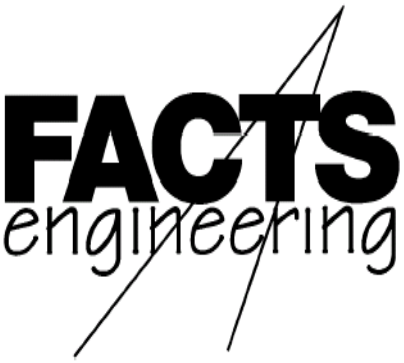

F2–DEVNETS–1
DeviceNet Base Controller
User Manual

Manual Number F2–DEVNETS1–M

WARNING

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Manual Revisions

If you contact us in reference to this manual, be sure to include the revision number.

Title: DeviceNet Base Controller User Manual
Manual Number: F2–DEVNETS1–M

Edition	Date	Description of Changes
1st Edition	9/02	Original issue

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Chapter 2: Installing the F2–DEVNETS–1 Base Controller

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Appendix E: F2–DEVNETS Compatibility Mode

1

Getting Started

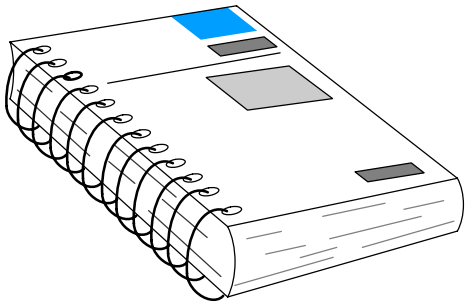
In This Chapter. . . .

- Introduction
- Introduction to DeviceNet
- DL205 I/O System
- F2–DEVNETS–1 DeviceNet Base Controller

Introduction

The Purpose of this Manual

This manual describes the installation and operation of the F2–DEVNETS–1.



Supplemental Manuals

The following manuals are essential to the proper use of your F2–DEVNETS–1.

- *DL205 Installation and I/O Manual* part number **D2–INST–M**
- The PLC/PC software manual
- The DeviceNet software (if separate) manual
- The DeviceNet Scanner (or Master) manual

Who Should Read this Manual

If you have a working knowledge of the DeviceNet network, the DeviceNet software and PLC or PC which you are using, this manual will help you configure and install your F2–DEVNETS–1 DeviceNet Base Controller.

Technical Support

We strive to make our manuals the best in the industry and rely on your feedback in reaching our goal. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call us at

1–800–783–3225

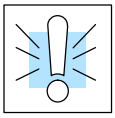
Our technical support team is glad to work with you in answering your questions. They are available **weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time**. We also encourage you to visit our website where you can find technical and nontechnical information about our products and our company.

www.facts–eng.com

Symbols Used

The “light bulb” icon in the left-hand margin indicates a **tip** or **shortcut**.

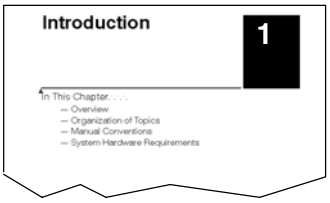
The “note pad” icon in the left–hand margin indicates a **special note**.



The “exclamation mark” icon in the left-hand margin indicates a **warning** or **caution**. These are very important because the information may help you prevent serious personal injury or equipment damage.

Key Topics for Each Chapter

The beginning of each chapter will list the key topics that can be found in that chapter.



Introduction to DeviceNet

DeviceNet is a low-level network designed to connect factory-floor devices to control systems. There are a host of manufacturers of DeviceNet products, offering an array of products including sensors, motor drives and starters, PLCs, pushbutton stations, remote I/O systems, etc.

DeviceNet Concepts

Here are some DeviceNet concepts you may find helpful.

- DeviceNet supports various communication structures including Peer to Peer, Multi-master and Master/Slave. *The F2–DEVNETS–1 uses the predefined Master/Slave connection.*
- DeviceNet has two types of messaging: Explicit Messaging and I/O Messaging.
    - Explicit Messaging is low priority, not time-critical and usually for configuration/diagnostic purposes.
    - I/O Messaging is time-critical and high priority for I/O data transfer. I/O Messaging comes in four types:
        - Strobed
        - Polled *(The F2–DEVNETS–1 only supports Polled.)*
        - Change of State (or COS)
        - Cyclic
- A single DeviceNet network is limited to 64 nodes. A node can be a single-bit device, such as a limit switch, or a remote I/O slave with several I/O modules, such as the F2–DEVNETS–1. The Master (Scanner) is usually assigned to node address 0, and many Slave devices have a factory default node address of 63.
- DeviceNet has the following data rates (with maximum bus lengths):
    - 125 kbps (bus length = 500m max.)
    - 250 kbps (bus length = 250m max.)
    - 500 kbps (bus length = 100m max.)
- The 24V DeviceNet power supply must be grounded at only one point. The – V terminal must be tied to Protective Earth Ground at the power supply only.

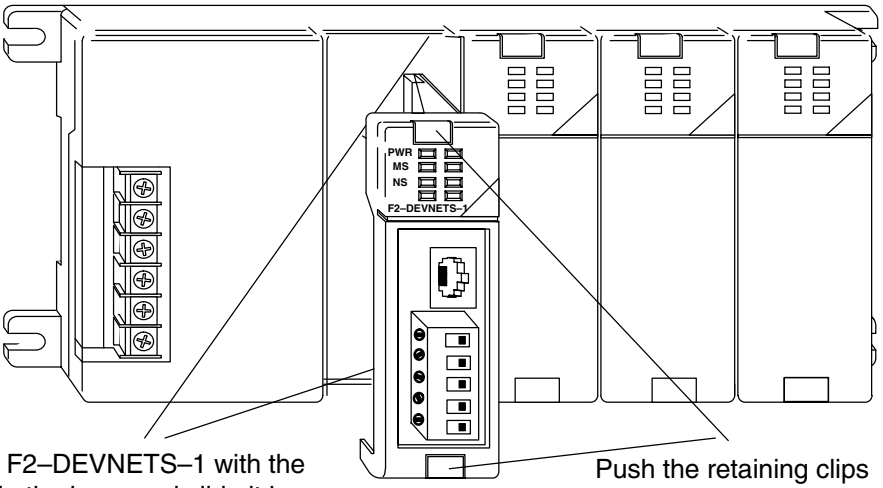
The ODVA

The DeviceNet standard is maintained by the ODVA (Open DeviceNet Vendor Association, Inc.). Contact the ODVA for detailed information about DeviceNet.

Open DeviceNet Vendor Association, Inc.
20423 State Road 7
Suite 499
Boca Raton, FL 33498
Phone: (954) 340–5412
Fax: (954) 340–5413
Internet: **www.odva.org**
Email: odva@powerinternet.com

DL205 I/O System

Each 205 I/O system has the following components: a Power Supply/Base, CPU or Interface Module, and one or more I/O Module(s).



Align the F2–DEVNETS–1 with the grooves in the base and slide it in.

Push the retaining clips in to secure the module in the DL205 base.

Mini Glossary

Below is a small glossary of terms used in this manual.

Scanner or Master	The DeviceNet Master of which the F2–DEVNETS–1 is a slave. This can be either a PLC module or a card in your PC.
Controller or Slave	Short for the F2–DEVNETS–1 Base Controller. The controller is also referred to as a Network Interface Module elsewhere.
Node Address or MAC ID	The unique device address on a DeviceNet network. There are a maximum of 64 total (0–63). Usually the scanner is node 0.

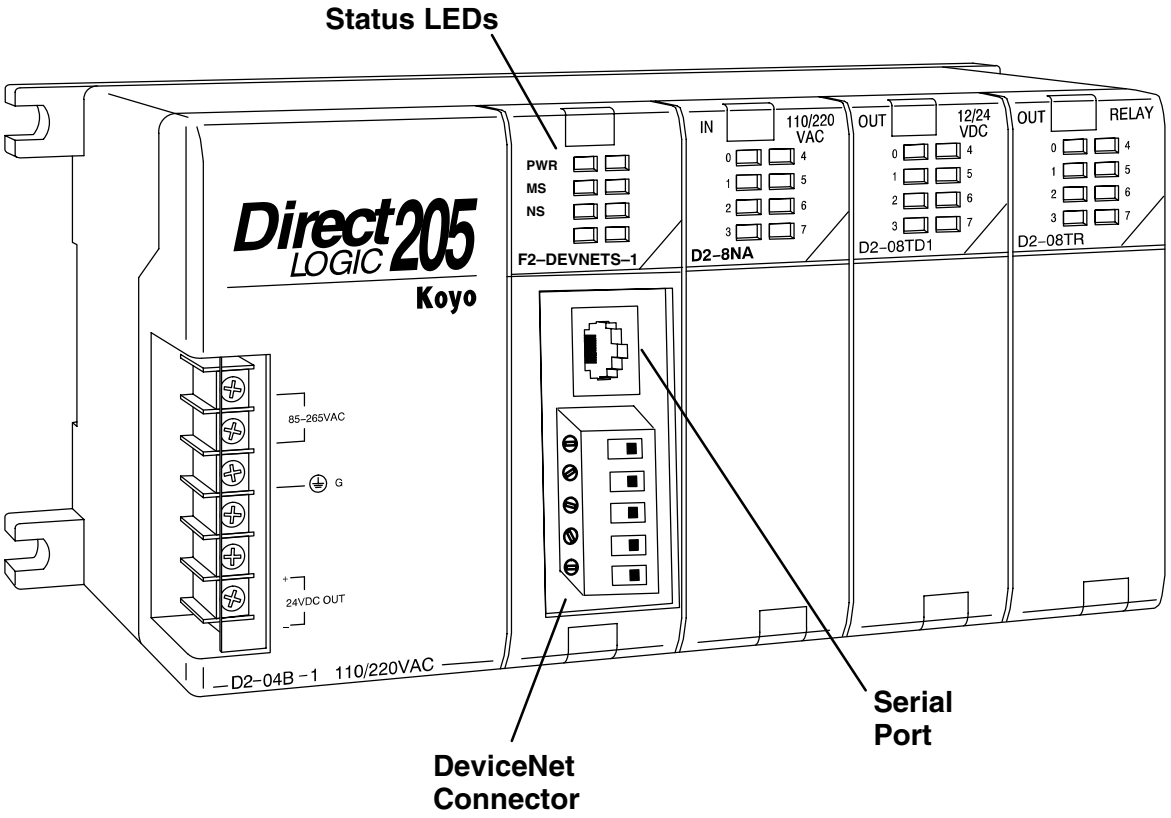
F2–DEVNETS–1 Base Controller

The F2–DEVNETS–1 Base Controller is a slave module that functions as a controller for 205 I/O on a DeviceNet network.

F2–DEVNETS–1 Base Controller Features

The Controller has the following features:

- Status LEDs (Power, Module and Network)
- Serial Port
- Node Address (MAC ID) and Baud Rate Jumpers
- DeviceNet Connector



2

Installing the F2–DEVNETS–1 Base Controller

In This Chapter. . . .

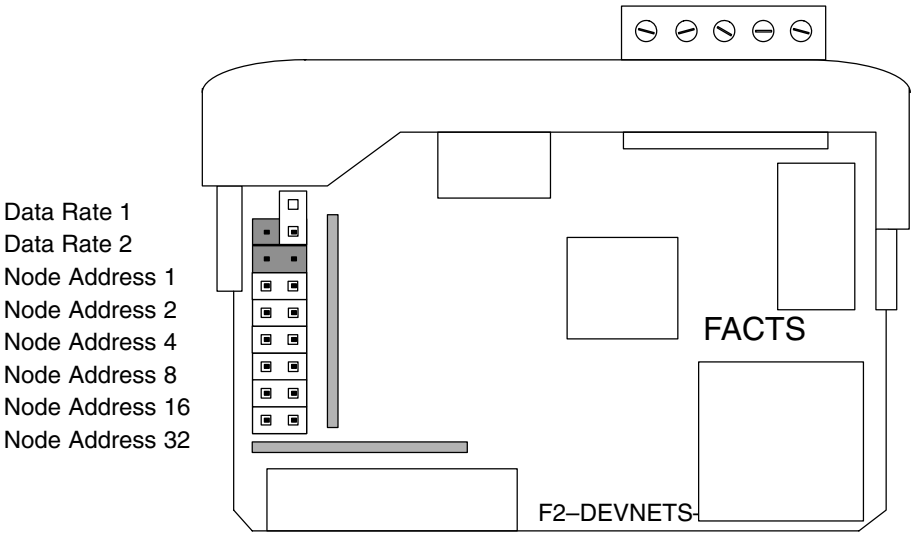
— Installing the F2–DEVNETS–1 Base Controller
— Configuring the Controller
— Master/Slave Communications
— DL205 Backplane Communications

Installing the F2–DEVNETS–1

Setting the Module Jumpers

The F2–DEVNETS–1 controller has a 8 jumpers which are used to set baud rates and the node address.

Note: Be sure to look closely at the default settings below. If you are connecting to an existing DeviceNet network, you may need to change the DeviceNet Baud Rate on your F2–DEVNETS–1. *The factory default baud rate is 125kbps.*



Factory Default Settings Shown (125K Baud/MAC ID = 63)

Set the DeviceNet baud rate.

DeviceNet Baud Rate		
Baud Rate	**Jumper 1**	**Jumper 2**
125 kbps	OFF	OFF
250 kbps	ON	OFF
500 kbps	OFF	ON
See Appendix E, Compatibility Mode	ON	ON

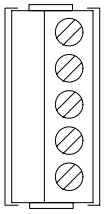
Set the combination of Node Address jumpers to match the desired Node Address (MAC ID).

Node Address Examples

Node Address	Jumper 1	Jumper 2	Jumper 4	Jumper 8	Jumper 16	Jumper 32
1	ON	OFF	OFF	OFF	OFF	OFF
63	ON	ON	ON	ON	ON	ON
10	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON

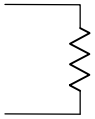
Wiring the Controller to a DeviceNet Network

Connect the DeviceNet cable (Belden 3085A, YR–29832 or equivalent) to the removable connector as shown below. Be sure to connect a terminating resistor (121 Ohm 1%, 1/4W).



V+ (red)
CAN* High (white)
Shield (bare)
CAN* Low (blue)
V– (black)

* Controller Area Network (CAN)



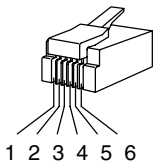
Connect a terminating resistor across the CAN High (white) and CAN Low (blue) screw terminals.

The terminating resistor is 121 Ohm 1%, 1/4 Watt. (2 resistors are included with each F2–DEVNETS–1).

Tip: Be sure that each end of the DeviceNet network 'trunk' has a proper terminating resistor connected as shown above.

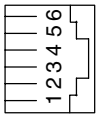
Serial Port (RS–232)

The F2–DEVNETS–1 serial port is used to update the firmware when necessary. Use cable part number **FA–CABKIT** to connect the F2–DEVNETS–1 to a PC, or use the following information to make a cable.



6–pin Male (RJ–12) Modular Plug

6–pin Female (RJ–12) Modular Jack



Serial Port Pinout	
Pin	**Signal**
1	0V
2	Internally shorted to Pin 5
3	RS232C Data in
4	RS232C Data out
5	Internally shorted to Pin 2
6	0V

Configuring the Controller

Configuring the DeviceNet Base Controller

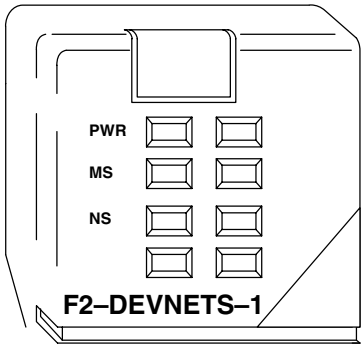
Use the software of your DeviceNet master to configure the controller for your network. *Refer to the software Help file and/or manual for help with configuration.* Follow these basic steps when configuring your F2–DEVNETS–1 controller.

1. **Set the Controller Node Address:**
   In the DeviceNet master software, make sure the Controller node address is set to an available node number on the DeviceNet network (from 0 to 63).
2. **Add the EDS file (if required by the software):**
   In your DeviceNet software, add the F2–DEVNETS–1 Electronic Data Sheet (EDS) file from the disk which came with this manual or from our web site **www.automationdirect.com**. Some software may not provide for the use of EDS files.
3. **Add the F2–DEVNETS–1 to the Scan List:**
   Add the F2–DEVNETS–1 to the Scan List in your DeviceNet Master software.
4. **Set the Input/Output Bytes:**
   If required by your DeviceNet software, set the I/O Parameters to Tx = Output bytes and Rx = Input bytes (on the Scanner's Scan List tab), for Polled I/O.
5. **Map the I/O to the Master:**
   Map the F2–DEVNETS–1 I/O to the Scanner using Auto Map, or map the I/O to another location if desired.
6. **Scan:**
   Go Online (or Scan) to verify the configuration and check for errors.
7. **View Indicators on the Controller:**
   Refer to the Status Indicators when connecting to the network.

The F2–DEVNETS has three LED's: PWR, MS and NS.

The MS LED represents the Module Status.

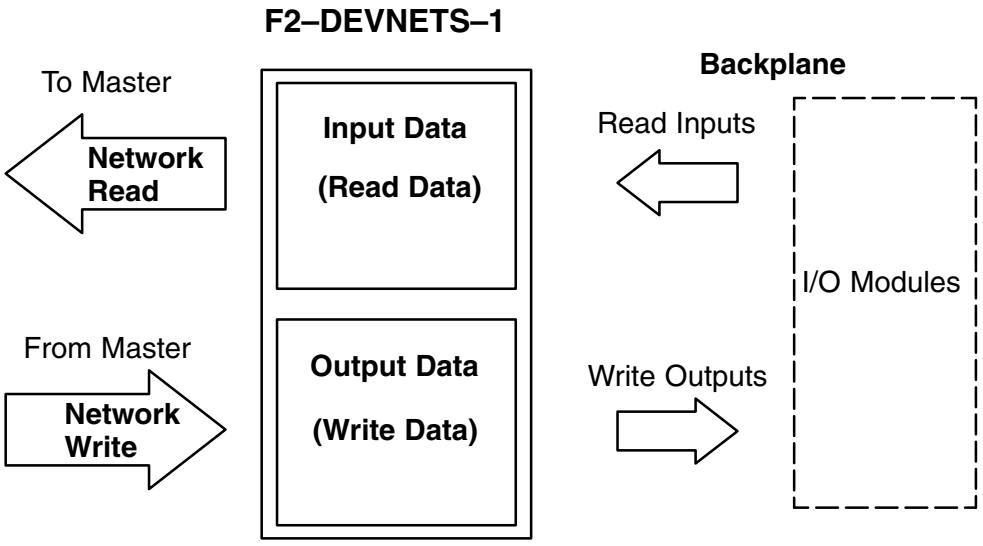
The NS LED indicates the Network Status.



PWR (Power) Indicator	
Indication	**Status**
OFF	No power or defective LED.
Solid Green	Power is ON.
MS (Module Status) Indicator	
Indication	**Status**
OFF	No power or defective LED.
Flashing Red–Green	LED test during power up cycle.
Solid Green	Allocated to a master.
Solid Red	Module Error.
NS (Network Status) Indicator	
Indication	**Status**
OFF	No power, defective LED or No Network Connection
Flashing Red–Green	LED test during power up cycle.
Flashing Green	A 0.25 sec. ON–OFF cycle indicates online and ready to accept commands from the master.
Solid Green	Under control of a master.
Flashing Red	A 0.25 sec. ON–OFF cycle indicates a communication fault or loss of Bus Power.
Solid Red	No bus power or a unrecoverable communications fault.

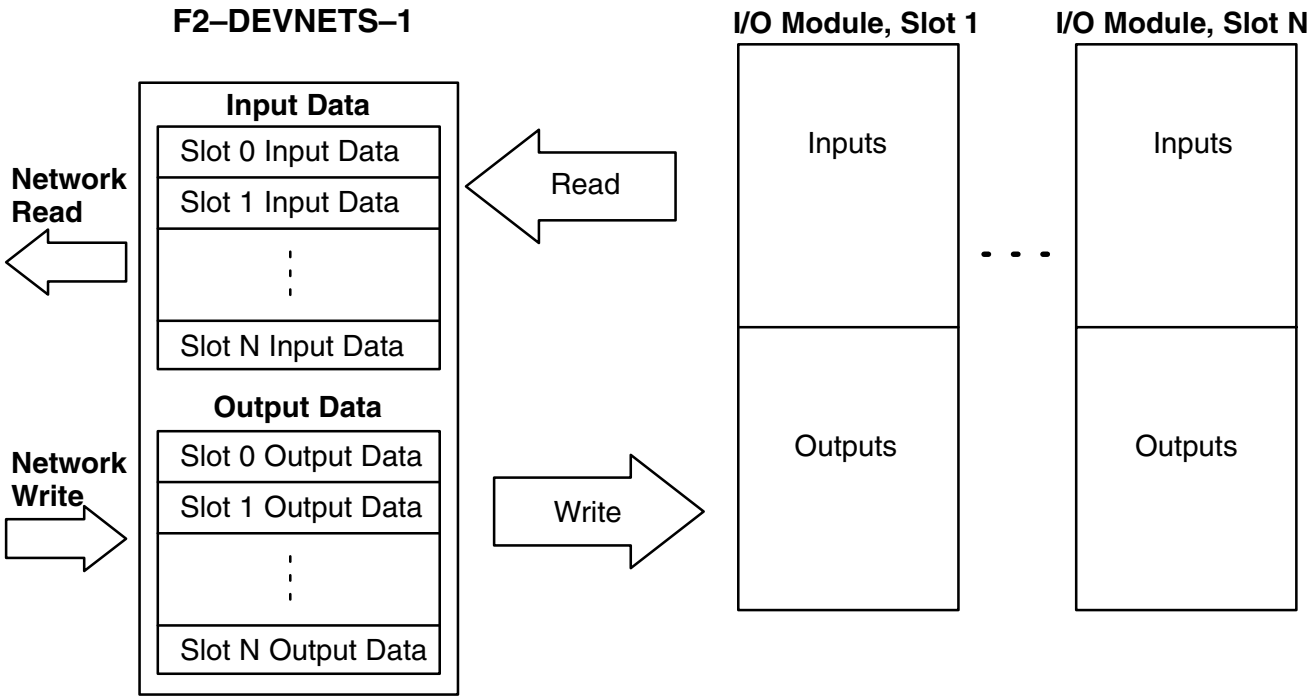
Master/Slave Communications

The F2–DEVNETS–1 controller (slave) communicates with the DeviceNet scanner (master) by sending Input Data and receiving Output Data. The controller *reads* Inputs from I/O Modules and *writes* Outputs to I/O Modules.



DL205 Backplane Communications

The Controller communicates with its I/O modules over the backplane. The I/O is mapped in consecutive order as shown.



I/O Module Memory Map

Module Type	Part Number	ID Code (Hex)	F2–DEVNETS–1 Mode	
			Bytes Produced	Bytes Consumed
Discrete Inputs	F2–08SIM	14	1	0
	D2–08ND3	14	1	0
	D2–16ND3–2	08	2	0
	D2–32ND3	05	4	0
	D2–08NA–1	14	1	0
	D2–08NA–2	14	1	0
	D2–16NA	08	2	0
Discrete Outputs	D2–04TD1	0A	0	1
	D2–08TD1	13	0	1
	D2–16TD1–2	06	0	2
	D2–16TD2–2	06	0	2
	D2–32TD1	0F	0	4
	D2–08TA	13	0	1
	F2–08TA	13	0	1
	D2–12TA	06	0	2
	D2–04TRS	0A	0	1
	D2–08TR	13	0	1
	F2–08TR	13	0	1
	F2–08TRS	13	0	1
	D2–12TR	06	0	2
Discrete Combo	D2–08CDR	0E	1	1
Analog In	F2–04AD–1(L)	03	8	0
	F2–04AD–2(L)	03	8	0
	F2–08AD–1	01	16	0
	F2–08AD–2	01	16	0
Temperature In	F2–04RTD	15	9	0
	F2–04THM	15	9	0
Analog Out	F2–02DA–1(L)	04	0	4
	F2–02DA–2(L)	04	0	4
	F2–02DAS–1	17	0	4
	F2–02DAS–2	17	0	4
	F2–08DA–1	16	0	16
	F2–08DA–2	16	0	16
Analog Combo	F2–4AD2DA	02	8	4

Modules Not Supported:
F2–CP128
H2–CTRIO, H2–ERM (–F), H2–ECOM (–F)
D2–DCM, D2–CTRINT, D2–RMSM

Analog Module Mapping

Module Type	Part Numbers	Data Format	Data Description	Comments
4 Channel AI (12 Bit)	F2–04AD–1(L) F2–04AD–2(L)	Word 1 Word 2 Word 3 Word 4	Ch1 Data Ch2 Data Ch3 Data Ch4 Data	The MSB (Bit) of each word of channel data is a diagnostic bit. ON indicates broken transmitter or no 24VDC.
8 Channel AI (12 Bit)	F2–08AD–1 F2–08AD–2	Word 1 Word 2 Word 3 Word 4 Word 5 Word 6 Word 7 Word 8	Ch1 Data Ch2 Data Ch3 Data Ch4 Data Ch5 Data Ch6 Data Ch7 Data Ch8 Data	The MSB (Bit) of each word of channel data is a diagnostic bit. ON indicates broken transmitter or no 24VDC.
4 Channel Temperature Input (16 Bit)	F2–04THM F2–04RTD	Word 1 Word 2 Word 3 Word 4 Byte 9	Ch1 Data Ch2 Data Ch3 Data Ch4 Data Burnout Byte	Each of the Low 4 bits of the burnout byte corresponds to a channel. ON indicates burnout.
2 Channel AO (12 Bit)	F2–02DA–1 F2–02DA–2	Word 1 Word 2	Ch1 Data Ch2 Data	
2 Channel AO (16 Bit)	F2–02DAS–1 F2–02DAS–2	Word 1 Word 2	Ch1 Data Ch2 Data	
8 Channel AO (12 Bit)	F2–08DA–1 F2–08DA–2	Word 1 Word 2 Word 3 Word 4 Word 5 Word 6 Word 7 Word 8	Ch1 Data Ch2 Data Ch3 Data Ch4 Data Ch5 Data Ch6 Data Ch7 Data Ch8 Data	
4 Channel AI 2 Channel AO (12 Bit)	F2–4AD2DA	Word 1 Word 2 Word 3 Word 4 Output Word 1 Output Word 2	Ch1 AI Data Ch2 AI Data Ch3 AI Data Ch4 AI Data Ch1 AO Data Ch2 AO Data	

Bytes=8 Bits, Word=16 Bits

Specifications

A

In This Appendix. . . .

— Specifications

Specifications

General	
Operating Temperature	32° F to 131° F (0° C to 55° C)
Storage Temperature	–4° F to 158° F (–20° C to 70° C)
Ambient Humidity	5% – 95% relative humidity (non–condensing)
Voltage Withstand	1500VAC, 1 minute (DeviceNet connector internal)
Insulation Resistance	500VDC, 10MΩ (DeviceNet connector internal)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD 810C, Method 516.2
Noise Immunity	NEMA (ICS3–304) Impulse noise 1μs, 1000V FCC class A RFI (145MHz, 435MHz 10W, 10cm)
Atmosphere	No corrosive gases Environmental Pollution Level 2

Communication	
Communication form	DeviceNet Communication Protocol (Slave) Predefined Master/Slave Group 2 Server only
Network Node Address	0 to 63 (Set by jumpers)
Data Packet	1 to 128 Bytes (Data beyond eight bytes are divided by fragmentation)
Communication Rate (Max. cable length)	125KB (1640 ft./ 500m) 250KB (820 ft./ 250m) 500KB (328 ft./ 100m)
Communication Status Indicator	MS: Module Status LED [Red/Green] NS: Network Status LED [Red/Green]
DeviceNet Power Consumption	11 to 25 VDC (45mA max.)

DeviceNet	
Device Type	Generic
Explicit Peer to Peer Message	No
I/O Peer to Peer Message	No
Configuration Consistency	No
Fault Node Recovery	No
Communication Baud Rate 125K, 250K, 500K	Yes
Master/Scanner	No
I/O Slave Message Bit Strobe Polling Cyclic Change of State	No Yes No No

Serial Port Communications	
Connector	6 pin female modular (RJ12 phone jack)
Connection Port Type	RS–232C
Protocol	Proprietary
Station Number	1 (fixed)
Baud Rate	9600 and 19200 bps
Data Bits	8
Start Bits	1
Stop Bits	1
Parity	None
Communication Time out	Prescribed Time

I/O Modules	
Number of I/O points	128 Bytes (1024 bits) In/128 Bytes (1024) Out
Number of Slots (I/O Modules)	1 to 8 slots
Self-diagnostics	Watchdog Timer Memory check
I/O module types	Discrete Input Module Discrete Output Module Analog Input Module Analog Output Module
Internal Power Consumption	190mA at 5VDC
Max. time of external power loss	10ms

B

DeviceNet Group2 only Explicit Messages

In This Appendix. . . .

— DeviceNet Commands

DeviceNet Group2 only Explicit Messages

These explicit messages are used to allocate/release the connection between the master and its slave.

DeviceNet Commands

The following tables identify the data being transferred. When GET is by itself in the Service column, the item is either fixed and cannot change or the system sets the item to reflect the system processing characteristics. SET only in the Service column indicates the user can modify the item.

Unless otherwise indicated, all data is given in HEX format. Single numbers shall be considered zero filled and right justified.

CLASS = 1

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
1	1	Vendor ID	660d	AutomationDirect.com	GET
2	1	Product Type	0	General Purpose I/O Device	GET
3	1	Product Code	20d	Vendor Assigned Product Code	GET
4	1	Revision Major/Minor	3.1	Released Product Version	GET
5	1	ID Status	1	Current Status of Entire Device	GET
6	1	Serial Number	XXXX	4–Digit Vendor Assigned	GET
7	1	Product Name	F2–DEVNETS	Vendor Assigned	GET
—	1	Reset		Reset the Device	RESET

CLASS = 3

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
1	1	MAC ID	0 – 63	MAC ID (Node Address)	GET
2	1	BAUD RATE	0 – 2	0=125k, 1=250k, 2= 500k	GET
3	1	BUS–OFF Interrupt	X	BUS–OFF Interrupt processing	GET
4	1	BUS–OFF Count	X	BUS–OFF Count	GET/SET
5	1	ALLOCATION	X	Explicit and I/O connections	GET

CLASS = 4

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
3	100	I/O DATA	Up to 128 BYTES	Read Input Data (Produced) Write Output Data (Consumed)	GET/SET
3	101	CONFIG DATA	4 Bytes + 1 Word (16 bits) for each occupied slot. Bytes 1–4 are always supplied. Other bytes are supplied when appropriate.		GET
		BYTE 1	0 – 3F (63d)	MAC ID	
		BYTE 2	0 – 2	BAUD RATE	
		BYTE 3	0 – 8	SLOTS (0=Empty Rack)	
		BYTE 4	0 – FF	SLOTS (Bit 0=Slot 0, Bit 1 = Slot 1, etc.)	
		BYTE 5/6	BITS 15 – 8 BITS 7 – 0	# Inputs # Outputs	
3	102	CONFIG DATA	8 BYTES	Configuration Data with the module ID for each occupied slot. 0FFH=Unoccupied	GET
			BYTE 1	Module ID in Slot 0	
			BYTE 2	Module ID in Slot 1	
			BYTE 3	Module ID in Slot 2	
			BYTE 4	Module ID in Slot 3	
			BYTE 5	Module ID in Slot 4	
			BYTE 6	Module ID in Slot 5	
			BYTE 7	Module ID in Slot 6	
			BYTE 8	Module ID in Slot 7	
3	103	PRODUCED DATA	0–0FFFFH	4 Channels (8 bytes) of analog inputs (First 4 of last 8 analog inuts in base)	GET
3	104	PRODUCED DATA	0–0FFFFH	4 Channels (8 bytes) of analog inputs (Second 4 of last 8 analog inuts in base)	GET
3	105	PRODUCED DATA	0–0FFFFH	4 Channels (8 bytes) of RTD/THM Inputs	GET

CLASS = 5

ATTR	INSTANCE 1=EXPLICIT 2=POLLING	ITEM	VALUE	DESCRIPTION	SERVICE
1	1/2	CNXN ATTR State	X	0=None, 1=Configuring, 2=Waiting, 3=Connected, 4=Timed out T	GET
2	1/2	Connect Type	X	0=Explicit 1=I/O	GET
3	1/2	Connect Trigger	X	83H = Explicit 82h = I/O	GET
4	1/2	Connect Produced	X	Connection ID that will produce...FFFF if no production	GET
5	1/2	Cconnect Consumed	X	Connection ID that will consume...FFFF if no production	GET
6	1/2	Connect COMM ID	021h	MSG Group2 Consuming MSG Group1 Producining	GET
7	1/2	Produced Connection Size	X	# Bytes data in polled connection # Bytes data + header in Explicit connection	GET
8	1/2	Consumed Connection Size		# Bytes data out polled connection # Bytes data + header out Explicit connection	GET
9 (see note)	1/2	Connect Expected Packet Rate	X	Number in milliseconds	GET
0C	1/2	Connect WD Timeout	0	Watchdog time out action reset device	GET
0D	1/2	Connect Path Length	X	0 for Explicit 6 for I/O	GET
0E	1/2	Connect Path ATTR ID	0/STRING	0 for Explicit 6 bytes for I/O	GET
0F	1/2	Connect Consumed Path Length	X	0 for Explicit 6 for I/O	GET
10	1/2	Connect Consumed ATTR ID	0/STRING	0 for Explicit 6 bytes for I/O	GET
11	1/2	PROD Inhibit	X		GET
—	1/2	Reset		Start Inactivity	RESET

Note: The F2–DEVNETS–1 has a interval timer that can be set to timeout after a selectable number of milliseconds. If there is no activity during the selected time value, the connection will release. ***When this timer is set to zero the connection will not timeout.***

Since the operation depends on the controlling actions of a Master CPU existing externally on the network, the connection should never be allowed to timeout. To keep the connection open, set the Expected Packet Rate (EPR) value for the connection to zero.

All outputs will turn off when the connection is released. This will occur when an EPR value counts down to zero or when the master releases the connection. This is a fixed condition and cannot be modified.

F2–DEVNETS–1 Think & Do Setup

C

In This Appendix. . . .

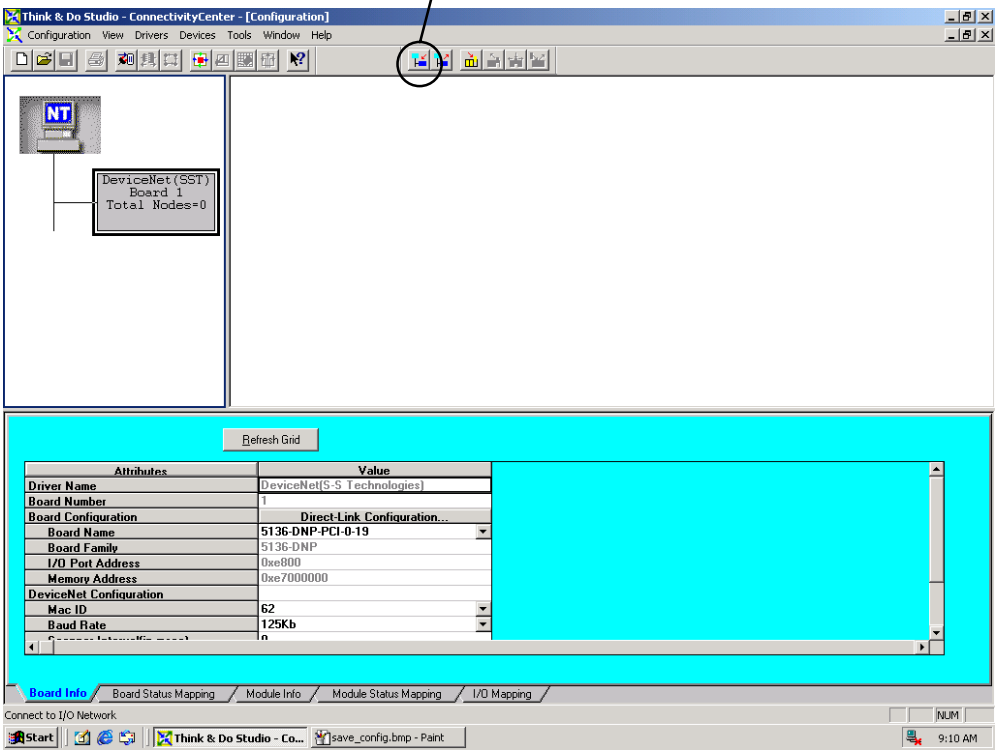
F2–DEVNETS–1 Think & Do Setup

For those who are using the F2–DEVNETS–1 as a slave with Think & Do Live or Studio, the following example shows how to setup Think & Do on your network.

T & D Studio setup for PC control

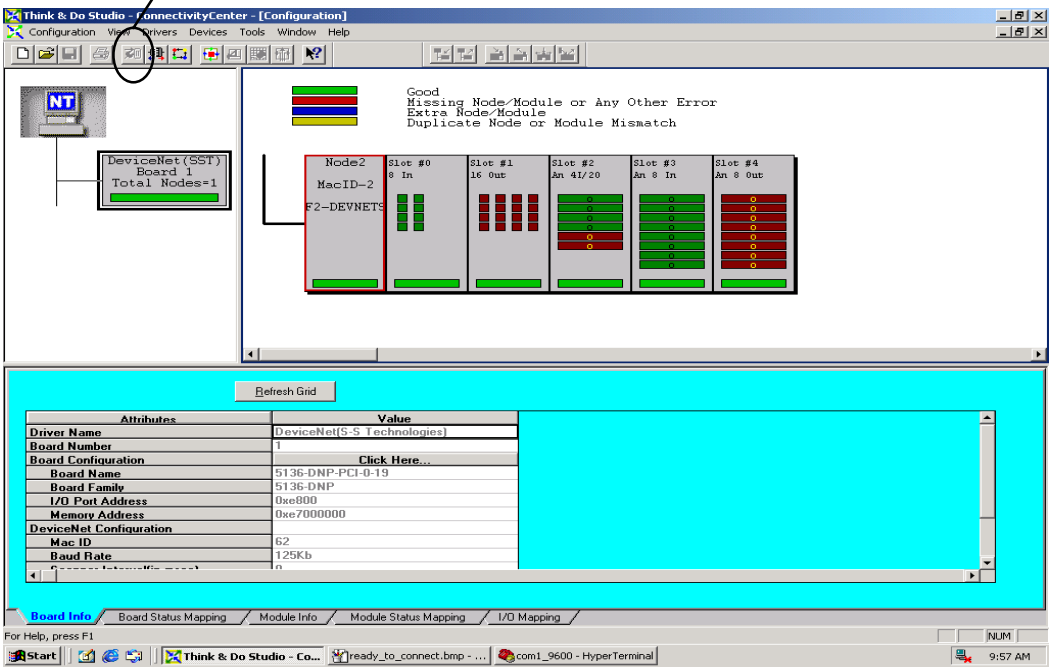
Use the following procedure to setup the F2–DEVNETS–1 adapter. This example is using Think & Do Studio. Be sure that the Node Address switches have been set to a proper address.

1. Click on Add Driver and SST card is installed.
2. Set MAC ID to 62.
3. Set baud rate to 125K,
   or to whatever the slave is set to.
4. Set scanner interval to 0.
5. Set timeout shutdown to 5.
6. EDS not needed.

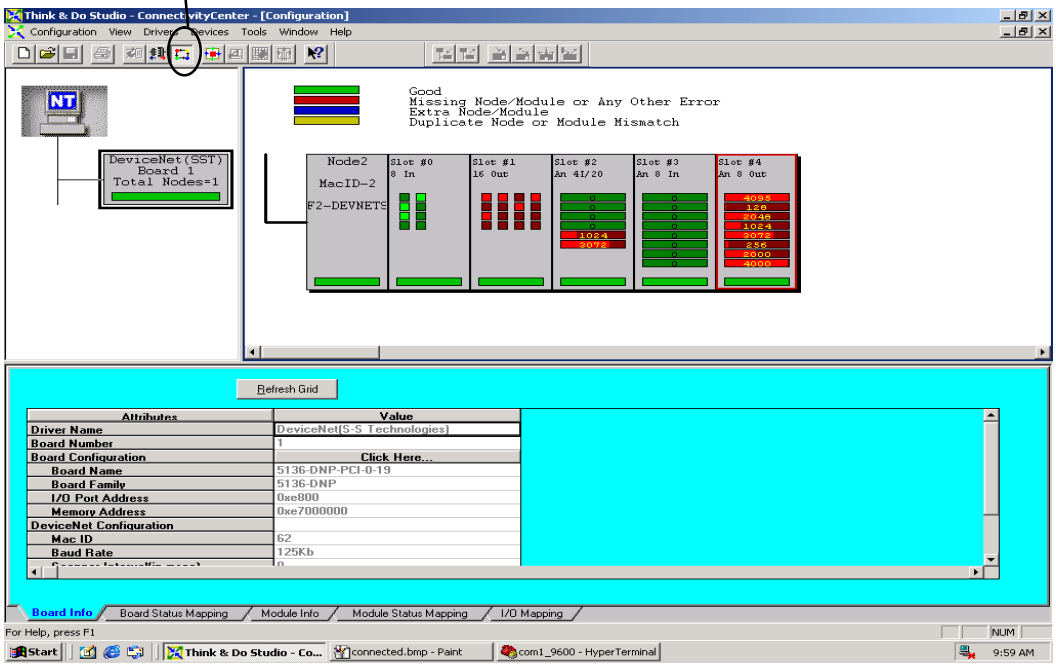


7. Click on connection.

Think & Do will display F2–DEVNETS–1 MacID–2. Inputs and outputs are displayed.



8. Click on Scan and communication will begin.



F2–DEVNETS–1 and RSNetWorx™ Setup

D

In this Appendix. . . .

— Setup F2-DEVNETS-1 with **RSNetWorx™**

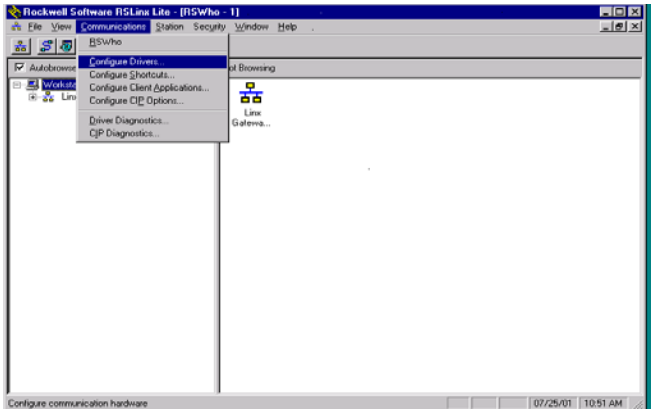
Setup F2–DEVNETS–1 with RSNetWorx™

For those who are using the F2–DEVNETS–1 as a slave with an Allen–Bradley PLC, the examples on the following pages have worked for us, and will be a guide for you. These steps should help you through the process of setting up your Allen–Bradley DeviceNet network using RSNetWorx™. If you encounter any difficulties with the setup process, please contact your local Rockwell International representative.

RSLinx

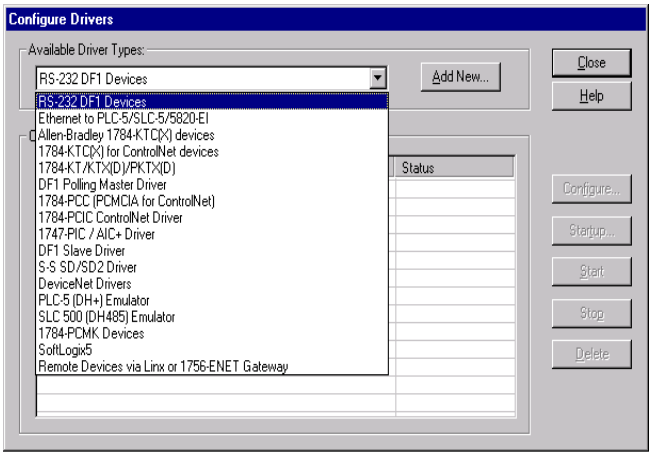
Begin by opening your RSLinx to configure the DeviceNet driver.

1. Click on **Communications.**
2. Click on **Configure Drivers**.



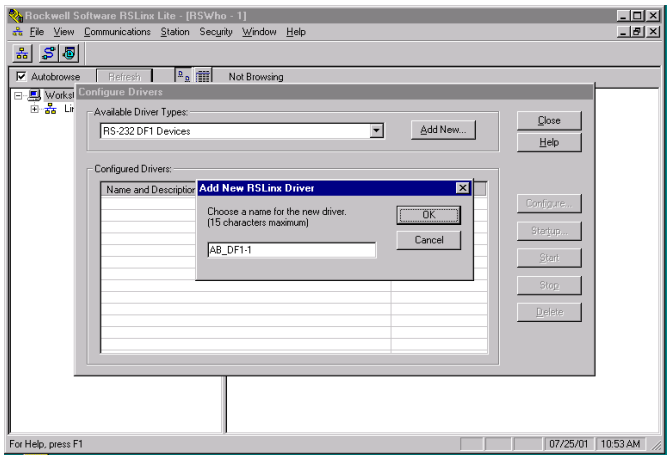
3. Click on the down arrowhead,▼, and select a driver from the drop–down list.
4. Click **Add New.**

A DF1 driver is selected in this example.



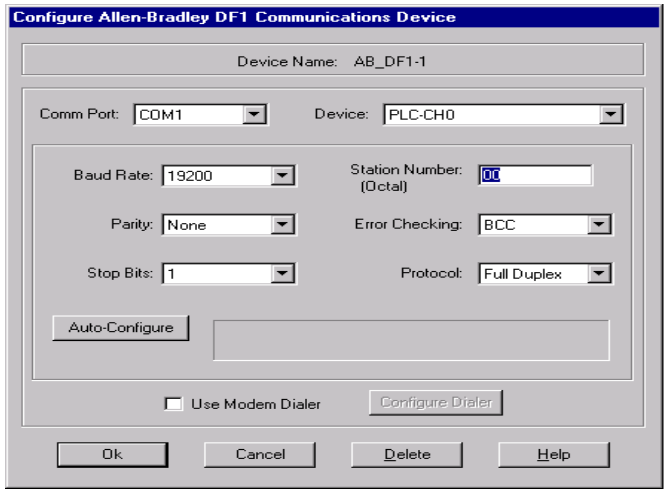
Note: Selecting a new driver may prompt you to reboot or to restart your computer.

5. Click **OK** in the pop–up window.



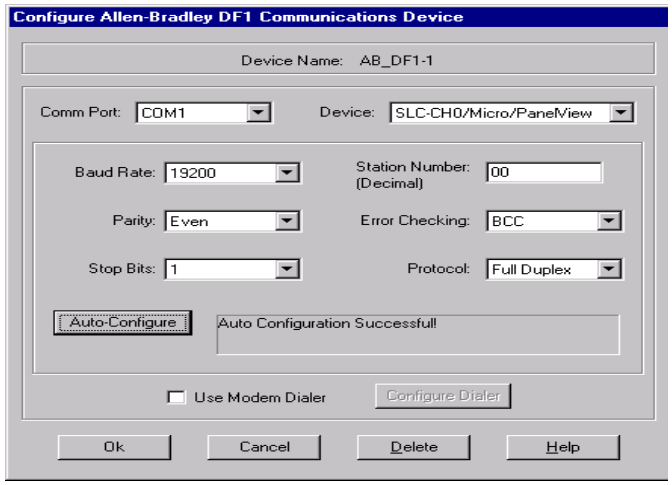
This window will appear.

6. Click on **Auto–Configure** to setup the communication parameters.

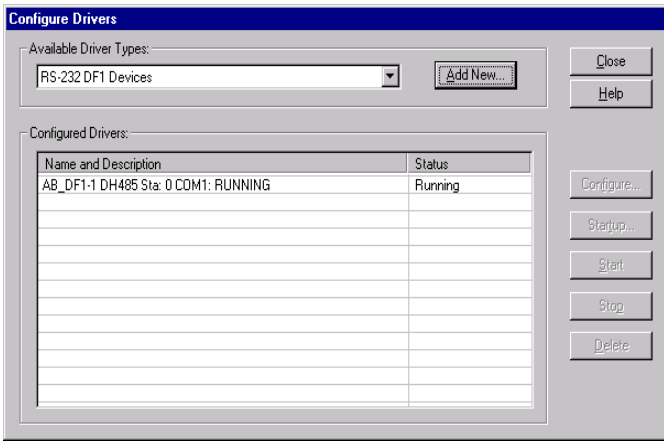


Auto Configuration Successfull will appear.

7. Click **OK**.

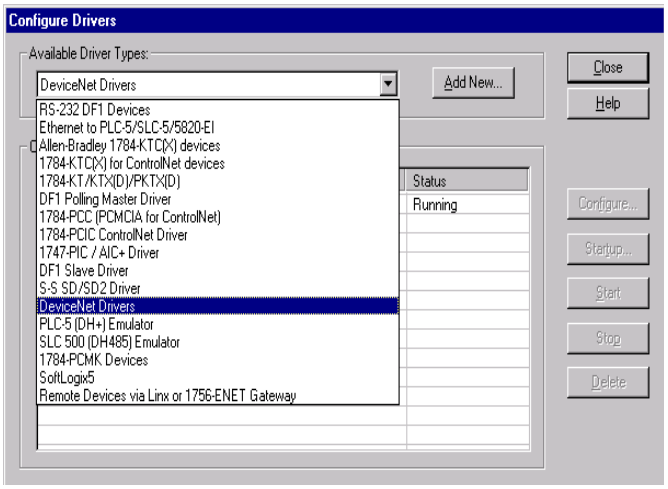


The Configure Drivers window will now appear showing the **Status** as Running.



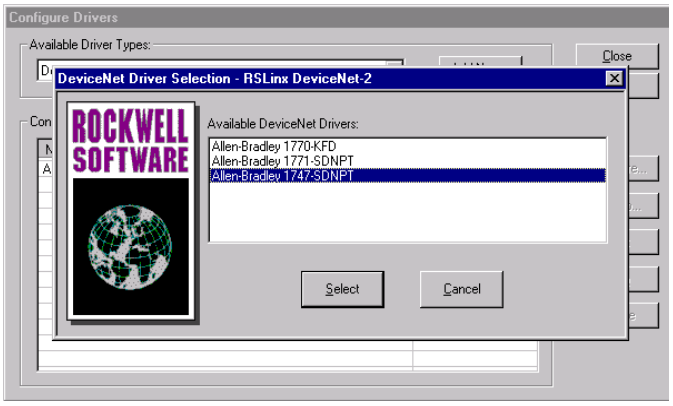
The next step is to add a DeviceNet driver.

8. Click on the down arrowhead, ▼, and select your choice of drivers from the drop–down list.
9. Click on **Add New**.

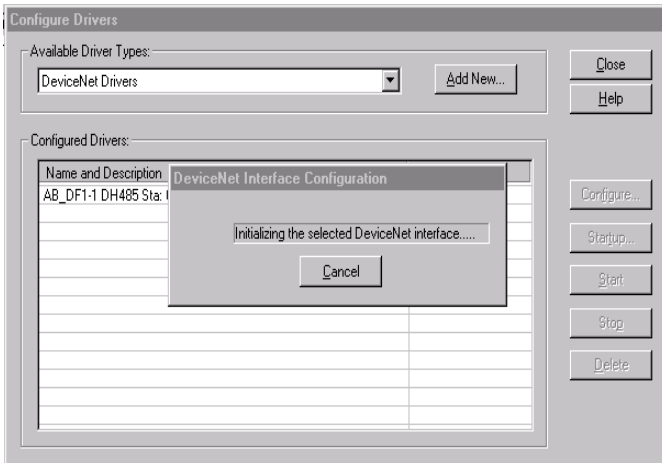


This window will appear.

10. Select the proper driver, then click **Select**.



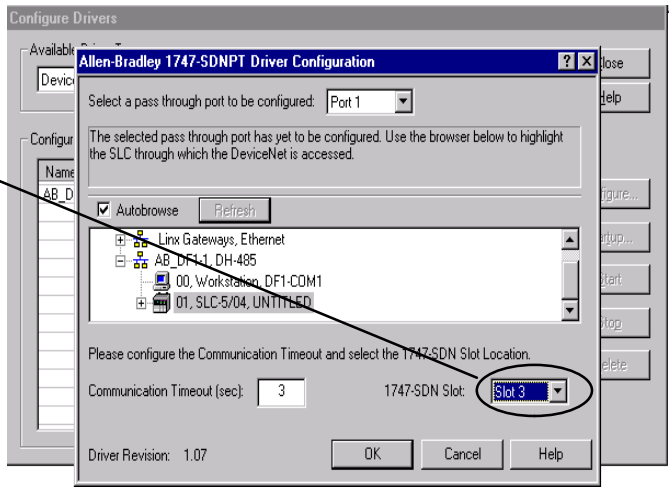
The DeviceNet Interface Configuration window will appear briefly.



This window will appear for you to setup the pass through port.

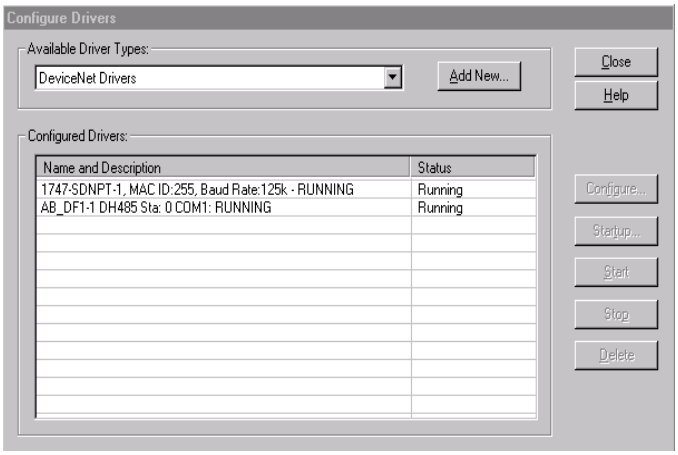
Be sure that you select the proper slot where the scanner module is located.

If this does not match, you will need to reconfigure the I/O in RSLogix.



11. Type in a name for the driver, then click **OK**.

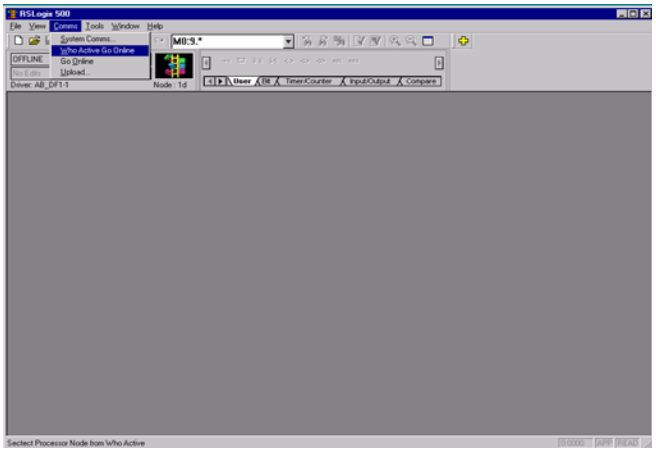
This window will appear indicating that both drivers are Running.



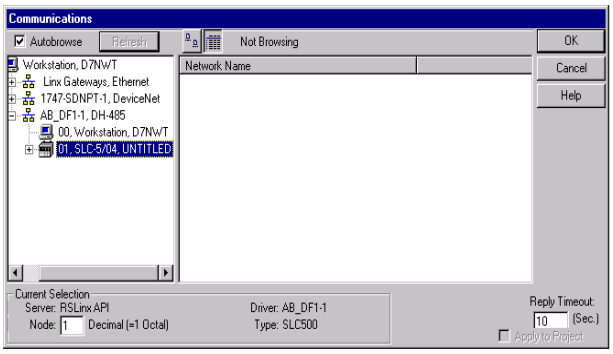
RSLogix

You are ready to connect to the PLC using your RSLogix software.

1. Click on **Communications** and select **Who Active Go Online.**

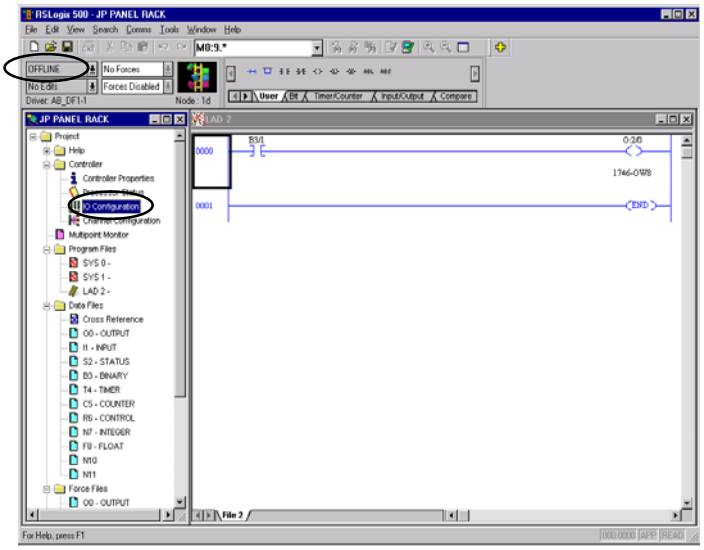


2. When this window appears, select the PLC to connect to.
3. Click **OK**.



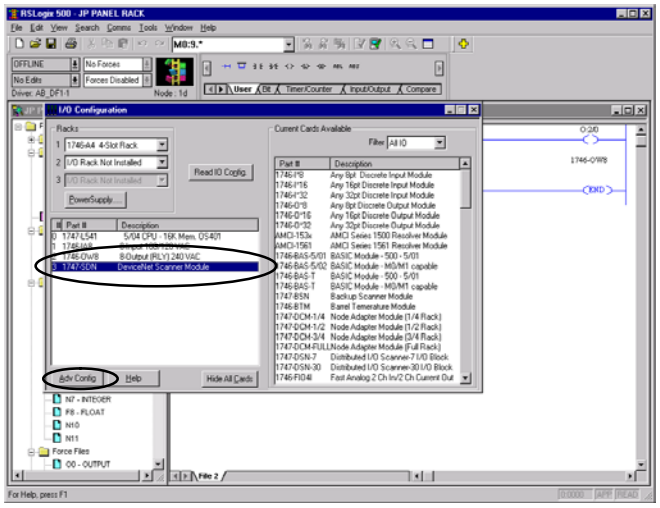
This window will appear with the relay ladder program. You now want to configure the I/O. This must be done **OFFLINE** in order to change the configuration.

4. Select **I/O Configuration**.



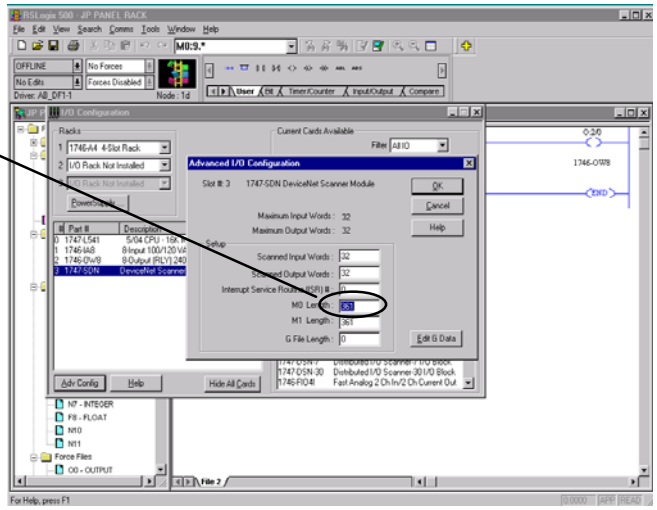
The I/O Configuration window will come into view. When you select the scanner module, verify that it is in the correct slot.

5. Click **Adv Config**.



The **Advanced I/O Configuration** window will appear. The **M0** and **M1** Lengths will show the default of 256. Change this to 361.

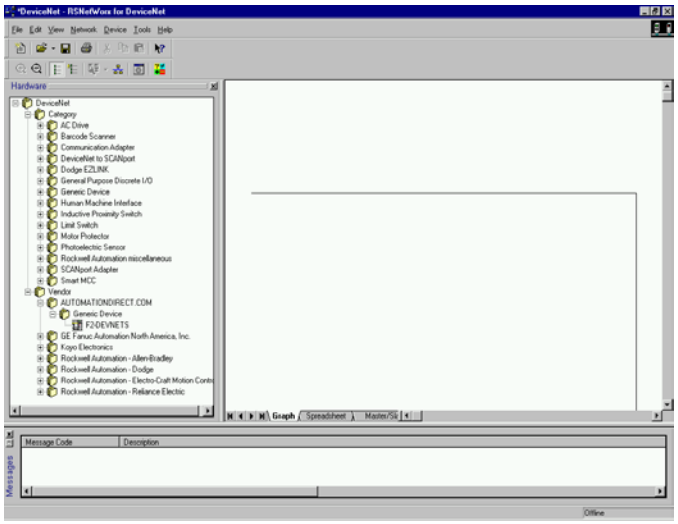
6. Click **OK**.



Configure F2–DEVNETS–1 with RSNetWorx

You are now ready to configure the F2–DEVNETS–1. First, open RSNetWorx. Look for AUTOMATIONDIRECT.COM in the hardware tree listed under **Vendor**. Click on the + to show the devices for AUTOMATIONDIRECT.COM. The following example shows the F2–DEVNETS–1 as an F2–DEVNETS.

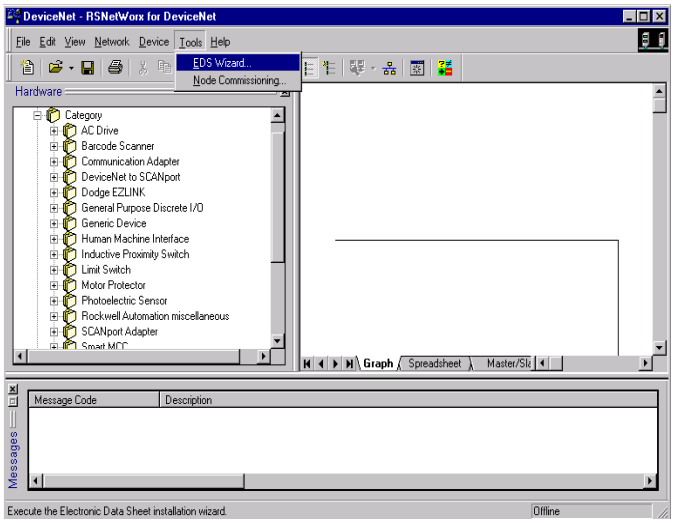
RSNetWorx opened.



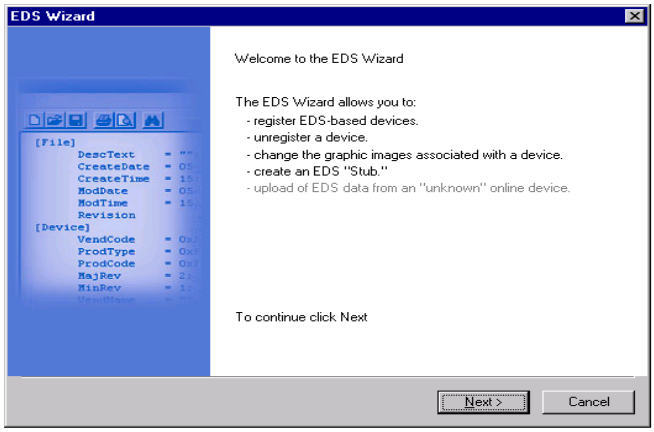
Using the EDS file

If you do not see your device listed, it will need to be added from the EDS file (refer to page 2–4). The following example will guide you through the procedure of installing the device from the EDS file.

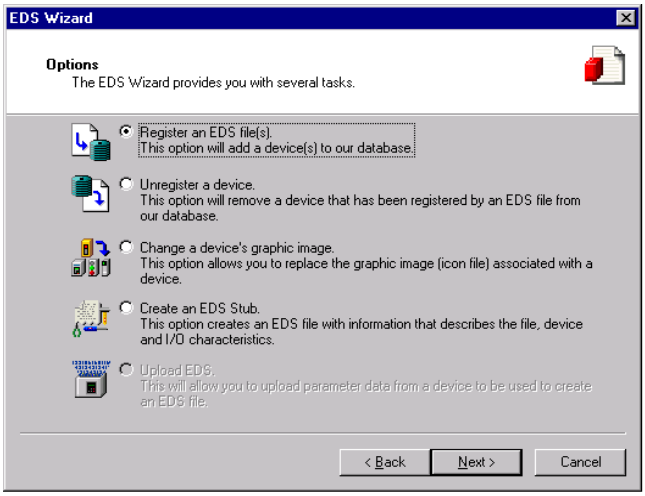
Click **Tools** and select **EDS Wizard...**.



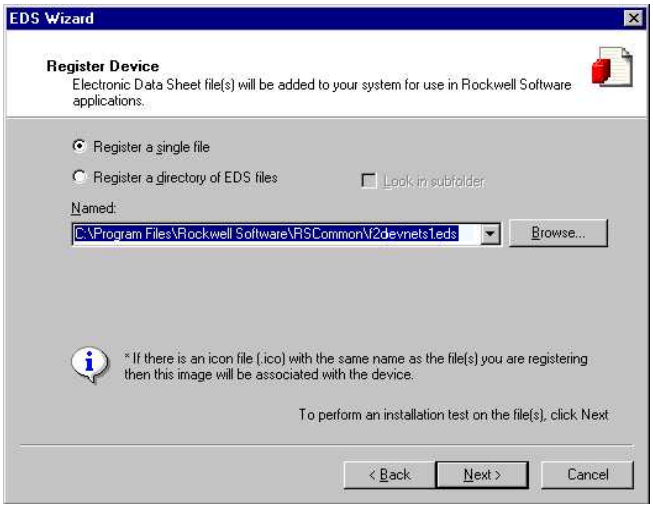
The EDS Wizard will open. Simply follow the instructions to register the device.



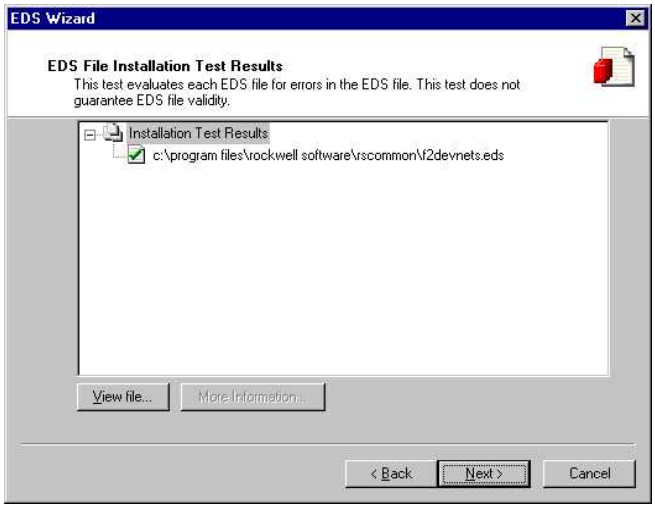
Register the EDS file.



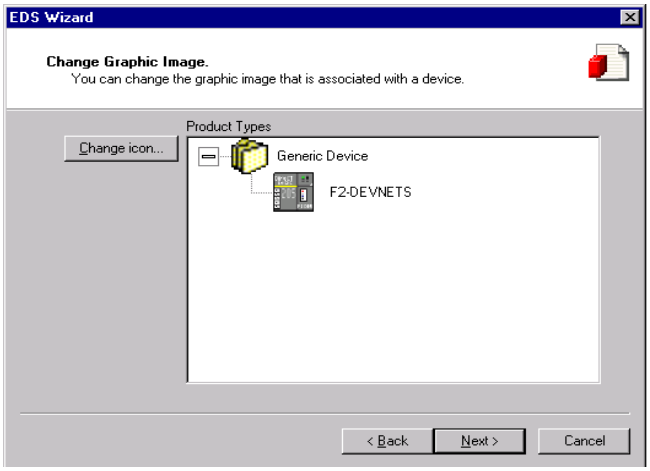
Enter the path for the EDS file.



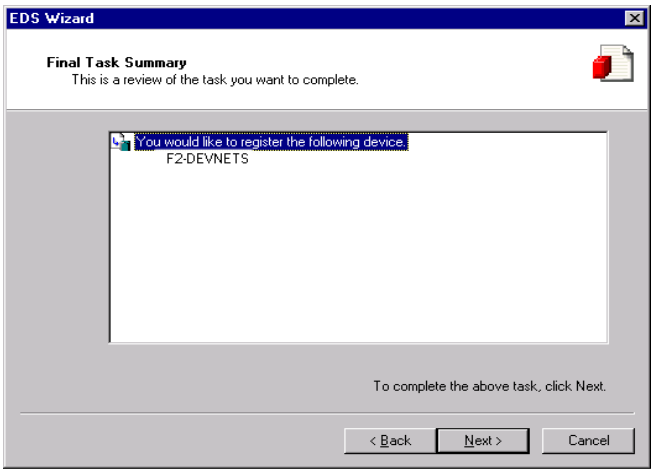
EDS file installation results.



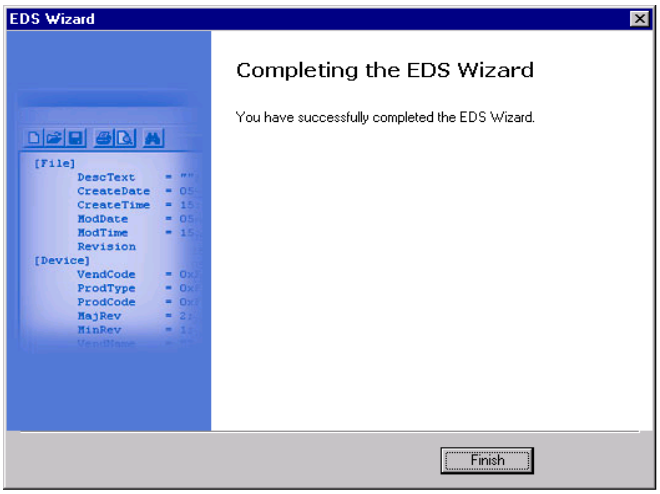
You can change the icon image for your device in this window.



Review what you have done.



EDS Wizard complete.

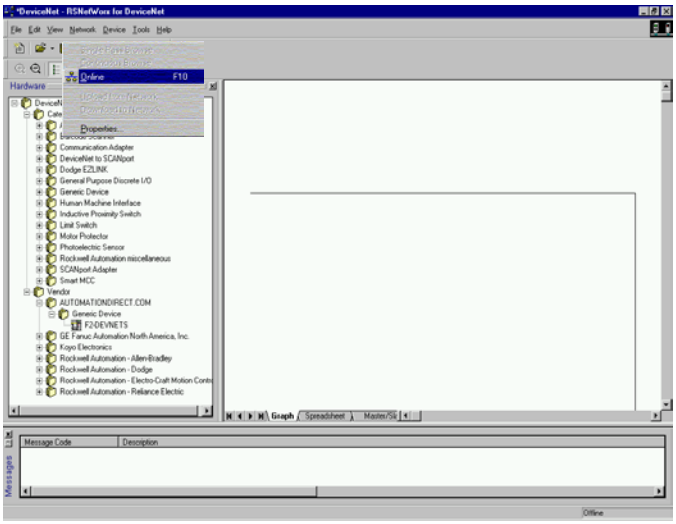


Go on line

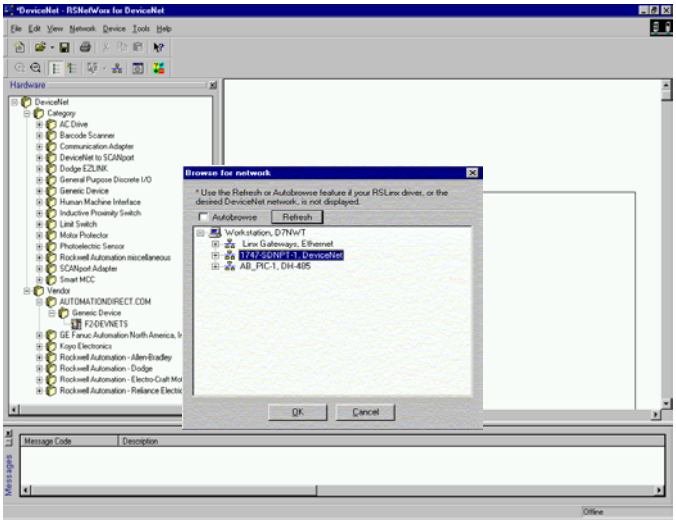
You will want to go on line with the network now.

In the main RSNetWorx window,

1. Click on **Network** to select **Online**.



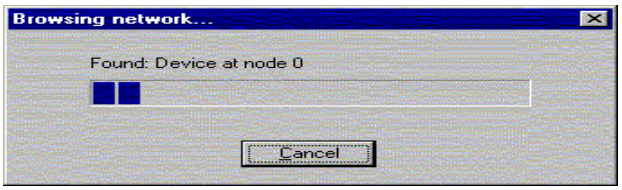
2. Select your network from the pop–up window.
3. Click **OK**.



This message will appear.

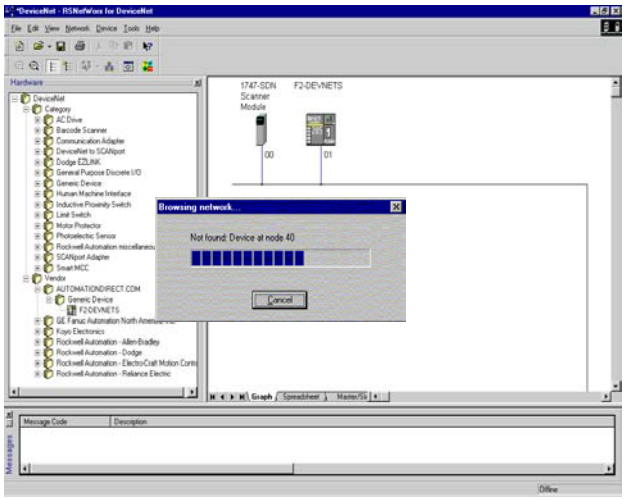
4. Click **OK**.

Browsing network message.



Once the nodes are found, each node icon will appear on the RSNetWorx window.

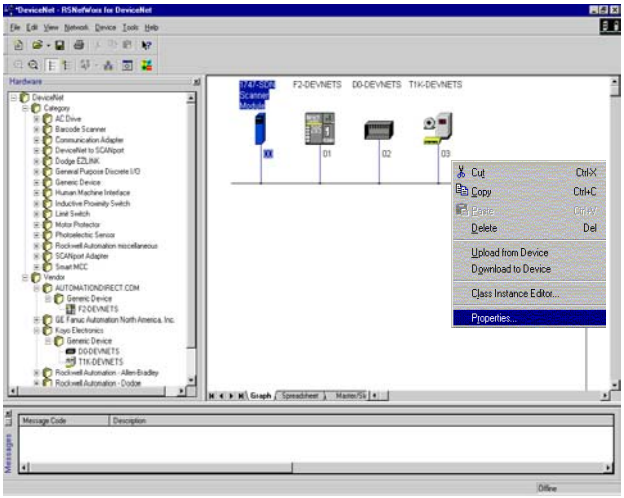
After all of the nodes have been found, browse can be cancelled.



Set up I/O parameters

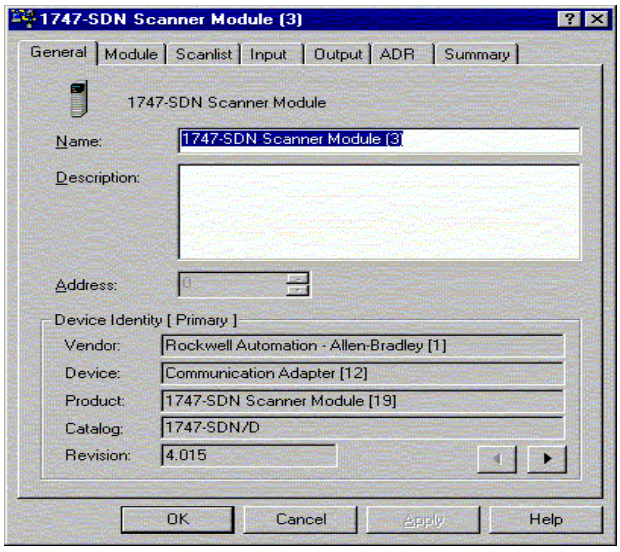
Now you can set up the I/O paramerters for the devices. The scanner needs to be configured first. This is done by accessing the scanner properties.

1. Selecting the scanner module can be done in two different ways. Either click on the scanner name and right click the mouse or click on **Device** then click on **Properties** in the pop–up window.

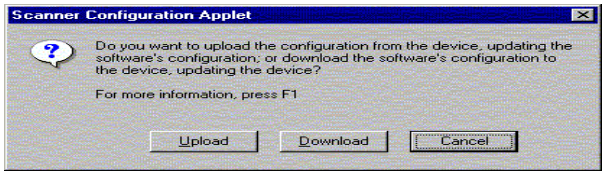


The properties window will appear.

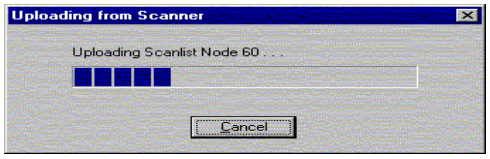
2. Click **Module**.



3. Click **Upload**.



Uploading network information.

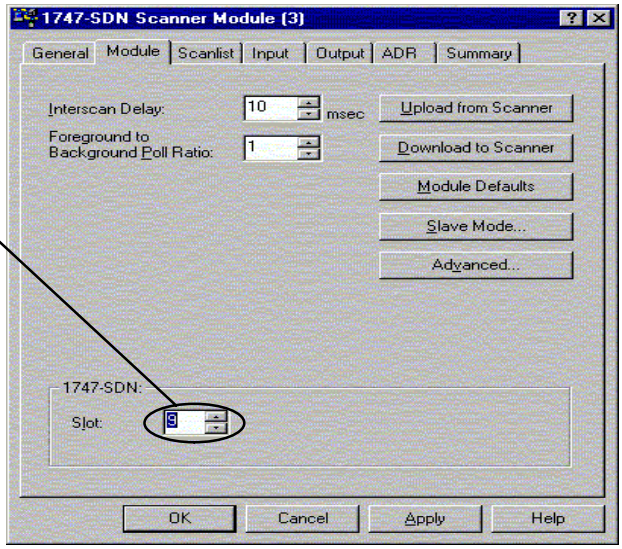


Note: Do not cancel. The entire network data must be allowed to upload.

The data appears.

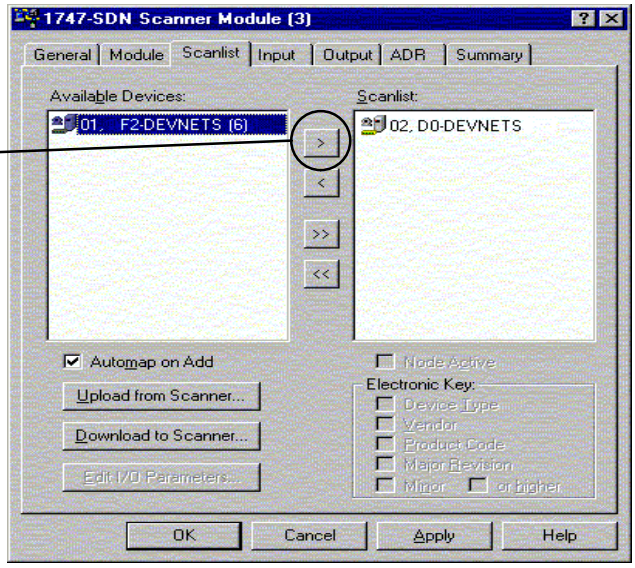
4. Select the correct slot number which the DeviceNet scanner module is residing.

5. Click **Scanlist**.



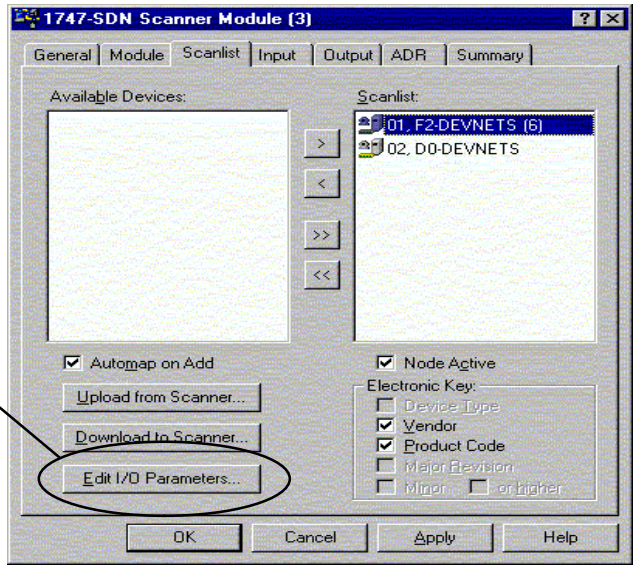
If the node that you want is not in the Scanlist, it needs to be moved to the list.

6. Highlight F2–DEVNETS
7. Click the right arrow.

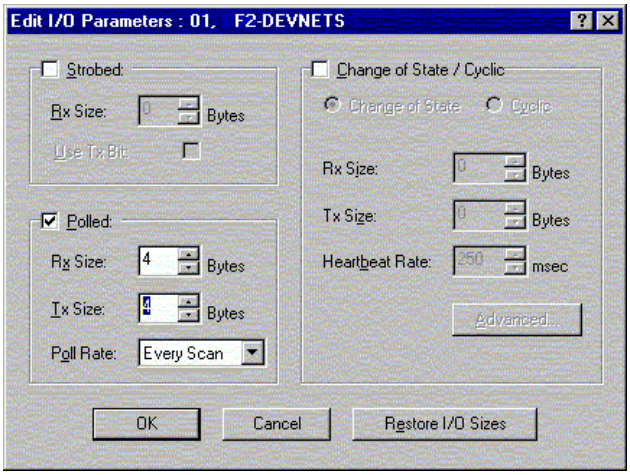


Now that F2–DEVNETS is in the list, be sure that it is selected.

8. Click **Edit I/O Parameters**.



9. Set the **Rx Size** and the **Tx Size** to match the polled data size for the number of I/O bytes (refer to tables in Appendix C).
10. Click **OK**.



Refer to page D–18 (**Service Class Instance Attribute**) if the total number of Rx and Tx bytes are not known.

This window will appear.

11. Click **Yes**.

Map the nodes

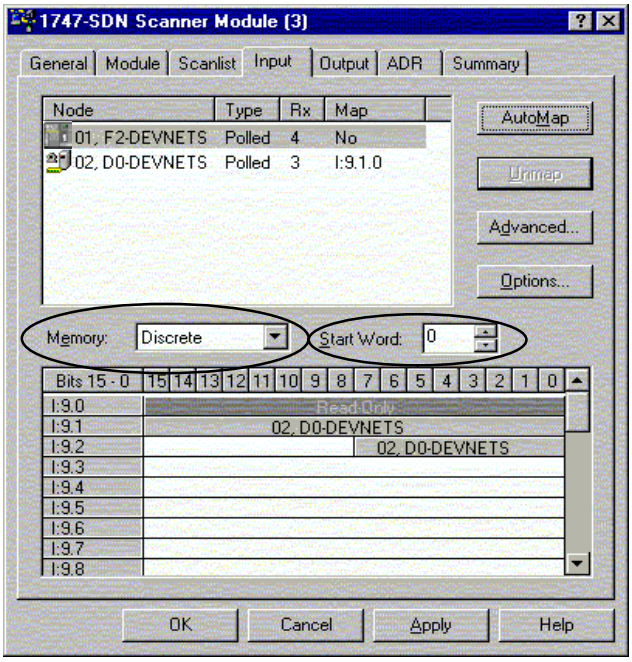
Map each node.

1. Click the **Input** tab in the properties window.

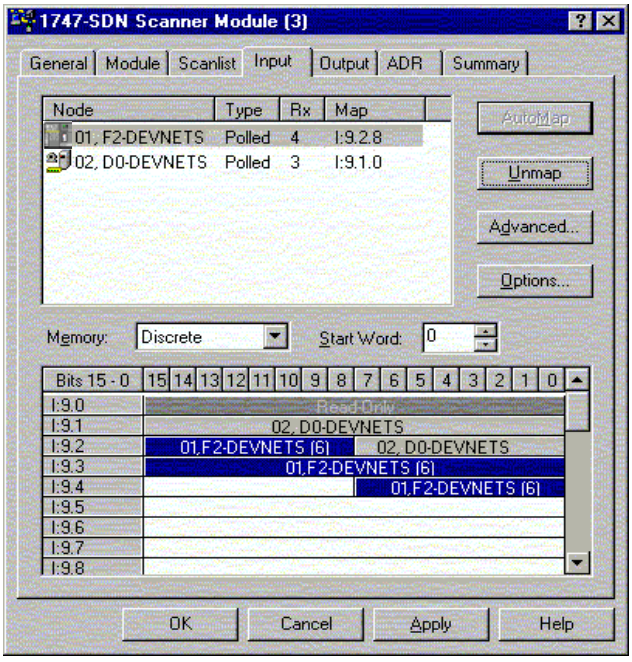
Be sure that F2–DEVNETS is selected.

2. Select **Discrete** for **Memory**, and **0** for **Start Word**.
3. Click **AutoMap**.

NOTE: M file is used with explicit messaging.



At the completion of the input AutoMapping, the window will look like this example. The F2–DEVNETS node is now shown.

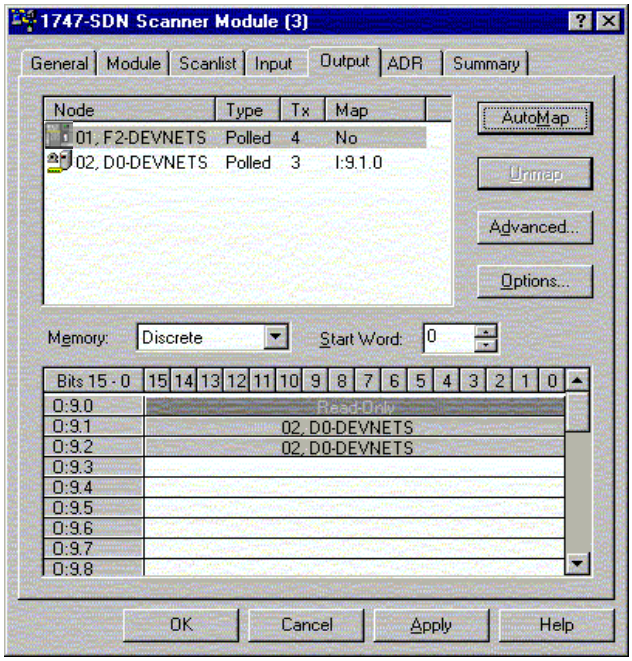


Now, map the outputs just the way you mapped the inputs. This time:

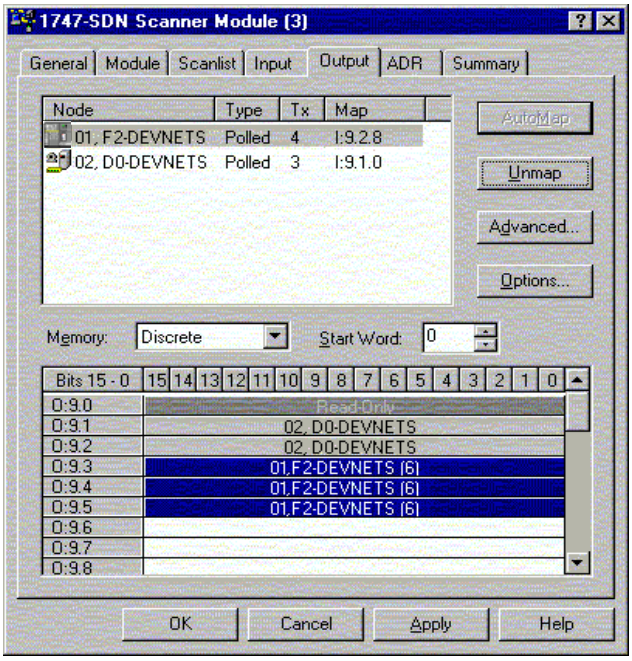
1. Click the **Output** tab in the properties window.

Be sure that F2–DEVNETS is selected.

2. Select **Discrete** for **Memory**, and **0** for **Start Word**.
3. Click **AutoMap**.



At the completion of the output AutoMapping, the window will appear like this example. The F2–DEVNETS node is now shown.

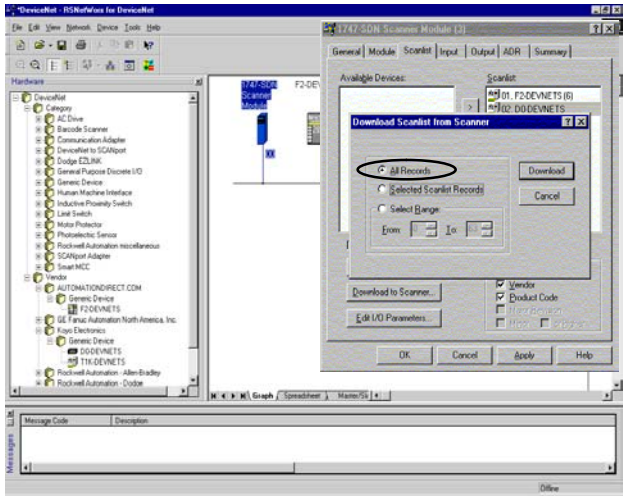


Download the scanlist to the scanner.

1. Select the **Scanlist** tab in the properties window.
2. Select **Download to Scanner**.

In the pop–up window:

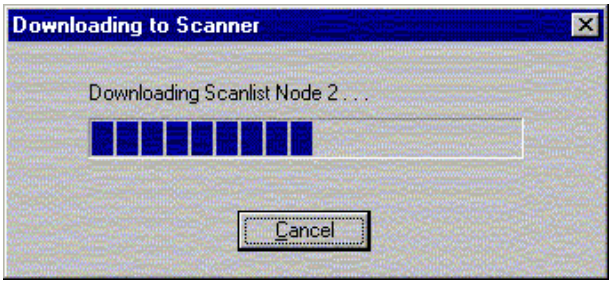
3. Check **All Records**, then
4. Click **Download**.



Note: Verify that the processor is in program mode before downloading the scanlist.

This is an error message that may appear.

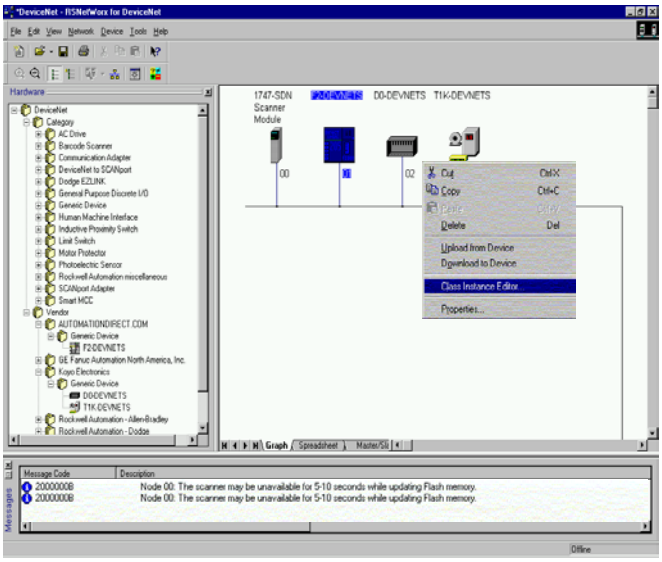
When the download indication ends, download is complete.



Service Class Instance Attribute

Use the Service Class Instance Attribute Editor to set the I/O to read and write to the F2 –DEVNETS.

1. Select the F2–DEVNETS node. Either click on **Device** or right click on the node symbol in theRSNetWorx window.
2. Select **Class Instance Editor** in the pop–up window.

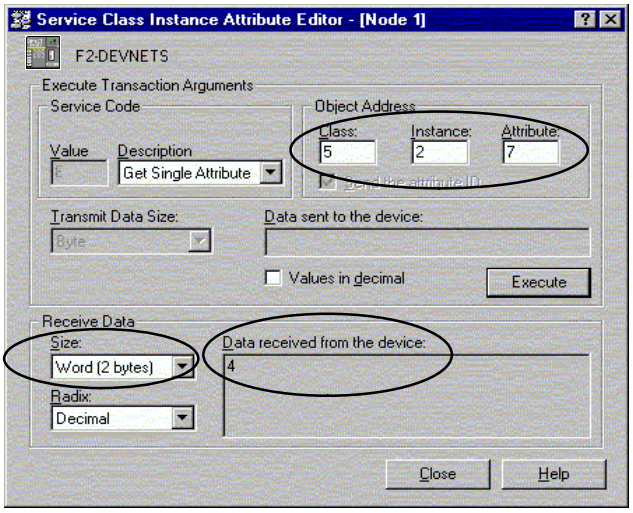


3. Setup input attributes in this window.

Object Address must be set to: **Class** = 5, **Instance** = 2, **Attribute** = 7

Size = Word (2 bytes).

4. Click on **Execute**. Read the data here.



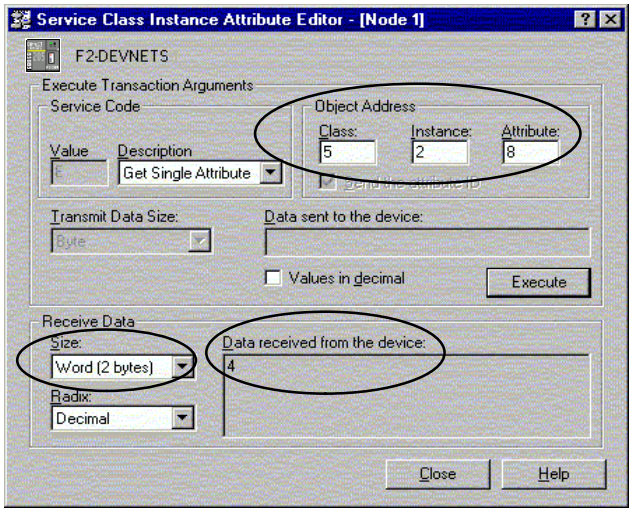
5. Setup output attributes in this window.

Object Address must be set to:

Class = 5, **Instance** = 2, **Attribute** = 8

Size = Word (2 bytes).

6. Click on **Execute**. Read the data here.



F2–DEVNETS Compatibility Mode

E

In This Appendix. . . .

Configuring for F2–DEVNETS Compatibility Mode

The F2–DEVNETS–1 module can replace a F2–DEVNETS module if the need arises. The F2–DEVNETS–1 can be configured to look and act like a F2–DEVNETS to the DeviceNet Master. This mode is not recommended for new applications.

1. Install both Baud Rate jumpers and Address 1 jumper only. Reinstall the module and power up.
2. The MS and NS LEDs flash red and green while powered up.
3. Power down and set the Baud Rate and the Address for the application, then power up.
4. The following message will be printed out of the F2–DEVNETS–1 serial port, indicating backwards compatibility mode is selected:

F2–DEVNETS–1 MACID–02 CAN Baud Rate=125K V3.1 ROM 08/20/2002 FLASH 08/21/2002 Backward Compatibility with F2–DEVNETS

Configuring for F2–DEVNETS–1 Mode (Factory Default Mode)

1. Install both Baud Rate jumpers and leave the Address jumpers off, then install the module and power up.
2. The MS and NS LEDs flash red and green while powered up.
3. Power down and set the Baud Rate and Address for the application. Reinstall the module and power up.
4. The following message will be printed out of the F2–DEVNETS–1 serial port, indicating default mode:

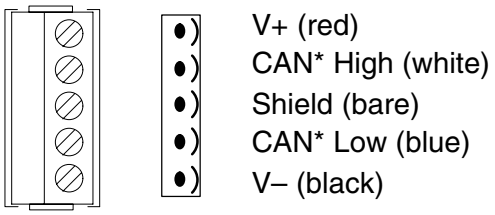
F2–DEVNETS–1 MACID–02 CAN Baud Rate=125K V3.1 ROM 08/20/2002 FLASH 08/21/2002

Connector Cross Reference

F2–DEVNETS

Pin	Description
5	V+ (Bus power positive)
4	Ground (Bus power common)
3	CAN_H
2	CAN_L
1	Shield

F2–DEVNETS–1



* Controller Area Network (CAN)

I/O Module Table

Module Type	Part Number	ID Code (Hex)	F2–DEVNETS–1 Mode		F2–DEVNETs Compatibility Mode	
			Bytes Produced	Bytes Consumed	Bytes Produced	Bytes Consumed
Discrete Inputs	F2–08SIM	14	1	0	1	0
	D2–08ND3	14	1	0	1	0
	D2–16ND3–2	08	2	0	2	0
	D2–32ND3	05	4	0	4	0
	D2–08NA–1	14	1	0	1	0
	D2–08NA–2	14	1	0	1	0
	D2–16NA	08	2	0	2	0
Discrete Inputs	D2–04TD1	0A	0	1	0	1
	D2–08TD1	13	0	1	0	1
	D2–16TD1–2	06	0	2	0	2
	D2–16TD2–2	06	0	2	0	2
	D2–32TD1	0F	0	4	0	4
	D2–08TA	13	0	1	0	1
	F2–08TA	13	0	1	0	1
	D2–12TA	06	0	2	0	2
	D2–04TRS	0A	0	1	0	1
	D2–08TR	13	0	1	0	1
	F2–08TR	13	0	1	0	1
	F2–08TRS	13	0	1	0	1
	D2–12TR	06	0	2	0	2
Discrete Combo	D2–08CDR	1	1	1	1	1
Analog In	F2–04AD–1(L)	03	8	0	2	0
	F2–04AD–2(L)	03	8	0	2	0
	F2–08AD–1	01	16	0	2	0
	F2–08AD–2	01	16	0	2	0
Temperature In	F2–04RTD	16	9	0	3	0
	F2–04THM	16	9	0	3	0
Analog Out	F2–02DA–1(L)	04	0	4	0	2
	F2–02DA–2(L)	04	0	4	0	2
	F2–02DAS–1	17	0	4	0	4
	F2–02DAS–2	17	0	4	0	4
	F2–08DA–1	16	0	16	0	2
	F2–08DA–2	16	0	16	0	2
Analog Combo	F2–4AD2DA	02	8	4	2	2

Modules not supported:
F2–CP128
H2–CTRIO, H2–ERM (–F), H2–ECOM (–F)
D2–DCM, D2–CTRINT, D2–RMSM

F2–DEVNETS Compatibility Mode

DEVICENET GROUP2 ONLY EXPLICIT MESSAGES

These are used to allocate/release the connection between the master and its slave.

DEVICENET COMMANDS

The following list identifies the data being transferred. When **GET** is alone in the **SERVICE** column, either indicates the item is fixed and cannot change or that the sestem sets the item to reflect the system processing characteristics.
SET indicates the user can midify the item.
Unless indicated otherwise, all data is given in HEX format. Single numbers shall be considered zero filled and right justified.

CLASS=1

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
1	1	VENDOR ID	157d	FACTS Engineering	GET
2	1	PRODUCT TYPE	0	General Purpose I/O Device	GET
3	1	PRODUCT CODE	20d	Vendor Assigned Product Code	GET
4	1	REVISION MAJOR.MINOR	3.1	Released Product Version	GET
5	1	ID STATUS	1	Current Status of Entire Device	GET
6	1	SERIAL NUMBER	XXXX	4–Digit Vendor Assigned	GET
7	1	PRODUCT NAME	F2–DEVNETS	Vendor Assigned	GET
—	1	RESET		Reset the Device	RESET

CLASS=3

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
1	1	MACID	0–63	MACID (Media Access Control ID)	GET
2	1	BAUD RATE	0–2	0=125K, 1=250K, 2–500K Baud	GET
3	1	BUS OFF INTERRUPT	X	BUS–OFF INTERRUPT PROCESSING	GET
4	1	BUS OFF COUNT	X	BUS–OFF COUNT	GET/SET
5	1	ALLOCATION	X	EXPLICIT and I/O CONNECTIONS	GET

CLASS=4

ATTR	INSTANCE	ITEM	VALUE	DESCRIPTION	SERVICE
3	1	I/O DATA	8 Bytes	Read Input Data (Produced) Write Output Data (Consumed)	GET / SET
3	2	CONFIG DATA	4 Bytes + 1 Word (16 Bits) for each occupied slot. Bytes 1–4 are always supplied. Other bytes are supplied when appropriate.		GET
		BYTE 1	0–3F (63d)	MAC ID	
		BYTE 2	0–2	BAUD RATE	
		BYTE 3	0–8	SLOTS (0=Empty Rack)	
		BYTE 4	0–FFF	SLOTS FILLED (Bit 0=Slot 0, Bit 1=Slot 1, etc.)	
		BYTES 5/6	Bits 15–8 Bits 7–0	# Inputs # Outputs	
3	3	CONFIG DATA	8 Bytes	Configuration Data with the module ID for each occupied slot. 0FFH=Unoccupied	GET
			Byte 1	ID of Module in Slot 0	
			Byte 2	ID of Module in Slot 1	
			Byte 3	ID of Module in Slot 2	
			Byte 4	ID of Module in Slot 3	
			Byte 5	ID of Module in Slot 4	
			Byte 6	ID of Module in Slot 5	
			Byte 7	ID of Module in Slot 6	
			Byte 8	ID of Module in Slot 7	
3	4	PRODUCED DATA	0–0FFFFH	4 Channels (8 Bytes) of Analog Inputs (1st 4 of last 8 Analog Inputs in Base)	GET
3	5	PRODUCED DATA	0–0FFFFH	4 Channels (8 Bytes) of Analog Inputs (2nd 4 of last 8 Analog Inputs in Base)	GET
3	6	PRODUCED DATA	0–0FFFFH	4 Channels (8 Bytes) of RTD/THM Iputs	GET

CLASS=5

ATTR	INSTANCE 1=EXPLICIT 2=POLLING	ITEM	VALUE	DESCRIPTION	SERVICE
1	1/2	CNXN ATTR STATE	X	0=None, 1=Configuring, 2=Waiting, 3=Connected, 4=Timed–Out	GET
2	1/2	CONNECT TYPE	X	0=Explicit 1=I/O	GET
3	1/2	CONNECT TRIGGER	X	083H Explicit 082H I/O	GET
4	1/2	CONNECT PRODUCED	X	Connection ID that will produce...FFFF if no production	GET
5	1/2	CONNECT CONSUMED	X	Connection ID that will produce...FFFF if no consumption	GET
6	1/2	CONNECT COMM ID	021h	MSG Group2 Consuming	GET
7	1/2	PRODUCED CONNECTION SIZE	X	8 Bytes of Non–Fragmented I/O Data Up to 10 Bytes Fragmented Explicit Messaging	GET
8	1/2	CONSUMED CONNECTION SIZE	X	8 Bytes of Non–Fragmented I/O Data Up to 10 Bytes Fragmented Explicit Messaging	GET
9 (see Note)	1/2	CONNECT EXPECTED PACKET RATE	X	Number of Milliseconds	GET/SET
0C	1/2	CONNECT WD TIMEOUT	X	Watch–Dog Time–Out Action Reset Device	GET
0D	1/2	CONNECT PATH LENGTH	X	0 for Explicit 6 for I/O	GET
0E	1/2	CONNECT PATH LENGTH	X	0 for Explicit 6 Bytes for I/O	GET
0F	1/2	CONNECT CONSUMED PATH LENGTH	X	0 for Explicit 6 for I/O	GET
10	1/2	CONNECT CONSUMED ATTR ID	0/STRING	0 for Explicit 6 Bytes for I/O	GET
11	1/2	PROD INHIBIT	X		GET
—	1/2	RESET	—	Start Inactivity Timer	RESET

Note: The F2–DEVNETS has an internal timer that can be set to timeout after a selected number of milliseconds. If there is no activity during the selected time value the connection will release. **When this timer is set to zero the connection will not timeout.**

Since the operation depends on the controlling actions of a Master CPU existing externally on the network, there is no none reason to allow the connection to timeout. To keep the connection(s) open, simply set the Expected Packet Rate value for each of the connections to zero.

All outputs will turn off when the connection is released. This will occur when an Expected Packet Rate value counts down to zero or when the master releases the connection. This is a fixed condition and cannot be modified.