Pass Through Program
(For the ROC800-Series Remote Operations Controller)

User Manual
(QER 05Q045)

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EMERSON
Process Management

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This manual may be revised periodically to incorporate new or updated information. The revision date of each page appears at the bottom of the page opposite the page number. A change in revision date to any page also changes the date of the manual that appears on the front cover. Listed below is the revision date of each page (if applicable):

Page	Revision
Initial release	Mar-06

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1 INTRODUCTION

1.1 Scope and Organization

This document serves as the user manual for the Pass Through program (QER 05Q045), which is intended for use in the ROC800-Series Remote Operation Controllers ("ROC800s"). This manual describes how to download, install, and configure the Pass Through user program (referred to as the "Pass Through program" or "the program" throughout the rest of this manual). You access and configure this program using ROCLINK™ 800 Configuration Software loaded on an IBM-compatible personal computer running Windows® 98, NT 4.0 (with Service Pack 6), 2000 (with Service Pack 2), or XP.

The sections in this manual provide information in a sequence appropriate for first-time users. Once you become familiar with the procedures and the software, the manual becomes a reference tool.

This manual has the following major sections:

- Section 1 – Introduction
- Section 2 – Installation
- Section 3 – Configuration
- Section 4 – Reference

This manual assumes that you are familiar with the ROC800s and their configuration. For more information, refer to the following manuals:

- *ROC809 Remote Operations Controller Instruction Manual* (Form A6116).
- *ROC827 Remote Operations Controller Instruction Manual* (Form A6175).
- *ROCLINK 800 Configuration Software User Manual* (Form A6121).

1.2 Product Overview

The Pass Through program enables host programs to send and receive messages from other devices through the host's connection to the ROC800. This pass-through feature supports host messages coming in through Ethernet or serial connections and then passing back out through another Ethernet connection or through different serial connections. Essentially, this means you can route requests from high-bandwidth (Ethernet-based) devices to low-bandwidth (serial-based) devices and back again. The program also provides a method to convert serial and Ethernet messages passing to and from devices attached to different physical connections.

For example, a host is connected via Ethernet to a ROC800. A FloBoss 407 is physically connected serially to the same ROC800. The Pass Through program enables the host to pass a message through the ROC800 to the FloBoss 407 via the serial connection. This can be especially useful for remote connections to ROC300-Series, FloBoss 100-Series, FloBoss 500-Series, FloBoss 407s, Modbus slave devices, or other ROC800s.

Note: The ROC Protocol limits the total number of serially-connected devices you can manage. Refer to the *ROC Plus Protocol Specification Manual* (Form A6127) for further information.

To accomplish this pass-through functionality, you complete the parameters on the Pass Through configuration screen, identifying the communications port the host connection and the slave connection(s) use.

Note: In addition to **routing** host requests through Ethernet-connected to serially connected flow computers or ROCs, you can also enable the routing ROC to respond to the host request using the industry-standard internal loopback address of **127.0.0.1:4000**. Since this program, by default, passes through all messages, it does not allow the ROC800 to "monitor" and then respond to messages intended for itself. However, you can configure the program to route incoming messages to the internal loopback address, which enables the ROC800 to respond to incoming Ethernet messages addressed to itself.

1.2.1 Product Environment

Figure 1 presents an example environment in which you might use the Pass Through program.
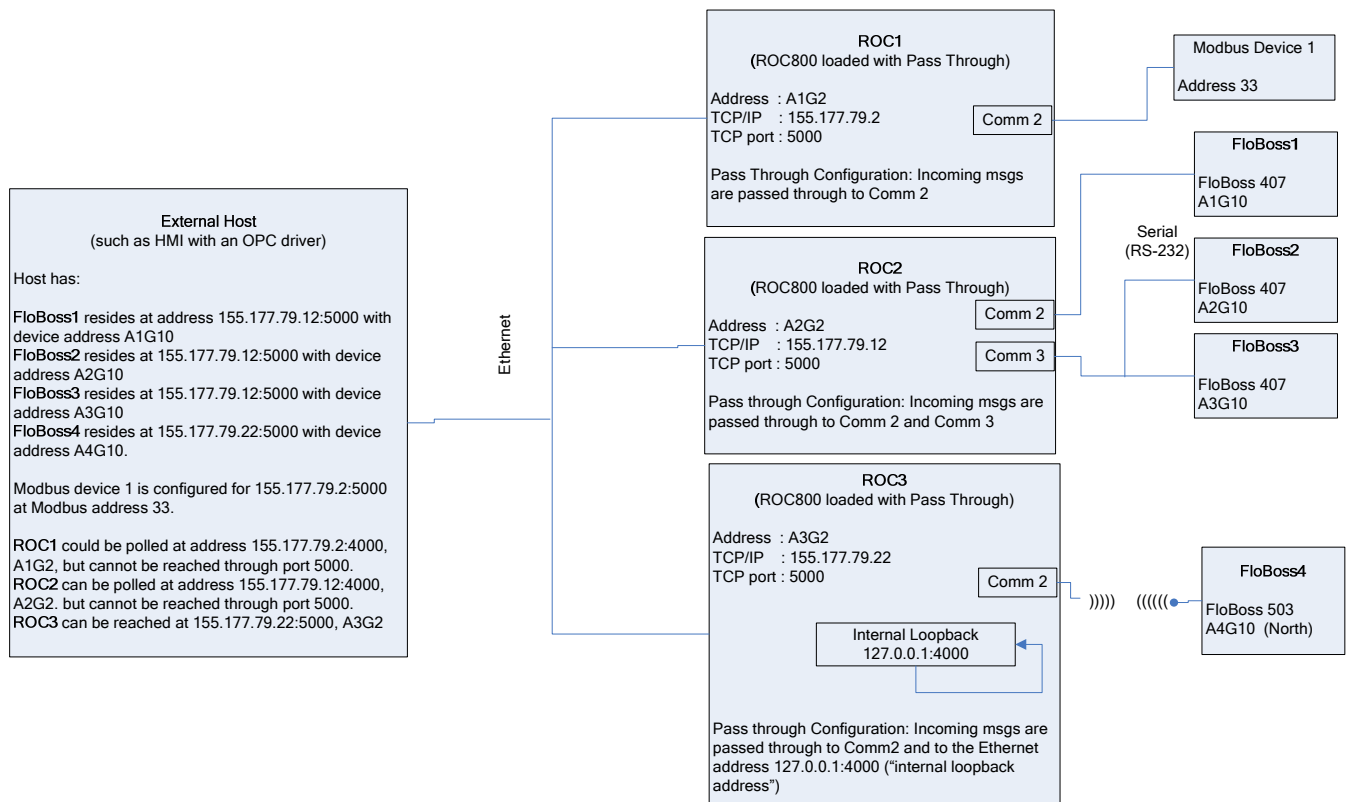

Figure 1. Pass Through Environment

Figure 1 shows how remote serial devices might be connected to a host using the Pass Through program. In this example, the host connects to the ROC800s (ROC1, ROC2, and ROC3) via Ethernet. The Pass Through program is located on each ROC800. Host requests come to port 5000 of the ROC800s and are,

in turn, sent out to the appropriate serial or Ethernet ports according to the configuration of the Pass Through program.

The Modbus device, the FloBoss 503, and the FloBoss 407s connect to the ROC800s using either a serial connection or a radio connection. Without the Pass Through program, they cannot respond to requests from the host. Once both the host and the Pass Through program are configured correctly, these devices can communicate with the host.

Note also that ROC3 uses the internal loopback address (127.0.0.1:4000) in order to respond to requests from the host. This would not typically be the way the host is configured, since ROC3 would probably be polled directly on port 4000. However, this loopback example is provided to illustrate this functionality.

Note: Refer to Appendix A in the *Protocol Driver Host Program User Manual* (Form A6201) for more information in using the Pass Through program in conjunction with the Protocol Driver Host program.

1.3 Program Requirements

The Pass Through program is compatible with version 1.50 (or greater) of the ROC800-Series firmware and with version 1.51 (or greater) of the ROCLINK 800 software.

Program specifics include:

File Name	Target Unit/ Version	User Defined Point (UDP)	Flash Used (in bytes)	SRAM Used (in bytes)	DRAM Used (in bytes)	ROCLINK 800 Version	Display Number
PassThrough.tar	ROC800 1.52	41	99782	558	229376	1.60	41

Note: You must connect a PC to the ROC800's LOI port before starting the download.

For information on viewing the memory allocation of user programs, refer to the *ROCLINK 800 Configuration Software User Manual* (Form A6121).

1.3.1. License Keys

License keys, when matched with valid license codes, grant access to applications such as the Run Switching program.

The term "license key" refers to the physical piece of hardware that can contain up to seven different licenses (refer to Figure 1). Each ROC800 can have none, one, or two license keys installed. If you remove a license key after enabling an application, the firmware disables the task from running. This prevents unauthorized execution of protected applications in a ROC800.
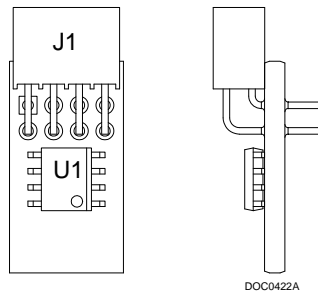

Figure 2. License Key

Note: You must install the 05Q045 license key to use the Pass Through program.

2 INSTALLATION

This section provides instructions for installing the Run Switching program. Read Section 1.3 of this manual for program requirements.

2.1 Installing the License Key

If you order the Pass Through program for a new ROC800, your ROC800 is delivered with the license key installed. Go to Section 2.2.

If you order the program for an existing ROC800, you must install the license key yourself.

> ### ⚠ CAUTION
>
> **Failure to exercise proper electrostatic discharge precautions—such as wearing a grounded wrist strap—may reset the processor or damage electronic components, resulting in interrupted operations.**
>
> **When working on units located in a hazardous area (where explosive gases may be present), make sure the area is in a non-hazardous state before performing these procedures. Performing these procedures in a hazardous area could result in personal injury or property damage**

To install a license key:

1. Remove power from the ROC800.
2. Remove the wire channel cover.
3. Unscrew the screws from the Central Processing Unit (CPU) faceplate.
4. Remove the CPU faceplate.
5. Place the license key in the appropriate terminal slot (**P4** or **P6**) in the CPU (refer to Figure 2).

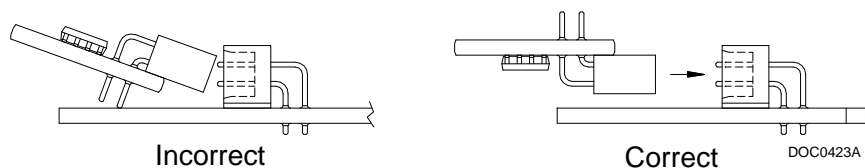Incorrect   Correct   DOC0423A

Figure 3. License Key Installation

Note: When using a single license key, install it in **slot P4**.

6. Press the license key into the terminal until it is firmly seated (refer to Figure 2).
7. Replace the CPU faceplate.
8. Replace the screws on the CPU faceplate.
9. Replace the wire channel cover.

10. Restore power to the ROC800.

2.1.1 Verifying the License Key Installation

After you install the license key, you can verify whether the ROC800 recognizes the key. From the ROCLINK 800 screen, select **Utilities** > **License Key Administrator**. The License Key Administrator screen displays:
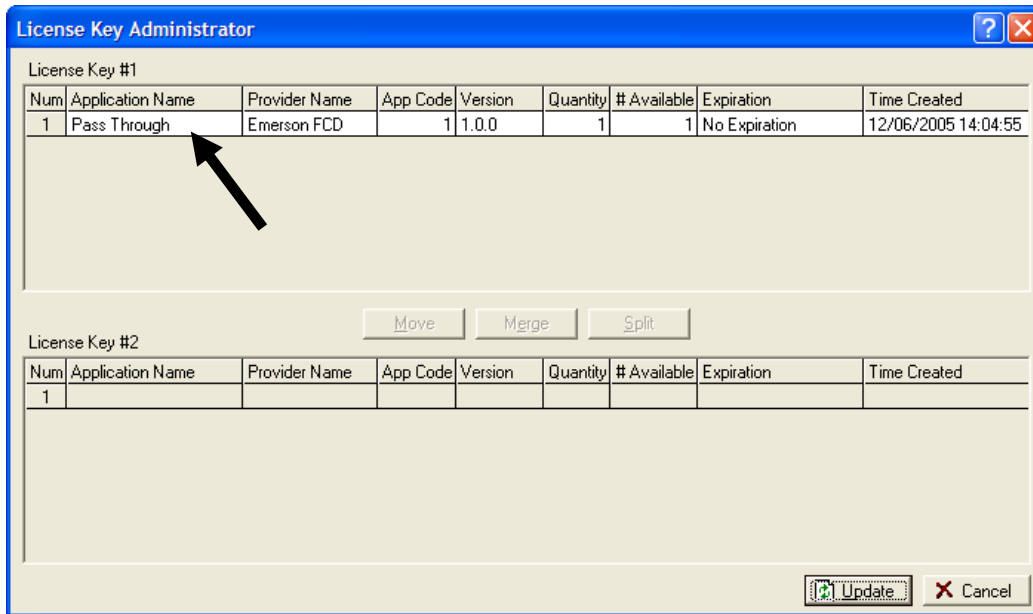
Figure 4. License Key Administrator

The Pass Through program appears in the Application Name column. (For further information on the License Key Administrator screen, refer to the *ROCLINK 800 Configuration Software User Manual,* Form A6121).

After you verify that the license key is correctly installed and recognized, proceed to Section 2.2.

2.2 Downloading the Program

This section provides instructions for installing the program into the Flash memory on the ROC800.

To download the program using ROCLINK 800 software:

1. Connect the ROC to your computer using the LOI port.

2. Start and logon to ROCLINK 800.

3. Select **Utilities** > **User Program Administrator** from the ROCLINK menu bar. The User Program Administrator screen displays (see Figure 4):
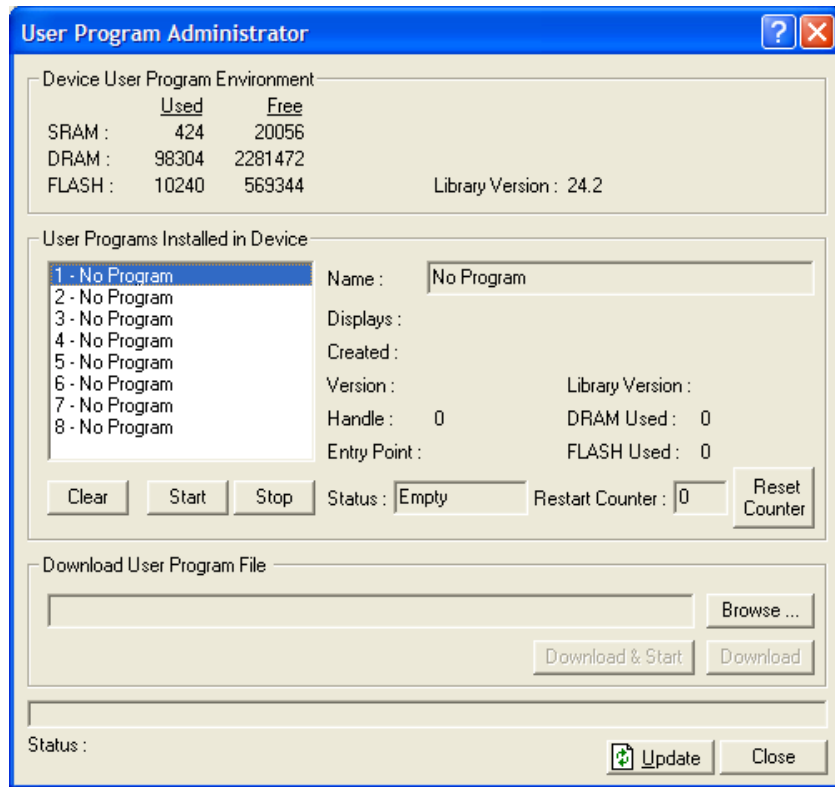
Figure 5. User Program Administrator

4. Select any empty program number into which to download the program.

5. Click **Browse** in the Download User Program File frame. The Select User Program File screen displays (see Figure 5).

6. Select the path and user program file to download from the CD-ROM. (Program files are typically located in the Program Files folder on the CD-ROM). As Figure 5 shows, the screen lists all valid user program files with the .TAR extension:

Figure 6. Select User Program File

7. Click **Open** to select the program file. The User Program Administrator screen displays. As shown in Figure 6, note that the Download User Program File frame identifies the selected program and that the **Download & Start** button is active:
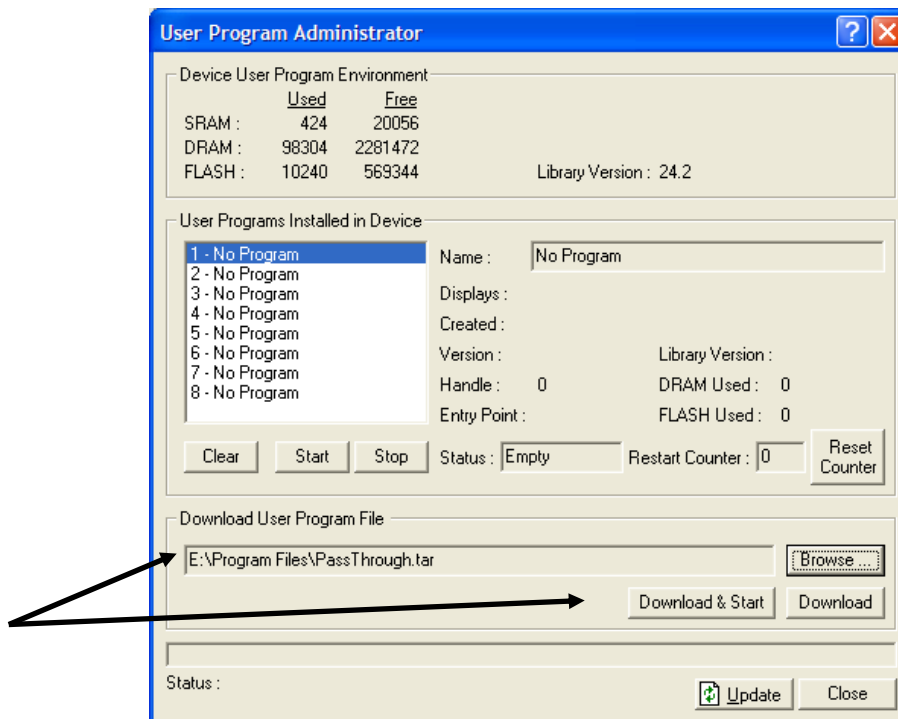
Figure 7. User Program Administrator

8. Click **Download & Start** to begin loading the selected programs. The following message displays:
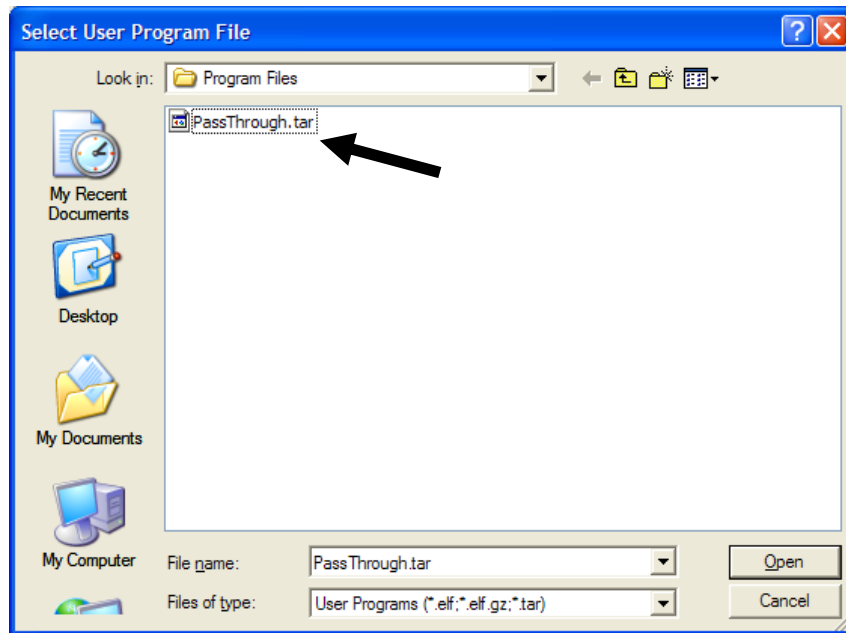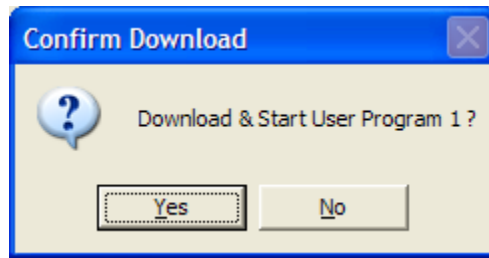
Figure 8. Confirm Download

9. Click **Yes** to begin the download. When the download completes the following message displays:
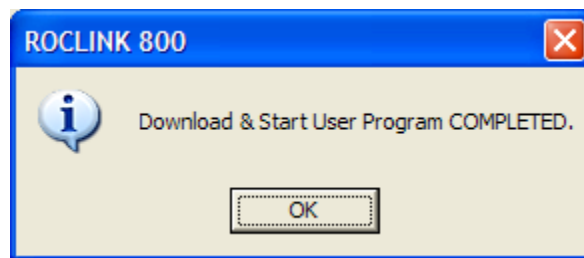
Figure 9. ROCLINK 800 Download Confirmation

10. Click **OK**. The User Program Administrator screen displays (see Figure 10). Note that:

- The Device User Program Environment frame reflects the use of system memory.
- The User Programs Installed in Device frame identifies the installed program(s).
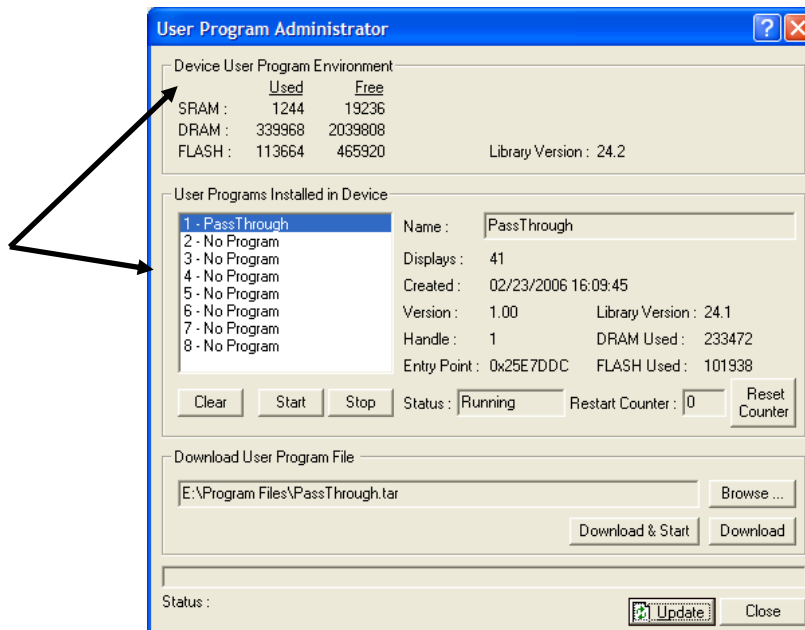
Figure 10. User Program Administrator

11. Click **Close**. The ROCLINK 800 screen displays and the download is complete.
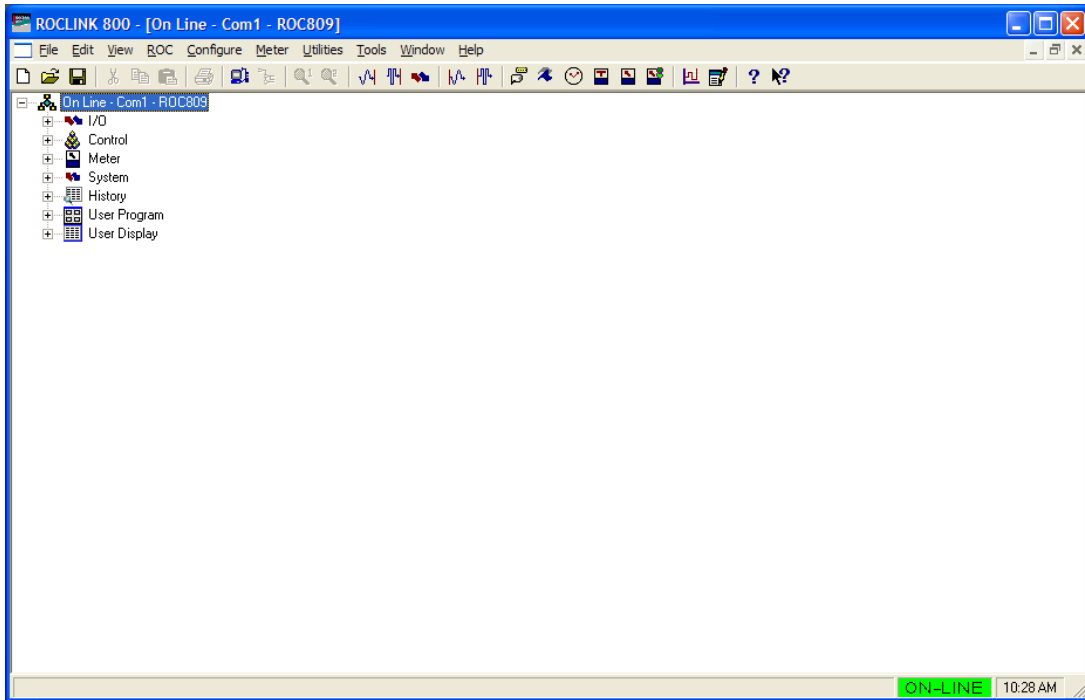
Figure 11. ROCLINK 800

3 CONFIGURATION

After you have loaded the Pass Through program on the ROC800, you configure the program using one ROCLINK 800 screen and a program-specific screen (Pass Through Configuration):

- Use ROCLINK 800's Comm Port screen to associate the Pass Through program with a comm port.
- Use the program-specific Pass Through Configuration screen to configure all other program parameters.

You can access the program-specific screen from the main ROCLINK 800 screen:
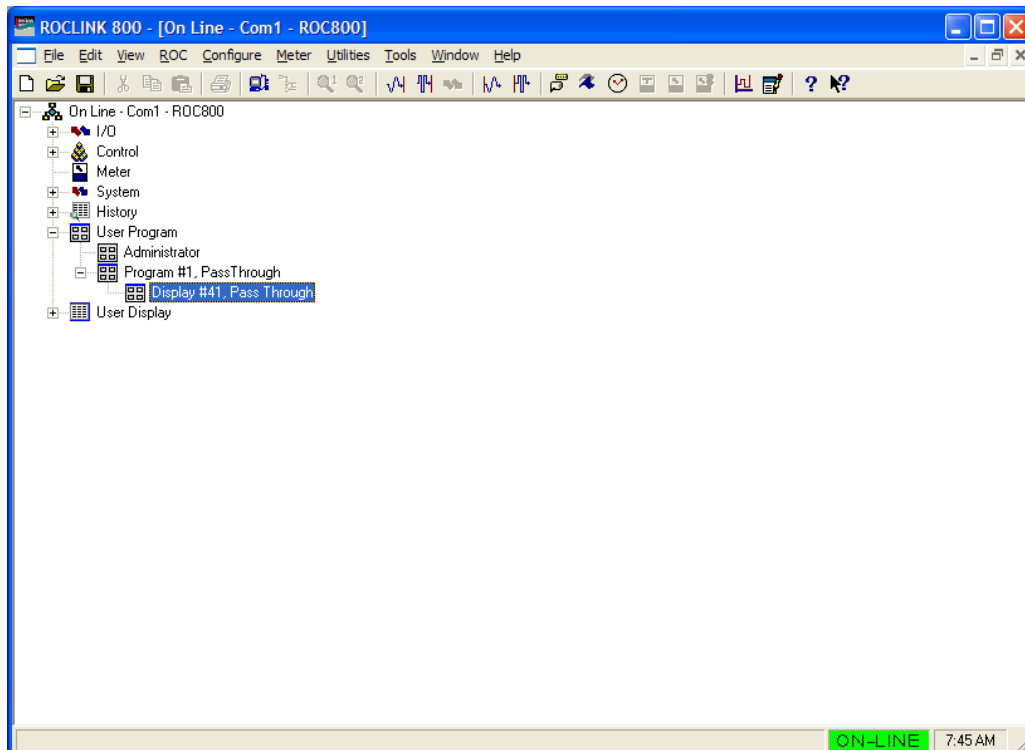
Figure 12. ROCLINK 800

3.1 Comm Port Screen

Use this screen to indicate the serial communications ports the external host (such as an HMI with an OPC driver) uses when passing requests through the ROC800 to other communication ports.

Many other user programs use a one-to-one correlation between a communication port and a program. This program permits a many-to-one correlation, allowing you associate multiple ports with the Pass Through program. With different logical instances of this screen, you identify the communication ports through which host requests come. You can ignore the Ethernet port (Comm1) since the Ethernet program is configured to pass through host requests on one of the user displays installed with this program.

Once you associate a communications port with a user program, you cannot use that port as a slave port (a port through which the ROC800 passes host messages). For reference, ROC2 in Figure 1 has Comm2 and Comm3 designated as slave ports.

To access this screen:

1. From the ROCLINK 800 menu bar, select **ROC** > **Comm Ports**. The Comm Port screen displays.
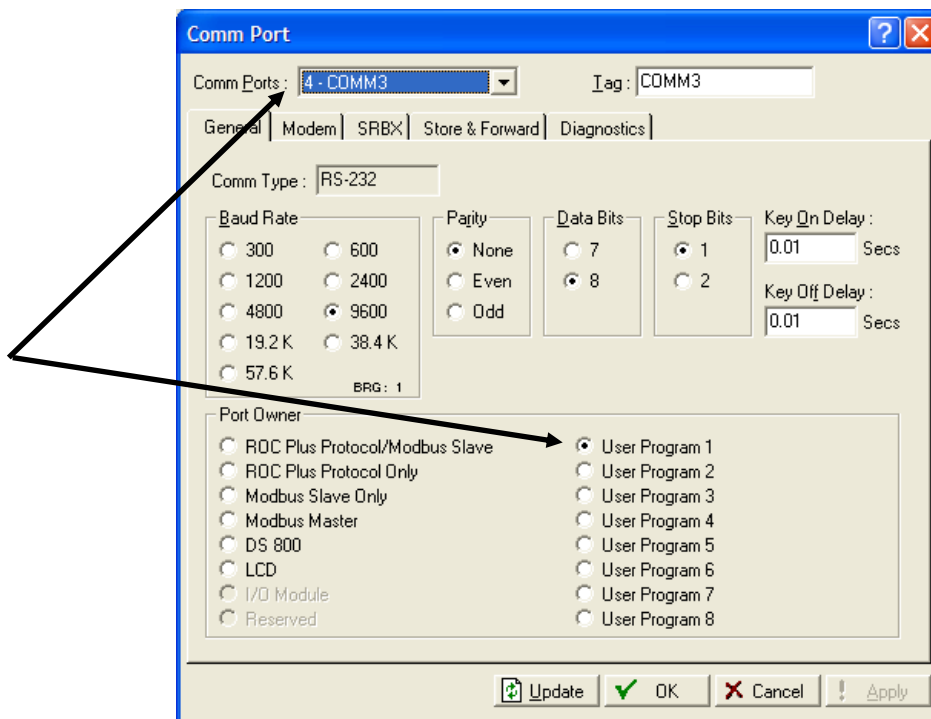
Figure 13. Comm Port

2. Select a comm port (in this example, COMM3) and associate it with the specific user program number (in this case, User Program 1) that represents the Pass Through program.

    Note: The program number may change, depending on where you have installed it.

3. Click **Apply** to save your changes. Proceed to Section 3.2.

3.2 Pass Through Configuration Screen

Use this screen to configure parameters for the Pass Through program. As you configure this program, keep the following conditions (or "operational rules") in mind:

- A "host" port is any comm port to which a host connects with the intent of passing messages through a slave port.

- If you intend that a host connect to one or more serial ports, you must associate those ports with the Pass Through program (see Section 3.1). You can associate multiple serial ports with the program. Using the Pass Through Configuration screen, you can designate the Ethernet port as a host port.

  Note: SRBX is not supported for the comm port you associate with the Pass Through program.

- You cannot designate a port as both slave and host. To assist in the configuration, the program automatically "grays out" invalid selections.

  For example, you associated Comm 3 with the program (see Section 3.1). Comm 3 is now available for selection on any of the logical iterations of the Pass Through Configuration screen. However, once you select Comm 3 on **any** logical iteration of the Pass Through Configuration screen, the program prevents you from selecting it as a host on any other logical iteration and grays the port out as a reminder.

  Note: Use the tabs on the configuration screen (which represent logical iterations—or "logicals"—of this program) to configure up to three unique pass-through scenarios.

- Slaves can be slaves on any logical.

To access this screen:

1. From the Directory Tree, select **User Program** > **Program #2, Pass Through**.

   Note: The program number may change depending on where you installed it.

2. Double-click **Display #41, Pass Through**. The Pass Through Configuration screen displays:
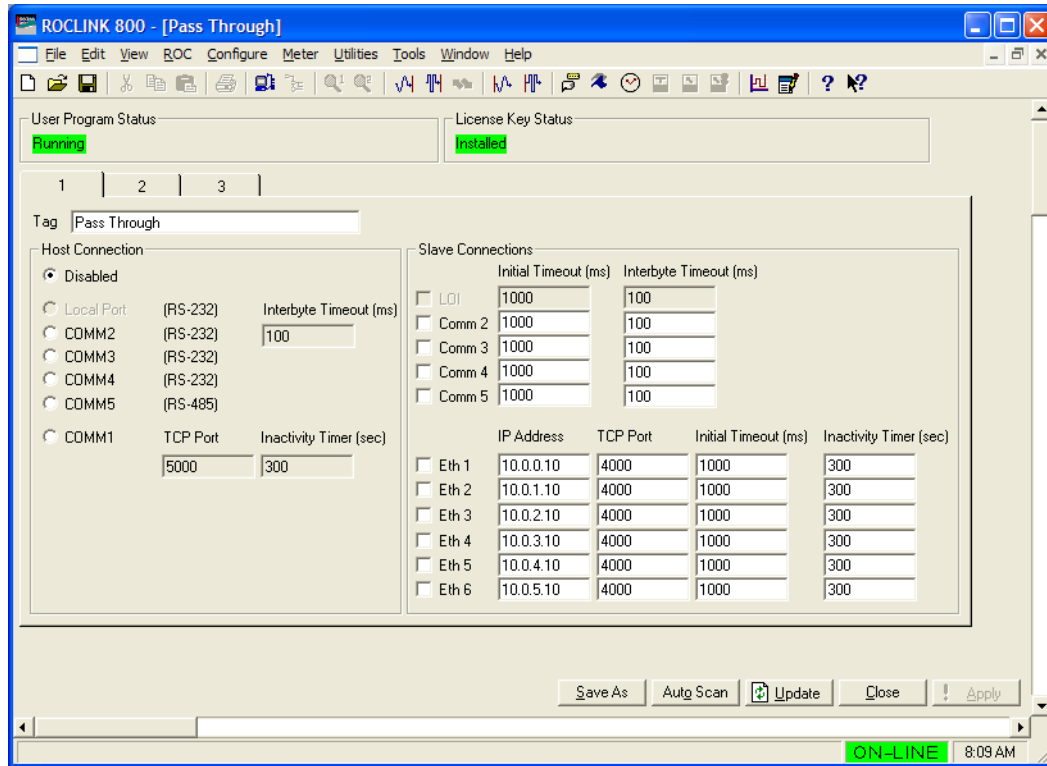
Figure 14. Pass Through Configuration

3. Review the values in the following fields:

Field	Description
User Program Status	Indicates the program's status. Valid values are **Running** (program is currently available for use) or **Loaded** (program is installed but has not been started). **Note**: To start this program, select **Utilities** > **User Program Administrator**. Select the program and click **Start**.
License Key Status	Indicates whether the Pass Through license key is installed. Valid values are **Installed** (license key is installed and recognized) or **Key Not Found** (license key is not installed or is not installed correctly).
Tag	Provides a label for this pass-through scenario. Enter up to 40 alphanumeric characters. The default tag is **Pass Through**. **Note**: Using the tabs (1, 2, or 3) on this screen, you can define up to three unique pass-through scenarios. Use the Tag field to uniquely identify each scenario you define.
Host Connection	Indicates, for this logical iteration of the Pass Through Configuration screen, which ports are available as **host** ports. The ports on this screen reflect the associations you made on the Comm Port screen (see Section 3.1). The program grays out any port you defined as a slave on another iteration of this screen. Select **Disabled** to prevent this ROC from responding to host requests.
	TCP Port Identifies the Transmission Control Protocol (TCP) port connecting this ROC host to the Ethernet. The default value is **5000**.

Field	Description	
Host Connection (continued)	Inactivity Timer	Sets, in seconds, how long the ROC host waits for a response before canceling the request. The default value is **300**.
		Note: This program **does not** support retires.
	Interbyte Timeout	Indicates, in milliseconds, the amount of time the ROC host waits between portions of a response before canceling the entire request and proceeding to the next request. The default value is **100**.
		Note: To ensure response receipt, you may need to tune this value to accommodate the baud rate and the request volume for your environment.
Slave Connections	Indicates, for this logical iteration of the Pass Through Configuration screen, slave ports through which the program passes messages from host ports identified on this same logical iteration of the screen.	
	Note: The program grays out any invalid comm port ("invalid" meaning the port has previously been defined as a host port).	
	Initial Timeout	Defines, in milliseconds, how long the master waits for a response to a request on this connection. If the response time exceeds the value you define, the master goes to the next request in the serial message queue and drops the first. You may need to tune this value to accommodate the baud rate and the request volume for your environment.
		Note: This program **does not** support retries.
	Interbyte Timeout	Indicates, in milliseconds, the amount of time the ROC host waits between portions of a response before canceling the entire request and proceeding to the next request.
		Note: To ensure response receipt, you may need to tune this value to accommodate the baud rate and the request volume for your environment.
	IP Address	Defines an Internet Protocol (IP) address for up to six Ethernet-based slave connections. The default values for slave connections 1 through 6 are, respectively, **10.0.0.10**, **10.0.1.10**, **10.0.2.10**, **10.0.3.10**, **10.0.4.10**, and **10.0.5.10**.
		Note: 127.0.0.1 is an industry-standard IP address you can enter to enable this ROC to respond to the host's request. It **must** be defined for the 4000 port to function.
	TCP Port	Defines a TCP port for the selected Ethernet-based slave connection. The default value is **4000**.

Field		Description
Slave Connections (continued)	Initial Timeout	Defines, in milliseconds, how long the master waits for a response to a request on this connection. The default value is **1000**.
		If the response time exceeds the value you define, the master goes to the next request in the serial message queue and drops the first. You may need to tune this value to accommodate the baud rate and the request volume for your environment.
		Note: This program **does not** support retries.
	Inactivity Timer	Sets, in seconds, how long the ROC host waits for a response before canceling the request. The default value is **300**.
		Note: This program **does not** support retires.

4. Click **Apply** to save any changes you have made to this screen.

5. Click **OK** to return to the ROCLINK 800 screen. Proceed to Section 3.3 to save the configuration.

3.3 Saving the Configuration

Whenever you modify or change the configuration, it is a good practice to save the final configuration to memory. To save the configuration:

1. Select **ROC** > **Flags**. The Flags screen displays:
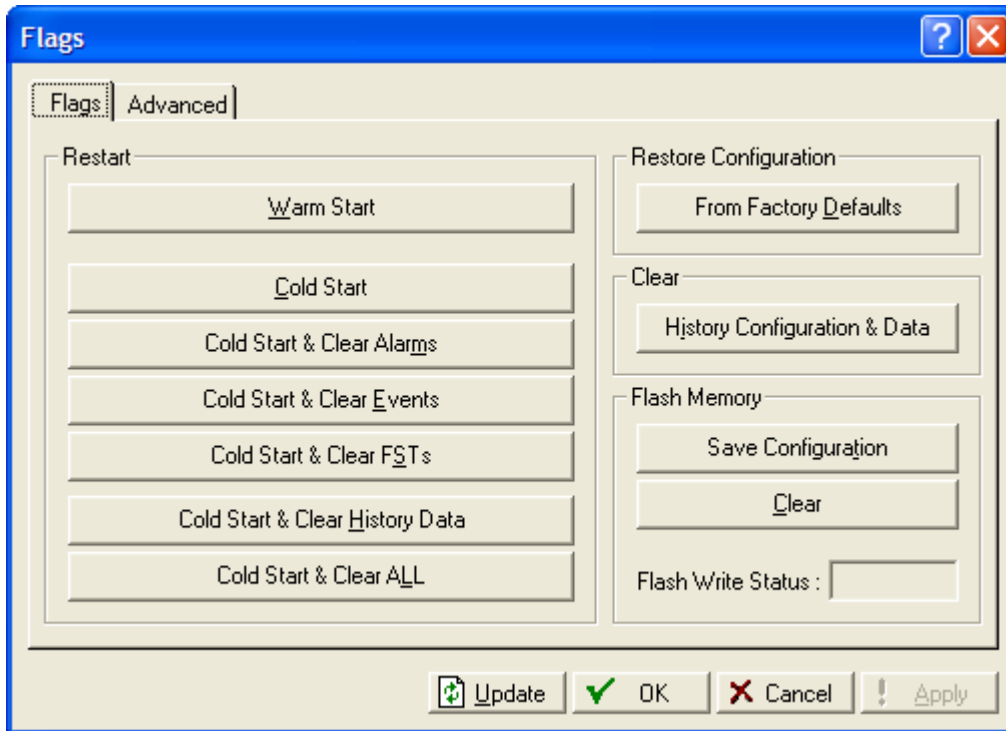
Figure 15. Flags screen

2. Click **Save Configuration**. A verification message displays:
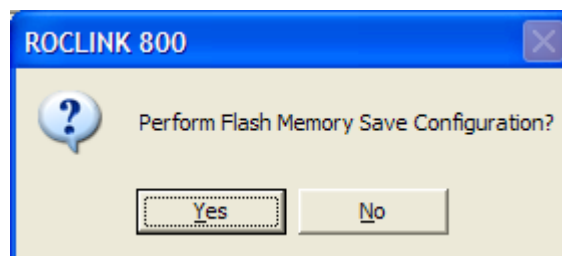
Figure 16. Perform screen

3. Click **Yes.** A confirmation message displays:

Figure 17. Flags screen

4. Click **OK** to begin the save process. The Status field on the Flags screen displays *In Progress*. When the process ends, the Status field on the Flags screen displays *Completed*.

5. Click **Update** on the Flags screen. This completes the process of saving your new configuration.

4 REFERENCE MATERIALS

This section provides tables of information on the user-defined point type the Pass Through program uses:

- ▪ 41 (Pass Through Configuration)

4.1 Point Type 41: Pass Through Configuration

Point type 41 is the Pass Through configuration point type. The program maintains 3 logical instances of this point type, and saves point type 41 to internal configuration memory.

Parm #	Name	Access	Data Type	Range	Default	Version	Description of functionality and meaning of values
0	Point Version	R/O	UINT32	0→4294967295		1.00	
1	Tag	R/W	String40	AC40	'Pass Through'	1.00	Label for iteration
2	Status	R/O	UINT8	0→1		1.00	
3	Host Connection Type	R/W	UINT8	0→6 seconds		1.00	Indicates the comm port associated with the host.
4	Host TCP Port	R/W	UINT16	0→65535	5000	1.00	TCP port host connection uses
5	Host TCP Inactivity Timeout	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
6	Host Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before canceling the request.
7	LOI Slave Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
8	LOI Slave Initial Timeout	R/W	UINT32	0→4294967295	1000	1.00	Indicates how long the host waits for a response to a request on this connection.
9	LOI Slave Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before cancelling the request.
10	CM2 Slave Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
11	CM2 Slave Initial Timeout	R/W	UINT32	0→4294967295	1000	1.00	Indicates how long the host waits for a response to a request on this connection.
12	CM2 Slave Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before cancelling the request.
13	CM3 Slave Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
14	CM3 Slave Initial Timeout	R/W	UINT32	0→4294967295	1000	1.00	Indicates how long the host waits for a response to a request on this connection.
15	CM3 Slave Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before cancelling the request.
16	CM4 Slave Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
17	CM4 Slave Initial Timeout	R/W	UINT32	0→4294967295	1000	1.00	Indicates how long the host waits for a response to a request on this connection.
18	CM4 Slave Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before cancelling the request.
19	CM5 Slave Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.

Parm #	Name	Access	Data Type	Range	Default	Version	Description of functionality and meaning of values
20	CM5 Slave Initial Timeout	R/W	UINT32	0→4294967295	1000	1.00	Indicates how long the host waits for a response to a request on this connection.
21	CM5 Slave Interbyte Timeout	R/W	UINT32	0→4294967295	100	1.00	Indicates how long the host waits between portions of a response before cancelling the request.
22	TCP Slave 1 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
23	TCP Slave 1 IP	R/W	String20	AC20	10.0.0.10	1.00	Indicates the IP address for this port.
24	TCP Slave 1 Port	R/W	UINT16	0→65535	4000	1.00	Indicates the TCP port for this slave connection.
25	TCP Slave 1 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
26	TCP Slave 1 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
27	TCP Slave 2 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
28	TCP Slave 2 IP	R/W	String20	AC20	10.0.1.10	1.00	Indicates the IP address for this port.
29	TCP Slave 2 Port	R/W	UINT16	0→65535	4000	1.00	Indicates the TCP port for this slave connection.
30	TCP Slave 2 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
31	TCP Slave 2 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
32	TCP Slave 3 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
33	TCP Slave 3 IP	R/W	String20	0→65535	10.0.2.10	1.00	Indicates the IP address for this port.
34	TCP Slave 3 Port	R/W	UINT16	AC20	4000	1.00	Indicates the TCP port for this slave connection.
35	TCP Slave 3 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
36	TCP Slave 3 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
37	TCP Slave 4 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
38	TCP Slave 4 IP	R/W	String20	AC20	10.0.3.10	1.00	Indicates the IP address for this port.
39	TCP Slave 4 Port	R/W	UINT16	0→65535	4000	1.00	Indicates the TCP port for this slave connection.
40	TCP Slave 4 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
41	TCP Slave 4 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
42	TCP Slave 5 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
43	TCP Slave 5 IP	R/W	String20	AC20	10.0.4.10	1.00	Indicates the IP address for this port.
44	TCP Slave 5 Port	R/W	UINT16	0→65535	4000	1.00	Indicates the TCP port for this slave connection.
45	TCP Slave 5 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
46	TCP Slave 5 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.
47	TCP Slave 6 Enable	R/W	UINT8	0→1	0	1.00	Enables or disables this port as a slave port.
48	TCP Slave 6 IP	R/W	String20	AC20	10.0.5.10	1.00	Indicates the IP address for this port.
49	TCP Slave 6 Port	R/W	UINT16	0→65535	4000	1.00	Indicates the TCP port for this slave connection.

Parm #	Name	Access	Data Type	Range	Default	Version	Description of functionality and meaning of values
50	TCP Slave 6 Initial Timeout	R/W	UINT32	0→65535 mSec	1000	1.00	Indicates how long the host waits for a response to a request.
51	TCP Slave 6 Inactivity Timer	R/W	UINT16	0→65535 seconds	300	1.00	Indicates how long the host waits for a response before canceling the request.

If you have comments or questions regarding this manual, please direct them to your local sales representative or contact: