



GW1000 User's Guide

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1.0 GW1000 General Operation & Applications

The GW1000 continues the functionality of the current DL2000/DL3000/DL3500 product line. In addition to having connectivity to Allen-Bradley's DH+, and the RS232/422/485/USB capabilities of the DL3500, the GW1000 offers a 10/100 Base-T Ethernet connection. The ability to power the GW1000 from the USB communication link is also present, removing the sometimes cumbersome procedure of locating a DC power supply when using laptops or PC's in the field.

The GW1000 has two communication ports. Channel A is designed to connect to your industrial Allen-Bradley DH+ network. Channel B is used to connect to your serial or USB device, the protocol depends on which model of the GW1000 you have ordered. Channel B has the capabilities of RS232C, RS422, RS485 and USB 2.0.

Configuration of the operating parameters is done quickly and easily via the Ethernet interface. Operational Firmware is also easily upgraded over the Ethernet interface. This allows for quick changes if you need to change your protocol.

Currently there are three standard GW1000 products available to allow access to Allen-Bradley's DH+ network. Many other custom ASCII and serial protocols have been implemented to DH+ on the GW1000 platform.

Contact DataLink Technologies to see if the GW1000 is the correct device for your communication needs.

2.0 Hardware Specifications

2.1 Operating Specifications:

- CHA can be configured DH+ with baud rates of 57.6, 115.2 and 230.4 KBAud
- CHB has full RS232C, as well as both RS422-4 wire and RS485 2-wire modes. CHB has the ability of being configured with asynchronous speeds up to 230.4 KBAud as well as the new Plug and Play Windows USB Interface.
- Currently DF1, Modbus, and ASCII are the supported protocols. Custom protocols are easily implemented. Both CRC 16 and BCC error checking can be implemented; custom error checking can be added at the customer's request.
- Simple Parameter Configuration using Ethernet interface.
- Configuration and Reset Pushbuttons to set up online configuration parameters and perform a full Hardware Reset as well as a Restore to Factory Defaults option.
- Operating Parameters are stored in non-volatile flash memory. The GW1000 firmware can be upgraded via the Ethernet interface.
- Bi-Color (Green/Red) LED's for each communication channel indicates activity and status. Green POWER LED indicates power on.

2.2 Physical Specifications:

Dimensions: 0.90" H x 4.65" D x 3.98" W (22.8mm x 118.3mm x 101.0mm)

Weight: 0.44lbs (0.2kg)

Installation: Plastic enclosure; Freestanding or DIN rail mounting with integrated clip

Operating Environment: 32 to 122 °F (0 to 50 °C)

Storage: -40 to 185 °F (-40 to 85 °C)

Humidity: 5% to 95% non-condensing

Power: 9-27V DC or standalone USB - 2.0 Watts

3.0 GW1000 Hardware Layout

This Section contains information on the physical position and purpose of the components of the GW1000.

Top side connectors

- 3-pin power – 3.81mm pitch removable screw terminal plug
- 3-pin A-B DH+ – 5.08mm pitch removable screw terminal plug
- RJ45 Ethernet

Bottom side connectors (note: one connection is permitted at a time)

- 5-pin RS485/RS422 for CHB – 3.81mm pitch removable screw terminal plug
- 9 Pin D9M connector for CHB RS232C communications
- USB connector for CHB

Front Panel Indicators

- DH+ Status
- Serial Status
- Serial Receive (RX)
- Serial Transmit (TX)
- Ethernet Activity
- Ethernet Link
- Power

RESET and CONFIGure pushbuttons are accessible through openings in the top of the case as depicted on product label.

4.0 Configuration

4.1 Online Mode of Operation

Online Mode is the normal operating Mode of the GW1000. In this mode the Channels are configured and the GW1000 is ready to interface to your equipment.

Power on or a press of the Reset pushbutton automatically puts the GW1000 into Online mode.

4.2 Configuring the GW1000

Connect the GW1000 ethernet port to a switch or hub on the same network as your PC using a CAT5 network patch cord. Power on the GW1000 and wait 30 seconds for the bootup sequence to complete. Note the LAN **LINK** indicator LED should be on. From Windows, open a DOS command prompt window by clicking:

START → All Programs → Accessories → **Command Prompt**

At the command prompt, type:

```
telnet 192.168.1.111 10000 (ENTER↵)
```

This will bring up the login screen for configuration. (note: if you have changed the default IP address of the GW1000, enter the new address. If you do not know the IP address programmed into the GW1000, first restore factory defaults.)

```
Welcome to Gateway 1000 Interface Configuration Utility 1.0
Serial Number: A000800042

login:
```

Type in the default login and password as: “**Netsilicon**” and “**sysadm**” respectively. Please note the login is case-sensitive.

The following is the main menu:

```
Hello Netsilicon

DataLink GW1000-DHP1:DF1 to DH+ Interface Main Menu.
Build : 0803.1.11
    1.) Modify IP Parameters
    2.) Modify Password
    3.) View/Modify Online Parameters
    4.) Online Diagnostic Statistics
    5.) Save and Reboot
    6.) Quit without save

Enter Selection:
```

To access a menu item, press the corresponding number followed by ENTER↵.

1) Modify IP Parameters

To edit the IP Parameters, press “1” followed by ENTER↵. The following submenu is displayed.

```
Enter Selection: 1

    IP Parameters:
    1.) IP Address          192.168.1.111
    2.) Subnet Mask         255.255.255.0
    3.) Default Gateway     192.168.1.1
    4.) Main Menu
```

To edit the IP address, press “1” ENTER↵ followed by a new address and ENTER↵. Likewise, the Subnet Mask and Default Gateway can be set.

```
Enter Selection: 1
Enter IP address: 192.168.1.33
New IP address [192.168.1.33] accepted

    IP Parameters:
    1.) IP Address          192.168.1.111
    2.) Subnet Mask         255.255.255.0
    3.) Default Gateway     192.168.1.1
    4.) Main Menu

Enter Selection:
```

Note: The new parameters will be written to memory upon returning to the main menu by pressing 4 ENTER.

2) Modify Password

The login password can be modified with main menu option 2.

```
Enter Selection: 2
Enter old password: *****
Enter new password: *****
Renter new password: *****
New password accepted
```

3) View / Modify Online Parameters

To edit the Online Parameters for DH+ port and serial port, from the main menu, press “3” followed by ENTER. The following submenu is displayed.

```
Enter Selection: 3

      Online Parameters:
      1.) Node Address           Oct:10, Hex:0x01, Dec:1
      2.) DH+ Baud Rate         57.6 KBaud
      3.) Serial Parameters
      4.) DF1 Parameters
      5.) Save Parameters and Exit
      6.) Return to Main Menu

Enter Selection:
```

To edit the DH+ node address, press “1” ENTER, enter the two-digit octal value and press ENTER.

```
Enter Selection: 1
```



```
Enter new DH+ Node address (Octal):
```

To edit the DH+ baud rate, press “2” ENTER↵ and select a value and press ENTER↵.

```
Enter Selection: 2

      DH+ Speed:          [57.6 KBaud]
      1.) 57.6K Baud
      2.) 115.2K Baud
      3.) 230.4K Baud
      4.) Autobaud Detection
      5.) or <CR> Keep as Configured and Return to Online
Parameters Menu
```

To edit the parameters for the serial port, press “3” ENTER↵ and the following submenu is displayed. Each of the parameters can be changed with corresponding submenus. To save the serial settings, press “7” ENTER↵.

```
Enter Selection: 3

      Serial Parameters:
      1.) Baud Rate                9600
      2.) Parity                   NONE
      3.) Data Bits                8
      4.) Stop Bits                1
      5.) Interface (RS232/422/485) RS232
      6.) RS232 RTS/CTS Handshaking NONE
      7.) Return to Online Parameters Menu

Enter Selection:
```

The following DF1 protocol parameters can be edited with option 4 and their associated submenus.

```
Enter Selection: 4

      DF1 Protocol Parameters:
      1.) Error Checking Mode      BCC
      2.) Duplex Protocol          FULL
      3.) PASS/EXECUTE Diagnostics PASS
      4.) Return to Online Parameters Menu

Enter Selection:
```

Note: To save the values and exit, press “5” from the Online Parameters menu: “Save Parameters and Exit.”

4) Online Diagnostic Statistics

An online diagnostics menu is provided for troubleshooting purposes.

```
Enter Selection: 4
```

```
Online Diagnostics Statistics and Counters
1.) DH+ Diagnostic Counters
2.) DF1 Diagnostic Counters
3.) Return to Main Menu
```

```
Enter Selection:
```

4.3 Restore Factory Defaults

To restore factory defaults, connect the GW1000 to a PC using either a USB or RS232 connection. If using USB, first install USB drivers as explained in “USB Driver Installation”. Using a terminal program such as “Hyperterminal” included with Microsoft Windows, configure a connection to the RS232 port on the PC (typically COM1 or COM2) or the virtual COM port assigned by the USB driver. This setting is under File → Properties menu. Press “**Configure**” and select baud rate of 57.6 Kbaud, 8 data bits, no Parity, 1 stop bit, flow control: none.

- Power on the GW1000 by connecting power supply or USB cable.
- Wait 30 seconds for the bootup sequence to complete
- In the Hyperterminal program, select Call → Call to connect to the selected COM port.
- Through the window in the side of the GW1000 case, press the “**Config**” button with a paperclip or small screwdriver. The config button should be pressed for one second and then released.
- The following screen is displayed

```
PLATFORM: ns7520_a_esp
BSP Library Built on: Mar 30 2008 11:25:37
APPLICATION: DataLink GW1000-DHP1 : DF1 to DH+ Interface
Application Built on: Mar 30 2008 11:26:31
-----
NETWORK INTERFACE PARAMETERS:
IP address on LAN is 192.168.1.111
LAN interface's subnet mask is 255.255.255.0
```

```
IP address of default gateway to other networks is 192.168.1.1
HARDWARE PARAMETERS:
GW1000's serial number is A00800333
GW1000's Ethernet MAC Address is 00:50:C2:89:F0:29
After board is reset, start-up code will wait 5 seconds
Default duplex setting for Ethernet connection: default
ONLINE DH+ PARAMETERS:
Serial DF1/Config channel will use a baud rate of 57600
DH+ Node address is 22 Octal.
DH+ baud Rate is 57600 Baud.
DF1 Parameters: Full Duplex Operation, and BCC Error Checking.
-----
Press any key in 5 seconds to change these settings.
```

- Press a key...

```
Press A to Accept the settings, or M to Modify?
```

- Press “M” followed by ENTER↵ to modify settings...

```
Enter the root password:
```

- At the password prompt, type “Netsilicon”. Note password is case-sensitive...

```
Reset configuration to default values [N]?
```

- Type “Y”, ENTER↵ to restore settings to default values, then press ENTER↵ at each prompt to accept default values, or enter desired new values followed by ENTER↵...

```
For each of the following questions, you can press <Return> to
select the value shown in braces, or you can enter a new value.
```

```
ETHERNET INTERFACE SETTINGS:
```

```
Obtain IP settings automatically using DHCP for this interface
[N]?
```

```
IP address [192.168.1.111]?
Subnet mask [255.255.255.0]?
Gateway address [192.168.1.1]?
```

```
This interface must have a unique MAC address.
```

```
Ethernet MAC Address [00:40:9D:43:35:97]?
Ethernet duplex setting (default, full, half)? [default]
```

```
SERIAL CONSOLE PORT SETTINGS:
```

```
Set the baud rate of the serial console port [57600]?
  9600, 19200, 38400, 57600, 115200

SECURITY SETTINGS:

Would you like to update the Root Password [N]?
Would you like to update the Administrator 'admin' Password [N]?

MISCELLANEOUS SETTINGS:

Each development board must have a unique serial number
Set the board's serial number[A00800333]?

How long (in seconds) should CPU delay before starting up [5]?

Saving the changes in NV memory...
```

Default Settings

DF1 protocol:
9600 Baud, 8 Bits, No Parity, BCC Checksum

DH+ defaults
57.6 KBaud
Node address: 1 octal, 0x01 hex, decimal 1

4.4 USB Driver Installation

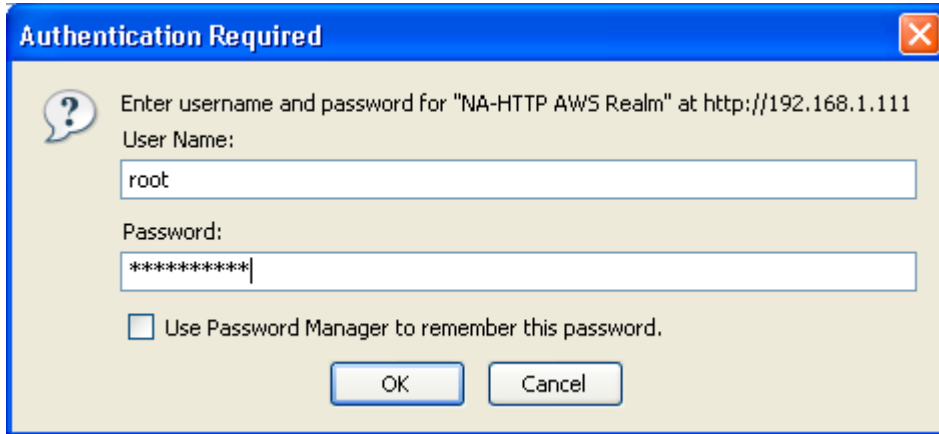
The USB driver is provided by Future Technology Devices International Ltd. Please see the [Windows_XP_Installation_Guide.pdf](#) in the Documentation folder on the CD included with the GW1000. The USB driver version on the CD is "CDM 2.02.04 WHQL Certified." See section "2.1 Installing CDM drivers" on page 4. For reference, the document is also available here...

http://www.ftdichip.com/Documents/InstallGuides/Windows_XP_Installation_Guide.pdf

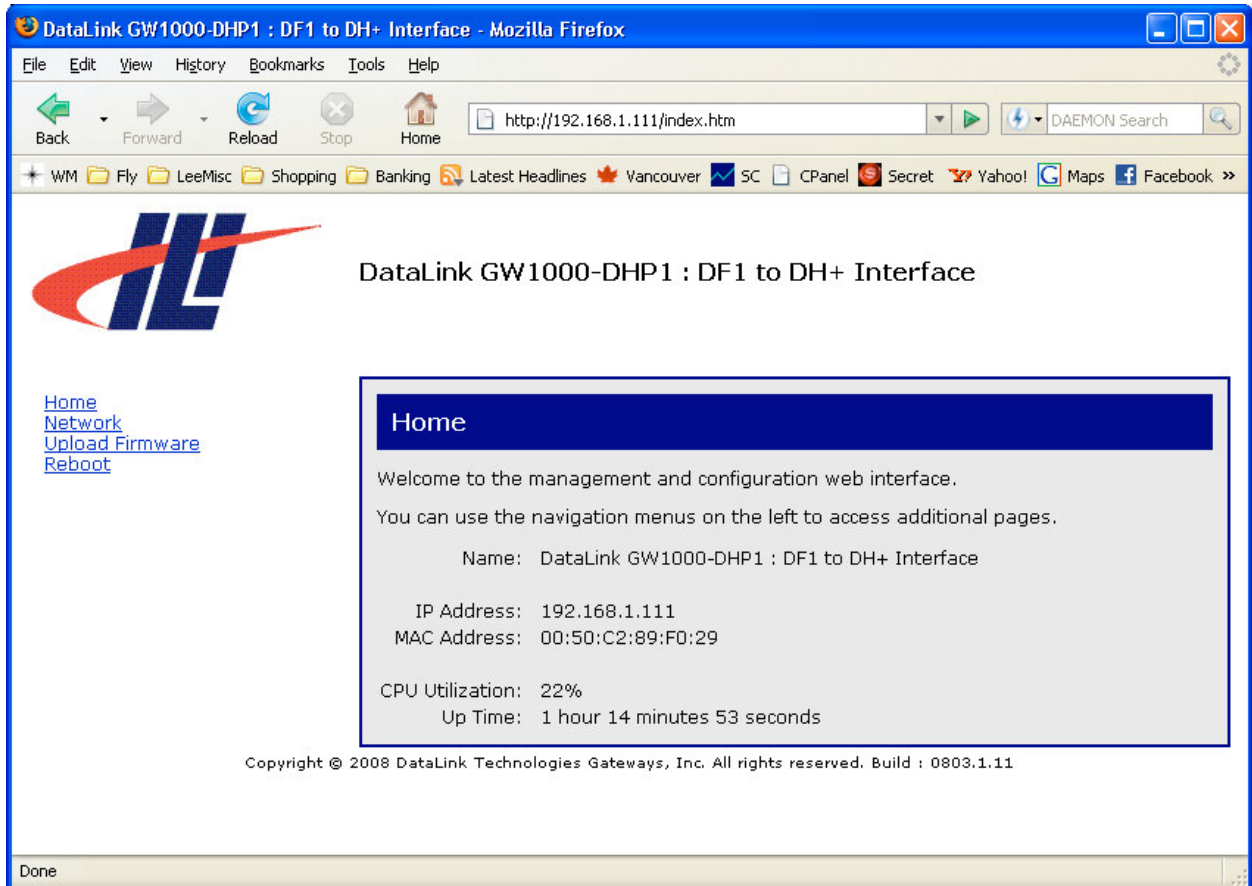
4.5 Firmware Upgrade

Firmware upgrade is accomplished using the ethernet interface and a web browser. Connect the GW1000 ethernet port to an ethernet port on the same network as your PC using a CAT5 network patch cord to a network hub or router. Open a web browser such as Microsoft Internet Explorer or Mozilla Firefox, power on the GW1000 and wait 30 seconds for bootup sequence to complete. Note the LAN **LINK** indicator LED should be on.

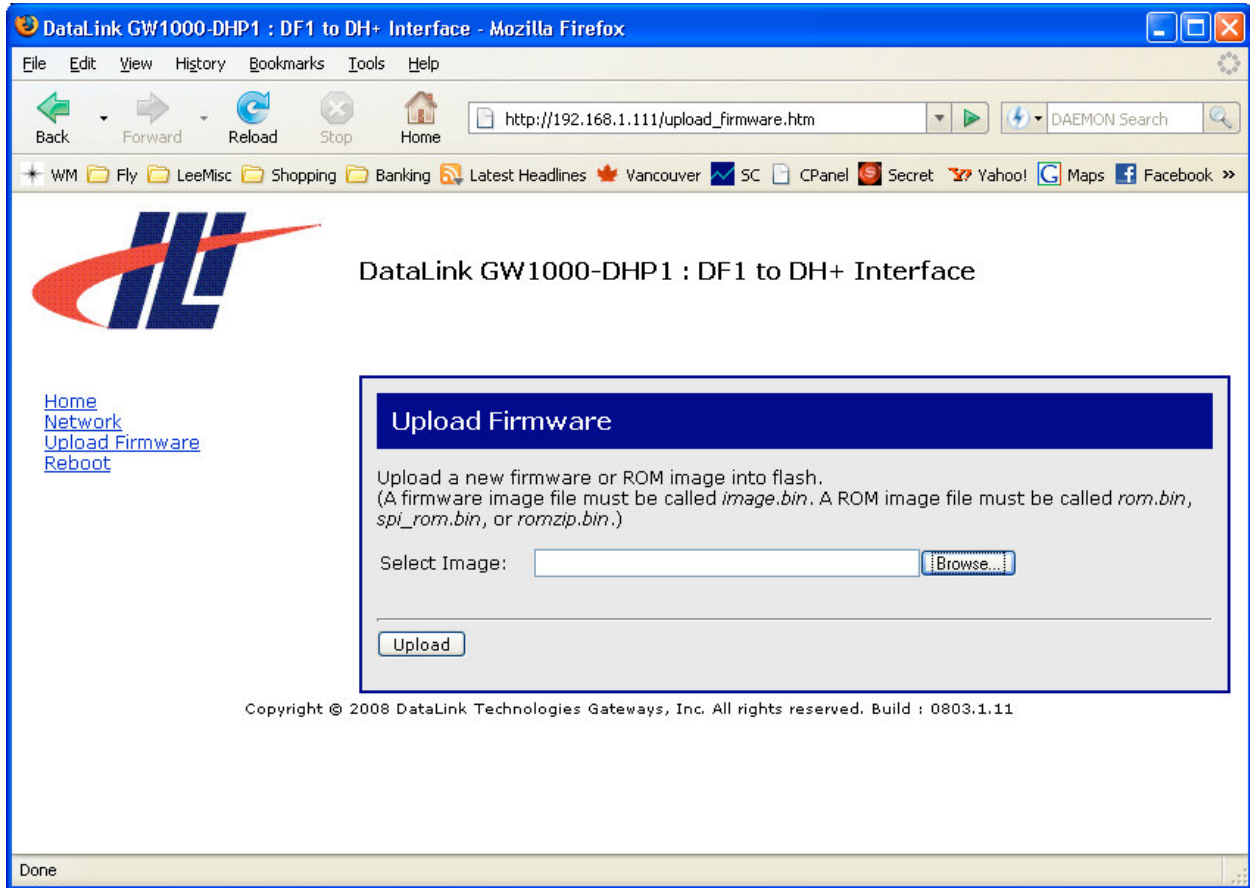
In the browser address bar, type **192.168.1.111** and press ENTER↵. (note: if you have changed the default IP address of the GW1000, enter the new address in the address bar. If you do not know the IP address programmed into the GW1000, first restore factory defaults.) In the “User Name” field, type “**root**”. In the Password field, type “**Netsilicon**”. (note: password is case-sensitive.)



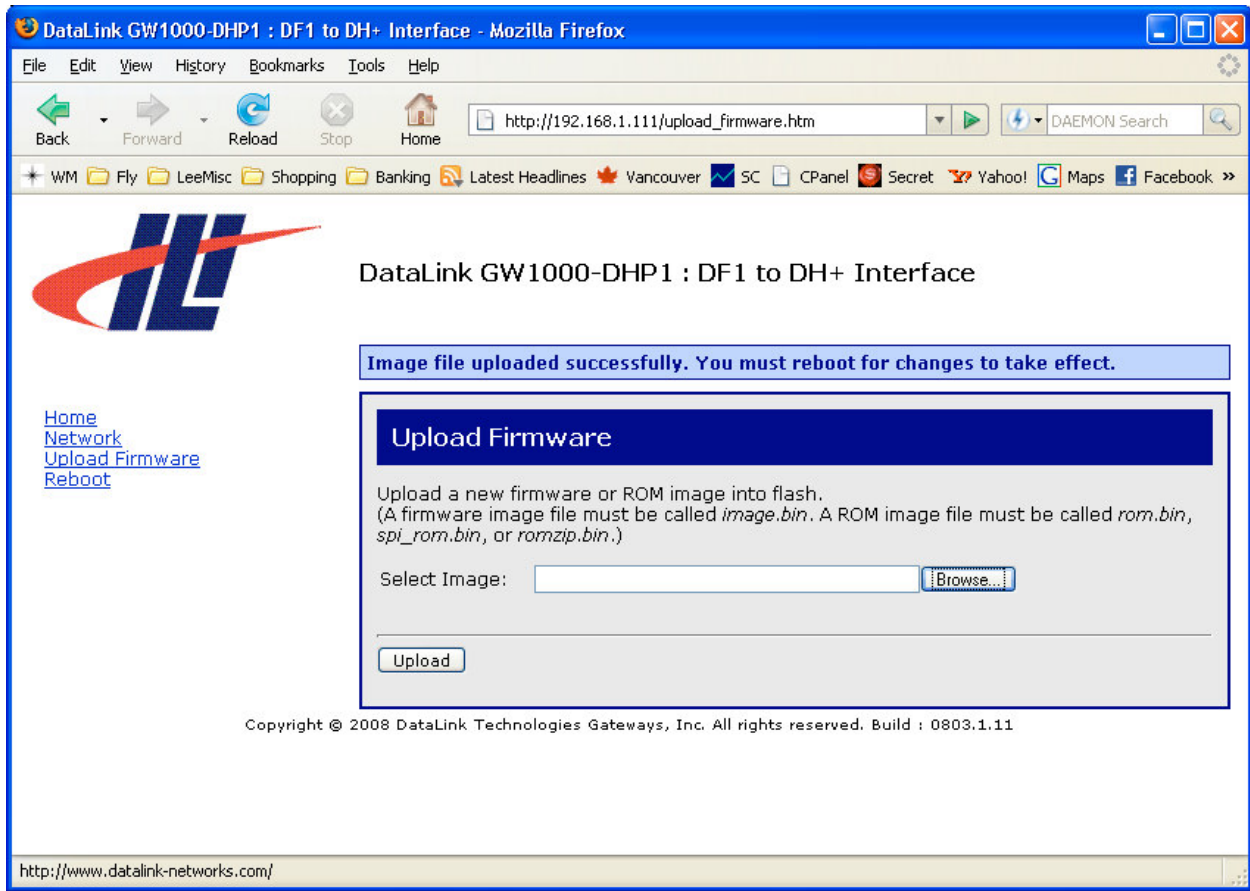
Click **OK** and the home page will be displayed. The current software version is displayed in the lower right of the screen.



Click **“Upload Firmware”**



Click **Browse** or type the location of the new firmware file. (note: the firmware image filename must **not** be edited. The filename must be **image.bin**. If you have multiple versions of firmware files, they must each be stored in a different folder on your computer.) Click **Upload**. Please wait two minutes until you see the **“Upload Successful”** message. On rare occurrences, the browser program may timeout before a successful response is received. In this case, wait an extra minute to make sure the upload has taken place, repower the GW1000, and login as explained above. Examine the firmware release number in the lower right of the screen to check the version has been updated.



To finalize firmware update, you must cycle power on the GW1000.

5.0 Switch and LED Indicator Functions

5.1 Switch Functions

The Reset pushbutton will perform a complete hardware reset of the GW1000. It is identical to a complete power cycle and will cause the GW1000 to go through its LED start-up sequence.

The Configure pushbutton takes the GW1000 out of On-Line operation mode and allows the user to restore factory default settings.

5.2 Indicator Functions

5.2.1 Power-Up and Reset Sequence

On Power-up or after the Reset button has been pressed the GW1000 executes a self-diagnostic check of the RAM and flash firmware. The correct LED indicator sequence to show the GW1000 is functioning properly is as follows: After all LEDs go out.

LED	STATUS
Power	Green Continuously
Serial Tx	Brief green flash then off
Serial Rx	Green for 3 seconds then off
Status	Red for 10 seconds then Green 1 second, then off
DH+	Green 1 second, Red 1 second, then flashing green for offline, solid green for online.

After this sequence the GW1000 goes into the On-line mode of Operation. The LED indicators will behave in the way defined by the GW1000 model used. Normally, all LEDs will be off waiting for communication on its channels.

5.2.2 Normal On-line Operation

The following is a description of the normal operation of the Channel LEDs on the GW1000. Custom products operation will differ from the following:

LED	Description of Operation
Power	Green Indicates Power is being supplied to the GW1000.
Serial Tx, & Serial Rx	Flashes GREEN when a Character is Received or Transmitted. If Characters are being received or transmitted rapidly, the LED might appear on SOLID.

Status	Flashes RED for 0.5 seconds if a NAK is received or transmitted in DF1 protocol or if all serial communication buffers are full. Flashes GREEN for 0.5 seconds if Good DF1 packets are being sent. If Characters are being received or transmitted rapidly, the LED might appear on SOLID.
DH+	Flashes RED if a Duplicate DH+ node address is already on the network. Flashes GREEN when soliciting for stations to create a new network or DH+ cable is not connected. Alternately flashes RED and GREEN if in DH+ autobaud detection mode and listening to the network to determine the baud rate to use.

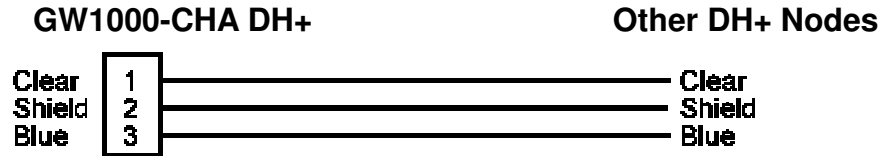
5.2.3 Off-Line Modes

The following table describes the meaning of LED patterns in the different Off-Line modes of operation.

LED Pattern	Description of Operation
DH+ and Status	Offline configuration of parameters mode from the serial menu: Solid GREEN, Rest OFF

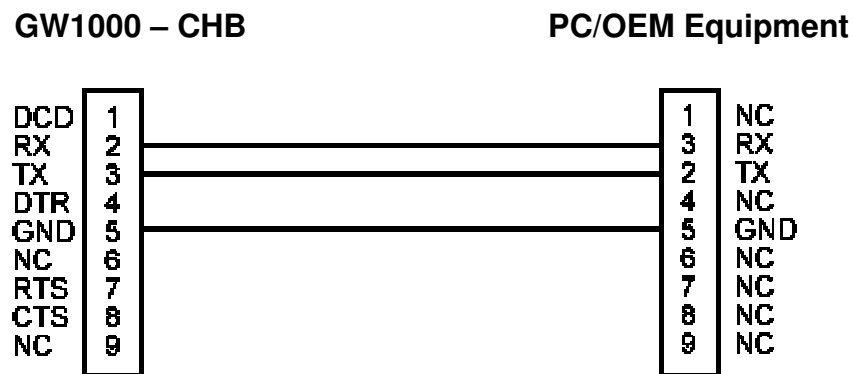
6.0 GW1000 Wiring Diagrams

6.1 Online Cable GW1000-CHA DH+



Note: Clear & Blue might have to be swapped depending on existing DH+ wiring

6.2 Configuration Cable/Online Cable GW1000-CHB RS-232 – No Handshaking



6.3 Online Cable GW1000-CHB RS-232 – With RTS/CTS Handshaking

