



M Y N A HSM

Programmable Serial Interface Card Driver Advanced Instruments 3250

USER MANUAL

Rev. P1.55

May 2010

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1 INTRODUCTION

1.1 Scope

This document is the User Manual for the Advanced Instruments 3250 Osmometer serial communication driver firmware for the Emerson Process Management (EPM) DeltaV Control System; it provides information required to install, configure, and maintain the driver firmware on the DeltaV Programmable Serial Interface Card (PSIC). The reader should be familiar with EPM's DeltaV PSIC and connected field devices.

The section *Document Format* briefly describes the contents of each section of this manual. *System Specifications* outlines hardware and software requirements for the 3250 Driver firmware.

1.2 Document Format

This document is organized as follows:

Introduction	Describes the scope and purpose of this document.
Theory of Operation	Provides a general functional overview of the 3250 Driver.
Flashing Firmware	Describes flashing procedures for the 3250 Driver firmware on to the DeltaV PSIC.
Configuration Information	Describes procedures and guidelines for configuring the DeltaV PSIC.
Operational Check	Provides tips and assistance to ensure PSIC is properly setup and configured.
DeltaV–Field Device Electrical Interface	Describes the electrical interface between DeltaV PSIC and the 3250 Device. Also describes the cable pin assignments for RS-232 and RS-422/485 communications.
Technical Support	Describes who to call if you need assistance.



1.3 System Specifications

The following table lists the minimum system requirements for the 3250 Driver:

Table 1: System Specifications

Firmware	3250 Driver Firmware v1.55 or later
Protocol Compatibility	<p>The protocol comprises capture and parse of selected, predefined 3250 string output messages. All other string messages are ignored. The list of selected messages is given below. The reference documents used are:</p> <ol style="list-style-type: none"> 1. Model 3250 Message Translations, PDF document released by Advanced Instruments. (PDF) 2. Advanced Instruments RS232 Supplemental for 3250 (PDF)
Software Requirements	<p>DeltaV System Software (Release 4.2 or later) installed on a hardware-appropriate Windows workstation configured as a ProfessionalPlus for DeltaV</p> <p>Serial Interface Port License (VE4102) if required.</p>
Minimum DeltaV Hardware Requirements	<p>DeltaV Series 2 Serial Module, Hardware Rev 1.1r or later</p> <p>DeltaV M3, M5, M5+, MD, MD Plus or MX Controller, Power Supply and 8 wide controller carrier</p>
Other Optional Hardware	<p>The 3250 has an RS232 serial interface port which can be directly connected to the DeltaV Serial card. This is limited to 50 feet of serial cable or less, however.</p> <p>Optionally, to gain distance, the user may use any RS485/RS232 converter. The DeltaV serial cards port would be configured as RS485, and connected to a converter, which then connects to the 3250.</p> <p>This document refers to one such converter, which is Technman Control-It 5258.</p>



2 THEORY OF OPERATION

DeltaV comprises an I/O sub-system, in which the PSIC is one type of card. The purpose of the PSIC is to serially integrate third-party devices, allowing data to be read into and written out from DeltaV. Each PSIC has 2 communication ports that can be configured as Master or Slave, using RS-232, RS-485 (Half Duplex), or RS-422 (Full Duplex). Various communications parameters, such as baud rate, are configurable.

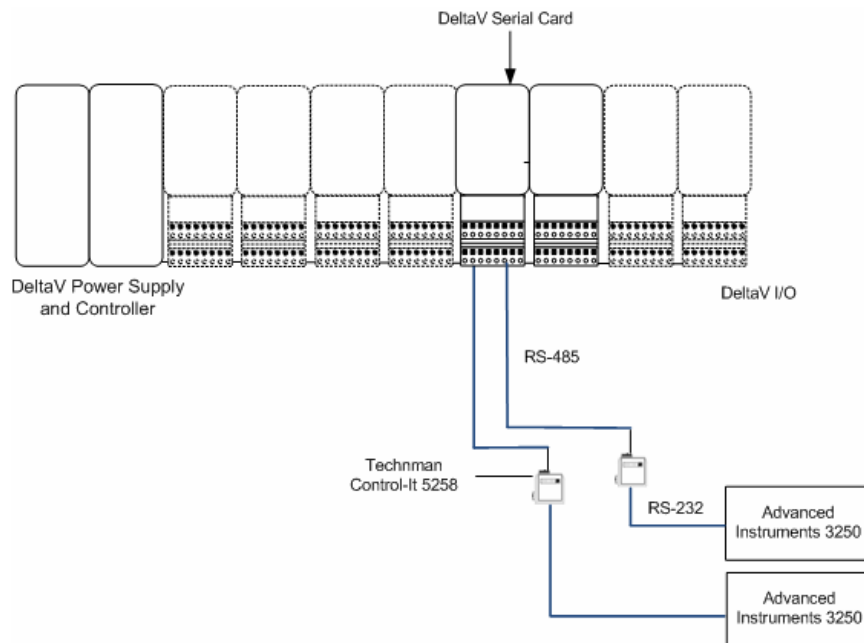
To gain distance, a single Technman Control-It 5258 RS485/RS232 converter is used. For this, additional configuration is required at the dataset level to enable this converter. Please see Section 4.3.1.

The PSIC driver functions only in Slave mode, while the 3250 device functions as the communications Master. On power-up, the PSIC driver receives its configuration from the DeltaV Controller. The driver then waits for master device messages which are parsed and either ignored, or pertinent data is reported up to the DeltaV Controller.

The PSIC configuration entered by users comprises the following:

1. Only one device under each port.
2. Maximum of 2 datasets under the device. Dataset 1 configured as string with 100 values. Dataset 2 configured as Floating Point with 20 values.

The physical architecture will be as follows:



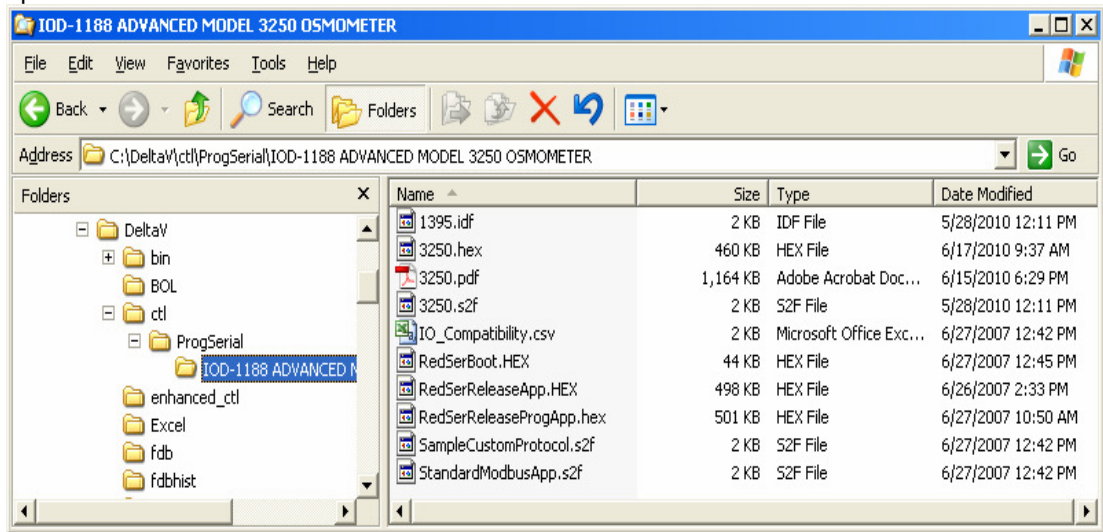


3 Flashing the firmware

The driver software distribution contains 10 files. These files must be copied to the DeltaV directory on your ProPlus Workstation. The path is:

\DeltaV\ctl\ProgSerial\IOD-1188 ADVANCED MODEL 3250 OSMOMETER

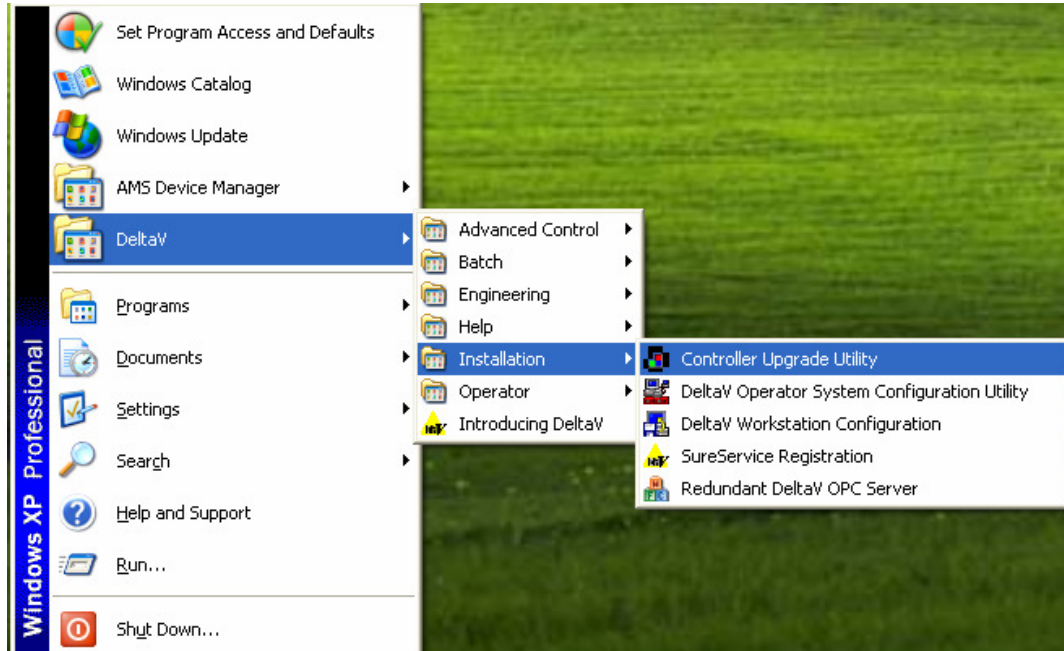
Note that you will have to create this subdirectory. The following shows a completed copy operation:



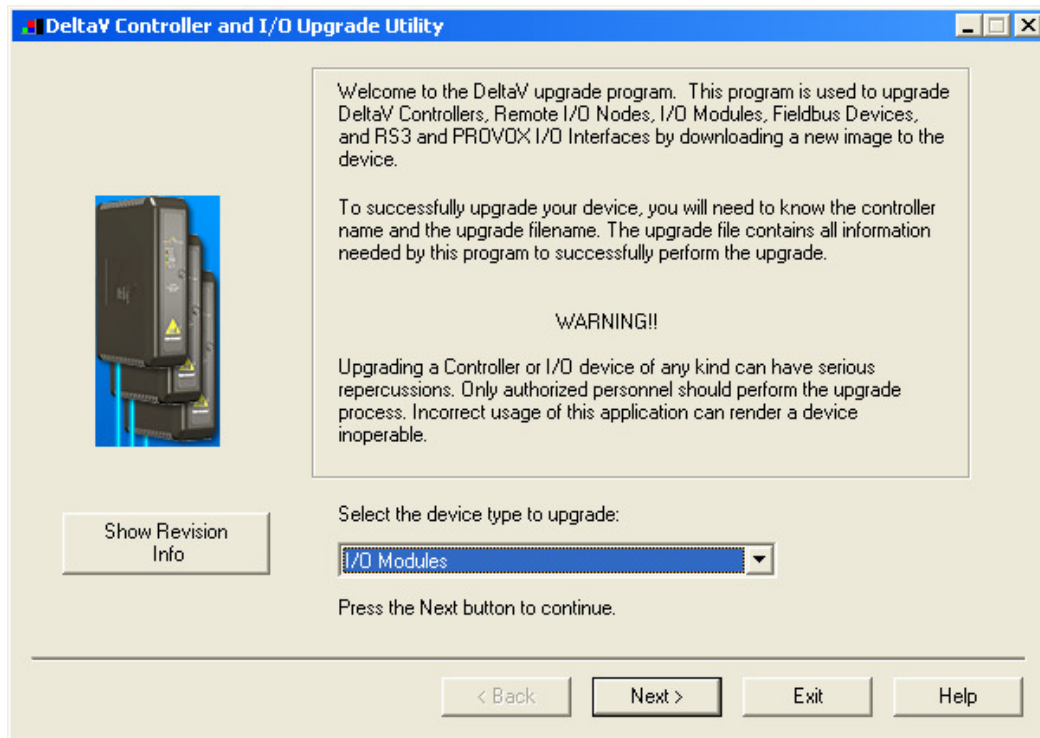
After copy completion, you are ready to program (or upgrade) the Programmable Serial Card with the supplied custom driver software. The steps are as follows:

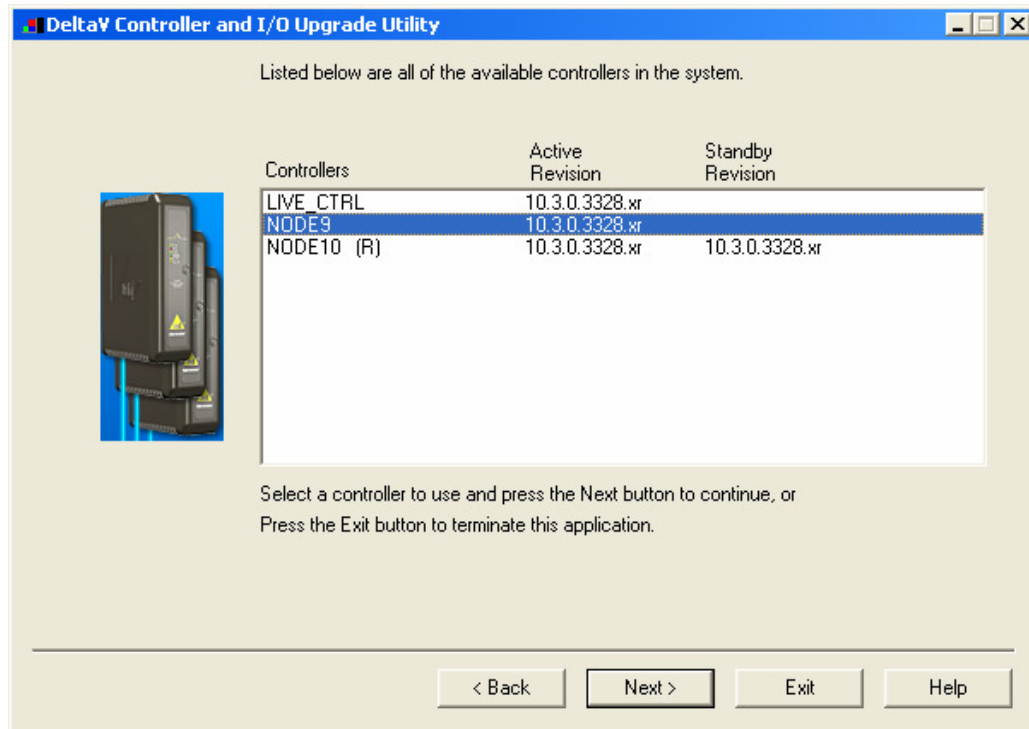


1. Click on the Start button and select DeltaV-> Installation-> Controller Upgrade Utility as shown below, and the following dialog will appear:



2. Click on the Upgrade I/O Modules radio button, and then click Next.

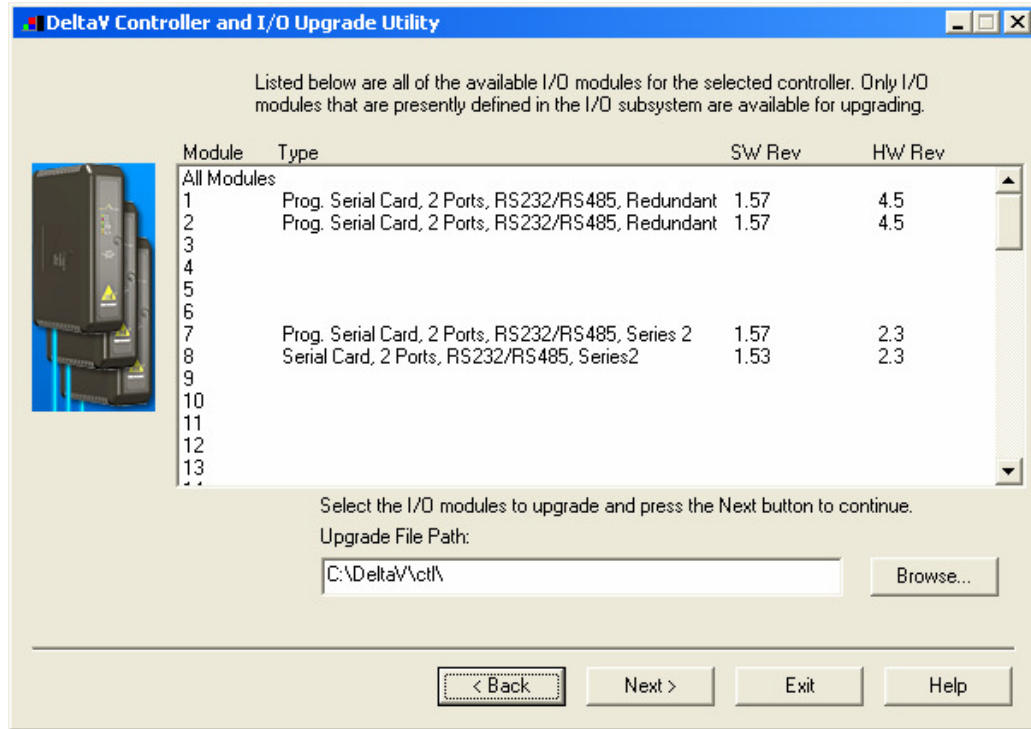




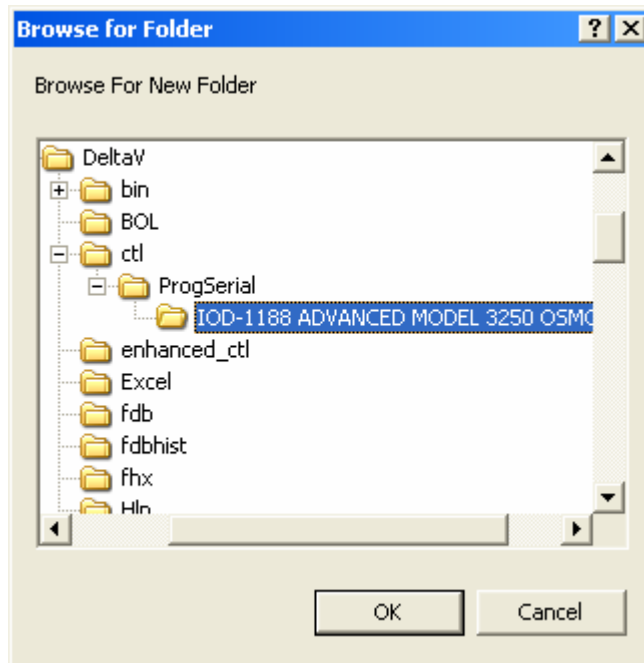
3. The above dialog will appear, listing all the available Controllers in your network. From this dialog, select the appropriate Controller and then Click Next.

4. The following dialog will appear, listing all the I/O modules in your selected Controller. The shown list of I/O modules is an example only. Your list will be different.

Note: The first time a standard Serial card is upgraded to the 3250 Driver, the dialog will be as shown below (card 8). When upgrading an existing Programmable Serial Card, skip Steps 5 and 6, and go to Step 7.

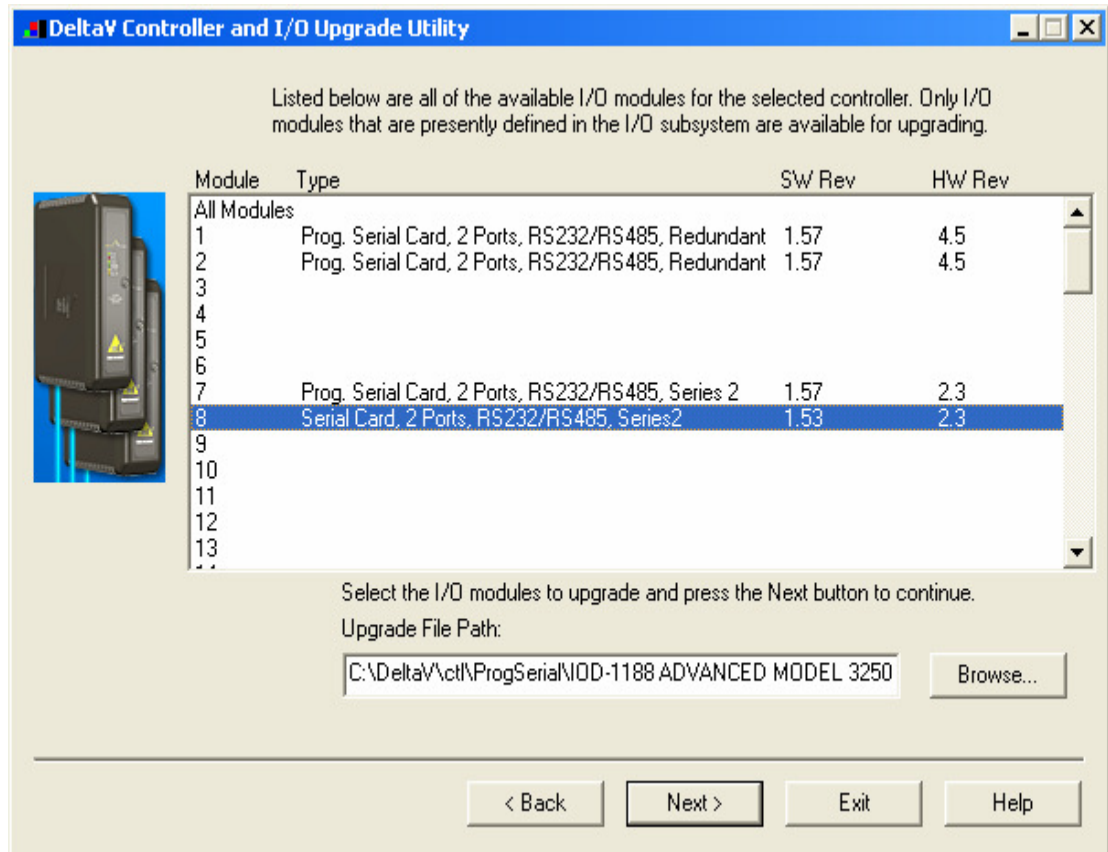


5. Click the Browse button and select the DeltaV path as shown below, and then click Ok. Note that the disk drive could be C or D.



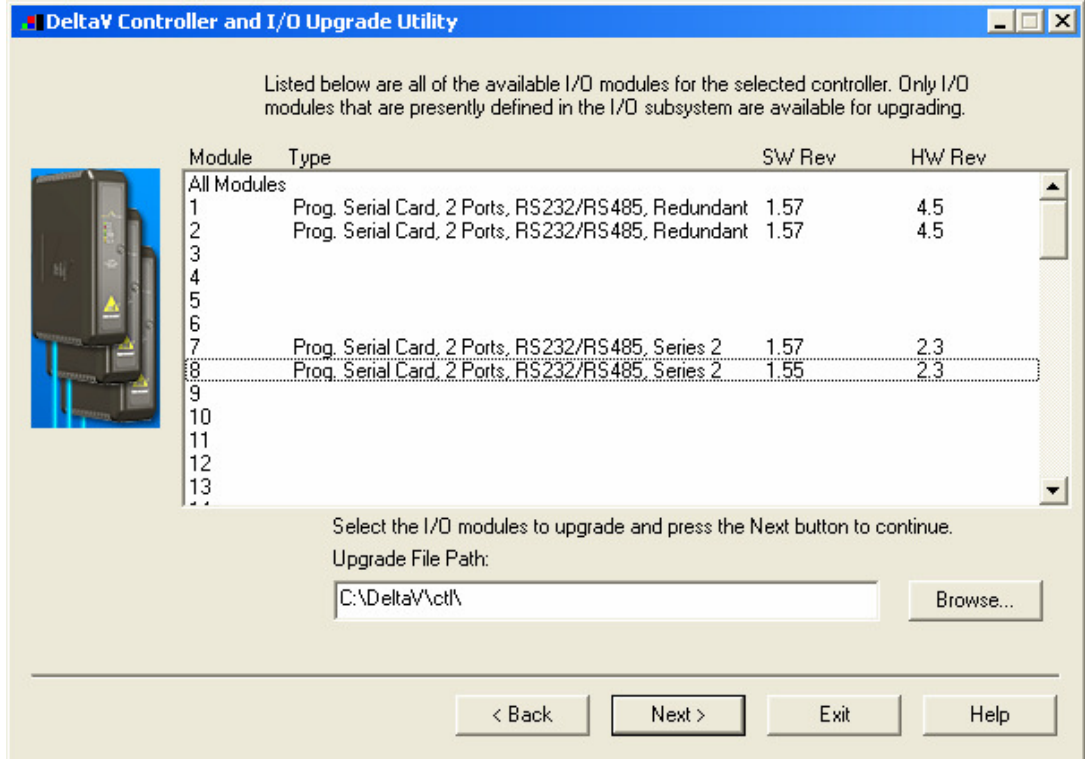


6. Select the I/O module again as shown below and then click Next. Go to Step 9.





7. If you are upgrading an existing Programmable Serial Card, the dialog will be as shown below. From this dialog, select the Programmable Serial Card I/O Module in the list.



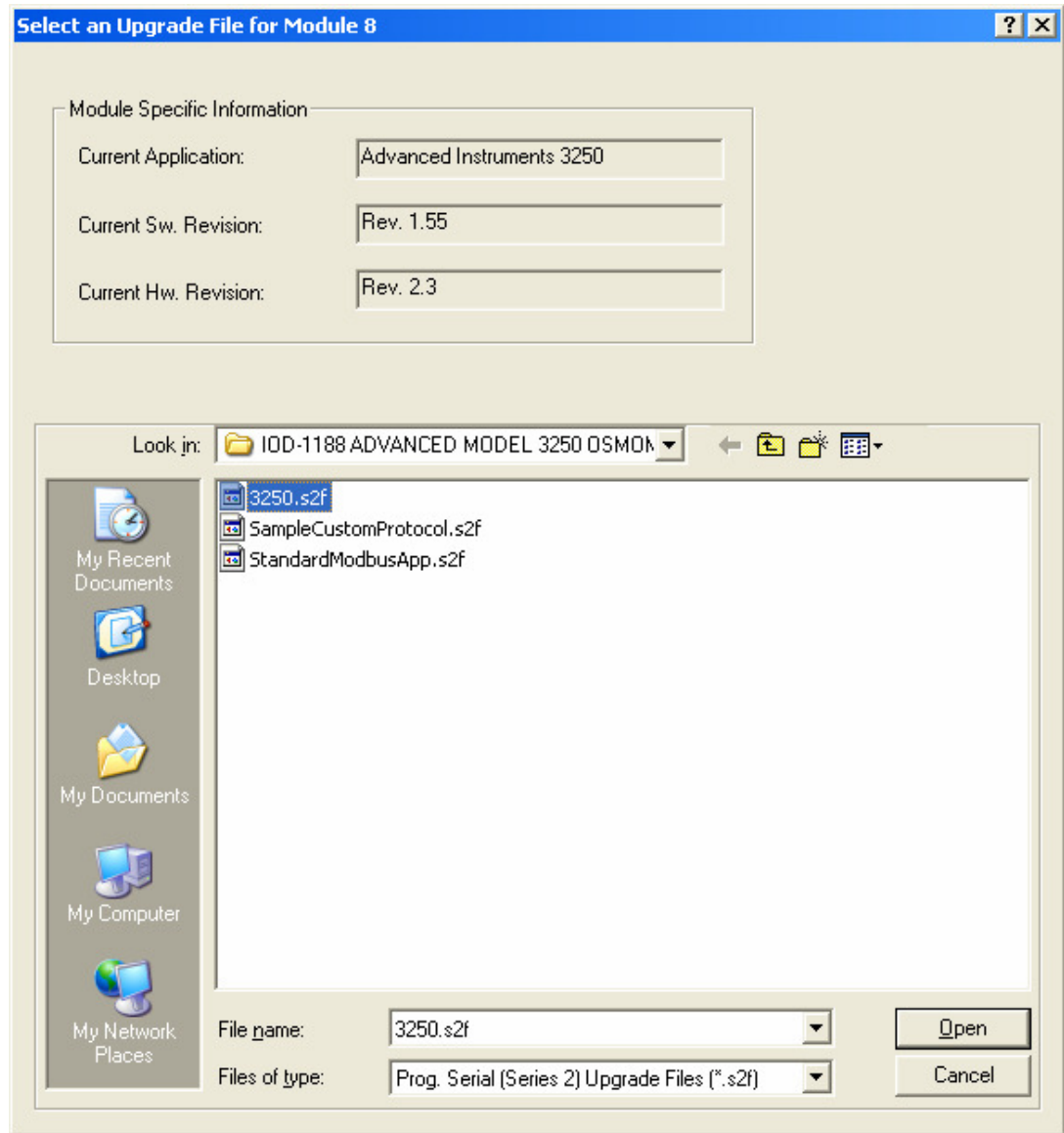
For example, we will select I/O Module 8. This will give you a dialog, from which you will select the file path to where the driver software is located. This path will be:

\\DeltaVctl\ProgSerial\IOD-1188 ADVANCED MODEL 3250 OSMOMETER

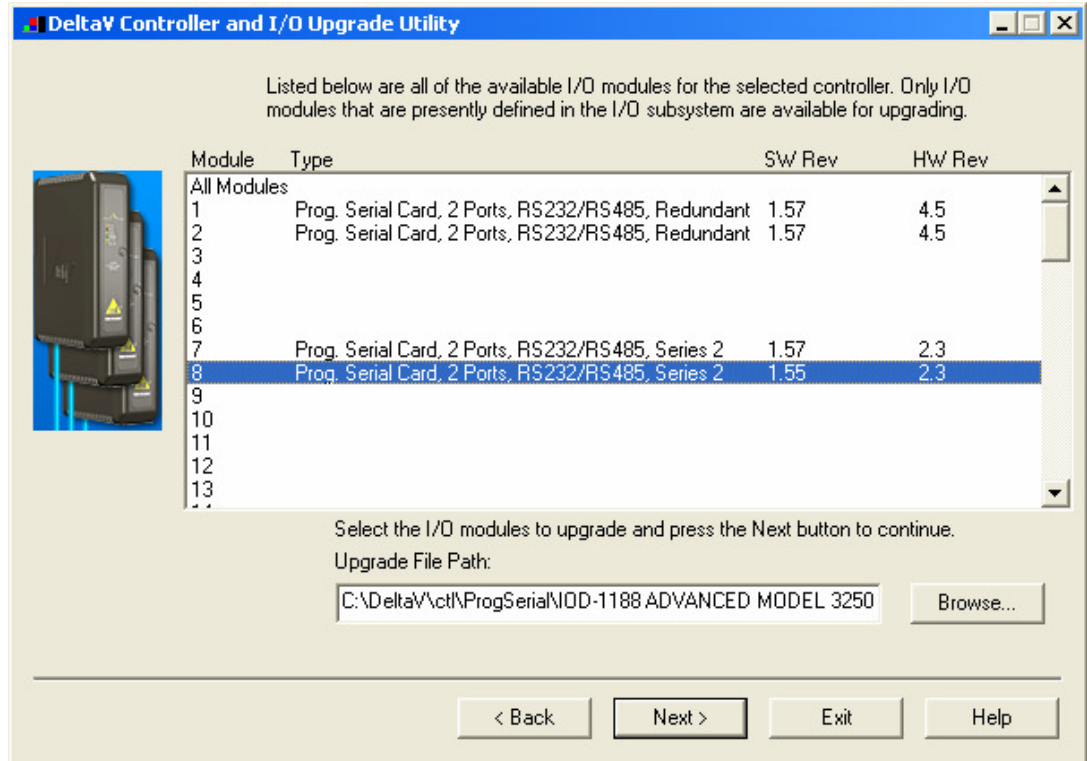
Once you are in the specified directory, you will need to select the following file:

3250.S2F

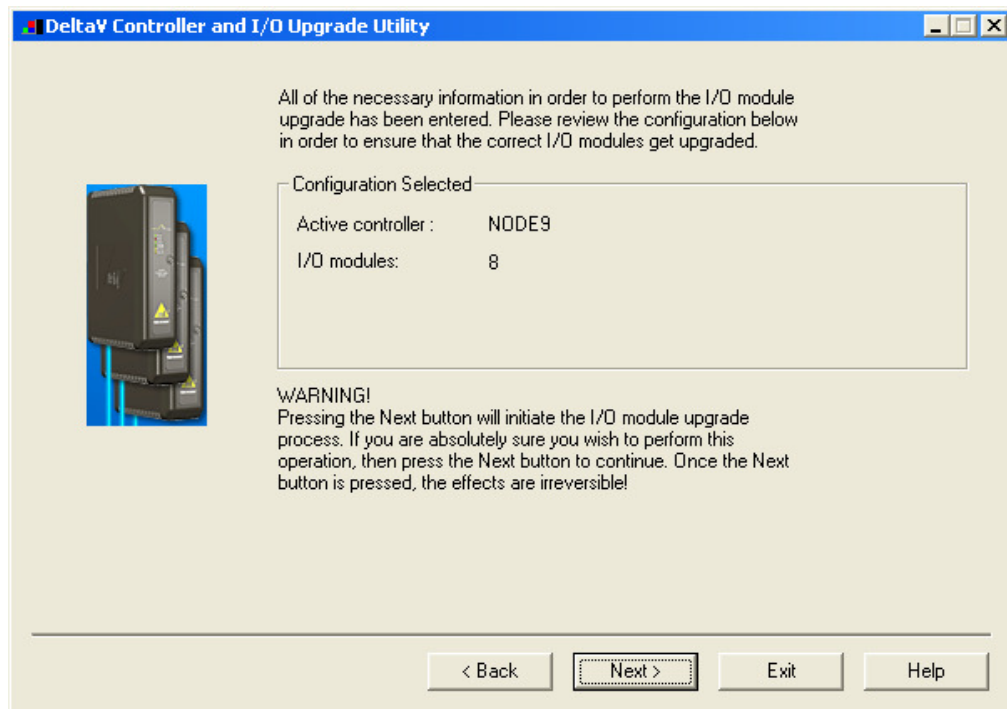
This is shown in the following dialog.



8. After selecting the .S2F file, Click on Open. This dialog will close and you will be back to the following:

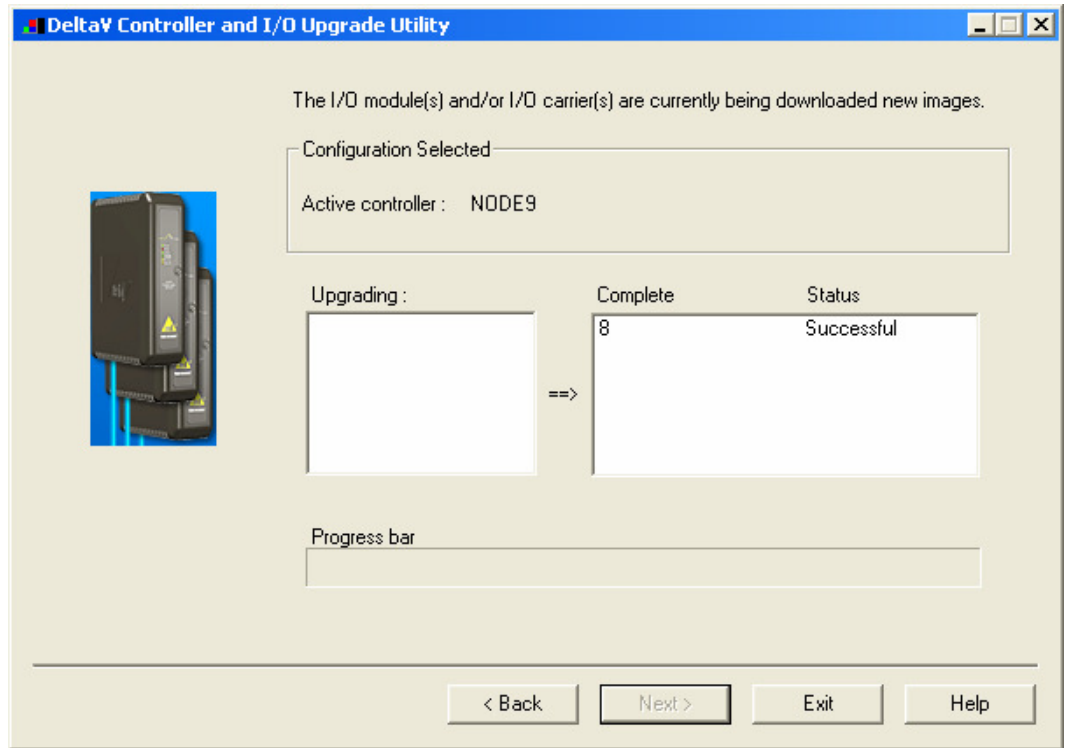


9. In this dialog, Click Next again. You will get the following dialog, confirming the Controller and I/O Module to program.





10. Click Next and the I/O Module upgrade process will begin. After completion, you will receive the following dialog, indicating success.



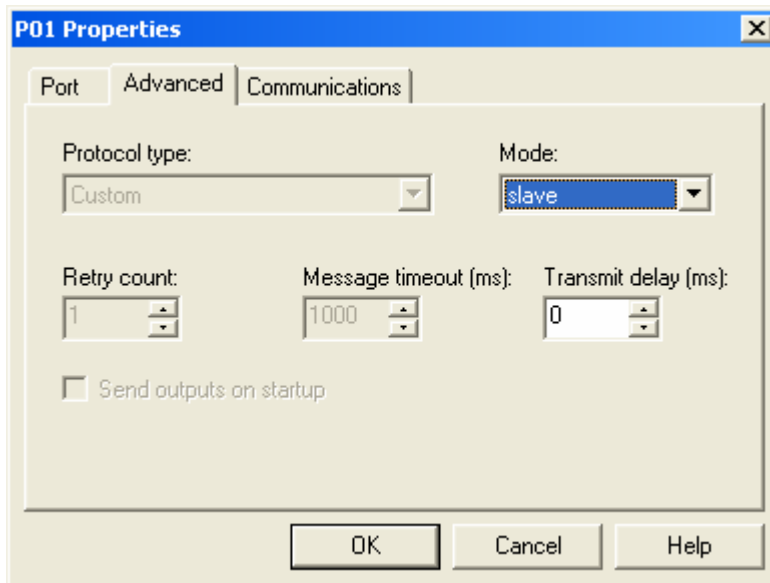
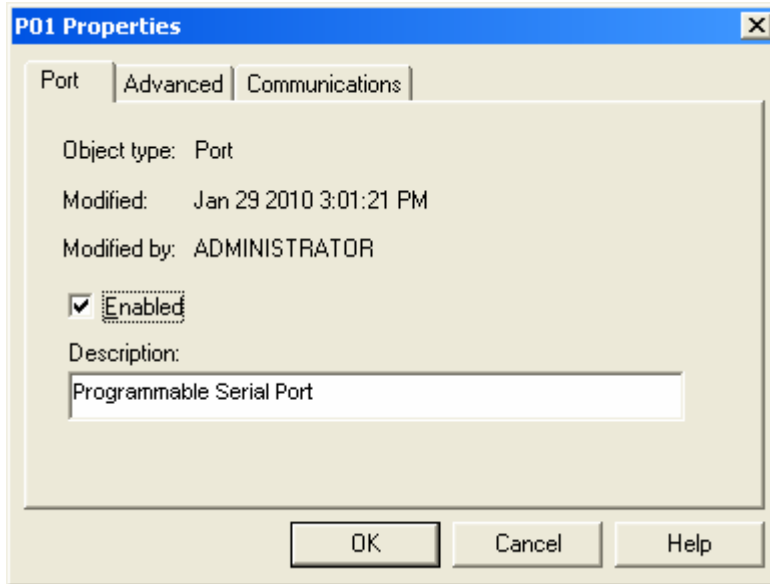
11. This completes the I/O Module upgrade process.

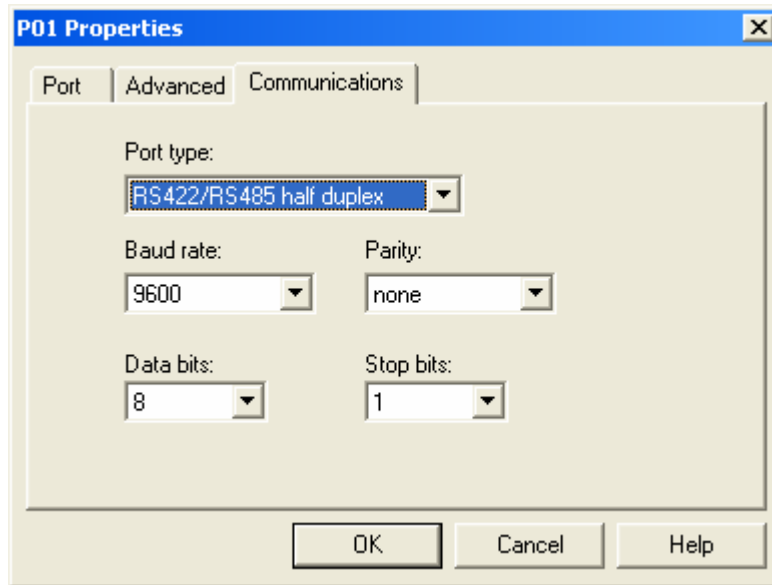


4 CONFIGURATION INFORMATION

4.1 Port Configuration

First, enable the port. Then click on the Advanced Tab and select Slave. Next, click on the Communications Tab and specify the Port type. The Port type will be RS-422/485 Half Duplex (2 wire) because of the RS485/RS232 converter being used. If the PSIC port is directly connected to the 3250 with less than 50 feet of cable, the Port type can be RS232. Lastly, select the Baud rate, Parity, Data bits and Stop bits parameters; these must match the 3250. The following screen shots show the configuration:

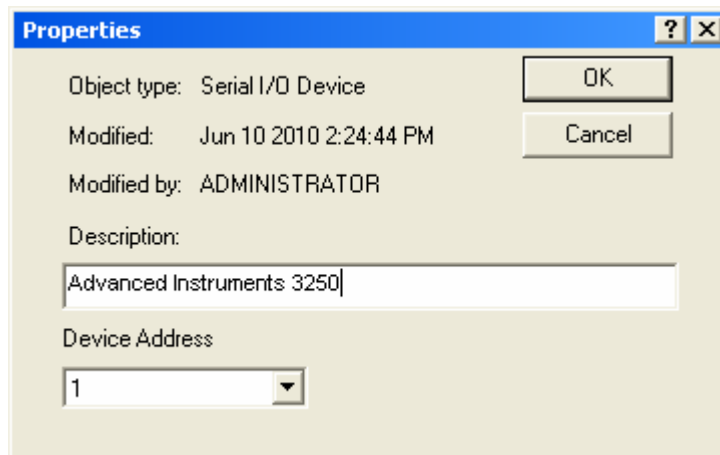




4.2 Device Configuration

Specify a single device and device address of 1.

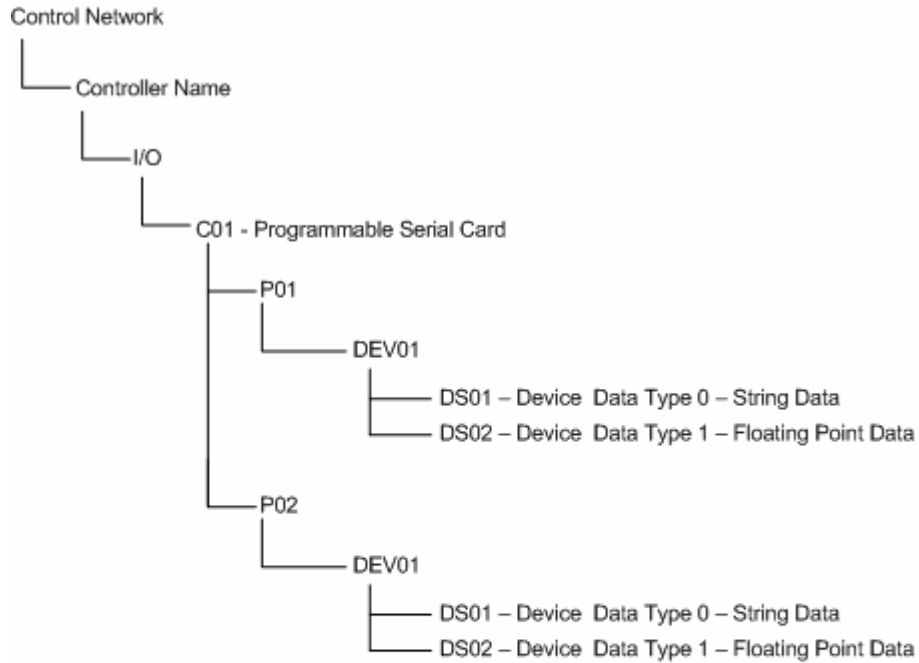
Note: The device address is used by the driver to enable the Technman Control-It 5258, and should match the dip-switches on the 5258. If a 5258 is not used or a different converter is used, then the device address selected may not be relevant. The PSIC driver forces the 5158 to be always enabled.





4.3 Dataset Configuration

A fixed dataset architecture is used to receive data. Dataset usage is as follows. Dataset 1, string data, holds the Serial # reported by the 3250. Dataset 2, Floating Point data, holds the run time sample analysis data.





4.3.1 Dataset 1:

Configure the String dataset as follows:

Direction	Input
DeltaV Data Type	String w/status
Device Data Type	0
Start Address	0
Number of Values	100
Special Data 1	16384 or 32768. See description below
Special Data 2	0
Special Data 3	0
Special Data 4	0
Special Data 5	0

When using the Technman Control-It 5258, the Special Data 1 register must be configured as follows:

16384	If the TechnMan Control-It 5258 is configured (via dip switches) for STX as the enabling message, then configure 16384 into Special Data 1.
32768	If the TechnMan Control-It 5258 is configured (via dip switches) for HeAdEr as the enabling message, then configure 32768 into Special Data 1.

The Serial number sent by the 3250 is stored in this dataset.



4.3.2 Dataset 2:

Configure the Floating Point dataset as follows:

Direction	Input
DeltaV Data Type	Floating Point
Device Data Type	1
Start Address	0
Number of Values	15
Special Data 1	0
Special Data 2	0
Special Data 3	0
Special Data 4	0
Special Data 5	0

The data stored in this dataset is as follows:

Register Number	Value and Units
R1	AVG mC
R2	AVG mH
R3	AVG mOsm
R4	Buzz Amplitude
R5	Buzz Point
R6	Freeze Point
R7	High Buzz Point
R8	Low Buzz Point
R9	Non Linear
R10	Osmolality
R11	Stir Amplitude
R12	Base Reading
R13	Std Dev mC
R14	Std mH
R15	Std mOsm



5 Operational Check

5.1 Scope

The following sections provide some assistance to ensure the interface is working properly.

5.2 Verify Hardware and Software Version Number

The user can verify that the 3250 driver has been installed using the DeltaV Diagnostics tool. The Diagnostics tool will show the Hardware Revision No. (HwRev) and the Software Revision No. (SwRev).

To begin the DeltaV Diagnostic tool select Start-> DeltaV-> Operator-> Diagnostics. In the Diagnostics tool expand the Controller, I/O and then double click on the Programmable Serial Interface Card that has the driver installed.

The following information will be displayed:

:	:	:
HwRev	Hardware Revision	1.1 (or later)
SwRev	Software Revision	P1.55 (or later)

5.3 Verify Configuration

- Verify port configuration: The serial port must be enabled. User needs to make sure communication settings such as baud rate, parity, and number of data bits match the field device settings.
- Verify dataset configuration: The datasets configured must be as shown above.

5.4 Verify I/O Communication With Control Studio

User can create I/O modules in the control studio to verify correct values are read from the PSIC. For AI and DI data, the values should be changed in the field device and verified that the new data are correctly reported in DeltaV. Similarly, verify that the AO and DO data is being written correctly from DeltaV to the field device.

5.5 Using Diagnostics

- Verify PSIC communication: Select the PSIC on Diagnostics and press the right mouse button. Select Display Real -Time Statistics from the drop down menu. If the Programmable Serial Interface Card is functioning then the user will see the Valid Responses counter and the Async and/or Sync Transactions counters incrementing. There will not be any error counting up.
- Verify port statistics: Select the Port on the Programmable Serial Interface Card and press the right mouse button. Then select Display Port Statistics form the drop down menu. Verify that the port communications statistics are being displayed properly and are counting as expected for the protocol's functionality.



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- Verify dataset values: Select a dataset and press the right mouse button. Select View Dataset Registers from the Drop down window. Verify that the dataset values are displayed as expected.
- Verify that there are no errors at the dataset level.

5.6 LED Indication

The Yellow LED for the port should be on solid when all communications on that port are valid. The Yellow LED should be blinking if there is some valid communications and some communications with errors on that port. The Yellow LED should be OFF if there are no valid communications on that port.

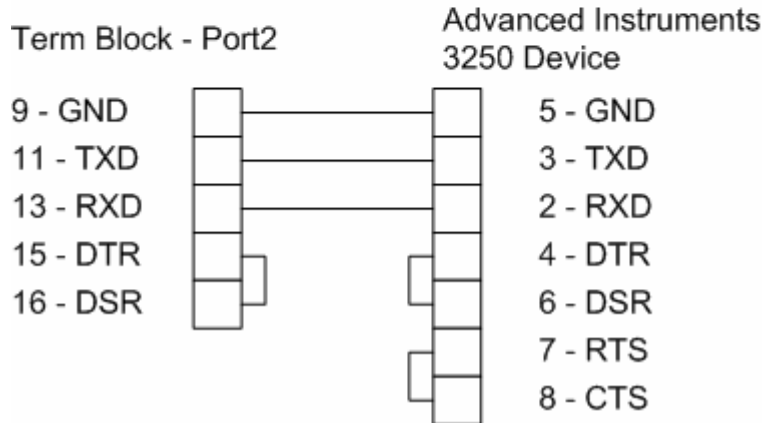
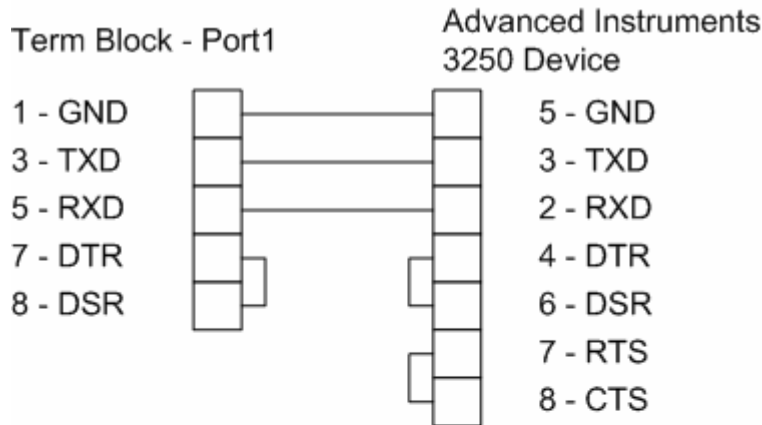


6 Connecting DeltaV PSIC to the 3250

The electrical interface between DeltaV and field devices conforms to the RS-232 and RS-422/485 standards.

6.1 Direct Connection using RS232

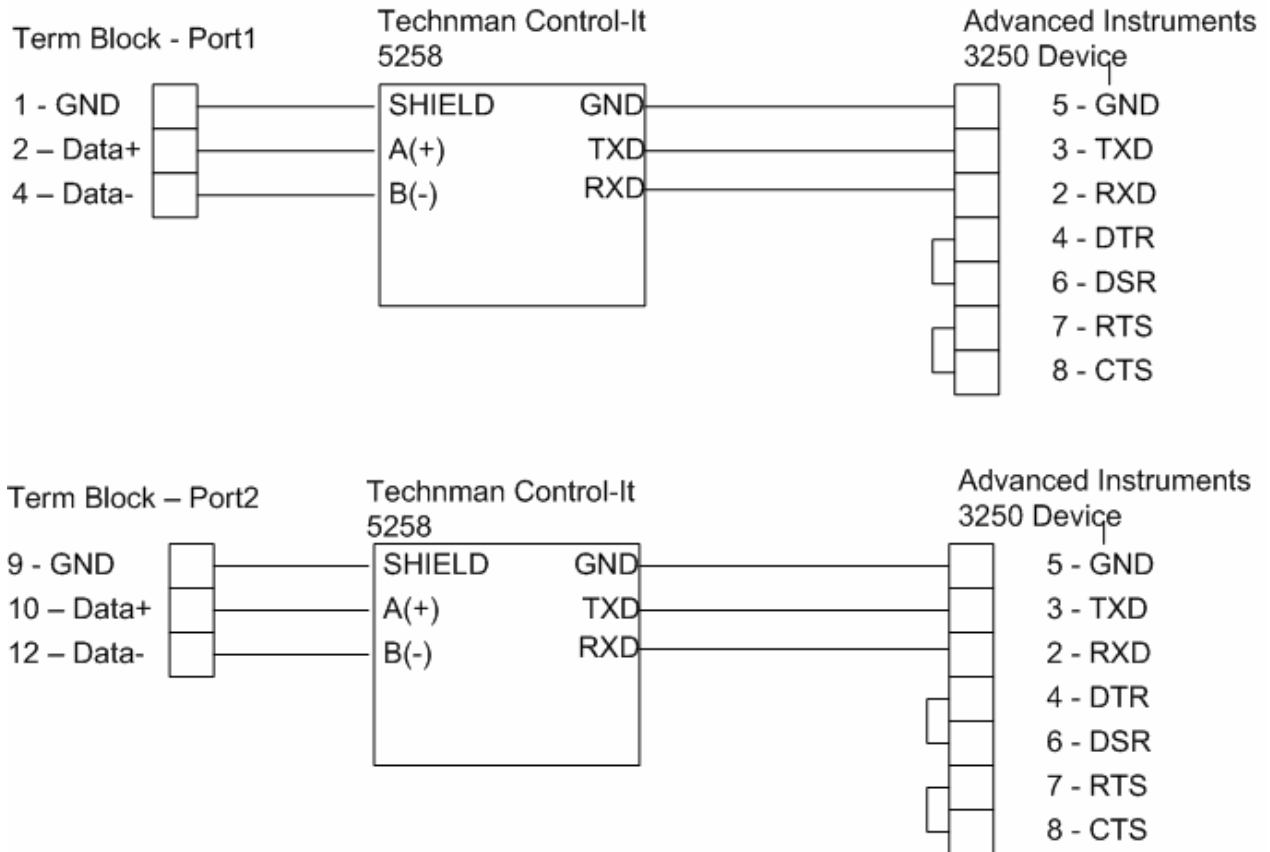
The following diagram shows the cable pinout to use.





6.2 Connection using RS485 via Technman Control-It 5258

The following diagram shows the cable pinout to use.





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7 Technical Support

For technical support or to report a defect, please give MYNAH Technologies a call at (636) 681-1555. If a defect is discovered, please document it in as much detail as possible and then fax your report to us at (636) 681-1660.

You can also send us your questions via e-mail. Our addresses are:

support@mynah.com

Thank you for using DeltaV.