

gclib
2.0.10

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Chapter 1

Galil Communications Library (gclib)

The Galil Communications Library (gclib) is a 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](#)

1.2 Quickstart

- **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 -B build
> cd build
> cmake --build .
> .\hello-world.exe
gclib version is 2.0.10 2.0.10
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 $GCLIB_ROOT/examples/c -B build
$ cd build
$ cmake --build .
$ ./hello-world
gclib version is 2.0.10 2.0.10
Hello World!
```

• Python

```
> py -m pip install https://galil.com/sw/pub/python/gclib-1.0.0.tar.gz
> py
>> import gclib
>> gclib.py().GVersion()
'py.2.0.10 2.0.10'
```

• Java

– Windows

```
> curl -O https://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=".;./gclib-1.0.0.jar;lib/jna-5.16.0.jar"
> javac examples/* -d .
> java HelloWorld
gclib version is 2.0.10 2.0.10
Hello World!
```

– Linux

```
$ curl -O https://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=".;./gclib-1.0.0.jar;lib/jna-5.16.0.jar"
$ javac examples/* -d .
$ java HelloWorld
gclib version is 2.0.10 2.0.10
Hello World!
```

• C#

```
> curl -O https://galil.com/sw/pub/dotnet/gclib-dotnet-1.0.0.tar.gz
> tar -xvf gclib-dotnet-1.0.0.tar.gz
> cd gclib-dotnet-1.0.0
> dotnet nuget add source %cd% --name gclib
> cd examples/cs
> dotnet run --project HelloWorld
gclib version is 2.0.10
Hello World!
```

• VB

```
> curl -O https://galil.com/sw/pub/dotnet/gclib-dotnet-1.0.0.tar.gz
> tar -xvf gclib-dotnet-1.0.0.tar.gz
> cd gclib-dotnet-1.0.0
> dotnet nuget add source %cd% --name gclib
> cd examples/vb
> dotnet run --project HelloWorld
gclib version is 2.0.10
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"

Next
Examples

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

- **Code**

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

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

    GAddresses(addresses, G_SMALL_BUFFER);
    printf("%s", addresses);
}
```

- **Output**

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

- **Code**

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

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

    GIpRequests(result, G_SMALL_BUFFER);
    printf("%s\n", result);

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

- **Output**

```
> .\ip-requests.exe
DMC4000, 10601, 00:50:4C:20:29:69, Ethernet, 192.168.0.1, 0.0.0.0
```

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

– Code

```
Module Program
    Sub Main(args As String())
        Dim Gcplib As new Gcplib()
        System.Console.WriteLine(string.Join(Environment.NewLine, Gcplib.GIpRequests()))
        Gcplib.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 `GOpen()` to receive a handle to the connection. This handle will be used in future library calls such as `GInfo()`, which we use to display some information about the open connection. After you are done, close the connection with `GClose()`.

– Code

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

int main(int argc, char* argv[]) {
    GCon g = 0;
    char info[G_SMALL_BUFFER];

    GOpen(argv[1], &g);
    GInfo(g, info, G_SMALL_BUFFER);
    printf("%s\n", info);
    GClose(g);
}
```

– Output

```
> .\connection.exe 192.168.0.40
192.168.0.40, DMC4040 Rev 1.3i, 10601
```

Attention

If the program exits before calling `GCclose()`, 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[1]);
        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 `GCclose()`, 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 `GCommand()` with an open connection. The following example uses `GCommand()` to implement a basic terminal.

– Code

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

int main(int argc, char* argv[]) {
    GCon g = NULL;
    char command[G_SMALL_BUFFER];
    char response[G_SMALL_BUFFER];

    GOpen(argv[1], &g);
    GInfo(g, response, G_SMALL_BUFFER);
    printf("Connected to %s\n", response);
    printf("Use Ctrl+C to exit.\n");
    while (1) {
        fgets(command, sizeof(command), stdin);
        GCommand(g, command, response, G_SMALL_BUFFER, NULL);
        printf("%s", response);
    }
    GClose(g);
}
```

– Output

```
> .\commands.exe 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
```

- **Python** To issue commands, use `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 `GReturn` value to indicate the error, with `G_NO_ERROR` (0) indicating that the function was successful. Pass a `GReturn` value to `GError()` to get a string description of the error. See `gclib_errors.h` for a full list of error codes.

– Code

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

int main(int argc, char* argv[]) {
    GCon g = NULL;
    char buf[G_SMALL_BUFFER];

    GOpen(argv[1], &g);

    GReturn ret = GCommand(g, "invalid", NULL, 0, NULL);
    GError(ret, buf, G_SMALL_BUFFER);
    printf("Command \"invalid\" returned %i: \"%s\"\n", ret, buf);

    GClose(g);
}
```

– Output

```
> .\errors.exe 192.168.0.40
Command "invalid" returned -10000: "question mark returned by controller"
```

- **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[1]);
        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 `GProgramUpload()` to get the controller's program, and use `GProgramDownload()` to set it. See the gclib [Program Preprocessor](#) for advanced usage.

– Code

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

int main(int argc, char* argv[]) {
    GCon g = NULL;
    char program[G_HUGE_BUFFER];

    GOpen(argv[1], &g);

    GProgramDownload(g, "MG \"Hello World\"", NULL);
    GProgramUpload(g, program, G_HUGE_BUFFER);
    printf("%s\n", program);

    GClose(g);
}
```

– Output

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

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

- Use the first and last arguments to transfer only part of the array.
- Use `G_CR` or `G_COMMA` for carriage return or comma delimiting, respectively.

– Code

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

int main(int argc, char* argv[]) {
    GCon g = NULL;
    char array[G_HUGE_BUFFER];

    GOpen(argv[1], &g);
    GCommand(g, "DM test[5]", NULL, 0, NULL);
```



```

GArrayDownload(g, "test", 0, 4, "1,2,3,4,5");
GArrayUpload(g, "test", 1, 3, G_COMMA, array, G_HUGE_BUFFER);
printf("%s\n", array);

GCommand(g, "DA test[5]", NULL, 0, NULL);
GClose(g);
}

```

– 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[1]);
        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[1]);
        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

To listen for unsolicited data, add `--subscribe ALL` to your connection string. See [GOpen\(\)](#) documentation for details.

Note

Subscribing to unsolicited data does not enable interrupts or turn on data records; it only ensures that `gclib` will be able to receive them. See [EI](#) and [DR](#) documentation for details.

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

– Code

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

int main(int argc, char* argv[]) {
    GCon g = NULL;
    char buf[G_HUGE_BUFFER];

    sprintf(buf, "%s --subscribe ALL", argv[1]);
    GOpen(buf, &g);

    GProgramDownload(g, "MG \"Hello World\"; UI0; EN", NULL);
    GCommand(g, "XQ", NULL, 0, NULL);
    GMessage(g, buf, G_HUGE_BUFFER);
    printf("Got message %s", buf);

    GStatus status = 0;
    GInterrupt(g, &status);
    printf("Got interrupt %i\n", status);

    union GDataRecord record;
    GCommand(g, "DR8", NULL, 0, NULL);
    GRecord(g, &record, G_DR);
    printf("Got data record %i\n", record.dmc4000.sample_number);
    GCommand(g, "DR0", NULL, 0, NULL);

    GClose(g);
}
```

– Output

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

• 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[1]);

    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 `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

```

Module Program
    Sub Main(args As String())
        Dim connection As 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 {0}", connection.GInterrupt().ToString())

        connection.GCommand("DR8")
        System.Console.WriteLine("Got data record {0}", connection.GRecord(Of
Gclib.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 `GRecord`, 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

Connection String	Message	Interrupt	Sample Number
192.168.1.45--usb00000411	Header Build	240	27000

– Block Diagram



2.7 Galil Connect

Galil Connect allows gclib 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 (in this example a Raspberry Pi), use `GPublishServer()`.

– Code

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

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

– Output

```
> .\server.exe Pi
Published gcaps server "Pi"
```

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

– Code

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

int main(int argc, char* argv[]) {
    char buf[G_SMALL_BUFFER];
    GCon g;

    GListServers(buf, G_SMALL_BUFFER);
    printf("Available servers:\n%s\n", buf);
    GSetServer("pi");

    GAddresses(buf, G_SMALL_BUFFER);
    printf("\nAddresses reported by pi:\n%s", buf);
    GOpen("COM5", &g);
    GInfo(g, buf, G_SMALL_BUFFER);
    printf("\nConnected to %s\n", buf);
    GClose(g);

    GSetServer("Local");
}
```

– Output

```
> .\client.exe
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(buf, G_SMALL_BUFFER)
{'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("pi");

        System.out.println("Addresses reported by pi: " + connection.GAddresses());
        connection.GOpen("COM5");
        System.out.println(connection.GInfo());
        connection.GClose();

        connection.GSetServer("Local");
    }
}
```

– Output

```
> java Client
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
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(connection.GListServers());
connection.GSetServer("pi");
System.Console.WriteLine("Addresses reported by pi: " + connection.GAddresses());
connection.GOpen("COM5");
connection.GSetServer("Local");
```

– Output

```
> dotnet run --project Client
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
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("pi")
        System.Console.WriteLine(Environment.NewLine + "Addresses reported by pi: " +
Environment.NewLine + String.Join(Environment.NewLine, connection.GAddresses()))
        connection.GOpen("/dev/ttyUSB0")
        System.Console.WriteLine(Environment.NewLine + "Connected to " + connection.GInfo())
        connection.GSetServer("Local")
    End Sub
End Module
```

– Output

```
> dotnet run --project Client
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 <gclibo.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>

char buf[G_HUGE_BUFFER];

void check(GReturn ret, GCon g) {
    if (ret == G_NO_ERROR)
        return;
    if (ret == G_BAD_RESPONSE_QUESTION_MARK) {
        GCommand(g, "TC1", buf, G_HUGE_BUFFER, NULL);
        printf("%s\n", buf);
    }

    GError(ret, buf, G_HUGE_BUFFER);
    fprintf(stderr, "Error %i: %s\n", ret, buf);
    GClose(g);
    exit(ret);
}

int main(int argc, char* argv[]) {
    if (argc != 3) {
        fprintf(stderr, "Usage: replay.exe ADDRESS SECONDS\n");
        return 0;
    }

    GReturn ret = G_NO_ERROR;
    GCon g = NULL;
    union GDataRecord record;
    GSize bytesReturned;

    check(GOpen(argv[1], &g), g);

    check(GCommand(g, "MG_BV", buf, G_HUGE_BUFFER, &bytesReturned), g);

    size_t axes = atoi(buf);

    char axisLabels[8] = {'A', 'B', 'C', 'D', 'E', 'F', 'H'};
    char arrayNames[8][5];
    for (int i = 0; i < axes; i++)
        sprintf(arrayNames[i], "pos%c", axisLabels[i]);

    check(GCmd(g, "MO"), g);
    strcpy(buf, "DM");
    for (int i = 0; i < axes; i++)
        sprintf(buf, strcat(buf, "%s pos%c[1000]"), i > 0 ? "," : "", axisLabels[i]);
    check(GCmd(g, buf), g);
    strcpy(buf, "RA");
    for (int i = 0; i < axes; i++)
        sprintf(buf, strcat(buf, "%s pos%c[]"), i > 0 ? "," : "", axisLabels[i]);
    check(GCmd(g, buf), g);
    strcpy(buf, "RD");
    for (int i = 0; i < axes; i++)
        sprintf(buf, strcat(buf, "%s _TP%c"), i > 0 ? "," : "", axisLabels[i]);
    check(GCmd(g, buf), g);
    check(GCmd(g, "RC 1,-1000"), g);

    size_t start = 0, end;
    char positions[8][G_HUGE_BUFFER];
    char* tokens[8];
    int count;
```



```

time_t startTime = time(NULL);
FILE* file = fopen("positions.txt", "w");
while (difftime(time(NULL), startTime) < atof(argv[2])) {
    GSleep(500);
    check(GCommand(g, "MG_RD", buf, G_HUGE_BUFFER, NULL), g);
    end = atoi(buf);
    for (int i = 0; i < axes; i++) {
        check(GArrayUpload(g, arrayNames[i], start, end < start ? -1 : end, G_COMMA,
positions[i], G_HUGE_BUFFER), g);
        if (end < start) {
            check(GArrayUpload(g, arrayNames[i], 0, end, G_COMMA, buf, G_HUGE_BUFFER), g);
            strcat(positions[i], ", ");
            strcat(positions[i], buf);
        }
    }
    count = end - start;
    if (end < start)
        count += 1000;
    for (int i = 0; i < count; i++) {
        for (int j = 0; j < axes; j++) {
            tokens[j] = strtok(i == 0 ? positions[j] : NULL, ",");
            if (tokens[j] == NULL)
                break;
            fprintf(file, "%s%s", j == 0 ? "" : ",", tokens[j]);
        }
        fputc('\n', file);
    }
    start = end;
}
fclose(file);

check(GCmd(g, "RC 0"), g);
GClose(g);
}

```

– 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.

– Code

```

#include <gclibo.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>

char buf[G_HUGE_BUFFER];

void check(GReturn ret, GCon g) {
    if (ret == G_NO_ERROR)
        return;
    if (ret == G_BAD_RESPONSE_QUESTION_MARK) {
        GCommand(g, "TC1", buf, G_HUGE_BUFFER, NULL);
        printf("%s\n", buf);
    }

    GError(ret, buf, G_HUGE_BUFFER);
    fprintf(stderr, "Error %i: %s\n", ret, buf);
    GClose(g);
    exit(ret);
}

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

    GCon g = NULL;
    check(GOpen(argv[1], &g), g);

    check(GCommand(g, "MG_BV", buf, G_HUGE_BUFFER, NULL), g);
    size_t axes = atoi(buf);
    char axisMask[] = "ABCDEFGH";
    axisMask[axes] = '\0';

    GCommand(g, "MG_CM", buf, G_HUGE_BUFFER, NULL);
    int contourSpace = atoi(buf);

    check(GCmd(g, "MO"), g);
    sprintf(buf, "SH %s", axisMask);
    check(GCmd(g, buf), g);
    sprintf(buf, "CM %s", axisMask);
    check(GCmd(g, buf), g);
}

```

```

check(GCmd(g, "DT -1"), g);

int lastPositions[8];
int positions[8];
FILE* f = fopen("positions.txt", "r");
fgets(buf, G_HUGE_BUFFER, f);
char* tok = strtok(buf, " ");
for (int i = 0; i < axes; i++)
    lastPositions[i] = atof(tok);
while (fgets(buf, G_HUGE_BUFFER, f)) {
    char* tok = strtok(buf, " ");
    for (int i = 0; i < axes; i++) {
        positions[i] = atof(tok);
        tok = strtok(NULL, " ");
    }
    strcpy(buf, "CD");
    for (int i = 0; i < axes; i++) {
        sprintf(&buf[strlen(buf)], "%i", positions[i] - lastPositions[i]);
        lastPositions[i] = positions[i];
        if (i != axes - 1)
            strcat(buf, ",");
    }
    GReturn ret = GCmd(g, buf);
    if (ret == G_BAD_RESPONSE_QUESTION_MARK) {
        GCmdT(g, "TC1", buf, G_HUGE_BUFFER, NULL);
        if (strcmp(buf, "32 Segment buffer full") == 0) {
            GCommand(g, "MG_DT", buf, G_HUGE_BUFFER, NULL);
            if ((int)atof(buf) == -1)
                GCmd(g, "DT 1");
            GSleep(100);
        }
    }
}

do {
    GCommand(g, "MG_CM", buf, G_HUGE_BUFFER, NULL);
} while ((int)atof(buf) < contourSpace);
fclose(f);

strcpy(buf, "CD ");
for (int i = 0; i < axes; i++)
    strcat(buf, i == 0 ? "0" : ",0");
strcat(buf, "=0");
check(GCmd(g, "RC 0"), g);
check(GCmd(g, "MO"), g);
GClose(g);
}

```

– 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) != 2):
        print(f"Usage: record.py ADDRESS SECONDS", file=sys.stderr)
        return

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

        axes = int(float(connection.GCommand("MG_BV")))
        axisLabels = [chr(i) for i in range(ord('A'), ord('A') + axes)]

        connection.GCommand('MO')
        connection.GCommand('DM' + ','.join([f"pos{x}[1000]" for x in axisLabels]))
        connection.GCommand('RA' + ','.join([f"pos{x}[]" for x in axisLabels]))
        connection.GCommand('RD' + ','.join([f"_TP{x}" for x in axisLabels]))
        connection.GCommand('RC 1,-1000') # Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

        start = 0
        end = -1
        positions = [None] * axes
        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")))
        for (i, label) in enumerate(axisLabels):
            positions[i] = connection.GArrayUpload(f'pos{label}', start, -1 if end < start
else end)
            if end < start:
                positions[i] += connection.GArrayUpload(f'pos{label}', 0, end)
        for i in range(end - start if end > start else 1000 - start + end):
            f.write(','.join([str(pos[i]) for pos in positions]) + '\n')
        start = end
        f.close()
        connection.GCommand("RC 0")
    except gclib.GclibError as e:
        print(e)
    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.

– Code

```

import gclib
import sys
import time

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

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

        axes = int(float(connection.GCommand("MG_BV")))
        axisMask = "".join([chr(i) for i in range(ord('A'), ord('A') + axes)])

        connection.GCommand(f'SH {axisMask}')
        connection.GCommand(f'CM {axisMask}')
        connection.GCommand('DT -1')

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

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

        lastPositions = None
        for line in f.read().splitlines():
            positions = line.split(',')
            if lastPositions:
                movement = [int(float(pos)) - int(float(lastPos)) for pos, lastPos in
zip(positions, lastPositions)]
                try:
                    connection.GCommand(f'CD {','.join([str(x) for x in 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)
                lastPositions = positions
            f.close()

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

            connection.GCommand(f'CD {','.join(['0' * len(axisMask)])}=0')
            connection.GCommand('RC 0')
            connection.GCommand('MO')
        except gclib.GclibError as e:
            print(e)
        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]);

        int axes = (int)Float.parseFloat(connection.GCommand("MG_BV"));
        String axisLabels = "ABCDEFGH".substring(0, axes);

        connection.GCommand("MO");
        List<String> list = new ArrayList<String>(axes);
        for (int i = 0; i < axes; i++) list.add(String.format("pos%c[1000]",
axisLabels.charAt(i)));
        connection.GCommand("DM" + String.join(",", list));
        for (int i = 0; i < axes; i++) list.set(i, String.format("pos%c[]",
axisLabels.charAt(i)));
        connection.GCommand("RA" + String.join(",", list));
        for (int i = 0; i < axes; i++) list.set(i, String.format("_TP%c", axisLabels.charAt(i)));
        connection.GCommand("RD" + String.join(",", list));
        connection.GCommand("RC 1,-1000"); // Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

        List<List<Double>> positions = new ArrayList<List<Double>>(Collections.nCopies(axes, new
ArrayList<Double>()));
        List<String> axisPositions = new ArrayList<String>(Collections.nCopies(axes, ""));
        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"));
                for (int i = 0; i < axes; i++) {
                    positions.set(i, connection.GArrayUpload(String.format("pos%c",
axisLabels.charAt(i)), start, end < start ? (short)-1 : end));
                    if (end < start)
                        positions.get(i).addAll(connection.GArrayUpload(String.format("pos%c",
axisLabels.charAt(i)), 0, end));
                }
                for (int i = 0; i < (end > start ? end - start : 1000 - start + end); i++) {
                    for (int axis = 0; axis < axes; axis++)
                        axisPositions.set(axis, positions.get(axis).get(i).toString());
                    fw.write(String.join(",", axisPositions) + 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.

– 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;

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

        int axes = (int)Float.parseFloat(connection.GCommand("MG_BV"));
        String axisLabels = "ABCDEFGH".substring(0, axes);

        connection.GCommand("SH" + axisLabels);
        connection.GCommand("CM" + axisLabels);
        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();
            String[] positions;
            String[] lastPositions = null;
            String[] movement = new String[axes];
            while (line != null) {
                positions = line.split(",");
                if (lastPositions == null) {
                    lastPositions = positions;
                    continue;
                }
                for (int i = 0; i < axes; i++) {
                    movement[i] = String.valueOf((int) (Float.parseFloat(positions[i]) -
                    Float.parseFloat(lastPositions[i])));
                }
                try {
                    connection.GCommand("CD " + String.join(",", 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);
                }
                lastPositions = positions;
                line = br.readLine();
            }

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

            connection.GCommand(String.format("CD %s=0", String.join(",", Collections.nCopies(axes,
            "0"))));
            connection.GCommand("RC 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;
}

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

    int axes = (int)float.Parse(connection.GCommand("MG_BV"));
    string axisLabels = "ABCDEFGH".Substring(0, axes);

    connection.GCommand("MO");
}

```

```

connection.GCommand("DM" + string.Join(',', from x in axisLabels select $"pos{x}[1000]"));
connection.GCommand("RA" + string.Join(',', from x in axisLabels select $"pos{x}[]"));
connection.GCommand("RD" + string.Join(',', from x in axisLabels select $"_TP{x}"));
connection.GCommand("RC 1,-1000"); // Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

List<double>[] positions = new List<double>[axes];
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"));
        for (int i = 0; i < axes; i++) {
            positions[i] = connection.GArrayUpload($"pos{axisLabels[i]}", start, end < start
? (short)-1 : end);
            if (end < start)
                positions[i].AddRange(connection.GArrayUpload($"pos{axisLabels[i]}", 0,
end));
        }
        for (int i = 0; i < (end > start ? end - start : 1000 - start + end); i++)
            file.WriteLine(string.Join(',', from x in positions select x[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();

```

– 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.

– Code

```

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

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

    int axes = (int)float.Parse(connection.GCommand("MG_BV"));
    string axisLabels = "ABCDEFGH".Substring(0, axes);

    connection.GCommand($"SH {axisLabels}");
    connection.GCommand($"CM {axisLabels}");
    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;
    using (StreamReader sr = new StreamReader("positions.txt")) {
        string? line = sr.ReadLine();
        List<int> positions;
        List<int>? lastPositions = null;
        while (line != null) {
            positions = line.Split(',').Select(x => int.Parse(x)).ToList();
            if (lastPositions == null) {
                lastPositions = positions;
                continue;
            }
            try {
                connection.GCommand($"CD {string.Join(',', from i in Enumerable.Range(0, axes)
select positions[i] - lastPositions[i])}");
            } 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);
            }
            lastPositions = positions;
            line = sr.ReadLine();
        }
    }
}

```

```

    }

    while ((int)float.Parse(connection.GCommand("MG_CM")) < contourSpace)
        System.Threading.Thread.Sleep(500);

    connection.GCommand($"CD {string.Join(',', Enumerable.Repeat("0", axes).ToArray())}=0");
    connection.GCommand("RC 0");
    connection.GCommand("MO");

} 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();

```

– 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

```

Imports System.IO

Module Program
    Sub Main(args As String())
        If args.Length <> 2
            System.Console.WriteLine("Usage: record.exe ADDRESS SECONDS")
            return
        End If

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

            Dim axes As Integer = CType(Single.Parse(connection.GCommand("MG_BV")), Integer)
            Dim axisLabels As String = "ABCDEFGH".Substring(0, axes)

            connection.GCommand("MO")
            connection.GCommand("DM" + String.Join(",", from x in axisLabels select
                $"pos{x}[1000]"))
            connection.GCommand("RA" + String.Join(",", from x in axisLabels select $"pos{x}[]"))
            connection.GCommand("RD" + String.Join(",", from x in axisLabels select $"_TP{x}"))
            connection.GCommand("RC 1,-1000") ' Assuming TM1000, record at 2ms intervals (1ms on
DMC30010 / EDD37010 / RIO47000)

            Dim positions(axes - 1) As List(Of Double)
            Dim axisPositions(axes - 1) As String
            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"))
                    For i = 0 To axes - 1
                        positions(i) = connection.GArrayUpload(String.Format("pos{0}",
axisLabels(i)), first, If(last < first, -1, last))
                        If (last < first)
                            positions(i).AddRange(connection.GArrayUpload(String.Format("pos{0}",
axisLabels(i)), 0, last))
                        End If
                    Next
                    For i = 0 To If(last > first, last - first, 1000 - first + last)
                        For x = 0 To axes - 1
                            axisPositions(x) = positions(x)(i).ToString()
                        Next
                        writer.WriteLine(String.Join(",", axisPositions))
                    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()
    End Sub
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.

– Code

```

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

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

            Dim axes As Integer = CType(Single.Parse(connection.GCommand("MG_BV")), Integer)
            Dim axisLabels As String = "ABCDEFGH".Substring(0, axes)

            connection.GCommand(String.Format("SH {0}", axisLabels))
            connection.GCommand(String.Format("CM {0}", axisLabels))
            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
            Using sr As System.IO.StreamReader = new System.IO.StreamReader("positions.txt")
                Dim line As String = sr.ReadLine()
                Dim positions As List(Of Integer)
                Dim lastPositions As List(Of Integer) = Nothing
                While line <> Nothing
                    positions = line.Split(",").Select(Function(x) Integer.Parse(x)).ToList()
                    If lastPositions Is Nothing
                        lastPositions = positions
                        Continue While
                    End If
                End If
                Try
                    connection.GCommand(String.Format("CD {0}", String.Join(",", From i in
Enumerable.Range(0, axes) Select positions(i) - lastPositions(i))))
                    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
                    lastPositions = positions
                    line = sr.ReadLine()
                End While
            End Using

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

            connection.GCommand(String.Format("CD {0}=0", string.Join(",", Enumerable.Repeat("0",
axes).ToArray()))
            connection.GCommand("RC 0")
            connection.GCommand("MO")
            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()
        End Sub
End Module

```

– Output

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


Chapter 3

gcaps

The Galil Asynchronous Proxy Server (gcaps) is a service that allows multiple gclib connections to share a single controller connection. This allows multiple clients to receive unsolicited data at once.

3.1 Thread safety

While multiple threads cannot safely use the same gclib connection handle, each thread can safely open a new gcaps connection to the same controller.

Chapter 4

Legacy Compatibility

- [GalilTools](#) included the GCL (GalilTools Communication Library). gclib ships with an open source wrapper implementation of the GCL.
- [DMC32 OSU](#) is intended for existing applications that used software based on the legacy DMCWIN32 library for Windows XP and earlier.

4.1 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.

4.1.1 Windows

4.1.1.1 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)**.

4.1.1.2 Launch the compiler command prompt

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

4.1.1.3 Set an environment variable for the base path

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

4.1.1.4 Compile the source code

Note the quotes.

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

4.1.1.5 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\gclibo.lib"
```

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

4.1.1.6 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
```

4.1.2 Linux

4.1.2.1 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
```

4.1.2.2 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...
```

4.1.2.3 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
```

4.2 DMC32 OSU

Note

gclib provides the communications foundation for the *DMC32 Operating System Upgrade (OSU)* project.

DMC32 OSU is intended for existing applications that used software based on the legacy DMCWIN32 library for Windows XP and earlier. If such an application must be upgraded to Windows 7 ‡, 8, 8.1, or 10 DMC32 OSU may be used on these O.S. upgrades.

‡ Galil's support for Windows 7 has ended. Please click [here](#) for more information.

4.2.0.1 Galil's Windows XP support statement, <http://www.galil.com/about/xp-support>

-
- For more information refer to the documentation, <http://www.galil.com/sw/pub/all/doc/dmc32osu/html/index.html>
 - See the release notes for changes, <http://www.galil.com/sw/pub/all/rn/dmc32osu.dmc32osu.release.html>
 - The installer is available for download from Galil's website, http://www.galil.com/sw/pub/win/dmc32osu/galil_dmc32_osu_exe.html

Chapter 5

License

- The gclib binaries are covered under the [Galil Closed Source License](#).
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- gclib and gcaps use [OpenSSL](#), which is licensed under the [Apache 2.0 License](#).
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Chapter 6

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.

6.1 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.

6.2 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
```

6.2.1 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.

6.2.2 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.

6.2.3 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.

6.2.4 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.

6.2.5 Preprocessor Directives

Note

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

6.2.5.1 `##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.

6.2.5.2 `##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.

6.2.5.3 `##gclib`

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

6.2.6 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*.

6.3 Preprocessor Options

6.3.1 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`.

6.3.1.1 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.

6.3.2 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 [DL](#) 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.

6.3.3 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.

6.3.3.1 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
```

6.3.4 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
```

```
SHA  
JGA=1000  
BGA
```

This causes the *A* axis to be addressed.

Note

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

6.3.5 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
```

6.4 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 7

Deprecated List

Member [GRead](#) (GCon g, GBufOut buffer, GSize buffer_len, GSize *bytes_read)

This function will be removed in a future gclib version. [Contact Galil](#) for needs not met by the other gclib functions.

Member [GUtility](#) (GCon g, GOption request, GMemory memory1, GMemory memory2)

This function will be removed in a future gclib version. [Contact Galil](#) for needs not met by the other gclib functions.

Member [GWrite](#) (GCon g, GBufIn buffer, GSize buffer_len)

This function will be removed in a future gclib version. [Contact Galil](#) for needs not met by the other gclib functions.

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Class Index

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Chapter 12

Topic Documentation

12.1 C

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_DLL_EXPORTED void GCALL [GSleep](#) (unsigned int timeout_ms)
Uses [GUtility\(\)](#) and [G_UTIL_SLEEP](#) to provide a blocking sleep call which can be useful for timing-based chores.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED void GCALL [GError](#) ([GReturn](#) rc, [GCStringOut](#) error, [GSize](#) error_len)
Provides a human-readable description string for return codes.

12.1.1 Function Documentation

12.1.1.1 [GSleep\(\)](#)

```
GCLIB_DLL_EXPORTED void GCALL GSleep (  
    unsigned int timeout_ms)
```

Uses [GUtility\(\)](#) and [G_UTIL_SLEEP](#) to provide a blocking sleep call which can be useful for timing-based chores.

Parameters

<i>timeout_ms</i>	The timeout, in milliseconds, to block before returning.
-------------------	--

See [GWaitForBool\(\)](#) for an example.

12.1.1.2 [GVersion\(\)](#)

```
GCLIB_DLL_EXPORTED GReturn GCALL GVersion (  
    GCStringOut ver,  
    GSize ver_len)
```

Uses [GUtility\(\)](#), [G_UTIL_VERSION](#) and [G_UTIL_GCAPS_VERSION](#) to provide the library and [gcaps](#) version numbers.

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](#).

See [x_examples.cpp](#) for an example.

12.1.1.3 GError()

```
GCLIB_DLL_EXPORTED void GCALL GError (
    GReturn rc,
    GCStringOut error,
    GSize error_len)
```

Provides a human-readable description string for return codes.

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.

See [x_examples.cpp](#) for an example.

12.1.2 Connection

Discover available controllers and open connections

Functions

- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GOpen](#) ([GCStringIn](#) address, [GCon](#) *g)
Open a connection to a Galil Controller.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GClose](#) ([GCon](#) g)
Closes a connection to a Galil Controller.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GInfo](#) ([GCon](#) g, [GCStringOut](#) info, [GSize](#) info_len)
Uses [GUtility\(\)](#) and [G_UTIL_INFO](#) to provide a useful connection string.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GTimeout](#) ([GCon](#) g, short timeout_ms)

Uses [GUtility\(\)](#) and [G_UTIL_TIMEOUT_OVERRIDE](#) to set the library timeout.

- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GlpRequests](#) ([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_DLL_EXPORTED [GReturn](#) GCALL [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.

12.1.2.1 Function Documentation

12.1.2.1.1 GOpen()

```
GCLIB_DLL_EXPORTED GReturn GCALL GOpen (
    GCStringIn address,
    GCon * g)
```

Open a connection to a Galil Controller.

Parameters

<i>address</i>	Null-terminated address string. See table below.
<i>g</i>	Pointer to user's GCon 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	Simple address to hardware	<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	Baud rate	(115200), <i>valid baud...</i>	COM2 --baud 19200
-b	shorthand for --baud		COM3 -b 38400
--command	Command-and-response socket protocol	(TCP), UDP	192.168.0.42 --command TCP
-c	shorthand for --command		192.168.0.42 -c UDP
--direct	Connect directly to hardware instead of via gcaps		-a GALILPCI2 --direct
-d	shorthand for --direct		GALILPCI2 -d
--subscribe	Subscribe to messages, data records, and/or interrupts	(NONE), MG, DR, EI, ALL	192.168.0.42 --subscribe MG
-s	shorthand for --subscribe		192.168.0.42 -s DR -s EI
--timeout	timeout in ms	(5000), <i>0-65535</i>	192.168.0.42 --timeout 5000
-t	shorthand for --timeout		GALILPCI2 -t 500
--unsolicited	Unsolicited socket protocol	(UDP), NONE	192.168.0.42 --unsolicited NONE

address switch	Meaning	Arguments (default), other options	Examples
-u	shorthand for --unsolicited		192.168.1.42 -u UDP
The following address switches are deprecated and will be unavailable starting July 1st, 2020.			
--p1	Primary port for command-and-response traffic	(23), valid port number	192.168.0.42 --p1 5000
--p2	Secondary port for unsolicited traffic	(60007), valid port number	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.

12.1.2.1.2 GClose()

```
GCLIB_DLL_EXPORTED GReturn GCALL GClose (
    GCon g)
```

Closes a connection to a Galil Controller.

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. The latter can occur, for example, if a call to [GRead\(\)](#) times out and the process exits without calling [GClose\(\)](#). In this case, [GRead\(\)](#) still has an outstanding asynchronous read pending. [GClose\(\)](#) will terminate this operation allowing the process to exit correctly.

Parameters

<i>g</i>	Connection's handle.
----------	----------------------

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

See [x_examples.cpp](#) for an example.

12.1.2.1.3 GAddresses()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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](#).

See `x_examples.cpp` for an example.

12.1.2.1.4 GInfo()

```
GCLIB_DLL_EXPORTED GReturn GCALL GInfo (
    GCon g,
    GCStringOut info,
    GSize info_len)
```

Uses [GUtility\(\)](#) and [G_UTIL_INFO](#) to provide a useful connection string.

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
```

See `x_examples.cpp` for an example.

12.1.2.1.5 GTimeout()

```
GCLIB_DLL_EXPORTED GReturn GCALL GTimeout (
    GCon g,
    short timeout_ms)
```

Uses [GUtility\(\)](#) and [G_UTIL_TIMEOUT_OVERRIDE](#) to set the library timeout.

Parameters

<i>g</i>	Connection's handle.
<i>timeout_ms</i>	The value to be used for the timeout. Use G_USE_INITIAL_TIMEOUT to set the timeout back to the initial GOpen() value, <code>--timeout</code> .

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

See `x_gcommand.cpp` and `x_gread_gwrite.cpp` for examples.

12.1.2.1.6 GIpRequests()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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
```

See `x_examples.cpp` for an example.

12.1.2.1.7 GAssign()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

See [x_examples.cpp](#) for an example.

12.1.3 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_DLL_EXPORTED](#) [GCLIB_DEPRECATED](#) [GReturn](#) [GCALL](#) [GUtility](#) ([GCon](#) g, [GOption](#) request, [GMemory](#) memory1, [GMemory](#) memory2)
Provides read/write access to driver settings and convenience features based on the request variable.
- [GCLIB_DLL_EXPORTED](#) [GReturn](#) [GCALL](#) [GWaitForBool](#) ([GCon](#) g, [GCStringIn](#) predicate, int trials)
Blocking call that returns when the controller evaluates the predicate as true.
- [GCLIB_DLL_EXPORTED](#) [GReturn](#) [GCALL](#) [GMotionComplete](#) ([GCon](#) g, [GCStringIn](#) axes)
Blocking call that returns once all axes specified have completed their motion.

12.1.3.1 Function Documentation

12.1.3.1.1 GUtility()

```
GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GUtility (
    GCon g,
    GOption request,
    GMemory memory1,
    GMemory memory2)
```

Provides read/write access to driver settings and convenience features based on the request variable.

Deprecated This function will be removed in a future [gclib](#) version. [Contact Galil](#) for needs not met by the other [gclib](#) functions.

Note

The open source library, [gclibo.h](#), has wrappers for most of these utilities.

Parameters

<i>g</i>	Connection's handle.
<i>request</i>	Defines the request. Input/Output and type of memory are implicit in the value of request. The following lists the supported request values.

- [G_UTIL_TIMEOUT](#) Read initial timeout value, as specified in [GOpen\(\)](#) via `--timeout` switch.
 - `memory1` is output and must be an `unsigned short*`.
 - `memory2` is ignored, use null.
- [G_UTIL_TIMEOUT_OVERRIDE](#) See [GTimeout\(\)](#). Write/Read override timeout value.
 - `memory1` is input. If nonnull, value must be a `short*` holding the override, in milliseconds, for the timeout. Write `G_USE_INITIAL_TIMEOUT` to use initial timeout. If null, no write occurs.
 - `memory2` is output. If nonnull, value must be a `short*` which will be filled with the current override. `G_USE_INITIAL_TIMEOUT` indicates initial timeout used. If null, no read occurs. `memory2` is processed before '`memory1`'.
- [G_UTIL_VERSION](#) See [GVersion\(\)](#). Returns the library version. A valid connection (`g`) is not necessary, i.e. `g` may be null.
 - `memory1` is output, and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - `memory2` is input and must be an `unsigned int*` holding the length of the buffer in `memory1`.
- [G_UTIL_INFO](#) See [GInfo\(\)](#). Returns information about the connection.
 - `memory1` is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - `memory2` is input and must be an `unsigned int*` holding the length of the buffer in `memory1`.
- [G_UTIL_SLEEP](#) See [GSleep\(\)](#). Platform-independent, non-busy, sleep. A valid connection (`g`) is not necessary, i.e. `g` may be null.
 - `memory1` is input and must be an `unsigned int*`, units are milliseconds.
 - `memory2` is ignored, use null.
- [G_UTIL_ADDRESSES](#) see [GAddresses\(\)](#). Provides a `\n` delimited listing of all available IP addresses, PCI addresses, and COM ports. A valid connection (`g`) is not necessary, i.e. `g` may be null. The suffix `-d` will be appended to each address to indicate these addresses are available via direct connection. See [G_UTIL_↔GCAPS_ADDRESSES](#) for addresses through [gcaps](#).
 - `memory1` is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - `memory2` is input and must be an `unsigned int*` holding the length of the buffer in `memory1`.
- [G_UTIL_IPREQUEST](#) see [GIpRequests\(\)](#). Listens and returns a `\n` delimited listing of Galil MAC addresses sending BOOT-P or DHCP requests. The function will listen, and block, for roughly 5 seconds. A valid connection (`g`) is not necessary, i.e. `g` may be null.
 - `memory1` is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - `memory2` is input and must be an `unsigned int*` holding the length of the buffer in `memory1`.

- [G_UTIL_ASSIGN](#) see [GAssign\(\)](#). Provides a method to assign an IP address given a Galil MAC address. A valid connection (g) is not necessary, i.e. g may be null.
 - memory1 is input and must be a `char*` containing the null terminated address that is to be assigned. e.g. "192.168.0.43".
 - memory2 is input and must be a `char*` containing the null terminated controller MAC address. e.g. "00:50:4C:20:01:23".
- [G_UTIL_DEVICE_INITIALIZE](#) Provides a method to reinitialize a connection after a reset, e.g. an RS command. Depending on the device type, the appropriate commands will be sent to configure the communication bus for optimal performance.
 - memory1 is ignored, use null.
 - memory2 is ignored, use null.
- [G_UTIL_PING](#) Uses ICMP ping to determine if an IP address is reachable and assigned. A valid connection (g) is not necessary, i.e. g may be null.
 - memory1 is input and must be a `char*` containing the null terminated address that is to be pinged. e.g. "192.168.0.43".
 - memory2 is output and must be an `int*`. The value will be set to zero if the ping times out, and nonzero if a ping reply is returned.
- [G_UTIL_ERROR_CONTEXT](#) More error detail for the last error on [GCon](#), where available. The internal error message is cleared upon read.
 - memory1 is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - memory2 is input and must be an `unsigned int*` holding the length of the buffer in memory1.

12.1.3.1.1.1 The following request values are for use with a [gcaps](#) server.

- [G_UTIL_GCAPS_VERSION](#) see [GVersion\(\)](#). Returns the [gcaps](#) server version. A valid connection (g) is not necessary, i.e. g may be null. This operation will connect to the server to determine the version.
 - memory1 is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - memory2 is input and must be an `unsigned int*` holding the length of the buffer in memory1.
- [G_UTIL_GCAPS_ADDRESSES](#) see [GAddresses\(\)](#). Provides a \n delimited listing of all available IP addresses, PCI addresses, and COM ports as available from the [gcaps](#) server. A valid connection (g) is not necessary, i.e. g may be null.
 - memory1 is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - memory2 is input and must be an `unsigned int*` holding the length of the buffer in memory1.
- [G_UTIL_GCAPS_IPREQUEST](#) see [GIpRequests\(\)](#). Connects to [gcaps](#) and returns a \n delimited listing of Galil MAC addresses sending BOOT-P or DHCP requests. A valid connection (g) is not necessary, i.e. g may be null.
 - memory1 is output and must be a `char*`. Data will be null terminated, even if the data must be truncated to do so.
 - memory2 is input and must be an `unsigned int*` holding the length of the buffer in memory1.
- [G_UTIL_GCAPS_ASSIGN](#) see [GAssign\(\)](#). Provides a method to assign an IP address through [gcaps](#) given a Galil MAC address. A valid connection (g) is not necessary, i.e. g may be null.
 - memory1 is input and must be a `char*` containing the null terminated address that is to be assigned. e.g. "192.168.0.43".

- `memory2` is input and must be a `char*` containing the null terminated controller MAC address. e.g. "00:50:4C:20:01:23".
- [G_UTIL_GCAPS_PING](#) Uses ICMP ping to determine if an IP address is reachable and assigned. Ping sent from the [gcaps](#) server. A valid connection (`g`) is not necessary, i.e. `g` may be null.
 - `memory1` is input and must be a `char*` containing the null terminated address that is to be pinged. e.g. "192.168.0.43".
 - `memory2` is output and must be an `int*`. The value will be set to zero if the ping times out, and nonzero if a ping reply is returned.

Parameters

<i>memory1</i>	An untyped pointer to data required for request. The data type is defined by the request variable.
<i>memory2</i>	An untyped pointer to data required for request. The data type is defined by the request variable.

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

See the following functions from `gclibo`, the open source portion, for implementation of several [GUtility\(\)](#) requests.:

- [GAddresses\(\)](#)
- [GAssign\(\)](#)
- [GInfo\(\)](#)
- [GlpRequests\(\)](#)
- [GSleep\(\)](#)
- [GTimeout\(\)](#)
- [GVersion\(\)](#)

12.1.3.1.2 GWaitForBool()

```
GCLIB_DLL_EXPORTED GReturn GCALL GWaitForBool (
    GCon g,
    GCStringIn predicate,
    int trials)
```

Blocking call that returns when the controller evaluates the predicate as true.

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 MG (<i>predicate</i>) 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.

12.1.3.1.3 GMotionComplete()

```
GCLIB_DLL_EXPORTED GReturn GCALL GMotionComplete (
    GCon g,
    GCStringIn axes)
```

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

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.

See `x_gmotioncomplete.cpp` for an example.

12.1.3.2 Communication

Send commands

Functions

- GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GRead (GCon g, GBufOut buffer, GSize buffer_len, GSize *bytes_read)
Performs a read on the connection.
- GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GWrite (GCon g, GBufIn buffer, GSize buffer_len)
Performs a write on the connection.
- GCLIB_DLL_EXPORTED GReturn GCALL GCommand (GCon g, GCStringIn command, GBufOut buffer, GSize buffer_len, GSize *bytes_returned)
Performs a command-and-response transaction on the connection.
- GCLIB_DLL_EXPORTED GReturn GCALL GCmd (GCon g, GCStringIn command)
Wrapper around GCommand for use when the return value is not desired.
- GCLIB_DLL_EXPORTED GReturn GCALL GCmdT (GCon g, GCStringIn command, GCStringOut trimmed_response, GSize response_len, GCStringOut *front)
Wrapper around GCommand that trims the response.
- GCLIB_DLL_EXPORTED GReturn GCALL GCmdI (GCon g, GCStringIn command, int *value)
Wrapper around GCommand that provides the return value of a command parsed into an int.
- GCLIB_DLL_EXPORTED GReturn GCALL GCmdD (GCon g, GCStringIn command, double *value)
Wrapper around GCommand that provides the return value of a command parsed into a double.

12.1.3.2.1 Function Documentation

12.1.3.2.1.1 GRead()

```
GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GRead (
    GCon g,
    GBufOut buffer,
    GSize buffer_len,
    GSize * bytes_read)
```

Performs a read on the connection.

Deprecated This function will be removed in a future gclib version. [Contact Galil](#) for needs not met by the other gclib functions.

Parameters

<i>g</i>	Connection's handle.
<i>buffer</i>	The user's read buffer.
<i>buffer_len</i>	The length of the user's read buffer.
<i>bytes_read</i>	Pointer to a GSize which will be filled with the number of bytes read upon return.

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

Unsolicited messages may be returned in the read data. The high bit of each message byte will be set unless the user changes the CW setting. Interrupts and Data Records are always filtered from a read.

See `x_gread_gwrite.cpp` for an example.

12.1.3.2.1.2 GWrite()

```
GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GWrite (
    GCon g,
    GBufIn buffer,
    GSize buffer_len)
```

Performs a write on the connection.

Deprecated This function will be removed in a future gclib version. [Contact Galil](#) for needs not met by the other gclib functions.

Parameters

<i>g</i>	Connection's handle.
<i>buffer</i>	The user's write buffer. To send a Galil command, a terminating carriage return is usually required.
<i>buffer_len</i>	The length of the data in the buffer.

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values. If `G_NO_ERROR` is returned, all bytes were written.

Warning

This function is deprecated and will be removed in a future gclib version. Please contact Galil for needs not covered by the other gclib functions.

See `x_gread_gwrite.cpp` for an example.

12.1.3.2.1.3 GCommand()

```
GCLIB_DLL_EXPORTED GReturn GCALL GCommand (
    GCon g,
    GCStringIn command,
    GBufOut buffer,
    GSize buffer_len,
    GSize * bytes_returned)
```

Performs a *command-and-response* transaction on the connection.

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.

See `x_gcommand.cpp` for an example.

12.1.3.2.1.4 GCmd()

```
GCLIB_DLL_EXPORTED GReturn GCALL GCmd (
    GCon g,
    GCStringIn command)
```

Wrapper around `GCommand` for use when the return value is not desired.

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.

See `x_gcommand.cpp` for an example.

12.1.3.2.1.5 GCmdT()

```
GCLIB_DLL_EXPORTED GReturn GCALL GCmdT (
    GCon g,
    GCStringIn command,
    GCStringOut trimmed_response,
    GSize response_len,
    GCStringOut * front)
```

Wrapper around `GCommand` that trims the response.

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 <i>trimmed_response</i> buffer.
<i>front</i>	If non-null, upon return <i>*front</i> will point to the first non-space character in <i>trimmed_response</i> . 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.

See `x_gcommand.cpp` for an example.

12.1.3.2.1.6 GCmdl()

```
GCLIB_DLL_EXPORTED GReturn GCALL GCmdlI (
    GCon g,
    GCStringIn command,
    int * value)
```

Wrapper around `GCommand` that provides the return value of a command parsed into an int. 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.

See `x_gcommand.cpp` for an example.

12.1.3.2.1.7 GCmdD()

```
GCLIB_DLL_EXPORTED GReturn GCALL GCmdD (
    GCon g,
    GCStringIn command,
    double * value)
```

Wrapper around `GCommand` that provides the return value of a command parsed into a double. 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.

See `x_gcommand.cpp` for an example.

12.1.3.3 Memory

Manage controller memory, such as program and arrays

Functions

- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramDownload](#) ([GCon](#) g, [GCStringIn](#) program, [GCStringIn](#) preprocessor)
Downloads a program to the controller's program buffer.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramUpload](#) ([GCon](#) g, [GBufOut](#) buffer, [GSize](#) buffer_len)
Uploads a program from the controller's program buffer.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GFirmwareDownload](#) ([GCon](#) g, [GCStringIn](#) filepath)
Upgrade firmware.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GCStringIn](#) preprocessor)
Program download from file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramUploadFile](#) ([GCon](#) g, [GCStringIn](#) file_path)
Program upload to file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GArrayDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path)
Array download from file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GArrayUploadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GCStringIn](#) names)
Array upload to file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GSetupDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GOption](#) options, [GCStringOut](#) info, [GSize](#) info_len)
Download a saved controller configuration from a file.

12.1.3.3.1 Function Documentation

12.1.3.3.1.1 GProgramDownload()

```
GCLIB_DLL_EXPORTED GReturn GCALL GProgramDownload (
    GCon g,
    GCStringIn program,
    GCStringIn preprocessor)
```

Downloads a program to the controller's program buffer.

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 Program Preprocessor documentation for options.

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

See `x_programs.cpp` for an example.

12.1.3.3.1.2 GProgramUpload()

```
GCLIB_DLL_EXPORTED GReturn GCALL GProgramUpload (
    GCon g,
    GBufOut buffer,
    GSize buffer_len)
```

Uploads a program from the controller's program buffer.

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.

See `x_programs.cpp` for an example.

12.1.3.3.1.3 GArrayDownload()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

See `x_arrays.cpp` for an example.

12.1.3.3.1.4 GArrayUpload()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

See `x_arrays.cpp` for an example.

12.1.3.3.1.5 GFirmwareDownload()

```
GCLIB_DLL_EXPORTED GReturn GCALL GFirmwareDownload (
    GCon g,
    GCStringIn filepath)
```

Upgrade firmware.

Parameters

<i>g</i>	Connection's handle.
<i>filepath</i>	The full file path to the Galil-supplied firmware hex file. See http://www.galil.com/downloads/firmware

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

```
ec(GInfo(g, buf, sizeof(buf))); //get controller info
cout << buf << '\n'; //print the info
ec(GFirmwareDownload(g, "F:/1806.dmc/dmc-1806-r11a.hex"));
ec(GInfo(g, buf, sizeof(buf))); //get the info again
cout << buf << '\n';
// example output:
// GALILPCI1, DMC1846 Rev 1.1a-CM, 4232
// GALILPCI1, DMC1846 Rev 1.1a, 4232
```

12.1.3.3.1.6 GProgramDownloadFile()

```
GCLIB_DLL_EXPORTED GReturn GCALL GProgramDownloadFile (
    GCon g,
    GCStringIn file_path,
    GCStringIn preprocessor)
```

Program download from file.

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 GProgramDownload() .

Returns

The success status or error code of the function. See [gclib_errors.h](#) for possible values.

See `x_programs.cpp` for an example.

12.1.3.3.1.7 GProgramUploadFile()

```
GCLIB_DLL_EXPORTED GReturn GCALL GProgramUploadFile (
    GCon g,
    GCStringIn file_path)
```

Program upload to file.

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.

See `x_programs.cpp` for an example.

12.1.3.3.1.8 GArrayDownloadFile()

```
GCLIB_DLL_EXPORTED GReturn GCALL GArrayDownloadFile (
    GCon g,
    GCStringIn file_path)
```

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>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.

See `x_arrays.cpp` for an example.

12.1.3.3.1.9 GArrayUploadFile()

```
GCLIB_DLL_EXPORTED GReturn GCALL GArrayUploadFile (
    GCon g,
    GCStringIn file_path,
    GCStringIn names)
```

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>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.

See `x_arrays.cpp` for an example.

12.1.3.3.1.10 GSetupDownloadFile()

```
GCLIB_DLL_EXPORTED GReturn GCALL GSetupDownloadFile (
    GCon g,
    GCStringIn file_path,
    GOption options,
    GCStringOut info,
    GSize info_len)
```

Download a saved controller configuration from a file.

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	KPA, KIA, KDA , etc...
3	0x0008	Restore variables	Variables are listed by the LV command
4	0x0010	Restore arrays	Arrays are listed by the LA command
5	0x0020	Restore program	The program is listed by the LS command
31	0x8000	Ignore errors	Ignore invalid parameter errors and continue restoring data. GSetupDownloadFile() 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 = GOpen("192.168.0.50", &g);
if (rc) return rc;

// 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;

```

12.1.3.4 Unsolicited Data

Receive messages, interrupts, and data records

Functions

- GCLIB_DLL_EXPORTED **GReturn** GCALL **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_DLL_EXPORTED **GReturn** GCALL **GMessage** (**GCon** g, **GCStringOut** buffer, **GSize** buffer_len)
Provides access to unsolicited messages from the controller.
- GCLIB_DLL_EXPORTED **GReturn** GCALL **GInterrupt** (**GCon** g, **GStatus** *status_byte)
Provides access to PCI and UDP interrupts from the controller.
- GCLIB_DLL_EXPORTED **GReturn** GCALL **GRecordRate** (**GCon** g, double period_ms)
Sets the asynchronous data record to a user-specified period via DR.

12.1.3.4.1 Function Documentation

12.1.3.4.1.1 GRecord()

```

GCLIB_DLL_EXPORTED GReturn GCALL 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**.

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"> • G_QR: QR is used via command-and-response. • G_DR: DR is used for asynchronous acquisition.

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.

See `x_grecord.cpp` for an example. See `x_nonblocking.cpp` for an example of non-blocking usage.

12.1.3.4.1.2 GMessage()

```
GCLIB_DLL_EXPORTED GReturn GCALL GMessage (
    GCon g,
    GCStringOut buffer,
    GSize buffer_len)
```

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. 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.

See `x_gmessage.cpp` for an example. See `x_nonblocking.cpp` for an example of non-blocking usage.

12.1.3.4.1.3 GInterrupt()

```
GCLIB_DLL_EXPORTED GReturn GCALL GInterrupt (
    GCon g,
    GStatus * status_byte)
```

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.

Parameters

<i>g</i>	Connection's handle.
<i>status_byte</i>	A pointer to a <code>GStatus</code> 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.

See `x_ginterrupt.cpp` for an example. See `x_nonblocking.cpp` for an example of non-blocking usage.

12.1.3.4.1.4 GRecordRate()

```
GCLIB_DLL_EXPORTED GReturn GCALL GRecordRate (
    GCon g,
    double period_ms)
```

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

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.

See `x_grecord.cpp` for an example.

12.1.4 Galil Connect

Host or connect to a remote gcaps instance

Functions

- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GSetServer](#) ([GCStringIn](#) server_name)
Uses [GUtility\(\)](#), [G_UTIL_GCAPS_SET_SERVER](#) to set the new active server.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GPublishServer](#) ([GCStringIn](#) name, [GOption](#) publish, [GOption](#) save)
Uses [GUtility\(\)](#), [G_UTIL_GCAPS_PUBLISH_SERVER](#) to publish local gcaps server to the local network.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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.

12.1.4.1 Function Documentation

12.1.4.1.1 GSetServer()

```
GCLIB_DLL_EXPORTED GReturn GCALL GSetServer (  
    GCStringIn server_name)
```

Uses [GUtility\(\)](#), [G_UTIL_GCAPS_SET_SERVER](#) to set the new active server.

Note

This function is only available on Windows 10 and Linux.

Parameters

<code>server_name</code>	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.

12.1.4.1.2 GListServers()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

12.1.4.1.3 GPublishServer()

```
GCLIB_DLL_EXPORTED GReturn GCALL GPublishServer (
    GCStringIn name,
    GOption publish,
    GOption save)
```

Uses [GUtility\(\)](#), [G_UTIL_GCAPS_PUBLISH_SERVER](#) to publish local gcaps server to the local network.

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.

12.1.4.1.4 GServerStatus()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

12.1.4.1.5 GRemoteConnections()

```
GCLIB_DLL_EXPORTED GReturn GCALL 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.

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.

12.2 .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.

12.2.1 Function Documentation

12.2.1.1 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

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

12.2.2 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.

12.2.2.1 Function Documentation

12.2.2.1.1 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](#).

12.2.2.1.2 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 G_NO_ERROR is received from gclib.
-------------------------	---

Definition at line 206 of file [gclib.cs](#).

12.2.2.1.3 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/gclibo_8h.html#a24a437bcde9637b0db4b94176563a052), http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo_8h.html#a24a437bcde9637b0db4b94176563a052 Be sure to call [GClose\(\)](#) whenever a connection is finished.

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

12.2.2.1.4 GInfo()

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

Provides a useful connection string.

Wrapper around gclib [GInfo\(\)](http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo_8h.html#a08abfcff8a1a85a01987859473167518), http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo_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](#).

12.2.2.1.5 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/gclibo↵_8h.html#a0afb4c82642a4ef86f997c39a5518952), http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo↵_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](#).

12.2.2.1.6 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 GOpen() .
----------------	---

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

12.2.2.1.7 GTimeout()

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

Set the timeout of communication transactions.

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

Parameters

<i>timeout_ms</i>	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

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

12.2.3 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.

12.2.3.1 Function Documentation

12.2.3.1.1 GMotionComplete()

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

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

Parameters

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

Wrapper around gclib [GMotionComplete\(\)](#), http://www.galil.com/sw/pub/all/doc/gclib/html/gclibo_8h.html#a19c220879442987970706444197f397a

Exceptions

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

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

12.2.3.2 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.

12.2.3.2.1 Function Documentation

12.2.3.2.1.1 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/gclibo_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](#).

12.2.3.2.1.2 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

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

12.2.3.2.1.3 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

Definition at line 287 of file [gclib.cs](#).

12.2.3.3 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.

12.2.3.3.1 Function Documentation

12.2.3.3.1.1 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/gclibo_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](#).

12.2.3.3.1.2 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/gclibo_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](#).

12.2.3.3.1.3 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

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](#).

12.2.3.3.1.4 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

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](#).

12.2.3.3.1.5 GFirmwareDownload()

```
void gclib.GFirmwareDownload (  
    string filepath) [inline]  
Upgrade firmware.
```

Parameters

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

Wrapper around gclib [GFirmwareDownload\(\)](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](#).

12.2.3.3.1.6 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#acafe19b2dd0537ff458e3c8afe3acfeb), http://www.galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html#acafe19b2dd0537ff458e3c8afe3acfeb

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](#).

12.2.3.3.1.7 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

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](#).

12.2.3.3.1.8 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

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](#).

12.2.3.3.1.9 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

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](#).

12.2.3.3.1.10 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](#).

12.2.3.4 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.

12.2.3.4.1 Function Documentation

12.2.3.4.1.1 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 -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`.

12.2.3.4.1.2 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 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`.

12.2.3.4.1.3 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

<code>async</code>	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 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](#).**12.2.3.4.1.4 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 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](#).**12.2.4 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.

12.2.4.1 Function Documentation**12.2.4.1.1 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](#).

12.2.4.1.2 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](#).

12.2.4.1.3 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](#).

12.2.4.1.4 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](#).

12.2.4.1.5 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](#).

12.3 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.

12.3.1 Function Documentation

12.3.1.1 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

<i>timeout_ms</i>	Sleep time in milliseconds.
-------------------	-----------------------------

Definition at line 552 of file [GclibJava.java](#).

12.3.1.2 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 579 of file [GclibJava.java](#).

12.3.2 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.

12.3.2.1 Function Documentation

12.3.2.1.1 GClose()

`void gclibjava.GclibJava.GClose () [inline]`

Closes a connection to a Galil Controller.

Definition at line 204 of file [GclibJava.java](#).

12.3.2.1.2 GOpen()

`void gclibjava.GclibJava.GOpen (String address) throws GclibJavaException [inline]`

Open a connection to a Galil Controller.

Parameters

<i>address</i>	address string. See GOpen () for details.
----------------	---

Exceptions

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 301 of file [GclibJava.java](#).

12.3.2.1.3 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 409 of file [GclibJava.java](#).

12.3.2.1.4 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 469 of file [GclibJava.java](#).

12.3.2.1.5 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 482 of file [GclibJava.java](#).

12.3.2.1.6 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 499 of file [GclibJava.java](#).

12.3.2.1.7 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 GOpen() value, -timeout.
-------------------	--

Exceptions

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 565 of file [GclibJava.java](#).

12.3.3 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.

12.3.3.1 Function Documentation

12.3.3.1.1 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 220 of file [GclibJava.java](#).

12.3.3.2 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.

12.3.3.2.1 Function Documentation

12.3.3.2.1.1 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 110 of file [GclibJava.java](#).

12.3.3.2.1.2 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 132 of file [GclibJava.java](#).

12.3.3.2.1.3 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 150 of file [GclibJava.java](#).

12.3.3.2.1.4 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 182 of file [GclibJava.java](#).

12.3.3.2.1.5 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 http://www.galil.com/downloads/firmware
-----------------	---

Exceptions

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 243 of file [GclibJava.java](#).

12.3.3.2.1.6 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 321 of file [GclibJava.java](#).

12.3.3.2.1.7 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 332 of file [GclibJava.java](#).

12.3.3.2.1.8 GProgramUpload()

```
String gclibjava.GclibJava.GProgramUpload () throws GclibJavaException [inline]
```

Uploads a program from the controller's program buffer.

Returns

The uploaded program.

Exceptions

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 344 of file [GclibJava.java](#).

12.3.3.2.1.9 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 423 of file [GclibJava.java](#).

12.3.3.2.1.10 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

gclibjava.GclibJavaException	If an error is generated by gclib.
--	------------------------------------

Definition at line 441 of file [GclibJava.java](#).

12.3.3.2.1.11 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 454 of file [GclibJava.java](#).

12.3.3.2.1.12 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 514 of file [GclibJava.java](#).

12.3.3.2.1.13 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 526 of file [GclibJava.java](#).

12.3.3.2.1.14 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 539 of file [GclibJava.java](#).

12.3.3.3 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.

12.3.3.3.1 Function Documentation

12.3.3.3.1.1 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 260 of file [GclibJava.java](#).

12.3.3.3.1.2 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 288 of file [GclibJava.java](#).

12.3.4 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.

12.3.4.1 Function Documentation

12.3.4.1.1 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 592 of file [GclibJava.java](#).

12.3.4.1.2 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 605 of file [GclibJava.java](#).

12.3.4.1.3 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 618 of file [GclibJava.java](#).

12.3.4.1.4 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 633 of file [GclibJava.java](#).

12.3.4.1.5 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

GclibJavaException	If an error is generated by gclib.
------------------------------------	------------------------------------

Definition at line 645 of file [GclibJava.java](#).

12.4 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.

12.4.1 Function Documentation

12.4.1.1 GSleep()

```
gclib.py.GSleep (
    self,
    val)
```

Provides a blocking sleep call which can be useful for timing-based chores.

Definition at line 206 of file [gclib.py](#).

12.4.1.2 GVersion()

```
gclib.py.GVersion (
    self)
```

Provides the gclib version number.

Please include the output of this function on all support cases.

Definition at line 214 of file [gclib.py](#).

12.4.2 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.

12.4.2.1 Function Documentation

12.4.2.1.1 GOpen()

```
gclib.py.GOpen (
    self,
    address)
```

Opens a connection a galil controller.

See the gclib docs for address string formatting.

Definition at line 174 of file [gclib.py](#).

12.4.2.1.2 GClose()

```
gclib.py.GClose (  
    self)
```

Closes a connection to a Galil Controller.

Definition at line 184 of file [gclib.py](#).

12.4.2.1.3 GInfo()

```
gclib.py.GInfo (  
    self)
```

Provides a useful connection string.

Please include the output of this function on all support cases.

Definition at line 258 of file [gclib.py](#).

12.4.2.1.4 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 266 of file [gclib.py](#).

12.4.2.1.5 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 286 of file [gclib.py](#).

12.4.2.1.6 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 297 of file [gclib.py](#).

12.4.2.1.7 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 413 of file [gclib.py](#).

12.4.2.1.8 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 424 of file [gclib.py](#).

12.4.2.1.9 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 431 of file [gclib.py](#).

12.4.3 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.

12.4.3.1 Function Documentation

12.4.3.1.1 GCommand()

```
gclib.py.GCommand (
    self,
    command)
```

Performs a command-and-response transaction on the connection.

Trims the response.

Definition at line 194 of file [gclib.py](#).

12.4.3.1.2 GMotionComplete()

```
gclib.py.GMotionComplete (
    self,
    axes)
```

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

Definition at line 458 of file [gclib.py](#).

12.4.3.2 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.

12.4.3.2.1 Function Documentation

12.4.3.2.1.1 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 316 of file [gclib.py](#).

12.4.3.2.1.2 GProgramUpload()

```
gclib.py.GProgramUpload (
    self)
```

Uploads a program from the controller's program buffer.
Definition at line 328 of file [gclib.py](#).

12.4.3.2.1.3 GProgramDownloadFile()

```
gclib.py.GProgramDownloadFile (
    self,
    file_path,
    preprocessor = "")
```

Program download from file.
See the gclib docs for preprocessor options.
Definition at line 337 of file [gclib.py](#).

12.4.3.2.1.4 GProgramUploadFile()

```
gclib.py.GProgramUploadFile (
    self,
    file_path)
```

Program upload to file.
Definition at line 348 of file [gclib.py](#).

12.4.3.2.1.5 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 357 of file [gclib.py](#).

12.4.3.2.1.6 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 372 of file [gclib.py](#).

12.4.3.2.1.7 GArrayDownloadFile()

```

gclib.py.GArrayDownloadFile (
    self,
    file_path)

```

Downloads a csv file containing array data at file_path.

Definition at line 389 of file [gclib.py](#).

12.4.3.2.1.8 GArrayUpload()

```

gclib.py.GArrayUpload (
    self,
    name,
    first,
    last)

```

Uploads array data from the controller's array table.

Definition at line 399 of file [gclib.py](#).

12.4.3.2.1.9 GFirmwareDownload()

```

gclib.py.GFirmwareDownload (
    self,
    file_path)

```

Upgrade firmware.

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

12.4.3.2.1.10 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 476 of file [gclib.py](#).

12.4.3.3 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.

12.4.3.3.1 Function Documentation

12.4.3.3.1.1 GMessage()

```
gclib.py.GMessage (
    self)
```

Provides access to unsolicited messages from the controller.

Definition at line 449 of file [gclib.py](#).

12.4.3.3.1.2 GInterrupt()

```
gclib.py.GInterrupt (
    self)
```

Provides access to PCI and UDP interrupts from the controller.

Definition at line 467 of file [gclib.py](#).

12.4.4 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.

12.4.4.1 Function Documentation

12.4.4.1.1 GServerStatus()

```
gclib.py.GServerStatus (
    self)
```

Provides the local server name and whether it is published to the local network.

Definition at line 221 of file [gclib.py](#).

12.4.4.1.2 GSetServer()

```
gclib.py.GSetServer (
    self,
    server_name)
```

Set the new active server.

Definition at line 228 of file [gclib.py](#).

12.4.4.1.3 GListServers()

```
gclib.py.GListServers (  
    self)
```

Provide a list of all available gcaps servers on the local network.

Definition at line 236 of file [gclib.py](#).

12.4.4.1.4 GPublishServer()

```
gclib.py.GPublishServer (  
    self,  
    server_name,  
    publish,  
    save)
```

Publish local gcaps server to the network.

Definition at line 243 of file [gclib.py](#).

12.4.4.1.5 GRemoteConnections()

```
gclib.py.GRemoteConnections (  
    self)
```

Shows all remote addresses that are connected to the local server.

Definition at line 251 of file [gclib.py](#).

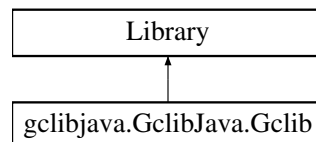
Chapter 13

Class Documentation

13.1 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](#)

13.1.1 Detailed Description

The JNA interface to the gclib library.

http://galil.com/sw/pub/all/doc/gclib/html/gclib_8h.html

Definition at line 73 of file [GclibJava.java](#).

13.1.2 Member Data Documentation

13.1.2.1 INSTANCE

`Gclib` gclibjava.GclibJava.Gclib.INSTANCE

Initial value:

```
= (Gclib) Native.loadLibrary("gclib",
```

```
Gclib.class)
```

Definition at line 74 of file [GclibJava.java](#).

13.1.2.2 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](#)

13.2 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(os.environ["GCLIB_ROOT"] + '/dll/x64/gclib.dll')
- [_gclibo](#) = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/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)`

13.2.1 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](#).

13.2.2 Member Function Documentation

13.2.2.1 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

Definition at line 534 of file [gclib.cs](#).

13.2.2.2 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

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](#).

13.2.3 Member Data Documentation

13.2.3.1 _gclib

```
gclib._gclib = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/gclib.dll') [protected]
```

Definition at line 31 of file [gclib.py](#).

13.2.3.2 _gclibo

```
gclib._gclibo = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/gclibo.dll') [protected]
```

Definition at line 32 of file [gclib.py](#).

13.2.3.3 `_gclib_path`

```
str gclib._gclib_path = '/Applications/gclib/dylib/gclib.0.dylib' [protected]
```

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

13.2.3.4 `_gclibo_path`

```
str gclib._gclibo_path = '/Applications/gclib/dylib/gclibo.0.dylib' [protected]
```

Definition at line 79 of file [gclib.py](#).

13.2.3.5 `_GReturn`

```
gclib._GReturn = c_int [protected]
```

Definition at line 88 of file [gclib.py](#).

13.2.3.6 `_GCon`

```
gclib._GCon = c_void_p [protected]
```

Definition at line 89 of file [gclib.py](#).

13.2.3.7 `_GCon_ptr`

```
gclib._GCon_ptr = POINTER(_GCon) [protected]
```

Definition at line 90 of file [gclib.py](#).

13.2.3.8 `_GSize`

```
gclib._GSize = c_ulong [protected]
```

Definition at line 91 of file [gclib.py](#).

13.2.3.9 `_GSize_ptr`

```
gclib._GSize_ptr = POINTER(_GSize) [protected]
```

Definition at line 92 of file [gclib.py](#).

13.2.3.10 `_GCStringIn`

```
gclib._GCStringIn = c_char_p [protected]
```

Definition at line 93 of file [gclib.py](#).

13.2.3.11 `_GCStringOut`

```
gclib._GCStringOut = c_char_p [protected]
```

Definition at line 94 of file [gclib.py](#).

13.2.3.12 `_GOption`

```
gclib._GOption = c_int [protected]
```

Definition at line 95 of file [gclib.py](#).

13.2.3.13 `_GStatus`

```
gclib._GStatus = c_ubyte [protected]
```

Definition at line 96 of file [gclib.py](#).

13.2.3.14 `_GStatus_ptr`

```
gclib._GStatus_ptr = POINTER(_GStatus) [protected]
```

Definition at line 97 of file [gclib.py](#).

13.2.3.15 argtypes

`gclib.argtypes`

Definition at line 101 of file [gclib.py](#).

13.2.3.16 restype

`gclib.restype`

Definition at line 117 of file [gclib.py](#).

13.2.3.17 _enc

`str gclib._enc = "ASCII" [protected]`

Definition at line 135 of file [gclib.py](#).

13.2.3.18 _buf_size

`int gclib._buf_size = 500000 [protected]`

Definition at line 136 of file [gclib.py](#).

13.2.3.19 _error_buf

`gclib._error_buf = create_string_buffer(128) [protected]`

Definition at line 137 of file [gclib.py](#).

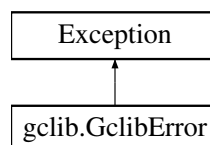
The documentation for this class was generated from the following files:

- [gclib.cs](#)
- [gclib.py](#)

13.3 gclib.GclibError Class Reference

Error class for non-zero gclib return codes.

Inheritance diagram for `gclib.GclibError`:



13.3.1 Detailed Description

Error class for non-zero gclib return codes.

Definition at line 146 of file [gclib.py](#).

The documentation for this class was generated from the following file:

- [gclib.py](#)

13.4 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 gclic 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.

13.4.1 Detailed Description

Definition at line 36 of file [GclibJava.java](#).

13.4.2 Constructor & Destructor Documentation

13.4.2.1 GclibJava()

```
gclicjava.GclicJava.GclicJava () [inline]
```

Constructor adds gclic to JNA's path.
Definition at line 45 of file [GclibJava.java](#).

13.4.3 Member Function Documentation

13.4.3.1 finalize()

```
void gclicjava.GclicJava.finalize () throws Throwable [inline], [protected]
```

The last line of defense to close connection.
Do NOT rely on [finalize\(\)](#), call [GClose\(\)](#) explicitly.

Exceptions

Throwable	super can throw.
---------------------------	------------------

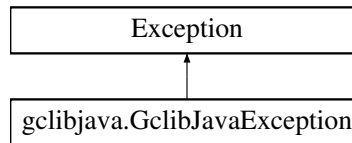
Definition at line 56 of file [GclibJava.java](#).

The documentation for this class was generated from the following file:

- [GclibJava.java](#)

13.5 gclibjava.GclibJavaException Class Reference

Inheritance diagram for gclibjava.GclibJavaException:



Public Member Functions

- [GclibJavaException](#) (int errorCode, String message)
- int [getErrorCode](#) ()

13.5.1 Detailed Description

Definition at line 6 of file [GclibJavaException.java](#).

13.5.2 Constructor & Destructor Documentation

13.5.2.1 GclibJavaException()

```

gclibjava.GclibJavaException.GclibJavaException (
    int errorCode,
    String message) [inline]
  
```

Definition at line 8 of file [GclibJavaException.java](#).

13.5.3 Member Function Documentation

13.5.3.1 getErrorCode()

```

int gclibjava.GclibJavaException.getErrorCode () [inline]
  
```

Definition at line 12 of file [GclibJavaException.java](#).

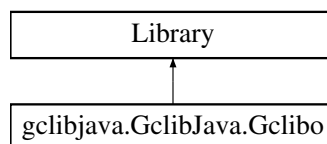
The documentation for this class was generated from the following file:

- [GclibJavaException.java](#)

13.6 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 **GlpRequests** (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](#)

13.6.1 Detailed Description

The JNA interface to the open source, gclibo library.

http://galil.com/sw/pub/all/doc/gclib/html/gclibo_8h.html

Definition at line 358 of file [GclibJava.java](#).

13.6.2 Member Data Documentation

13.6.2.1 INSTANCE

[Gclibo](#) `gclibjava.GclibJava.Gclibo.INSTANCE`

Initial value:

```
= (Gclibo)
    Native.loadLibrary("gclibo",
                      Gclibo.class)
```

Definition at line 359 of file [GclibJava.java](#).

13.6.2.2 SYNC_INSTANCE

[Gclibo](#) `gclibjava.GclibJava.Gclibo.SYNC_INSTANCE`

Initial value:

```
= (Gclibo)
    Native.synchronizedLibrary(INSTANCE)
```

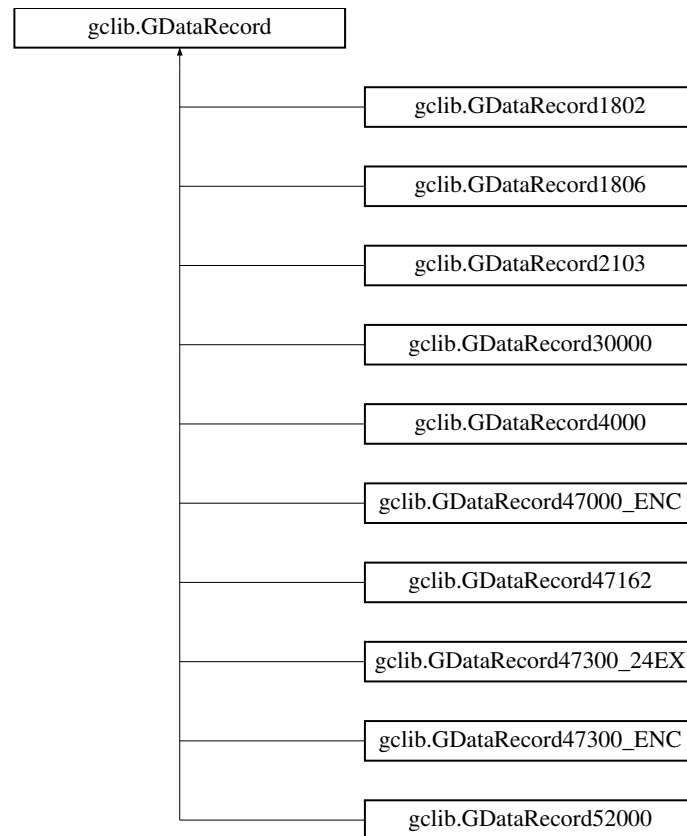
Definition at line 367 of file [GclibJava.java](#).

The documentation for this interface was generated from the following file:

- [GclibJava.java](#)

13.7 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.

13.7.1 Detailed Description

Definition at line 905 of file [gclid.cs](#).

13.7.2 Member Function Documentation

13.7.2.1 `byte_array()`

`byte[] gclid.GDataRecord.byte_array()`

Returns the data record as a byte array and allows for access to individual bytes.

Implemented in [gclid.GDataRecord1802](#), [gclid.GDataRecord1806](#), [gclid.GDataRecord2103](#), [gclid.GDataRecord30000](#), [gclid.GDataRecord4000](#), [gclid.GDataRecord47000_ENC](#), [gclid.GDataRecord47162](#), [gclid.GDataRecord47300_24EX](#), [gclid.GDataRecord47300_ENC](#), and [gclid.GDataRecord52000](#).

The documentation for this interface was generated from the following file:

- [gclid.cs](#)

13.8 GDataRecord Union Reference

Data record union, containing all structs and a generic byte array accessor.

```
#include <gclid_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.*

13.8.1 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](#).

13.8.2 Member Data Documentation

13.8.2.1 dmc4000

```
struct GDataRecord4000 GDataRecord::dmc4000
```

The DMC-4000 data record.

Definition at line 1080 of file [gclib_record.h](#).

13.8.2.2 dmc4103

```
struct GDataRecord4000 GDataRecord::dmc4103
```

The DMC-4103 data record.

Definition at line 1081 of file [gclib_record.h](#).

13.8.2.3 dmc50000

```
struct GDataRecord4000 GDataRecord::dmc50000
```

The DMC-50000 data record.

Definition at line 1082 of file [gclib_record.h](#).

13.8.2.4 dmc52000

```
struct GDataRecord52000 GDataRecord::dmc52000
```

The DMC-52000 data record.

Definition at line 1084 of file [gclib_record.h](#).

13.8.2.5 dmc30000

```
struct GDataRecord30000 GDataRecord::dmc30000
```

The DMC-30000 data record.

Definition at line 1086 of file [gclib_record.h](#).

13.8.2.6 dmc2103

```
struct GDataRecord2103 GDataRecord::dmc2103
```

The DMC-21x3 data record.

Definition at line 1088 of file [gclib_record.h](#).

13.8.2.7 dmc1806

```
struct GDataRecord1806 GDataRecord::dmc1806
```

The DMC-1806 data record.

Definition at line 1090 of file [gclib_record.h](#).

13.8.2.8 dmc1802

```
struct GDataRecord1802 GDataRecord::dmc1802
```

The DMC-1802 data record.

Definition at line 1092 of file [gclib_record.h](#).

13.8.2.9 rio47000

```
struct GDataRecord47000_ENC GDataRecord::rio47000
```

The RIO-471xx & 472xx data record, including encoder support.

Definition at line 1094 of file [gclib_record.h](#).

13.8.2.10 rio47300

```
struct GDataRecord47300_ENC GDataRecord::rio47300
```

The RIO 473xx data record, including encoder support.

Definition at line 1095 of file [gclib_record.h](#).

13.8.2.11 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](#).

13.8.2.12 rio47162

```
struct GDataRecord47162 GDataRecord::rio47162
```

The RIO 47162 data record.

Definition at line 1097 of file [gclib_record.h](#).

13.8.2.13 byte_array

```
unsigned char GDataRecord::byte_array[GALILDATARECORDMAXLENGTH]
```

Generic byte array for offsets.

Definition at line 1099 of file [gclib_record.h](#).

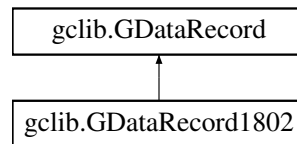
The documentation for this union was generated from the following file:

- [gclib_record.h](#)

13.9 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 Member Functions inherited from [gclib.GDataRecord](#)

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.

13.9.1 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](#).

13.9.2 Member Function Documentation

13.9.2.1 `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](#).

13.9.3 Member Data Documentation

13.9.3.1 `sample_number`

```
UW gclib.GDataRecord1802.sample_number
```

sample number.

Definition at line [1629](#) of file [gclib.cs](#).

13.9.3.2 `input_bank_0`

```
UB gclib.GDataRecord1802.input_bank_0
```

general input bank 0 (inputs 1-8).

Definition at line [1631](#) of file [gclib.cs](#).

13.9.3.3 `input_bank_1`

```
UB gclib.GDataRecord1802.input_bank_1
```

general input bank 1 (inputs 9-16).

Definition at line [1632](#) of file [gclib.cs](#).

13.9.3.4 `input_bank_2`

```
UB gclib.GDataRecord1802.input_bank_2
```

general input bank 2 (inputs 17-24).

Definition at line [1633](#) of file [gclib.cs](#).

13.9.3.5 input_bank_3

UB `gclib.GDataRecord1802.input_bank_3`
general input bank 3 (inputs 25-32).
Definition at line 1634 of file [gclib.cs](#).

13.9.3.6 input_bank_4

UB `gclib.GDataRecord1802.input_bank_4`
general input bank 4 (inputs 33-40).
Definition at line 1635 of file [gclib.cs](#).

13.9.3.7 input_bank_5

UB `gclib.GDataRecord1802.input_bank_5`
general input bank 5 (inputs 41-48).
Definition at line 1636 of file [gclib.cs](#).

13.9.3.8 input_bank_6

UB `gclib.GDataRecord1802.input_bank_6`
general input bank 6 (inputs 49-56).
Definition at line 1637 of file [gclib.cs](#).

13.9.3.9 input_bank_7

UB `gclib.GDataRecord1802.input_bank_7`
general input bank 7 (inputs 57-64).
Definition at line 1638 of file [gclib.cs](#).

13.9.3.10 input_bank_8

UB `gclib.GDataRecord1802.input_bank_8`
general input bank 8 (inputs 65-72).
Definition at line 1639 of file [gclib.cs](#).

13.9.3.11 input_bank_9

UB `gclib.GDataRecord1802.input_bank_9`
general input bank 9 (inputs 73-80).
Definition at line 1640 of file [gclib.cs](#).

13.9.3.12 output_bank_0

UB `gclib.GDataRecord1802.output_bank_0`
general output bank 0 (outputs 1-8).
Definition at line 1642 of file [gclib.cs](#).

13.9.3.13 output_bank_1

UB `gclib.GDataRecord1802.output_bank_1`
general output bank 1 (outputs 9-16).
Definition at line 1643 of file [gclib.cs](#).

13.9.3.14 output_bank_2

UB `gclib.GDataRecord1802.output_bank_2`
general output bank 2 (outputs 17-24).
Definition at line 1644 of file [gclib.cs](#).

13.9.3.15 output_bank_3

UB `gclib.GDataRecord1802.output_bank_3`
general output bank 3 (outputs 25-32).
Definition at line 1645 of file [gclib.cs](#).

13.9.3.16 output_bank_4

UB `gclib.GDataRecord1802.output_bank_4`
general output bank 4 (outputs 33-40).
Definition at line 1646 of file [gclib.cs](#).

13.9.3.17 output_bank_5

UB `gclib.GDataRecord1802.output_bank_5`
general output bank 5 (outputs 41-48).
Definition at line 1647 of file [gclib.cs](#).

13.9.3.18 output_bank_6

UB `gclib.GDataRecord1802.output_bank_6`
general output bank 6 (outputs 49-56).
Definition at line 1648 of file [gclib.cs](#).

13.9.3.19 output_bank_7

UB `gclib.GDataRecord1802.output_bank_7`
general output bank 7 (outputs 57-64).
Definition at line 1649 of file [gclib.cs](#).

13.9.3.20 output_bank_8

UB `gclib.GDataRecord1802.output_bank_8`
general output bank 8 (outputs 65-72).
Definition at line 1650 of file [gclib.cs](#).

13.9.3.21 output_bank_9

UB `gclib.GDataRecord1802.output_bank_9`
general output bank 9 (outputs 73-80).
Definition at line 1651 of file [gclib.cs](#).

13.9.3.22 error_code

UB `gclib.GDataRecord1802.error_code`
error code.
Definition at line 1653 of file [gclib.cs](#).

13.9.3.23 general_status

UB `gclib.GDataRecord1802.general_status`
general status
Definition at line 1654 of file [gclib.cs](#).

13.9.3.24 s_plane_segment_count

UB `gclib.GDataRecord1802.s_plane_segment_count`
segment count of coordinated move for S plane.
Definition at line 1656 of file [gclib.cs](#).

13.9.3.25 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](#).

13.9.3.26 s_distance

SL `gclib.GDataRecord1802.s_distance`
distance traveled in coordinated move for S plane.
Definition at line 1658 of file [gclib.cs](#).

13.9.3.27 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](#).

13.9.3.28 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](#).

13.9.3.29 t_distance

SL `gclib.GDataRecord1802.t_distance`
distance traveled in coordinated move for T plane.
Definition at line 1662 of file [gclib.cs](#).

13.9.3.30 axis_a_status

UW `gclib.GDataRecord1802.axis_a_status`
A axis status.
Definition at line 1664 of file [gclib.cs](#).

13.9.3.31 axis_a_switches

UB `gclib.GDataRecord1802.axis_a_switches`
A axis switches.
Definition at line 1665 of file [gclib.cs](#).

13.9.3.32 axis_a_stop_code

UB `gclib.GDataRecord1802.axis_a_stop_code`
A axis stop code.
Definition at line 1666 of file [gclib.cs](#).

13.9.3.33 axis_a_reference_position

SL `gclib.GDataRecord1802.axis_a_reference_position`
A axis reference position.
Definition at line 1667 of file [gclib.cs](#).

13.9.3.34 axis_a_motor_position

SL `gclib.GDataRecord1802.axis_a_motor_position`
A axis motor position.
Definition at line 1668 of file [gclib.cs](#).

13.9.3.35 axis_a_position_error

SL gclib.GDataRecord1802.axis_a_position_error

A axis position error.

Definition at line 1669 of file [gclib.cs](#).

13.9.3.36 axis_a_aux_position

SL gclib.GDataRecord1802.axis_a_aux_position

A axis auxiliary position.

Definition at line 1670 of file [gclib.cs](#).

13.9.3.37 axis_a_velocity

SL gclib.GDataRecord1802.axis_a_velocity

A axis velocity.

Definition at line 1671 of file [gclib.cs](#).

13.9.3.38 axis_a_torque

SW gclib.GDataRecord1802.axis_a_torque

A axis torque.

Definition at line 1672 of file [gclib.cs](#).

13.9.3.39 axis_a_reserved_0

UB gclib.GDataRecord1802.axis_a_reserved_0

Reserved.

Definition at line 1673 of file [gclib.cs](#).

13.9.3.40 axis_a_reserved_1

UB gclib.GDataRecord1802.axis_a_reserved_1

Reserved.

Definition at line 1674 of file [gclib.cs](#).

13.9.3.41 axis_b_status

UW gclib.GDataRecord1802.axis_b_status

B axis status.

Definition at line 1676 of file [gclib.cs](#).

13.9.3.42 axis_b_switches

UB gclib.GDataRecord1802.axis_b_switches

B axis switches.

Definition at line 1677 of file [gclib.cs](#).

13.9.3.43 axis_b_stop_code

UB gclib.GDataRecord1802.axis_b_stop_code

B axis stop code.

Definition at line 1678 of file [gclib.cs](#).

13.9.3.44 axis_b_reference_position

SL gclib.GDataRecord1802.axis_b_reference_position

B axis reference position.

Definition at line 1679 of file [gclib.cs](#).

13.9.3.45 axis_b_motor_position

SL `gclib.GDataRecord1802.axis_b_motor_position`

B axis motor position.

Definition at line 1680 of file [gclib.cs](#).

13.9.3.46 axis_b_position_error

SL `gclib.GDataRecord1802.axis_b_position_error`

B axis position error.

Definition at line 1681 of file [gclib.cs](#).

13.9.3.47 axis_b_aux_position

SL `gclib.GDataRecord1802.axis_b_aux_position`

B axis auxiliary position.

Definition at line 1682 of file [gclib.cs](#).

13.9.3.48 axis_b_velocity

SL `gclib.GDataRecord1802.axis_b_velocity`

B axis velocity.

Definition at line 1683 of file [gclib.cs](#).

13.9.3.49 axis_b_torque

SW `gclib.GDataRecord1802.axis_b_torque`

B axis torque.

Definition at line 1684 of file [gclib.cs](#).

13.9.3.50 axis_b_reserved_0

UB `gclib.GDataRecord1802.axis_b_reserved_0`

Reserved.

Definition at line 1685 of file [gclib.cs](#).

13.9.3.51 axis_b_reserved_1

UB `gclib.GDataRecord1802.axis_b_reserved_1`

Reserved.

Definition at line 1686 of file [gclib.cs](#).

13.9.3.52 axis_c_status

UW `gclib.GDataRecord1802.axis_c_status`

C axis status.

Definition at line 1688 of file [gclib.cs](#).

13.9.3.53 axis_c_switches

UB `gclib.GDataRecord1802.axis_c_switches`

C axis switches.

Definition at line 1689 of file [gclib.cs](#).

13.9.3.54 axis_c_stop_code

UB `gclib.GDataRecord1802.axis_c_stop_code`

C axis stop code.

Definition at line 1690 of file [gclib.cs](#).

13.9.3.55 axis_c_reference_position

SL gclib.GDataRecord1802.axis_c_reference_position

C axis reference position.

Definition at line 1691 of file [gclib.cs](#).

13.9.3.56 axis_c_motor_position

SL gclib.GDataRecord1802.axis_c_motor_position

C axis motor position.

Definition at line 1692 of file [gclib.cs](#).

13.9.3.57 axis_c_position_error

SL gclib.GDataRecord1802.axis_c_position_error

C axis position error.

Definition at line 1693 of file [gclib.cs](#).

13.9.3.58 axis_c_aux_position

SL gclib.GDataRecord1802.axis_c_aux_position

C axis auxiliary position.

Definition at line 1694 of file [gclib.cs](#).

13.9.3.59 axis_c_velocity

SL gclib.GDataRecord1802.axis_c_velocity

C axis velocity.

Definition at line 1695 of file [gclib.cs](#).

13.9.3.60 axis_c_torque

SW gclib.GDataRecord1802.axis_c_torque

C axis torque.

Definition at line 1696 of file [gclib.cs](#).

13.9.3.61 axis_c_reserved_0

UB gclib.GDataRecord1802.axis_c_reserved_0

Reserved.

Definition at line 1697 of file [gclib.cs](#).

13.9.3.62 axis_c_reserved_1

UB gclib.GDataRecord1802.axis_c_reserved_1

Reserved.

Definition at line 1698 of file [gclib.cs](#).

13.9.3.63 axis_d_status

UW gclib.GDataRecord1802.axis_d_status

D axis status.

Definition at line 1700 of file [gclib.cs](#).

13.9.3.64 axis_d_switches

UB gclib.GDataRecord1802.axis_d_switches

D axis switches.

Definition at line 1701 of file [gclib.cs](#).

13.9.3.65 axis_d_stop_code

UB `gclib.GDataRecord1802.axis_d_stop_code`

D axis stop code.

Definition at line 1702 of file [gclib.cs](#).

13.9.3.66 axis_d_reference_position

SL `gclib.GDataRecord1802.axis_d_reference_position`

D axis reference position.

Definition at line 1703 of file [gclib.cs](#).

13.9.3.67 axis_d_motor_position

SL `gclib.GDataRecord1802.axis_d_motor_position`

D axis motor position.

Definition at line 1704 of file [gclib.cs](#).

13.9.3.68 axis_d_position_error

SL `gclib.GDataRecord1802.axis_d_position_error`

D axis position error.

Definition at line 1705 of file [gclib.cs](#).

13.9.3.69 axis_d_aux_position

SL `gclib.GDataRecord1802.axis_d_aux_position`

D axis auxiliary position.

Definition at line 1706 of file [gclib.cs](#).

13.9.3.70 axis_d_velocity

SL `gclib.GDataRecord1802.axis_d_velocity`

D axis velocity.

Definition at line 1707 of file [gclib.cs](#).

13.9.3.71 axis_d_torque

SW `gclib.GDataRecord1802.axis_d_torque`

D axis torque.

Definition at line 1708 of file [gclib.cs](#).

13.9.3.72 axis_d_reserved_0

UB `gclib.GDataRecord1802.axis_d_reserved_0`

Reserved.

Definition at line 1709 of file [gclib.cs](#).

13.9.3.73 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](#)

13.10 GDataRecord1802 Struct Reference

Data record struct for DMC-1802 controllers.

```
#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.

13.10.1 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 723 of file [gclib_record.h](#).

13.10.2 Member Data Documentation

13.10.2.1 sample_number

UB GDataRecord1802::sample_number

sample number.

Definition at line 728 of file [gclib_record.h](#).

13.10.2.2 input_bank_0

UB GDataRecord1802::input_bank_0

general input bank 0 (inputs 1-8).

Definition at line 730 of file [gclib_record.h](#).

13.10.2.3 input_bank_1

UB GDataRecord1802::input_bank_1

general input bank 1 (inputs 9-16).

Definition at line 731 of file [gclib_record.h](#).

13.10.2.4 input_bank_2

UB GDataRecord1802::input_bank_2

general input bank 2 (inputs 17-24).

Definition at line 732 of file [gclib_record.h](#).

13.10.2.5 input_bank_3

UB GDataRecord1802::input_bank_3

general input bank 3 (inputs 25-32).

Definition at line 733 of file [gclib_record.h](#).

13.10.2.6 input_bank_4

UB GDataRecord1802::input_bank_4

general input bank 4 (inputs 33-40).

Definition at line 734 of file [gclib_record.h](#).

13.10.2.7 input_bank_5

UB GDataRecord1802::input_bank_5

general input bank 5 (inputs 41-48).

Definition at line 735 of file [gclib_record.h](#).

13.10.2.8 input_bank_6

UB GDataRecord1802::input_bank_6

general input bank 6 (inputs 49-56).

Definition at line 736 of file [gclib_record.h](#).

13.10.2.9 input_bank_7

UB GDataRecord1802::input_bank_7
general input bank 7 (inputs 57-64).
Definition at line 737 of file [gclib_record.h](#).

13.10.2.10 input_bank_8

UB GDataRecord1802::input_bank_8
general input bank 8 (inputs 65-72).
Definition at line 738 of file [gclib_record.h](#).

13.10.2.11 input_bank_9

UB GDataRecord1802::input_bank_9
general input bank 9 (inputs 73-80).
Definition at line 739 of file [gclib_record.h](#).

13.10.2.12 output_bank_0

UB GDataRecord1802::output_bank_0
general output bank 0 (outputs 1-8).
Definition at line 741 of file [gclib_record.h](#).

13.10.2.13 output_bank_1

UB GDataRecord1802::output_bank_1
general output bank 1 (outputs 9-16).
Definition at line 742 of file [gclib_record.h](#).

13.10.2.14 output_bank_2

UB GDataRecord1802::output_bank_2
general output bank 2 (outputs 17-24).
Definition at line 743 of file [gclib_record.h](#).

13.10.2.15 output_bank_3

UB GDataRecord1802::output_bank_3
general output bank 3 (outputs 25-32).
Definition at line 744 of file [gclib_record.h](#).

13.10.2.16 output_bank_4

UB GDataRecord1802::output_bank_4
general output bank 4 (outputs 33-40).
Definition at line 745 of file [gclib_record.h](#).

13.10.2.17 output_bank_5

UB GDataRecord1802::output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 746 of file [gclib_record.h](#).

13.10.2.18 output_bank_6

UB GDataRecord1802::output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 747 of file [gclib_record.h](#).

13.10.2.19 output_bank_7

UB GDataRecord1802::output_bank_7

general output bank 7 (outputs 57-64).

Definition at line 748 of file [gclib_record.h](#).

13.10.2.20 output_bank_8

UB GDataRecord1802::output_bank_8

general output bank 8 (outputs 65-72).

Definition at line 749 of file [gclib_record.h](#).

13.10.2.21 output_bank_9

UB GDataRecord1802::output_bank_9

general output bank 9 (outputs 73-80).

Definition at line 750 of file [gclib_record.h](#).

13.10.2.22 error_code

UB GDataRecord1802::error_code

error code.

Definition at line 752 of file [gclib_record.h](#).

13.10.2.23 general_status

UB GDataRecord1802::general_status

general status

Definition at line 753 of file [gclib_record.h](#).

13.10.2.24 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](#).

13.10.2.25 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](#).

13.10.2.26 s_distance

SL GDataRecord1802::s_distance

distance traveled in coordinated move for S plane.

Definition at line 757 of file [gclib_record.h](#).

13.10.2.27 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](#).

13.10.2.28 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](#).

13.10.2.29 t_distance

SL GDataRecord1802::t_distance

distance traveled in coordinated move for T plane.

Definition at line 761 of file [gclib_record.h](#).

13.10.2.30 axis_a_status

UW GDataRecord1802::axis_a_status

A axis status.

Definition at line 763 of file [gclib_record.h](#).

13.10.2.31 axis_a_switches

UB GDataRecord1802::axis_a_switches

A axis switches.

Definition at line 764 of file [gclib_record.h](#).

13.10.2.32 axis_a_stop_code

UB GDataRecord1802::axis_a_stop_code

A axis stop code.

Definition at line 765 of file [gclib_record.h](#).

13.10.2.33 axis_a_reference_position

SL GDataRecord1802::axis_a_reference_position

A axis reference position.

Definition at line 766 of file [gclib_record.h](#).

13.10.2.34 axis_a_motor_position

SL GDataRecord1802::axis_a_motor_position

A axis motor position.

Definition at line 767 of file [gclib_record.h](#).

13.10.2.35 axis_a_position_error

SL GDataRecord1802::axis_a_position_error

A axis position error.

Definition at line 768 of file [gclib_record.h](#).

13.10.2.36 axis_a_aux_position

SL GDataRecord1802::axis_a_aux_position

A axis auxiliary position.

Definition at line 769 of file [gclib_record.h](#).

13.10.2.37 axis_a_velocity

SL GDataRecord1802::axis_a_velocity

A axis velocity.

Definition at line 770 of file [gclib_record.h](#).

13.10.2.38 axis_a_torque

SW GDataRecord1802::axis_a_torque

A axis torque.

Definition at line 771 of file [gclib_record.h](#).

13.10.2.39 axis_a_reserved_0

UB GDataRecord1802::axis_a_reserved_0
Reserved.
Definition at line 772 of file [gclib_record.h](#).

13.10.2.40 axis_a_reserved_1

UB GDataRecord1802::axis_a_reserved_1
Reserved.
Definition at line 773 of file [gclib_record.h](#).

13.10.2.41 axis_b_status

UW GDataRecord1802::axis_b_status
B axis status.
Definition at line 775 of file [gclib_record.h](#).

13.10.2.42 axis_b_switches

UB GDataRecord1802::axis_b_switches
B axis switches.
Definition at line 776 of file [gclib_record.h](#).

13.10.2.43 axis_b_stop_code

UB GDataRecord1802::axis_b_stop_code
B axis stop code.
Definition at line 777 of file [gclib_record.h](#).

13.10.2.44 axis_b_reference_position

SL GDataRecord1802::axis_b_reference_position
B axis reference position.
Definition at line 778 of file [gclib_record.h](#).

13.10.2.45 axis_b_motor_position

SL GDataRecord1802::axis_b_motor_position
B axis motor position.
Definition at line 779 of file [gclib_record.h](#).

13.10.2.46 axis_b_position_error

SL GDataRecord1802::axis_b_position_error
B axis position error.
Definition at line 780 of file [gclib_record.h](#).

13.10.2.47 axis_b_aux_position

SL GDataRecord1802::axis_b_aux_position
B axis auxiliary position.
Definition at line 781 of file [gclib_record.h](#).

13.10.2.48 axis_b_velocity

SL GDataRecord1802::axis_b_velocity
B axis velocity.
Definition at line 782 of file [gclib_record.h](#).

13.10.2.49 axis_b_torque

SW GDataRecord1802::axis_b_torque

B axis torque.

Definition at line 783 of file [gclib_record.h](#).

13.10.2.50 axis_b_reserved_0

UB GDataRecord1802::axis_b_reserved_0

Reserved.

Definition at line 784 of file [gclib_record.h](#).

13.10.2.51 axis_b_reserved_1

UB GDataRecord1802::axis_b_reserved_1

Reserved.

Definition at line 785 of file [gclib_record.h](#).

13.10.2.52 axis_c_status

UW GDataRecord1802::axis_c_status

C axis status.

Definition at line 787 of file [gclib_record.h](#).

13.10.2.53 axis_c_switches

UB GDataRecord1802::axis_c_switches

C axis switches.

Definition at line 788 of file [gclib_record.h](#).

13.10.2.54 axis_c_stop_code

UB GDataRecord1802::axis_c_stop_code

C axis stop code.

Definition at line 789 of file [gclib_record.h](#).

13.10.2.55 axis_c_reference_position

SL GDataRecord1802::axis_c_reference_position

C axis reference position.

Definition at line 790 of file [gclib_record.h](#).

13.10.2.56 axis_c_motor_position

SL GDataRecord1802::axis_c_motor_position

C axis motor position.

Definition at line 791 of file [gclib_record.h](#).

13.10.2.57 axis_c_position_error

SL GDataRecord1802::axis_c_position_error

C axis position error.

Definition at line 792 of file [gclib_record.h](#).

13.10.2.58 axis_c_aux_position

SL GDataRecord1802::axis_c_aux_position

C axis auxiliary position.

Definition at line 793 of file [gclib_record.h](#).

13.10.2.59 axis_c_velocity

SL GDataRecord1802::axis_c_velocity

C axis velocity.

Definition at line 794 of file [gclib_record.h](#).

13.10.2.60 axis_c_torque

SW GDataRecord1802::axis_c_torque

C axis torque.

Definition at line 795 of file [gclib_record.h](#).

13.10.2.61 axis_c_reserved_0

UB GDataRecord1802::axis_c_reserved_0

Reserved.

Definition at line 796 of file [gclib_record.h](#).

13.10.2.62 axis_c_reserved_1

UB GDataRecord1802::axis_c_reserved_1

Reserved.

Definition at line 797 of file [gclib_record.h](#).

13.10.2.63 axis_d_status

UW GDataRecord1802::axis_d_status

D axis status.

Definition at line 799 of file [gclib_record.h](#).

13.10.2.64 axis_d_switches

UB GDataRecord1802::axis_d_switches

D axis switches.

Definition at line 800 of file [gclib_record.h](#).

13.10.2.65 axis_d_stop_code

UB GDataRecord1802::axis_d_stop_code

D axis stop code.

Definition at line 801 of file [gclib_record.h](#).

13.10.2.66 axis_d_reference_position

SL GDataRecord1802::axis_d_reference_position

D axis reference position.

Definition at line 802 of file [gclib_record.h](#).

13.10.2.67 axis_d_motor_position

SL GDataRecord1802::axis_d_motor_position

D axis motor position.

Definition at line 803 of file [gclib_record.h](#).

13.10.2.68 axis_d_position_error

SL GDataRecord1802::axis_d_position_error

D axis position error.

Definition at line 804 of file [gclib_record.h](#).

13.10.2.69 axis_d_aux_position

SL GDataRecord1802::axis_d_aux_position

D axis auxiliary position.

Definition at line 805 of file [gclib_record.h](#).

13.10.2.70 axis_d_velocity

SL GDataRecord1802::axis_d_velocity

D axis velocity.

Definition at line 806 of file [gclib_record.h](#).

13.10.2.71 axis_d_torque

SW GDataRecord1802::axis_d_torque

D axis torque.

Definition at line 807 of file [gclib_record.h](#).

13.10.2.72 axis_d_reserved_0

UB GDataRecord1802::axis_d_reserved_0

Reserved.

Definition at line 808 of file [gclib_record.h](#).

13.10.2.73 axis_d_reserved_1

UB GDataRecord1802::axis_d_reserved_1

Reserved.

Definition at line 809 of file [gclib_record.h](#).

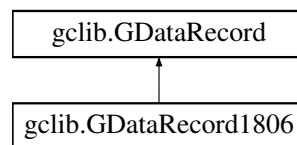
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.11 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 Member Functions inherited from [gclib.GDataRecord](#)**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).

13.11.1 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](#).

13.11.2 Member Function Documentation

13.11.2.1 `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](#).

13.11.3 Member Data Documentation

13.11.3.1 `sample_number`

```
UW gclib.GDataRecord1806.sample_number
```

sample number.

Definition at line 1307 of file [gclib.cs](#).

13.11.3.2 `input_bank_0`

```
UB gclib.GDataRecord1806.input_bank_0
```

general input bank 0 (inputs 1-8).

Definition at line 1309 of file [gclib.cs](#).

13.11.3.3 `input_bank_1`

```
UB gclib.GDataRecord1806.input_bank_1
```

general input bank 1 (inputs 9-16).

Definition at line 1310 of file [gclib.cs](#).

13.11.3.4 `input_bank_2`

```
UB gclib.GDataRecord1806.input_bank_2
```

general input bank 2 (inputs 17-24).

Definition at line 1311 of file [gclib.cs](#).

13.11.3.5 `input_bank_3`

```
UB gclib.GDataRecord1806.input_bank_3
```

general input bank 3 (inputs 25-32).

Definition at line 1312 of file [gclib.cs](#).

13.11.3.6 `input_bank_4`

```
UB gclib.GDataRecord1806.input_bank_4
```

general input bank 4 (inputs 33-40).

Definition at line 1313 of file [gclib.cs](#).

13.11.3.7 input_bank_5

UB `gclib.GDataRecord1806.input_bank_5`
general input bank 5 (inputs 41-48).
Definition at line [1314](#) of file [gclib.cs](#).

13.11.3.8 input_bank_6

UB `gclib.GDataRecord1806.input_bank_6`
general input bank 6 (inputs 49-56).
Definition at line [1315](#) of file [gclib.cs](#).

13.11.3.9 input_bank_7

UB `gclib.GDataRecord1806.input_bank_7`
general input bank 7 (inputs 57-64).
Definition at line [1316](#) of file [gclib.cs](#).

13.11.3.10 input_bank_8

UB `gclib.GDataRecord1806.input_bank_8`
general input bank 8 (inputs 65-72).
Definition at line [1317](#) of file [gclib.cs](#).

13.11.3.11 input_bank_9

UB `gclib.GDataRecord1806.input_bank_9`
general input bank 9 (inputs 73-80).
Definition at line [1318](#) of file [gclib.cs](#).

13.11.3.12 output_bank_0

UB `gclib.GDataRecord1806.output_bank_0`
general output bank 0 (outputs 1-8).
Definition at line [1320](#) of file [gclib.cs](#).

13.11.3.13 output_bank_1

UB `gclib.GDataRecord1806.output_bank_1`
general output bank 1 (outputs 9-16).
Definition at line [1321](#) of file [gclib.cs](#).

13.11.3.14 output_bank_2

UB `gclib.GDataRecord1806.output_bank_2`
general output bank 2 (outputs 17-24).
Definition at line [1322](#) of file [gclib.cs](#).

13.11.3.15 output_bank_3

UB `gclib.GDataRecord1806.output_bank_3`
general output bank 3 (outputs 25-32).
Definition at line [1323](#) of file [gclib.cs](#).

13.11.3.16 output_bank_4

UB `gclib.GDataRecord1806.output_bank_4`
general output bank 4 (outputs 33-40).
Definition at line [1324](#) of file [gclib.cs](#).

13.11.3.17 output_bank_5

UB `gclib.GDataRecord1806.output_bank_5`
general output bank 5 (outputs 41-48).
Definition at line 1325 of file [gclib.cs](#).

13.11.3.18 output_bank_6

UB `gclib.GDataRecord1806.output_bank_6`
general output bank 6 (outputs 49-56).
Definition at line 1326 of file [gclib.cs](#).

13.11.3.19 output_bank_7

UB `gclib.GDataRecord1806.output_bank_7`
general output bank 7 (outputs 57-64).
Definition at line 1327 of file [gclib.cs](#).

13.11.3.20 output_bank_8

UB `gclib.GDataRecord1806.output_bank_8`
general output bank 8 (outputs 65-72).
Definition at line 1328 of file [gclib.cs](#).

13.11.3.21 output_bank_9

UB `gclib.GDataRecord1806.output_bank_9`
general output bank 9 (outputs 73-80).
Definition at line 1329 of file [gclib.cs](#).

13.11.3.22 reserved_0

SW `gclib.GDataRecord1806.reserved_0`
Reserved.
Definition at line 1331 of file [gclib.cs](#).

13.11.3.23 reserved_2

SW `gclib.GDataRecord1806.reserved_2`
Reserved.
Definition at line 1332 of file [gclib.cs](#).

13.11.3.24 reserved_4

SW `gclib.GDataRecord1806.reserved_4`
Reserved.
Definition at line 1333 of file [gclib.cs](#).

13.11.3.25 reserved_6

SW `gclib.GDataRecord1806.reserved_6`
Reserved.
Definition at line 1334 of file [gclib.cs](#).

13.11.3.26 reserved_8

SW `gclib.GDataRecord1806.reserved_8`
Reserved.
Definition at line 1335 of file [gclib.cs](#).

13.11.3.27 reserved_10

SW gclib.GDataRecord1806.reserved_10

Reserved.

Definition at line 1336 of file [gclib.cs](#).

13.11.3.28 reserved_12

SW gclib.GDataRecord1806.reserved_12

Reserved.

Definition at line 1337 of file [gclib.cs](#).

13.11.3.29 reserved_14

SW gclib.GDataRecord1806.reserved_14

Reserved.

Definition at line 1338 of file [gclib.cs](#).

13.11.3.30 reserved_16

UB gclib.GDataRecord1806.reserved_16

Reserved.

Definition at line 1340 of file [gclib.cs](#).

13.11.3.31 reserved_17

UB gclib.GDataRecord1806.reserved_17

Reserved.

Definition at line 1341 of file [gclib.cs](#).

13.11.3.32 reserved_18

UB gclib.GDataRecord1806.reserved_18

Reserved.

Definition at line 1342 of file [gclib.cs](#).

13.11.3.33 reserved_19

UB gclib.GDataRecord1806.reserved_19

Reserved.

Definition at line 1343 of file [gclib.cs](#).

13.11.3.34 reserved_20

UB gclib.GDataRecord1806.reserved_20

Reserved.

Definition at line 1344 of file [gclib.cs](#).

13.11.3.35 reserved_21

UB gclib.GDataRecord1806.reserved_21

Reserved.

Definition at line 1345 of file [gclib.cs](#).

13.11.3.36 reserved_22

UB gclib.GDataRecord1806.reserved_22

Reserved.

Definition at line 1346 of file [gclib.cs](#).

13.11.3.37 reserved_23

UB `gclib.GDataRecord1806.reserved_23`

Reserved.

Definition at line 1347 of file [gclib.cs](#).

13.11.3.38 error_code

UB `gclib.GDataRecord1806.error_code`

error code.

Definition at line 1349 of file [gclib.cs](#).

13.11.3.39 thread_status

UB `gclib.GDataRecord1806.thread_status`

thread status.

Definition at line 1350 of file [gclib.cs](#).

13.11.3.40 reserved_24

UL `gclib.GDataRecord1806.reserved_24`

Reserved.

Definition at line 1351 of file [gclib.cs](#).

13.11.3.41 contour_segment_count

UL `gclib.GDataRecord1806.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 1353 of file [gclib.cs](#).

13.11.3.42 contour_buffer_available

UW `gclib.GDataRecord1806.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 1354 of file [gclib.cs](#).

13.11.3.43 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](#).

13.11.3.44 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](#).

13.11.3.45 s_distance

SL `gclib.GDataRecord1806.s_distance`

distance traveled in coordinated move for S plane.

Definition at line 1358 of file [gclib.cs](#).

13.11.3.46 s_plane_buffer_available

UW `gclib.GDataRecord1806.s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 1359 of file [gclib.cs](#).

13.11.3.47 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](#).

13.11.3.48 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](#).

13.11.3.49 t_distance

SL gclib.GDataRecord1806.t_distance
distance traveled in coordinated move for T plane.
Definition at line 1363 of file [gclib.cs](#).

13.11.3.50 t_plane_buffer_available

UW gclib.GDataRecord1806.t_plane_buffer_available
Buffer space remaining, T Plane.
Definition at line 1364 of file [gclib.cs](#).

13.11.3.51 axis_a_status

UW gclib.GDataRecord1806.axis_a_status
A axis status.
Definition at line 1366 of file [gclib.cs](#).

13.11.3.52 axis_a_switches

UB gclib.GDataRecord1806.axis_a_switches
A axis switches.
Definition at line 1367 of file [gclib.cs](#).

13.11.3.53 axis_a_stop_code

UB gclib.GDataRecord1806.axis_a_stop_code
A axis stop code.
Definition at line 1368 of file [gclib.cs](#).

13.11.3.54 axis_a_reference_position

SL gclib.GDataRecord1806.axis_a_reference_position
A axis reference position.
Definition at line 1369 of file [gclib.cs](#).

13.11.3.55 axis_a_motor_position

SL gclib.GDataRecord1806.axis_a_motor_position
A axis motor position.
Definition at line 1370 of file [gclib.cs](#).

13.11.3.56 axis_a_position_error

SL gclib.GDataRecord1806.axis_a_position_error
A axis position error.
Definition at line 1371 of file [gclib.cs](#).

13.11.3.57 axis_a_aux_position

SL `gclib.GDataRecord1806.axis_a_aux_position`

A axis auxiliary position.

Definition at line 1372 of file [gclib.cs](#).

13.11.3.58 axis_a_velocity

SL `gclib.GDataRecord1806.axis_a_velocity`

A axis velocity.

Definition at line 1373 of file [gclib.cs](#).

13.11.3.59 axis_a_torque

SL `gclib.GDataRecord1806.axis_a_torque`

A axis torque.

Definition at line 1374 of file [gclib.cs](#).

13.11.3.60 axis_a_analog_in

UW `gclib.GDataRecord1806.axis_a_analog_in`

A axis analog input.

Definition at line 1375 of file [gclib.cs](#).

13.11.3.61 axis_a_reserved_0

UB `gclib.GDataRecord1806.axis_a_reserved_0`

Reserved.

Definition at line 1376 of file [gclib.cs](#).

13.11.3.62 axis_a_reserved_1

UB `gclib.GDataRecord1806.axis_a_reserved_1`

Reserved.

Definition at line 1377 of file [gclib.cs](#).

13.11.3.63 axis_a_variable

SL `gclib.GDataRecord1806.axis_a_variable`

A User-defined variable (ZA).

Definition at line 1378 of file [gclib.cs](#).

13.11.3.64 axis_b_status

UW `gclib.GDataRecord1806.axis_b_status`

B axis status.

Definition at line 1380 of file [gclib.cs](#).

13.11.3.65 axis_b_switches

UB `gclib.GDataRecord1806.axis_b_switches`

B axis switches.

Definition at line 1381 of file [gclib.cs](#).

13.11.3.66 axis_b_stop_code

UB `gclib.GDataRecord1806.axis_b_stop_code`

B axis stop code.

Definition at line 1382 of file [gclib.cs](#).

13.11.3.67 axis_b_reference_position

SL gclib.GDataRecord1806.axis_b_reference_position

B axis reference position.

Definition at line 1383 of file [gclib.cs](#).

13.11.3.68 axis_b_motor_position

SL gclib.GDataRecord1806.axis_b_motor_position

B axis motor position.

Definition at line 1384 of file [gclib.cs](#).

13.11.3.69 axis_b_position_error

SL gclib.GDataRecord1806.axis_b_position_error

B axis position error.

Definition at line 1385 of file [gclib.cs](#).

13.11.3.70 axis_b_aux_position

SL gclib.GDataRecord1806.axis_b_aux_position

B axis auxiliary position.

Definition at line 1386 of file [gclib.cs](#).

13.11.3.71 axis_b_velocity

SL gclib.GDataRecord1806.axis_b_velocity

B axis velocity.

Definition at line 1387 of file [gclib.cs](#).

13.11.3.72 axis_b_torque

SL gclib.GDataRecord1806.axis_b_torque

B axis torque.

Definition at line 1388 of file [gclib.cs](#).

13.11.3.73 axis_b_analog_in

UW gclib.GDataRecord1806.axis_b_analog_in

B axis analog input.

Definition at line 1389 of file [gclib.cs](#).

13.11.3.74 axis_b_reserved_0

UB gclib.GDataRecord1806.axis_b_reserved_0

Reserved.

Definition at line 1390 of file [gclib.cs](#).

13.11.3.75 axis_b_reserved_1

UB gclib.GDataRecord1806.axis_b_reserved_1

Reserved.

Definition at line 1391 of file [gclib.cs](#).

13.11.3.76 axis_b_variable

SL gclib.GDataRecord1806.axis_b_variable

B User-defined variable (ZA).

Definition at line 1392 of file [gclib.cs](#).

13.11.3.77 axis_c_status

UW `gclib.GDataRecord1806.axis_c_status`

C axis status.

Definition at line 1394 of file [gclib.cs](#).

13.11.3.78 axis_c_switches

UB `gclib.GDataRecord1806.axis_c_switches`

C axis switches.

Definition at line 1395 of file [gclib.cs](#).

13.11.3.79 axis_c_stop_code

UB `gclib.GDataRecord1806.axis_c_stop_code`

C axis stop code.

Definition at line 1396 of file [gclib.cs](#).

13.11.3.80 axis_c_reference_position

SL `gclib.GDataRecord1806.axis_c_reference_position`

C axis reference position.

Definition at line 1397 of file [gclib.cs](#).

13.11.3.81 axis_c_motor_position

SL `gclib.GDataRecord1806.axis_c_motor_position`

C axis motor position.

Definition at line 1398 of file [gclib.cs](#).

13.11.3.82 axis_c_position_error

SL `gclib.GDataRecord1806.axis_c_position_error`

C axis position error.

Definition at line 1399 of file [gclib.cs](#).

13.11.3.83 axis_c_aux_position

SL `gclib.GDataRecord1806.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1400 of file [gclib.cs](#).

13.11.3.84 axis_c_velocity

SL `gclib.GDataRecord1806.axis_c_velocity`

C axis velocity.

Definition at line 1401 of file [gclib.cs](#).

13.11.3.85 axis_c_torque

SL `gclib.GDataRecord1806.axis_c_torque`

C axis torque.

Definition at line 1402 of file [gclib.cs](#).

13.11.3.86 axis_c_analog_in

UW `gclib.GDataRecord1806.axis_c_analog_in`

C axis analog input.

Definition at line 1403 of file [gclib.cs](#).

13.11.3.87 axis_c_reserved_0

UB gclib.GDataRecord1806.axis_c_reserved_0

Reserved.

Definition at line 1404 of file [gclib.cs](#).

13.11.3.88 axis_c_reserved_1

UB gclib.GDataRecord1806.axis_c_reserved_1

Reserved.

Definition at line 1405 of file [gclib.cs](#).

13.11.3.89 axis_c_variable

SL gclib.GDataRecord1806.axis_c_variable

C User-defined variable (ZA).

Definition at line 1406 of file [gclib.cs](#).

13.11.3.90 axis_d_status

UW gclib.GDataRecord1806.axis_d_status

D axis status.

Definition at line 1408 of file [gclib.cs](#).

13.11.3.91 axis_d_switches

UB gclib.GDataRecord1806.axis_d_switches

D axis switches.

Definition at line 1409 of file [gclib.cs](#).

13.11.3.92 axis_d_stop_code

UB gclib.GDataRecord1806.axis_d_stop_code

D axis stop code.

Definition at line 1410 of file [gclib.cs](#).

13.11.3.93 axis_d_reference_position

SL gclib.GDataRecord1806.axis_d_reference_position

D axis reference position.

Definition at line 1411 of file [gclib.cs](#).

13.11.3.94 axis_d_motor_position

SL gclib.GDataRecord1806.axis_d_motor_position

D axis motor position.

Definition at line 1412 of file [gclib.cs](#).

13.11.3.95 axis_d_position_error

SL gclib.GDataRecord1806.axis_d_position_error

D axis position error.

Definition at line 1413 of file [gclib.cs](#).

13.11.3.96 axis_d_aux_position

SL gclib.GDataRecord1806.axis_d_aux_position

D axis auxiliary position.

Definition at line 1414 of file [gclib.cs](#).

13.11.3.97 axis_d_velocity

SL `gclib.GDataRecord1806.axis_d_velocity`

D axis velocity.

Definition at line 1415 of file [gclib.cs](#).

13.11.3.98 axis_d_torque

SL `gclib.GDataRecord1806.axis_d_torque`

D axis torque.

Definition at line 1416 of file [gclib.cs](#).

13.11.3.99 axis_d_analog_in

UW `gclib.GDataRecord1806.axis_d_analog_in`

D axis analog input.

Definition at line 1417 of file [gclib.cs](#).

13.11.3.100 axis_d_reserved_0

UB `gclib.GDataRecord1806.axis_d_reserved_0`

Reserved.

Definition at line 1418 of file [gclib.cs](#).

13.11.3.101 axis_d_reserved_1

UB `gclib.GDataRecord1806.axis_d_reserved_1`

Reserved.

Definition at line 1419 of file [gclib.cs](#).

13.11.3.102 axis_d_variable

SL `gclib.GDataRecord1806.axis_d_variable`

D User-defined variable (ZA).

Definition at line 1420 of file [gclib.cs](#).

13.11.3.103 axis_e_status

UW `gclib.GDataRecord1806.axis_e_status`

E axis status.

Definition at line 1422 of file [gclib.cs](#).

13.11.3.104 axis_e_switches

UB `gclib.GDataRecord1806.axis_e_switches`

E axis switches.

Definition at line 1423 of file [gclib.cs](#).

13.11.3.105 axis_e_stop_code

UB `gclib.GDataRecord1806.axis_e_stop_code`

E axis stop code.

Definition at line 1424 of file [gclib.cs](#).

13.11.3.106 axis_e_reference_position

SL `gclib.GDataRecord1806.axis_e_reference_position`

E axis reference position.

Definition at line 1425 of file [gclib.cs](#).

13.11.3.107 axis_e_motor_position

SL gclib.GDataRecord1806.axis_e_motor_position

E axis motor position.

Definition at line 1426 of file [gclib.cs](#).

13.11.3.108 axis_e_position_error

SL gclib.GDataRecord1806.axis_e_position_error

E axis position error.

Definition at line 1427 of file [gclib.cs](#).

13.11.3.109 axis_e_aux_position

SL gclib.GDataRecord1806.axis_e_aux_position

E axis auxiliary position.

Definition at line 1428 of file [gclib.cs](#).

13.11.3.110 axis_e_velocity

SL gclib.GDataRecord1806.axis_e_velocity

E axis velocity.

Definition at line 1429 of file [gclib.cs](#).

13.11.3.111 axis_e_torque

SL gclib.GDataRecord1806.axis_e_torque

E axis torque.

Definition at line 1430 of file [gclib.cs](#).

13.11.3.112 axis_e_analog_in

UW gclib.GDataRecord1806.axis_e_analog_in

E axis analog input.

Definition at line 1431 of file [gclib.cs](#).

13.11.3.113 axis_e_reserved_0

UB gclib.GDataRecord1806.axis_e_reserved_0

Reserved.

Definition at line 1432 of file [gclib.cs](#).

13.11.3.114 axis_e_reserved_1

UB gclib.GDataRecord1806.axis_e_reserved_1

Reserved.

Definition at line 1433 of file [gclib.cs](#).

13.11.3.115 axis_e_variable

SL gclib.GDataRecord1806.axis_e_variable

E User-defined variable (ZA).

Definition at line 1434 of file [gclib.cs](#).

13.11.3.116 axis_f_status

UW gclib.GDataRecord1806.axis_f_status

F axis status.

Definition at line 1436 of file [gclib.cs](#).

13.11.3.117 axis_f_switches

UB `gclib.GDataRecord1806.axis_f_switches`

F axis switches.

Definition at line 1437 of file [gclib.cs](#).

13.11.3.118 axis_f_stop_code

UB `gclib.GDataRecord1806.axis_f_stop_code`

F axis stop code.

Definition at line 1438 of file [gclib.cs](#).

13.11.3.119 axis_f_reference_position

SL `gclib.GDataRecord1806.axis_f_reference_position`

F axis reference position.

Definition at line 1439 of file [gclib.cs](#).

13.11.3.120 axis_f_motor_position

SL `gclib.GDataRecord1806.axis_f_motor_position`

F axis motor position.

Definition at line 1440 of file [gclib.cs](#).

13.11.3.121 axis_f_position_error

SL `gclib.GDataRecord1806.axis_f_position_error`

F axis position error.

Definition at line 1441 of file [gclib.cs](#).

13.11.3.122 axis_f_aux_position

SL `gclib.GDataRecord1806.axis_f_aux_position`

F axis auxiliary position.

Definition at line 1442 of file [gclib.cs](#).

13.11.3.123 axis_f_velocity

SL `gclib.GDataRecord1806.axis_f_velocity`

F axis velocity.

Definition at line 1443 of file [gclib.cs](#).

13.11.3.124 axis_f_torque

SL `gclib.GDataRecord1806.axis_f_torque`

F axis torque.

Definition at line 1444 of file [gclib.cs](#).

13.11.3.125 axis_f_analog_in

UW `gclib.GDataRecord1806.axis_f_analog_in`

F axis analog input.

Definition at line 1445 of file [gclib.cs](#).

13.11.3.126 axis_f_reserved_0

UB `gclib.GDataRecord1806.axis_f_reserved_0`

Reserved.

Definition at line 1446 of file [gclib.cs](#).

13.11.3.127 axis_f_reserved_1

UB gclib.GDataRecord1806.axis_f_reserved_1

Reserved.

Definition at line 1447 of file [gclib.cs](#).

13.11.3.128 axis_f_variable

SL gclib.GDataRecord1806.axis_f_variable

F User-defined variable (ZA).

Definition at line 1448 of file [gclib.cs](#).

13.11.3.129 axis_g_status

UW gclib.GDataRecord1806.axis_g_status

G axis status.

Definition at line 1450 of file [gclib.cs](#).

13.11.3.130 axis_g_switches

UB gclib.GDataRecord1806.axis_g_switches

G axis switches.

Definition at line 1451 of file [gclib.cs](#).

13.11.3.131 axis_g_stop_code

UB gclib.GDataRecord1806.axis_g_stop_code

G axis stop code.

Definition at line 1452 of file [gclib.cs](#).

13.11.3.132 axis_g_reference_position

SL gclib.GDataRecord1806.axis_g_reference_position

G axis reference position.

Definition at line 1453 of file [gclib.cs](#).

13.11.3.133 axis_g_motor_position

SL gclib.GDataRecord1806.axis_g_motor_position

G axis motor position.

Definition at line 1454 of file [gclib.cs](#).

13.11.3.134 axis_g_position_error

SL gclib.GDataRecord1806.axis_g_position_error

G axis position error.

Definition at line 1455 of file [gclib.cs](#).

13.11.3.135 axis_g_aux_position

SL gclib.GDataRecord1806.axis_g_aux_position

G axis auxiliary position.

Definition at line 1456 of file [gclib.cs](#).

13.11.3.136 axis_g_velocity

SL gclib.GDataRecord1806.axis_g_velocity

G axis velocity.

Definition at line 1457 of file [gclib.cs](#).

13.11.3.137 axis_g_torque

SL `gclib.GDataRecord1806.axis_g_torque`

G axis torque.

Definition at line 1458 of file [gclib.cs](#).

13.11.3.138 axis_g_analog_in

UW `gclib.GDataRecord1806.axis_g_analog_in`

G axis analog input.

Definition at line 1459 of file [gclib.cs](#).

13.11.3.139 axis_g_reserved_0

UB `gclib.GDataRecord1806.axis_g_reserved_0`

Reserved.

Definition at line 1460 of file [gclib.cs](#).

13.11.3.140 axis_g_reserved_1

UB `gclib.GDataRecord1806.axis_g_reserved_1`

Reserved.

Definition at line 1461 of file [gclib.cs](#).

13.11.3.141 axis_g_variable

SL `gclib.GDataRecord1806.axis_g_variable`

G User-defined variable (ZA).

Definition at line 1462 of file [gclib.cs](#).

13.11.3.142 axis_h_status

UW `gclib.GDataRecord1806.axis_h_status`

H axis status.

Definition at line 1464 of file [gclib.cs](#).

13.11.3.143 axis_h_switches

UB `gclib.GDataRecord1806.axis_h_switches`

H axis switches.

Definition at line 1465 of file [gclib.cs](#).

13.11.3.144 axis_h_stop_code

UB `gclib.GDataRecord1806.axis_h_stop_code`

H axis stop code.

Definition at line 1466 of file [gclib.cs](#).

13.11.3.145 axis_h_reference_position

SL `gclib.GDataRecord1806.axis_h_reference_position`

H axis reference position.

Definition at line 1467 of file [gclib.cs](#).

13.11.3.146 axis_h_motor_position

SL `gclib.GDataRecord1806.axis_h_motor_position`

H axis motor position.

Definition at line 1468 of file [gclib.cs](#).

13.11.3.147 axis_h_position_error

SL `gclib.GDataRecord1806.axis_h_position_error`

H axis position error.

Definition at line 1469 of file [gclib.cs](#).

13.11.3.148 axis_h_aux_position

SL `gclib.GDataRecord1806.axis_h_aux_position`

H axis auxiliary position.

Definition at line 1470 of file [gclib.cs](#).

13.11.3.149 axis_h_velocity

SL `gclib.GDataRecord1806.axis_h_velocity`

H axis velocity.

Definition at line 1471 of file [gclib.cs](#).

13.11.3.150 axis_h_torque

SL `gclib.GDataRecord1806.axis_h_torque`

H axis torque.

Definition at line 1472 of file [gclib.cs](#).

13.11.3.151 axis_h_analog_in

UW `gclib.GDataRecord1806.axis_h_analog_in`

H axis analog input.

Definition at line 1473 of file [gclib.cs](#).

13.11.3.152 axis_h_reserved_0

UB `gclib.GDataRecord1806.axis_h_reserved_0`

Reserved.

Definition at line 1474 of file [gclib.cs](#).

13.11.3.153 axis_h_reserved_1

UB `gclib.GDataRecord1806.axis_h_reserved_1`

Reserved.

Definition at line 1475 of file [gclib.cs](#).

13.11.3.154 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](#)

13.12 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).

13.12.1 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 [405](#) of file [gclib_record.h](#).

13.12.2 Member Data Documentation

13.12.2.1 sample_number

UB `GDataRecord1806::sample_number`
sample number.

Definition at line [409](#) of file [gclib_record.h](#).

13.12.2.2 input_bank_0

UB `GDataRecord1806::input_bank_0`
general input bank 0 (inputs 1-8).

Definition at line [411](#) of file [gclib_record.h](#).

13.12.2.3 input_bank_1

UB `GDataRecord1806::input_bank_1`
general input bank 1 (inputs 9-16).

Definition at line [412](#) of file [gclib_record.h](#).

13.12.2.4 input_bank_2

UB `GDataRecord1806::input_bank_2`
general input bank 2 (inputs 17-24).

Definition at line [413](#) of file [gclib_record.h](#).

13.12.2.5 input_bank_3

UB `GDataRecord1806::input_bank_3`
general input bank 3 (inputs 25-32).

Definition at line [414](#) of file [gclib_record.h](#).

13.12.2.6 input_bank_4

UB `GDataRecord1806::input_bank_4`
general input bank 4 (inputs 33-40).

Definition at line [415](#) of file [gclib_record.h](#).

13.12.2.7 input_bank_5

UB GDataRecord1806::input_bank_5
general input bank 5 (inputs 41-48).
Definition at line 416 of file [gclib_record.h](#).

13.12.2.8 input_bank_6

UB GDataRecord1806::input_bank_6
general input bank 6 (inputs 49-56).
Definition at line 417 of file [gclib_record.h](#).

13.12.2.9 input_bank_7

UB GDataRecord1806::input_bank_7
general input bank 7 (inputs 57-64).
Definition at line 418 of file [gclib_record.h](#).

13.12.2.10 input_bank_8

UB GDataRecord1806::input_bank_8
general input bank 8 (inputs 65-72).
Definition at line 419 of file [gclib_record.h](#).

13.12.2.11 input_bank_9

UB GDataRecord1806::input_bank_9
general input bank 9 (inputs 73-80).
Definition at line 420 of file [gclib_record.h](#).

13.12.2.12 output_bank_0

UB GDataRecord1806::output_bank_0
general output bank 0 (outputs 1-8).
Definition at line 422 of file [gclib_record.h](#).

13.12.2.13 output_bank_1

UB GDataRecord1806::output_bank_1
general output bank 1 (outputs 9-16).
Definition at line 423 of file [gclib_record.h](#).

13.12.2.14 output_bank_2

UB GDataRecord1806::output_bank_2
general output bank 2 (outputs 17-24).
Definition at line 424 of file [gclib_record.h](#).

13.12.2.15 output_bank_3

UB GDataRecord1806::output_bank_3
general output bank 3 (outputs 25-32).
Definition at line 425 of file [gclib_record.h](#).

13.12.2.16 output_bank_4

UB GDataRecord1806::output_bank_4
general output bank 4 (outputs 33-40).
Definition at line 426 of file [gclib_record.h](#).

13.12.2.17 output_bank_5

UB GDataRecord1806::output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 427 of file [gclib_record.h](#).

13.12.2.18 output_bank_6

UB GDataRecord1806::output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 428 of file [gclib_record.h](#).

13.12.2.19 output_bank_7

UB GDataRecord1806::output_bank_7
general output bank 7 (outputs 57-64).
Definition at line 429 of file [gclib_record.h](#).

13.12.2.20 output_bank_8

UB GDataRecord1806::output_bank_8
general output bank 8 (outputs 65-72).
Definition at line 430 of file [gclib_record.h](#).

13.12.2.21 output_bank_9

UB GDataRecord1806::output_bank_9
general output bank 9 (outputs 73-80).
Definition at line 431 of file [gclib_record.h](#).

13.12.2.22 reserved_0

SW GDataRecord1806::reserved_0
Reserved.
Definition at line 433 of file [gclib_record.h](#).

13.12.2.23 reserved_2

SW GDataRecord1806::reserved_2
Reserved.
Definition at line 434 of file [gclib_record.h](#).

13.12.2.24 reserved_4

SW GDataRecord1806::reserved_4
Reserved.
Definition at line 435 of file [gclib_record.h](#).

13.12.2.25 reserved_6

SW GDataRecord1806::reserved_6
Reserved.
Definition at line 436 of file [gclib_record.h](#).

13.12.2.26 reserved_8

SW GDataRecord1806::reserved_8
Reserved.
Definition at line 437 of file [gclib_record.h](#).

13.12.2.27 reserved_10

SW GDataRecord1806::reserved_10

Reserved.

Definition at line 438 of file [gclib_record.h](#).

13.12.2.28 reserved_12

SW GDataRecord1806::reserved_12

Reserved.

Definition at line 439 of file [gclib_record.h](#).

13.12.2.29 reserved_14

SW GDataRecord1806::reserved_14

Reserved.

Definition at line 440 of file [gclib_record.h](#).

13.12.2.30 reserved_16

UB GDataRecord1806::reserved_16

Reserved.

Definition at line 442 of file [gclib_record.h](#).

13.12.2.31 reserved_17

UB GDataRecord1806::reserved_17

Reserved.

Definition at line 443 of file [gclib_record.h](#).

13.12.2.32 reserved_18

UB GDataRecord1806::reserved_18

Reserved.

Definition at line 444 of file [gclib_record.h](#).

13.12.2.33 reserved_19

UB GDataRecord1806::reserved_19

Reserved.

Definition at line 445 of file [gclib_record.h](#).

13.12.2.34 reserved_20

UB GDataRecord1806::reserved_20

Reserved.

Definition at line 446 of file [gclib_record.h](#).

13.12.2.35 reserved_21

UB GDataRecord1806::reserved_21

Reserved.

Definition at line 447 of file [gclib_record.h](#).

13.12.2.36 reserved_22

UB GDataRecord1806::reserved_22

Reserved.

Definition at line 448 of file [gclib_record.h](#).

13.12.2.37 reserved_23

UB GDataRecord1806::reserved_23

Reserved.

Definition at line 449 of file [gclib_record.h](#).

13.12.2.38 error_code

UB GDataRecord1806::error_code

error code.

Definition at line 451 of file [gclib_record.h](#).

13.12.2.39 thread_status

UB GDataRecord1806::thread_status

thread status.

Definition at line 452 of file [gclib_record.h](#).

13.12.2.40 reserved_24

UL GDataRecord1806::reserved_24

Reserved.

Definition at line 453 of file [gclib_record.h](#).

13.12.2.41 contour_segment_count

UL GDataRecord1806::contour_segment_count

Segment Count for Contour Mode.

Definition at line 455 of file [gclib_record.h](#).

13.12.2.42 contour_buffer_available

UW GDataRecord1806::contour_buffer_available

Buffer space remaining, Contour Mode.

Definition at line 456 of file [gclib_record.h](#).

13.12.2.43 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](#).

13.12.2.44 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](#).

13.12.2.45 s_distance

SL GDataRecord1806::s_distance

distance traveled in coordinated move for S plane.

Definition at line 460 of file [gclib_record.h](#).

13.12.2.46 s_plane_buffer_available

UW GDataRecord1806::s_plane_buffer_available

Buffer space remaining, S Plane.

Definition at line 461 of file [gclib_record.h](#).

13.12.2.47 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](#).

13.12.2.48 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](#).

13.12.2.49 t_distance

SL GDataRecord1806::t_distance
distance traveled in coordinated move for T plane.
Definition at line 465 of file [gclib_record.h](#).

13.12.2.50 t_plane_buffer_available

UW GDataRecord1806::t_plane_buffer_available
Buffer space remaining, T Plane.
Definition at line 466 of file [gclib_record.h](#).

13.12.2.51 axis_a_status

UW GDataRecord1806::axis_a_status
A axis status.
Definition at line 468 of file [gclib_record.h](#).

13.12.2.52 axis_a_switches

UB GDataRecord1806::axis_a_switches
A axis switches.
Definition at line 469 of file [gclib_record.h](#).

13.12.2.53 axis_a_stop_code

UB GDataRecord1806::axis_a_stop_code
A axis stop code.
Definition at line 470 of file [gclib_record.h](#).

13.12.2.54 axis_a_reference_position

SL GDataRecord1806::axis_a_reference_position
A axis reference position.
Definition at line 471 of file [gclib_record.h](#).

13.12.2.55 axis_a_motor_position

SL GDataRecord1806::axis_a_motor_position
A axis motor position.
Definition at line 472 of file [gclib_record.h](#).

13.12.2.56 axis_a_position_error

SL GDataRecord1806::axis_a_position_error
A axis position error.
Definition at line 473 of file [gclib_record.h](#).

13.12.2.57 axis_a_aux_position

SL GDataRecord1806::axis_a_aux_position

A axis auxiliary position.

Definition at line 474 of file [gclib_record.h](#).

13.12.2.58 axis_a_velocity

SL GDataRecord1806::axis_a_velocity

A axis velocity.

Definition at line 475 of file [gclib_record.h](#).

13.12.2.59 axis_a_torque

SL GDataRecord1806::axis_a_torque

A axis torque.

Definition at line 476 of file [gclib_record.h](#).

13.12.2.60 axis_a_analog_in

UW GDataRecord1806::axis_a_analog_in

A axis analog input.

Definition at line 477 of file [gclib_record.h](#).

13.12.2.61 axis_a_reserved_0

UB GDataRecord1806::axis_a_reserved_0

Reserved.

Definition at line 478 of file [gclib_record.h](#).

13.12.2.62 axis_a_reserved_1

UB GDataRecord1806::axis_a_reserved_1

Reserved.

Definition at line 479 of file [gclib_record.h](#).

13.12.2.63 axis_a_variable

SL GDataRecord1806::axis_a_variable

A User-defined variable (ZA).

Definition at line 480 of file [gclib_record.h](#).

13.12.2.64 axis_b_status

UW GDataRecord1806::axis_b_status

B axis status.

Definition at line 482 of file [gclib_record.h](#).

13.12.2.65 axis_b_switches

UB GDataRecord1806::axis_b_switches

B axis switches.

Definition at line 483 of file [gclib_record.h](#).

13.12.2.66 axis_b_stop_code

UB GDataRecord1806::axis_b_stop_code

B axis stop code.

Definition at line 484 of file [gclib_record.h](#).

13.12.2.67 axis_b_reference_position

SL GDataRecord1806::axis_b_reference_position

B axis reference position.

Definition at line 485 of file [gclib_record.h](#).

13.12.2.68 axis_b_motor_position

SL GDataRecord1806::axis_b_motor_position

B axis motor position.

Definition at line 486 of file [gclib_record.h](#).

13.12.2.69 axis_b_position_error

SL GDataRecord1806::axis_b_position_error

B axis position error.

Definition at line 487 of file [gclib_record.h](#).

13.12.2.70 axis_b_aux_position

SL GDataRecord1806::axis_b_aux_position

B axis auxiliary position.

Definition at line 488 of file [gclib_record.h](#).

13.12.2.71 axis_b_velocity

SL GDataRecord1806::axis_b_velocity

B axis velocity.

Definition at line 489 of file [gclib_record.h](#).

13.12.2.72 axis_b_torque

SL GDataRecord1806::axis_b_torque

B axis torque.

Definition at line 490 of file [gclib_record.h](#).

13.12.2.73 axis_b_analog_in

UW GDataRecord1806::axis_b_analog_in

B axis analog input.

Definition at line 491 of file [gclib_record.h](#).

13.12.2.74 axis_b_reserved_0

UB GDataRecord1806::axis_b_reserved_0

Reserved.

Definition at line 492 of file [gclib_record.h](#).

13.12.2.75 axis_b_reserved_1

UB GDataRecord1806::axis_b_reserved_1

Reserved.

Definition at line 493 of file [gclib_record.h](#).

13.12.2.76 axis_b_variable

SL GDataRecord1806::axis_b_variable

B User-defined variable (ZA).

Definition at line 494 of file [gclib_record.h](#).

13.12.2.77 axis_c_status

UW GDataRecord1806::axis_c_status

C axis status.

Definition at line 496 of file [gclib_record.h](#).

13.12.2.78 axis_c_switches

UB GDataRecord1806::axis_c_switches

C axis switches.

Definition at line 497 of file [gclib_record.h](#).

13.12.2.79 axis_c_stop_code

UB GDataRecord1806::axis_c_stop_code

C axis stop code.

Definition at line 498 of file [gclib_record.h](#).

13.12.2.80 axis_c_reference_position

SL GDataRecord1806::axis_c_reference_position

C axis reference position.

Definition at line 499 of file [gclib_record.h](#).

13.12.2.81 axis_c_motor_position

SL GDataRecord1806::axis_c_motor_position

C axis motor position.

Definition at line 500 of file [gclib_record.h](#).

13.12.2.82 axis_c_position_error

SL GDataRecord1806::axis_c_position_error

C axis position error.

Definition at line 501 of file [gclib_record.h](#).

13.12.2.83 axis_c_aux_position

SL GDataRecord1806::axis_c_aux_position

C axis auxiliary position.

Definition at line 502 of file [gclib_record.h](#).

13.12.2.84 axis_c_velocity

SL GDataRecord1806::axis_c_velocity

C axis velocity.

Definition at line 503 of file [gclib_record.h](#).

13.12.2.85 axis_c_torque

SL GDataRecord1806::axis_c_torque

C axis torque.

Definition at line 504 of file [gclib_record.h](#).

13.12.2.86 axis_c_analog_in

UW GDataRecord1806::axis_c_analog_in

C axis analog input.

Definition at line 505 of file [gclib_record.h](#).

13.12.2.87 axis_c_reserved_0

UB GDataRecord1806::axis_c_reserved_0
Reserved.
Definition at line 506 of file [gclib_record.h](#).

13.12.2.88 axis_c_reserved_1

UB GDataRecord1806::axis_c_reserved_1
Reserved.
Definition at line 507 of file [gclib_record.h](#).

13.12.2.89 axis_c_variable

SL GDataRecord1806::axis_c_variable
C User-defined variable (ZA).
Definition at line 508 of file [gclib_record.h](#).

13.12.2.90 axis_d_status

UW GDataRecord1806::axis_d_status
D axis status.
Definition at line 510 of file [gclib_record.h](#).

13.12.2.91 axis_d_switches

UB GDataRecord1806::axis_d_switches
D axis switches.
Definition at line 511 of file [gclib_record.h](#).

13.12.2.92 axis_d_stop_code

UB GDataRecord1806::axis_d_stop_code
D axis stop code.
Definition at line 512 of file [gclib_record.h](#).

13.12.2.93 axis_d_reference_position

SL GDataRecord1806::axis_d_reference_position
D axis reference position.
Definition at line 513 of file [gclib_record.h](#).

13.12.2.94 axis_d_motor_position

SL GDataRecord1806::axis_d_motor_position
D axis motor position.
Definition at line 514 of file [gclib_record.h](#).

13.12.2.95 axis_d_position_error

SL GDataRecord1806::axis_d_position_error
D axis position error.
Definition at line 515 of file [gclib_record.h](#).

13.12.2.96 axis_d_aux_position

SL GDataRecord1806::axis_d_aux_position
D axis auxiliary position.
Definition at line 516 of file [gclib_record.h](#).

13.12.2.97 axis_d_velocity

SL GDataRecord1806::axis_d_velocity

D axis velocity.

Definition at line 517 of file [gclib_record.h](#).

13.12.2.98 axis_d_torque

SL GDataRecord1806::axis_d_torque

D axis torque.

Definition at line 518 of file [gclib_record.h](#).

13.12.2.99 axis_d_analog_in

UW GDataRecord1806::axis_d_analog_in

D axis analog input.

Definition at line 519 of file [gclib_record.h](#).

13.12.2.100 axis_d_reserved_0

UB GDataRecord1806::axis_d_reserved_0

Reserved.

Definition at line 520 of file [gclib_record.h](#).

13.12.2.101 axis_d_reserved_1

UB GDataRecord1806::axis_d_reserved_1

Reserved.

Definition at line 521 of file [gclib_record.h](#).

13.12.2.102 axis_d_variable

SL GDataRecord1806::axis_d_variable

D User-defined variable (ZA).

Definition at line 522 of file [gclib_record.h](#).

13.12.2.103 axis_e_status

UW GDataRecord1806::axis_e_status

E axis status.

Definition at line 524 of file [gclib_record.h](#).

13.12.2.104 axis_e_switches

UB GDataRecord1806::axis_e_switches

E axis switches.

Definition at line 525 of file [gclib_record.h](#).

13.12.2.105 axis_e_stop_code

UB GDataRecord1806::axis_e_stop_code

E axis stop code.

Definition at line 526 of file [gclib_record.h](#).

13.12.2.106 axis_e_reference_position

SL GDataRecord1806::axis_e_reference_position

E axis reference position.

Definition at line 527 of file [gclib_record.h](#).

13.12.2.107 axis_e_motor_position

SL GDataRecord1806::axis_e_motor_position

E axis motor position.

Definition at line 528 of file [gclib_record.h](#).

13.12.2.108 axis_e_position_error

SL GDataRecord1806::axis_e_position_error

E axis position error.

Definition at line 529 of file [gclib_record.h](#).

13.12.2.109 axis_e_aux_position

SL GDataRecord1806::axis_e_aux_position

E axis auxiliary position.

Definition at line 530 of file [gclib_record.h](#).

13.12.2.110 axis_e_velocity

SL GDataRecord1806::axis_e_velocity

E axis velocity.

Definition at line 531 of file [gclib_record.h](#).

13.12.2.111 axis_e_torque

SL GDataRecord1806::axis_e_torque

E axis torque.

Definition at line 532 of file [gclib_record.h](#).

13.12.2.112 axis_e_analog_in

UW GDataRecord1806::axis_e_analog_in

E axis analog input.

Definition at line 533 of file [gclib_record.h](#).

13.12.2.113 axis_e_reserved_0

UB GDataRecord1806::axis_e_reserved_0

Reserved.

Definition at line 534 of file [gclib_record.h](#).

13.12.2.114 axis_e_reserved_1

UB GDataRecord1806::axis_e_reserved_1

Reserved.

Definition at line 535 of file [gclib_record.h](#).

13.12.2.115 axis_e_variable

SL GDataRecord1806::axis_e_variable

E User-defined variable (ZA).

Definition at line 536 of file [gclib_record.h](#).

13.12.2.116 axis_f_status

UW GDataRecord1806::axis_f_status

F axis status.

Definition at line 538 of file [gclib_record.h](#).

13.12.2.117 axis_f_switches

UB GDataRecord1806::axis_f_switches

F axis switches.

Definition at line 539 of file [gclib_record.h](#).

13.12.2.118 axis_f_stop_code

UB GDataRecord1806::axis_f_stop_code

F axis stop code.

Definition at line 540 of file [gclib_record.h](#).

13.12.2.119 axis_f_reference_position

SL GDataRecord1806::axis_f_reference_position

F axis reference position.

Definition at line 541 of file [gclib_record.h](#).

13.12.2.120 axis_f_motor_position

SL GDataRecord1806::axis_f_motor_position

F axis motor position.

Definition at line 542 of file [gclib_record.h](#).

13.12.2.121 axis_f_position_error

SL GDataRecord1806::axis_f_position_error

F axis position error.

Definition at line 543 of file [gclib_record.h](#).

13.12.2.122 axis_f_aux_position

SL GDataRecord1806::axis_f_aux_position

F axis auxiliary position.

Definition at line 544 of file [gclib_record.h](#).

13.12.2.123 axis_f_velocity

SL GDataRecord1806::axis_f_velocity

F axis velocity.

Definition at line 545 of file [gclib_record.h](#).

13.12.2.124 axis_f_torque

SL GDataRecord1806::axis_f_torque

F axis torque.

Definition at line 546 of file [gclib_record.h](#).

13.12.2.125 axis_f_analog_in

UW GDataRecord1806::axis_f_analog_in

F axis analog input.

Definition at line 547 of file [gclib_record.h](#).

13.12.2.126 axis_f_reserved_0

UB GDataRecord1806::axis_f_reserved_0

Reserved.

Definition at line 548 of file [gclib_record.h](#).

13.12.2.127 axis_f_reserved_1

UB GDataRecord1806::axis_f_reserved_1

Reserved.

Definition at line 549 of file [gclib_record.h](#).

13.12.2.128 axis_f_variable

SL GDataRecord1806::axis_f_variable

F User-defined variable (ZA).

Definition at line 550 of file [gclib_record.h](#).

13.12.2.129 axis_g_status

UW GDataRecord1806::axis_g_status

G axis status.

Definition at line 552 of file [gclib_record.h](#).

13.12.2.130 axis_g_switches

UB GDataRecord1806::axis_g_switches

G axis switches.

Definition at line 553 of file [gclib_record.h](#).

13.12.2.131 axis_g_stop_code

UB GDataRecord1806::axis_g_stop_code

G axis stop code.

Definition at line 554 of file [gclib_record.h](#).

13.12.2.132 axis_g_reference_position

SL GDataRecord1806::axis_g_reference_position

G axis reference position.

Definition at line 555 of file [gclib_record.h](#).

13.12.2.133 axis_g_motor_position

SL GDataRecord1806::axis_g_motor_position

G axis motor position.

Definition at line 556 of file [gclib_record.h](#).

13.12.2.134 axis_g_position_error

SL GDataRecord1806::axis_g_position_error

G axis position error.

Definition at line 557 of file [gclib_record.h](#).

13.12.2.135 axis_g_aux_position

SL GDataRecord1806::axis_g_aux_position

G axis auxiliary position.

Definition at line 558 of file [gclib_record.h](#).

13.12.2.136 axis_g_velocity

SL GDataRecord1806::axis_g_velocity

G axis velocity.

Definition at line 559 of file [gclib_record.h](#).

13.12.2.137 axis_g_torque

SL GDataRecord1806::axis_g_torque

G axis torque.

Definition at line 560 of file [gclib_record.h](#).

13.12.2.138 axis_g_analog_in

UW GDataRecord1806::axis_g_analog_in

G axis analog input.

Definition at line 561 of file [gclib_record.h](#).

13.12.2.139 axis_g_reserved_0

UB GDataRecord1806::axis_g_reserved_0

Reserved.

Definition at line 562 of file [gclib_record.h](#).

13.12.2.140 axis_g_reserved_1

UB GDataRecord1806::axis_g_reserved_1

Reserved.

Definition at line 563 of file [gclib_record.h](#).

13.12.2.141 axis_g_variable

SL GDataRecord1806::axis_g_variable

G User-defined variable (ZA).

Definition at line 564 of file [gclib_record.h](#).

13.12.2.142 axis_h_status

UW GDataRecord1806::axis_h_status

H axis status.

Definition at line 566 of file [gclib_record.h](#).

13.12.2.143 axis_h_switches

UB GDataRecord1806::axis_h_switches

H axis switches.

Definition at line 567 of file [gclib_record.h](#).

13.12.2.144 axis_h_stop_code

UB GDataRecord1806::axis_h_stop_code

H axis stop code.

Definition at line 568 of file [gclib_record.h](#).

13.12.2.145 axis_h_reference_position

SL GDataRecord1806::axis_h_reference_position

H axis reference position.

Definition at line 569 of file [gclib_record.h](#).

13.12.2.146 axis_h_motor_position

SL GDataRecord1806::axis_h_motor_position

H axis motor position.

Definition at line 570 of file [gclib_record.h](#).

13.12.2.147 axis_h_position_error

SL GDataRecord1806::axis_h_position_error

H axis position error.

Definition at line 571 of file [gclib_record.h](#).

13.12.2.148 axis_h_aux_position

SL GDataRecord1806::axis_h_aux_position

H axis auxiliary position.

Definition at line 572 of file [gclib_record.h](#).

13.12.2.149 axis_h_velocity

SL GDataRecord1806::axis_h_velocity

H axis velocity.

Definition at line 573 of file [gclib_record.h](#).

13.12.2.150 axis_h_torque

SL GDataRecord1806::axis_h_torque

H axis torque.

Definition at line 574 of file [gclib_record.h](#).

13.12.2.151 axis_h_analog_in

UW GDataRecord1806::axis_h_analog_in

H axis analog input.

Definition at line 575 of file [gclib_record.h](#).

13.12.2.152 axis_h_reserved_0

UB GDataRecord1806::axis_h_reserved_0

Reserved.

Definition at line 576 of file [gclib_record.h](#).

13.12.2.153 axis_h_reserved_1

UB GDataRecord1806::axis_h_reserved_1

Reserved.

Definition at line 577 of file [gclib_record.h](#).

13.12.2.154 axis_h_variable

SL GDataRecord1806::axis_h_variable

H User-defined variable (ZA).

Definition at line 578 of file [gclib_record.h](#).

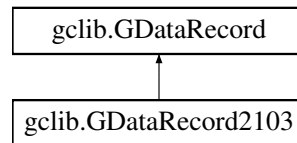
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.13 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 Member Functions inherited from [gclib.GDataRecord](#)

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.

13.13.1 Detailed Description

Data record struct for DMC-2103 controllers.
Definition at line 1481 of file [gclib.cs](#).

13.13.2 Member Function Documentation

13.13.2.1 `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](#).

13.13.3 Member Data Documentation

13.13.3.1 header_0

UB gclib.GDataRecord2103.header_0

1st Byte of Header.

Definition at line 1487 of file [gclib.cs](#).

13.13.3.2 header_1

UB gclib.GDataRecord2103.header_1

2nd Byte of Header.

Definition at line 1488 of file [gclib.cs](#).

13.13.3.3 header_2

UB gclib.GDataRecord2103.header_2

3rd Byte of Header.

Definition at line 1489 of file [gclib.cs](#).

13.13.3.4 header_3

UB gclib.GDataRecord2103.header_3

4th Byte of Header.

Definition at line 1490 of file [gclib.cs](#).

13.13.3.5 sample_number

UW gclib.GDataRecord2103.sample_number

sample number.

Definition at line 1492 of file [gclib.cs](#).

13.13.3.6 input_bank_0

UB gclib.GDataRecord2103.input_bank_0

general input bank 0 (inputs 1-8).

Definition at line 1494 of file [gclib.cs](#).

13.13.3.7 input_bank_1

UB gclib.GDataRecord2103.input_bank_1

general input bank 1 (inputs 9-16).

Definition at line 1495 of file [gclib.cs](#).

13.13.3.8 input_bank_2

UB gclib.GDataRecord2103.input_bank_2

general input bank 2 (inputs 17-24).

Definition at line 1496 of file [gclib.cs](#).

13.13.3.9 input_bank_3

UB gclib.GDataRecord2103.input_bank_3

general input bank 3 (inputs 25-32).

Definition at line 1497 of file [gclib.cs](#).

13.13.3.10 input_bank_4

UB gclib.GDataRecord2103.input_bank_4

general input bank 4 (inputs 33-40).

Definition at line 1498 of file [gclib.cs](#).

13.13.3.11 input_bank_5

UB `gclib.GDataRecord2103.input_bank_5`
general input bank 5 (inputs 41-48).
Definition at line 1499 of file [gclib.cs](#).

13.13.3.12 input_bank_6

UB `gclib.GDataRecord2103.input_bank_6`
general input bank 6 (inputs 49-56).
Definition at line 1500 of file [gclib.cs](#).

13.13.3.13 input_bank_7

UB `gclib.GDataRecord2103.input_bank_7`
general input bank 7 (inputs 57-64).
Definition at line 1501 of file [gclib.cs](#).

13.13.3.14 input_bank_8

UB `gclib.GDataRecord2103.input_bank_8`
general input bank 8 (inputs 65-72).
Definition at line 1502 of file [gclib.cs](#).

13.13.3.15 input_bank_9

UB `gclib.GDataRecord2103.input_bank_9`
general input bank 9 (inputs 73-80).
Definition at line 1503 of file [gclib.cs](#).

13.13.3.16 output_bank_0

UB `gclib.GDataRecord2103.output_bank_0`
general output bank 0 (outputs 1-8).
Definition at line 1505 of file [gclib.cs](#).

13.13.3.17 output_bank_1

UB `gclib.GDataRecord2103.output_bank_1`
general output bank 1 (outputs 9-16).
Definition at line 1506 of file [gclib.cs](#).

13.13.3.18 output_bank_2

UB `gclib.GDataRecord2103.output_bank_2`
general output bank 2 (outputs 17-24).
Definition at line 1507 of file [gclib.cs](#).

13.13.3.19 output_bank_3

UB `gclib.GDataRecord2103.output_bank_3`
general output bank 3 (outputs 25-32).
Definition at line 1508 of file [gclib.cs](#).

13.13.3.20 output_bank_4

UB `gclib.GDataRecord2103.output_bank_4`
general output bank 4 (outputs 33-40).
Definition at line 1509 of file [gclib.cs](#).

13.13.3.21 output_bank_5

UB gclib.GDataRecord2103.output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 1510 of file [gclib.cs](#).

13.13.3.22 output_bank_6

UB gclib.GDataRecord2103.output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 1511 of file [gclib.cs](#).

13.13.3.23 output_bank_7

UB gclib.GDataRecord2103.output_bank_7
general output bank 7 (outputs 57-64).
Definition at line 1512 of file [gclib.cs](#).

13.13.3.24 output_bank_8

UB gclib.GDataRecord2103.output_bank_8
general output bank 8 (outputs 65-72).
Definition at line 1513 of file [gclib.cs](#).

13.13.3.25 output_bank_9

UB gclib.GDataRecord2103.output_bank_9
general output bank 9 (outputs 73-80).
Definition at line 1514 of file [gclib.cs](#).

13.13.3.26 error_code

UB gclib.GDataRecord2103.error_code
error code.
Definition at line 1516 of file [gclib.cs](#).

13.13.3.27 general_status

UB gclib.GDataRecord2103.general_status
general status
Definition at line 1517 of file [gclib.cs](#).

13.13.3.28 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](#).

13.13.3.29 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](#).

13.13.3.30 s_distance

SL gclib.GDataRecord2103.s_distance
distance traveled in coordinated move for S plane.
Definition at line 1521 of file [gclib.cs](#).

13.13.3.31 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](#).

13.13.3.32 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](#).

13.13.3.33 t_distance

SL `gclib.GDataRecord2103.t_distance`
distance traveled in coordinated move for T plane.
Definition at line 1525 of file [gclib.cs](#).

13.13.3.34 axis_a_status

UW `gclib.GDataRecord2103.axis_a_status`
A axis status.
Definition at line 1527 of file [gclib.cs](#).

13.13.3.35 axis_a_switches

UB `gclib.GDataRecord2103.axis_a_switches`
A axis switches.
Definition at line 1528 of file [gclib.cs](#).

13.13.3.36 axis_a_stop_code

UB `gclib.GDataRecord2103.axis_a_stop_code`
A axis stop code.
Definition at line 1529 of file [gclib.cs](#).

13.13.3.37 axis_a_reference_position

SL `gclib.GDataRecord2103.axis_a_reference_position`
A axis reference position.
Definition at line 1530 of file [gclib.cs](#).

13.13.3.38 axis_a_motor_position

SL `gclib.GDataRecord2103.axis_a_motor_position`
A axis motor position.
Definition at line 1531 of file [gclib.cs](#).

13.13.3.39 axis_a_position_error

SL `gclib.GDataRecord2103.axis_a_position_error`
A axis position error.
Definition at line 1532 of file [gclib.cs](#).

13.13.3.40 axis_a_aux_position

SL `gclib.GDataRecord2103.axis_a_aux_position`
A axis auxiliary position.
Definition at line 1533 of file [gclib.cs](#).

13.13.3.41 axis_a_velocity

SL gclib.GDataRecord2103.axis_a_velocity

A axis velocity.

Definition at line 1534 of file [gclib.cs](#).

13.13.3.42 axis_a_torque

SW gclib.GDataRecord2103.axis_a_torque

A axis torque.

Definition at line 1535 of file [gclib.cs](#).

13.13.3.43 axis_a_analog_in

UW gclib.GDataRecord2103.axis_a_analog_in

A axis analog input.

Definition at line 1536 of file [gclib.cs](#).

13.13.3.44 axis_b_status

UW gclib.GDataRecord2103.axis_b_status

B axis status.

Definition at line 1538 of file [gclib.cs](#).

13.13.3.45 axis_b_switches

UB gclib.GDataRecord2103.axis_b_switches

B axis switches.

Definition at line 1539 of file [gclib.cs](#).

13.13.3.46 axis_b_stop_code

UB gclib.GDataRecord2103.axis_b_stop_code

B axis stop code.

Definition at line 1540 of file [gclib.cs](#).

13.13.3.47 axis_b_reference_position

SL gclib.GDataRecord2103.axis_b_reference_position

B axis reference position.

Definition at line 1541 of file [gclib.cs](#).

13.13.3.48 axis_b_motor_position

SL gclib.GDataRecord2103.axis_b_motor_position

B axis motor position.

Definition at line 1542 of file [gclib.cs](#).

13.13.3.49 axis_b_position_error

SL gclib.GDataRecord2103.axis_b_position_error

B axis position error.

Definition at line 1543 of file [gclib.cs](#).

13.13.3.50 axis_b_aux_position

SL gclib.GDataRecord2103.axis_b_aux_position

B axis auxiliary position.

Definition at line 1544 of file [gclib.cs](#).

13.13.3.51 axis_b_velocity

SL `gclib.GDataRecord2103.axis_b_velocity`

B axis velocity.

Definition at line 1545 of file [gclib.cs](#).

13.13.3.52 axis_b_torque

SW `gclib.GDataRecord2103.axis_b_torque`

B axis torque.

Definition at line 1546 of file [gclib.cs](#).

13.13.3.53 axis_b_analog_in

UW `gclib.GDataRecord2103.axis_b_analog_in`

B axis analog input.

Definition at line 1547 of file [gclib.cs](#).

13.13.3.54 axis_c_status

UW `gclib.GDataRecord2103.axis_c_status`

C axis status.

Definition at line 1549 of file [gclib.cs](#).

13.13.3.55 axis_c_switches

UB `gclib.GDataRecord2103.axis_c_switches`

C axis switches.

Definition at line 1550 of file [gclib.cs](#).

13.13.3.56 axis_c_stop_code

UB `gclib.GDataRecord2103.axis_c_stop_code`

C axis stop code.

Definition at line 1551 of file [gclib.cs](#).

13.13.3.57 axis_c_reference_position

SL `gclib.GDataRecord2103.axis_c_reference_position`

C axis reference position.

Definition at line 1552 of file [gclib.cs](#).

13.13.3.58 axis_c_motor_position

SL `gclib.GDataRecord2103.axis_c_motor_position`

C axis motor position.

Definition at line 1553 of file [gclib.cs](#).

13.13.3.59 axis_c_position_error

SL `gclib.GDataRecord2103.axis_c_position_error`

C axis position error.

Definition at line 1554 of file [gclib.cs](#).

13.13.3.60 axis_c_aux_position

SL `gclib.GDataRecord2103.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1555 of file [gclib.cs](#).

13.13.3.61 axis_c_velocity

SL gclib.GDataRecord2103.axis_c_velocity

C axis velocity.

Definition at line 1556 of file [gclib.cs](#).

13.13.3.62 axis_c_torque

SW gclib.GDataRecord2103.axis_c_torque

C axis torque.

Definition at line 1557 of file [gclib.cs](#).

13.13.3.63 axis_c_analog_in

UW gclib.GDataRecord2103.axis_c_analog_in

C axis analog input.

Definition at line 1558 of file [gclib.cs](#).

13.13.3.64 axis_d_status

UW gclib.GDataRecord2103.axis_d_status

D axis status.

Definition at line 1560 of file [gclib.cs](#).

13.13.3.65 axis_d_switches

UB gclib.GDataRecord2103.axis_d_switches

D axis switches.

Definition at line 1561 of file [gclib.cs](#).

13.13.3.66 axis_d_stop_code

UB gclib.GDataRecord2103.axis_d_stop_code

D axis stop code.

Definition at line 1562 of file [gclib.cs](#).

13.13.3.67 axis_d_reference_position

SL gclib.GDataRecord2103.axis_d_reference_position

D axis reference position.

Definition at line 1563 of file [gclib.cs](#).

13.13.3.68 axis_d_motor_position

SL gclib.GDataRecord2103.axis_d_motor_position

D axis motor position.

Definition at line 1564 of file [gclib.cs](#).

13.13.3.69 axis_d_position_error

SL gclib.GDataRecord2103.axis_d_position_error

D axis position error.

Definition at line 1565 of file [gclib.cs](#).

13.13.3.70 axis_d_aux_position

SL gclib.GDataRecord2103.axis_d_aux_position

D axis auxiliary position.

Definition at line 1566 of file [gclib.cs](#).

13.13.3.71 axis_d_velocity

SL `gclib.GDataRecord2103.axis_d_velocity`

D axis velocity.

Definition at line 1567 of file [gclib.cs](#).

13.13.3.72 axis_d_torque

SW `gclib.GDataRecord2103.axis_d_torque`

D axis torque.

Definition at line 1568 of file [gclib.cs](#).

13.13.3.73 axis_d_analog_in

UW `gclib.GDataRecord2103.axis_d_analog_in`

D axis analog input.

Definition at line 1569 of file [gclib.cs](#).

13.13.3.74 axis_e_status

UW `gclib.GDataRecord2103.axis_e_status`

E axis status.

Definition at line 1571 of file [gclib.cs](#).

13.13.3.75 axis_e_switches

UB `gclib.GDataRecord2103.axis_e_switches`

E axis switches.

Definition at line 1572 of file [gclib.cs](#).

13.13.3.76 axis_e_stop_code

UB `gclib.GDataRecord2103.axis_e_stop_code`

E axis stop code.

Definition at line 1573 of file [gclib.cs](#).

13.13.3.77 axis_e_reference_position

SL `gclib.GDataRecord2103.axis_e_reference_position`

E axis reference position.

Definition at line 1574 of file [gclib.cs](#).

13.13.3.78 axis_e_motor_position

SL `gclib.GDataRecord2103.axis_e_motor_position`

E axis motor position.

Definition at line 1575 of file [gclib.cs](#).

13.13.3.79 axis_e_position_error

SL `gclib.GDataRecord2103.axis_e_position_error`

E axis position error.

Definition at line 1576 of file [gclib.cs](#).

13.13.3.80 axis_e_aux_position

SL `gclib.GDataRecord2103.axis_e_aux_position`

E axis auxiliary position.

Definition at line 1577 of file [gclib.cs](#).

13.13.3.81 axis_e_velocity

SL gclib.GDataRecord2103.axis_e_velocity

E axis velocity.

Definition at line 1578 of file [gclib.cs](#).

13.13.3.82 axis_e_torque

SW gclib.GDataRecord2103.axis_e_torque

E axis torque.

Definition at line 1579 of file [gclib.cs](#).

13.13.3.83 axis_e_analog_in

UW gclib.GDataRecord2103.axis_e_analog_in

E axis analog input.

Definition at line 1580 of file [gclib.cs](#).

13.13.3.84 axis_f_status

UW gclib.GDataRecord2103.axis_f_status

F axis status.

Definition at line 1582 of file [gclib.cs](#).

13.13.3.85 axis_f_switches

UB gclib.GDataRecord2103.axis_f_switches

F axis switches.

Definition at line 1583 of file [gclib.cs](#).

13.13.3.86 axis_f_stop_code

UB gclib.GDataRecord2103.axis_f_stop_code

F axis stop code.

Definition at line 1584 of file [gclib.cs](#).

13.13.3.87 axis_f_reference_position

SL gclib.GDataRecord2103.axis_f_reference_position

F axis reference position.

Definition at line 1585 of file [gclib.cs](#).

13.13.3.88 axis_f_motor_position

SL gclib.GDataRecord2103.axis_f_motor_position

F axis motor position.

Definition at line 1586 of file [gclib.cs](#).

13.13.3.89 axis_f_position_error

SL gclib.GDataRecord2103.axis_f_position_error

F axis position error.

Definition at line 1587 of file [gclib.cs](#).

13.13.3.90 axis_f_aux_position

SL gclib.GDataRecord2103.axis_f_aux_position

F axis auxiliary position.

Definition at line 1588 of file [gclib.cs](#).

13.13.3.91 axis_f_velocity

SL `gclib.GDataRecord2103.axis_f_velocity`

F axis velocity.

Definition at line 1589 of file [gclib.cs](#).

13.13.3.92 axis_f_torque

SW `gclib.GDataRecord2103.axis_f_torque`

F axis torque.

Definition at line 1590 of file [gclib.cs](#).

13.13.3.93 axis_f_analog_in

UW `gclib.GDataRecord2103.axis_f_analog_in`

F axis analog input.

Definition at line 1591 of file [gclib.cs](#).

13.13.3.94 axis_g_status

UW `gclib.GDataRecord2103.axis_g_status`

G axis status.

Definition at line 1593 of file [gclib.cs](#).

13.13.3.95 axis_g_switches

UB `gclib.GDataRecord2103.axis_g_switches`

G axis switches.

Definition at line 1594 of file [gclib.cs](#).

13.13.3.96 axis_g_stop_code

UB `gclib.GDataRecord2103.axis_g_stop_code`

G axis stop code.

Definition at line 1595 of file [gclib.cs](#).

13.13.3.97 axis_g_reference_position

SL `gclib.GDataRecord2103.axis_g_reference_position`

G axis reference position.

Definition at line 1596 of file [gclib.cs](#).

13.13.3.98 axis_g_motor_position

SL `gclib.GDataRecord2103.axis_g_motor_position`

G axis motor position.

Definition at line 1597 of file [gclib.cs](#).

13.13.3.99 axis_g_position_error

SL `gclib.GDataRecord2103.axis_g_position_error`

G axis position error.

Definition at line 1598 of file [gclib.cs](#).

13.13.3.100 axis_g_aux_position

SL `gclib.GDataRecord2103.axis_g_aux_position`

G axis auxiliary position.

Definition at line 1599 of file [gclib.cs](#).

13.13.3.101 axis_g_velocity

SL gclib.GDataRecord2103.axis_g_velocity

G axis velocity.

Definition at line 1600 of file [gclib.cs](#).

13.13.3.102 axis_g_torque

SW gclib.GDataRecord2103.axis_g_torque

G axis torque.

Definition at line 1601 of file [gclib.cs](#).

13.13.3.103 axis_g_analog_in

UW gclib.GDataRecord2103.axis_g_analog_in

G axis analog input.

Definition at line 1602 of file [gclib.cs](#).

13.13.3.104 axis_h_status

UW gclib.GDataRecord2103.axis_h_status

H axis status.

Definition at line 1604 of file [gclib.cs](#).

13.13.3.105 axis_h_switches

UB gclib.GDataRecord2103.axis_h_switches

H axis switches.

Definition at line 1605 of file [gclib.cs](#).

13.13.3.106 axis_h_stop_code

UB gclib.GDataRecord2103.axis_h_stop_code

H axis stop code.

Definition at line 1606 of file [gclib.cs](#).

13.13.3.107 axis_h_reference_position

SL gclib.GDataRecord2103.axis_h_reference_position

H axis reference position.

Definition at line 1607 of file [gclib.cs](#).

13.13.3.108 axis_h_motor_position

SL gclib.GDataRecord2103.axis_h_motor_position

H axis motor position.

Definition at line 1608 of file [gclib.cs](#).

13.13.3.109 axis_h_position_error

SL gclib.GDataRecord2103.axis_h_position_error

H axis position error.

Definition at line 1609 of file [gclib.cs](#).

13.13.3.110 axis_h_aux_position

SL gclib.GDataRecord2103.axis_h_aux_position

H axis auxiliary position.

Definition at line 1610 of file [gclib.cs](#).

13.13.3.111 axis_h_velocity

SL `gclib.GDataRecord2103.axis_h_velocity`

H axis velocity.

Definition at line 1611 of file [gclib.cs](#).

13.13.3.112 axis_h_torque

SW `gclib.GDataRecord2103.axis_h_torque`

H axis torque.

Definition at line 1612 of file [gclib.cs](#).

13.13.3.113 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](#)

13.14 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.

13.14.1 Detailed Description

Data record struct for DMC-2103 controllers.
Definition at line 582 of file [gclib_record.h](#).

13.14.2 Member Data Documentation

13.14.2.1 header_0

UB GDataRecord2103::header_0

1st Byte of Header.

Definition at line 587 of file [gclib_record.h](#).

13.14.2.2 header_1

UB GDataRecord2103::header_1

2nd Byte of Header.

Definition at line 588 of file [gclib_record.h](#).

13.14.2.3 header_2

UB GDataRecord2103::header_2

3rd Byte of Header.

Definition at line 589 of file [gclib_record.h](#).

13.14.2.4 header_3

UB GDataRecord2103::header_3

4th Byte of Header.

Definition at line 590 of file [gclib_record.h](#).

13.14.2.5 sample_number

UW GDataRecord2103::sample_number

sample number.

Definition at line 592 of file [gclib_record.h](#).

13.14.2.6 input_bank_0

UB GDataRecord2103::input_bank_0

general input bank 0 (inputs 1-8).

Definition at line 594 of file [gclib_record.h](#).

13.14.2.7 input_bank_1

UB GDataRecord2103::input_bank_1

general input bank 1 (inputs 9-16).

Definition at line 595 of file [gclib_record.h](#).

13.14.2.8 input_bank_2

UB GDataRecord2103::input_bank_2

general input bank 2 (inputs 17-24).

Definition at line 596 of file [gclib_record.h](#).

13.14.2.9 input_bank_3

UB GDataRecord2103::input_bank_3

general input bank 3 (inputs 25-32).

Definition at line 597 of file [gclib_record.h](#).

13.14.2.10 input_bank_4

UB GDataRecord2103::input_bank_4

general input bank 4 (inputs 33-40).

Definition at line 598 of file [gclib_record.h](#).

13.14.2.11 input_bank_5

UB GDataRecord2103::input_bank_5

general input bank 5 (inputs 41-48).

Definition at line 599 of file [gclib_record.h](#).

13.14.2.12 input_bank_6

UB GDataRecord2103::input_bank_6

general input bank 6 (inputs 49-56).

Definition at line 600 of file [gclib_record.h](#).

13.14.2.13 input_bank_7

UB GDataRecord2103::input_bank_7

general input bank 7 (inputs 57-64).

Definition at line 601 of file [gclib_record.h](#).

13.14.2.14 input_bank_8

UB GDataRecord2103::input_bank_8

general input bank 8 (inputs 65-72).

Definition at line 602 of file [gclib_record.h](#).

13.14.2.15 input_bank_9

UB GDataRecord2103::input_bank_9

general input bank 9 (inputs 73-80).

Definition at line 603 of file [gclib_record.h](#).

13.14.2.16 output_bank_0

UB GDataRecord2103::output_bank_0

general output bank 0 (outputs 1-8).

Definition at line 605 of file [gclib_record.h](#).

13.14.2.17 output_bank_1

UB GDataRecord2103::output_bank_1

general output bank 1 (outputs 9-16).

Definition at line 606 of file [gclib_record.h](#).

13.14.2.18 output_bank_2

UB GDataRecord2103::output_bank_2

general output bank 2 (outputs 17-24).

Definition at line 607 of file [gclib_record.h](#).

13.14.2.19 output_bank_3

UB GDataRecord2103::output_bank_3

general output bank 3 (outputs 25-32).

Definition at line 608 of file [gclib_record.h](#).

13.14.2.20 output_bank_4

UB GDataRecord2103::output_bank_4

general output bank 4 (outputs 33-40).

Definition at line 609 of file [gclib_record.h](#).

13.14.2.21 output_bank_5

UB GDataRecord2103::output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 610 of file [gclib_record.h](#).

13.14.2.22 output_bank_6

UB GDataRecord2103::output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 611 of file [gclib_record.h](#).

13.14.2.23 output_bank_7

UB GDataRecord2103::output_bank_7
general output bank 7 (outputs 57-64).
Definition at line 612 of file [gclib_record.h](#).

13.14.2.24 output_bank_8

UB GDataRecord2103::output_bank_8
general output bank 8 (outputs 65-72).
Definition at line 613 of file [gclib_record.h](#).

13.14.2.25 output_bank_9

UB GDataRecord2103::output_bank_9
general output bank 9 (outputs 73-80).
Definition at line 614 of file [gclib_record.h](#).

13.14.2.26 error_code

UB GDataRecord2103::error_code
error code.
Definition at line 616 of file [gclib_record.h](#).

13.14.2.27 general_status

UB GDataRecord2103::general_status
general status
Definition at line 617 of file [gclib_record.h](#).

13.14.2.28 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](#).

13.14.2.29 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](#).

13.14.2.30 s_distance

SL GDataRecord2103::s_distance
distance traveled in coordinated move for S plane.
Definition at line 621 of file [gclib_record.h](#).

13.14.2.31 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](#).

13.14.2.32 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](#).

13.14.2.33 t_distance

SL GDataRecord2103::t_distance
distance traveled in coordinated move for T plane.
Definition at line 625 of file [gclib_record.h](#).

13.14.2.34 axis_a_status

UW GDataRecord2103::axis_a_status
A axis status.
Definition at line 627 of file [gclib_record.h](#).

13.14.2.35 axis_a_switches

UB GDataRecord2103::axis_a_switches
A axis switches.
Definition at line 628 of file [gclib_record.h](#).

13.14.2.36 axis_a_stop_code

UB GDataRecord2103::axis_a_stop_code
A axis stop code.
Definition at line 629 of file [gclib_record.h](#).

13.14.2.37 axis_a_reference_position

SL GDataRecord2103::axis_a_reference_position
A axis reference position.
Definition at line 630 of file [gclib_record.h](#).

13.14.2.38 axis_a_motor_position

SL GDataRecord2103::axis_a_motor_position
A axis motor position.
Definition at line 631 of file [gclib_record.h](#).

13.14.2.39 axis_a_position_error

SL GDataRecord2103::axis_a_position_error
A axis position error.
Definition at line 632 of file [gclib_record.h](#).

13.14.2.40 axis_a_aux_position

SL GDataRecord2103::axis_a_aux_position
A axis auxiliary position.
Definition at line 633 of file [gclib_record.h](#).

13.14.2.41 axis_a_velocity

SL GDataRecord2103::axis_a_velocity

A axis velocity.

Definition at line 634 of file [gclib_record.h](#).

13.14.2.42 axis_a_torque

SW GDataRecord2103::axis_a_torque

A axis torque.

Definition at line 635 of file [gclib_record.h](#).

13.14.2.43 axis_a_analog_in

UW GDataRecord2103::axis_a_analog_in

A axis analog input.

Definition at line 636 of file [gclib_record.h](#).

13.14.2.44 axis_b_status

UW GDataRecord2103::axis_b_status

B axis status.

Definition at line 638 of file [gclib_record.h](#).

13.14.2.45 axis_b_switches

UB GDataRecord2103::axis_b_switches

B axis switches.

Definition at line 639 of file [gclib_record.h](#).

13.14.2.46 axis_b_stop_code

UB GDataRecord2103::axis_b_stop_code

B axis stop code.

Definition at line 640 of file [gclib_record.h](#).

13.14.2.47 axis_b_reference_position

SL GDataRecord2103::axis_b_reference_position

B axis reference position.

Definition at line 641 of file [gclib_record.h](#).

13.14.2.48 axis_b_motor_position

SL GDataRecord2103::axis_b_motor_position

B axis motor position.

Definition at line 642 of file [gclib_record.h](#).

13.14.2.49 axis_b_position_error

SL GDataRecord2103::axis_b_position_error

B axis position error.

Definition at line 643 of file [gclib_record.h](#).

13.14.2.50 axis_b_aux_position

SL GDataRecord2103::axis_b_aux_position

B axis auxiliary position.

Definition at line 644 of file [gclib_record.h](#).

13.14.2.51 axis_b_velocity

SL GDataRecord2103::axis_b_velocity

B axis velocity.

Definition at line 645 of file [gclib_record.h](#).

13.14.2.52 axis_b_torque

SW GDataRecord2103::axis_b_torque

B axis torque.

Definition at line 646 of file [gclib_record.h](#).

13.14.2.53 axis_b_analog_in

UW GDataRecord2103::axis_b_analog_in

B axis analog input.

Definition at line 647 of file [gclib_record.h](#).

13.14.2.54 axis_c_status

UW GDataRecord2103::axis_c_status

C axis status.

Definition at line 649 of file [gclib_record.h](#).

13.14.2.55 axis_c_switches

UB GDataRecord2103::axis_c_switches

C axis switches.

Definition at line 650 of file [gclib_record.h](#).

13.14.2.56 axis_c_stop_code

UB GDataRecord2103::axis_c_stop_code

C axis stop code.

Definition at line 651 of file [gclib_record.h](#).

13.14.2.57 axis_c_reference_position

SL GDataRecord2103::axis_c_reference_position

C axis reference position.

Definition at line 652 of file [gclib_record.h](#).

13.14.2.58 axis_c_motor_position

SL GDataRecord2103::axis_c_motor_position

C axis motor position.

Definition at line 653 of file [gclib_record.h](#).

13.14.2.59 axis_c_position_error

SL GDataRecord2103::axis_c_position_error

C axis position error.

Definition at line 654 of file [gclib_record.h](#).

13.14.2.60 axis_c_aux_position

SL GDataRecord2103::axis_c_aux_position

C axis auxiliary position.

Definition at line 655 of file [gclib_record.h](#).

13.14.2.61 axis_c_velocity

SL GDataRecord2103::axis_c_velocity

C axis velocity.

Definition at line 656 of file [gclib_record.h](#).

13.14.2.62 axis_c_torque

SW GDataRecord2103::axis_c_torque

C axis torque.

Definition at line 657 of file [gclib_record.h](#).

13.14.2.63 axis_c_analog_in

UW GDataRecord2103::axis_c_analog_in

C axis analog input.

Definition at line 658 of file [gclib_record.h](#).

13.14.2.64 axis_d_status

UW GDataRecord2103::axis_d_status

D axis status.

Definition at line 660 of file [gclib_record.h](#).

13.14.2.65 axis_d_switches

UB GDataRecord2103::axis_d_switches

D axis switches.

Definition at line 661 of file [gclib_record.h](#).

13.14.2.66 axis_d_stop_code

UB GDataRecord2103::axis_d_stop_code

D axis stop code.

Definition at line 662 of file [gclib_record.h](#).

13.14.2.67 axis_d_reference_position

SL GDataRecord2103::axis_d_reference_position

D axis reference position.

Definition at line 663 of file [gclib_record.h](#).

13.14.2.68 axis_d_motor_position

SL GDataRecord2103::axis_d_motor_position

D axis motor position.

Definition at line 664 of file [gclib_record.h](#).

13.14.2.69 axis_d_position_error

SL GDataRecord2103::axis_d_position_error

D axis position error.

Definition at line 665 of file [gclib_record.h](#).

13.14.2.70 axis_d_aux_position

SL GDataRecord2103::axis_d_aux_position

D axis auxiliary position.

Definition at line 666 of file [gclib_record.h](#).

13.14.2.71 axis_d_velocity

SL GDataRecord2103::axis_d_velocity

D axis velocity.

Definition at line 667 of file [gclib_record.h](#).

13.14.2.72 axis_d_torque

SW GDataRecord2103::axis_d_torque

D axis torque.

Definition at line 668 of file [gclib_record.h](#).

13.14.2.73 axis_d_analog_in

UW GDataRecord2103::axis_d_analog_in

D axis analog input.

Definition at line 669 of file [gclib_record.h](#).

13.14.2.74 axis_e_status

UW GDataRecord2103::axis_e_status

E axis status.

Definition at line 671 of file [gclib_record.h](#).

13.14.2.75 axis_e_switches

UB GDataRecord2103::axis_e_switches

E axis switches.

Definition at line 672 of file [gclib_record.h](#).

13.14.2.76 axis_e_stop_code

UB GDataRecord2103::axis_e_stop_code

E axis stop code.

Definition at line 673 of file [gclib_record.h](#).

13.14.2.77 axis_e_reference_position

SL GDataRecord2103::axis_e_reference_position

E axis reference position.

Definition at line 674 of file [gclib_record.h](#).

13.14.2.78 axis_e_motor_position

SL GDataRecord2103::axis_e_motor_position

E axis motor position.

Definition at line 675 of file [gclib_record.h](#).

13.14.2.79 axis_e_position_error

SL GDataRecord2103::axis_e_position_error

E axis position error.

Definition at line 676 of file [gclib_record.h](#).

13.14.2.80 axis_e_aux_position

SL GDataRecord2103::axis_e_aux_position

E axis auxiliary position.

Definition at line 677 of file [gclib_record.h](#).

13.14.2.81 axis_e_velocity

SL GDataRecord2103::axis_e_velocity
E axis velocity.
Definition at line 678 of file [gclib_record.h](#).

13.14.2.82 axis_e_torque

SW GDataRecord2103::axis_e_torque
E axis torque.
Definition at line 679 of file [gclib_record.h](#).

13.14.2.83 axis_e_analog_in

UW GDataRecord2103::axis_e_analog_in
E axis analog input.
Definition at line 680 of file [gclib_record.h](#).

13.14.2.84 axis_f_status

UW GDataRecord2103::axis_f_status
F axis status.
Definition at line 682 of file [gclib_record.h](#).

13.14.2.85 axis_f_switches

UB GDataRecord2103::axis_f_switches
F axis switches.
Definition at line 683 of file [gclib_record.h](#).

13.14.2.86 axis_f_stop_code

UB GDataRecord2103::axis_f_stop_code
F axis stop code.
Definition at line 684 of file [gclib_record.h](#).

13.14.2.87 axis_f_reference_position

SL GDataRecord2103::axis_f_reference_position
F axis reference position.
Definition at line 685 of file [gclib_record.h](#).

13.14.2.88 axis_f_motor_position

SL GDataRecord2103::axis_f_motor_position
F axis motor position.
Definition at line 686 of file [gclib_record.h](#).

13.14.2.89 axis_f_position_error

SL GDataRecord2103::axis_f_position_error
F axis position error.
Definition at line 687 of file [gclib_record.h](#).

13.14.2.90 axis_f_aux_position

SL GDataRecord2103::axis_f_aux_position
F axis auxiliary position.
Definition at line 688 of file [gclib_record.h](#).

13.14.2.91 axis_f_velocity

SL GDataRecord2103::axis_f_velocity

F axis velocity.

Definition at line 689 of file [gclib_record.h](#).

13.14.2.92 axis_f_torque

SW GDataRecord2103::axis_f_torque

F axis torque.

Definition at line 690 of file [gclib_record.h](#).

13.14.2.93 axis_f_analog_in

UW GDataRecord2103::axis_f_analog_in

F axis analog input.

Definition at line 691 of file [gclib_record.h](#).

13.14.2.94 axis_g_status

UW GDataRecord2103::axis_g_status

G axis status.

Definition at line 693 of file [gclib_record.h](#).

13.14.2.95 axis_g_switches

UB GDataRecord2103::axis_g_switches

G axis switches.

Definition at line 694 of file [gclib_record.h](#).

13.14.2.96 axis_g_stop_code

UB GDataRecord2103::axis_g_stop_code

G axis stop code.

Definition at line 695 of file [gclib_record.h](#).

13.14.2.97 axis_g_reference_position

SL GDataRecord2103::axis_g_reference_position

G axis reference position.

Definition at line 696 of file [gclib_record.h](#).

13.14.2.98 axis_g_motor_position

SL GDataRecord2103::axis_g_motor_position

G axis motor position.

Definition at line 697 of file [gclib_record.h](#).

13.14.2.99 axis_g_position_error

SL GDataRecord2103::axis_g_position_error

G axis position error.

Definition at line 698 of file [gclib_record.h](#).

13.14.2.100 axis_g_aux_position

SL GDataRecord2103::axis_g_aux_position

G axis auxiliary position.

Definition at line 699 of file [gclib_record.h](#).

13.14.2.101 axis_g_velocity

SL GDataRecord2103::axis_g_velocity

G axis velocity.

Definition at line 700 of file [gclib_record.h](#).

13.14.2.102 axis_g_torque

SW GDataRecord2103::axis_g_torque

G axis torque.

Definition at line 701 of file [gclib_record.h](#).

13.14.2.103 axis_g_analog_in

UW GDataRecord2103::axis_g_analog_in

G axis analog input.

Definition at line 702 of file [gclib_record.h](#).

13.14.2.104 axis_h_status

UW GDataRecord2103::axis_h_status

H axis status.

Definition at line 704 of file [gclib_record.h](#).

13.14.2.105 axis_h_switches

UB GDataRecord2103::axis_h_switches

H axis switches.

Definition at line 705 of file [gclib_record.h](#).

13.14.2.106 axis_h_stop_code

UB GDataRecord2103::axis_h_stop_code

H axis stop code.

Definition at line 706 of file [gclib_record.h](#).

13.14.2.107 axis_h_reference_position

SL GDataRecord2103::axis_h_reference_position

H axis reference position.

Definition at line 707 of file [gclib_record.h](#).

13.14.2.108 axis_h_motor_position

SL GDataRecord2103::axis_h_motor_position

H axis motor position.

Definition at line 708 of file [gclib_record.h](#).

13.14.2.109 axis_h_position_error

SL GDataRecord2103::axis_h_position_error

H axis position error.

Definition at line 709 of file [gclib_record.h](#).

13.14.2.110 axis_h_aux_position

SL GDataRecord2103::axis_h_aux_position

H axis auxiliary position.

Definition at line 710 of file [gclib_record.h](#).

13.14.2.111 axis_h_velocity

SL GDataRecord2103::axis_h_velocity

H axis velocity.

Definition at line 711 of file [gclib_record.h](#).

13.14.2.112 axis_h_torque

SW GDataRecord2103::axis_h_torque

H axis torque.

Definition at line 712 of file [gclib_record.h](#).

13.14.2.113 axis_h_analog_in

UW GDataRecord2103::axis_h_analog_in

H axis analog input.

Definition at line 713 of file [gclib_record.h](#).

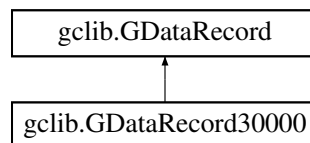
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.15 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 Member Functions inherited from [gclib.GDataRecord](#)**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).*

13.15.1 Detailed Description

Data record struct for DMC-30010 controllers.
Definition at line 1716 of file [gclib.cs](#).

13.15.2 Member Function Documentation

13.15.2.1 `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](#).

13.15.3 Member Data Documentation

13.15.3.1 `header_0`

```
UB gclib.GDataRecord30000.header_0
```

1st Byte of Header.
Definition at line 1722 of file [gclib.cs](#).

13.15.3.2 `header_1`

```
UB gclib.GDataRecord30000.header_1
```

2nd Byte of Header.
Definition at line 1723 of file [gclib.cs](#).

13.15.3.3 `header_2`

```
UB gclib.GDataRecord30000.header_2
```

3rd Byte of Header.
Definition at line 1724 of file [gclib.cs](#).

13.15.3.4 `header_3`

```
UB gclib.GDataRecord30000.header_3
```

4th Byte of Header.
Definition at line 1725 of file [gclib.cs](#).

13.15.3.5 `sample_number`

```
UW gclib.GDataRecord30000.sample_number
```

sample number.
Definition at line 1727 of file [gclib.cs](#).

13.15.3.6 `input_bank_0`

```
UB gclib.GDataRecord30000.input_bank_0
```

general input bank 0 (inputs 1-8).
Definition at line 1729 of file [gclib.cs](#).

13.15.3.7 `input_bank_1`

```
UB gclib.GDataRecord30000.input_bank_1
```

general input bank 1 (inputs 9-16).
Definition at line 1730 of file [gclib.cs](#).

13.15.3.8 output_bank_0

UB gclib.GDataRecord30000.output_bank_0

general output bank 0 (outputs 1-8).

Definition at line 1732 of file [gclib.cs](#).

13.15.3.9 output_bank_1

UB gclib.GDataRecord30000.output_bank_1

general output bank 1 (outputs 9-16).

Definition at line 1733 of file [gclib.cs](#).

13.15.3.10 error_code

UB gclib.GDataRecord30000.error_code

error code.

Definition at line 1735 of file [gclib.cs](#).

13.15.3.11 thread_status

UB gclib.GDataRecord30000.thread_status

thread status.

Definition at line 1736 of file [gclib.cs](#).

13.15.3.12 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](#).

13.15.3.13 output_analog_1

UW gclib.GDataRecord30000.output_analog_1

Analog output 1.

Definition at line 1740 of file [gclib.cs](#).

13.15.3.14 output_analog_2

UW gclib.GDataRecord30000.output_analog_2

Analog output 2.

Definition at line 1741 of file [gclib.cs](#).

13.15.3.15 amplifier_status

UL gclib.GDataRecord30000.amplifier_status

Amplifier Status.

Definition at line 1743 of file [gclib.cs](#).

13.15.3.16 contour_segment_count

UL gclib.GDataRecord30000.contour_segment_count

Segment Count for Contour Mode.

Definition at line 1745 of file [gclib.cs](#).

13.15.3.17 contour_buffer_available

UW gclib.GDataRecord30000.contour_buffer_available

Buffer space remaining, Contour Mode.

Definition at line 1746 of file [gclib.cs](#).

13.15.3.18 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](#).

13.15.3.19 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](#).

13.15.3.20 s_distance

SL `gclib.GDataRecord30000.s_distance`
distance traveled in coordinated move for S plane.
Definition at line 1750 of file [gclib.cs](#).

13.15.3.21 s_plane_buffer_available

UW `gclib.GDataRecord30000.s_plane_buffer_available`
Buffer space remaining, S Plane.
Definition at line 1751 of file [gclib.cs](#).

13.15.3.22 axis_a_status

UW `gclib.GDataRecord30000.axis_a_status`
A axis status.
Definition at line 1753 of file [gclib.cs](#).

13.15.3.23 axis_a_switches

UB `gclib.GDataRecord30000.axis_a_switches`
A axis switches.
Definition at line 1754 of file [gclib.cs](#).

13.15.3.24 axis_a_stop_code

UB `gclib.GDataRecord30000.axis_a_stop_code`
A axis stop code.
Definition at line 1755 of file [gclib.cs](#).

13.15.3.25 axis_a_reference_position

SL `gclib.GDataRecord30000.axis_a_reference_position`
A axis reference position.
Definition at line 1756 of file [gclib.cs](#).

13.15.3.26 axis_a_motor_position

SL `gclib.GDataRecord30000.axis_a_motor_position`
A axis motor position.
Definition at line 1757 of file [gclib.cs](#).

13.15.3.27 axis_a_position_error

SL `gclib.GDataRecord30000.axis_a_position_error`
A axis position error.
Definition at line 1758 of file [gclib.cs](#).

13.15.3.28 axis_a_aux_position

SL `gclib.GDataRecord30000.axis_a_aux_position`

A axis auxiliary position.

Definition at line 1759 of file [gclib.cs](#).

13.15.3.29 axis_a_velocity

SL `gclib.GDataRecord30000.axis_a_velocity`

A axis velocity.

Definition at line 1760 of file [gclib.cs](#).

13.15.3.30 axis_a_torque

SL `gclib.GDataRecord30000.axis_a_torque`

A axis torque.

Definition at line 1761 of file [gclib.cs](#).

13.15.3.31 axis_a_analog_in

UW `gclib.GDataRecord30000.axis_a_analog_in`

A axis analog input.

Definition at line 1762 of file [gclib.cs](#).

13.15.3.32 axis_a_halls

UB `gclib.GDataRecord30000.axis_a_halls`

A Hall Input Status.

Definition at line 1763 of file [gclib.cs](#).

13.15.3.33 axis_a_reserved

UB `gclib.GDataRecord30000.axis_a_reserved`

Reserved.

Definition at line 1764 of file [gclib.cs](#).

13.15.3.34 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](#)

13.16 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).

13.16.1 Detailed Description

Data record struct for DMC-30010 controllers.
Definition at line 814 of file [gclib_record.h](#).

13.16.2 Member Data Documentation

13.16.2.1 header_0

UB GDataRecord30000::header_0
1st Byte of Header.
Definition at line 819 of file [gclib_record.h](#).

13.16.2.2 header_1

UB GDataRecord30000::header_1
2nd Byte of Header.
Definition at line 820 of file [gclib_record.h](#).

13.16.2.3 header_2

UB GDataRecord30000::header_2
3rd Byte of Header.
Definition at line 821 of file [gclib_record.h](#).

13.16.2.4 header_3

UB GDataRecord30000::header_3
4th Byte of Header.
Definition at line 822 of file [gclib_record.h](#).

13.16.2.5 sample_number

UW GDataRecord30000::sample_number
sample number.
Definition at line 824 of file [gclib_record.h](#).

13.16.2.6 input_bank_0

UB GDataRecord30000::input_bank_0
general input bank 0 (inputs 1-8).
Definition at line 826 of file [gclib_record.h](#).

13.16.2.7 input_bank_1

UB GDataRecord30000::input_bank_1

general input bank 1 (inputs 9-16).

Definition at line 827 of file [gclib_record.h](#).

13.16.2.8 output_bank_0

UB GDataRecord30000::output_bank_0

general output bank 0 (outputs 1-8).

Definition at line 829 of file [gclib_record.h](#).

13.16.2.9 output_bank_1

UB GDataRecord30000::output_bank_1

general output bank 1 (outputs 9-16).

Definition at line 830 of file [gclib_record.h](#).

13.16.2.10 error_code

UB GDataRecord30000::error_code

error code.

Definition at line 832 of file [gclib_record.h](#).

13.16.2.11 thread_status

UB GDataRecord30000::thread_status

thread status.

Definition at line 833 of file [gclib_record.h](#).

13.16.2.12 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](#).

13.16.2.13 output_analog_1

UW GDataRecord30000::output_analog_1

Analog output 1.

Definition at line 837 of file [gclib_record.h](#).

13.16.2.14 output_analog_2

UW GDataRecord30000::output_analog_2

Analog output 2.

Definition at line 838 of file [gclib_record.h](#).

13.16.2.15 amplifier_status

UL GDataRecord30000::amplifier_status

Amplifier Status.

Definition at line 840 of file [gclib_record.h](#).

13.16.2.16 contour_segment_count

UL GDataRecord30000::contour_segment_count

Segment Count for Contour Mode.

Definition at line 842 of file [gclib_record.h](#).

13.16.2.17 contour_buffer_available

UW GDataRecord30000::contour_buffer_available

Buffer space remaining, Contour Mode.

Definition at line 843 of file [gclib_record.h](#).

13.16.2.18 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](#).

13.16.2.19 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](#).

13.16.2.20 s_distance

SL GDataRecord30000::s_distance

distance traveled in coordinated move for S plane.

Definition at line 847 of file [gclib_record.h](#).

13.16.2.21 s_plane_buffer_available

UW GDataRecord30000::s_plane_buffer_available

Buffer space remaining, S Plane.

Definition at line 848 of file [gclib_record.h](#).

13.16.2.22 axis_a_status

UW GDataRecord30000::axis_a_status

A axis status.

Definition at line 850 of file [gclib_record.h](#).

13.16.2.23 axis_a_switches

UB GDataRecord30000::axis_a_switches

A axis switches.

Definition at line 851 of file [gclib_record.h](#).

13.16.2.24 axis_a_stop_code

UB GDataRecord30000::axis_a_stop_code

A axis stop code.

Definition at line 852 of file [gclib_record.h](#).

13.16.2.25 axis_a_reference_position

SL GDataRecord30000::axis_a_reference_position

A axis reference position.

Definition at line 853 of file [gclib_record.h](#).

13.16.2.26 axis_a_motor_position

SL GDataRecord30000::axis_a_motor_position

A axis motor position.

Definition at line 854 of file [gclib_record.h](#).

13.16.2.27 axis_a_position_error

SL GDataRecord30000::axis_a_position_error

A axis position error.

Definition at line 855 of file [gclib_record.h](#).

13.16.2.28 axis_a_aux_position

SL GDataRecord30000::axis_a_aux_position

A axis auxiliary position.

Definition at line 856 of file [gclib_record.h](#).

13.16.2.29 axis_a_velocity

SL GDataRecord30000::axis_a_velocity

A axis velocity.

Definition at line 857 of file [gclib_record.h](#).

13.16.2.30 axis_a_torque

SL GDataRecord30000::axis_a_torque

A axis torque.

Definition at line 858 of file [gclib_record.h](#).

13.16.2.31 axis_a_analog_in

UW GDataRecord30000::axis_a_analog_in

A axis analog input.

Definition at line 859 of file [gclib_record.h](#).

13.16.2.32 axis_a_halls

UB GDataRecord30000::axis_a_halls

A Hall Input Status.

Definition at line 860 of file [gclib_record.h](#).

13.16.2.33 axis_a_reserved

UB GDataRecord30000::axis_a_reserved

Reserved.

Definition at line 861 of file [gclib_record.h](#).

13.16.2.34 axis_a_variable

SL GDataRecord30000::axis_a_variable

A User-defined variable (ZA).

Definition at line 862 of file [gclib_record.h](#).

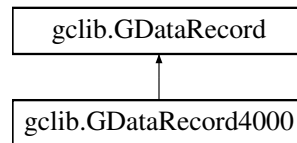
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.17 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 Member Functions inherited from [gclib.GDataRecord](#)

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).

13.17.1 Detailed Description

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.
Definition at line 926 of file [gclib.cs](#).

13.17.2 Member Function Documentation

13.17.2.1 `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](#).

13.17.3 Member Data Documentation

13.17.3.1 `header_0`

```
UB gclib.GDataRecord4000.header_0
```

1st Byte of Header.

Definition at line 931 of file [gclib.cs](#).

13.17.3.2 `header_1`

```
UB gclib.GDataRecord4000.header_1
```

2nd Byte of Header.

Definition at line 932 of file [gclib.cs](#).

13.17.3.3 header_2

UB `gclib.GDataRecord4000.header_2`

3rd Byte of Header.

Definition at line 933 of file [gclib.cs](#).

13.17.3.4 header_3

UB `gclib.GDataRecord4000.header_3`

4th Byte of Header.

Definition at line 934 of file [gclib.cs](#).

13.17.3.5 sample_number

UW `gclib.GDataRecord4000.sample_number`

sample number.

Definition at line 936 of file [gclib.cs](#).

13.17.3.6 input_bank_0

UB `gclib.GDataRecord4000.input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 938 of file [gclib.cs](#).

13.17.3.7 input_bank_1

UB `gclib.GDataRecord4000.input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 939 of file [gclib.cs](#).

13.17.3.8 input_bank_2

UB `gclib.GDataRecord4000.input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 940 of file [gclib.cs](#).

13.17.3.9 input_bank_3

UB `gclib.GDataRecord4000.input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 941 of file [gclib.cs](#).

13.17.3.10 input_bank_4

UB `gclib.GDataRecord4000.input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 942 of file [gclib.cs](#).

13.17.3.11 input_bank_5

UB `gclib.GDataRecord4000.input_bank_5`

general input bank 5 (inputs 41-48).

Definition at line 943 of file [gclib.cs](#).

13.17.3.12 input_bank_6

UB `gclib.GDataRecord4000.input_bank_6`

general input bank 6 (inputs 49-56).

Definition at line 944 of file [gclib.cs](#).

13.17.3.13 input_bank_7

UB `gclib.GDataRecord4000.input_bank_7`
general input bank 7 (inputs 57-64).
Definition at line 945 of file [gclib.cs](#).

13.17.3.14 input_bank_8

UB `gclib.GDataRecord4000.input_bank_8`
general input bank 8 (inputs 65-72).
Definition at line 946 of file [gclib.cs](#).

13.17.3.15 input_bank_9

UB `gclib.GDataRecord4000.input_bank_9`
general input bank 9 (inputs 73-80).
Definition at line 947 of file [gclib.cs](#).

13.17.3.16 output_bank_0

UB `gclib.GDataRecord4000.output_bank_0`
general output bank 0 (outputs 1-8).
Definition at line 949 of file [gclib.cs](#).

13.17.3.17 output_bank_1

UB `gclib.GDataRecord4000.output_bank_1`
general output bank 1 (outputs 9-16).
Definition at line 950 of file [gclib.cs](#).

13.17.3.18 output_bank_2

UB `gclib.GDataRecord4000.output_bank_2`
general output bank 2 (outputs 17-24).
Definition at line 951 of file [gclib.cs](#).

13.17.3.19 output_bank_3

UB `gclib.GDataRecord4000.output_bank_3`
general output bank 3 (outputs 25-32).
Definition at line 952 of file [gclib.cs](#).

13.17.3.20 output_bank_4

UB `gclib.GDataRecord4000.output_bank_4`
general output bank 4 (outputs 33-40).
Definition at line 953 of file [gclib.cs](#).

13.17.3.21 output_bank_5

UB `gclib.GDataRecord4000.output_bank_5`
general output bank 5 (outputs 41-48).
Definition at line 954 of file [gclib.cs](#).

13.17.3.22 output_bank_6

UB `gclib.GDataRecord4000.output_bank_6`
general output bank 6 (outputs 49-56).
Definition at line 955 of file [gclib.cs](#).

13.17.3.23 output_bank_7

UB `gclib.GDataRecord4000.output_bank_7`
general output bank 7 (outputs 57-64).
Definition at line 956 of file [gclib.cs](#).

13.17.3.24 output_bank_8

UB `gclib.GDataRecord4000.output_bank_8`
general output bank 8 (outputs 65-72).
Definition at line 957 of file [gclib.cs](#).

13.17.3.25 output_bank_9

UB `gclib.GDataRecord4000.output_bank_9`
general output bank 9 (outputs 73-80).
Definition at line 958 of file [gclib.cs](#).

13.17.3.26 reserved_0

SW `gclib.GDataRecord4000.reserved_0`
Reserved.
Definition at line 960 of file [gclib.cs](#).

13.17.3.27 reserved_2

SW `gclib.GDataRecord4000.reserved_2`
Reserved.
Definition at line 961 of file [gclib.cs](#).

13.17.3.28 reserved_4

SW `gclib.GDataRecord4000.reserved_4`
Reserved.
Definition at line 962 of file [gclib.cs](#).

13.17.3.29 reserved_6

SW `gclib.GDataRecord4000.reserved_6`
Reserved.
Definition at line 963 of file [gclib.cs](#).

13.17.3.30 reserved_8

SW `gclib.GDataRecord4000.reserved_8`
Reserved.
Definition at line 964 of file [gclib.cs](#).

13.17.3.31 reserved_10

SW `gclib.GDataRecord4000.reserved_10`
Reserved.
Definition at line 965 of file [gclib.cs](#).

13.17.3.32 reserved_12

SW `gclib.GDataRecord4000.reserved_12`
Reserved.
Definition at line 966 of file [gclib.cs](#).

13.17.3.33 reserved_14

SW `gclib.GDataRecord4000.reserved_14`

Reserved.

Definition at line 967 of file [gclib.cs](#).

13.17.3.34 ethernet_status_a

UB `gclib.GDataRecord4000.ethernet_status_a`

Ethernet Handle A Status.

Definition at line 969 of file [gclib.cs](#).

13.17.3.35 ethernet_status_b

UB `gclib.GDataRecord4000.ethernet_status_b`

Ethernet Handle B Status.

Definition at line 970 of file [gclib.cs](#).

13.17.3.36 ethernet_status_c

UB `gclib.GDataRecord4000.ethernet_status_c`

Ethernet Handle C Status.

Definition at line 971 of file [gclib.cs](#).

13.17.3.37 ethernet_status_d

UB `gclib.GDataRecord4000.ethernet_status_d`

Ethernet Handle D Status.

Definition at line 972 of file [gclib.cs](#).

13.17.3.38 ethernet_status_e

UB `gclib.GDataRecord4000.ethernet_status_e`

Ethernet Handle E Status.

Definition at line 973 of file [gclib.cs](#).

13.17.3.39 ethernet_status_f

UB `gclib.GDataRecord4000.ethernet_status_f`

Ethernet Handle F Status.

Definition at line 974 of file [gclib.cs](#).

13.17.3.40 ethernet_status_g

UB `gclib.GDataRecord4000.ethernet_status_g`

Ethernet Handle G Status.

Definition at line 975 of file [gclib.cs](#).

13.17.3.41 ethernet_status_h

UB `gclib.GDataRecord4000.ethernet_status_h`

Ethernet Handle H Status.

Definition at line 976 of file [gclib.cs](#).

13.17.3.42 error_code

UB `gclib.GDataRecord4000.error_code`

error code.

Definition at line 978 of file [gclib.cs](#).

13.17.3.43 thread_status

UB `gclib.GDataRecord4000.thread_status`

thread status

Definition at line 979 of file [gclib.cs](#).

13.17.3.44 amplifier_status

UL `gclib.GDataRecord4000.amplifier_status`

Amplifier Status.

Definition at line 980 of file [gclib.cs](#).

13.17.3.45 contour_segment_count

UL `gclib.GDataRecord4000.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 982 of file [gclib.cs](#).

13.17.3.46 contour_buffer_available

UW `gclib.GDataRecord4000.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 983 of file [gclib.cs](#).

13.17.3.47 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](#).

13.17.3.48 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](#).

13.17.3.49 s_distance

SL `gclib.GDataRecord4000.s_distance`

distance traveled in coordinated move for S plane.

Definition at line 987 of file [gclib.cs](#).

13.17.3.50 s_plane_buffer_available

UW `gclib.GDataRecord4000.s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 988 of file [gclib.cs](#).

13.17.3.51 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](#).

13.17.3.52 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](#).

13.17.3.53 t_distance

SL gclib.GDataRecord4000.t_distance

distance traveled in coordinated move for T plane.

Definition at line 992 of file [gclib.cs](#).

13.17.3.54 t_plane_buffer_available

UW gclib.GDataRecord4000.t_plane_buffer_available

Buffer space remaining, T Plane.

Definition at line 993 of file [gclib.cs](#).

13.17.3.55 axis_a_status

UW gclib.GDataRecord4000.axis_a_status

A axis status.

Definition at line 995 of file [gclib.cs](#).

13.17.3.56 axis_a_switches

UB gclib.GDataRecord4000.axis_a_switches

A axis switches.

Definition at line 996 of file [gclib.cs](#).

13.17.3.57 axis_a_stop_code

UB gclib.GDataRecord4000.axis_a_stop_code

A axis stop code.

Definition at line 997 of file [gclib.cs](#).

13.17.3.58 axis_a_reference_position

SL gclib.GDataRecord4000.axis_a_reference_position

A axis reference position.

Definition at line 998 of file [gclib.cs](#).

13.17.3.59 axis_a_motor_position

SL gclib.GDataRecord4000.axis_a_motor_position

A axis motor position.

Definition at line 999 of file [gclib.cs](#).

13.17.3.60 axis_a_position_error

SL gclib.GDataRecord4000.axis_a_position_error

A axis position error.

Definition at line 1000 of file [gclib.cs](#).

13.17.3.61 axis_a_aux_position

SL gclib.GDataRecord4000.axis_a_aux_position

A axis auxiliary position.

Definition at line 1001 of file [gclib.cs](#).

13.17.3.62 axis_a_velocity

SL gclib.GDataRecord4000.axis_a_velocity

A axis velocity.

Definition at line 1002 of file [gclib.cs](#).

13.17.3.63 axis_a_torque

SL `gclib.GDataRecord4000.axis_a_torque`

A axis torque.

Definition at line 1003 of file [gclib.cs](#).

13.17.3.64 axis_a_analog_in

UW `gclib.GDataRecord4000.axis_a_analog_in`

A axis analog input.

Definition at line 1004 of file [gclib.cs](#).

13.17.3.65 axis_a_halls

UB `gclib.GDataRecord4000.axis_a_halls`

A Hall Input Status.

Definition at line 1005 of file [gclib.cs](#).

13.17.3.66 axis_a_reserved

UB `gclib.GDataRecord4000.axis_a_reserved`

Reserved.

Definition at line 1006 of file [gclib.cs](#).

13.17.3.67 axis_a_variable

SL `gclib.GDataRecord4000.axis_a_variable`

A User-defined variable (ZA).

Definition at line 1007 of file [gclib.cs](#).

13.17.3.68 axis_b_status

UW `gclib.GDataRecord4000.axis_b_status`

B axis status.

Definition at line 1009 of file [gclib.cs](#).

13.17.3.69 axis_b_switches

UB `gclib.GDataRecord4000.axis_b_switches`

B axis switches.

Definition at line 1010 of file [gclib.cs](#).

13.17.3.70 axis_b_stop_code

UB `gclib.GDataRecord4000.axis_b_stop_code`

B axis stop code.

Definition at line 1011 of file [gclib.cs](#).

13.17.3.71 axis_b_reference_position

SL `gclib.GDataRecord4000.axis_b_reference_position`

B axis reference position.

Definition at line 1012 of file [gclib.cs](#).

13.17.3.72 axis_b_motor_position

SL `gclib.GDataRecord4000.axis_b_motor_position`

B axis motor position.

Definition at line 1013 of file [gclib.cs](#).

13.17.3.73 axis_b_position_error

SL gclib.GDataRecord4000.axis_b_position_error

B axis position error.

Definition at line 1014 of file [gclib.cs](#).

13.17.3.74 axis_b_aux_position

SL gclib.GDataRecord4000.axis_b_aux_position

B axis auxiliary position.

Definition at line 1015 of file [gclib.cs](#).

13.17.3.75 axis_b_velocity

SL gclib.GDataRecord4000.axis_b_velocity

B axis velocity.

Definition at line 1016 of file [gclib.cs](#).

13.17.3.76 axis_b_torque

SL gclib.GDataRecord4000.axis_b_torque

B axis torque.

Definition at line 1017 of file [gclib.cs](#).

13.17.3.77 axis_b_analog_in

UW gclib.GDataRecord4000.axis_b_analog_in

B axis analog input.

Definition at line 1018 of file [gclib.cs](#).

13.17.3.78 axis_b_halls

UB gclib.GDataRecord4000.axis_b_halls

B Hall Input Status.

Definition at line 1019 of file [gclib.cs](#).

13.17.3.79 axis_b_reserved

UB gclib.GDataRecord4000.axis_b_reserved

Reserved.

Definition at line 1020 of file [gclib.cs](#).

13.17.3.80 axis_b_variable

SL gclib.GDataRecord4000.axis_b_variable

B User-defined variable (ZA).

Definition at line 1021 of file [gclib.cs](#).

13.17.3.81 axis_c_status

UW gclib.GDataRecord4000.axis_c_status

C axis status.

Definition at line 1023 of file [gclib.cs](#).

13.17.3.82 axis_c_switches

UB gclib.GDataRecord4000.axis_c_switches

C axis switches.

Definition at line 1024 of file [gclib.cs](#).

13.17.3.83 axis_c_stop_code

UB `gclib.GDataRecord4000.axis_c_stop_code`

C axis stop code.

Definition at line 1025 of file [gclib.cs](#).

13.17.3.84 axis_c_reference_position

SL `gclib.GDataRecord4000.axis_c_reference_position`

C axis reference position.

Definition at line 1026 of file [gclib.cs](#).

13.17.3.85 axis_c_motor_position

SL `gclib.GDataRecord4000.axis_c_motor_position`

C axis motor position.

Definition at line 1027 of file [gclib.cs](#).

13.17.3.86 axis_c_position_error

SL `gclib.GDataRecord4000.axis_c_position_error`

C axis position error.

Definition at line 1028 of file [gclib.cs](#).

13.17.3.87 axis_c_aux_position

SL `gclib.GDataRecord4000.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1029 of file [gclib.cs](#).

13.17.3.88 axis_c_velocity

SL `gclib.GDataRecord4000.axis_c_velocity`

C axis velocity.

Definition at line 1030 of file [gclib.cs](#).

13.17.3.89 axis_c_torque

SL `gclib.GDataRecord4000.axis_c_torque`

C axis torque.

Definition at line 1031 of file [gclib.cs](#).

13.17.3.90 axis_c_analog_in

UW `gclib.GDataRecord4000.axis_c_analog_in`

C axis analog input.

Definition at line 1032 of file [gclib.cs](#).

13.17.3.91 axis_c_halls

UB `gclib.GDataRecord4000.axis_c_halls`

C Hall Input Status.

Definition at line 1033 of file [gclib.cs](#).

13.17.3.92 axis_c_reserved

UB `gclib.GDataRecord4000.axis_c_reserved`

Reserved.

Definition at line 1034 of file [gclib.cs](#).

13.17.3.93 axis_c_variable

SL gclib.GDataRecord4000.axis_c_variable

C User-defined variable (ZA).

Definition at line 1035 of file [gclib.cs](#).

13.17.3.94 axis_d_status

UW gclib.GDataRecord4000.axis_d_status

D axis status.

Definition at line 1037 of file [gclib.cs](#).

13.17.3.95 axis_d_switches

UB gclib.GDataRecord4000.axis_d_switches

D axis switches.

Definition at line 1038 of file [gclib.cs](#).

13.17.3.96 axis_d_stop_code

UB gclib.GDataRecord4000.axis_d_stop_code

D axis stop code.

Definition at line 1039 of file [gclib.cs](#).

13.17.3.97 axis_d_reference_position

SL gclib.GDataRecord4000.axis_d_reference_position

D axis reference position.

Definition at line 1040 of file [gclib.cs](#).

13.17.3.98 axis_d_motor_position

SL gclib.GDataRecord4000.axis_d_motor_position

D axis motor position.

Definition at line 1041 of file [gclib.cs](#).

13.17.3.99 axis_d_position_error

SL gclib.GDataRecord4000.axis_d_position_error

D axis position error.

Definition at line 1042 of file [gclib.cs](#).

13.17.3.100 axis_d_aux_position

SL gclib.GDataRecord4000.axis_d_aux_position

D axis auxiliary position.

Definition at line 1043 of file [gclib.cs](#).

13.17.3.101 axis_d_velocity

SL gclib.GDataRecord4000.axis_d_velocity

D axis velocity.

Definition at line 1044 of file [gclib.cs](#).

13.17.3.102 axis_d_torque

SL gclib.GDataRecord4000.axis_d_torque

D axis torque.

Definition at line 1045 of file [gclib.cs](#).

13.17.3.103 axis_d_analog_in

UW `gclib.GDataRecord4000.axis_d_analog_in`

D axis analog input.

Definition at line 1046 of file [gclib.cs](#).

13.17.3.104 axis_d_halls

UB `gclib.GDataRecord4000.axis_d_halls`

D Hall Input Status.

Definition at line 1047 of file [gclib.cs](#).

13.17.3.105 axis_d_reserved

UB `gclib.GDataRecord4000.axis_d_reserved`

Reserved.

Definition at line 1048 of file [gclib.cs](#).

13.17.3.106 axis_d_variable

SL `gclib.GDataRecord4000.axis_d_variable`

D User-defined variable (ZA).

Definition at line 1049 of file [gclib.cs](#).

13.17.3.107 axis_e_status

UW `gclib.GDataRecord4000.axis_e_status`

E axis status.

Definition at line 1051 of file [gclib.cs](#).

13.17.3.108 axis_e_switches

UB `gclib.GDataRecord4000.axis_e_switches`

E axis switches.

Definition at line 1052 of file [gclib.cs](#).

13.17.3.109 axis_e_stop_code

UB `gclib.GDataRecord4000.axis_e_stop_code`

E axis stop code.

Definition at line 1053 of file [gclib.cs](#).

13.17.3.110 axis_e_reference_position

SL `gclib.GDataRecord4000.axis_e_reference_position`

E axis reference position.

Definition at line 1054 of file [gclib.cs](#).

13.17.3.111 axis_e_motor_position

SL `gclib.GDataRecord4000.axis_e_motor_position`

E axis motor position.

Definition at line 1055 of file [gclib.cs](#).

13.17.3.112 axis_e_position_error

SL `gclib.GDataRecord4000.axis_e_position_error`

E axis position error.

Definition at line 1056 of file [gclib.cs](#).

13.17.3.113 axis_e_aux_position

SL gclib.GDataRecord4000.axis_e_aux_position

E axis auxiliary position.

Definition at line 1057 of file [gclib.cs](#).

13.17.3.114 axis_e_velocity

SL gclib.GDataRecord4000.axis_e_velocity

E axis velocity.

Definition at line 1058 of file [gclib.cs](#).

13.17.3.115 axis_e_torque

SL gclib.GDataRecord4000.axis_e_torque

E axis torque.

Definition at line 1059 of file [gclib.cs](#).

13.17.3.116 axis_e_analog_in

UW gclib.GDataRecord4000.axis_e_analog_in

E axis analog input.

Definition at line 1060 of file [gclib.cs](#).

13.17.3.117 axis_e_halls

UB gclib.GDataRecord4000.axis_e_halls

E Hall Input Status.

Definition at line 1061 of file [gclib.cs](#).

13.17.3.118 axis_e_reserved

UB gclib.GDataRecord4000.axis_e_reserved

Reserved.

Definition at line 1062 of file [gclib.cs](#).

13.17.3.119 axis_e_variable

SL gclib.GDataRecord4000.axis_e_variable

E User-defined variable (ZA).

Definition at line 1063 of file [gclib.cs](#).

13.17.3.120 axis_f_status

UW gclib.GDataRecord4000.axis_f_status

F axis status.

Definition at line 1065 of file [gclib.cs](#).

13.17.3.121 axis_f_switches

UB gclib.GDataRecord4000.axis_f_switches

F axis switches.

Definition at line 1066 of file [gclib.cs](#).

13.17.3.122 axis_f_stop_code

UB gclib.GDataRecord4000.axis_f_stop_code

F axis stop code.

Definition at line 1067 of file [gclib.cs](#).

13.17.3.123 axis_f_reference_position

SL `gclib.GDataRecord4000.axis_f_reference_position`

F axis reference position.

Definition at line 1068 of file [gclib.cs](#).

13.17.3.124 axis_f_motor_position

SL `gclib.GDataRecord4000.axis_f_motor_position`

F axis motor position.

Definition at line 1069 of file [gclib.cs](#).

13.17.3.125 axis_f_position_error

SL `gclib.GDataRecord4000.axis_f_position_error`

F axis position error.

Definition at line 1070 of file [gclib.cs](#).

13.17.3.126 axis_f_aux_position

SL `gclib.GDataRecord4000.axis_f_aux_position`

F axis auxiliary position.

Definition at line 1071 of file [gclib.cs](#).

13.17.3.127 axis_f_velocity

SL `gclib.GDataRecord4000.axis_f_velocity`

F axis velocity.

Definition at line 1072 of file [gclib.cs](#).

13.17.3.128 axis_f_torque

SL `gclib.GDataRecord4000.axis_f_torque`

F axis torque.

Definition at line 1073 of file [gclib.cs](#).

13.17.3.129 axis_f_analog_in

UW `gclib.GDataRecord4000.axis_f_analog_in`

F axis analog input.

Definition at line 1074 of file [gclib.cs](#).

13.17.3.130 axis_f_halls

UB `gclib.GDataRecord4000.axis_f_halls`

F Hall Input Status.

Definition at line 1075 of file [gclib.cs](#).

13.17.3.131 axis_f_reserved

UB `gclib.GDataRecord4000.axis_f_reserved`

Reserved.

Definition at line 1076 of file [gclib.cs](#).

13.17.3.132 axis_f_variable

SL `gclib.GDataRecord4000.axis_f_variable`

F User-defined variable (ZA).

Definition at line 1077 of file [gclib.cs](#).

13.17.3.133 axis_g_status

UW gclib.GDataRecord4000.axis_g_status

G axis status.

Definition at line 1079 of file [gclib.cs](#).

13.17.3.134 axis_g_switches

UB gclib.GDataRecord4000.axis_g_switches

G axis switches.

Definition at line 1080 of file [gclib.cs](#).

13.17.3.135 axis_g_stop_code

UB gclib.GDataRecord4000.axis_g_stop_code

G axis stop code.

Definition at line 1081 of file [gclib.cs](#).

13.17.3.136 axis_g_reference_position

SL gclib.GDataRecord4000.axis_g_reference_position

G axis reference position.

Definition at line 1082 of file [gclib.cs](#).

13.17.3.137 axis_g_motor_position

SL gclib.GDataRecord4000.axis_g_motor_position

G axis motor position.

Definition at line 1083 of file [gclib.cs](#).

13.17.3.138 axis_g_position_error

SL gclib.GDataRecord4000.axis_g_position_error

G axis position error.

Definition at line 1084 of file [gclib.cs](#).

13.17.3.139 axis_g_aux_position

SL gclib.GDataRecord4000.axis_g_aux_position

G axis auxiliary position.

Definition at line 1085 of file [gclib.cs](#).

13.17.3.140 axis_g_velocity

SL gclib.GDataRecord4000.axis_g_velocity

G axis velocity.

Definition at line 1086 of file [gclib.cs](#).

13.17.3.141 axis_g_torque

SL gclib.GDataRecord4000.axis_g_torque

G axis torque.

Definition at line 1087 of file [gclib.cs](#).

13.17.3.142 axis_g_analog_in

UW gclib.GDataRecord4000.axis_g_analog_in

G axis analog input.

Definition at line 1088 of file [gclib.cs](#).

13.17.3.143 axis_g_halls

UB `gclib.GDataRecord4000.axis_g_halls`

G Hall Input Status.

Definition at line 1089 of file [gclib.cs](#).

13.17.3.144 axis_g_reserved

UB `gclib.GDataRecord4000.axis_g_reserved`

Reserved.

Definition at line 1090 of file [gclib.cs](#).

13.17.3.145 axis_g_variable

SL `gclib.GDataRecord4000.axis_g_variable`

G User-defined variable (ZA).

Definition at line 1091 of file [gclib.cs](#).

13.17.3.146 axis_h_status

UW `gclib.GDataRecord4000.axis_h_status`

H axis status.

Definition at line 1093 of file [gclib.cs](#).

13.17.3.147 axis_h_switches

UB `gclib.GDataRecord4000.axis_h_switches`

H axis switches.

Definition at line 1094 of file [gclib.cs](#).

13.17.3.148 axis_h_stop_code

UB `gclib.GDataRecord4000.axis_h_stop_code`

H axis stop code.

Definition at line 1095 of file [gclib.cs](#).

13.17.3.149 axis_h_reference_position

SL `gclib.GDataRecord4000.axis_h_reference_position`

H axis reference position.

Definition at line 1096 of file [gclib.cs](#).

13.17.3.150 axis_h_motor_position

SL `gclib.GDataRecord4000.axis_h_motor_position`

H axis motor position.

Definition at line 1097 of file [gclib.cs](#).

13.17.3.151 axis_h_position_error

SL `gclib.GDataRecord4000.axis_h_position_error`

H axis position error.

Definition at line 1098 of file [gclib.cs](#).

13.17.3.152 axis_h_aux_position

SL `gclib.GDataRecord4000.axis_h_aux_position`

H axis auxiliary position.

Definition at line 1099 of file [gclib.cs](#).

13.17.3.153 axis_h_velocity

SL `gclib.GDataRecord4000.axis_h_velocity`

H axis velocity.

Definition at line 1100 of file [gclib.cs](#).

13.17.3.154 axis_h_torque

SL `gclib.GDataRecord4000.axis_h_torque`

H axis torque.

Definition at line 1101 of file [gclib.cs](#).

13.17.3.155 axis_h_analog_in

UW `gclib.GDataRecord4000.axis_h_analog_in`

H axis analog input.

Definition at line 1102 of file [gclib.cs](#).

13.17.3.156 axis_h_halls

UB `gclib.GDataRecord4000.axis_h_halls`

H Hall Input Status.

Definition at line 1103 of file [gclib.cs](#).

13.17.3.157 axis_h_reserved

UB `gclib.GDataRecord4000.axis_h_reserved`

Reserved.

Definition at line 1104 of file [gclib.cs](#).

13.17.3.158 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](#)

13.18 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).

13.18.1 Detailed Description

Data record struct for DMC-4000 controllers, including 4000, 4200, 4103, and 500x0.
Definition at line 31 of file [gclib_record.h](#).

13.18.2 Member Data Documentation

13.18.2.1 header_0

UB GDataRecord4000::header_0
1st Byte of Header.
Definition at line 36 of file [gclib_record.h](#).

13.18.2.2 header_1

UB GDataRecord4000::header_1
2nd Byte of Header.
Definition at line 37 of file [gclib_record.h](#).

13.18.2.3 header_2

UB GDataRecord4000::header_2
3rd Byte of Header.
Definition at line 38 of file [gclib_record.h](#).

13.18.2.4 header_3

UB GDataRecord4000::header_3
4th Byte of Header.
Definition at line 39 of file [gclib_record.h](#).

13.18.2.5 sample_number

UW GDataRecord4000::sample_number
sample number.
Definition at line 41 of file [gclib_record.h](#).

13.18.2.6 input_bank_0

UB GDataRecord4000::input_bank_0
general input bank 0 (inputs 1-8).
Definition at line 43 of file [gclib_record.h](#).

13.18.2.7 input_bank_1

UB GDataRecord4000::input_bank_1
general input bank 1 (inputs 9-16).
Definition at line 44 of file [gclib_record.h](#).

13.18.2.8 input_bank_2

UB GDataRecord4000::input_bank_2
general input bank 2 (inputs 17-24).
Definition at line 45 of file [gclib_record.h](#).

13.18.2.9 input_bank_3

UB GDataRecord4000::input_bank_3
general input bank 3 (inputs 25-32).
Definition at line 46 of file [gclib_record.h](#).

13.18.2.10 input_bank_4

UB GDataRecord4000::input_bank_4
general input bank 4 (inputs 33-40).
Definition at line 47 of file [gclib_record.h](#).

13.18.2.11 input_bank_5

UB GDataRecord4000::input_bank_5
general input bank 5 (inputs 41-48).
Definition at line 48 of file [gclib_record.h](#).

13.18.2.12 input_bank_6

UB GDataRecord4000::input_bank_6
general input bank 6 (inputs 49-56).
Definition at line 49 of file [gclib_record.h](#).

13.18.2.13 input_bank_7

UB GDataRecord4000::input_bank_7
general input bank 7 (inputs 57-64).
Definition at line 50 of file [gclib_record.h](#).

13.18.2.14 input_bank_8

UB GDataRecord4000::input_bank_8
general input bank 8 (inputs 65-72).
Definition at line 51 of file [gclib_record.h](#).

13.18.2.15 input_bank_9

UB GDataRecord4000::input_bank_9
general input bank 9 (inputs 73-80).
Definition at line 52 of file [gclib_record.h](#).

13.18.2.16 output_bank_0

UB GDataRecord4000::output_bank_0
general output bank 0 (outputs 1-8).
Definition at line 54 of file [gclib_record.h](#).

13.18.2.17 output_bank_1

UB GDataRecord4000::output_bank_1
general output bank 1 (outputs 9-16).
Definition at line 55 of file [gclib_record.h](#).

13.18.2.18 output_bank_2

UB GDataRecord4000::output_bank_2
general output bank 2 (outputs 17-24).
Definition at line 56 of file [gclib_record.h](#).

13.18.2.19 output_bank_3

UB GDataRecord4000::output_bank_3
general output bank 3 (outputs 25-32).
Definition at line 57 of file [gclib_record.h](#).

13.18.2.20 output_bank_4

UB GDataRecord4000::output_bank_4
general output bank 4 (outputs 33-40).
Definition at line 58 of file [gclib_record.h](#).

13.18.2.21 output_bank_5

UB GDataRecord4000::output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 59 of file [gclib_record.h](#).

13.18.2.22 output_bank_6

UB GDataRecord4000::output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 60 of file [gclib_record.h](#).

13.18.2.23 output_bank_7

UB GDataRecord4000::output_bank_7
general output bank 7 (outputs 57-64).
Definition at line 61 of file [gclib_record.h](#).

13.18.2.24 output_bank_8

UB GDataRecord4000::output_bank_8
general output bank 8 (outputs 65-72).
Definition at line 62 of file [gclib_record.h](#).

13.18.2.25 output_bank_9

UB GDataRecord4000::output_bank_9
general output bank 9 (outputs 73-80).
Definition at line 63 of file [gclib_record.h](#).

13.18.2.26 reserved_0

SW GDataRecord4000::reserved_0
Reserved.
Definition at line 65 of file [gclib_record.h](#).

13.18.2.27 reserved_2

SW GDataRecord4000::reserved_2
Reserved.
Definition at line 66 of file [gclib_record.h](#).

13.18.2.28 reserved_4

SW GDataRecord4000::reserved_4
Reserved.
Definition at line 67 of file [gclib_record.h](#).

13.18.2.29 reserved_6

SW GDataRecord4000::reserved_6
Reserved.
Definition at line 68 of file [gclib_record.h](#).

13.18.2.30 reserved_8

SW GDataRecord4000::reserved_8

Reserved.

Definition at line 69 of file [gclib_record.h](#).

13.18.2.31 reserved_10

SW GDataRecord4000::reserved_10

Reserved.

Definition at line 70 of file [gclib_record.h](#).

13.18.2.32 reserved_12

SW GDataRecord4000::reserved_12

Reserved.

Definition at line 71 of file [gclib_record.h](#).

13.18.2.33 reserved_14

SW GDataRecord4000::reserved_14

Reserved.

Definition at line 72 of file [gclib_record.h](#).

13.18.2.34 ethernet_status_a

UB GDataRecord4000::ethernet_status_a

Ethernet Handle A Status.

Definition at line 74 of file [gclib_record.h](#).

13.18.2.35 ethernet_status_b

UB GDataRecord4000::ethernet_status_b

Ethernet Handle B Status.

Definition at line 75 of file [gclib_record.h](#).

13.18.2.36 ethernet_status_c

UB GDataRecord4000::ethernet_status_c

Ethernet Handle C Status.

Definition at line 76 of file [gclib_record.h](#).

13.18.2.37 ethernet_status_d

UB GDataRecord4000::ethernet_status_d

Ethernet Handle D Status.

Definition at line 77 of file [gclib_record.h](#).

13.18.2.38 ethernet_status_e

UB GDataRecord4000::ethernet_status_e

Ethernet Handle E Status.

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

13.18.2.39 ethernet_status_f

UB GDataRecord4000::ethernet_status_f

Ethernet Handle F Status.

Definition at line 79 of file [gclib_record.h](#).

13.18.2.40 ethernet_status_g

UB GDataRecord4000::ethernet_status_g

Ethernet Handle G Status.

Definition at line 80 of file [gclib_record.h](#).

13.18.2.41 ethernet_status_h

UB GDataRecord4000::ethernet_status_h

Ethernet Handle H Status.

Definition at line 81 of file [gclib_record.h](#).

13.18.2.42 error_code

UB GDataRecord4000::error_code

error code.

Definition at line 83 of file [gclib_record.h](#).

13.18.2.43 thread_status

UB GDataRecord4000::thread_status

thread status

Definition at line 84 of file [gclib_record.h](#).

13.18.2.44 amplifier_status

UL GDataRecord4000::amplifier_status

Amplifier Status.

Definition at line 85 of file [gclib_record.h](#).

13.18.2.45 contour_segment_count

UL GDataRecord4000::contour_segment_count

Segment Count for Contour Mode.

Definition at line 87 of file [gclib_record.h](#).

13.18.2.46 contour_buffer_available

UW GDataRecord4000::contour_buffer_available

Buffer space remaining, Contour Mode.

Definition at line 88 of file [gclib_record.h](#).

13.18.2.47 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](#).

13.18.2.48 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](#).

13.18.2.49 s_distance

SL GDataRecord4000::s_distance

distance traveled in coordinated move for S plane.

Definition at line 92 of file [gclib_record.h](#).

13.18.2.50 s_plane_buffer_available

UW GDataRecord4000::s_plane_buffer_available

Buffer space remaining, S Plane.

Definition at line 93 of file [gclib_record.h](#).

13.18.2.51 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](#).

13.18.2.52 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](#).

13.18.2.53 t_distance

SL GDataRecord4000::t_distance

distance traveled in coordinated move for T plane.

Definition at line 97 of file [gclib_record.h](#).

13.18.2.54 t_plane_buffer_available

UW GDataRecord4000::t_plane_buffer_available

Buffer space remaining, T Plane.

Definition at line 98 of file [gclib_record.h](#).

13.18.2.55 axis_a_status

UW GDataRecord4000::axis_a_status

A axis status.

Definition at line 100 of file [gclib_record.h](#).

13.18.2.56 axis_a_switches

UB GDataRecord4000::axis_a_switches

A axis switches.

Definition at line 101 of file [gclib_record.h](#).

13.18.2.57 axis_a_stop_code

UB GDataRecord4000::axis_a_stop_code

A axis stop code.

Definition at line 102 of file [gclib_record.h](#).

13.18.2.58 axis_a_reference_position

SL GDataRecord4000::axis_a_reference_position

A axis reference position.

Definition at line 103 of file [gclib_record.h](#).

13.18.2.59 axis_a_motor_position

SL GDataRecord4000::axis_a_motor_position

A axis motor position.

Definition at line 104 of file [gclib_record.h](#).

13.18.2.60 axis_a_position_error

SL GDataRecord4000::axis_a_position_error

A axis position error.

Definition at line 105 of file [gclib_record.h](#).

13.18.2.61 axis_a_aux_position

SL GDataRecord4000::axis_a_aux_position

A axis auxiliary position.

Definition at line 106 of file [gclib_record.h](#).

13.18.2.62 axis_a_velocity

SL GDataRecord4000::axis_a_velocity

A axis velocity.

Definition at line 107 of file [gclib_record.h](#).

13.18.2.63 axis_a_torque

SL GDataRecord4000::axis_a_torque

A axis torque.

Definition at line 108 of file [gclib_record.h](#).

13.18.2.64 axis_a_analog_in

UW GDataRecord4000::axis_a_analog_in

A axis analog input.

Definition at line 109 of file [gclib_record.h](#).

13.18.2.65 axis_a_halls

UB GDataRecord4000::axis_a_halls

A Hall Input Status.

Definition at line 110 of file [gclib_record.h](#).

13.18.2.66 axis_a_reserved

UB GDataRecord4000::axis_a_reserved

Reserved.

Definition at line 111 of file [gclib_record.h](#).

13.18.2.67 axis_a_variable

SL GDataRecord4000::axis_a_variable

A User-defined variable (ZA).

Definition at line 112 of file [gclib_record.h](#).

13.18.2.68 axis_b_status

UW GDataRecord4000::axis_b_status

B axis status.

Definition at line 114 of file [gclib_record.h](#).

13.18.2.69 axis_b_switches

UB GDataRecord4000::axis_b_switches

B axis switches.

Definition at line 115 of file [gclib_record.h](#).

13.18.2.70 axis_b_stop_code

UB GDataRecord4000::axis_b_stop_code

B axis stop code.

Definition at line 116 of file [gclib_record.h](#).

13.18.2.71 axis_b_reference_position

SL GDataRecord4000::axis_b_reference_position

B axis reference position.

Definition at line 117 of file [gclib_record.h](#).

13.18.2.72 axis_b_motor_position

SL GDataRecord4000::axis_b_motor_position

B axis motor position.

Definition at line 118 of file [gclib_record.h](#).

13.18.2.73 axis_b_position_error

SL GDataRecord4000::axis_b_position_error

B axis position error.

Definition at line 119 of file [gclib_record.h](#).

13.18.2.74 axis_b_aux_position

SL GDataRecord4000::axis_b_aux_position

B axis auxiliary position.

Definition at line 120 of file [gclib_record.h](#).

13.18.2.75 axis_b_velocity

SL GDataRecord4000::axis_b_velocity

B axis velocity.

Definition at line 121 of file [gclib_record.h](#).

13.18.2.76 axis_b_torque

SL GDataRecord4000::axis_b_torque

B axis torque.

Definition at line 122 of file [gclib_record.h](#).

13.18.2.77 axis_b_analog_in

UW GDataRecord4000::axis_b_analog_in

B axis analog input.

Definition at line 123 of file [gclib_record.h](#).

13.18.2.78 axis_b_halls

UB GDataRecord4000::axis_b_halls

B Hall Input Status.

Definition at line 124 of file [gclib_record.h](#).

13.18.2.79 axis_b_reserved

UB GDataRecord4000::axis_b_reserved

Reserved.

Definition at line 125 of file [gclib_record.h](#).

13.18.2.80 axis_b_variable

SL GDataRecord4000::axis_b_variable

B User-defined variable (ZA).

Definition at line 126 of file [gclib_record.h](#).

13.18.2.81 axis_c_status

UW GDataRecord4000::axis_c_status

C axis status.

Definition at line 128 of file [gclib_record.h](#).

13.18.2.82 axis_c_switches

UB GDataRecord4000::axis_c_switches

C axis switches.

Definition at line 129 of file [gclib_record.h](#).

13.18.2.83 axis_c_stop_code

UB GDataRecord4000::axis_c_stop_code

C axis stop code.

Definition at line 130 of file [gclib_record.h](#).

13.18.2.84 axis_c_reference_position

SL GDataRecord4000::axis_c_reference_position

C axis reference position.

Definition at line 131 of file [gclib_record.h](#).

13.18.2.85 axis_c_motor_position

SL GDataRecord4000::axis_c_motor_position

C axis motor position.

Definition at line 132 of file [gclib_record.h](#).

13.18.2.86 axis_c_position_error

SL GDataRecord4000::axis_c_position_error

C axis position error.

Definition at line 133 of file [gclib_record.h](#).

13.18.2.87 axis_c_aux_position

SL GDataRecord4000::axis_c_aux_position

C axis auxiliary position.

Definition at line 134 of file [gclib_record.h](#).

13.18.2.88 axis_c_velocity

SL GDataRecord4000::axis_c_velocity

C axis velocity.

Definition at line 135 of file [gclib_record.h](#).

13.18.2.89 axis_c_torque

SL GDataRecord4000::axis_c_torque

C axis torque.

Definition at line 136 of file [gclib_record.h](#).

13.18.2.90 axis_c_analog_in

UW GDataRecord4000::axis_c_analog_in

C axis analog input.

Definition at line 137 of file [gclib_record.h](#).

13.18.2.91 axis_c_halls

UB GDataRecord4000::axis_c_halls

C Hall Input Status.

Definition at line 138 of file [gclib_record.h](#).

13.18.2.92 axis_c_reserved

UB GDataRecord4000::axis_c_reserved

Reserved.

Definition at line 139 of file [gclib_record.h](#).

13.18.2.93 axis_c_variable

SL GDataRecord4000::axis_c_variable

C User-defined variable (ZA).

Definition at line 140 of file [gclib_record.h](#).

13.18.2.94 axis_d_status

UW GDataRecord4000::axis_d_status

D axis status.

Definition at line 142 of file [gclib_record.h](#).

13.18.2.95 axis_d_switches

UB GDataRecord4000::axis_d_switches

D axis switches.

Definition at line 143 of file [gclib_record.h](#).

13.18.2.96 axis_d_stop_code

UB GDataRecord4000::axis_d_stop_code

D axis stop code.

Definition at line 144 of file [gclib_record.h](#).

13.18.2.97 axis_d_reference_position

SL GDataRecord4000::axis_d_reference_position

D axis reference position.

Definition at line 145 of file [gclib_record.h](#).

13.18.2.98 axis_d_motor_position

SL GDataRecord4000::axis_d_motor_position

D axis motor position.

Definition at line 146 of file [gclib_record.h](#).

13.18.2.99 axis_d_position_error

SL GDataRecord4000::axis_d_position_error

D axis position error.

Definition at line 147 of file [gclib_record.h](#).

13.18.2.100 axis_d_aux_position

SL GDataRecord4000::axis_d_aux_position

D axis auxiliary position.

Definition at line 148 of file [gclib_record.h](#).

13.18.2.101 axis_d_velocity

SL GDataRecord4000::axis_d_velocity

D axis velocity.

Definition at line 149 of file [gclib_record.h](#).

13.18.2.102 axis_d_torque

SL GDataRecord4000::axis_d_torque

D axis torque.

Definition at line 150 of file [gclib_record.h](#).

13.18.2.103 axis_d_analog_in

UW GDataRecord4000::axis_d_analog_in

D axis analog input.

Definition at line 151 of file [gclib_record.h](#).

13.18.2.104 axis_d_halls

UB GDataRecord4000::axis_d_halls

D Hall Input Status.

Definition at line 152 of file [gclib_record.h](#).

13.18.2.105 axis_d_reserved

UB GDataRecord4000::axis_d_reserved

Reserved.

Definition at line 153 of file [gclib_record.h](#).

13.18.2.106 axis_d_variable

SL GDataRecord4000::axis_d_variable

D User-defined variable (ZA).

Definition at line 154 of file [gclib_record.h](#).

13.18.2.107 axis_e_status

UW GDataRecord4000::axis_e_status

E axis status.

Definition at line 156 of file [gclib_record.h](#).

13.18.2.108 axis_e_switches

UB GDataRecord4000::axis_e_switches

E axis switches.

Definition at line 157 of file [gclib_record.h](#).

13.18.2.109 axis_e_stop_code

UB GDataRecord4000::axis_e_stop_code

E axis stop code.

Definition at line 158 of file [gclib_record.h](#).

13.18.2.110 axis_e_reference_position

SL GDataRecord4000::axis_e_reference_position

E axis reference position.

Definition at line 159 of file [gclib_record.h](#).

13.18.2.111 axis_e_motor_position

SL GDataRecord4000::axis_e_motor_position

E axis motor position.

Definition at line 160 of file [gclib_record.h](#).

13.18.2.112 axis_e_position_error

SL GDataRecord4000::axis_e_position_error

E axis position error.

Definition at line 161 of file [gclib_record.h](#).

13.18.2.113 axis_e_aux_position

SL GDataRecord4000::axis_e_aux_position

E axis auxiliary position.

Definition at line 162 of file [gclib_record.h](#).

13.18.2.114 axis_e_velocity

SL GDataRecord4000::axis_e_velocity

E axis velocity.

Definition at line 163 of file [gclib_record.h](#).

13.18.2.115 axis_e_torque

SL GDataRecord4000::axis_e_torque

E axis torque.

Definition at line 164 of file [gclib_record.h](#).

13.18.2.116 axis_e_analog_in

UW GDataRecord4000::axis_e_analog_in

E axis analog input.

Definition at line 165 of file [gclib_record.h](#).

13.18.2.117 axis_e_halls

UB GDataRecord4000::axis_e_halls

E Hall Input Status.

Definition at line 166 of file [gclib_record.h](#).

13.18.2.118 axis_e_reserved

UB GDataRecord4000::axis_e_reserved

Reserved.

Definition at line 167 of file [gclib_record.h](#).

13.18.2.119 axis_e_variable

SL GDataRecord4000::axis_e_variable

E User-defined variable (ZA).

Definition at line 168 of file [gclib_record.h](#).

13.18.2.120 axis_f_status

UW GDataRecord4000::axis_f_status

F axis status.

Definition at line 170 of file [gclib_record.h](#).

13.18.2.121 axis_f_switches

UB GDataRecord4000::axis_f_switches

F axis switches.

Definition at line 171 of file [gclib_record.h](#).

13.18.2.122 axis_f_stop_code

UB GDataRecord4000::axis_f_stop_code

F axis stop code.

Definition at line 172 of file [gclib_record.h](#).

13.18.2.123 axis_f_reference_position

SL GDataRecord4000::axis_f_reference_position

F axis reference position.

Definition at line 173 of file [gclib_record.h](#).

13.18.2.124 axis_f_motor_position

SL GDataRecord4000::axis_f_motor_position

F axis motor position.

Definition at line 174 of file [gclib_record.h](#).

13.18.2.125 axis_f_position_error

SL GDataRecord4000::axis_f_position_error

F axis position error.

Definition at line 175 of file [gclib_record.h](#).

13.18.2.126 axis_f_aux_position

SL GDataRecord4000::axis_f_aux_position

F axis auxiliary position.

Definition at line 176 of file [gclib_record.h](#).

13.18.2.127 axis_f_velocity

SL GDataRecord4000::axis_f_velocity

F axis velocity.

Definition at line 177 of file [gclib_record.h](#).

13.18.2.128 axis_f_torque

SL GDataRecord4000::axis_f_torque

F axis torque.

Definition at line 178 of file [gclib_record.h](#).

13.18.2.129 axis_f_analog_in

UW GDataRecord4000::axis_f_analog_in

F axis analog input.

Definition at line 179 of file [gclib_record.h](#).

13.18.2.130 axis_f_halls

UB GDataRecord4000::axis_f_halls

F Hall Input Status.

Definition at line 180 of file [gclib_record.h](#).

13.18.2.131 axis_f_reserved

UB GDataRecord4000::axis_f_reserved

Reserved.

Definition at line 181 of file [gclib_record.h](#).

13.18.2.132 axis_f_variable

SL GDataRecord4000::axis_f_variable

F User-defined variable (ZA).

Definition at line 182 of file [gclib_record.h](#).

13.18.2.133 axis_g_status

UW GDataRecord4000::axis_g_status

G axis status.

Definition at line 184 of file [gclib_record.h](#).

13.18.2.134 axis_g_switches

UB GDataRecord4000::axis_g_switches

G axis switches.

Definition at line 185 of file [gclib_record.h](#).

13.18.2.135 axis_g_stop_code

UB GDataRecord4000::axis_g_stop_code

G axis stop code.

Definition at line 186 of file [gclib_record.h](#).

13.18.2.136 axis_g_reference_position

SL GDataRecord4000::axis_g_reference_position

G axis reference position.

Definition at line 187 of file [gclib_record.h](#).

13.18.2.137 axis_g_motor_position

SL GDataRecord4000::axis_g_motor_position

G axis motor position.

Definition at line 188 of file [gclib_record.h](#).

13.18.2.138 axis_g_position_error

SL GDataRecord4000::axis_g_position_error

G axis position error.

Definition at line 189 of file [gclib_record.h](#).

13.18.2.139 axis_g_aux_position

SL GDataRecord4000::axis_g_aux_position

G axis auxiliary position.

Definition at line 190 of file [gclib_record.h](#).

13.18.2.140 axis_g_velocity

SL GDataRecord4000::axis_g_velocity

G axis velocity.

Definition at line 191 of file [gclib_record.h](#).

13.18.2.141 axis_g_torque

SL GDataRecord4000::axis_g_torque

G axis torque.

Definition at line 192 of file [gclib_record.h](#).

13.18.2.142 axis_g_analog_in

UW GDataRecord4000::axis_g_analog_in

G axis analog input.

Definition at line 193 of file [gclib_record.h](#).

13.18.2.143 axis_g_halls

UB GDataRecord4000::axis_g_halls

G Hall Input Status.

Definition at line 194 of file [gclib_record.h](#).

13.18.2.144 axis_g_reserved

UB GDataRecord4000::axis_g_reserved

Reserved.

Definition at line 195 of file [gclib_record.h](#).

13.18.2.145 axis_g_variable

SL GDataRecord4000::axis_g_variable

G User-defined variable (ZA).

Definition at line 196 of file [gclib_record.h](#).

13.18.2.146 axis_h_status

UW GDataRecord4000::axis_h_status

H axis status.

Definition at line 198 of file [gclib_record.h](#).

13.18.2.147 axis_h_switches

UB GDataRecord4000::axis_h_switches

H axis switches.

Definition at line 199 of file [gclib_record.h](#).

13.18.2.148 axis_h_stop_code

UB GDataRecord4000::axis_h_stop_code

H axis stop code.

Definition at line 200 of file [gclib_record.h](#).

13.18.2.149 axis_h_reference_position

SL GDataRecord4000::axis_h_reference_position

H axis reference position.

Definition at line 201 of file [gclib_record.h](#).

13.18.2.150 axis_h_motor_position

SL GDataRecord4000::axis_h_motor_position

H axis motor position.

Definition at line 202 of file [gclib_record.h](#).

13.18.2.151 axis_h_position_error

SL GDataRecord4000::axis_h_position_error

H axis position error.

Definition at line 203 of file [gclib_record.h](#).

13.18.2.152 axis_h_aux_position

SL GDataRecord4000::axis_h_aux_position

H axis auxiliary position.

Definition at line 204 of file [gclib_record.h](#).

13.18.2.153 axis_h_velocity

SL GDataRecord4000::axis_h_velocity

H axis velocity.

Definition at line 205 of file [gclib_record.h](#).

13.18.2.154 axis_h_torque

SL GDataRecord4000::axis_h_torque

H axis torque.

Definition at line 206 of file [gclib_record.h](#).

13.18.2.155 axis_h_analog_in

UW GDataRecord4000::axis_h_analog_in

H axis analog input.

Definition at line 207 of file [gclib_record.h](#).

13.18.2.156 axis_h_halls

UB GDataRecord4000::axis_h_halls

H Hall Input Status.

Definition at line 208 of file [gclib_record.h](#).

13.18.2.157 axis_h_reserved

UB GDataRecord4000::axis_h_reserved

Reserved.

Definition at line 209 of file [gclib_record.h](#).

13.18.2.158 axis_h_variable

SL GDataRecord4000::axis_h_variable

H User-defined variable (ZA).

Definition at line 210 of file [gclib_record.h](#).

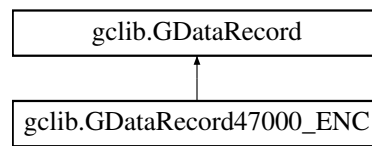
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.19 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 Member Functions inherited from [gclib.GDataRecord](#)

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.*

13.19.1 Detailed Description

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.
Definition at line [1770](#) of file [gclib.cs](#).

13.19.2 Member Function Documentation

13.19.2.1 `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](#).

13.19.3 Member Data Documentation

13.19.3.1 `header_0`

```
UB gclib.GDataRecord47000_ENC.header_0
```

1st Byte of Header.
Definition at line [1776](#) of file [gclib.cs](#).

13.19.3.2 header_1

UB `gclib.GDataRecord47000_ENC.header_1`

2nd Byte of Header.

Definition at line 1777 of file [gclib.cs](#).

13.19.3.3 header_2

UB `gclib.GDataRecord47000_ENC.header_2`

3rd Byte of Header.

Definition at line 1778 of file [gclib.cs](#).

13.19.3.4 header_3

UB `gclib.GDataRecord47000_ENC.header_3`

4th Byte of Header.

Definition at line 1779 of file [gclib.cs](#).

13.19.3.5 sample_number

UW `gclib.GDataRecord47000_ENC.sample_number`

Sample number.

Definition at line 1781 of file [gclib.cs](#).

13.19.3.6 error_code

UB `gclib.GDataRecord47000_ENC.error_code`

Error code.

Definition at line 1782 of file [gclib.cs](#).

13.19.3.7 general_status

UB `gclib.GDataRecord47000_ENC.general_status`

General status.

Definition at line 1783 of file [gclib.cs](#).

13.19.3.8 output_analog_0

UW `gclib.GDataRecord47000_ENC.output_analog_0`

Analog output 0.

Definition at line 1785 of file [gclib.cs](#).

13.19.3.9 output_analog_1

UW `gclib.GDataRecord47000_ENC.output_analog_1`

Analog output 1.

Definition at line 1786 of file [gclib.cs](#).

13.19.3.10 output_analog_2

UW `gclib.GDataRecord47000_ENC.output_analog_2`

Analog output 2.

Definition at line 1787 of file [gclib.cs](#).

13.19.3.11 output_analog_3

UW `gclib.GDataRecord47000_ENC.output_analog_3`

Analog output 3.

Definition at line 1788 of file [gclib.cs](#).

13.19.3.12 output_analog_4

UW gclib.GDataRecord47000_ENC.output_analog_4

Analog output 4.

Definition at line 1789 of file [gclib.cs](#).

13.19.3.13 output_analog_5

UW gclib.GDataRecord47000_ENC.output_analog_5

Analog output 5.

Definition at line 1790 of file [gclib.cs](#).

13.19.3.14 output_analog_6

UW gclib.GDataRecord47000_ENC.output_analog_6

Analog output 6.

Definition at line 1791 of file [gclib.cs](#).

13.19.3.15 output_analog_7

UW gclib.GDataRecord47000_ENC.output_analog_7

Analog output 7.

Definition at line 1792 of file [gclib.cs](#).

13.19.3.16 input_analog_0

UW gclib.GDataRecord47000_ENC.input_analog_0

Analog input 0.

Definition at line 1794 of file [gclib.cs](#).

13.19.3.17 input_analog_1

UW gclib.GDataRecord47000_ENC.input_analog_1

Analog input 1.

Definition at line 1795 of file [gclib.cs](#).

13.19.3.18 input_analog_2

UW gclib.GDataRecord47000_ENC.input_analog_2

Analog input 2.

Definition at line 1796 of file [gclib.cs](#).

13.19.3.19 input_analog_3

UW gclib.GDataRecord47000_ENC.input_analog_3

Analog input 3.

Definition at line 1797 of file [gclib.cs](#).

13.19.3.20 input_analog_4

UW gclib.GDataRecord47000_ENC.input_analog_4

Analog input 4.

Definition at line 1798 of file [gclib.cs](#).

13.19.3.21 input_analog_5

UW gclib.GDataRecord47000_ENC.input_analog_5

Analog input 5.

Definition at line 1799 of file [gclib.cs](#).

13.19.3.22 input_analog_6

UW `gclib.GDataRecord47000_ENC.input_analog_6`

Analog input 6.

Definition at line 1800 of file [gclib.cs](#).

13.19.3.23 input_analog_7

UW `gclib.GDataRecord47000_ENC.input_analog_7`

Analog input 7.

Definition at line 1801 of file [gclib.cs](#).

13.19.3.24 output_bank_0

UW `gclib.GDataRecord47000_ENC.output_bank_0`

Digital outputs 0-15;.

Definition at line 1803 of file [gclib.cs](#).

13.19.3.25 input_bank_0

UW `gclib.GDataRecord47000_ENC.input_bank_0`

Digital inputs 0-15;.

Definition at line 1805 of file [gclib.cs](#).

13.19.3.26 pulse_count_0

UL `gclib.GDataRecord47000_ENC.pulse_count_0`

Pulse counter (see PC).

Definition at line 1807 of file [gclib.cs](#).

13.19.3.27 zc_variable

SL `gclib.GDataRecord47000_ENC.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1808 of file [gclib.cs](#).

13.19.3.28 zd_variable

SL `gclib.GDataRecord47000_ENC.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1809 of file [gclib.cs](#).

13.19.3.29 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](#).

13.19.3.30 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](#).

13.19.3.31 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](#).

13.19.3.32 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](#)

13.20 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.*

13.20.1 Detailed Description

Data record struct for RIO-471xx and RIO-472xx PLCs. Includes encoder fields.

Definition at line 866 of file [gclib_record.h](#).

13.20.2 Member Data Documentation

13.20.2.1 header_0

UB `GDataRecord47000_ENC::header_0`

1st Byte of Header.

Definition at line 871 of file [gclib_record.h](#).

13.20.2.2 header_1

UB `GDataRecord47000_ENC::header_1`

2nd Byte of Header.

Definition at line 872 of file [gclib_record.h](#).

13.20.2.3 header_2

UB `GDataRecord47000_ENC::header_2`

3rd Byte of Header.

Definition at line 873 of file [gclib_record.h](#).

13.20.2.4 header_3

UB GDataRecord47000_ENC::header_3

4th Byte of Header.

Definition at line 874 of file [gclib_record.h](#).

13.20.2.5 sample_number

UW GDataRecord47000_ENC::sample_number

Sample number.

Definition at line 876 of file [gclib_record.h](#).

13.20.2.6 error_code

UB GDataRecord47000_ENC::error_code

Error code.

Definition at line 877 of file [gclib_record.h](#).

13.20.2.7 general_status

UB GDataRecord47000_ENC::general_status

General status.

Definition at line 878 of file [gclib_record.h](#).

13.20.2.8 output_analog_0

UW GDataRecord47000_ENC::output_analog_0

Analog output 0.

Definition at line 880 of file [gclib_record.h](#).

13.20.2.9 output_analog_1

UW GDataRecord47000_ENC::output_analog_1

Analog output 1.

Definition at line 881 of file [gclib_record.h](#).

13.20.2.10 output_analog_2

UW GDataRecord47000_ENC::output_analog_2

Analog output 2.

Definition at line 882 of file [gclib_record.h](#).

13.20.2.11 output_analog_3

UW GDataRecord47000_ENC::output_analog_3

Analog output 3.

Definition at line 883 of file [gclib_record.h](#).

13.20.2.12 output_analog_4

UW GDataRecord47000_ENC::output_analog_4

Analog output 4.

Definition at line 884 of file [gclib_record.h](#).

13.20.2.13 output_analog_5

UW GDataRecord47000_ENC::output_analog_5

Analog output 5.

Definition at line 885 of file [gclib_record.h](#).

13.20.2.14 output_analog_6

UW GDataRecord47000_ENC::output_analog_6

Analog output 6.

Definition at line 886 of file [gclib_record.h](#).

13.20.2.15 output_analog_7

UW GDataRecord47000_ENC::output_analog_7

Analog output 7.

Definition at line 887 of file [gclib_record.h](#).

13.20.2.16 input_analog_0

UW GDataRecord47000_ENC::input_analog_0

Analog input 0.

Definition at line 889 of file [gclib_record.h](#).

13.20.2.17 input_analog_1

UW GDataRecord47000_ENC::input_analog_1

Analog input 1.

Definition at line 890 of file [gclib_record.h](#).

13.20.2.18 input_analog_2

UW GDataRecord47000_ENC::input_analog_2

Analog input 2.

Definition at line 891 of file [gclib_record.h](#).

13.20.2.19 input_analog_3

UW GDataRecord47000_ENC::input_analog_3

Analog input 3.

Definition at line 892 of file [gclib_record.h](#).

13.20.2.20 input_analog_4

UW GDataRecord47000_ENC::input_analog_4

Analog input 4.

Definition at line 893 of file [gclib_record.h](#).

13.20.2.21 input_analog_5

UW GDataRecord47000_ENC::input_analog_5

Analog input 5.

Definition at line 894 of file [gclib_record.h](#).

13.20.2.22 input_analog_6

UW GDataRecord47000_ENC::input_analog_6

Analog input 6.

Definition at line 895 of file [gclib_record.h](#).

13.20.2.23 input_analog_7

UW GDataRecord47000_ENC::input_analog_7

Analog input 7.

Definition at line 896 of file [gclib_record.h](#).

13.20.2.24 output_bank_0

UW GDataRecord47000_ENC::output_bank_0

Digital outputs 0-15;

Definition at line 898 of file [gclib_record.h](#).

13.20.2.25 input_bank_0

UW GDataRecord47000_ENC::input_bank_0

Digital inputs 0-15;

Definition at line 900 of file [gclib_record.h](#).

13.20.2.26 pulse_count_0

UL GDataRecord47000_ENC::pulse_count_0

Pulse counter (see PC).

Definition at line 902 of file [gclib_record.h](#).

13.20.2.27 zc_variable

SL GDataRecord47000_ENC::zc_variable

ZC User-defined variable (see ZC).

Definition at line 903 of file [gclib_record.h](#).

13.20.2.28 zd_variable

SL GDataRecord47000_ENC::zd_variable

ZD User-defined variable (see ZD).

Definition at line 904 of file [gclib_record.h](#).

13.20.2.29 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](#).

13.20.2.30 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](#).

13.20.2.31 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](#).

13.20.2.32 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](#).

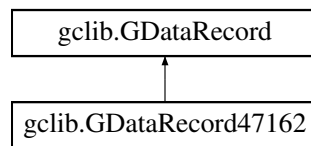
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.21 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 Member Functions inherited from [gclib.GDataRecord](#)

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.*

13.21.1 Detailed Description

Data record struct for RIO-47162.

Definition at line 1925 of file [gclib.cs](#).

13.21.2 Member Function Documentation

13.21.2.1 `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](#).

13.21.3 Member Data Documentation

13.21.3.1 `header_0`

`UB gclib.GDataRecord47162.header_0`

1st Byte of Header.

Definition at line 1930 of file [gclib.cs](#).

13.21.3.2 `header_1`

`UB gclib.GDataRecord47162.header_1`

2nd Byte of Header.

Definition at line 1931 of file [gclib.cs](#).

13.21.3.3 `header_2`

`UB gclib.GDataRecord47162.header_2`

3rd Byte of Header.

Definition at line 1932 of file [gclib.cs](#).

13.21.3.4 `header_3`

`UB gclib.GDataRecord47162.header_3`

4th Byte of Header.

Definition at line 1933 of file [gclib.cs](#).

13.21.3.5 `sample_number`

`UW gclib.GDataRecord47162.sample_number`

Sample number.

Definition at line 1935 of file [gclib.cs](#).

13.21.3.6 `error_code`

`UB gclib.GDataRecord47162.error_code`

Error code.

Definition at line 1936 of file [gclib.cs](#).

13.21.3.7 `general_status`

`UB gclib.GDataRecord47162.general_status`

General status.

Definition at line 1937 of file [gclib.cs](#).

13.21.3.8 `output_analog_0`

`UW gclib.GDataRecord47162.output_analog_0`

Analog output 0.

Definition at line 1939 of file [gclib.cs](#).

13.21.3.9 output_analog_1

UW `gclib.GDataRecord47162.output_analog_1`

Analog output 1.

Definition at line 1940 of file [gclib.cs](#).

13.21.3.10 output_analog_2

UW `gclib.GDataRecord47162.output_analog_2`

Analog output 2.

Definition at line 1941 of file [gclib.cs](#).

13.21.3.11 output_analog_3

UW `gclib.GDataRecord47162.output_analog_3`

Analog output 3.

Definition at line 1942 of file [gclib.cs](#).

13.21.3.12 output_analog_4

UW `gclib.GDataRecord47162.output_analog_4`

Analog output 4.

Definition at line 1943 of file [gclib.cs](#).

13.21.3.13 output_analog_5

UW `gclib.GDataRecord47162.output_analog_5`

Analog output 5.

Definition at line 1944 of file [gclib.cs](#).

13.21.3.14 output_analog_6

UW `gclib.GDataRecord47162.output_analog_6`

Analog output 6.

Definition at line 1945 of file [gclib.cs](#).

13.21.3.15 output_analog_7

UW `gclib.GDataRecord47162.output_analog_7`

Analog output 7.

Definition at line 1946 of file [gclib.cs](#).

13.21.3.16 input_analog_0

UW `gclib.GDataRecord47162.input_analog_0`

Analog input 0.

Definition at line 1948 of file [gclib.cs](#).

13.21.3.17 input_analog_1

UW `gclib.GDataRecord47162.input_analog_1`

Analog input 1.

Definition at line 1949 of file [gclib.cs](#).

13.21.3.18 input_analog_2

UW `gclib.GDataRecord47162.input_analog_2`

Analog input 2.

Definition at line 1950 of file [gclib.cs](#).

13.21.3.19 input_analog_3

UW `gclib.GDataRecord47162.input_analog_3`

Analog input 3.

Definition at line 1951 of file [gclib.cs](#).

13.21.3.20 input_analog_4

UW `gclib.GDataRecord47162.input_analog_4`

Analog input 4.

Definition at line 1952 of file [gclib.cs](#).

13.21.3.21 input_analog_5

UW `gclib.GDataRecord47162.input_analog_5`

Analog input 5.

Definition at line 1953 of file [gclib.cs](#).

13.21.3.22 input_analog_6

UW `gclib.GDataRecord47162.input_analog_6`

Analog input 6.

Definition at line 1954 of file [gclib.cs](#).

13.21.3.23 input_analog_7

UW `gclib.GDataRecord47162.input_analog_7`

Analog input 7.

Definition at line 1955 of file [gclib.cs](#).

13.21.3.24 output_byte_0

UB `gclib.GDataRecord47162.output_byte_0`

Digital outputs 0-7.

Definition at line 1957 of file [gclib.cs](#).

13.21.3.25 output_byte_1

UB `gclib.GDataRecord47162.output_byte_1`

Digital outputs 8-15.

Definition at line 1958 of file [gclib.cs](#).

13.21.3.26 output_byte_2

UB `gclib.GDataRecord47162.output_byte_2`

Digital outputs 16-23.

Definition at line 1959 of file [gclib.cs](#).

13.21.3.27 input_byte_0

UB `gclib.GDataRecord47162.input_byte_0`

Digital inputs 0-7.

Definition at line 1961 of file [gclib.cs](#).

13.21.3.28 input_byte_1

UB `gclib.GDataRecord47162.input_byte_1`

Digital inputs 8-15.

Definition at line 1962 of file [gclib.cs](#).

13.21.3.29 input_byte_2

UB gclib.GDataRecord47162.input_byte_2

Digital inputs 16-23.

Definition at line 1963 of file [gclib.cs](#).

13.21.3.30 input_byte_3

UB gclib.GDataRecord47162.input_byte_3

Digital inputs 24-31.

Definition at line 1964 of file [gclib.cs](#).

13.21.3.31 input_byte_4

UB gclib.GDataRecord47162.input_byte_4

Digital inputs 32-39.

Definition at line 1965 of file [gclib.cs](#).

13.21.3.32 pulse_count_0

UL gclib.GDataRecord47162.pulse_count_0

Pulse counter (see PC).

Definition at line 1967 of file [gclib.cs](#).

13.21.3.33 zc_variable

SL gclib.GDataRecord47162.zc_variable

ZC User-defined variable (see ZC).

Definition at line 1968 of file [gclib.cs](#).

13.21.3.34 zd_variable

SL gclib.GDataRecord47162.zd_variable

ZD User-defined variable (see ZD).

Definition at line 1969 of file [gclib.cs](#).

13.21.3.35 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](#).

13.21.3.36 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](#).

13.21.3.37 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](#).

13.21.3.38 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](#)

13.22 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.

13.22.1 Detailed Description

Data record struct for RIO-47162.

Definition at line 1015 of file [gclib_record.h](#).

13.22.2 Member Data Documentation

13.22.2.1 header_0

UB GDataRecord47162::header_0

1st Byte of Header.

Definition at line 1019 of file [gclib_record.h](#).

13.22.2.2 header_1

UB GDataRecord47162::header_1

2nd Byte of Header.

Definition at line 1020 of file [gclib_record.h](#).

13.22.2.3 header_2

UB `GDataRecord47162::header_2`

3rd Byte of Header.

Definition at line 1021 of file [gclib_record.h](#).

13.22.2.4 header_3

UB `GDataRecord47162::header_3`

4th Byte of Header.

Definition at line 1022 of file [gclib_record.h](#).

13.22.2.5 sample_number

UW `GDataRecord47162::sample_number`

Sample number.

Definition at line 1024 of file [gclib_record.h](#).

13.22.2.6 error_code

UB `GDataRecord47162::error_code`

Error code.

Definition at line 1025 of file [gclib_record.h](#).

13.22.2.7 general_status

UB `GDataRecord47162::general_status`

General status.

Definition at line 1026 of file [gclib_record.h](#).

13.22.2.8 output_analog_0

UW `GDataRecord47162::output_analog_0`

Analog output 0.

Definition at line 1028 of file [gclib_record.h](#).

13.22.2.9 output_analog_1

UW `GDataRecord47162::output_analog_1`

Analog output 1.

Definition at line 1029 of file [gclib_record.h](#).

13.22.2.10 output_analog_2

UW `GDataRecord47162::output_analog_2`

Analog output 2.

Definition at line 1030 of file [gclib_record.h](#).

13.22.2.11 output_analog_3

UW `GDataRecord47162::output_analog_3`

Analog output 3.

Definition at line 1031 of file [gclib_record.h](#).

13.22.2.12 output_analog_4

UW `GDataRecord47162::output_analog_4`

Analog output 4.

Definition at line 1032 of file [gclib_record.h](#).

13.22.2.13 output_analog_5

UW GDataRecord47162::output_analog_5

Analog output 5.

Definition at line 1033 of file [gclib_record.h](#).

13.22.2.14 output_analog_6

UW GDataRecord47162::output_analog_6

Analog output 6.

Definition at line 1034 of file [gclib_record.h](#).

13.22.2.15 output_analog_7

UW GDataRecord47162::output_analog_7

Analog output 7.

Definition at line 1035 of file [gclib_record.h](#).

13.22.2.16 input_analog_0

UW GDataRecord47162::input_analog_0

Analog input 0.

Definition at line 1037 of file [gclib_record.h](#).

13.22.2.17 input_analog_1

UW GDataRecord47162::input_analog_1

Analog input 1.

Definition at line 1038 of file [gclib_record.h](#).

13.22.2.18 input_analog_2

UW GDataRecord47162::input_analog_2

Analog input 2.

Definition at line 1039 of file [gclib_record.h](#).

13.22.2.19 input_analog_3

UW GDataRecord47162::input_analog_3

Analog input 3.

Definition at line 1040 of file [gclib_record.h](#).

13.22.2.20 input_analog_4

UW GDataRecord47162::input_analog_4

Analog input 4.

Definition at line 1041 of file [gclib_record.h](#).

13.22.2.21 input_analog_5

UW GDataRecord47162::input_analog_5

Analog input 5.

Definition at line 1042 of file [gclib_record.h](#).

13.22.2.22 input_analog_6

UW GDataRecord47162::input_analog_6

Analog input 6.

Definition at line 1043 of file [gclib_record.h](#).

13.22.2.23 input_analog_7

UW GDataRecord47162::input_analog_7
Analog input 7.
Definition at line 1044 of file [gclib_record.h](#).

13.22.2.24 output_byte_0

UB GDataRecord47162::output_byte_0
Digital outputs 0-7.
Definition at line 1046 of file [gclib_record.h](#).

13.22.2.25 output_byte_1

UB GDataRecord47162::output_byte_1
Digital outputs 8-15.
Definition at line 1047 of file [gclib_record.h](#).

13.22.2.26 output_byte_2

UB GDataRecord47162::output_byte_2
Digital outputs 16-23.
Definition at line 1048 of file [gclib_record.h](#).

13.22.2.27 input_byte_0

UB GDataRecord47162::input_byte_0
Digital inputs 0-7.
Definition at line 1050 of file [gclib_record.h](#).

13.22.2.28 input_byte_1

UB GDataRecord47162::input_byte_1
Digital inputs 8-15.
Definition at line 1051 of file [gclib_record.h](#).

13.22.2.29 input_byte_2

UB GDataRecord47162::input_byte_2
Digital inputs 16-23.
Definition at line 1052 of file [gclib_record.h](#).

13.22.2.30 input_byte_3

UB GDataRecord47162::input_byte_3
Digital inputs 24-31.
Definition at line 1053 of file [gclib_record.h](#).

13.22.2.31 input_byte_4

UB GDataRecord47162::input_byte_4
Digital inputs 32-39.
Definition at line 1054 of file [gclib_record.h](#).

13.22.2.32 pulse_count_0

UL GDataRecord47162::pulse_count_0
Pulse counter (see PC).
Definition at line 1056 of file [gclib_record.h](#).

13.22.2.33 `zc_variable`

SL `GDataRecord47162::zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1057 of file [gclib_record.h](#).

13.22.2.34 `zd_variable`

SL `GDataRecord47162::zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1058 of file [gclib_record.h](#).

13.22.2.35 `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](#).

13.22.2.36 `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](#).

13.22.2.37 `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](#).

13.22.2.38 `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](#).

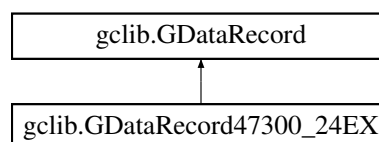
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.23 `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 Member Functions inherited from [gclib.GDataRecord](#)

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.

13.23.1 Detailed Description

Data record struct for RIO-47300 with 24EX I/O daughter board.
Definition at line [1872](#) of file [gclib.cs](#).

13.23.2 Member Function Documentation

13.23.2.1 `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](#).

13.23.3 Member Data Documentation

13.23.3.1 `header_0`

```
UB gclib.GDataRecord47300_24EX.header_0
```

1st Byte of Header.
Definition at line [1878](#) of file [gclib.cs](#).

13.23.3.2 `header_1`

```
UB gclib.GDataRecord47300_24EX.header_1
```

2nd Byte of Header.
Definition at line [1879](#) of file [gclib.cs](#).

13.23.3.3 `header_2`

```
UB gclib.GDataRecord47300_24EX.header_2
```

3rd Byte of Header.
Definition at line [1880](#) of file [gclib.cs](#).

13.23.3.4 header_3

UB `gclib.GDataRecord47300_24EX.header_3`

4th Byte of Header.

Definition at line 1881 of file [gclib.cs](#).

13.23.3.5 sample_number

UW `gclib.GDataRecord47300_24EX.sample_number`

Sample number.

Definition at line 1883 of file [gclib.cs](#).

13.23.3.6 error_code

UB `gclib.GDataRecord47300_24EX.error_code`

Error code.

Definition at line 1884 of file [gclib.cs](#).

13.23.3.7 general_status

UB `gclib.GDataRecord47300_24EX.general_status`

General status.

Definition at line 1885 of file [gclib.cs](#).

13.23.3.8 output_analog_0

UW `gclib.GDataRecord47300_24EX.output_analog_0`

Analog output 0.

Definition at line 1887 of file [gclib.cs](#).

13.23.3.9 output_analog_1

UW `gclib.GDataRecord47300_24EX.output_analog_1`

Analog output 1.

Definition at line 1888 of file [gclib.cs](#).

13.23.3.10 output_analog_2

UW `gclib.GDataRecord47300_24EX.output_analog_2`

Analog output 2.

Definition at line 1889 of file [gclib.cs](#).

13.23.3.11 output_analog_3

UW `gclib.GDataRecord47300_24EX.output_analog_3`

Analog output 3.

Definition at line 1890 of file [gclib.cs](#).

13.23.3.12 output_analog_4

UW `gclib.GDataRecord47300_24EX.output_analog_4`

Analog output 4.

Definition at line 1891 of file [gclib.cs](#).

13.23.3.13 output_analog_5

UW `gclib.GDataRecord47300_24EX.output_analog_5`

Analog output 5.

Definition at line 1892 of file [gclib.cs](#).

13.23.3.14 output_analog_6

UW `gclib.GDataRecord47300_24EX.output_analog_6`

Analog output 6.

Definition at line 1893 of file [gclib.cs](#).

13.23.3.15 output_analog_7

UW `gclib.GDataRecord47300_24EX.output_analog_7`

Analog output 7.

Definition at line 1894 of file [gclib.cs](#).

13.23.3.16 input_analog_0

UW `gclib.GDataRecord47300_24EX.input_analog_0`

Analog input 0.

Definition at line 1896 of file [gclib.cs](#).

13.23.3.17 input_analog_1

UW `gclib.GDataRecord47300_24EX.input_analog_1`

Analog input 1.

Definition at line 1897 of file [gclib.cs](#).

13.23.3.18 input_analog_2

UW `gclib.GDataRecord47300_24EX.input_analog_2`

Analog input 2.

Definition at line 1898 of file [gclib.cs](#).

13.23.3.19 input_analog_3

UW `gclib.GDataRecord47300_24EX.input_analog_3`

Analog input 3.

Definition at line 1899 of file [gclib.cs](#).

13.23.3.20 input_analog_4

UW `gclib.GDataRecord47300_24EX.input_analog_4`

Analog input 4.

Definition at line 1900 of file [gclib.cs](#).

13.23.3.21 input_analog_5

UW `gclib.GDataRecord47300_24EX.input_analog_5`

Analog input 5.

Definition at line 1901 of file [gclib.cs](#).

13.23.3.22 input_analog_6

UW `gclib.GDataRecord47300_24EX.input_analog_6`

Analog input 6.

Definition at line 1902 of file [gclib.cs](#).

13.23.3.23 input_analog_7

UW `gclib.GDataRecord47300_24EX.input_analog_7`

Analog input 7.

Definition at line 1903 of file [gclib.cs](#).

13.23.3.24 output_bank_0

UW `gclib.GDataRecord47300_24EX.output_bank_0`

Digital outputs 0-15.

Definition at line 1905 of file [gclib.cs](#).

13.23.3.25 output_bank_1

UW `gclib.GDataRecord47300_24EX.output_bank_1`

Digital outputs 16-23.

Definition at line 1906 of file [gclib.cs](#).

13.23.3.26 input_bank_0

UW `gclib.GDataRecord47300_24EX.input_bank_0`

Digital inputs 0-15.

Definition at line 1908 of file [gclib.cs](#).

13.23.3.27 input_bank_1

UW `gclib.GDataRecord47300_24EX.input_bank_1`

Digital inputs 16-23.

Definition at line 1909 of file [gclib.cs](#).

13.23.3.28 pulse_count_0

UL `gclib.GDataRecord47300_24EX.pulse_count_0`

Pulse counter (see PC)8.

Definition at line 1911 of file [gclib.cs](#).

13.23.3.29 zc_variable

SL `gclib.GDataRecord47300_24EX.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1912 of file [gclib.cs](#).

13.23.3.30 zd_variable

SL `gclib.GDataRecord47300_24EX.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1913 of file [gclib.cs](#).

13.23.3.31 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](#).

13.23.3.32 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](#).

13.23.3.33 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](#).

13.23.3.34 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](#)

13.24 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.*

13.24.1 Detailed Description

Data record struct for RIO-47300 with 24EX I/O daughter board.
 Definition at line 964 of file [gclib_record.h](#).

13.24.2 Member Data Documentation

13.24.2.1 header_0

UB `GDataRecord47300_24EX::header_0`
 1st Byte of Header.
 Definition at line 969 of file [gclib_record.h](#).

13.24.2.2 header_1

UB `GDataRecord47300_24EX::header_1`
 2nd Byte of Header.
 Definition at line 970 of file [gclib_record.h](#).

13.24.2.3 header_2

UB `GDataRecord47300_24EX::header_2`
 3rd Byte of Header.
 Definition at line 971 of file [gclib_record.h](#).

13.24.2.4 header_3

UB GDataRecord47300_24EX::header_3

4th Byte of Header.

Definition at line 972 of file [gclib_record.h](#).

13.24.2.5 sample_number

UW GDataRecord47300_24EX::sample_number

Sample number.

Definition at line 974 of file [gclib_record.h](#).

13.24.2.6 error_code

UB GDataRecord47300_24EX::error_code

Error code.

Definition at line 975 of file [gclib_record.h](#).

13.24.2.7 general_status

UB GDataRecord47300_24EX::general_status

General status.

Definition at line 976 of file [gclib_record.h](#).

13.24.2.8 output_analog_0

UW GDataRecord47300_24EX::output_analog_0

Analog output 0.

Definition at line 978 of file [gclib_record.h](#).

13.24.2.9 output_analog_1

UW GDataRecord47300_24EX::output_analog_1

Analog output 1.

Definition at line 979 of file [gclib_record.h](#).

13.24.2.10 output_analog_2

UW GDataRecord47300_24EX::output_analog_2

Analog output 2.

Definition at line 980 of file [gclib_record.h](#).

13.24.2.11 output_analog_3

UW GDataRecord47300_24EX::output_analog_3

Analog output 3.

Definition at line 981 of file [gclib_record.h](#).

13.24.2.12 output_analog_4

UW GDataRecord47300_24EX::output_analog_4

Analog output 4.

Definition at line 982 of file [gclib_record.h](#).

13.24.2.13 output_analog_5

UW GDataRecord47300_24EX::output_analog_5

Analog output 5.

Definition at line 983 of file [gclib_record.h](#).

13.24.2.14 output_analog_6

UW GDataRecord47300_24EX::output_analog_6

Analog output 6.

Definition at line 984 of file [gclib_record.h](#).

13.24.2.15 output_analog_7

UW GDataRecord47300_24EX::output_analog_7

Analog output 7.

Definition at line 985 of file [gclib_record.h](#).

13.24.2.16 input_analog_0

UW GDataRecord47300_24EX::input_analog_0

Analog input 0.

Definition at line 987 of file [gclib_record.h](#).

13.24.2.17 input_analog_1

UW GDataRecord47300_24EX::input_analog_1

Analog input 1.

Definition at line 988 of file [gclib_record.h](#).

13.24.2.18 input_analog_2

UW GDataRecord47300_24EX::input_analog_2

Analog input 2.

Definition at line 989 of file [gclib_record.h](#).

13.24.2.19 input_analog_3

UW GDataRecord47300_24EX::input_analog_3

Analog input 3.

Definition at line 990 of file [gclib_record.h](#).

13.24.2.20 input_analog_4

UW GDataRecord47300_24EX::input_analog_4

Analog input 4.

Definition at line 991 of file [gclib_record.h](#).

13.24.2.21 input_analog_5

UW GDataRecord47300_24EX::input_analog_5

Analog input 5.

Definition at line 992 of file [gclib_record.h](#).

13.24.2.22 input_analog_6

UW GDataRecord47300_24EX::input_analog_6

Analog input 6.

Definition at line 993 of file [gclib_record.h](#).

13.24.2.23 input_analog_7

UW GDataRecord47300_24EX::input_analog_7

Analog input 7.

Definition at line 994 of file [gclib_record.h](#).

13.24.2.24 output_bank_0

UW GDataRecord47300_24EX::output_bank_0

Digital outputs 0-15.

Definition at line 996 of file [gclib_record.h](#).

13.24.2.25 output_bank_1

UW GDataRecord47300_24EX::output_bank_1

Digital outputs 16-23.

Definition at line 997 of file [gclib_record.h](#).

13.24.2.26 input_bank_0

UW GDataRecord47300_24EX::input_bank_0

Digital inputs 0-15.

Definition at line 999 of file [gclib_record.h](#).

13.24.2.27 input_bank_1

UW GDataRecord47300_24EX::input_bank_1

Digital inputs 16-23.

Definition at line 1000 of file [gclib_record.h](#).

13.24.2.28 pulse_count_0

UL GDataRecord47300_24EX::pulse_count_0

Pulse counter (see PC)8.

Definition at line 1002 of file [gclib_record.h](#).

13.24.2.29 zc_variable

SL GDataRecord47300_24EX::zc_variable

ZC User-defined variable (see ZC).

Definition at line 1003 of file [gclib_record.h](#).

13.24.2.30 zd_variable

SL GDataRecord47300_24EX::zd_variable

ZD User-defined variable (see ZD).

Definition at line 1004 of file [gclib_record.h](#).

13.24.2.31 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](#).

13.24.2.32 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](#).

13.24.2.33 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](#).

13.24.2.34 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](#).

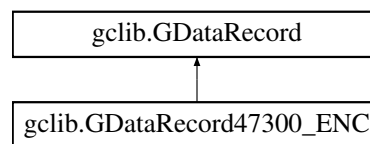
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.25 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 Member Functions inherited from [gclib.GDataRecord](#)

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.*

13.25.1 Detailed Description

Data record struct for RIO-47300. Includes encoder fields.

Definition at line 1820 of file [gclib.cs](#).

13.25.2 Member Function Documentation

13.25.2.1 `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](#).

13.25.3 Member Data Documentation

13.25.3.1 `header_0`

```
UB gclib.GDataRecord47300_ENC.header_0
```

1st Byte of Header.

Definition at line 1826 of file [gclib.cs](#).

13.25.3.2 `header_1`

```
UB gclib.GDataRecord47300_ENC.header_1
```

2nd Byte of Header.

Definition at line 1827 of file [gclib.cs](#).

13.25.3.3 `header_2`

```
UB gclib.GDataRecord47300_ENC.header_2
```

3rd Byte of Header.

Definition at line 1828 of file [gclib.cs](#).

13.25.3.4 `header_3`

```
UB gclib.GDataRecord47300_ENC.header_3
```

4th Byte of Header.

Definition at line 1829 of file [gclib.cs](#).

13.25.3.5 `sample_number`

```
UW gclib.GDataRecord47300_ENC.sample_number
```

Sample number.

Definition at line 1831 of file [gclib.cs](#).

13.25.3.6 `error_code`

```
UB gclib.GDataRecord47300_ENC.error_code
```

Error code.

Definition at line 1832 of file [gclib.cs](#).

13.25.3.7 `general_status`

```
UB gclib.GDataRecord47300_ENC.general_status
```

General status.

Definition at line 1833 of file [gclib.cs](#).

13.25.3.8 `output_analog_0`

```
UW gclib.GDataRecord47300_ENC.output_analog_0
```

Analog output 0.

Definition at line 1835 of file [gclib.cs](#).

13.25.3.9 output_analog_1

UW `gclib.GDataRecord47300_ENC.output_analog_1`

Analog output 1.

Definition at line 1836 of file [gclib.cs](#).

13.25.3.10 output_analog_2

UW `gclib.GDataRecord47300_ENC.output_analog_2`

Analog output 2.

Definition at line 1837 of file [gclib.cs](#).

13.25.3.11 output_analog_3

UW `gclib.GDataRecord47300_ENC.output_analog_3`

Analog output 3.

Definition at line 1838 of file [gclib.cs](#).

13.25.3.12 output_analog_4

UW `gclib.GDataRecord47300_ENC.output_analog_4`

Analog output 4.

Definition at line 1839 of file [gclib.cs](#).

13.25.3.13 output_analog_5

UW `gclib.GDataRecord47300_ENC.output_analog_5`

Analog output 5.

Definition at line 1840 of file [gclib.cs](#).

13.25.3.14 output_analog_6

UW `gclib.GDataRecord47300_ENC.output_analog_6`

Analog output 6.

Definition at line 1841 of file [gclib.cs](#).

13.25.3.15 output_analog_7

UW `gclib.GDataRecord47300_ENC.output_analog_7`

Analog output 7.

Definition at line 1842 of file [gclib.cs](#).

13.25.3.16 input_analog_0

UW `gclib.GDataRecord47300_ENC.input_analog_0`

Analog input 0.

Definition at line 1844 of file [gclib.cs](#).

13.25.3.17 input_analog_1

UW `gclib.GDataRecord47300_ENC.input_analog_1`

Analog input 1.

Definition at line 1845 of file [gclib.cs](#).

13.25.3.18 input_analog_2

UW `gclib.GDataRecord47300_ENC.input_analog_2`

Analog input 2.

Definition at line 1846 of file [gclib.cs](#).

13.25.3.19 input_analog_3

UW `gclib.GDataRecord47300_ENC.input_analog_3`

Analog input 3.

Definition at line 1847 of file [gclib.cs](#).

13.25.3.20 input_analog_4

UW `gclib.GDataRecord47300_ENC.input_analog_4`

Analog input 4.

Definition at line 1848 of file [gclib.cs](#).

13.25.3.21 input_analog_5

UW `gclib.GDataRecord47300_ENC.input_analog_5`

Analog input 5.

Definition at line 1849 of file [gclib.cs](#).

13.25.3.22 input_analog_6

UW `gclib.GDataRecord47300_ENC.input_analog_6`

Analog input 6.

Definition at line 1850 of file [gclib.cs](#).

13.25.3.23 input_analog_7

UW `gclib.GDataRecord47300_ENC.input_analog_7`

Analog input 7.

Definition at line 1851 of file [gclib.cs](#).

13.25.3.24 output_bank_0

UW `gclib.GDataRecord47300_ENC.output_bank_0`

Digital outputs 0-15;.

Definition at line 1853 of file [gclib.cs](#).

13.25.3.25 output_bank_1

UW `gclib.GDataRecord47300_ENC.output_bank_1`

Digital outputs 16-23;.

Definition at line 1854 of file [gclib.cs](#).

13.25.3.26 input_bank_0

UW `gclib.GDataRecord47300_ENC.input_bank_0`

Digital inputs 0-15;.

Definition at line 1856 of file [gclib.cs](#).

13.25.3.27 input_bank_1

UW `gclib.GDataRecord47300_ENC.input_bank_1`

Digital inputs 16-23;.

Definition at line 1857 of file [gclib.cs](#).

13.25.3.28 pulse_count_0

UL `gclib.GDataRecord47300_ENC.pulse_count_0`

Pulse counter (see PC).

Definition at line 1859 of file [gclib.cs](#).

13.25.3.29 zc_variable

SL `gclib.GDataRecord47300_ENC.zc_variable`

ZC User-defined variable (see ZC).

Definition at line 1860 of file [gclib.cs](#).

13.25.3.30 zd_variable

SL `gclib.GDataRecord47300_ENC.zd_variable`

ZD User-defined variable (see ZD).

Definition at line 1861 of file [gclib.cs](#).

13.25.3.31 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](#).

13.25.3.32 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](#).

13.25.3.33 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](#).

13.25.3.34 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](#)

13.26 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.

13.26.1 Detailed Description

Data record struct for RIO-47300. Includes encoder fields.
Definition at line 914 of file [gclib_record.h](#).

13.26.2 Member Data Documentation

13.26.2.1 header_0

UB GDataRecord47300_ENC::header_0
1st Byte of Header.
Definition at line 919 of file [gclib_record.h](#).

13.26.2.2 header_1

UB GDataRecord47300_ENC::header_1
2nd Byte of Header.
Definition at line 920 of file [gclib_record.h](#).

13.26.2.3 header_2

UB GDataRecord47300_ENC::header_2
3rd Byte of Header.
Definition at line 921 of file [gclib_record.h](#).

13.26.2.4 header_3

UB GDataRecord47300_ENC::header_3
4th Byte of Header.
Definition at line 922 of file [gclib_record.h](#).

13.26.2.5 sample_number

UW GDataRecord47300_ENC::sample_number
Sample number.
Definition at line 924 of file [gclib_record.h](#).

13.26.2.6 error_code

UB GDataRecord47300_ENC::error_code
Error code.
Definition at line 925 of file [gclib_record.h](#).

13.26.2.7 general_status

UB GDataRecord47300_ENC::general_status
General status.
Definition at line 926 of file [gclib_record.h](#).

13.26.2.8 output_analog_0

UW GDataRecord47300_ENC::output_analog_0

Analog output 0.

Definition at line 928 of file [gclib_record.h](#).

13.26.2.9 output_analog_1

UW GDataRecord47300_ENC::output_analog_1

Analog output 1.

Definition at line 929 of file [gclib_record.h](#).

13.26.2.10 output_analog_2

UW GDataRecord47300_ENC::output_analog_2

Analog output 2.

Definition at line 930 of file [gclib_record.h](#).

13.26.2.11 output_analog_3

UW GDataRecord47300_ENC::output_analog_3

Analog output 3.

Definition at line 931 of file [gclib_record.h](#).

13.26.2.12 output_analog_4

UW GDataRecord47300_ENC::output_analog_4

Analog output 4.

Definition at line 932 of file [gclib_record.h](#).

13.26.2.13 output_analog_5

UW GDataRecord47300_ENC::output_analog_5

Analog output 5.

Definition at line 933 of file [gclib_record.h](#).

13.26.2.14 output_analog_6

UW GDataRecord47300_ENC::output_analog_6

Analog output 6.

Definition at line 934 of file [gclib_record.h](#).

13.26.2.15 output_analog_7

UW GDataRecord47300_ENC::output_analog_7

Analog output 7.

Definition at line 935 of file [gclib_record.h](#).

13.26.2.16 input_analog_0

UW GDataRecord47300_ENC::input_analog_0

Analog input 0.

Definition at line 937 of file [gclib_record.h](#).

13.26.2.17 input_analog_1

UW GDataRecord47300_ENC::input_analog_1

Analog input 1.

Definition at line 938 of file [gclib_record.h](#).

13.26.2.18 input_analog_2

UW GDataRecord47300_ENC::input_analog_2

Analog input 2.

Definition at line 939 of file [gclib_record.h](#).

13.26.2.19 input_analog_3

UW GDataRecord47300_ENC::input_analog_3

Analog input 3.

Definition at line 940 of file [gclib_record.h](#).

13.26.2.20 input_analog_4

UW GDataRecord47300_ENC::input_analog_4

Analog input 4.

Definition at line 941 of file [gclib_record.h](#).

13.26.2.21 input_analog_5

UW GDataRecord47300_ENC::input_analog_5

Analog input 5.

Definition at line 942 of file [gclib_record.h](#).

13.26.2.22 input_analog_6

UW GDataRecord47300_ENC::input_analog_6

Analog input 6.

Definition at line 943 of file [gclib_record.h](#).

13.26.2.23 input_analog_7

UW GDataRecord47300_ENC::input_analog_7

Analog input 7.

Definition at line 944 of file [gclib_record.h](#).

13.26.2.24 output_bank_0

UW GDataRecord47300_ENC::output_bank_0

Digital outputs 0-15;.

Definition at line 946 of file [gclib_record.h](#).

13.26.2.25 output_bank_1

UW GDataRecord47300_ENC::output_bank_1

Digital outputs 16-23;.

Definition at line 947 of file [gclib_record.h](#).

13.26.2.26 input_bank_0

UW GDataRecord47300_ENC::input_bank_0

Digital inputs 0-15;.

Definition at line 949 of file [gclib_record.h](#).

13.26.2.27 input_bank_1

UW GDataRecord47300_ENC::input_bank_1

Digital inputs 16-23;.

Definition at line 950 of file [gclib_record.h](#).

13.26.2.28 pulse_count_0

UL GDataRecord47300_ENC::pulse_count_0

Pulse counter (see PC).

Definition at line 952 of file [gclib_record.h](#).

13.26.2.29 zc_variable

SL GDataRecord47300_ENC::zc_variable

ZC User-defined variable (see ZC).

Definition at line 953 of file [gclib_record.h](#).

13.26.2.30 zd_variable

SL GDataRecord47300_ENC::zd_variable

ZD User-defined variable (see ZD).

Definition at line 954 of file [gclib_record.h](#).

13.26.2.31 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](#).

13.26.2.32 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](#).

13.26.2.33 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](#).

13.26.2.34 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](#).

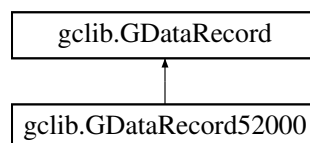
The documentation for this struct was generated from the following file:

- [gclib_record.h](#)

13.27 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 Member Functions inherited from [gclib.GDataRecord](#)**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).

13.27.1 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](#).

13.27.2 Member Function Documentation

13.27.2.1 `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](#).

13.27.3 Member Data Documentation

13.27.3.1 `header_0`

```
UB gclib.GDataRecord52000.header_0
```

1st Byte of Header.

Definition at line 1115 of file [gclib.cs](#).

13.27.3.2 `header_1`

```
UB gclib.GDataRecord52000.header_1
```

2nd Byte of Header.

Definition at line 1116 of file [gclib.cs](#).

13.27.3.3 `header_2`

```
UB gclib.GDataRecord52000.header_2
```

3rd Byte of Header.

Definition at line 1117 of file [gclib.cs](#).

13.27.3.4 header_3

UB `gclib.GDataRecord52000.header_3`

4th Byte of Header.

Definition at line 1118 of file [gclib.cs](#).

13.27.3.5 sample_number

UW `gclib.GDataRecord52000.sample_number`

sample number.

Definition at line 1120 of file [gclib.cs](#).

13.27.3.6 input_bank_0

UB `gclib.GDataRecord52000.input_bank_0`

general input bank 0 (inputs 1-8).

Definition at line 1122 of file [gclib.cs](#).

13.27.3.7 input_bank_1

UB `gclib.GDataRecord52000.input_bank_1`

general input bank 1 (inputs 9-16).

Definition at line 1123 of file [gclib.cs](#).

13.27.3.8 input_bank_2

UB `gclib.GDataRecord52000.input_bank_2`

general input bank 2 (inputs 17-24).

Definition at line 1124 of file [gclib.cs](#).

13.27.3.9 input_bank_3

UB `gclib.GDataRecord52000.input_bank_3`

general input bank 3 (inputs 25-32).

Definition at line 1125 of file [gclib.cs](#).

13.27.3.10 input_bank_4

UB `gclib.GDataRecord52000.input_bank_4`

general input bank 4 (inputs 33-40).

Definition at line 1126 of file [gclib.cs](#).

13.27.3.11 input_bank_5

UB `gclib.GDataRecord52000.input_bank_5`

general input bank 5 (inputs 41-48).

Definition at line 1127 of file [gclib.cs](#).

13.27.3.12 input_bank_6

UB `gclib.GDataRecord52000.input_bank_6`

general input bank 6 (inputs 49-56).

Definition at line 1128 of file [gclib.cs](#).

13.27.3.13 input_bank_7

UB `gclib.GDataRecord52000.input_bank_7`

general input bank 7 (inputs 57-64).

Definition at line 1129 of file [gclib.cs](#).

13.27.3.14 input_bank_8

UB `gclib.GDataRecord52000.input_bank_8`
general input bank 8 (inputs 65-72).
Definition at line 1130 of file [gclib.cs](#).

13.27.3.15 input_bank_9

UB `gclib.GDataRecord52000.input_bank_9`
general input bank 9 (inputs 73-80).
Definition at line 1131 of file [gclib.cs](#).

13.27.3.16 output_bank_0

UB `gclib.GDataRecord52000.output_bank_0`
general output bank 0 (outputs 1-8).
Definition at line 1133 of file [gclib.cs](#).

13.27.3.17 output_bank_1

UB `gclib.GDataRecord52000.output_bank_1`
general output bank 1 (outputs 9-16).
Definition at line 1134 of file [gclib.cs](#).

13.27.3.18 output_bank_2

UB `gclib.GDataRecord52000.output_bank_2`
general output bank 2 (outputs 17-24).
Definition at line 1135 of file [gclib.cs](#).

13.27.3.19 output_bank_3

UB `gclib.GDataRecord52000.output_bank_3`
general output bank 3 (outputs 25-32).
Definition at line 1136 of file [gclib.cs](#).

13.27.3.20 output_bank_4

UB `gclib.GDataRecord52000.output_bank_4`
general output bank 4 (outputs 33-40).
Definition at line 1137 of file [gclib.cs](#).

13.27.3.21 output_bank_5

UB `gclib.GDataRecord52000.output_bank_5`
general output bank 5 (outputs 41-48).
Definition at line 1138 of file [gclib.cs](#).

13.27.3.22 output_bank_6

UB `gclib.GDataRecord52000.output_bank_6`
general output bank 6 (outputs 49-56).
Definition at line 1139 of file [gclib.cs](#).

13.27.3.23 output_bank_7

UB `gclib.GDataRecord52000.output_bank_7`
general output bank 7 (outputs 57-64).
Definition at line 1140 of file [gclib.cs](#).

13.27.3.24 output_bank_8

UB `gclib.GDataRecord52000.output_bank_8`
general output bank 8 (outputs 65-72).
Definition at line 1141 of file [gclib.cs](#).

13.27.3.25 output_bank_9

UB `gclib.GDataRecord52000.output_bank_9`
general output bank 9 (outputs 73-80).
Definition at line 1142 of file [gclib.cs](#).

13.27.3.26 reserved_0

SW `gclib.GDataRecord52000.reserved_0`
Reserved.
Definition at line 1144 of file [gclib.cs](#).

13.27.3.27 reserved_2

SW `gclib.GDataRecord52000.reserved_2`
Reserved.
Definition at line 1145 of file [gclib.cs](#).

13.27.3.28 reserved_4

SW `gclib.GDataRecord52000.reserved_4`
Reserved.
Definition at line 1146 of file [gclib.cs](#).

13.27.3.29 reserved_6

SW `gclib.GDataRecord52000.reserved_6`
Reserved.
Definition at line 1147 of file [gclib.cs](#).

13.27.3.30 reserved_8

SW `gclib.GDataRecord52000.reserved_8`
Reserved.
Definition at line 1148 of file [gclib.cs](#).

13.27.3.31 reserved_10

SW `gclib.GDataRecord52000.reserved_10`
Reserved.
Definition at line 1149 of file [gclib.cs](#).

13.27.3.32 reserved_12

SW `gclib.GDataRecord52000.reserved_12`
Reserved.
Definition at line 1150 of file [gclib.cs](#).

13.27.3.33 ethercat_bank

UB `gclib.GDataRecord52000.ethercat_bank`
EtherCAT Bank Indicator.
Definition at line 1151 of file [gclib.cs](#).

13.27.3.34 reserved_14

UB `gclib.GDataRecord52000.reserved_14`

Reserved.

Definition at line 1152 of file [gclib.cs](#).

13.27.3.35 ethernet_status_a

UB `gclib.GDataRecord52000.ethernet_status_a`

Ethernet Handle A Status.

Definition at line 1154 of file [gclib.cs](#).

13.27.3.36 ethernet_status_b

UB `gclib.GDataRecord52000.ethernet_status_b`

Ethernet Handle B Status.

Definition at line 1155 of file [gclib.cs](#).

13.27.3.37 ethernet_status_c

UB `gclib.GDataRecord52000.ethernet_status_c`

Ethernet Handle C Status.

Definition at line 1156 of file [gclib.cs](#).

13.27.3.38 ethernet_status_d

UB `gclib.GDataRecord52000.ethernet_status_d`

Ethernet Handle D Status.

Definition at line 1157 of file [gclib.cs](#).

13.27.3.39 ethernet_status_e

UB `gclib.GDataRecord52000.ethernet_status_e`

Ethernet Handle E Status.

Definition at line 1158 of file [gclib.cs](#).

13.27.3.40 ethernet_status_f

UB `gclib.GDataRecord52000.ethernet_status_f`

Ethernet Handle F Status.

Definition at line 1159 of file [gclib.cs](#).

13.27.3.41 ethernet_status_g

UB `gclib.GDataRecord52000.ethernet_status_g`

Ethernet Handle G Status.

Definition at line 1160 of file [gclib.cs](#).

13.27.3.42 ethernet_status_h

UB `gclib.GDataRecord52000.ethernet_status_h`

Ethernet Handle H Status.

Definition at line 1161 of file [gclib.cs](#).

13.27.3.43 error_code

UB `gclib.GDataRecord52000.error_code`

error code.

Definition at line 1163 of file [gclib.cs](#).

13.27.3.44 thread_status

UB `gclib.GDataRecord52000.thread_status`

thread status

Definition at line 1164 of file [gclib.cs](#).

13.27.3.45 amplifier_status

UL `gclib.GDataRecord52000.amplifier_status`

Amplifier Status.

Definition at line 1165 of file [gclib.cs](#).

13.27.3.46 contour_segment_count

UL `gclib.GDataRecord52000.contour_segment_count`

Segment Count for Contour Mode.

Definition at line 1167 of file [gclib.cs](#).

13.27.3.47 contour_buffer_available

UW `gclib.GDataRecord52000.contour_buffer_available`

Buffer space remaining, Contour Mode.

Definition at line 1168 of file [gclib.cs](#).

13.27.3.48 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](#).

13.27.3.49 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](#).

13.27.3.50 s_distance

SL `gclib.GDataRecord52000.s_distance`

distance traveled in coordinated move for S plane.

Definition at line 1172 of file [gclib.cs](#).

13.27.3.51 s_plane_buffer_available

UW `gclib.GDataRecord52000.s_plane_buffer_available`

Buffer space remaining, S Plane.

Definition at line 1173 of file [gclib.cs](#).

13.27.3.52 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](#).

13.27.3.53 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](#).

13.27.3.54 t_distance

SL gclib.GDataRecord52000.t_distance

distance traveled in coordinated move for T plane.

Definition at line 1177 of file [gclib.cs](#).

13.27.3.55 t_plane_buffer_available

UW gclib.GDataRecord52000.t_plane_buffer_available

Buffer space remaining, T Plane.

Definition at line 1178 of file [gclib.cs](#).

13.27.3.56 axis_a_status

UW gclib.GDataRecord52000.axis_a_status

A axis status.

Definition at line 1180 of file [gclib.cs](#).

13.27.3.57 axis_a_switches

UB gclib.GDataRecord52000.axis_a_switches

A axis switches.

Definition at line 1181 of file [gclib.cs](#).

13.27.3.58 axis_a_stop_code

UB gclib.GDataRecord52000.axis_a_stop_code

A axis stop code.

Definition at line 1182 of file [gclib.cs](#).

13.27.3.59 axis_a_reference_position

SL gclib.GDataRecord52000.axis_a_reference_position

A axis reference position.

Definition at line 1183 of file [gclib.cs](#).

13.27.3.60 axis_a_motor_position

SL gclib.GDataRecord52000.axis_a_motor_position

A axis motor position.

Definition at line 1184 of file [gclib.cs](#).

13.27.3.61 axis_a_position_error

SL gclib.GDataRecord52000.axis_a_position_error

A axis position error.

Definition at line 1185 of file [gclib.cs](#).

13.27.3.62 axis_a_aux_position

SL gclib.GDataRecord52000.axis_a_aux_position

A axis auxiliary position.

Definition at line 1186 of file [gclib.cs](#).

13.27.3.63 axis_a_velocity

SL gclib.GDataRecord52000.axis_a_velocity

A axis velocity.

Definition at line 1187 of file [gclib.cs](#).

13.27.3.64 axis_a_torque

SL `gclib.GDataRecord52000.axis_a_torque`

A axis torque.

Definition at line 1188 of file [gclib.cs](#).

13.27.3.65 axis_a_analog_in

UW `gclib.GDataRecord52000.axis_a_analog_in`

A axis analog input.

Definition at line 1189 of file [gclib.cs](#).

13.27.3.66 axis_a_halls

UB `gclib.GDataRecord52000.axis_a_halls`

A Hall Input Status.

Definition at line 1190 of file [gclib.cs](#).

13.27.3.67 axis_a_reserved

UB `gclib.GDataRecord52000.axis_a_reserved`

Reserved.

Definition at line 1191 of file [gclib.cs](#).

13.27.3.68 axis_a_variable

SL `gclib.GDataRecord52000.axis_a_variable`

A User-defined variable (ZA).

Definition at line 1192 of file [gclib.cs](#).

13.27.3.69 axis_b_status

UW `gclib.GDataRecord52000.axis_b_status`

B axis status.

Definition at line 1194 of file [gclib.cs](#).

13.27.3.70 axis_b_switches

UB `gclib.GDataRecord52000.axis_b_switches`

B axis switches.

Definition at line 1195 of file [gclib.cs](#).

13.27.3.71 axis_b_stop_code

UB `gclib.GDataRecord52000.axis_b_stop_code`

B axis stop code.

Definition at line 1196 of file [gclib.cs](#).

13.27.3.72 axis_b_reference_position

SL `gclib.GDataRecord52000.axis_b_reference_position`

B axis reference position.

Definition at line 1197 of file [gclib.cs](#).

13.27.3.73 axis_b_motor_position

SL `gclib.GDataRecord52000.axis_b_motor_position`

B axis motor position.

Definition at line 1198 of file [gclib.cs](#).

13.27.3.74 axis_b_position_error

SL gclib.GDataRecord52000.axis_b_position_error

B axis position error.

Definition at line 1199 of file [gclib.cs](#).

13.27.3.75 axis_b_aux_position

SL gclib.GDataRecord52000.axis_b_aux_position

B axis auxiliary position.

Definition at line 1200 of file [gclib.cs](#).

13.27.3.76 axis_b_velocity

SL gclib.GDataRecord52000.axis_b_velocity

B axis velocity.

Definition at line 1201 of file [gclib.cs](#).

13.27.3.77 axis_b_torque

SL gclib.GDataRecord52000.axis_b_torque

B axis torque.

Definition at line 1202 of file [gclib.cs](#).

13.27.3.78 axis_b_analog_in

UW gclib.GDataRecord52000.axis_b_analog_in

B axis analog input.

Definition at line 1203 of file [gclib.cs](#).

13.27.3.79 axis_b_halls

UB gclib.GDataRecord52000.axis_b_halls

B Hall Input Status.

Definition at line 1204 of file [gclib.cs](#).

13.27.3.80 axis_b_reserved

UB gclib.GDataRecord52000.axis_b_reserved

Reserved.

Definition at line 1205 of file [gclib.cs](#).

13.27.3.81 axis_b_variable

SL gclib.GDataRecord52000.axis_b_variable

B User-defined variable (ZA).

Definition at line 1206 of file [gclib.cs](#).

13.27.3.82 axis_c_status

UW gclib.GDataRecord52000.axis_c_status

C axis status.

Definition at line 1208 of file [gclib.cs](#).

13.27.3.83 axis_c_switches

UB gclib.GDataRecord52000.axis_c_switches

C axis switches.

Definition at line 1209 of file [gclib.cs](#).

13.27.3.84 axis_c_stop_code

UB `gclib.GDataRecord52000.axis_c_stop_code`

C axis stop code.

Definition at line 1210 of file [gclib.cs](#).

13.27.3.85 axis_c_reference_position

SL `gclib.GDataRecord52000.axis_c_reference_position`

C axis reference position.

Definition at line 1211 of file [gclib.cs](#).

13.27.3.86 axis_c_motor_position

SL `gclib.GDataRecord52000.axis_c_motor_position`

C axis motor position.

Definition at line 1212 of file [gclib.cs](#).

13.27.3.87 axis_c_position_error

SL `gclib.GDataRecord52000.axis_c_position_error`

C axis position error.

Definition at line 1213 of file [gclib.cs](#).

13.27.3.88 axis_c_aux_position

SL `gclib.GDataRecord52000.axis_c_aux_position`

C axis auxiliary position.

Definition at line 1214 of file [gclib.cs](#).

13.27.3.89 axis_c_velocity

SL `gclib.GDataRecord52000.axis_c_velocity`

C axis velocity.

Definition at line 1215 of file [gclib.cs](#).

13.27.3.90 axis_c_torque

SL `gclib.GDataRecord52000.axis_c_torque`

C axis torque.

Definition at line 1216 of file [gclib.cs](#).

13.27.3.91 axis_c_analog_in

UW `gclib.GDataRecord52000.axis_c_analog_in`

C axis analog input.

Definition at line 1217 of file [gclib.cs](#).

13.27.3.92 axis_c_halls

UB `gclib.GDataRecord52000.axis_c_halls`

C Hall Input Status.

Definition at line 1218 of file [gclib.cs](#).

13.27.3.93 axis_c_reserved

UB `gclib.GDataRecord52000.axis_c_reserved`

Reserved.

Definition at line 1219 of file [gclib.cs](#).

13.27.3.94 axis_c_variable

SL gclib.GDataRecord52000.axis_c_variable

C User-defined variable (ZA).

Definition at line 1220 of file [gclib.cs](#).

13.27.3.95 axis_d_status

UW gclib.GDataRecord52000.axis_d_status

D axis status.

Definition at line 1222 of file [gclib.cs](#).

13.27.3.96 axis_d_switches

UB gclib.GDataRecord52000.axis_d_switches

D axis switches.

Definition at line 1223 of file [gclib.cs](#).

13.27.3.97 axis_d_stop_code

UB gclib.GDataRecord52000.axis_d_stop_code

D axis stop code.

Definition at line 1224 of file [gclib.cs](#).

13.27.3.98 axis_d_reference_position

SL gclib.GDataRecord52000.axis_d_reference_position

D axis reference position.

Definition at line 1225 of file [gclib.cs](#).

13.27.3.99 axis_d_motor_position

SL gclib.GDataRecord52000.axis_d_motor_position

D axis motor position.

Definition at line 1226 of file [gclib.cs](#).

13.27.3.100 axis_d_position_error

SL gclib.GDataRecord52000.axis_d_position_error

D axis position error.

Definition at line 1227 of file [gclib.cs](#).

13.27.3.101 axis_d_aux_position

SL gclib.GDataRecord52000.axis_d_aux_position

D axis auxiliary position.

Definition at line 1228 of file [gclib.cs](#).

13.27.3.102 axis_d_velocity

SL gclib.GDataRecord52000.axis_d_velocity

D axis velocity.

Definition at line 1229 of file [gclib.cs](#).

13.27.3.103 axis_d_torque

SL gclib.GDataRecord52000.axis_d_torque

D axis torque.

Definition at line 1230 of file [gclib.cs](#).

13.27.3.104 axis_d_analog_in

UW `gclib.GDataRecord52000.axis_d_analog_in`

D axis analog input.

Definition at line 1231 of file [gclib.cs](#).

13.27.3.105 axis_d_halls

UB `gclib.GDataRecord52000.axis_d_halls`

D Hall Input Status.

Definition at line 1232 of file [gclib.cs](#).

13.27.3.106 axis_d_reserved

UB `gclib.GDataRecord52000.axis_d_reserved`

Reserved.

Definition at line 1233 of file [gclib.cs](#).

13.27.3.107 axis_d_variable

SL `gclib.GDataRecord52000.axis_d_variable`

D User-defined variable (ZA).

Definition at line 1234 of file [gclib.cs](#).

13.27.3.108 axis_e_status

UW `gclib.GDataRecord52000.axis_e_status`

E axis status.

Definition at line 1236 of file [gclib.cs](#).

13.27.3.109 axis_e_switches

UB `gclib.GDataRecord52000.axis_e_switches`

E axis switches.

Definition at line 1237 of file [gclib.cs](#).

13.27.3.110 axis_e_stop_code

UB `gclib.GDataRecord52000.axis_e_stop_code`

E axis stop code.

Definition at line 1238 of file [gclib.cs](#).

13.27.3.111 axis_e_reference_position

SL `gclib.GDataRecord52000.axis_e_reference_position`

E axis reference position.

Definition at line 1239 of file [gclib.cs](#).

13.27.3.112 axis_e_motor_position

SL `gclib.GDataRecord52000.axis_e_motor_position`

E axis motor position.

Definition at line 1240 of file [gclib.cs](#).

13.27.3.113 axis_e_position_error

SL `gclib.GDataRecord52000.axis_e_position_error`

E axis position error.

Definition at line 1241 of file [gclib.cs](#).

13.27.3.114 axis_e_aux_position

SL gclib.GDataRecord52000.axis_e_aux_position

E axis auxiliary position.

Definition at line 1242 of file [gclib.cs](#).

13.27.3.115 axis_e_velocity

SL gclib.GDataRecord52000.axis_e_velocity

E axis velocity.

Definition at line 1243 of file [gclib.cs](#).

13.27.3.116 axis_e_torque

SL gclib.GDataRecord52000.axis_e_torque

E axis torque.

Definition at line 1244 of file [gclib.cs](#).

13.27.3.117 axis_e_analog_in

UW gclib.GDataRecord52000.axis_e_analog_in

E axis analog input.

Definition at line 1245 of file [gclib.cs](#).

13.27.3.118 axis_e_halls

UB gclib.GDataRecord52000.axis_e_halls

E Hall Input Status.

Definition at line 1246 of file [gclib.cs](#).

13.27.3.119 axis_e_reserved

UB gclib.GDataRecord52000.axis_e_reserved

Reserved.

Definition at line 1247 of file [gclib.cs](#).

13.27.3.120 axis_e_variable

SL gclib.GDataRecord52000.axis_e_variable

E User-defined variable (ZA).

Definition at line 1248 of file [gclib.cs](#).

13.27.3.121 axis_f_status

UW gclib.GDataRecord52000.axis_f_status

F axis status.

Definition at line 1250 of file [gclib.cs](#).

13.27.3.122 axis_f_switches

UB gclib.GDataRecord52000.axis_f_switches

F axis switches.

Definition at line 1251 of file [gclib.cs](#).

13.27.3.123 axis_f_stop_code

UB gclib.GDataRecord52000.axis_f_stop_code

F axis stop code.

Definition at line 1252 of file [gclib.cs](#).

13.27.3.124 axis_f_reference_position

SL `gclib.GDataRecord52000.axis_f_reference_position`

F axis reference position.

Definition at line 1253 of file [gclib.cs](#).

13.27.3.125 axis_f_motor_position

SL `gclib.GDataRecord52000.axis_f_motor_position`

F axis motor position.

Definition at line 1254 of file [gclib.cs](#).

13.27.3.126 axis_f_position_error

SL `gclib.GDataRecord52000.axis_f_position_error`

F axis position error.

Definition at line 1255 of file [gclib.cs](#).

13.27.3.127 axis_f_aux_position

SL `gclib.GDataRecord52000.axis_f_aux_position`

F axis auxiliary position.

Definition at line 1256 of file [gclib.cs](#).

13.27.3.128 axis_f_velocity

SL `gclib.GDataRecord52000.axis_f_velocity`

F axis velocity.

Definition at line 1257 of file [gclib.cs](#).

13.27.3.129 axis_f_torque

SL `gclib.GDataRecord52000.axis_f_torque`

F axis torque.

Definition at line 1258 of file [gclib.cs](#).

13.27.3.130 axis_f_analog_in

UW `gclib.GDataRecord52000.axis_f_analog_in`

F axis analog input.

Definition at line 1259 of file [gclib.cs](#).

13.27.3.131 axis_f_halls

UB `gclib.GDataRecord52000.axis_f_halls`

F Hall Input Status.

Definition at line 1260 of file [gclib.cs](#).

13.27.3.132 axis_f_reserved

UB `gclib.GDataRecord52000.axis_f_reserved`

Reserved.

Definition at line 1261 of file [gclib.cs](#).

13.27.3.133 axis_f_variable

SL `gclib.GDataRecord52000.axis_f_variable`

F User-defined variable (ZA).

Definition at line 1262 of file [gclib.cs](#).

13.27.3.134 axis_g_status

UW gclib.GDataRecord52000.axis_g_status

G axis status.

Definition at line 1264 of file [gclib.cs](#).

13.27.3.135 axis_g_switches

UB gclib.GDataRecord52000.axis_g_switches

G axis switches.

Definition at line 1265 of file [gclib.cs](#).

13.27.3.136 axis_g_stop_code

UB gclib.GDataRecord52000.axis_g_stop_code

G axis stop code.

Definition at line 1266 of file [gclib.cs](#).

13.27.3.137 axis_g_reference_position

SL gclib.GDataRecord52000.axis_g_reference_position

G axis reference position.

Definition at line 1267 of file [gclib.cs](#).

13.27.3.138 axis_g_motor_position

SL gclib.GDataRecord52000.axis_g_motor_position

G axis motor position.

Definition at line 1268 of file [gclib.cs](#).

13.27.3.139 axis_g_position_error

SL gclib.GDataRecord52000.axis_g_position_error

G axis position error.

Definition at line 1269 of file [gclib.cs](#).

13.27.3.140 axis_g_aux_position

SL gclib.GDataRecord52000.axis_g_aux_position

G axis auxiliary position.

Definition at line 1270 of file [gclib.cs](#).

13.27.3.141 axis_g_velocity

SL gclib.GDataRecord52000.axis_g_velocity

G axis velocity.

Definition at line 1271 of file [gclib.cs](#).

13.27.3.142 axis_g_torque

SL gclib.GDataRecord52000.axis_g_torque

G axis torque.

Definition at line 1272 of file [gclib.cs](#).

13.27.3.143 axis_g_analog_in

UW gclib.GDataRecord52000.axis_g_analog_in

G axis analog input.

Definition at line 1273 of file [gclib.cs](#).

13.27.3.144 axis_g_halls

UB `gclib.GDataRecord52000.axis_g_halls`

G Hall Input Status.

Definition at line 1274 of file [gclib.cs](#).

13.27.3.145 axis_g_reserved

UB `gclib.GDataRecord52000.axis_g_reserved`

Reserved.

Definition at line 1275 of file [gclib.cs](#).

13.27.3.146 axis_g_variable

SL `gclib.GDataRecord52000.axis_g_variable`

G User-defined variable (ZA).

Definition at line 1276 of file [gclib.cs](#).

13.27.3.147 axis_h_status

UW `gclib.GDataRecord52000.axis_h_status`

H axis status.

Definition at line 1278 of file [gclib.cs](#).

13.27.3.148 axis_h_switches

UB `gclib.GDataRecord52000.axis_h_switches`

H axis switches.

Definition at line 1279 of file [gclib.cs](#).

13.27.3.149 axis_h_stop_code

UB `gclib.GDataRecord52000.axis_h_stop_code`

H axis stop code.

Definition at line 1280 of file [gclib.cs](#).

13.27.3.150 axis_h_reference_position

SL `gclib.GDataRecord52000.axis_h_reference_position`

H axis reference position.

Definition at line 1281 of file [gclib.cs](#).

13.27.3.151 axis_h_motor_position

SL `gclib.GDataRecord52000.axis_h_motor_position`

H axis motor position.

Definition at line 1282 of file [gclib.cs](#).

13.27.3.152 axis_h_position_error

SL `gclib.GDataRecord52000.axis_h_position_error`

H axis position error.

Definition at line 1283 of file [gclib.cs](#).

13.27.3.153 axis_h_aux_position

SL `gclib.GDataRecord52000.axis_h_aux_position`

H axis auxiliary position.

Definition at line 1284 of file [gclib.cs](#).

13.27.3.154 axis_h_velocity

SL `gclib.GDataRecord52000.axis_h_velocity`

H axis velocity.

Definition at line 1285 of file [gclib.cs](#).

13.27.3.155 axis_h_torque

SL `gclib.GDataRecord52000.axis_h_torque`

H axis torque.

Definition at line 1286 of file [gclib.cs](#).

13.27.3.156 axis_h_analog_in

UW `gclib.GDataRecord52000.axis_h_analog_in`

H axis analog input.

Definition at line 1287 of file [gclib.cs](#).

13.27.3.157 axis_h_halls

UB `gclib.GDataRecord52000.axis_h_halls`

H Hall Input Status.

Definition at line 1288 of file [gclib.cs](#).

13.27.3.158 axis_h_reserved

UB `gclib.GDataRecord52000.axis_h_reserved`

Reserved.

Definition at line 1289 of file [gclib.cs](#).

13.27.3.159 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](#)

13.28 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).

13.28.1 Detailed Description

Data record struct for DMC-52000 controller. Same as DMC-4000, with bank indicator added at byte 40.
Definition at line 214 of file [gclib_record.h](#).

13.28.2 Member Data Documentation

13.28.2.1 header_0

UB GDataRecord52000::header_0

1st Byte of Header.

Definition at line 219 of file [gclib_record.h](#).

13.28.2.2 header_1

UB GDataRecord52000::header_1

2nd Byte of Header.

Definition at line 220 of file [gclib_record.h](#).

13.28.2.3 header_2

UB GDataRecord52000::header_2

3rd Byte of Header.

Definition at line 221 of file [gclib_record.h](#).

13.28.2.4 header_3

UB GDataRecord52000::header_3

4th Byte of Header.

Definition at line 222 of file [gclib_record.h](#).

13.28.2.5 sample_number

UW GDataRecord52000::sample_number

sample number.

Definition at line 224 of file [gclib_record.h](#).

13.28.2.6 input_bank_0

UB GDataRecord52000::input_bank_0

general input bank 0 (inputs 1-8).

Definition at line 226 of file [gclib_record.h](#).

13.28.2.7 input_bank_1

UB GDataRecord52000::input_bank_1

general input bank 1 (inputs 9-16).

Definition at line 227 of file [gclib_record.h](#).

13.28.2.8 input_bank_2

UB GDataRecord52000::input_bank_2

general input bank 2 (inputs 17-24).

Definition at line 228 of file [gclib_record.h](#).

13.28.2.9 input_bank_3

UB GDataRecord52000::input_bank_3

general input bank 3 (inputs 25-32).

Definition at line 229 of file [gclib_record.h](#).

13.28.2.10 input_bank_4

UB GDataRecord52000::input_bank_4

general input bank 4 (inputs 33-40).

Definition at line 230 of file [gclib_record.h](#).

13.28.2.11 input_bank_5

UB GDataRecord52000::input_bank_5

general input bank 5 (inputs 41-48).

Definition at line 231 of file [gclib_record.h](#).

13.28.2.12 input_bank_6

UB GDataRecord52000::input_bank_6

general input bank 6 (inputs 49-56).

Definition at line 232 of file [gclib_record.h](#).

13.28.2.13 input_bank_7

UB GDataRecord52000::input_bank_7

general input bank 7 (inputs 57-64).

Definition at line 233 of file [gclib_record.h](#).

13.28.2.14 input_bank_8

UB GDataRecord52000::input_bank_8

general input bank 8 (inputs 65-72).

Definition at line 234 of file [gclib_record.h](#).

13.28.2.15 input_bank_9

UB GDataRecord52000::input_bank_9

general input bank 9 (inputs 73-80).

Definition at line 235 of file [gclib_record.h](#).

13.28.2.16 output_bank_0

UB GDataRecord52000::output_bank_0

general output bank 0 (outputs 1-8).

Definition at line 237 of file [gclib_record.h](#).

13.28.2.17 output_bank_1

UB GDataRecord52000::output_bank_1

general output bank 1 (outputs 9-16).

Definition at line 238 of file [gclib_record.h](#).

13.28.2.18 output_bank_2

UB GDataRecord52000::output_bank_2

general output bank 2 (outputs 17-24).

Definition at line 239 of file [gclib_record.h](#).

13.28.2.19 output_bank_3

UB GDataRecord52000::output_bank_3

general output bank 3 (outputs 25-32).

Definition at line 240 of file [gclib_record.h](#).

13.28.2.20 output_bank_4

UB GDataRecord52000::output_bank_4
general output bank 4 (outputs 33-40).
Definition at line 241 of file [gclib_record.h](#).

13.28.2.21 output_bank_5

UB GDataRecord52000::output_bank_5
general output bank 5 (outputs 41-48).
Definition at line 242 of file [gclib_record.h](#).

13.28.2.22 output_bank_6

UB GDataRecord52000::output_bank_6
general output bank 6 (outputs 49-56).
Definition at line 243 of file [gclib_record.h](#).

13.28.2.23 output_bank_7

UB GDataRecord52000::output_bank_7
general output bank 7 (outputs 57-64).
Definition at line 244 of file [gclib_record.h](#).

13.28.2.24 output_bank_8

UB GDataRecord52000::output_bank_8
general output bank 8 (outputs 65-72).
Definition at line 245 of file [gclib_record.h](#).

13.28.2.25 output_bank_9

UB GDataRecord52000::output_bank_9
general output bank 9 (outputs 73-80).
Definition at line 246 of file [gclib_record.h](#).

13.28.2.26 reserved_0

SW GDataRecord52000::reserved_0
Reserved.
Definition at line 248 of file [gclib_record.h](#).

13.28.2.27 reserved_2

SW GDataRecord52000::reserved_2
Reserved.
Definition at line 249 of file [gclib_record.h](#).

13.28.2.28 reserved_4

SW GDataRecord52000::reserved_4
Reserved.
Definition at line 250 of file [gclib_record.h](#).

13.28.2.29 reserved_6

SW GDataRecord52000::reserved_6
Reserved.
Definition at line 251 of file [gclib_record.h](#).

13.28.2.30 reserved_8

SW GDataRecord52000::reserved_8

Reserved.

Definition at line 252 of file [gclib_record.h](#).

13.28.2.31 reserved_10

SW GDataRecord52000::reserved_10

Reserved.

Definition at line 253 of file [gclib_record.h](#).

13.28.2.32 reserved_12

SW GDataRecord52000::reserved_12

Reserved.

Definition at line 254 of file [gclib_record.h](#).

13.28.2.33 ethercat_bank

UB GDataRecord52000::ethercat_bank

EtherCAT Bank Indicator.

Definition at line 255 of file [gclib_record.h](#).

13.28.2.34 reserved_14

UB GDataRecord52000::reserved_14

Reserved.

Definition at line 256 of file [gclib_record.h](#).

13.28.2.35 ethernet_status_a

UB GDataRecord52000::ethernet_status_a

Ethernet Handle A Status.

Definition at line 258 of file [gclib_record.h](#).

13.28.2.36 ethernet_status_b

UB GDataRecord52000::ethernet_status_b

Ethernet Handle B Status.

Definition at line 259 of file [gclib_record.h](#).

13.28.2.37 ethernet_status_c

UB GDataRecord52000::ethernet_status_c

Ethernet Handle C Status.

Definition at line 260 of file [gclib_record.h](#).

13.28.2.38 ethernet_status_d

UB GDataRecord52000::ethernet_status_d

Ethernet Handle D Status.

Definition at line 261 of file [gclib_record.h](#).

13.28.2.39 ethernet_status_e

UB GDataRecord52000::ethernet_status_e

Ethernet Handle E Status.

Definition at line 262 of file [gclib_record.h](#).

13.28.2.40 ethernet_status_f

UB GDataRecord52000::ethernet_status_f
Ethernet Handle F Status.
Definition at line 263 of file [gclib_record.h](#).

13.28.2.41 ethernet_status_g

UB GDataRecord52000::ethernet_status_g
Ethernet Handle G Status.
Definition at line 264 of file [gclib_record.h](#).

13.28.2.42 ethernet_status_h

UB GDataRecord52000::ethernet_status_h
Ethernet Handle H Status.
Definition at line 265 of file [gclib_record.h](#).

13.28.2.43 error_code

UB GDataRecord52000::error_code
error code.
Definition at line 267 of file [gclib_record.h](#).

13.28.2.44 thread_status

UB GDataRecord52000::thread_status
thread status
Definition at line 268 of file [gclib_record.h](#).

13.28.2.45 amplifier_status

UL GDataRecord52000::amplifier_status
Amplifier Status.
Definition at line 269 of file [gclib_record.h](#).

13.28.2.46 contour_segment_count

UL GDataRecord52000::contour_segment_count
Segment Count for Contour Mode.
Definition at line 271 of file [gclib_record.h](#).

13.28.2.47 contour_buffer_available

UW GDataRecord52000::contour_buffer_available
Buffer space remaining, Contour Mode.
Definition at line 272 of file [gclib_record.h](#).

13.28.2.48 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](#).

13.28.2.49 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](#).

13.28.2.50 s_distance

SL GDataRecord52000::s_distance

distance traveled in coordinated move for S plane.

Definition at line 276 of file [gclib_record.h](#).

13.28.2.51 s_plane_buffer_available

UW GDataRecord52000::s_plane_buffer_available

Buffer space remaining, S Plane.

Definition at line 277 of file [gclib_record.h](#).

13.28.2.52 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](#).

13.28.2.53 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](#).

13.28.2.54 t_distance

SL GDataRecord52000::t_distance

distance traveled in coordinated move for T plane.

Definition at line 281 of file [gclib_record.h](#).

13.28.2.55 t_plane_buffer_available

UW GDataRecord52000::t_plane_buffer_available

Buffer space remaining, T Plane.

Definition at line 282 of file [gclib_record.h](#).

13.28.2.56 axis_a_status

UW GDataRecord52000::axis_a_status

A axis status.

Definition at line 284 of file [gclib_record.h](#).

13.28.2.57 axis_a_switches

UB GDataRecord52000::axis_a_switches

A axis switches.

Definition at line 285 of file [gclib_record.h](#).

13.28.2.58 axis_a_stop_code

UB GDataRecord52000::axis_a_stop_code

A axis stop code.

Definition at line 286 of file [gclib_record.h](#).

13.28.2.59 axis_a_reference_position

SL GDataRecord52000::axis_a_reference_position

A axis reference position.

Definition at line 287 of file [gclib_record.h](#).

13.28.2.60 axis_a_motor_position

SL GDataRecord52000::axis_a_motor_position

A axis motor position.

Definition at line 288 of file [gclib_record.h](#).

13.28.2.61 axis_a_position_error

SL GDataRecord52000::axis_a_position_error

A axis position error.

Definition at line 289 of file [gclib_record.h](#).

13.28.2.62 axis_a_aux_position

SL GDataRecord52000::axis_a_aux_position

A axis auxiliary position.

Definition at line 290 of file [gclib_record.h](#).

13.28.2.63 axis_a_velocity

SL GDataRecord52000::axis_a_velocity

A axis velocity.

Definition at line 291 of file [gclib_record.h](#).

13.28.2.64 axis_a_torque

SL GDataRecord52000::axis_a_torque

A axis torque.

Definition at line 292 of file [gclib_record.h](#).

13.28.2.65 axis_a_analog_in

UW GDataRecord52000::axis_a_analog_in

A axis analog input.

Definition at line 293 of file [gclib_record.h](#).

13.28.2.66 axis_a_halls

UB GDataRecord52000::axis_a_halls

A Hall Input Status.

Definition at line 294 of file [gclib_record.h](#).

13.28.2.67 axis_a_reserved

UB GDataRecord52000::axis_a_reserved

Reserved.

Definition at line 295 of file [gclib_record.h](#).

13.28.2.68 axis_a_variable

SL GDataRecord52000::axis_a_variable

A User-defined variable (ZA).

Definition at line 296 of file [gclib_record.h](#).

13.28.2.69 axis_b_status

UW GDataRecord52000::axis_b_status

B axis status.

Definition at line 298 of file [gclib_record.h](#).

13.28.2.70 axis_b_switches

UB GDataRecord52000::axis_b_switches

B axis switches.

Definition at line 299 of file [gclib_record.h](#).

13.28.2.71 axis_b_stop_code

UB GDataRecord52000::axis_b_stop_code

B axis stop code.

Definition at line 300 of file [gclib_record.h](#).

13.28.2.72 axis_b_reference_position

SL GDataRecord52000::axis_b_reference_position

B axis reference position.

Definition at line 301 of file [gclib_record.h](#).

13.28.2.73 axis_b_motor_position

SL GDataRecord52000::axis_b_motor_position

B axis motor position.

Definition at line 302 of file [gclib_record.h](#).

13.28.2.74 axis_b_position_error

SL GDataRecord52000::axis_b_position_error

B axis position error.

Definition at line 303 of file [gclib_record.h](#).

13.28.2.75 axis_b_aux_position

SL GDataRecord52000::axis_b_aux_position

B axis auxiliary position.

Definition at line 304 of file [gclib_record.h](#).

13.28.2.76 axis_b_velocity

SL GDataRecord52000::axis_b_velocity

B axis velocity.

Definition at line 305 of file [gclib_record.h](#).

13.28.2.77 axis_b_torque

SL GDataRecord52000::axis_b_torque

B axis torque.

Definition at line 306 of file [gclib_record.h](#).

13.28.2.78 axis_b_analog_in

UW GDataRecord52000::axis_b_analog_in

B axis analog input.

Definition at line 307 of file [gclib_record.h](#).

13.28.2.79 axis_b_halls

UB GDataRecord52000::axis_b_halls

B Hall Input Status.

Definition at line 308 of file [gclib_record.h](#).

13.28.2.80 axis_b_reserved

UB GDataRecord52000::axis_b_reserved
Reserved.
Definition at line 309 of file [gclib_record.h](#).

13.28.2.81 axis_b_variable

SL GDataRecord52000::axis_b_variable
B User-defined variable (ZA).
Definition at line 310 of file [gclib_record.h](#).

13.28.2.82 axis_c_status

UW GDataRecord52000::axis_c_status
C axis status.
Definition at line 312 of file [gclib_record.h](#).

13.28.2.83 axis_c_switches

UB GDataRecord52000::axis_c_switches
C axis switches.
Definition at line 313 of file [gclib_record.h](#).

13.28.2.84 axis_c_stop_code

UB GDataRecord52000::axis_c_stop_code
C axis stop code.
Definition at line 314 of file [gclib_record.h](#).

13.28.2.85 axis_c_reference_position

SL GDataRecord52000::axis_c_reference_position
C axis reference position.
Definition at line 315 of file [gclib_record.h](#).

13.28.2.86 axis_c_motor_position

SL GDataRecord52000::axis_c_motor_position
C axis motor position.
Definition at line 316 of file [gclib_record.h](#).

13.28.2.87 axis_c_position_error

SL GDataRecord52000::axis_c_position_error
C axis position error.
Definition at line 317 of file [gclib_record.h](#).

13.28.2.88 axis_c_aux_position

SL GDataRecord52000::axis_c_aux_position
C axis auxiliary position.
Definition at line 318 of file [gclib_record.h](#).

13.28.2.89 axis_c_velocity

SL GDataRecord52000::axis_c_velocity
C axis velocity.
Definition at line 319 of file [gclib_record.h](#).

13.28.2.90 axis_c_torque

SL GDataRecord52000::axis_c_torque

C axis torque.

Definition at line 320 of file [gclib_record.h](#).

13.28.2.91 axis_c_analog_in

UW GDataRecord52000::axis_c_analog_in

C axis analog input.

Definition at line 321 of file [gclib_record.h](#).

13.28.2.92 axis_c_halls

UB GDataRecord52000::axis_c_halls

C Hall Input Status.

Definition at line 322 of file [gclib_record.h](#).

13.28.2.93 axis_c_reserved

UB GDataRecord52000::axis_c_reserved

Reserved.

Definition at line 323 of file [gclib_record.h](#).

13.28.2.94 axis_c_variable

SL GDataRecord52000::axis_c_variable

C User-defined variable (ZA).

Definition at line 324 of file [gclib_record.h](#).

13.28.2.95 axis_d_status

UW GDataRecord52000::axis_d_status

D axis status.

Definition at line 326 of file [gclib_record.h](#).

13.28.2.96 axis_d_switches

UB GDataRecord52000::axis_d_switches

D axis switches.

Definition at line 327 of file [gclib_record.h](#).

13.28.2.97 axis_d_stop_code

UB GDataRecord52000::axis_d_stop_code

D axis stop code.

Definition at line 328 of file [gclib_record.h](#).

13.28.2.98 axis_d_reference_position

SL GDataRecord52000::axis_d_reference_position

D axis reference position.

Definition at line 329 of file [gclib_record.h](#).

13.28.2.99 axis_d_motor_position

SL GDataRecord52000::axis_d_motor_position

D axis motor position.

Definition at line 330 of file [gclib_record.h](#).

13.28.2.100 axis_d_position_error

SL GDataRecord52000::axis_d_position_error

D axis position error.

Definition at line 331 of file [gclib_record.h](#).

13.28.2.101 axis_d_aux_position

SL GDataRecord52000::axis_d_aux_position

D axis auxiliary position.

Definition at line 332 of file [gclib_record.h](#).

13.28.2.102 axis_d_velocity

SL GDataRecord52000::axis_d_velocity

D axis velocity.

Definition at line 333 of file [gclib_record.h](#).

13.28.2.103 axis_d_torque

SL GDataRecord52000::axis_d_torque

D axis torque.

Definition at line 334 of file [gclib_record.h](#).

13.28.2.104 axis_d_analog_in

UW GDataRecord52000::axis_d_analog_in

D axis analog input.

Definition at line 335 of file [gclib_record.h](#).

13.28.2.105 axis_d_halls

UB GDataRecord52000::axis_d_halls

D Hall Input Status.

Definition at line 336 of file [gclib_record.h](#).

13.28.2.106 axis_d_reserved

UB GDataRecord52000::axis_d_reserved

Reserved.

Definition at line 337 of file [gclib_record.h](#).

13.28.2.107 axis_d_variable

SL GDataRecord52000::axis_d_variable

D User-defined variable (ZA).

Definition at line 338 of file [gclib_record.h](#).

13.28.2.108 axis_e_status

UW GDataRecord52000::axis_e_status

E axis status.

Definition at line 340 of file [gclib_record.h](#).

13.28.2.109 axis_e_switches

UB GDataRecord52000::axis_e_switches

E axis switches.

Definition at line 341 of file [gclib_record.h](#).

13.28.2.110 axis_e_stop_code

UB GDataRecord52000::axis_e_stop_code

E axis stop code.

Definition at line 342 of file [gclib_record.h](#).

13.28.2.111 axis_e_reference_position

SL GDataRecord52000::axis_e_reference_position

E axis reference position.

Definition at line 343 of file [gclib_record.h](#).

13.28.2.112 axis_e_motor_position

SL GDataRecord52000::axis_e_motor_position

E axis motor position.

Definition at line 344 of file [gclib_record.h](#).

13.28.2.113 axis_e_position_error

SL GDataRecord52000::axis_e_position_error

E axis position error.

Definition at line 345 of file [gclib_record.h](#).

13.28.2.114 axis_e_aux_position

SL GDataRecord52000::axis_e_aux_position

E axis auxiliary position.

Definition at line 346 of file [gclib_record.h](#).

13.28.2.115 axis_e_velocity

SL GDataRecord52000::axis_e_velocity

E axis velocity.

Definition at line 347 of file [gclib_record.h](#).

13.28.2.116 axis_e_torque

SL GDataRecord52000::axis_e_torque

E axis torque.

Definition at line 348 of file [gclib_record.h](#).

13.28.2.117 axis_e_analog_in

UW GDataRecord52000::axis_e_analog_in

E axis analog input.

Definition at line 349 of file [gclib_record.h](#).

13.28.2.118 axis_e_halls

UB GDataRecord52000::axis_e_halls

E Hall Input Status.

Definition at line 350 of file [gclib_record.h](#).

13.28.2.119 axis_e_reserved

UB GDataRecord52000::axis_e_reserved

Reserved.

Definition at line 351 of file [gclib_record.h](#).

13.28.2.120 axis_e_variable

SL GDataRecord52000::axis_e_variable

E User-defined variable (ZA).

Definition at line 352 of file [gclib_record.h](#).

13.28.2.121 axis_f_status

UW GDataRecord52000::axis_f_status

F axis status.

Definition at line 354 of file [gclib_record.h](#).

13.28.2.122 axis_f_switches

UB GDataRecord52000::axis_f_switches

F axis switches.

Definition at line 355 of file [gclib_record.h](#).

13.28.2.123 axis_f_stop_code

UB GDataRecord52000::axis_f_stop_code

F axis stop code.

Definition at line 356 of file [gclib_record.h](#).

13.28.2.124 axis_f_reference_position

SL GDataRecord52000::axis_f_reference_position

F axis reference position.

Definition at line 357 of file [gclib_record.h](#).

13.28.2.125 axis_f_motor_position

SL GDataRecord52000::axis_f_motor_position

F axis motor position.

Definition at line 358 of file [gclib_record.h](#).

13.28.2.126 axis_f_position_error

SL GDataRecord52000::axis_f_position_error

F axis position error.

Definition at line 359 of file [gclib_record.h](#).

13.28.2.127 axis_f_aux_position

SL GDataRecord52000::axis_f_aux_position

F axis auxiliary position.

Definition at line 360 of file [gclib_record.h](#).

13.28.2.128 axis_f_velocity

SL GDataRecord52000::axis_f_velocity

F axis velocity.

Definition at line 361 of file [gclib_record.h](#).

13.28.2.129 axis_f_torque

SL GDataRecord52000::axis_f_torque

F axis torque.

Definition at line 362 of file [gclib_record.h](#).

13.28.2.130 axis_f_analog_in

UW GDataRecord52000::axis_f_analog_in

F axis analog input.

Definition at line 363 of file [gclib_record.h](#).

13.28.2.131 axis_f_halls

UB GDataRecord52000::axis_f_halls

F Hall Input Status.

Definition at line 364 of file [gclib_record.h](#).

13.28.2.132 axis_f_reserved

UB GDataRecord52000::axis_f_reserved

Reserved.

Definition at line 365 of file [gclib_record.h](#).

13.28.2.133 axis_f_variable

SL GDataRecord52000::axis_f_variable

F User-defined variable (ZA).

Definition at line 366 of file [gclib_record.h](#).

13.28.2.134 axis_g_status

UW GDataRecord52000::axis_g_status

G axis status.

Definition at line 368 of file [gclib_record.h](#).

13.28.2.135 axis_g_switches

UB GDataRecord52000::axis_g_switches

G axis switches.

Definition at line 369 of file [gclib_record.h](#).

13.28.2.136 axis_g_stop_code

UB GDataRecord52000::axis_g_stop_code

G axis stop code.

Definition at line 370 of file [gclib_record.h](#).

13.28.2.137 axis_g_reference_position

SL GDataRecord52000::axis_g_reference_position

G axis reference position.

Definition at line 371 of file [gclib_record.h](#).

13.28.2.138 axis_g_motor_position

SL GDataRecord52000::axis_g_motor_position

G axis motor position.

Definition at line 372 of file [gclib_record.h](#).

13.28.2.139 axis_g_position_error

SL GDataRecord52000::axis_g_position_error

G axis position error.

Definition at line 373 of file [gclib_record.h](#).

13.28.2.140 axis_g_aux_position

SL GDataRecord52000::axis_g_aux_position

G axis auxiliary position.

Definition at line 374 of file [gclib_record.h](#).

13.28.2.141 axis_g_velocity

SL GDataRecord52000::axis_g_velocity

G axis velocity.

Definition at line 375 of file [gclib_record.h](#).

13.28.2.142 axis_g_torque

SL GDataRecord52000::axis_g_torque

G axis torque.

Definition at line 376 of file [gclib_record.h](#).

13.28.2.143 axis_g_analog_in

UW GDataRecord52000::axis_g_analog_in

G axis analog input.

Definition at line 377 of file [gclib_record.h](#).

13.28.2.144 axis_g_halls

UB GDataRecord52000::axis_g_halls

G Hall Input Status.

Definition at line 378 of file [gclib_record.h](#).

13.28.2.145 axis_g_reserved

UB GDataRecord52000::axis_g_reserved

Reserved.

Definition at line 379 of file [gclib_record.h](#).

13.28.2.146 axis_g_variable

SL GDataRecord52000::axis_g_variable

G User-defined variable (ZA).

Definition at line 380 of file [gclib_record.h](#).

13.28.2.147 axis_h_status

UW GDataRecord52000::axis_h_status

H axis status.

Definition at line 382 of file [gclib_record.h](#).

13.28.2.148 axis_h_switches

UB GDataRecord52000::axis_h_switches

H axis switches.

Definition at line 383 of file [gclib_record.h](#).

13.28.2.149 axis_h_stop_code

UB GDataRecord52000::axis_h_stop_code

H axis stop code.

Definition at line 384 of file [gclib_record.h](#).

13.28.2.150 axis_h_reference_position

SL GDataRecord52000::axis_h_reference_position

H axis reference position.

Definition at line 385 of file [gclib_record.h](#).

13.28.2.151 axis_h_motor_position

SL GDataRecord52000::axis_h_motor_position

H axis motor position.

Definition at line 386 of file [gclib_record.h](#).

13.28.2.152 axis_h_position_error

SL GDataRecord52000::axis_h_position_error

H axis position error.

Definition at line 387 of file [gclib_record.h](#).

13.28.2.153 axis_h_aux_position

SL GDataRecord52000::axis_h_aux_position

H axis auxiliary position.

Definition at line 388 of file [gclib_record.h](#).

13.28.2.154 axis_h_velocity

SL GDataRecord52000::axis_h_velocity

H axis velocity.

Definition at line 389 of file [gclib_record.h](#).

13.28.2.155 axis_h_torque

SL GDataRecord52000::axis_h_torque

H axis torque.

Definition at line 390 of file [gclib_record.h](#).

13.28.2.156 axis_h_analog_in

UW GDataRecord52000::axis_h_analog_in

H axis analog input.

Definition at line 391 of file [gclib_record.h](#).

13.28.2.157 axis_h_halls

UB GDataRecord52000::axis_h_halls

H Hall Input Status.

Definition at line 392 of file [gclib_record.h](#).

13.28.2.158 axis_h_reserved

UB GDataRecord52000::axis_h_reserved

Reserved.

Definition at line 393 of file [gclib_record.h](#).

13.28.2.159 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](#)

13.29 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

13.29.1 Detailed Description

Represents a single Python connection to a Galil Controller or PLC.
Definition at line 152 of file [gclib.py](#).

13.29.2 Constructor & Destructor Documentation

13.29.2.1 [__init__](#)()

```
gclib.py.__init__ (
    self)
```

Constructor for the Connection class.
Initializes gclib's handle and read buffer.
Definition at line 157 of file [gclib.py](#).

13.29.2.2 [__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 164 of file [gclib.py](#).

13.29.3 Member Function Documentation

13.29.3.1 `_cc()`

```
gclib.py._cc (
    self) [protected]
```

Checks if connection is established, throws error if not.

Definition at line 169 of file [gclib.py](#).

13.29.4 Member Data Documentation

13.29.4.1 `_gcon`

```
gclib.py._gcon = _GCon(0) [protected]
```

Definition at line 159 of file [gclib.py](#).

13.29.4.2 `_buf`

```
gclib.py._buf = create_string_buffer(_buf_size) [protected]
```

Definition at line 160 of file [gclib.py](#).

13.29.4.3 `_timeout`

```
int gclib.py._timeout = 5000 [protected]
```

Definition at line 161 of file [gclib.py](#).

The documentation for this class was generated from the following file:

- [gclib.py](#)

Chapter 14

File Documentation

14.1 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](#)
Data record struct for DMC-1802 controllers.
- 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](#)

14.1.1 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](#).

14.1.2 Macro Definition Documentation

14.1.2.1 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](#).

14.1.3 Typedef Documentation

14.1.3.1 UB

```
typedef uint8_t UB
```

Definition at line 12 of file [gclib_record.h](#).

14.1.3.2 UW

```
typedef uint16_t UW
```

Definition at line 13 of file [gclib_record.h](#).

14.1.3.3 SW

```
typedef int16_t SW
```

Definition at line 14 of file [gclib_record.h](#).

14.1.3.4 SL

```
typedef int32_t SL
```

Definition at line 15 of file [gclib_record.h](#).

14.1.3.5 UL

```
typedef uint32_t UL
```

Definition at line 16 of file [gclib_record.h](#).

14.2 gclib_record.h

[Go to the documentation of this file.](#)

```
00001
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;
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;

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```
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;
```

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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;

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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
00718
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

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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

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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
01068
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 #ifdef 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

```

14.3 gclib.h File Reference

```

#include "gclib_record.h"
#include "gclib_errors.h"

```

Macros

- #define [GCLIB_DLL_EXPORTED](#)
- #define [GCLIB_DEPRECATED](#)
- #define [GCALL](#)
- #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_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
[GUtility\(\)](#), for timeout override. Set [G_UTIL_TIMEOUT_OVERRIDE](#) to 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_KEEPAIVE 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.*
- `#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.*

Typedefs

- `typedef int GReturn`
- *Every function returns a value of type [GReturn](#). See [gclib_errors.h](#) for possible values.*
- `typedef void * 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 * [GBufln](#)
 - 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_DLL_EXPORTED [GReturn](#) GCALL [GOpen](#) ([GCStringIn](#) address, [GCon](#) *g)
 - Open a connection to a Galil Controller.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GClose](#) ([GCon](#) g)
 - Closes a connection to a Galil Controller.*
- GCLIB_DLL_EXPORTED GCLIB_DEPRECATED [GReturn](#) GCALL [GRead](#) ([GCon](#) g, [GBufOut](#) buffer, [GSize](#) buffer_len, [GSize](#) *bytes_read)
 - Performs a read on the connection.*
- GCLIB_DLL_EXPORTED GCLIB_DEPRECATED [GReturn](#) GCALL [GWrite](#) ([GCon](#) g, [GBufln](#) buffer, [GSize](#) buffer_len)
 - Performs a write on the connection.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GCommand](#) ([GCon](#) g, [GCStringIn](#) command, [GBufOut](#) buffer, [GSize](#) buffer_len, [GSize](#) *bytes_returned)
 - Performs a command-and-response transaction on the connection.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramDownload](#) ([GCon](#) g, [GCStringIn](#) program, [GCStringIn](#) preprocessor)
 - Downloads a program to the controller's program buffer.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramUpload](#) ([GCon](#) g, [GBufOut](#) buffer, [GSize](#) buffer_len)
 - Uploads a program from the controller's program buffer.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GMessage](#) ([GCon](#) g, [GCStringOut](#) buffer, [GSize](#) buffer_len)
 - Provides access to unsolicited messages from the controller.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GInterrupt](#) ([GCon](#) g, [GStatus](#) *status_byte)
 - Provides access to PCI and UDP interrupts from the controller.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GFirmwareDownload](#) ([GCon](#) g, [GCStringIn](#) filepath)
 - Upgrade firmware.*
- GCLIB_DLL_EXPORTED GCLIB_DEPRECATED [GReturn](#) GCALL [GUtility](#) ([GCon](#) g, [GOption](#) request, [GMemory](#) memory1, [GMemory](#) memory2)
 - Provides read/write access to driver settings and convenience features based on the request variable.*

14.3.1 Detailed Description

Defines the interface for the Galil C Library (GCLIB).
Definition in file [gclib.h](#).

14.3.2 Macro Definition Documentation

14.3.2.1 GCLIB_DLL_EXPORTED

```
#define GCLIB_DLL_EXPORTED
```

Definition at line 37 of file [gclib.h](#).

14.3.2.2 GCLIB_DEPRECATED

```
#define GCLIB_DEPRECATED
```

Definition at line 45 of file [gclib.h](#).

14.3.2.3 GCALL

```
#define GCALL
```

Definition at line 54 of file [gclib.h](#).

14.3.2.4 G_DR

```
#define G_DR 1
```

Value for [GRecord\(\)](#) method variable for acquiring a data record via DR mode.
Definition at line 64 of file [gclib.h](#).

14.3.2.5 G_QR

```
#define G_QR 0
```

Value for [GRecord\(\)](#) method variable for acquiring a data record via QR mode.
Definition at line 65 of file [gclib.h](#).

14.3.2.6 G_BOUNDS

```
#define G_BOUNDS -1
```

For functions that take range options, e.g. [GArrayUpload\(\)](#), use this value for full range.
Definition at line 66 of file [gclib.h](#).

14.3.2.7 G_CR

```
#define G_CR 0
```

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with carriage returns.
Definition at line 67 of file [gclib.h](#).

14.3.2.8 G_COMMA

```
#define G_COMMA 1
```

For [GArrayUpload\(\)](#), use this value in the delim field to delimit with commas.
Definition at line 68 of file [gclib.h](#).

14.3.2.9 G_PUBLISH_SERVER

```
#define G_PUBLISH_SERVER 1
```

For [GPublishServer\(\)](#), use this value to publish server to local network.
Definition at line 69 of file [gclib.h](#).

14.3.2.10 G_REMOVE_SERVER

```
#define G_REMOVE_SERVER 0
```

For [GPublishServer\(\)](#), use this value to remove server from local network.
Definition at line 70 of file [gclib.h](#).

14.3.2.11 G_UTIL_TIMEOUT

```
#define G_UTIL_TIMEOUT 1
```

[GUtility\(\)](#), Access to timeout.

Definition at line 73 of file [gclib.h](#).

14.3.2.12 G_UTIL_TIMEOUT_OVERRIDE

```
#define G_UTIL_TIMEOUT_OVERRIDE 2
```

[GUtility\(\)](#), read/write access to timeout override.

Definition at line 74 of file [gclib.h](#).

14.3.2.13 G_USE_INITIAL_TIMEOUT

```
#define G_USE_INITIAL_TIMEOUT -1
```

[GUtility\(\)](#), for timeout override. Set `G_UTIL_TIMEOUT_OVERRIDE` to this value to use initial [GOpen\(\)](#) timeout (`--timeout`).

Definition at line 75 of file [gclib.h](#).

14.3.2.14 G_UTIL_VERSION

```
#define G_UTIL_VERSION 128
```

[GUtility\(\)](#), get a library version string.

Definition at line 76 of file [gclib.h](#).

14.3.2.15 G_UTIL_INFO

```
#define G_UTIL_INFO 129
```

[GUtility\(\)](#), get a connection info string.

Definition at line 77 of file [gclib.h](#).

14.3.2.16 G_UTIL_SLEEP

```
#define G_UTIL_SLEEP 130
```

[GUtility\(\)](#), specify an interval to sleep.

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

14.3.2.17 G_UTIL_ADDRESSES

```
#define G_UTIL_ADDRESSES 131
```

[GUtility\(\)](#), get a list of available connections.

Definition at line 79 of file [gclib.h](#).

14.3.2.18 G_UTIL_IPREQUEST

```
#define G_UTIL_IPREQUEST 132
```

[GUtility\(\)](#), get a list of hardware requesting IPs.

Definition at line 80 of file [gclib.h](#).

14.3.2.19 G_UTIL_ASSIGN

```
#define G_UTIL_ASSIGN 133
```

[GUtility\(\)](#), assign IP addresses over the network.

Definition at line 81 of file [gclib.h](#).

14.3.2.20 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 82 of file [gclib.h](#).

14.3.2.21 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 83 of file [gclib.h](#).

14.3.2.22 G_UTIL_ERROR_CONTEXT

```
#define G_UTIL_ERROR_CONTEXT 136
```

[GUtility\(\)](#), provides additional error context, where available.

Definition at line 84 of file [gclib.h](#).

14.3.2.23 G_UTIL_GCAPS_HOST

```
#define G_UTIL_GCAPS_HOST 256
```

Definition at line 86 of file [gclib.h](#).

14.3.2.24 G_UTIL_GCAPS_VERSION

```
#define G_UTIL_GCAPS_VERSION 257
```

[GUtility\(\)](#), get the version of the [gcaps](#) server.

Definition at line 87 of file [gclib.h](#).

14.3.2.25 G_UTIL_GCAPS_KEEPALIVE

```
#define G_UTIL_GCAPS_KEEPALIVE 258
```

[GUtility\(\)](#), Deprecated 20210119. No longer functional.

Definition at line 88 of file [gclib.h](#).

14.3.2.26 G_UTIL_GCAPS_ADDRESSES

```
#define G_UTIL_GCAPS_ADDRESSES 259
```

[GUtility\(\)](#), get a list of available connections from the [gcaps](#) server.

Definition at line 89 of file [gclib.h](#).

14.3.2.27 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 90 of file [gclib.h](#).

14.3.2.28 G_UTIL_GCAPS_ASSIGN

```
#define G_UTIL_GCAPS_ASSIGN 261
```

[GUtility\(\)](#), assign IP addresses over the network from the [gcaps](#) server.

Definition at line 91 of file [gclib.h](#).

14.3.2.29 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 92 of file [gclib.h](#).

14.3.2.30 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 93 of file [gclib.h](#).

14.3.2.31 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 94 of file [gclib.h](#).

14.3.2.32 G_UTIL_GCAPS_SET_SERVER

```
#define G_UTIL_GCAPS_SET_SERVER 265
```

[GUtility\(\)](#), set the new active gcaps server.

Definition at line 95 of file [gclib.h](#).

14.3.2.33 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 96 of file [gclib.h](#).

14.3.2.34 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 97 of file [gclib.h](#).

14.3.2.35 G_UTIL_GCAPS_SERVER_INFO

```
#define G_UTIL_GCAPS_SERVER_INFO 268
```

Definition at line 98 of file [gclib.h](#).

14.3.2.36 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 99 of file [gclib.h](#).

14.3.2.37 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 100 of file [gclib.h](#).

14.3.2.38 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 103 of file [gclib.h](#).

14.3.2.39 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 104 of file [gclib.h](#).

14.3.2.40 G_LINE_BUFFER

```
#define G_LINE_BUFFER 80
```

For writes, via command interpreter, to the Galil.

Definition at line 105 of file [gclib.h](#).

14.3.3 Typedef Documentation

14.3.3.1 GReturn

```
typedef int GReturn
```

Every function returns a value of type GReturn. See [gclib_errors.h](#) for possible values.

Definition at line 107 of file [gclib.h](#).

14.3.3.2 GCon

```
typedef void* GCon
```

Connection handle. Unique for each connection in process. Assigned a non-zero value in [GOpen\(\)](#).

Definition at line 108 of file [gclib.h](#).

14.3.3.3 GSize

```
typedef unsigned int GSize
```

Size of buffers, etc.

Definition at line 109 of file [gclib.h](#).

14.3.3.4 GOption

```
typedef int GOption
```

Option integer for various formatting, etc.

Definition at line 110 of file [gclib.h](#).

14.3.3.5 GCStringOut

```
typedef char* GCStringOut
```

C-string output from the library. Implies null-termination.

Definition at line 111 of file [gclib.h](#).

14.3.3.6 GCStringIn

```
typedef const char* GCStringIn
```

C-string input to the library. Implies null-termination.

Definition at line 112 of file [gclib.h](#).

14.3.3.7 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 113 of file [gclib.h](#).

14.3.3.8 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 114 of file [gclib.h](#).

14.3.3.9 GStatus

```
typedef unsigned char GStatus
```

Interrupt status byte.

Definition at line 115 of file [gclib.h](#).

14.3.3.10 GMemory

typedef void* [GMemory](#)

Pointer to untyped memory for use in [GUtility\(\)](#).

Definition at line 116 of file [gclib.h](#).

14.4 gclib.h

[Go to the documentation of this file.](#)

```
00001
00026 #ifndef I_D48432D9_1FA3_4C7D_B44C_05F8B9000ADF
00027 #define I_D48432D9_1FA3_4C7D_B44C_05F8B9000ADF
00028
00029 //set library visibility for gcc and msvc
00030 #if BUILDING_GCLIB && HAVE_VISIBILITY
00031 #define GCLIB_DLL_EXPORTED __attribute__((__visibility__("default")))
00032 #elif BUILDING_GCLIB && defined _MSC_VER
00033 #define GCLIB_DLL_EXPORTED __declspec(dllexport)
00034 #elif defined _MSC_VER
00035 #define GCLIB_DLL_EXPORTED __declspec(dllimport)
00036 #else
00037 #define GCLIB_DLL_EXPORTED
00038 #endif
00039
00040 #ifdef _MSC_VER
00041 #define GCLIB_DEPRECATED __declspec(deprecated)
00042 #elif defined(__GNUC__) | defined(__clang__)
00043 #define GCLIB_DEPRECATED __attribute__((__deprecated__))
00044 #else
00045 #define GCLIB_DEPRECATED
00046 #endif
00047
00048 #include "gclib_record.h" // Galil data record structs and unions.
00049 #include "gclib_errors.h" // GReturn error code values and strings.
00050
00051 #ifdef _WIN32
00052 #define GCALL __stdcall
00053 #else
00054 #define GCALL
00055 #endif
00056
00057 // #define G_USE_GCOMPOUND //!< GCompound() is not part of the standard gclib release. Contact Galil
    Applications for a special build, http://galil.com/contact.
00058
00059 #ifdef __cplusplus
00060 extern "C" {
00061 #endif
00062
00063     //Constants for function arguments
00064 #define G_DR 1
00065 #define G_QR 0
00066 #define G_BOUNDS -1
00067 #define G_CR 0
00068 #define G_COMMA 1
00069 #define G_PUBLISH_SERVER 1
00070 #define G_REMOVE_SERVER 0
00071
00072     //Constants for GUtility()
00073 #define G_UTIL_TIMEOUT 1
00074 #define G_UTIL_TIMEOUT_OVERRIDE 2
00075 #define G_USE_INITIAL_TIMEOUT -1
00076 #define G_UTIL_VERSION 128
00077 #define G_UTIL_INFO 129
00078 #define G_UTIL_SLEEP 130
00079 #define G_UTIL_ADDRESSES 131
00080 #define G_UTIL_IPREQUEST 132
00081 #define G_UTIL_ASSIGN 133
00082 #define G_UTIL_DEVICE_INITIALIZE 134
00083 #define G_UTIL_PING 135
00084 #define G_UTIL_ERROR_CONTEXT 136
00085
00086 #define G_UTIL_GCAPS_HOST 256
00087 #define G_UTIL_GCAPS_VERSION 257
00088 #define G_UTIL_GCAPS_KEEPALIVE 258
00089 #define G_UTIL_GCAPS_ADDRESSES 259
00090 #define G_UTIL_GCAPS_IPREQUEST 260
00091 #define G_UTIL_GCAPS_ASSIGN 261
00092 #define G_UTIL_GCAPS_PING 262
00093 #define G_UTIL_GCAPS_LIST_SERVERS 263
00094 #define G_UTIL_GCAPS_PUBLISH_SERVER 264
00095 #define G_UTIL_GCAPS_SET_SERVER 265
00096 #define G_UTIL_GCAPS_SERVER_STATUS 266
00097 #define G_UTIL_GCAPS_REMOTE_CONNECTIONS 267
```

```

00098 #define G_UTIL_GCAPS_SERVER_INFO 268
00099 #define G_UTIL_GCAPS_ADDRESSES_GET_REMEMBERED 269
00100 #define G_UTIL_GCAPS_ADDRESSES_SET_REMEMBERED 270
00101
00102 //Convenience constants
00103 #define G_SMALL_BUFFER 1024
00104 #define G_HUGE_BUFFER 524288
00105 #define G_LINE_BUFFER 80
00106
00107 typedef int GReturn;
00108 typedef void* GCon;
00109 typedef unsigned int GSize;
00110 typedef int GOption;
00111 typedef char* GCStringOut;
00112 typedef const char* GCStringIn;
00113 typedef char* GBufOut;
00114 typedef const char* GBufIn;
00115 typedef unsigned char GStatus;
00116 typedef void* GMemory;
00117
00119 GCLIB_DLL_EXPORTED GReturn GCALL GOpen(GCStringIn address, GCon* g);
00164 GCLIB_DLL_EXPORTED GReturn GCALL GClose(GCon g);
00184 GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GRead(GCon g, GBufOut buffer, GSize buffer_len,
GSize* bytes_read);
00204 GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GWrite(GCon g, GBufIn buffer, GSize buffer_len);
00223 GCLIB_DLL_EXPORTED GReturn GCALL GCommand(GCon g, GCStringIn command, GBufOut buffer, GSize
buffer_len, GSize* bytes_returned);
00241 GCLIB_DLL_EXPORTED GReturn GCALL GProgramDownload(GCon g, GCStringIn program, GCStringIn
preprocessor);
00258 GCLIB_DLL_EXPORTED GReturn GCALL GProgramUpload(GCon g, GBufOut buffer, GSize buffer_len);
00272 GCLIB_DLL_EXPORTED GReturn GCALL GArrayDownload(GCon g, const GCStringIn array_name, GOption
first, GOption last, GCStringIn buffer);
00290 GCLIB_DLL_EXPORTED GReturn GCALL GArrayUpload(GCon g, const GCStringIn array_name, GOption first,
GOption last, GOption delim, GBufOut buffer, GSize buffer_len);
00308 GCLIB_DLL_EXPORTED GReturn GCALL GRecord(GCon g, union GDataRecord* record, GOption method);
00337 GCLIB_DLL_EXPORTED GReturn GCALL GMessage(GCon g, GCStringOut buffer, GSize buffer_len);
00372 GCLIB_DLL_EXPORTED GReturn GCALL GInterrupt(GCon g, GStatus* status_byte);
00395 GCLIB_DLL_EXPORTED GReturn GCALL GFirmwareDownload(GCon g, GCStringIn filepath);
00417 GCLIB_DLL_EXPORTED GCLIB_DEPRECATED GReturn GCALL GUtility(GCon g, GOption request, GMemory
memory1, GMemory memory2);
00525 #ifdef G_USE_GCOMPOUND
00527 GCLIB_DLL_EXPORTED GReturn GCALL GCompound(GCon g, GCStringIn buffer);
00572 #endif
00573
00574 #ifdef __cplusplus
00575 } //extern "C"
00576 #endif
00577
00578 #endif //I_D48432D9_1FA3_4C7D_B44C_05F8B9000ADF

```

14.5 gclibo.h File Reference

```
#include "gclib.h"
```

Macros

- #define [GCLIB_DLL_EXPORTED](#)
- #define [GCALL](#) /* nothing */
- #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_DLL_EXPORTED void GCALL [GSleep](#) (unsigned int timeout_ms)
Uses [GUtility\(\)](#) and [G_UTIL_SLEEP](#) to provide a blocking sleep call which can be useful for timing-based chores.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GInfo](#) ([GCon](#) g, [GCStringOut](#) info, [GSize](#) info_len)
Uses [GUtility\(\)](#) and [G_UTIL_INFO](#) to provide a useful connection string.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GTimeout](#) ([GCon](#) g, short timeout_ms)
Uses [GUtility\(\)](#) and [G_UTIL_TIMEOUT_OVERRIDE](#) to set the library timeout.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GCmd](#) ([GCon](#) g, [GCStringIn](#) command)
Wrapper around [GCommand](#) for use when the return value is not desired.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GCmdT](#) ([GCon](#) g, [GCStringIn](#) command, [GCStringOut](#) trimmed_response, [GSize](#) response_len, [GCStringOut](#) *front)
Wrapper around [GCommand](#) that trims the response.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GCmdI](#) ([GCon](#) g, [GCStringIn](#) command, int *value)
Wrapper around [GCommand](#) that provides the return value of a command parsed into an int.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GCmdD](#) ([GCon](#) g, [GCStringIn](#) command, double *value)
Wrapper around [GCommand](#) that provides the return value of a command parsed into a double.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GWaitForBool](#) ([GCon](#) g, [GCStringIn](#) predicate, int trials)
Blocking call that returns when the controller evaluates the predicate as true.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GMotionComplete](#) ([GCon](#) g, [GCStringIn](#) axes)
Blocking call that returns once all axes specified have completed their motion.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GRecordRate](#) ([GCon](#) g, double period_ms)
*Sets the asynchronous data record to a user-specified period via *DR*.*
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GCStringIn](#) preprocessor)
Program download from file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GProgramUploadFile](#) ([GCon](#) g, [GCStringIn](#) file_path)
Program upload to file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GArrayDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path)
Array download from file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GArrayUploadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GCStringIn](#) names)
Array upload to file.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GSetServer](#) ([GCStringIn](#) server_name)
Uses [GUtility\(\)](#), [G_UTIL_GCAPS_SET_SERVER](#) to set the new active server.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [GPublishServer](#) ([GCStringIn](#) name, [GOption](#) publish, [GOption](#) save)
Uses [GUtility\(\)](#), [G_UTIL_GCAPS_PUBLISH_SERVER](#) to publish local gcaps server to the local network.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED [GReturn](#) GCALL [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_DLL_EXPORTED void GCALL [GError](#) ([GReturn](#) rc, [GCStringOut](#) error, [GSize](#) error_len)
Provides a human-readable description string for return codes.
- GCLIB_DLL_EXPORTED [GReturn](#) GCALL [GSetupDownloadFile](#) ([GCon](#) g, [GCStringIn](#) file_path, [GOption](#) options, [GCStringOut](#) info, [GSize](#) info_len)
Download a saved controller configuration from a file.

14.5.1 Detailed Description

Open-source convenience functions for Galil C Lib. Please email softwarefeedback@galil.com with suggestions for useful/missing functions.
Definition in file [gclibo.h](#).

14.5.2 Macro Definition Documentation

14.5.2.1 GCLIB_DLL_EXPORTED

```
#define GCLIB_DLL_EXPORTED
```

Definition at line 17 of file [gclibo.h](#).

14.5.2.2 GCALL

```
#define GCALL /* nothing */
```

Definition at line 25 of file [gclibo.h](#).

14.5.2.3 MALLOCBUF

```
#define MALLOCBUF G_HUGE_BUFFER
```

Malloc used for large program and array uploads.
Definition at line 32 of file [gclibo.h](#).

14.5.2.4 MAXPROG

```
#define MAXPROG MALLOCBUF
```

Maximum size for a program.
Definition at line 33 of file [gclibo.h](#).

14.5.2.5 MAXARRAY

```
#define MAXARRAY MALLOCBUF
```

Maximum size for an array table upload.
Definition at line 34 of file [gclibo.h](#).

14.5.2.6 POLLINGINTERVAL

```
#define POLLINGINTERVAL 100
```

Interval, in milliseconds, for polling commands, e.g. [GWaitForBool\(\)](#).
Definition at line 35 of file [gclibo.h](#).

14.5.2.7 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 36 of file [gclibo.h](#).

14.6 gclibo.h

[Go to the documentation of this file.](#)

```
00001
00006 #ifndef I_007AD0AF_C956_4B96_ADE2_AD04FAFFEE99
00007 #define I_007AD0AF_C956_4B96_ADE2_AD04FAFFEE99
00008
00009 //set library visibility for gcc and msvc
00010 #if BUILDING_GCLIB && HAVE_VISIBILITY
00011 #define GCLIB_DLL_EXPORTED __attribute__((__visibility__("default")))
00012 #elif BUILDING_GCLIB && defined _MSC_VER
00013 #define GCLIB_DLL_EXPORTED __declspec(dllexport)
00014 #elif defined _MSC_VER
00015 #define GCLIB_DLL_EXPORTED __declspec(dllimport)
00016 #else
00017 #define GCLIB_DLL_EXPORTED
00018 #endif
00019
00020 #include "gclib.h" //Galil's C Library
00021
00022 #ifdef _WIN32
00023 #define GCALL __stdcall
00024 #else
00025 #define GCALL /* nothing */
00026 #endif
00027
00028 #ifdef __cplusplus
00029 extern "C" {
00030 #endif
00031
00032 #define MALLOCBUF G_HUGE_BUFFER
00033 #define MAXPROG MALLOCBUF
00034 #define MAXARRAY MALLOCBUF
00035 #define POLLINGINTERVAL 100
00036 #define G_USE_GCAPS
00037
00039 GCLIB_DLL_EXPORTED void GCALL GSleep(unsigned int timeout_ms);
00049 GCLIB_DLL_EXPORTED GReturn GCALL GVersion(GCStringOut ver, GSize ver_len);
00074 GCLIB_DLL_EXPORTED GReturn GCALL GAddresses(GCStringOut addresses, GSize addresses_len);
00107 GCLIB_DLL_EXPORTED GReturn GCALL GInfo(GCon g, GCStringOut info, GSize info_len);
00125 GCLIB_DLL_EXPORTED GReturn GCALL GTimeout(GCon g, short timeout_ms);
00138 GCLIB_DLL_EXPORTED GReturn GCALL GCmd(GCon g, GCStringIn command);
00153 GCLIB_DLL_EXPORTED GReturn GCALL GCmdT(GCon g, GCStringIn command, GCStringOut trimmed_response,
GSize response_len, GCStringOut* front);
00172 GCLIB_DLL_EXPORTED GReturn GCALL GCmdI(GCon g, GCStringIn command, int* value);
00188 GCLIB_DLL_EXPORTED GReturn GCALL GCmdD(GCon g, GCStringIn command, double* value);
00204 GCLIB_DLL_EXPORTED GReturn GCALL GWaitForBool(GCon g, GCStringIn predicate, int trials);
00227 GCLIB_DLL_EXPORTED GReturn GCALL GMotionComplete(GCon g, GCStringIn axes);
00245 GCLIB_DLL_EXPORTED GReturn GCALL GRecordRate(GCon g, double period_ms);
00260 GCLIB_DLL_EXPORTED GReturn GCALL GProgramDownloadFile(GCon g, GCStringIn file_path, GCStringIn
preprocessor);
00274 GCLIB_DLL_EXPORTED GReturn GCALL GProgramUploadFile(GCon g, GCStringIn file_path);
00287 GCLIB_DLL_EXPORTED GReturn GCALL GArrayDownloadFile(GCon g, GCStringIn file_path);
00302 GCLIB_DLL_EXPORTED GReturn GCALL GArrayUploadFile(GCon g, GCStringIn file_path, GCStringIn names);
00318 GCLIB_DLL_EXPORTED GReturn GCALL GIpRequests(GCStringOut requests, GSize requests_len);
00347 GCLIB_DLL_EXPORTED GReturn GCALL GSetServer(GCStringIn server_name);
00366 GCLIB_DLL_EXPORTED GReturn GCALL GListServers(GCStringOut servers, GSize servers_len);
00386 GCLIB_DLL_EXPORTED GReturn GCALL GPublishServer(GCStringIn name, GOption publish, GOption save);
00413 GCLIB_DLL_EXPORTED GReturn GCALL GServerStatus(GCStringOut status, GSize status_len);
00437 GCLIB_DLL_EXPORTED GReturn GCALL GRemoteConnections(GCStringOut connections, GSize
connections_length);
00460 GCLIB_DLL_EXPORTED GReturn GCALL GAssign(GCStringIn ip, GCStringIn mac);
00486 GCLIB_DLL_EXPORTED void GCALL GError(GReturn rc, GCStringOut error, GSize error_len);
00496 #ifndef G_OMIT_GSETUPDOWNLOADFILE
00498 GCLIB_DLL_EXPORTED GReturn GCALL GSetupDownloadFile(GCon g, GCStringIn file_path, GOption options,
GCStringOut info, GSize info_len);
00557 #endif //G_OMIT_GSETUPDOWNLOADFILE
00558
00559 #ifdef GCLIB_LOGGING
00560 void LogMsg(const char* msg);
00561 #endif
00562
00563 #ifdef __cplusplus
00564 } //extern "C"
00565 #endif
```

```
00566
00567 #endif //I_007AD0AF_C956_4B96_ADE2_AD04FAFFEE99
```

14.7 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

14.7.1 Typedef Documentation

14.7.1.1 UB

```
using UB = System.Byte
```

Definition at line 34 of file [gclib.cs](#).

14.7.1.2 UW

using UW = System.UInt16
Definition at line 35 of file [gclib.cs](#).

14.7.1.3 SW

using SW = System.Int16
Definition at line 36 of file [gclib.cs](#).

14.7.1.4 SL

using SL = System.Int32
Definition at line 37 of file [gclib.cs](#).

14.7.1.5 UL

using UL = System.UInt32
Definition at line 38 of file [gclib.cs](#).

14.7.1.6 GReturn

using GReturn = System.Int32
Definition at line 40 of file [gclib.cs](#).

14.7.1.7 GCon

using GCon = System.IntPtr
Definition at line 41 of file [gclib.cs](#).

14.7.1.8 GSize

using GSize = System.UInt32
Definition at line 42 of file [gclib.cs](#).

14.7.1.9 GOption

using GOption = System.Int32
Definition at line 43 of file [gclib.cs](#).

14.7.1.10 GCStringOut

using GCStringOut = System.Text.StringBuilder
Definition at line 44 of file [gclib.cs](#).

14.7.1.11 GCStringIn

using GCStringIn = System.String
Definition at line 45 of file [gclib.cs](#).

14.7.1.12 GBufOut

using GBufOut = System.Text.StringBuilder
Definition at line 46 of file [gclib.cs](#).

14.7.1.13 GBufIn

using GBufIn = System.String
Definition at line 47 of file [gclib.cs](#).

14.7.1.14 GStatus

using `GStatus` = System.Byte
 Definition at line 48 of file `gclib.cs`.

14.8 gclib.cs

[Go to the documentation of this file.](#)

```

00001
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     public string[] GAddresses()
00071     {
00072         GReturn rc = DllGAddresses(Buffer_, BufferSize_);
00073         if (rc == G_NO_ERROR)
00074         {
00075             char[] delimiters = new char[] { '\r', '\n' };
00076             return Buffer_.ToString().Split(delimiters, System.StringSplitOptions.RemoveEmptyEntries);
00077         }
00078         else
00079             return new string[0];
00080     }
00081
00082     public void GArrayDownload(string array_name, ref List<double> data, Int16 first = -1, Int16 last
    = -1)
00083     {
00084         System.Text.StringBuilder ArrayData = new System.Text.StringBuilder(BufferSize_); //for
    converting to ASCII
00085         int len = data.Count();
00086         for (int i = 0; i <= len - 1; i++)
00087         {
00088             ArrayData.Append(data[i].ToString("F4")); //format to fixed point
00089             if (i < len - 1)
00090             {
00091                 ArrayData.Append(","); //delimiter
00092             }
00093         }
00094         GReturn rc = DllGArrayDownload(ConnectionHandle_, array_name, first, last,
    ArrayData.ToString());
00095         if (!rc == G_NO_ERROR)
00096         {
00097             throw new System.Exception(GError(rc));
00098         }
00099     }
00100 }
00101
00102

```

```

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
00389
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("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
"GAddresses", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00788     private static extern GReturn DllGAddresses(GCStringOut addresses, GSize addresses_len);
00789
00790     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", 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("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
"GArrayDownloadFile", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00794     private static extern GReturn DllGArrayDownloadFile(GCon g, GCStringIn path);
00795
00796     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", 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("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
"GArrayUploadFile", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00800     private static extern GReturn DllGArrayUploadFile(GCon g, GCStringIn path, GCStringIn names);
00801
00802     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint = "GAssign",
CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00803     private static extern GReturn DllGAssign(GCStringIn ip, GCStringIn mac);
00804
00805     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GClose",
CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00806     private static extern GReturn DllGClose(GCon g);
00807
00808     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", 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("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", 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("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint =
"GFirmwareDownload", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00815     private static extern GReturn DllGFirmwareDownload(GCon g, GCStringIn path);
00816
00817     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint = "GInfo",
CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00818     private static extern GReturn DllGInfo(GCon g, GCStringOut info, GSize infoLength);
00819
00820     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint =
"GInterrupt", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00821     private static extern GReturn DllGInterrupt(GCon g, ref GStatus status_byte);
00822
00823     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
"GIpRequests", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]

```

```

00824     private static extern GReturn DllGIpRequests(GCStringOut requests, GSize requests_len);
00825
00826     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GMessage",
00827 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00828     private static extern GReturn DllGMessage(GCon g, GCStringOut buffer, GSize bufferLength);
00829
00829     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00830 "GMotionComplete", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00831     private static extern GReturn DllGMotionComplete(GCon g, GCStringIn axes);
00832
00832     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GOpen",
00833 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00834     private static extern GReturn DllGOpen(GCStringIn address, ref GCon g);
00835
00835     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint =
00836 "GProgramDownload", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00837     private static extern GReturn DllGProgramDownload(GCon g, GCStringIn program, GCStringIn
00838 preprocessor);
00839
00839     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00840 "GProgramDownloadFile", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00841     private static extern GReturn DllGProgramDownloadFile(GCon g, GCStringIn path, GCStringIn
00842 preprocessor);
00843
00843     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint =
00844 "GProgramUpload", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00845     private static extern GReturn DllGProgramUpload(GCon g, GCStringOut buffer, GSize bufferLength);
00846
00846     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00847 "GProgramUploadFile", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00848     private static extern GReturn DllGProgramUploadFile(GCon g, GCStringIn path);
00849
00849     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GRead",
00850 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00851     private static extern GReturn DllGRead(GCon g, byte[] record, GSize buffer_len, ref GSize
00852 bytes_read);
00853
00853     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GRecord",
00854 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00855     private static extern GReturn DllGRecord(GCon g, byte[] record, GOption method);
00856
00856     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00857 "GRecordRate", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00858     private static extern GReturn DllGRecordRate(GCon g, double period_ms);
00859
00859     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint = "GTimeout",
00860 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00861     private static extern void DllGTimeout(GCon g, GOption timeoutMs);
00862
00862     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint = "GVersion",
00863 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00864     private static extern GReturn DllGVersion(GCStringOut ver, GSize ver_len);
00865
00865     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclib.dll", EntryPoint = "GWrite",
00866 CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00867     private static extern GReturn DllGWrite(GCon g, GCStringIn buffer, GSize buffer_len);
00868
00868     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00869 "GSetupDownloadFile", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00870     private static extern GReturn DllGSetupDownloadFile(GCon g, GCStringIn file_path, GOption options,
00871 GCStringOut info, GSize info_len);
00872
00872     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00873 "GSetServer", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00874     private static extern GReturn DllGSetServer(GCStringIn server_name);
00875
00875     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00876 "GServerStatus", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00877     private static extern GReturn DllGServerStatus(GCStringOut status, GSize status_len);
00878
00878     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00879 "GListServers", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00880     private static extern GReturn DllGListServers(GCStringOut servers, GSize servers_len);
00881
00881     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00882 "GPublishServer", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00883     private static extern GReturn DllGPublishServer(GCStringIn name, GOption publish, GOption save);
00884
00884     [DllImport("C:\\Program Files (x86)\\Galil\\gclib\\dll\\x86\\gclibo.dll", EntryPoint =
00885 "GRemoteConnections", CharSet = CharSet.Ansi, CallingConvention = CallingConvention.StdCall)]
00886     private static extern GReturn DllGRemoteConnections(GCStringOut connections, GSize
00887 connections_len);
00888
00888     #endregion
00889
00889     #region "Data Record"
00890

```



```

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
00925     [StructLayout(LayoutKind.Sequential, Pack=1)]
00926     public struct GDataRecord4000 : GDataRecord
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;
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;
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;
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
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;
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;

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```

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;
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;

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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;
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;

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```

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;
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;

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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;

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```

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

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```

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
01929         /*Offset    type name        description*/
01930
01931         /*00*/      public UB    header_0;
01932         /*01*/      public UB    header_1;
01933         /*02*/      public UB    header_2;
01934         /*03*/      public UB    header_3;
01935
01936         /*04-05*/   public UW    sample_number;
01937         /*06*/      public UB    error_code;
01938         /*07*/      public UB    general_status;
01939
01940         /*08-09*/   public UW    output_analog_0;
01941         /*10-11*/   public UW    output_analog_1;
01942         /*12-13*/   public UW    output_analog_2;
01943         /*14-15*/   public UW    output_analog_3;
01944         /*16-17*/   public UW    output_analog_4;
01945         /*18-19*/   public UW    output_analog_5;
01946         /*20-21*/   public UW    output_analog_6;
01947         /*22-23*/   public UW    output_analog_7;
01948
01949         /*24-25*/   public UW    input_analog_0;
01950         /*26-27*/   public UW    input_analog_1;
01951         /*28-29*/   public UW    input_analog_2;
01952         /*30-31*/   public UW    input_analog_3;
01953         /*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  }

```

14.9 GclibJava.java File Reference

```
import java.nio.charset.Charset;
```

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.

14.9.1 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](#).

14.10 GclibJava.java

[Go to the documentation of this file.](#)

```

00001
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
00079             Warning: gclibo library calls gclib. Therefore, calls to Gclib and
00080             Gclibo interfaces should not be concurrent.
00081             */
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,
00087                 int len);
00088             int GCommand(Pointer g, String command, byte[] response, int len, IntByReference
00089                 bytesReturned);
00089             int GClose(Pointer g);
00090             int GFirmwareDownload(Pointer g, String filePath);
00091             int GInterrupt(Pointer g, ByteByReference statusByte);
00092             int GMessage(Pointer g, byte[] response, int len);
00093             int GOpen(String address, PointerByReference g);
00094             int GProgramDownload(Pointer g, String program, String preprocessor);
00095             int GProgramUpload(Pointer g, byte[] response, int len);
00096         }
00097
00098         // -----
00099         // gclib functions
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
00133         GclibJavaException
00134         {
00135             String buf = new String();
00136             buf = data.stream().map((d) -> d.toString() + ",").reduce(buf, String::concat);
00137
00138             ec(Gclib.SYNC_INSTANCE.GArrayDownload(gclibHandle, arrayName, first, last,
00139                 buf.substring(0, buf.length() - 1))); //remove trailing comma
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         }
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,
trafficBuffer.length));
00185         String[] elements = cstringToString(trafficBuffer).split(", ");
00186         List<Double> doubleList = new ArrayList();
00187         for (String s : elements)
00188         {
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,
ptrInt));
00224         String response = cstringToString(trafficBuffer);
00225
00226         int index = response.lastIndexOf("\r\n:");
00227         if (index > 0)
00228             response = response.substring(0, index); //trim trailing crlf:
00229
00230         return response;
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             GClose();
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         Limit calls to one at a time
00364         Warning: gclibo library calls gclib. Therefore, calls to Gclib and
00365         Gclibo interfaces should not be concurrent.
00366         */
00367         Gclibo SYNC_INSTANCE = (Gclibo)
00368             Native.synchronizedLibrary(INSTANCE);
00369
00370         int GAddresses(byte[] response, int len);
00371         int GArrayDownloadFile(Pointer g, String filePath);
00372         int GArrayUploadFile(Pointer g, String filePath, String names);
00373         int GAssign(String ip, String mac);
00374         void GError(int rc, byte[] response, int len);
00375         int GInfo(Pointer g, byte[] response, int len);
00376         int GIpRequests(byte[] response, int len);
00377         int GProgramDownloadFile(Pointer g, String filePath, String preprocessor);
00378         int GProgramUploadFile(Pointer g, String filePath);
00379         void GSleep(int timeout_ms);
00380         int GTimeout(Pointer g, short timeout_ms);
00381         int GVersion(byte[] response, int len);
00382         int GSetServer(String server_name);
00383         int GServerStatus(byte[] response, int len);
00384         int GListServers(byte[] response, int len);
00385         int GPublishServer(String server_name, int publish, int save);
00386         int GRemoteConnections(byte[] response, int len);
00387     }
00388
00389     // -----
00390     // gclibo functions
00391     // -----
00392
00409     public String GAddresses() throws GclibJavaException
00410     {
00411         ec(Gclibo.SYNC_INSTANCE.GAddresses(trafficBuffer, trafficBuffer.length));
00412         return cstringToString(trafficBuffer);
00413     }
00414
00423     public void GArrayDownloadFile(String filePath) throws GclibJavaException
00424     {
00425         ec(Gclibo.SYNC_INSTANCE.GArrayDownloadFile(gclibHandle, filePath));
00426     }
00427
00441     public void GArrayUploadFile(String filePath, String names) throws GclibJavaException
00442     {
00443         ec(Gclibo.SYNC_INSTANCE.GArrayUploadFile(gclibHandle, filePath, names));
00444     }
00445
00454     public void GArrayUploadFile(String filePath) throws GclibJavaException
00455     {
00456         GArrayUploadFile(filePath, "");
00457     }
00458
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     }

```

14.11 GclibJavaException.java File Reference

Classes

- class [gclibjava.GclibJavaException](#)

14.12 GclibJavaException.java

[Go to the documentation of this file.](#)

```

00001
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 }

```

14.13 gclib.py

```

00001 ''' @defgroup python Python
00002 @defgroup py_connection Connection
00003 @ingroup python
00004 Discover available controllers and open connections
00005 @defgroup py_controller Controller
00006 @ingroup python
00007 Manage a Galil controller
00008 @defgroup py_memory Memory
00009 @ingroup py_controller
00010 Manage controller memory, such as program and arrays
00011 @defgroup py_unsolicited Unsolicited Data
00012 @ingroup py_controller
00013 Receive messages and interrupts
00014 @defgroup py_remote Galil Connect
00015 @ingroup python
00016 Host or connect to a remote gcaps instance
00017 '''
00018
00019
00023 import platform #for distinguishing 'Windows', 'Linux', 'Darwin'
00024 from ctypes import *
00025 import os
00026
00027 if platform.system() == 'Windows':
00028     if '64 bit' in platform.python_compiler():
00029         WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/libcrypto-1_1-x64.dll')
00030         WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/libssl-1_1-x64.dll')
00031         _gclib = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/gclib.dll')
00032         _gclibo = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x64/gclibo.dll')
00033     else:
00034         WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x86/libcrypto-1_1.dll')
00035         WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x86/libssl-1_1.dll')
00036         _gclib = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x86/gclib.dll')
00037         _gclibo = WinDLL(os.environ["GCLIB_ROOT"] + '/dll/x86/gclibo.dll')
00038     #Reassign symbol name, Python doesn't like @ in function names
00039     #gclib calls
00040     setattr(_gclib, 'GArrayDownload', getattr(_gclib, '_GArrayDownload@20'))
00041     setattr(_gclib, 'GArrayUpload', getattr(_gclib, '_GArrayUpload@28'))
00042     setattr(_gclib, 'GClose', getattr(_gclib, '_GClose@4'))
00043     setattr(_gclib, 'GCommand', getattr(_gclib, '_GCommand@20'))
00044     setattr(_gclib, 'GFirmwareDownload', getattr(_gclib, '_GFirmwareDownload@8'))
00045     setattr(_gclib, 'GInterrupt', getattr(_gclib, '_GInterrupt@8'))
00046     setattr(_gclib, 'GMessage', getattr(_gclib, '_GMessage@12'))
00047     setattr(_gclib, 'GOpen', getattr(_gclib, '_GOpen@8'))
00048     setattr(_gclib, 'GProgramDownload', getattr(_gclib, '_GProgramDownload@12'))
00049     setattr(_gclib, 'GProgramUpload', getattr(_gclib, '_GProgramUpload@12'))
00050     #gclibo calls (open source component/convenience functions)
00051     setattr(_gclibo, 'GAddresses', getattr(_gclibo, '_GAddresses@8'))
00052     setattr(_gclibo, 'GArrayDownloadFile', getattr(_gclibo, '_GArrayDownloadFile@8'))
00053     setattr(_gclibo, 'GArrayUploadFile', getattr(_gclibo, '_GArrayUploadFile@12'))
00054     setattr(_gclibo, 'GAssign', getattr(_gclibo, '_GAssign@8'))
00055     setattr(_gclibo, 'GError', getattr(_gclibo, '_GError@12'))
00056     setattr(_gclibo, 'GInfo', getattr(_gclibo, '_GInfo@12'))
00057     setattr(_gclibo, 'GIpRequests', getattr(_gclibo, '_GIpRequests@8'))
00058     setattr(_gclibo, 'GMotionComplete', getattr(_gclibo, '_GMotionComplete@8'))
00059     setattr(_gclibo, 'GProgramDownloadFile', getattr(_gclibo, '_GProgramDownloadFile@12'))
00060     setattr(_gclibo, 'GSleep', getattr(_gclibo, '_GSleep@4'))
00061     setattr(_gclibo, 'GProgramUploadFile', getattr(_gclibo, '_GProgramUploadFile@8'))
00062     setattr(_gclibo, 'GTimeout', getattr(_gclibo, '_GTimeout@8'))
00063     setattr(_gclibo, 'GVersion', getattr(_gclibo, '_GVersion@8'))
00064     setattr(_gclibo, 'GSetupDownloadFile', getattr(_gclibo, '_GSetupDownloadFile@20'))
00065     setattr(_gclibo, 'GServerStatus', getattr(_gclibo, '_GServerStatus@8'))
00066     setattr(_gclibo, 'GSetServer', getattr(_gclibo, '_GSetServer@4'))
00067     setattr(_gclibo, 'GListServers', getattr(_gclibo, '_GListServers@8'))
00068     setattr(_gclibo, 'GPublishServer', getattr(_gclibo, '_GPublishServer@12'))
00069     setattr(_gclibo, 'GRemoteConnections', getattr(_gclibo, '_GRemoteConnections@8'))
00070
00071 elif platform.system() == 'Linux':
00072     cdll.LoadLibrary("libgclib.so.2")
00073     _gclib = CDLL("libgclib.so.2")

```

```

00074     cdll.LoadLibrary("libgclibo.so.2")
00075     _gclibo = CDLL("libgclibo.so.2")
00076
00077 elif platform.system() == 'Darwin': #OSX
00078     _gclib_path = '/Applications/gclib/dylib/gclib.0.dylib'
00079     _gclibo_path = '/Applications/gclib/dylib/gclibo.0.dylib'
00080     cdll.LoadLibrary(_gclib_path)
00081     _gclib = CDLL(_gclib_path)
00082     cdll.LoadLibrary(_gclibo_path)
00083     _gclibo = CDLL(_gclibo_path)
00084
00085
00086
00087 # Python "typedefs"
00088 _GReturn = c_int #type for a return code
00089 _GCon = c_void_p #type for a Galil connection handle
00090 _GCon_ptr = POINTER(_GCon) #used for argtypes declaration
00091 _GSize = c_ulong #type for a Galil size variable
00092 _GSize_ptr = POINTER(_GSize) #used for argtypes declaration
00093 _GCStringIn = c_char_p #char*. In C it's const.
00094 _GCStringOut = c_char_p #char*
00095 _GOption = c_int #type for option variables, e.g.     GArrayDownload
00096 _GStatus = c_ubyte #type for interrupt status bytes
00097 _GStatus_ptr = POINTER(_GStatus) #used for argtypes declaration
00098
00099 #Define arguments and result type (if not C int type)
00100 #gclib calls
00101 _gclib.GArrayDownload.argtypes = [_GCon, _GCStringIn, _GOption, _GOption, _GCStringIn]
00102 _gclib.GArrayUpload.argtypes = [_GCon, _GCStringIn, _GOption, _GOption, _GOption, _GCStringOut,
00103     _GSize]
00103 _gclib.GClose.argtypes = [_GCon]
00104 _gclib.GCommand.argtypes = [_GCon, _GCStringIn, _GCStringOut, _GSize, _GSize_ptr]
00105 _gclib.GFirmwareDownload.argtypes = [_GCon, _GCStringIn]
00106 _gclib.GInterrupt.argtypes = [_GCon, _GStatus_ptr]
00107 _gclib.GMessage.argtypes = [_GCon, _GCStringOut, _GSize]
00108 _gclib.GOpen.argtypes = [_GCStringIn, _GCon_ptr]
00109 _gclib.GProgramDownload.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00110 _gclib.GProgramUpload.argtypes = [_GCon, _GCStringOut, _GSize]
00111 #gclibo calls (open source component/convenience functions)
00112 _gclibo.GAddresses.argtypes = [_GCStringOut, _GSize]
00113 _gclibo.GArrayDownloadFile.argtypes = [_GCon, _GCStringIn]
00114 _gclibo.GArrayUploadFile.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00115 _gclibo.GAssign.argtypes = [_GCStringIn, _GCStringIn]
00116 _gclibo.GError.argtypes = [_GReturn, _GCStringOut, _GSize]
00117 _gclibo.GError.restype = None
00118 _gclibo.GError.argtypes = [_GCon, _GCStringOut, _GSize]
00119 _gclibo.GIpRequests.argtypes = [_GCStringOut, _GSize]
00120 _gclibo.GMotionComplete.argtypes = [_GCon, _GCStringIn]
00121 _gclibo.GProgramDownloadFile.argtypes = [_GCon, _GCStringIn, _GCStringIn]
00122 _gclibo.GSleep.argtypes = [c_uint]
00123 _gclibo.GSleep.restype = None
00124 _gclibo.GProgramUploadFile.argtypes = [_GCon, _GCStringIn]
00125 _gclibo.GTimeout.argtypes = [_GCon, c_int]
00126 _gclibo.GVersion.argtypes = [_GCStringOut, _GSize]
00127 _gclibo.GServerStatus.argtypes = [_GCStringOut, _GSize]
00128 _gclibo.GSetServer.argtypes = [_GCStringIn]
00129 _gclibo.GListServers.argtypes = [_GCStringOut, _GSize]
00130 _gclibo.GPublishServer.argtypes = [_GCStringIn, _GOption, _GOption]
00131 _gclibo.GRemoteConnections.argtypes = [_GCStringOut, _GSize]
00132 _gclibo.GSetupDownloadFile.argtypes = [_GCon, _GCStringIn, _GOption, _GCStringOut, _GSize]
00133
00134 #Set up some constants
00135 _enc = "ASCII" #byte encoding for going between python strings and c strings.
00136 _buf_size = 500000 #size of response buffer. Big enough to fit entire 4000 program via UL/LS, or 24000
00137     elements of array data.
00137 _error_buf = create_string_buffer(128) #buffer for retrieving error code descriptions.
00138
00139 def _rc(return_code):
00140     """Checks return codes from gclib and raises a python error if result is exceptional."""
00141     if return_code != 0:
00142         _gclibo.GError(return_code, _error_buf, 128) #Get the library's error description
00143         raise GclibError(str(_error_buf.value.decode(_enc)))
00144     return
00145
00146 class GclibError(Exception):
00147     """@ingroup python
00148     Error class for non-zero gclib return codes.
00149     """
00150     pass
00151
00152 class py:
00153     """
00154     Represents a single Python connection to a Galil Controller or PLC.
00155     """
00156
00157     def __init__(self):
00158         """Constructor for the Connection class. Initializes gclib's handle and read buffer."""

```

```

00159         self._gcon = _GCon(0) #handle to connection
00160         self._buf = create_string_buffer(_buf_size)
00161         self._timeout = 5000
00162         return
00163
00164     def __del__(self):
00165         """Destructor for the Connection class. Ensures close gets called to release Galil resource
00166         (Sockets, Kernel Driver, Com Port, etc)."""
00167         self.GClose()
00168         return
00169
00169     def _cc(self):
00170         """Checks if connection is established, throws error if not."""
00171         if self._gcon.value == None:
00172             _rc(-1201) #G_CONNECTION_NOT_ESTABLISHED
00173
00174     def GOpen(self, address):
00175         """@ingroup py_connection
00176         Opens a connection a galil controller.
00177         See the gclib docs for address string formatting.
00178         """
00179         c_address = _GCStringIn(address.encode(_enc))
00180         _rc(_gclib.GOpen(c_address, byref(self._gcon)))
00181         return
00182
00183     def GClose(self):
00184         """@ingroup py_connection
00185         Closes a connection to a Galil Controller.
00186         """
00187         if self._gcon.value != None:
00188             _rc(_gclib.GClose(self._gcon))
00189             self._gcon = _GCon(0)
00190         return
00191
00192     def GCommand(self, command):
00193         """@ingroup py_controller
00194         Performs a command-and-response transaction on the connection.
00195         Trims the response.
00196         """
00197         self._cc()
00198         c_command = _GCStringIn(command.encode(_enc))
00199         _rc(_gclib.GCommand(self._gcon, c_command, self._buf, _buf_size, None))
00200         response = str(self._buf.value.decode(_enc))
00201         return response[:-3].strip() # trim trailing /r/n: and leading space
00202
00203     def GSleep(self, val):
00204         """@ingroup python
00205         Provides a blocking sleep call which can be useful for timing-based chores.
00206         """
00207         _gclibo.GSleep(val)
00208         return
00209
00210     def GVersion(self):
00211         """@ingroup python
00212         Provides the gclib version number. Please include the output of this function on all support
00213         cases.
00214         """
00215         _rc(_gclibo.GVersion(self._buf, _buf_size))
00216         return "py." + str(self._buf.value.decode(_enc))
00217
00218     def GServerStatus(self):
00219         """@ingroup py_remote
00220         Provides the local server name and whether it is published to the local network.
00221         """
00222         _rc(_gclibo.GServerStatus(self._buf, _buf_size))
00223         return str(self._buf.value.decode(_enc))
00224
00225     def GSetServer(self, server_name):
00226         """@ingroup py_remote
00227         Set the new active server.
00228         """
00229         c_server_name = _GCStringIn(server_name.encode(_enc))
00230         _rc(_gclibo.GSetServer(c_server_name))
00231         return
00232
00233     def GListServers(self):
00234         """@ingroup py_remote
00235         Provide a list of all available gcaps servers on the local network.
00236         """
00237         _rc(_gclibo.GListServers(self._buf, _buf_size))
00238         return str(self._buf.value.decode(_enc))
00239
00240     def GPublishServer(self, server_name, publish, save):

```

```

00244         """@ingroup py_remote
00245         Publish local gcaps server to the network.
00246         """
00247         c_server_name = _GCStringIn(server_name.encode(_enc))
00248         _rc(_gclibo.GPublishServer(c_server_name, publish, save))
00249         return
00250
00251     def GRemoteConnections(self):
00252         """@ingroup py_remote
00253         Shows all remote addresses that are connected to the local server.
00254         """
00255         _rc(_gclibo.GRemoteConnections(self._buf, _buf_size))
00256         return str(self._buf.value.decode(_enc))
00257
00258     def GInfo(self):
00259         """@ingroup py_connection
00260         Provides a useful connection string. Please include the output of this function on all support
00261         cases.
00262         """
00263         _rc(_gclibo.GInfo(self._gcon, self._buf, _buf_size))
00264         return str(self._buf.value.decode(_enc))
00265
00266     def GIpRequests(self):
00267         """@ingroup py_connection
00268         Provides a dictionary of all Galil controllers requesting IP addresses via BOOT-P or DHCP.
00269
00270         Returns a dictionary mapping 'model-serial' --> 'mac address'
00271         e.g. {'DMC4000-783': '00:50:4c:20:03:0f', 'DMC4103-9998': '00:50:4c:38:27:0e'}
00272
00273         Linux/OS X users must be root to use GIpRequests() and have UDP access to bind and listen on
00274         port 67.
00275         """
00276         _rc(_gclibo.GIpRequests(self._buf, _buf_size)) #get the c string from gclib
00277         ip_req_dict = {}
00278         for line in str(self._buf.value.decode(_enc)).splitlines():
00279             line = line.replace(' ', "") #trim spaces throughout
00280             if (line == ""): continue
00281             fields = line.split(',')
00282             #fields go [model, serial number, mac]
00283             ip_req_dict[fields[0] + '-' + fields[1]] = fields[2] # e.g. DMC4000-783 maps to its MAC
00284         return ip_req_dict
00285
00286     def GAssign(self, ip, mac):
00287         """@ingroup py_connection
00288         Assigns IP address over the Ethernet to a controller at a given MAC address.
00289         Linux/OS X users must be root to use GAssign() and have UDP access to send on port 68.
00290         """
00291         c_ip = _GCStringIn(ip.encode(_enc))
00292         c_mac = _GCStringIn(mac.encode(_enc))
00293         _rc(_gclibo.GAssign(c_ip, c_mac))
00294         return
00295
00296     def GAddresses(self):
00297         """@ingroup py_connection
00298         Provides a dictionary of all available connection addresses.
00299
00300         Returns a dictionary mapping 'address' -> 'revision reports', where possible
00301         e.g. {}
00302         """
00303         _rc(_gclibo.GAddresses(self._buf, _buf_size))
00304         addr_dict = {}
00305         for line in str(self._buf.value.decode(_enc)).splitlines():
00306             fields = line.split(',')
00307             if len(fields) >= 2:
00308                 addr_dict[fields[0]] = fields[1]
00309             else:
00310                 addr_dict[fields[0]] = ""
00311         return addr_dict
00312
00313     def GProgramDownload(self, program, preprocessor=""):
00314         """@ingroup py_memory
00315         Downloads a program to the controller's program buffer.
00316         See the gclib docs for preprocessor options.
00317         """
00318         self._cc()
00319         c_prog = _GCStringIn(program.encode(_enc))
00320         c_pre = _GCStringIn(preprocessor.encode(_enc))
00321         _rc(_gclibo.GProgramDownload(self._gcon, c_prog, c_pre))
00322         return
00323
00324
00325
00326
00327

```

```

00328     def GProgramUpload(self):
00329         """@ingroup py_memory
00330         Uploads a program from the controller's program buffer.
00331         """
00332         self._cc()
00333         _rc(_gclib.GProgramUpload(self._gcon, self._buf, _buf_size))
00334         return str(self._buf.value.decode(_enc))
00335
00336     def GProgramDownloadFile(self, file_path, preprocessor=""):
00337         """@ingroup py_memory
00338         Program download from file.
00339         See the gclib docs for preprocessor options.
00340         """
00341         self._cc()
00342         c_path = _GCStringIn(file_path.encode(_enc))
00343         c_pre = _GCStringIn(preprocessor.encode(_enc))
00344         _rc(_gclib.GProgramDownloadFile(self._gcon, c_path, c_pre))
00345         return
00346
00347     def GProgramUploadFile(self, file_path):
00348         """@ingroup py_memory
00349         Program upload to file.
00350         """
00351         self._cc()
00352         c_path = _GCStringIn(file_path.encode(_enc))
00353         _rc(_gclib.GProgramUploadFile(self._gcon, c_path))
00354         return
00355
00356     def GArrayDownload(self, name, first, last, array_data):
00357         """@ingroup py_memory
00358         Downloads array data to a pre-dimensioned array in the controller's array table.
00359         array_data should be a list of values (e.g. int or float)
00360         """
00361         self._cc()
00362         c_name = _GCStringIn(name.encode(_enc))
00363         array_string = ""
00364         for val in array_data:
00365             array_string += str(val) + ","
00366         c_data = _GCStringIn(array_string[:-1].encode(_enc)) #trim trailing command
00367         _rc(_gclib.GArrayDownload(self._gcon, c_name, first, last, c_data))
00368         return
00369
00370     def GArrayUploadFile(self, file_path, names = []):
00371         """@ingroup py_memory
00372         Uploads the entire controller array table or a subset and saves the data as a csv file
00373         specified by file_path.
00374         names is optional and should be a list of array names on the controller.
00375         """
00376         self._cc()
00377         c_path = _GCStringIn(file_path.encode(_enc))
00378         names_string = ""
00379         c_names = _GCStringIn("").encode(_enc) #in case empty list provided
00380         for name in names:
00381             names_string += name + ' '
00382         c_names = _GCStringIn(names_string[:-1].encode(_enc)) #trim trailing space
00383         _rc(_gclib.GArrayUploadFile(self._gcon, c_path, c_names))
00384         return
00385
00386     def GArrayDownloadFile(self, file_path):
00387         """@ingroup py_memory
00388         Downloads a csv file containing array data at file_path.
00389         """
00390         self._cc()
00391         c_path = _GCStringIn(file_path.encode(_enc))
00392         _rc(_gclib.GArrayDownloadFile(self._gcon, c_path))
00393         return
00394
00395     def GArrayUpload(self, name, first, last):
00396         """@ingroup py_memory
00397         Uploads array data from the controller's array table.
00398         """
00399         self._cc()
00400         c_name = _GCStringIn(name.encode(_enc))
00401         _rc(_gclib.GArrayUpload(self._gcon, c_name, first, last, 1, self._buf, _buf_size)) #1 is comma
00402         delimiter
00403         string_list = str(self._buf.value.decode(_enc)).split(',')
00404         float_list = []
00405         for s in string_list:
00406             float_list.append(float(s))
00407         return float_list
00408
00409
00410
00411
00412

```

```

00413     def GTimeout(self, timeout):
00414         """@ingroup py_connection
00415         Set the library timeout. Set to -1 to use the initial library timeout, as specified in GOpen.
00416         """
00417         self._cc()
00418         _rc(_gclibo.GTimeout(self._gcon, timeout))
00419         self._timeout = timeout
00420         return
00421
00422
00423     @property
00424     def timeout(self):
00425         """@ingroup py_connection
00426         Convenience property read access to timeout value. If -1, gclib uses the initial library
00427         timeout, as specified in GOpen.
00428         """
00429         return self._timeout
00430
00431     @timeout.setter
00432     def timeout(self, timeout):
00433         """@ingroup py_connection
00434         Convenience property write access to timeout value. Set to -1 to use the initial library
00435         timeout, as specified in GOpen.
00436         """
00437         self.GTimeout(timeout)
00438         return
00439
00440     def GFirmwareDownload(self, file_path):
00441         """@ingroup py_memory
00442         Upgrade firmware.
00443         """
00444         self._cc()
00445         c_path = _GCStringIn(file_path.encode(_enc))
00446         _rc(_gclib.GFirmwareDownload(self._gcon, c_path))
00447         return
00448
00449     def GMessage(self):
00450         """@ingroup py_unsolicited
00451         Provides access to unsolicited messages from the controller.
00452         """
00453         self._cc()
00454         _rc(_gclib.GMessage(self._gcon, self._buf, _buf_size))
00455         return str(self._buf.value.decode(_enc))
00456
00457
00458     def GMotionComplete(self, axes):
00459         """@ingroup py_controller
00460         Blocking call that returns once all axes specified have completed their motion.
00461         """
00462         self._cc()
00463         c_axes = _GCStringIn(axes.encode(_enc))
00464         _rc(_gclibo.GMotionComplete(self._gcon, c_axes))
00465         return
00466
00467     def GInterrupt(self):
00468         """@ingroup py_unsolicited
00469         Provides access to PCI and UDP interrupts from the controller.
00470         """
00471         self._cc()
00472         status = _GStatus(0)
00473         _rc(_gclib.GInterrupt(self._gcon, byref(status)))
00474         return status.value
00475
00476     def GSetupDownloadFile(self, file_path, options):
00477         """@ingroup py_memory
00478         Downloads specified sectors from a Galil compressed backup (gcb) file to a controller.
00479
00480         Returns a dictionary with the controller information stored in the gcb file.
00481         If options is specified as 0, an additional "options" key will be in the dictionary indicating
00482         the info sectors available in the gcb
00483         """
00484         self._cc()
00485         c_path = _GCStringIn(file_path.encode(_enc))
00486
00487         rc = _gclibo.GSetupDownloadFile(self._gcon, c_path, options, self._buf, _buf_size)
00488         if (options != 0):
00489             _rc(rc)
00490
00491         info_dict = {}
00492         for line in str(self._buf.value.decode(_enc)).split("\n"):
00493             fields = line.split(' ', 1)
00494
00495             if (fields[0] == ""): continue
00496             elif len(fields) >= 2:
00497                 info_dict[fields[0].strip("\'")] = fields[1].strip("\'")

```

```

00497         else:
00498             info_dict[fields[0].strip("\'")] = "
00499
00500         if (options == 0):
00501             info_dict["options"] = rc
00502
00503         return info_dict

```

14.14 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.
- `#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\(\)](#)"

14.14.1 Detailed Description

Defines values for the Galil C Library return codes and error strings.

Definition in file [gclib_errors.h](#).

14.14.2 Macro Definition Documentation

14.14.2.1 G_NO_ERROR

```
#define G_NO_ERROR 0
```

Return value if function succeeded.

Definition at line 9 of file [gclib_errors.h](#).

14.14.2.2 G_NO_ERROR_S

```
#define G_NO_ERROR_S "no error"
```

Definition at line 10 of file [gclib_errors.h](#).

14.14.2.3 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.

Definition at line 12 of file [gclib_errors.h](#).

14.14.2.4 G_GCLIB_ERROR_S

```
#define G_GCLIB_ERROR_S "gclib unexpected error"
```

Definition at line 13 of file [gclib_errors.h](#).

14.14.2.5 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](#).

14.14.2.6 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](#).

14.14.2.7 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](#).

14.14.2.8 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](#).

14.14.2.9 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](#).

14.14.2.10 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](#).

14.14.2.11 G_GCLIB_POLLING_FAILED

#define G_GCLIB_POLLING_FAILED -5
GWaitForBool out of polling trials.
Definition at line 24 of file [gclib_errors.h](#).

14.14.2.12 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](#).

14.14.2.13 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](#).

14.14.2.14 G_TIMEOUT_S

#define G_TIMEOUT_S "device timed out"
Definition at line 28 of file [gclib_errors.h](#).

14.14.2.15 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](#).

14.14.2.16 G_OPEN_ERROR_S

#define G_OPEN_ERROR_S "device failed to open"
Definition at line 31 of file [gclib_errors.h](#).

14.14.2.17 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](#).

14.14.2.18 G_ALREADY_OPEN_S

#define G_ALREADY_OPEN_S "Serial or PCI port already open"
Definition at line 34 of file [gclib_errors.h](#).

14.14.2.19 G_READ_ERROR

#define G_READ_ERROR -1103
Device read failed. E.G. Socket was closed by remote host. See [G_UTIL_GCAPS_KEEPALIVE](#).
Definition at line 36 of file [gclib_errors.h](#).

14.14.2.20 G_READ_ERROR_S

#define G_READ_ERROR_S "device read error"
Definition at line 37 of file [gclib_errors.h](#).

14.14.2.21 G_WRITE_ERROR

#define G_WRITE_ERROR -1104
Device write failed. E.G. Socket was closed by remote host. See [G_UTIL_GCAPS_KEEPALIVE](#).
Definition at line 39 of file [gclib_errors.h](#).

14.14.2.22 G_WRITE_ERROR_S

#define G_WRITE_ERROR_S "device write error"
Definition at line 40 of file [gclib_errors.h](#).

14.14.2.23 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](#).

14.14.2.24 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](#).

14.14.2.25 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](#).

14.14.2.26 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](#).

14.14.2.27 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](#).

14.14.2.28 G_DATA_RECORD_ERROR_S

#define G_DATA_RECORD_ERROR_S "data record error"
Definition at line 49 of file [gclib_errors.h](#).

14.14.2.29 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](#).

14.14.2.30 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](#).

14.14.2.31 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](#).

14.14.2.32 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](#).

14.14.2.33 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](#).

14.14.2.34 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](#).

14.14.2.35 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](#).

14.14.2.36 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](#).

14.14.2.37 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](#).

14.14.2.38 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](#).

14.14.2.39 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](#).

14.14.2.40 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](#).

14.14.2.41 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](#).

14.14.2.42 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](#).

14.14.2.43 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](#).

14.14.2.44 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](#).

14.14.2.45 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](#).

14.14.2.46 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](#).

14.14.2.47 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](#).

14.14.2.48 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](#).

14.14.2.49 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](#).

14.14.2.50 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](#).

14.14.2.51 G_BAD_ADDRESS

#define G_BAD_ADDRESS -10006
Bad address.
Definition at line 84 of file [gclib_errors.h](#).

14.14.2.52 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](#).

14.14.2.53 G_BAD_FIRMWARE_LOAD

#define G_BAD_FIRMWARE_LOAD -10008
Bad firmware upgrade.
Definition at line 87 of file [gclib_errors.h](#).

14.14.2.54 G_BAD_FIRMWARE_LOAD_S

#define G_BAD_FIRMWARE_LOAD_S "Firmware upgrade failed"
Definition at line 88 of file [gclib_errors.h](#).

14.14.2.55 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](#).

14.14.2.56 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](#).

14.14.2.57 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](#).

14.14.2.58 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](#).

14.15 gclib_errors.h

[Go to the documentation of this file.](#)

```
00001
00006 #ifndef I_0DD3687F_47D0_454B_ADB2_CBAB0ED46FCE
00007 #define I_0DD3687F_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
```


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