DLPCIe

User's Guide

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1.0 DLPCIe General Operation & Applications

The DLPCIe continues the functionality of the current DLPC/DLPCI product line. It offers both the new addition of DH-485 as well an extra Serial com port. New is the ability to have the DLPCIe an extra serial communication port that most desktops don't have.

The DLPCIe has two communication ports. Channel A is designed to connect to you industrial network, either A-B's DH+ or DH-485 networks. Channel B is used to connect to your serial DF1 protocol.

Configuration of the operating parameters is done quickly and easily by the EQ32 windows based software shipped with the unit or available on the Equustek Website.

Currently there are two standard DLPCIe products available to allow access to A-B's DH-485 and DH+ network. Contact Equustek Solutions to see if the DLPCIe is the correct device for your communication needs.

The **DLPCIe-DF1** is a two port device that allows your DF1 driver to communicate with ones on an A-B DH-485 or DH+ network. The DF1 model is a direct replacement for the 1770-KF3 for DH-485 and 1770-KF2 for DH+ and allows your PCs or Laptops access to any node on the corresponding A-B network.

2.0 Hardware Specifications

The DLPCIe Hardware Platform has the following specifications.

2.1 Operating Specifications:

CHA can be configured for DH-485 at 4800, 9600 or 19.2 KBaud, or DH+ of 57.6, 115.2 and 230.4 KBaud

CHB has RS232 with the ability of being configured with asynchronous speeds up to 230.4 KBaud, or 460.8 up on request if needed.

Currently DF is the supported protocol. Both CRC 16 and BCC error checking can be implemented.

Simple Parameter Configuration using menu driven Windows (95/98/ME/XP/NT/2000/VISTA) based Program.
Configuration Pushbutton to setup online configuration parameters.

Operating Parameters are stored in Non-Volatile Serial EEPROM

The DLPCIe uses FLASH upgradeable firmware from the configuration Software.

Color LED's for each communication channel indicates activity and status.

2.2 Physical Specifications:

Dimensions: 4.376" H x 4.0" W
PCI Express bus connection: Can be installed in any X1, X4 , X8, and X16 PCI Express bus slot.
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:PCI Express 3V and 12V - 1.5 Watts

3.0 DLPCIe-Hardware Layout

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

- At the top of the bracket has Configure pushbutton
- CHA DH+ or DH-485 3 pin Screw terminal (Phoenix Type) pin 1 is the bottom one.
- PCI Express Bus connector (CHB the DF1 Physical communication port).
- 9 Pin DSUB connector (Extra General purpose Serial RS232 communication port).

The LED's are from top STATUS LED (ERR), NETWORK LED (CHA) and BUSLED (CHB).

4.0 Mode of Operation

4.1 Online Mode of Operation

Online Mode is the normal operating Mode of the DLPCIe. In this mode the Channels are now configured as they are defined by the configuration and the DLPCIe Model. The DLPCIe is ready to interface your equipment.
The Reset pushbutton automatically puts the DLPCIe into Online mode.

4.2 Offline Mode

Once the Configure Pushbutton is Pressed the Offline BIOS Manager is started. Using either the configuration software and the **"DL Offline Manager"** option or a Windows Hyper Terminal type program with com port settings of 19,2KBaud, 8,N,1 and Xon/Xoff flow control.

BIOS MANAGER for DLPCIe - Ver 1.10a - Jan 14,2009
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MAIN MENU

1 - Restore EEPROM to Factory settings
2 - WRITE new Firmware

3 - Memory DUMP
4 - OFF-LINE Diagnostics
5 - DEBUG Mode

6 - FIRMWARE Version
7 - ONLINE

MAKE SELECTION (1-7) –

4.3 BIOS Manager Options

1. Restore EEPROM to factory settings
   Once Pressed you will be asked "**Restore EEPROM to defaults (Y/N)?**" If the answer is "Y"es then the Online parameters will be reset to defults of Address 1, and settings of 19200,N,8,1 on the communication channel.

2. Write New Firmware
   **Please do not use this option unless instructed by the tech support team.

   Once pressed the message **"This *WILL* overwrite DATALINK system code enter (Y/N) to proceed"** will be displayed. Hit "Y" and the next message will appear telling you that it is alright to send the new firmware to the Flash;
   ERASING FLASH, PLEASE WAIT...

   SEND FIRMWARE TEXT FILE NOW...

   Once the message to send the firmware appears then either click on the "Send Firmware File" button to select the .txt file to send, or send the Text File under HyperTerminal.
   Wait for an **"*A-OK* BURN COMPLETE!"** message to appear.

3. Memory Dump
   This is used to display the RAM memory of the DLPCIe. This should only be done after contacting Equustek Solutions to debug problems.

4. Off-Line Diagnostics
   Starts a series of tests to test the DLPCIe's hardware and should only be done if instructed so by a trained person.

5. Debug Mode
   Starts up a DLPCIe internal Debug mode that can be used by trained personnel to debug problems and check hardware configuration and operation.

6. Firmware Version
   Once selected the current DLPCIe model and version numbers will be displayed. Can be used to check the correct firmware was burnt into the Flash or if the DLPCIe has the most up to date firmware in the Flash.

7. Online
   Does a soft "software" reset of the unit to put it online.5.0 Switch and LED Indicator Functions

5.0 Switch and LED Indicator Functions

5.1 Switch Functions

The Configure pushbutton takes the DLPCIe out of On-Line operation mode and puts it in the BIOS Manager mode. The BIOS Manager mode also allows for configuration parameters to be downloaded from or uploaded to the Windows based configuration software (EQ32). When this mode has been entered the STATUS LED will be RED and BUS LED will be Green while NET LED will be off. To put the unit back On-line use option 7 from the BIOS menu or can power off then on the PC.

5.2 Indicator Functions

5.2.1 Power-Up and Reset Sequence

On Power-up the DLPCIe executes a self diagnostic check-up or the ram and flash firmware. The correct LED indicator sequence to show the DLPCIe is functioning properly is as follows: After all LEDS go out.

LED	**STATUS**
STATUSLED	RED for 0.5 seconds
BUSLED	Green for 0.5 seconds
NETLED	Green for 0.5 seconds

After this sequence the DLPCIe goes into the On-line mode of Operation. The LED indicators will behave in the certain way defined by the DLPCIe model used. Most likely 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 DLPCIe.

LED	**Description of Operation**
NET LED	Solid Green when on line on DH+ or DH485 Network.
BUS LED	Flashes or solid Green if there is activity of the DF1 side.
STATUS LED	Flashes RED for 0.5 seconds if a NAK is received or transmitted in DF1 protocol. Will also flash RED if duplicate node address.

5.2.3 On-Line, Power-Up and Reset Errors

The following table describes the meaning of LED patterns if the internal diagnostic tests detect an error on Reset/Power-Up.

LED Pattern	**Description of Problem**
All Three LED's Flashing	The flash has not be burnt properly and the A-OK was not transmitted. Please reburn the flash with the correct text file. Contact Customer Support for help.
Start-up Sequence keeps repeating.	The DLPCIe EEPROM is corrupt.. Please Restore to Factory Settings (See Section 1.1) and then reconfigure the unit.

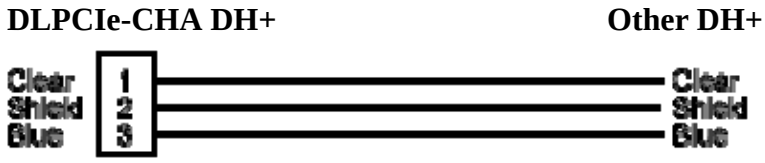
5.2.4 Off-Line Modes

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

LED Pattern	**Description of Operation**
STATUSLED ON NETLED OFF and BUSLED ON	BIOS Manager/Configuration Parameter Download/Upload
All Three LED's ON	Offline Debug Mode

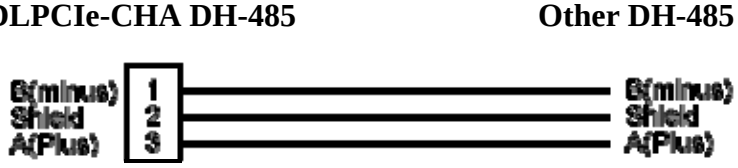
6.0 DLPCIe Wiring Diagrams

6.1 Online Cable DLPCIe-CHA DH+



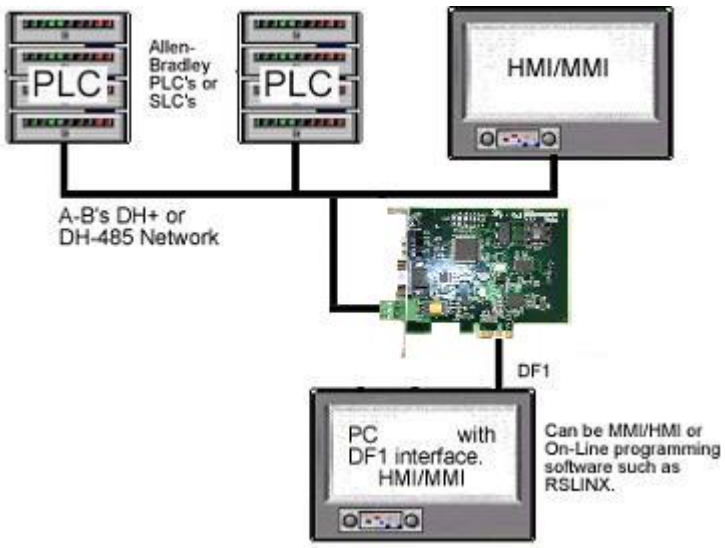
Note: Clear & Blue might have to be swapped depending on existing DH+ wiring

6.2 Online Cable DLPCIe-CHA DH-485



7.0 DLPCIe DH-485/DH+ Networking Applications

7.1 DLPCIe-DF1 – DF1 to DH-485/DH+ interface



Note:
PC can be running RS-LINX or like software (MMI) to have access to nodes on the DH-485/DH+ Network.

Appendix A: Installing the RS232 Serial Driver For the PCI Express BUS

Installing Device Drivers for Default Configuration (Two RS232 Serial Ports)

The software installation comprises three stages:
- Installing the GPIO Adapter
- Installing the PCI Express Multiport Serial Adapter
- Installing the PCI Express UART Ports

1. When the OXPCIe952 board is detected by the operating system, the Found New Hardware Wizard Welcome screen appears.
Select No, not this time, as the required files will be installed from the driver CD, then select Next.
2. When the next display appears, select Install from a list or specific location (Advanced), followed by Next. Follow the instructions below to install the required files.

GPIO Adapter
3. The base system device (GPIO Adapter) will now be installed. To locate the files required, select **Browse** in the next display, then browse to **c:\Device Drivers\Windows\Windows_XP - 32\General Purpose IO** on the driver CD , then
select **Next**.

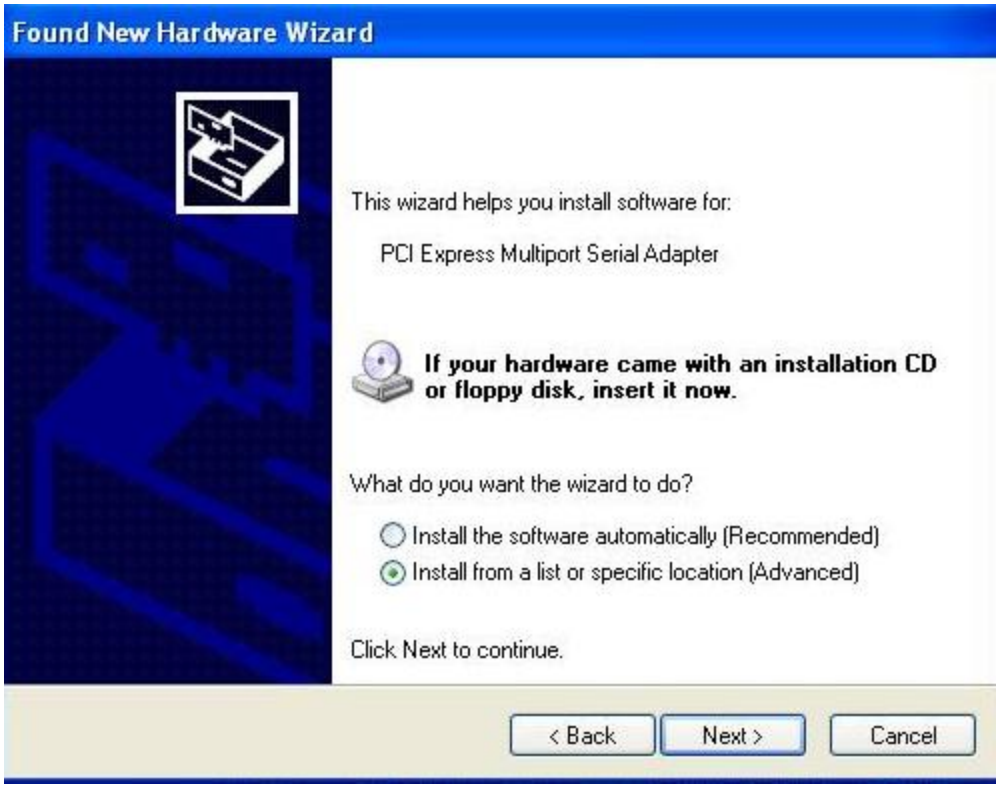
PCI Express Multiport Serial Adapter
4. When the GPIO has been installed the Found New Hardware Wizard **Welcome** screen re - appears. Select **No, not this time**, because the required files will be installed from the driver CD, then select **Next**.
5. The drivers for the PCI Express UART Ports will now be installed. When the next display appears, select **Install from a list or specific location (Advanced)**, followed by **Next**. Follow the instructions below to install the required files.
6. To locate the files required, select **Browse** in the next display, then browse to C:***Device Drivers\Windows\Windows_XP - 32\Native UART*** on the driver CD , then
select **Next**. The operating system now installs the required files.
When the installation is complete, select **Finish** on the screen that appears. The PCI Express Multiport Serial Adapter has now been installed.

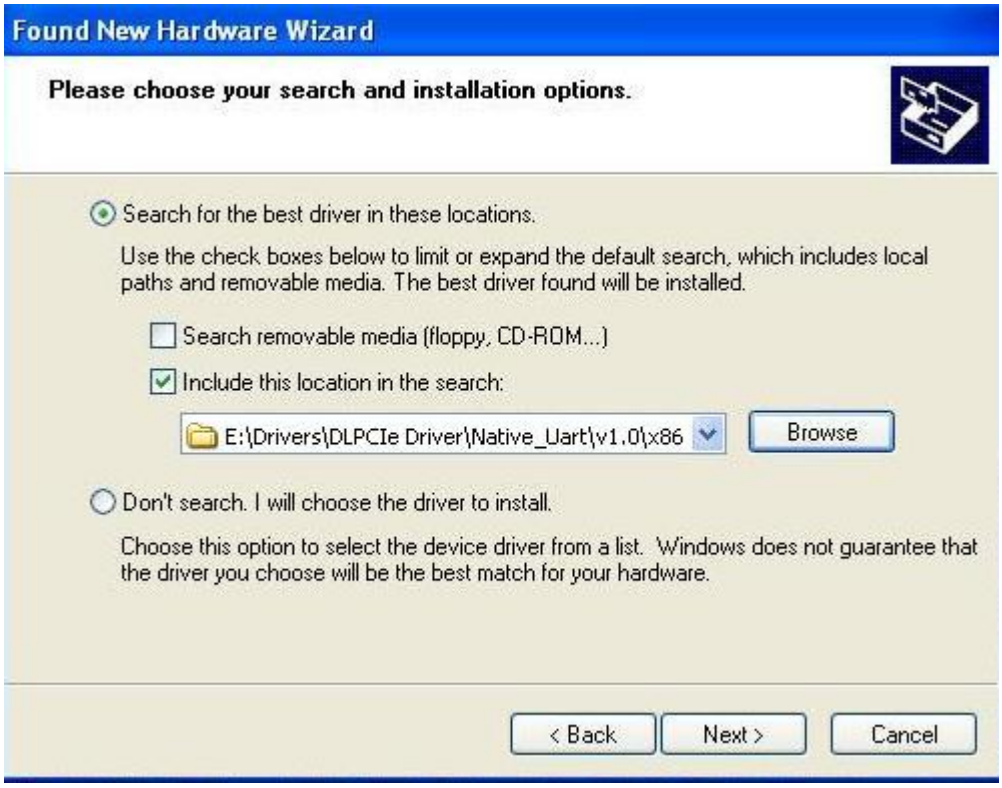
1st PCI Express UART Port
7. When the PCI Express Multiport Serial Adapter has been installed the Found New Hardware Wizard **Welcome** screen reappears.
Select **No, not this time**, because the required files will be installed from the Driver CD, then

select **Next**.
8. The driver for a PCI Express UART Port will now be installed. When the next display appears, select **Install the software automatically (Recommended)**, followed by **Next**.
9. When the installation is complete, select **Finish** on the screen that appears. The first PCI Express UART port has now been installed.

2nd PCI Express UART Port
10. When the first PCI Express UART port has been installed the Found New Hardware Wizard **Welcome** screen re‑appears. Select **No, not this time**, because the required files will be installed from the Driver CD; select **Next**.
11. The drivers for the second PCI Express UART Port will now be installed. When the next display appears, select **Install the software automatically (Recommended)**, followed by **Next**.
12. The second PCI Express UART port has now been installed and the installation of the default configuration is now complete.

Screen shots for an example of installing a driver are shown below

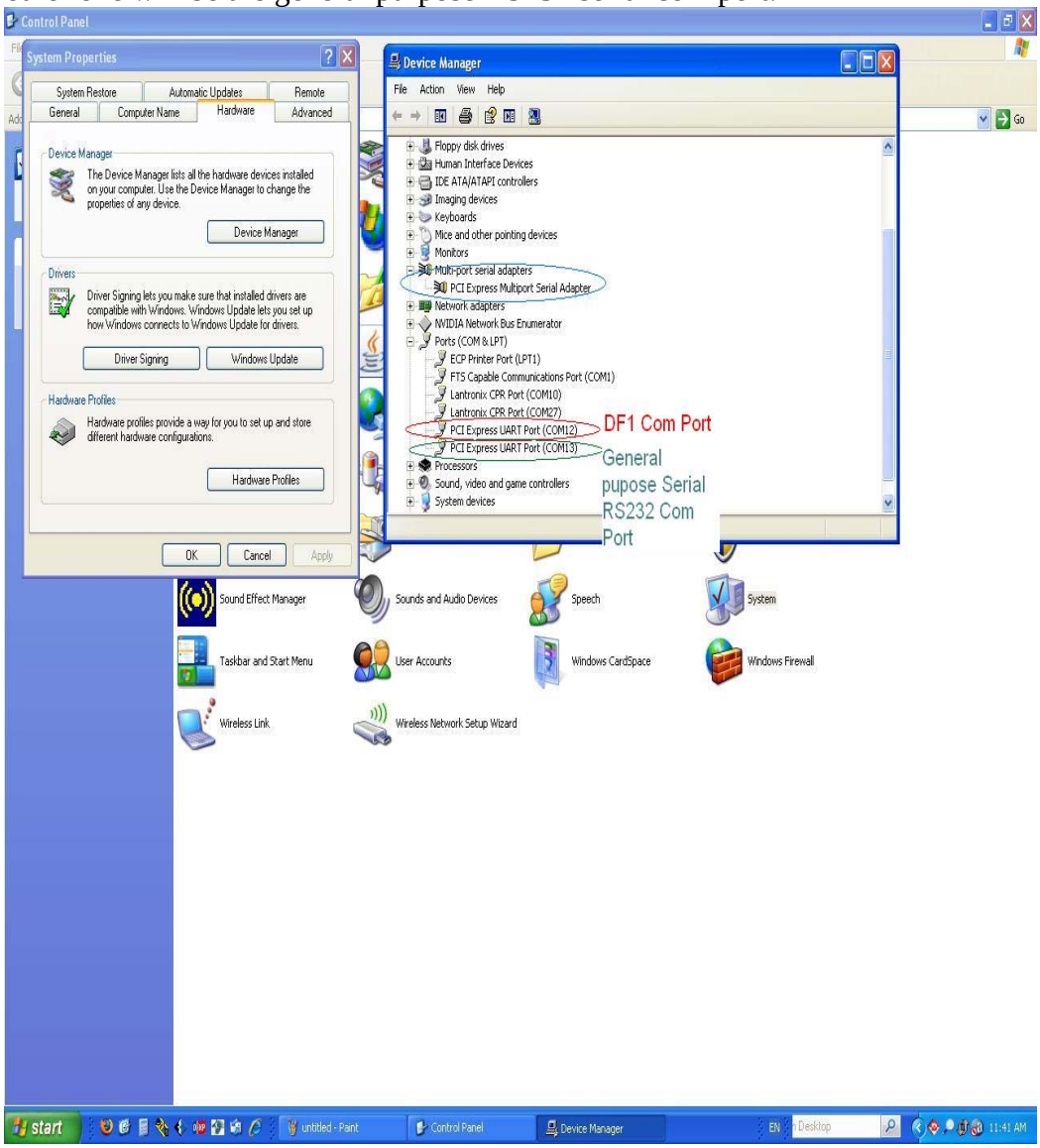

Found New Hardware Wizard
This wizard helps you install software for:
PCI Express Multiport Serial Adapter
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
E:\Drivers\DLPCIe Driver\Native_Uart\v1.0\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

After installing the driver please make sure that it is installed correctly by checking it under the device manager, it should be some thing like it is shown below but with different port number depending on what is installed in the PC.

The COM Port with lowest number is the one to be used for the DF1 Driver.

While the other one will be the general purpose RS232 serial com port.

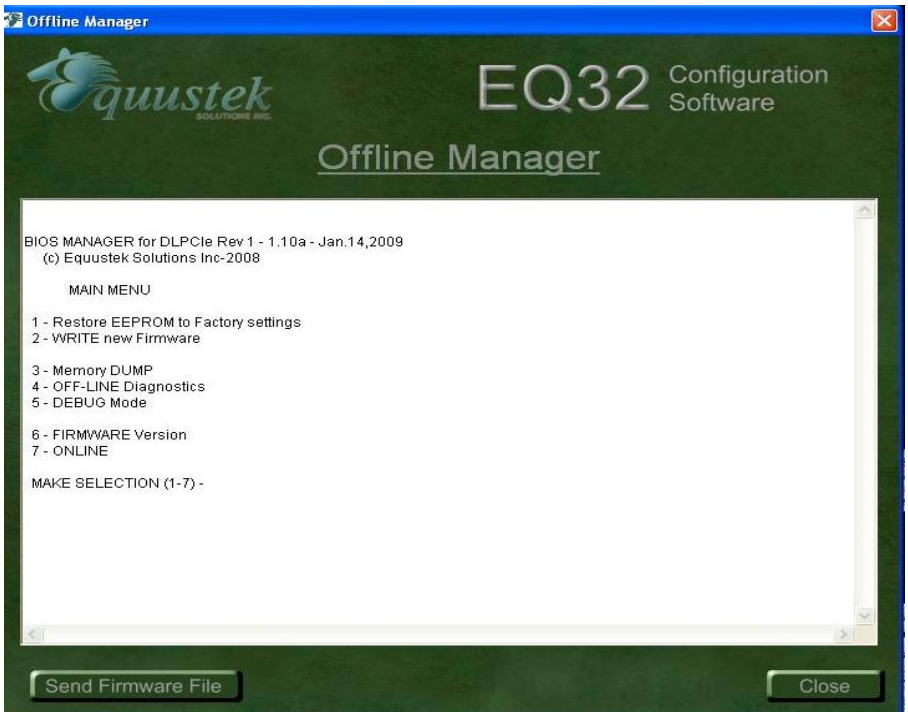


Appendix B: Configuring the DL_PCI Express BUS card

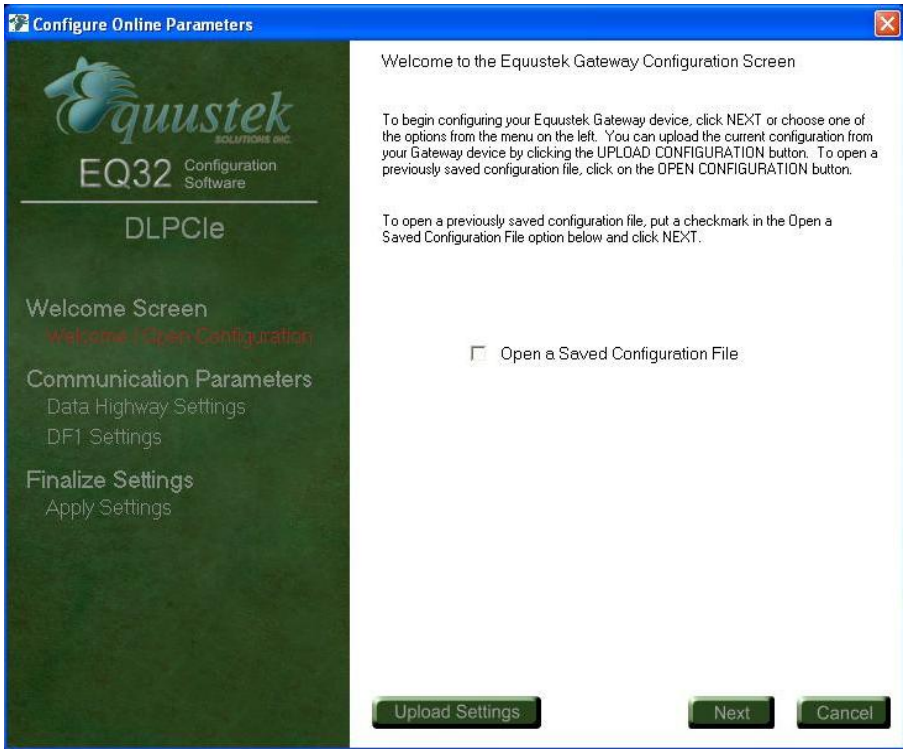
1- Using the EQ32 configuration software to configure the unit, all the screen shots below show an example of that.

Click on the DLPCIe Button

Select the DF1 Com port that was found under the Device Manager, then click on the Offline Manager button, you should see some thing like the screen below.

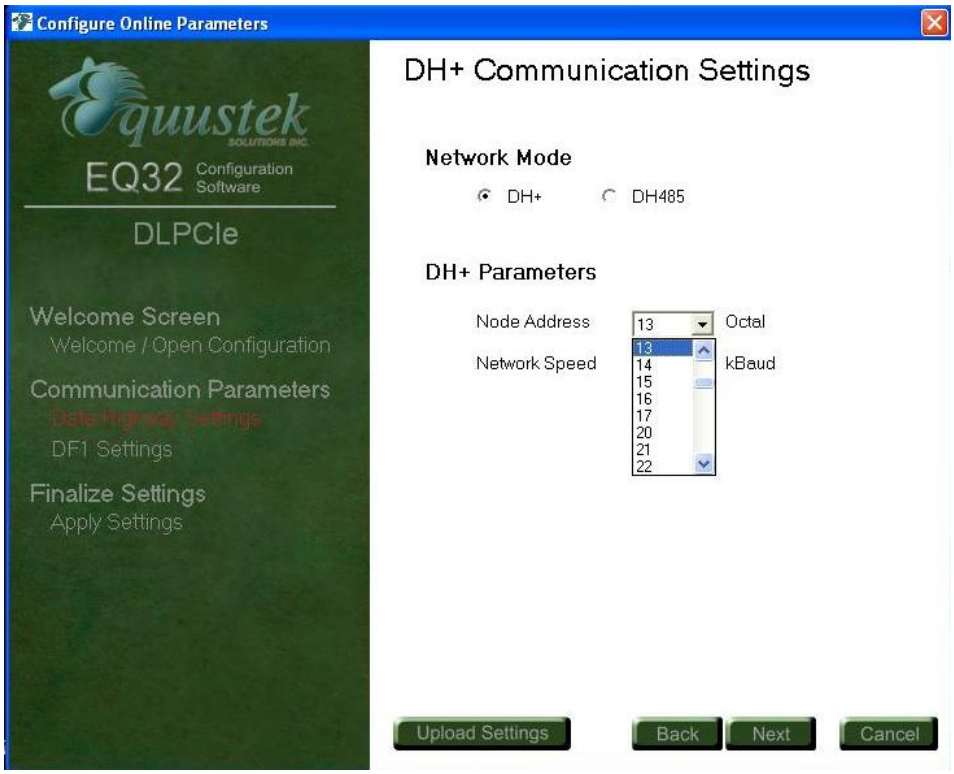


This confirms that the serial port is working, click on close. Then click on Configure button. It should come up with the screen shot shown below.

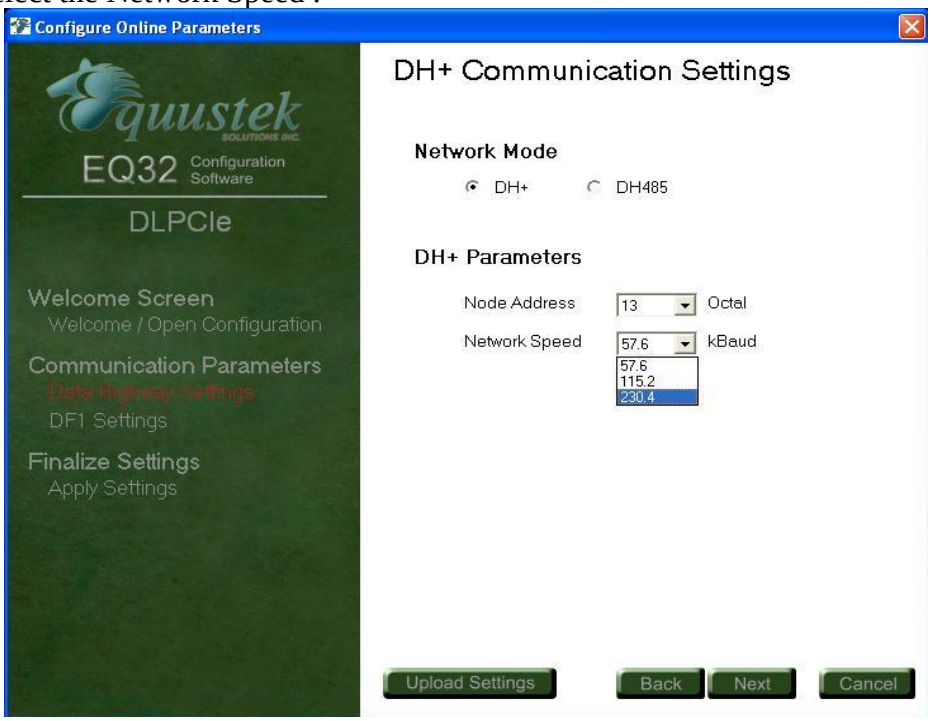


Click on Next

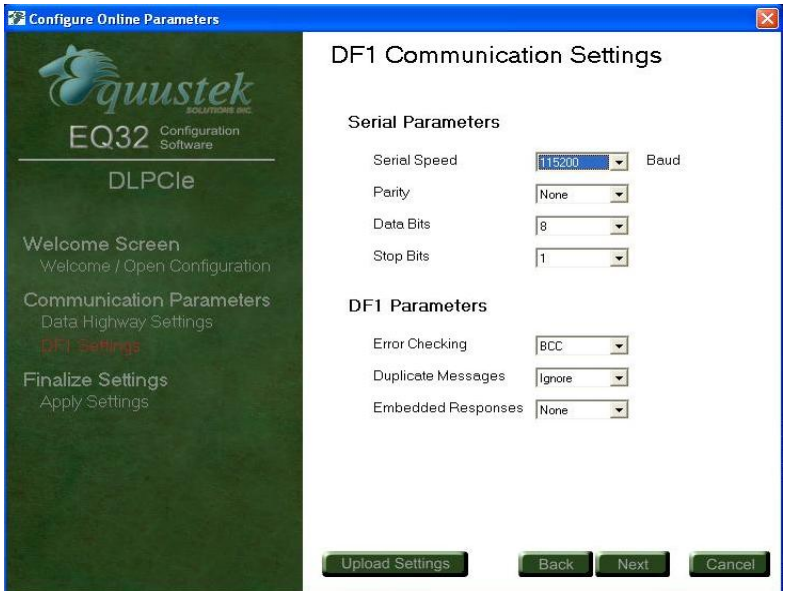
On next screen shot select the Network mode DH+ or HD485 and also select the node address number in Octal, please make sure that it is not a duplicate.



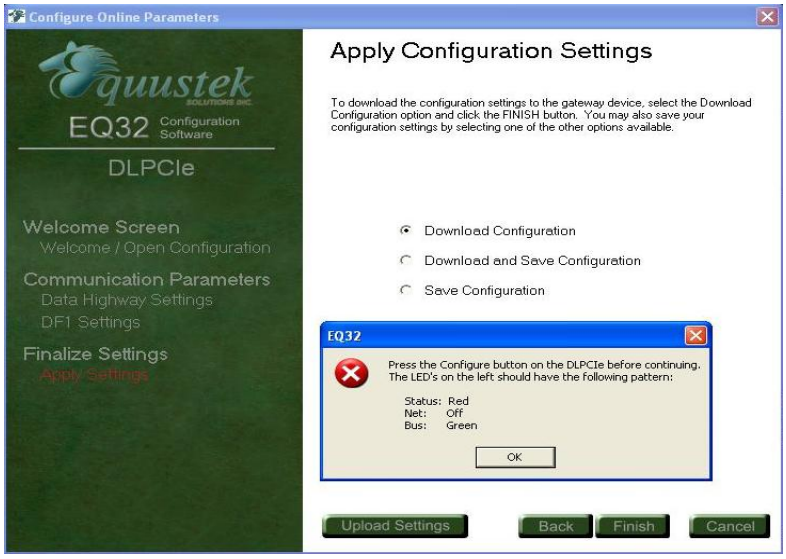
Here select the Network Speed .



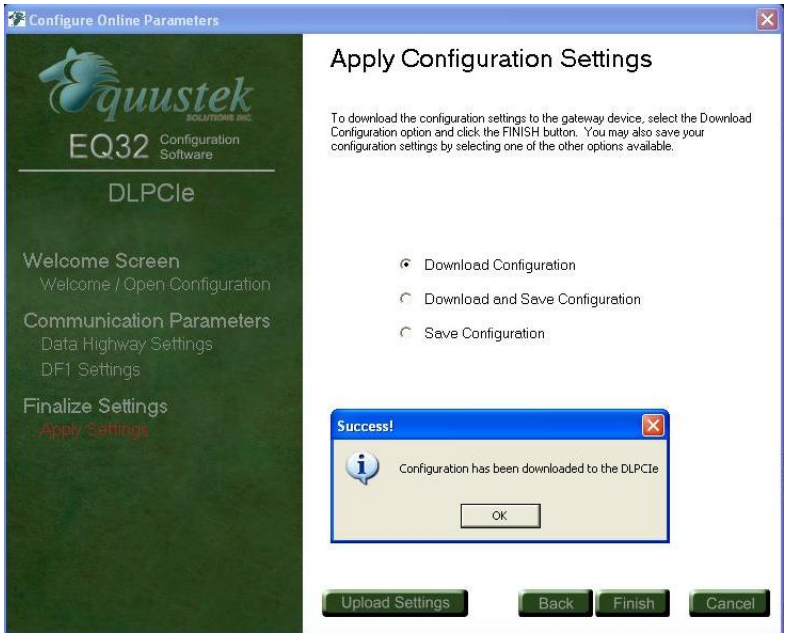
Click on Next then enter the DF1 serial Parameters shown below.



Click on Next and make sure that the unit is in configure mode other wise press the configure button as shown below.



Click on Ok then on Next. It should come with what is shown below



Click on Ok, then on Finish, and close the EQ32 program.

2- Configuring the Card using the Switch SW2:

2.1Select The Network Node address and Baud rate settings:

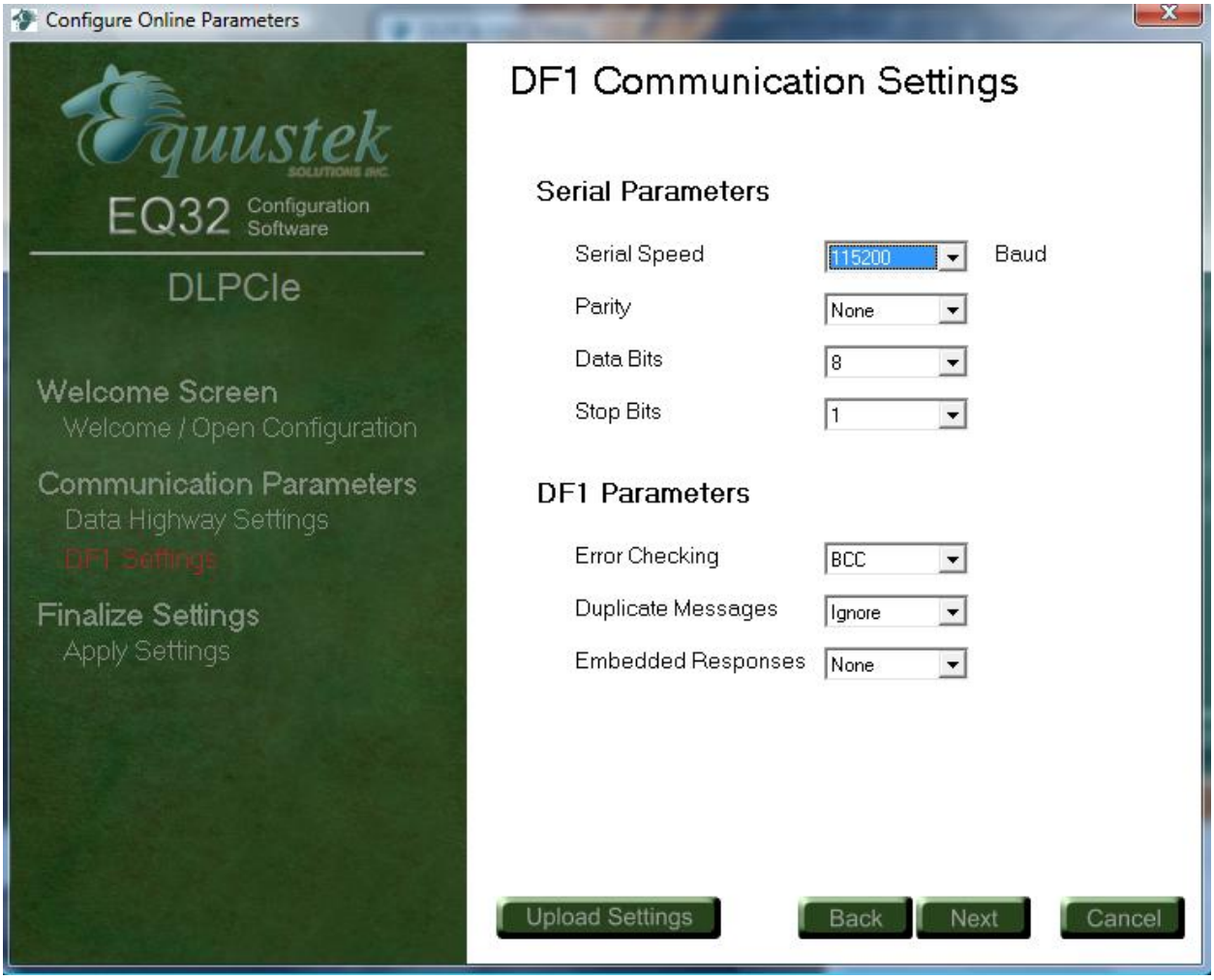
Please not that SW ON= 0 and SW OFF =1

Network Baud Rate	Switches 2-1
230.4Kbaud	OFF-OFF
115.2Kbaud	OFF-ON
57.6Kbaud	ON-OFF
EEPROM	ON-ON

Node Address Octal	Switches 8-7-6-5-4-3
0	ON-ON-ON-ON-ON-ON
1	ON-ON-ON-ON-ON-OFF
2	ON-ON-ON-ON-OFF-ON
3	ON-ON-ON-ON-OFF-OFF
…	…
10	ON-ON-OFF-ON-ON-ON
…	…
33	ON-OFF-OFF-ON-OFF-OFF

Node Address Octal	Switches 8-7-6-5-4-3
50	OFF-ON-OFF-ON-ON-ON
…	…
63	OFF-OFF-ON-ON-OFF-OFF
64	OFF-OFF-ON-OFF-ON-ON
…	…
75	OFF-OFF-OFF-OFF-ON-OFF
76	OFF-OFF-OFF-OFF-OFF-ON
77	OFF-OFF-OFF-OFF-OFF-OFF

As for the DF1 parameters they are preconfigured as shown below.



If different settings are required please use the EQ32 to configure the unit with the EEPROM as shown in the previous step.