

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

PROSOFT TECHNOLOGY

MVI56-DFCM

DF1 COMMUNICATION MODULE

Used with the applicable ControlLogix in-chassis modules configuration.

REFERENCE PACKAGE

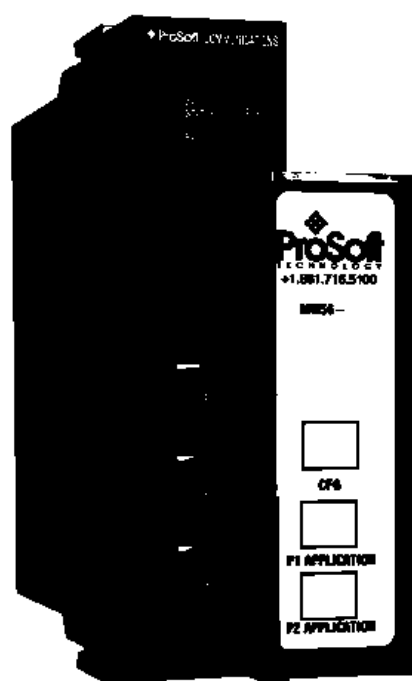
OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: ProSoft manufacturer documentation



Where Automation Connects.



MVI56-DFCM

ControlLogix Platform

DF1 Half/Full Duplex Master/Slave Serial
Communication Module

December 3, 2020

USER MANUAL

Your Feedback Please

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MVI56-DFCM User Manual

December 3, 2020

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In an effort to conserve paper, ProSoft Technology no longer includes printed manuals with our product shipments. User Manuals, Datasheets, Sample Ladder Files, and Configuration Files are provided at:
www.prosoft-technology.com

Important Installation Instructions

Power, Input, and Output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods, Article 501-4 (b) of the National Electrical Code, NFPA 70 for installation in the U.S., or as specified in Section 18-1J2 of the Canadian Electrical Code for installations in Canada, and in accordance with the authority having jurisdiction. The following warnings must be heeded:

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIV. 2;

WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

THIS DEVICE SHALL BE POWERED BY CLASS 2 OUTPUTS ONLY.

MVI (Multi Vendor Interface) Modules

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DÉCONNECTER L'ÉQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

Warnings

North America Warnings

Power, Input, and Output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods, Article 501-4 (b) of the National Electrical Code, NFPA 70 for installation in the U.S., or as specified in Section 18-1J2 of the Canadian Electrical Code for installations in Canada, and in accordance with the authority having jurisdiction.

The following warnings must be heeded:

- A** Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- B** Warning - Explosion Hazard - When in hazardous locations, turn off power before replacing or rewiring modules.
- C** Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
Avertissement - Risque d'explosion - Avant de déconnecter l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.
- D** Suitable for use in Class I, Division 2 Groups A, B, C and D Hazardous Locations or Non-Hazardous Locations.

ATEX Warnings and Conditions of Safe Usage

Power, Input, and Output (I/O) wiring must be in accordance with the authority having jurisdiction.

- A** Warning - Explosion Hazard - When in hazardous locations, turn off power before replacing or wiring modules.
- B** Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- C** These products are intended to be mounted in an IP54 enclosure. The devices shall provide external means to prevent the rated voltage being exceeded by transient disturbances of more than 40%. This device must be used only with ATEX certified backplanes.
- D** DO NOT OPEN WHEN ENERGIZED.

Battery Life Advisory

The MVI46, MVI56, MVI56E, MVI69, and MVI71 modules use a rechargeable Lithium Vanadium Pentoxide battery to backup the real-time clock and CMOS. The battery should last for the life of the module. The module must be powered for approximately twenty hours before the battery becomes fully charged. After it is fully charged, the battery provides backup power for the CMOS setup and the real-time clock for approximately 21 days. When the battery is fully discharged, the module will revert to the default BIOS and clock settings.



For professional users in the European Union

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.



Prop 65 Warning – Cancer and Reproductive Harm – www.P65Warnings.ca.gov

Agency Approvals & Certifications

Please visit our website: www.prosoft-technology.com

Contents

Your Feedback Please.....	2
Important Installation Instructions	2
MVI (Multi Vendor Interface) Modules	2
Warnings	3
Battery Life Advisory	3

Guide to the MVI56-DFCM User Manual 6

1 Start Here 7

1.1	System Requirements	8
1.2	Package Contents	8
1.3	Setting Jumpers	9
1.4	Installing the Module in the Rack	10
1.5	Connecting Your PC to the ControlLogix Processor	11
1.6	Using the Sample Ladder Logic	12
1.7	Connecting Your PC to the ControlLogix Processor	12
1.8	Downloading the Sample Program to the Processor	14
1.8.1	Configuring the RSLinx Driver for the PC COM Port	15
1.9	Connecting Your PC to the Module	17

2 Using the RSLogix 5000 v16 Add-On Instruction 20

2.1	Creating a New RSLogix 5000 Project	20
2.2	Creating the Module	22
2.3	Importing the Add-On Instruction Ladder Rung	25
2.4	Adding Multiple Modules (Optional)	28

3 Ladder Logic 33

3.1	Module Data Object (DFCMModuleDef)	33
3.2	Configuration Objects (DFCMCONFIG)	33
3.2.1	Module Definition (DFCMModule)	34
3.2.2	DF1 Port Parameters (DFCMPort)	35
3.2.3	DF1 Master Commands (DFCMCmd)	36
3.3	User Data Objects (DFMC.DATA)	37
3.4	Status Object (DFCM.STATUS)	38
3.5	Special Functions and Controls (DFCM.CONTROL)	39
3.6	Special Functions and Controls (DFCM.CONTROL)	41
3.7	Adding the Module to an Existing Project	41

4 Diagnostics and Troubleshooting 44

4.1	LED Status Indicators	45
4.1.1	Clearing a Fault Condition	47
4.1.2	Troubleshooting	48
4.2	Reading Status Data from the Module	49
4.2.1	The Configuration/Debug Menu	49
4.2.2	Main Menu	51

4.2.3	Data Analyzer	55
4.2.4	Database View Menu	59
4.2.5	Master Command Error List Menu	61
4.2.6	Master Command List Menu	62

5 Reference 63

5.1	Product Specifications	63
5.1.1	General Specifications	63
5.1.2	Hardware Specifications	64
5.1.3	Functional Specifications	65
5.2	Functional Overview	66
5.2.1	General Concepts	66
5.2.2	Data Flow between MVI56-DFCM Module and ControlLogix Processor	70
5.2.3	Normal Data Transfer	74
5.2.4	Configuration Data Transfer Blocks (-9000, -6000 to -6004, -6100 to -6104, 6000 to 6004, 6100- to 6104, and 9000)	77
5.2.5	Event Command Blocks (1000 or 2000)	80
5.2.6	Slave Status Blocks (3002, 3003, 3102, and 3103)	81
5.2.7	Command Control Blocks (5000 to 5006 or 5100 to 5106)	83
5.2.8	Override File Map Configuration Blocks (7000 and 7100, 50 entries per port)	84
5.2.9	Module Time Blocks (9972 and 9973)	84
5.2.10	Block 9999: Cold Boot	85
5.2.11	Warm Boot Block (9998) MVI56-DFCM	86
5.3	DFCM Database Definition	86
5.3.1	Basic Command Set Functions	87
5.3.2	PLC-5 Command Set Functions	88
5.3.3	SLC-500 Command Set Functions	88
5.4	Error Codes	90
5.4.1	Local STS Error Codes	90
5.4.2	Remote STS Error Codes	90
5.4.3	Errors When EXT STS Is Present	91
5.4.4	Module Specific Error (not DFCM Compliant)	91
5.5	Cable Connections	92
5.5.1	RS-232 Configuration/Debug Port	92
5.5.2	RS-232 Application Port(s)	92
5.5.3	RS-422	95
5.5.4	RS-485 Application Port(s)	95
5.5.5	DB9 to RJ45 Adaptor (Cable 14)	96

6 Support, Service & Warranty 97

6.1	Contacting Technical Support	97
6.2	Warranty Information	97

Guide to the MVI56-DFCM User Manual

Function		Section to Read	Details
Introduction (Must Do)	→	Start Here (page 7)	This section introduces the customer to the module. Included are: package contents, system requirements, hardware installation, and basic configuration.
Diagnostic and Troubleshooting	→	Diagnostics and Troubleshooting (page 44)	This section describes Diagnostic and Troubleshooting procedures.
Reference Product Specifications Functional Overview	→	Reference (page 63) Product Specifications Functional Overview	These sections contain general references associated with this product, Specifications and the Functional Overview.
Support, Service, and Warranty Index	→	Support, Service & Warranty (page 97) Index	This section contains Support, Service and Warranty information. Index of chapters.

1 Start Here

In This Chapter

❖ System Requirements	8
❖ Package Contents	8
❖ Setting Jumpers.....	9
❖ Installing the Module in the Rack.....	10
❖ Using the Sample Ladder Logic	12
❖ Connecting Your PC to the ControlLogix Processor.....	12
❖ Downloading the Sample Program to the Processor	14
❖ Connecting Your PC to the Module	16

To get the most benefit from this User Manual, you should have the following skills:

- **Rockwell Automation® RSLogix™ software:** launch the program, configure ladder logic, and transfer the ladder logic to the processor
- **Microsoft Windows®:** install and launch programs, execute menu commands, navigate dialog boxes, and enter data
- **Hardware installation and wiring:** install the module, and safely connect DFCM and ControlLogix devices to a power source and to the MVI56-DFCM module's application port(s)

1.1 System Requirements

The MVI56-DFCM module requires the following minimum hardware and software components:

- Rockwell Automation ControlLogix™ processor, with compatible power supply and one free slot in the rack, for the MVI56-DFCM module. The module requires 800 mA of available power.
- Rockwell Automation RSLogix 5000 programming software version 2.51 or higher
- Rockwell Automation RSLinx communication software
- Pentium® II 450 MHz minimum. Pentium III 733 MHz (or better) recommended
- Supported operating systems:
 - Microsoft Windows 10
 - Microsoft Windows 7 Professional (32-or 64-bit)
 - Microsoft Windows XP Professional with Service Pack 1 or 2
 - Microsoft Windows Vista
 - Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
 - Microsoft Windows Server 2003
- 128 Mbytes of RAM minimum, 256 Mbytes of RAM recommended
- 100 Mbytes of free hard disk space (or more based on application requirements)
- 256-color VGA graphics adapter, 800 x 600 minimum resolution (True Color 1024 x 768 recommended)
- ProSoft Configuration Builder, HyperTerminal or other terminal emulator program.

Note: You can install the module in a local or remote rack. For remote rack installation, the module requires EtherNet/IP or ControlNet communication with the processor.

1.2 Package Contents

The following components are included with your MVI56-DFCM module, and are all required for installation and configuration.

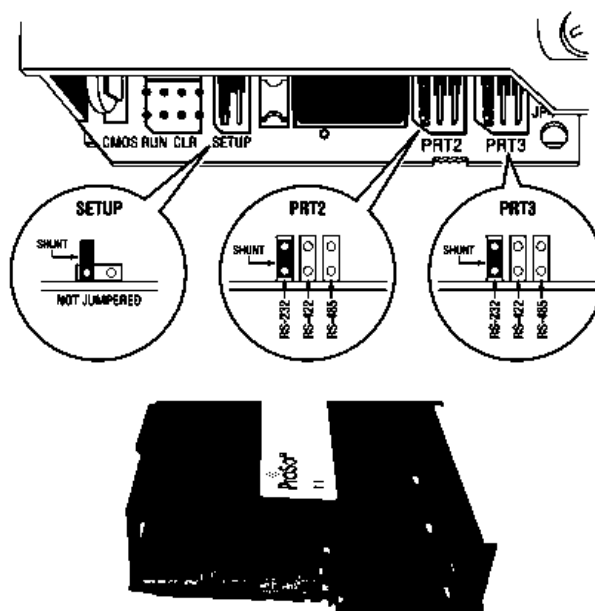
Important: Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	MVI56-DFCM Module	MVI56-DFCM	DF1 Half/Full Duplex Master/Slave Serial Communication Module
1	Cable	Cable #15, RS232 Null Modem	For RS232 Connection to the CFG Port
3	Cable	Cable #14, RJ45 to DB9 Male Adapter cable	For DB9 Connection to Module's Port
2	Adapter	1454-9F	(2) DB9 Female to Screw Terminal. For RS422 or RS485 Connections to Port 1 and 2 of the Module

1.3 Setting Jumpers

If you use an interface other than RS-232 (default), you must change the jumper configuration to select the interface you wish to use. There are three jumpers located at the bottom of the module.

The following illustration shows the MVI56-DFCM jumper configuration:



- 1 Set the PRT 2 (for application port 1) and PRT 3 (for application port 2) jumpers select RS232, RS422, or RS485 to match the wiring needed for your application. The default jumper setting for both application ports is RS-232.
- 2 The Setup Jumper acts as "write protection" for the module's flash memory. In "write protected" mode, the Setup pins are not connected, and the module's firmware cannot be overwritten. Do not jumper the Setup pins together unless you are directed to do so by ProSoft Technical Support.

1.4 Installing the Module in the Rack

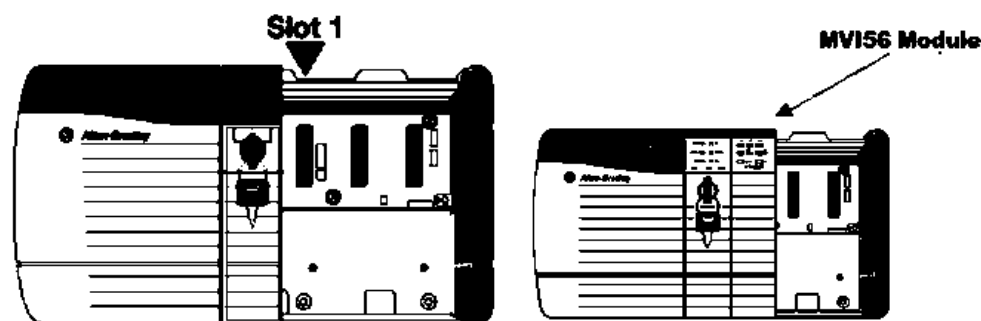
If you have not already installed and configured your ControlLogix processor and power supply, please do so before installing the MVI56-DFCM module. Refer to your Rockwell Automation product documentation for installation instructions.

Warning: You must follow all safety instructions when installing this or any other electronic devices. Failure to follow safety procedures could result in damage to hardware or data, or even serious injury or death to personnel. Refer to the documentation for each device you plan to connect to verify that suitable safety procedures are in place before installing or servicing the device.

After you have checked the placement of the jumpers, insert MVI56-DFCM into the ControlLogix chassis. Use the same technique recommended by Rockwell Automation to remove and install ControlLogix modules.

Warning: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Verify that power is removed or the area is non-hazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

- 1 Turn power OFF.
- 2 Align the module with the top and bottom guides, and slide it into the rack until the module is firmly against the backplane connector.



- 3 With a firm but steady push, snap the module into place.
- 4 Check that the holding clips on the top and bottom of the module are securely in the locking holes of the rack.
- 5 Make a note of the slot location. You must identify the slot in which the module is installed in order for the sample program to work correctly. Slot numbers are identified on the green circuit board (backplane) of the ControlLogix rack.
- 6 Turn power ON.

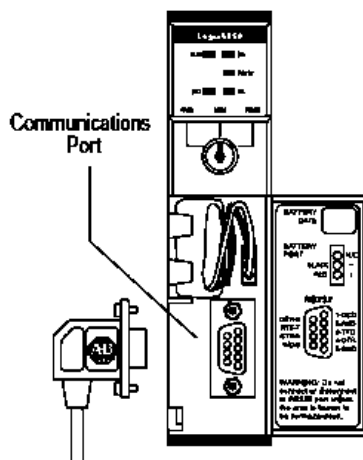
Note: If you insert the module improperly, the system may stop working, or may behave unpredictably.

1.5 Connecting Your PC to the ControlLogix Processor

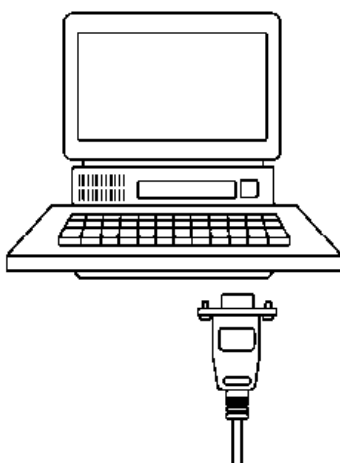
There are several ways to establish communication between your PC and the ControlLogix processor. The following steps show how to establish communication through the serial interface.

Note: It is not mandatory that you use the processor's serial interface. You may access the processor through whatever network interface is available on your system. Refer to your Rockwell Automation documentation for information on other connection methods.

- 1 Connect the right-angle connector end of the cable to your controller at the communications port.



- 2 Connect the straight connector end of the cable to the serial port on your computer.



1.6 Using the Sample Ladder Logic

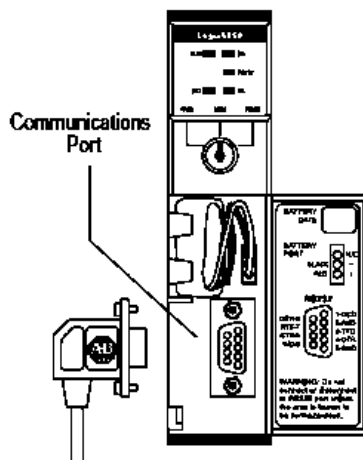
The sample program for your MVI56-DFCM module includes custom tags, data types, and ladder logic for data I/O and status monitoring. For most applications, you can run the sample ladder program without modification, or, for advanced applications, you can incorporate the sample program into your existing application.

1.7 Connecting Your PC to the ControlLogix Processor

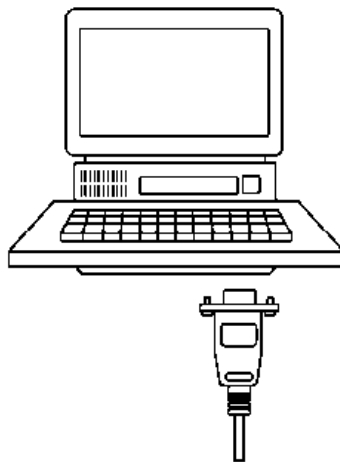
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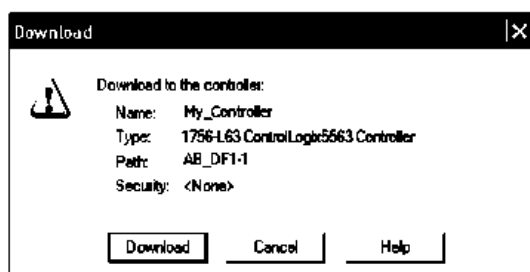
- 2 Connect the straight connector end of the cable to the serial port on your computer.



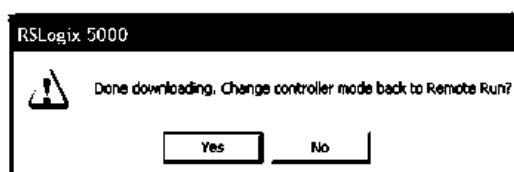
1.8 Downloading the Sample Program to the Processor

Note: The key switch on the front of the ControlLogix processor must be in the REM or PROG position.

- 1 If you are not already online with the processor, in RSLogix 5000 open the *Communications* menu, and then choose **DOWNLOAD**. RSLogix 5000 will establish communication with the processor. You do not have to download through the processor's serial port, as shown here. You may download through any available network connection.
- 2 When communication is established, RSLogix 5000 will open a confirmation dialog box. Click the **DOWNLOAD** button to transfer the sample program to the processor.



- 3 RSLogix 5000 will compile the program and transfer it to the processor. This process may take a few minutes.
- 4 When the download is complete, RSLogix 5000 will open another confirmation dialog box. If the key switch is in the REM position, click **OK** to switch the processor from PROGRAM mode to RUN mode.

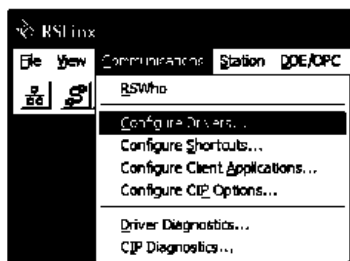


Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

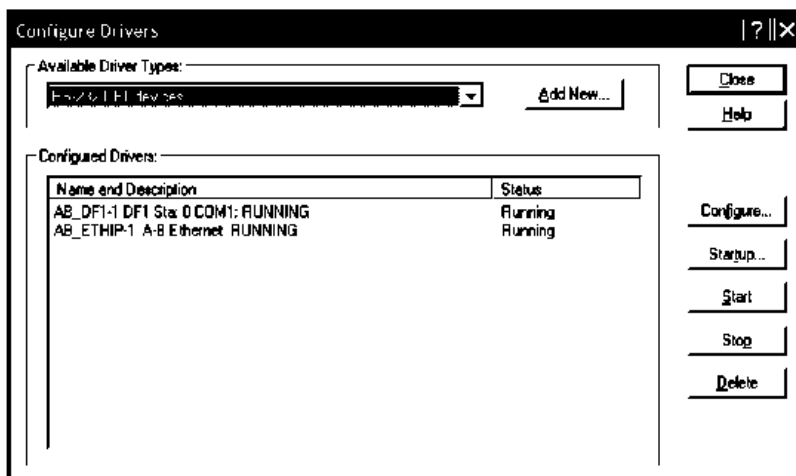
1.8.1 Configuring the RSLinx Driver for the PC COM Port

When trying to connect serially, if RSLogix is unable to establish communication with the processor, follow these steps.

- 1 Open *RSLogix*.
- 2 Open the **COMMUNICATIONS** menu, and click **CONFIGURE DRIVERS**.

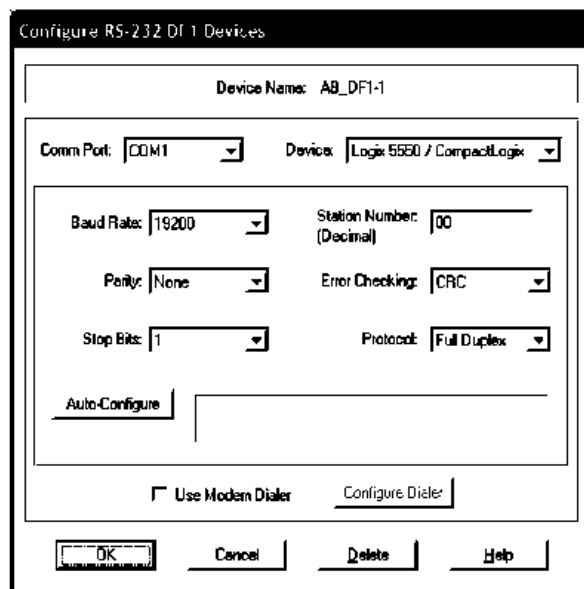


This action opens the *Configure Drivers* dialog box.



Note: If the list of configured drivers is blank, you must first choose and configure a driver from the *Available Driver Types* list. The recommended driver type to choose for serial communication with the processor is *RS-232 DF1 Devices*.

- Click to select the driver, and then click **CONFIGURE**. This action opens the *Configure RS-232 DF1 Devices* dialog box.



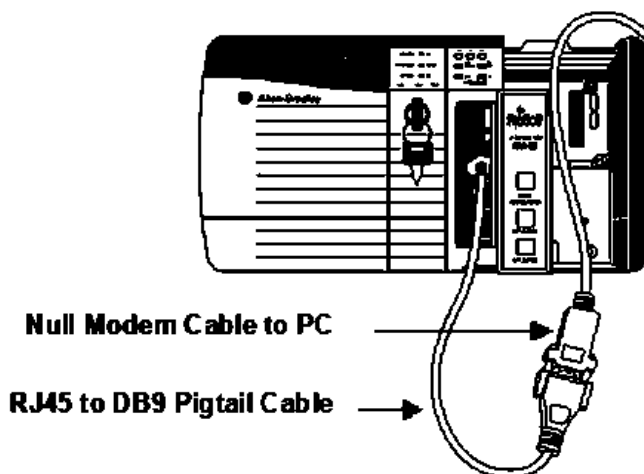
- Click the **AUTO-CONFIGURE** button. RSLinx will attempt to configure your serial port to work with the selected driver.
- When you see the message *Auto Configuration Successful*, click the **OK** button to dismiss the dialog box.

Note: If the auto-configuration procedure fails, verify that the cables are connected correctly between the processor and the serial port on your computer, and then try again. If you are still unable to auto-configure the port, refer to your RSLinx documentation for further troubleshooting steps.

1.9 Connecting Your PC to the Module

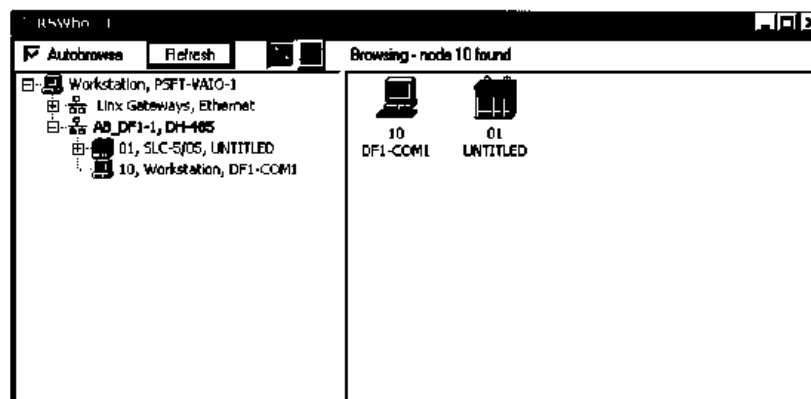
With the module securely mounted, connect your PC to the **Configuration/Debug** port using an RJ45-DB-9 Serial Adapter Cable and a Null Modem Cable.

- 1 Attach both cables as shown.
- 2 Insert the RJ45 cable connector into the *Config/Debug* port of the module.
- 3 Attach the other end to the serial port on your PC.

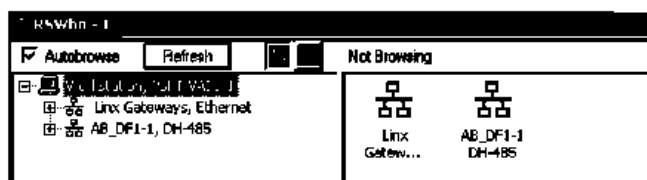


The communication port driver in *RSLink* can occasionally prevent other applications from using the PC's COM port. If you are not able to connect to the module's configuration/debug port using *ProSoft Configuration Builder (PCB)*, *HyperTerminal* or another terminal emulator, follow these steps to disable the *RSLink* driver.

- 1 Open *RSLink* and go to **COMMUNICATIONS > RSWHO**.
- 2 Make sure that you are not actively browsing using the driver that you wish to stop.
The following shows an actively browsed network.



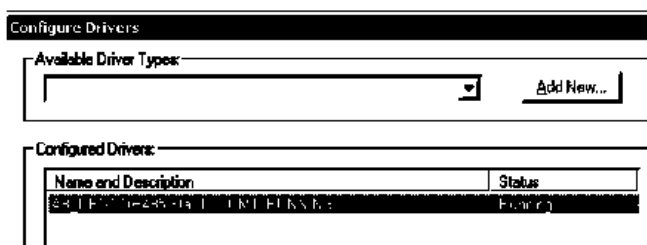
- Notice how the DF1 driver is opened, and the driver is looking for a processor on Node 1. If the network is being browsed, then you will not be able to stop this driver. To stop the driver your *RSWho* screen should look like this:



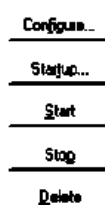
Branches are displayed or hidden by clicking on the  or the  icons.



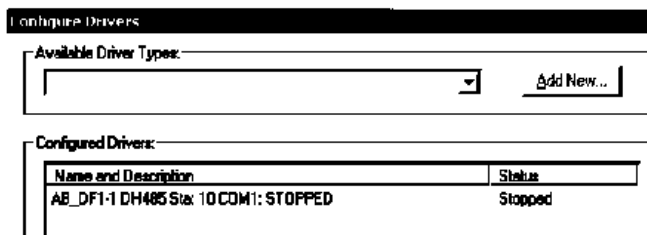
- When you have verified that the driver is not being browsed, go to **COMMUNICATIONS > CONFIGURE DRIVERS**. You may see something like this:



- If you see the status as running, you will not be able to use this COM port for anything other than communication to the processor. To stop the driver press the **STOP** button on the side of the window:



- After you have stopped the driver you will see the following.



7 You may now use the COM port to connect to the *Config/Debug* port of the module.

Note: You may need to shut down and restart your PC before it will allow you to stop the driver (usually only on *Windows NT* machines). If you have followed all of the above steps, and it will not stop the driver, then make sure you do not have *RSLogix* open. If *RSLogix* is open, you will not be able to stop the DF1 driver. If *RSLogix* is not open, and you still cannot stop the driver, then reboot your PC.

2 Using the RSLogix 5000 v16 Add-On Instruction

In This Chapter

- ❖ Creating a New RSLogix 5000 Project 20
- ❖ Creating the Module 21
- ❖ Importing the Add-On Instruction Ladder Rung 24
- ❖ Adding Multiple Modules (Optional) 27

Important: If you are using an older version of RSLogix 5000 (version 15 or older), you will not be able to use the Add-On Instruction. Please see www.prosoft-technology.com for standard ladder logic examples.

If you have RSLogix 5000 version 16 or newer, you can use an Add-On Instruction to simplify the task of configuring the module, either as a new application, or within an existing application.

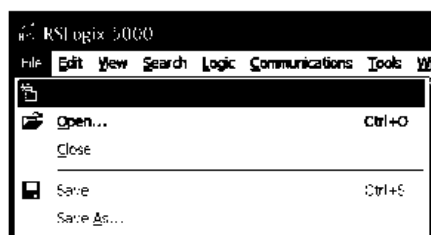
Download the manuals and sample program from the ProSoft Technology web site

You can always download the latest version of the sample ladder logic and user manuals for the MVI56-DFCM module from the ProSoft Technology web site, at www.prosoft-technology.com/support/downloads

From that link, navigate to the download page for your module and choose the sample ladder program to download for your version of RSLogix 5000 and your processor.

2.1 Creating a New RSLogix 5000 Project

- 1 Open the **FILE** menu, and then choose **NEW**.



- 2 Select your ControlLogix controller model.
- 3 Select the **REVISION** of your controller. Depending on the revision, there may be some small differences in the appearance of dialog boxes.
- 4 Enter a name for your controller, such as *My_Controller*.
- 5 Select your ControlLogix chassis type.