SOFTWARE

MODBUSVIEW™

PC-Based Software Tool

for the FT1, FT4A, and FT4X Thermal Gas Mass Flow Meters

Software User's Manual

Document #112268

Rev A

FOX THERMAL

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This publication must be read in its entirety before performing any operation. Failure to understand and follow these instructions could result in serious personal injury and/or damage to the equipment. Should this equipment require repair or adjustment beyond the procedures given herein, contact the factory at:

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Table of Contents

Introduction
Thank you for purchasing a thermal gas mass flow meter from Fox Thermal, manufacturer of some of the most technically advanced flow meters in the world. Extensive engineering effort has been invested to deliver advanced features, accurate measurement performance, and outstanding reliability.

The ModbusView™ software allows users to easily display data and configure the FT1, FT4A, and FT4X to specific application parameters. The software can access the Gas-SelectX® menu and the CAL-V™ calibration validation diagnostic test. Unique to the FT4X is the 24-Hour Log which provides the daily totals by Contract Time.

The Modbus View software can interface with your flow meter if it has been ordered with the RS485 serial communication option. The ModbusView™ Software has been developed to react intuitively to the type of flow meter with which it is interfacing.

ModbusView can also interface with your flow meter through Modbus TCP/IP over ethernet when using a compatible Modbus RTU serial to TCP/IP converter. The FT1, FT4A, and FT4X meters communicate through serial Modbus RTU and require the converter to interface with Modbus TCP/IP. This setup allows the meter to be accessed across standard networking equipment using TCP/IP.

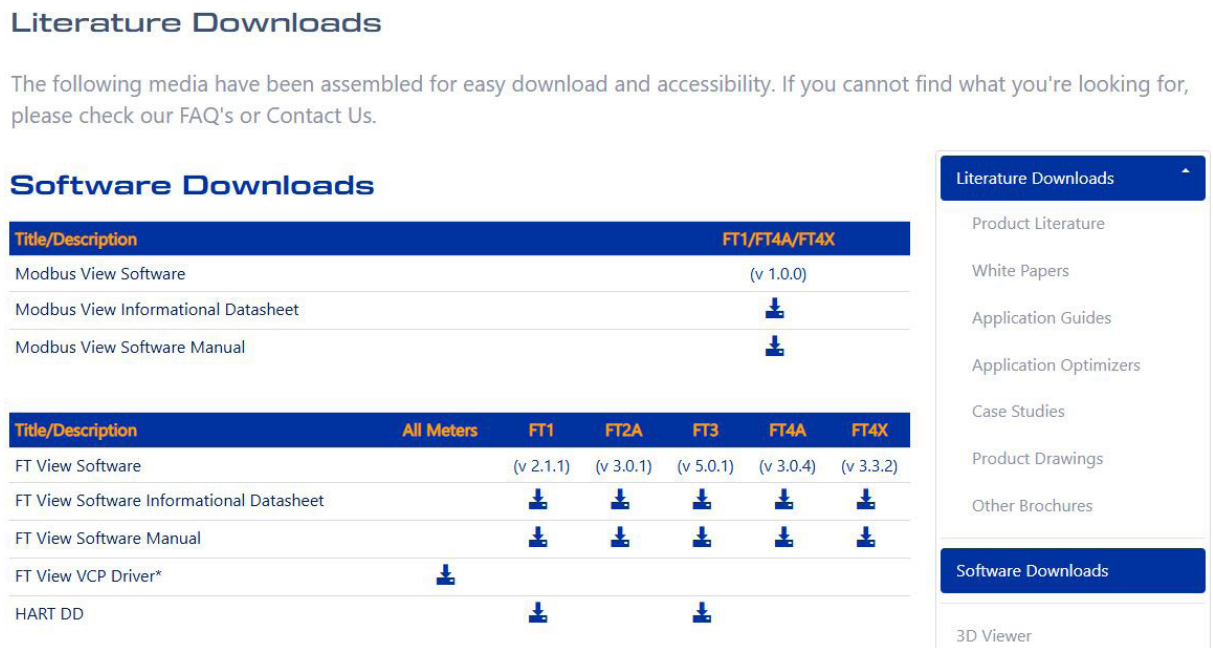
This Manual contains the installation and operation instructions for the ModbusView™ Software.

This manual is divided into the following sections: Introduction, Installation, Wiring, Startup, Operation, Glossary and Index.

Download the ModbusView™ Software from Fox Website
The latest version of the ModbusView™ software is available for download at www.foxthermal.com/literature/#software

The location of the ModbusView Software download link on the Fox Thermal website is shown below.

Fig. 2.1: Online Download Location for ModbusView™ Software



Literature Downloads

The following media have been assembled for easy download and accessibility. If you cannot find what you're looking for, please check our FAQ's or Contact Us.

Software Downloads

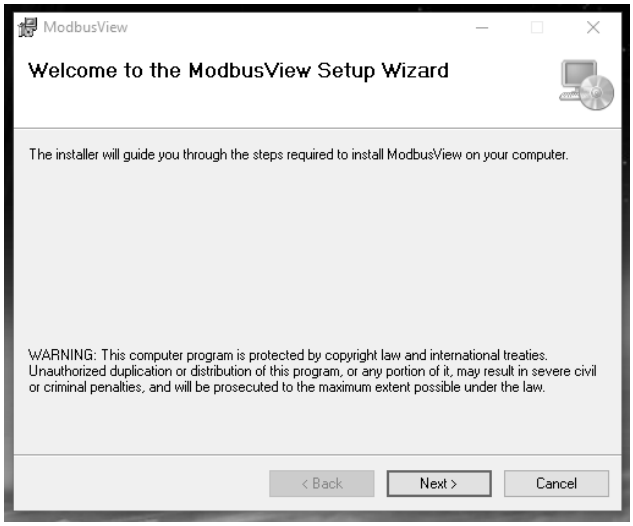
Title/Description	FT1/FT4A/FT4X
Modbus View Software	(v 1.0.0)
Modbus View Informational Datasheet	
Modbus View Software Manual	

Title/Description	All Meters	FT1	FT2A	FT3	FT4A	FT4X
FT View Software		(v 2.1.1)	(v 3.0.1)	(v 5.0.1)	(v 3.0.4)	(v 3.3.2)
FT View Software Informational Datasheet						
FT View Software Manual						
FT View VCP Driver*						
HART DD						

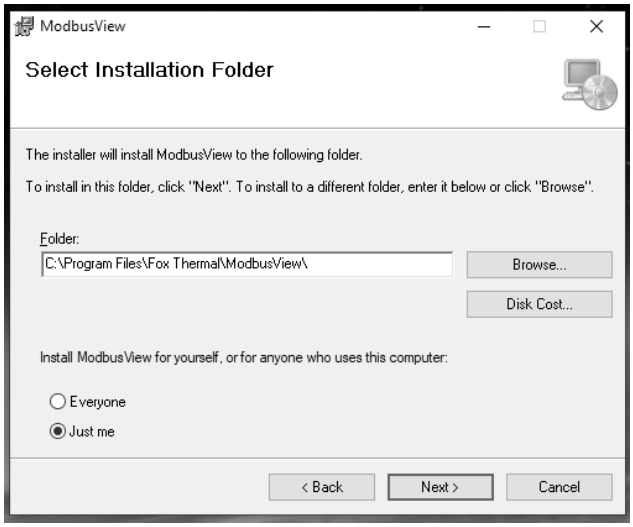
Literature Downloads
Product Literature
White Papers
Application Guides
Application Optimizers
Case Studies
Product Drawings
Other Brochures
Software Downloads
3D Viewer

Install the ModbusView™ Software on a PC

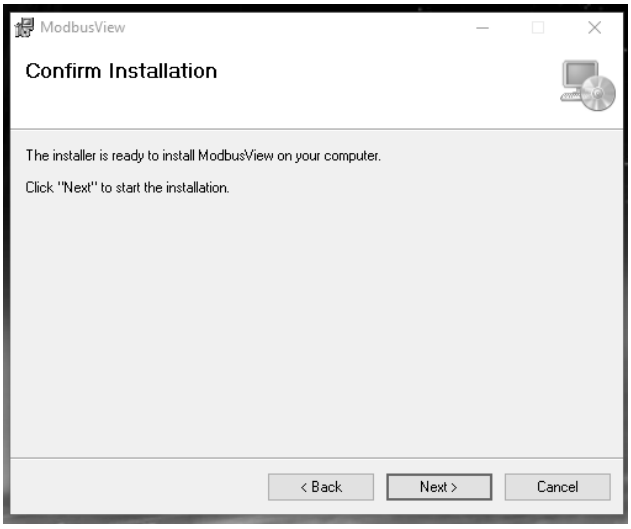
To install the ModbusView™ program, run the "ModbusViewInstaller.msi" file that is located in the downloaded file. The installer will show:



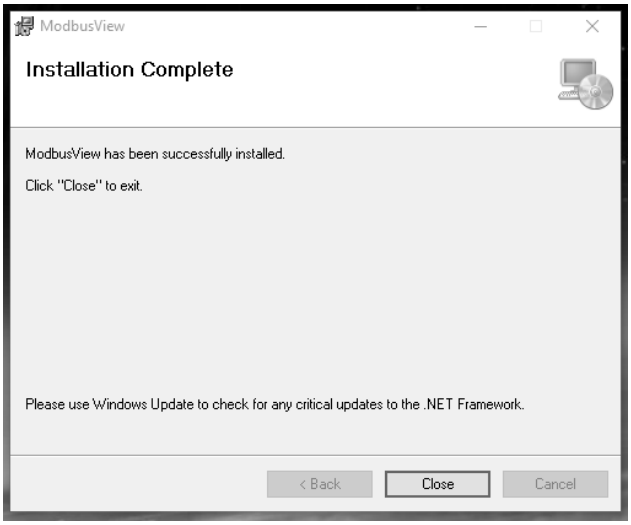
Click "Next" to get started on the installation.



If the default folder location is not desirable, select the folder in which you wish to install ModbusView™. Then choose the radio button for accessibility options. When finished, click "Next".



When the program is ready to install, confirm installation by clicking "Next".



When the program is done installing, click "Close". The ModbusView™ Software is now ready to use. You will be able to find ModbusView™ by accessing the Start menu on your desktop.

Power Wiring

Refer to the product Instruction Manual for Power input wiring instructions. The flow meter must have power to communicate with the ModbusView software tool.

Connect the Flow Meter to a PC or Laptop

Connect your flow meter to a PC or laptop that has ModbusView software successfully downloaded to the operating system. For Modbus RS-485 serial communication, connect to a computer with a built in RS-485 Modbus port or use a USB to RS-485 Modbus converter. When communicating through Modbus TCP/IP over ethernet, a Modbus RTU serial to TCP/IP converter is required.
Fox Thermal offers USB to RS-485 Modbus converter and Modbus RTU serial to TCP/IP converter accessories. Compatible devices are also available from other manufacturers.

Fig. 3.1: FT1 and FT4A Wiring Diagram

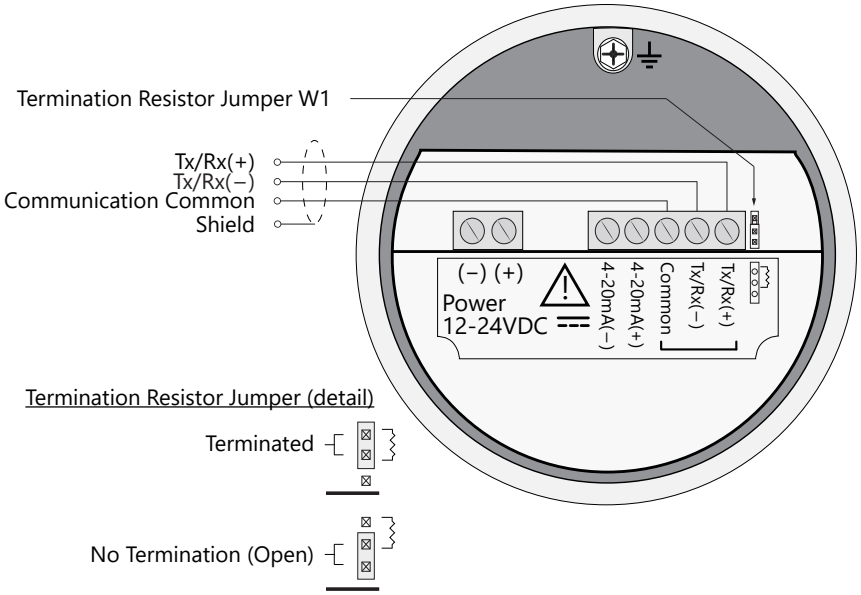
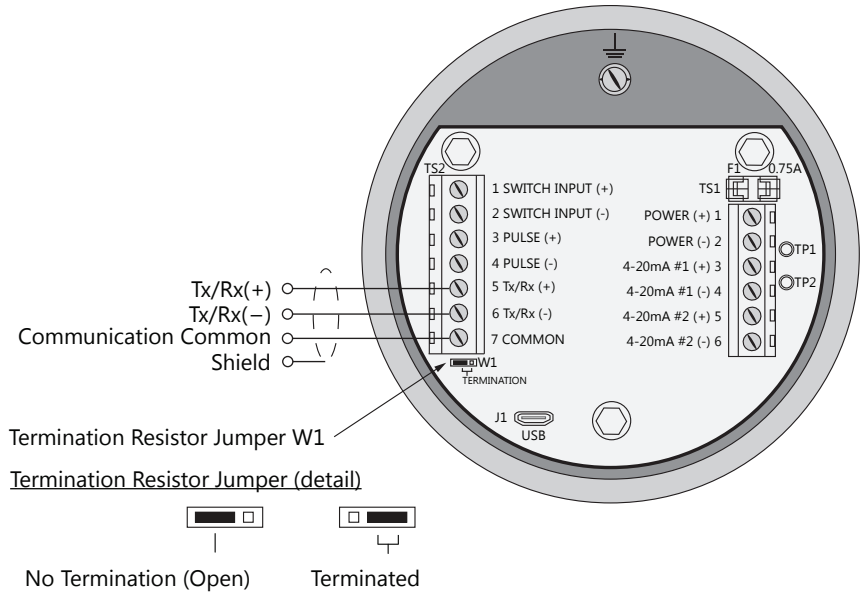


Fig. 3.2: FT4X Wiring Diagram



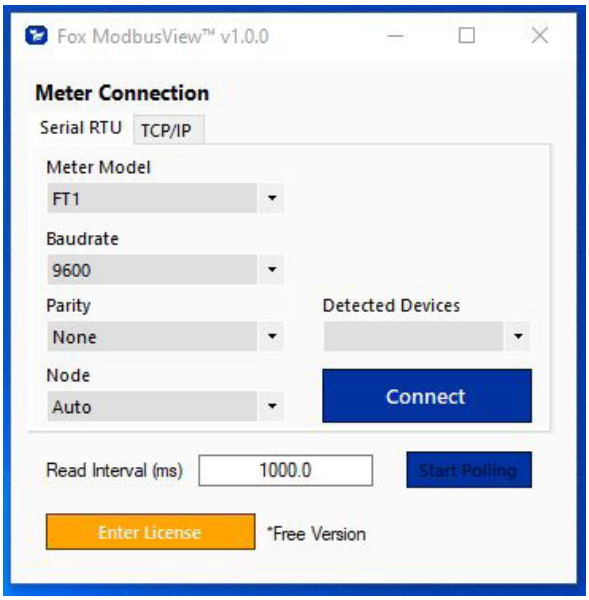
Startup ModbusView™ Software

After connecting to a PC, ensure the flow meter is powered on and startup the ModbusView software. The software is accessible in the Windows "Start" menu, Windows Search, or the Desktop Shortcut.

ModbusView™ Connect Window

Upon opening ModbusView, the Connect window will appear.

Fig. 3.3: Connect Window

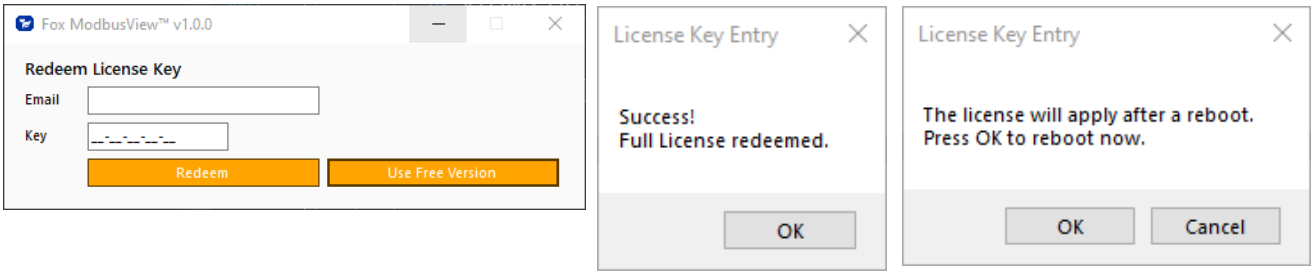


Redeem License Key

To unlock the full version of the software, press the "Enter License" button. This will bring up a menu where you will enter your Email and Key. The Key is sent to the email designated on the order. Please check any spam folders or contact support if the Key was not sent. Once entered, press the "Redeem" button" to redeem the key. The software will then reboot as the full version. Alternatively, select the "Use Free Version" button to use the software without the advanced features.

This activation requires an internet connection.

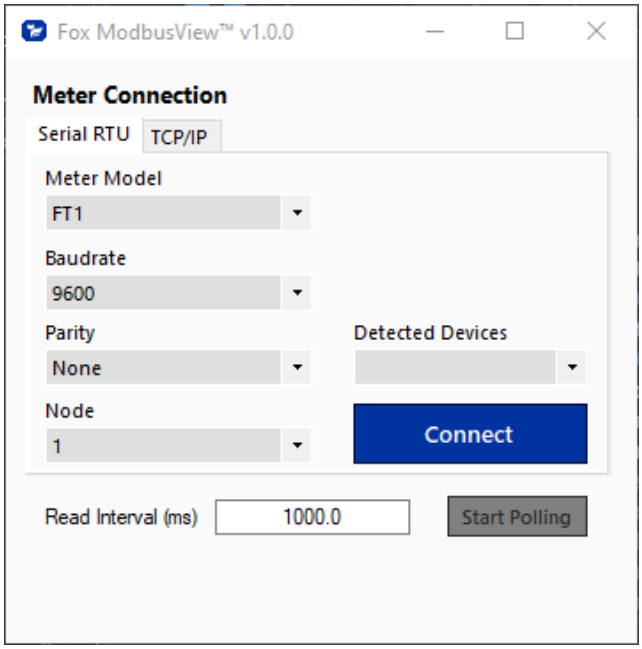
Fig. 3.4: License



Using the ModbusView™ Connect Window

Ensure the correct tab is selected for the communication type: Serial RTU for RS485 Modbus, or TCP/IP for Modbus TCP/IP over Ethernet. Match the following Modbus settings from the meter to the software for a successful connection. The serial communication settings of the meters can be viewed in the display menus of the FT1, FT4A, and FT4X flow meters. Refer to the flow meter instruction manuals. The default settings are shown in the Connect Window below.

Fig. 4.1: Connect Window



Meter Model

On meter firmware v8.3 and newer, the Meter Model will be automatically detected upon connection. On meter firmware below v8.3, the Meter Model must be selected from the drop down menu. The flow meter's label will note the model number. Options available are: FT1, FT4A, FT4X.

Baudrate

Options available are: 1200, 2400, 4800, 9600, 19200, 38400, 57500, 76800, 115200.

Parity

Options available are: None, Odd, and Even

Node

Select the node address of the meter or "Auto". Selecting "Auto" will search for all possible Modbus nodes (1-255) and add them to the Detected Devices. Serial communication can be switched between the multiple detected devices.

NOTE! The "Auto" option may take a few moments to finish searching all devices - set to a specific node value for a faster connection.

When all menu options for baudrate, parity, and node have been chosen, click **Connect**.

Detected Devices
After clicking "Connect", all detected devices will populate this drop down menu, allowing the user to switch between them.

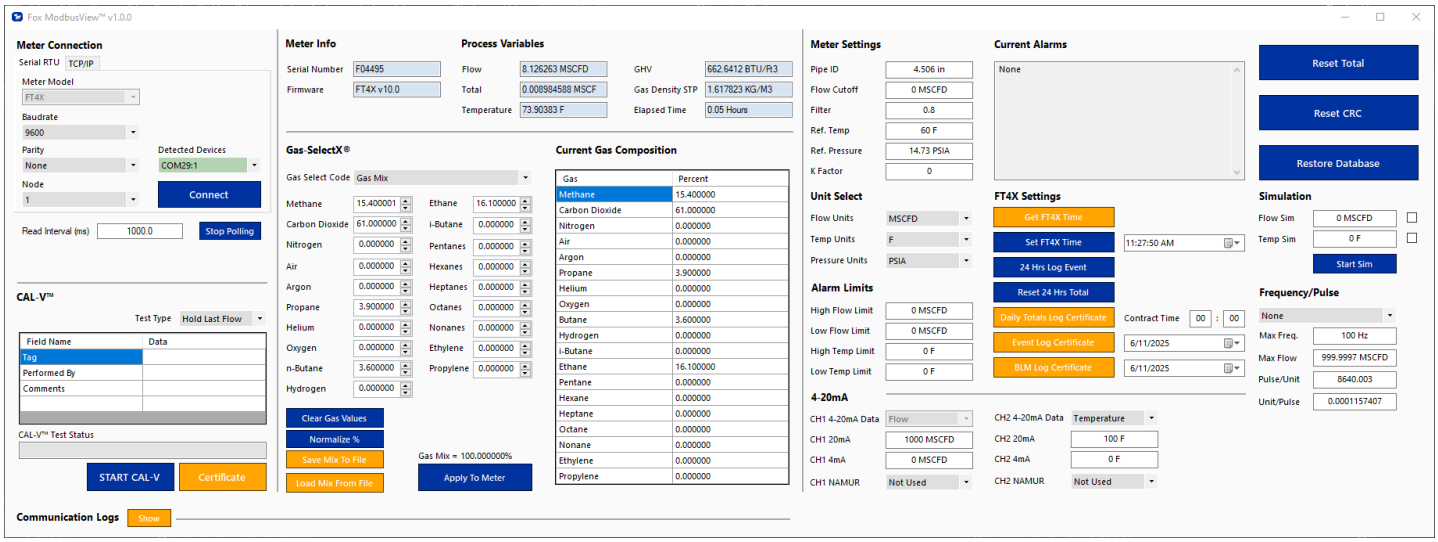
NOTE! The flow meter must be connected to the computer for the system to register it.

Read Interval (ms)
This value defines the amount of time between each of the data requests. For example, when the value is 1000 ms, the software will request all of the values, then wait 1000 ms (1 second) until the data is requested again. Once connected, the software will automatically start polling the Modbus registers. Use the Start/Stop Polling button pause or resume data acquisition.

Main Screen

The image below depicts the full ModbusView Window that appears after the Connect Window.

Fig. 4.2: ModbusView™ Main Screen

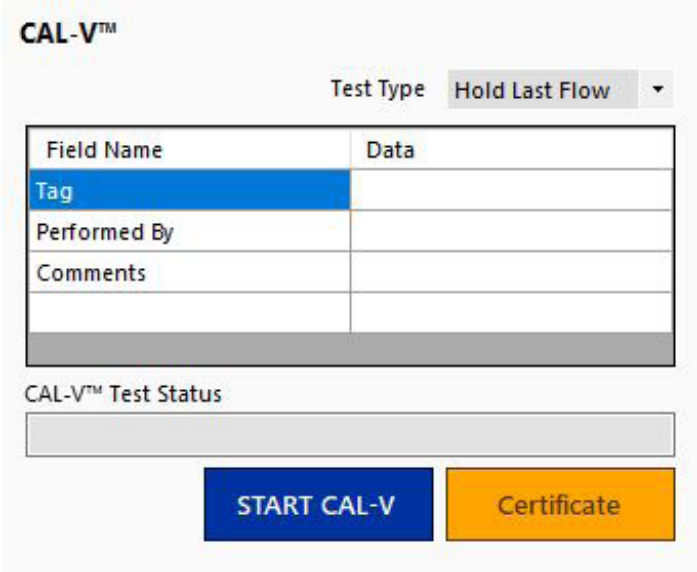


NOTE! Data on the screen is refreshed at user selected Read Interval rate.

Details on the different sections of the Main Screen, will be covered on the following pages.

CAL-V™ Section
The CAL-V™ calibration validation test can be performed from the ModbusView™ software interface. Upon completion of the test, a certificate can be produced and printed. Enter information in the three data fields (Tag, Performed By, and Comments) or custom blank fields that you want included on the corresponding fields of the CAL-V certificate.

Fig. 4.3: CAL-V™ Window



Tag
The "Tag" is a meter identifier.

Performed By
"Performed By" identifies the person who initiated the test.

Comments
"Comments" provide any additional details.

Test Type
To control the action of the flow meter outputs during the CAL-V test, select "Hold Last Flow" or "Go to zero" in the Test Type field. "Hold Last Flow" will keep the flow 4-20mA and pulse outputs at the last value measured. "Go to zero" will set the flow 4-20mA and pulse outputs to the equivalent of zero flow.

START CAL-V™ Button
To start a CAL-V test, use the "Start CAL-V" button. This will run the test for 5 minutes and display realtime results in the "CAL-V Test Status" box.

Print Certificate
When the test is complete, use the "Certificate" button to generate the certificate. Follow the prompts to print as desired.

Meter Info Section

Serial Number
Serial number of the flow meter.

Firmware
Revision level of the firmware (software) programmed in the flow meter.

Process Variables Section

Flow
Current flow rate in selected units

Total
Cumulative mass or volume flow in selected units

Temperature
Gas temperature (Fahrenheit or Celsius)

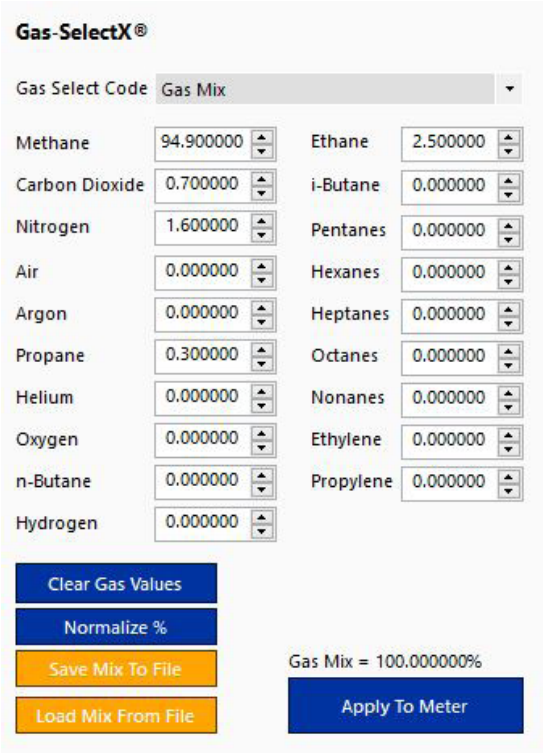
GHV
Gross Heating Value (GHV) of the programmed gas in the Gas-SelectX® gas menu calculated by the meter

Gas Density STP
Density of the gas composition programmed in the Gas-SelectX® menu at the Standard Temperature and Pressure conditions specified in the flow Meter Settings

Elapsed Time
Time since the Totalizer was reset

Gas-SelectX® Section
This menu is used to program the gas selection. The available gases are model specific and will update accordingly based on what the current "Meter Model" selection is set to.

Fig. 4.4: Gas-SelectX® Window



Gas Select Code
When setting any Gas Mix or Oil and Gas Mix, use the value boxes to set the exact percentages. Once the gas configuration is complete, use the "Apply To Meter" button to write the configuration to the meter.

Clear Gas Values
Use the "Clear Gas Values" button to reset all of the gas percentages to zero in the input boxes.

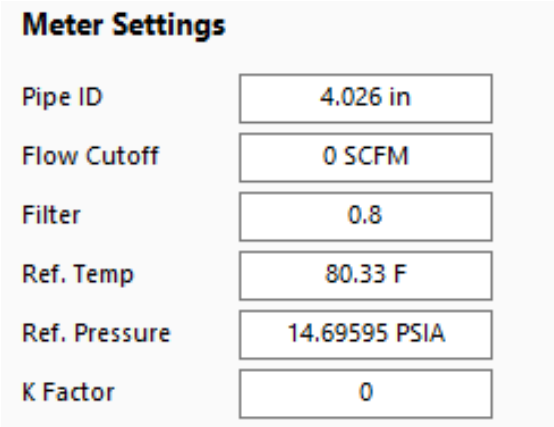
Normalize %
In the event that the final mix does not equate to 100% then use the "Normalize %" button - this will scale the mix up or down while maintaining the ratio between gases.

Save Mix To File
When the desired mix is configured, it is possible to save it as a file for reference - use the "Save Mix To File" feature and follow the prompts.

Load Mix From File
To load in a previously saved gas mix, use the "Load Mix From File" feature.

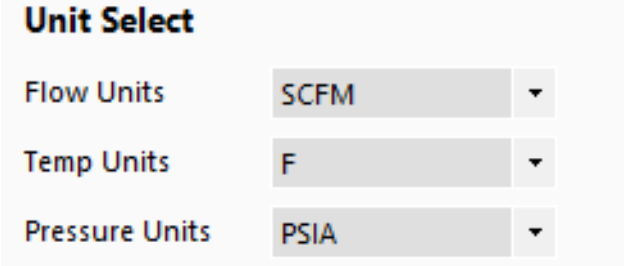
Meter Settings Section
Basic configuration of the meter can be set including Pipe ID, Flow Cutoff, Filter, Ref. Temp, Ref. Pressure, and K Factor.

Fig. 4.5: Meter Settings



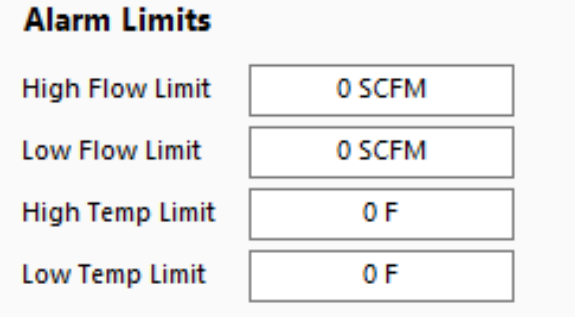
Unit Select
Select from a variety of units for Flow, Temperature, and Pressure.

Fig. 4.6: Selecting Units



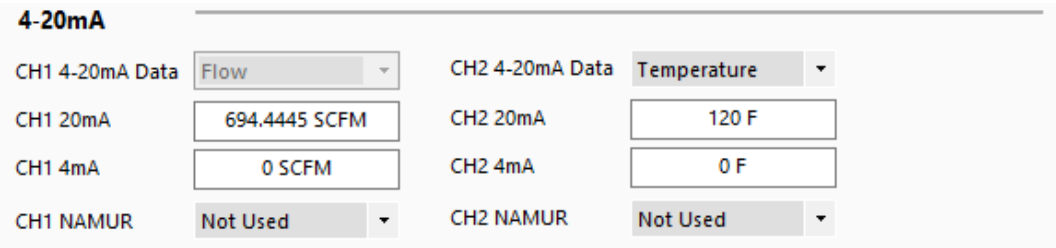
Alarm Limits
Set the values for the following alarms: High Flow Limit, Low Flow Limit, High Temp Limit, and Low Temp Limit.

Fig. 4.7: Alarm Limits



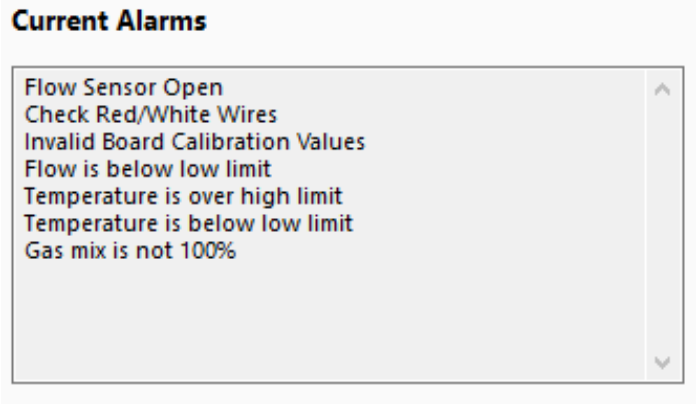
4-20mA
Configure the 4-20mA output(s) including Data Select (Flow or Temperature), 20mA scaling value, 4mA scaling value, and NAMUR setting.

Fig. 4.8: 4 to 20mA



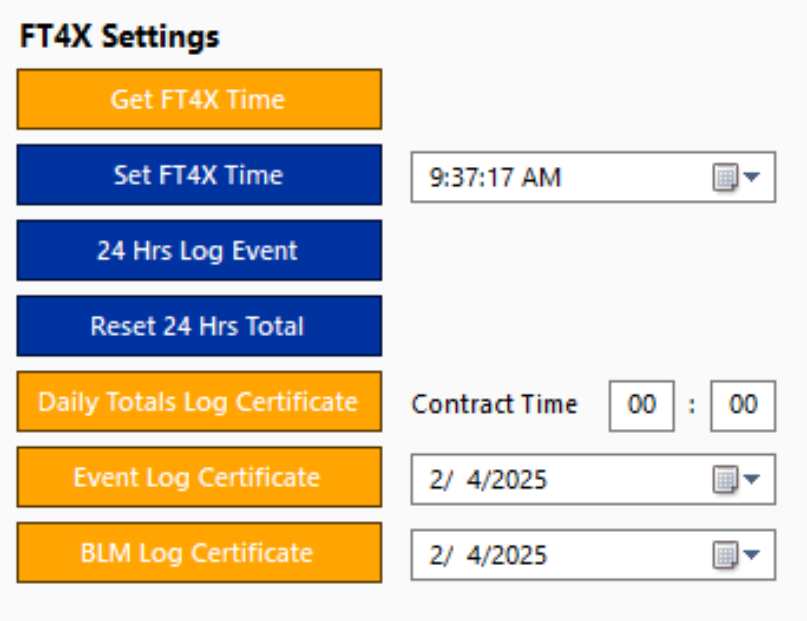
Current Alarms
This box displays all of the current Alarms/Error messages the meter will output.

Fig. 4.9: Current Alarms



FT4X Settings Section (Only on FT4X Models)
This menu controls the FT4X specific settings including the 24 Hour Totals Log, the Event Log, the BLM Log, and the current time.

Fig. 4.10: FT4X Settings Window



Get FT4X Time
Request the current time from the FT4X clock.

Set FT4X Time
Use the Date Time input box to define the time, then use the "Set FT4X Time" button to write it to the FT4X.

24 Hrs Log Event
This button will generate a Daily Totals Log record using the total flow accumulated since the previous record.

Reset 24 Hrs Total
This button will clear all of the 40 Daily Total records and clear today's accumulated total as well.

Daily Totals Log Certificate
Use this button to generate a certificate containing 40 Daily Total records.

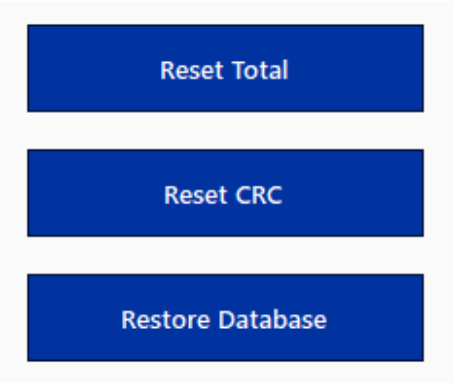
Contract Time
Set the time-of-day HH:MM for which the Daily Totals Log will record the total each day.

Event Log Certificate
Use the Date input box to define the date that the software will read Event Logs back through, then use the "Event Log Certificate" button to generate the certificate.

BLM Log Certificate
Use the Date input box to define the date that the software will read BLM Logs back through, then use the "BLM Log Certificate" button to generate the certificate.

Control Commands Section
The control commands provide additional functionality by sending available commands for the meter to perform.

Fig. 4.11: Control Commands Section



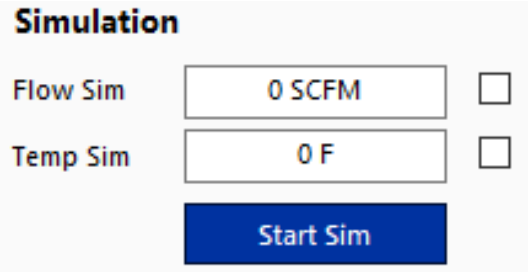
Reset Total Button
The "Reset Total" button will clear the meter totalizer.

Reset CRC Button
In the event of a CRC error, review the meter parameters and ensure they are correct. The use the "Reset CRC" button to clear the alarm.

Retore Database Button
The "Restore Database" button will reset the meter to the factory configuration.

Simulation
Simulate a flow and/or temperature value for the device to output.
Use the check boxes to include the desired simulation value(s) before pressing the "Start Sim" button.

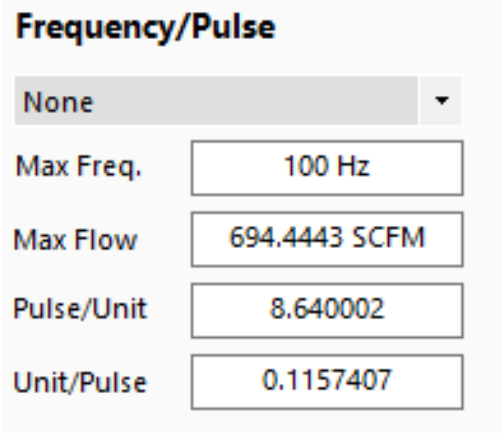
Fig. 4.12: Simulation



When finished with the simulation function, press the button to end the simulation and return the flow meter to normal operation.

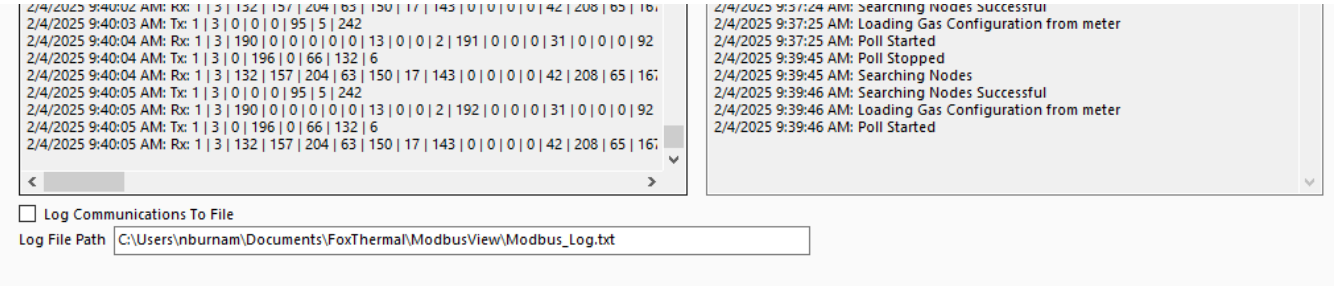
Frequency/Pulse
Configure the values used for the Frequency/Pulse output including: output select (Frequency, Hi/Low Flow or Temp Alarms, or System Alarm), Max Frequency Value, Max Flow Value, Pulse/Unit Value, and Unit/Pulse Value.

Fig. 4.13: Frequency/Pulse



Communication Logs Section
The Communications Logs give access to two logs: Modbus Communications Log and Software Event Log. This menu is hidden by default.

Fig. 4.14: Communication Logs Window



Communication Log Show/Hide Button
Use the button to "Hide" or "Show" the Communications Logs.

Modbus Communication Log
The "Modbus Communications Log" displays all of the outgoing (Tx) and incoming (Rx) Modbus communications as bytes separated with a vertical line.

Log Communication To File
To use the log to file feature, first set the file path by clicking within the "Log File Path" input box. Then, check the box for "Log Communications To file" and follow the prompt.

NOTE! It is recommended to uncheck the "Log Communications To File" box before opening the file in a text file viewer - this will help avoid multiple programs accessing the same file at the same time.

Software Event Log
The Software Event Log is a more user-friendly log for displaying events that take place within the Modbus View Software.

Glossary of Terms and Definitions

BLM	Bureau of Land Management
CFG	Configuration
COM	Communication
CRC	Cyclical Redundancy Check
GHV	Gross Heating Value
Hrs	Hours
Max	Maximum
NAMUR	User Association of Automation Technology in Process Industries
PC	Personal Computer
RTC	Real Time Clock
RTU	Remote Terminal Unit
Rx	Receive
STP	Standard Temperature Pressure
TOT	Total
TCP/IP	Transmission Control Protocol/Internet Protocol
Tx	Transmit
USB	Universal Serial Bus

Index

Wiring

Troubleshooting Tips

NOTE! is used for Notes and Information

WARNING! is used to indicate a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION! is used to indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.

FOX® THERMAL

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THERMAL MASS AND VORTEX FLOW METERS
NON-STOP PERFORMANCE

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