



GW1000 User's Guide

Revision 1.09



DataLink Technologies Gateways, Inc.
Website: www.datalinkconverters.com
Tel : (360) 306-5878 / (866) 286-2745

Table of Contents

1.0 GW1000 General Operation & Applications.....	3
2.0 Hardware Specifications.....	4
2.1 Operating Specifications:.....	4
2.2 Physical Specifications:.....	4
2.3 Detailed dimensions.....	5
3.0 GW1000 Hardware Layout.....	7
4.0 Configuration.....	8
4.1 Online Mode of Operation.....	8
4.2 Configuring the GW1000.....	8
Cabling.....	8
Accessing the Webscreen Interface.....	8
4.2.1 Network IP Settings.....	11
4.2.2 Upload Firmware.....	12
4.2.3 Standard Parameters (GW1000-DHP1).....	13
4.2.4 DF1 Parameters (GW1000-DHP1).....	14
4.3 Online Diagnostic Statistics.....	15
4.4 Restore Factory Defaults.....	16
Default Settings.....	16
4.5 USB Driver Installation.....	17
5.0 Switch and LED Indicator Functions.....	18
5.1 Switch Functions.....	18
5.2 Indicator Functions.....	18
5.2.1 Power-Up and Reset Sequence.....	18
5.2.2 Normal On-line Operation.....	19
5.2.3 Off-line Modes.....	19
6.0 GW1000 Wiring Diagrams.....	20
6.1 GW1000 DH+.....	20
6.2 GW1000 RS232 – No Handshaking.....	20
6.3 GW1000 RS232 – With RTS/CTS Handshaking.....	21
6.4 GW1000 RS422.....	21
6.5 GW1000 RS485.....	22

1.0 GW1000 General Operation & Applications

The GW1000 is a protocol converter for Allen Bradley Data Highway Plus (DH+) networks. It is capable of communicating over several serial and Ethernet protocols depending on the operating firmware loaded into the device.

One of three different serial interfaces can be used including RS232, RS422/RS485, and USB. The GW1000 also offers a 10/100 Base-T Ethernet connection for communications as set up purposes.

Power can be provided from a USB connection or a DC power supply capable of between 9 and 27 Volts DC. Nominal current at 24 Volts is 100mA.

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

Currently there are five standard GW1000 products available to allow access to Allen-Bradley's DH+ network.

- GW1000-DHP1 (DF1 to DH+)
- GW1000-DHPM (modbus to DH+)
- GW1000-ABEIP (Allen Bradley Ethernet and Ethernet/IP to DH+)
- GW1000-modTCP (modbus TCP to DH+)
- GW1000-DHPA (ASCII to DH+)

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:

- DH+ baud rates of 57.6, 115.2 and 230.4 KBaud are supported
- One serial interface may be used: RS232, RS422-4 wire, RS485 2-wire modes, or USB.
- Currently DF1, Modbus, and ASCII are supported protocols. Custom protocols are easily implemented. Both CRC 16 and BCC error checking are 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 Restore Factory Default settings.
- 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)

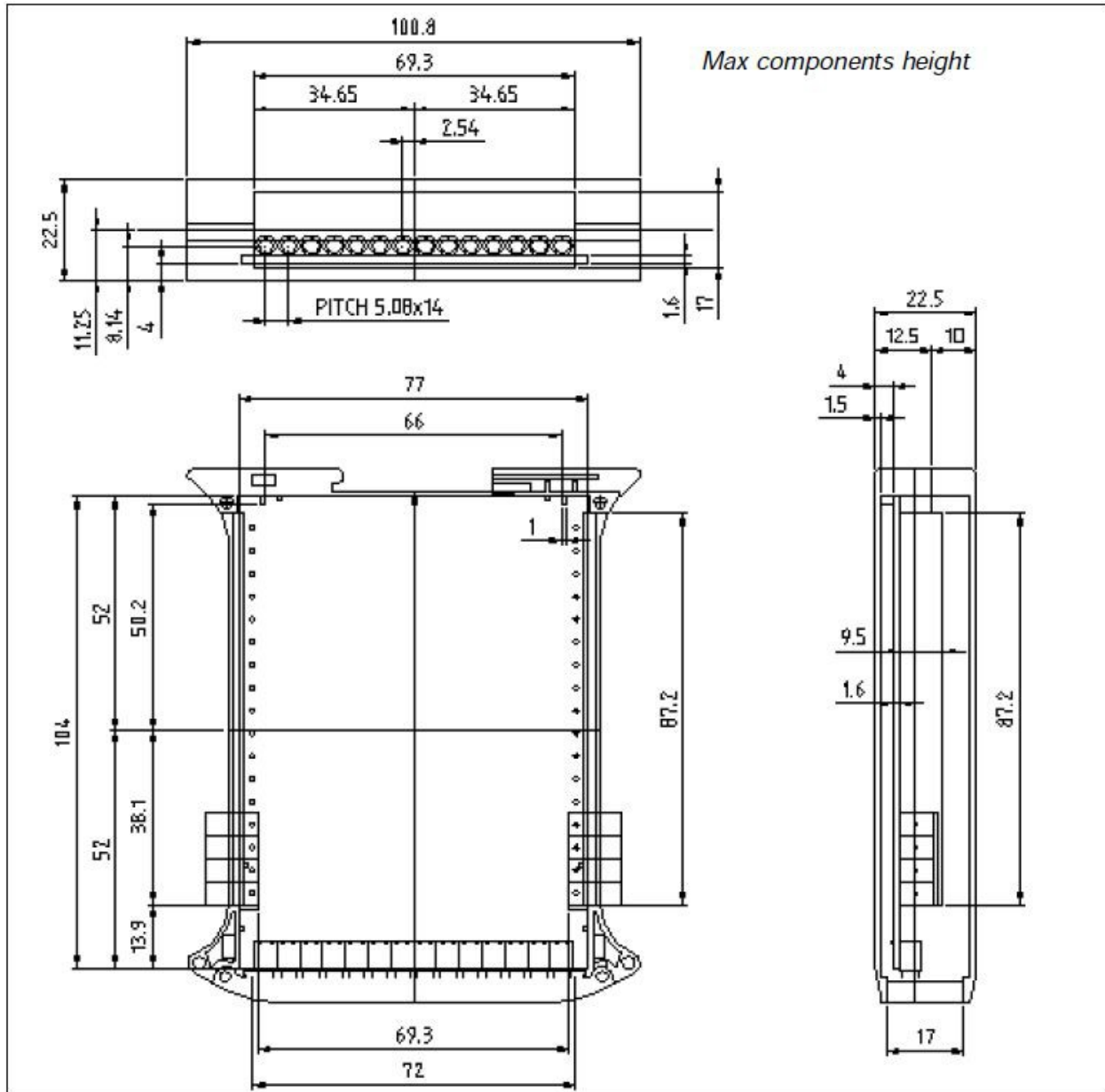
Storage: -40 to 185°F (-40 to 85°C)

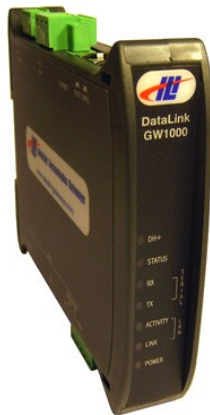
Humidity: 5% to 95% non-condensing

Power: 9-27V DC or standalone USB - 2.25 Watts

2.3 Detailed dimensions

All measures are in millimeters.





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 – 3.81mm pitch removable screw terminal plug
- 9 Pin D9 connector for RS232C communications
- USB connector

Front Panel Indicators

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

RESET and 'CONFIG' (configuration) 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

Cabling

The GW1000 is configured using a web browser connected via the Ethernet port. Connect the GW1000 Ethernet port to a switch or hub on the same network as your PC using a CAT5 network patch cord.

Please note that your computer must have an IP address assigned. If your Windows PC is set to “obtain an IP address automatically”, it must be connected to a network with a running DHCP server. Alternatively, your PC may be set to use a static IP address.

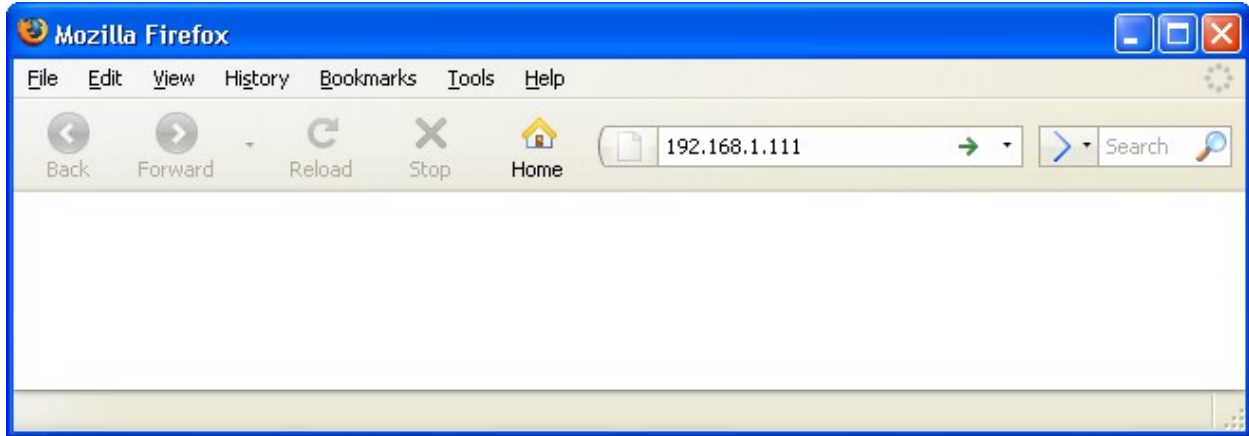
(Control Panel→Network Connections→LAN→Properties→Internet Protocol TCP/IP→Properties)

If you do not have a router or hub, it is possible to directly connect the ethernet port from your PC to the GW1000 but you will require an Ethernet crossover cable rather than a standard straight-through patch cord. Furthermore, your PC must be set to a static IP address.

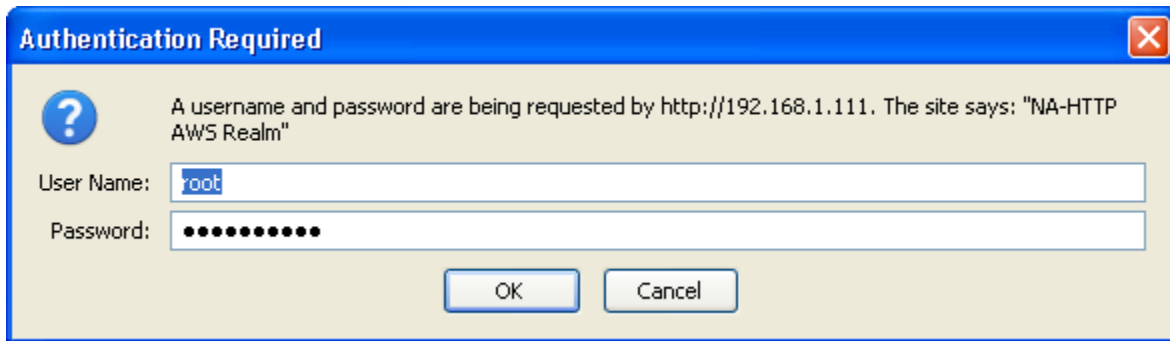
Accessing the Webscreen Interface

Power on the GW1000 and wait 30 seconds for the boot up sequence to complete. Note the LAN **LINK** indicator LED should be on and the LAN ACTIVITY LED may be blinking.

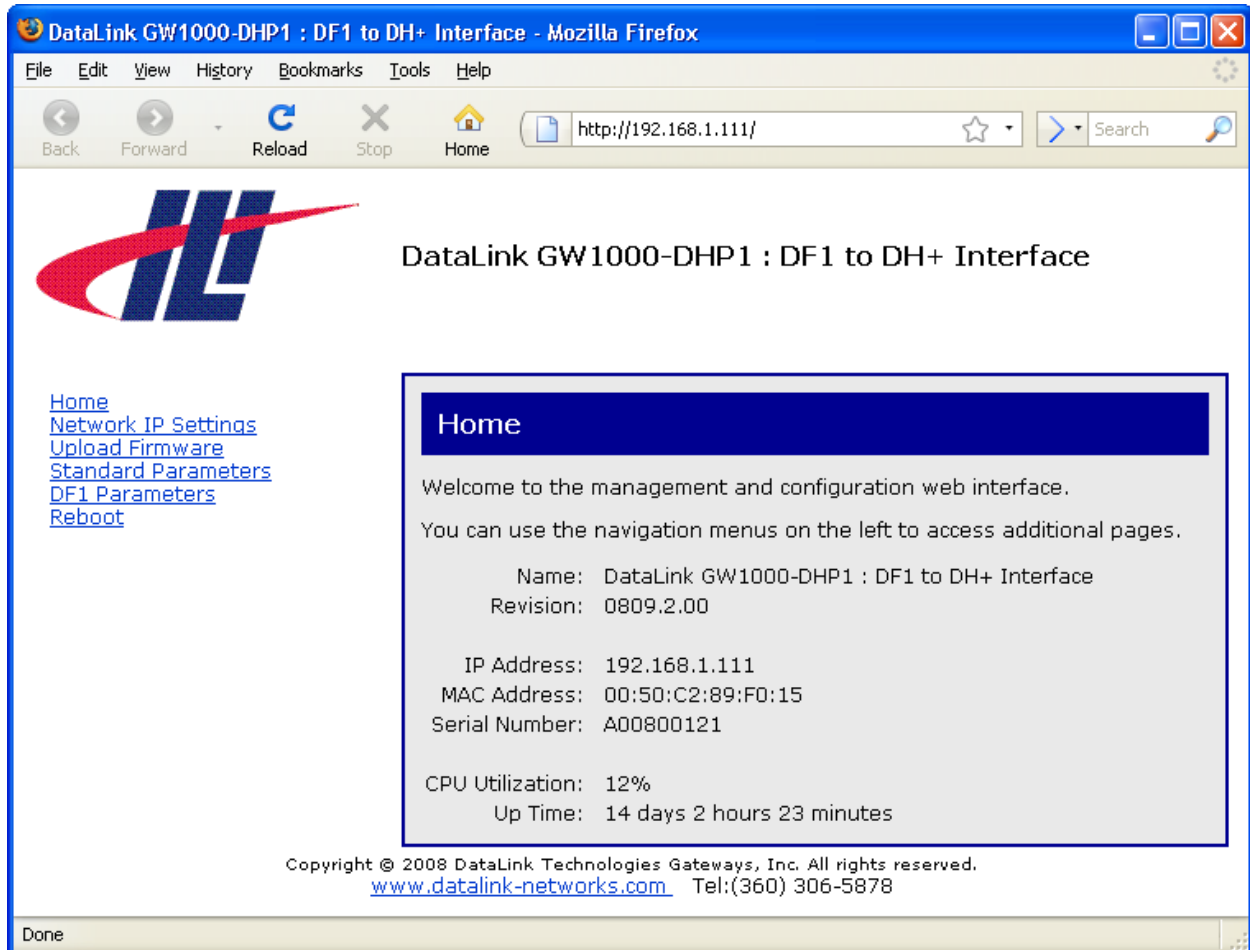
Open a web browser such as Firefox or Internet Explorer. In the address bar, type the IP address of the GW1000. (The default IP address is 192.168.1.111) ↵. (Note: if you have changed the default IP address of the GW1000, enter the new address in the address bar. If you do not know the IP address programmed into the GW1000, first restore factory defaults.)



At the login prompt, type login "root" and Password "Netsilicon". Please note passwords are case-sensitive.



The Home page Setup screen is displayed which shows the model version of the GW1000, firmware revision level, IP address, Ethernet MAC address, and serial number.



DataLink GW1000-DHP1 : DF1 to DH+ Interface

Home
[Network IP Settings](#)
[Upload Firmware](#)
[Standard Parameters](#)
[DF1 Parameters](#)
[Reboot](#)

Home

Welcome to the management and configuration web interface.
You can use the navigation menus on the left to access additional pages.

Name: DataLink GW1000-DHP1 : DF1 to DH+ Interface
Revision: 0809.2.00

IP Address: 192.168.1.111
MAC Address: 00:50:C2:89:F0:15
Serial Number: A00800121

CPU Utilization: 12%
Up Time: 14 days 2 hours 23 minutes

Copyright © 2008 DataLink Technologies Gateways, Inc. All rights reserved.
www.datalink-networks.com Tel:(360) 306-5878

Using the links in the left margin, changes to the configuration can be made. Please note that on each screen, to save new settings, you must click Apply, then click "Reboot" from the left margin, then click Reboot to confirm.



DataLink GW1000-DHP1 : DF1 to DH+ Interface

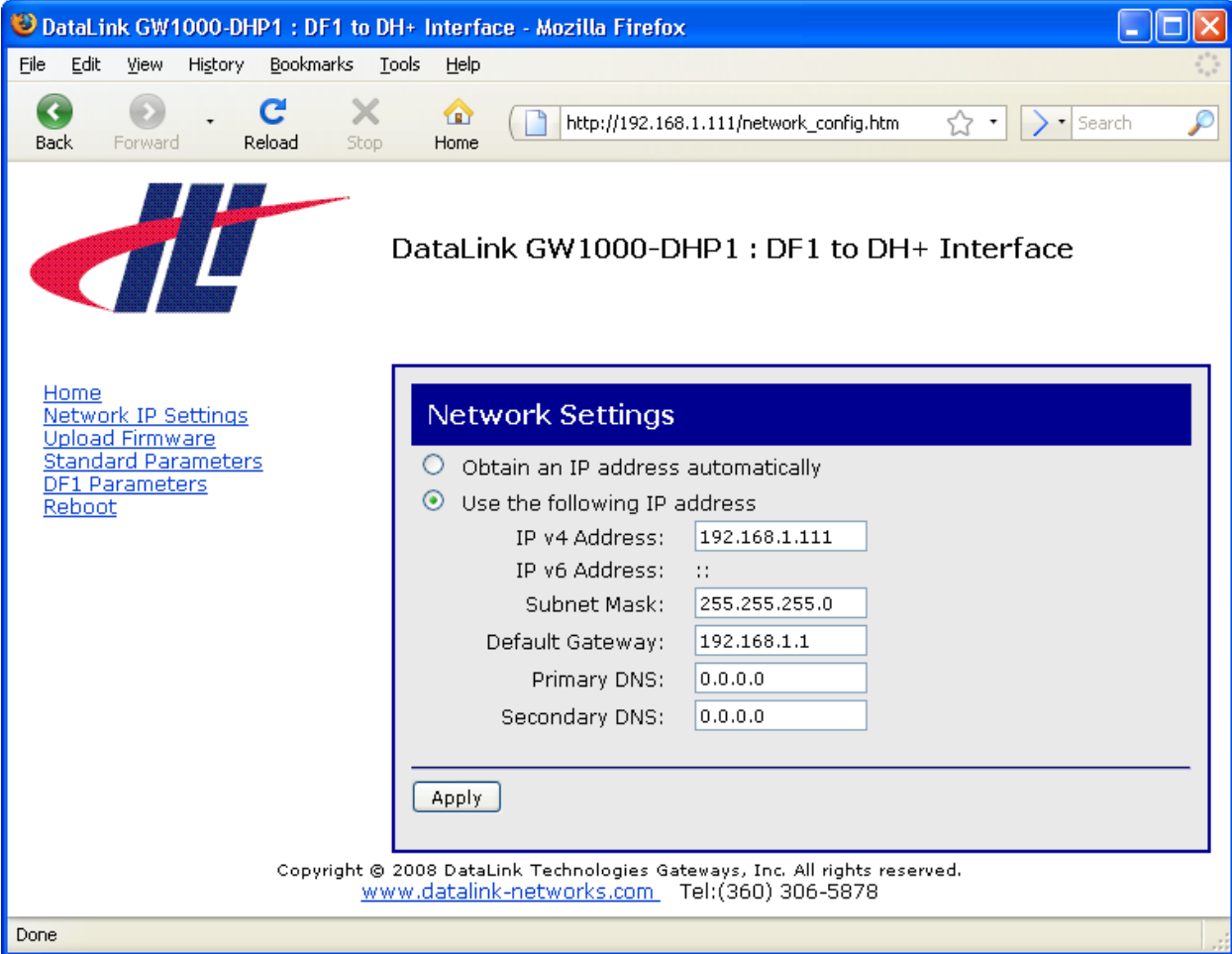
Home
[Network IP Settings](#)
[Upload Firmware](#)
[Standard Parameters](#)
[DF1 Parameters](#)
[Reboot](#)

Reboot

Click Reboot to reboot this device.

Copyright © 2008 DataLink Technologies Gateways, Inc. All rights reserved.
www.datalink-networks.com Tel:(360) 306-5878

4.2.1 Network IP Settings



DataLink GW1000-DHP1 : DF1 to DH+ Interface

Home
[Network IP Settings](#)
[Upload Firmware](#)
[Standard Parameters](#)
[DF1 Parameters](#)
[Reboot](#)

Network Settings

Obtain an IP address automatically

Use the following IP address

IP v4 Address:

IP v6 Address:

Subnet Mask:

Default Gateway:

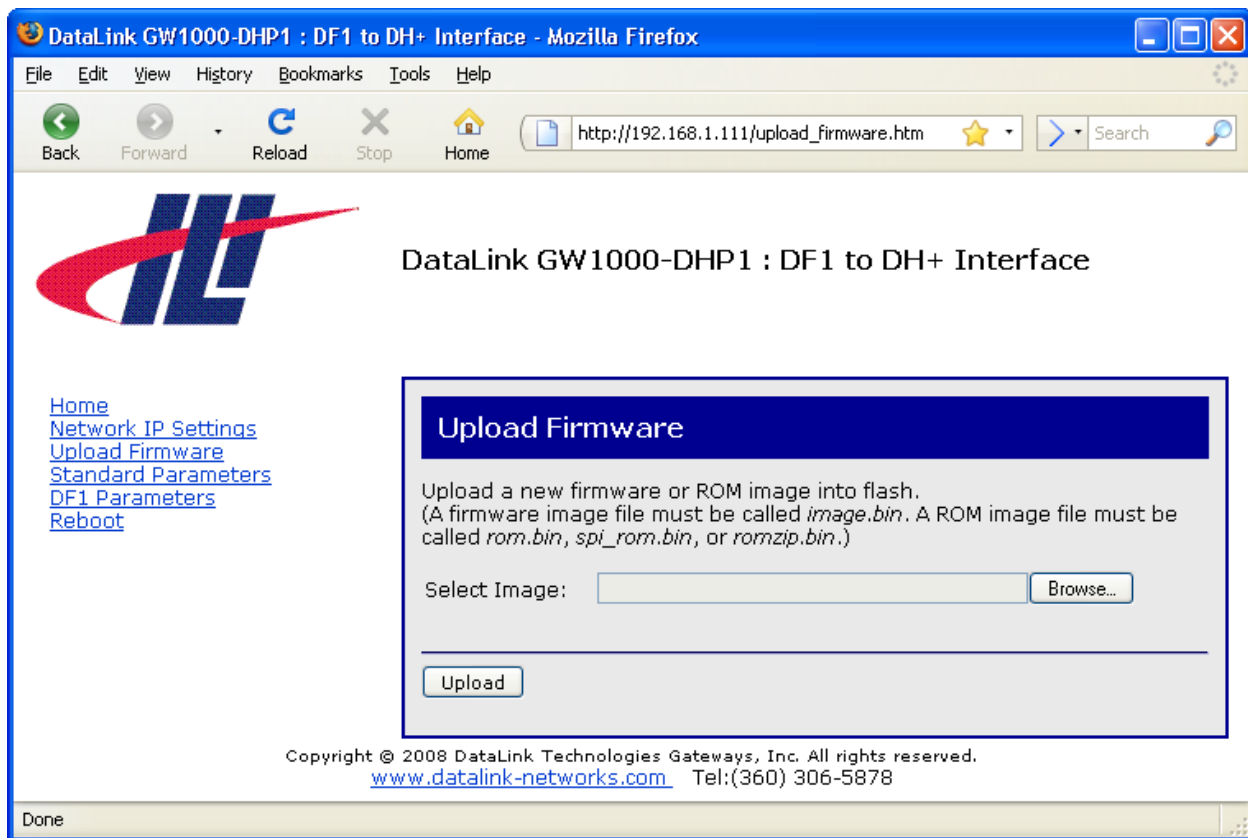
Primary DNS:

Secondary DNS:

Copyright © 2008 DataLink Technologies Gateways, Inc. All rights reserved.
www.datalink-networks.com Tel:(360) 306-5878

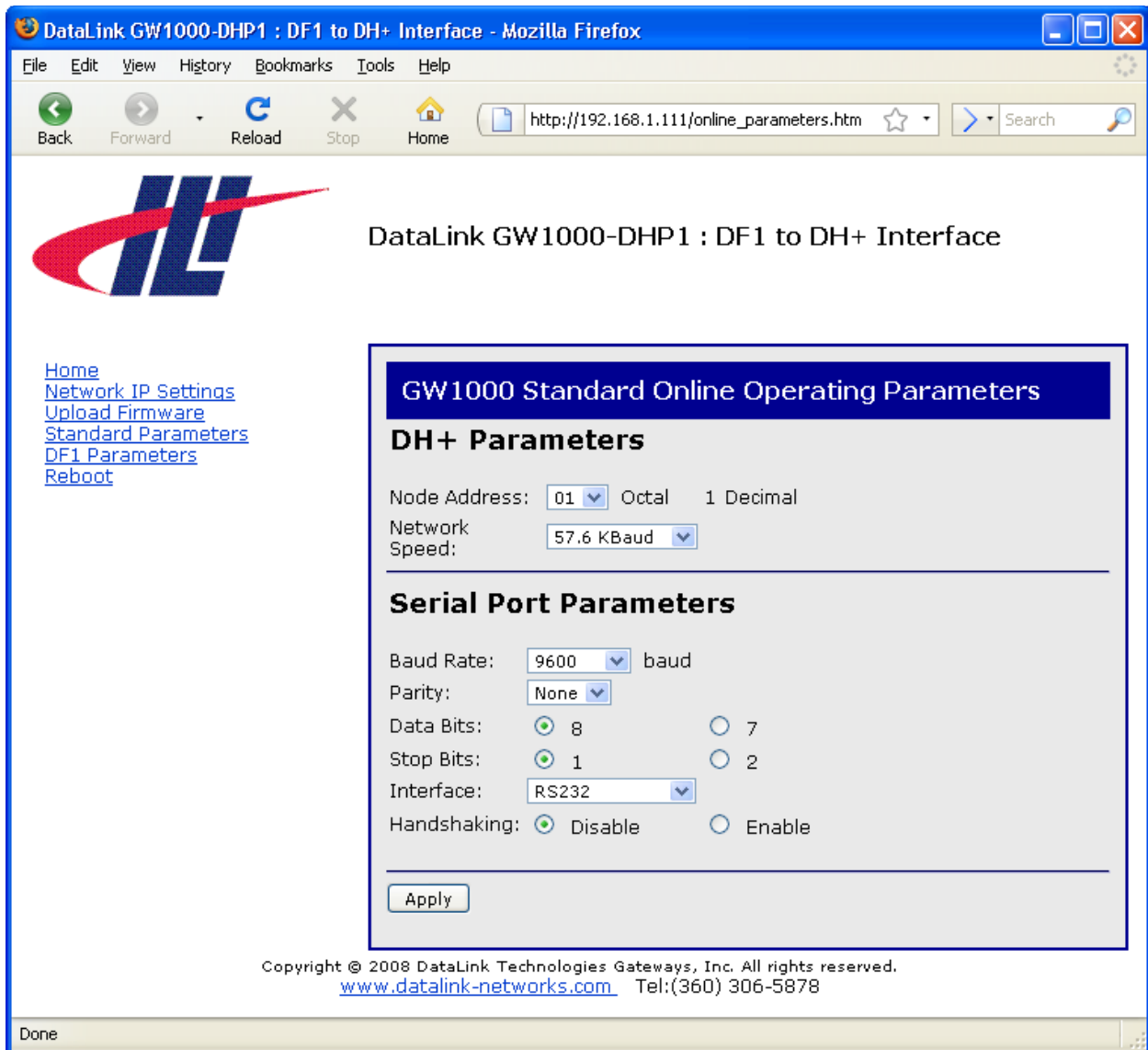
Please set the GW1000 to a static IP address of your choice. If changing the IP address from the default, it is good practice to affix a label to the GW1000 indicating the new IP address for future reference.

4.2.2 Upload Firmware



From this screen, you may browse to a folder on your machine containing revised firmware version. 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. After the firmware update, the GW1000 will reboot automatically and cycle through its start-up LED pattern. Log in to the device again as explained above and check the firmware revision information to ensure a successful upload.

4.2.3 Standard Parameters (GW1000-DHP1)



DataLink GW1000-DHP1 : DF1 to DH+ Interface

[Home](#)
[Network IP Settings](#)
[Upload Firmware](#)
[Standard Parameters](#)
[DF1 Parameters](#)
[Reboot](#)

GW1000 Standard Online Operating Parameters

DH+ Parameters

Node Address: Octal 1 Decimal
Network Speed:

Serial Port Parameters

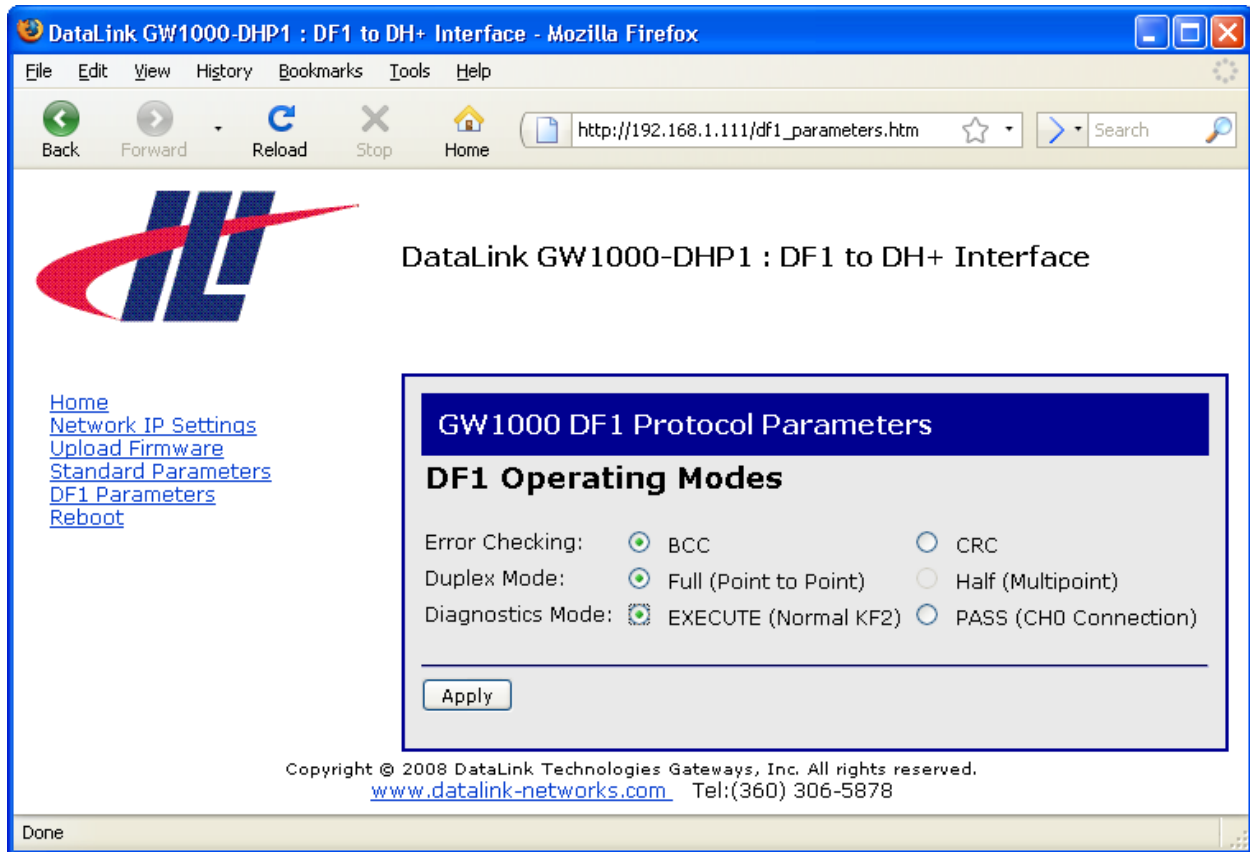
Baud Rate: baud
Parity:
Data Bits: 8 7
Stop Bits: 1 2
Interface:
Handshaking: Disable Enable

Copyright © 2008 DataLink Technologies Gateways, Inc. All rights reserved.
www.datalink-networks.com Tel:(360) 306-5878

From this screen, you may assign a DH+ node address (in octal) and network baud rate for the GW1000. The default node address is 01 and the default baud rate is 57.6Kbaud.

On the serial side of the GW1000, you may set the baud rate, parity, etc. to match that of a connected PC or PLC.

4.2.4 DF1 Parameters (GW1000-DHP1)



Set the Error checking mode to match that of your connected PC or PLC. Default is BCC.

Diagnostics Mode:

EXECUTE is the default. The GW1000 will respond to diagnostic commands it receives. The GW1000 will show up in the RSWho window of RSLINX software.

PASS. The GW1000 will not respond to diagnostic commands it receives. Instead, it passes them on to a connected PLC for example. This is the setting used for connecting the CH0 of a PLC through the GW1000 to the DH+ network.

4.3 Online Diagnostic Statistics

An online diagnostics menu is provided for troubleshooting purposes. This menu is accessed through telnet rather than the web interface.

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 s: “**Netsilicon**” and “**sysadm**” respectively. Please note this login differs from the webscreen login and is also 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↵.

```
Enter Selection: 4
```

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

```
Enter Selection:
```

Pressing 1) or 2) will display the corresponding diagnostic counters. Pressing ENTER will reprint the counters. Pressing SPACE will exit the display of counters. To verify a good DH+ network connection, examine the DH+ counters and the number of active nodes (last item). The correct number of DH+ stations for your system should be shown. The GW1000 is included in the count.

4.4 Restore Factory Defaults

- Power on the unit and immediately depress and hold in the CONFIG button.
- Continue holding the CONFIG button
- While still holding the CONFIG button, the STATUS led will go solid RED for about 5 seconds, and then rapidly blink RED 3 times. Release the CONFIG button now.
- Power down and re-power the unit at this time, or press RESET.
- Log in at default IP address 192.168.1.111 (you may need to temporarily change your laptop's IP address to the same network segment. ie. change your laptop address to 192.168.1.100 for example. If you have a spare independent network hub, or an ethernet crossover cable, this would be the best option so as not to disrupt your network.

Default Settings

(For GW1000-DHP1)

DF1 protocol:

9600 Baud, 8 Bits, No Parity, BCC Checksum

DH+ defaults

57.6 KBaud

Node address: 1 octal, 0x01 hex, decimal 1

4.5 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

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 when 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.

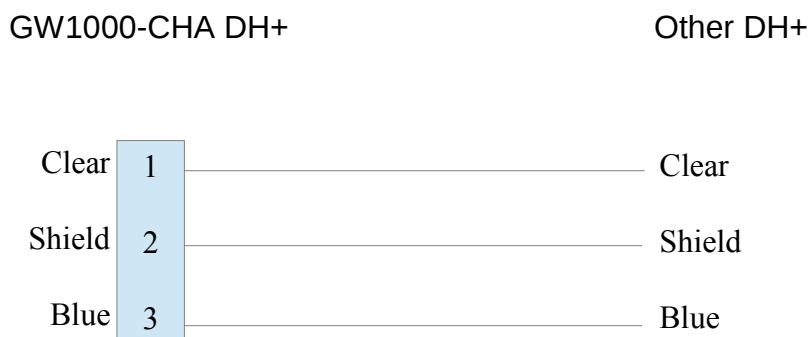
5.2.3 Off-line Modes

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

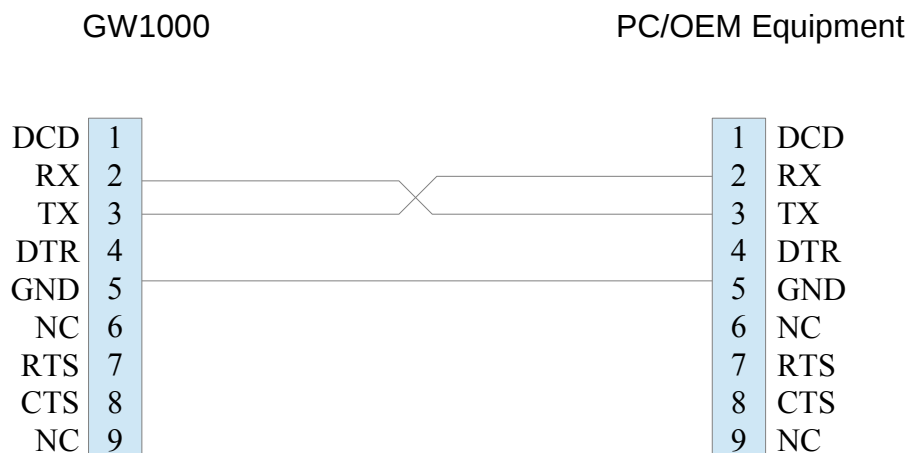
6.1 GW1000 DH+



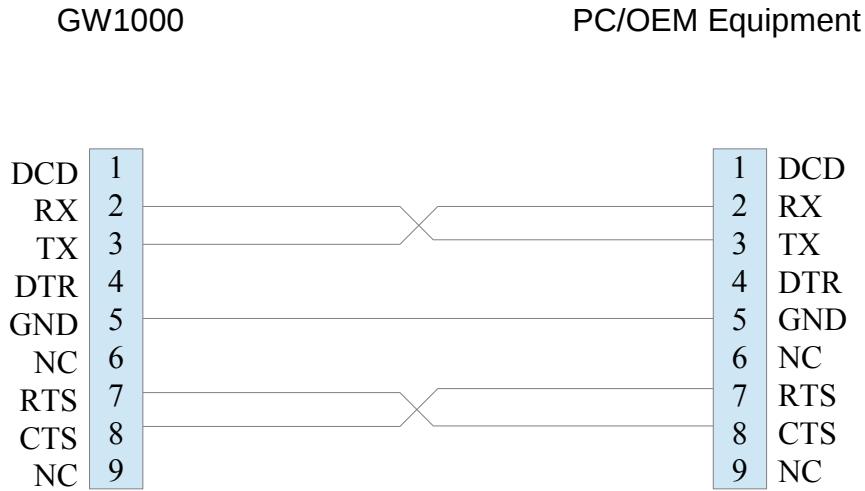
Note: Clear & Blue might have to be swapped depending on existing DH+ wiring

6.2 GW1000 RS232 – No Handshaking

Please note this is a “NULL-modem” cable.



6.3 GW1000 RS232 – With RTS/CTS Handshaking



6.4 GW1000 RS422

(note: observe product label for pin 1 indication)



6.5 GW1000 RS485

(note: observe product label for pin 1 indication)

GW1000		Equipment
Tx+/Rx+	1	_____
Tx-/Rx-	2	_____
	3	_____
	4	_____
Shield	5	_____

Rev. 1.09