Wonderware® Allen-Bradley® Serial I/O Server

User's Guide

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Wonderware Corporation

Wonderware Allen-Bradley Serial I/O Server User's Guide

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Trademarks

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Wonderware Allen-Bradley Serial I/O Server

Introduction

The Wonderware® Allen-Bradley® Serial I/O Server (referred to as the server through the remainder of this user's guide) is a Microsoft® Windows® application program that acts as a communication protocol server. It allows other Windows application programs access to data in PLCs (also referred to as devices). The server communicates with Allen-Bradley PLCs either directly, or indirectly using the Data Highway™, Data Highway Plus™, or DH485 with the appropriate Allen-Bradley communications interface. The Wonderware Allen-Bradley Serial I/O Server can access data in PLC-2, PLC-3, PLC-5, PLC-5/250, and SLC-500 PLCs.

While the server is primarily intended for use with Wonderware InTouch® (version 3.01 and later), it may be used by any Microsoft Windows program capable of acting as a DDE, FastDDE, or SuiteLink™ client.

Communication Protocols

Dynamic Data Exchange (DDE) is a communication protocol developed by Microsoft to allow applications in the Windows environment to send/receive data and instructions to/from each other. It implements a client-server relationship between two concurrently running applications. The server application provides the data and accepts requests from any other application interested in its data. Requesting applications are called clients. Some applications such as InTouch and Microsoft Excel can simultaneously be both a client and a server.

FastDDE provides a means of packing many proprietary Wonderware DDE messages into a single Microsoft DDE message. This packing improves efficiency and performance by reducing the total number of DDE transactions required between a client and a server. Although Wonderware's FastDDE has extended the usefulness of DDE for our industry, this extension is being pushed to its performance constraints in distributed environments.

NetDDE™ extends the standard Windows DDE functionality to include communication over local area networks and through serial ports. Network extensions are available to allow DDE links between applications running on different computers connected via networks or modems. For example, NetDDE supports DDE between applications running on IBM® compatible computers connected via LAN or modem and DDE-aware applications running on non-PC based platforms under operating environments such as VMS™ and UNIX®.

SuiteLink uses a TCP/IP based protocol and is designed specifically to meet industrial needs such as data integrity, high-throughput, and easier diagnostics. This protocol standard is only supported on Microsoft Windows NT 4.0 and Windows 2000.

SuiteLink is not a replacement for DDE, FastDDE, or NetDDE. The protocol used between a client and a server depends on your network connections and configurations. SuiteLink was designed to be the industrial data network distribution standard and provides the following features:

- Value Time Quality (VTQ) places a time stamp and quality indicator on all data values delivered to VTQ-aware clients.
- Extensive diagnostics of the data throughput, server loading, computer resource consumption, and network transport are made accessible through the Microsoft Windows NT and Windows 2000 operating systems Performance Monitor. This feature is critical for the scheme and maintenance of distributed industrial networks.
- Consistent high data volumes can be maintained between applications regardless if the applications are on a single node or distributed over a large node count.
- The network transport protocol is TCP/IP using Microsoft's standard WinSock interface.

Accessing Remote Items via the I/O Server

The communication protocol addresses an element of data in a conversation that uses a three-part naming convention that includes the application name, topic name and item name. The following briefly describes each portion of this naming convention:

application name — The name of the Windows program (server) that will be accessing the data element. In the case of data coming from or going to Allen-Bradley PLC equipment via this server, the application portion of the address is **ABKF2**.

topic name — Meaningful names are configured in the server to identify specific devices. These names are then used as the topic name in all conversations to that device. For example, **ABPLC**.

Note You can define multiple topic names for the same device (PLC) to poll different points at different rates.

item name — A specific data element within the specified topic. For example, when using this server, an item can be a relay, timer, counter, register, etc., in the PLC.

Note The item/point names are predefined by the server. The term "point" is used interchangeably with the term "item" in this user's guide.

For more information on item/point names, see the "Item Names" section later in this user's guide.

Getting Started Quickly with the I/O Server

This section briefly describes the procedure required to install the Wonderware Allen-Bradley Serial I/O Server and prepare it for use. Detailed descriptions of each step can be found in the manuals provided by Allen-Bradley and in sections of this user's guide.

Note If using an ISA-style card in EISA-bus computers, it is essential to use the PC vendor provided EISA configuration utilities to let the PC know what slot, IRQ's, memory addresses, etc. that the ISA-style card is using.

1. Install the Wonderware Allen-Bradley Serial I/O Server. Click the **Start** button on the task bar, then choose Run and enter the following in the **Open** combo box: **X:\SETUP** (X identifies the drive being used). Follow the instructions.
2. Reboot your system and run the server by double-clicking on its icon from the server's program group or from Windows' **Start** menu.
3. Invoke the **Configure/Com Port Settings** command and type in the settings for the communication port.
4. Configure the Allen-Bradley PLC or Allen-Bradley Communication Adapter as described in later sections of this user's guide.
5. Invoke the **Configure/Topic Definition** command to define one or more topics associated with PLCs.
6. Minimize the server window to an icon.
7. The Wonderware Allen-Bradley Serial I/O Server is now ready for use.

Note If this is a new install, it is essential to select Wonderware Common Components to be installed first at Step 1.

Connection Diagrams

Organized by the PLC family, this section describes the cables required to connect your PC to the Allen-Bradley PLC either directly or through an Allen-Bradley Communication Adapter. Although there are many connections which are the same, for example, the cable between the PC and the 1770-KF2 module, every supported connection is listed under each PLC family for clarity.

PLC-2 Family Connection Diagrams

The following list is the supported connection configurations for the PLC-2.

PSEUDO DIRECT:

1. PC Serial Port pseudo direct to PLC 2 Processor via 1771-KG Module

MULTI-DROP DH:

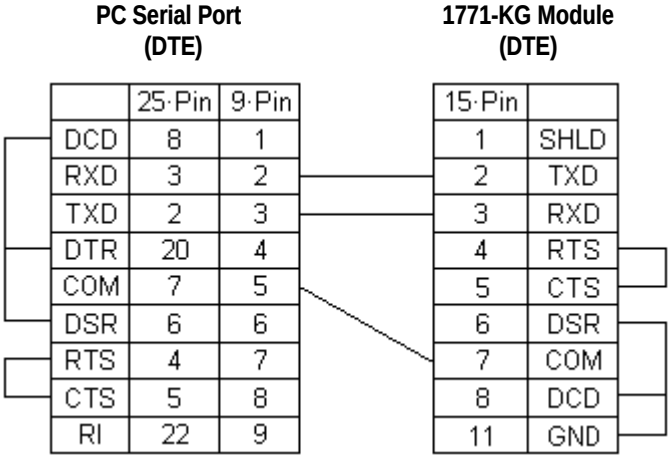
1. PC Serial Port to 1770-KF2 module to DH Network
2. PC Serial Port to 1771-KE module to DH Network
3. PC Serial Port to 1771-KF module to DH Network

IMPORTANT! A 1771-KA2 module is needed at each PLC-2 processor.

Note Because the handshaking lines, RTS/CTS, are "tied back", these cables will work for all PC's, even if you are not able to disable handshaking on the serial port(s).

PSEUDO DIRECT / 1771-KG

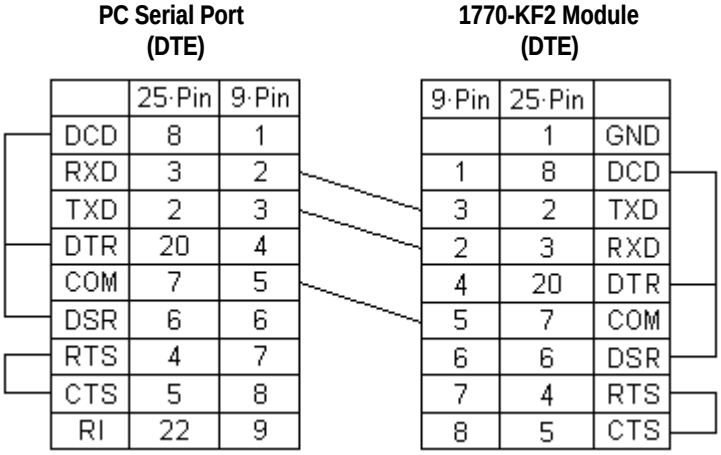
PC Serial Port pseudo direct to PLC-2 processor via 1771-KG Module



Note The 1771-KG module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

MULTI-DROP DH / 1770-KF2

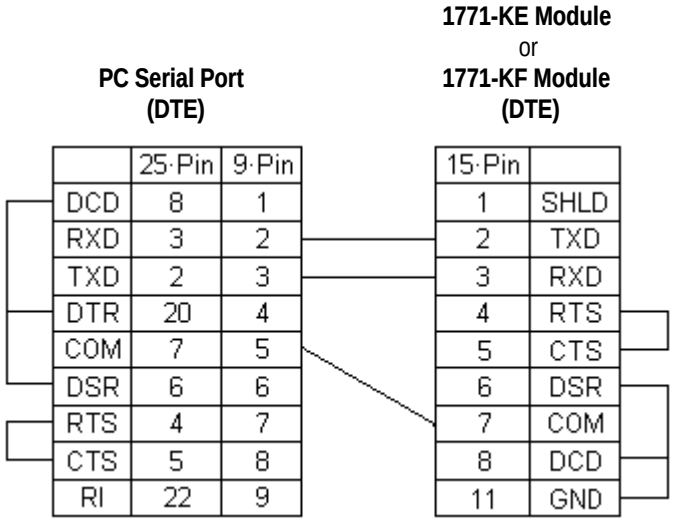
PC Serial Port to 1770-KF2 module to DH Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9–25 converter to be used.

MULTI-DROP DH / 1771-KE, 1771-KF

PC Serial Port to 1771-KE or 1771-KF module to DH Network



Note The 1771-KE and 1771-KF modules have only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

PLC-3 Family Connection Diagrams

The following list is the supported connection configurations for the PLC-3.

MULTI-DROP DH:

1. PC Serial Port to 1770-KF2 module to DH Network
2. PC Serial Port to 1771-KE module to DH Network

IMPORTANT! A 1775-SR5 or 1775-KA module is needed at each PLC 3 processor.

MULTI-DROP DH+:

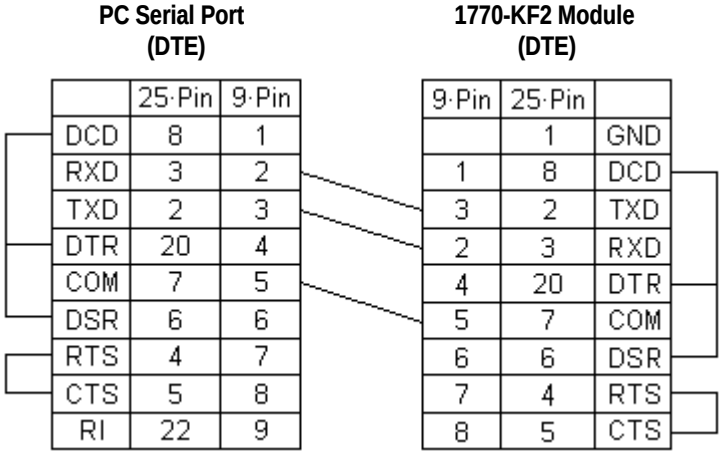
1. PC Serial Port to 1770-KF2 module to DH+ Network
2. PC Serial Port to 1785-KE module to DH+ Network

IMPORTANT! A 1775-SR5 or 1775-KA module is needed at each PLC 3 processor.

Note Because the handshaking lines, RTS/CTS, are "tied back", these cables will work for all PC's, even if you are not able to disable handshaking on the serial port(s).

MULTI-DROP DH / 1770-KF2

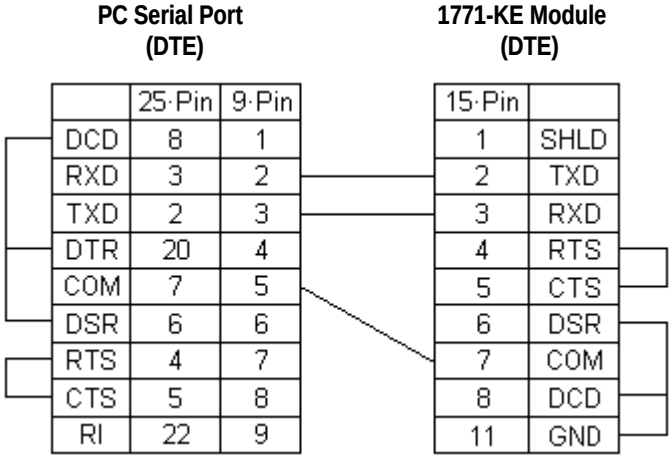
PC Serial Port to 1770-KF2 module to DH Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH / 1771-KE

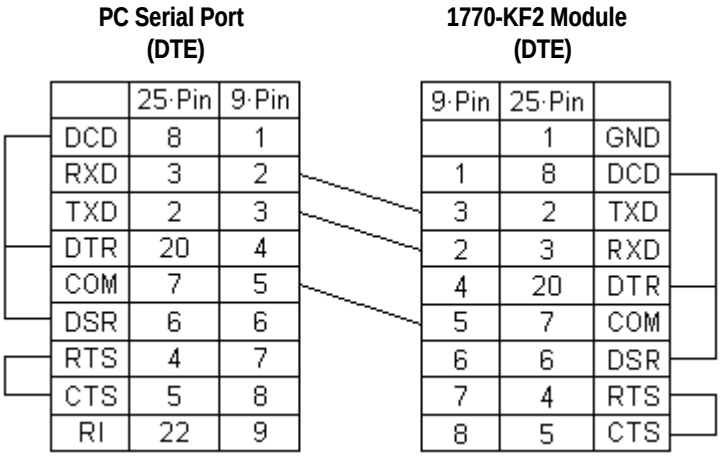
PC Serial Port to 1771-KE module to DH Network



Note The 1771-KE module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

MULTI-DROP DH+ / 1770-KF2

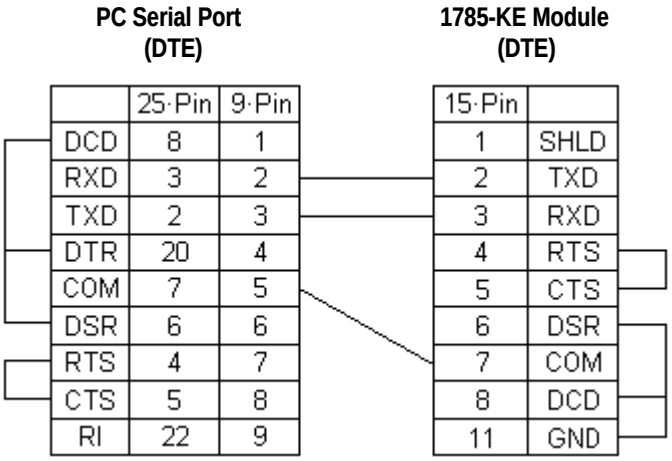
PC Serial Port to 1770-KF2 module to DH+ Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1785-KE

PC Serial Port to 1785-KE module to DH+ Network



Note The 1785-KE module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

PLC-5 Family Connection Diagrams

The following list is the supported connection configurations for the PLC-5.

DIRECT: ("New Platform" PLC-5 Series only)

1. PC Serial Port direct to PLC-5 Processor's Serial Port

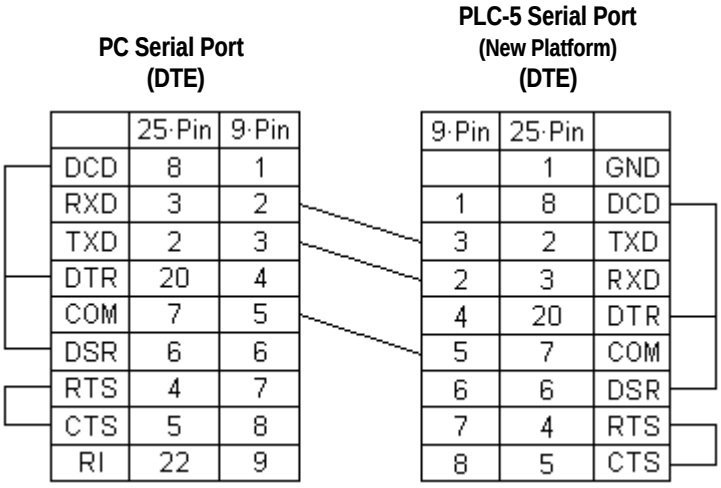
MULTI-DROP DH+:

1. PC Serial Port to 1770-KF2 module to DH+ Network
2. PC Serial Port to 1785-KE module to DH+ Network

Note Because the handshaking lines, RTS/CTS, are "tied back", these cables will work for all PC's, even if you are not able to disable handshaking on the serial port(s).

DIRECT

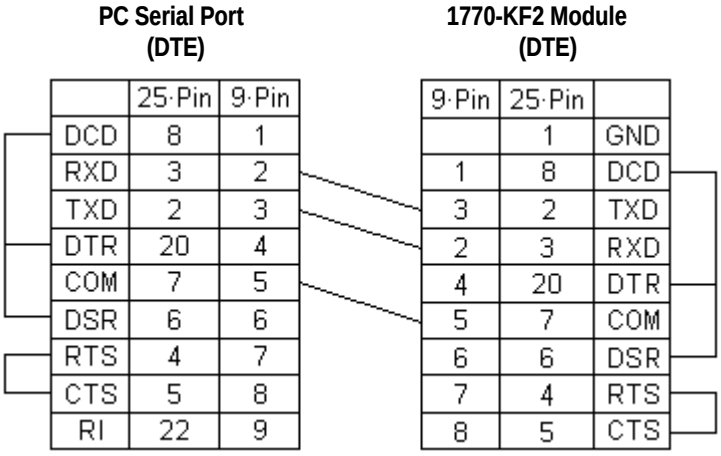
PC Serial Port direct to PLC-5 Processor's Serial Port ("New Platform" PLC-5 Series only)



Note The PLC-5 Processors have only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1770-KF2

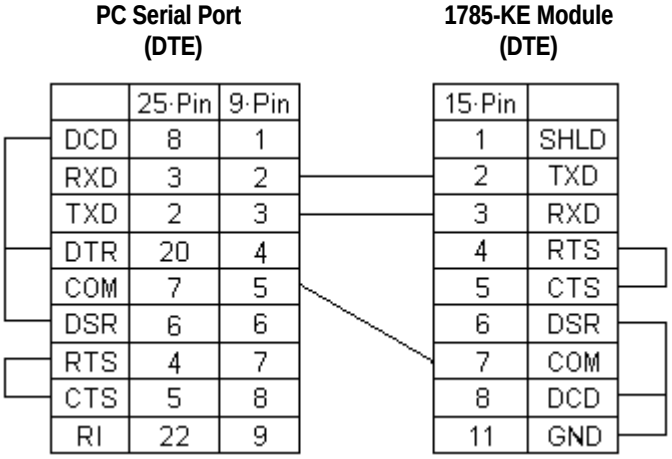
PC Serial Port to 1770-KF2 module to DH+ Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1785-KE

PC Serial Port to 1785-KE module to DH+ Network



Note The 1785-KE module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

PLC-5/250 Family Connection Diagrams

The following list is the supported connection configurations for the PLC-5/250.

PSEUDO DIRECT:

1. PC Serial Port pseudo direct to 5130-RM or 5130-KA module in PLC 5/250 Chassis

MULTI-DROP DH:

1. PC Serial Port to 1770-KF2 module to DH Network
2. PC Serial Port to 1771-KE module to DH Network
3. PC Serial Port to 1771-KF module to DH Network

IMPORTANT! A 5130-RM or 5130-KA module is needed at each PLC 5/250 processor.

MULTI-DROP DH+:

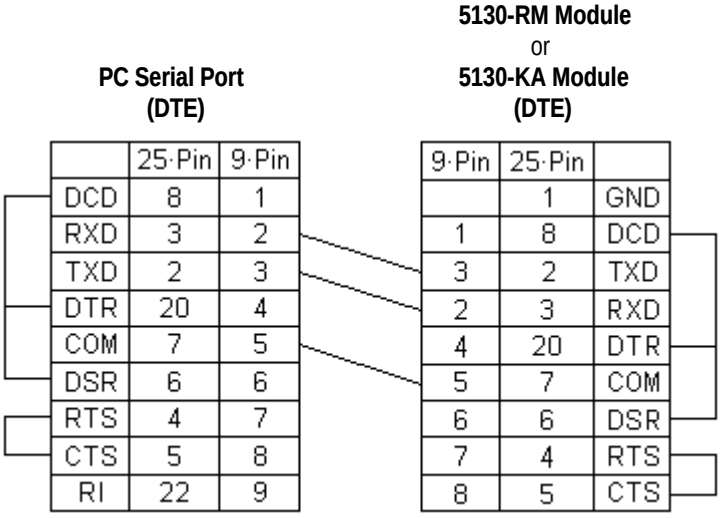
1. PC Serial Port to 1770-KF2 module to DH+ Network.
2. PC Serial Port to 1785-KE module to DH+ Network.

IMPORTANT! A 5130-RM or 5130-KA module is needed at each PLC 5/250 processor.

Note Because the handshaking lines, RTS/CTS, are "tied back", these cables will work for all PC's, even if you are not able to disable handshaking on the serial port(s).

PSEUDO DIRECT / 5130-RM, 5130-KA

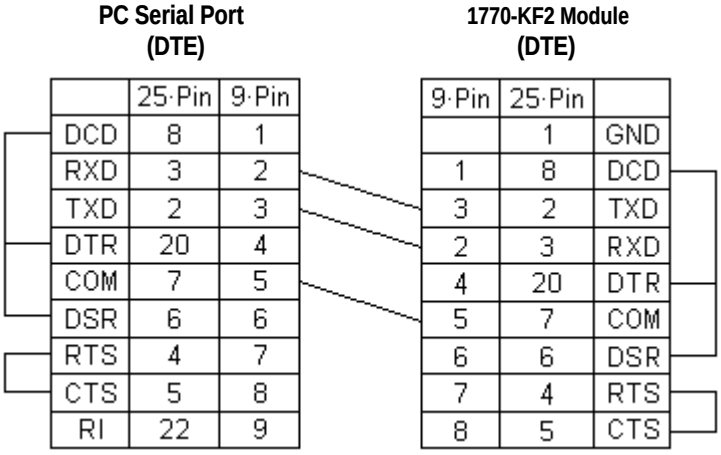
PC Serial Port pseudo direct to 5130-RM or 5130-KA module in PLC 5/250 Chassis



Note The 5130-RM and 5130-KA modules have only a 25-pin D-Shell connector. The 9 pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH / 1770-KF2

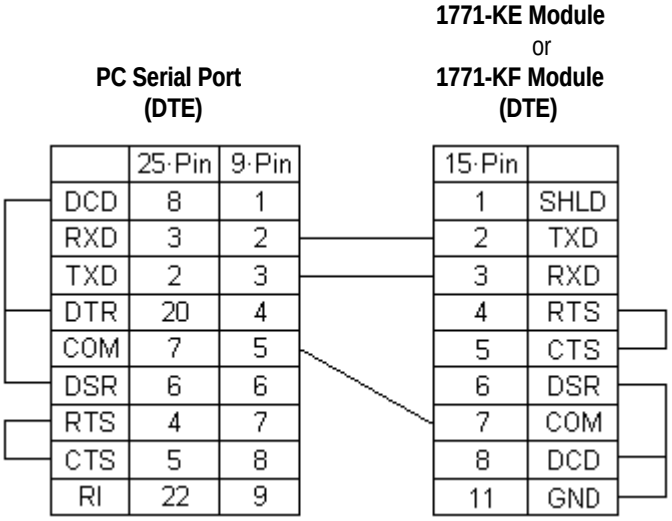
PC Serial Port to 1770-KF2 module to DH Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH / 1771-KE, 1771-KF

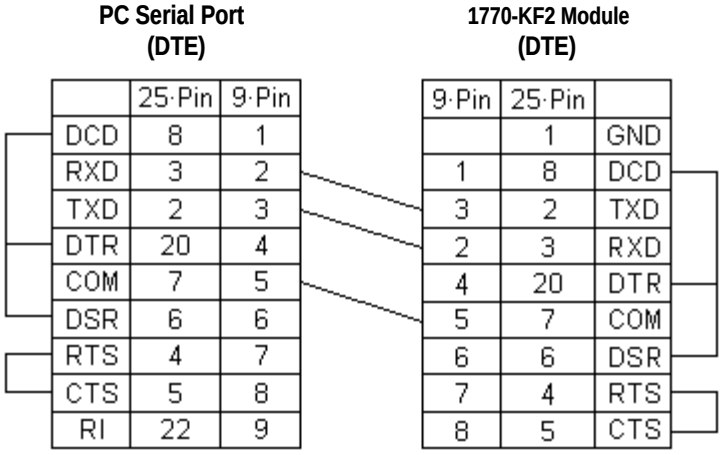
PC Serial Port to 1771-KE and 1771-KF modules to DH Network



Note The 1771-KE and 1771-KF modules have only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

MULTI-DROP DH+ / 1770-KF2

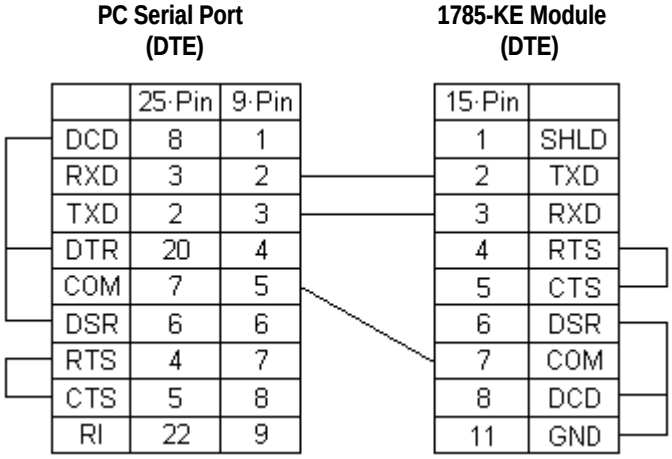
PC Serial Port to 1770-KF2 module to DH+ Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1785-KE

PC Serial Port to 1785-KE module to DH+ Network



Note The 1785-KE module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

SLC-500 Family Connection Diagrams

The following list is the supported connection configurations for the SLC-500.

DIRECT: (SLC-5/03, 5/03C, 5/04 only)

1. PC Serial Port to SLC 5/03, SLC 5/03C, or SLC 5/04 Processor's Serial Port

MULTI-DROP DH485:

1. PC Serial Port to 1770-KF3 module to DH485 Network
2. PC Serial Port to 1747-KE module to DH485 Network

IMPORTANT! An AIC module is needed at each SLC processor.

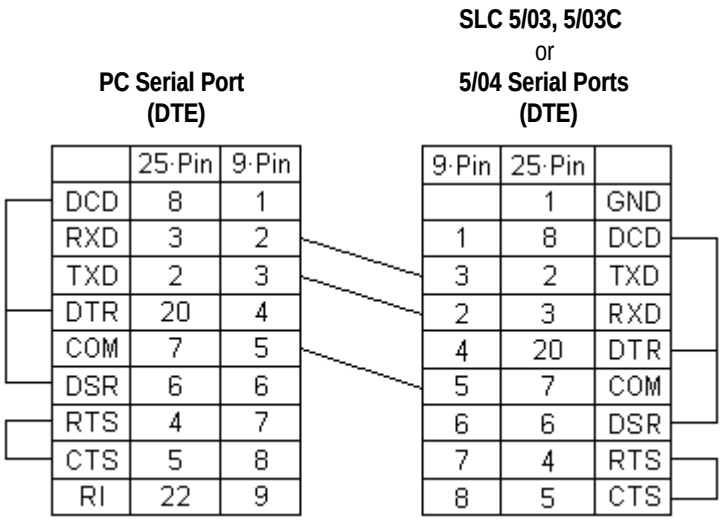
MULTI-DROP DH+: (SLC 5/04 only)

1. PC Serial Port to 1770-KF2 module to DH+ Network
2. PC Serial Port to 1785-KE module to DH+ Network

Note Because the handshaking lines, RTS/CTS, are "tied back", these cables will work for all PC's, even if you are not able to disable handshaking on the serial port(s).

DIRECT

1. PC Serial Port to SLC 5/03, SLC 5/03C, or SLC 5/04 Processor's Serial Port

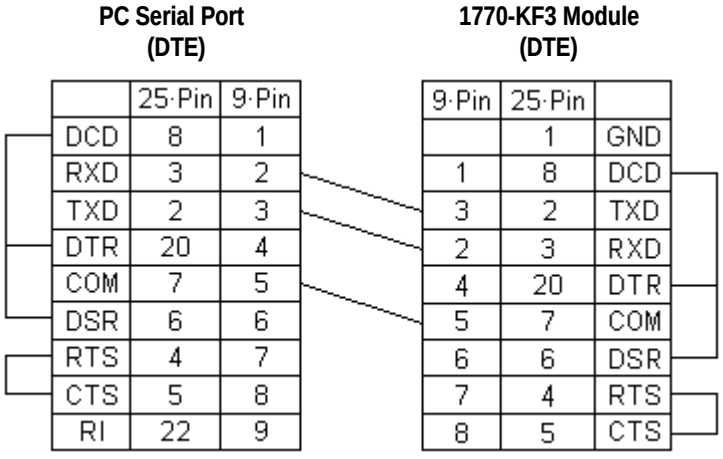


Note This is not the same pinout used in the Allen-Bradley 1747-CP3 cable, but a CP3 will work in this situation.

Note The SLC processors only have a 9-pin D-Shell connector. The 25-pin connection is shown to allow for a 25-9 converter to be used.

MULTI-DROP DH485 / 1770-KF3

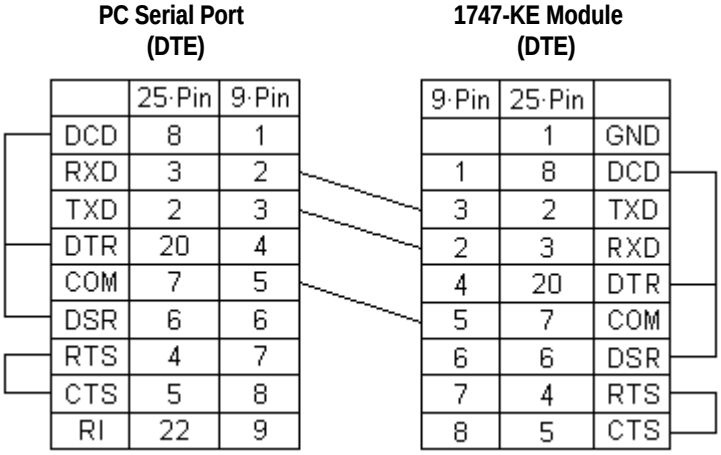
PC Serial Port to 1770-KF3 module to DH485 Network



Note The 1770-KF3 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH485 / 1747-KE

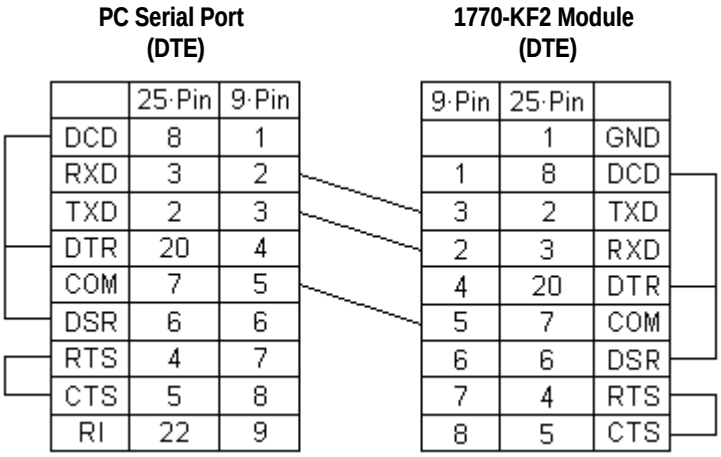
PC Serial Port to 1747-KE module to DH485 Network



Note The 1747-KE module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1770-KF2

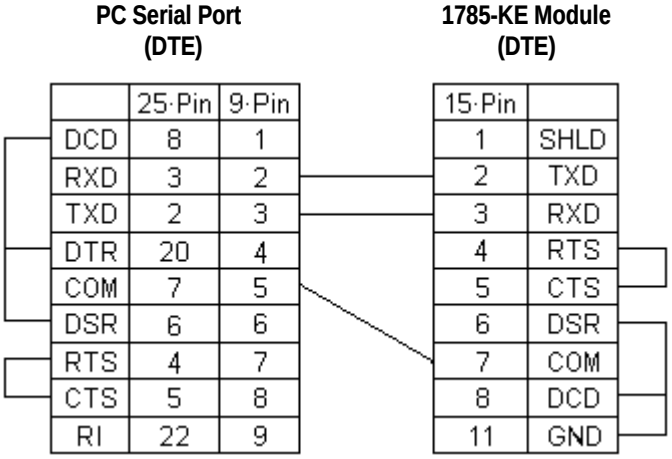
PC Serial Port to 1770-KF2 module to DH+ Network



Note The 1770-KF2 module has only a 25-pin D-Shell connector. The 9-pin connection is shown to allow for a 9-25 converter to be used.

MULTI-DROP DH+ / 1785-KE

PC Serial Port to 1785-KE module to DH+ Network



Note The 1785-KE module has only a 15-pin D-Shell connector. Therefore, only the 15-pin is shown.

Miscellaneous Connection Details

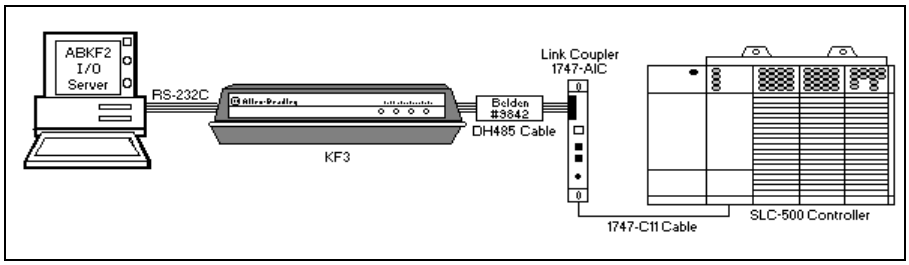
The following sections describe additional connection details.

Connecting the PC to the 1770-KF3

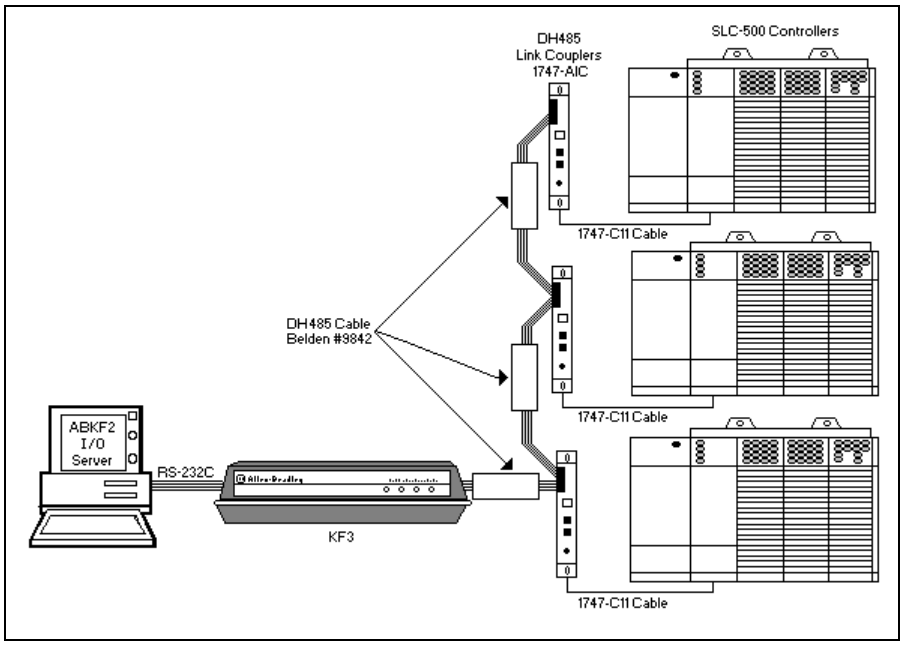
The diagrams below illustrate two typical network configurations that can be used when using the server to communicate with Allen-Bradley SLC-500 controllers.

Hardware Configurations for the 1770-KF3

POINT-TO-POINT DH485 LINK



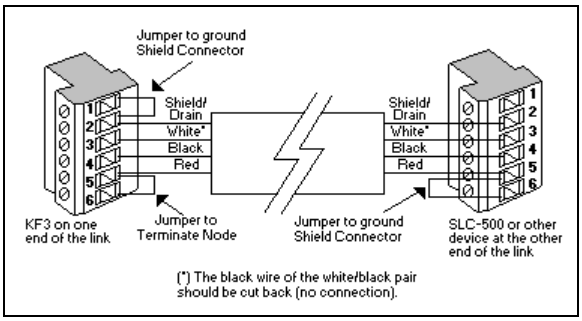
MULTI-DROP DH485 NETWORK



The RS-232-C cable used between the computer and the KF3 module should be pinned out as previously described.

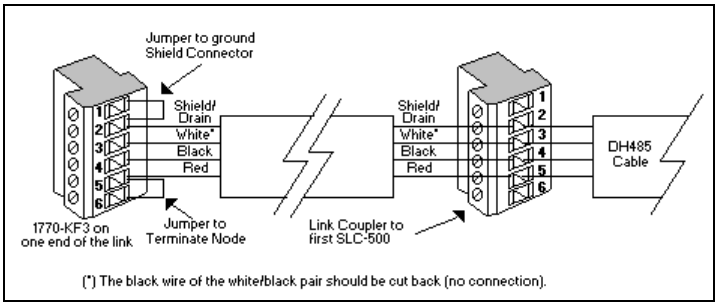
DH485 Cable Configuration between KF3 and AIC

The DH485 cable used between the KF3 module and the AIC modules should be compatible with the Belden #9842 as illustrated below:



Connection for First Segment of a Multi-drop Network

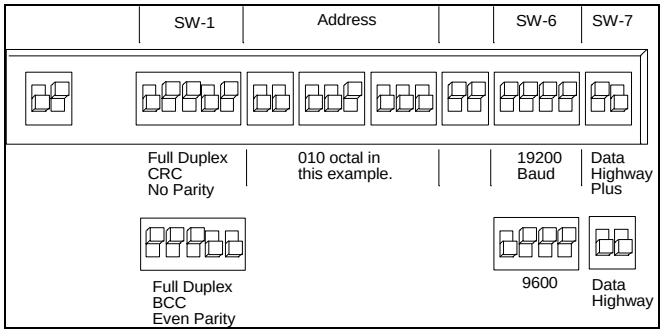
The third cable needed is Allen-Bradley's 1747-C11. This cable goes between the AIC module and the programming port on the SLC-500: SLC-5/01, SLC-5/02, or SLC-5/03 controllers.



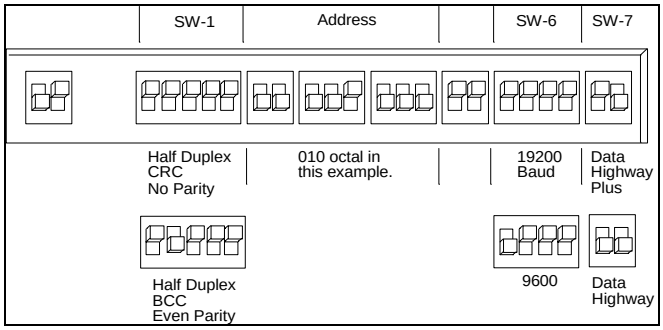
Setting the Switches on the 1770-KF2

The Allen-Bradley 1770-KF2 has a group of configuration switches that are accessible through an opening in the bottom of its cabinet. The switch settings for the 1770-KF2 are illustrated below:

Full Duplex (DF1) Settings



Half Duplex (Multidrop) Settings

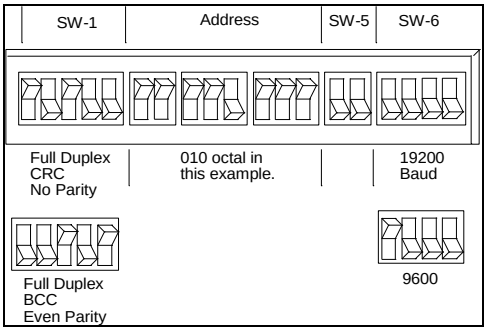


Note The switch settings must correspond to the choices made when configuring the server. For more information on configuring the server, see the "Configuring the I/O Server Settings" section in this user's guide.

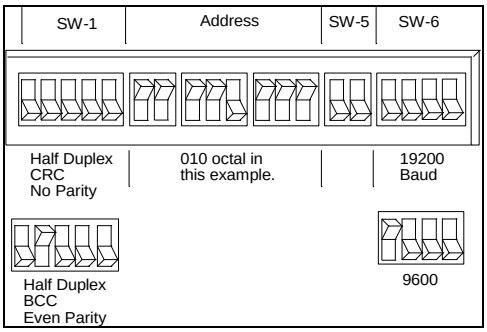
Setting the Switches on the 1771-KE / KF

The Allen-Bradley 1771-KE and 1771-KF have a group of configuration switches that are accessible through an opening in the side of the cabinet. The switch settings for the 1771-KE/KF are shown below:

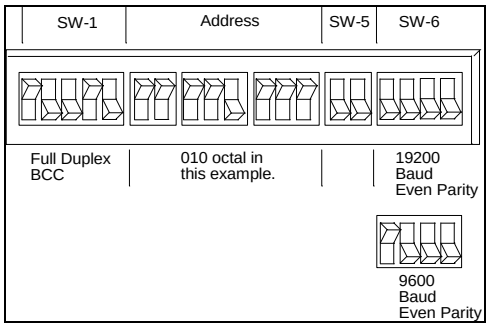
Full Duplex, Revision H Settings



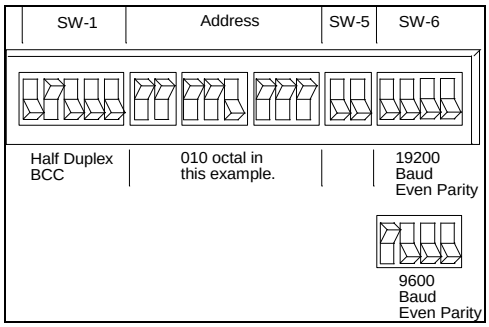
Half Duplex, Revision H Settings



Full Duplex, Revision A-G Settings



Half Duplex, Revision A-G Settings

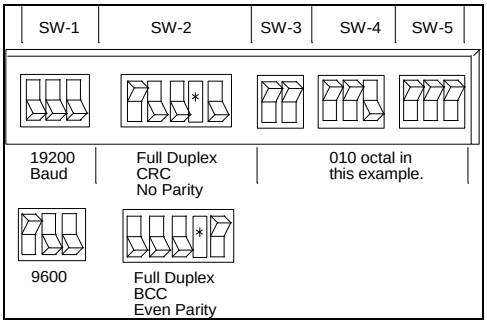


Note The switch settings must correspond to the choices made when configuring the server. For more information on configuring the server, see "Configuring the I/O Server Settings" section in this user's guide.

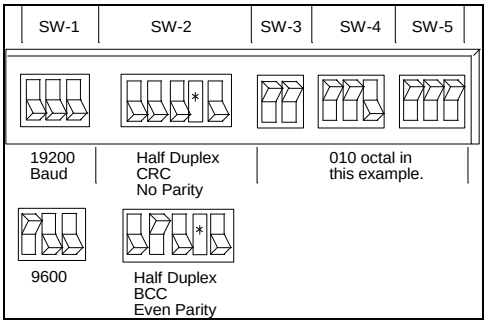
Setting the Switches on the 1771-KG

The Allen-Bradley 1771-KG has a group of configuration switches that are accessible through an opening in the side of the cabinet. The switch settings for the 1771-KG are shown below:

Full Duplex, Series B Settings

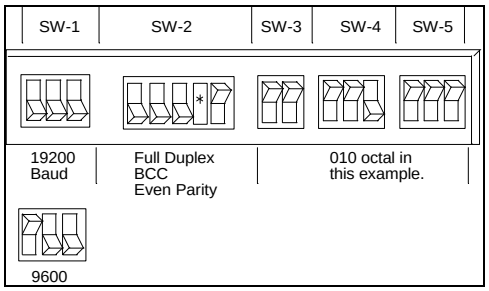


Half Duplex, Series B Settings

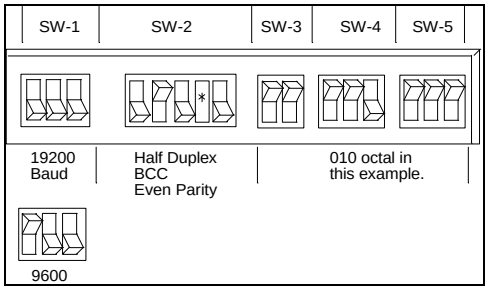


***** Set this switch to first/second Module.

Full Duplex, Series A Settings



Half Duplex, Series A Settings



***** Set this switch to accept physical writes if needed by other software. The Wonderware Allen-Bradley Serial I/O Server does not use physical writes.

Note The switch settings must correspond to the choices made when configuring the server. For more information on configuring the server, see the “Configuring the I/O Server Settings" section in this user's guide.

Configuring the 1770-KF3 Interface

The three buttons on the back of the KF3 module are used to set the configuration parameters 0-8. To start the configuration turn on the power to the KF3. Use the **VIEW** button to step through the parameters. Use the **DATA** button to change the options.

Parameter 0

Node Station number for the KF3.
Set this between 0-31. Use a station number that is not used by any other device on the DH-485 network.

Parameter 1

DH-485 Baud Rate
This value can be set to 3 for 300, 12 for 1200, 24 for 2400, 48 for 4800, 96 for 9600 or 19 for 19200. It is recommended that 19 be used to match the SLC-500 default Baud Rate setting (19200).

Parameter 2

Diagnostic Command Execution
This can be set to 00 or 01. It is recommended that 00 be used.

Parameter 3

RS-232-C Baud Rate
The possible Baud Rates are the same as the DH-485 (Parameter 1). It is recommended that 96 (9600) be used.

Parameter 4

RS-232-C Parity
This can be set to 00 for no parity or 01 for even parity. It is recommended that 00 be used.

Parameter 5

DF1 Device Category
This can be 00 for full duplex or 01 for half duplex. It is recommended that 00 be used.

Parameter 6

Error Detection
This can be set to 00 for BCC or 01 for CRC. It is recommended that 01 be used.

Parameter 7

Flow Control
This can be 00 for Disabled or 01 for Enabled. It is recommended that 01 be used.

Parameter 8

Duplicate Message Detection
This can be 00 for Disabled or 01 for Enabled. It is recommended that 00 be used.

Exit and **Save** by pressing the **VIEW** and **EXIT** buttons simultaneously.

Using the Allen-Bradley 1747-KE Module

The Wonderware Allen-Bradley Serial I/O Server can be connected directly to the DF1 Port of a Allen-Bradley 1747-KE module in a SLC-500: SLC-5/01, SLC-5/02, and SLC-5/03 rack. The Allen-Bradley 1747-KE has a DF1 Port and Configure Port that plugs directly into the SLC-500 chassis. Connection to the DF1 (DH485) Port is made via an RS-232 to 1747-KE adapter. Connection to the Allen-Bradley 1747-KE DF1 Port is made directly via an ordinary RS-232 null modem cable from the PC's serial port to the DF1 Port.

For more information, see the "SLC-500 Family Connection" section in this user's guide.

Perform the following steps to install and configure the Allen-Bradley 1747-KE Module for communication with the Wonderware Allen-Bradley Serial I/O Server:

1. Locate the Jumper JW2 on the Allen-Bradley 1747-KE Module. Position it to the configured position as shown in the Allen-Bradley 1747-KE User's Manual. Set up JW1 and JW2 Jumpers. Then install the module in a free module slot.
2. Check the slot containing the interface module. This interface module must be assigned within the SLC program. This can be done by using the Rockwell PLC programming software. Refer to the Allen-Bradley 1747-KE User's Manual for specific details.
3. Connect the cable between the computer serial port and the top port (Configure Port). Then, by using the Windows Terminal Program, set the Communication parameters to the following:

Baud Rate	1200
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	XON/XOFF
Terminal Emulation	DEC VT-100 (ANSI)

   - Cycle the power on the SLC power supply to restart the processor.
   - In the Windows Terminal Program, press the [ENTER] key. Then the Top Level Setup Menu will appear.
   - Configure Menu Items 1-4 according to the Allen-Bradley 1747-KE User's Manual.

4. Connect the same cable between the serial communication port and the Allen-Bradley 1747-KE DF1 port. Configure the Wonderware Allen-Bradley Serial (ABKF2) I/O Server to match the setting on the KE Module.

   Note When the KE module is used in master/slave half duplex mode, the KE's Poll Timeout needs to be set to at least twenty seconds. In its default setting, the KE module retains polled transmissions for one second. If the server is heavily loaded, it may not be able to poll for the transmission before the timeout period. The result is intermittent reply timeouts. If intermittent reply timeouts continue, increase the "Poll Timeout" again in twenty second increments.

5. The Allen-Bradley 1747-KE is now ready to communicate to the Wonderware Allen-Bradley Serial I/O Server.

Using Modems with Allen-Bradley Equipment

When configured to use modem signals, Allen-Bradley communications interfaces expect to be used with modems that use the DTR, DSR, and DCD signals to indicate readiness of the modems and to control the disconnection of switched lines. If the modems do not drop DSR in response to DTR dropping, the cable should be modified between the Allen-Bradley communications adapter and the modem such that DTR is looped-back to DSR. Also, if DCD is not present, Allen-Bradley communications interfaces will ignore received data.

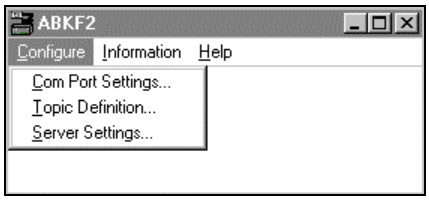
Configuring the I/O Server

Once the server has been installed, a small amount of configuration is required. Configuring the server automatically creates a configuration file named, **ABKF2.CFG**. This file stores the configuration information for the adapter cards or communication ports and all of the topic definitions (described in detail later).

The configuration file is automatically saved to the directory in which the server is installed unless a different directory is specified.

To perform the required configurations, start up the server by double-clicking on its icon. If the server starts up as an icon, double-click on the icon to open the server's window.

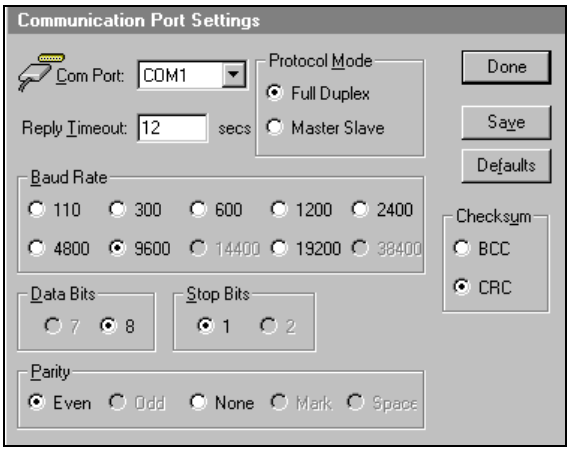
To access the options used for the various configurations, open the **Configure** menu:



Note If any of the options appear grayed, then these options are not available with this software version.

Configuring a Communication Port

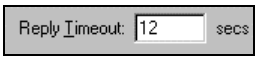
Use the **Communication Port Settings** option from the Configure Menu to configure the communication ports that will be used to communication with Allen-Bradley device. When this option is selected, this dialog box will appear:



Communication Port Settings

Note All communication ports can be configured without leaving this dialog box. Repeat these steps; select a COM Port, set configuration, and click **Save.**

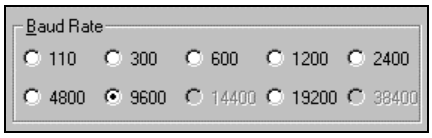
Select a communication port connected to the Allen-Bradley device.



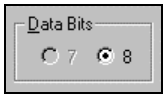
Enter the amount of time (in seconds) that all PLCs connected via this communication port will be given to reply to commands from the server.

Note This timeout is sustained only when the PLC fails to respond. When the PLC is responding normally, there is no penalty. The default value of twelve seconds should be sufficient for most configurations.

Select the option for the protocol mode to be used on the communication port. The default, **Full Duplex** is the preferred setting.

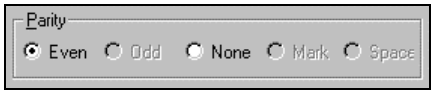


Select the Baud Rate (serial bit rate) setting that matches the configuration of the Allen-Bradley device.

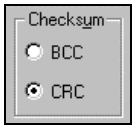


Select the number of Data Bits that matches the configuration of the Allen-Bradley device.

Select the number of Stop Bits that matches the configuration of the Allen-Bradley device. If the Baud Rate is greater than 300, the Stop Bits should be set to **1**.



Select the Parity setting that matches the configuration of the Allen-Bradley device.



Enable the option for the type of data checksum to be used. The default, **CRC** is the preferred setting for checksum.

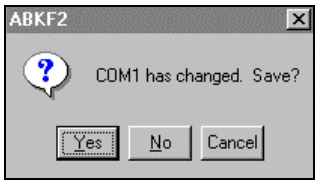
Note When selecting **CRC** error checking, the Parity selection must be set to **None**.

Note All devices on a single communication port must be configured with the same Baud Rate, Data Bits, Stop Bits, and Parity.

Click **Defaults** to reset the settings to their default values without saving changes.

Click **Save** to save settings for the selected COM Port. The dialog box will remain open giving you the option to configure additional COM Ports.

Click **Done** to close the dialog box. If the settings have not been saved, the following dialog box will appear:



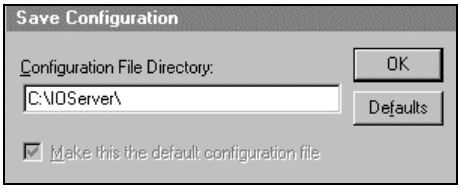
Click **Yes** to save settings for the COM Port.

Click **No** to prevent saving the settings.

Click **Cancel** to return to the **Communication Port Settings** dialog box without saving the settings.

Saving the I/O Server's Configuration File

If a configuration file does not currently exist in the configuration file directory, the server will automatically display the **Save Configuration** dialog box:



Save Configuration

This field displays the drive\directory into which the server will save the current configuration file. To save the configuration file to a different directory, enter the path for that directory in this field.

This option is selected and disabled on initial entry to the **Save Configuration** dialog box. This field becomes active if the Configuration File Directory is changed. Once enabled, selecting this option will record a new Configuration File path in the **WIN.INI** file. This option allows the server to find its configuration file automatically each time it is started.

Note When the server initially starts up, it attempts to locate its default configuration file by first checking the **WIN.INI** file for a previously specified path. If a path is not present in the **WIN.INI** file, the server will assume that the current working directory is to be used.

Click **Defaults** to reset the settings to their default values without saving changes.

Click **OK** to save the configuration file to the specified directory.

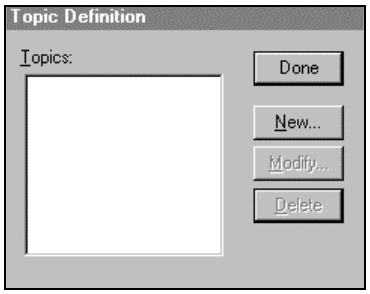
Saving Multiple Configuration Files

There is no limit to the number of configuration files that you can create as long as they are saved in separate directories. This allows you to have multiple configuration files that can be accessed by using a special switch (/d:). For example, to start the server using a configuration file located in a different directory, click the **Start** button on the taskbar, then choose **Run** and enter the following in the **Open** combo box:

ABKF2 /d:c:\directoryname

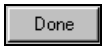
Configuring a Topic Definition

Use the **Topic Definition** option from the Configure menu to create new, modify, or delete topic definitions. One or more topic definitions must exist for each PLC that the server will communicate with. Each topic definition must contain a unique name for the PLC associated with it. When this option is selected, the **Topic Definition** dialog box will appear:



Topic Definition

Note Once topics have been defined, their names will be listed in the **Topics** section of this dialog box.

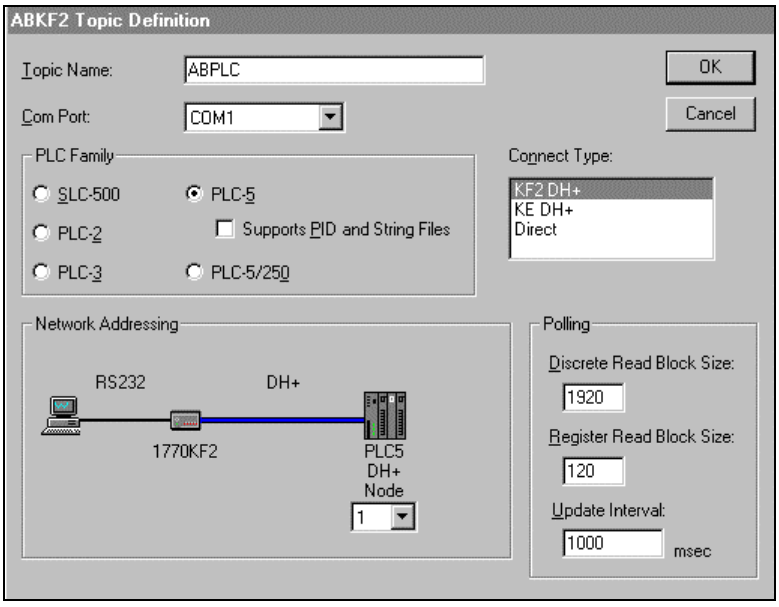


Click this button to close the dialog box and accept any new definitions, modifications or deletions made.

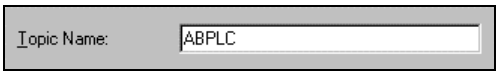
To modify or view an existing topic definition, select its name in the list and click on this button. The **ABKF2 Topic Definition** dialog box (described below) will appear displaying the selected topic definition.

To delete an existing topic definition, select its name in the list and click on this button. (A message box will appear prompting you to confirm the deletion.)

To add a new topic definition, click on this button. The **ABKF2 Topic Definition** dialog box will appear:



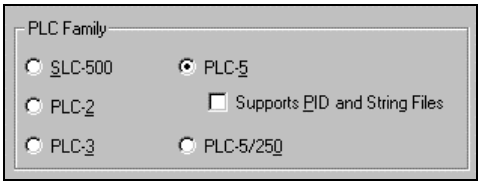
ABKF2 Topic Definition



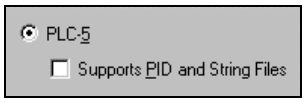
Enter a unique name (up to 32-characters long with the first character being alphabetic) for the PLC in this field. (By default, **ABPLC** will appear in this field when the dialog box is initially accessed.)

Note When communicating with InTouch, this **exact** name is used as the topic name in the Access Name definition.

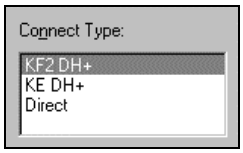
The communications port currently associated with this topic will appear in this field. To select a different port, click the down arrow to open the list of communication ports. Select the name of the communications port to be associated with this topic.



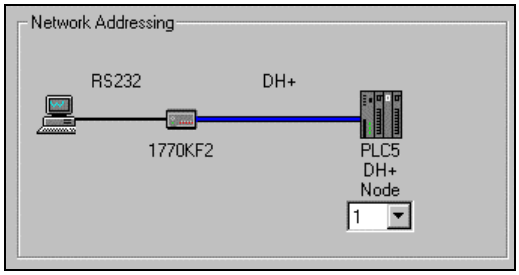
Select the PLC type that connects to the communication port for this topic definition. This is a dynamic field, as you select a PLC type the **Connect Type** list and **Network Addressing** diagram change.



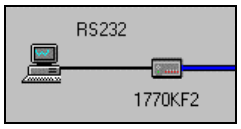
Enable this option if using a 1785 PLC-5 that supports PID, ASCII String, Block Transfer and SFC Status Files. (This field only appears when **PLC-5** is selected for the **PLC Family**.)



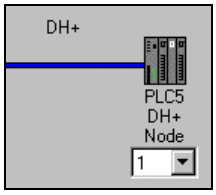
Select the Connect Type appropriate for your PLC network configuration. The supported **Network Addressing** options for your selection will be activated.



The Network Addressing is a dynamic field. The applicable options appear according to the **PLC Family** type and **Connect Type** selected. In the example above the Networking Address is defined as follows:

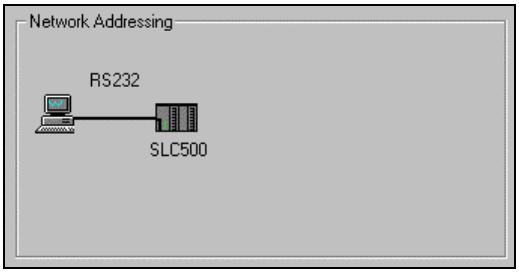


The Host computer is directly connected to a 1770KF2 by a RS232 cable.

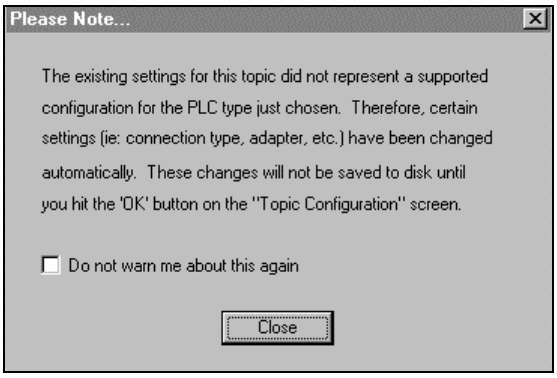


The 1770KF2 is connected to the PLC-5 by the Data Highway Plus (DH+). The DH+ Node ID must contain a unique identification. This information can be changed by using the drop down arrow and selecting a new Node ID. Valid entries are 0 - 77 octal.

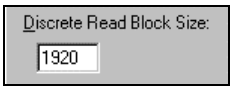
Another example of a Network Addressing is shown below.



The above Network Addressing is for a SLC-500 with a Direct **Connect Type**. In this example the Networking Address is simple. The Host computer is directly connected to the SLC-500 by a RS232 cable.

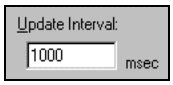


This warning box will appear when a change to the PLC Family selection is made and the Connect Type is not supported for the new PLC selection. Click **Close** to continue.



Enter the maximum number of consecutive discrete values to be read at one time. The Discrete Read Block Size can be any integer between 8 and 1920 that is an even multiple of 8. For the SLC-500s, the maximum Discrete Read Block Size is 320.

Enter the maximum number of consecutive registers to be read at one time. The Register Read Block Size can be any integer between 1 and 120. For the SLC-500s, the maximum Register Read Block Size is 40.

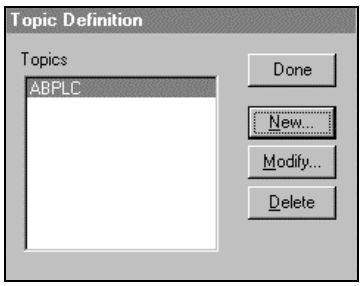


Enter the frequency (in milliseconds) that the server will read (poll) the items/points associated with this topic.

Note Different items/points can be polled at different rates by defining multiple topic names for the same PLC and setting different update rates for each topic.

Click **Cancel** to close the dialog box without saving changes.

Click **OK** to accept the topic definition and return to the **Topic Definition** dialog box:



Click **Done** to close this dialog box.

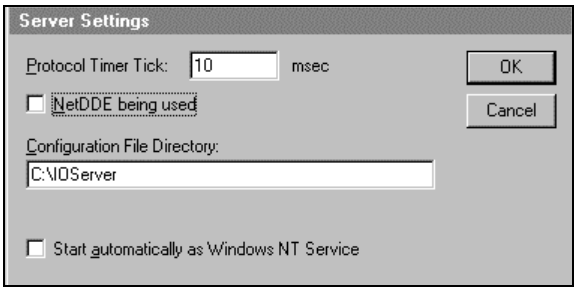
Note If this is the first configuration performed for the server, the **Save Configuration** dialog box will appear prompting you to save the configuration file.

Configuring the I/O Server Settings

Use the **Server Settings** option from the Configure menu to change the protocol timer, to enable the network using Wonderware NetDDE, to specify the default configuration file path, or to enable the server to start automatically as a Windows NT service.

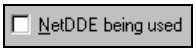
Note When configuring the server on Windows NT, the user must be logged on with system administrator privileges. This will ensure that updates to the system registry may be performed.

When the **Server Settings** option is selected, the **Server Settings** dialog box will appear:

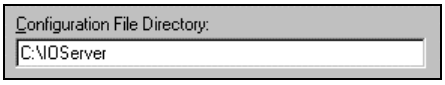


Server Settings

Enter the frequency (in milliseconds) that the server is to check for data to process. This should be approximately two to four times faster than the fastest rate desired to update data from the equipment.

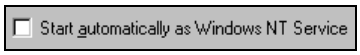


Select this option if you are networking using Wonderware NetDDE.



To create a new default configuration file, enter the complete path for the directory in which the file is to be saved in this field. This new path will automatically be written to the **WIN.INI** file and the server will use this path to load its configuration file the next time it is started.

Note There is no limit to the number of configuration files created. However, each must be saved in a different directory. When using the server with InTouch, we recommend that you save the configuration file in your application directory. For more information on the Configuration File, see "Saving the I/O Server's Configuration File" in this user's guide.



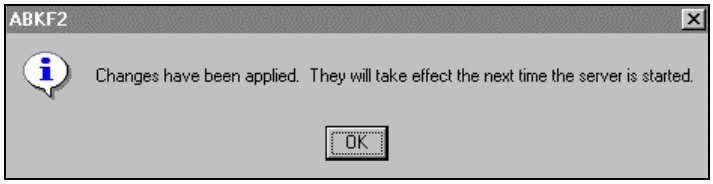
Enabling this option will cause the server to start as a Windows NT Service.

Windows NT offers the capability of running applications even when a user is not logged on to the system. This is valuable when systems must operate in an unattended mode. Enabling this option and rebooting the system will cause the server to run as a Windows NT service. However, to view configuration information or to reconfigure the server, the user must log on to the system. Any server related problems that may arise such as missing adapter cards, licensing failures or device drivers not loading will not be visible to the user until a log on is performed. Disabling this option and rebooting the system will cause the server to run as a Windows NT application program once again.

Note It is highly recommended that the server is configured and communicating successfully prior to running it as a Windows NT service.

Click **Cancel** to close the dialog box without saving changes.

Click **OK** to accept the server settings. The following message box will appear:



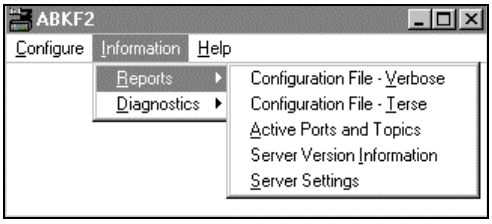
Click **OK** to close the dialog box.

Note You must restart the server for the changes to take effect.

Accessing I/O Server Information

The Information menu contains two options, each with a submenu to access information on the server.

Information/Reports



The following describes the Reports menu options.

Configuration File-Verbose

Reads the current configuration file (.CFG) from disk and prints it to the Wonderware Logger in a verbose form. The report includes a text description of every selection made within the server with regards to the configured Adapters and Topics.

For example, the report shown below was generated from a configuration file that defined one Adapter (Wonder0) and two Topics (ABPLC and BACKUPPLC) attached to the Adapter. Notice the hierarchical layout, wherein the Adapter comes first, then all Topics attached to that Adapter are indented and listed below it.

```
=== Verbose Report of Configuration File ===
KT Card: 'Wonder0'
     Memory Address: D400 (Hex)
     Reply Timeout: 3 (Seconds)
     DH+ Address: 1 (Octal)
     Firmware Source: Server Supplied
     Termination Resistor: DISABLED
     Configured Topics Attached To This Card:
     Topic: 'BACKUPPLC'
           PLC Model: PLC5
           -- Addressing --
           Connects to remote DH+ Station: 2 (Octal) through a bridge
           configuration.
           The local bridge device, a 1779-KP5 module, is DH+ Station: 0
           (Octal)
           and the remote device is Non-DH+ Station: 0 (Octal)
           -- Other Information --
           Update Interval = 1000 (Milliseconds)
           PLC Does Not Support PID and String file types
           Max Block Size for Reading Bits: 1824
           Max Block Size for Reading Words: 108
     Topic: 'ABPLC'
           PLC Model: PLC5
           Connects to local DH+ Station: 0 (Octal)
           Update Interval = 1000 (Milliseconds)
           PLC Supports PID and String file types
           Max Block Size for Reading Bits: 1920
           Max Block Size for Reading Words: 120
Total Configured Topics: 2
Total Configured Boards: 1
=== End Verbose Report ===
```

Configuration File-Terse

Reads the current configuration file (.CFG) from disk and prints it to the Wonderware Logger in a terse (short) form. The report lists each of the configured Adapters and Topics.

For example, the report shown below was generated from a configuration file that defined one Adapter (Wonder0) and two Topics (ABPLC and BACKUPPLC) attached to the Adapter. Notice the hierarchical layout, wherein the Adapter comes first, then all Topics attached to that Adapter are indented and listed below it.

```
=== Summary Report of Configuration File ===
Adapter Card: 'Wonder0'
        Topic: 'BACKUPPLC'
        Topic: 'ABPLC'
=== End of Summary Report ===
```

Active Ports and Topics

Prints the run-time state of the server to the Wonderware Logger in a verbose form. The report includes a text description of every currently active Adapter and Topic within the server during runtime.

For example, the report shown below was generated from a configuration file that defined one Adapter (Wonder0) and two Topics (ABPLC and BACKUPPLC) attached to the Adapter. Notice the hierarchical layout, wherein the Adapter comes first, then all Topics attached to that Adapter are indented and listed below it.

```
=== Report of Active Ports/Topics ===
KT Card: 'Wonder0'
    Memory Address: D400 (Hex)
    Reply Timeout: 3 (Seconds)
    DH+ Address: 1 (Octal)
    Firmware Source: Server Supplied
    Termination Resistor: DISABLED
    Active Topics Attached To This Card:
    Topic: 'backupplc'
       PLC Model: PLC5
       -- Addressing --
       Connects to remote DH+ Station: 2 (Octal) through a bridge
       configuration.
       The local bridge device, a 1779-KP5 module, is DH+ Station: 0
       (Octal)
       and the remote device is Non-DH+ Station: 0 (Octal)
       -- Other Information --
       Update Interval = 1000 (Milliseconds)
       PLC Does Not Support PID and String file types
       Max Block Size for Reading Bits: 1824
       Max Block Size for Reading Words: 108
       Read Messages: 1
       Write Messages: 0
       Total Active Items: 1
    Topic: 'abplc'
       PLC Model: PLC5
       Connects to Local DH+ Station: 0 (Octal)
       Update Interval = 1000 (Milliseconds)
       PLC Supports PID and String file types
       Max Block Size for Reading Bits: 1920
       Max Block Size for Reading Words: 120
       Read Messages: 1
       Write Messages: 0
Total Active Items: 1
Total Active Topics: 2
Total Active Ports:  1
===End of Active Ports/Topics Report ===
```

Server Version Information

Prints the server's version number to the Wonderware Logger.

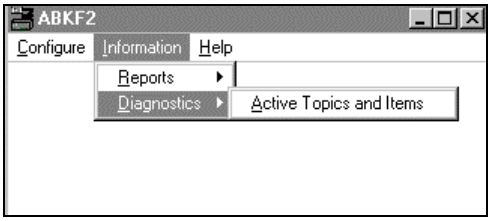
Server Settings

Reads the current settings of the server from the WIN.INI file and prints them to the Wonderware Logger in report form. This report provides information on the settings as configured in the Server Settings dialog.

For example:

```
=== Report of Server Settings ===
Protocol Timer Tick: 10 (Milliseconds)
Valid Data Timeout:  60000 (Milliseconds)
Config File Path:  'C:\IOServer\'
The server will purge any pending writes upon entering slow poll mode
=== End of Server Settings Report ===
```

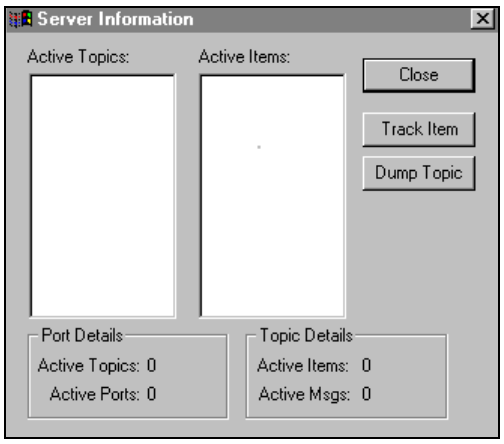
Information/Diagnostics



The following describes the Diagnostics menu options.

Active Topics and Items

Displays the **Server Information** dialog box, containing information pertaining to active topics and the active items attached to those topics.



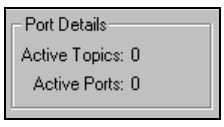
Server Information

When one or more topics are active, they will be displayed in the **Active Topics** list box.

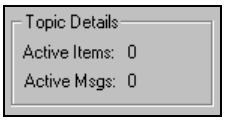
Selecting a topic within the **Active Topics** list box will cause the dialog box to display the **Active Items** associated with the selected topic. Normally, the client area of the server displays a list of all the active topics and messages.

Note This list can be very long in large applications, so long in fact that the list extends off the end of the window. This window was not designed to be scrollable due to performance considerations. Therefore, when many topics and many messages are active, the screen will not be able to display the entire list.

To provide a clearer picture of what is happening inside the server, this dialog box modifies the content of the client area. When this dialog box is open and a Topic has been selected, the client area displays ONLY the messages associated with the selected topic. Additionally, when an item is selected, the client area will move the line containing the description of the message to the top of the list and paint it red.



Displays the current state of the server.



Displays the number of active items on the selected topic as well as the number of active messages on the selected topic.

Instructs the server to dump a one-time TRACE of the selected item. This trace consists of three messages dumped to the Wonderware Logger:

- Acknowledgment that the TRACE has been requested
- A dump of the message request as it was sent to the PLC
- A dump of the data returned by the PLC in response to the request made.

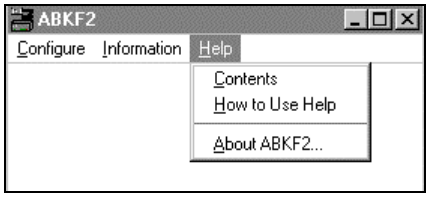
Or:

- A message indicating that the PLC failed to respond within the "Reply Timeout" period. In this case, no data is dumped to the logger, because nothing was sent back from the PLC.

Dumps a report to the Wonderware Logger describing the items and messages associated with the selected topic. This report is very detailed. For large applications with many items, the server may "pause" while outputting this report; this will significantly impact the performance of the server while outputting the report.

Accessing I/O Server Help

The Help menu contains three options that are used to access help for the server.



The following briefly describes the Help menu options.

Contents

This option is used to display the table of contents for the Help file.

How to Use Help

This option is used to access a list of basic instructions for using the Help file.

About ABKF2

This option is used to access miscellaneous information regarding the server, such as the software version, the copyright information, license information, etc.

Your FactorySuite system license information can be viewed through the license viewing utility that is launched from the **About** dialog box.

For more information on the license viewing utility, see your online *FactorySuite System Administrator's Guide*.

Item Names

The Wonderware Allen-Bradley Serial I/O Server supports item names that follow the conventions described for PLC-2, PLC-3, PLC-5, PLC-5/250, and SLC 500 PLCs.

PLC-2 Item Naming

The general format of item names for data from PLC-2 controllers matches the naming convention used by the programming software. The following sub-sections describe these formats.

Protected and Unprotected Data

If PLC-2 memory protection is being used, it is necessary for data to be written to the PLC using Protected Writes (or Protected Bit Writes for discrete items). Normally data is written using Unprotected Writes. Protected Writes can be selected by appending a "P" to the end of an item name (separated by a space). Protected and Unprotected items may be freely mixed in an application.

Examples:

070 P
100/3 P

Using Protected Writes will require the PLC-2 ladder program to contain appropriately configured memory protection rungs. Without these rungs, Protected Writes will be rejected by the PLC.

Numeric Values from the PLC-2

The item name for a numeric value from the PLC-2 is the data table address in octal. These values will be treated as unsigned 16-bit values (0 to 65535) unless one of the qualifiers described below is appended to the item name. Note that the qualifiers must be separated from the data table address by a blank space (using the spacebar).

S or SIGNED	The value is treated as a signed 16-bit number (-32768 to 32767).
4 or 4BCD	The value is treated as a 4-digit BCD number (0 to 9999).
3 or 3BCD	The value is treated as a 3-digit BCD number (0 to 999). Bits 0 through 13 octal are used, bits 14 through 17 octal are ignored.

Examples:

030	A 16-bit unsigned binary value (0 to 65535).
030 S	A 16-bit signed binary value (-32768 to 32767).
030 SIGNED	Same as 030 S.
030 3	A 3-digit BCD value (0 to 999).
030 3BCD	Same as 030 3.
030 4BCD	A 4-digit BCD value (0 to 9999).
030 4	Same as 030 4BCD.

Note Poking on items in 3-digit BCD is not supported.

ASCII String

The item name for an ASCII string is a range of data table addresses specified as "x-y". "x" and "y" must be valid data table addresses. The ASCII string is stored with two characters per word.

Example:

1030-1045 (28-character ASCII string)

Note If reading only one word as a two-character string, the range must be "x-x". For example, 1030-1030.

Discrete Values From the PLC-2

The item name for a discrete value (whether it's an I/O point or a bit in the data table) is "www/bb", where "www" is the data table word address in octal and "bb" is the bit number in octal. "www" must be a valid and appropriate data table word address and "bb" must be between 0 and 17 octal. No spaces are allowed.

Examples:

010/0	Output, rack 1, group 0, bit 0.
122/17	Input, rack 2, group 2, bit 17.
020/7	Internal bit at data table word 020 bit 7.

PLC-2 Counter and Timer Fields

There are two ways to access the fields of a Counter or Timer. The first way is to identify the word and bit(s) using octal addresses. The second way is to use the ".fields" described below. For all of the field references, the item name takes the form "www.field". "www" is the octal address of the Timer or Counter. No spaces are allowed.

Timer Fields

www.AC or .ACC

The Accumulated value - refers to bits 0 through 13 octal of the data table word "www". It is treated as a 3-digit BCD value (0 to 999). An alternate way to refer to this field is "www 3" as described above.

www.EN

The Enable bit - refers to bit 17 of the timer "www". An alternate way to refer to this field is "www/17."

www.DN

The Done bit - refers to bit 15 of the timer "www". An alternate way to refer to this field is "www/15".

www.PR or .PRE

The Preset value - refers to bits 0 through 13 octal of the data table word "www+100". It is treated as a 3-digit BCD value (0 to 999). An alternate way to refer to this field is "xxx 3" where "xxx" is "www+100".

Counter Fields

www.AC or .ACC

Same as for Timers.

www.DN

Same as for Timers.

www.PR or .PRE

Same as for Timers.

www.OV

The Overflow/Underflow bit - refers to bit 14 of the counter "www". An alternate way to refer to this field is "www/14".

www.DE

Enable bit for CTD instructions - refers to bit 16 of the counter "www". An alternate way to refer to this field is "www/16".

www.UE

Enable bit for CTU instructions - refers to bit 17 of the counter "www". An alternate way to refer to this field is "www/17".

Examples:

030.DN	Done bit of counter/timer 030.
030.AC	Accumulated value of counter/timer 030 (implies a 3-digit value).
030.PRE	Preset value of counter/timer 030. Note this reference will access the data table location 130. (.PRE implies +100 octal and it implies a 3-digit BCD value.)
030.PR	Same as 030.PRE.
030.EN	Enable bit of counter/timer 030.
030/17	Same as 030.EN.

PLC-3 Item Naming

The format of item names for data from PLC-3 controllers matches the naming convention used by the programming software. Leading zeros are optional in all parts of the item name. For example, I0/1, I0000/001 and I0000:0000/001 are equivalent names. The general form is shown below. The parts of the name shown in square brackets ([]) are optional.

section [file :] word [/bit]

section

A single letter identifying a section of the data table must be one of the following letters:

Section	Table Title
O	Output Image
I	Input Image
T	Timer
C	Counter
N	Integer
F	Floating-Point
D	Decimal
B	Binary
A	ASCII
H	High-Order-Integer
S	Status

file

Optional file number (0-999 decimal). If absent, file zero is used.

word

Word number within the section or file. For Input and Output sections it must be between 0 and 7777 octal. For all other sections, it must be between 0 and 9999 decimal.

bit

Optional bit number within a word. It is valid for all sections except Floating Point. For the High-Order Integer section, it must be between 0 and 37 octal. For all other sections, it must be between 0 and 17 octal.

Output Section Items

O[n:]rg[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"r" indicates the rack number (0 - 777 octal).

"g" indicates the I/O group (0 - 7 octal).

"b" specifies the bit (0 - 17 octal). "/b" may be omitted to treat the I/O group as a numeric value.

Examples:

O0/0 or O0:0/0
O0:37/17 or O37/17
O3 4BCD (4-digit BCD, for 16-bit 7-segment display.)

Input Section Items

I[n:]rg[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"r" indicates the rack number (0 - 777 octal).

"g" indicates the I/O group (0 - 7 octal).

"b" specifies the bit (0 - 17 octal). "/b" may be omitted to treat the I/O group as a numeric value.

Examples:

I0/0 or I0:0/0
I1:37/17
I3 4BCD (for 16-bit thumbwheel input.)

Timer Section Items

T[f:]e[/b]

"f" identifies the file name of the Timer. If present, it must be CTL, PRE or ACC. If "f:" is omitted, it is assumed to be the CTL word (containing the status bits). CTL may be abbreviated C or CT. PRE may be abbreviated P or PR. ACC may be abbreviated A or AC.

"e" specifies the Timer number. It must be between 0 and 9999 decimal.

"b" specifies an optional bit number. This is normally used with the CTL word, but it may also be used with the ACC or PRE words. The bit number may be an octal number between 0 and 17 or it may be one of the status bit names: TE, TT, or TD.

Examples:

TACC:0 (same as TA:0 and TAC:0)
T3/TD (same as TCTL:3/TD and T3/15)
TPRE:1 (same as TP:1)

Counter Section Items

C[f:]e[/b]

"f" identifies the file name of the counter. If present, it must be CTL, PRE or ACC. If "f:" is omitted, it is assumed to be the CTL word (containing the status bits). CTL may be abbreviated C or CT. PRE may be abbreviated P or PR. ACC may be abbreviated A or AC.

"e" specifies the Counter number. It must be between 0 and 9999 decimal.

"b" specifies an optional bit number. This is normally used with the CTL word, but it may also be used with the ACC or PRE words. The bit number may be an octal number between 0 and 17 or it may be one of the status bit names: CU, CD, DN, OV or UF.

Examples:

CACC:0	(same as CA:0 and CAC:0)
C3/OV	(same as CCTL:3/OV)
CPRE:1	(same as CP:1)

Integer Section Items

N[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the Integer section or file. It must be between 0 and 9999 decimal.

"b" is optional. If specified, it indicates the bit (0-17 octal).

Examples:

N0
N7:0/15
N15:0003

Floating Point Section Items

F[n:]w

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the Floating Point section or file. It must be between 0 and 9999 decimal. In the Floating Point section, each word refers to a 32-bit Floating Point number that occupies two 16-bit words of storage.

Examples:

F0
F17:309

Decimal Section Items

D[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the Decimal section or file. It must be between 0 and 9999 decimal. Each word in the Decimal section contains a number between 0 and 9999.

"b" is optional. If specified, it indicates the bit (0 - 17 octal). When using bit numbers in Decimal items, remember that the Decimal section stores numbers in Binary Coded Decimal (BCD).

Examples:

D3
D10:0/3

Binary Section Items

B[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the Binary section or file. It must be between 0 and 9999 decimal.

"b" is optional. If specified, it indicates bit (0-17 octal).

Examples:

B0/15
B3:6/4
B9999

ASCII Section Items

A[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the ASCII section or file. It must be between 0 and 9999 decimal. Each word in the ASCII section stores two ASCII characters.

"b" is optional. If specified, indicates bit (0-17 octal).

A[n:]x-y

"x" and "y" also specify word numbers. In this form, the item is an ASCII string occupying word "x" through word "y". Each word contains two ASCII characters. The first character is the high order byte and the second is the low order, etc.

Note If reading only one word as a two-character string, the range must be "x-x". For example, A3-3.

Examples:

A3	
A10:0/0	
A0/17	
A0-19	(40-character ASCII string)

High-Order-Integer Section Items

H[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the High-Order-Integer section or file. It must be between 0 and 9999 decimal. In the High-Order-Integer section, each word refers to a 32-bit integer that occupies two 16-bit words of storage.

"b" is optional and is normally not used. If specified, it indicates the bit (0 - 37 octal).

Examples:

H0
H7:0/23
H15:0003
H1/37

Status Section Items

S[n:]w[/b]

"n" indicates an optional file number between 0 and 999 decimal. If absent, file zero is used.

"w" specifies the word number within the Status section or file. It must be between 0 and 9999 decimal.

"b" is optional. If specified, it indicates the bit (0 - 17 octal).

Note Refer to the PLC-3 Family Programmable Controller Manual (Allen-Bradley Publication 1775-6.4.1) for a complete description of Status file information.

Examples:

S1:0	(year)
S1:1	(month)
S0:2/14	(battery low status bit)

PLC-5 Item Naming

The general format of item names for data from 1785 PLC-5 controllers matches the naming convention used by the programming software. The format is shown below. The parts of the name shown in square brackets ([]) are optional.

[$] X [file] : element [.field] [/bit]

$

Purely optional.

X

Identifies the file type. The table below summarizes the valid file types, the default file number for each type and the fields allowed (if any):

X	File Type	Default File #	.Fields
O	Output	0	
I	Input	1	
S	Status	2	
B	Binary	3	
T	Timer	4	.PRE .ACC .EN .TT .DN
C	Counter	5	.PRE .ACC .CU .CD .DN .OV .UN
R	Control	6	.LEN .POS .EN .EU .DN .EM .ER .UL .IN .FD
N	Integer	7	
F	Floating Point	8	
A	ASCII	none	
D	BCD	none	
ST	ASCII String*	none	.LEN
PD	PID*	none	.ADRM .ADRF .ADRE .BIAS .CA .CL .CT .DB .DO .DVDB .DVN .DVNA .DVP .DVPA .EN .ERR .EWD .INI .KD .KI .KP .MAXI .MAXO .MAXS .MINI .MINO .MINS .MO .OLH .OLL .OUT .PE .PV .PVDB .PVH .PVHA .PVL .PVLA .PVT .SO .SP .SPOR .SWM .TIE .UPD
SC	SFC Status*	none	.DN .ER .FS .LS .OV PRE .SA .TIM
BT	Block Transfer* **(Read Only)**	none	.EN .ST .DN .ER .CO .EW .NR .RW .TO .RLEN .DLEN .FILE .ELEM

* Available only on certain PLC-5 models. Check the Processor Manual for the model being used.

file

File number (0-999 decimal). File 0 must be Output, file 1 must be Input and file 2 must be Status.

element

Element number within the file. For Input and Output files it must be between 0 and 777 octal. For all other file types, it must be between 0 and 999 decimal.

.field

Valid only for Counter, Timer, Control, ASCII String, PID, SFC Status, and Block Transfer files. Refer to the previous table.

/bit

Valid for all file types except ASCII String and Floating Point. For Input and Output files it must be between 0 and 17 octal. For all other file types it must be between 0 and 15 decimal.

Output File Items

O[n]:rg[/b]

"n" represents the file number is optional and if specified, must be zero.

"r" indicates the rack number (octal).

"g" indicates the I/O group (octal).

"b" specifies the bit (0 - 17 octal). "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

O0:0/0
$O:37/17
O:3 4BCD (for 16-bit 7-segment display)

Input File Items

I[n]:rg[/b]

"n" represents the file number is optional and, if specified, must be one.

"r" indicates the rack number (octal).

"g" indicates the I/O group (octal).

"b" specifies the bit (0 - 17 octal). "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

I1:0/0
I:37/17
I:3 4BCD (for 16-bit thumbwheel input)

Status File Items

S[n]:e[/b]

"n" represents the file number is optional and, if specified, must be two.

"e" indicates the element number in the file.

"b" is optional. If specified, indicates the bit (0-15 decimal).

Note Refer to the 1785 PLC-5 Family Processor Manual (Allen-Bradley Publication 1785-6.8.2) for a complete description of status file information.

Examples:

$S:18	(year)
$S2:18	(year)
S2:19	(month)
S2:10/0	(battery low status bit)

Binary File Items

B[n]:e/b

or

B[n]/m

"n" represents the file number and is optional. If not specified, it is assumed to be three. If specified, the file number must be between 3 and 999 decimal.

"e" specifies the element (word) number within the Binary file. It must be between 0 and 999 decimal.

"b" specifies the bit number within the word. In the first form (where ":e" is present), the bit number must be between 0 and 15 decimal.

"m" specifies the bit number within the file. However, in the second form, no word number is specified and the bit number may be between 0 and 15999.

Examples:

B3/15999	(same bit as B:999/15)
B:6/4	(same bit as B/100)

Timer File Items

T[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be four. If specified, the file number must be between 4 and 999 decimal.

"e" specifies the element number (three words per element) within the Timer file. It must be between 0 and 999 decimal.

"f" identifies one of the valid Timer fields. The valid fields for Timer Files are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a timer can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words). For Timer files, the bit number must be between 0 and 15 decimal.

Examples:

T4:0.ACC
T4:0.DN
T4:1.PRE

Counter File Items

C[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be five. If specified, the file number must be between 5 and 999 decimal.

"e" specifies the element number (three words per element) within the Counter file. It must be between 0 and 999 decimal.

"f" identifies one of the valid Counter fields. The valid fields for the Counter files are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a counter can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words). For Counter files, the bit number must be between 0 and 15 decimal.

Examples:

C5:0.ACC
C5:3.OV
C5:1.PRE

Control File Items

R[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be six. If specified, the file number must be between 6 and 999 decimal.

"e" specifies the element number (three words per element) within the Control file. It must be between 0 and 999 decimal.

"f" identifies one of the valid Control fields. The valid fields for Control files are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a Control file can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .LEN or .POS fields (which are words). If specified, it indicates the bit (0 - 15 decimal).

Examples:

R6:0.LEN
R6:3.EM
R6:1.POS

Integer File Items

N[n]:e[/b]

"n" represents the file number (optional). If not specified, it is assumed to be seven. If specified, the file number must be between 7 and 999 decimal.

"e" specifies the element number within the Integer file. It must be between 0 and 999 decimal.

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Examples:

N7:0
N7:0/15
N7:3

Floating Point File Items

F[n]:e

"n" represents the file number (optional). If not specified, it is assumed to be eight. If specified, the file number must be between 8 and 999 decimal.

"e" specifies the element number within the Floating Point file. It must be between 0 and 999 decimal.

Examples:

F8:0
F8:3

ASCII File Items

An:e[/b]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number within the ASCII file. It must be between 0 and 999 decimal. Each element in an ASCII file contains two ASCII characters.

"b" is optional. If specified, indicates bit (0-15 decimal).

An:x-y

"x" and "y" also specify element numbers. In this form, the item is an ASCII string occupying element "x" through element "y". Each element contains two ASCII characters. The first character is the high order byte and the second is the low order, etc.

Note If reading only one word as a two-character string, the range must be "x-x." For example, A20:3-3.

Examples:

A20:3
A10:0/0
A9:0-19 (40-character ASCII string)

BCD File Items

Dn:e[/b]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number within the BCD file. It must be between 0 and 999 decimal. Each element in a BCD file contains a number between 0 and 9999.

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Examples:

D20:3
D10:0/3

ASCII String Section Items

STn:e[.f]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number within the String file. It must be between 0 and 999 decimal. Each element in a String file contains an ASCII string with a maximum length of 82 characters.

"f" identifies the following ASCII string field: .LEN. If ".f" is omitted, it is assumed to be the string.

Examples:

ST9:0
ST9:900
ST9:900.LEN

Block Transfer Section Items

BTn:e[.f][/b]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number (three words per element) within the Block Transfer file (0 to 999 decimal).

"f" identifies one of the valid Block Transfer fields. The valid fields for Block Transfer items are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a Block Transfer can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .FILE or .ELEM fields (which are words). For Block Transfer files, the bit number must be between 0 and 15 decimal.

Note Block Transfer files are read only.

Examples:

BT9:0.EN
BT9:3.RLEN
BT9:3.FILE

PID Section Items

PDn:e[.f][/b]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number within the PID file. It must be between 0 and 999 decimal.

"f" identifies one of the valid PID fields. The valid fields for PID files are listed in the table. If PID field .ADDR is needed, use .ADRE for element and .ADRF for file.

"b" is optional and is normally not used. All of the fields of a PID can be accessed by specifying the ".f" fields. If specified, it indicates the bit (0 - 15 decimal).

Warning Access to PID files may degrade the server's performance due to the extreme size of the PID element (82 words each). If accessing only a few PIDs at a time, performance will not be greatly affected. If accessing a few fields of many PIDs at once, it may be faster to move the needed fields to an intermediate file (Floating Point or Binary) and let the server access the intermediate files.

Examples:

PD9:2.SP
PD9:3.OLH
PD9:0.INI

SFC Status Section Items

SCn:e[.f][/b]

"n" represents the file number (NOT optional) and must be between 9 and 999 decimal.

"e" specifies the element number within the SFC Status file. It must be between 0 and 999 decimal.

"f" identifies one of the valid SFC fields. The valid fields for SFC files are listed in the table.

"b" is optional and is normally not used. All of the fields of a SFC can be accessed by specifying the ".f" fields. For SFC Status items, the bit number must be between 0 and 15 decimal.

Examples:

SC9:0
SC9:0.PRE
SC9:0.SA

PLC-5/250 (Pyramid Integrator) Item Naming

The format of item names for data from PLC-5/250 controllers matches the naming convention used by the programming software. The general form is shown below. The parts of the name shown in square brackets ([]) are optional.

[$] [module] section [file] : element [.field] [/bit]

$

Purely optional.

module

PLC-5/250 is comprised of several modules. Use zero to access items in the RM (Resource Manager.) Use 1-4 to access items in specific Logic Processors. Omit the module number when accessing I/O.

section

Identifies the section type. The following table summarizes the supported section types:

Section	Section File	.Fields
B	Binary	
C	Counter	.PRE .ACC .CU .CD .DN .OV .UN
F	Floating Point	
I	Input Image	
L	Long Integer	
MSG	MSG	.AD .AE .CO .DLEN .DN .EN .ER .EW .ST .RLEN .ERR
N	Integer	
O	Output Image	
PD	PID	.ADRM .ADRF .ADRE .BIAS .CA .CL .CT .DB .DO .DVDB .DVN .DVNA .DVP .DVPA .EN .ERR .EWD .INI .KD .KI .KP .MAXI .MAXO .MAXS .MINI .MINO .MINS .MO .OLH .OLL .OUT .PE .PV .PVDB .PVH .PVHA .PVL .PVLA .PVT .SO .SP .SPOR .SWM .TIE .UPD
R	Control	.DN .EM .EN .ER .EU .FD .IN .LEN .POS .UL
S	Status	
ST	String	
T	Timer	.ACC .DN .EN .PRE .TT

file

File number (0-9999 decimal). If omitted, file 0 is assumed.

element

Element number within the file. For Input and Output sections it must be between 0 and 377 octal. For all other sections, it must be between 0 and 9999 decimal.

.field

Valid only for Counter, Timer, Control, MSG and PID sections. See the previous table.

/bit

Valid for all sections except Floating Point and String. For Input and Output sections it must be between 0 and 17 octal. When applied to a Long Integer or a field of a Timer, it may be between 0 and 31 decimal. For all other sections it must be between 0 and 15 decimal.

Binary Section Items

[m]B[n]:e[/b]

or

[m]B[n]:/x

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element (word) number within the Binary file. It must be between 0 and 9999 decimal.

"b" specifies the bit number within the word. The bit number must be between 0 and 15 decimal. If "/b" is omitted, the entire word will be accessed as a 16-bit integer.

"x" specifies the bit number within the file. In this form, the element number must be omitted and the bit number may be between 0 and 159999.

Examples:

1B3:/159999	(same bit as 1B3:9999/15)
0B:6/4	(same bit as 0B:/100)

Counter Section Items

[m]C[n]:e[.f][/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number (three words per element) within the Counter file. It must be between 0 and 9999 decimal.

"f" identifies one of the valid Counter fields. The valid fields for the Counter section are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a Counter can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words). For Counter files, the bit number must be between 0 and 15 decimal.

Examples:

C5:0.ACC
1C9:3.OV
0C:1.PRE

Floating Point Section Items

[m]F[n]:e

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the Floating Point file. It must be between 0 and 9999 decimal.

Examples:

F8:0
2F17:3

Input Section Items

I:rg[/b]

Module numbers and file numbers are not allowed.

"r" indicates the rack number (0 - 37 octal).

"g" indicates the I/O group (0 - 7 octal).

"b" specifies the bit (0 - 17 octal.) "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

I:0/0
I:37/17
I:3 4BCD (for 16-bit thumbwheel input)

Long Integer Section Items

[m]L[n]:e[/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the Long Integer file. It must be between 0 and 9999 decimal.

"b" is optional. If specified, it indicates the bit (0 - 31 decimal).

Examples:

0L:0/31
$L7:0/15
2L15:3

MSG Section Items

[m]MSG[n]:e[.f] [/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the String file. It must be between 0 and 9999 decimal.

"f" identifies one of the valid MSG fields. The valid fields for MSG files are listed in the table.

"b" is optional and is normally not used. All of the fields of a timer can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words). For Timer files, the bit number must be between 0 and 15 decimal.

Important Note Access to MSG files may degrade the server's performance due to the extreme size of the MSG file element (56 words each). If accessing only a few MSG elements at one time, performance will not be affected greatly. However, if accessing a few fields of many MSG file elements at once, it may be faster to move the needed fields to an intermediate file (Binary or Integer) and let the server access the intermediate files.

Examples:

0MSG0:0.EN
1MSG3:900.DLEN

Integer Section Items

[m]N[n]:e[/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the Integer file. It must be between 0 and 9999 decimal.

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Examples:

0N:0
$N7:0/15
2N15:3

Output Section Items

O:rg[/b]

Module numbers and file numbers are not allowed.

"r" indicates the rack number (0 - 37 octal).

"g" indicates the I/O group (0 - 7 octal).

"b" specifies the bit (0 - 17 octal.) "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

O:0/0
$O:37 4BCD (for 16-bit 7-segment display)

PID Section Items

[m]PD[n]:e[.f][/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the PID file. It must be between 0 and 9999 decimal.

"f" identifies one of the valid PID fields. The valid fields for PID files are listed in the table. If PID field .ADDR is needed, use .ADRM for module, .ADRE for element, or .ADRF for file.

"b" is optional and is normally not used. All of the fields of a PID can be accessed by specifying the ".f" fields. If specified, it indicates the bit (0 - 15 decimal).

Warning Access to PID files may degrade the server's performance due to the extreme size of the PID element (82 words each). If accessing only a few PIDs at one time, performance will not be affected greatly. However, if accessing a few fields of many PIDs at once, it may be faster to move the needed fields to an intermediate file (Floating Point or Binary) and let the server access the intermediate files.

Examples:

1PD:0.SP
1PD9:3.OLH
0PD1:0.INI

Control Section Items

[m]R[n]:e[.f][/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number (three words per element) within the Control file. It must be between 0 and 9999 decimal.

"f" identifies one of the valid Control fields. The valid fields for Control files are listed in the table. If ".f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a Control file can be accessed by specifying the ".f" fields. If specified, it indicates the bit (0 - 15 decimal).

Examples:

1R:0.LEN
R9:3.EM
0R:1.POS

Status Section Items

[m]S[n]:e[/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" indicates the element number in the file (0 - 31 decimal).

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Examples:

$0S:20	(seconds)
0S0:16	(month)
0S:22/10	(battery low status bit)

String Section Items

[m]ST[n]:e

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number within the String file. It must be between 0 and 9999 decimal. Each element in a String file contains an ASCII string with a maximum length of 82 characters.

Examples:

0ST0:0
1ST3:900

Timer Section Items

[m]T[n]:e[.f][/b]

"m" indicates the module to access. If not specified, it is assumed to be zero which selects the Resource Manager. If specified, it must be zero or the thumbwheel setting for a Logic Processor.

"n" represents the file number. If not specified, it is assumed to be zero. If specified, the file number must be between 0 and 9999 decimal.

"e" specifies the element number (six words per element) within the Timer file. It must be between 0 and 9999 decimal.

"f" identifies one of the valid Timer fields. The valid fields for Timer files are listed in the table.

"b" is optional and is normally not used. All of the fields of a timer can be accessed by specifying the ".f" fields. For Timer files, the bit number must be between 0 and 31 decimal.

Examples:

T:0.ACC
1T9:3.DN
T:1.PRE

SLC 500 Item Naming

The general format of item names for data from SLC-500 controllers matches the naming convention used by the programming software. The format is shown below. (The parts of the name shown in square brackets ([]) are optional).

[$] X [file] : element [.field] [/bit]

$

Purely optional.

X

Identifies the file type. The table below summarizes the valid file types, the default file number for each type and the .fields allowed (if any):

X	File Type	Default File	.Fields
O	Output*	0	
I	Input*	1	
S	Status	2	
B	Binary	3	
T	Timer	4	.PRE .ACC .EN .TT .DN
C	Counter	5	.PRE .ACC. CU .CD .DN .OV .UN .UA
R	Control	6	.LEN .POS .EN .DN .ER .UL .IN .FD
N	Integer	7	
F	Floating Point*	8	
A	ASCII*	none	
ST	ASCII String*	none	

* Available only on certain SLC500 models. Check the Processor Manual for the model being used.

file

File number must be 0-255 decimal. File 0 must be Output, file 1 must be Input, file 2 must be Status.

element

Element number within the file. For Input and Output files it must be between 0and 30 decimal. All other file types, it must be between 0 and 255 decimal.

.field

Valid only for Counter, Timer and Control files, see table above.

/bit

Valid for all file types except ASCII String and Floating Point. Must be 0-15 decimal.

Output File Items

O[n]:e.s[/b]

"n" represents the file number and is optional. If not specified, it is assumed to be zero.

"e" indicates the element number in the file.

"s" indicates the sub-element number (0 - 255).

"b" specifies the bit (0 - 15 decimal.) "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

O0:0/0
$O:2/15
O:3 4BCD (for 16-bit 7-segment display)

Input File Items

I[n]:e.s[/b]

"n" represents the file number and is optional. If not specified, it is assumed to be one.

"e" indicates the element number in the file.

"s" indicates the sub-element number (0 - 255).

"b" specifies the bit (0 - 15 decimal.) "/b" may be omitted if necessary to treat the I/O group as a numeric value.

Examples:

I1:0/0
I:2/15
I:3 4BCD (for 16-bit thumbwheel input)

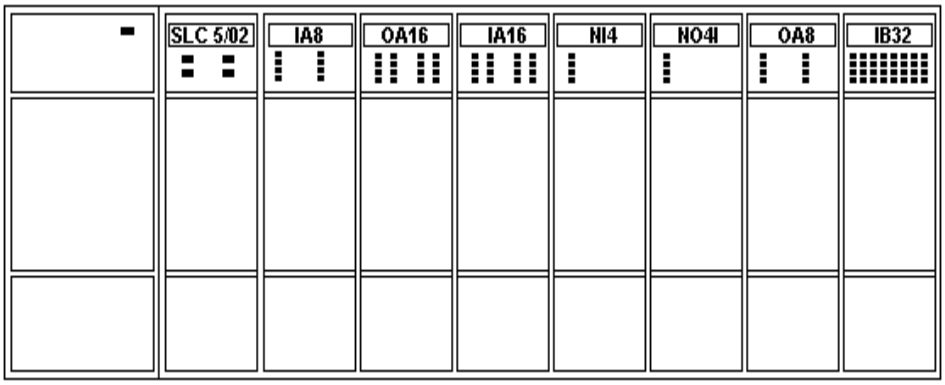
Addressing SLC I/O Modules

The elements (words) in I/O modules are mapped into a memory table. If the Analog I/O modules are being used, then the point naming will differ from the point naming in the programming software. The server item name must be computed from the sum total of words used by the previous input or output blocks. The operator can use the programming software Data Monitor to look at the memory map of the I file or O file to verify your address. If the address is unsure, or if the PLC configuration is likely to change, copy the points in question to the N table or B table and access the data from there.

The naming conventions used in the Allen-Bradley programming software are not supported by the Wonderware Allen-Bradley Serial I/O Server. The addressing convention is similar to that of the PLC 5 family processors. To derive the correct address for each I/O point, use the following.

Diagram system

Addressing of the I/O points begins by drawing a schematic of the system. The figure below is a diagram of the SLC 5/02 system.



The far left unit is the power supply. From left to right, the modules are:

1747-L524	SLC 5/02 Module Processor
1746-IA8	8 point 120VAC input module
1746-OA16	16 Point 120VAC output module
1746-IA16	16 point 120VAC input module
1746-NI4	4 point 20mA analog input module
1746-NO4I	4 point 20mA analog output module
1746-0A8	8 point 120VAC input module
1746-IB32	32 point DC input module

Label I/O modules with "word counts"

The address of any point within the I/O datatable space, in an SLC processor, is the sum of the words occupied by previous modules (to the left in the rack) of the same type. Therefore, to determine the correct address for any particular point in the I/O datatable, one must know the number of words each module will consume. Refer to the list below:

Number of Words	Module	
0	1747-L524	SLC 5/02 Module Processor
1	1746-IA8	8 point 120VAC input module
1	1746-OA16	16 Point 120VAC output module
1	1746-IA16	16 point 120VAC input module
4	1746-NI4	4 point 20mA analog input module
4	1746-NO4I	4 point 20mA analog output module
1	1746-0A8	8 point 120VAC input module
2	1746-IB32	32 point DC input module

Note In the table above, the minimum amount of words which can be consumed by a module is 1 (16-bits). This is due to the memory scheme of all Allen-Bradley processors.

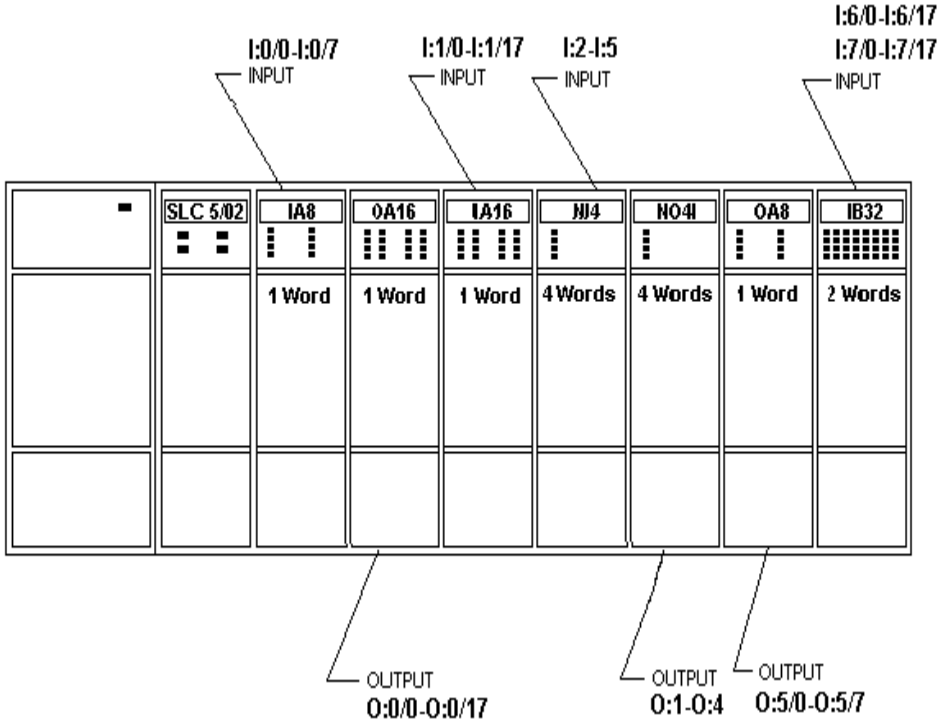
Sequentially number the Input modules

In the I/O diagram below, the first input module's addressing should start with "I:0". Previously noted, this module consumes one datatable word. Therefore, the addressing of the next INPUT module encounter, moving from left to right, will begin with "I:1", regardless of the module's physical location.

Sequentially number the Output modules

In the I/O diagram below, the first output card encountered is the OA16. Although it is not in the first slot, its address will be "O:0" ('OHH, colon ZERO"). This module consumes one datatable word. Therefore, the addressing of the next OUTPUT module; moving from left to right, will begin with "O:1", regardless of the module's physical location.

I/O Diagram



Status File Items

S[n]:e[/b]

"n" represents the file number and is optional. If not specified, it is assumed to be two.

"e" indicates the element number in the file

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Note Refer to the SLC-500 Family Processor Manual (Allen-Bradley Publication) for a complete description of Status file information.

Examples:

S2:6	(major error fault)
S2:13	(math register)
S:1/5	(forces enabled)

Binary File Items

B[n]:e/b

or

B[n]/m

"n" represents the file number and is optional. If not specified, it is assumed to be three. If specified, the file number must be between 3 and 255 decimal.

"e" specifies the element (word) number within the Binary file. It must be between 0 and 255 decimal.

"b" specifies the bit number within the word. In the first form (where ":e" is present,) the bit number must be between 0 and 15 decimal.

"m" also represents the bit number. However, in the second form, no word number is specified and the bit number may be between 0 and 4095.

Examples:

B3/4095	(same bit as B:255/15)
B:6/4	(same bit as B/100)
B3	

Timer File Items

T[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be four. If specified, the file number must be between 4 and 255 decimal.

"e" specifies the element number (three words per element) within the Timer file. It must be between 0 and 255 decimal.

"f" identifies one of the valid Timer fields. The valid fields for Timer Files are listed in the table. If "f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a timer can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words).

Examples:

T4:0.ACC
T4:3.DN
T4:1.PRE

Counter File Items

C[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be five. If specified, the file number must be between 5 and 255 decimal.

"e" specifies the element number (three words per element) within the Counter file. It must be between 0 and 255 decimal.

"f" identifies one of the valid Counter fields. The valid fields for the Counter Files are listed in the table. If "f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a counter can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .PRE or .ACC fields (which are words).

Examples:

C5:0.ACC
C5:3.OV
C5:1.PRE

Control File Items

R[n]:e[.f][/b]

"n" represents the file number and is optional. If not specified, it is assumed to be six. If specified, the file number must be between 6 and 255 decimal.

"e" specifies the element number (three words per element) within the Control file. It must be between 0 and 255 decimal.

"f" identifies one of the valid Control fields. The valid fields for the Control files are listed in the table. If "f" is omitted, it is assumed to be the word containing the status bits.

"b" is optional and is normally not used. All of the fields of a Control file can be accessed by specifying the ".f" fields. However, it is possible to use "/b" to single out a bit in the .LEN or .POS fields (which are words).

Examples:

R6:0.LEN
R6:3.EN
R6:1.POS

Integer File Items

N[n]:e[/b]

"n" represents the file number and is optional. If not specified, it is assumed to be seven. If specified, the file number must be between 7 and 255 decimal.

"e" specifies the element number within the Integer file. It must be between 0 and 255 decimal.

"b" is optional. If specified, it indicates the bit (0 - 15 decimal).

Examples:

N7:0
N7:0/15
N7:3

Floating Point File Items

F[n]:e

"n" represents the file number and is optional. If not specified, it is assumed to be eight. If specified, the file number must be between 8 and 255 decimal.

"e" specifies the element number within the Floating Point file. It must be between 0 and 255 decimal.

Examples:

F8:0
F8:3

ASCII File Items

An:e[/b]

"n" represents the file number (NOT optional).

"e" specifies the element number within the ASCII file. It must be between 0 and 255 decimal. Each element in an ASCII file contains two ASCII characters.

"b" is optional. If specified, indicates bit (0-15 decimal).

Examples:

A20:3
A10:0/0

ASCII String Section Items

STn:e

"n" represents the file number (NOT optional).

"e" specifies the element number within the String file. It must be between 0 and 255 decimal. Each element in a String file contains an ASCII string with a maximum length of 78 characters.

Examples:

ST9:0
ST9:900

Monitoring the Status of Communications with a PLC

For each topic name (PLC), there is a built-in discrete item that can be used to monitor the status of communications with the PLC. The discrete item, **Status,** is set to **0** when communication with the PLC fails and is set to **1** when communication is successful.

Using the Status Item in Excel

The status of the PLC communications can be read into Excel by entering the following DDE reference formula in a cell on a spreadsheet:

=ABKF2|ABPLC!Status

where:

ABKF2	Is the name of the server application.
ABPLC	Is the exact topic name defined in the server for the PLC.
Status	Built-in discrete item used to monitor the status of communications with the PLC.

Monitoring the Status of Communications with InTouch

InTouch supports built-in topic names called DDEStatus and IOStatus that are used to monitor the status of communications between the server and InTouch. For more information on the built-in topic names DDEStatus and IOStatus, see your online "InTouch User's Guide".

Using DDEStatus and IOStatus in Excel

The status of communication between the server and InTouch can be read into Excel by entering the following DDE reference formula in a cell on a spreadsheet:

=view|DDEStatus!ABPLC

or

=view|IOStatus!ABPLC

where:

view	Is the name of the InTouch application.
[DDE][IO]Status	Built-in topic name used to monitor the status of communications between the server and InTouch.
ABPLC	The exact topic name defined in the server for the PLC.

Reading Values from the I/O Server into Excel

Values may be read directly into Excel spreadsheets from the server by entering a DDE formula into a cell using the following format:

=appliationname|topicname!itemname

Example formula:

=ABKF2|ABPLC!N7:0

where:

ABKF2	Is the name of the server application.
ABPLC	Is the exact topic name defined in the server for the PLC.
N7:0	Is the actual location in the PLC that contains the data value. This is the item name.

In this example, each time the value of **N7:0** changes in the PLC, the server will automatically send the new value to the cell containing the formula in Excel.

Note Refer to the Microsoft Excel manual for complete details on entering Remote Reference formulas for cells.

Writing Values to the I/O Server from Excel

Values may be written to the server from Microsoft Excel by creating an Excel macro that uses the **POKE** command. The proper command is entered in Excel as follows:

channel=INITIATE("applicationname","topicname")

=POKE(channel,"itemname",Data_Reference)

=TERMINATE(channel)

=RETURN()

The following describes each of the above **POKE** macro statements:

channel=INITIATE("applicationname","topicname")

Opens a channel to a specific topic name (defined in the server) in a particular application name (the executable name less the .EXE) and assigns the number of that opened channel to **channel.**

Note By using the **channel=INITIATE** statement the word **channel** must be used in the **=POKE** statement instead of the actual cell reference. The **"applicationname"** and **"topicname"** portions of the formula must be enclosed in quotation marks.

=POKE(channel,"itemname",Data_Reference)

POKEs the value contained in the **Data_Reference** to the specified item name (actual location in the PLC) via the **channel** number returned by the previously executed **INITIATE** function. **Data_Reference** is the row/column ID of the cell containing the data value.

=TERMINATE(channel)

Closes the channel at the end of the macro. Some applications have a limited number of channels therefore, they should be closed when finished. **Channel** is the channel number returned by the previously executed **INITIATE** function.

=RETURN()

Marks the end of the macro.

Note Refer to the **.XLM** sample Excel poke macro provided on the server program disk. Also refer to the Microsoft Excel manual for complete details on entering Remote Reference formulas for cells.

Troubleshooting I/O Server Communication Problems

This section provides you with some simple steps that can be taken to ascertain and correct communication problems. The problems described here represent the most probable causes of communication failure.

Note This is a general troubleshooting guide and for the sake of brevity we cannot cover every possible source of communication problems.

Debugging Communication Between InTouch and an I/O Server

This section explains the most common error situations that can occur when attempting to establish communication between InTouch and a server.

Servers are Window applications that communicate with I/O, PLCs, and/or other data sources. If a server supports either the Microsoft Dynamic Data Exchange (DDE) or the Wonderware SuiteLink protocol, it is capable of communicating with the Wonderware InTouch program.

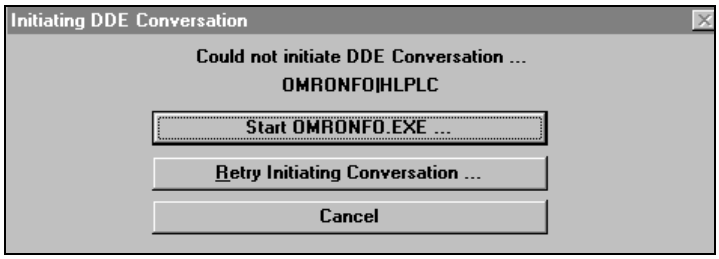
Note All Wonderware version 7.0 or later servers support both DDE and SuiteLink. However, the SuiteLink protocol is only supported on the Windows NT (version 4.0 or later) operating system.

Servers respond to data requests made by other applications. Requesting applications are called clients. When WindowViewer acts as a client and requires the value of an item, it contacts the server and requests the item's value. The server will report the value and update WindowViewer only if a change occurs. All WindowViewer data requests provide information relating an item to a register, coil number, or I/O data point understood by the server. The server uses the information to automatically handle all messages to and from I/O, hardware devices (PLC), and/or other data sources.

Note We highly recommend starting all the servers required by the InTouch application before starting WindowViewer. InTouch (versions prior to 7.0) will display the **Initiating DDE Conversation** message box for each uninitiated conversation.

For example:

If you start up WindowViewer and cannot successfully establish a conversation with a server, the following Initiating DDE Conversation dialog box will appear:



The information in the second line indicates that you have at least one I/O type tagname defined in your Tagname Dictionary that is associated with an Access Name that defines OMRONFO as the Application Name, and HLPLC as the Topic Name. Make note of exactly how the application and topic names are spelled.

- This example only applies when using a version of InTouch prior to InTouch 7.0.

To troubleshoot communication problems between WindowViewer and the server, perform the following steps as listed below.

- **Verify the I/O Server is running.**

  1. Start the server program.
  2. Verify the server is running by checking to see if it is in the Windows Task List.

     On Windows NT, click the right mouse button on the Windows taskbar and select Task Manager from the menu. Click the Applications tab to view all currently running applications. Or press the CTRL+SHIFT+ESC keys.

     On Windows 95, press the ALT+TAB keys while holding down the ALT key.

     On Windows 3.1 or Windows for Workgroups, press the CTRL+ESC keys.

- **If the I/O Server is running, verify the I/O Server's program name is correct in all WindowMaker Access Name definitions.**

  1. Switch to (or start) WindowMaker. Select Access Names from the Special Menu, the Access Name Definitions dialog box appears listing all Access Names defined in the WindowMaker.
  2. In the Access Names list, select the Access Name referencing the server and click Modify. The Modify Access Name dialog box will appear.
  3. Verify the server's program name in the Application Name box is correct. If it is wrong then correct it and click OK , else click Cancel.
     - The server's exact "executable name" must be typed in the Application Name box in all Access Name definitions. The "**.**exe" extension is not used.
     - If you are debugging a remote tagname reference, also verify that the node name for the remote computer in the Node Name box is correct.
  4. Repeat steps 2 & 3 and verify the server program name is correct in all Access Names that use it.

- **If you still cannot establish a conversation, verify the exact topic name used in the WindowMaker Access Name definitions are defined in the I/O Server program.**

  1. Close WindowViewer if it is running. The server cannot be configured if WindowViewer is running.
  2. Start the server program.
  3. From the server's Configure menu select Topic Definition. The Topic Definition dialog box appears listing all topic names defined in the server.
  4. Verify that the topic name exists and is spelled exactly the same (including spaces) as the topic name referenced in the WindowMaker Access Name definition.

- Blank spaces cannot follow the topic name in either the server's Topic Definition or the Access Name definition.

5. If the topic name is different, either correct it in the server or switch to WindowMaker and correct it in the Access Name definition.
6. Once you performed the above procedure, restart WindowViewer and switch to the server program. Data should now appear in the server's program window to indicate that WindowViewer and the server are communicating.
   - The data in the server's program window indicates the read and write messages the server is sending to and receiving from the PLC. These are not error messages; only status messages are written to the server's program window.
7. If no data appears in the server's program window, switch to the Wonderware Logger to check for error messages. For example, a common error message is:

   "Error for DDE: OMRONFO|HLPLC!<null>("item") Advise failed"

   This message appears when the item defined in one or more tagnames is invalid for the server.
   - InTouch tagnames use specific naming conventions when accessing data from a server. The valid item names for all Wonderware servers are documented in their respective user's guides. Typically, the item naming conventions used by each server are consistent with the names used by the equipment manufacturer.
   - For more information on the Wonderware Logger, see your online "FactorySuite System Administrator's Guide."

➢ **If you are still experiencing problems, continue with the following troubleshooting section.**

Debugging Communication Between SuiteLink and an I/O Server

If you have successfully applied the debug techniques listed in the previous section and are still experiencing communication problems to a server that is attempting to communicate using the SuiteLink protocol, perform the following steps as listed below:

➢ **Verify the I/O Server supports the Wonderware SuiteLink protocol, that is, the I/O Server is version 7.0 or above.**

➢ **Try communicating to the I/O Server using the DDE protocol. If this is not possible, then proceed to the next troubleshooting section otherwise continue with the following steps:**

1. Verify Microsoft's TCP/IP stack is installed and configured properly.
   - SuiteLink uses the Microsoft TCP/IP stack for its communications even if the client application and the server reside on the same node.
2. If you do not have an Ethernet card to bind to the TCP/IP stack, install the Microsoft Loop Back Adapter.
3. Install the Microsoft TCP/IP stack.

Debugging Communication Between an I/O Server and a PLC

This section provides you with simple steps to diagnose and correct server to PLC communication problems. The debug techniques listed below address both serial and board servers. Disregard any information that is not applicable to the server type that you are using.

When attempting to establish communication between a server and a PLC, if no data appears in the server's program window and the data items are not updating in WindowViewer, switch to the Wonderware Logger and check for error messages.

For more information on the Wonderware Logger, see your online "FactorySuite System Administrator's Guide."

For example, some of the most common errors that may appear in the Wonderware Logger for serial servers are:

Response Timeout
WCRET = -2
WakeUp = -2
Receive Overrun
Framing Errors

Note Unless specified otherwise, most serial communication based servers are full duplex. If you require a server for half duplex (one that monitors the CTS and RTS lines) or if you are not sure whether the PLC's protocol is full or half duplex, call your PLC supplier.

Also, during in-house server testing, we have found that the communication cards that use the National 16450 and 16550 UARTs seem to be less susceptible to level and timing problems. Cards based on other chips may work, but we recommend using the National cards. Some of the highly integrated UART chips (most notably, Winbond and UMC) have a tendency for their transmitters to hang, requiring re-initialization of the UART. If this occurs, you may have to restart the server or execute the Reinitialize I/O command from the Special menu in WindowViewer.

- **Check your cabling to the PLC.**

  Is it wired correctly? Check for shorts, loose wires, broken wires, crossed wires, and so on.

  A continuity tester can be helpful here.

- **Verify the I/O Server's serial configuration settings (Parity, Stop Bits, Baud Rate, Handshaking and so on) against the settings in the hardware device.**

- **Verify the communication port is working properly in Windows.**

  1. Close the server program.

     If you are using a server that requires a TSR, you will not be able to verify that the port is functioning properly while the TSR is running. Stop all TSRs then continue with this procedure. If you confirm that the port functions properly without the TSR running, change your software interrupt (IRQ) to another number, for example, change 60 to 62.

- Also, if you are using an AT type computer, two devices cannot share interrupts. Verify that the communication port you are using has a unique interrupt setting.

2. On Windows 3.1 or Windows for Workgroups, start the Terminal program. On Windows 95 or Windows NT, start the HyperTerminal program.
3. Configure the Terminal (or HyperTerminal) program to use the same communication port with the same settings (baud rate, parity, stop bits and so on) as the hardware device.
4. Connect a null modem cable to a second computer's port.
5. On the second computer, start and configure the Terminal (or HyperTerminal) program with the same settings as the first computer.
6. Verify that you can send data between the two computers.
   - If you do not have two computers and the computer you are using has another port, start two instances of the Terminal (or HyperTerminal) program with each configured to their own port. Then try communicating between them.
   - If you have an external modem, connect the modem to the communication port that you are testing to see if you can dial out.
7. If the communication port does not appear to be functioning properly, check your environment files (**AUTOEXE.BAT**, **CONFIG.SYS**, **SYSTEM.INI**, and **WIN.INI**). Look for suspicious programs or drivers that might be taking control of the port or its interrupt before the server is loaded. Always keep your environment files as clean as possible. If you are in doubt about an entry, comment it out.
8. If the previous step was unsuccessful, try another communication port or another computer.

Note A common misconception of connecting to a PLC with a DOS program and the same communication port will work in Windows is not the case! Windows is an entirely different environment than DOS.

➢ **What type of UART is on the COM port?**

If it's not a 16550, then you must lower your baud rate to 9600 or slower. Only the 16550 UART can sustain continuous, error free communications at speeds higher than 9600 baud. Other UARTs may work at speeds faster than 9600 baud, but errors may be written to the Wonderware Logger. For example, "Receive Overruns." To determine which UART you have, enter MSD at a DOS prompt, then choose COM Ports from the MSD menu.

➢ **If you are running Windows for Workgroups, verify the following:**

1. Add these lines to the [386Enh] section of your **SYSTEM.INI** file which is located in your \Windows directory:

   EMMEXCLUDE=A000-EFFF
   COMxFIFO=0

   where x specifies the COM port number. You need to add a separate COMxFIFO line for each serial port using a 16550 UART chip.

2. If you are running Windows for Workgroups (version 3.1 or later), download SERIAL.386 (this fixes a Microsoft bug) from the Wonderware Bulletin Board system (949-727-0726) or from the Wonderware WEB site at: http://wondertech.wonderware.com.

   - The size of this file is 10620 bytes, has a date of 2/17/94, and is a self-extracting zip file called wg1001.exe. It's located in the "PatchFix Library" on the Wonderware BBS in the File Transfers / Patchfix area.
   - You must be registered to access the Wonderware Web site.

3. If the above numbers, 1. and 2., do not work, verify the value of the ComBoostTime parameter in your **SYSTEM.INI** file. This parameter represents the number of milliseconds a virtual machine processes a COM interrupt. (The default value is 2.) It is not recommended that you change this setting. However, if you are receiving errors such as "Receive Overruns" or "WCRE=-2", try increasing the value to 20.

- **Verify the parameters for WWCOMTSR.**

  Do not specify a receive and/or transmit buffer size of 8!

  For example:

  Correct:
  COM1:0 COM2:1,2048,2048
  COM1:0 COM2:1

  Incorrect:
  COM1:0 COM2:1,8,8

- **Does your computer crash when trying to communicate through the COM port?**

  If so, verify that each TSR has a unique software interrupt.

  - A utility, ShowSoft, is available on the Knowledge Base CD that can assist in determining the available software interrupts.

- **Does your computer lock up?**

  Verify the COM port's IRQ's do not conflict with each other or with other communication boards in the computer.

- **If the PLC or field device has more than one COM port, verify the connection to the correct port.**

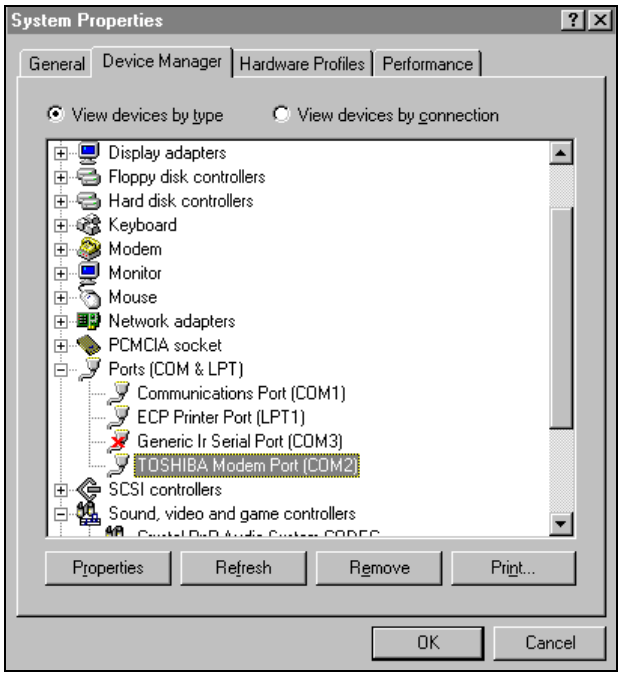
  The COM port on your computer uses the RS-232 hardware communication standard and connects the cable from the COM port to an RS-232 compliant device.

  Note To connect to an RS-422 or RS-485 port on the PLC, you need an RS-232 to RS-422/485 conversion device.

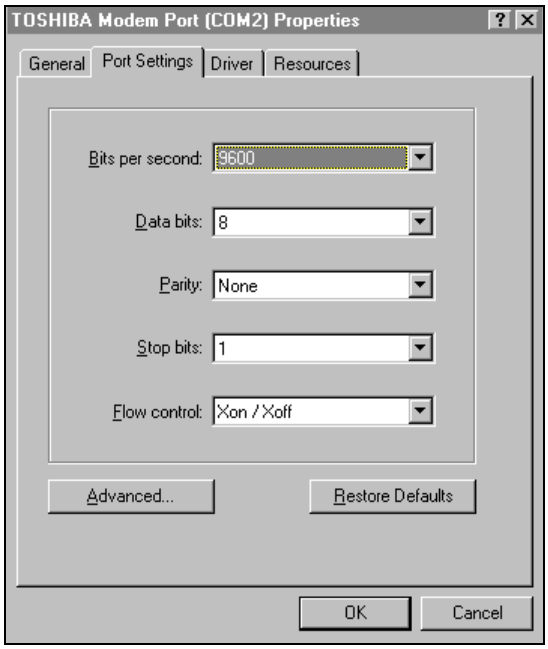
  If possible, use an external converter instead of a board-based converter that plugs into a slot in the computer. A board-based converter is difficult to get working for inexperienced users. If a board-based converter is not set up properly, it can conflict with other communication boards in the computer such as, internal modems.

➢ **If you are using the Windows 95 operating system, verify the following:**

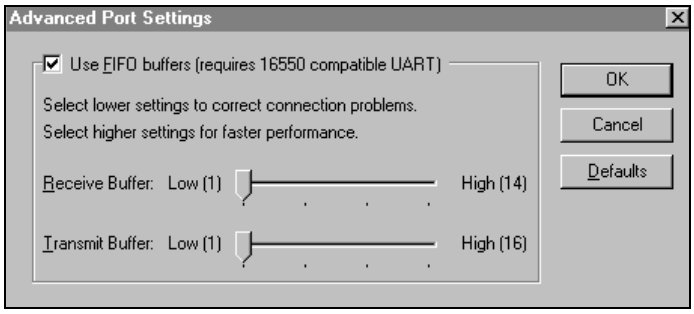
1. Click Start on the Windows taskbar. Point to Settings, then click Control Panel in the menu. The Control Panel dialog box will appear.
2. Double-click the System icon. The System Properties dialog box will appear. Click the Device Manager tab and select the COM port that you are using for the server. For example:



3. Click Properties. The Properties dialog box will appear. Click the Port Settings tab.



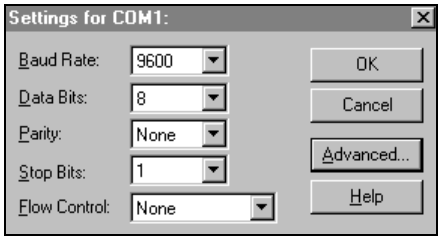
4. Click Advanced. The Advanced Port Settings dialog box appears:



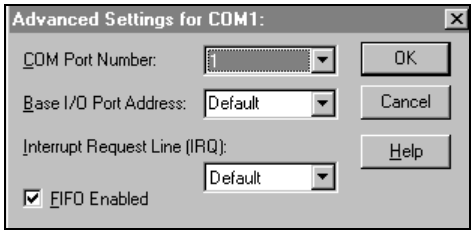
5. Lowering the default Receive Buffer and Transmit Buffer settings to their minimum may solve I/O communication problems for portable computers (notebook or laptops) and framing errors for standard computers.
6. If using a 16550 UART chip, select the Use FIFO buffers (requires 16550 compatible UART) option. If you are not using a UART chip, make sure this option is not selected.

➢ **If you are using the Windows NT operating system, verify the following:**

1. Click Start on the Windows taskbar. Point to Settings, then click Control Panel in the menu. The Control Panel dialog box will appear.
2. Double-click the Ports icon, the Ports dialog box will appear.
3. Select a port and click the Settings button. The Settings for COMx dialog box appears:



4. Click Advanced. The Advanced Settings for COMx dialog box appears:



5. Lowering the setting for the Interrupt Request Line (IRQ) value to the minimum may solve I/O communication problems for portable computers (notebook or laptops) and framing errors for standard computers.
6. If you are using a 16550 UART chip, select the FIFO Enabled option. If you are not using a UART chip, make sure this option is not selected.

➢ **How long is your RS-232 cable?**

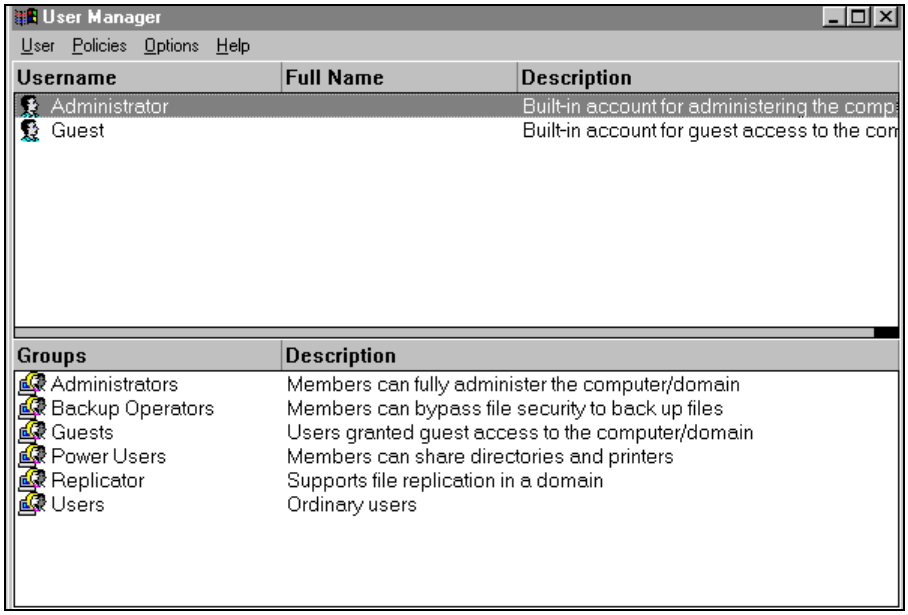
Fifty feet is the maximum practical length for the RS-232 standard.

➢ **Try using a different COM port for the I/O Server.**

➢ **If you are installing an I/O Server or configuring a board-based I/O Server on a computer running on the Windows NT operating system, log on with Administrator privileges.**

Without Administrator privileges, the server and Server Install program cannot make the necessary edits to the Windows NT Registry during installation or board configuration of the server.

1. Click Start on the Windows taskbar. Point to Programs, then to Administrative Tools (Common), and click User Manager in the menu. The User Manager dialog box will appear:



2. Double-click the Username you typed in during log on.
3. If the User Properties dialog box does not appear, you do not have Administrator privileges.
4. If the User Properties dialog box does appear, click on the Groups button and verify "Administrators" is in the "Member of" list.

➢ **If you experience occasional or random communication errors in the Wonderware Logger, such as "Response Timeouts," check for noise.**

Do the physical cables run past any known noise sources such as photocopiers, fluorescent lamps, fans, pumps, motors or generators? Are the cables properly shielded from its environment? With radio modems and satellite link ups, occasional communications errors in the Wonderware Logger are normal and to be expected as long as they do not adversely impact the flow of data.

➢ **Increase the Reply Timeout setting in the I/O Server to a value between 5 and 10 seconds.**

Not allowing the PLC or field device enough time to respond to the server's request for data may result in communication errors.erify the PLC is configured properly and the cable is good by using the programming software for the PLC.

Run the programming software and communicate with the server at the same time when testing.

- Performance of this test depends upon the type of PLC you are using.

- **Reinstall the I/O Server and verify that you are using the latest version.**

  Wonderware is continually improving our servers and using the latest version will guarantee the best results.

  - New versions of the Wonderware I/O Servers are released regularly on the Knowledge Base CD. These are available to Comprehensive Support customers on the Wonderware Bulletin Board System (949-727-0726) or from the Wonderware WEB site at: http://wondertech.wonderware.com.

- **Move the I/O Server's configuration file to another location on the computer's hard drive. This will clear all configuration for the I/O Server, then reconfigure the I/O Server.**

  - Wonderware server configuration files are typically the exact same name as the server's executable name with the .CFG extension. For example, **OMRONFO.CFG**. Refer to the Configuration File section of the specific server user's guide for the exact name of the configuration file.

- **If possible, reinstall the Windows operating system.**

  Files installed earlier on your computer or the NT registry may have been corrupted or accidentally modified.

- **If these troubleshooting suggestions do not solve your problem, there may be a problem with your computer. There are many subtle differences between the various computer hardware brands. Using a computer that is a different brand and meets the following criteria:**

  1. Select a different PC manufacturer and if this is not possible, try a different PC model from the same manufacturer.
  2. The computer can not use an OEM (Original Equipment Manufacturer) version of Microsoft Windows. We highly recommend using only a Microsoft Windows product. Contact your vendor to determine if installing an off-the-shelf copy of Microsoft Windows will cause any problems.

- **If you feel you have tested all possible situations that may be causing your failed I/O communications, contact your local Wonderware distributor for technical support.**

  - For more information on obtaining technical support, see your online *FactorySuite System Administrator's Guide*.