



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 comes in two hardware models one for DH+ and another for DH-485, it also gives an extra RS232 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 your industrial network, either A-B's DH+ or DH-485 networks depending on hardware model. 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 Allen Bradley 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 Allen Bradley network.

To replace the AB 1784-PKTX now you can use our DLPCIE since all new PCs has only PCI-Express bus, but please make sure you select the right model for your network DH+ or DH485, also remember that the DLPCIE uses Allen Bradley DF1 driver or 1784U2DHP driver, not the 1784KT driver.

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, again depending on the hardware model.

CHB has RS232 with the ability of being configured with asynchronous speeds up to 115.2 KBaud.

Currently DF1 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/WIN7/WIN8 & WIN10) 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 DLPCle-Hardware Layout

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



- 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 DLPCle. In this mode the Channels should be configured as they are defined by the configuration and the DLPCle Model. The DLPCle is ready to interface your equipment.

To put the unit online there are two option:

Option1: Pressing 7 from the BIOS MANAGER Offline menu puts the DLPCle into Online mode (This is a software RESET).

Option2: Power off then power on the PC will puts the DLPCle into Online mode(This is a hardware RESET).

4.2 Offline Mode

Once the Configure Pushbutton is pressed the Offline BIOS Manager is started. Using either the EQ32 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 will show the BIOS MANAGER menu shown below.

BIOS MANAGER for DLPCle - Ver 1.10a - Jan 14,2009
(c) Equustek Solutions Inc. 2008

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 defaults of Address 1, and settings of 9600,N,8,1 on the communication channel, and DH+ baud rate to 57.6 K Baud.

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 DLPCle. This should only be done after contacting Equustek Solutions to debug problems.
4. Off-Line Diagnostics
Starts a series of tests to test the DLPCle’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

5.1 Switch Functions

The Configure pushbutton takes the DLPCIE out of On-Line operation mode and puts it in the BIOS Manager mode (Off Line or Configuration 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 of 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 on DH+/DH485 exists.

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

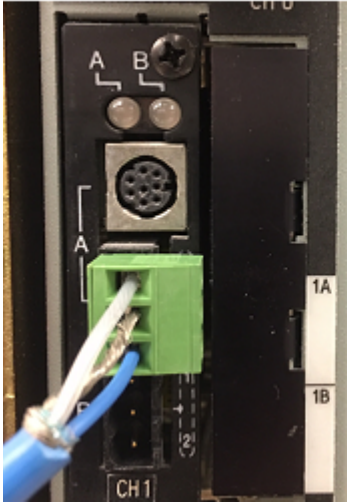
The following table describes the meaning of LED patterns in the different Off-Line modes of operation.

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

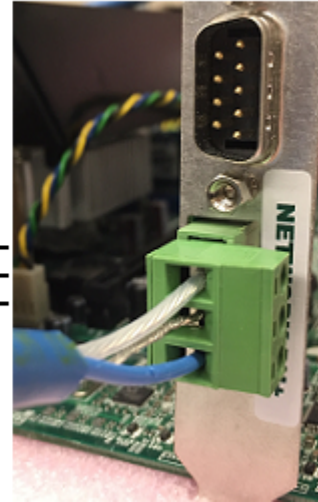
6.0 DLPCle Wiring Diagrams

6.1 Online Cable DLPCle-CHA DH+

Allen Bradley PLC DH+



DLPCle DH+

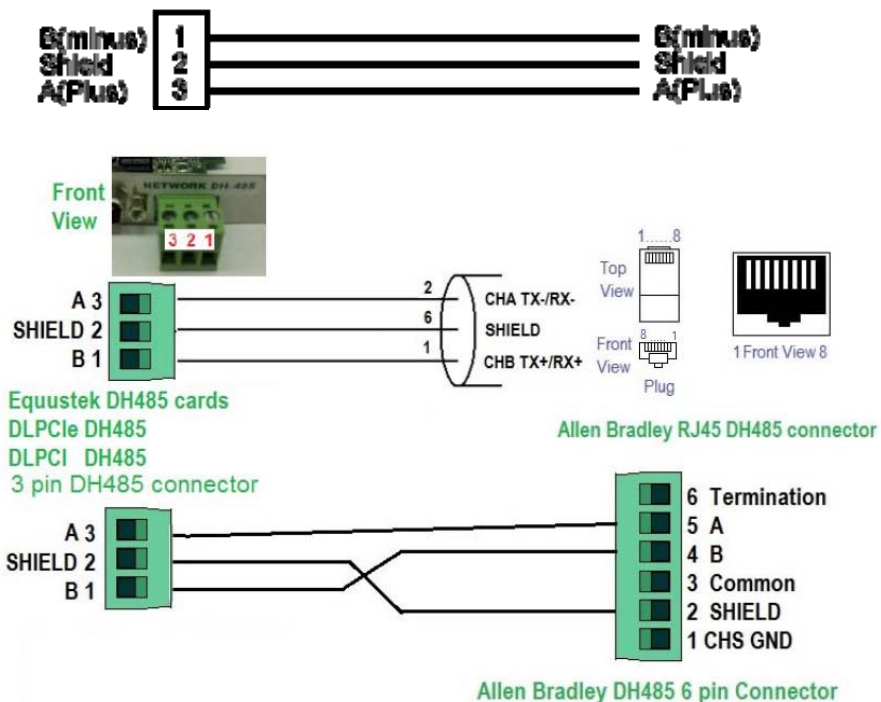


Note: DH+ wiring of the DLPCle is compatible with AB DH+ 3 pin connector in a way that if you unplug any DH+ 3 pin connector from any DH+ device and plug it in the DLPCle it should work.

6.2 Online Cable DLPCle-CHA DH-485

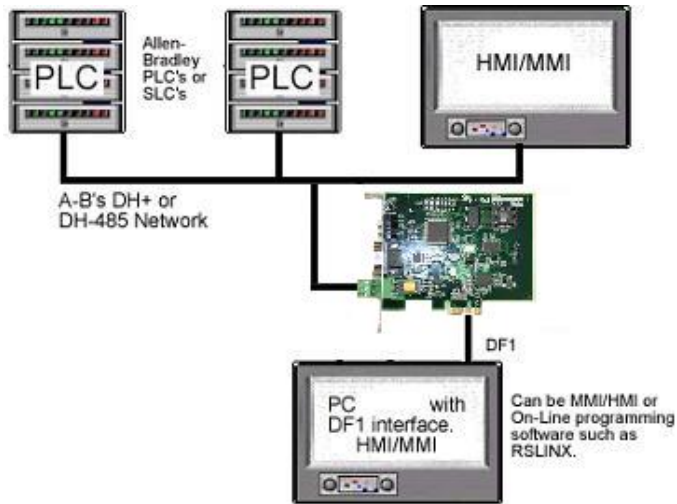
DLPCle-CHA DH-485

Other DH-485 Nodes



7.0 DLPCle DH-485/DH+ Networking Applications

7.1 DLPCle-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

A1- Screen shots for an example of installing a driver for Windows XP 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 >

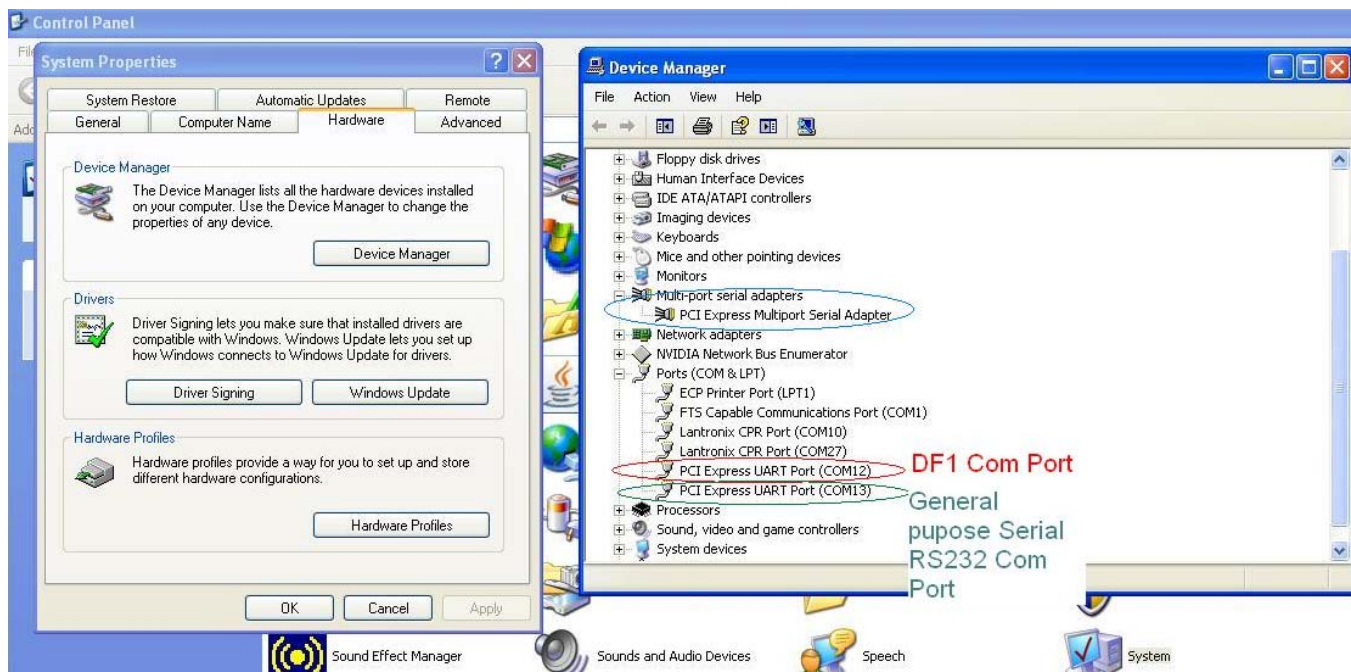
Cancel



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.

Depending on your PC and windows, usually the COM Port with lowest number is the one to be used for the DF1 Driver, since sometimes it is not the case it is recommended to make sure, so please press the configure push button on the unit then use Offline Manager in EQ32 software after selecting one of the ports, if you see the BIOD MANAGER menu then that is the port that is used for DF1 if you don't see the menu go back and select the other port and make sure this time you see the menu in offline manager and use that port for the DF1 driver.

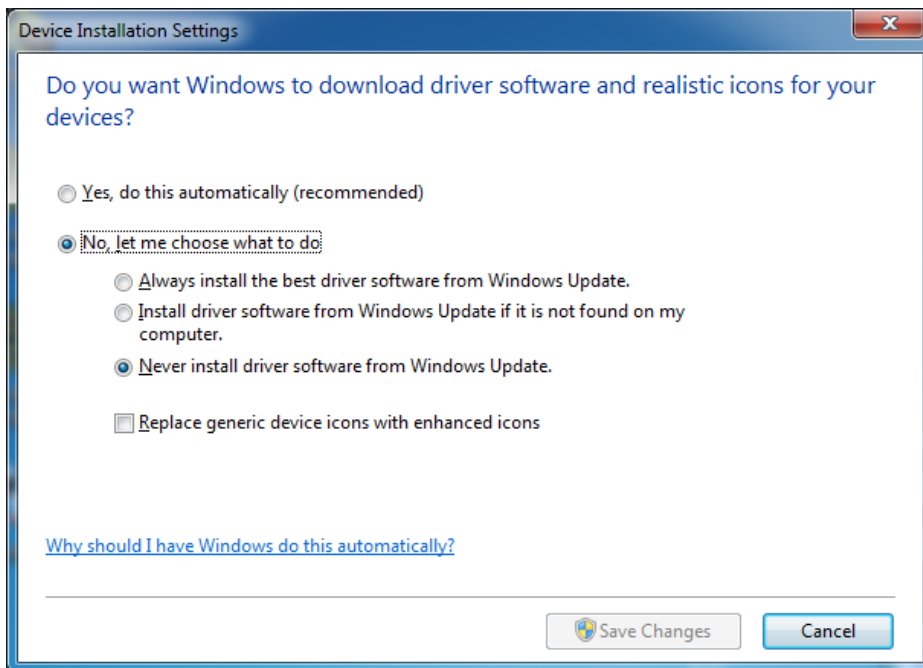
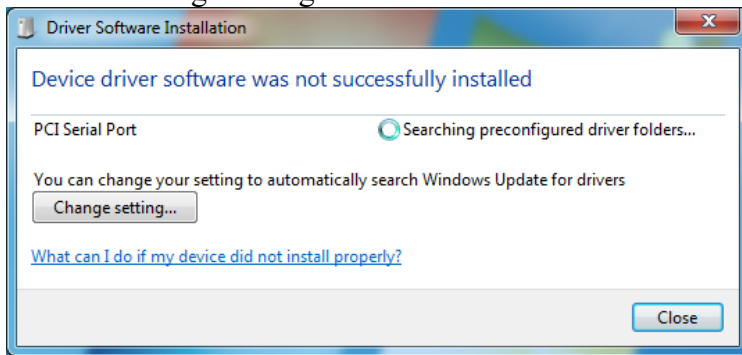
While the other one will be the general purpose RS232 serial com port.



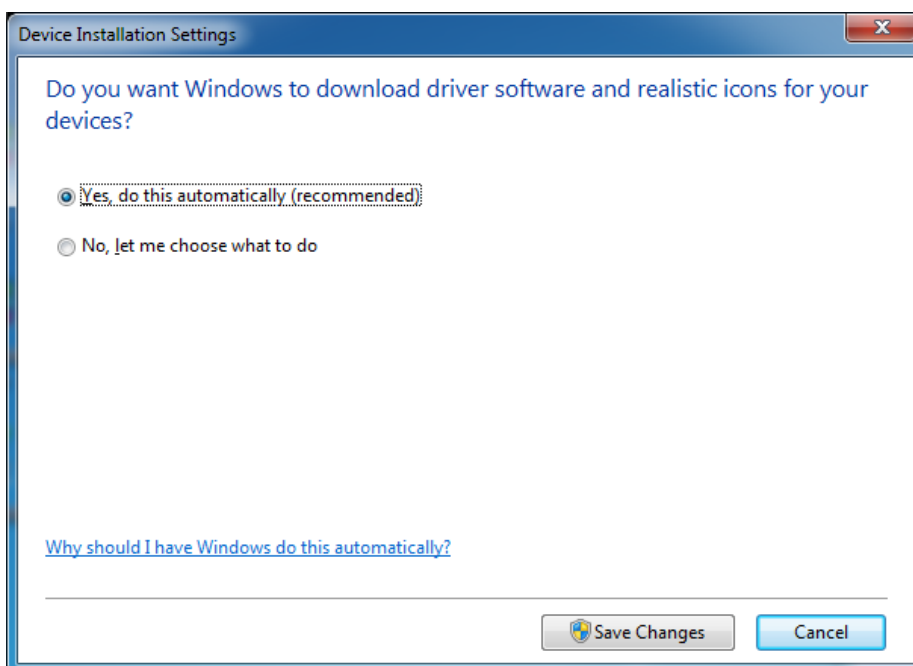
A2- Equustek DLPCiE (Allen BradleyDF1 to DH+ / DH485) PCI Express Bus Card with Windows 7

In case Windows 7 does not successfully install the DLPCiE driver like what you see in the following screen shots.

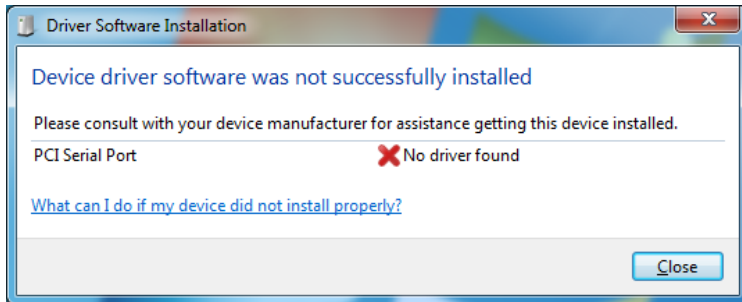
Click on Change setting..



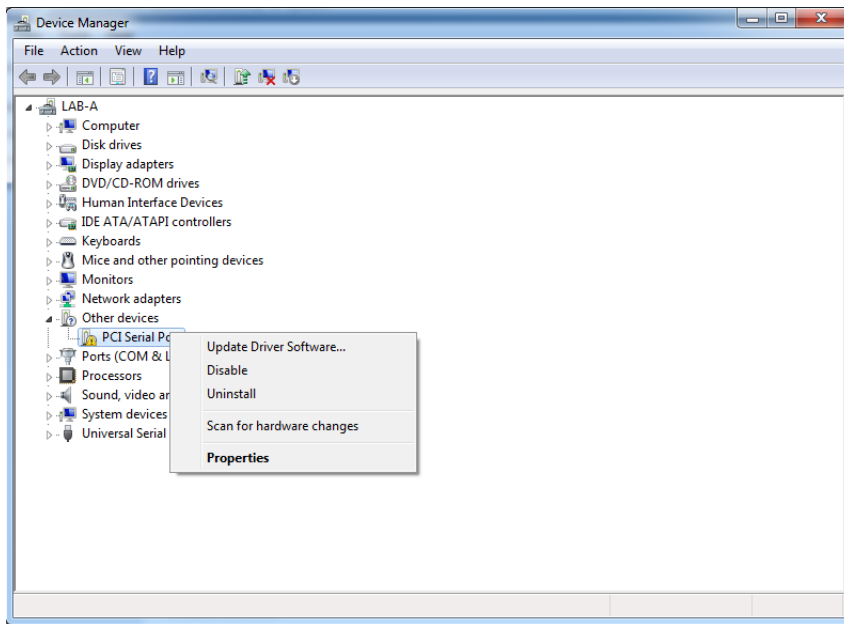
Change it to Automatic update.



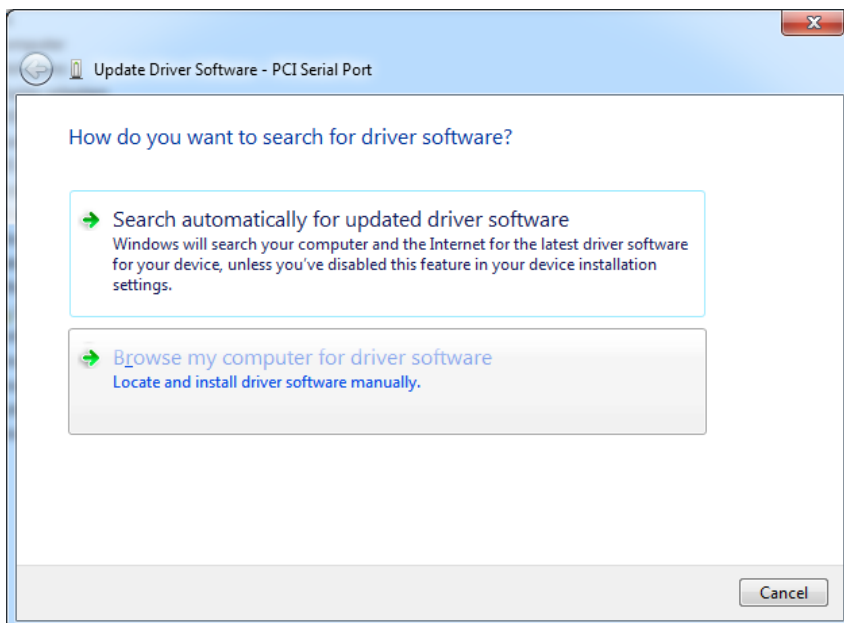
And if it still does not find the driver like what you see below.



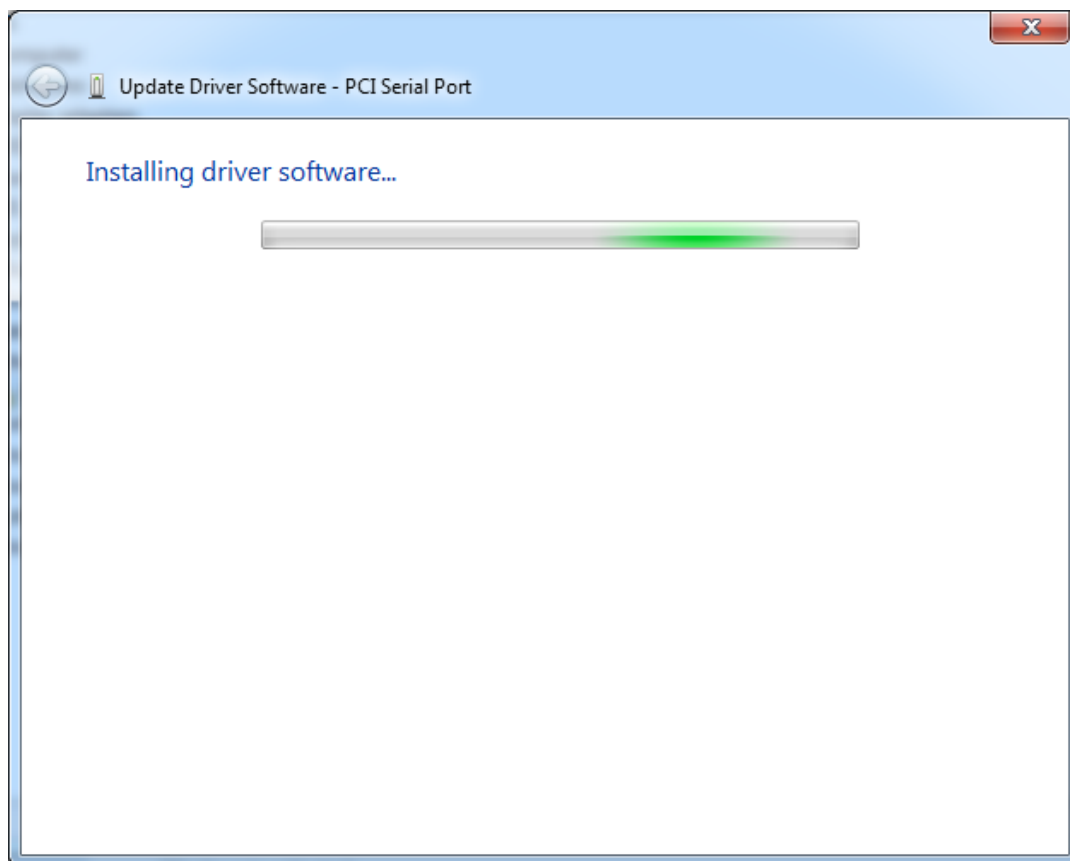
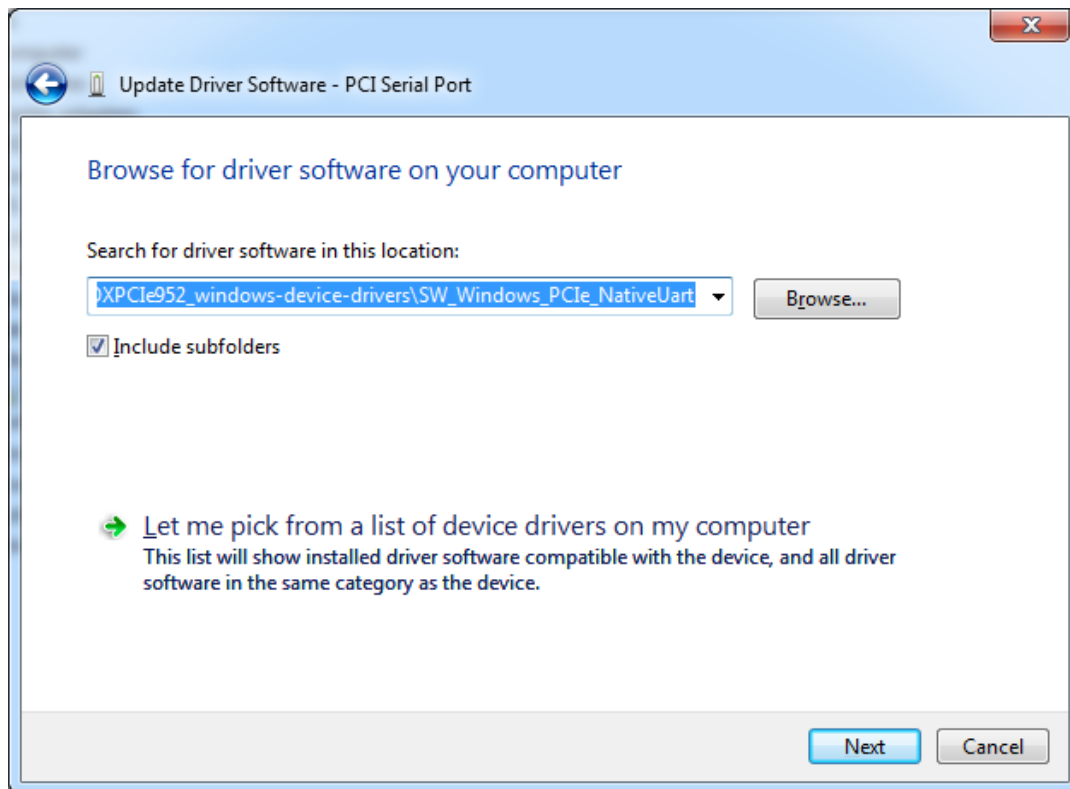
Then go to your device manager and look under ports and LPTs and click on update driver software.



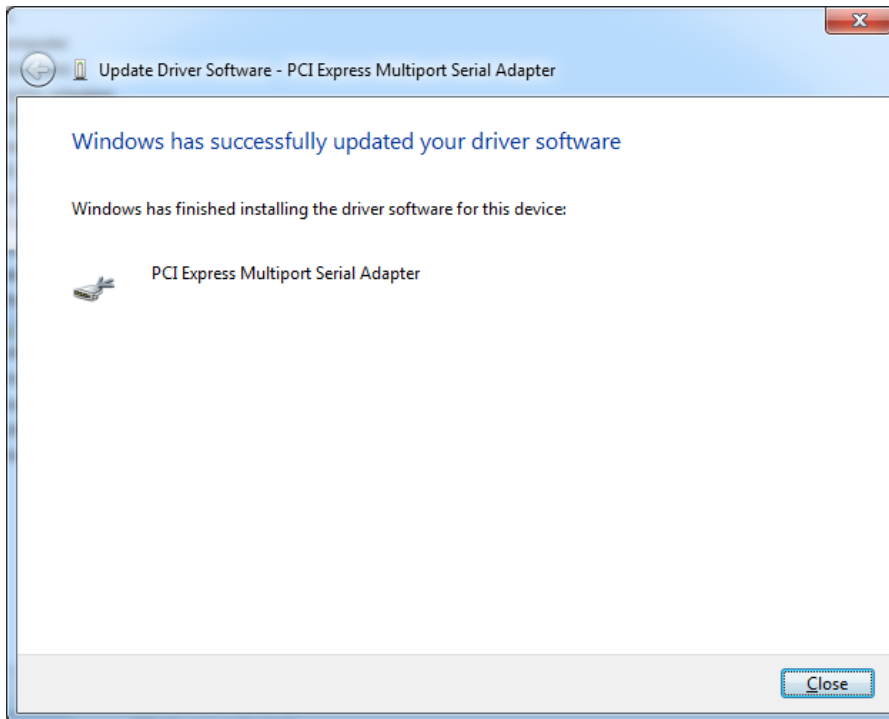
Choose Browse my computer.



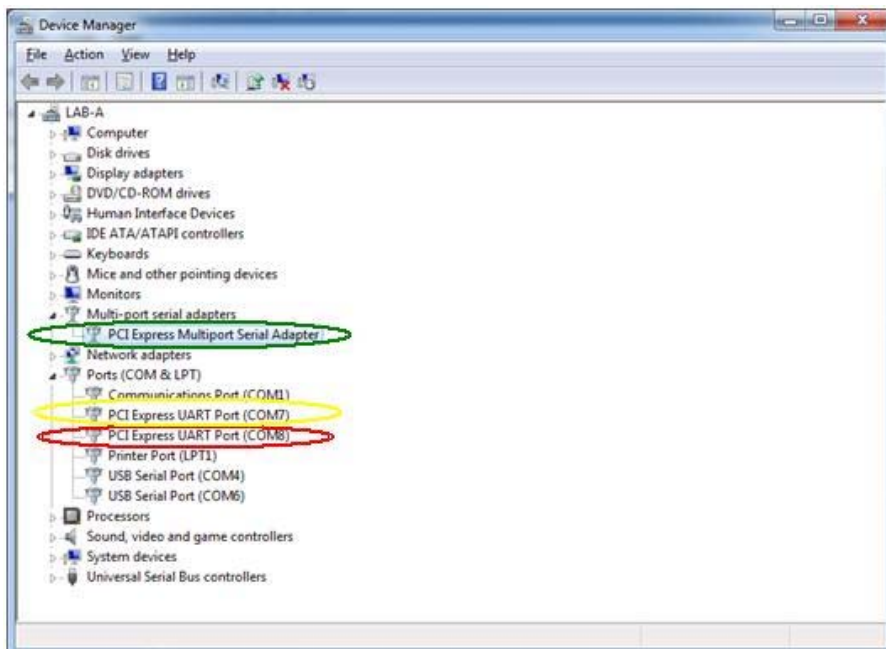
Browse to where the SW_Windows_PCIe_NativeUart folder is on your CD and click on Next



Wait until you see



The two serial port numbers will differ from one PC to another and you can change the number to your desired available one.



That will complete the installation of the PCI Express driver for the card. please use the same procedure shown before to find the right DF1 port.

Same driver is used for windows 8, 8.1 and windows 10.

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



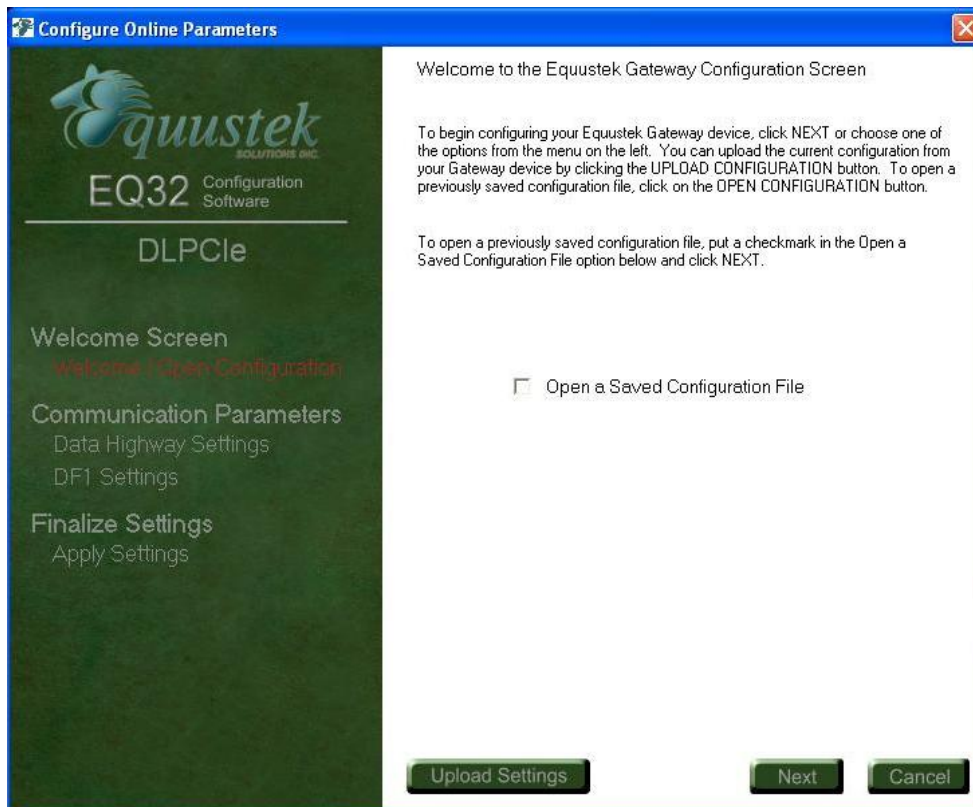
Select the DF1 Com port that was found under the Device Manager, then click on the Offline Manager button, you should see some thing like the screen below.



If you don't see this menu, then as explained before go back and select the other port number once you see the BIOS MANAGER menu shown above, that confirms that the serial port is working, click on close.

Then click on Configure button in EQ32

It should come up with the screen shot shown below.



Click on Next

Here 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 (Selected Node address does not exist on network).

Configure Online Parameters

quustek
SOLUTIONS INC.
EQ32 Configuration Software
DLPCle

Welcome Screen
Welcome / Open Configuration

Communication Parameters
Data Highway Settings
DF1 Settings

Finalize Settings
Apply Settings

DH+ Communication Settings

Network Mode
☒ DH+ ☐ DH485

DH+ Parameters

Node Address: 13 Octal

Network Speed: 13 kBaud

Upload Settings Back Next Cancel

Here select the Data Highway Network Speed .

Configure Online Parameters

quustek
SOLUTIONS INC.
EQ32 Configuration Software
DLPCle

Welcome Screen
Welcome / Open Configuration

Communication Parameters
Data Highway Settings
DF1 Settings

Finalize Settings
Apply Settings

DH+ Communication Settings

Network Mode
☒ DH+ ☐ DH485

DH+ Parameters

Node Address: 13 Octal

Network Speed: 57.6 kBaud

Upload Settings Back Next Cancel

Click on Next to enter the DF1 serial Parameters .

Configure Online Parameters

quustek
SOLUTIONS INC.
EQ32 Configuration Software
DLPCle

Welcome Screen
Welcome / Open Configuration

Communication Parameters
Data Highway Settings
DF1 Settings

Finalize Settings
Apply Settings

DF1 Communication Settings

Serial Parameters

Serial Speed: 115200 Baud

Parity: None

Data Bits: 8

Stop Bits: 1

DF1 Parameters

Error Checking: BCC

Duplicate Messages: Ignore

Embedded Responses: None

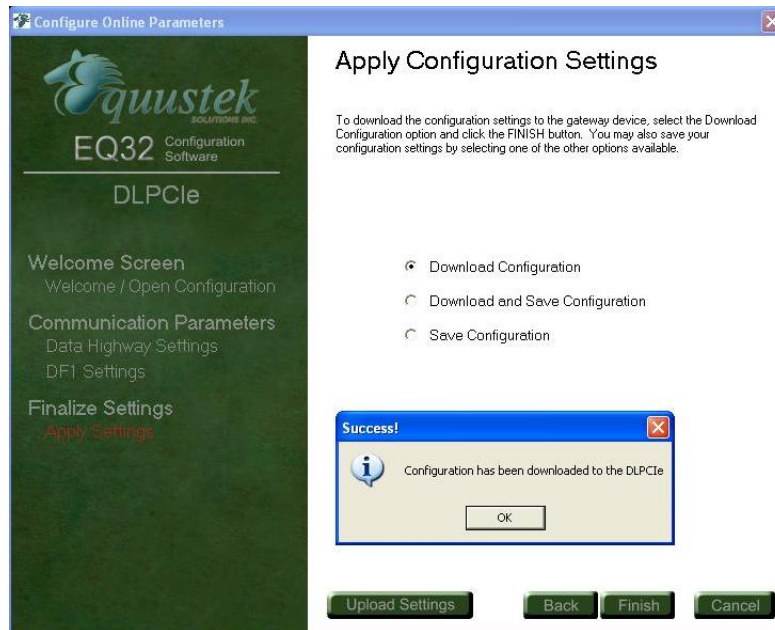
Upload Settings Back Next Cancel

Click Next

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.

It is recommended to have a Hardware RESET of the card after configuration, that is done by power Off then Power on the PC.

2- Configuring the Card using the Switch SW2:

2.1 Select The Network Node address and Baud rate settings:

Please note 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.

The screenshot shows a software window titled 'Configure Online Parameters'. On the left is a dark green sidebar with the 'quustek SOLUTIONS INC.' logo and 'EQ32 Configuration Software' text. Below this is a 'DLPCle' section with a menu: 'Welcome Screen' (Welcome / Open Configuration), 'Communication Parameters' (Data Highway Settings, **DF1 Settings**), and 'Finalize Settings' (Apply Settings). The main area is titled 'DF1 Communication Settings' and contains two sections: 'Serial Parameters' and 'DF1 Parameters'. The 'Serial Parameters' section has four dropdown menus: 'Serial Speed' (set to 115200 Baud), 'Parity' (None), 'Data Bits' (8), and 'Stop Bits' (1). The 'DF1 Parameters' section has three dropdown menus: 'Error Checking' (BCC), 'Duplicate Messages' (Ignore), and 'Embedded Responses' (None). At the bottom are four buttons: 'Upload Settings', 'Back', 'Next', and 'Cancel'.

Parameter	Value
Serial Speed	115200 Baud
Parity	None
Data Bits	8
Stop Bits	1
Error Checking	BCC
Duplicate Messages	Ignore
Embedded Responses	None

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