

# Wonderware<sup>®</sup> OMRON<sup>®</sup> FinsGateway I/O Server

## **User's Guide**

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**Wonderware Corporation**

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Wonderware OMRON FinsGateway I/O Server User's Guide

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# Wonderware OMRON FinsGateway I/O Server



## Introduction

The Wonderware® OMRON® FinsGateway I/O Server (also referred to as the server through the remainder of this user's guide) is a Microsoft® Windows NT® application program that acts as a FINS message communication protocol server. The server uses the OMRON FinsGateway software package. It allows other Windows application programs to access data from OMRON PLCs over the following OMRON FA (Factory Automation) networks:

- SYSMAC LINK
- Controller Link
- Ethernet
- Serial
- SYSMAC Board

The server can access data simultaneously from different OMRON FA networks. Some of the networks support both local and remote (using routes) data access.

The server can also access data using the Data Link function available on some networks. A network using the SYSMAC Board, for example C200PC-ISA02-DRM-E, supports the Data Link function if installed on the host computer. For additional network information, refer to the *Getting Started* section later in this user's guide.

Supported devices for network data access is network-specific and includes the following:

- C200HX/C200HG/C200HE Series PLCs
- C-Series PLCs
- CS1-Series PLCs
- CV-Series PLCs

The server supports PLC data and memory areas accessible by any FINS command. To run the server, OMRON's FinsGateway software (included with the server) must be installed on the same system.

While the server is primarily intended for use with Wonderware's 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 OMRON controllers via this server, the application portion of the address is **FINSGTWY**.

*topic name* Meaningful names are configured in the server to identify specific devices (also referred as PLCs through the remainder of this user's guide). These names are used as the topic name in all conversations to that device, for example **Node2**.

---

**Note:** You can define multiple topic names for the same device (PLC) to poll different points at different rates and/or through different OMRON FA networks.

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*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.

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

## Getting Started

This section contains some instructions to startup the networks, hardware, and software necessary to run the server. It does not give sufficient information for each OMRON FA (factory automation) network. Refer to the corresponding network user's guides or manuals for additional information.

This is the generic procedure for server access to PLC data using a particular network:

1. Install the hardware (PLCs, Communication cards, network cables, etc.)
2. Set routing tables (and/or IP address tables) in the PLCs
3. Ensure OMRON FinsGateway embedded edition software (version 2.xx) is installed on the same computer that will run the server
4. Configure OMRON FinsGateway software to access the FA network
5. Start the OMRON FinsGateway CPU\_UNIT service and the network FA service
6. Test the nodes using the FINS Network Tester
7. Start the server, create topics for each PLC, and access data by Item Name

## Required Hardware and Software

OMRON FinsGateway embedded edition software (NT version) must be installed on the same computer as the server.

Any required communication cards should be installed using its corresponding *OMRON Operational Manual*. The corresponding FinsGateway FA network service should be started and configured using the FinsGateway utilities. See the *FinsGateway Runtime User's Manual* for more information.

# SYSMAC LINK

A SYSMAC LINK Support Board must be installed for the computer to communicate with OMRON PLCs over the SYSMAC LINK network. FinsGateway Software must be installed, CPU\_UNIT and SYSMAC LINK Unit FinsGateway services must be started, and the SYSMAC LINK Unit service must be configured. Each connected OMRON PLC with a SYSMAC LINK Communication Unit installed must be configured to function as a node in the SYSMAC LINK network. To configure, use OMRON's SYSMAC LINK Support Software, SYSWIN, (CV-Series PLCs only) or CX-Programmer, version 1.1 or later. If the PLC is a CS1-Series, CX-Programmer version 1.0 may be used.

To prepare the SYSMAC LINK network for data access by the server:

- Install the hardware for SYSMAC LINK communication.
- Configure the PLC(s). Set network numbers into the Routing Table.
- Install FinsGateway on the PC.
- Configure FinsGateway to access the SYSMAC LINK network. Start the server to configure the server Topic(s).

## OMRON PLCs Used on SYSMAC LINK Network

The C200HX/C200HG/C200HE Series, C-Series, CS1-Series, and CV-Series PLCs can be used as nodes on a SYSMAC LINK network. The PLCs must be supplied with SYSMAC LINK Communication Unit such as C200HX/C200HG/C200HE SLK23. Node numbers between 1 and 62 can be set on the rotary switch.

## Installing OMRON SYSMAC LINK Support Board

These settings must be made on SYSMAC LINK Support Board:

1. Set the Memory Area address to a value that does not overlap another resource currently used by the computer, for example D0000.
2. Set the Interrupt Level, for example IRQ10. This interrupt can not be used by another resource on the computer.
3. To install a SYSMAC LINK Support Board, see OMRON's *SYSMAC LINK Support Board Operation Manual* for details.

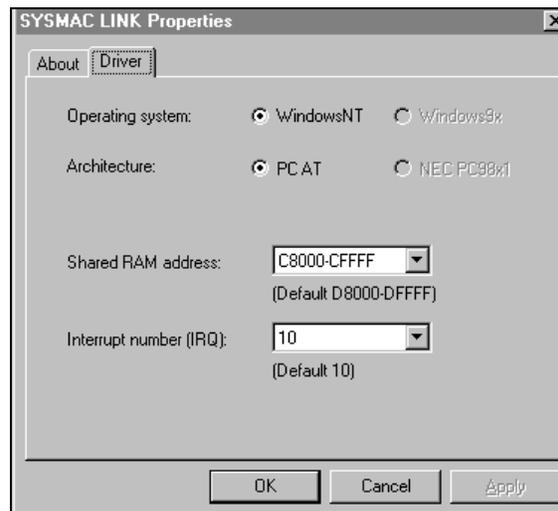
## SYSMAC LINK Unit Configuration

Configuring the SYSMAC LINK unit to allow the PLC to function as a node in the SYSMAC LINK network, use the *SYSMAC LINK System Manual*. The network number of your choice must be configured in the PLC Routing Table.

**Note:** The OMRON CX-Programmer utility version 1.1 or later can be used to configure Routing Tables. For a description of a Routing Table setup procedure, see "Appendix B" later in this user's guide.

## Configuring FinsGateway for a SYSMAC LINK Network

In the SLK Driver Config utility, select the **Driver** option. The following dialog will appear:

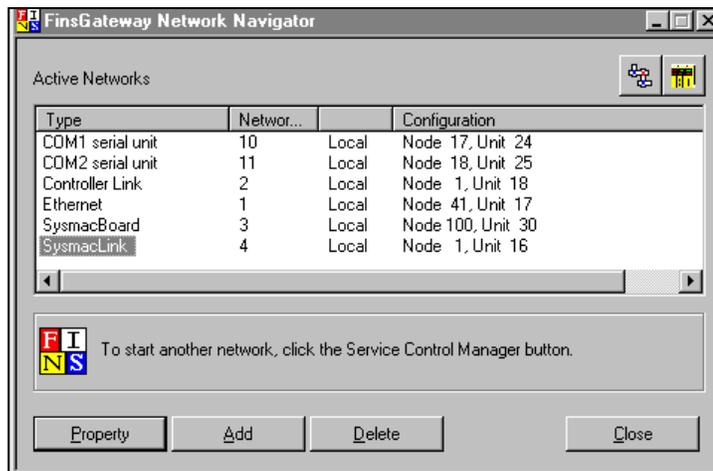


**Note:** The Memory Area and Interrupt Level must match the corresponding values set in the board using the switches and jumpers.

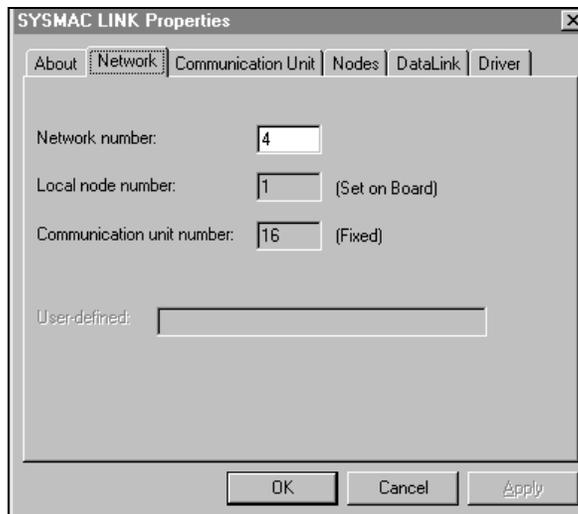
Enter the Shared RAM address and Interrupt Number that match the installed board.

Using the FinsGateway Service Control Manager or the Control Panel/Services, start the CPU\_UNIT and SYSMAC LINK Unit services.

Start the FinsGateway Network Navigator. Select the **SYSMAC LINK** active network and the following dialog will appear:

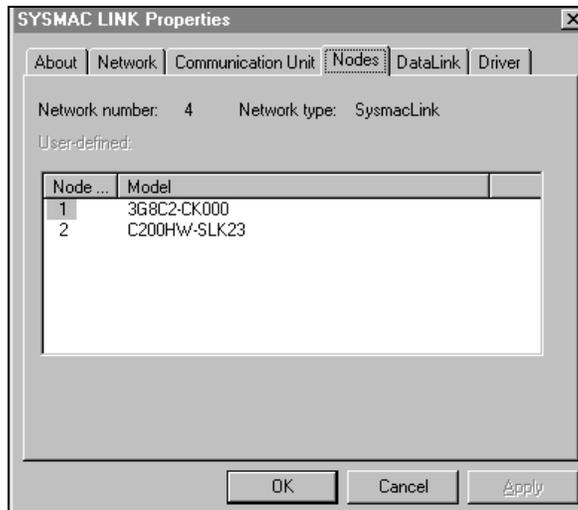


Select **Property**, then the **Network** tab to display the following dialog:



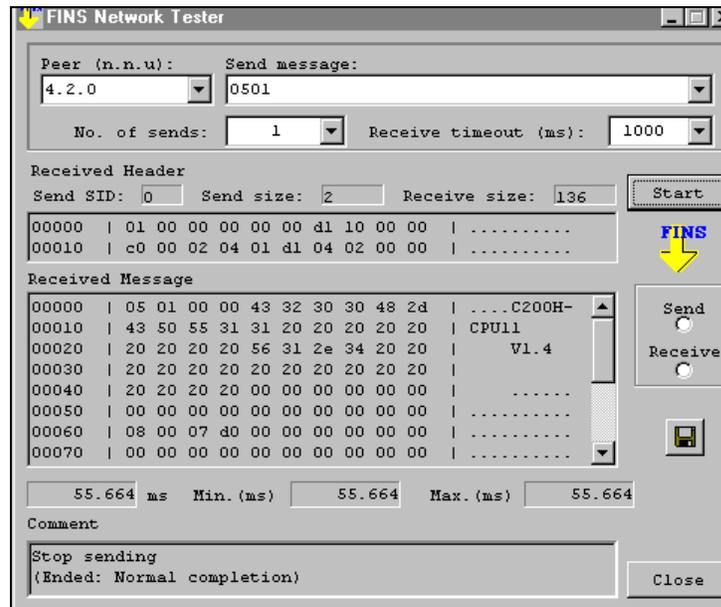
Enter a **Network number** (0 to 127) for this SYSMAC LINK Network. Zero may only be assigned if the computer is installed in a single network. Normally there is no reason to change Local node number or Communication unit number assigned by FinsGateway.

Select the **Nodes** tab to display the SYSMAC LINK nodes on the selected network number. The following dialog will appear:



## Testing the SYSMAC LINK Network

Use the FINS Network Tester utility to test the network. The dialog below shows a test example:



This test is for Peer 4.2.0 (Network number 4, Node 2, Unit 0). The Network number and Node number are from this sections example procedures for configuring FinsGateway access to a SYSMAC LINK Network.

Receiving any message proves an Active Node exists at the Peer. This Received Message (shown in the above dialog) identified the Active Node as a Model C200H-CPU11 PLC. Its device type is C200H-Series.

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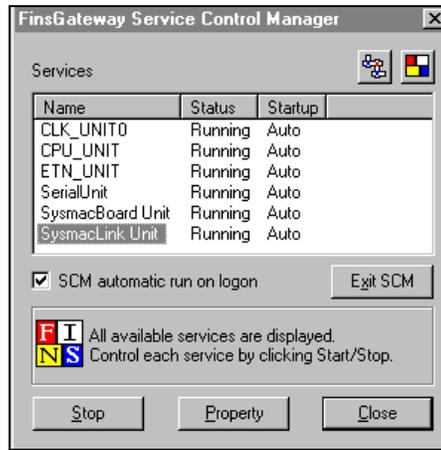
**Note:** The Peer and Device Type information are used in the following Topic Configuration example.

---

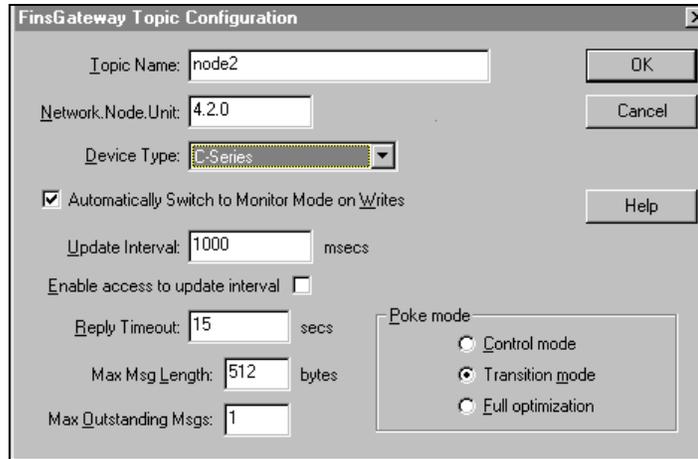
## Starting the Server and Configuring Topics

CPU\_UNIT and SysmacLink Unit FinsGateway Services must be started and running before starting the server. These services can be started either from FinsGateway Service Control Manager or from Control Panel/Services.

The FinsGateway services will start automatically at Windows startup by selecting the service and then selecting **Property** in the FinsGateway Service Control Manager dialog, now select **Automatic start** in the Service Properties dialog



The following Topic Configuration dialog is based on the information displayed in the SYSMAC LINK Properties dialog/Nodes tab list displayed earlier in this section.



## Controller Link

The following assumes a Controller Link network is being created for the first-time. For the server to communicate with PLCs using the Controller Link network, a Controller Link Support Board and FinsGateway software must be installed and the CPU\_UNIT and CLK\_UNIT0 FinsGateway Services must be started.

Each connected OMRON PLC (with Controller Link Communications Unit installed) must be configured to function as a node in the Controller Link network. To configure, use OMRON's programming software such as OMRON SYSWIN or CX-Programmer.

- CX-Programmer, version 1.1 or later for any series PLCs
- SYSWIN only works for CV-Series PLCs

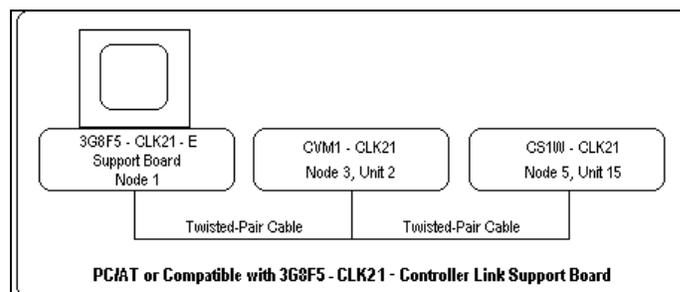
To prepare a Controller Link network for use by the server:

- Install the hardware for Controller Link communications.
- Configure the PLC(s). Set network numbers into the Routing Table.
- Install FinsGateway on the PC.
- Configure FinsGateway to access the Controller Link Network.
- Start CPU\_UNIT and CLK\_UNIT0 FinsGateway Services.
- Test the network using FINS Network Tester utility.
- Start the server to configure the topic(s).

## OMRON PLCs Used on Controller Link Network

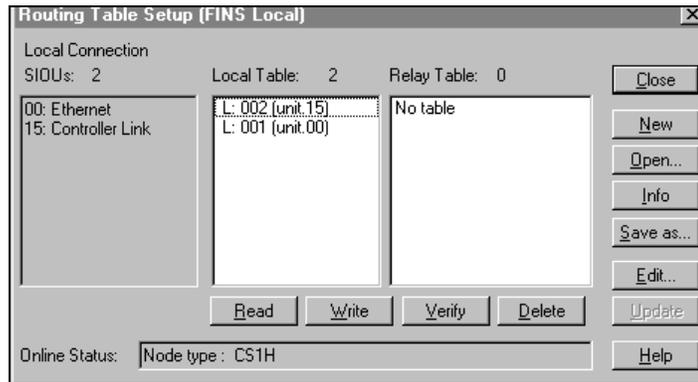
The C200HX/C200HG/C200HE Series, C-Series, CS1-Series, and CV-Series PLCs can be used as nodes on a Controller Link network. The PLC(s) must be supplied with Controller Link Communication Units such as CLK21.

The example used in this section is comprised of two PLCs; a CVM1-V2 and a CS1W, with their respective CLK21 units as shown below.



Below is an example of a Routing Table showing two networks:

- L:002 (unit 015) - Controller Link
- L:001 (unit 000) - Ethernet



To configure Routing Tables, refer to the CX-Server user's manual. An example of a configuration procedure is shown in "Appendix A" later in this user's guide.

## Installing the OMRON Controller Link Support Board

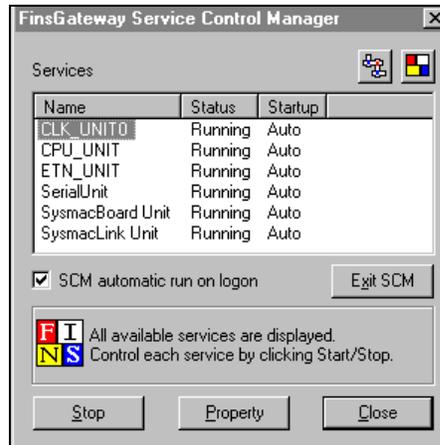
The following settings must be made on a Controller Link Support Board:

1. Set the Memory Area address to some value not overlapping with another resource currently used by the computer, for example, use address D8000.
2. Set the Interrupt Level, for example IRQ15, making sure this interrupt is not used by another resource on the computer.
3. Set the Termination Resistance to **ON**.

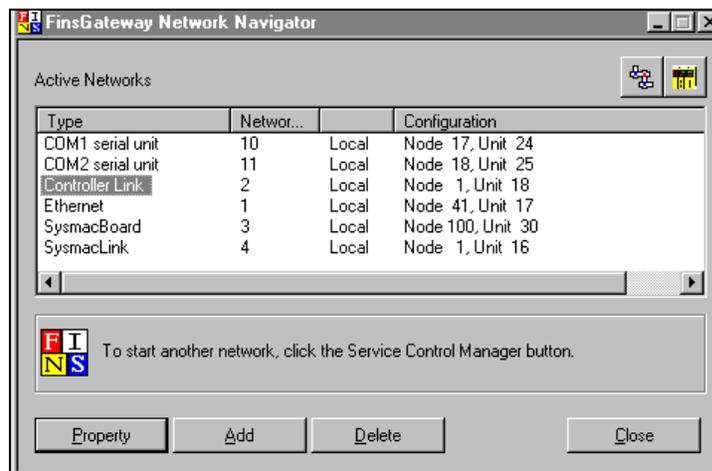
See the *OMRON SYSMAC 3G8F5-CLK21-E Controller Link Support Board Operation Manual* (Doc. No. W307) to setup the Controller Link Support Board.

## Configuring FinsGateway to Communicate with a Controller Link Network

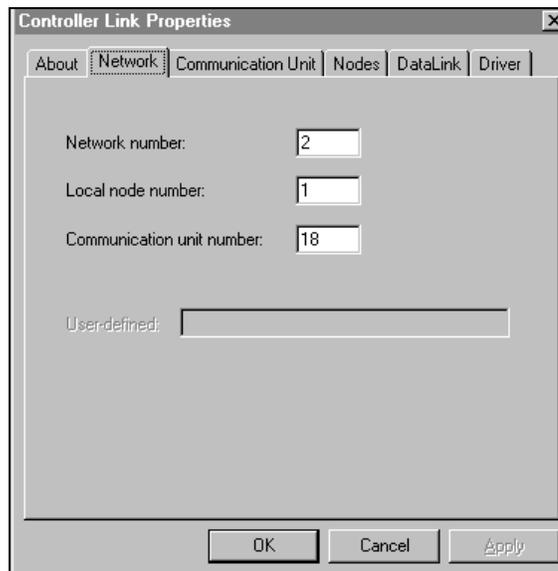
The Service Manager icon appears on the right side of the Tool Bar by selecting Start/Programs/FinsGateway/Service Manager. Left click the icon, then select **Settings**. The Services dialog appears. Start CPU\_UNIT and CLK\_UNIT0 services.



Start the FinsGateway Network Navigator. The Active Networks list dialog appears.

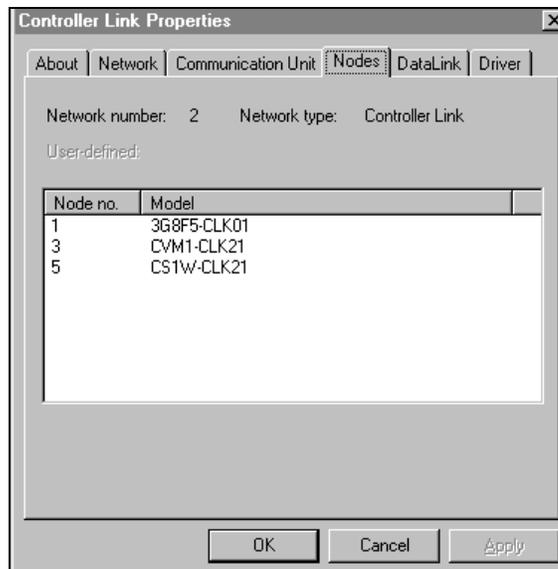


Choose **Controller Link** from the list, select **Property**, then select the **Network** tab to display the following dialog:



This example assigns the Controller Link a Network number of 2. There is no reason to change Local node number and Communication unit number.

Select the **Nodes** tab to view active nodes on this Controller Link.



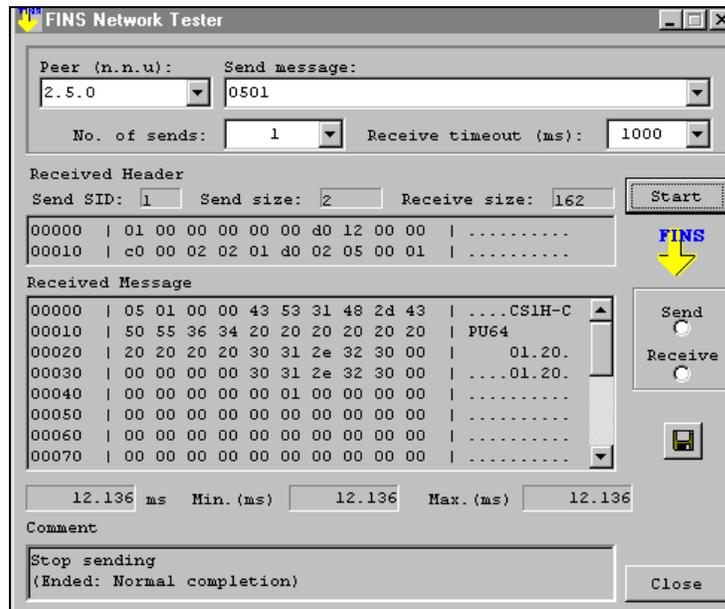
---

**Note:** The information in this dialog is required to configure server topics. The Topic Configuration example at the end of this section refers to this dialog.

---

## Testing the Controller Link Network

Use the FINS Network Tester utility to test the network. The FINS Network Tester dialog appears:



This test is for Peer 2.5.0 (Network number 2, Node 5, Unit 0). This Network number and Node number are from this sections procedures for configuring FinsGateway access to a Controller Link Network.

Receiving any message proves an Active Node exists at the Peer. This Received Message (shown in the above dialog) identified the Active Node as a Model CS1H-CPU64 PLC. Its device type is CS-Series.

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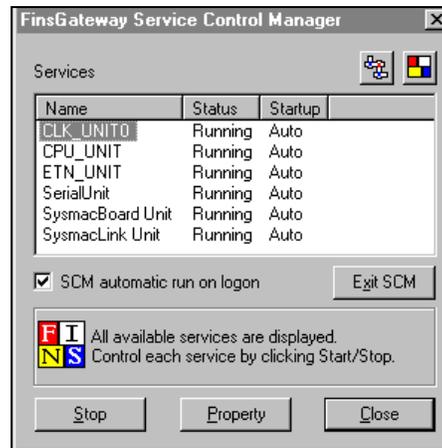
**Note:** The Peer and Device Type information are used in the following Topic Configuration example.

---

## Starting the Server and Configuring Topics

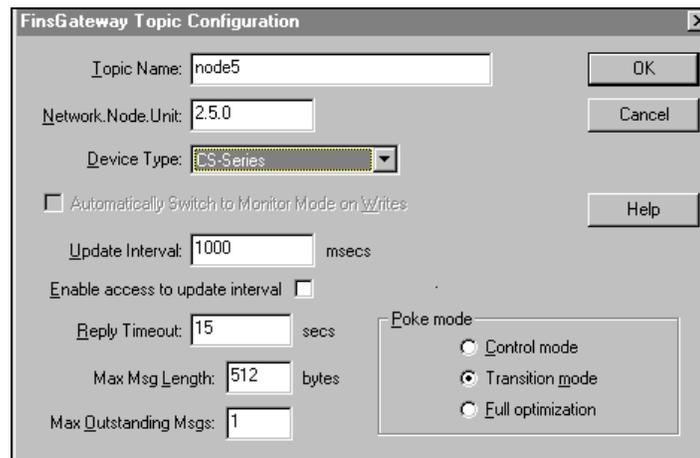
CPU\_UNIT and CLK\_UNIT0 FinsGateway Services must be started and running before starting the server. These services can be started either from FinsGateway Service Control Manager or from Control Panel/Services.

The FinsGateway services will start automatically at Windows startup by selecting the service and then selecting Property in the FinsGateway Service Control Manager dialog, now select Automatic start in the Service Properties dialog



Topic configurations require proven network information that can not be validated by the server.

Successful tests using the FINS Network Tester furnished the Device Type and Network.Node.Unit (Peer) configuration information for the following topic.



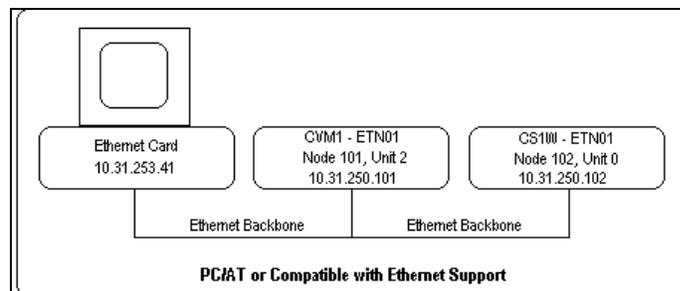
## Ethernet Communication

To communicate with OMRON PLC(s) over Ethernet, the server requires an Ethernet card and TCP/IP protocol software supporting Windows Sockets (WinSock) interface to be installed on the computer. The FinsGateway software must be installed. CPU\_UNIT and ETN\_UNIT FinsGateway services must be started and ETN\_UNIT must be configured.

Each connected OMRON Controller with an Ethernet unit must be configured to function as a node in the Ethernet Network. This setup is done by switches on the Ethernet unit and the appropriate programming software such as OMRON SYSWIN or CX-Programmer.

The example network explains the setup for this section and is comprised of three nodes:

- PC node (41)
- CVM1-ETN01 node (101)
- CS1W-ETN01 node (102)

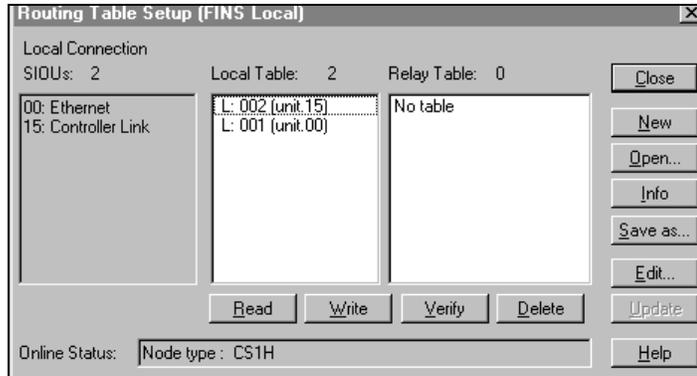


Using the unit rotary switches, set the CVM1-ETN01 Node number to 101 and Unit number to 2. For additional information, see *OMRON SYSMAC CV-Series Ethernet System Manual*.

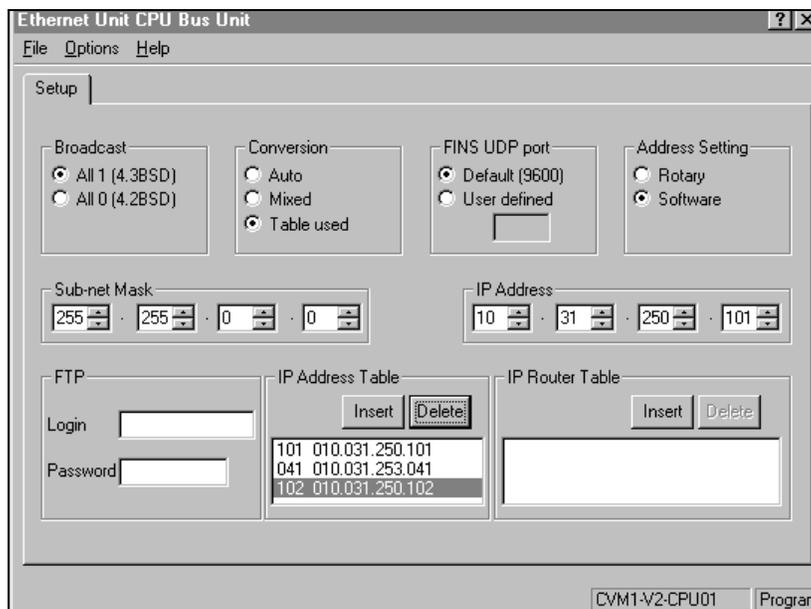
Set the CS1W-ETN01 Node number to 102 and Unit Number to 0. The ETN01 CS (CS1-Series) has eight rotary switches in back of the Unit for setting up the Unit IP address. For additional information, see *OMRON SYSMAC CS1-Series CS1W-ETN01 Ethernet Unit Operation Manual* for details.

Configure the PLC(s) Routing Table and IP Address Table. These configurations are documented in "Appendix A" and "Appendix B" using the OMRON CX-Programmer utility.

The following Routing Table shows an Ethernet Network (network number 1) and a Controller Link Network (network 2). The Ethernet Network is used for this sections example:



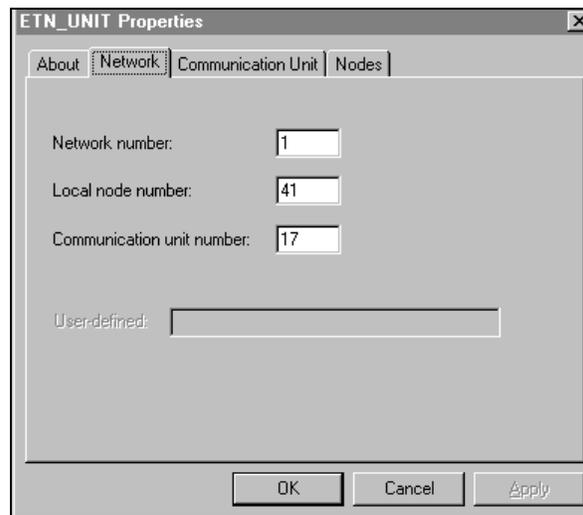
The following is the IP Address Table for this sections example:



## Configuring FinsGateway for Ethernet Access

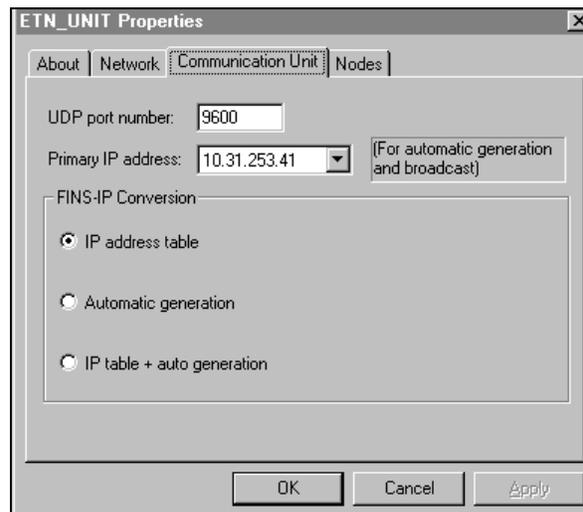
1. Start FinsGateway Service Control Manager (refer to the “Controller Link” section in this user's guide for details).
2. Left click the **Service Manager** icon at the right of the Task Bar.
3. Start CPU\_UNIT and ETN\_UNIT services.
4. Start the FinsGateway Network Navigator.
5. Choose **Ethernet** from the list of networks, select **Property** and then the **Network** tab.

The following dialog appears:

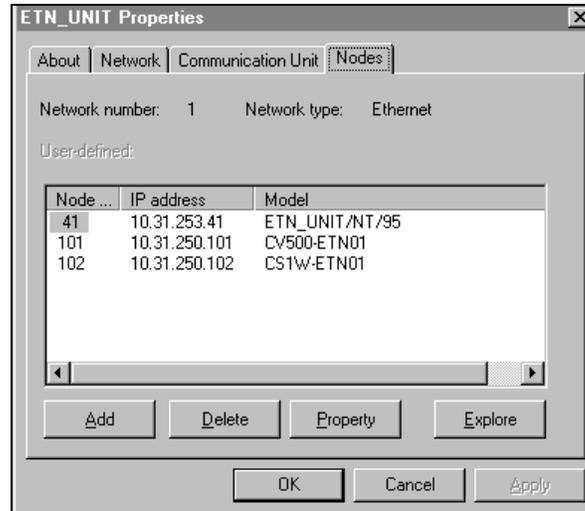


Enter the Network number (from the Routing Table dialog above) in this example, 1 is being used. Usually, there is no need to change Local node number and the Communication unit number set by FinsGateway.

Select the **Communication Unit** tab to view the Primary IP address assigned by FinsGateway, in this case 10.31.253.41. This IP address must be fixed (No DHCP).



Select the **Nodes** tab and then select Apply.



The host node should be seen in the dialog:

Node 41    IP Address 10.31.253.41 ETN\_UNIT/NT/95

To add PLC nodes, select **Add** and enter the node number and the IP address. In this example we added the two PLC nodes we configured earlier in the IP Address Table:

Node 101    IP Address 10.31.250.101 and

Node 102    IP Address 10.31.250.102

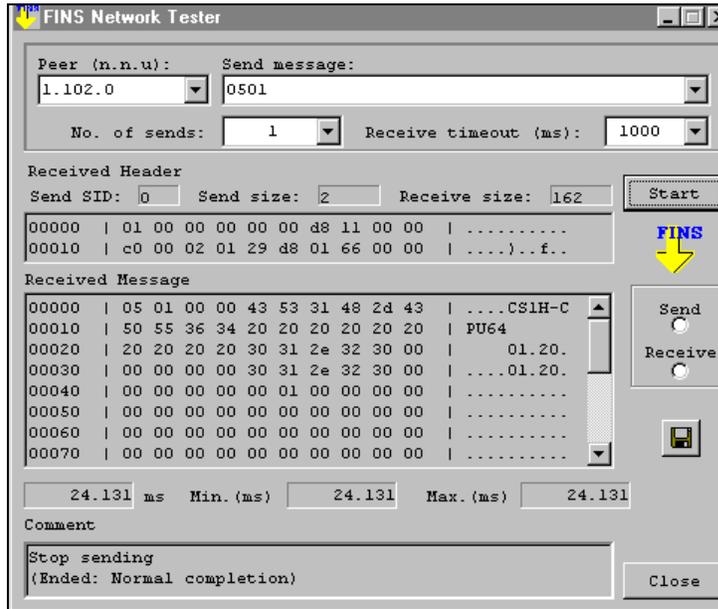
---

**Note:** The information in this dialog is required to configure server topics. The Topic Configuration example at the end of this section refers to this dialog.

---

## Testing the Ethernet Network

Using FINS Network Tester utility to test the network, this dialog will appear:



This test is for Peer 1.102.0 (Network number 1, Node 102, Unit 0). A Network number and Node number are from this sections example procedures for configuring FinsGateway access to an Ethernet Network.

Receiving any message proves an Active Node exists at the Peer. This Received Message (shown in the above dialog) identified the Active Node as a Model CS1H-CPU64 PLC. Its device type is CS1-Series.

---

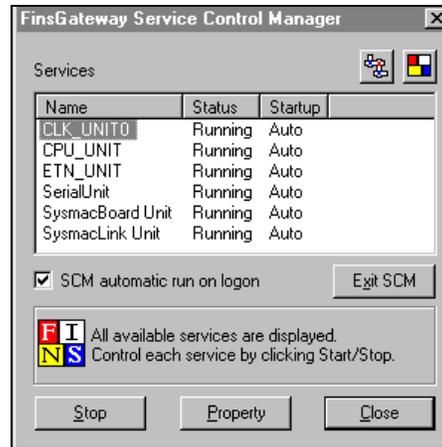
**Note:** The Peer and Device Type information are used in the following Topic Configuration example.

---

## Starting the Server and Configuring Topics

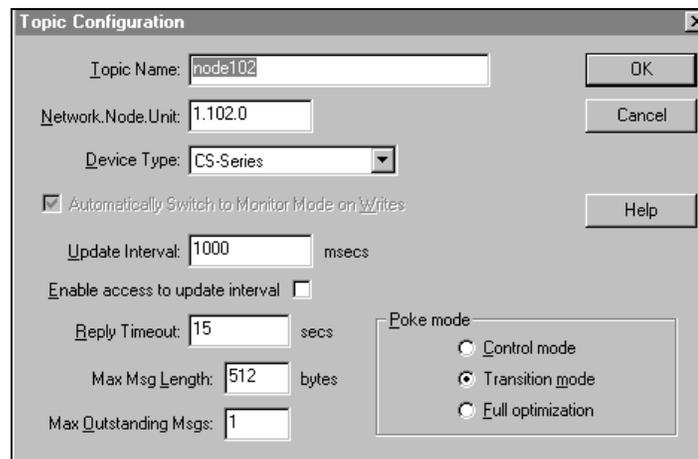
CPU\_UNIT and ETN\_UNIT FinsGateway Services must be started and running before starting the server. These services can be started either from FinsGateway Service Control Manager or from Control Panel/Services.

The FinsGateway services will start automatically at Windows startup by selecting the service and then selecting Property in the FinsGateway Service Control Manager dialog, now select Automatic start in the Service Properties dialog



Topic configurations require proven network information that cannot be validated by the server.

Successful tests using the FINS Network Tester furnished the Device Type and Network.Node.Unit (Peer) configuration information for the following topic.



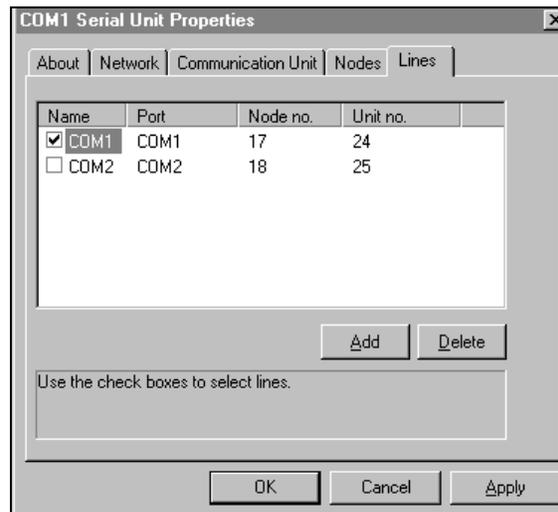
## Serial Communication

OMRON C200HX/C200HG/C200HE Series, C-Series, CS1-Series, and CV-Series PLCs may be used as nodes on Serial Unit networks using SYSWAY (Host Link in C-mode). CV-Series PLCs also support SYSWAY-CV (Host Link FINS protocol).

The CPU of the C200HX/C200HG/C200HE Series PLC has a built-in RS-232 C port that can be used to communicate with the PC. A communication Board, C200HW-COM02, may also be used. A CS1-Series PLC can be connected to a PC using the RS-232 port on its CPU Unit. A CV-Series PLC can be connected to a PC with the Host Link connector on its CPU or a CV500-LK201 Host Link Unit mounted to a Rack. For additional information, refer to *SYSMAC CV-Series Programmable Controllers Operation Manual*. If a CPU unit does not have a Host Link port, then a separate serial communication unit, for example, LK201-V1, must be used.

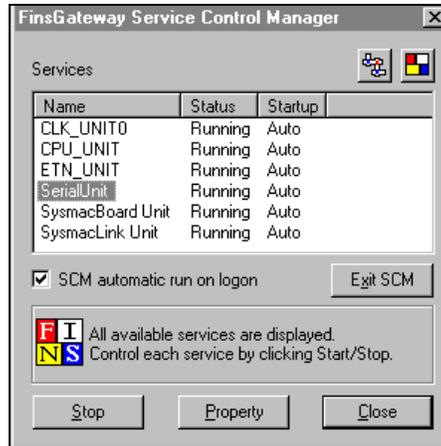
## Configuring FinsGateway to Communicate with a Serial Device

Select **Start/Programs/FinsGateway/SerialConfig**. When the COM1 Serial Unit Properties dialog appears, select the **Lines** tab.



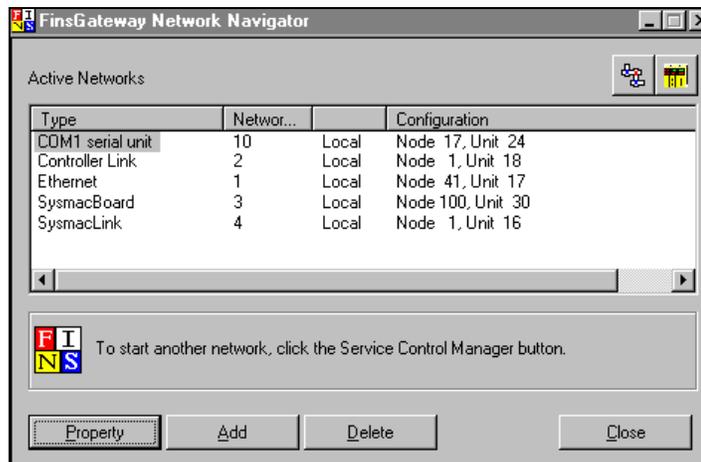
Select the **COM port(s)** to be used. In the example above, COM1 was selected. To add more COM ports, select **Add** and follow the directions given.

Start the FinsGateway Service Control Manager. The Services dialog appears:

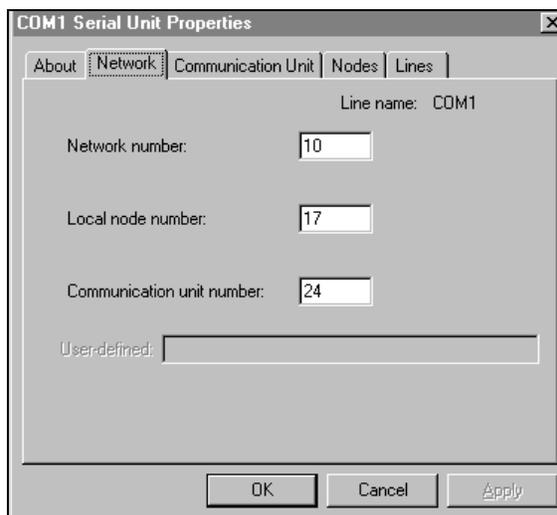


Start CPU\_UNIT and SerialUnit services.

Start FinsGateway Network Navigator using the icon (the Red-White-Yellow-Blue square) at the top-right of FinsGateway Service Control Manager dialog. The Active Networks list dialog appears:



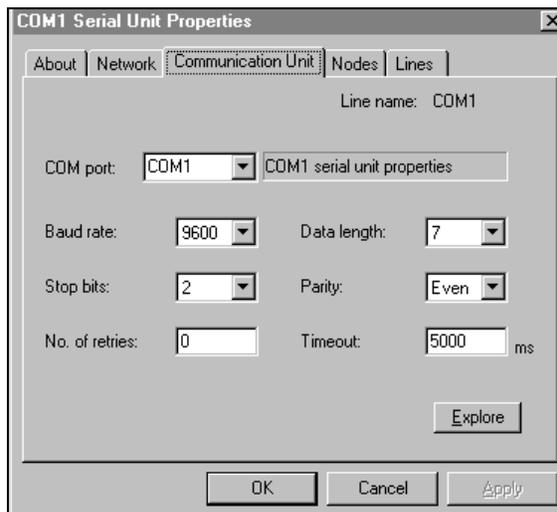
Choose **COM1** serial unit from the list, select **Property**, then select the Network tab to display the following dialog:



The screenshot shows the 'COM1 Serial Unit Properties' dialog box with the 'Network' tab selected. The 'Line name' is 'COM1'. The 'Network number' is set to 10, 'Local node number' is 17, and 'Communication unit number' is 24. There is an empty 'User-defined' text field. At the bottom are 'OK', 'Cancel', and 'Apply' buttons.

Enter a unique Network number, 10 in this example. Usually there is no reason to change Local node number and Communication unit number.

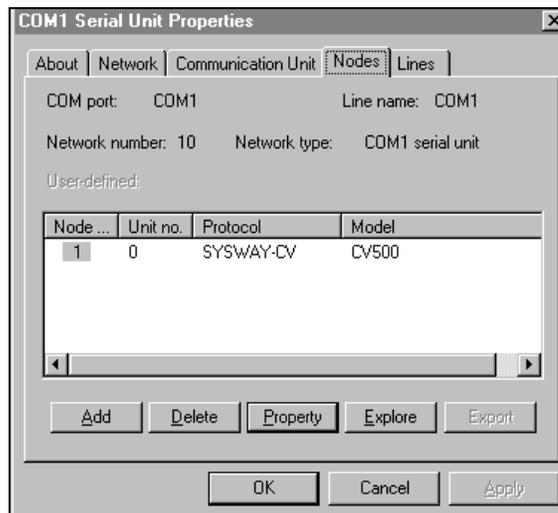
Select **Communication Unit** tab to display the following dialog:



The screenshot shows the 'COM1 Serial Unit Properties' dialog box with the 'Communication Unit' tab selected. The 'Line name' is 'COM1'. The 'COM port' is set to 'COM1' with a dropdown arrow and a text field containing 'COM1 serial unit properties'. The 'Baud rate' is 9600, 'Data length' is 7, 'Stop bits' is 2, 'Parity' is Even, 'No. of retries' is 0, and 'Timeout' is 5000 ms. There is an 'Explore' button. At the bottom are 'OK', 'Cancel', and 'Apply' buttons.

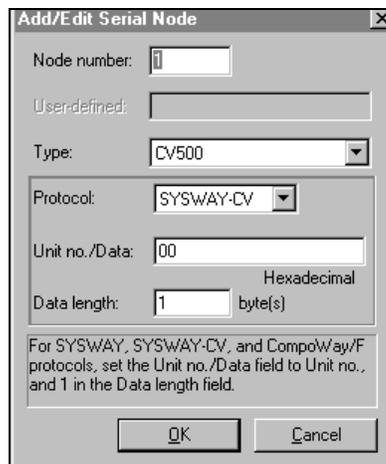
Enter communication parameters values. Usually the default values are OK.

Select **Nodes** tab to display the following dialog:



**Note:** The information in this dialog is required to configure server topics. The Topic Configuration example at the end of this section refers to this dialog.

Choose **Node 1** from the list and then select **Property**. The Add/Edit Serial Unit Node dialog appears.

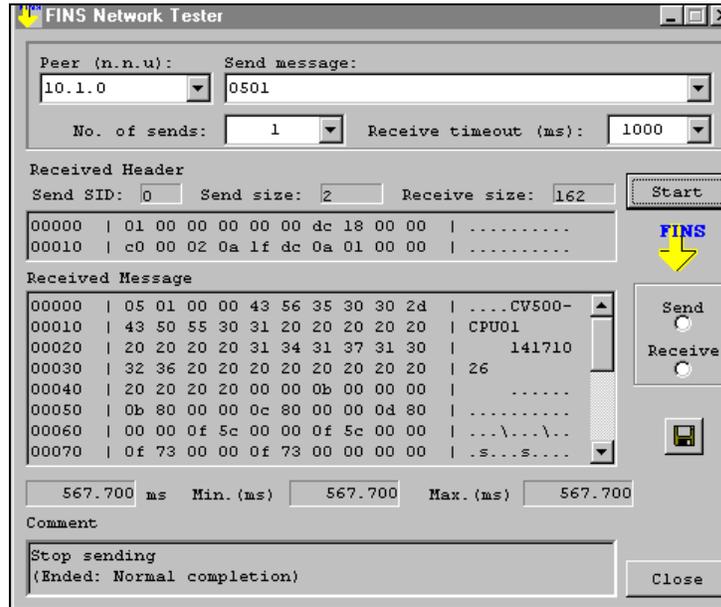


The example above shows 1 entered as the Node number. CV500, the Type of PLC, and SYSWAY-CV, the Protocol, were selected from their drop down list box. Enter 00 for Unit no./Data and 1 [bytes(s)] for the Data length to finish configuring this dialog.

Select **OK** then select **Apply**.

## Testing the Serial Network

Using the FINS Network Tester utility to test the network, the following dialog appears:



This test is for Peer 10.1.0 (Network number 10, Node 1, Unit 0). A Network number and Node number are from this sections example procedures for configuring FinsGateway access to a Serial Unit Network.

Enter the Peer address 10.1.0 as in this example, then select Start. Receiving any message proves an Active Node exists at the Peer. This Received Message (shown in the above dialog) identified the Active Node as a Model CV500-CPU01 PLC. Its device type is CV-Series.

---

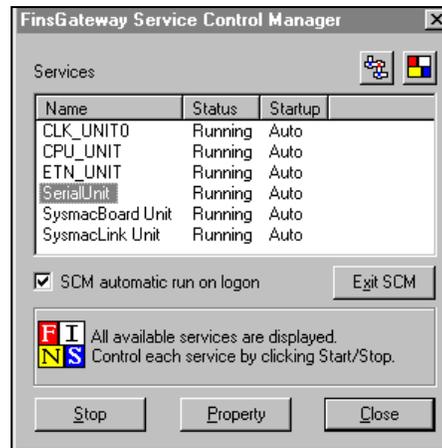
**Note:** The Peer and Device Type information are used in the following Topic Configuration example.

---

## Starting the Server and Configuring Topics

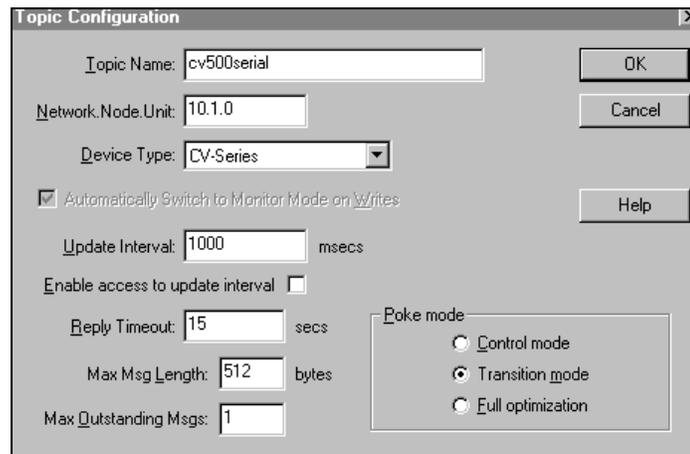
CPU\_UNIT and SerialUnit FinsGateway Services must be started and running before starting the server. These services can be started either from FinsGateway Service Control Manager or from Control Panel/Services.

The FinsGateway services will start automatically at Windows NT startup by selecting the service and then selecting Property in the FinsGateway Service Control Manager dialog, now select Automatic start in the Service Properties dialog



Topic configurations require proven network information that cannot be validated by the server.

Successful tests using the FINS Network Tester furnished the Device Type and Network.Node.Unit (Peer) configuration information for the following topic.



## SYSMAC Board

The server, FinsGateway embedded edition software, and the OMRON SYSMAC Board must operate in the same computer. SYSMAC Board functions as a PLC inside the computer. Setup is done by FinsGateway's SYSMAC Board Config. utility.

To prepare SYSMAC Board for data access by the server:

1. Install the SYSMAC Board into the PC
2. Install FinsGateway embedded edition software
3. Configure FinsGateway to access SYSMAC Board
4. Start CPU\_UNIT and SYSMAC Board Unit FinsGateway Services
5. Test the connection using the FinsGateway Network Tester utility
6. Start the server and create topics to communicate with SYSMAC Board

## Installing the OMRON SYSMAC Board

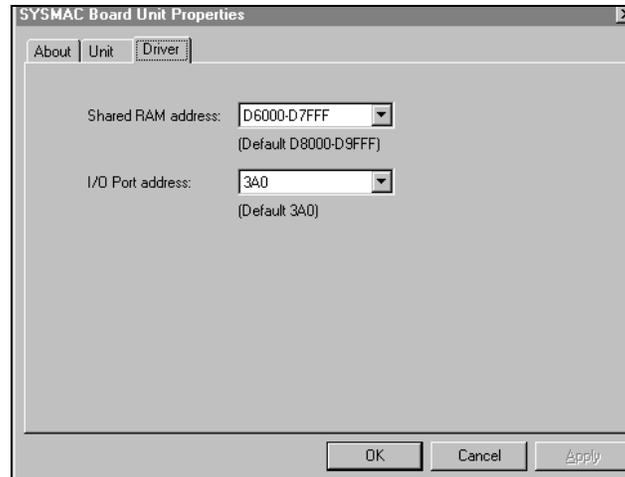
For detailed information, refer to *OMRON's C200PC - ISA01 - E, C200PC - ISA02 - DRM - E, C200PC - ISA02 - SRM - E, C200PC - EXP01 SYSMAC Board Operation Manual*.

These settings must be made on the SYSMAC Board:

1. The I/O port address must be set to an unused area in the computer. This example uses 03A0 to 03A4.
2. Set a unique node number via the rotary switch. This example uses 230.
3. Set any of the board-specific operating parameters.

## Configuring FinsGateway to Access SYSMAC Board

Select **Start/Programs/FinsGateway/SYSMAC BOARD Config**, then select the **Driver** tab. SYSMAC Board Unit Properties dialog appears:



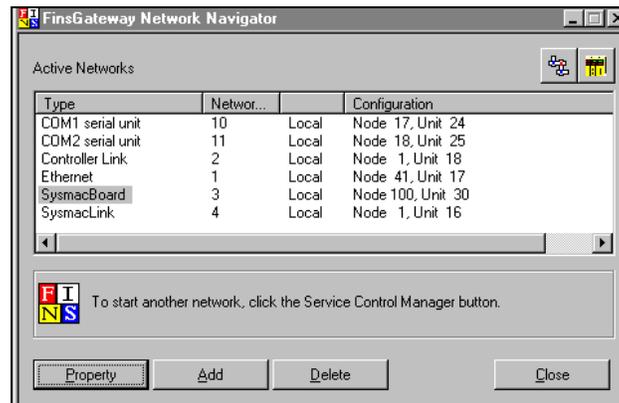
Select a **Shared RAM** address that does not conflict with another resource.

Select the **I/O Port** address that matches the DIP switch settings on the board.

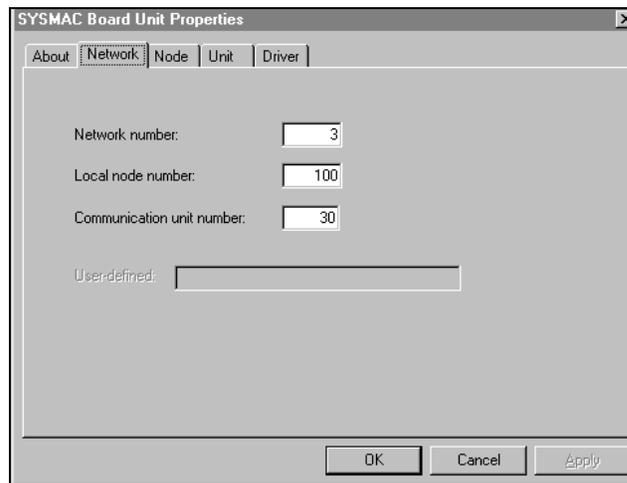
Select **OK**.

Using the FinsGateway Service Control Manager, start the CPU\_UNIT and SYSMACBoard Unit services.

Start the FinsGateway Network Navigator, the Active Networks list dialog appears:

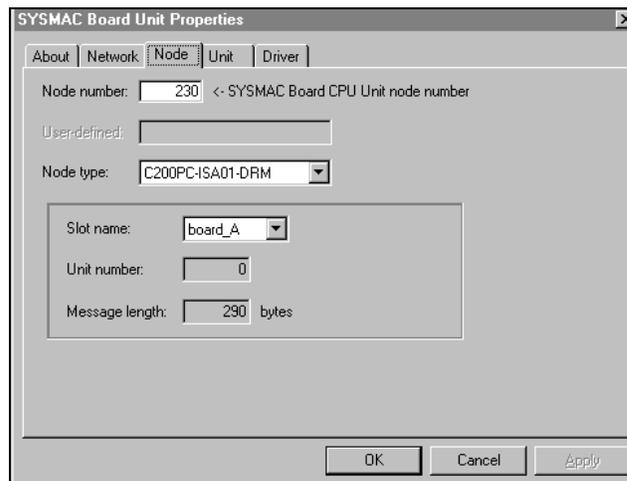


Choose **SYSMAC Board** from the list, select **Property**, then select the **Network** tab to display the following dialog:



This section's example assigns a SYSMAC Board the Network number of 3. Usually there is no reason to change the default values of Local node number and Communication unit number.

Select the **Node** tab. The following dialog appears:



Enter the Node number of 230 for this example. This was the unique Node number set on the SYSMAC Board.

Select **OK**.

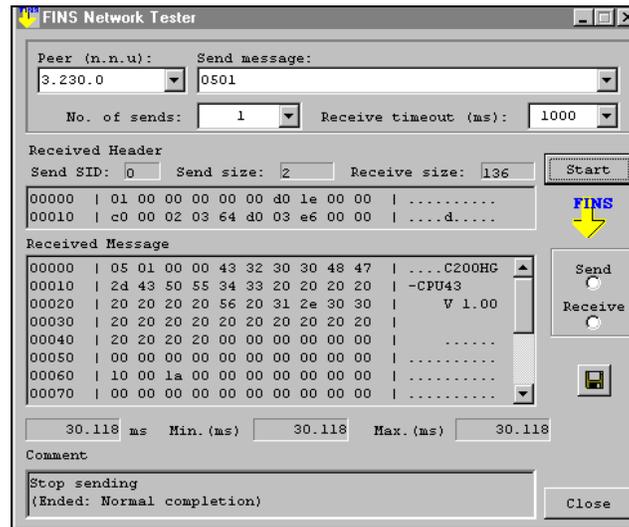
---

**Note:** The information in these dialogs is required to configure server topics. The Topic Configuration example at the end of this section refers to these dialogs.

---

## Testing SYSMAC Board

Using FINS Network Tester utility, test the network.



This test is for Peer 3.230.0 (Network number 3, Node 230, Unit 0). This Network number and Node number are from this section's procedures for configuring FinsGateway access to SYSMAC Board. The unit will always be 0 for the SYSMAC Board.

Receiving any message proves an Active Node exists at the Peer. This Received Message (shown in the above dialog) identified the Active Node as a Model C200HG-CPU43 PLC. Its device type is C200HX/C200HG/C200HE Series.

The SYSMAC Board copies the functionality of one of the following CPUs:

- C200HG-CPU43
- C200HX-CPU64

Both CPUs are from the same series. This means all server topics configured for SYSMAC Board will have a device type of C200HX/C200HG/C200HE Series.

---

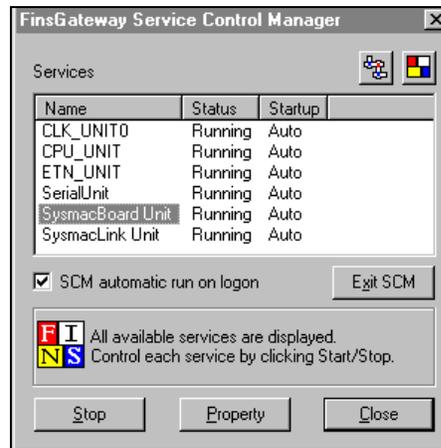
**Note:** The Peer and Device Type information are used in the following Topic Configuration example.

---

## Starting the Server and Configuring Topics

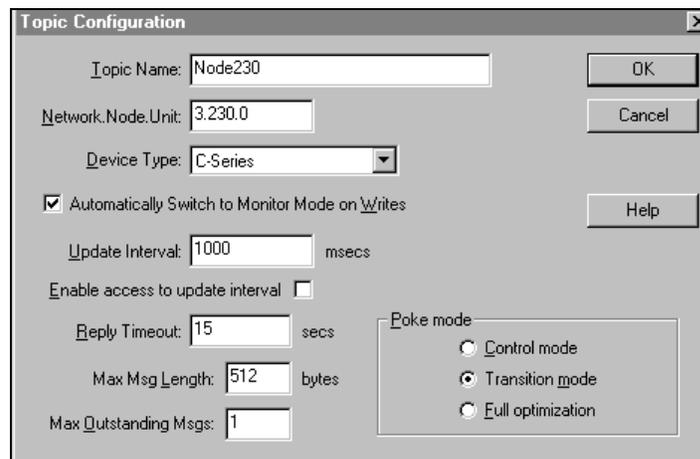
CPU\_UNIT and SYSMAC Board Unit Services must be started and running before starting the server. These services can be started either from FinsGateway Service Control Manager or from Control Panel/Services.

The FinsGateway services will start automatically at Windows NT startup by selecting the service and then selecting Property in the FinsGateway Service Control Manager dialog, now select Automatic start in the Service Properties dialog



Topic configurations require proven network information that cannot be validated by the server.

Successful tests using the FINS Network Tester furnished the Device Type and Network.Node.Unit (Peer) configuration information for the following topic.



# IOServer-FinsGateway Main Window



Double-click on the server's icon to start.

When the server starts, the main dialog will appear:



The title bar displays the current configuration file and its full path. Any active topic will appear in the client area of this dialog called the topic monitor list.

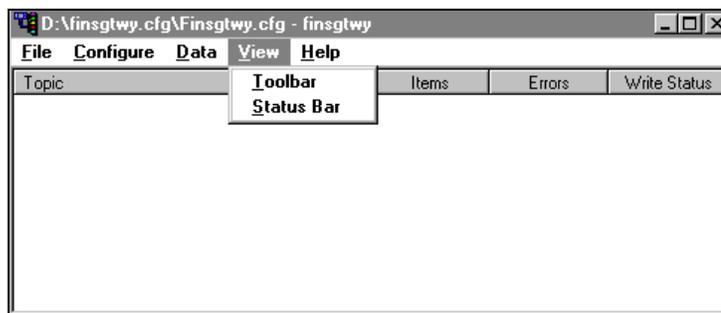
## View Menu

There are two options that change the appearance of the **View** menu. Both options are enabled or disabled by selecting the menu option. A check next to the option indicates the option is enabled.

**Toolbar** option adds (when enabled) or removes the toolbar (small buttons) located below the menu.

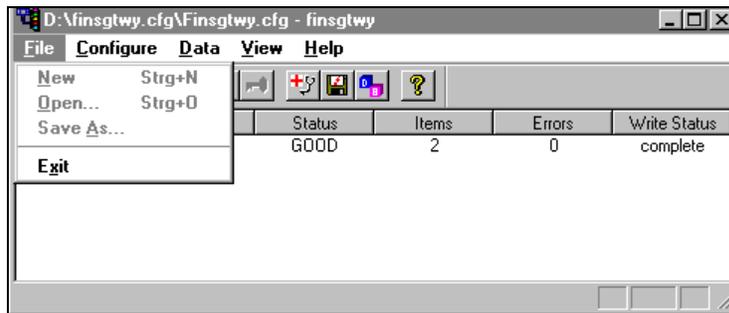
**Status Bar** option adds (when enabled) or removes the status indication bar located at the bottom of the dialog.

The dialog above has both options enabled. The following dialog has both options disabled.



# File Menu

File menu options deals with loading and saving the internal topic configuration database.



## New

Clears the internal topic database for a new topic configuration. This menu is disabled when the server is active (a client is connected).

## Open

Replaces the internal topic database with the information contained in the user selected topic configuration file. This menu is disabled when the server is active (a client is connected).

## Save As

Saves the internal topic database under a new name. This command is only needed if you want to save the configuration under a different name. If you edit the internal topic database, the data is stored automatically in the current configuration file. This menu is disabled when the server is active (a client is connected).

## Exit

Terminates the server.

## 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, **FINSGTWY.CFG**. This file stores the configuration information for the boards 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 access the options used for the various configurations, open the Configure menu:



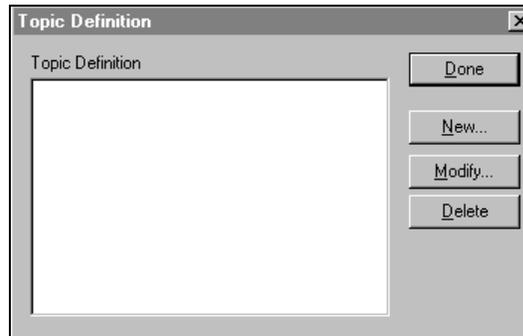
---

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

---

## Configuring a 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 Done 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 FinsGateway 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 confirmation of the deletion.



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

## FinsGateway Topic Definition

This server supports multiple communications boards and multiple PLC families all with different capabilities. The details of creating topics for all the combinations of boards and PLCs has been made into examples. The resulting topic definition examples are in the Getting Started section.

Enter a unique name for the topic being created in this field.

---

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

---

Enter the Peer Address of the OMRON FA network. Testing for each of the FA networks supported is described in the “Getting Started” section of this user's guide.

Select the option for the Device Type (PLC family) associated with this topic definition.

Automatically Switch to Monitor Mode on Writes: OMRON devices are Host Link write-protected when in run mode. In some cases, a device may be left in run mode for safety reasons and the Windows applications are a monitoring-only function. At other times, read/write may be necessary.

A screenshot of a software interface showing a text input field labeled "Update Interval:" with the value "1000" and the unit "msecs" to its right.

Update Interval: 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.

---

 A screenshot of a software interface showing a checkbox labeled "Enable access to update interval" which is currently unchecked.

This feature permits changes to Update Interval while the server is active.

 A screenshot of a software interface showing a text input field labeled "Reply Timeout:" with the value "15" and the unit "secs" to its right.

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.

---

 A screenshot of a software interface showing a text input field labeled "Max Msg Length:" with the value "512" and the unit "bytes" to its right.

This is the maximum length for messages.

---

**Note:** SYSMAC Board and SYSMAC LINK can not have values greater than 256.

---

 A screenshot of a software interface showing a text input field labeled "Max Outstanding Msgs:" with the value "1".

Max. Outstanding Msgs is used to tune-up parameters.

 A screenshot of a software interface showing a dialog box titled "Poke mode" with three radio button options: "Control mode", "Transition mode" (which is selected), and "Full optimization".

Poke mode shows how poke messages are built.

Control mode preserves the poke order with no folding.

Transition mode preserves the poke order and folding by keeping the first, second, and last poke values of an item.

Full optimization does not preserve the poke order but uses maximum folding. Only poking the last value of an item.

Click **OK** to save changes and close the dialog box.

Click **Cancel** to close the dialog box without changing current settings.

# Configuring the I/O Server Settings

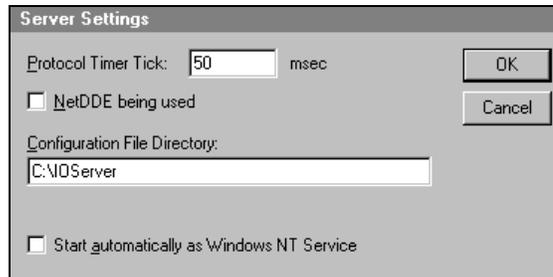
Use the Server Settings option from the Configure menu to change the protocol timer, to enable the network using Wonderware NetDDE, to specify the default configuration file path, or to enable the server to start automatically as a Windows NT service.

---

**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

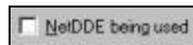


Enter the frequency (in milliseconds) that the server is to check for data to process. This should be approximately two to four times faster than the fastest rate desired to update data from the equipment.

---

**Note:** The default protocol timer tick value will vary between servers.

---



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. If the names are unique, they can be saved in the same directory. When using the server with InTouch, we recommend that you save the configuration file in your application directory.

---

Start automatically as Windows NT Service

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.

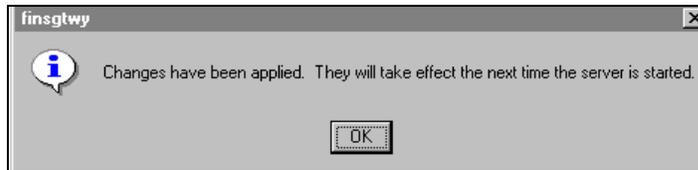
---

**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.

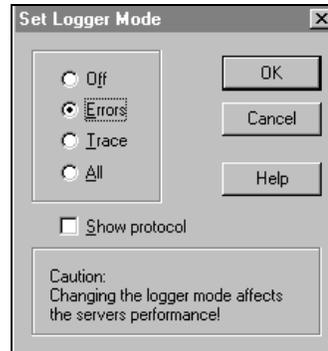
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**Note:** You must restart the server for the changes to take effect.

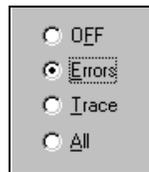
---

# Configuring Logger

Use the **Logger** option from the configure menu to set the working logger mode of the server. The options controlled by this dialog box are NOT retained in the configuration file.



## Set Logger Mode




---

**Note:** Each time the server starts, the logger mode will default to Errors.

---

Select **Off** to disable normal server logging.

Select **Errors** for normal operation logging to the Wonderware Logger.

Select **Trace** to log errors and all activation/deactivation activities including calls to the driver libraries.

Select **All** to log all activities including single item value updates.



Enable Show protocol to add PLC communication message data to the selected logger mode.

Click **OK** to use changes and close the dialog box.

Click **Cancel** to close the dialog box without changing current settings.

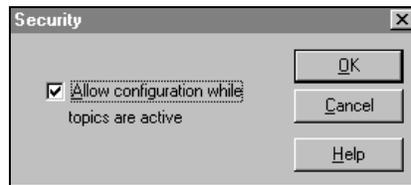
---

**Note:** When logging activity increases, the server's performance degrades.

---

# Configuring Security

Use the **Security** option from the configure menu to control server configuration changes.



## Security

When the server is not active (no clients connected), all server configuration options are available for modification.

The default setting for Allow configuration while topics are active is disabled. When disabled, all topics are viewable but locked against changes while the server is active (a client is connected).

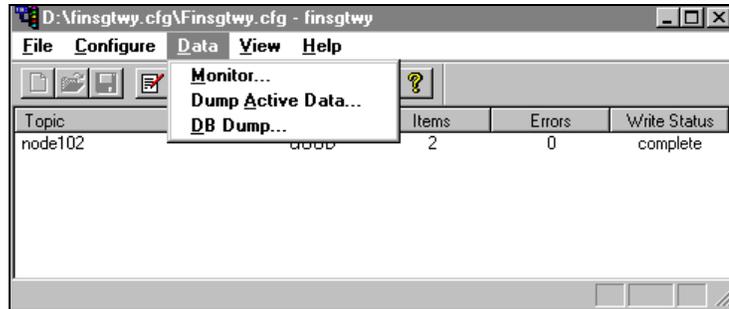
Enable 'Allow configuration while topics are active' to allow write access to some parameters of the topic configuration while the server is active. This server supports write access to Update Interval and Enable access to update interval. You cannot add, delete, rename, or change other parameters of a topic configuration.

Click **OK** to save changes and close the dialog box.

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

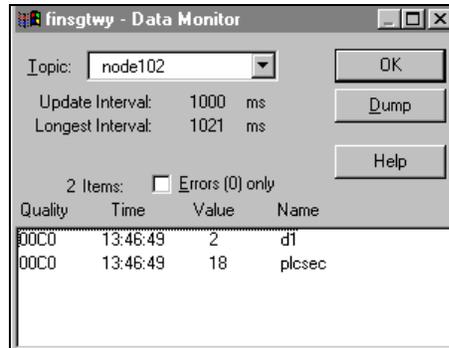
## Data Menu

The Data Menu contains two commands that are used for diagnostic purposes during runtime (Monitor and Dump Active Data) and one command for transferring the topic configuration to the FactorySuite visualization client (DB Dump).



## Data Monitor

This option is used to display current information for an active topic and its corresponding items/points. When this command is selected, the View Item States dialog box appears:

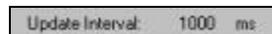


## View Item States

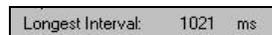
The data monitor dialog box displays information for any allocated topic and its active items. The data is updated as it changes. It is a useful tool for tracking down errors, for determining bus performance, and to validate item values.



This list box allows the selection of the allocated topics. A preceding '\*' indicates that at least one item in this topic has an error, while a preceding '#' indicates bad status (disconnected).



This field displays the current configured update interval of the topic. This value changes whenever the value is poked.



This field displays the current update interval of the slowest item of the topic. This value is measured for each poll cycle. If this value drastically differs from the desired update interval, the communication media is not fast enough to satisfy the load.

---

**Note:** Both values (update interval and longest interval) are accessible. You can create a Wonderware FactorySuite client performance meter by displaying these values graphically for each topic. If access is enabled, you can even tune the bus performance conveniently from a FactorySuite client by poking new update intervals.

---

2 Items:  Errors (0) only

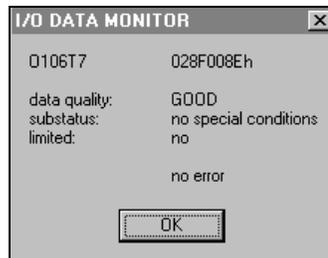
This field displays the number of active items and the number of items with errors (in parenthesis). If you check the box, only the items with errors will be displayed in the item data list box.

Quality	Time	Value	Name
00C0	13:46:49	2	d1
00C0	13:46:49	18	plcsec

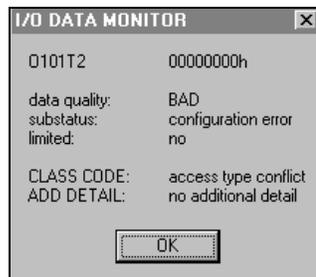
The item data list box displays information about each item per row. The box is divided into four columns:

- **Quality** displays the items quality.
- **Time** displays the items timestamp.
- **Value** displays the items data in hexadecimal notation. If the data is larger than 4 bytes (as in the case of strings or data blocks), it will be indicated by dots, for example, AB0102FF.. . Strings are displayed as string values. Reals are displayed as real values.
- **Name** contains the item name.

Clicking on an item line generates a dialog box showing the item name and a message:



In the case of an error, a dialog box with an error message describing the error appears:





Choose Dump to dump the contents of the monitor dialog into an ASCII text file. You can load this file into Excel or any standard text editor. All columns are separated by tabs. Set the tabs width of your editor appropriately.

After the dump is completed the server displays a message box confirming the name of the file the data was dumped to:



The server automatically generates the filenames in the following format:

**<current working directory>\datmonXX.txt**

Where XX is a two digit number between 00 and 99.

The server increments XX each time a file is dumped. Existing files with the same names are erased.

## Dump Active Data to a File

Use the Dump Active Data option from the data menu to dump information on topics with active items into an ASCII text file. The resulting file can be loaded into Excel or any standard text editor. All columns are separated by tabs.

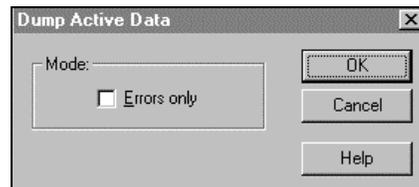
The server automatically generates the ASCII text file name and sets the files location using the following pattern:

**<current working directory>\datdmpXX.txt**

Where XX is a two digit number between 00 and 99.

The server increments XX each time a file is dumped.

When the Dump Active Data option is selected, the Dump Active Data dialog box will appear:



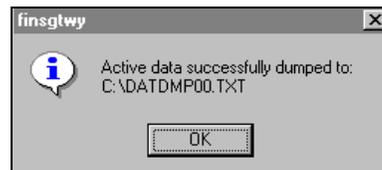
## Dump Active Data

Enable Errors only option to dump topics with errors.

Click **OK** to start the dump.

Click **Cancel** to close dialog without creating dump file.

After the dump is complete, a message box containing the newly created ASCII text file name is displayed.



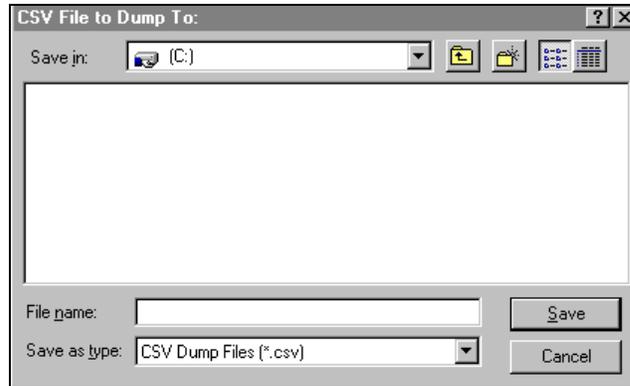
---

**Note:** Existing files with the same name are erased.

---

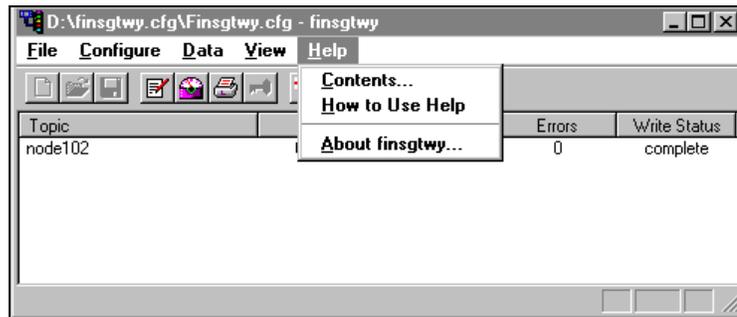
## Dumping Topic Database to a File

Use the DB Dump option from the Data menu to dump the internal topic database into a CVS format file. Wonderware's DbLoad utility can use the resulting file to automatically generate InTouch access names. Create the file by selecting a directory and filename using the standard dialog shown below.



# 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 fingswtwy

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

This server supports item/point names consistent with the point naming conventions used by OMRON PLCs and programming software. Tag type formats and item names for supported OMRON PLCs are described.

## Special Item/Point Naming Conventions

By default, the server formats data to/from the OMRON PLCs as 16-bit unsigned integers (0 to 65535) or as discretes. Optional item name suffixes can be used to change the default server format of data.

---

**Note:** Item name suffixes are not case sensitive.

---

## Unsigned/Signed Format

The server is capable of interpreting the data in 16-bit signed format (-32768 to 32767). Consider the following example, channel DM100 in a C200H PLC contains 8000 hex. Unsigned quantities may be read from this channel by one of two methods, simply enter the item name or append the letter 'U' to the item name. Therefore, item name DM100 or DM100U would be displayed in InTouch or Excel as 32768. Signed quantities may be read from this same channel by appending the letter 'S' to the item name. Therefore, item name DM100S would be displayed in InTouch or Excel as -32768.

## BCD Format

The OMRON PLCs families support BCD (Binary Coded Decimal) data representation and manipulation within their instruction sets. To read/write data using BCD format, simply append the letter 'B' to the item name. For example, the item name DM100B will read/write a channel in BCD format.

## Long Format (Signed/BCD)

Two consecutive 16-bit words in a PLC can be interpreted as a 32-bit long integer. It can be formatted as either signed (-2,147,483,648 to 2,147,483,648) or BCD (0 to 99,999,999). To read/write an item in signed long format, simply append the letter 'L' to the item name. To read/write an item in BCD long format, simply append the letter 'M' to the item name. For example, if DM100 contains 0234 hex and DM101 contains 1356 hex, DM100L returns 324,403,764 and DM100M returns 13,560,234.

## Floating Point Format (IEEE/BCD)

Two consecutive 16-bit words in a PLC can be interpreted as a single precision floating point number. It is formatted as either IEEE (-3.402823 \* 10<sup>38</sup> to 3.402823 \* 10<sup>38</sup>) or BCD (0.0000001 \* 10<sup>-7</sup> to 0.9999999 \* 10<sup>7</sup>). To read/write an item in IEEE floating point format, append the letter 'F' to the item name. To read/write an item in BCD floating point format, append the letter 'G' to the item name. For example, if D100 contains 9620 hex and D101 contains 2436 hex in a CV500 PLC, D100F returns 3.959212 \* 10<sup>-17</sup> and D100G returns 0.4369620 \* 10<sup>2</sup>.

---

**Note:** IEEE format is **NOT** supported in the C-Series PLC family.

---

## ASCII Strings Format

Multiple consecutive 16-bit words (block size of 1 to 29) in a PLC can be interpreted as a string of ASCII characters. The ASCII string is stored/retrieved from the lowest-numbered address to the highest and from the high-order byte to the low-order byte with each address. To define a range of words, use a '-' between the two address locations. For example, DM10-DM12 indicates locations from DM10 to DM12. ASCII string characters can be specified to come from the high-order byte, low-order byte, or both bytes of the words.

<b>Low-order Byte</b>	Only the low-order byte (LSB - least significant 8-bits) of each word is used for read/write. To use this format, simply append the letter 'E' to the item name.
<b>High-order Byte</b>	Only the high-order byte (MSB - most significant 8-bits) of each word is used for read/write. To use this format, simply append the letter 'D' to the item name.
<b>Both Bytes</b>	Both bytes of each word are used for read/write. To use this format, simply append the letter 'C' to the item name.

---

**Note:** All bytes in the specified memory range will be used. If the string is shorter than the range of memory specified, it will be padded with '\0'. If the string is longer than the range of memory specified, the string will be truncated.

---

For example, assume the following memory contents (numeric values shown in hex):

	<b>MSB</b>	<b>LSB</b>	
DM10	41	42	"AB"
DM11	43	44	"CD"
DM12	45	46	"EF"

**Read:**

DM10 - DM12C	returns ABCDE
DM10 - DM11D	returns AC
DM10 - DM12E	returns BDF

**Write:**

DM10 - DM12C after written with "Test"

	<b>MSB</b>	<b>LSB</b>	
DM10	54	65	"Te"
DM11	73	74	"st"
DM12	0	0	" "

DM10 - DM12E after written with "ABCDE"

	<b>MSB</b>	<b>LSB</b>	
DM10	0	41	"A"
DM11	0	42	"B"
DM12	0	43	"C"

## C200HX/C200HG/C200HE Programmable Controllers

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
Internal Relay	IR,CH*	Integer	0 – 511	u s b
Internal Relay Bits	IR,CH*	Discrete	0:00 – 511:15	
Holding Relay	HR	Integer	0 – 99	u s b f g l m d e c
Holding Relay Bits	HR	Discrete	0:00 – 99:15	
Auxiliary Relay	AR	Integer	0 – 27	u s b f g l m d e c
Auxiliary Relay Bits	AR	Discrete	0:00 – 27:15	
Link Relay	LR	Integer	0 – 63	u s b f g l m d e c
Link Relay Bits	LR	Discrete	0:00 – 63:15	
Extended Data***	EM	Integer	0 – 6143	u s b f g l m d e c
Data Memory**	DM	Integer	0 – 6655	u s b f g l m d e c
Timers/Counters Present Value	PV	Integer	0 – 511	u s b f g l m d e c
Timer/Counters Completion Flag****	TC	Discrete	0 – 511	

**Note:** The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

- \* CH is an alias. The Address Range is limited to 0 – 255 and 0:00 – 255:15
- \*\* Address Range depends on CPU type used
- \*\*\* Current bank only (Memory Area code 98)
- \*\*\*\* Read only

## C-Series Programmable Controller

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
Internal Relay Words**	IR,CH*	Integer	0 – 511	u s b
Internal Relay Bits**	IR,CH*	Discrete	0:00 – 511:15	
Holding Relay Words	HR	Integer	0 – 99	u s b g l m d e c
Holding Relay Bits	HR	Discrete	0:00 – 99:15	
Auxiliary Relay Words	AR	Integer	0 – 27	u s b g l m d e c
Auxiliary Relay Bits	AR	Discrete	0:00 – 27:15	
Link Relay Words	LR	Integer	0 – 63	u s b g l m d e c
Link Relay Bits	LR	Discrete	0:00 – 63:15	
Data Memory**	DM	Integer	0 – 6655	u s b g l m d e c
Timers/Counters Present Value Words	PV	Integer	0 – 511	u s b g l m d e c
Timer/Counters Completion***	TC	Discrete	0 – 511	

**Note:** The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

- \* CH is an alias. The Address Range is limited to 0 – 255 and 0:00 – 255:15
- \*\* Address Range depends on CPU type used
- \*\*\* Read only

## CS1-Series Programmable Controller

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
Auxiliary Words**	A	Integer	0 – 959	u s b f g l m d e c
Auxiliary Bits**	A	Discrete	0:00 - 959:15	
Holding Words	H	Integer	0 – 511	u s b f g l m d e c
Holding Bits	H	Discrete	0:00 - 511:15	
Work Words	W	Integer	0 – 511	u s b f g l m d e c
Work Bits	W	Discrete	0:00 - 511:15	
CIO Words	CIO	Integer	0 – 6143	u s b f g l m d e c
CIO Bits	CIO	Discrete	0:00 - 6143:15	
Data Registers	DR	Integer	0 – 15	u s b
Index Registers*	IR	Long	0 – 15	m
Counter	PVC	Integer	0 – 4095	u s b f g l m d e c
Timer	PVT	Integer	0 – 4095	u s b f g l m d e c
Counter Completion****	C	Discrete	0 – 4095	
Timer Completion****	T	Discrete	0 – 4095	
Extended Data***	E	Integer	0 – 32767	u s b f g l m d e c
Data	D	Integer	0 – 32767	u s b f g l m d e c

**Note:** The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

- \* Default value for Long Tag Type is 32-bit integer
- \*\* Poke only allowed in the Address Range of 0 – 447 or 0:00 – 447:15
- \*\*\* Current Bank only (Memory Area Code 98)
- \*\*\*\* Read only

## CV500 Programmable Controller

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
CIO Words	CIO	Integer	0 – 2555	u s b f g l m d e c
CIO Bits	CIO	Discrete	0:00 – 2555:15	
Bus Link Words	G	Integer	0 – 255	u s b f g l m d e c
Bus Link Bits	G	Discrete	0:00 – 0255:15	
Auxiliary Words	A	Integer	0 – 511	u s b f g l m d e c
Auxiliary Bits	A	Discrete	0:00 – 0511:15	
Transition*	TN	Integer	0 – 511	
Step Flag Status*	ST	Integer	0 – 511	
IR Register*	IR	Integer	0 – 2	b
DR Register*	DR	Integer	0 – 2	
Timer Present Value	PVT	Integer	0 – 511	b
Counter Present Value	PVC	Integer	0 – 511	b
Data Memory	D	Integer	0 – 8191	u s b f g l m d e c
Timer Completion Flag*	T	Discrete	0 – 511	
Counter Completion Flag*	C	Discrete	0 – 511	

**Note:** The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

\* Read Only

## CV1000 and CV2000 Programmable Controller

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
CIO Words	CIO	Integer	0 – 2555	u s b f g l m d e c
CIO Bits	CIO	Discrete	0:00 – 2555:15	
Bus Link Words	G	Integer	0 – 255	u s b f g l m d e c
Bus Link Bits	G	Discrete	0:00 – 0255:15	
Auxiliary Words	A	Integer	0 – 511	u s b f g l m d e c
Auxiliary Bits	A	Discrete	0:00 – 0511:15	
Transition*	TN	Integer	0 – 1023	
Step Flag Status*	ST	Integer	0 – 1023	
IR Register*	IR	Integer	0 – 2	
DR Register*	DR	Integer	0 – 2	
Timer Present Value	PVT	Integer	0 – 1023	b
Counter Present Value	PVC	Integer	0 – 1023	b
Data Memory	D	Integer	0 – 24575	u s b f g l m d e c
Expansion Data**	E	Integer	0 – 32765	u s b f g l m d e c
Expansion Data A**	EA	Integer	0 – 32765	u s b f g l m d e c
Expansion Data B**	EB	Integer	0 – 32765	u s b f g l m d e c
Expansion Data C**	EC	Integer	0 – 32765	u s b f g l m d e c
Expansion Data D**	ED	Integer	0 – 32765	u s b f g l m d e c
Expansion Data E**	EE	Integer	0 – 32765	u s b f g l m d e c
Expansion Data F**	EF	Integer	0 – 32765	u s b f g l m d e c
Expansion Data G**	EG	Integer	0 – 32765	u s b f g l m d e c
Expansion Data H**	EH	Integer	0 – 32765	u s b f g l m d e c
Timer Completion Flag*	T	Discrete	0 – 1023	
Counter Completion Flag*	C	Discrete	0 – 1023	

Note: The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

\* Read Only

\*\* Address Range depends on CPU type used

## CVM1 Programmable Controller

Memory Area	Item Name	Tag Type	Address Range	Format Suffix
CIO Words	CIO	Integer	0 – 2555	u s b f g l m d e c
CIO Bits	CIO	Discrete	0:00 – 2555:15	
Bus Link Words	G	Integer	0 – 255	u s b f g l m d e c
Bus Link Bits	G	Discrete	0:00 – 0255:15	
Auxiliary Words	A	Integer	0 – 511	u s b f g l m d e c
Auxiliary Bits	A	Discrete	0:00 – 0511:15	
IR Register*	IR	Integer	0 – 2	
DR Register*	DR	Integer	0 – 2	
Timer Present Value	PVT	Integer	0 – 1023	b
Counter Present Value	PVC	Integer	0 – 1023	b
Data Memory	D	Integer	0 – 24575	u s b f g l m d e c
Expansion Data**	E	Integer	0 – 32765	u s b f g l m d e c
Expansion Data A**	EA	Integer	0 – 32765	u s b f g l m d e c
Expansion Data B**	EB	Integer	0 – 32765	u s b f g l m d e c
Expansion Data C**	EC	Integer	0 – 32765	u s b f g l m d e c
Expansion Data D**	ED	Integer	0 – 32765	u s b f g l m d e c
Expansion Data E**	EE	Integer	0 – 32765	u s b f g l m d e c
Expansion Data F**	EF	Integer	0 – 32765	u s b f g l m d e c
Expansion Data G**	EG	Integer	0 – 32765	u s b f g l m d e c
Expansion Data H**	EH	Integer	0 – 32765	u s b f g l m d e c
Timer Completion Flag*	T	Discrete	0 – 1023	
Counter Completion Flag*	C	Discrete	0 – 1023	

Note: The value range for unsigned integer is 0 – 65535, for signed integer is -32768 – 32767 and for 16-bit BCD is 0 – 9999. The value range for 32-bit integer is -2147483648 – 2147483647 and for 32-bit BCD is 0 – 99999999. Default value range for Integer Tag Type is unsigned integer.

\* Read Only

\*\* Address Range depends on CPU type used

---

# Predefined Item/Point Names

All topics have predefined item/point names to monitor and control communication properties.

## UPDATEINTERVAL Item

The **UPDATEINTERVAL** item is used to access the currently set update interval. It is the same value displayed in the monitor window of the server. It indicates the current requested update interval in milliseconds. If the corresponding topic is configured for **Enable access to update interval**, a client can poke new values into this item. In any case, the value can always be read through DDE or SuiteLink.. The range of valid values differs with respect to the topic settings. The value of zero indicates that no items on that topic are updated.

TYPE: INTEGER

ACCESS: READ, WRITE (if configured)

RANGE: 1..2147483647

0 (topic inactive, no items are polled, however unsolicited messages are received)

---

**Note:** By poking a value of zero into the update interval item a client can conveniently stop all update activities on the corresponding topic without having to deactivate the items.

---

## MAXINTERVAL Item

The **MAXINTERVAL** item is used to access the measured maximum update interval in milliseconds of all items of the corresponding topic for the last completed poll cycle. It is the same value displayed in the monitor window of the server under "Longest Interval". This item is read only. The value of the slowest item is displayed.

TYPE: INTEGER

ACCESS: READ

RANGE: 0..2147483647

---

**Note:** Use the **UPDATEINTERVAL** and **MAXINTERVAL** items to conveniently tune the performance of the communication.

---

## STORESETTINGS Item

The **STORESETTINGS** item is used to make the temporary update interval changes via DDE or SuiteLink permanent. If the client pokes a value of 1 to the **STORESETTINGS** item, the current set update interval is written to the server's configuration file. If the update interval has been changed and **STORESETTINGS** is not poked to 1, the server will use the original update interval for that topic the next time it is started. Reading the item will always return 0.

TYPE: DISCRETE  
ACCESS: READ, WRITE  
RANGE: 0, 1

---

**Note:** Use this item to conveniently store your optimized configuration through DDE or SuiteLink.

---

## ITEMCOUNT Item

The **ITEMCOUNT** item is used to access the number of active items in the corresponding topic. It is the same value displayed in the monitor window of the server under "Items". This item is read only.

TYPE: INTEGER  
ACCESS: READ  
RANGE: 0..2147483647

---

**Note:** Use the **ITEMCOUNT** item to monitor the number of currently active items.

---

## ERRORCOUNT Item

The **ERRORCOUNT** item is used to access the number of active items with errors in the corresponding topic. It is the same value displayed in the monitor window of the server under "errors ( ) only". If the communication status of a topic is bad, all items have errors (item count equals error count). This item is read only.

TYPE: INTEGER  
ACCESS: READ  
RANGE: 0..2147483647

---

**Note:** Use the **ERRORCOUNT** item to check for badly configured items or invalid item values. If the topic's **Status** is 1 and **ERRORCOUNT** is not zero, an error has been detected.

---

## WRITECOMPLETE Item

The **WRITECOMPLETE** item is used to access the state of pending write activities on the corresponding topic. When the topic is initially opened, the **WRITECOMPLETE** item is 1 indicating all write activities are complete - no pokes are pending. When values are poked into any of the topic's items, the **WRITECOMPLETE** item changes to 0 indicating write activity is currently in progress. When the server completes all write activities, the **WRITECOMPLETE** item changes to 1 if all pokes were successful or to -1 if at least one poke failed. When **WRITECOMPLETE** item is not zero, a client can poke it with a value of 1 or -1. Poking a 1 clears **WRITECOMPLETE** errors. Poking a -1 forces the **WRITECOMPLETE** value to indicate an error for simulation of a failed write activity.

TYPE: INTEGER

ACCESS: READ/WRITE

RANGE: -1,0,1

---

**Note:** Use the **WRITECOMPLETE** item to serialize a sequence of poked values to a single item or to monitor success or failure of poking into one or more items.

---

## STATUS Item

The **STATUS** item is used to access the state of communication between the server and PLC. The discrete item, **STATUS**, indicates successful communication when its value is 1 and failed communication when its value is 0.

TYPE: DISCRETE

ACCESS: READ ONLY

RANGE: 0,1

## 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:

**= FINSGTWY|Node2!Status**

where:

<b>FINSGTWY</b>	Is the server application name.
<b>Node2</b>	Is the exact topic name defined in the server for the PLC.
<b>Status</b>	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!Node2**

or

**=view|IOStatus!Node2**

where:

<b>view</b>	Is the name of the InTouch application.
<b>[DDE][IO]Status</b>	Built-in topic name used to monitor the status of communications between the server and InTouch.
<b>Node2</b>	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:

**=applicationname|topicname!itemname**

Example formula:

**=FINSGTWY|Node2!'DM100'**

where:

<b>FINSGTWY</b>	Is the server application name.
<b>Node2</b>	Is the exact topic name defined in the server for the PLC.
<b>DM100</b>	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 **DM100** 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) & Windows2000 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.

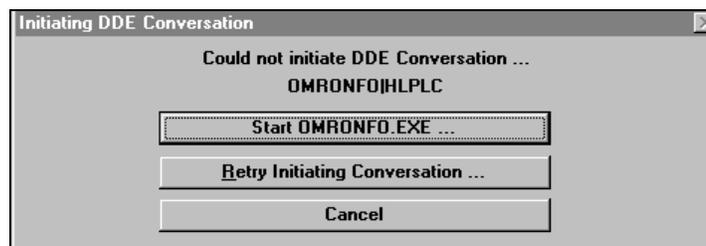
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**Note:** We highly recommend starting all the servers required by the InTouch application before starting WindowViewer. InTouch (versions prior to 7.0) will display the **Initiating DDE Conversation** message box for each uninitiated conversation.

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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 / Windows 2000, 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.

➤ **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 SuiteLink Communication

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
- Receive Overrun
- Framing Errors

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**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.

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➤ **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.

- ☞ 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 NT or Windows 2000, 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 (**AUTOEXEC.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.

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➤ **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.

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**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.

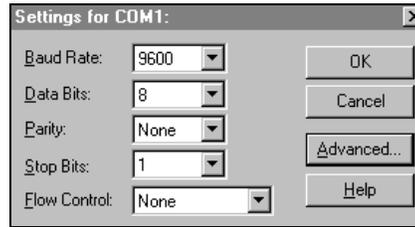
If possible, use an external converter instead of a board-based converter that plugs into a slot in the computer. A board-based converter is difficult to get working for inexperienced users. If a board-based converter is not set up properly, it can conflict with other communication boards in the computer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

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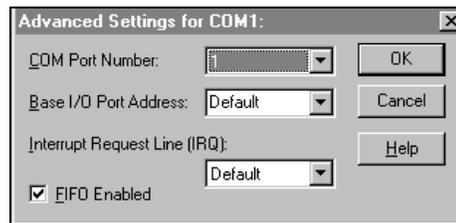
➤ **If you are using the Windows NT operating system, verify the following:**

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:



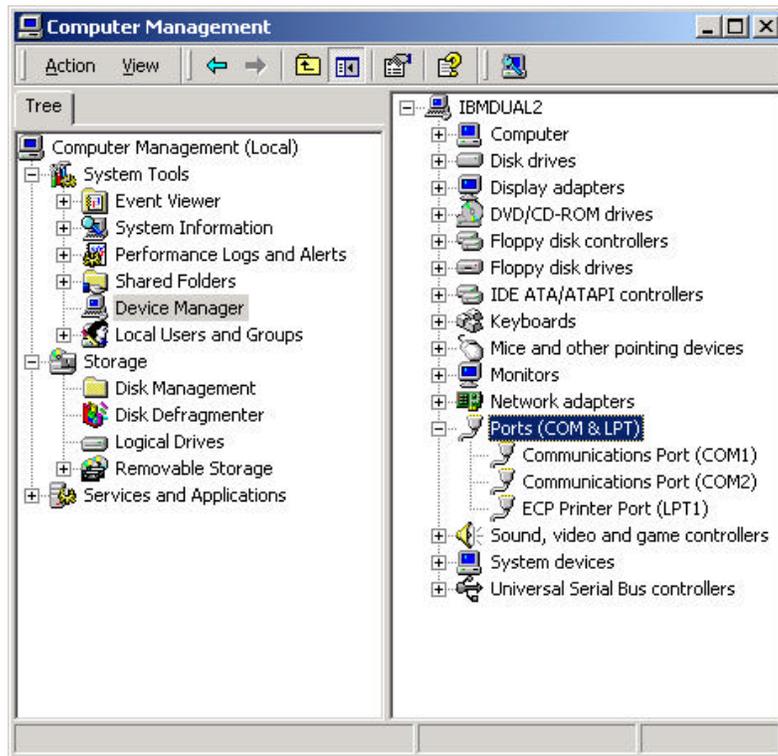
4. Click Advanced. The Advanced Settings for COMx dialog box appears:



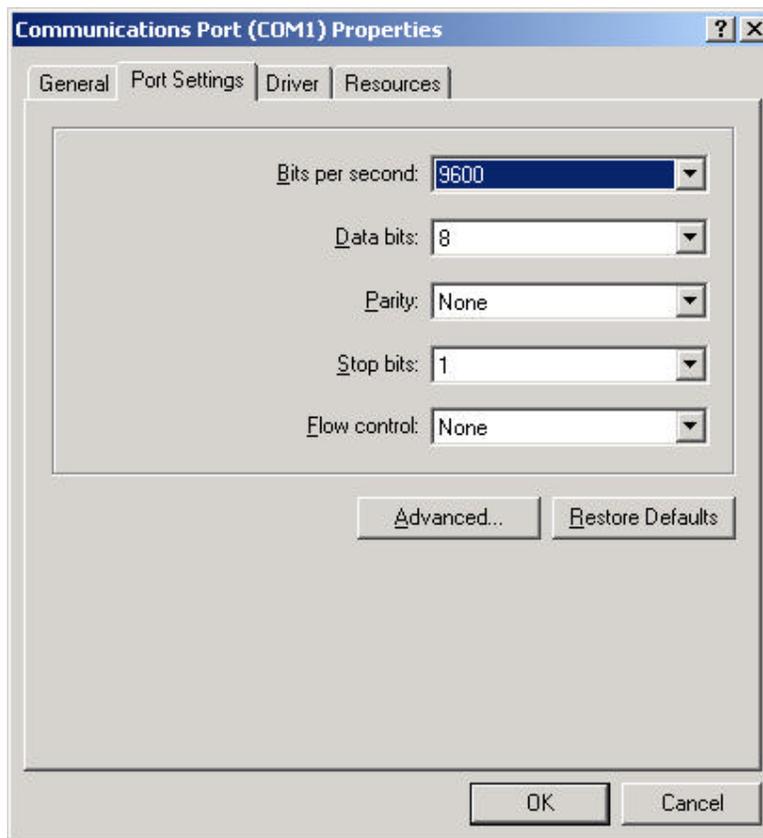
5. Lowering the setting for the Interrupt Request Line (IRQ) value to the minimum may solve I/O communication problems for portable computers (notebook or laptops) and framing errors for standard computers.

➤ **If you are using the Windows 2000 operating system, verify the following:**

1. Click Start on the Windows task bar. Point to Settings, then click Control Panel in the menu. The Control Panel dialog box will appear. Now click on Administrative Tools.
2. In the Administrative Tools Dialog double-click the Computer Management icon, the Computer Management dialog box will appear. Click on Device Manager and select the COM port you are using for the server. For example:

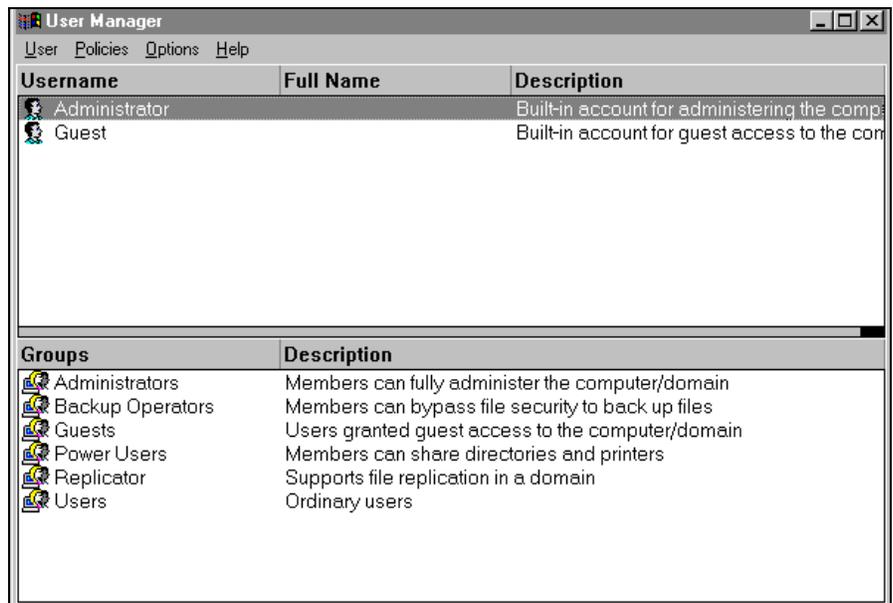


3. Click on the selected Communication Port. The Properties dialog box will appear. Click the Port Settings tab.



- **How long is your RS-232 cable?**

Fifteen meters (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 are installing an I/O Server or configuring a board-based I/O Server on a computer running on the Windows 2000 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. On the Windows taskbar Start/Settings/Control Panel. In the Control Panel click on Users and Passwords, the Users and Passwords 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 Group Membership tab and verify "Administrator" is selected.

➤ **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.

- **Verify the PLC is properly configured and the cable is good by using the programming software for the PLC.**
  1. Connect to the PLC with the programming software. The connection must be through the same port and cable. Go into the programming software configuration and write down what the communications parameters are (baud rates, routes, node number, error checking, etc.).
  2. Close the programming software. Open the I/O Server and verify the communications settings are the same.
  3. Poke data into the PLC with InTouch or WWClient.
  4. Shut down the server and use the programming software to verify that the values were correctly poked.
    - ☞ 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 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*.

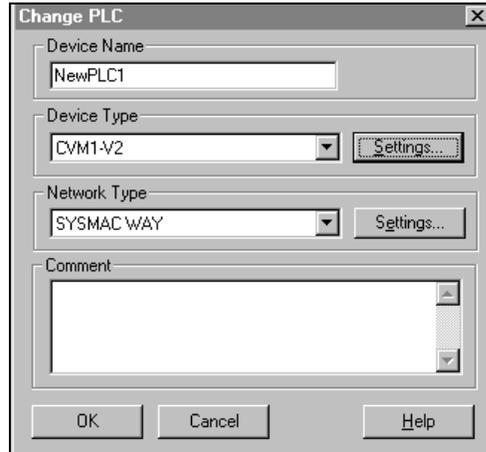
## Appendix A

### IP Address Table Set Up Using OMRON's CX-Programmer Utility

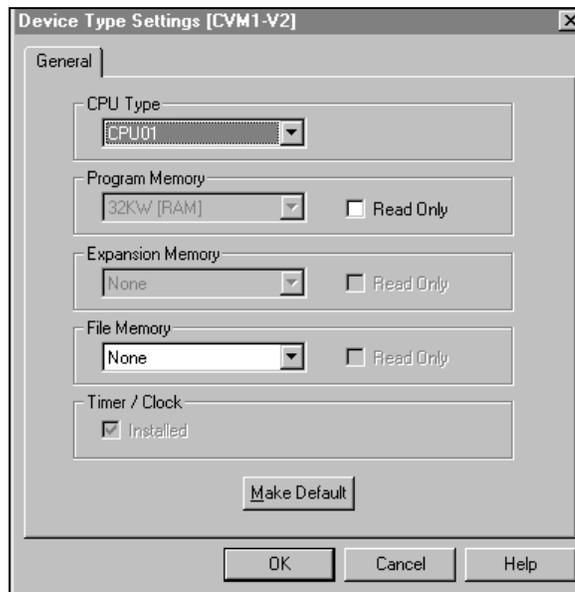
If the PLC is a CS1-Series, CX-Programmer version 1.0 may be used. For CV-Series PLCs, version 1.1 or later must be used. For C-Series PLCs, the DOS-based Setup Disk supplied with the hardware must be used. Contacting OMRON directly for C-Series PLC setup is highly recommended. Or consult OMRON's *SYSMAC C200HW- PCU01, C200HW-PCS01-EVI PC CARD UNIT Operational Manual* for detailed instructions using the utilities.

Verify FinsGateway Serial Unit Service is not running. Connect the PLC Host Link port to the PC serial port using a serial cable supplied by OMRON.

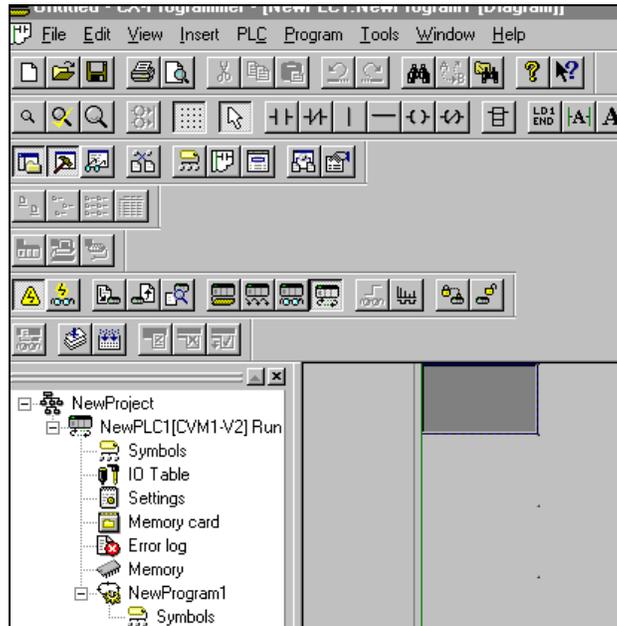
Select Start/Programs/OMRON/CX-Programmer/CX-Programmer to start the CX-Programmer. Select File/New for the Change PLC dialog to appear:



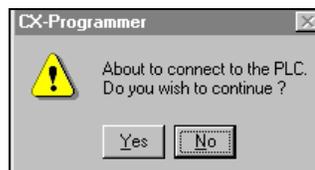
Enter the Device Name. Select the **Device Type** and **Network Type** from its drop-down list. Choose **Device Type/Settings...** to select the CPU type. CPU01 was selected for this example.



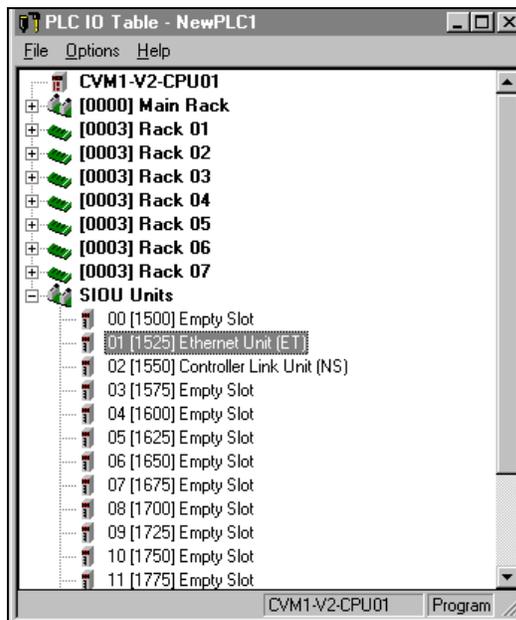
Selecting **OK** twice, returns to the main dialog of the CX-Programmer.



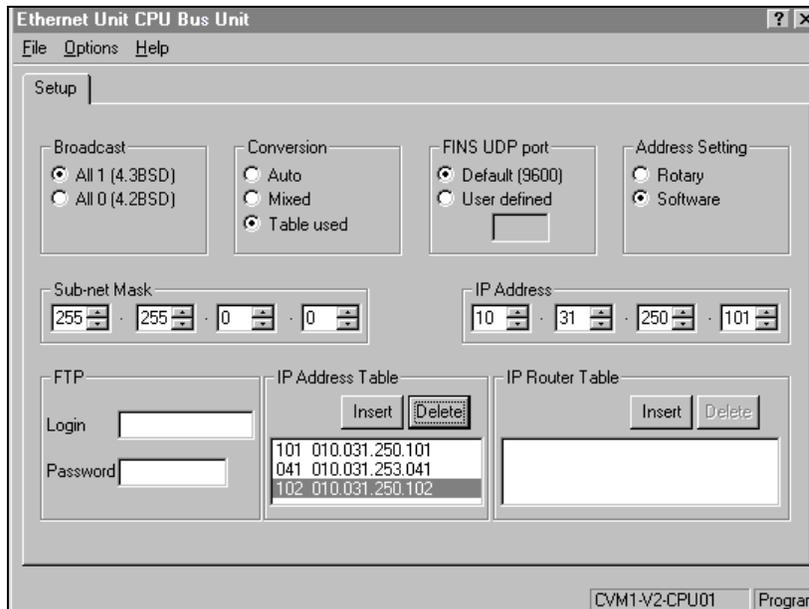
Select **PLC/Work Online** and acknowledge the confirmation message.



Select the PLC/IO Table and the PLC IO Table dialog appears.

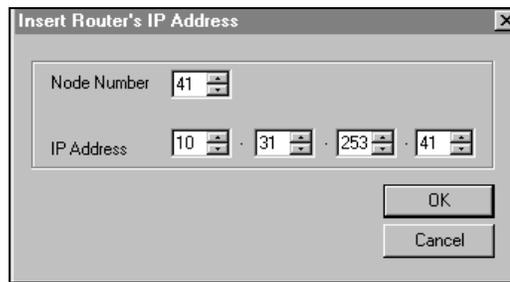


Select Options/Transfer from the PLC. When the transfer is complete, right click on Ethernet Unit (ET)/CPU Bus Unit Setup. The Ethernet Unit CPU Bus Unit dialog appears:



Select the Sub-net Mask and the PLC IP Address. The example dialog above has 255.255.0.0. for the Sub-net Mask and 10.31.250.101 for the IP Address.

An IP Address Table is created by selecting Insert and entering the Node Number and IP Address.



Do this for every Ethernet node in your network. Shown in this example are three inserted Nodes with their respective IP Address:

101 010.031.250.101 (PLC – CVM1-V2)

041 010.031.253.041 (Host PC)

102 010.031.250.102 (another PLC – CS1H)

When finished entering all the addresses, select Options/Transfer to PLC. When the transfer is complete, closing the PLC IO Table dialog will complete the IP Address Table setup.

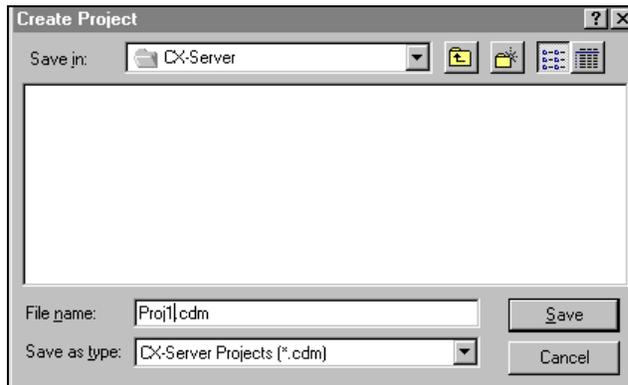
## Appendix B

### Routing Table Set Up Using OMRON's CX-Programmer Utility

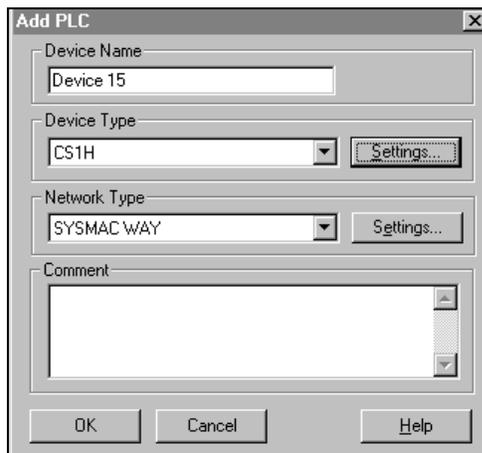
If the PLC is a CS1-Series, CX-Programmer version 1.0 may be used. For CV-Series PLC, version 1.1 or later must be used. For C-Series PLC, the DOS based Setup Disk supplied with hardware must be used. Contacting OMRON directly for C-Series PLC setup is highly recommended. Or consult OMRON's *SYSMAC C200HW-PCU01, C200HW-PCS01-EVI PC CARD UNIT Operational Manual* for detailed instructions using the utilities.

Verify FinsGateway Serial Unit Service is not running. Connect the PLC Host Link port to the PC serial port using a serial cable supplied by OMRON.

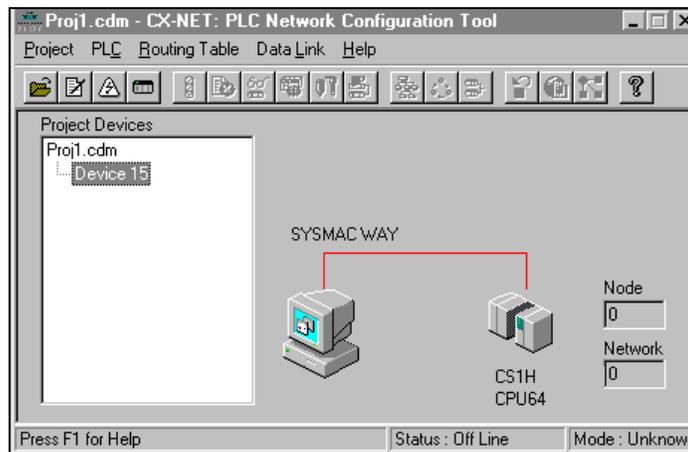
Select Start/Programs/OMRON/CX-Server/CX-Net Network Configuration Tool. Select Project/New and enter the project name and select Save. This example shows Proj1.cdm as its project name.



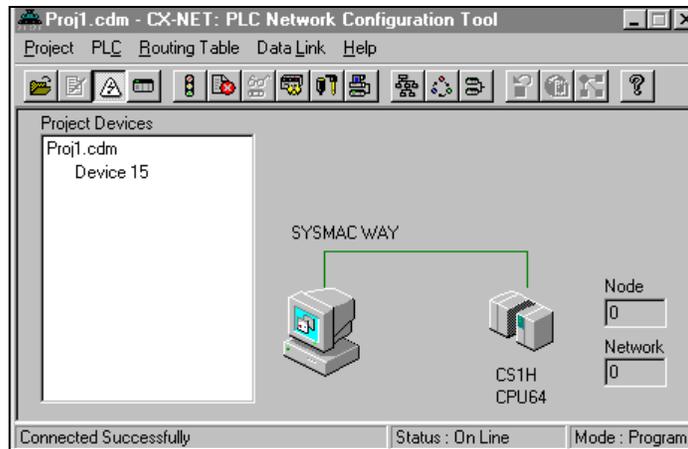
Select Project/Add Device. The Add PLC dialog appears. Enter Device Name and select Device Type.



In this example, Device 15 is the Device Name and CS1H is the Device Type. To return to the project dialog showing the Device Name under the project name, select OK.

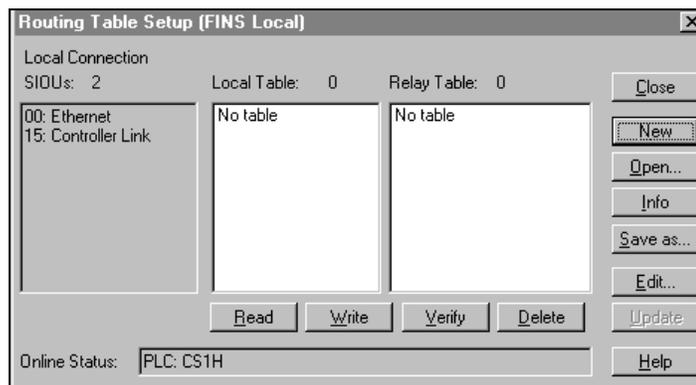


Select Device 15 then move the mouse over the PLC drawing and right-click on PLC/Device/Open. The line labeled SYSMAC WAY should turn from red to green.



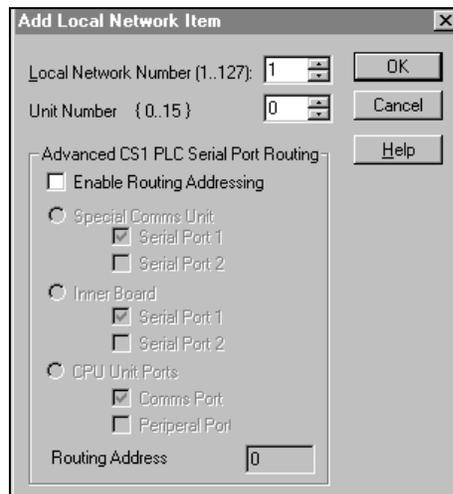
Select the Routing Table Setup. The program displays the SIOUs found in the network:

00:Ethernet and  
15:Controller Link

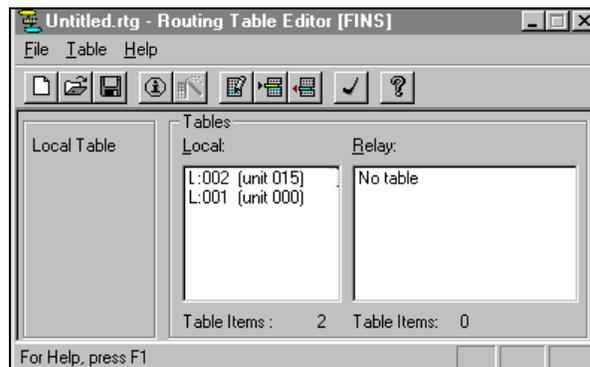


Click Edit to open Routing Table Editor.

Then in the Routing Table Editor select Table/Insert Table Item to get the Add Local Network Item dialog.

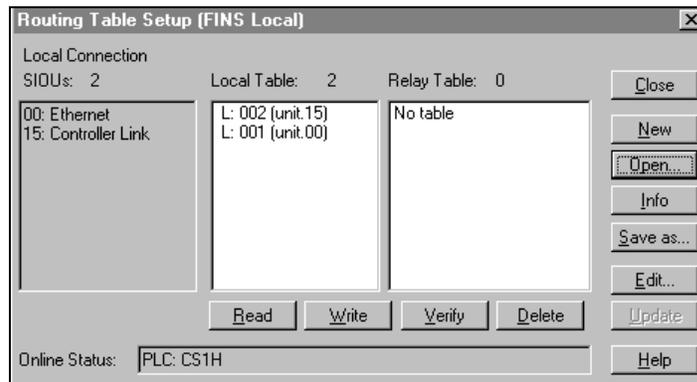


Enter the local network number and unit number. In this example, 1 and 0 were entered for an Ethernet network. Select **OK** to return to the Routing Table Editor dialog. Select the **Table/Insert Table** Item again to add another network.



In this example, for the Controller Link Network the local network number is 2 and unit number is 15. Select the **Save** icon and then **File/Exit** to return to the Routing Table Setup dialog.

Now click **Update**.



Then click on **Write** to load the settings into the PLC. After the download is complete, close the **Routing Table Setup** dialog

