axis_h_stop_code;
01281      /*338-341*/ public SL axis_h_reference_position;
01282      /*342-345*/ public SL axis_h_motor_position;
01283      /*346-349*/ public SL axis_h_position_error;
01284      /*350-353*/ public SL axis_h_aux_position;
01285      /*354-357*/ public SL axis_h_velocity;
01286      /*358-361*/ public SL axis_h_torque;
01287      /*362-363*/ public UW axis_h_analog_in;
01288      /*364*/ public UB axis_h_halls;
01289      /*365*/ public UB axis_h_reserved;
01290      /*366-369*/ public SL axis_h_variable;
01291  }; //DataRecord52000
01292
01293
01294
01301  [StructLayout(LayoutKind.Sequential, Pack=1)]
01302  public struct GDataRecord1806 : GDataRecord
01303  {
01304      public byte[] byte_array() { return StructToByteArray(this); }
01305      /*Offset    type name          description*/
01306
01307      /*00-01*/ public UW sample_number;
01308
01309      /*02*/ public UB input_bank_0;
01310      /*03*/ public UB input_bank_1;
01311      /*04*/ public UB input_bank_2;
01312      /*05*/ public UB input_bank_3;
01313      /*06*/ public UB input_bank_4;
01314      /*07*/ public UB input_bank_5;
01315      /*08*/ public UB input_bank_6;
01316      /*09*/ public UB input_bank_7;
01317      /*10*/ public UB input_bank_8;
01318      /*11*/ public UB input_bank_9;
01319
01320      /*12*/ public UB output_bank_0;
01321      /*13*/ public UB output_bank_1;

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01322      /*14*/      public UB output_bank_2;
01323      /*15*/      public UB output_bank_3;
01324      /*16*/      public UB output_bank_4;
01325      /*17*/      public UB output_bank_5;
01326      /*18*/      public UB output_bank_6;
01327      /*19*/      public UB output_bank_7;
01328      /*20*/      public UB output_bank_8;
01329      /*21*/      public UB output_bank_9;
01330
01331      /*22-23*/    public SW reserved_0;
01332      /*24-25*/    public SW reserved_2;
01333      /*26-27*/    public SW reserved_4;
01334      /*28-29*/    public SW reserved_6;
01335      /*30-31*/    public SW reserved_8;
01336      /*32-33*/    public SW reserved_10;
01337      /*34-35*/    public SW reserved_12;
01338      /*36-37*/    public SW reserved_14;
01339
01340      /*38*/      public UB reserved_16;
01341      /*39*/      public UB reserved_17;
01342      /*40*/      public UB reserved_18;
01343      /*41*/      public UB reserved_19;
01344      /*42*/      public UB reserved_20;
01345      /*43*/      public UB reserved_21;
01346      /*44*/      public UB reserved_22;
01347      /*45*/      public UB reserved_23;
01348
01349      /*46*/      public UB error_code;
01350      /*47*/      public UB thread_status;
01351      /*48-51*/    public UL reserved_24;
01352
01353      /*52-55*/    public UL contour_segment_count;
01354      /*56-57*/    public UW contour_buffer_available;
01355
01356      /*58-59*/    public UW s_plane_segment_count;
01357      /*60-61*/    public UW s_plane_move_status;
01358      /*62-65*/    public SL s_distance;
01359      /*66-67*/    public UW s_plane_buffer_available;
01360
01361      /*68-69*/    public UW t_plane_segment_count;
01362      /*70-71*/    public UW t_plane_move_status;
01363      /*72-75*/    public SL t_distance;
01364      /*76-77*/    public UW t_plane_buffer_available;
01365
01366      /*78-79*/    public UW axis_a_status;
01367      /*80*/      public UB axis_a_switches;
01368      /*81*/      public UB axis_a_stop_code;
01369      /*82-85*/    public SL axis_a_reference_position;
01370      /*86-89*/    public SL axis_a_motor_position;
01371      /*90-93*/    public SL axis_a_position_error;
01372      /*94-97*/    public SL axis_a_aux_position;
01373      /*98-101*/   public SL axis_a_velocity;
01374      /*102-105*/  public SL axis_a_torque;
01375      /*106-107*/  public UW axis_a_analog_in;
01376      /*108*/      public UB axis_a_reserved_0;
01377      /*109*/      public UB axis_a_reserved_1;
01378      /*110-113*/  public SL axis_a_variable;
01379
01380      /*114-115*/  public UW axis_b_status;
01381      /*116*/      public UB axis_b_switches;
01382      /*117*/      public UB axis_b_stop_code;
01383      /*118-121*/  public SL axis_b_reference_position;
01384      /*122-125*/  public SL axis_b_motor_position;
01385      /*126-129*/  public SL axis_b_position_error;
01386      /*130-133*/  public SL axis_b_aux_position;
01387      /*134-137*/  public SL axis_b_velocity;
01388      /*138-141*/  public SL axis_b_torque;
01389      /*142-143*/  public UW axis_b_analog_in;
01390      /*144*/      public UB axis_b_reserved_0;
01391      /*145*/      public UB axis_b_reserved_1;
01392      /*146-149*/  public SL axis_b_variable;
01393
01394      /*150-151*/  public UW axis_c_status;
01395      /*152*/      public UB axis_c_switches;
01396      /*153*/      public UB axis_c_stop_code;
01397      /*154-157*/  public SL axis_c_reference_position;
01398      /*158-161*/  public SL axis_c_motor_position;
01399      /*162-165*/  public SL axis_c_position_error;
01400      /*166-169*/  public SL axis_c_aux_position;
01401      /*170-173*/  public SL axis_c_velocity;
01402      /*174-177*/  public SL axis_c_torque;
01403      /*178-179*/  public UW axis_c_analog_in;
01404      /*180*/      public UB axis_c_reserved_0;
01405      /*181*/      public UB axis_c_reserved_1;
01406      /*182-185*/  public SL axis_c_variable;
01407
01408      /*186-187*/  public UW axis_d_status;

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01409         /*188*/      public UB axis_d_switches;
01410         /*189*/      public UB axis_d_stop_code;
01411         /*190-193*/    public SL axis_d_reference_position;
01412         /*194-197*/    public SL axis_d_motor_position;
01413         /*198-201*/    public SL axis_d_position_error;
01414         /*202-205*/    public SL axis_d_aux_position;
01415         /*206-209*/    public SL axis_d_velocity;
01416         /*210-213*/    public SL axis_d_torque;
01417         /*214-215*/    public UW axis_d_analog_in;
01418         /*216*/      public UB axis_d_reserved_0;
01419         /*217*/      public UB axis_d_reserved_1;
01420         /*218-221*/    public SL axis_d_variable;
01421
01422         /*222-223*/    public UW axis_e_status;
01423         /*224*/      public UB axis_e_switches;
01424         /*225*/      public UB axis_e_stop_code;
01425         /*226-229*/    public SL axis_e_reference_position;
01426         /*230-233*/    public SL axis_e_motor_position;
01427         /*234-237*/    public SL axis_e_position_error;
01428         /*238-241*/    public SL axis_e_aux_position;
01429         /*242-245*/    public SL axis_e_velocity;
01430         /*256-249*/    public SL axis_e_torque;
01431         /*250-251*/    public UW axis_e_analog_in;
01432         /*252*/      public UB axis_e_reserved_0;
01433         /*253*/      public UB axis_e_reserved_1;
01434         /*254-257*/    public SL axis_e_variable;
01435
01436         /*258-259*/    public UW axis_f_status;
01437         /*260*/      public UB axis_f_switches;
01438         /*261*/      public UB axis_f_stop_code;
01439         /*262-265*/    public SL axis_f_reference_position;
01440         /*266-269*/    public SL axis_f_motor_position;
01441         /*270-273*/    public SL axis_f_position_error;
01442         /*274-277*/    public SL axis_f_aux_position;
01443         /*278-281*/    public SL axis_f_velocity;
01444         /*282-285*/    public SL axis_f_torque;
01445         /*286-287*/    public UW axis_f_analog_in;
01446         /*288*/      public UB axis_f_reserved_0;
01447         /*289*/      public UB axis_f_reserved_1;
01448         /*290-293*/    public SL axis_f_variable;
01449
01450         /*294-295*/    public UW axis_g_status;
01451         /*296*/      public UB axis_g_switches;
01452         /*297*/      public UB axis_g_stop_code;
01453         /*298-301*/    public SL axis_g_reference_position;
01454         /*302-305*/    public SL axis_g_motor_position;
01455         /*306-309*/    public SL axis_g_position_error;
01456         /*310-313*/    public SL axis_g_aux_position;
01457         /*314-317*/    public SL axis_g_velocity;
01458         /*318-321*/    public SL axis_g_torque;
01459         /*322-323*/    public UW axis_g_analog_in;
01460         /*324*/      public UB axis_g_reserved_0;
01461         /*325*/      public UB axis_g_reserved_1;
01462         /*326-329*/    public SL axis_g_variable;
01463
01464         /*330-331*/    public UW axis_h_status;
01465         /*332*/      public UB axis_h_switches;
01466         /*333*/      public UB axis_h_stop_code;
01467         /*334-337*/    public SL axis_h_reference_position;
01468         /*338-341*/    public SL axis_h_motor_position;
01469         /*342-345*/    public SL axis_h_position_error;
01470         /*346-349*/    public SL axis_h_aux_position;
01471         /*350-353*/    public SL axis_h_velocity;
01472         /*354-357*/    public SL axis_h_torque;
01473         /*358-359*/    public UW axis_h_analog_in;
01474         /*360*/      public UB axis_h_reserved_0;
01475         /*361*/      public UB axis_h_reserved_1;
01476         /*362-365*/    public SL axis_h_variable;
01477     }; //DataRecord1806
01478
01480     [StructLayout(LayoutKind.Sequential, Pack=1)]
01481     public struct GDataRecord2103 : GDataRecord
01482     {
01483         public byte[] byte_array() { return StructToByteArray(this); }
01484
01485         /*Offset   type name      description*/
01486
01487         /*00*/      public UB header_0;
01488         /*01*/      public UB header_1;
01489         /*02*/      public UB header_2;
01490         /*03*/      public UB header_3;
01491
01492         /*04-05*/    public UW sample_number;
01493
01494         /*06*/      public UB input_bank_0;
01495         /*07*/      public UB input_bank_1;
01496         /*08*/      public UB input_bank_2;

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01497      /*09*/      public UB input_bank_3;
01498      /*10*/      public UB input_bank_4;
01499      /*11*/      public UB input_bank_5;
01500      /*12*/      public UB input_bank_6;
01501      /*13*/      public UB input_bank_7;
01502      /*14*/      public UB input_bank_8;
01503      /*15*/      public UB input_bank_9;
01504
01505      /*16*/      public UB output_bank_0;
01506      /*17*/      public UB output_bank_1;
01507      /*18*/      public UB output_bank_2;
01508      /*19*/      public UB output_bank_3;
01509      /*20*/      public UB output_bank_4;
01510      /*21*/      public UB output_bank_5;
01511      /*22*/      public UB output_bank_6;
01512      /*23*/      public UB output_bank_7;
01513      /*24*/      public UB output_bank_8;
01514      /*25*/      public UB output_bank_9;
01515
01516      /*26*/      public UB error_code;
01517      /*27*/      public UB general_status;
01518
01519      /*28-29*/      public UW s_plane_segment_count;
01520      /*30-31*/      public UW s_plane_move_status;
01521      /*32-35*/      public SL s_distance;
01522
01523      /*36-37*/      public UW t_plane_segment_count;
01524      /*38-39*/      public UW t_plane_move_status;
01525      /*40-43*/      public SL t_distance;
01526
01527      /*44-45*/      public UW axis_a_status;
01528      /*46*/      public UB axis_a_switches;
01529      /*47*/      public UB axis_a_stop_code;
01530      /*48-51*/      public SL axis_a_reference_position;
01531      /*52-55*/      public SL axis_a_motor_position;
01532      /*56-59*/      public SL axis_a_position_error;
01533      /*60-63*/      public SL axis_a_aux_position;
01534      /*64-67*/      public SL axis_a_velocity;
01535      /*68-69*/      public SW axis_a_torque;
01536      /*70-71*/      public UW axis_a_analog_in;
01537
01538      /*72-73*/      public UW axis_b_status;
01539      /*74*/      public UB axis_b_switches;
01540      /*75*/      public UB axis_b_stop_code;
01541      /*76-79*/      public SL axis_b_reference_position;
01542      /*80-83*/      public SL axis_b_motor_position;
01543      /*84-87*/      public SL axis_b_position_error;
01544      /*88-91*/      public SL axis_b_aux_position;
01545      /*92-95*/      public SL axis_b_velocity;
01546      /*96-97*/      public SW axis_b_torque;
01547      /*98-99*/      public UW axis_b_analog_in;
01548
01549      /*100-101*/      public UW axis_c_status;
01550      /*102*/      public UB axis_c_switches;
01551      /*103*/      public UB axis_c_stop_code;
01552      /*104-107*/      public SL axis_c_reference_position;
01553      /*108-111*/      public SL axis_c_motor_position;
01554      /*112-115*/      public SL axis_c_position_error;
01555      /*116-119*/      public SL axis_c_aux_position;
01556      /*120-123*/      public SL axis_c_velocity;
01557      /*124-125*/      public SW axis_c_torque;
01558      /*126-127*/      public UW axis_c_analog_in;
01559
01560      /*128-129*/      public UW axis_d_status;
01561      /*130*/      public UB axis_d_switches;
01562      /*131*/      public UB axis_d_stop_code;
01563      /*132-135*/      public SL axis_d_reference_position;
01564      /*136-139*/      public SL axis_d_motor_position;
01565      /*140-143*/      public SL axis_d_position_error;
01566      /*144-147*/      public SL axis_d_aux_position;
01567      /*148-151*/      public SL axis_d_velocity;
01568      /*152-153*/      public SW axis_d_torque;
01569      /*154-155*/      public UW axis_d_analog_in;
01570
01571      /*156-157*/      public UW axis_e_status;
01572      /*158*/      public UB axis_e_switches;
01573      /*159*/      public UB axis_e_stop_code;
01574      /*160-163*/      public SL axis_e_reference_position;
01575      /*164-167*/      public SL axis_e_motor_position;
01576      /*168-171*/      public SL axis_e_position_error;
01577      /*172-175*/      public SL axis_e_aux_position;
01578      /*176-179*/      public SL axis_e_velocity;
01579      /*180-181*/      public SW axis_e_torque;
01580      /*182-183*/      public UW axis_e_analog_in;
01581
01582      /*184-185*/      public UW axis_f_status;
01583      /*186*/      public UB axis_f_switches;
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01584         /*187*/      public UB axis_f_stop_code;
01585         /*188-191*/    public SL axis_f_reference_position;
01586         /*192-195*/    public SL axis_f_motor_position;
01587         /*196-199*/    public SL axis_f_position_error;
01588         /*200-203*/    public SL axis_f_aux_position;
01589         /*204-207*/    public SL axis_f_velocity;
01590         /*208-209*/    public SW axis_f_torque;
01591         /*210-211*/    public UW axis_f_analog_in;
01592
01593         /*212-213*/    public UW axis_g_status;
01594         /*214*/      public UB axis_g_switches;
01595         /*215*/      public UB axis_g_stop_code;
01596         /*216-219*/    public SL axis_g_reference_position;
01597         /*220-223*/    public SL axis_g_motor_position;
01598         /*224-227*/    public SL axis_g_position_error;
01599         /*228-231*/    public SL axis_g_aux_position;
01600         /*232-235*/    public SL axis_g_velocity;
01601         /*236-237*/    public SW axis_g_torque;
01602         /*238-239*/    public UW axis_g_analog_in;
01603
01604         /*240-241*/    public UW axis_h_status;
01605         /*242*/      public UB axis_h_switches;
01606         /*243*/      public UB axis_h_stop_code;
01607         /*244-247*/    public SL axis_h_reference_position;
01608         /*248-251*/    public SL axis_h_motor_position;
01609         /*252-255*/    public SL axis_h_position_error;
01610         /*256-259*/    public SL axis_h_aux_position;
01611         /*260-263*/    public SL axis_h_velocity;
01612         /*264-265*/    public SW axis_h_torque;
01613         /*266-267*/    public UW axis_h_analog_in;
01614     }; //DataRecord2013
01615
01622     [StructLayout(LayoutKind.Sequential, Pack=1)]
01623     public struct GDataRecord1802 : GDataRecord
01624     {
01625         public byte[] byte_array() { return StructToByteArray(this); }
01626
01627         /*Offset      type name      description*/
01628
01629         /*00-01*/      public UW sample_number;
01630
01631         /*02*/          public UB input_bank_0;
01632         /*03*/          public UB input_bank_1;
01633         /*04*/          public UB input_bank_2;
01634         /*05*/          public UB input_bank_3;
01635         /*06*/          public UB input_bank_4;
01636         /*07*/          public UB input_bank_5;
01637         /*08*/          public UB input_bank_6;
01638         /*09*/          public UB input_bank_7;
01639         /*10*/          public UB input_bank_8;
01640         /*11*/          public UB input_bank_9;
01641
01642         /*12*/          public UB output_bank_0;
01643         /*13*/          public UB output_bank_1;
01644         /*14*/          public UB output_bank_2;
01645         /*15*/          public UB output_bank_3;
01646         /*16*/          public UB output_bank_4;
01647         /*17*/          public UB output_bank_5;
01648         /*18*/          public UB output_bank_6;
01649         /*19*/          public UB output_bank_7;
01650         /*20*/          public UB output_bank_8;
01651         /*21*/          public UB output_bank_9;
01652
01653         /*22*/          public UB error_code;
01654         /*23*/          public UB general_status;
01655
01656         /*24-25*/      public UW s_plane_segment_count;
01657         /*26-27*/      public UW s_plane_move_status;
01658         /*28-31*/      public SL s_distance;
01659
01660         /*32-33*/      public UW t_plane_segment_count;
01661         /*34-35*/      public UW t_plane_move_status;
01662         /*36-39*/      public SL t_distance;
01663
01664         /*40-41*/      public UW axis_a_status;
01665         /*42*/          public UB axis_a_switches;
01666         /*43*/          public UB axis_a_stop_code;
01667         /*44-47*/      public SL axis_a_reference_position;
01668         /*48-51*/      public SL axis_a_motor_position;
01669         /*52-55*/      public SL axis_a_position_error;
01670         /*56-59*/      public SL axis_a_aux_position;
01671         /*60-63*/      public SL axis_a_velocity;
01672         /*64-65*/      public SW axis_a_torque;
01673         /*66*/          public UB axis_a_reserved_0;
01674         /*67*/          public UB axis_a_reserved_1;
01675
01676         /*68-69*/      public UW axis_b_status;

```



```

01677         /*70*/      public UB axis_b_switches;
01678         /*71*/      public UB axis_b_stop_code;
01679         /*72-75*/    public SL axis_b_reference_position;
01680         /*76-79*/    public SL axis_b_motor_position;
01681         /*80-83*/    public SL axis_b_position_error;
01682         /*84-87*/    public SL axis_b_aux_position;
01683         /*88-91*/    public SL axis_b_velocity;
01684         /*92-93*/    public SW axis_b_torque;
01685         /*94*/      public UB axis_b_reserved_0;
01686         /*95*/      public UB axis_b_reserved_1;
01687
01688         /*96-97*/    public UW axis_c_status;
01689         /*98*/      public UB axis_c_switches;
01690         /*99*/      public UB axis_c_stop_code;
01691         /*100-103*/   public SL axis_c_reference_position;
01692         /*104-107*/   public SL axis_c_motor_position;
01693         /*108-111*/   public SL axis_c_position_error;
01694         /*112-115*/   public SL axis_c_aux_position;
01695         /*116-119*/   public SL axis_c_velocity;
01696         /*120-121*/   public SW axis_c_torque;
01697         /*122*/      public UB axis_c_reserved_0;
01698         /*123*/      public UB axis_c_reserved_1;
01699
01700         /*124-125*/   public UW axis_d_status;
01701         /*126*/      public UB axis_d_switches;
01702         /*127*/      public UB axis_d_stop_code;
01703         /*128-131*/   public SL axis_d_reference_position;
01704         /*132-135*/   public SL axis_d_motor_position;
01705         /*136-139*/   public SL axis_d_position_error;
01706         /*140-143*/   public SL axis_d_aux_position;
01707         /*144-147*/   public SL axis_d_velocity;
01708         /*148-149*/   public SW axis_d_torque;
01709         /*150*/      public UB axis_d_reserved_0;
01710         /*151*/      public UB axis_d_reserved_1;
01711
01712     }; //DataRecord1802
01713
01715     [StructLayout(LayoutKind.Sequential, Pack=1)]
01716     public struct GDataRecord30000 : GDataRecord
01717     {
01718         public byte[] byte_array() { return StructToByteArray(this); }
01719
01720         /*Offset   type name      description*/
01721
01722         /*00*/      public UB header_0;
01723         /*01*/      public UB header_1;
01724         /*02*/      public UB header_2;
01725         /*03*/      public UB header_3;
01726
01727         /*04-05*/    public UW sample_number;
01728
01729         /*06*/      public UB input_bank_0;
01730         /*07*/      public UB input_bank_1;
01731
01732         /*08*/      public UB output_bank_0;
01733         /*09*/      public UB output_bank_1;
01734
01735         /*10*/      public UB error_code;
01736         /*11*/      public UB thread_status;
01737
01738         /*12-13*/    public UW input_analog_2;
01739
01740         /*14-15*/    public UW output_analog_1;
01741         /*16-17*/    public UW output_analog_2;
01742
01743         /*18-21*/    public UL amplifier_status;
01744
01745         /*22-25*/    public UL contour_segment_count;
01746         /*26-27*/    public UW contour_buffer_available;
01747
01748         /*28-29*/    public UW s_plane_segment_count;
01749         /*30-31*/    public UW s_plane_move_status;
01750         /*32-35*/    public SL s_distance;
01751         /*36-37*/    public UW s_plane_buffer_available;
01752
01753         /*38-39*/    public UW axis_a_status;
01754         /*40*/      public UB axis_a_switches;
01755         /*41*/      public UB axis_a_stop_code;
01756         /*42-45*/    public SL axis_a_reference_position;
01757         /*46-49*/    public SL axis_a_motor_position;
01758         /*50-53*/    public SL axis_a_position_error;
01759         /*54-57*/    public SL axis_a_aux_position;
01760         /*58-61*/    public SL axis_a_velocity;
01761         /*62-65*/    public SL axis_a_torque;
01762         /*66-67*/    public UW axis_a_analog_in;
01763         /*68*/      public UB axis_a_halls;
01764         /*69*/      public UB axis_a_reserved;

```

```

01765         /*70-73*/ public SL axis_a_variable;
01766     }; //DataRecord30000
01767
01769     [StructLayout(LayoutKind.Sequential, Pack=1)]
01770     public struct GDataRecord47000_ENC : GDataRecord
01771     {
01772         public byte[] byte_array() { return StructToByteArray(this); }
01773
01774         /*Offset    type name          description*/
01775
01776         /*00*/      public UB header_0;
01777         /*01*/      public UB header_1;
01778         /*02*/      public UB header_2;
01779         /*03*/      public UB header_3;
01780
01781         /*04-05*/   public UW sample_number;
01782         /*06*/      public UB error_code;
01783         /*07*/      public UB general_status;
01784
01785         /*08-09*/   public UW output_analog_0;
01786         /*10-11*/   public UW output_analog_1;
01787         /*12-13*/   public UW output_analog_2;
01788         /*14-15*/   public UW output_analog_3;
01789         /*16-17*/   public UW output_analog_4;
01790         /*18-19*/   public UW output_analog_5;
01791         /*20-21*/   public UW output_analog_6;
01792         /*22-23*/   public UW output_analog_7;
01793
01794         /*24-25*/   public UW input_analog_0;
01795         /*26-27*/   public UW input_analog_1;
01796         /*28-29*/   public UW input_analog_2;
01797         /*30-31*/   public UW input_analog_3;
01798         /*32-33*/   public UW input_analog_4;
01799         /*34-35*/   public UW input_analog_5;
01800         /*36-37*/   public UW input_analog_6;
01801         /*38-39*/   public UW input_analog_7;
01802
01803         /*40-41*/   public UW output_bank_0;
01804
01805         /*42-43*/   public UW input_bank_0;
01806
01807         /*44-47*/   public UL pulse_count_0;
01808         /*48-51*/   public SL zc_variable;
01809         /*52-55*/   public SL zd_variable;
01810
01811         /*56-59*/   public SL encoder_0;
01812         /*60-63*/   public SL encoder_1;
01813         /*64-67*/   public SL encoder_2;
01814         /*68-71*/   public SL encoder_3;
01815
01816     }; //GDataRecord47000_ENC
01817
01819     [StructLayout(LayoutKind.Sequential, Pack=1)]
01820     public struct GDataRecord47300_ENC : GDataRecord
01821     {
01822         public byte[] byte_array() { return StructToByteArray(this); }
01823
01824         /*Offset    type name          description*/
01825
01826         /*00*/      public UB header_0;
01827         /*01*/      public UB header_1;
01828         /*02*/      public UB header_2;
01829         /*03*/      public UB header_3;
01830
01831         /*04-05*/   public UW sample_number;
01832         /*06*/      public UB error_code;
01833         /*07*/      public UB general_status;
01834
01835         /*08-09*/   public UW output_analog_0;
01836         /*10-11*/   public UW output_analog_1;
01837         /*12-13*/   public UW output_analog_2;
01838         /*14-15*/   public UW output_analog_3;
01839         /*16-17*/   public UW output_analog_4;
01840         /*18-19*/   public UW output_analog_5;
01841         /*20-21*/   public UW output_analog_6;
01842         /*22-23*/   public UW output_analog_7;
01843
01844         /*24-25*/   public UW input_analog_0;
01845         /*26-27*/   public UW input_analog_1;
01846         /*28-29*/   public UW input_analog_2;
01847         /*30-31*/   public UW input_analog_3;
01848         /*32-33*/   public UW input_analog_4;
01849         /*34-35*/   public UW input_analog_5;
01850         /*36-37*/   public UW input_analog_6;
01851         /*38-39*/   public UW input_analog_7;
01852
01853         /*40-41*/   public UW output_bank_0;

```

```

01854         /*42-43*/    public UW output_bank_1;
01855
01856         /*44-45*/    public UW input_bank_0;
01857         /*46-47*/    public UW input_bank_1;
01858
01859         /*48-51*/    public UL pulse_count_0;
01860         /*52-55*/    public SL zc_variable;
01861         /*56-59*/    public SL zd_variable;
01862
01863         /*60-63*/    public SL encoder_0;
01864         /*64-67*/    public SL encoder_1;
01865         /*68-71*/    public SL encoder_2;
01866         /*72-75*/    public SL encoder_3;
01867
01868     }; //GDataRecord47300_ENC
01869
01871     [StructLayout(LayoutKind.Sequential, Pack=1)]
01872     public struct GDataRecord47300_24EX : GDataRecord
01873     {
01874         public byte[] byte_array() { return StructToByteArray(this); }
01875
01876         /*Offset    type name        description*/
01877
01878         /*00*/      public UB header_0;
01879         /*01*/      public UB header_1;
01880         /*02*/      public UB header_2;
01881         /*03*/      public UB header_3;
01882
01883         /*04-05*/   public UW sample_number;
01884         /*06*/      public UB error_code;
01885         /*07*/      public UB general_status;
01886
01887         /*08-09*/   public UW output_analog_0;
01888         /*10-11*/   public UW output_analog_1;
01889         /*12-13*/   public UW output_analog_2;
01890         /*14-15*/   public UW output_analog_3;
01891         /*16-17*/   public UW output_analog_4;
01892         /*18-19*/   public UW output_analog_5;
01893         /*20-21*/   public UW output_analog_6;
01894         /*22-23*/   public UW output_analog_7;
01895
01896         /*24-25*/   public UW input_analog_0;
01897         /*26-27*/   public UW input_analog_1;
01898         /*28-29*/   public UW input_analog_2;
01899         /*30-31*/   public UW input_analog_3;
01900         /*32-33*/   public UW input_analog_4;
01901         /*34-35*/   public UW input_analog_5;
01902         /*36-37*/   public UW input_analog_6;
01903         /*38-39*/   public UW input_analog_7;
01904
01905         /*40-41*/   public UW output_bank_0;
01906         /*42-43*/   public UW output_bank_1;
01907
01908         /*44-45*/   public UW input_bank_0;
01909         /*46-47*/   public UW input_bank_1;
01910
01911         /*48-51*/   public UL pulse_count_0;
01912         /*52-55*/   public SL zc_variable;
01913         /*56-59*/   public SL zd_variable;
01914
01915         /*60-61*/   public UW output_bank_2;
01916         /*62-63*/   public UW output_bank_3;
01917
01918         /*64-65*/   public UW input_bank_2;
01919         /*66-67*/   public UW input_bank_3;
01920
01921     }; //GDataRecord47300_24EX
01922
01924     [StructLayout(LayoutKind.Sequential, Pack=1)]
01925     public struct GDataRecord47162 : GDataRecord
01926     {
01927         public byte[] byte_array() { return StructToByteArray(this); }
01928         /*Offset    type name        description*/
01929
01930         /*00*/      public UB header_0;
01931         /*01*/      public UB header_1;
01932         /*02*/      public UB header_2;
01933         /*03*/      public UB header_3;
01934
01935         /*04-05*/   public UW sample_number;
01936         /*06*/      public UB error_code;
01937         /*07*/      public UB general_status;
01938
01939         /*08-09*/   public UW output_analog_0;
01940         /*10-11*/   public UW output_analog_1;
01941         /*12-13*/   public UW output_analog_2;
01942         /*14-15*/   public UW output_analog_3;

```

```

01943      /*16-17*/ public UW output_analog_4;
01944      /*18-19*/ public UW output_analog_5;
01945      /*20-21*/ public UW output_analog_6;
01946      /*22-23*/ public UW output_analog_7;
01947
01948      /*24-25*/ public UW input_analog_0;
01949      /*26-27*/ public UW input_analog_1;
01950      /*28-29*/ public UW input_analog_2;
01951      /*30-31*/ public UW input_analog_3;
01952      /*32-33*/ public UW input_analog_4;
01953      /*34-35*/ public UW input_analog_5;
01954      /*36-37*/ public UW input_analog_6;
01955      /*38-39*/ public UW input_analog_7;
01956
01957      /*40*/ public UB output_byte_0;
01958      /*41*/ public UB output_byte_1;
01959      /*42*/ public UB output_byte_2;
01960
01961      /*43*/ public UB input_byte_0;
01962      /*44*/ public UB input_byte_1;
01963      /*45*/ public UB input_byte_2;
01964      /*46*/ public UB input_byte_3;
01965      /*47*/ public UB input_byte_4;
01966
01967      /*48-51*/ public UL pulse_count_0;
01968      /*52-55*/ public SL zc_variable;
01969      /*56-59*/ public SL zd_variable;
01970
01971      /*60-63*/ public SL encoder_0;
01972      /*64-67*/ public SL encoder_1;
01973      /*68-71*/ public SL encoder_2;
01974      /*72-75*/ public SL encoder_3;
01975
01976      }; //GDataRecord47162
01977
01978      #endregion
01979  }

```

## 15.18 GclibJava.java File Reference

```

import java.nio.charset.Charset;
import com.sun.jna.Library;
import com.sun.jna.Native;
import com.sun.jna.Pointer;
import com.sun.jna.ptr.PointerByReference;
import com.sun.jna.ptr.IntByReference;
import com.sun.jna.ptr.ByteByReference;
import java.util.ArrayList;
import java.util.List;

```

### Classes

- class [gclibjava.GclibJava](#)
- interface [gclibjava.GclibJava.Gclib](#)  
*The JNA interface to the gclib library.*
- interface [gclibjava.GclibJava.Gclibo](#)  
*The JNA interface to the open source, gclibo library.*

### Packages

- package [gclibjava](#)

### 15.18.1 Detailed Description

The initial version of the the gclib Java wrapper. All functions are subject to change in future releases of gclib. Definition in file [GclibJava.java](#).

## 15.19 GclibJava.java

[Go to the documentation of this file.](#)

```

00001
00002
00022 package gclibjava;
00023
00024 import java.nio.charset.Charset; //Charset for string conversions
00025
00026 //JNA imports
00027 import com.sun.jna.Library;
00028 import com.sun.jna.Native;
00029 import com.sun.jna.Pointer; //g
00030 import com.sun.jna.ptr.PointerByReference; //for GCon* in GOpen()
00031 import com.sun.jna.ptr.IntByReference; //for GSize* in GCommand()
00032 import com.sun.jna.ptr.ByteByReference; //for GStatus* in GInterrupt()
00033 import java.util.ArrayList;
00034 import java.util.List; //List<Double>
00035
00036 public class GclibJava {
00037
00038     Pointer gclibHandle; //handle for gclib's connection
00039     Boolean connected = false; //we use a bool to indicate connection status
00040     byte[] trafficBuffer = new byte[524288]; //Most reads/writes to Galil hardware are small. This
    size will hold the largest array or program upload/download possible.
00041
00045     public GclibJava()
00046     {
00047     }
00048
00055     @Override
00056     protected void finalize() throws Throwable
00057     {
00058         try {
00059             if (connected)
00060                 GClose();
00061             finally {
00062                 super.finalize();
00063             }
00064         }
00065
00066         // -----
00067         // JNA for gclib
00068         // -----
00073         interface Gclib extends Library {
00074             Gclib INSTANCE = (Gclib)
00075                 Native.loadLibrary("gclib",
00076                     Gclib.class);
00077
00078             /*
00079             Limit calls to one at a time
00080             Warning: gclibo library calls gclib. Therefore, calls to Gclib and
00081             Gclibo interfaces should not be concurrent.
00082             */
00082             Gclib SYNC_INSTANCE = (Gclib)
00083                 Native.synchronizedLibrary(INSTANCE);
00084
00085             int GArrayDownload(Pointer g, String arrayName, int first, int last, String buffer);
00086             int GArrayUpload(Pointer g, String arrayName, int first, int last, int delim, byte[] response,
    int len);
00087             int GCommand(Pointer g, String command, byte[] response, int len, IntByReference
    bytesReturned);
00088             int GClose(Pointer g);
00089             int GFirmwareDownload(Pointer g, String filePath);
00090             int GInterrupt(Pointer g, ByteByReference statusByte);
00091             int GMessage(Pointer g, byte[] response, int len);
00092             int GOpen(String address, PointerByReference g);
00093             int GProgramDownload(Pointer g, String program, String preprocessor);
00094             int GProgramUpload(Pointer g, byte[] response, int len);
00095         }
00096
00097         // -----
00098         // gclib functions
00099         // -----
00100
00110         public void GArrayDownload(String arrayName, List<Double> data) throws GclibJavaException
00111         {
00112             String buf = new String();
00113             buf = data.stream().map((d) -> d.toString() + ",").reduce(buf, String::concat);
00114
00115             ec(Gclib.SYNC_INSTANCE.GArrayDownload(gclibHandle, arrayName, -1, -1,
00116                 buf.substring(0, buf.length() - 1)); //remove trailing comma
00117         }
00118
00132         public void GArrayDownload(String arrayName, List<Double> data, int first, int last) throws
    GclibJavaException
00133         {

```

```

00134         String buf = new String();
00135         buf = data.stream().map((d) -> d.toString() + ",").reduce(buf, String::concat);
00136
00137         ec(Gclib.SYNC_INSTANCE.GArrayDownload(gclibHandle, arrayName, first, last,
00138             buf.substring(0, buf.length() - 1))); //remove trailing comma
00139     }
00140
00150     public List<Double> GArrayUpload(String arrayName) throws GclibJavaException
00151     {
00152         ec(Gclib.SYNC_INSTANCE.GArrayUpload(gclibHandle, arrayName, -1, -1, 1, trafficBuffer,
00153             trafficBuffer.length));
00154         String[] elements = cstringToString(trafficBuffer).split(", ");
00155         List<Double> doubleList = new ArrayList();
00156         for (String s : elements)
00157         {
00158             try
00159             {
00159                 doubleList.add(Double.parseDouble(s));
00160             }
00161             catch (NumberFormatException e)
00162             {
00163                 throw new GclibJavaException(-10002, e.getMessage()); //G_BAD_VALUE_RANGE
00164             }
00165         }
00166         return doubleList;
00167     }
00168
00182     public List<Double> GArrayUpload(String arrayName, int first, int last) throws GclibJavaException
00183     {
00184         ec(Gclib.SYNC_INSTANCE.GArrayUpload(gclibHandle, arrayName, first, last, 1, trafficBuffer,
00185             trafficBuffer.length));
00186         String[] elements = cstringToString(trafficBuffer).split(", ");
00187         List<Double> doubleList = new ArrayList();
00188         for (String s : elements)
00189         {
00189             try
00190             {
00191                 doubleList.add(Double.parseDouble(s));
00192             }
00193             catch (NumberFormatException e)
00194             {
00195                 throw new GclibJavaException(-10002, e.getMessage()); //G_BAD_VALUE_RANGE
00196             }
00197         }
00198         return doubleList;
00199     }
00200
00204     public void GClose()
00205     {
00206         Gclib.SYNC_INSTANCE.GClose(gclibHandle);
00207         connected = false;
00208     }
00209
00220     public String GCommand(String command) throws GclibJavaException
00221     {
00222         IntByReference ptrInt = new IntByReference(); //for bytes read
00223         ec(Gclib.SYNC_INSTANCE.GCommand(gclibHandle, command, trafficBuffer, trafficBuffer.length,
00224             ptrInt));
00225         String response = cstringToString(trafficBuffer);
00226         int index = response.lastIndexOf("\r\n:");
00227         if (index > 0)
00228             response = response.substring(0, index); //trim trailing crlf:
00229         return response;
00230     }
00231
00232
00243     public void GFirmwareDownload(String filePath) throws GclibJavaException
00244     {
00245         ec(Gclib.SYNC_INSTANCE.GFirmwareDownload(gclibHandle, filePath));
00246     }
00247
00260     public byte GInterrupt() throws GclibJavaException
00261     {
00262         ByteByReference statusByte = new ByteByReference();
00263         ec(Gclib.SYNC_INSTANCE.GInterrupt(gclibHandle, statusByte));
00264         return statusByte.getValue();
00265     }
00266
00288     public String GMessage() throws GclibJavaException
00289     {
00290         ec(Gclib.SYNC_INSTANCE.GMessage(gclibHandle, trafficBuffer, trafficBuffer.length));
00291         return cstringToString(trafficBuffer);
00292     }
00293
00301     public void GOpen(String address) throws GclibJavaException
00302     {

```

```

00303         if (connected)
00304             GCclose();
00305
00306         PointerByReference ptrRef = new PointerByReference();
00307         ec(Gclib.SYNC_INSTANCE.GOpen(address, ptrRef));
00308         gclibHandle = ptrRef.getValue();
00309         connected = true;
00310     }
00311
00321     public void GProgramDownload(String program, String preprocessor) throws GclibJavaException
00322     {
00323         ec(Gclib.SYNC_INSTANCE.GProgramDownload(gclibHandle, program, preprocessor));
00324     }
00332     public void GProgramDownload(String program) throws GclibJavaException
00333     {
00334         GProgramDownload(program, "");
00335     }
00336
00344     public String GProgramUpload() throws GclibJavaException
00345     {
00346         ec(Gclib.SYNC_INSTANCE.GProgramUpload(gclibHandle, trafficBuffer, trafficBuffer.length));
00347         return cstringToString(trafficBuffer);
00348     }
00349
00350     // -----
00351     // JNA for gclibo
00352     // -----
00353
00358     interface Gclibo extends Library {
00359         Gclibo INSTANCE = (Gclibo)
00360             Native.loadLibrary("gclibo",
00361                               Gclibo.class);
00362
00363         /*
00364          * Limit calls to one at a time
00365          * Warning: gclibo library calls gclib. Therefore, calls to Gclib and
00366          * Gclibo interfaces should not be concurrent.
00367          */
00368         Gclibo SYNC_INSTANCE = (Gclibo)
00369             Native.synchronizedLibrary(INSTANCE);
00370
00371         int GAddresses(byte[] response, int len);
00372         int GArrayDownloadFile(Pointer g, String filePath);
00373         int GArrayUploadFile(Pointer g, String filePath, String names);
00374         int GAssign(String ip, String mac);
00375         void GError(int rc, byte[] response, int len);
00376         int GInfo(Pointer g, byte[] response, int len);
00377         int GIPRequests(byte[] response, int len);
00378         int GProgramDownloadFile(Pointer g, String filePath, String preprocessor);
00379         int GProgramUploadFile(Pointer g, String filePath);
00380         void GSleep(int timeout_ms);
00381         int GTimeout(Pointer g, short timeout_ms);
00382         int GVersion(byte[] response, int len);
00383         int GSetServer(String server_name);
00384         int GServerStatus(byte[] response, int len);
00385         int GListServers(byte[] response, int len);
00386         int GPublishServer(String server_name, int publish, int save);
00387         int GRemoteConnections(byte[] response, int len);
00388     }
00389
00390     // -----
00391     // gclibo functions
00392     // -----
00409     public String GAddresses() throws GclibJavaException
00410     {
00411         ec(Gclibo.SYNC_INSTANCE.GAddresses(trafficBuffer, trafficBuffer.length));
00412         return cstringToString(trafficBuffer);
00413     }
00423     public void GArrayDownloadFile(String filePath) throws GclibJavaException
00424     {
00425         ec(Gclibo.SYNC_INSTANCE.GArrayDownloadFile(gclibHandle, filePath));
00426     }
00441     public void GArrayUploadFile(String filePath, String names) throws GclibJavaException
00442     {
00443         ec(Gclibo.SYNC_INSTANCE.GArrayUploadFile(gclibHandle, filePath, names));
00444     }
00454     public void GArrayUploadFile(String filePath) throws GclibJavaException
00455     {
00456         GArrayUploadFile(filePath, "");
00457     }
00469     public void GAssign(String ipAddress, String macAddress) throws GclibJavaException
00470     {
00471         ec(Gclibo.SYNC_INSTANCE.GAssign(ipAddress, macAddress));

```

```

00472     }
00473
00482     public String GInfo() throws GclibJavaException
00483     {
00484         ec(Gclibo.SYNC_INSTANCE.GInfo(gclibHandle, trafficBuffer, trafficBuffer.length));
00485         return cstringToString(trafficBuffer);
00486     }
00487
00499     public String GIpRequests() throws GclibJavaException
00500     {
00501         ec(Gclibo.SYNC_INSTANCE.GIpRequests(trafficBuffer, trafficBuffer.length));
00502         return cstringToString(trafficBuffer);
00503     }
00504
00514     public void GProgramDownloadFile(String filePath, String preprocessor) throws GclibJavaException
00515     {
00516         ec(Gclibo.SYNC_INSTANCE.GProgramDownloadFile(gclibHandle, filePath, preprocessor));
00517     }
00518
00526     public void GProgramDownloadFile(String filePath) throws GclibJavaException
00527     {
00528         GProgramDownloadFile(filePath, "");
00529     }
00530
00539     public void GProgramUploadFile(String filePath) throws GclibJavaException
00540     {
00541         ec(Gclibo.SYNC_INSTANCE.GProgramUploadFile(gclibHandle, filePath));
00542     }
00543
00552     public void GSleep(int timeout_ms)
00553     {
00554         Gclibo.SYNC_INSTANCE.GSleep(timeout_ms);
00555     }
00556
00565     public void GTimeout(short timeout_ms) throws GclibJavaException
00566     {
00567         ec(Gclibo.SYNC_INSTANCE.GTimeout(gclibHandle, timeout_ms));
00568     }
00569
00579     public String GVersion() throws GclibJavaException
00580     {
00581         ec(Gclibo.SYNC_INSTANCE.GVersion(trafficBuffer, trafficBuffer.length));
00582         return cstringToString(trafficBuffer);
00583     }
00584
00592     public void GSetServer(String server_name) throws GclibJavaException
00593     {
00594         ec(Gclibo.SYNC_INSTANCE.GSetServer(server_name));
00595     }
00596
00605     public String GServerStatus() throws GclibJavaException
00606     {
00607         ec(Gclibo.SYNC_INSTANCE.GServerStatus(trafficBuffer, trafficBuffer.length));
00608         return cstringToString(trafficBuffer);
00609     }
00610
00618     public String GListServers() throws GclibJavaException
00619     {
00620         ec(Gclibo.SYNC_INSTANCE.GListServers(trafficBuffer, trafficBuffer.length));
00621         return cstringToString(trafficBuffer);
00622     }
00623
00633     public void GPublishServer(String server_name, int publish, int save) throws GclibJavaException
00634     {
00635         ec(Gclibo.SYNC_INSTANCE.GPublishServer(server_name, publish, save));
00636     }
00637
00645     public String GRemoteConnections() throws GclibJavaException
00646     {
00647         ec(Gclibo.SYNC_INSTANCE.GRemoteConnections(trafficBuffer, trafficBuffer.length));
00648         return cstringToString(trafficBuffer);
00649     }
00650
00651     // -----
00652     // Helper functions
00653     // -----
00654
00655     //convert gclib's C strings to Java strings.
00656     String cstringToString(byte[] cbuf)
00657     {
00658         Charset charset = Charset.forName("UTF-8");
00659         int i;
00660         for (i = 0; i < cbuf.length && cbuf[i] != 0; i++){//search for gclib's null terminator
00661             return new String(cbuf, 0, i, charset);
00662         }
00663
00664         //Error checker for gclib return code

```



```

00665     void ec(int returnCode) throws GclibJavaException
00666     {
00667         if (returnCode != 0)
00668         {
00669             //lookup human-readable string
00670             Gclibo.SYNC_INSTANCE.GError(returnCode, trafficBuffer, trafficBuffer.length);
00671             throw new GclibJavaException(returnCode, cstringToString(trafficBuffer));
00672         }
00673     }
00674 }
00675 }

```

## 15.20 GclibJavaException.java File Reference

### Classes

- class [gclibjava.GclibJavaException](#)

### Packages

- package [gclibjava](#)

## 15.21 GclibJavaException.java

[Go to the documentation of this file.](#)

```

00001
00003
00004 package gclibjava;
00005
00006 public class GclibJavaException extends Exception {
00007     int myErrorCode = 0;
00008     public GclibJavaException(int errorCode, String message) {
00009         super(message);
00010         myErrorCode = errorCode;
00011     }
00012     public int getErrorCode()
00013     {
00014         return myErrorCode;
00015     }
00016 }

```

## 15.22 gclib.py File Reference

### Classes

- class [gclib.GclibError](#)  
*Error class for non-zero gclib return codes.*
- class [gclib.py](#)  
*Represents a single Python connection to a Galil Controller or PLC.*

### Namespaces

- namespace [gclib](#)

### Functions

- [gclib.\\_rc](#) (return\_code)  
*Checks return codes from gclib and raises a python error if result is exceptional.*

## 15.23 gclib.py

[Go to the documentation of this file.](#)

```

00001
00018

```

```

00019
00023 import platform #for distinguishing 'Windows', 'Linux', 'Darwin'
00024 from ctypes import *
00025 from ctypes.util import find_library
00026 import os
00027
00028 if platform.system() == 'Windows':
00029     _gclib = WinDLL(find_library('gclib.dll'))
00030     _gclibo = WinDLL(find_library('gclibo.dll'))
00031
00032 elif platform.system() == 'Linux':
00033     cdll.LoadLibrary("libgclib.so.2")
00034     _gclib = CDLL("libgclib.so.2")
00035     cdll.LoadLibrary("libgclibo.so.2")
00036     _gclibo = CDLL("libgclibo.so.2")
00037
00038 elif platform.system() == 'Darwin': #OSX
00039     _gclib_path = '/Applications/gclib/dylib/gclib.0.dylib'
00040     _gclibo_path = '/Applications/gclib/dylib/gclibo.0.dylib'
00041     cdll.LoadLibrary(_gclib_path)
00042     _gclib = CDLL(_gclib_path)
00043     cdll.LoadLibrary(_gclibo_path)
00044     _gclibo = CDLL(_gclibo_path)
00045
00046
00047
00048 # Python "typedefs"
00049 _GReturn = c_int #type for a return code
00050 _GCon = c_void_p #type for a Galil connection handle
00051 _GCon_ptr = POINTER(_GCon) #used for argtypes declaration
00052 _GSize = c_ulong #type for a Galil size variable
00053 _GSize_ptr = POINTER(_GSize) #used for argtypes declaration
00054 _GCStringIn = c_char_p #char*. In C it's const.
00055 _GCStringOut = c_char_p #char*
00056 _GOption = c_int #type for option variables, e.g. GArrayDownload
00057 _GStatus = c_ubyte #type for interrupt status bytes
00058 _GStatus_ptr = POINTER(_GStatus) #used for argtypes declaration
00059
00060 #Define arguments and result type (if not C int type)
00061 #gclib calls
00062 _gclib.GArrayDownload.argtypes = [_GCon, _GCStringIn, _GOption, _GOption, _GCStringIn]
00063 _gclib.GArrayUpload.argtypes = [_GCon, _GCStringIn, _GOption, _GOption, _GOption, _GCStringOut,
    _GSize]
00064 _gclib.GClose.argtypes = [_GCon]
00065 _gclib.GCommand.argtypes = [_GCon, _GCStringIn, _GCStringOut, _GSize, _GSize_ptr]
00066 _gclib.GFirmwareDownload.argtypes = [_GCon, _GCStringIn]
00067 _gclib.GInterrupt.argtypes = [_GCon, _GStatus_ptr]
00068 _gclib.GMessage.argtypes = [_GCon, _GCStringOut, _GSize]
00069 _gclib.GOpen.argtypes = [_GCStringIn, _GCon_ptr]
00070 _gclib.GProgramDownload.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00071 _gclib.GProgramUpload.argtypes = [_GCon, _GCStringOut, _GSize]
00072 #gclibo calls (open source component/convenience functions)
00073 _gclibo.GAddresses.argtypes = [_GCStringOut, _GSize]
00074 _gclibo.GArrayDownloadFile.argtypes = [_GCon, _GCStringIn]
00075 _gclibo.GArrayUploadFile.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00076 _gclibo.GAssign.argtypes = [_GCStringIn, _GCStringIn]
00077 _gclibo.GError.argtypes = [_GReturn, _GCStringOut, _GSize]
00078 _gclibo.GError.restype = None
00079 _gclibo.GError.argtypes = [_GCon, _GCStringOut, _GSize]
00080 _gclibo.GIpRequests.argtypes = [_GCStringOut, _GSize]
00081 _gclibo.GMotionComplete.argtypes = [_GCon, _GCStringIn]
00082 _gclibo.GProgramDownloadFile.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00083 _gclibo.GSleep.argtypes = [c_uint]
00084 _gclibo.GSleep.restype = None
00085 _gclibo.GProgramUploadFile.argtypes = [_GCon, _GCStringIn]
00086 _gclibo.GTimeout.argtypes = [_GCon, c_int]
00087 _gclibo.GVersion.argtypes = [_GCStringOut, _GSize]
00088 _gclibo.GServerStatus.argtypes = [_GCStringOut, _GSize]
00089 _gclibo.GSetServer.argtypes = [_GCStringIn]
00090 _gclibo.GListServers.argtypes = [_GCStringOut, _GSize]
00091 _gclibo.GPublishServer.argtypes = [_GCStringIn, _GOption, _GOption]
00092 _gclibo.GRemoteConnections.argtypes = [_GCStringOut, _GSize]
00093 _gclibo.GSetupDownloadFile.argtypes = [_GCon, _GCStringIn, _GOption, _GCStringOut, _GSize]
00094
00095 #Set up some constants
00096 _enc = "ASCII" #byte encoding for going between python strings and c strings.
00097 _buf_size = 500000 #size of response buffer. Big enough to fit entire 4000 program via UL/LS, or 24000
    elements of array data.
00098 _error_buf = create_string_buffer(128) #buffer for retrieving error code descriptions.
00099
00100 def _rc(return_code):
00101     """Checks return codes from gclib and raises a python error if result is exceptional."""
00102     if return_code != 0:
00103         _gclibo.GError(return_code, _error_buf, 128) #Get the library's error description
00104         raise GclibError(str(_error_buf.value.decode(_enc)))
00105     return
00106

```

```

00107 class GclibError(Exception):
00108     """@ingroup python
00109     Error class for non-zero gclib return codes.
00110     """
00111     pass
00112
00113 class py:
00114     """
00115     Represents a single Python connection to a Galil Controller or PLC.
00116     """
00117
00118     def __init__(self):
00119         """Constructor for the Connection class. Initializes gclib's handle and read buffer."""
00120         self._gcon = _GCon(0) #handle to connection
00121         self._buf = create_string_buffer(_buf_size)
00122         self._timeout = 5000
00123         return
00124
00125     def __del__(self):
00126         """Destructor for the Connection class. Ensures close gets called to release Galil resource
00127         (Sockets, Kernel Driver, Com Port, etc)."""
00128         self.GClose()
00129         return
00130
00131     def _cc(self):
00132         """Checks if connection is established, throws error if not."""
00133         if self._gcon.value == None:
00134             _rc(-1201) #G_CONNECTION_NOT_ESTABLISHED
00135
00136     def GOpen(self, address):
00137         """@ingroup py_connection
00138         Opens a connection a galil controller.
00139         See the gclib docs for address string formatting.
00140         """
00141         c_address = _GCStringIn(address.encode(_enc))
00142         _rc(_gclib.GOpen(c_address, byref(self._gcon)))
00143         return
00144
00145     def GClose(self):
00146         """@ingroup py_connection
00147         Closes a connection to a Galil Controller.
00148         """
00149         if self._gcon.value != None:
00150             _rc(_gclib.GClose(self._gcon))
00151             self._gcon = _GCon(0)
00152         return
00153
00154     def GCommand(self, command):
00155         """@ingroup py_controller
00156         Performs a command-and-response transaction on the connection.
00157         Trims the response.
00158         """
00159         self._cc()
00160         c_command = _GCStringIn(command.encode(_enc))
00161         _rc(_gclib.GCommand(self._gcon, c_command, self._buf, _buf_size, None))
00162         response = str(self._buf.value.decode(_enc))
00163         return response[:-3].strip() # trim trailing /r/n: and leading space
00164
00165     def GSleep(self, val):
00166         """@ingroup python
00167         Provides a blocking sleep call which can be useful for timing-based chores.
00168         """
00169         _gclibo.GSleep(val)
00170         return
00171
00172     def GVersion(self):
00173         """@ingroup python
00174         Provides the gclib version number. Please include the output of this function on all support
00175         cases.
00176         """
00177         _rc(_gclibo.GVersion(self._buf, _buf_size))
00178         return "py." + str(self._buf.value.decode(_enc))
00179
00180     def GServerStatus(self):
00181         """@ingroup py_remote
00182         Provides the local server name and whether it is published to the local network.
00183         """
00184         _rc(_gclibo.GServerStatus(self._buf, _buf_size))
00185         return str(self._buf.value.decode(_enc))
00186
00187     def GSetServer(self, server_name):
00188         """@ingroup py_remote
00189         Set the new active server.
00190         """
00191

```

```

00192         """
00193         c_server_name = _GCStringIn(server_name.encode(_enc))
00194         _rc(_gclibo.GSetServer(c_server_name))
00195         return
00196
00197     def GListServers(self):
00198         """@ingroup py_remote
00199         Provide a list of all available gcaps servers on the local network.
00200         """
00201         _rc(_gclibo.GListServers(self._buf, _buf_size))
00202         return str(self._buf.value.decode(_enc))
00203
00204     def GPublishServer(self, server_name, publish, save):
00205         """@ingroup py_remote
00206         Publish local gcaps server to the network.
00207         """
00208         c_server_name = _GCStringIn(server_name.encode(_enc))
00209         _rc(_gclibo.GPublishServer(c_server_name, publish, save))
00210         return
00211
00212     def GRemoteConnections(self):
00213         """@ingroup py_remote
00214         Shows all remote addresses that are connected to the local server.
00215         """
00216         _rc(_gclibo.GRemoteConnections(self._buf, _buf_size))
00217         return str(self._buf.value.decode(_enc))
00218
00219     def GInfo(self):
00220         """@ingroup py_connection
00221         Provides a useful connection string. Please include the output of this function on all support
00222         cases.
00223         """
00224         _rc(_gclibo.GInfo(self._gcon, self._buf, _buf_size))
00225         return str(self._buf.value.decode(_enc))
00226
00227     def GIpRequests(self):
00228         """@ingroup py_connection
00229         Provides a dictionary of all Galil controllers requesting IP addresses via BOOT-P or DHCP.
00230
00231         Returns a dictionary mapping 'model-serial' --> 'mac address'
00232         e.g. {'DMC4000-783': '00:50:4c:20:03:0f', 'DMC4103-9998': '00:50:4c:38:27:0e'}
00233
00234         Linux/OS X users must be root to use GIpRequests() and have UDP access to bind and listen on
00235         port 67.
00236         """
00237         _rc(_gclibo.GIpRequests(self._buf, _buf_size)) #get the c string from gclib
00238         ip_req_dict = {}
00239         for line in str(self._buf.value.decode(_enc)).splitlines():
00240             line = line.replace(' ', '') #trim spaces throughout
00241             if (line == ""): continue
00242             fields = line.split(',')
00243             #fields go [model, serial number, mac]
00244             ip_req_dict[fields[0] + '-' + fields[1]] = fields[2] # e.g. DMC4000-783 maps to its MAC
00245
00246         return ip_req_dict
00247
00248     def GAssign(self, ip, mac):
00249         """@ingroup py_connection
00250         Assigns IP address over the Ethernet to a controller at a given MAC address.
00251         Linux/OS X users must be root to use GAssign() and have UDP access to send on port 68.
00252         """
00253         c_ip = _GCStringIn(ip.encode(_enc))
00254         c_mac = _GCStringIn(mac.encode(_enc))
00255         _rc(_gclibo.GAssign(c_ip, c_mac))
00256         return
00257
00258     def GAddresses(self):
00259         """@ingroup py_connection
00260         Provides a dictionary of all available connection addresses.
00261
00262         Returns a dictionary mapping 'address' -> 'revision reports', where possible
00263         e.g. {}
00264         """
00265         _rc(_gclibo.GAddresses(self._buf, _buf_size))
00266         addr_dict = {}
00267         for line in str(self._buf.value.decode(_enc)).splitlines():
00268             fields = line.split(',')
00269             if len(fields) >= 2:
00270                 addr_dict[fields[0]] = fields[1]
00271             else:
00272                 addr_dict[fields[0]] = ""
00273
00274         return addr_dict
00275

```

```

00276
00277 def GProgramDownload(self, program, preprocessor=""):
00278     """@ingroup py_memory
00279     Downloads a program to the controller's program buffer.
00280     See the gclib docs for preprocessor options.
00281     """
00282     self._cc()
00283     c_prog = _GCStringIn(program.encode(_enc))
00284     c_pre = _GCStringIn(preprocessor.encode(_enc))
00285     _rc(_gclib.GProgramDownload(self._gcon, c_prog, c_pre))
00286     return
00287
00288
00289 def GProgramUpload(self):
00290     """@ingroup py_memory
00291     Uploads a program from the controller's program buffer.
00292     """
00293     self._cc()
00294     _rc(_gclib.GProgramUpload(self._gcon, self._buf, _buf_size))
00295     return str(self._buf.value.decode(_enc))
00296
00297
00298 def GProgramDownloadFile(self, file_path, preprocessor=""):
00299     """@ingroup py_memory
00300     Program download from file.
00301     See the gclib docs for preprocessor options.
00302     """
00303     self._cc()
00304     c_path = _GCStringIn(file_path.encode(_enc))
00305     c_pre = _GCStringIn(preprocessor.encode(_enc))
00306     _rc(_gclib.GProgramDownloadFile(self._gcon, c_path, c_pre))
00307     return
00308
00309 def GProgramUploadFile(self, file_path):
00310     """@ingroup py_memory
00311     Program upload to file.
00312     """
00313     self._cc()
00314     c_path = _GCStringIn(file_path.encode(_enc))
00315     _rc(_gclib.GProgramUploadFile(self._gcon, c_path))
00316     return
00317
00318 def GArrayDownload(self, name, first, last, array_data):
00319     """@ingroup py_memory
00320     Downloads array data to a pre-dimensioned array in the controller's array table.
00321     array_data should be a list of values (e.g. int or float)
00322     """
00323     self._cc()
00324     c_name = _GCStringIn(name.encode(_enc))
00325     array_string = ""
00326     for val in array_data:
00327         array_string += str(val) + ","
00328     c_data = _GCStringIn(array_string[:-1].encode(_enc)) #trim trailing command
00329     _rc(_gclib.GArrayDownload(self._gcon, c_name, first, last, c_data))
00330     return
00331
00332
00333 def GArrayUploadFile(self, file_path, names = []):
00334     """@ingroup py_memory
00335     Uploads the entire controller array table or a subset and saves the data as a csv file
00336     specified by file_path.
00337     names is optional and should be a list of array names on the controller.
00338     """
00339     self._cc()
00340     c_path = _GCStringIn(file_path.encode(_enc))
00341     names_string = ""
00342     c_names = _GCStringIn("").encode(_enc) #in case empty list provided
00343     for name in names:
00344         names_string += name + ' '
00345     c_names = _GCStringIn(names_string[:-1].encode(_enc)) #trim trailing space
00346     _rc(_gclib.GArrayUploadFile(self._gcon, c_path, c_names))
00347     return
00348
00349
00350 def GArrayDownloadFile(self, file_path):
00351     """@ingroup py_memory
00352     Downloads a csv file containing array data at file_path.
00353     """
00354     self._cc()
00355     c_path = _GCStringIn(file_path.encode(_enc))
00356     _rc(_gclib.GArrayDownloadFile(self._gcon, c_path))
00357     return
00358
00359
00360 def GArrayUpload(self, name, first, last):
00361     """@ingroup py_memory

```

```

00362         Uploads array data from the controller's array table.
00363         """
00364         self._cc()
00365         c_name = _GCStringIn(name.encode(_enc))
00366         _rc(_gclib.GArrayUpload(self._gcon, c_name, first, last, 1, self._buf, _buf_size)) #1 is comma
delimiter
00367         string_list = str(self._buf.value.decode(_enc)).split(',')
00368         float_list = []
00369         for s in string_list:
00370             float_list.append(float(s))
00371         return float_list
00372
00373
00374     def GTimeout(self, timeout):
00375         """@ingroup py_connection
00376         Set the library timeout. Set to -1 to use the initial library timeout, as specified in GOpen.
00377         """
00378         self._cc()
00379         _rc(_gclibo.GTimeout(self._gcon, timeout))
00380         self._timeout = timeout
00381         return
00382
00383
00384     @property
00385     def timeout(self):
00386         """@ingroup py_connection
00387         Convenience property read access to timeout value. If -1, gclib uses the initial library
00388         timeout, as specified in GOpen.
00389         """
00390         return self._timeout
00391
00392     @timeout.setter
00393     def timeout(self, timeout):
00394         """@ingroup py_connection
00395         Convenience property write access to timeout value. Set to -1 to use the initial library
00396         timeout, as specified in GOpen.
00397         """
00398         self.GTimeout(timeout)
00399         return
00400
00401     def GFirmwareDownload(self, file_path):
00402         """@ingroup py_memory
00403         Upgrade firmware.
00404         """
00405         self._cc()
00406         c_path = _GCStringIn(file_path.encode(_enc))
00407         _rc(_gclib.GFirmwareDownload(self._gcon, c_path))
00408         return
00409
00410     def GMessage(self):
00411         """@ingroup py_unsolicited
00412         Provides access to unsolicited messages from the controller.
00413         """
00414         self._cc()
00415         _rc(_gclib.GMessage(self._gcon, self._buf, _buf_size))
00416         return str(self._buf.value.decode(_enc))
00417
00418
00419     def GMotionComplete(self, axes):
00420         """@ingroup py_controller
00421         Blocking call that returns once all axes specified have completed their motion.
00422         """
00423         self._cc()
00424         c_axes = _GCStringIn(axes.encode(_enc))
00425         _rc(_gclibo.GMotionComplete(self._gcon, c_axes))
00426         return
00427
00428     def GInterrupt(self):
00429         """@ingroup py_unsolicited
00430         Provides access to PCI and UDP interrupts from the controller.
00431         """
00432         self._cc()
00433         status = _GStatus(0)
00434         _rc(_gclib.GInterrupt(self._gcon, byref(status)))
00435         return status.value
00436
00437     def GSetupDownloadFile(self, file_path, options):
00438         """@ingroup py_memory
00439         Downloads specified sectors from a Galil compressed backup (gcb) file to a controller.
00440
00441         Returns a dictionary with the controller information stored in the gcb file.
00442         If options is specified as 0, an additional "options" key will be in the dictionary indicating
00443         the info sectors available in the gcb
00444         """
00445         self._cc()

```

```
00445         c_path = _GCStringIn(file_path.encode(_enc))
00446
00447         rc = _gclibo.GSetupDownloadFile(self._gcon, c_path, options, self._buf, _buf_size)
00448         if (options != 0):
00449             _rc(rc)
00450
00451         info_dict = {}
00452         for line in str(self._buf.value.decode(_enc)).split("\n"):
00453             fields = line.split(',',1)
00454
00455             if (fields[0] == ""): continue
00456             elif len(fields) >= 2:
00457                 info_dict[fields[0].strip("\'")] = fields[1].strip("\'")
00458             else:
00459                 info_dict[fields[0].strip("\'")] = ""
00460
00461         if (options == 0):
00462             info_dict["options"] = rc
00463
00464         return info_dict
```





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