



M Y N A HSM

**MSA AUER M-292
Programmable Serial Interface Card
Series 2**

USER MANUAL

Rev. P1.57

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1 INTRODUCTION

1.1 Scope

This document is the User Manual for the MSA Auer M-292 communications driver firmware for the Emerson Process Management (EPM) DeltaV Control System. The driver runs in the DeltaV Series 2 Programmable Serial Interface Card (PSIC). The reader should be familiar with EPM's DeltaV PSIC and connected Auer devices.

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 Driver.
Downloading Firmware	Describes downloading procedures for the 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 and the Auer devices. Also describes the cable pin assignments for RS-232.
Technical Support	Describes who to call if you need assistance.



1.3 System Specifications

The following table lists the minimum system requirements for the driver:

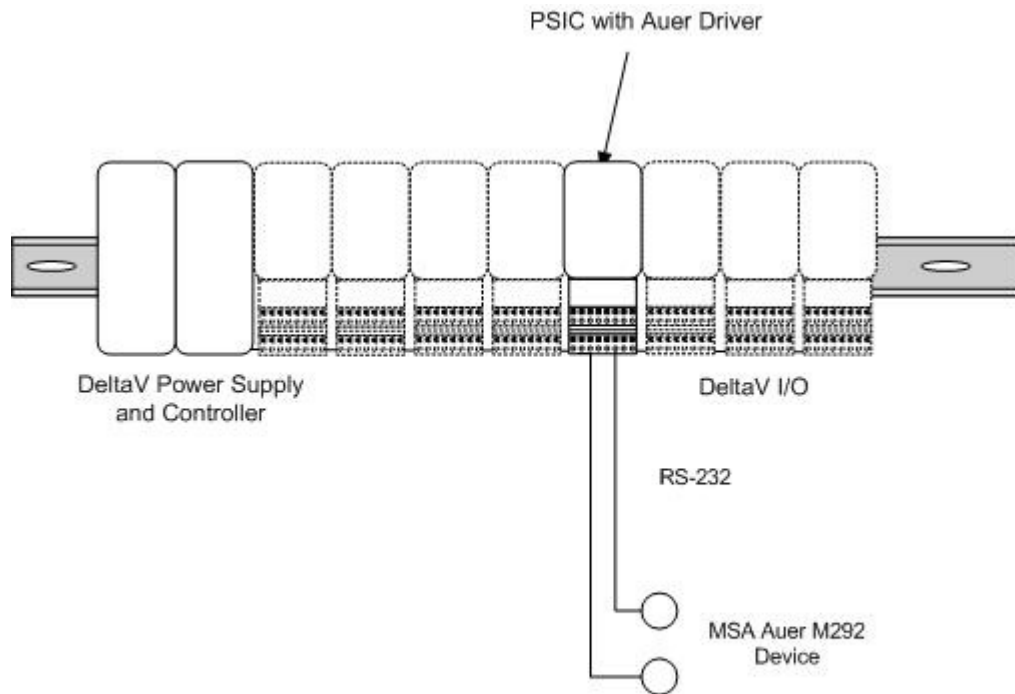
Protocol Compatibility and Reference documents	The Auer message format/protocol.
Software Requirements	DeltaV System Software (Release 6.3.2 or later) installed on a hardware-appropriate Windows workstation configured as a ProfessionalPlus for DeltaV Serial Interface Port License (VE4102)
Minimum DeltaV Hardware Requirements	FRSI DeltaV Serial Interface Series 2, Hardware PN: 12P2506X022 FRSI DeltaV M3, M5, MD or Series 2 MD Controller, Power Supply and 2 wide controller carrier FRSI 8 wide I/O card carrier



2 THEORY OF OPERATION

The Programmable Serial Interface Card (PSIC) has 2 ports which can be configured for RS-232, RS-422/RS-485 Half Duplex or RS-422/RS-485 Full Duplex communications with external devices.

For communications with the Auer modules, the PSIC connects to the RS-232 port of the device. Each PSIC port must be connected to a single Auer as illustrated below. The default port settings are 9600 baud, 8 data bits, even parity.



Point-to-Point architecture for DeltaV / Auer communications

The driver runs in Master mode only. Each Auer device uses two datasets. Dataset 1 contains the Rack and Slot Status data. Dataset 2 contains the Slot data.

Being the Master device, the serial card sends a space character to the Auer device. The Auer device responds with rack data messages. Each received message is parsed according to the expected fixed format, and the results are stored in dataset registers. The expected format is documented in the following external sources:

- 2008P1521-Protocol Definition-RevF2-Section1.pdf
- 2008P1521-Protocol Definition-RevF2-Section2.pdf
- 2008P1521-Protocol Definition-RevF2-Section2b.pdf
- 2008P1521-Protocol Definition-RevF2-Section3.pdf
- 2008P1521-Protocol Definition-RevF2-Section4.pdf
- 2008P1521-Protocol Definition-RevF2-Section5.pdf

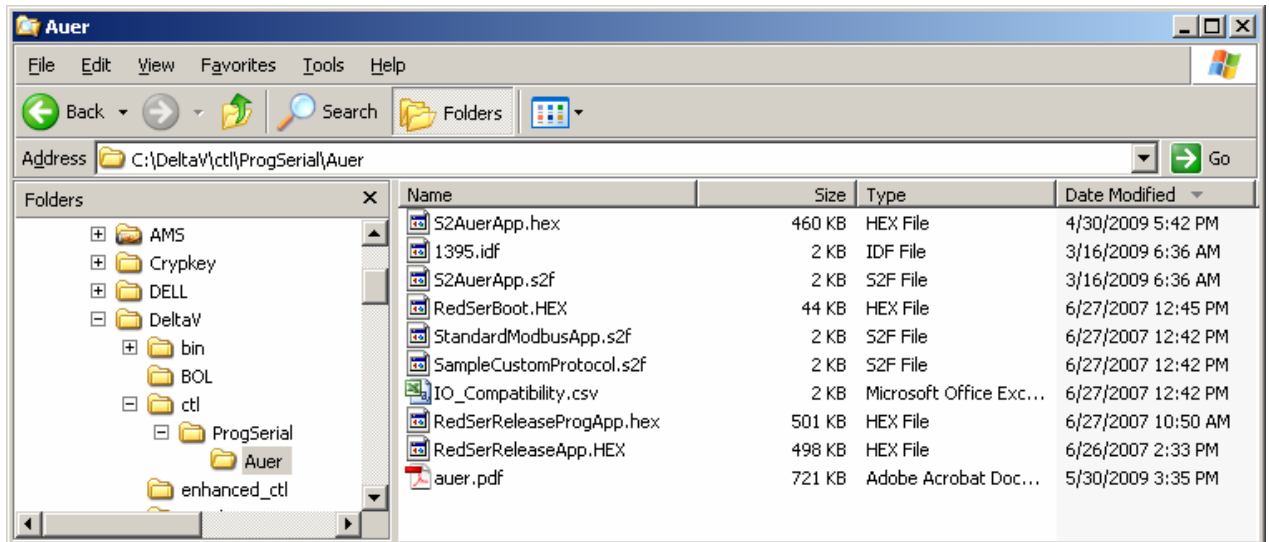


3 Downloading the firmware

The driver software distribution comprises 10 files, distributed on a CD. These files must be copied to the DeltaV directory on your ProPlus Workstation. The path is:

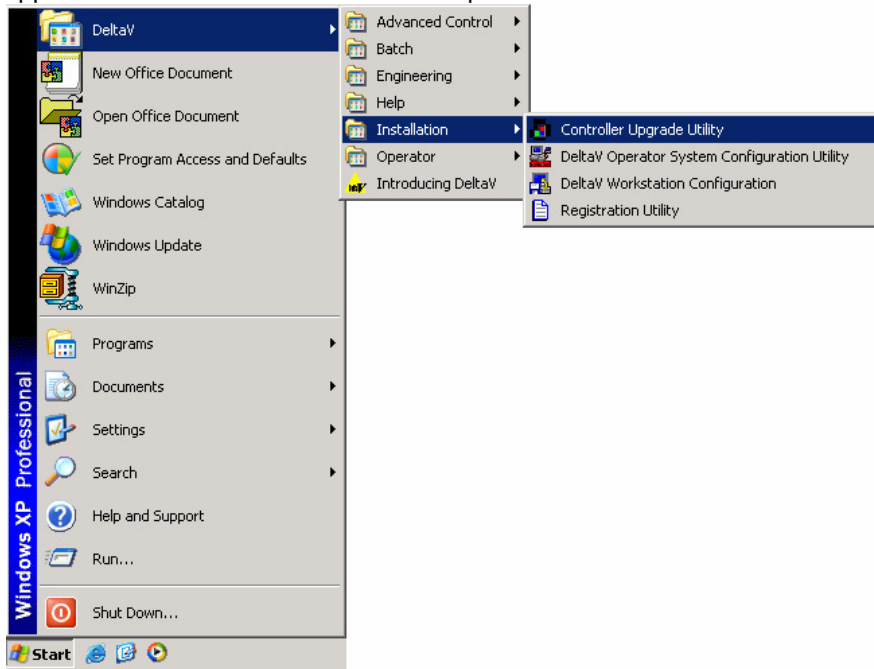
\DeltaV\ctl\ProgSerial\AUER

Note that you will have to create the \AUER subdirectory. The following files will be copied:

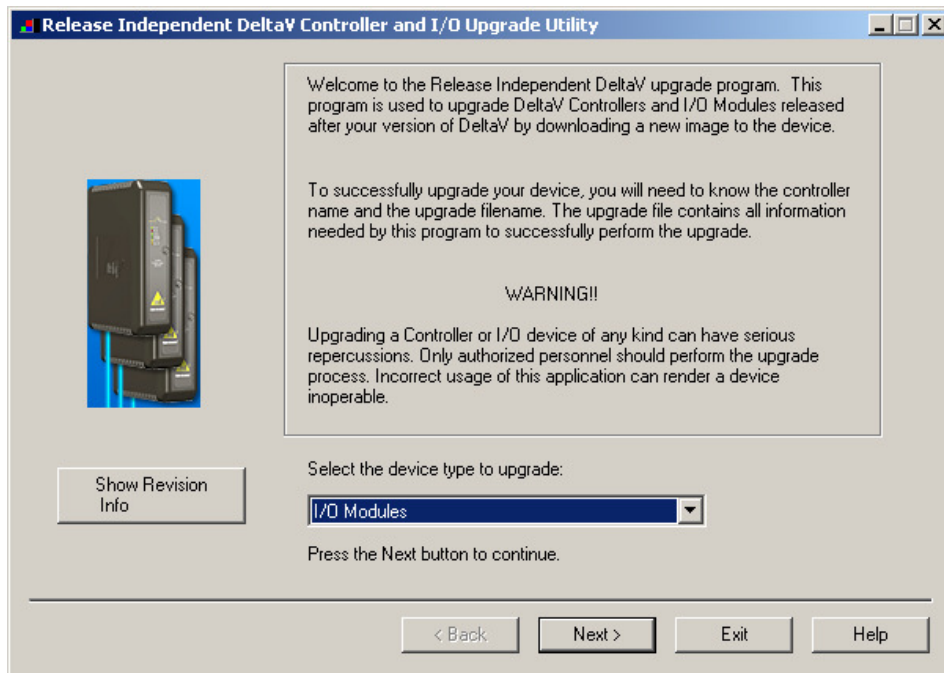




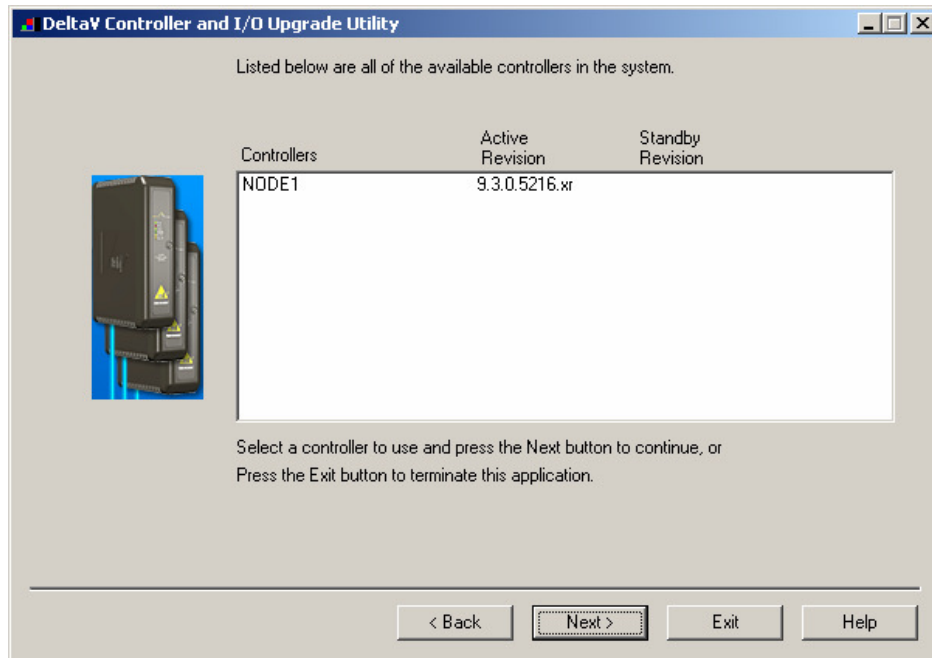
After copy completion, you are ready to program (or upgrade) the Programmable Serial Card with the supplied custom driver software. The steps are as follows:



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

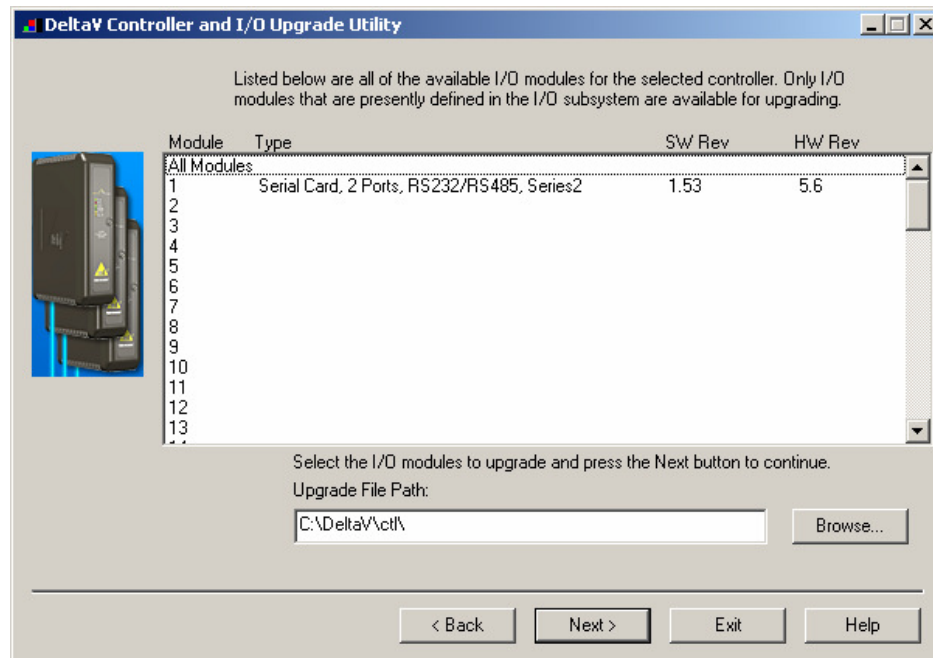


2. Choose Upgrade I/O Modules from the drop down menu and click Next.



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.

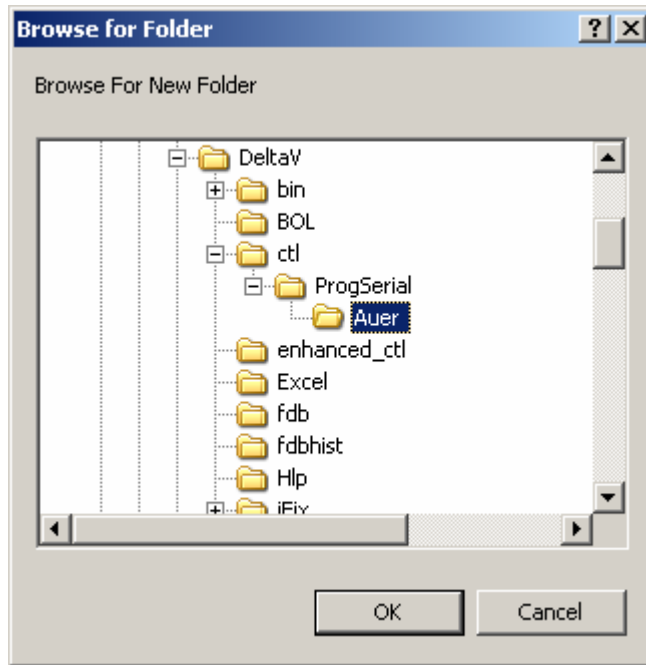
4. The following dialog will appear, listing all the I/O modules in your selected Controller. The shown list of I/O modules is an example only. Your list will be different.



Note: The first time a standard Serial card is upgraded to the Auer Driver, the dialog will be as shown above. When upgrading an existing Programmable Serial Card, skip Steps 4, 5 and 6, and go to Step 7.

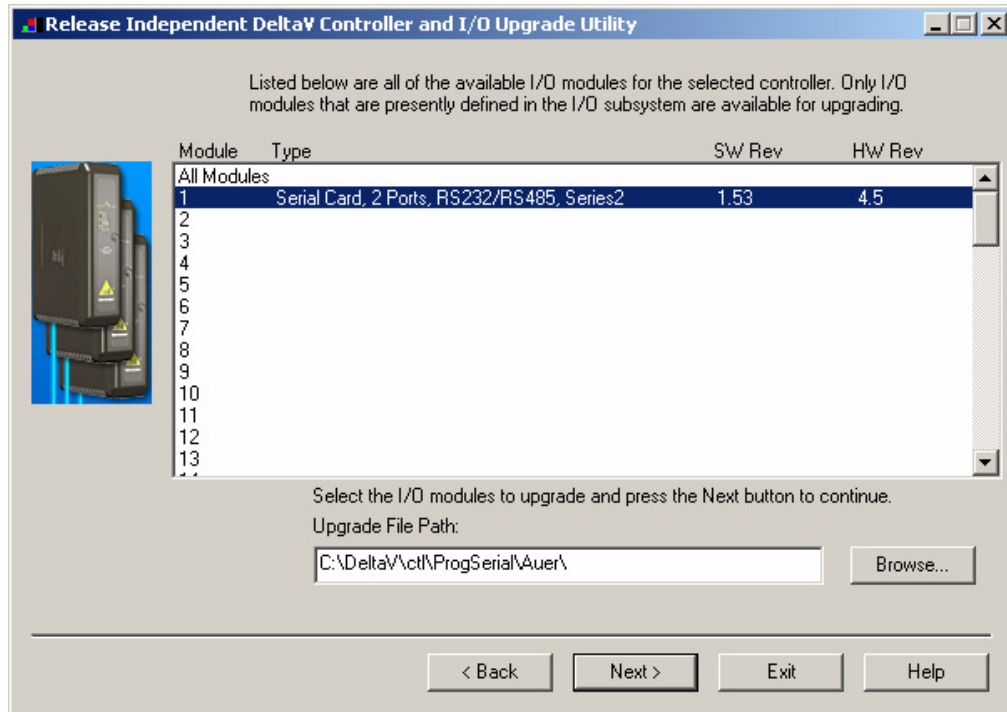


5. Click the Browse button and select the DeltaV path as shown below, and then click Ok. Note that the disk drive could be C or D.

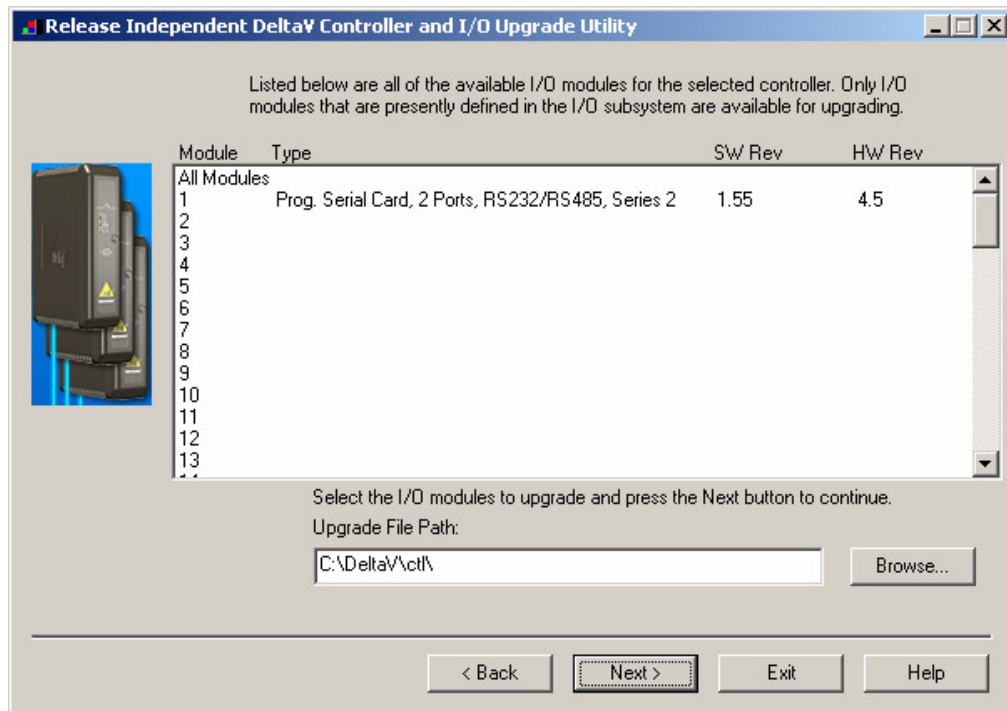




6. Select the I/O module again as shown below and then click Next. Go to Step 9.



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.



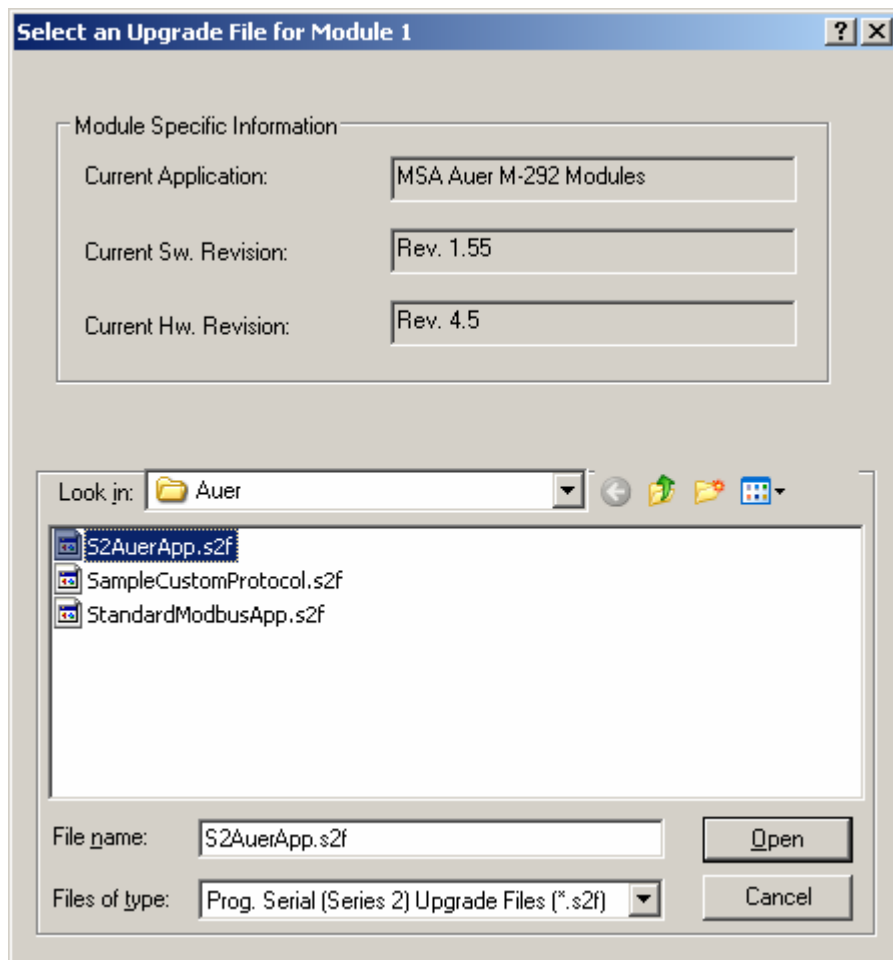
For example, we will select I/O Module 1. This will give you a dialog, from which you will select the file path to where the driver software is located. This path will be:

\Delta\ct\ProgSerial\AUER

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

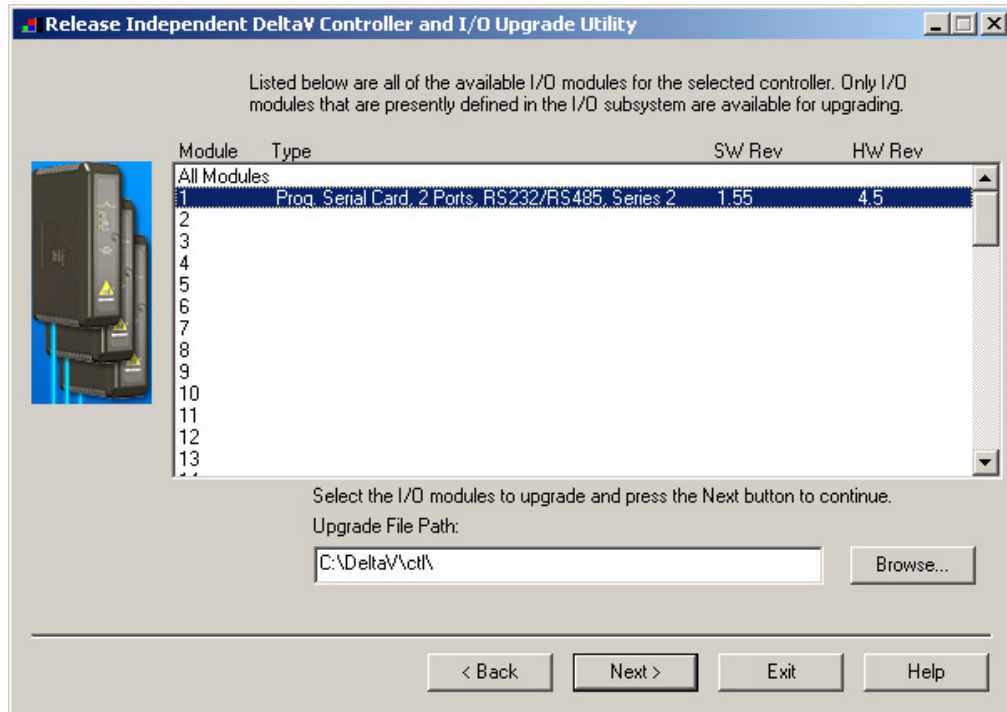
AUER.S2F

This is shown in the following dialog.

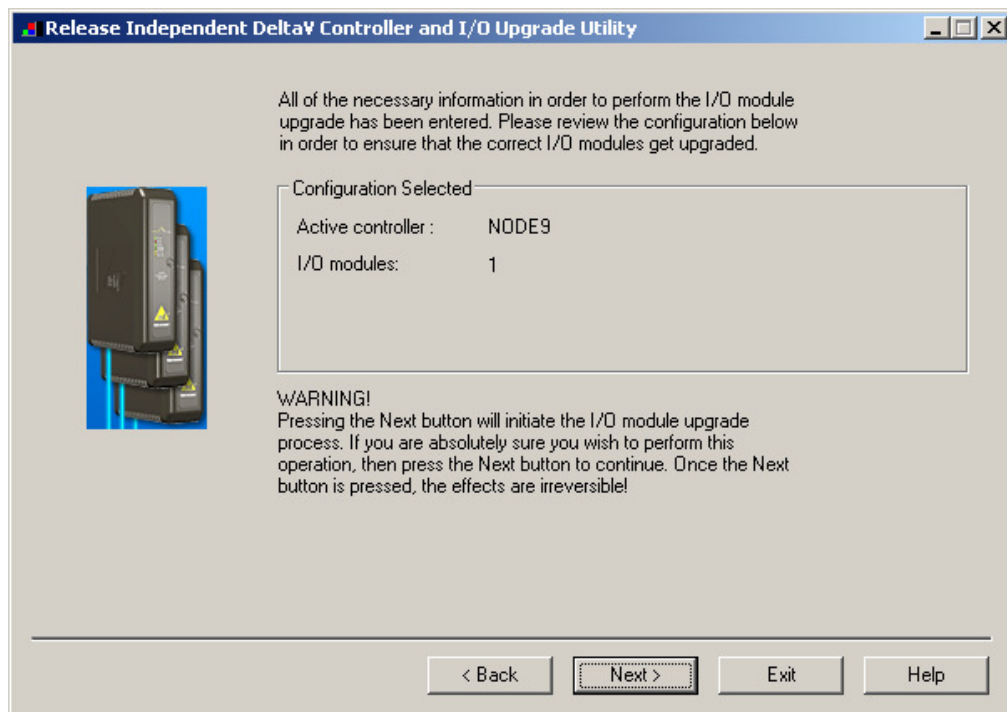




8. After selecting the .S2F file, Click on Open. This dialog will close and you will be back to the following:

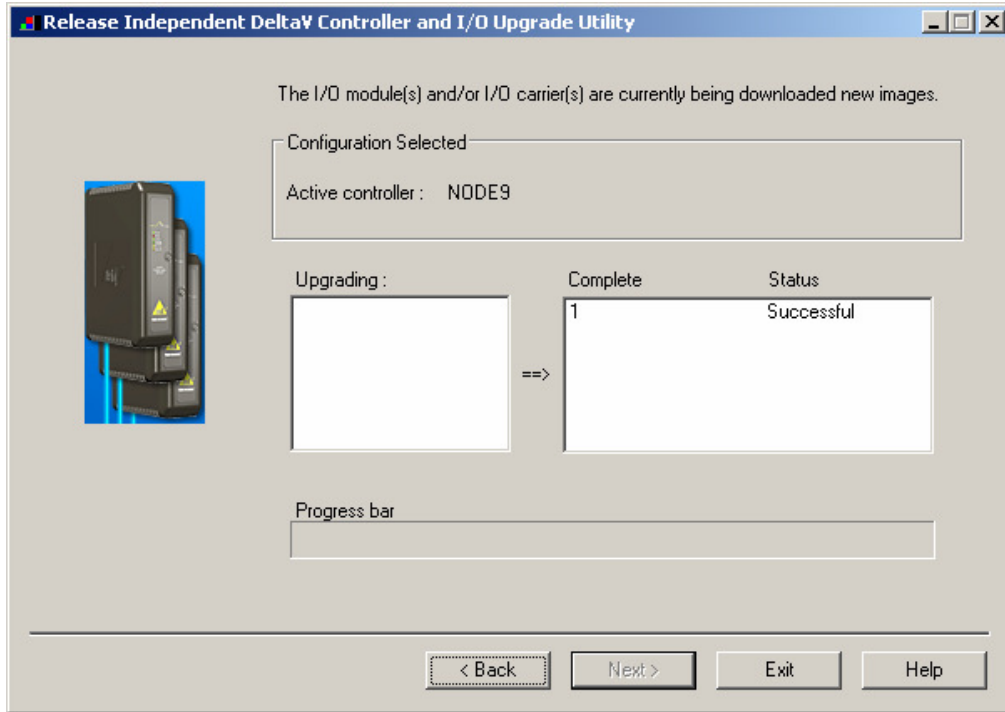


9. In this dialog, Click Next again. You will get the following dialog, confirming the Controller and I/O Module to program.





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



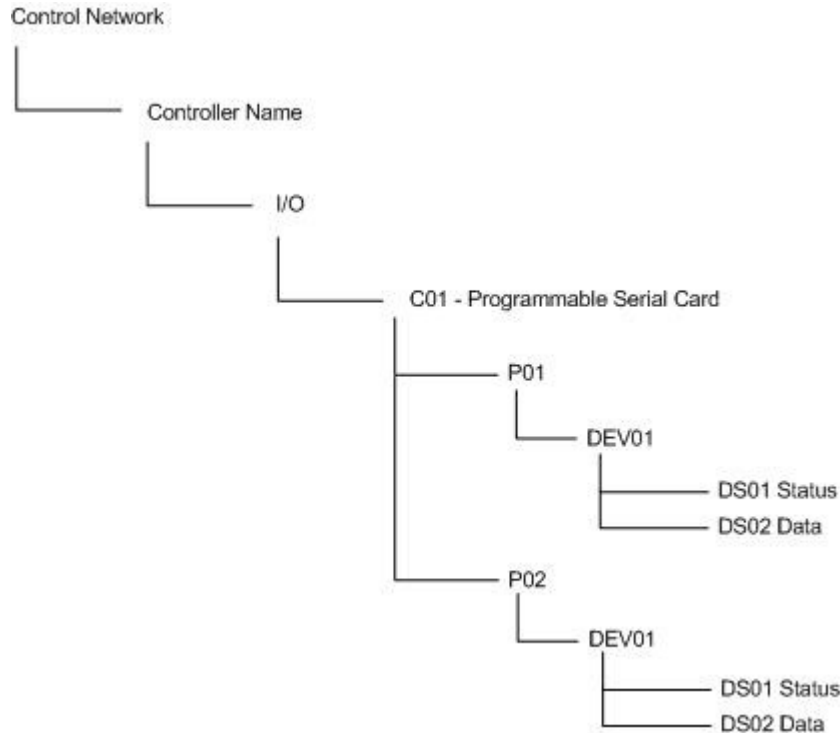
11. This completes the I/O Module upgrade process.



4 Configuration Information

Under each port, there exist 16 datasets. Data from attached Auer device will be stored in the first two datasets only. There can only be one Auer device attached per port. Under the port, create a device. The device address is not needed and may be disregarded in this driver.

Two datasets, 1 and 2, will be configured to receive the Auer data as shown below:



4.1 Port Configuration

The port must be configured as Master. Transmit delay may be configured to control the frequency of the poll sent to the Auer device. For example, by selecting the Transmit delay as 3000, the driver will wait 3 seconds between each poll. The Port Type should be defined as RS-232. The Baud Rate, Parity, Data Bits and Stop Bits should match the settings of the Auer device.

4.2 Device Configuration

One device must be configured for each Auer device connected to a given port. The device address is not used in this driver. Only one device may be configured per port for a total of two per PSIC.

4.3 Dataset Configuration

4.3.1 Data Direction:

Configure 2 datasets, both of type Input.



4.3.2 DeltaV Data Type:

See below.

4.3.3 Device Data Type and Number of Values

Table 1 – Dataset Configuration for each Auer Device

DATASET	DeltaV DATA TYPE	DEVICE DATA TYPE	DATA START ADDRESS	NUMBER OF VALUES
1	16-bit UINT	0	0	100
2	Floating Point	0	0	50

4.3.4 Special Data

Configure all Special Data registers with default values of 0.



4.3.5 Register Mappings

Table 2 – Dataset 1 – Auer Rack 1 Register Mapping

Register #	Data Description
1	Rack Number
2	Message Status
3	Rack Status
4	Slot 1 Status
5	Slot 1 Data
6	Slot 2 Status
7	Slot 2 Data
8	Slot 3 Status
9	Slot 3 Data
10	Slot 4 Status
11	Slot 4 Data
12	Slot 5 Status
13	Slot 5 Data
14	Slot 6 Status
15	Slot 6 Data
16	Slot 7 Status
17	Slot 7 Data
18	Slot 8 Status
19	Slot 8 Data
20	Slot 9 Status
21	Slot 9 Data
22	Slot 10 Status
23	Slot 10 Data
24	Slot 11 Status
25	Slot 11 Data
26	Slot 12 Status
27	Slot 12 Data
28	Not used
29	Not used
30	Not used



Table 3 – Dataset 1 – Auer Rack 2 Register Mapping

Register #	Data Description
31	Rack Number
32	Message Status
33	Rack Status
34	Slot 1 Status
35	Slot 1 Data
36	Slot 2 Status
37	Slot 2 Data
38	Slot 3 Status
39	Slot 3 Data
40	Slot 4 Status
41	Slot 4 Data
42	Slot 5 Status
43	Slot 5 Data
44	Slot 6 Status
45	Slot 6 Data
46	Slot 7 Status
47	Slot 7 Data
48	Slot 8 Status
49	Slot 8 Data
50	Slot 9 Status
51	Slot 9 Data
52	Slot 10 Status
53	Slot 10 Data
54	Slot 11 Status
55	Slot 11 Data
56	Slot 12 Status
57	Slot 12 Data
58	Not used
59	Not used
60	Not used



Table 4 – Dataset 1 – Auer Rack 3 Register Mapping

Register #	Data Description
61	Rack Number
62	Message Status
63	Rack Status
64	Slot 1 Status
65	Slot 1 Data
66	Slot 2 Status
67	Slot 2 Data
68	Slot 3 Status
69	Slot 3 Data
70	Slot 4 Status
71	Slot 4 Data
72	Slot 5 Status
73	Slot 5 Data
74	Slot 6 Status
75	Slot 6 Data
76	Slot 7 Status
77	Slot 7 Data
78	Slot 8 Status
79	Slot 8 Data
80	Slot 9 Status
81	Slot 9 Data
82	Slot 10 Status
83	Slot 10 Data
84	Slot 11 Status
85	Slot 11 Data
86	Slot 12 Status
87	Slot 12 Data
88	Not used
89	Not used
90	Not used



Table 5 – Dataset 2 – Auer Rack 1 Register Mapping

Register #	Data Values
1	Slot 1
2	Slot 2
3	Slot 3
4	Slot 4
5	Slot 5
6	Slot 6
7	Slot 7
8	Slot 8
9	Slot 9
10	Slot 10
11	Slot 11
12	Slot 12
13	Not Used
14	Not Used
15	Not Used

Table 6 – Dataset 2 – Auer Rack 2 Register Mapping

Register #	Data Values
16	Slot 1
17	Slot 2
18	Slot 3
19	Slot 4
20	Slot 5
21	Slot 6
22	Slot 7
23	Slot 8
24	Slot 9
25	Slot 10
26	Slot 11
27	Slot 12
28	Not Used
29	Not Used
30	Not Used



Table 7 – Dataset 2 – Auer Rack 3 Register Mapping

Register #	Data Values
31	Slot 1
32	Slot 2
33	Slot 3
34	Slot 4
35	Slot 5
36	Slot 6
37	Slot 7
38	Slot 8
39	Slot 9
40	Slot 10
41	Slot 11
42	Slot 12
43	Not Used
44	Not Used
45	Not Used
46	Not Used
47	Not Used
48	Not Used
49	Not Used
50	Not Used



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 Auer 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:

:	:	:
SwRev	Software Revision	1.10 (or later)
HwRev	Hardware Revision	2.3 (or later)

5.3 Verify Configuration

- Verify port configuration: The serial port must be enabled. It must be set to Slave mode. User needs to make sure communication settings such as baud rate, parity, and number of data bits match the Auer settings.
- Verify Dataset configuration: two datasets. Dataset 1 is a Floating Point and Dataset set 2 is a 16-bit Uint.



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 and written between the foreign device into the PSIC. For input data, the values should be changed in the foreign device and verified that the new data are correctly reported.
- To assign a Dataset and a register in the Dataset to an I/O module, follow these steps:
 1. Double click the IO_IN/IO_OUT parameter for the module. This brings up the IO_IN/IO_OUT Property window.
 2. Click on the Browse button. This brings up the Browse window.
 3. Click on the Object_Type drop down list, select All. This displays all the Dataset tags.
 4. Double click on the desired Dataset tag. This assigns the tag to the module and closes the Browse window.
 5. Choose the desired register in the Parameter drop down list.
 6. Click the OK button.

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.
- 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.

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 DeltaV–Field Device Electrical Interface

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

Each PSIC has 2 ports. For RS-232 Full-Duplex mode, use the following pin connections.

6.1 Pin Assignments for DeltaV PSIC

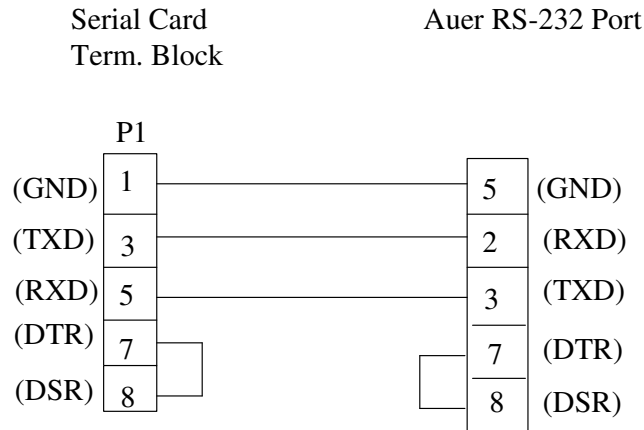
Table 3 - RS-232 Standard

Terminal Number	Signal Description
1	Port 1 – Isolated Ground (GND)
2	Unused
3	Port 1 - TXD
4	Unused
5	Port 1 - RXD
6	Unused
7	Port 1 - DTR
8	Port 1 - DSR
9	Port 2 – Isolated Ground (GND)
10	Unused
11	Port 2 - TXD
12	Unused
13	Port 2 - RXD
14	Unused
15	Port 2 - DTR
16	Port 2 - DSR



6.2 Wiring Connections

The figure below shows the connections between the Auer RS-232 (assumed 9-pin) port and Port 1 on the Serial Card Termination Block.





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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 address is:

support@mynah.com

Thank you for using DeltaV.