Modbus Express Module Instruction Manual (for ROC800-Series and FloBoss™ 107 Controllers)

Remote Automation Solutions

EMERSON
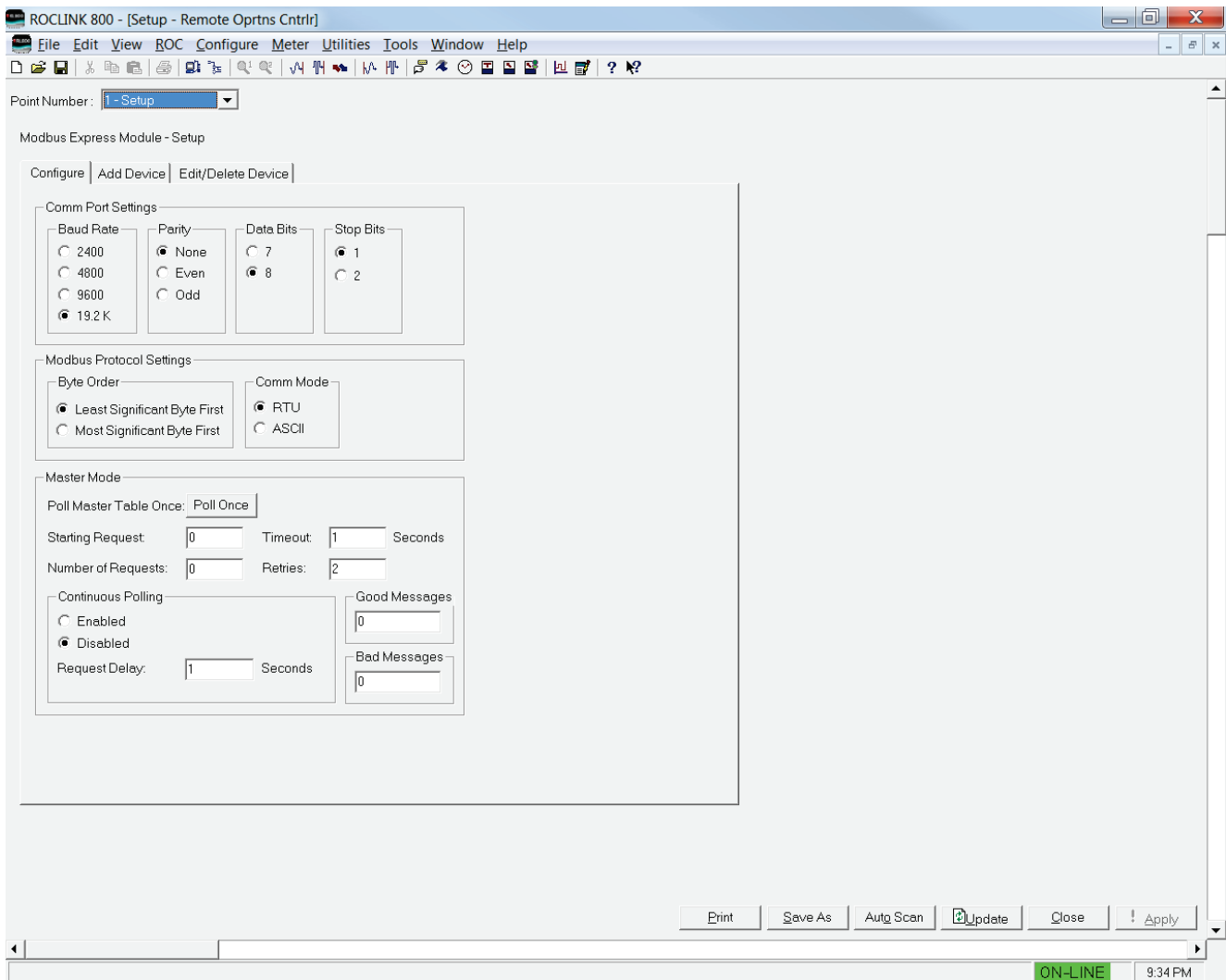
Revision Tracking Sheet

May 2016

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
All pages	May-2016
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Contents

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Chapter 1 – Introduction

This chapter describes the structure of this manual and presents an overview of the Modbus Express Module for the ROC800-Series Remote Operations Controller (ROC800) and the FloBoss 107 Flow Manager (FB107). The Modbus Express Module provides all of the functions necessary to communicate with other devices using the Modbus protocol over RS-485 serial communications.

The Modbus Express Module streamlines the installation process by automatically installing all point types and screens that are part of the application.

1.1 Scope and Organization

This document serves as the user manual for the Modbus Express Module, which is intended for use in a ROC800 and FB107. This manual describes how to install and configure the Modbus Express Module (referred to as the "Modbus module" or "the module" throughout the rest of this manual). You access and configure this module using ROCLINK™ 800 Configuration Software loaded on a personal computer running Windows® 2000 (with Service Pack 2), Windows XP, Windows Vista, or Windows 7.

The chapters 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:

- *Chapter 1 – Introduction*
- *Chapter 2 – Installation*
- *Chapter 3 – Configuration*
- *Chapter 4 – Usage*
- *Chapter 5 – Reference*

This manual assumes that you are familiar with the ROC800 and the FB107 and its configuration. For more information, refer to the following manuals:

- *FloBoss™ 107 Flow Manager Instruction Manual* (D301232X012).
- *ROC800 Remote Operations Controller Instruction Manual* (D301217X012).
- *ROCLINK™ 800 Configuration Software User Manual (for FloBoss 107)* (D301249X012).
- *ROCLINK™ 800 Configuration Software User Manual (for ROC800-Series)* (D301250X012).

1.2   Product Overview

The Modbus Express module enables the ROC800 or the FB107 to communicate directly with devices using the Modbus protocol. The module has an on-board EIA-485 (RS-485) communications port for this purpose.

The Modbus Express module provides the following features:

- Predetermined register lists for the supported field devices
- Easy addition and removal of devices from active service
- The ability to poll for user defined registers from a field device
- Advanced editing of the Modbus master table
- Expanded registers which provide native I/O-like features for certain registers

The data from the field devices is made available in the host device's TLP database for easy access by other system features such as FSTs, meter runs, and PID loops, as well as a SCADA host system.

The application module communicates with up to six separate devices over a single multidrop 485 communication. The module also includes user displays, which are accessible by ROCLINK 800, providing a user interface to the application's database.

The module contains two master tables, each with 25 entries. Each entry corresponds to a separate request to a device. The module uses 200 registers to store the data read from and written to the devices. The registers support integer and float data entries.

The Modbus Express module allows you to quickly add supported Modbus devices. The module's Master Table is pre-populated to poll a list of pre-selected registers and the module's RS-485 communication port is pre-configured to match the selected device's defaults (where possible). Once you add the device, you enable the Modbus polling, and the module begins to populate its registers with the data from the device.

> **Note:** Some devices may require settings the module does not natively support. You may externally configure these devices. Refer to *Section 1.2.1*, *Supported Devices*, for the specific devices supported at this time and *Section 1.2.2*, *Module Wiring*, for its wiring configurations.

Capabilities The Modbus Express Module can simultaneously support up to six Modbus devices, provided all devices use the same communication port settings. Since there is a limit to the available number of Master Table entries (50) and registers (200), the actual number of devices you can add depends on how the individual devices use the Master Tables and registers. For example, you may be able to add six devices that only use a few Master Table or register entries, or to add only two or three devices that use many entries. Refer to *Table 1* for a list of Master

Table and register entries required for each supported devices.

Use Express Mode to add multiple instances of the same devices, which only requires you to change the Modbus RTU address for each occurrence of the device.

Use Advanced Mode to add different devices, which must be preconfigured to use the same communication settings (baud rate, parity, data bits, stop bits, byte order, and RTU/ASCII mode). When using Advanced Mode, you should disable the module's automatic configuration of communication ports and then manually configure the ports to match the common port settings currently in use.

The User Interface The Modbus Express Module contains its own central processing unit (CPU) which handles the Modbus protocol and RS-485 communications. Any data a device sends or receives passes between the module's CPU and the flow computer. Due to this architecture, the user interface has special considerations.

When you change information on a screen (entering a value in a field, selecting a checkbox, or selecting an item from a pull-down menu), the module does not "see" that change until you click **Apply**. Clicking **Apply** sends all changes on the screen to the module's CPU for processing. When you update items in the module, any changes do not display on the screen until you click **Update**. If you click **Update** before the flow computer has received updated data from the module, the screen cannot show the changes.

For example, you select a different baud rate and then click **Apply** to apply that change to the module. If you then immediately click **Update**, the module's CPU and the flow computer may not have had sufficient time to process your change and display it on the screen. You may need to click **Update** again. This is particularly evident with status/error messages.

Additionally, to ensure that the flow of data between the module and flow computer has sufficient processing and communication time, the module prevents you from entering data in certain fields on screens (such as "Add Device" and "Edit/Delete Device" tabs on the Setup configurations screen). This "locking" feature helps you to select components in the proper order. A green box around the button or frame indicates that it is active. For example, in the Add Device tab of the Setup configurations screen, if you select a device to add and then click **Apply**, the module locks the **Device** section of the screen and activates the **Edit** and **Add Device** buttons. At this point, you can only click **Add Device** to add the device you select, or click **Edit** to unlock the Device frame and make any changes. See *Figures 1* and *2*.
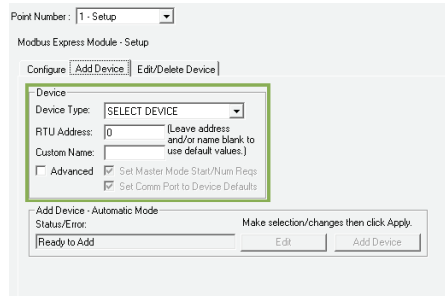
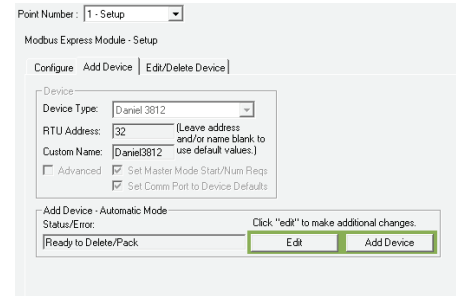*Figure 1. Setup Screen – Device Frame highlighted with a green box*

Figure 2. Setup Screen – Edit and Add Device Frame highlighted with a green box

1.2.1　Supported Devices

The Modbus Express module allows devices to communicate using Modbus protocol over RS-485 serial communication. The following devices below are pre-mapped so configuration is not required.

- Daniel Model 3812 Liquid Ultrasonic Meter
- Daniel Mark III Gas Ultrasonic Meter
- Fisher Easy-Drive Actuator
- Micro Motion Direct Connect (700/800 Core Processor)
- Micro Motion Transmitter (1700/2700)
- Micro Motion 7826/7828 Density Meter
- Micro Motion 7829 Viscosity Meter
- Rosemount 3095 MV Transmitter
- Rosemount 3300 Guided Wave Radar Level
- Platinum BMS-731 Burner Manager
- Sick Maihak FlowSic600 Ultrasonic Meter
- Krohne Altosonic V12 Ultrasonic Meter
- Spectra Sensors SS500/SS2000/SS3000

Table 1 shows the Master Table and Register entries for each supported devices.

Table 1. Master Table and Register entries for supported devices

Device	Register Name	Function Code	Slave Reg	Num Reg	Conv Code	Reg Value Type
Daniel Model 3812 Liquid Ultrasonic Meter	Status A	3	2458	1	28	Integer
	Status B	3	2459	1	28	Integer
	Status C	3	2460	1	28	Integer
	Status D	3	2461	1	28	Integer
	Status	3	2462	1	28	Integer
	Data Qual	3	2300	1	29	Integer
	Flow Dir	3	2463	1	28	Integer
	Avg Flow	3	2018	2	66	Float
	Avg Snd	3	2034	2	66	Float

Device	Register Name	Function Code	Slave Reg	Num Reg	Conv Code	Reg Value Type
	Avg Flow	3	2018	2	66	Float
	Q Meter	3	2042	2	66	Float
	Q Flow	3	2056	2	66	Float
	Freq 1 KF	3	2516	2	66	Float
	Freq ChA	3	2504	2	66	Float
	Freq 1 KF	3	2566	2	66	Float
	Freq ChA	3	2554	2	66	Float
	CPU FW Ver	3	9006	1	29	Integer
	Fwd A Hour	3	4110	1	29	Integer
	Rev A Hour	3	4112	1	29	Integer
	Fwd A Day	3	4160	1	29	Integer
	Rev A Day	3	4162	1	29	Integer
	Fwd A Hour	3	4210	1	29	Integer
	Rev A Hour	3	4212	1	29	Integer
	Fwd A Day	3	4260	1	29	Integer
	Rev A Day	3	4262	1	29	Integer
	Flow Time	3	2106	2	66	Float
	Flow Time	3	2108	2	66	Float
Daniel Mark III Gas Ultrasonic Meter	Sys Status	3	10953	1	28	Integer
	Path A Sta	3	10954	1	28	Integer
	Path B Sta	3	10955	1	28	Integer
	Path C Sta	3	10956	1	28	Integer
	Path D Sta	3	10957	1	28	Integer
	CPU SW Ver	3	11000	1	29	Integer
	Data Qual	3	10584	1	29	Integer
	Freq 1	3	12468	2	67	Float
	Freq 2	3	12518	2	67	Float
	K-Factor 1	3	12472	2	67	Float
	K-Factor 2	3	12522	2	67	Float
	Velocity	3	13574	2	67	Float
	Spd of Snd	3	13594	2	67	Float
	Ucorr Rate	3	13624	2	67	Float
	Corr Rate	3	13638	2	67	Float
Fisher Easy-Drive Actuator	Pos Demand	3	0	1	28	Integer
	Reset Diag	3	1	1	28	Integer
	Recal Dmd	3	2	1	28	Integer
	A Cal 0%	3	3	1	28	Integer
	A Cal 100%	3	4	1	28	Integer
	Actual Pos	3	9	1	28	Integer
	Actual Dmd	3	10	1	28	Integer
	Num Cycles	3	12	2	63	Integer
	Tm Running	3	14	2	63	Integer
	Tm Open	3	16	2	63	Integer
	Tm Closed	3	18	2	63	Integer
	A IP Val	3	24	1	28	Integer
	Ctr Src	3	33	1	28	Integer
	Loss D Pos	3	34	1	28	Integer
	Deadband	3	35	1	28	Integer
	LowT Ctoff	3	36	1	28	Integer

Device	Register Name	Function Code	Slave Reg	Num Reg	Conv Code	Reg Value Type
	Comm Tmout	3	37	1	28	Integer
	GO TO POS	6	0	1	28	Integer
Krohne Altosonic V12 Ultrasonic Meter	SNR 1 AB	4	7025	2	65	Float
	SNR 2 AB	4	7027	2	65	Float
	SNR 3 AB	4	7029	2	65	Float
	SNR 4 AB	4	7031	2	65	Float
	SNR 5 AB	4	7033	2	65	Float
	SNR 6 AB	4	7035	2	65	Float
	SNR 1 BA	4	7037	2	65	Float
	SNR 2 BA	4	7039	2	65	Float
	SNR 3 BA	4	7041	2	65	Float
	SNR 4 BA	4	7043	2	65	Float
	SNR 5 BA	4	7045	2	65	Float
	SNR 6 BA	4	7047	2	65	Float
	Flow Rate	4	7055	2	65	Float
	Velocity	4	7057	2	65	Float
	Spd of Snd	4	7059	2	65	Float
	Vel Path 1	4	7061	2	65	Float
	Vel Path 2	4	7063	2	65	Float
	Vel Path 3	4	7065	2	65	Float
	Vel Path 4	4	7067	2	65	Float
	Vel Path 5	4	7069	2	65	Float
	Vel Path 6	4	7071	2	65	Float
	Spd Snd 1	4	7073	2	65	Float
	Spd Snd 2	4	7075	2	65	Float
	Spd Snd 3	4	7077	2	65	Float
	Spd Snd 4	4	7079	2	65	Float
	Spd Snd 5	4	7081	2	65	Float
	Spd Snd 6	4	7083	2	65	Float
Micro Motion Direct Connect (700/800) and Micro Motion Transmitter (1700/2700)	Meter Zero	1	4	1	28	Integer
	Flow Dir	1	65	1	28	Integer
	Status	3	244	2	70	Float
	Mass Rate	3	246	2	70	Float
	Density	3	248	2	70	Float
	Temp	3	250	2	70	Float
	Vol Rate	3	252	2	70	Float
	Mass Total	3	258	2	70	Float
	Vol Total	3	260	2	70	Float
	Mass Inv	3	262	2	70	Float
	Vol Inv	3	264	2	70	Float
	Pr Corr Fl	3	266	2	70	Float
	Pr Corr Dn	3	268	2	70	Float
	Tube Freq	3	284	2	70	Float
	L Pckf Vol	3	288	2	70	Float
	Drive Gain	3	290	2	70	Float
	Mass Fl Zr	3	292	2	70	Float
Micro Motion 7826/7828 Density	Status	3	256	2	60	Integer
	Cor Line D	3	257	2	65	Float
	Cor Base D	3	258	2	65	Float

Device	Register Name	Function Code	Slave Reg	Num Reg	Conv Code	Reg Value Type
Meter	Line Temp	3	259	2	65	Float
	Coil Level	3	264	2	65	Float
	Timer Per	3	261	2	65	Float
Micro Motion 7829 Viscosity Meter	Status	3	256	2	60	Integer
	Line Dens	3	357	2	65	Float
	Base Dens	3	258	2	65	Float
	Line Temp	3	259	2	65	Float
	Coil Level	3	264	2	65	Float
	Time Per	3	261	2	65	Float
	Kinem Visc	3	290	2	65	Float
	Dynam Visc	3	289	2	65	Float
Platinum BMS-731 Burner Manager	Temp Deg C	4	8	1	28	Integer
	Temp Deg C	4	9	1	28	Integer
	Relights	4	10	1	28	Integer
	FlamResist	4	14	1	28	Integer
	Input Volt	4	28	2	67	Float
	Aux A DegF	4	59	1	28	Integer
	Aux B DegF	4	60	1	28	Integer
	Curr State	3	23	1	28	Integer
	Error Type	3	24	1	28	Integer
	Reset Type	3	25	1	28	Integer
	Reset Year	3	26	1	28	Integer
	Reset Mnth	3	27	1	28	Integer
	Reset Day	3	28	1	28	Integer
	Reset Hour	3	29	1	28	Integer
	Reset Min	3	30	1	28	Integer
	Pilot On	3	31	2	57	Integer
	Main Pilot On	3	33	2	57	Integer
	TC A Temp	3	37	1	28	Integer
	TC B Temp	3	38	1	28	Integer
	Rem On Off	1	17	1	28	Integer
Rosemount 3095 MV Transmitter	Status	4	2000	1	28	Integer
	PV	4	2002	2	66	Float
	SV	4	2004	2	66	Float
	TV	4	2006	2	66	Float
	FV	4	2008	2	66	Float
Sick Maihak FloSci600 Ultrasonic Meter	Sys Status	3	3002	1	28	Integer
	Status 1	3	3003	1	28	Integer
	Status 2	3	3004	1	28	Integer
	Status 3	3	3005	1	28	Integer
	Status 4	3	3006	1	28	Integer
	Freq Hz	3	3028	1	28	Integer
	Ext Stat 1	3	3057	1	28	Integer
	Ext Stat 2	3	3058	1	28	Integer
	Ext Stat 3	3	3059	1	28	Integer
	Ext Stat 4	3	3059	1	28	Integer
	Version	3	5001	2	61	Integer
	System Err	3	5039	2	61	Integer
	Limit Warn	3	5055	2	61	Integer

Device	Register Name	Function Code	Slave Reg	Num Reg	Conv Code	Reg Value Type
	Uncor Rate	3	7000	2	66	Float
	Velocity	3	7003	2	66	Float
	Spd of Snd	3	7002	2	66	Float
	Meter Fact	3	7026	2	66	Float
Spectra Sensors SS500 / SS2000 / SS3000	Concentrat	3	7000	2	65	Float
	Temp	3	7002	2	65	Float
	Pressure	3	7004	2	65	Float
	Spply Volt	3	7006	2	65	Float
	PkD1 Mid	3	7008	2	65	Float
	FW Version	3	7112	2	65	Float
	S Factor	3	7200	2	65	Float
	Alm Flags	3	5000	2	64	Integer

1.2.2   Module and Device Wiring

Connect the device(s) to the communications port on the module using 16 to 24 AWG wiring. *Figures 3* and *4* show sample wirings between the module and several sensor types. *Figures 5* through *17* show the wiring diagrams for each supported devices.
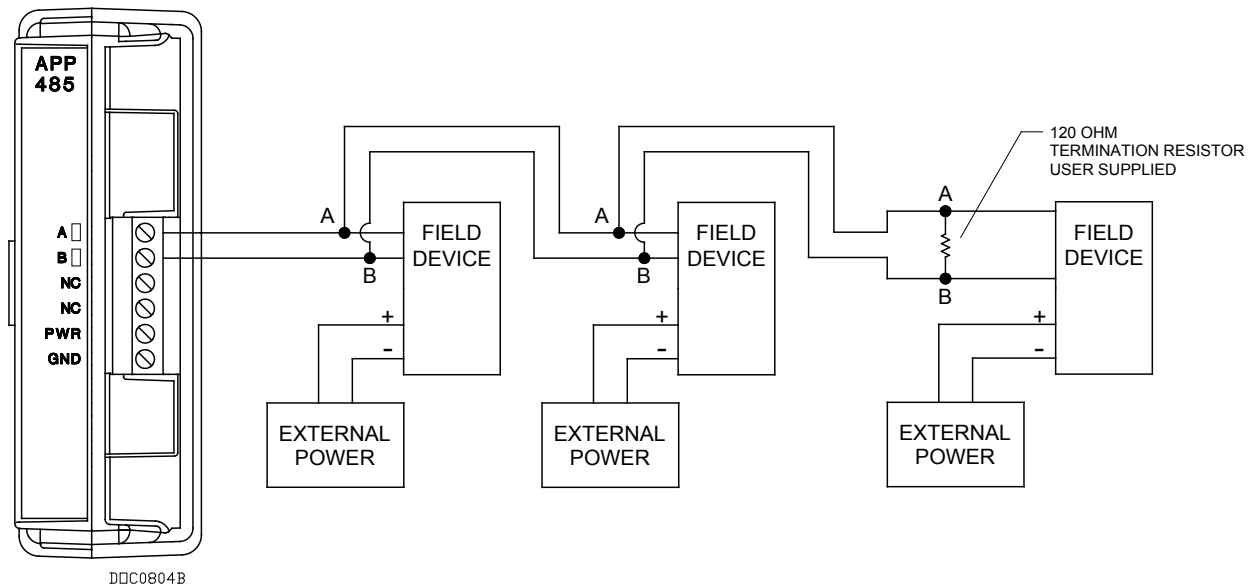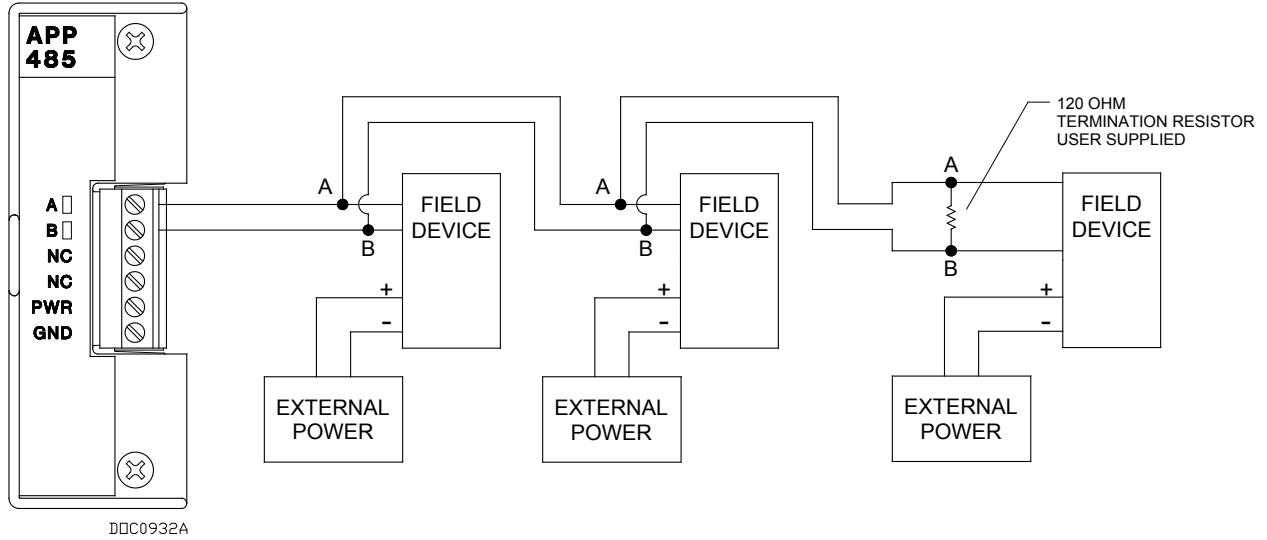

Figure 3. Module Wiring FB107 (Generic)
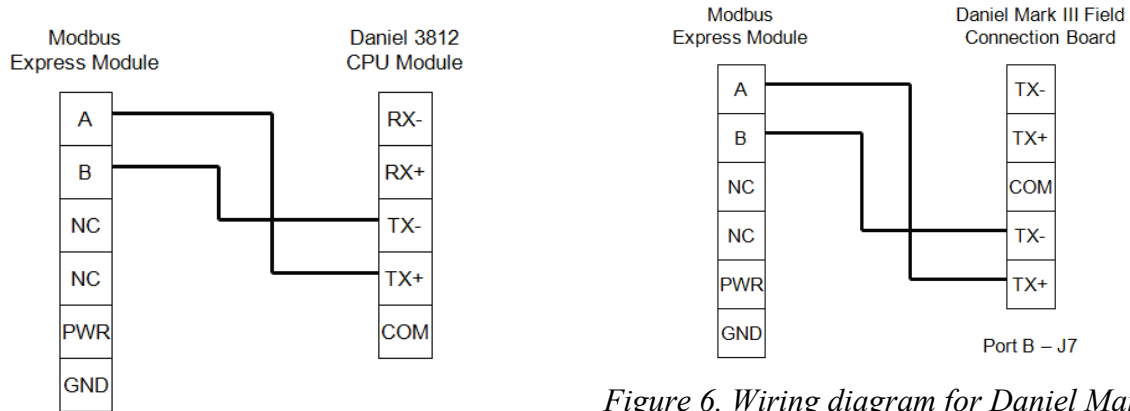
Figure 4. Module Wiring for ROC800 (Generic)

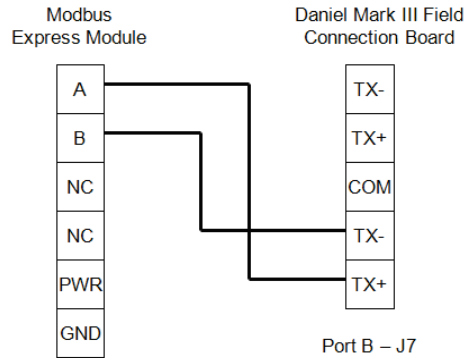*Figure 5. Wiring diagram for Daniel Model 3812 Liquid Ultrasonic Meter*

Figure 6. Wiring diagram for Daniel Mark III Gas Ultrasonic Meter
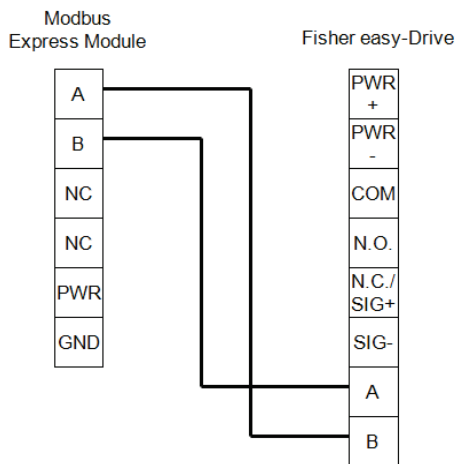
Note: S1, Port B - Half Duplex Set, Term On

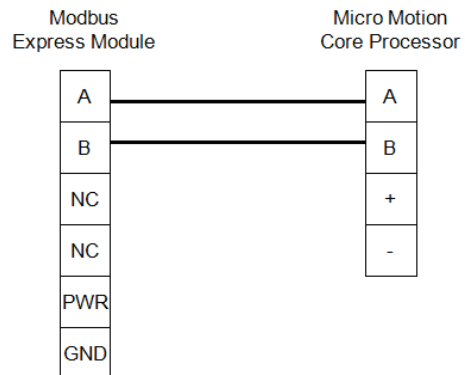*Figure 7. Wiring diagram for Fisher Easy-Drive Actuator*

Figure 8. Wiring diagram for Micro Motion Direct Connect 700 Core Processor and 800 Enhanced Core Processor
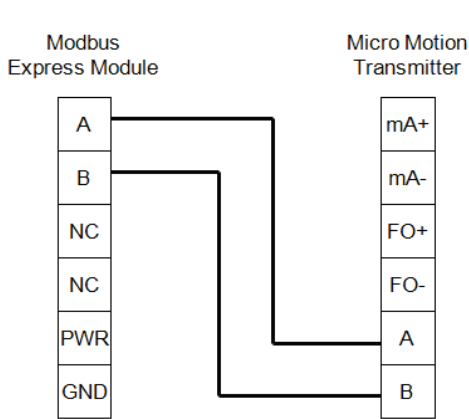
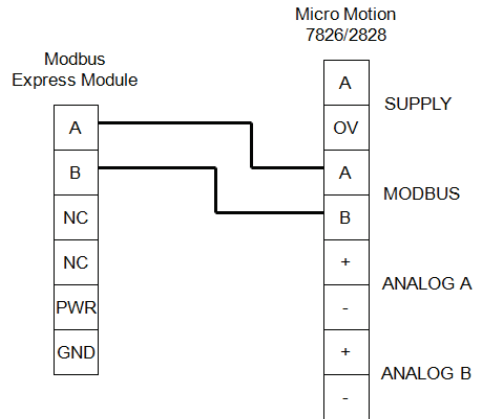*Figure 9. Wiring diagram for 1700 / 2700 Micro Motion Transmitter*

Figure 10. Wiring diagram for Micro Motion 7826 / 7828 Density Meter
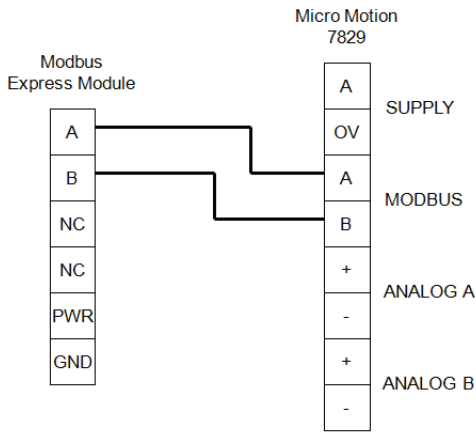

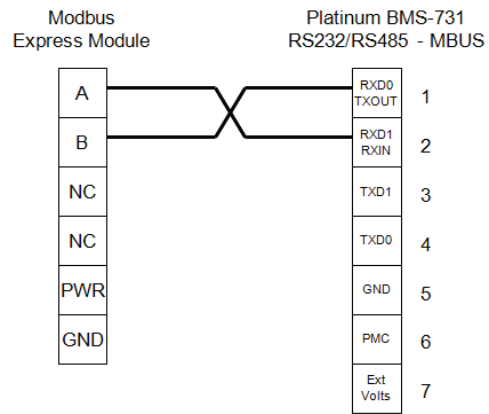*Figure 11. Wiring diagram for Micro Motion 7829 Viscosity Meter*

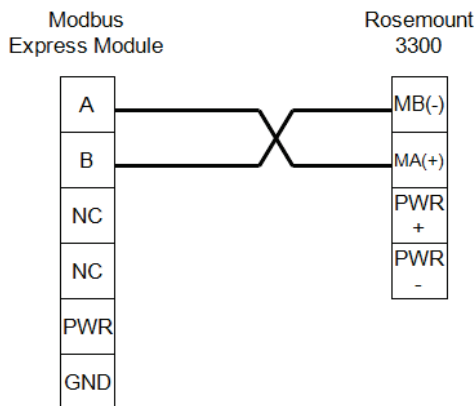*Figure 12. Wiring diagram for Platinum BMS-731 Burner Manager*

Figure 13. Wiring diagram for Rosemount 3300 Guided Wave Radar Level
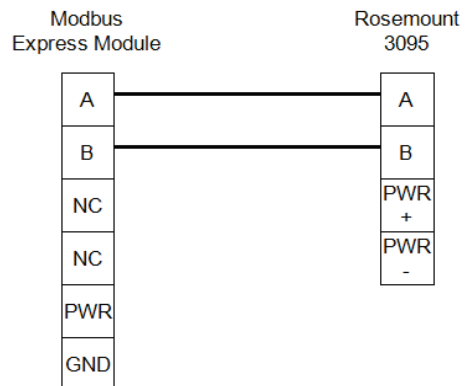

Figure 14. Wiring diagram for Rosemount 3095 MV Transmitter
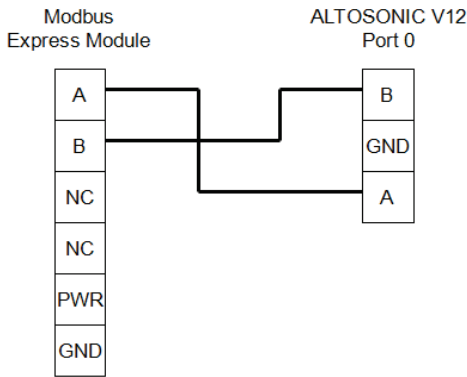
Figure 15. Wiring Diagram for Krohne Altosonic V12 Ultrasonic Meter
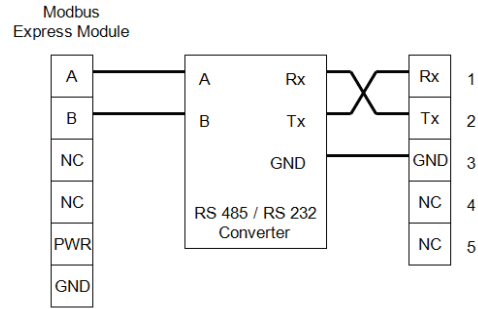
Figure 16. Wiring Diagram for Spectra Sensors SS500 / SS2000 / SS3000

Note: The Spectra Sensor devices do not provide an RS-485 port, requiring a RS-485 to RS-232 converter.
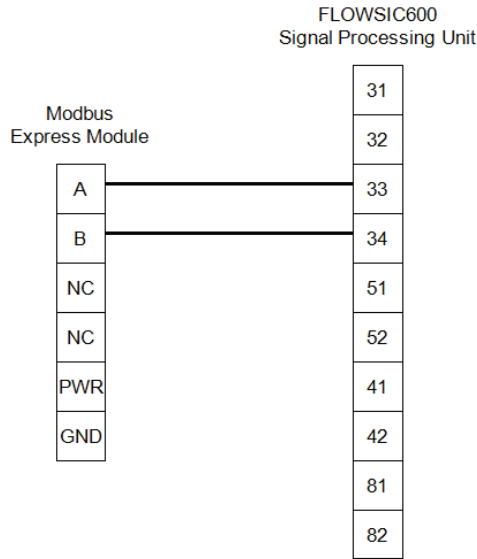
Figure 17. Wiring Diagram for Sick Maihak FlowSic600 Ultrasonic Meter

Note: By default, the RS-485 port on the FLOWSIC600 uses the SICK Modbus ASCII protocol. You must change this to generic Modbus RTU protocol using the MEPAFLOW600 configuration software.

1.3   Module Requirements

The Modbus Express module is compatible with version 1.60 (or greater) of the FB107 firmware, with version 3.51 (or greater) of the ROC800 Series 2 firmware, with version 1.30 (or greater) of the ROC800L firmware and with version 2.10 (or greater) of the ROCLINK 800 software.

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Chapter 2 – Installation

This chapter provides instructions for installing the Modbus Express module. Read *Section 1.3* of this manual for the module requirements.

Note: You can install only one Modbus Express module in either the ROC800 or the FB107.

2.1   Installing the Application Module

The application module occupies the standard footprint of an FB107 or ROC800 I/O or communications module.

To install the module in ROC800, place it in any empty slot on the ROC800. To install the module in FB107, remove power to the FB107. Place the module in an empty slot (1 through 7) on the FB107 and reapply power.

To ensure that the FB107 and ROC800 recognizes the module, you must perform a warm start (**ROC** > **Flags** > **Warm Start**).

Note: Although the label on the physical module is **APP 485**, the Modules (for FB107) or the User Display (for ROC800) from the Directory Tree verifies that this module contains the Modbus Express application. See *Figures 18 and 19*.
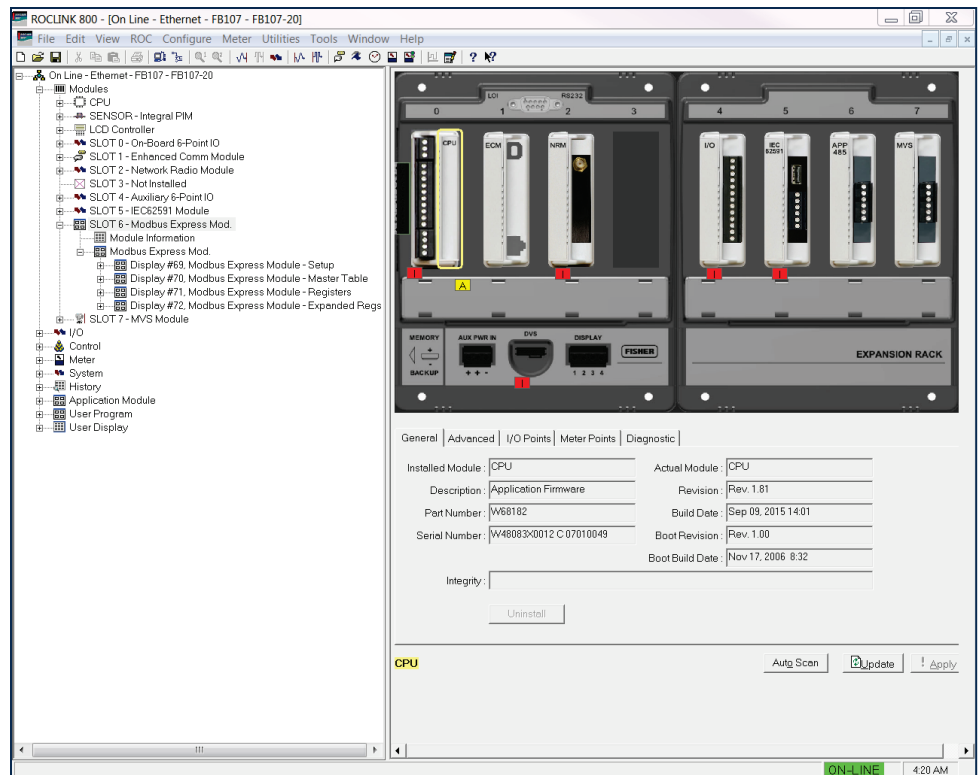
Figure 18. Modbus Express Module (FB107)
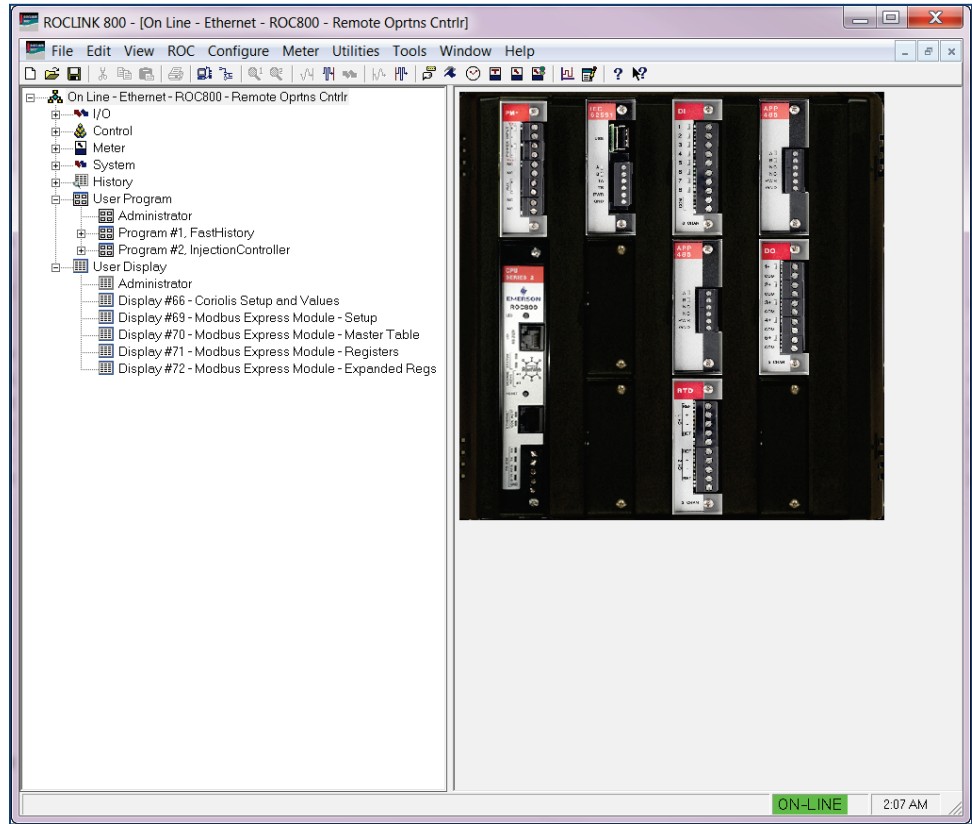
Figure 19. Modbus Express Module (ROC800)

Once you have verified that the ROC800 has recognized the Modbus Express module, proceed to *Chapter 3* to begin configuring the module.

2.2 Updating the Application Module

The ROC800 version of the Modbus Express module is factory-loaded to use displays 69, 70, 71, and 72. If you have previously installed another application that already uses one of those displays, you must update the module's firmware using the Modbus Express Module 1.01 ALT.BIN file, which provides the same functionality using displays 73, 74, 75, and 76. Contact Technical Support for a copy of the ALT.BIN file.

For further information on updating firmware, refer to *Section 9.1 Update Firmware*, in Chapter 9 of the *ROCLINK 800™ Configuration Software User Manual (for ROC800 Series),* (part D301250X012).

2.3 MPU Loading Threshold (ROC800)

To maximize the performance of your ROC800 device, always verify the performance of specific application combinations before using them in the field to ensure the MPU load typically remains **below** 85% with peak MPU loading levels **below** 95%.

To check the current MPU load at any time, select **ROC** > **Information > Other Information** and review the value in the MPU loading field.
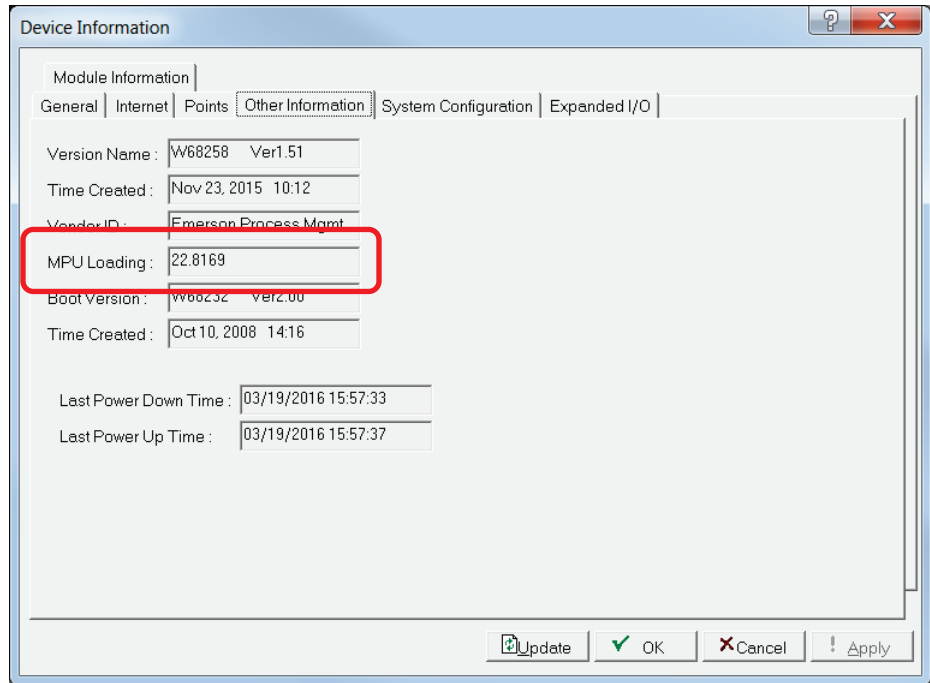
Figure 20. MPU Loading

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Chapter 3 – Configuration

After you have successfully installed the Modbus Express module in the FB107 or ROC800, you configure the module using four module-specific screens (Setup, Master Table, Registers, and Expanded Registers). Use the Modbus Master Configuration screen to configure communications with the device(s).

You must configure the module **before** you can establish communications with the device(s). To configure the module (after logging onto ROCLINK 800 and successfully installing the module) proceed through the screens as shown in this chapter.

Note: The configurations screens of the Modbus Express module for both the ROC800 and FB107 platform are identical.

You can access the module-specific screens from the main ROCLINK 800 screen:
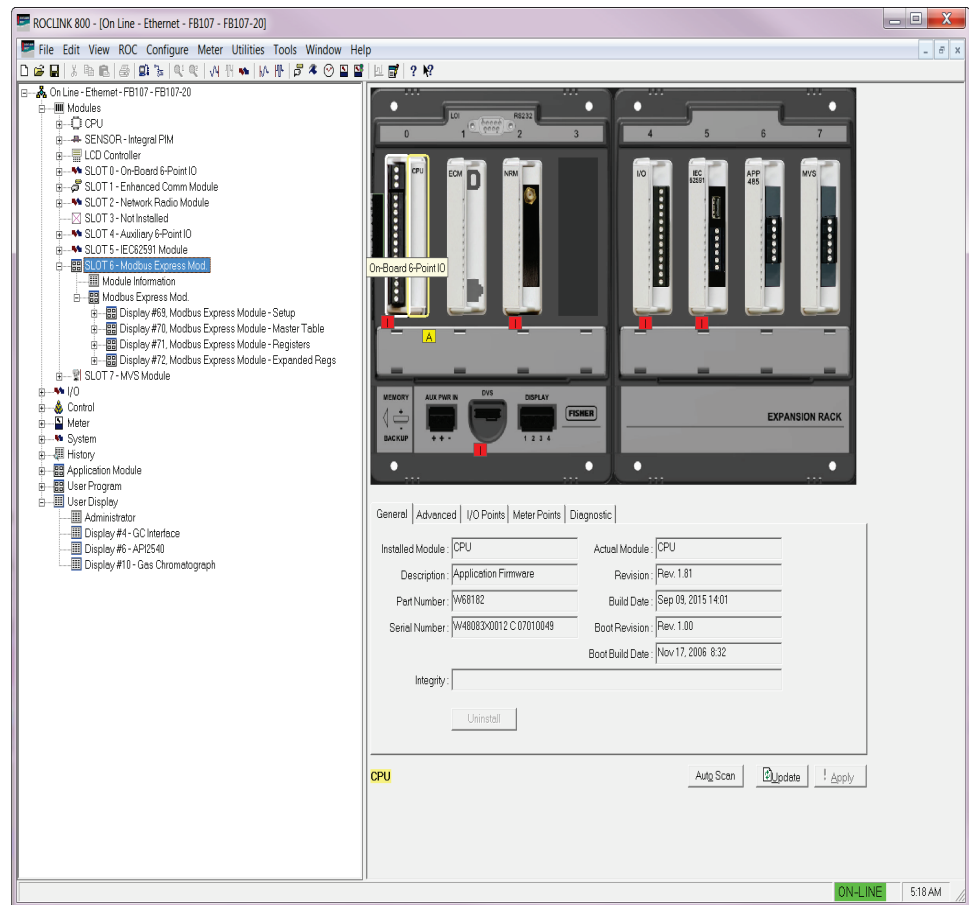
Figure 21. ROCLINK 800 (FB107)
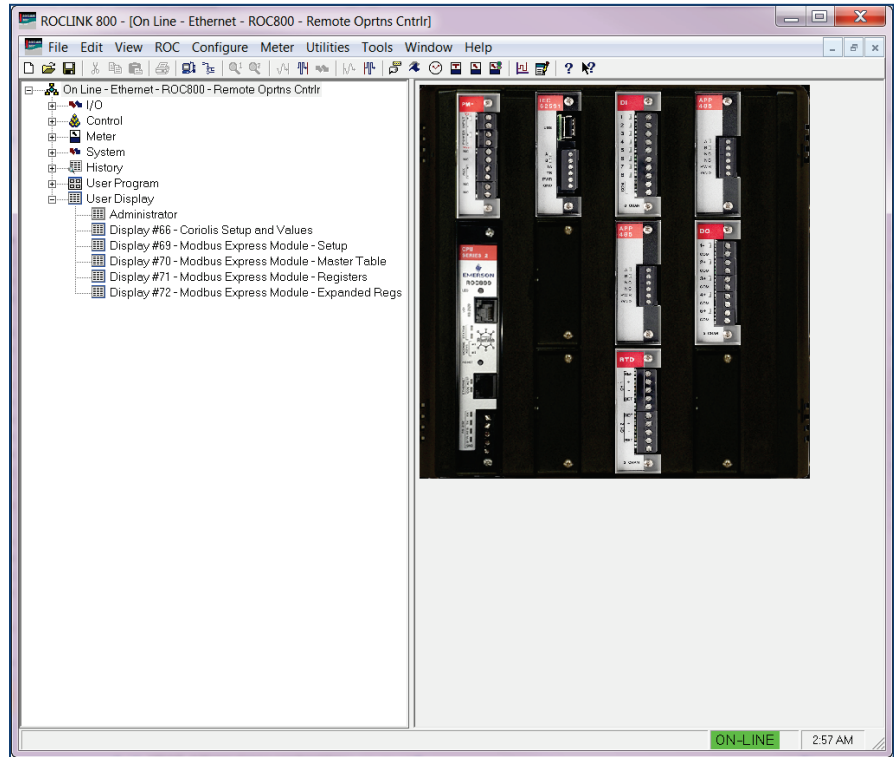
Figure 22. ROCLINK 800 (ROC800)

3.1   Setup Screen

Use this screen to configure the communications with Modbus devices and to add, edit, or delete Modbus devices. The Setup screen has three tabs (Configure, Add Device, and Edit/Delete Device).

To Access this screen:

1. From the Directory Tree, double-click **User Display** if you use ROC800 or **Modules** > **Slot #, Modbus Express Mod** if you use FB107.

    Note: For FB107, the **Slot #** indicates the slot where you install your Modbus Express module. For example, if you install your Modbus Express module in slot 2, then you double-click **Module > Slot 2, Modbus Express Mod** from the directory tree.

2. Double-click **Display #69 - Modbus Express Module – Setup**. The setup screen displays:
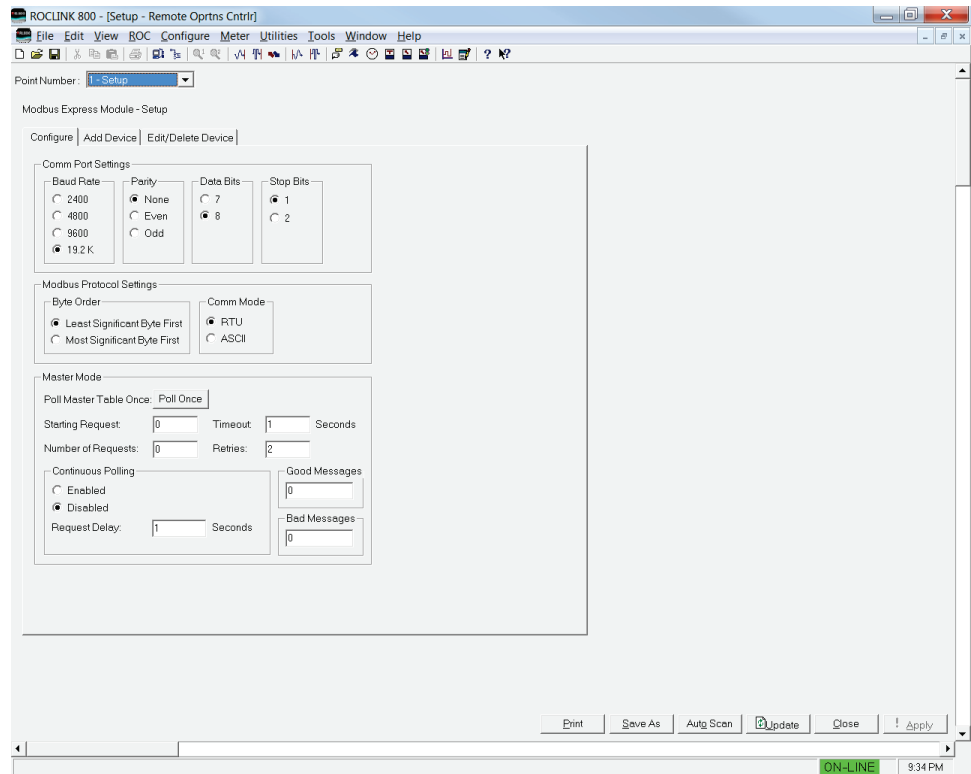
Figure 23. Modbus Setup screen

Follow *Section 3.1.1* through *Section 3.1.3* to configure the Configure, Add Device, and Edit/Delete Device tabs.

3.1.1   Setup – Configure Tab

Use this screen (which displays when you first access the Setup screen) to configure the comm port settings, Modbus protocol settings, and the Modbus mode for your Modbus devices.
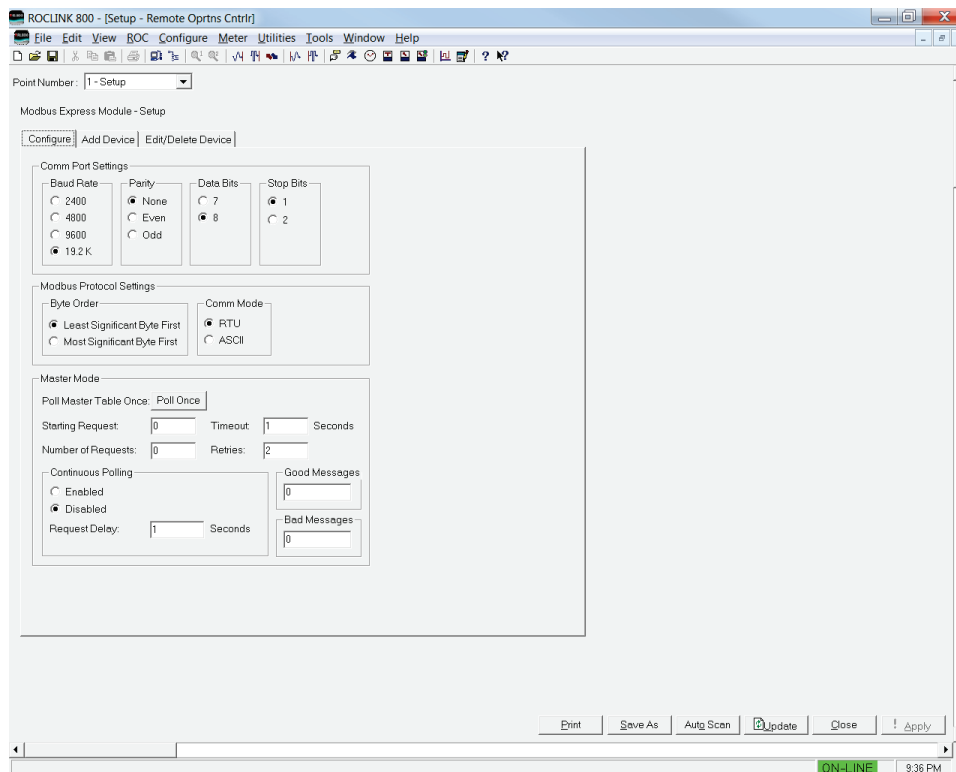
Figure 24. Setup – Configure screen

1. Review the values in the following fields:

Field	Description
Point Number	Selects the Modbus Express screen to configure. Available option is **Setup** configuration screen only.
Baud Rate	Sets, in bits per second, the baud rate this comm port uses when transmitting and receiving data. The default value is **19.2 kbps**.
Parity	Indicates whether the communications controller performs parity checks. The parity value can be odd, even, or none. The default value is **None**.
Data Bits	Sets the number of data bits contained in an asynchronous byte or character. The default is **8**.
Stop Bits	Sets the number of stop bits contained in an asynchronous byte or character. The default is **1**.

Field	Description
Byte Order	Sets the order of data bytes in a transmission or requests, which can be reversed. This only affects the Data field of a Modbus message and has no effect on the data bytes for Function Codes 01, 02, and 05. Valid values are **Least Significant Byte First** (places the Least Significant Byte first; this is the default value) and **Most Significant Byte First** (places the Most Significant Byte first).
Comm Mode	Sets the communications mode for the selected comm port. The Modbus protocol supports two modes of transmission, **ASCII** and **RTU**. **RTU** is the default.
	Note: You must configure all devices in the same communications network with the same mode of transmission. Additionally, in either ASCII or RTU mode, the transmitting device places the Modbus message into a frame that has a known beginning and ending point.
	ASCII — American Standard Code for Information Interchange mode represents each 8-bit byte of data as two ASCII characters that are the hexadecimal representation of the value. This allows the messages to be read with the use of a dumb terminal, but uses twice as many characters as the RTU mode. Each character sent is composed of a start bit, 7 or 8 data bits, and one or two stop bits with Even, Odd, or No parity. ASCII mode uses Longitudinal Redundancy Checking (LRC) error checking.
	RTU — Remote Terminal Unit mode allows for greater character density and better data throughput than ASCII for the same baud rate. Each message is transmitted in a continuous stream. Data is sent in 8-bit binary characters. RTU mode uses Cyclic Redundancy Check (CRC) error checking. This is the default.
Poll Master Table Once	Controls whether the system begins a Modbus Master polling sequence. Click to perform an on-demand poll of the Modbus master table.

Field	Description
Starting Request	Sets a beginning value from which the Modbus Master polling sequence begins. This number corresponds to a line number on the Modbus Master Table associated with this comm port (Point Number 1, 1–25 and Point Number 2, 26–50).
Number of Requests	Sets the total number of requests the Modbus Master makes for this polling sequence. This value specifies the total number of lines in the Master tables on which to execute the polls. The default value **0** prevents the polling from occurring.
	Note： The tables are contiguous. If you indicate requests that are more than a single table, the system accesses the second table to complete the request.
Timeout	Sets the amount of time, in seconds, that the Master (Host) waits to receive a valid message after the FB107 or ROC800 sends a request to a device.
	Note： A value less than 1 may not give enough time for a response and may fail.
Retries	Sets the number of times (after the initial try) that the Master, FB107 or ROC800, attempts to establish communications with the specified device before reporting a timeout error. Valid values are between **0** and **255**; the default is **2**.
Continuous Polling	Indicates whether the system continually executes the Modbus Master polling sequence. Valid values are **Enabled** (polling occurs continually) or **Disabled** (polling occurs only as requested).
	Note： Use the **Request Delay** field to schedule the continual polling.
Request Delay	Sets a delay time, in seconds, between polling sequences. A polling sequence includes all requests defined in the Number of Requests field.
	Note： This field is valid **only** when you **enable** Continuous Polling.
Good Messages	Indicates the number of valid responses the module has received.
Bad Messages	Indicates the number of invalid responses the module has received.

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

3. Proceed to *Section 3.1.2* to configure the Setup – Add Device Tab.

3.1.2 Setup – Add Device Tab

Use this screen to select and configure Modbus device. To access the screen:

1. Select the **Add Device** tab on the Setup Screen. The Add Device screen displays:

   Note: The green box around the section indicates that the section is active and configurable.
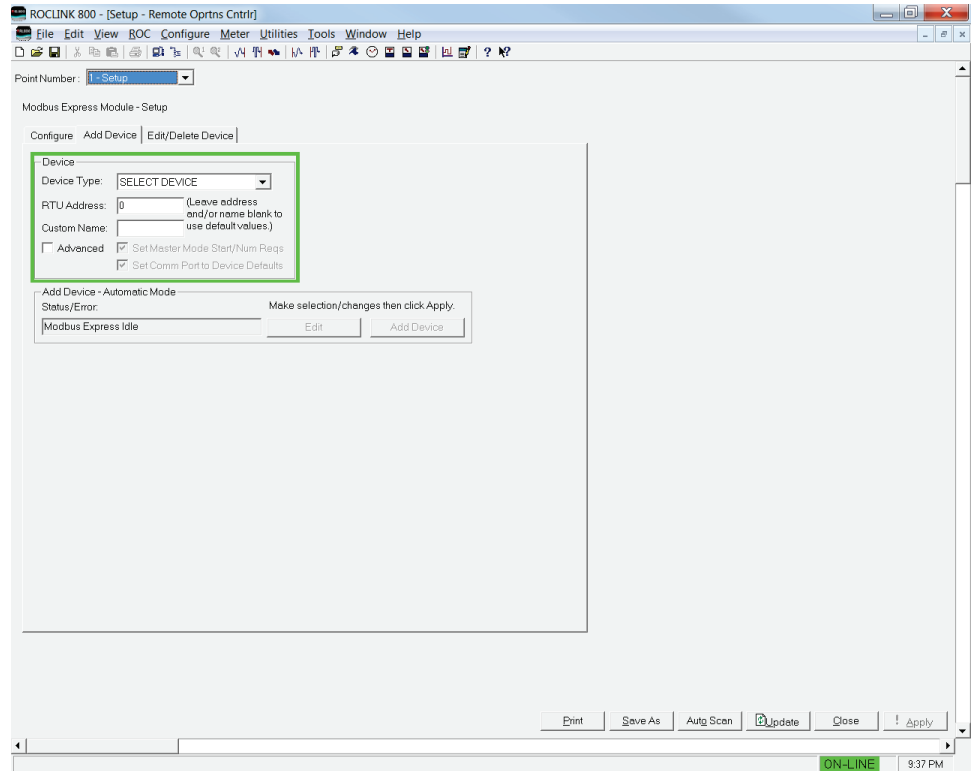
Figure 25. Setup – Add Device screen
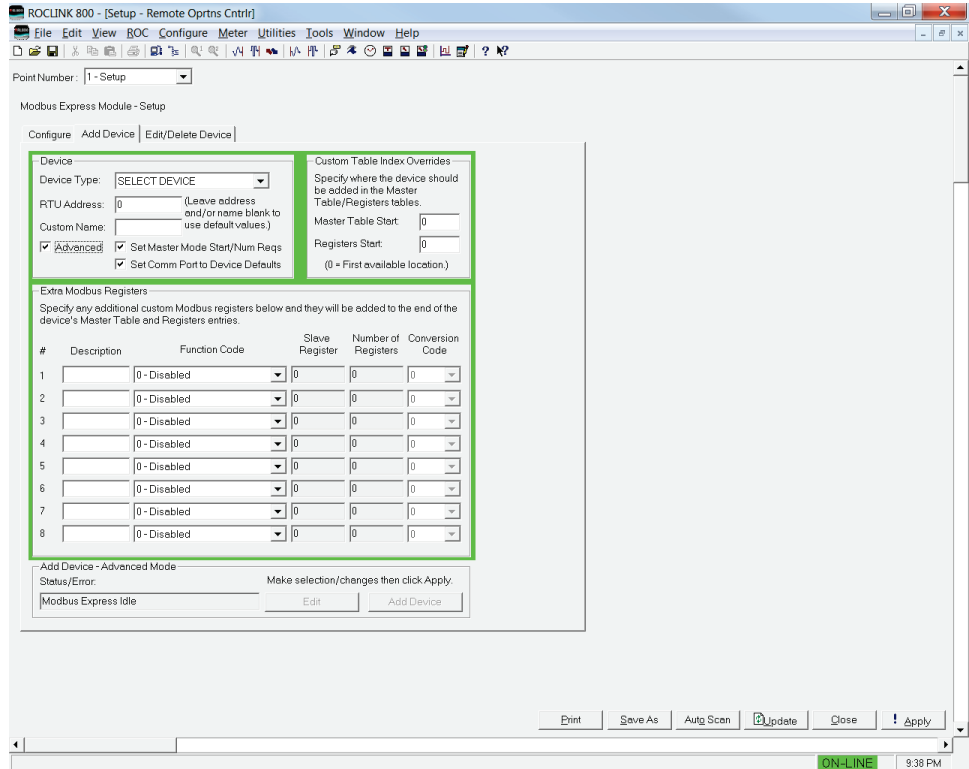
Figure 26. Setup – Add Device screen (Advanced mode – enabled)

2. Review the values in the following fields:

Field	Description
Device Type	Selects the type of device to be added. Click ▼ to display all available devices.
RTU Address	Sets the RTU address for the slave device to be queried.
Custom Name	Sets a custom tag up to 10 characters in length you can define for the device.
Advanced	Enables the advanced options for adding a device.
Set Master Mode Start/Num Reqs.	Allows master table adjustments. This parameter activates **only** when you select the **Advanced** option.
Set Comm Port to Device Defaults	Allows communication settings adjustments This parameter activates **only** when you select the **Advanced** option.
Master Table Start	Sets the location in master table to where the device is added. This parameter shows **only** when you select the **Advanced** option.
Register Start	Sets the location in registers table to where the device is added. This parameter shows **only** when you select the **Advanced** option.

Field	Description
Description (1-8)	Sets the description for additional registers. This parameter shows **only** when you select the **Advanced** option.
Function Code (1-8)	Sets the function code to be used for the added registers. This parameter shows **only** when you select the **Advanced** option.
Slave Register (1-8)	Configures the slave register to be polled. Shows **only** when you select the **Advanced** option and activates only when the **function code** is not disabled.
Number of Registers (1-8)	Sets the number of slave registers to be polled. Shows **only** when you select the **Advanced** option and activates only when the **function code** is not set to disabled.
Conversion Code	Sets the conversion code to be used for the additional registers. Shows **only** when you select the **Advanced** option and activates only when the **function code** is not set to disabled.
Add Device – Automatic Mode	Shows the status or error for devices added automatically. This shows by default or when you uncheck the **Advanced** option.
Add Device – Advanced Mode	Shows the status or error for devices added manually. Shows **only** when you select the **Advanced** option

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

4. Proceed to *Section 3.1.3* to configure the Setup – Edit/Delete Device Tab.

3.1.3   Setup – Edit/Delete Device Tab

Use this screen to edit and delete Modbus devices. To access the screen:

1. Select the **Edit/Delete Device** tab on the Setup Screen. The Edit/Delete Device screen displays:
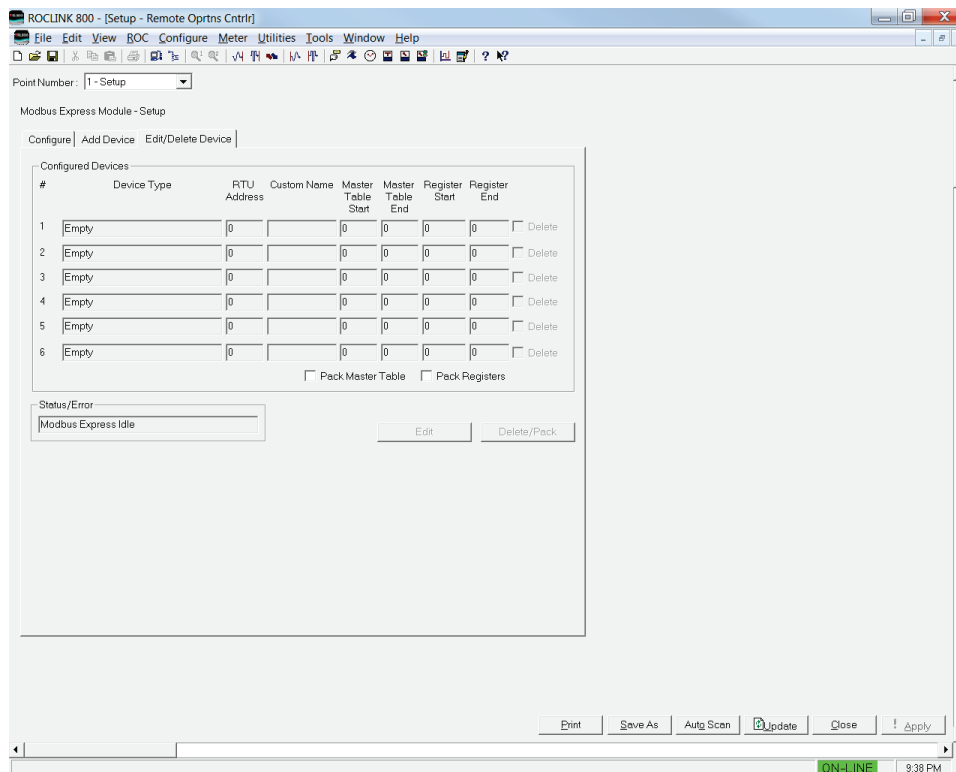
Figure 27. Setup – Edit/Delete Device screen

2. Review the values in the following fields:

Field	Description
Device Type (1-6)	Sets the device type.
RTU Address (1-6)	Sets the RTU address for the device to be queried.
Custom Name (1-6)	Shows the custom name entered from Add device tab.
Master Table Start (1-6)	Shows where in the Master Table this device's entries begin.
Master Table End (1-6)	Shows where in the Master Table that this device's entries end.
Register Start (1-6)	Shows where in the Registers Table this device's entries begin. A value of 0 indicates the device is not configured.
Register End (1-6)	Shows where in the Registers Table this device's entries end. A value of 0 indicates the device is not configured.
Pack Master Table	Deletes empty Master Table fields and makes the entries contiguous.
Pack Registers	Deletes empty Registers Table fields and makes the entries contiguous.
Status/Error	Show the status error of the added devices

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

4. Click **Close** to return to the main ROCLINK 800 screen. Proceed to *Section 3.2* to configure the Master Table Screen.

3.2 Master Table Screen

Use this screen to configure the Modbus Express master table. The module uses 50 Master Table entries (25 for each logical). To access this screen:

1. From the Directory Tree, double-click **User Display** if you use ROC800 or **Modules** > **Slot #, Modbus Express Mod** if you use FB107.

   Note: For FB107, the **Slot #** indicates the slot where you install your Modbus Express module. For example, if you install your Modbus Express module in slot 2, then you double-click **Module > Slot 2, Modbus Express Mod** from the directory tree.

2. Double-click **Display #70 – Modbus Express Module – Master Table**. The setup screen displays:
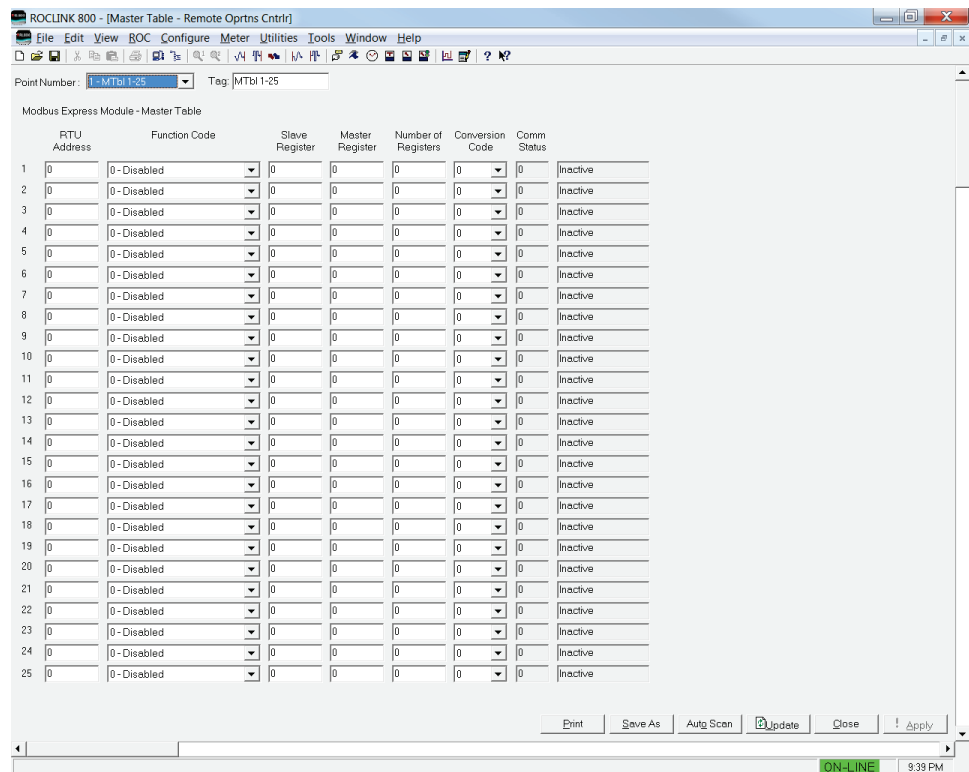
Figure 28. Master Table screen

3. Review the values in the following fields:

Field	Description
Point Number	Selects the Modbus master table to configure. Click ▼ to display all available master tables.
RTU Address (1-25), (26-50)	Sets the RTU address for the device to be queried. **Note**: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
Function Code (1-25), (26-50)	Sets the Modbus function code to be sent to the device. Click ▼ to display all valid function codes. **Note**: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
Slave Register (1-25), (26-50)	Sets the starting register number from which data is drawn from the device. Valid values are 1 to 65535. **Note**: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
Master Register (1-25), (26-50)	Sets the starting register number into which data is stored on the device. Valid values are 1 to 65535. **Notes:** ▪ This number corresponds to the Value field on the Register screen. ▪ The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
Number of Registers (1-25), (26-50)	Sets the total number of registers to poll. **Note**: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.

Field	Description
Conversion Code (1-25), (26-50)	Sets the type of conversion performed (if any) on data before it is either sent to the host or written to the FB107 or ROC800. The conversions accommodate differences in data types between the devices. Conversion codes affect Function Codes 3, 4, 6, and 15. Click ▼ to display all valid conversion codes:
	0 = No Conversion
	25 = Any type to FLOAT
	26 = Any type to signed short
	27 = Any type to signed long
	28 = Any type to unsigned short
	29 = Any type to unsigned long
	30 = Any type to unsigned byte
	57 = Any type to signed long 0,1,2,3
	58 = Any type to signed long 1,0,3,2
	59 = Any type to signed long 2,3,0,1
	60 = Any type to signed long 3,2,1,0
	61 = Any type to unsigned long 0,1,2,3
	62 = Any type to unsigned long 1,0,3,2
	63 = Any type to unsigned long 2,3,0,1
	64 = Any type to unsigned long 3,2,1,0
	65-72 = IEEE Floating Point Number
	Note: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
Comm Status (1-25), (26-50)	This **read-only** field shows the status of the query.
	Note: The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.
	0 Inactive
	1 Timeout Error
	2 Addr Check
	3 Function Code Error.
	4 Num of Exp Bytes
	5 RCV Slave Resp
	6 CRC/LRC Check
	7 CRC/LRC Check
	8 Valid Response Received
	128 Write Data Error
	129 Acc Dev Data
	130 Master Table Error
	131 Trans Timeout
	144 Tx/Rx Buff Ovr
	145 Invalid Func #

Field	Description
Device (1-25), (26-50)	Shows the custom name of the device.
	Note：The Master Table screen has two continuous sections; rows 1-25 and rows 26- 50. Rows 1-25 are shown by default. Select **2 - MTbl 26-50** using the **Point Number** field to access rows 26-50.

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

5. Click **Close** to return to the ROCLINK 800 screen. Proceed to *Section 3.3* to configure the Register screen.

3.3   Registers Screen

The module uses 200 registers (50 for each logical) to store data read from or written to the devices. All register values are in float or register data types that depend on the conversion codes you use. To access this screen:

1. From the Directory Tree, double-click **User Display** if you use ROC800 or **Modules** > **Slot #, Modbus Express Mod** if you use FB107.

   Note: For FB107, the **Slot #** indicates the slot where you install your Modbus Express module. For example, if you install your Modbus Express module in slot 2, then you double-click **Module > Slot 2, Modbus Express Mod** from the directory tree.

2. Double-click **Display #71 – Modbus Express Module – Registers**. The Registers screen displays:
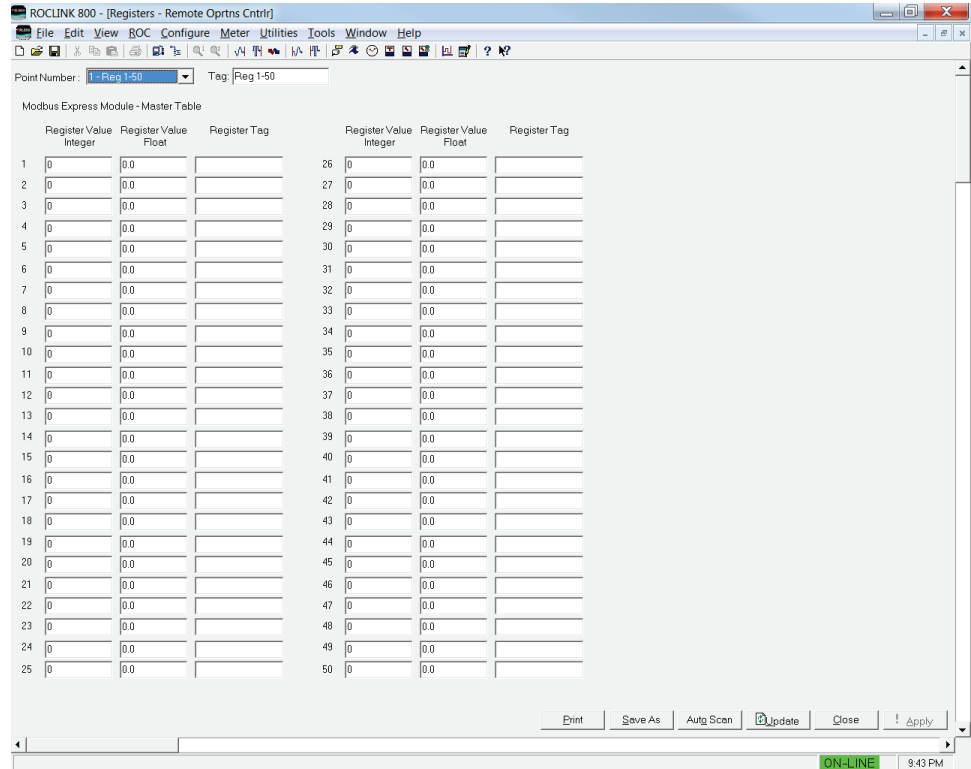
Figure 29. Registers screen

3. Review—and change as necessary—the values in the following fields:

Field	Description
Point Number	Selects one of the four register logicals. Click ▼ to display all available Registers tables.
Tag	Sets a unique identifier for the selected table.
Register Value Integer (1-50), (51-100), (101-150), and (151-200)	Shows or sets the integer value for each register. **Note**: The Registers table screen has four continuous sections; rows 1-50, rows 51-100, rows 101-150, and rows 151-200. Rows 1-50 are shown by default. Select **2 - Reg 51-100** using the **Point Number** field to access rows 51-100. Use the other Point Number options to access the rest of the rows.
Register Value Float (1-50), (51-100), (101-150), and (151-200)	Shows or sets the floating value for each register. **Note**: The Registers table screen has four continuous sections; rows 1-50, rows 51-100, rows 101-150, and rows 151-200. Rows 1-50 are shown by default. Select **2 - Reg 51-100** using the **Point Number** field to access rows 51-100. Use the other Point Number options to access the rest of the rows.

Field	Description
Register Tag (1-50), (51-100), (101-150), and (151-200)	Shows or sets a unique identifier for each register.
	Note: The Registers table screen has four continuous sections; rows 1-50, rows 51-100, rows 101-150, and rows 151-200. Rows 1-50 are shown by default. Select **2 - Reg 51-100** using the **Point Number** field to access rows 51-100. Use the other Point Number options to access the rest of the rows.
Device (1-50), (51-100), (101-150), and (151-200)	Shows the device's custom name.
	Note: The Registers table screen has four continuous sections; rows 1-50, rows 51-100, rows 101-150, and rows 151-200. Rows 1-50 are shown by default. Select **2 - Reg 51-100** using the **Point Number** field to access rows 51-100. Use the other Point Number options to access the rest of the rows.

4. Click **Close** to return to the ROCLINK 800 screen. Proceed to *Section 3.4* to configure the Expanded Registers screen.

3.4   Expanded Regs Screen

Use this screen to configure the Expanded Registers. To access this screen:

1. From the Directory Tree, double-click **User Display** if you use ROC800 or **Modules** > **Slot #, Modbus Express Mod** if you use FB107.

   Note: For FB107, the **Slot #** indicates the slot where you install your Modbus Express module. For example, if you install your Modbus Express module in slot 2, then you double-click **Module > Slot 2, Modbus Express Mod** from the directory tree.

2. Double-click **Display #72 – Modbus Express Module – Expanded Regs**. The Expanded Registers screen displays:
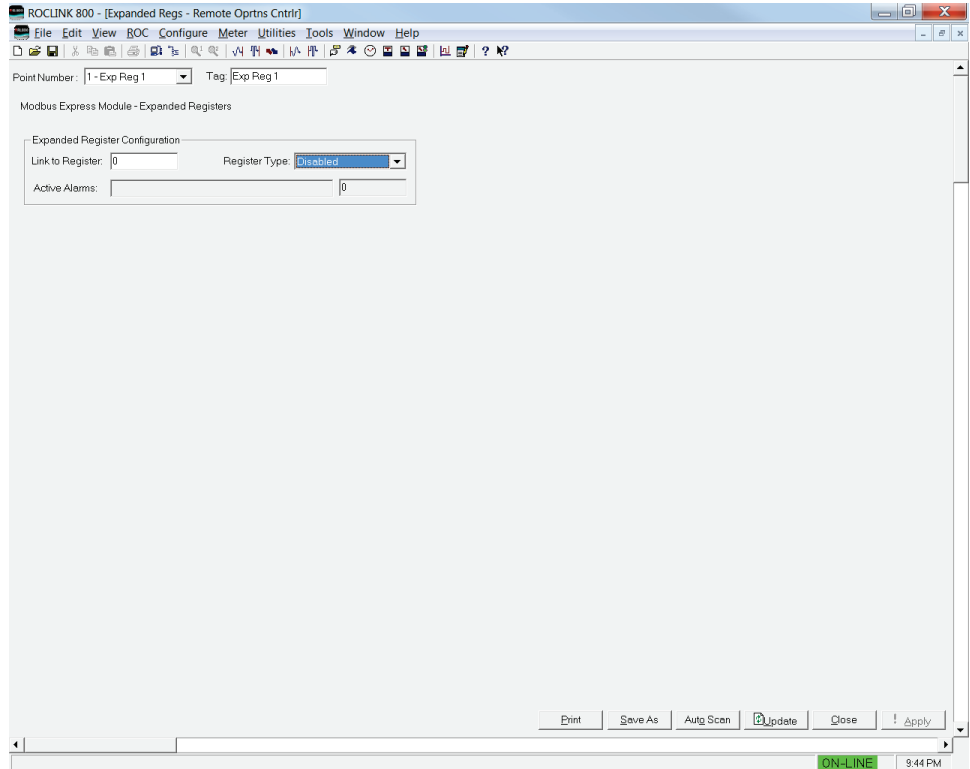
Figure 30. Expanded Registers screen, Register Type – Disabled
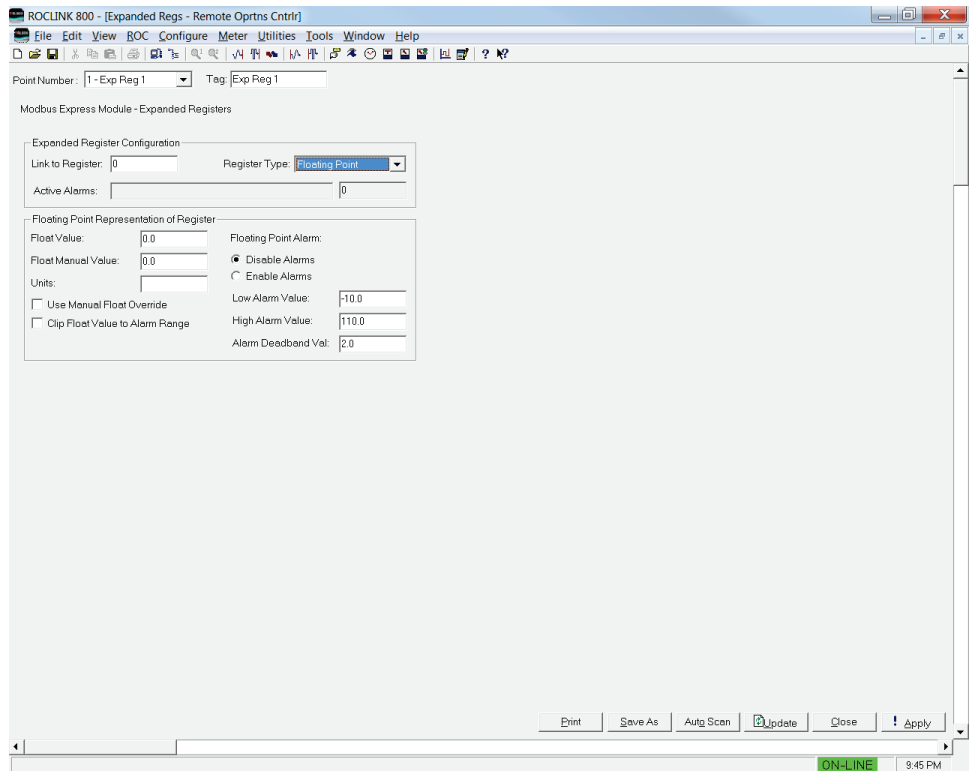
Figure 31. Expanded Registers screen, Register Type – Floating Point
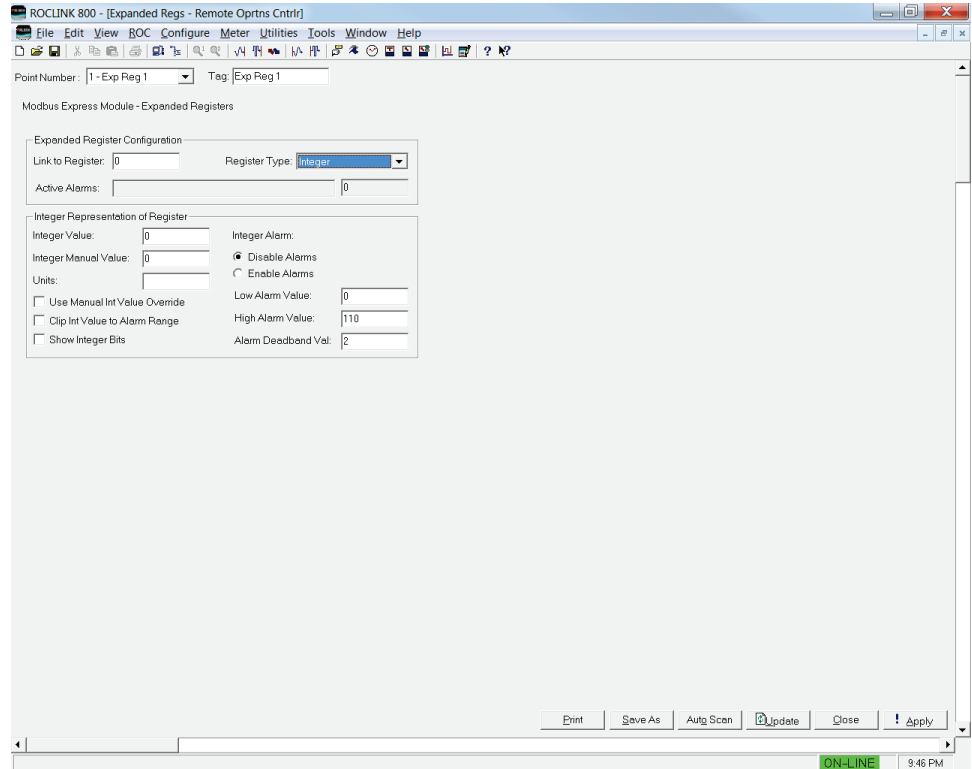
Figure 32. Expanded Registers screen, Register Type – Integer
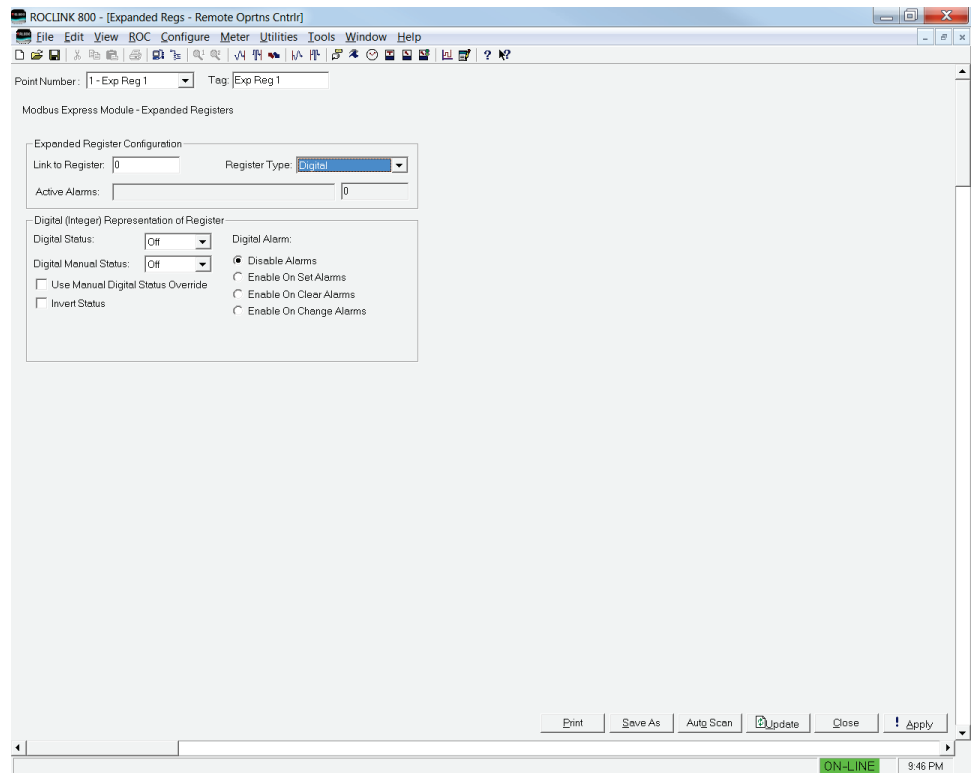
Figure 33. Expanded Registers screen, Register Type – Digital

3. Review—and change as necessary—the values in the following fields:

Field	Description		
Point Number	Selects one of the twenty-five expanded register logicals.		
Tag	Sets a unique identifier for the selected expanded register table.		
Link to Register	Set which register the expanded register maps to.		
Register Type	Sets the register type.		
	Float Value	Shows the live floating value for the register. This parameter shows **only** when **Register Type** is set to **Floating Point.**
	Float Manual Value	Sets the manual float value for the register. This parameter shows **only** when **Register Type** is set to **Floating Point.**
	Units	Configures the units for the register. This parameter shows **only** when **Register Type** is set to **Floating Point** or **Integer.**
	Floating Point Alarm	Sets the floating alarm. This parameter shows **only** when **Register Type** is set to **Floating Point**.
	Low Alarm Value	Sets the low alarm value. This parameter shows **only** when **Register Type** is set to **Floating Point**.
	High Alarm Value	Sets the high alarm value. This parameter shows **only** when **Register Type** is set to **Floating Point** or **Integer**.
	Alarm Deadband Val.	Sets the alarm deadband value. This parameter shows **only** when **Register Type** is set to **Floating Point** or **Integer**.
	Use Manual Float Override	Configures float override. This parameter shows **only** when **Register Type** is set to **Floating Point** or **Integer**.
	Clip Float Value to Alarm Range	Sets float value clipping. This parameter shows **only** when **Register Type** is set to **Floating Point**.

Field	Description
Integer Value	Shows the live integer value for the register. This parameter shows **only** when **Register Type** is set to **Integer**.
Integer Manual Value	Sets the manual integer value for the register. This parameter shows **only** when **Register Type** is set to **Integer**.
Integer Alarm	Sets the integer alarm. This parameter shows **only** when **Register Type** is set to **Integer**.
Use Manual Int Override	Configures float override. This parameter shows **only** when **Register Type** is set to **Integer**.
Clip Int Value to Alarm Range	Sets integer clipping to alarm range. This parameter shows **only** when **Register Type** is set to **Integer**.
Show Integer Bits	Shows integers as bits. This parameter shows **only** when **Register Type** is set to **Integer**.
Digital Status	Enables or disables the digital register type. This parameter shows **only** when **Register Type** is set to **Digital**.
Digital Manual Status	Sets the manual digital status for the register. This parameter shows **only** when **Register Type** is set to **Digital**.
Digital Alarm	Sets the digital alarm mode. The digital alarm selections include: disable alarms, enable on set alarms, enable on clear alarms, and enable on change alarms. This parameter shows **only** when **Register Type** is set to **Digital**.
Use Manual Digital Status Override	Enables manual digital status override. This parameter shows **only** when **Register Type** is set to **Digital**.

Field	Description
Invert Status	Sets user interface options. This parameter displays **only** when you select **Digital** as the **Register Type**.
Active Alarms	Shows the active alarms.

4. Click **Close** to return to the ROCLINK 800 screen. Proceed to *Section 3.5* to save the configuration.

3.5   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:
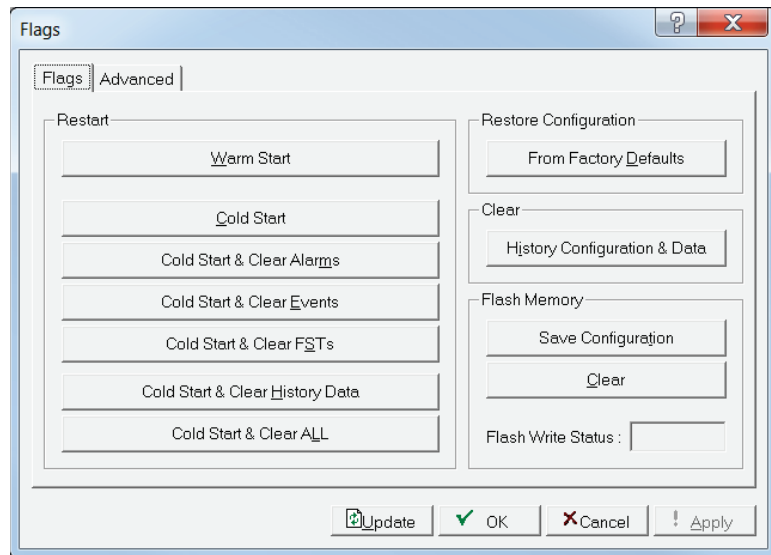
Figure 34. Flags

2. Click **Save Configuration**. A verification message displays:
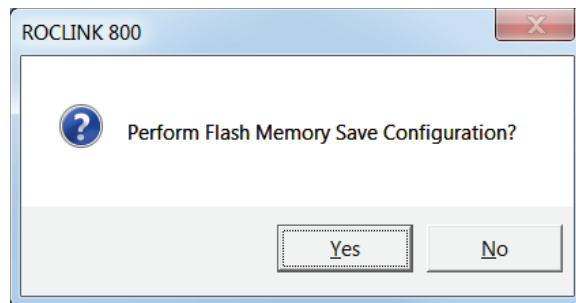
Figure 35. Save Verification

3. Click **Yes** to begin the save process. The Flash Write Status field on the Flags screen displays *In Progress*. When the process ends, the Flash Write Status field on the Flags screen displays *Completed*.

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

Note: For archive purposes, you should also save this configuration to your PC's hard drive or a removable media (such as a flash drive) using the **File** > **Save Configuration** option on the ROCLINK 800 menu bar.

Chapter 4 – Usage

This chapter describes quick start procedures and best practices for the Modbus Express module.

4.1   Quick Start Procedures

Adding a Device using Defaults Settings

From the **Setup** (**Display #69**) Configuration Screen, select the **Add Device** tab. A green box around the **Device** area indicates the portion of the display that is active.

1. Select a device from the **Device Type** pull-down menu and click the **Apply** button. (If the device is not using the factory default RTU address, you may optionally enter a custom address and a short custom name for the device. When you leave those fields empty, the Modbus Express module uses the program defaults.)

2. Click **Update**. The **Status/Error** box shows a **Ready to Add** message and the green box highlights the **Edit** and **Add Device** buttons.

    Note: It takes time before the changes to propagate.

3. Click the **Add Device** button. After a moment, click **Update**. The **Status/Error** box displays **Device Added** message.

To verify if you successfully added the device, select the Edit/Delete Device tab from the Setup configuration screen. The screen shows all the devices you added with the default RTU Address and Custom Name. Other entries will show where in the Master Table the device is (start to end) and where in the Registers table the device registers are (start to end).

To begin polling, select the Configure tab of the Setup configuration screen, select Enabled from the Continuous Polling section and click Apply. Click Auto Scan to enable auto refresh of the display (remember to turn it off later), or click Update periodically to verify if the Good Messages count is increasing. If Bad Messages count increases, the device is either incorrectly wired or the comm port settings do not match the default communication settings the Modbus Express module uses.

The **Modbus Express Module - Master Table** (**Display #70**) screen also displays the entries of the device you add for further verification. The Comm Status and Comm Status Description columns indicate the statuses of each Master Table entry.

To check if the data are being polled from the device, view the **Modbus Express Module - Registers** (**Display #71**) screen and check if the Register entry of the device you add (either in the Integer column or Floating column) contains a value other than 0 or 0.0.

Deleting a Device   To delete a device:

1. Open the **Edit/Delete Device** tab of the **Setup** (**Display #69**) configuration screen.

2. Check the box(es) of the device(s) you wanted to delete then click **Apply**.

3. Click **Update**. The **Status/Error** field should show **Ready to Delete/Pack**.

4. Click the **Delete/Pack** then wait a moment before you click **Update**. The **Status/Error** shows **Device Deleted**. This resets the device entries to empty or zero values.

Note:
- If desired, you can reset the Starting Request and Number of Request Values using the Configure tab of the **Setup** (**Display #69**) configuration screen.
- The Modbus Express module ignores empty Master Table entries.

Packing the Master Table/Registers   If you delete a device, you may leave gaps in the Master Table or Registers table. For example, if you add three devices and the first device takes Master Table entries 1-3, the second takes entries 4-9, and the third takes entries 10-15, the deletion of the second device leaves entries 4-9 empty.

If this is undesirable, you can check the **Pack Master Table** the **Edit/Delete Device** tab of the **Modbus Express Module – Setup** (**Display #69**) configuration screen to remove the empty entries. So, If you select **Pack Master Table** the first device still occupies entries 1-3, the former third device (originally entries 10-15) moves down to 5-10 and so on. The same thing applies to the Registers. This is to make more contiguous empty entries in the tables for adding new devices.

Disabling Automatic Comm Port or Master Mode Configuration (Advanced Mode)   You can access the **Advanced** mode using the **Add Device** tab on the **Modbus Express Module – Setup (Display #69)** configuration screen. When you enable the **Advanced** mode, you can override the automatic setting of the Master Mode and the comm port settings.

When you uncheck the **Set Master Mode Start/Num Reqs**, the module prevents the automatic setting of the Master Mode such as setting the starting entry and the number of requests. When you uncheck the **Set Comm Port to Defaults**, the module prevents automatic configuration of the RS485.

If you add a device with different comm port settings than factory defaults, enable the **Advanced** mode and uncheck Set **Comm Port Device Defaults**.

Overriding Custom Table Index Entries (Advanced Mode)

When in **Advanced** mode, you can specify the location of your device's entries in the Master Table and Registers table. If you specify **Master Table Start** to be 10, the device's Master Table entries start at 10. If a device is already present or if table spaces are not enough to accommodate the entries, the module returns an error. The same thing applies for device registers if you specify the **Registers Start** value.

This feature is applicable if you are sectioning your device's entries in the Registers table. Since each Registers table is made up of four columns with 25 registers each (1-25, 26-75, etc.), you can add a device with less than 25 registers at entry 1, then the second device at entry 26, the third device at entry 76, and so on. This places the device entries in each column of the Registers table. This feature does not affect any process.

Adding Extra Modbus Registers (Advanced Mode)

You can add up to eight additional Master Table entries for the device to enable polling of additional custom device registers. You can add any device registers. After you add the device, these registers appear in the Master Table and Registers entry for the device. If you delete the device, the module deletes these additional entries along with the default entries. The entries also move along with default entries if you pack the Master Table or Registers.

You can set a custom Register tag name for each extra modbus register. If you add and entry that polls multiple registers and only entered the description of first entry, the first Register uses the description name you enter plus a generated name of "+RegXXX" where "XXX" is an offset from the Register value. For example, if you enter "Volume" in the first register at register 3000, you first register name is "Volume" plus "+Reg3002", "+Reg3004", etc. You can change these generated names in the **Modbus Express Modules - Registers** (**Display #71**) configuration screen.

Manually Adding Master Table and Registers

You can configure the Modbus Express module manually to add devices that are not natively supported by the module.

You must manually configure the Master Table start and end request entries to include any manual Master Table entries you add. You must enable **Continuous Polling** using the Configure tab of the **Setup** configuration screen.

Note: Any devices added by Express Mode will not overwrite any manual entries made by the user.

4.2   Best Practices

Monitor the Good Messages Counter

When you enable Continuous Polling, the Good Messages counter increments for each line in the Master Table that is successfully polled. Any FST or other application that monitors Modbus Express Registers should verify that the Good Messages count is incrementing. If not, the Registers data may not be accurate. If you detect this situation, check the Master Table status.

Note: The baud rate of the comm port, the number of slave registers being polled in the Master Table, and the Request Delay value all impact how often the Good Messages counter increments. Reading the Register values may happen faster than the Modbus Express module can retrieve data from the device(s).

Check the Master Table Comm Status field

If you configure a device is with ten Master Table entries, each entry has a Comm Status value of 8 indicating that the last poll was successful. If **Good Messages** value appears to stop incrementing, an FST can scan through the Master Table **Comm Status** parameters for the device and look for error indicators.

Note: Both Good Messages and Comm Status should be checked to verify an error. In the event of some failure of the Modbus Express module, such as the disconnected cable, the Comm Status values remain in the last successful polling but do not indicate any error.

To verify errors:

1. Check if the Good Messages has incremented since the last check.

2. If Good Messages does not increment, check **Master Table – Comm Status** fields for the device being polled and check for non-successful status codes.

3. Handle this potential error as needed.

Chapter 5 – Reference Materials

This section provides tables of information on the point types the Modbus Express module uses.

For the FB107:

- Point Type 68 (Modbus Express Setup)
- Point Type 69 (Modbus Master Table)
- Point Type 70 (Modbus Registers)
- Point Type 71 (Modbus Expanded Registers)

For the ROC800:

- Point Type 247 (Modbus Express Setup)
- Point Type 248 (Modbus Master Table)
- Point Type 249 (Modbus Registers)
- Point Type 250 (Modbus Expanded Registers)

5.1   Point Type 68/247: Modbus Express Setup

Point type 68 (for FB107) or 247 (for ROC800) contains configuration parameters for the Modbus Express App Module as a whole. There is a single logical for this point type.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"EasyMB Cfg"	1.00	Sets point type description
1	Baud Rate	R/W	User	UINT8	1	0-3	3	1.00	Sets the baud rate for the RS-485 communication port 0 = 2400 1 = 4800 2 = 9600 3 = 19200
2	Data Bits	R/W	User	UINT8	1	0-1	8	1.00	Sets the data bits. 7 = 7 bits 8 = 8 bits
3	Stop Bits	R/W	User	UINT8	1	0-1	1	1.00	Sets the stop bits. 1 = 1 bit 2 = 2 bits
4	Parity	R/W	User	UINT8	1	0-2	0	1.00	Sets the parity. 0 = None 1 = Odd 2 = Even
5	Transmission Mode	R/W	User	UINT8	1	0-1	0	1.00	Controls the type of transmission mode desired. 0 = RTU Mode 1 = ASCII Mode
6	Byte Order	R/W	User	UINT8	1	0-1	0	1.00	Controls which byte is sent out first for floats, short integers, and long integers. 0 = LSB first (Associated with little-endian processors) 1 = MSB first (Associated with big-endian processors)

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
7	Master Poll Trigger	R/W	User	UINT8	1	0-1	0	1.00	Controls the initiation of a Modbus master polling sequence. 0 = Idle 1 = Enable a one-time pass through the Master Table.
8	Master Start Reg Num	R/W	User	UINT8	1	0-255	0	1.00	Sets on which row the scanning begins.
9	Master Num Requests	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of rows to be polled. The polling starts on what is set in Master Start Reg Num.
10	Master Cont Poll Enable	R/W	User	UINT8	1	0-1	0	1.00	Controls whether the Modbus master poll request sequence. 0 = Disabled 1 = Continuously poll the configured Master Table, with a Master Poll Delay between each scan.
11	Master Poll Delay	R/W	User	UINT32	4	0-86400 (24 hrs)	1	1.00	Contains the delay time in seconds between continuous master poll requests (Continous poll mode only).
12	Master Poll Timeout	R/W	User	UINT16	4	0-3600 (1 hr)	1	1.00	Contains the amount of time in seconds the module will wait for a response from a device before marking it as timeout error.
13	Master Poll Retries	R/W	User	UINT8	1	0-255	3	1.00	Sets the number of times a Master Table row will be retried in the event of a timeout.
14	Number of Good Msgs	R/W	System	UINT32	4	0-4294967295	0	1.00	Indicates the number of good Modbus responses received from all devices.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
15	Number of Bad Msgs	R/W	System	UINT32	4	0-4294967295	0	1.00	Indicates the number of bad Modbus responses received from all devices.
16	Device 1 Type	R/W	User	UINT8	1	0-15	0	1.00	Selects the type of device. 0 = None Selected 1 = Daniel 3812 2 = Reserved 3 = Daniel Mark III 4 = Fisher easy-Drive D4 5 = Reserved 6 = Reserved 7 = Khrone Altosonic V12 8 = Micro Motion 800 9 = Micro Motion Trans 10 = Micro Motion 7826 11 = Micro Motion 7928 12 = Platinum BMS 731 13 = Rosemount 3095 MVT 14 = Rosemount 3300 GWR 15 = Sick Maihak FlowSIC 600 16 = Spectra SS500 / SS2000 / SS3000
17	Device 1 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for this device.
18	Device 1 Name	R/W	User/System	AC10	10	0x20 → 0x7E for each ASCII character	0	1.00	Shows the name defined for this device. The module populates this field according to the device type but this can be overwritten.
19	Device 1 Table Start	R/W	User	UINT1	1	0-50	0	1.00	Sets the starting row for this device in the Modbus master table.
20	Device 1 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
21	Device 1 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
22	Device 1 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
23	Device 2 Type	R/W	User	UINT8	1	(See Param 16)	0	1.00	Sets the type of device configured for this instance. (See Param 16)
24	Device 2 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for the device.
25	Device 2 Name	R/W	Both	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the device name. The module populates this field according to the device type, but may be overwritten.
26	Device 2 Table Start	R/W	User	UINT8	1	0-50	0	1.00	Sets the starting row for the device in the Modbus master table.
27	Device 2 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.
28	Device 2 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
29	Device 2 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
30	Device 3 Type	R/W	User	UINT8	1	(See Param 16)	0	1.00	Sets the type of device configured for this instance. (See Param 16)
31	Device 3 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for the device.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
32	Device 3 Name	R/W	Both	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the device name. The module populates this field according to the device type, but may be overwritten.
33	Device 3 Table Start	R/W	User	UINT8	1	0-50	0	1.00	Sets the starting row for the device in the Modbus master table.
34	Device 3 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.
35	Device 3 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
36	Device 3 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
37	Device 4 Type	R/W	User	UINT8	1	(See Param 16)	0	1.00	Sets the type of device configured for this instance. (See Param 16)
38	Device 4 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for the device.
39	Device 4 Name	R/W	Both	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the device name. The module populates this field according to the device type, but may be overwritten.
40	Device 4 Table Start	R/W	User	UINT8	1	0-50	0	1.00	Sets the starting row for the device in the Modbus master table.
41	Device 4 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.
42	Device 4 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
43	Device 4 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
44	Device 5 Type	R/W	User	UINT8	1	(See Param 16)	0	1.00	Sets the type of device configured for this instance. (See Param 16)
45	Device 5 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for the device.
46	Device 5 Name	R/W	Both	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the device name. The module populates this field according to the device type, but may be overwritten.
47	Device 5 Table Start	R/W	User	UINT8	1	0-50	0	1.00	Sets the starting row for the device in the Modbus master table.
48	Device 5 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.
49	Device 5 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
50	Device 5 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
51	Device 6 Type	R/W	User	UINT8	1	(See Param 16)	0	1.00	Sets the type of device configured for this instance. (See Param 16)
52	Device 6 Address	R/W	User	UINT8	1	0-255	0	1.00	Sets the Modbus slave address for the device.
53	Device 6 Name	R/W	Both	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the device name. The module populates this field according to the device type, but may be overwritten.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
54	Device 6 Table Start	R/W	User	UINT8	1	0-50	0	1.00	Sets the starting row for the device in the Modbus master table.
55	Device 6 Table End	R/W	User	UINT8	1	0-50	0	1.00	Sets the last row for this device in the Modbus master table.
56	Device 6 Regs Start	R/W	User	UINT8	1	0-200	0	1.00	Sets the first register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
57	Device 6 Regs End	R/W	User	UINT8	1	0-200	0	1.00	Sets the last register for this device in the Modbus registers list. A value of 0 indicates the device is not configured.
58	Add MB Device Type	R/W	User	UINT8	1	1-(See Param 16)	0	1.00	Sets the type of device to be added. (See Param 16)
59	Add MB Dev Address	R/O	System	UINT16	2	0-65535	0	1.00	Sets the RTU address of device to be added.
60	Add MB Dev Name	R/O	System	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the short name of device to be added.
61	Add MB Dev Tbl Start	R/O	System	UINT8	1	0-50	0	1.00	Sets the location of the device in the Modbus master table to add device (0=default).
62	Add MB Dev Regs Start	R/O	User	UINT8	1	0-200	0	1.00	Sets the location of the device in Modbus registers table to add device (0=default).
63	Add MB Dev Tag 1	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
64	Add MB Dev Func Code 1	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
65	Add MB Dev Slave Reg 1	R/W	User	UIN16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.
66	Add MB Dev Num Regs 1	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
67	Add MB Dev Conv Code 1	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
68	Add MB Dev Tag 2	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	User entered description for the additional register(s).
69	Add MB Dev Func Code 2	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
70	Add MB Dev Slave Reg 2	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
71	Add MB Dev Num Regs 2	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
72	Add MB Dev Conv Code 2	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
73	Add MB Dev Tag 3	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).
74	Add MB Dev Func Code 3	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
75	Add MB Dev Slave Reg 3	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.
76	Add MB Dev Num Regs 3	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
77	Add MB Dev Conv Code 3	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
78	Add MB Dev Tag 4	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
79	Add MB Dev Func Code 4	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
80	Add MB Dev Slave Reg 4	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.
81	Add MB Dev Num Regs 4	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
82	Add MB Dev Conv Code 4	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
83	Add MB Dev Tag 5	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).
84	Add MB Dev Func Code 5	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
85	Add MB Dev Slave Reg 5	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
86	Add MB Dev Num Regs 5	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
87	Add MB Dev Conv Code 5	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
88	Add MB Dev Tag 6	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).
89	Add MB Dev Func Code 6	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
90	Add MB Dev Slave Reg 6	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.
91	Add MB Dev Num Regs 6	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
92	Add MB Dev Conv Code 6	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
93	Add MB Dev Tag 7	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
94	Add MB Dev Func Code 7	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
95	Add MB Dev Slave Reg 7	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.
96	Add MB Dev Num Regs 7	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
97	Add MB Dev Conv Code 7	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
98	Add MB Dev Tag 8	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for the additional register(s).
99	Add MB Dev Func Code 8	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code to be used for the additional register(s). 0 = Disabled 1 = Read Coil Status 2 = Read Input Status 3 = Read Holding Registers 4 = Read Input Registers 5 = Force Single Coil 6 = Preset Single Register 15 = Force Multiple Coils 16 = Preset Multiple Registers
100	Add MB Dev Slave Reg 8	R/W	User	UINT16	2	0-65535	0	1.00	Sets the slave register(s) to be polled.

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
101	Add MB Dev Num Regs 8	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of slave registers to be polled.
102	Add MB Dev Conv Code 8	R/W	User	UINT8	1	0, 25-30, 57-72	0	1.00	Sets the conversion code to be used for the additional register(s).
103	Add MB Checkbox	R/W	User	UINT8	1	0-255	3	1.00	Bit 0 = Adjust Master Table Bit 1 = Adjust Comm Settings Bit 2 = unused Bit 3 = unused Bit 4 = unused Bit 5 = unused Bit 6 = unused Bit 7 = Advanced Options enable
104	Add MB Button	R/W	User	UINT8	1	0-2	0	1.00	0 = Idle 1 = Device to add selected 2 = Device input locked, Add button enabled
105	Del MB Checkbox	R/W	User	UINT8	1	0-255	0	1.00	Bit 0 = Delete device 1 Bit 1 = Delete device 2 Bit 2 = Delete device 3 Bit 3 = Delete device 4 Bit 4 = Delete device 5 Bit 5 = Delete device 6 Bit 6 = Pack Master Table Bit 7 = Pack Registers
106	Dell MB Button	R/W	User	UINT8	1	0-2	0	1.00	0 = Idle 1 = Devices to delete selected 2 = Device input locked, Delete button enabled

Point Type 68/247: Modbus Express Setup

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
107	MB Error / Status	R/O	System	UINT8	1	0-255	0	1.00	Shows the Modbus error or status.
									Status:
									0 = Idle 1 = Ready to Add 2 = Device Added 3 = Ready to Delete/Pack 4 = Device Deleted 5 = Master Table Packed 6 = Registers Packed 7 = Both Master Tbl/Registers Packed
									Errors:
									250 = Bad Conversion Code 251 = Invalid Device Type selected 252 = Unable to Delete/Pack 253 = Master Table Full 255 = Registers Full 255 = Device Table Full

5.2   Point Type 69/248: Modbus Master Table

Point type 69 (for FB107) or 248 (for ROC800) contains configuration parameters for the Modbus Master Table. There are two logicals for this point type.

Point Type 69/248: Modbus Master Table

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	"Master Tbl X" where X is the logical	1.00	Sets the point type description.
1	Slave Address 1	R/W	User	UINT8	1	0-255	0	1.00	Sets the device RTU address
2	Function Code 1	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code: 0 = Disabled 1 = Read logic coil status 2 = Read discrete input status 3 = Read output registers (holding) 4 = Read input registers 5 = Force single logic coil 6 = Preset single holding register 15 = Force multiple logic coils 16 = Preset multiple holding registers
3	Slave Register 1	R/W	User	UINT16	2	0-65535	0	1.00	Sets the device register
4	Master Register 1	R/W	User	UINT8	1	0-200	0	1.00	Sets the App module register
5	Number of Registers 1	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of registers to request from device

Point Type 69/248: Modbus Master Table

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
6	Conversion Code 1	R/W	User	UINT8	1	0, 25-30, 57-74	0	1.00	Sets the conversion code: 0 = No Conversion 25 = Any type to FLOAT 26 = Any type to signed short 27 = Any type to signed long 28 = Any type to unsigned short 29 = Any type to unsigned long 30 = Any type to unsigned byte 57 = Any type to signed long 0,1,2,3 58 = Any type to signed long 1,0,3,2 59 = Any type to signed long 2,3,0,1 60 = Any type to signed long 3,2,1,0 61 = Any type to unsigned long 0,1,2,3 62 = Any type to unsigned long 1,0,3,2 63 = Any type to unsigned long 2,3,0,1 64 = Any type to unsigned long 3,2,1,0 65-72 = IEEE FLOATing Point Number

Point Type 69/248: Modbus Master Table

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
7	Comm Status 1	R	System	UINT8	1	0-9, 128-131, 144-145	0	1.00	Shows the last poll status. 0 = Inactive 1 = Timeout Error 2 = Addr Check 3 = Function Code Error 4 = Num of Exp Bytes 5 = Rcv Slave Resp 6 = CRC/LRC Check 7 = CRC/LRC Check 8 = Valid Slave Resp 128 = Write Data Err 129 = Acc Dev Data 130 = Master Table Error 131 = Trans Timeout 144 = Tx/Rx Buff Ovr 145 = Invalid Func #
...									

Note: Parameters 1-7 repeat up to 25 times, once for each Master Table entry.

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
169	Slave Address 25	R/W	User	UINT8	1	0-255	0	1.00	Sets the slave RTU address
170	Function Code 25	R/W	User	UINT8	1	0-6, 15-16	0	1.00	Sets the Modbus function code: 0 = Disabled 1 = Read logic coil status 2 = Read discrete input status 3 = Read output registers (holding) 4 = Read input registers 5 = Force single logic coil 6 = Preset single holding register 15 = Force multiple logic coils 16 = Preset multiple holding registers
171	Slave Register 25	R/W	User	UINT16	2	0-65535	0	1.00	Sets the device register
172	Master Register 25	R/W	User	UINT8	1	0-200	0	1.00	Sets the App module register

Point Type 69/248: Modbus Master Table

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
173	Number of Registers 25	R/W	User	UINT8	1	0-255	0	1.00	Sets the number of registers to request from the device
174	Conversion Code 25	R/W	User	UINT8	1	0, 25-30, 57-74	0	1.00	Sets the conversion code: 0 = No Conversion 25 = Any type to FLOAT 26 = Any type to signed short 27 = Any type to signed long 28 = Any type to unsigned short 29 = Any type to unsigned long 30 = Any type to unsigned byte 57 = Any type to signed long 0,1,2,3 58 = Any type to signed long 1,0,3,2 59 = Any type to signed long 2,3,0,1 60 = Any type to signed long 3,2,1,0 61 = Any type to unsigned long 0,1,2,3 62 = Any type to unsigned long 1,0,3,2 63 = Any type to unsigned long 2,3,0,1 64 = Any type to unsigned long 3,2,1,0 65-72 = IEEE FLOATing Point Number

Point Type 69/248: Modbus Master Table

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
175	Comm Status 25	R	System	UINT8	1	0-8, 128-131, 144-145	0	1.00	Shows the last poll status. 0 = Inactive 1 = Timeout Error 2 = Addr Check 3 = Function Code Error 4 = Num of Exp Bytes 5 = Rcv Slave Resp 6 = CRC/LRC Check 7 = CRC/LRC Check 8 = Valid Slave Resp 128 = Write Data Err 129 = Acc Dev Data 130 = Master Table Error 131 = Trans Timeout 144 = Tx/Rx Buff Ovr 145 = Invalid Func #

5.3   Point Type 70/249: Modbus Registers

Point type 70 (for FB107) or 249 (for ROC800) contains the registers (50 per logical) that the module uses to store data it reads from and writes to slave devices. This point type has four logicals.

Point Type 70/249: Modbus Registers

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	"Registers X", where X is the logical	1.00	Sets the point type description.
1	Register Value U32 1	R/W	User	UINT32	4	0-4294967295	0.0	1.00	Shows or sets the integer value for register number 1.
2	Register Value Float 1	R/W	User	FLOAT	4	Any valid IEEE floating point	0.0	1.00	Shows or sets the floating value for register number 1.
3	Register Tag 1	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for register 1.
...									

Note: Parameters 1-3 repeat up to 50 times, once for each Master Table entry.

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
148	Register Value U32 50	R/W	User	UINT32	4	0-4294967295	0.0	1.00	Sets the holding parameter for the value of register 50 if register is an integer (else 0).
149	Register Value FLOAT 50	R/W	User	FLOAT	4	Any valid IEEE floating point	0.0	1.00	Sets the holding parameter for the value of register 50 if register is floating point (else 0.0).
150	Register Tag 50	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	""	1.00	Sets the description for register 50.

5.4   Point Type 71/250: Modbus Expanded Registers

Point type 71 (for FB107) or 250 (for ROC800) contains the expanded registers. This point type has twenty-five logicals.

Point Type 71/250: Modbus Expanded Registers

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC10	10	0x20 → 0x7E for each ASCII character	"Exp Reg X", where X is the logical	1.00	Shows or sets the Point Type description.
1	Expanded Register Type	R/W	User	UINT8	1	0-3	0	1.00	Shows or sets the I/O type for the expanded register: 0 = Disabled 1 = Floating Point 2 = Integer 3 = Digital
2	Parent Register	R/W	User	UINT8	1	1-200	0	1.00	Shows or sets which register this expanded register maps to.
3	Float Value	R	System	FLOAT	4	Any valid IEEE floating point	0.0	1.00	Shows the live value read from the register, in floating point form.
4	Float Manual Value	R/W	User	FLOAT	4	Any valid IEEE floating point	0.0	1.00	Shows or sets the value for the register in floating point form.
5	Float Alarm Low Value	R/W	User	FLOAT	4	Any valid IEEE floating point	-10.0	1.00	Shows or sets the float alarm low value.
6	Float Alarm High Value	R/W	User	FLOAT	4	Any valid IEEE floating point	110.0	1.00	Shows or sets the float alarm high value.
7	Float Alarm Deadband Value	R/W	User	FLOAT	4	Any valid IEEE floating point	2.0	1.00	Shows or sets the float alarm deadband value.
8	Integer Value	R/W	User	UINT32	4	0-4294967295	0	1.00	Shows the live value read from the register, in integer form.
9	Integer Manual Value	R/W	User	UINT32	4	0-4294967295	0	1.00	Shows or sets the value for the register in integer form.
10	Integer Alarm Low Value	R/W	User	UINT32	4	0-4294967295	0	1.00	Shows or sets the integer alarm low value.
11	Integer Alarm High Value	R/W	User	UINT32	4	0-4294967295	110	1.00	Sets the integer alarm high value.

Point Type 71/250: Modbus Expanded Registers

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
12	Integer Alarm Deadband Value	R/W	User	UINT32	4	0-4294967295	2	1.00	Sets integer alarm deadband value.
13	Units	R/W	User	AC10	10	0x20 – 0x7E for each ASCII character	""	1.00	Sets string to indicate the units of the value.
14	Digital Status	R	System	UINT8	1	0-1	0	1.00	Shows if the digital status is active or not. 0 = Off 1 = On
15	Digital Manual Status	R/W	User	UINT8	1	0-1	0	1.00	Sets status for the register in digital form.
16	Alarm Mode	R/W	User	UINT8	1	0-15	0	1.00	Configures the alarm mode: 0 = All alarms disabled Bit 0 = Floating point alarm enabled Bit 1 = Integer alarm enabled Bit 2-3 = Digital alarm bits Bit 2 (4) = Digital alarm on set Bit 3 (8) = Digital alarm on clear Bit 2 & 3 (12) = Digital alarm on change
17	Alarm Status	R	System	U8	1	0-255	0	1.00	Shows the alarm status: 0 = No alarm Bit 0 = Low Alarm Bit 1 = Low Low Alarm (unused) Bit 2 = High Alarm Bit 3 = High High Alarm (unused) Bit 4 = Rate Alarm (unused) Bit 5 = Digital Alarm Bit 6 = Point Fail Alarm (unused) Bit 7 = Scanning Disabled (unused)

Point Type 71/250: Modbus Expanded Registers

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
18	Exp Reg UI Flags	R/W	User	UINT8	1	0-255	0	1.00	Configures the user interface flags: Bit 0 = Float manual override Bit 1 = Float clipping Bit 2 = Int manual override Bit 3 = Int clipping Bit 4 = Digital override Bit 5 = Digital invert Bit 6 = unused Bit 7 = Show Int as bits

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