

DLPCI/104
User's Guide

Fig 1 : DLPCI/104 DF1/DH+ Version

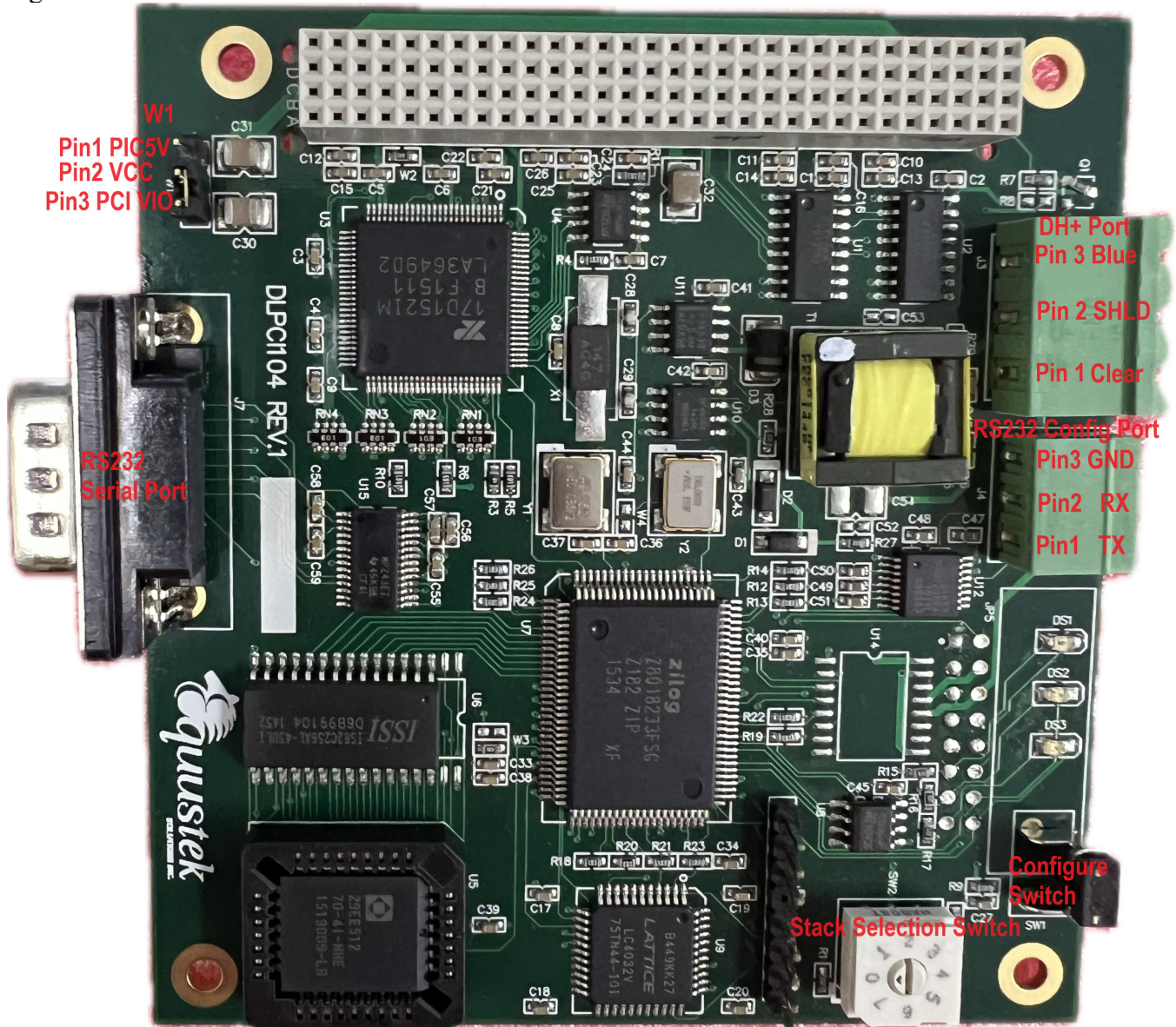
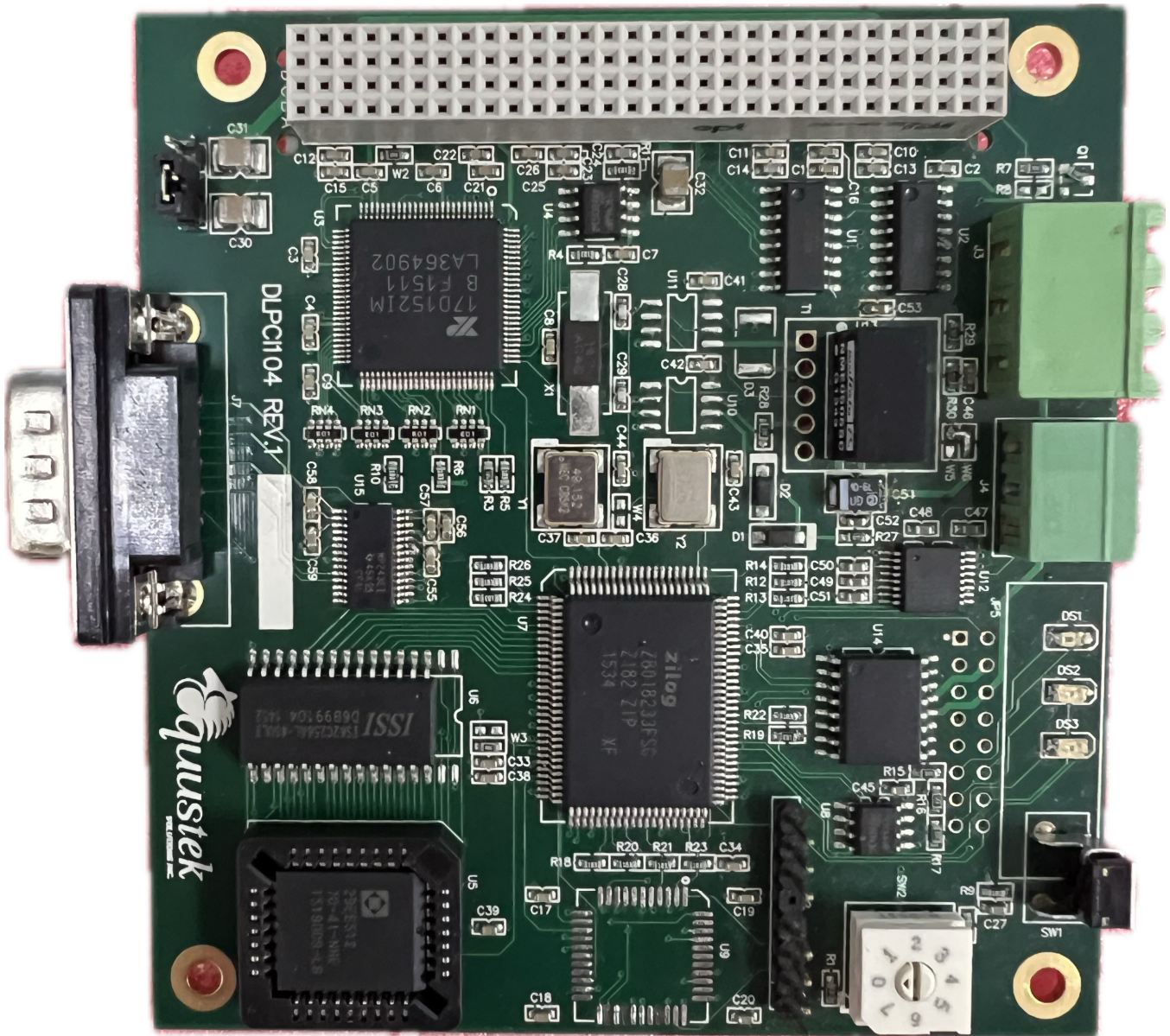


Fig 2 : DLPCI/104 DF1/DH485 Version



Equustek Solutions, Inc.
Suite 286, 5489 Byrne Rd.
Burnaby, BC, Canada
V5J 3J1
Toll Free: 888-387-3787
<http://www.equustek.com>
Revision 1.01 – Mar. 06, 2024

Table of Contents

1.0 DLPCI/104 General Operation & Applications.....	4
2.0 Hardware Specifications.....	4
2.1 Operating Specifications:	4
2.2 Physical Specifications:	4
3.0 DLPCI/104-Hardware Layout.....	5
4.0 Mode of Operation	5
4.1 Online Mode of Operation	5
4.2 Offline Mode.....	6
4.3 BIOS Manager Options.....	6
5.0 Switch and LED Indicator Functions	7
5.1 Switch Functions	7
5.2 Indicator Functions.....	7
5.2.1 Power-Up and Reset Sequence	7
5.2.2 Normal On-line Operation	7
5.2.3 On-Line, Power-Up and Reset Errors	8
5.2.4 Off-Line Modes	8
6.0 DLPCI/104 Wiring Diagrams.....	8
6.1 Online Cable DLPCI/104-CHA DH+	8
6.2 Online Cable DLPCI/104-CHA DH-485.....	9
7.0 DLPCI/104 DH-485/DH+ Networking Applications.....	9
7.1 DLPCI/104-DF1 – DF1 to DH-485/DH+ interface.....	9
Appendix A: Installing the RS232 Serial Driver For the DLPCI/104.....	10
Appendix B: DLPCI/104 Configuration:.....	14

1.0 DLPCI/104 General Operation & Applications

The DLPCI/104 continues the functionality of the current DLPC/DLPC104 and DLPCI product line. It offers the Allen Bradley DH+ or DH-485 support.

The DLPCI/104 has three communication ports. Channel A is designed to connect to your industrial network, either A-B's DH+ or DH-485 network. Channel B is used to connect to your serial DF1 protocol. Channel C is 3 pin RS232 used for offline configuration and testing. It also provide an extra RS232 DB9 serial communication port to the industrial PC for general use.

Configuration of the operating parameters is done quickly and easily by the EQ32 configuration software shipped with the unit or available on the Equustek [Website](#).

There are two standard hardware models for DLPCI/104 product available to allow access to Allen Bradley's DH+ or DH-485 network. Each one has it's own firmware version one that support DH+ networks and another that supports DH485 networks.

The **DLPCI/104-DF1** is a two port device that allows your DF1 driver to communicate with an Allen Bradley either DH+ or DH-485 networks. The DF1 model is a direct replacement for the 1770-KF2 for DH+ and 1770-KF3 for DH-485 and allows your PCs access to any node on the corresponding Allen Bradley network.

2.0 Hardware Specifications

The DLPCI/104 Hardware Platform has the following specifications.

2.1 Operating Specifications:

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

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

Currently DF1 is the supported protocol. Both CRC 16 and BCC error checking can be implemented.

Simple Parameter Configuration using menu driven Windows

(XP/NT/2000/VISTA/WIN7/WIN8/WIN/10 & Windows11) based Program.

Configuration Pushbutton switch to setup online configuration parameters.

Operating Parameters are stored in Non-Volatile Serial EEPROM

The DLPCI/104 uses FLASH upgradeable firmware from the configuration Software.

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

2.2 Physical Specifications:

Dimensions:

Main PCB 3.55"(90.20mm)W x 3.775"(96mm)L x 0.8464"(21.5mm)H

PCI/014 bus connection: Can be installed in any PCI/104 bus slot.

Operating Environment: 32 to 158 °F (0 to 70 °C)

Storage: -40 to 185°F (-40 to 85°C)

Humidity: 5% to 95% non-condensing

Power:PCI/104 3.3V & 5V - 1.1 Watts

3.0 DLPCI/104-Hardware Layout

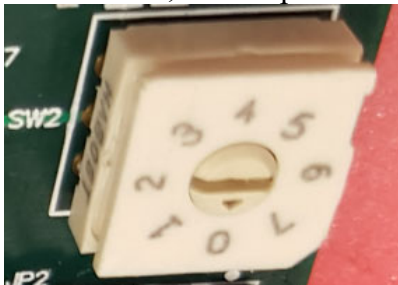
This Section contains information of the physical position and purpose of the components of the DLPCI/104.

- Configure push button switch.
- The LED's starting for the Configure switch are, BUS LED (DF1), NETWORK LED (DH+) STATUS LED (ERR)
- 3 Pin connector (External Serial RS232 communication port for DLPCI/104 configuration, used in case there is a bus communication issue).
- CHA DH+ 3 pin connector (Phoenix Type) pin 1 on the switch side is CLEAR, pin 2 is SHIELD and Pin3 is BLUE.

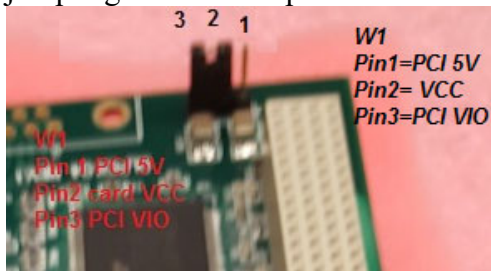
3.1 Hardware Installation:

Depending on where the card is going to be stacked use the rotating switch to select the stack position or (Slot Number) that will select its (ID Select , Clock, INTR).

Switch positions 0 or 4 selects slot 1, Switch positions 1or 5 selects slot 2, Switch positions 2or 6 selects slot 3, Switch positions 3or 7 selects slot 4.



The DLPCI/104 is universal power card, the power VCC of the card is supplied through jumper W1, in case the VIO of the PC is 5V jumper goes between pin2&3, if the VIO is 3.3 then the jumper goes between pin 1&2.



4.0 Mode of Operation

4.1 Online Mode of Operation

Online Mode is the normal operating Mode of the DLPCI/104. In this mode the Channels are now configured as they are defined by the configuration and the DLPCI/104 Model. The DLPCI/104 is ready to interface your equipment.

4.2 Offline Mode

Once the Configure Pushbutton is pressed the Offline BIOS Manager is started. Using either the configuration software EQ32 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 DLPCI104 Rev 1 (49.152 MHz) - 1.01 - Feb.11th,2016
(c) Equustek Solutions Inc-2015
```

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 DH+ @57.6KB, Address 1, and DF1 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 for updating firmware.

Once pressed the message “**This \*WILL\* overwrite 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 Flash System 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  
Used to Display Memory contents for debug purposes.
4. Off-Line Diagnostics  
Starts a series of tests to test the DLPCI/104’s hardware and should only be done if instructed so by a trained person.
5. Debug Mode

Starts up a DLPCI/104 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 DLPCI/104 model and version numbers will be displayed. Can be used to check the correct firmware was burnt into the Flash or if the DLPCI/104 has the most up to date firmware in the Flash.

7. Online

Does 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 DLPCI/104 out of On-Line operation mode and puts it in the BIOS Manager mode (Offline 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 use mode change DF1 command, or just power off then on the PC.

### 5.2 Indicator Functions

#### 5.2.1 Power-Up and Reset Sequence

On Power-up the DLPCI/104 executes a self-diagnostic check-up of the RAM and flash firmware. The correct LED indicator sequence to show the DLPCI/104 is functioning properly is as follows: After all LEDs go out.

| LED       | STATUS                |
|-----------|-----------------------|
| STATUSLED | RED for 0.5 seconds   |
| NETLED    | Green for 0.5 seconds |
| BUSLED    | Green for 0.5 seconds |

After this sequence the DLPCI/104 goes into the On-line mode of Operation. The LED indicators will behave in the certain way defined by the DLPCI/104 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 DLPCI/104.

| LED        | Description of Operation                                                                                                                            |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| NET LED    | Solid Green when on line on DH+ or Flashing on 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 return the flash with the correct text file. Contact Customer Support for help. |
| Start-up Sequence        | The DLPCI/104 EEPROM is corrupt. Please Restore to Factory Settings Then reconfigure the unit.                                                               |

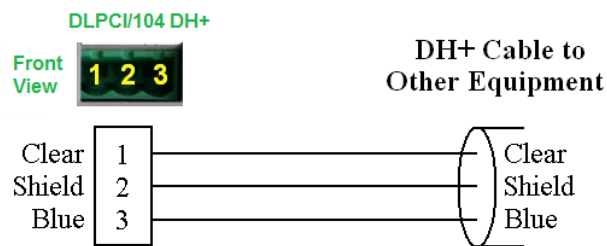
### 5.2.4 Off-Line Modes

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

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

## 6.0 DLPCI/104 Wiring Diagrams

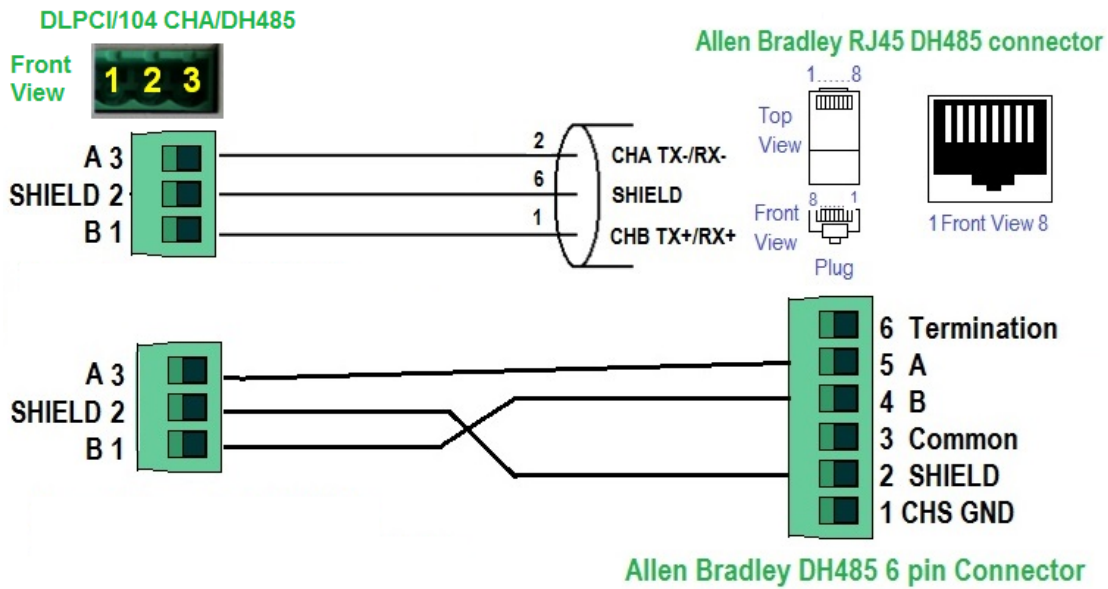
### 6.1 Online Cable DLPCI/104-CHA DH+



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

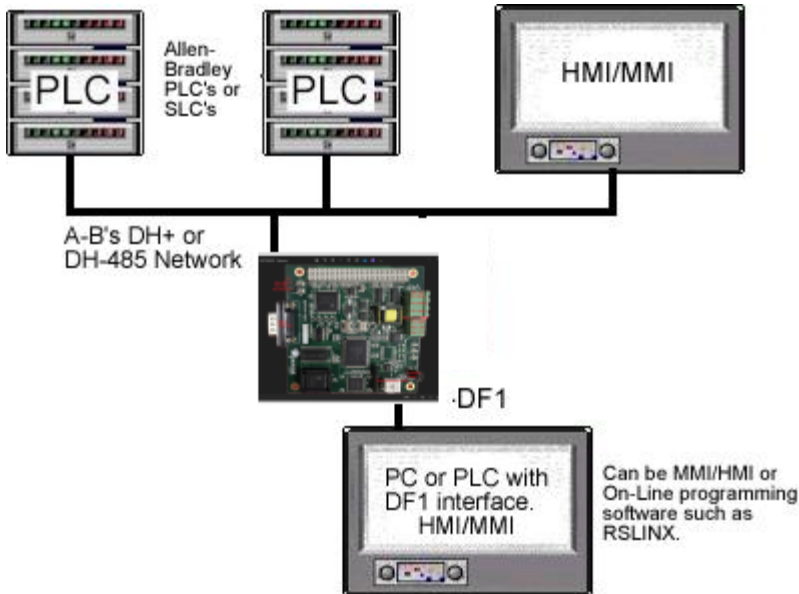


## 6.2 Online Cable DLPCI/104-CHA DH-485



## 7.0 DLPCI/104 DH+/DH485 Networking Applications

### 7.1 DLPCI/104-DF1 – DF1 to DH+/DH485 interface



Note:

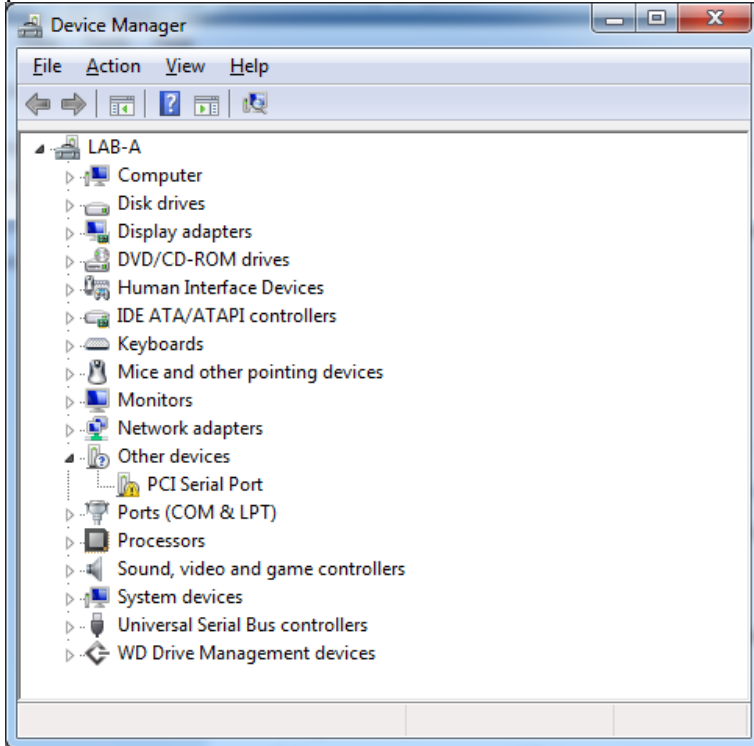
PC can be running RS-LINX or like software (MMI) to have access to nodes on the DH+/DH485 Network.

## Appendix A: Installing the Driver For DLPCI/104

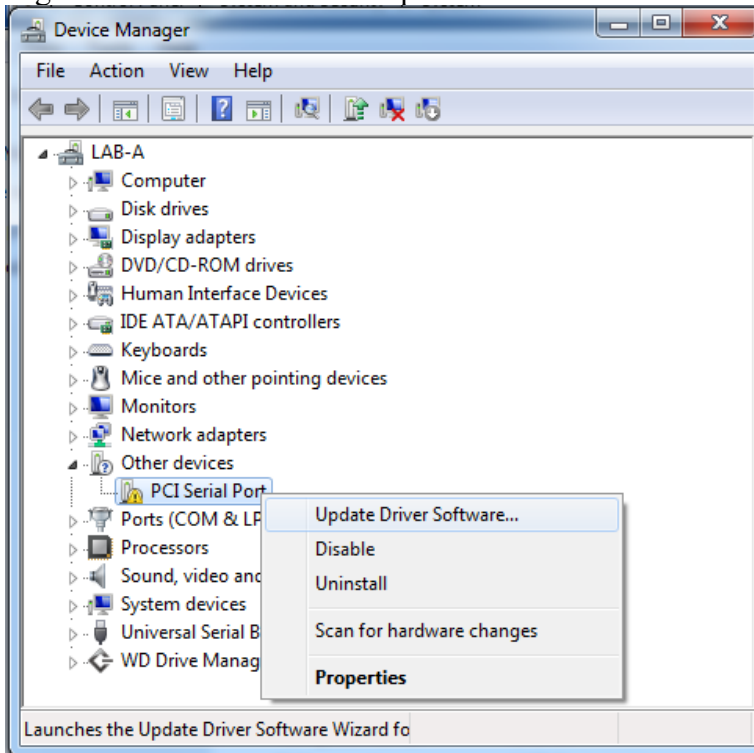
### DLPCI/104 Windows driver installation

After installing the card in any PCI bus when you power up the PC it will come up with Found new hard in case it does not find the right driver from online updates please follow steps shown below.

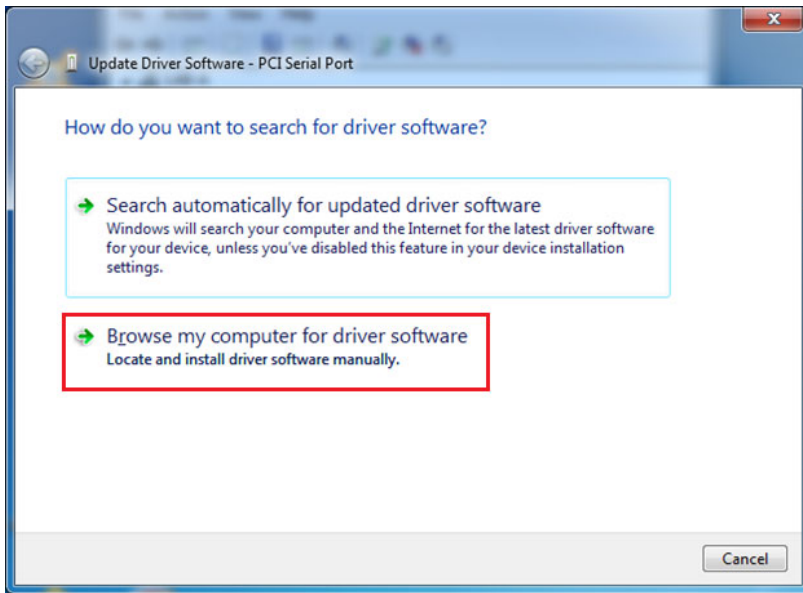
A1- This example is for windows 7 under device manager you will see under other devices PCI serial port.



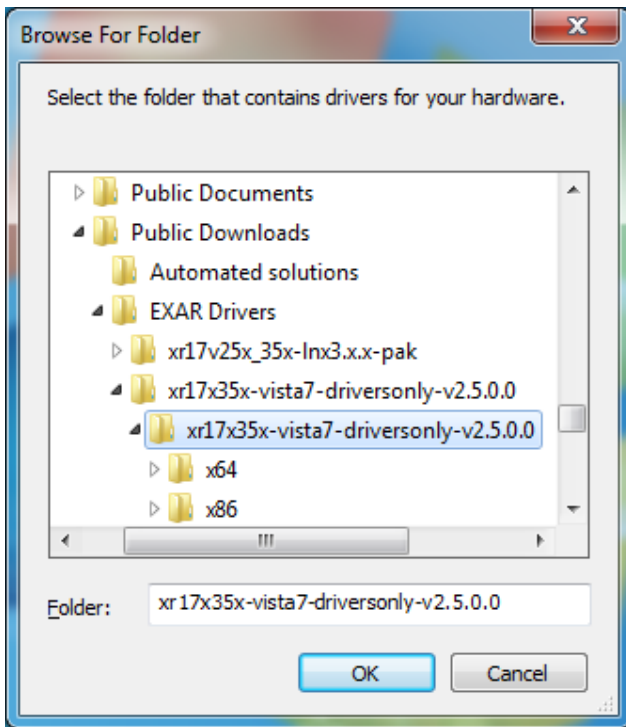
Right click on it and click on update driver.



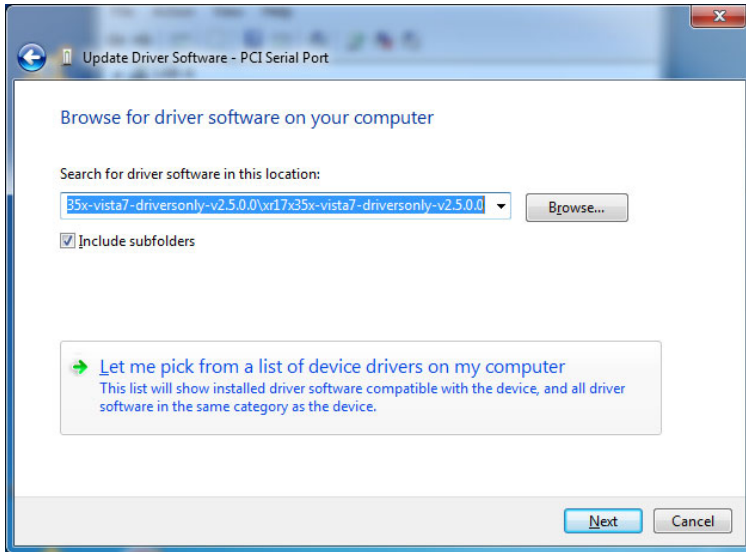
Click on browse my computer



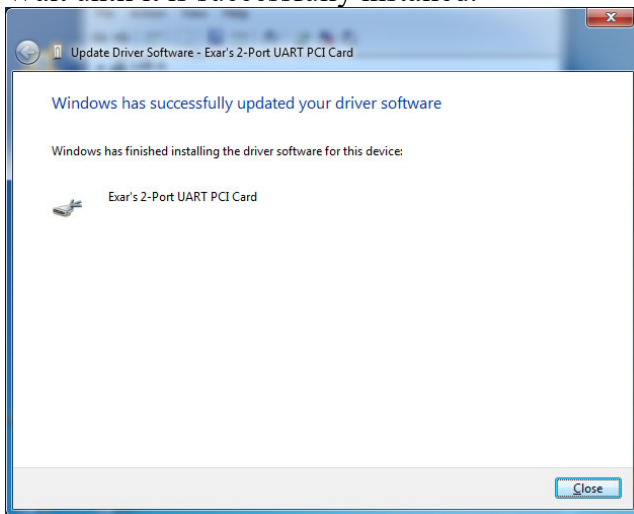
Browse to the location where the driver folder is as shown and click on OK.



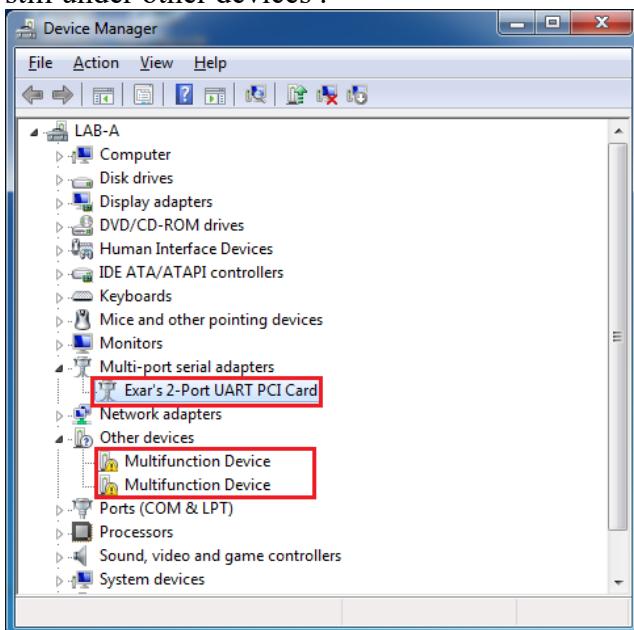
Click On Next



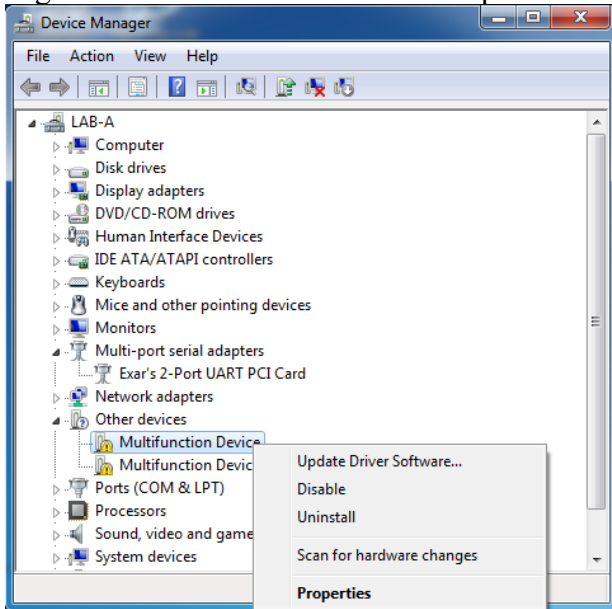
Wait until it is successfully installed.



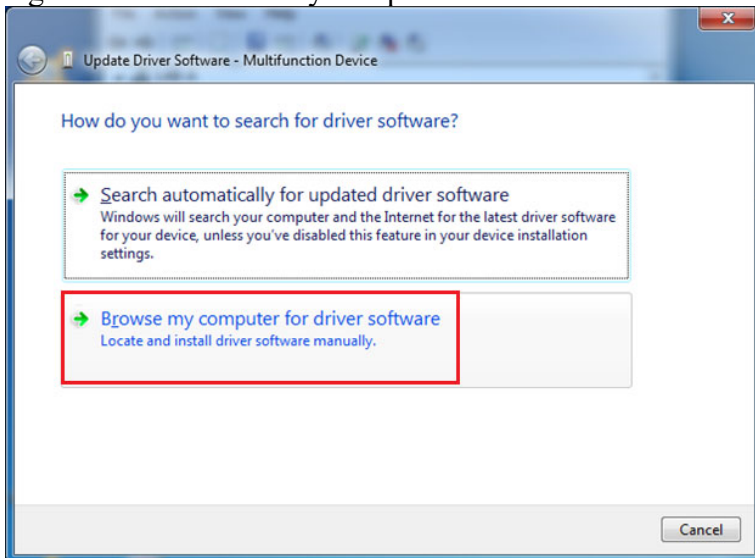
Now under device manager you will see that the dual port multi port adapter is installed but ports are still under other devices .



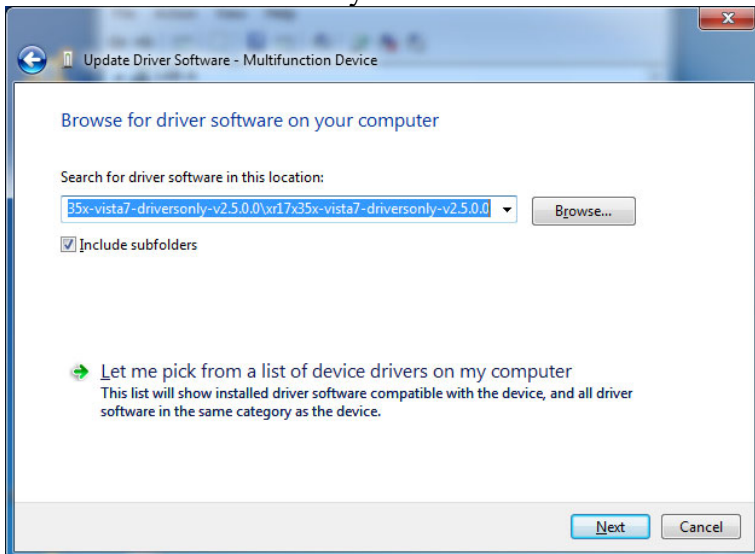
Right click on the 1<sup>st</sup> one and click Update Driver Software.



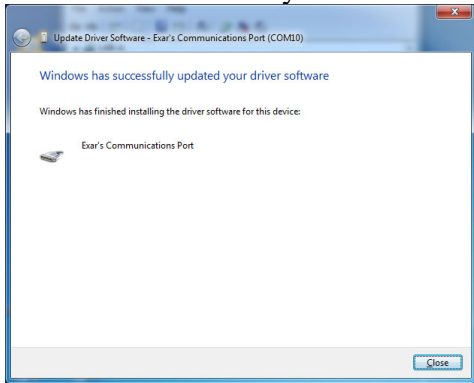
Again Select Browse my computer for driver.



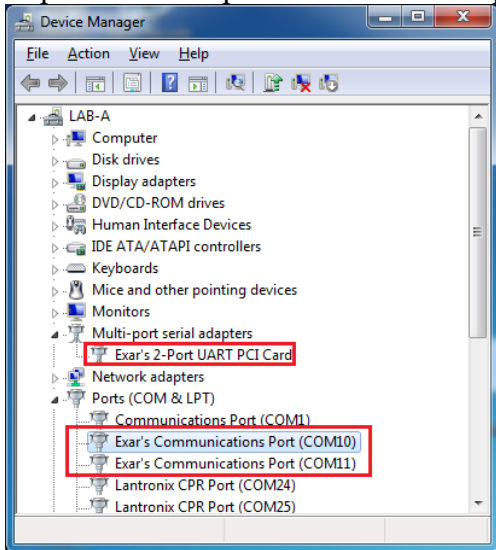
Browse to the same folder you did before and click on Next.



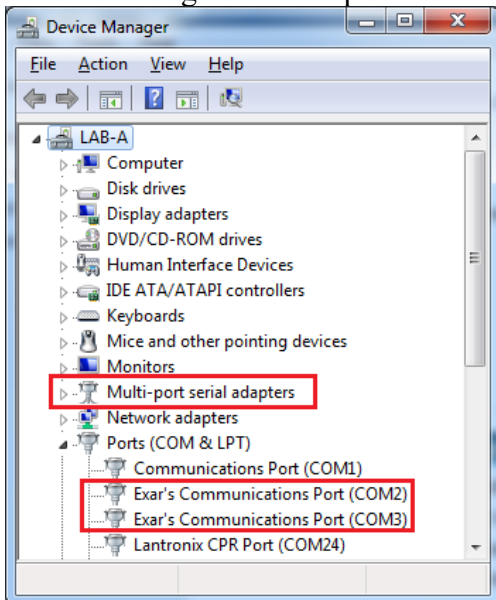
Wait until successfully installed.



Repeat the same process for the other port.



You can change the serial port numbers to any other two available.



Now you can restart your PC.

That will complete the installation of the WIN7 DLPCI/104 driver for the card.  
Again please note this serial port number is used for setting up the DF1 drive, later on.

## Appendix B: DLPCI/104 Configuration:

To configure the DLPCI/104 you need the EQ32 configuration software installed. Download the latest version from Equustek website .

Once completed the download unzip the file and run setup follow the instruction until installation is completed.

Start the EQ32 & select DLPCle which is similar to DLPCI/104 when it come to configuration



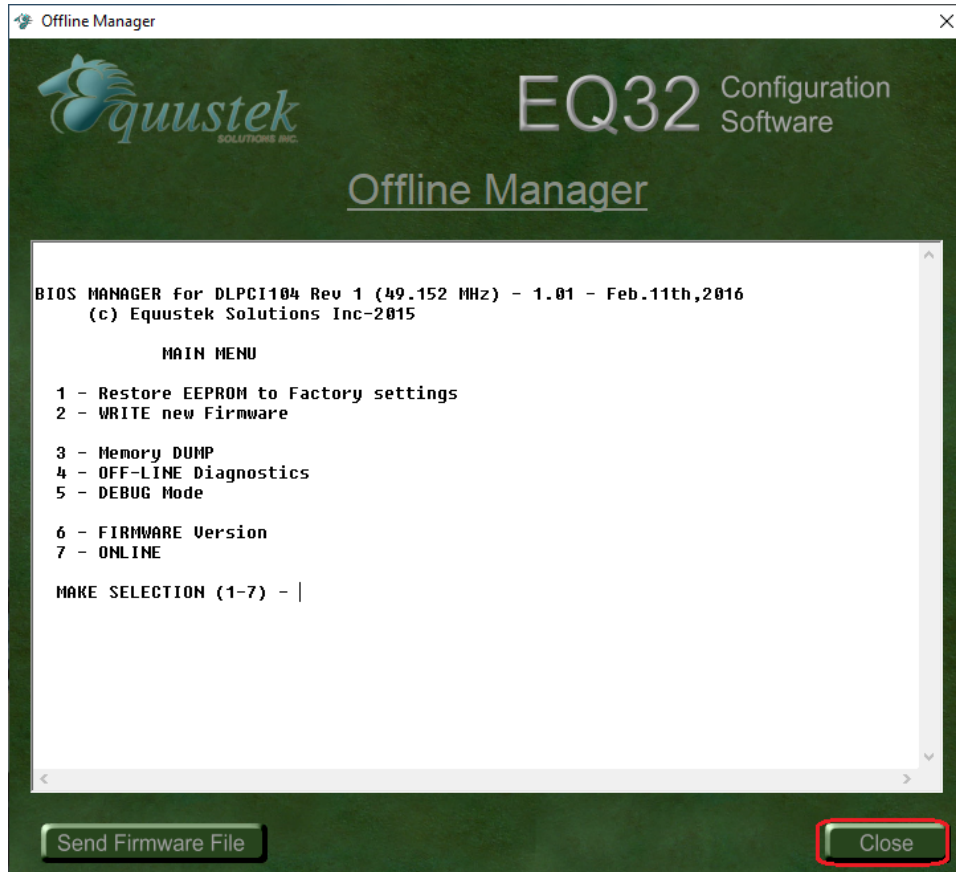
From the EQ32 Main Menu, select the COM Port that has been assigned to the DLPCI/104. Or if you are using the 3pin RS232 connection to an external PC then select that PC port.



Click on DL Offline manager

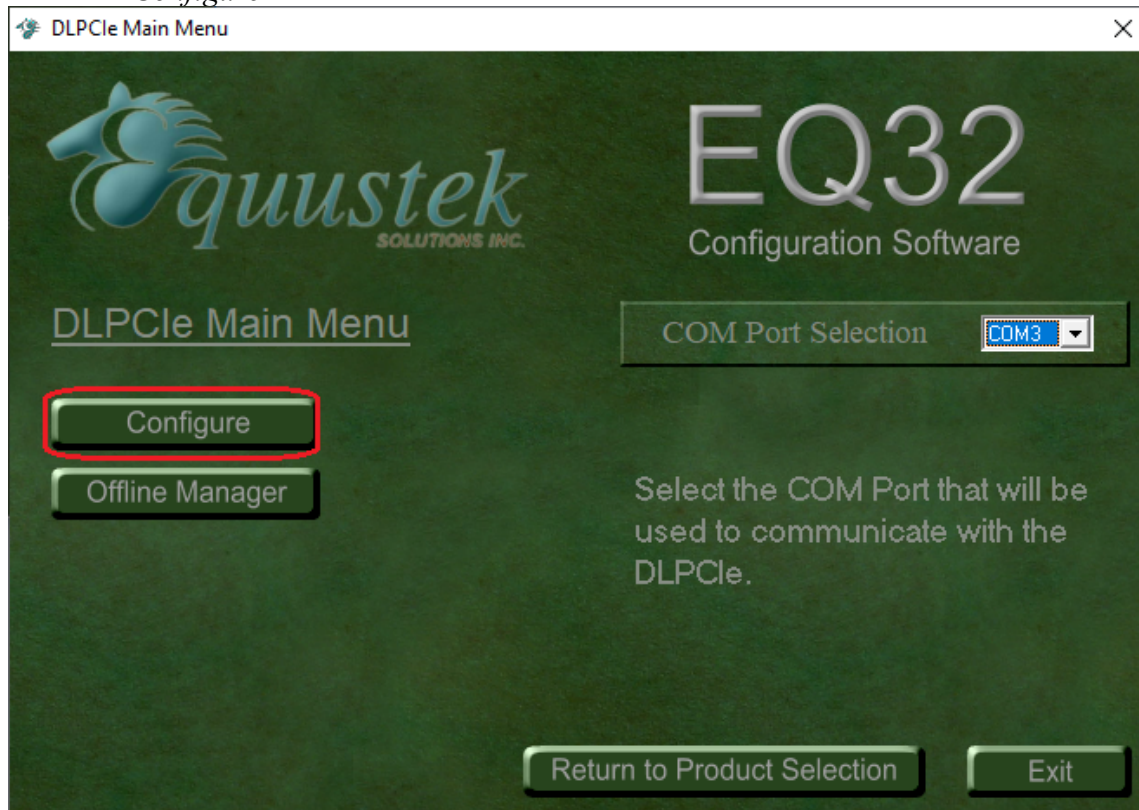


Here just hit the enter key, the menu will be displayed again, that confirms that your PC is communicating with the card and you can see the menu shown below. Click on Close to return to the main menu.

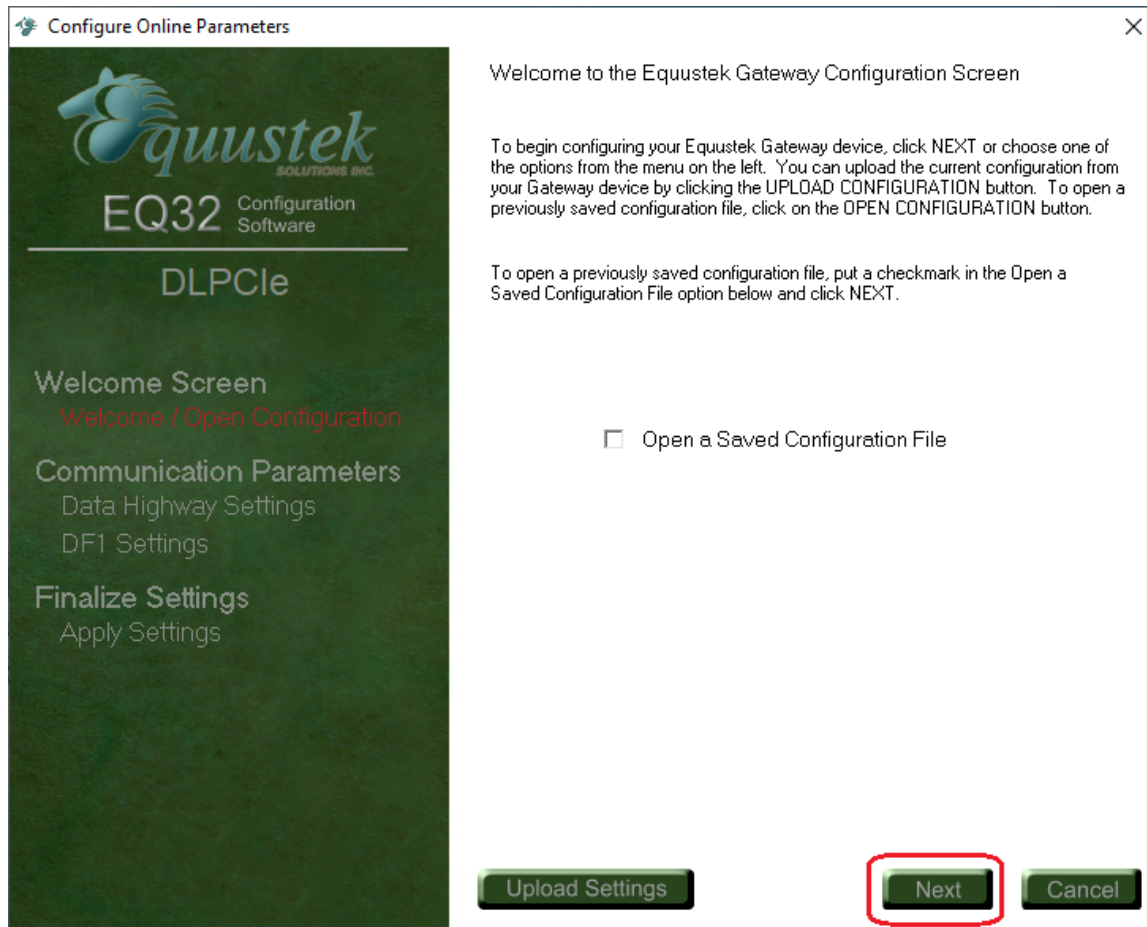




Click the *Configure* button.



Click On Next.



Select Network Type depending on your card DH+ or DH485, here will continue assuming having a DH+ 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  Octal

Network Speed  kBaud

Select a Node address from the drop menu of node address.

**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**  Octal

Network Speed  kBaud

Select DH+ network Speed (baud rate).

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: 1 Octal

Network Speed: 57.6 kBaud

57.6  
115.2  
230.4

Upload Settings Back Next Cancel

Click on Next.

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: 1 Octal

Network Speed: 57.6 kBaud

Upload Settings Back Next Cancel

Set the emulated serial bus speed and the rest of the DF1 serial parameters settings.

Configure Online Parameters

### DF1 Communication Settings

**Serial Parameters**

Serial Speed: 9600 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

After setting the DF1 parameters click on Next.

Configure Online Parameters

### DF1 Communication Settings

**Serial Parameters**

Serial Speed: 115200 Baud

Parity: [None]

Data Bits: [8]

Stop Bits: [1]

**DF1 Parameters**

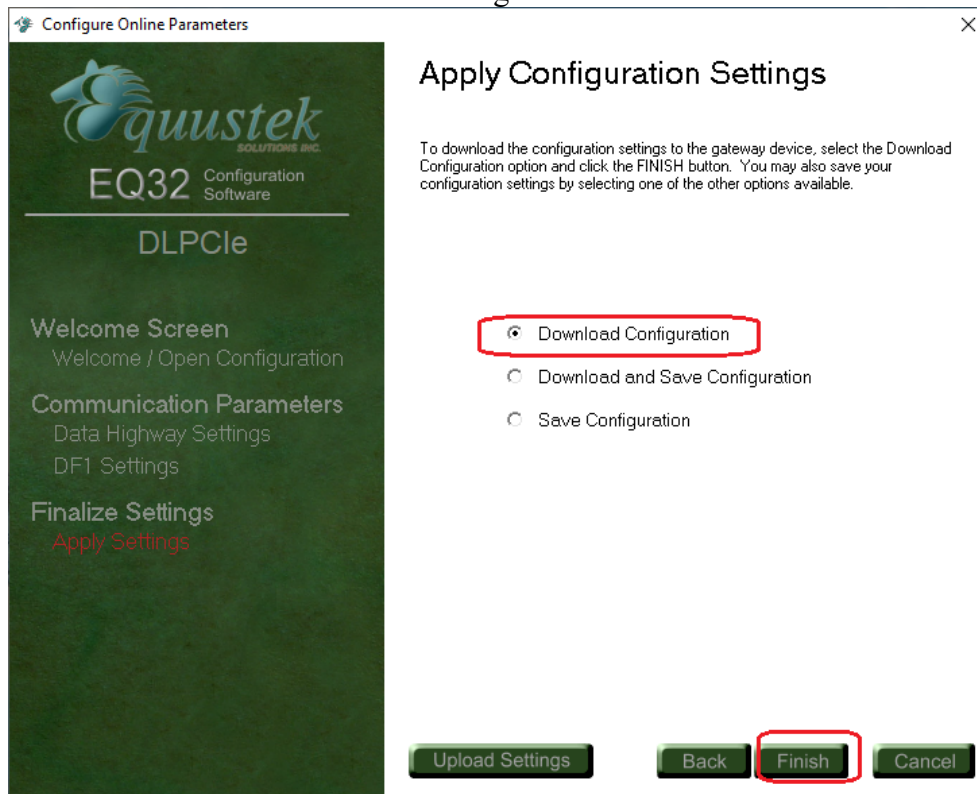
Error Checking: [BCC]

Duplicate Messages: [Ignore]

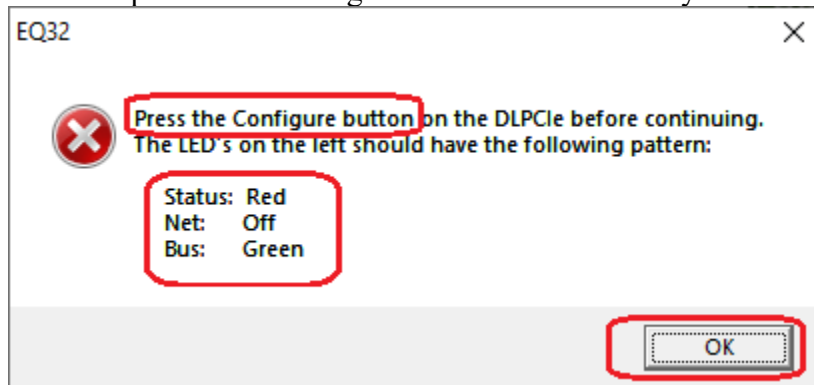
Embedded Responses: [None]

Upload Settings Back Next Cancel

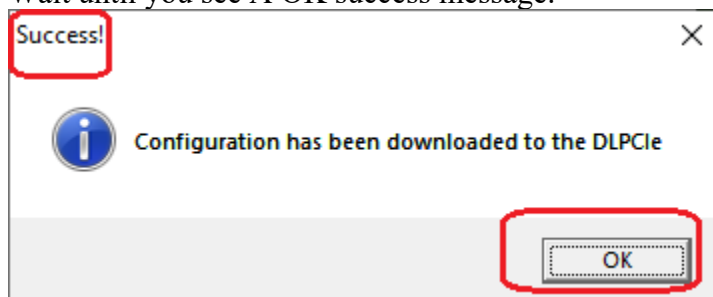
Click on Finish to download the configuration.



Press the pushbutton configure switch on the card if you have not done that yet and click on ok.



Wait until you see A OK success message.



This completes the DLPCI/104 card configuration, close the program and restart the PC.