

SafEye™ Quasar 900

Modbus® Manager Manual



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Warranty

The SafEye Quasar 900 Detector is backed by a 3-year warranty.

Technical support

To get technical support for this product, contact your local Emerson representative or the Emerson Technical Support department at +1 866 347 3427 or safety.csc@emerson.com.

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1 Introduction

1.1 Product overview

Modbus® Manager is customized software based on the Modbus protocol over RS-485, used to configure the device to suit the customer needs, perform firmware upgrades, and provide troubleshooting information and functionality.

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

Note

Modbus Manager works with the Quasar 900 series.

1.2 Minimum requirements

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

- Pentium® 3GHz
- Microsoft® Windows™ 7 SP1, 8.1, 10, 11
- Latest VC++ 2015/2019/2022 redistributable [download link](#)
- 4GB RAM
- 1GB hard disk free space
- Minimal screen resolution of 1024x768
- 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://spectrex.net).
2. Using the site navigation, go to the relevant product page.
3. Scroll down to **Documents and Drawings**.
4. Click **SOFTWARE DOWNLOADS & DRIVERS**.
5. Download the relevant file.

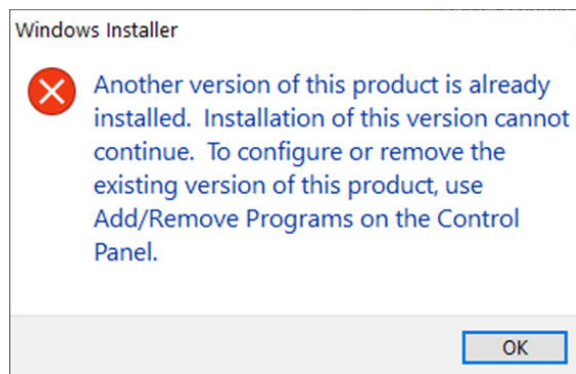
Product Category	▼	DEVICE FIRMWARE
Industry	▼	📎 Software: Spectrex Modbus Manager
Document Type	▼	.ZIP 13.9 MB

2.2 Installing the software

Once the software file has been downloaded to your computer, create a shortcut in a convenient location.

Procedure

1. To run the software, double-click the executable file. If a previous version is installed, then the following message is displayed:



2. Remove any previously installed Gas Modbus Manager using Control Panel.
3. Run the Installation Wizard.

2.3 Connecting the computer to the device

Before performing any configuration or diagnostic operations on the device, the computer must be connected to the device using the RS-485 harness cable.

If you are using a different RS-485 to USB adapter than the one supplied by your vendor with the extended commissioning kit then, check that the D-sub connector port wiring is according to the following:

- RS-485 (+) connected to Pin 2
- RS-485 (-) connected to Pin 1
- RTN connected to Pin 5

Procedure

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

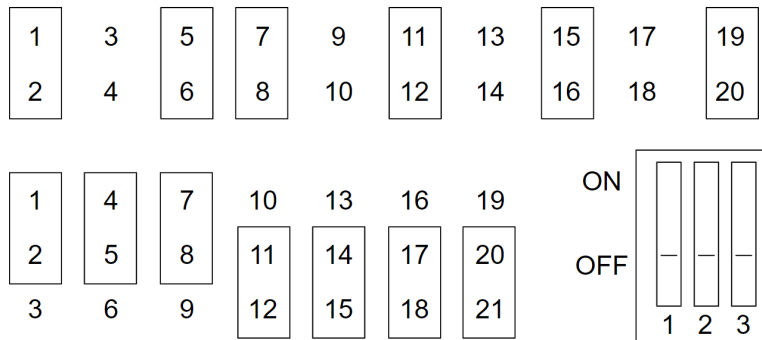
2.3.1 Set up the USB adapter

NOTICE

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.

2.4 Connect the device to the harness cable

Procedure

1. Connect one side of the cable to detector Terminal 5 for RS-485 (+).
2. Connect the other side of the cable to detector Terminal 6 for RS-485 (-).

2.5 Selecting the COM port

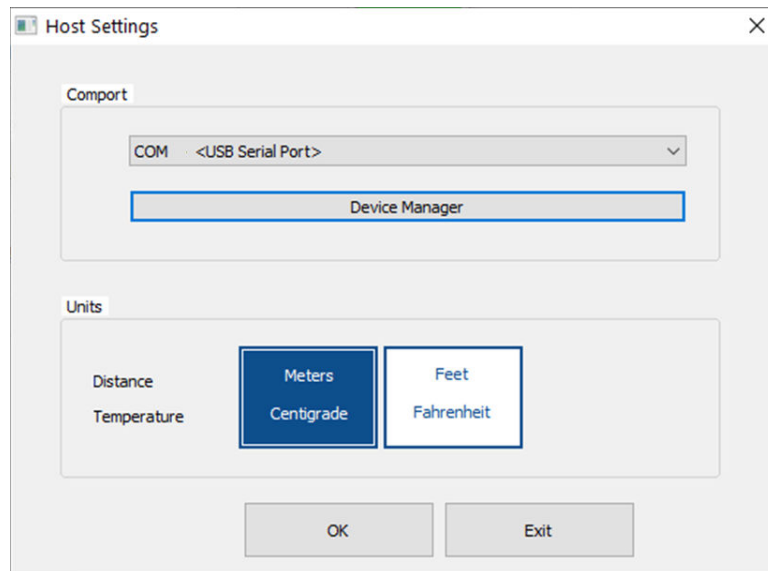
Note

When first connecting the harness, you are prompted to select a COM port.

Procedure

1. Run Modbus® Manager.

You are prompted to select a COM port.



2. In the **Comport** dropdown list, select the relevant COM port activated in the Device Manager.
3. Click the **OK** button.

2.6 Connect device

Procedure

1. Connect the RS-485 to the terminals according to the following table:

Function	Wire color	Terminal
RS-485 (+)	Red	5
RS-485 (-)	Black	6

2. Connect the device to power.

2.7 Set up the RTC

Procedure

Set the RTC from the **Setup** → **Miscellaneous** tab for log usage.

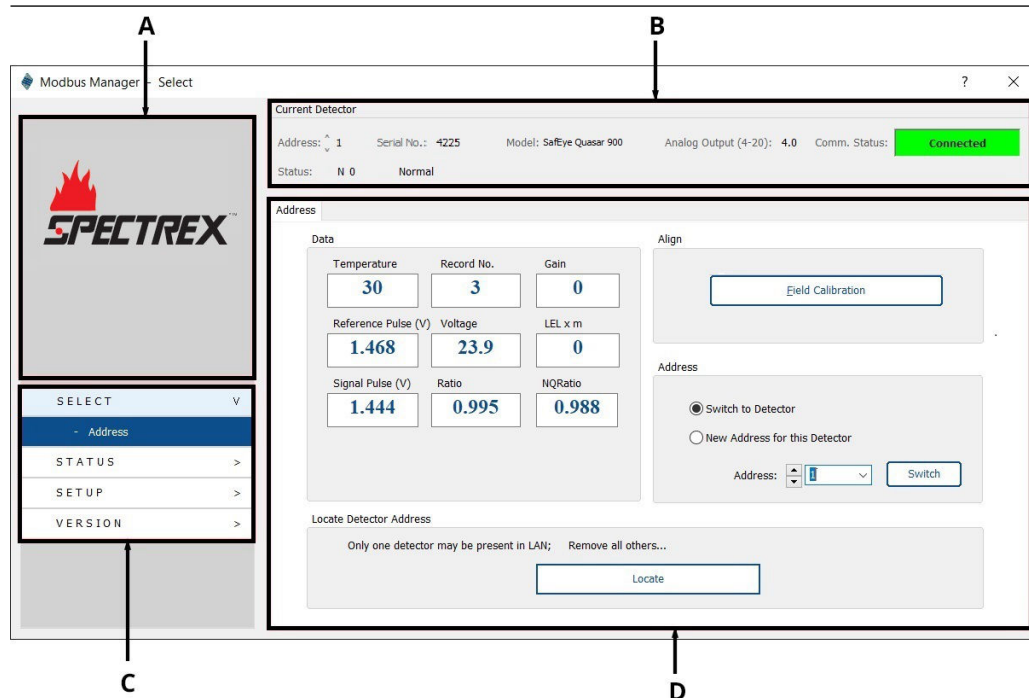
See [Figure 4-1](#) in [Miscellaneous functions](#).

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.



- A. Device brand
- B. Top bar (device information)
- C. Left bar (navigation controls)
- D. Various controls and actions

Top bar

The top bar contains information about the connected detector and appears on every screen.

The screenshot shows the 'Modbus Manager - Select' window. The top bar contains the following information:

- A:** Current Detector Address: 2
- B:** Detector Status: No Normal
- C:** Serial No.: 10
- D:** Model: SafeEye Quesar 900
- E:** Analog Output (4-20): 4.0
- F:** Comm. Status: Connected

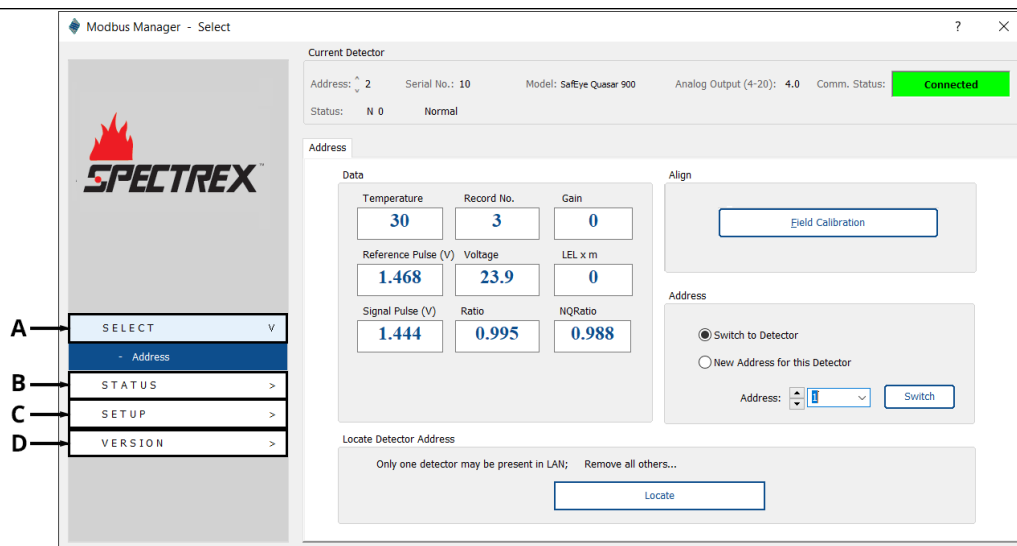
The main interface includes a left sidebar with the Spectrex logo and a menu with options: SELECT, STATUS, SETUP, and VERSION. The main area displays various data fields and controls:

- Data:** Temperature (30), Record No. (3), Gain (0), Reference Pulse (V) (1.468), Voltage (23.9), LEL x m (0), Signal Pulse (V) (1.444), Ratio (0.995), and NQRatio (0.988).
- Align:** Field Calibration button.
- Address:** Switch to Detector (selected), New Address for this Detector, and an Address field with a Switch button.
- Locate Detector Address:** Only one detector may be present in LAN; Remove all others... and a Locate button.

- A. Current detector address
- B. Detector status
- C. Detector serial number
- D. Full detector model code
- E. Analog output signal
- F. Communication status

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.

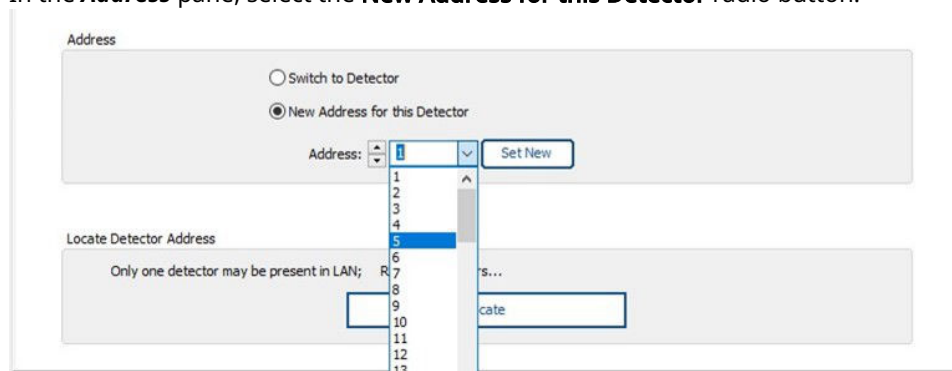


- A. Device information
- B. Device STATUS
- C. Device SETUP
- D. Device and software VERSION

3.2 Assign address to 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.

3.3 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 the software. It is divided into three main sections: 'Data', 'Align', and 'Address'. The 'Data' section contains a grid of numerical values: Temperature (38), Record No. (210), Gain (5), Reference Pulse (V) (0.090), Voltage (24.1), LEL x m (0), Signal Pulse (V) (0.072), Ratio (1.482), and NQRatio (1.000). The 'Align' section has a 'Field Calibration (N/A)' button. The 'Address' section has two radio buttons: 'Switch to Detector' (which is selected) and 'New Address for this Detector'. Below the radio buttons is an 'Address' dropdown menu showing the value '1' and a 'Switch' button. At the bottom, there is a 'Locate Detector Address' section with a note '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 detector address set by the factory is 1.

3.4 Locating the detector address

If the detector address is not shown in the top bar or it is not communicating, you can locate its address by clicking the **Locate** button in the **Locate Detector Address** pane.

This screenshot is identical to the one in section 3.3, showing the 'Address' pane. However, the 'Locate' button in the 'Locate Detector Address' section at the bottom is highlighted with a red rectangle, indicating it is the button to be clicked to locate the detector address.

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).

3.5 Address tab

Detector Data

The Address tab displays the live detector data. Add the contents of the Excel spreadsheet below the concept data.

Modbus Manager - Select

Current Detector

Address: 1 Serial No.: 4225 Model: SafEye Quasar 900 Analog Output (4-20): 4.0 Comm. Status: **Connected**

Status: N 0 Normal

Address

Data	A	B	C
Temperature	35	Record No.	24
Gain	0	Voltage	24.3
Reference Pulse (V)	1.725	LEL x m	0
Signal Pulse (V)	1.736	Ratio	1.105
		NQRatio	1.002

Align

D

Field Calibration

Address

J

☒ Switch to Detector
☐ New Address for this Detector

Address:

Locate Detector Address

Only one detector may be present in LAN; Remove all others...

K

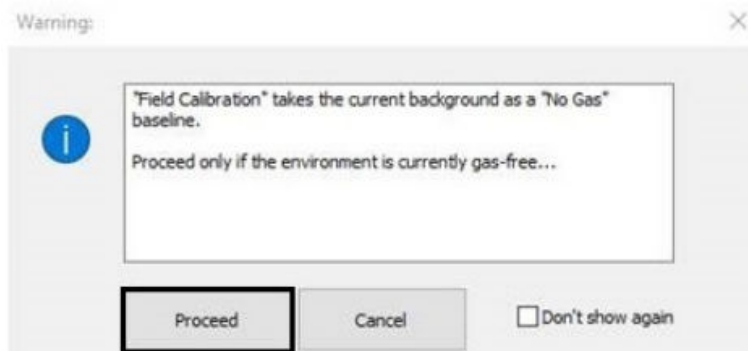
- A. Temperature - indicates the internal temperature of the device
- B. Record No. - status counter
- C. Gain - gain level
- D. Field Calibration - three-step zero calibration
- E. Signal Strength - signal and reference channel signal levels
- F. Input Voltage - supplied voltage
- G. LEL.m reading - gas reading
- H. Ratio
- I. NQ Ratio
- J. Address
- K. Locate address

3.6 Field calibration process

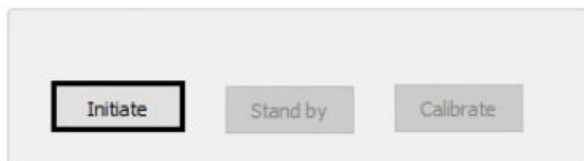
Field calibration takes the current background as a "No Gas" baseline.

Procedure

1. Click **Proceed** if only the environment is currently gas free.



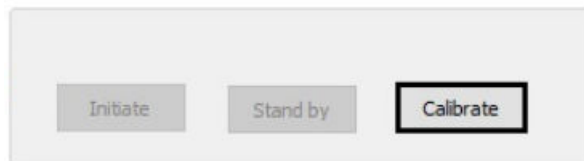
2. To start the field calibration, select **Initiate**.



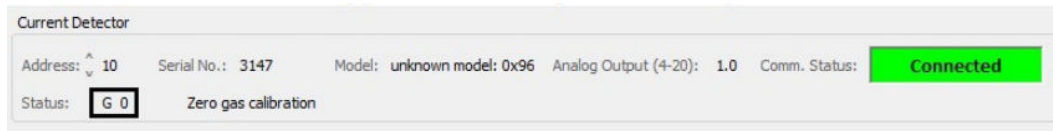
3. Click **Stand by**.



4. Then, select **Calibrate**.



Status 'G' will appear next indicating the calibration process.



3.7 Status tab

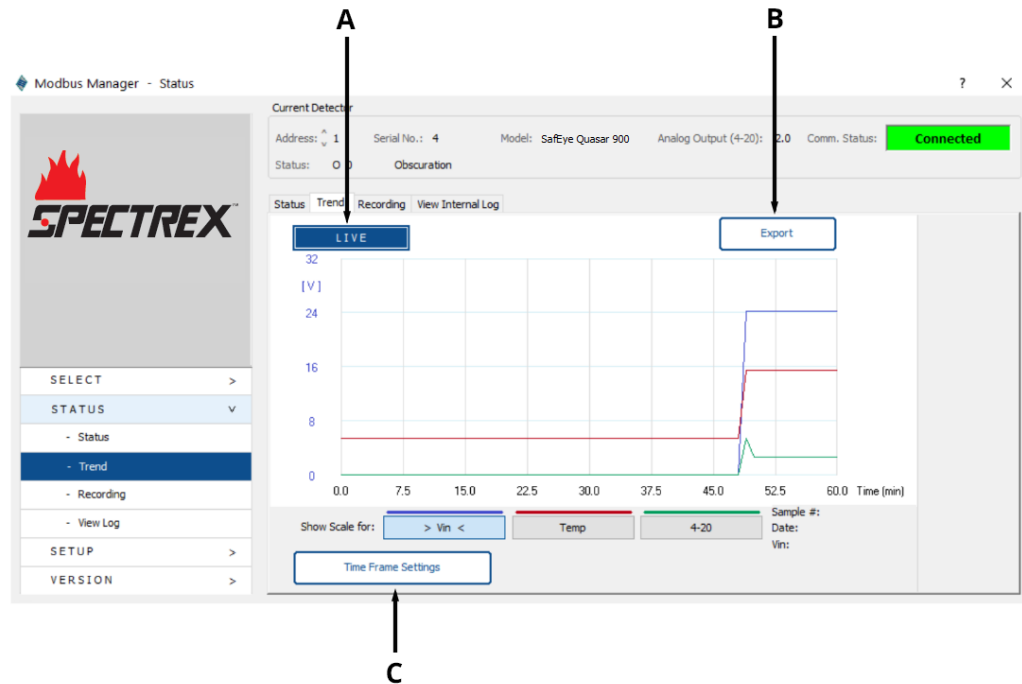
This tab displays the device status for the currently selected detector.



- A. Shows current input voltage (in volts)
- B. Shows current internal temperature (in degrees C or F according to the setup)
- C. Shows current 4-20 analog output (in mA)

3.8 Trend tab

This tab shows the input voltage, internal temperature, and analog output live trends according to the selected time frame.



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

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

The 'Time Frame Settings' dialog box has a title bar with a question mark and a close button. It contains two rows of settings. The first row has a 'Duration' field with the value '2' and a 'Days' dropdown menu. The second row has a 'Sampling Rate' field with the value '1' and a 'Seconds' dropdown menu. A 'Reset' button is located to the right of the 'Seconds' dropdown.

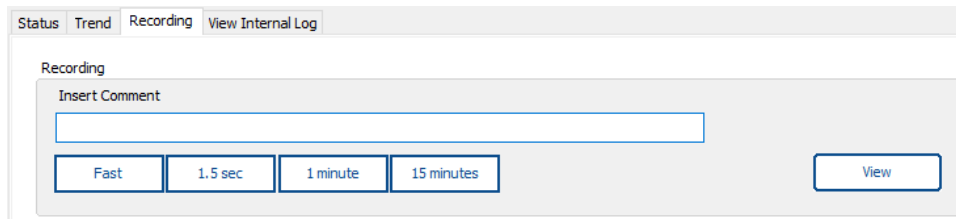
3.9 Recording tab

In this tab, you can record data and export it to a .txt or .xls file.

3.9.1 Record data

Procedure

1. Enter a comment.

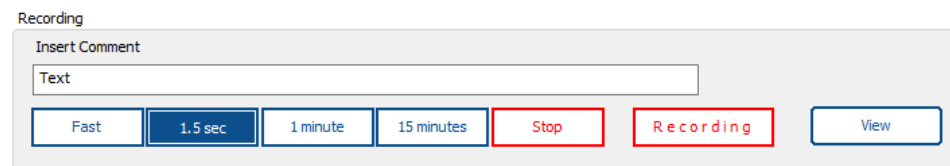


The screenshot shows the 'Recording' tab in the software interface. At the top, there are four tabs: 'Status', 'Trend', 'Recording' (which is active), and 'View Internal Log'. Below the tabs, there is a section titled 'Recording'. Inside this section, there is a text input field labeled 'Insert Comment'. Below the input field, there are four buttons for recording modes: 'Fast', '1.5 sec', '1 minute', and '15 minutes'. To the right of these buttons is a 'View' button.

Note

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

2. Click the required recording mode. The log recording begins immediately.
3. To end the recording, click the **Stop** button.



The screenshot shows the 'Recording' tab in the software interface. At the top, there are four tabs: 'Status', 'Trend', 'Recording' (which is active), and 'View Internal Log'. Below the tabs, there is a section titled 'Recording'. Inside this section, there is a text input field labeled 'Insert Comment' with the word 'Text' entered. Below the input field, there are four buttons for recording modes: 'Fast', '1.5 sec', '1 minute', and '15 minutes'. To the right of these buttons, there are two buttons: 'Stop' and 'Recording'. To the far right is a 'View' button.

4. (Optional) Once recording has ended, click **View**.

Note

The folder is in the Modbus® directory installed on the computer is titled "Recordings". SafEye Quasar 900 file name format is **QuasarIRlog_YMDHMS** (Year, Month, Date, Hours, Minute, Second).

The time stamp is according to local PC time.

3.9.2 View internal log

In the log, you can view the 12 most recent records without scrolling.

Procedure

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

Current Detector

Address: 2 Serial No.: 10 Model: SafEye Quasar 900 Analog Output (4-20): Comm. Status: **Connected**

Status:

Status Trend Recording **View Internal Log**

Reco...	RTC(Date)	RTC(Time)	Work Time	Status	Gain	Ref ...	Sig ...	Ratio	NQRatio	Ref ...	Sig ...	LEL	Temp [...	Volt...
4	27/02/23	08:35:42	0:03:00	N0	0	1.779	1.672	0.996	0.985	0.500	0.500	0	24	34.1
3	01/01/23	00:00:12	0:00:00	N0	1	2.706	2.754	1.005	1.000	0.500	0.500	0	19	10.0
2	01/01/23	00:00:02	0:00:00	S0	0	0.161	0.161	1.000	1.000	362...	0.000	0	15	10.0

< [Progress Bar] >

Get 3 | **Open Last** > | Detector Operating Time: 0:06:19

Select row for verbose status

A

B

A. Pulls latest records according to the selected number.

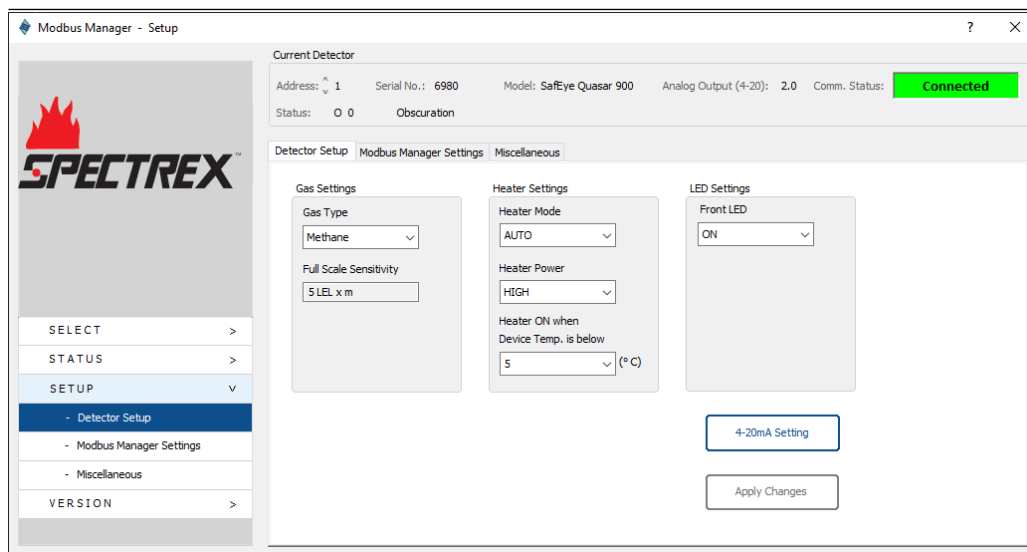
B. Opens selected number of most recent records in .txt or Excel format.

3.10 Setup

3.10.1 Detector setup tab

This tab is used for field configuration different from the factory default.

The detector is set up using the **Detector Setup** screen, in which Gas Settings, Heater Settings and LED Settings, and 4-20 mA Settings can be changed.



Note

Any unavailable options will be grayed out depending on specific detector model connected.

3.10.2 4-20 mA settings

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

Fault range	1 to 3.5 Default: 1 (1 mA)
Obscuration range	1 to 3.5 Default: 2 (2 mA)
Normal range	4 to 5 Default: 4 (4 mA)
Maintenance range	1 to 3.5 Default: 3 (3 mA)
Alignment range	1 Default: 1 (1 mA)
Misalignment range	1 to 3.5 Default: 2.5 (2.5 mA)

3.10.3 Modbus® Manager settings

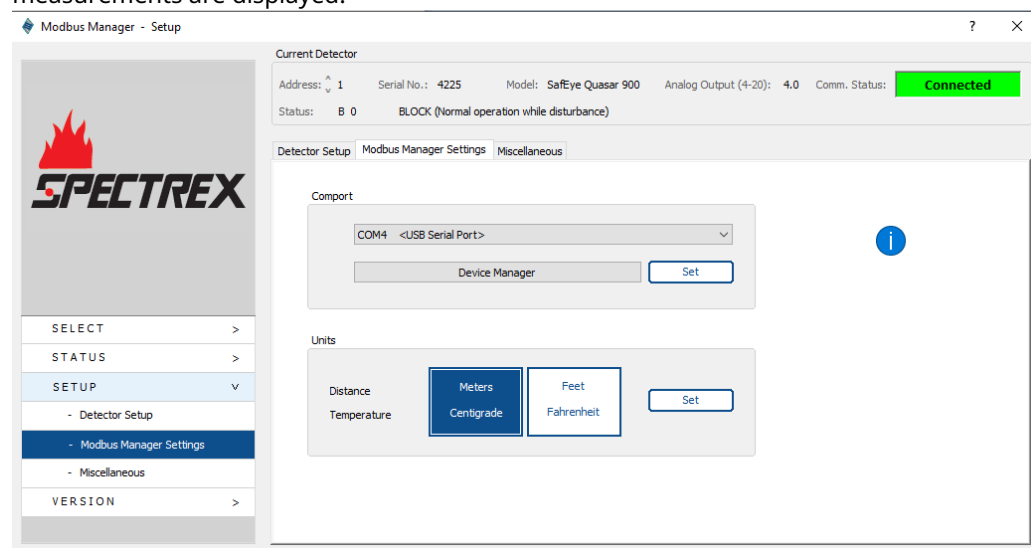
The **Modbus Manager Settings** screen is used to change COM port and the units throughout the software.

Comport

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

Units

Use this section to change the units (i.e. metric or feet and Fahrenheit) in which all measurements are displayed.



Note

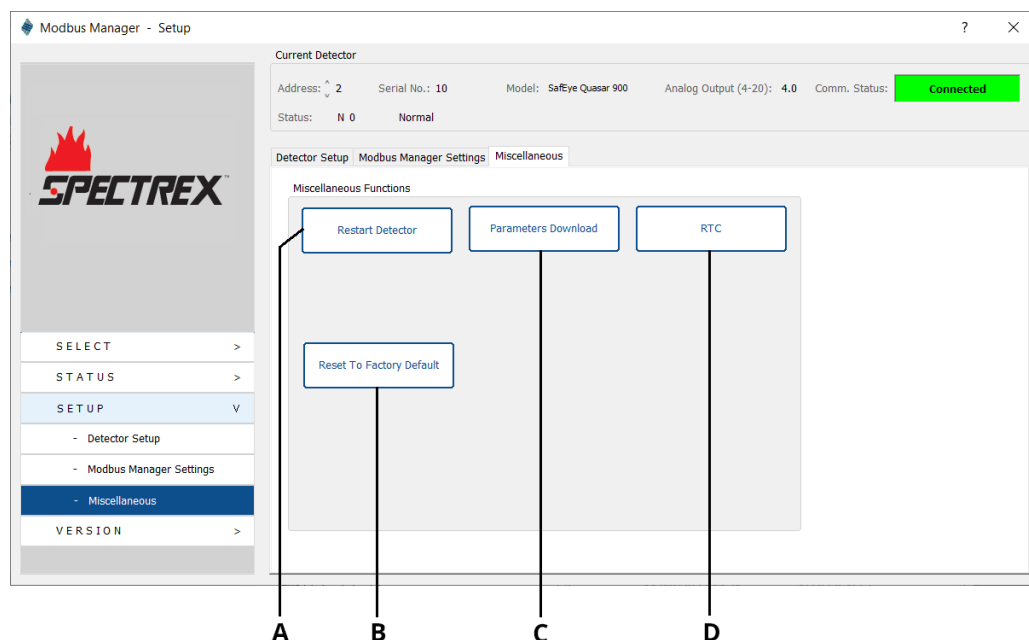
The application automatically restarts when the COM port or the unit system is changed.

4 Maintenance

4.1 Miscellaneous functions

This screen provides access to various maintenance functions.

Figure 4-1: Miscellaneous tab



- A. Restart detector
- B. Reset to factory default
- C. Parameters download
- D. RTC - Real-Time-Clock

4.2 A - Restart detector

The detector restarts as soon as you click this button.

4.3 B - Reset to factory default

Resets all settings to the default values programmed by the factory.

4.4 C - Parameters download

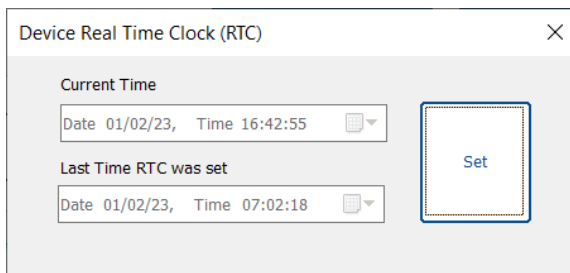
There is an optional feature to download device parameter files incorporated into one user specified directory. The default path is **Modbus® Manager directory → detector serial number → Summary**. The file extension is .prm.

When required, this file can be sent to the vendor.

4.5 D - RTC

Click **Set** to update the Real Time Clock with the current time and date as displayed in the **Current Time** field of the PC used.

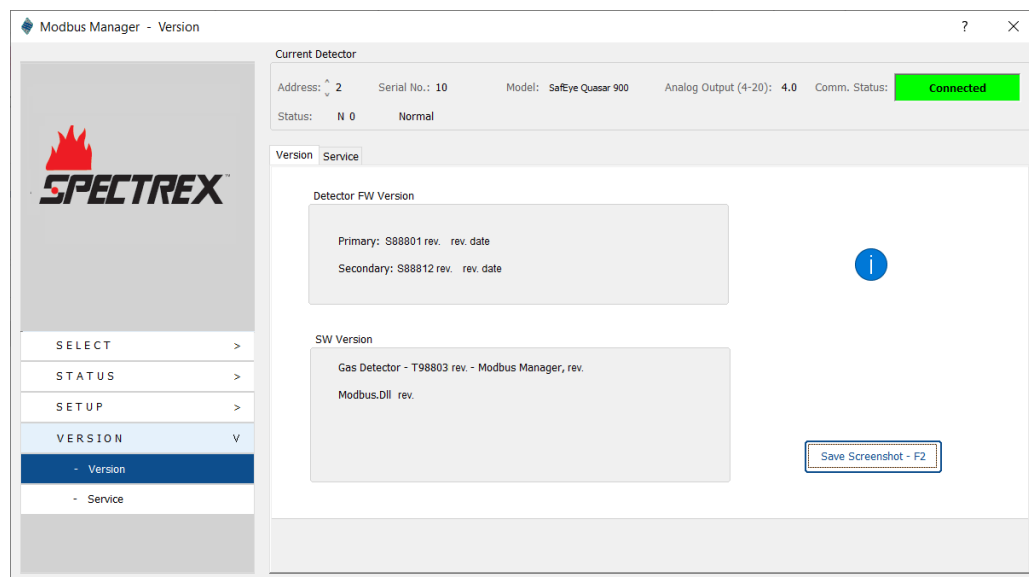
This dialog displays the date and time that the RTC was last set in the **Last Time RTC was set** field. Before the RTC is set for the first time, the RTC begins on 01/01/00.



The dialog box is titled "Device Real Time Clock (RTC)" and has a close button (X) in the top right corner. It contains two sections: "Current Time" and "Last Time RTC was set". Each section has a date and time field (e.g., "Date 01/02/23, Time 16:42:55") and a calendar icon. To the right of these fields is a large blue button labeled "Set".

4.6 Version information

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



The screen is titled "Modbus Manager - Version" and has a close button (X) in the top right corner. On the left is a sidebar with the Spectrex logo and a menu with options: SELECT, STATUS, SETUP, VERSION, - Version, and - Service. The main area displays detector and software version information. At the top, it shows "Current Detector" details: Address: 2, Serial No.: 10, Model: SaEye Quasar 900, Analog Output (4-20): 4.0, Comm. Status: Connected (green button), and Status: N 0 Normal. Below this is a tabbed interface with "Version" and "Service" tabs. The "Version" tab shows "Detector FW Version" (Primary: S88801 rev. rev. date, Secondary: S88812 rev. rev. date) and "SW Version" (Gas Detector - T98803 rev. - Modbus Manager, rev., Modbus.Dll rev.). A blue information icon (i) is next to the FW version, and a "Save Screenshot - F2" button is at the bottom right.

4.7 Service functions

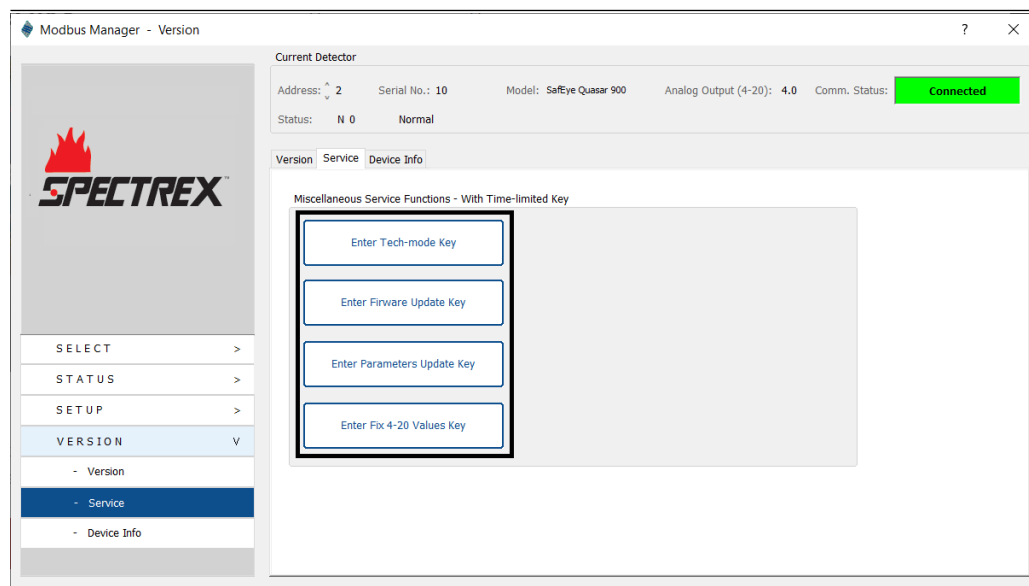
This screen provides access to various service functions.

On request, the vendor can generate time limited keys to enable the services in the red box in the following figure.

When you exit, Modbus Manager, the keys are erased from Modbus Manager, a new key is required to reenter tech mode or reset the password.

The buttons to access these services are on the **Setup** → **Miscellaneous** tab. Contact the vendor for further information.

The Device Info tab displays after entering the Tech-mode key.



A Reference data

A.1 Ordering information, specifications, dimensional drawings, and installation drawings

To view current SafEye Quasar 900 Series ordering information, specifications, and dimensional drawings, follow these steps:

Procedure

1. Go to [Spectrex.net/en-us/flame-gas-detectors/gas-detectors/open-path-gas-detector-hydrocarbons/safeye-quasar-900](https://spectrex.net/en-us/flame-gas-detectors/gas-detectors/open-path-gas-detector-hydrocarbons/safeye-quasar-900).
2. Select the appropriate product.
3. Scroll down to **Documents and Drawings**.
4. Select **DATA SHEETS & BULLETINS**.
5. Select the appropriate Product Data Sheet.

A.2 Detector statuses

Table A-1: Detector statuses

Status	Group	Description
N0	Normal	Normal operation
B0		Normal operation during interference
C0		Maintenance call for low signal or reference
O0	Fault	Obscuration
M0		Misalignment
I0		Saturation
S0		Searching pulse
DD		Disconnection
A0	Alarm	Alarm
W0	Warning	Warning
X0	Alignment	Align
Y0		Standby
G0		Zero calibration

B Configurable options

B.1 Detection sensitivity

The gas calibrations can be changed on the Detector Setup tab.

Table B-1: Gas concentrations for models 901, 902, 903 and 904

	100% Scale LEL.m.	Warning LEL.m.	Alarm LEL.m.
Methane	5	1	3
Propane	5	1	3
Ethylene	8	1.6	4.8

B.2 Factory default settings

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

	Function	Default
Receiver Default Settings	Gas type	Methane
	Heat mode	Auto
	Heater Power	High
	Heat On temperature	5
	4-20 mA Mode	Continuous
	Front LED	Disable
	Address	1

For more information: [Emerson.com/global](https://emerson.com/global)

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