

Spectrex[™] 40/40C, 40/40D, and 20/20Q Flame Detector

Modbus[®] Manager Manual

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1 Introduction

1.1 Product overview

Modbus® Manager is a customized software based on the Modbus protocol over RS-485. It is used to:

- Configure the device to suit the customer's needs.
- Perform firmware upgrades.
- Provide troubleshooting information and functionality.

This Manual describes the Modbus Manager and provides instructions on how to install, operate, and maintain the software.

Note

The Modbus Manager software is for use with Spectrex 40/40C, 40/40D, and 20/20Q models only.

1.2 Minimum requirements

The minimum requirements for operating Modbus® Manager are as follows:

- Pentium® 3 GHz
- Microsoft® Windows® 10 or 11
- 2 GB RAM
- 10 GB hard disk free space
- Isolated RS-485 interface card to be defined as COM or an RS-485 converter to connect to a standard COM port

2 Initial setup

2.1 Download software

To download the Modbus® Manager, follow these steps:

Procedure

1. Go to [Spectrex.net](https://www.spectrex.net).
2. Using the site navigation, go to the relevant product page.
3. Scroll down to **Documents and Drawings**.
4. Click **Software Downloads and Drivers**.
5. Download the relevant file.

2.2 Run software

Prerequisites

Before installing the new version, any existing installation must be fully uninstalled to prevent conflicts.

Procedure

1. Once the software file has been downloaded to your computer, create a shortcut in a convenient location.
2. To run the software, double-click on the executable file.

2.3 Connect the computer to the device

Prerequisites

Before performing any configuration or diagnostic operations, connect the computer to the device using the RS-485 harness cable.

Procedure

1. Connect one end of the USB cable to one of the computer's USB ports.
2. Connect the other end of the USB cable to the USB serial (RS-485) adapter.
3. Connect the serial port of the adapter to the harness cable.

2.4 Connect the device to the harness cable

Connect the harness according to the following table:

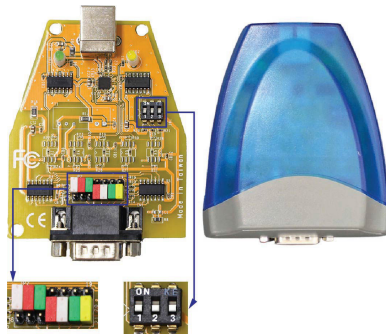
Wire color	Detector model	
	Spectrex 40/40C and 40/40D	Spectrex 20/20Q
Red wire RS-485 (+)	Terminal 13	Terminal 3
Black wire RS-485 (-)	Terminal 14	Terminal 4

2.5 Set up the USB adapter

Check that the D-connector adapter wiring is similar to the wiring shown. If it is not, adjust the cable wiring to fit the desired adapter.

Procedure

1. If required, unscrew the cover of the USB adapter.
2. Set up jumpers using one of the following options.

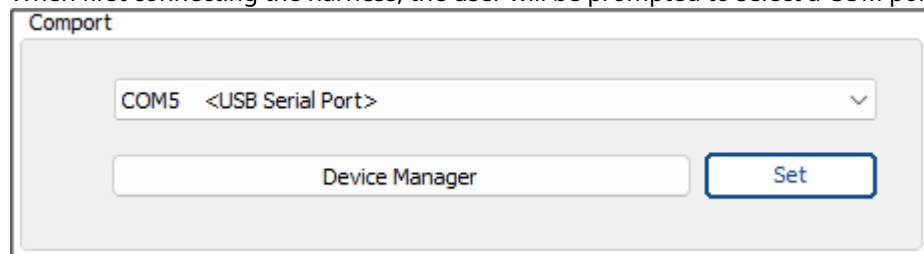


3. Close the USB adapter cover.
4. Connect the cable.

2.6 Establish the COM port

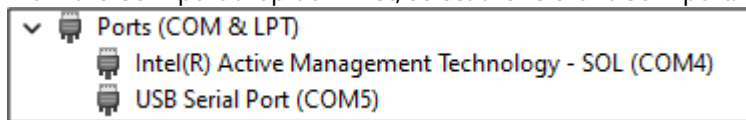
Prerequisites

When first connecting the harness, the user will be prompted to select a COM port.



Procedure

1. Open Modbus® Manager.
2. Select **Device Manager**.
3. Select **Ports**.
4. Note to which COM the USB Serial Port is connected. This will vary between computers.
5. From the COM port drop-down list, select the relevant COM port:



6. Click **OK**.

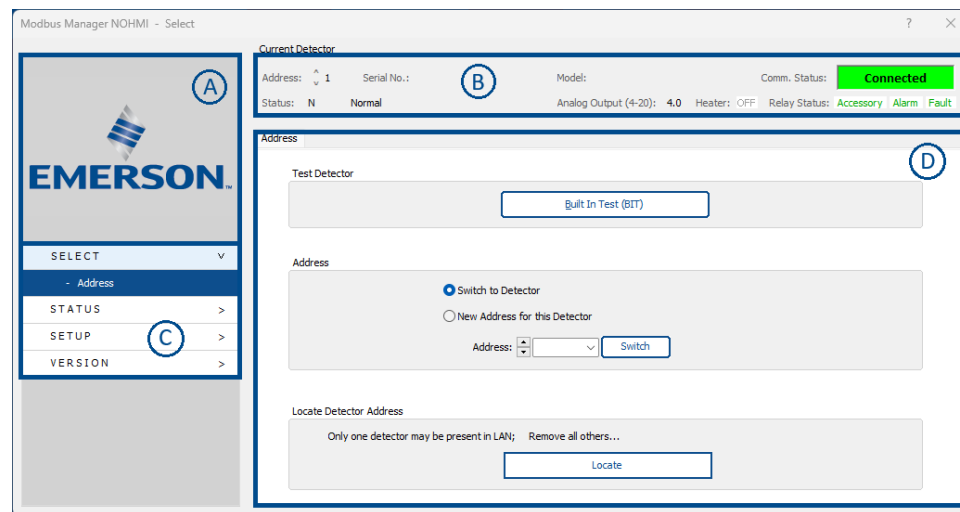
3 Operation

3.1 Screen overview

Main screen

The left bar and top bar display on every screen. The left bar displays the brand name and navigation controls; the top bar displays device information.

Figure 3-1: Main Screen



- A. Device brand logo
- B. Top bar (Device information)
- C. Left bar (Navigation menu)
- D. Address configuration

Top bar

The top bar contains information about the connected detector and is always visible.

Figure 3-2: Top Bar

The screenshot shows a software window titled "Current Detector" with a close button (X) and a help button (?). The window is divided into several sections:

- Current Detector:** A header section.
- Address:** A dropdown menu showing "1" (labeled A).
- Serial No.:** A text field showing "Detector serial number" (labeled B).
- Model:** A text field showing "Detector model" (labeled C).
- Comm. Status:** A green button labeled "Connected" (labeled D).
- Status:** A section with "N" and "Normal" (labeled E).
- Analog Output (4-20):** A text field showing "4.0" (labeled F).
- Heater:** A text field showing "OFF" (labeled G).
- Relay Status:** A section with "Accessory", "Alarm", and "Fault" (labeled H).

Below the "Current Detector" section, there are three main areas:

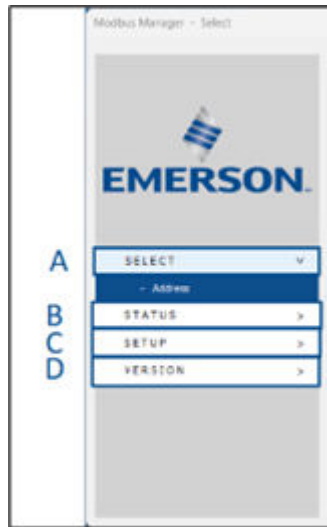
- Test Detector:** A section with a "Built In Test (BIT)" button.
- Address:** A section with two radio buttons: "Switch to Detector" (selected) and "New Address for this Detector". Below the radio buttons is an "Address:" dropdown menu and a "Switch" button.
- Locate Detector Address:** A section with the text "Only one detector may be present in LAN; Remove all others..." and a "Locate" button.

- A. Current Detector Address
- B. Detector Serial Number
- C. Full Detector Model Code
- D. Communication Status
- E. Detector Status
- F. Analog Output Signal
- G. Heater Status ON/OFF (40/40C and 40/40D models only)
- H. Relay Status
 - Green indicates de-energized state for Alarm, energized for Fault
 - Red indicates energized state for Alarm, de-energized for Fault

Left bar

The left navigation bar contains expandable menus. Click the menu link, or expand it and click one of the menu items to open a new page in the software.

Figure 3-3: Left Bar



- A. Device information
- B. STATUS
- C. SETUP
- D. VERSION

3.2 Perform manual built-in test (BIT)

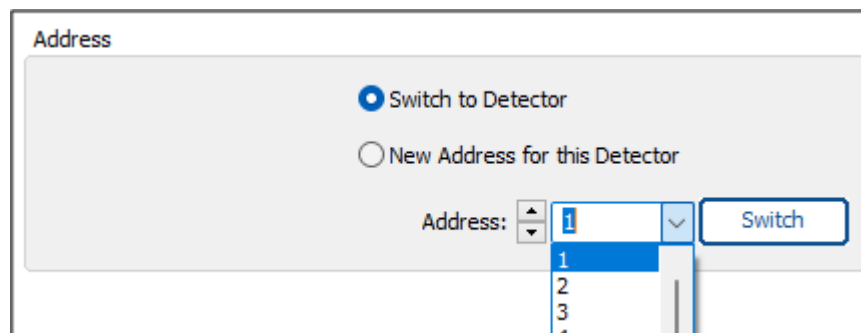
Procedure

Click the **Built-In Test (BIT)** button in the **Test Detector** pane.

3.3 Assign an address to the device

Procedure

1. In the **Address** pane, select the **New Address for this Detector** radio button.
2. Use the **Address** drop-down list to select the required address or enter the address in the drop-down text box.
3. Click the **Set New** button.



3.4 Switch device address

Procedure

1. In the **Address** pane, if more than one detector is in the network and its address is known, select the **Switch to Detector** radio button.

The screenshot shows the 'Address' pane of a software interface. It contains three main sections: 'Test Detector' with a 'Built In Test (BIT)' button; 'Address' with two radio buttons ('Switch to Detector' is selected) and a 'New Address for this Detector' option, followed by an 'Address' dropdown menu showing '1' and a 'Switch' button; and 'Locate Detector Address' with a message 'Only one detector may be present in LAN; Remove all others...' and a 'Locate' button.

2. Use the **Address** drop-down list to select the required address.
3. Click the **Switch** button.

Note

The default detector address set by the factory is 1.

3.5 Locating the detector address

If the detector address is not shown in the top bar or is not communicating, the user can identify the address by clicking the **Locate** button in the **Locate Detector Address** pane.

Figure 3-4: Detector Address

The screenshot shows a software window titled "Address". It contains three main sections: "Test Detector" with a "Built In Test (BIT)" button; "Address" with radio buttons for "Switch to Detector" (selected) and "New Address for this Detector", a numeric input field for "Address" set to 1, and a "Switch" button; and "Locate Detector Address" with a note "Only one detector may be present in LAN; Remove all others..." and a "Locate" button.

Once communication is established, the current detector address is shown in the [Top bar](#).

Note

To use the **Locate** function, make sure that only one detector is present in the RS-485 local area network (LAN).

3.6 Status tab

The **Status** tab displays the device status for the currently selected detector.

Figure 3-5: Status



1. Displays the following information:

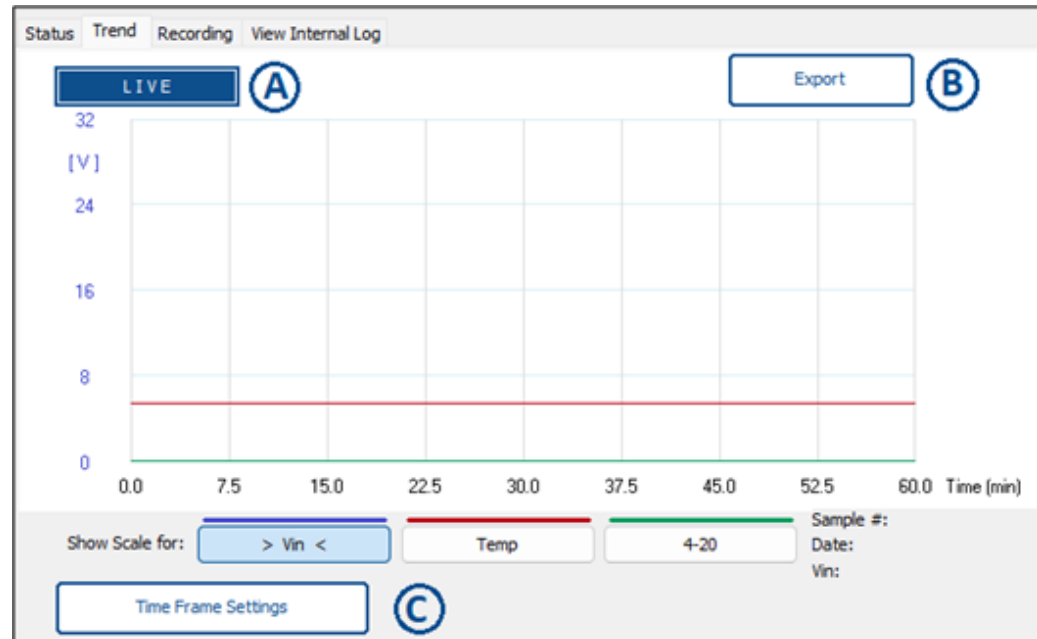
- Current Input Voltage (in volts)
 - Current internal temperature (in °C or °F according to setup)
 - Current 4-20 Analog Output (in mA)
2. Activates manual Built-In Test (BIT)

3.7 Trend tab

The **Trend** tab shows the following information for a selected time frame:

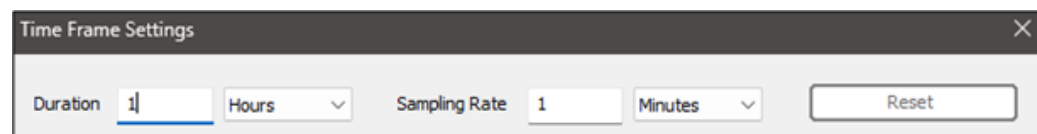
- Input voltage
- Internal temperature
- Analog output live trends

Figure 3-6: Trend



- A. Displays all recorded data according to time frame settings
B. Exports all data as a .txt file
C. Opens Time Frame Settings dialog

Figure 3-7: Time Frame Setting



To adjust time frame settings, set the desired **Duration** and **Sampling Rate**, and click the **Reset** button.

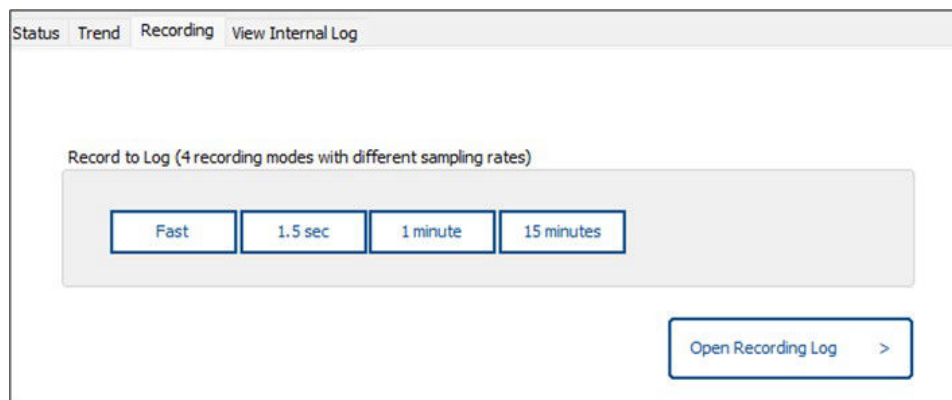
3.8 Recording tab

In the **Recording** tab, user can record data and export it as a .txt or .xls file.

3.8.1 Record data

Procedure

1. Select the required recording mode.



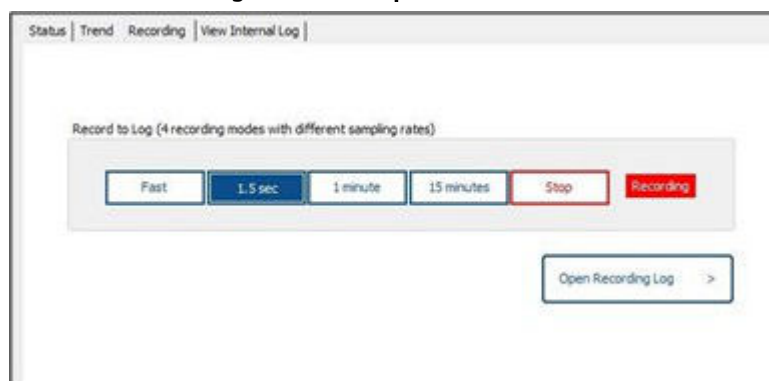
Note

The **Fast** mode provides recording at the best possible polling rate, around three records per second.

2. Enter a comment and click the **Insert** button.



3. To end the recording, click the **Stop** button.



4. (Optional) Once the recording has ended, click the **Open Recording Log** button.

Note

Log files are stored in the Recording folder of the Modbus directory. File names start with QuadIRlog_YMDHMS (Year, Month, Date, Hour, Minute, Second). The timestamp is according to Greenwich Mean Time (GMT).

3.8.2 View internal log

The log displays the 12 most recent records without requiring the user to scroll.

Procedure

To adjust the number of records shown, change the number in the **Get** field and then press the **Get** button.

The screenshot shows the 'View Internal Log' window with the following components:

- Table:**

#	Record	Operating Time	Voltage	4-20	Status	Temp [°C]
-	-	-	-	-	-	-
2	664	19:55:57	24.4	1.0	S	0
3	665	19:56:13	24.4	1.0	M	0
4	666	19:56:16	24.4	1.0	E	25
5	667	19:56:19	24.4	1.0	N	25
6	668	20:11:19	24.4	4.0	N	30
7	669	20:11:20	24.3	4.0	B	30
8	670	20:11:23	24.3	4.0	E	30
9	671	20:11:26	24.3	4.0	N	30
10	672	20:26:26	24.4	4.0	N	30
11	673	20:26:27	24.4	4.0	B	30
12	674	20:26:30	24.4	4.0	E	30
- Controls:**
 - A:** Get button
 - B:** Page Up button
 - C:** Page Down button
 - D:** Line Up button
 - E:** Line Down button
 - F:** dropdown menu showing 'records up to current position' and '663'
 - G:** Open Last > button
 - H:** Store Log Data button
- Other UI elements:**
 - Detector Operating Time: 20:28:18
 - Select row for verbose status

- A. Displays records according to the selected criteria, up to the current position field
- B. Scrolls up by page
- C. Scrolls down by page
- D. Scrolls up by line
- E. Re-read by line
- F. Select which records will be displayed when clicking the **Get** button
- G. Opens selected number of most recent records in .txt or Excel format
- H. Save a more detailed log file in .bin format

3.9 Detector setup tab

3.9.1 Detector configurable settings

The following detector parameters can be configured:

- Sensitivity** Sets the detector's sensitivity (in meters/feet). A higher number indicates greater sensitivity. See the relevant product manual for more information.
- Alarm delay** The delay (in seconds) between the detection of a signal and the activation of the alarm. Choose from:
0, 3, 5, 10, 15, 20, 30, or A (anti-flare)
Default: A

3.9.2 Built-in test (BIT) settings

The user can configure the following BIT settings:

Enable Automatic BIT	When selected, the BIT runs automatically according to the settings. Default: Enabled
Fault count	Number of sequential BIT faults before BIT fault indication. Default: 0
Interval (in minutes)	Duration between BIT cycles (maximum 60). Default: 15
Activate alarm relay on successful manual BIT	Activates an alarm relay when a manual BIT is successfully completed. Default: Not enabled

3.9.3 Lock option

Modbus® Manager offers password protection for various maintenance and administrative actions.

Not locked	No password is required to change detector settings or perform BIT.
Locked	Password required to change detector settings; opens dialog box.
Change passwords	To change the password, the user must enter the previous password. If the previous password is unavailable, contact the manufacturer to obtain a time-limited password for resetting. Once received, use the Enable Password reset button in the Version → Service menu .

When the **locked** option is selected, access to selected actions is controlled. There are two independent permission types that allow access to the actions listed in [Table 3-1](#) once the detector is locked by passwords. When selecting the **locked** option, a dialog box opens to enter the maintenance and admin passwords.

Both passwords must be entered by an authorized personnel to complete the password-setting process. Once completed, only share the relevant password in accordance with internal policy.

Table 3-1: Permission Types

Action	Permissions	
	Maintenance	Admin
Reset detector	Yes	Yes
Change password	Authorized personnel only	
Manual BIT	Yes	No
Detector setup	No	Yes
Firmware update	No	Yes
Fix 4-20 scale values	No	Yes
Parameter upload	No	Yes

Note

Once locked, the actions can be activated only when entering the correct password. The manufacturer will provide a time-limited password on authorized demand within five business days.

3.9.4 4–20 settings

Clicking the **4–20 Settings** button opens a window showing the current 4–20 settings. These settings can be customized in accordance with the allowed nominal values.

Fault	0 or 1 mA Default: 1 mA
BIT fault	Fixed value, cannot be changed
Normal	4 or 5 mA Default: 4 mA
Pre-alarm warning	10 to 16 mA (must be lower than alarm value) Default: 16 mA
Alarm	15 to 20 mA (must be higher than a warning) Default: 20 mA

Once values are entered, click the **OK** button to update the setup.

Note

To save the new settings, close the 4–20 Settings dialog and subsequent application of the setup dialog.

3.9.5 Modbus® Manager settings

The Modbus Manager Settings screen is used to change the COM port and the units throughout the software.

COM port Use this section to change the COM port as described in [Establish the COM port](#).

Units Use this section to change the units such as metric or feet and Fahrenheit, in which all measurements are displayed.

The screenshot shows a software window titled 'Modbus Manager Settings'. It is divided into two main sections: 'Comport' and 'Units'. The 'Comport' section has a dropdown menu currently showing 'COM5 <USB Serial Port>'. Below the dropdown is a 'Device Manager' button and a 'Set' button. The 'Units' section contains two columns of unit selection buttons. The first column is labeled 'Distance' and contains 'Meters' and 'Feet' buttons. The second column is labeled 'Temperature' and contains 'Centigrade' and 'Fahrenheit' buttons. A 'Set' button is located to the right of these unit buttons.

Note

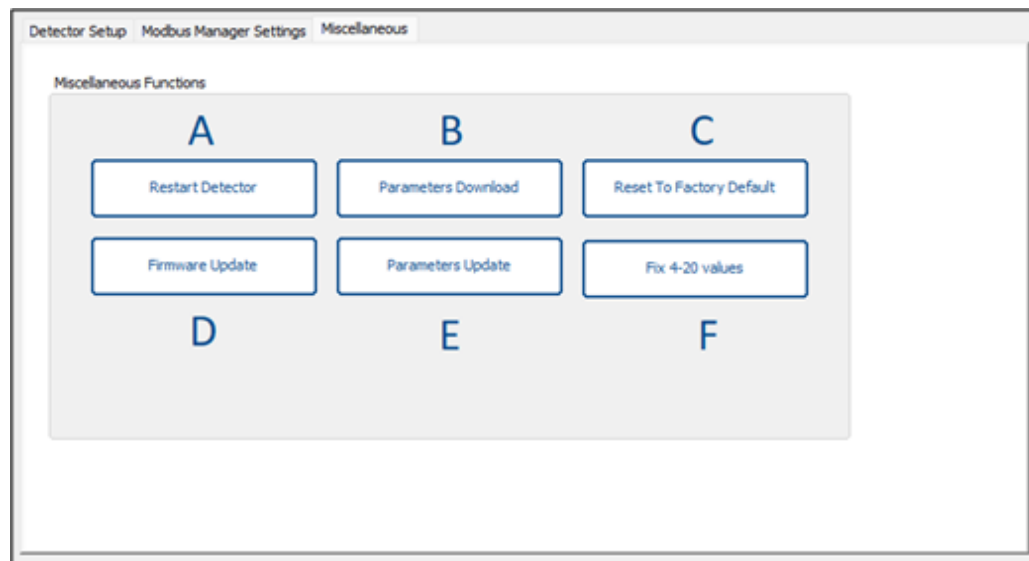
The application automatically restarts when the COM port or the unit system is changed.

4 Maintenance

4.1 Miscellaneous functions

The Miscellaneous tab provides access to various maintenance functions.

Figure 4-1: Miscellaneous Tab



- A. *Restarts the detector*
- B. *Download parameters file*
- C. *Resets the detector to factory default settings*
- D. *Perform firmware update with the provided file*
- E. *Upload parameters file*
- F. *Fix 4-20 values*

4.2 Update firmware

Prerequisites

A firmware update file will be provided.

Procedure

1. Save the file to your computer.
2. Click the **Firmware update** button.
3. Switch to the required baud rate.
4. Select the new firmware file from the saved location.
5. If the new firmware file is okay, press **Start**.

Note

If the device is locked, a password will be required.

4.3 Parameter update

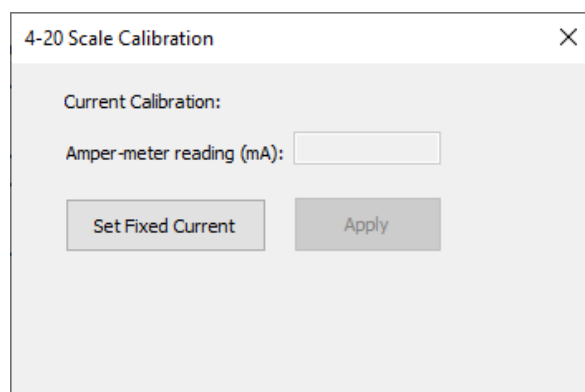
There is an optional feature to upload device parameters files with the extension ".upm". Where required, this file will be provided by the manufacturer.

4.4 Set fixed current 4–20 values

4–20 mA is factory-calibrated with controlled and certified equipment; there is no need for additional calibration. This process allows the fixing of multimeter values to 4 mA and 20 mA fixed values.

For different equipment used at the customer site over ± 0.05 mA, the 4–20 mA output can be fixed to match the reading indicated on the customer's multimeter. The reading can be adjusted within ± 0.05 mA.

Figure 4-2: 4–20 Scale Calibration



Procedure

1. Click the **Fix 4–20 values** button.
2. Click the **Set fixed Current** button.
3. Follow the on-screen instructions.
4. Enter the multimeter reading.
5. Click the **Apply** button.
6. Follow the on-screen instructions to either repeat steps [Step 4](#) and [Step 5](#) until the 4 mA value is in range, or to move.
7. Enter the multimeter reading.
8. Click the **Apply** button.
9. Follow the on-screen instructions to either repeat steps [Step 7](#) and [Step 8](#) until the 20 mA value is in range, or to finish the calibration.

4.5 Parameter download

There is an optional feature to download device parameter files incorporated into one folder located in the Modbus® Manager directory. This folder is saved to the subfolder with the detector serial number included in the title.

Where required, this file will be provided by the manufacturer.

4.6 Version information

Detector information and the software version can be viewed on this screen.

The screenshot shows the 'Current Detector' screen with the following fields:

- Address: 1
- Serial No.:
- Model:
- Comm. Status: **Connected**
- Status: N Normal
- Analog Output (4-20): 4.0
- Heater: OFF
- Relay Status: Accessory Alarm Fault

Below these fields are two tabs: 'Version' and 'Service'. The 'Version' tab is selected, showing:

- Detector FW Version: S87701xx Day.Month.Year
- SW Version: T87740xx, Month Day, Year, Version Modbus.Dll Version

There is an information icon (i) and a 'Save Screenshot - F2' button.

4.7 Service functions

This screen provides access to various service functions.

The screenshot shows the 'Modbus Manager NOHMI - Version' screen. On the left is a sidebar with the Emerson logo and a menu:

- SELECT >
- STATUS >
- SETUP >
- VERSION v
- Version
- Service

The main area shows the 'Current Detector' information at the top, identical to the previous screen. Below it, the 'Service' tab is selected, displaying 'Time limited keys to enable more Miscellaneous Functions' with the following buttons:

- Enter Tech mode Key
- Enter Password Reset Key
- Enter Firmware Update Key
- Enter Parameters Update Key
- Fix 4-20 Values Key

Enter a time-limited password received from the manufacturer to use the following functions:

- Tech Mode
- Password Reset
- Firmware Update
- Parameters Upload
- Fix 4-20 Values

Note

If the application is closed after entering the password, a new password is required to re-enter tech mode or reset the password.

5 Reference data

5.1 Status codes

Status	Description	4–20 mA output	Fault relay	LED indicator
S	Start-up	1 mA	OPEN	4 Hz Blinking orange
V	Voltage Indication	1 mA	OPEN	4 Hz Blinking orange
P	Memory Indication	1 mA	OPEN	4 Hz Blinking orange
F	General Indication	1 mA	OPEN	4 Hz Blinking orange
N	Normal	4 mA	CLOSE	1 Hz Blinking green
N	Maintenance call	2 mA	OPEN	4 Hz Blinking orange
B	Automatic BIT	4 mA	CLOSE	1 Hz Blinking green
M	Manual BIT	4 mA	CLOSE	1 Hz Blinking green
E	End of BIT	4 mA	CLOSE	1 Hz Blinking green
G	Pre-alarm	4 mA	CLOSE	1 Hz Blinking green
T	Alarm delay	16 mA	CLOSE	2 Hz Blinking red
W	Warning	16 mA	CLOSE	2 Hz Blinking red
A	Alarm	20 mA	CLOSE	Constant red
L	Latch	20 mA	CLOSE	Constant red
Z	Post alarm	4 mA	CLOSE	1 Hz Blinking green
J	Pre-alarm	20 mA	CLOSE	1 Hz Blinking green
X ⁽¹⁾	Flash fire	20 mA	CLOSE	Constant red

(1) Available in Spectrex 40/40D only.

5.2 Configurable options

This section contains values for configurable options. Asterisks (*) indicate default values unless otherwise noted.

5.2.1 Spectrex 40/40C options

Option	Model		
	40/40C-I, 40/40C-M	40/40C-LB	40/40C-L4B
Detection sensitivity	3 m 15 m 30 m* 45 m 65 m	3 m 15 m*	3 m 15 m* 28 m*

Option	Model		
	40/40C-I, 40/40C-M	40/40C-LB	40/40C-L4B
Alarm delay (in seconds)	0 A (Anti-flare)* 3 5 10 15 20 30		
Alarm latching	Yes No*		
Heated optics	Constantly ON Constantly OFF Auto ON: 32 °F (0 °C) Auto ON: 41 °F (5 °C)* Auto ON: 50 °F (10 °C) Auto ON: 59 °F (15 °C) Auto ON: 68 °F (20 °C) Auto ON: 77 °F (25 °C) Auto ON: 86 °F (30 °C)		
Heated power	Low High*		
BIT and Lock option settings			
Alarm relay on successful manual BIT	Yes No*		
Accessory relay on successful manual BIT	Yes No*		
Post manual BIT indication duration (in seconds)	3–60 Default value: 3		
Enable automatic BIT	Yes* No		
Fault count	0–10 Default value: 3		
Bit interval (in minutes)	1–60 Default value: 15		
Accessory relay options	Disabled* Accessory relay on warning Accessory relay as EOL		
Lock option	Not locked* Locked		

Option	Model		
	40/40C-I, 40/40C-M	40/40C-LB	40/40C-L4B
4-20 mA settings			
Fault	0 1*		
BIT fault	2*		
Normal	4* 5		
Warning	16* Custom		
Alarm	20* Custom		

5.2.2 Spectrex 40/40D options

Option	Model		
	40/40D-I, 40/40D-M	40/40D-LB	40/40D-L4B
Detection sensitivity	3 m 15 m 30 m* 45 m 65 m	3 m 15 m* 28 m*	
Alarm delay (in seconds)	0 A (Anti-flare)* 3 5 10 15 20 30		
Alarm latching	Yes No*		
Heated optics	Constantly ON Constantly OFF Auto ON: 32 °F (0 °C) Auto ON: 41 °F (5 °C)* Auto ON: 50 °F (10 °C) Auto ON: 59 °F (15 °C) Auto ON: 68 °F (20 °C) Auto ON: 77 °F (25 °C) Auto ON: 86 °F (30 °C)		
Heated power	Low High*		

Option	Model		
	40/40D-I, 40/40D-M	40/40D-LB	40/40D-L4B
BIT and Lock option settings			
Alarm relay on successful manual BIT	Yes No*		
Accessory relay on successful manual BIT	Yes No*		
Post manual BIT indication duration (in seconds)	3–60 Default value: 3		
Enable automatic BIT	Yes* No		
Fault count	0–10 Default value: 3		
Bit interval (in minutes)	1–60 Default value: 15		
Detection options	Standard* Fast Explosion	Standard* Fast Explosion IR only UV only UV/IR*	
Accessory relay options	Disabled* Accessory relay on warning Accessory relay as EOL Accessory relay as FOV FOV integrity		
Lock option	Not locked* Locked		
4–20 mA settings			
Fault	0 1*		
BIT fault	2*		
Normal	4* 5		
Warning	16* Custom		
Alarm	20* Custom		
Option			
FOV	3 4* 5		

5.2.3 Spectrex 20/20Q options

Option	Detection settings
Detection sensitivity	3 m 10 m 20 m* 30 m 45 m
Alarm delay (in seconds)	0 A (Anti-flare)* 3 5 10 15 20 30
Alarm latching	Yes No*
Option	BIT and Lock option settings
Alarm relay on successful manual BIT	Yes No*
Post manual BIT indication duration (in seconds)	3–60 Default value: 3
Enable automatic BIT	Yes* No
Fault count	0–10 Default value: 3
Bit interval (in minutes)	1–60 Default value: 15
Lock option	Not locked* Locked
Option	4–20 mA settings
Fault	0 1*
BIT fault	2*
Normal	4* 5
Warning	16* Custom
Alarm	20* Custom

For more information: [Spectrex.net](https://spectrex.net)

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