

TM500™ View Software
Instruction Manual

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For Global Service Centers, go to <http://www.sierrainstruments.com/facilities.html>

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Warnings and Cautions

General Safety Information

We use caution and warning statements throughout this book to draw your attention to important information.

Symbol Key		
Symbol	Symbol Meaning	Description
	Warning	This statement appears with information that is important to protect people and equipment from damage. Pay very close attention to all warnings that apply to your application.
	Caution/Note	This statement appears with information that is important for protecting your equipment's performance. Read and follow all cautions that apply to your application.

CAUTION

- Caution! Before making adjustments to the TM500, verify the flow meter is not actively monitoring or reporting to any master control system. Adjustments to the electronics will cause direct changes to flow control settings.
- Caution! All flow meter connections, isolation valves and fittings for hot tapping must have the same or higher pressure rating as the main pipeline.
- Caution! The flow meter electronics and sensor probe have been manufactured and calibrated to operate as a unit. The flow meter will not operate properly if parts are replaced from another meter.
- Caution! Printed circuit boards are sensitive to electrostatic discharge. To avoid damaging the board, follow these precautions to minimize the risk of damage:
 - before handling the assembly, discharge your body by touching a grounded, metal object
 - handle all cards by their edges unless otherwise required
 - when possible, use grounded electrostatic discharge wrist straps when handling sensitive components

Notice

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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TM500-View Software

Introduction

Introduction

Thank you for purchasing the TM500™ Thermal Gas Mass Flow Meter from Sierra Instruments. The TM500 is one of the most technically advanced flow meters in the world. Extensive engineering effort has been invested to deliver advanced features, accuracy measurement performance, and outstanding reliability.

The new TM500-View™ software allows users to easily display data and configure the TM500 to their specific application parameters. The software can also access the Gas-Mix™ menu, the TM-Cal™ calibration validation diagnostic test, and log flow/temperature data to an Excel file.

The TM500 is available with Modbus or HART communication options and the Gas-Mix option. The TM500-View software has been developed to react intuitively to the type of TM500 meter with which it is interfacing.

This manual contains the installation and operation instructions for the TM500-View software.

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

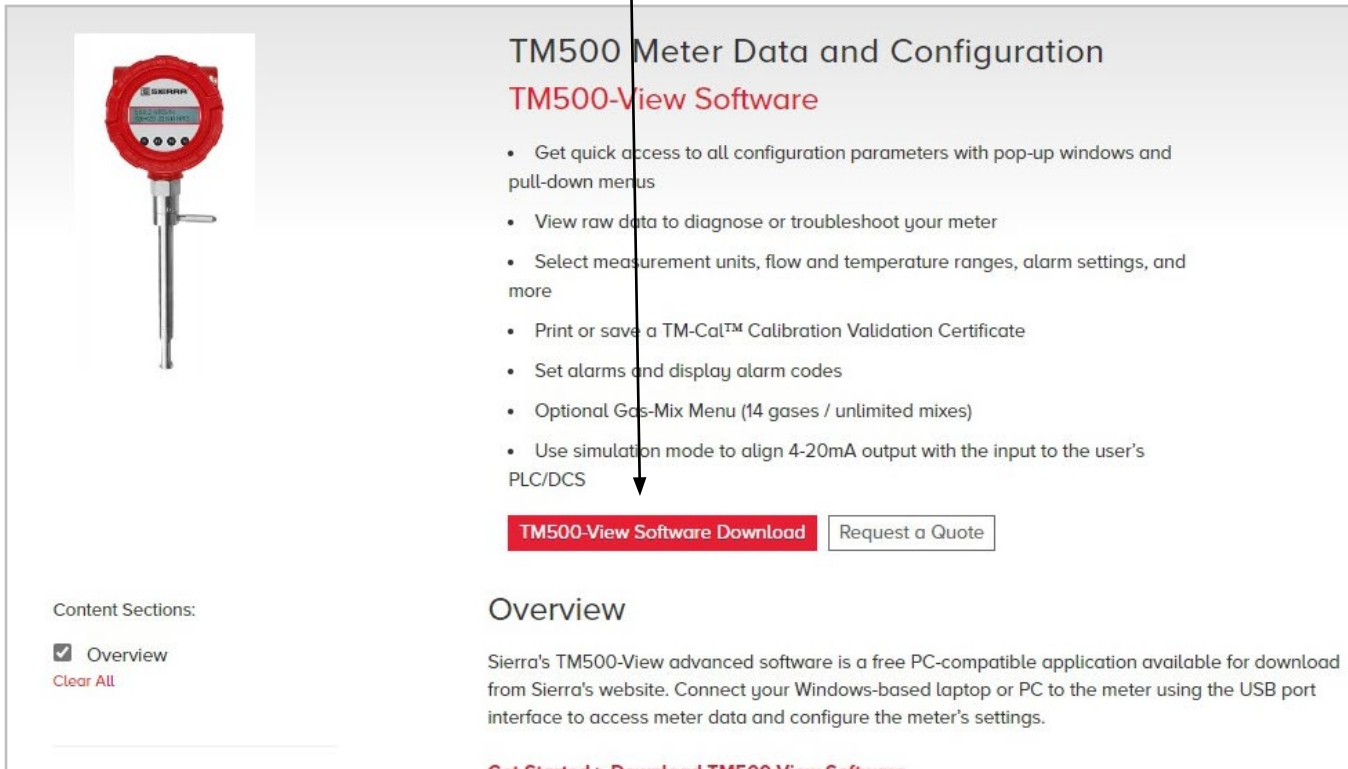
Installation

Unscrew the rear enclosure cap to access the wiring terminals and USB communication port. Connect the TM500 to a PC with a USB (Type A, Micro-B) cable. If the PC is connected to the internet and running Windows®, the PC will try to automatically load the VCP driver. If the driver does not load automatically, download the VCP driver at: www.ftdichip.com/Drivers/VCP.htm

NOTE! The latest version of the TM500-View™ software is available for download at <https://www.sierrainstruments.com/products/upgrades/tm500-view.html>

Fig. 2.1: Online Download Location for TM500-View™ software

Click on the TM500-View™ Software Download button



TM500 Meter Data and Configuration
TM500-View Software

- Get quick access to all configuration parameters with pop-up windows and pull-down menus
- View raw data to diagnose or troubleshoot your meter
- Select measurement units, flow and temperature ranges, alarm settings, and more
- Print or save a TM-Cal™ Calibration Validation Certificate
- Set alarms and display alarm codes
- Optional Gas-Mix Menu (14 gases / unlimited mixes)
- Use simulation mode to align 4-20mA output with the input to the user's PLC/DCS

TM500-View Software Download Request a Quote

Content Sections:
☒ Overview
[Clear All](#)

Overview

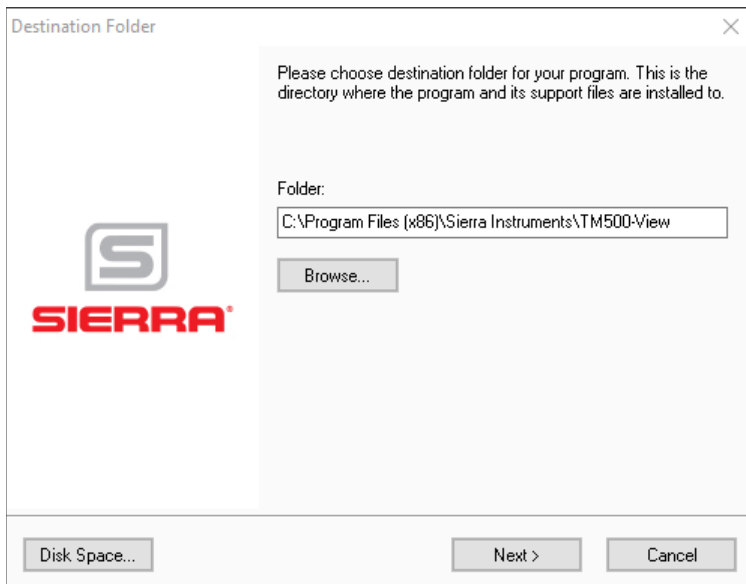
Sierra's TM500-View advanced software is a free PC-compatible application available for download from Sierra's website. Connect your Windows-based laptop or PC to the meter using the USB port interface to access meter data and configure the meter's settings.

[Get Started > Download TM500-View Software](#)

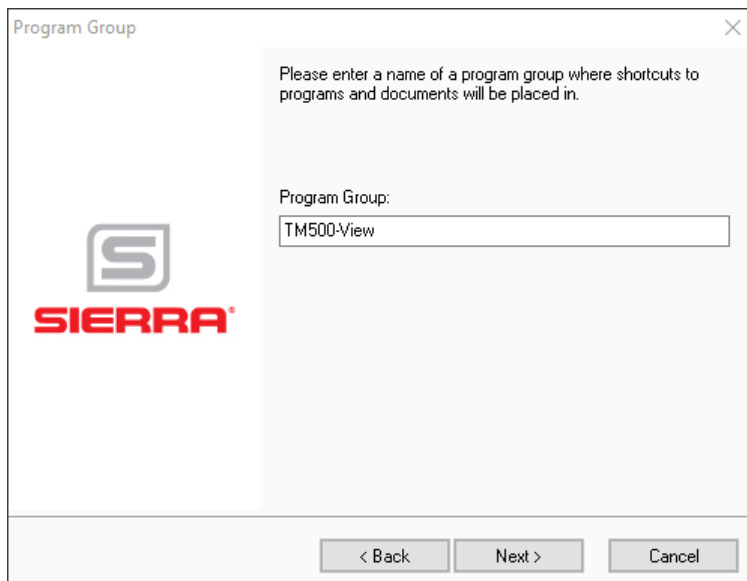
TM500-View Software

Installation

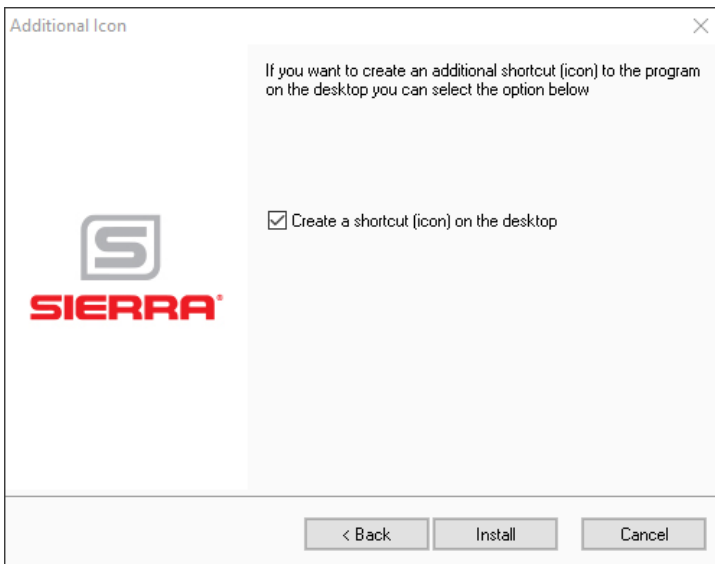
To install the TM500-View™ software program, run the "TM500-View-Setup-vx.x.x.exe" file that is located in the downloaded file. After clicking "Next" the screen will show:



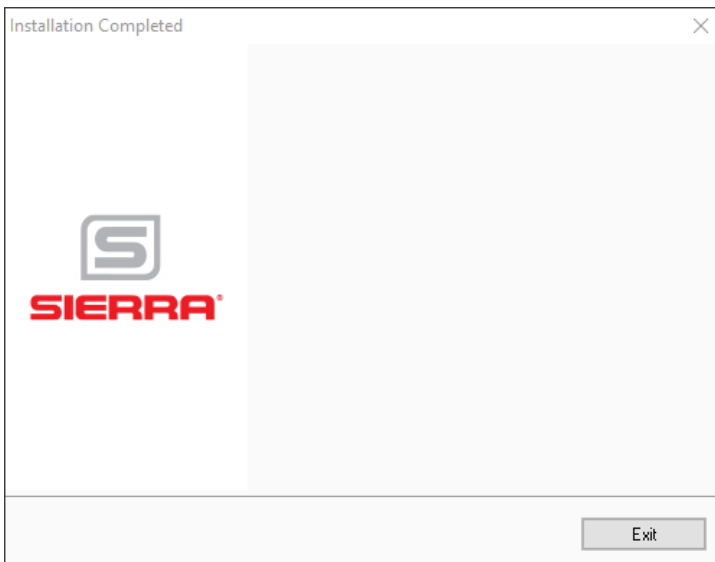
Select the folder in which you wish to install TM500-View software, then click "Next".



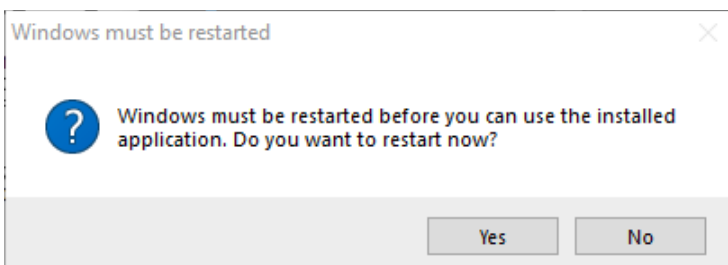
Please enter a name for the Program Group or use the default TM500-View name and click "Next".



To find the program easily, you may choose to create a shortcut icon for your PC desktop by placing a check in the checkbox. Click "Install" to continue.



When the program is done installing, click "Exit", then restart your computer.



To complete the installation process, close all applications, and restart your computer. The TM500 View™ Software will be ready to use after the computer has rebooted.

TM500-View Software

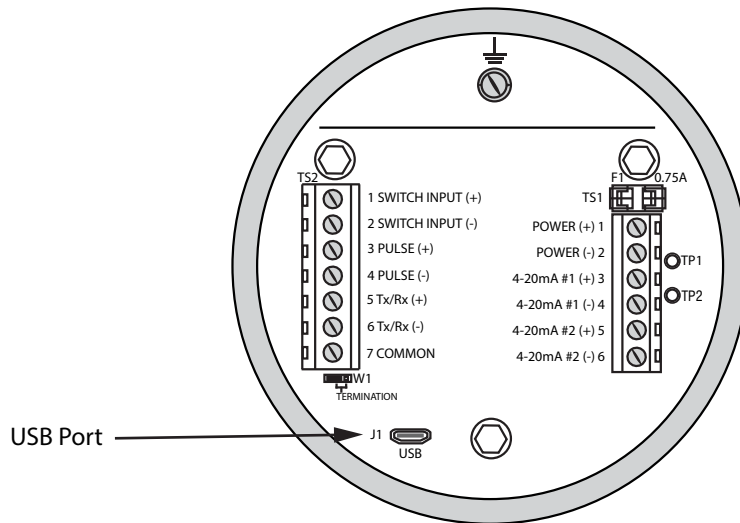
Installation

Power on the Meter

Refer to the TM500 Instruction Manual for Power input wiring instructions. The TM500 must be powered on to communicate with the TM500-View software™ tool.

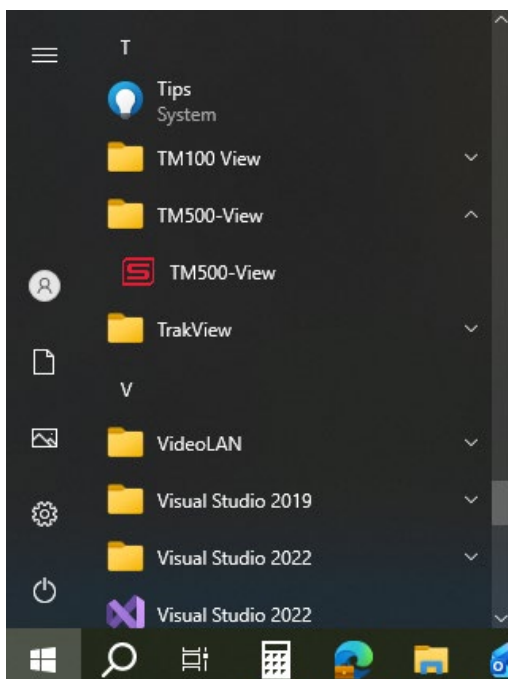
Connect the TM500 to a PC or Laptop via USB

Be sure to have your TM500 flow meter connected by USB to a PC or laptop that has TM500 View™ software successfully downloaded to the operating system. The USB port can be found by removing the rear enclosure cap.



Startup TM500 View™ Software

After re-boot and connecting to a PC via USB, startup the TM500 View™ software accessible in the Windows "Start" button or search bar."



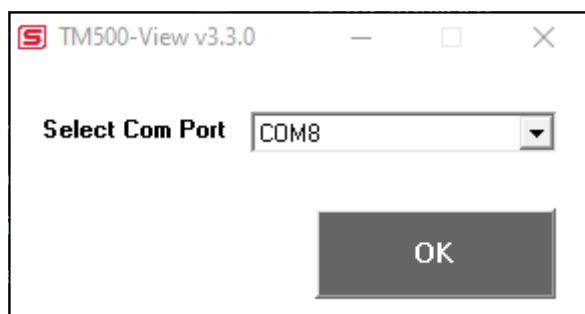
COM Port Assignment

Upon opening TM500-View software for the first time, Windows® will assign a "virtual COM port". The COM port number that has been assigned will appear automatically in the drop down box. If the correct COM Port does not appear, go to Control Panel/Device Manager and click on Ports (COM & LPT). The COM port number should be displayed under the USB symbol.

If prompted, enter the assigned COM port in TM500-View software™ by using the drop down menu and press **OK**.

! NOTE! The TM500 meter must be plugged into the computer in order for the system to register it.

Fig. 2.2: COM Port Selection Window



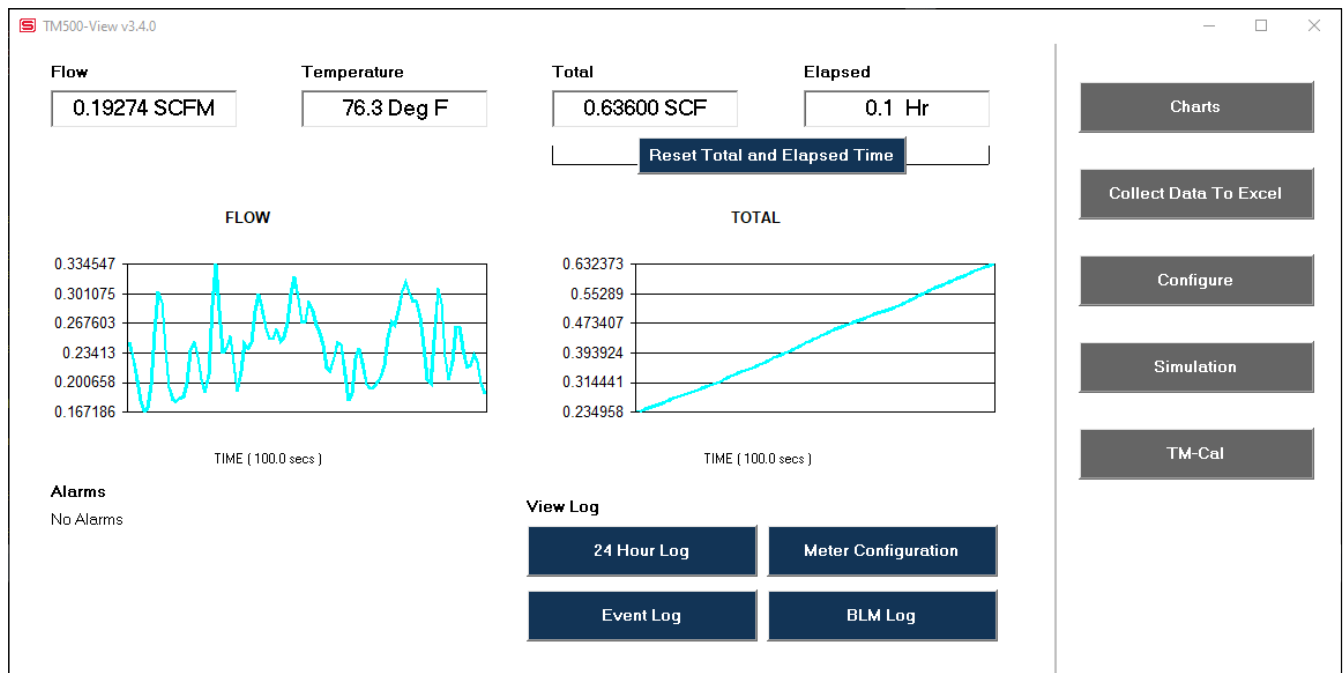
TM500-View Software

Operations

Main Screen

The image below depicts the main screen that appears upon entering TM500-View software.

Fig. 3.1: TM500-View™ software Main Screen



Flow & Temperature

TM500-View™ will show values for flow and temperature in the pipe in real time based on how the flow meter has been configured (in this case, MSCFD and °F). These values are in the upper left of the screen.

Total & Elapsed Time

Flow total and Elapsed Time are shown in the upper right of the screen and can be reset with the button just underneath the displayed values.

Charts Button

This calls up two charts that can be configured for flow, temperature, or total flow. Each chart can be individually enlarged and re-scaled from the original default settings. For more information on how to change the charts settings, refer to p. 14.

NOTE! The charts are refreshed at user selected update rate.

Collect Data to Excel

This function allows all selected data to be logged to an Excel® file at the specified sample time. All readings are time/date stamped. For more information on using the Data Logger function, refer to "Data Logger" on page 16.

Configure

This allows the operator to go in and set the application parameters. This can be done using the TM500 View software or manually using the instrument's display. For more information on configuring application parameters, refer to p. 18.

Simulation

This function can be used to verify that all the flow meter outputs are working properly. The easiest way to perform this check is to enter a specific temperature/flow rate. The corresponding analog outputs can be verified using a DMM and using a timer for the pulse. Refer to p. 26 for more information on how to use the Simulation function.

TM-Cal™

Sierra Instruments has developed the TM-Cal™ Calibration Validation to help our customers avoid sending the meter back for annual or biennial re-calibrations. Calibration Validation allows our customers to validate the accuracy and functionality of the meter in the field with the push of a button. By performing a simple test, the operator can verify that the meter is running accurately. TM-Cal™ ensures the repeatability, functionality of the sensor and its associated signal processing circuitry, and cleanliness of the sensor.

The TM-Cal™ calibration validation test can be performed while the unit is still in the pipe. The TM-Cal™ calibration validation test is explained in greater detail on p. 27.

View Log (Data Logger) Section

24 Hour Log Button

Pressing this button produces a pdf list of the 40 latest 24-hour totals. The user defined Contract. Time specifies when the Daily Total 24 Hour Log is recorded each day.

Meter Configuration Button

The Configuration Log button produces a pdf listing of the meter's current configuration settings.

Event Log Button

The Event Log button will open a series of windows requesting the number of records to be accessed and which record must start the list. This data will be produced in a pdf document.

BLM Log Button

The BLM Log Button provides the user with a log detailing a 7 year history of flow, temperature, and total at hourly intervals.

Alarms

The unit can be configured for high/low alarms for either flow or temperature. The "alarms window" displays any alarms or warnings.

Exit

Exit the application by clicking on the "X" at the top right corner of the window.

Charts Settings

From the main menu screen, click on "Charts". Two charts will appear side-by-side. Each chart can be selected for flow, temperature or total flow and scaled in one of three ways: a plus/minus percent scale, inputting min/max values manually, or real-time automatic scaling.

Fig. 3.2: Chart Settings Window - Chart 1

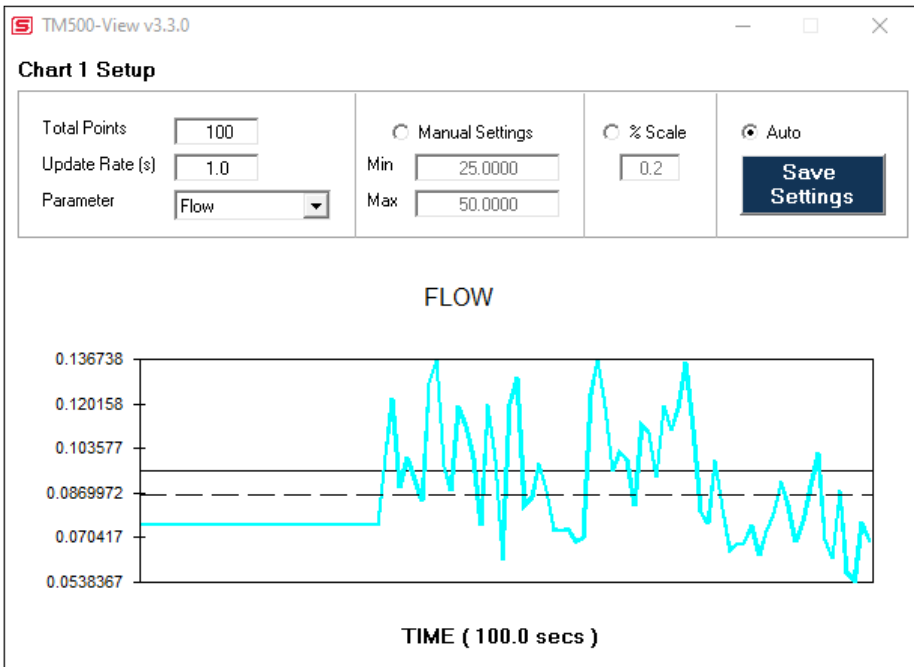
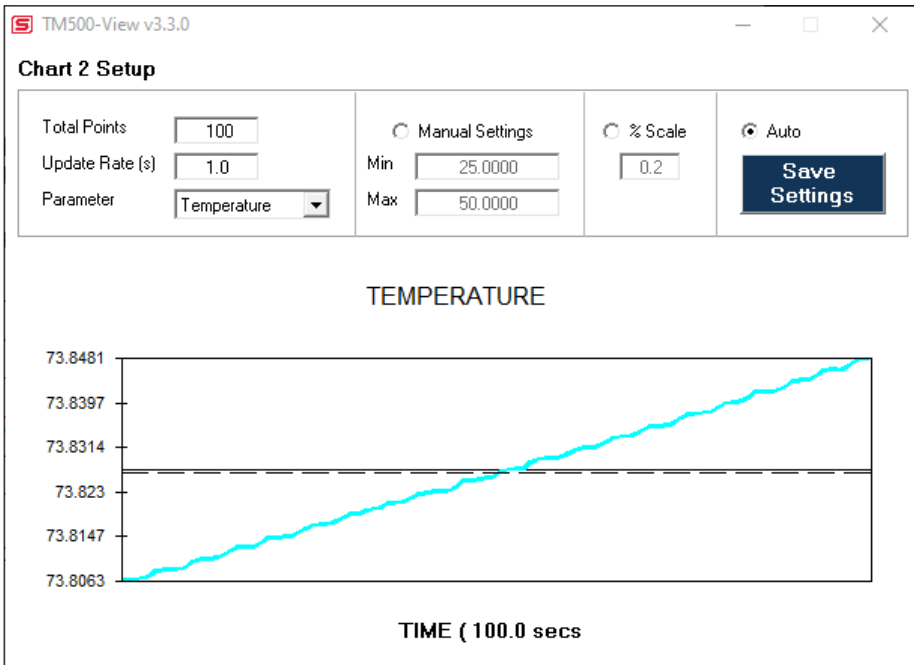


Fig. 3.3: Chart Settings Window - Chart 2



Total Points

The total points specifies the number of points plotted on the graph. Older data is automatically omitted.

Update Rate

The update rate controls the data refresh rate.

Parameters

Flow, temperature or total flow can easily be selected for charting.

Manual Chart Setting

The Manual mode allows a user to input min/max values for chart scaling. When entering new values, click on Save Settings for them to take effect.

Percent (%) Scale

This sets the scale to a plus/minus specified percentage from the initial measured value. Typically, the minimum/maximum is scaled at plus/minus 10% of that initial value.

Automatic Chart Setting

Automatic mode lets the program adjust the scaling on a real-time basis based on the entire range of values.

Save Setting

Click the Save Settings button to save the chart settings to the Main Screen. These settings can then be closed by clicking on the "X" at the top right corner of the window.

Collect Data to Excel

The Collect Data to Excel function can be accessed from the Main screen. Clicking the "Collect Data To Excel" button will prompt the user for a password. Enter a Level I or Level II password and the Data to Excel window will appear.

Fig. 3.4: Data to Excel Window - Logging Turned Off

TM500-View v3.3.0

Excel Filename

Select

Data Selection

- ☐ CSV (Current Sense Voltage)
- ☐ Flow
- ☐ Flow NM3/H
- ☐ Gas Temperature
- ☐ Total
- ☐ Elapsed Time

Data Preview

Index	Name	Value

Logged Values

Sample Time

Hrs: Min: Sec:

Start Data Logger

Select the sample time from the drop down menu, and then select the required data from the Data Selection list. Select or create a name for the Excel® file and then press the "Start Data Logging" button.

Fig. 3.5: Data to Excel Window - Logging Turned On

Excel Filename

Select

Data Selection

- ☒ CSV (Current Sense Voltage)
- ☒ Flow
- ☒ Flow NM3/H
- ☒ Gas Temperature
- ☒ Total
- ☒ Elapsed Time

Data Preview

Index	Name	Value
15	Csv []	0.043988872
0	Flow [SCFM]	0.25531009
8	FloVol [NM3/H]	0.41116461
12	Gas_temp [Deg F]	73.902679
20	Total [SCF]	526.239
21	ElapsedTime [Hrs]	15.883333

Logged Values

10/31/23 11:18:20	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:24	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:25	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:26	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:27	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:28	0.0	0.3	0.4	73.9	526.2	15.9
10/31/23 11:18:29	0.0	0.3	0.4	73.9	526.2	15.9

Sample Time

Hrs: Min: Sec:

Stop Data Logger

When "Start Data Logging" is pressed, the data is recorded in the specified Excel® file - and also displayed in the Data Logged window. Pressing "Stop Data Logging" ends data acquisition.

TM500-View Software

Operations

Configure

From the main menu, click on the "Configure" button and enter the requested password for either Level I (1234) or Level II (9111) access.

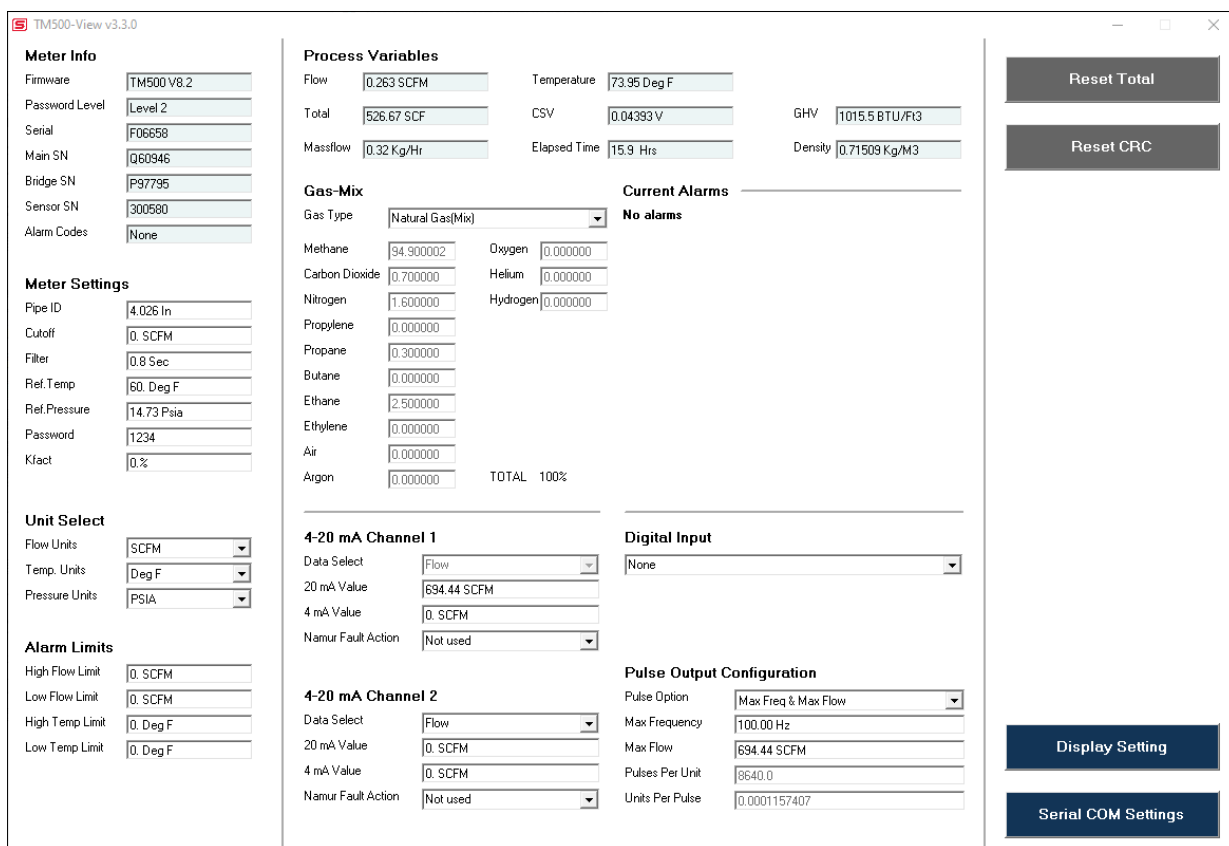
Fig. 3.6: Password Window



A screenshot of the 'Password Entry' window. It features a title bar with a red 'S' icon and the text 'Password Entry'. Below the title bar, there is a label 'Enter Password' followed by a text input field containing four asterisks '****'. At the bottom right of the window is a large 'OK' button.

NOTE! Most users will only need access to the Level I screen to do basic setting of units, alarms and output scaling.

Fig. 3.7: Level II Configuration Screen



A screenshot of the 'Level II Configuration Screen' in the TM500-View v3.3.0 software. The screen is divided into several sections:

- Meter Info:** Includes fields for Firmware (TM500 V8.2), Password Level (Level 2), Serial (F06658), Main SN (Q60946), Bridge SN (P97795), Sensor SN (300580), and Alarm Codes (None).
- Meter Settings:** Includes fields for Pipe ID (4.026 In), Cutoff (0 SCFM), Filter (0.8 Sec), Ref. Temp (60. Deg F), Ref. Pressure (14.73 Psia), Password (1234), and Kfactor (0. %).
- Unit Select:** Includes dropdown menus for Flow Units (SCFM), Temp. Units (Deg F), and Pressure Units (PSIA).
- Alarm Limits:** Includes fields for High Flow Limit (0 SCFM), Low Flow Limit (0 SCFM), High Temp Limit (0. Deg F), and Low Temp Limit (0. Deg F).
- Process Variables:** Includes fields for Flow (0.263 SCFM), Temperature (73.95 Deg F), Total (526.67 SCF), CSV (0.04393 V), GHV (1015.5 BTU/F3), Massflow (0.32 Kg/Hr), Elapsed Time (15.9 Hrs), and Density (0.71509 Kg/M3).
- Gas-Mix:** Includes a dropdown for Gas Type (Natural Gas(Mix)) and fields for Methane (34.900002), Oxygen (0.000000), Carbon Dioxide (0.700000), Helium (0.000000), Nitrogen (1.600000), Hydrogen (0.000000), Propylene (0.000000), Propane (0.300000), Butane (0.000000), Ethane (2.500000), Ethylene (0.000000), Air (0.000000), and Argon (0.000000). A 'TOTAL 100%' label is also present.
- Current Alarms:** Displays 'No alarms'.
- 4-20 mA Channel 1:** Includes fields for Data Select (Flow), 20 mA Value (694.44 SCFM), 4 mA Value (0. SCFM), and Namur Fault Action (Not used).
- 4-20 mA Channel 2:** Includes fields for Data Select (Flow), 20 mA Value (0. SCFM), 4 mA Value (0. SCFM), and Namur Fault Action (Not used).
- Digital Input:** Includes a dropdown menu set to 'None'.
- Pulse Output Configuration:** Includes fields for Pulse Option (Max Freq & Max Flow), Max Frequency (100.00 Hz), Max Flow (694.44 SCFM), Pulses Per Unit (6640.0), and Units Per Pulse (0.0001157407).
- Buttons:** Includes 'Reset Total', 'Reset CRC', 'Display Setting', and 'Serial COM Settings'.

Meter Info

- **Firmware:** TM500 meter firmware revision level.
- **Password level:** TM500-View Password level entered.
- **Serial Numbers:** Serial numbers of the meter, the main board, bridge and sensor (factory set).
- **Alarm Codes:** Displays the alarm codes as described in the meter manual. These codes are written out in the Current Alarms menu.

Meter Settings

- **Pipe Inner Diameter (ID):** The pipe inner diameter can be entered in either inches or millimeters, depending on whether the flow or mass measurement units selected are metric or US standard. Once entered, the program will automatically recalculate the pipe cross-sectional area for the velocity/flow calculations. A precise ID is required to ensure accurate flow measurement.
- **Cut-off:** A gas flow rate at - or below - the cut-off setting will cause the meter to read zero. Default cut-off is set to 1% of maximum flow value.
- **Filter:** Changing this value will increase or decrease the damping of the flow rate reading. Increase the setting to increase damping. The default setting is 0.8.
- **Ref. Temp:** Reference Temperature - Reference temperature and pressure are the standard (or normal) temperature and pressure (STP) for which the flow rate is calculated. This is set in the factory according to the customer's original ApplD data.
- **Ref. Pressure:** Reference Pressure - Reference temperature and pressure are the standard (or normal) temperature and pressure (STP) for which the flow rate is calculated. This is set in the factory according to the customer's original ApplD data.
- **Password:** The Level 1 password can be changed to a new value (number or letter characters up to 4 digits).
- **K-factor:** Enter a percent value [-200 to 200] to scale the flow output. $\text{Final Flow} = \text{Flow} + (\text{Flow} * \text{K Factor}/100)$

 **NOTE!** K-factor settings are only available with Level 2 Password

Unit Select

The "Unit Select" section is used to change the desired units of the flow rate, temperature and reference pressure.

Alarm Limits

Users can set both high/low alarms for both flow and temperature. When a limit is reached, an alarm message is displayed. In addition, if the meter's digital output is activated, breaching the alarm limit automatically activates a discrete output to control an external buzzer, light or some other way to alert the operator.

TM500-View Software

Operations

Process Variables

Flow: Current flow rate in selected units

Total: Cumulative mass or volume flow in selected units

Massflow: Mass flow of gas in Kg/Hr

Temperature: Gas temperature (Fahrenheit or Celsius)

CSV: Current sense voltage of sensor measurement circuit

Elapsed Time: Time since the Totalizer was reset

GHV: Gross Heating Value (GHV) of the programmed gas in the Gas-SelectX[®] gas menu is calculated by the meter and viewed here.

Density: View the density of the programmed gas in the Gas-SelectX[®] gas menu is displayed here

Reset Total Button

The Reset Total button will clear the total and elapsed time.

Reset CRC Button

CRC (Cyclical Redundancy Check) is a value that verifies that all critical values in the meter's database are good. This check is performed once every minute. The Reset CRC button clears and generates a new CRC value.

Gas-Mix™

This menu allows the user to select a gas or gas mix from a list of gases. When entering the gas menu the user will have three choices:

1. Pure Gas-Mix Gas Menu (PUR) - a list of pure gases
2. Gas Mix (MIX) - any combination of gases in the Gas Mix menu (total must equal 100%)
3. Oil & Gas Mix (O&G Mix) Menu - any combination of the gases in the Oil & Gas menu (total must equal 100%)

Fig. 3.8: Gas-Mix Gas Menu in Configuration Screen

Meter Info

Firmware: TM500 v10.0
 Password Level: Level 2
 Serial: F04495
 Main SN: 34752-0029
 Bridge SN: F46-100267
 Sensor SN: 724599

Meter Settings

Pipe ID: 101.6 mm
 Cutoff: 0. NM3/Hr
 Filter: 0.8 Sec
 Ref. Temp: 15.556 Deg C
 Ref. Pressure: 14.889 Paia
 Password: 1234
 Klact: 0. %
 Flow Conditioner: None

Unit Select

Flow Units: NM3/Hr
 Temp. Units: Deg C
 Pressure Units: PSIA

Alarm Limits

High Flow Limit: 0. NM3/Hr
 Low Flow Limit: 0. NM3/Hr
 High Temp Limit: 0. Deg C
 Low Temp Limit: 0. Deg C

Current Alarms

Code	Description

Process Variables

Flow: 6.256 NM3/Hr
 Mass Flow: 7.75 Kg/Hr
 CSV: 0.03160 V
 Temperature: 23.46 Deg C
 GHV: 0.0 BTU/R3
 Elapsed Time: 18.5 Hrs
 Total: 3480.2 NM3
 Density: 1.23927 Kg/M3

Gas SelectX

Gas Type: Air

Gas	Value	Gas	Value
Methane	0.000000	Ammonia	0.000000
Carbon Dioxide	0.000000	Chlorine	0.000000
Nitrogen	0.000000	CO	0.000000
Propylene	0.000000	Decane	0.000000
Propane	0.000000	Ethanol	0.000000
Butane	0.000000	H2S	0.000000
Ethane	0.000000	Isopentane	0.000000
Ethylene	0.000000	Methanol	0.000000
Air	100.000000	N2O	0.000000
Argon	0.000000	R125	0.000000
Oxygen	0.000000	R134a	0.000000
Helium	0.000000	R143a	0.000000
Hydrogen	0.000000	R22	0.000000
*Pentane	0.000000	R32	0.000000
*Hexane	0.000000	SF6	0.000000
*Heptane	0.000000	SO2	0.000000
*Octane	0.000000	Water	0.000000
*Nonane	0.000000	Acetone	0.000000
*1-Butane	0.000000	*Benzene	0.000000
		*1-Butyne	0.000000
		*Propadiene	0.000000
		*Ozone	0.000000
		TOTAL	100%

*Note: These Gases are not supported in this version of TM500 Firmware

4-20 mA Channel 1

Data Select: Flow
 20 mA Value: 1000 NM3/Hr
 4 mA Value: 0. NM3/Hr
 Namur Fault Action: 3.6 mA

4-20 mA Channel 2

Data Select: Temp
 20 mA Value: 200. Deg C
 4 mA Value: 0. Deg C
 Namur Fault Action: 3.6 mA

Digital Input

Reset Total

Digital Output

System Alarm

Buttons: Reset Total, Reset CRC, Daily Total On/Off, Clear 24 Hrs Totals Log, Set RTC (Real Time Clock), Display Setting, Serial COM Settings

NOTE! A list of pure and mixed gases available on the TM500 flow meter are kept on the Sierra Instruments website at www.sierrainstruments.com.

NOTE! Gases are in mole percentages.

Fig. 3.9: Setting the Gas-Mix Menu or Gas Mix

Gas-Mix

Gas Type: Gas Mix

Methane	0.000000
Carbon Dioxide	0.000000
Nitrogen	0.000000
Air	0.000000
Natural Gas(Mix)	0.000000
Argon	0.000000
Propane	0.000000
Helium	0.000000
TOTAL	100%

Normalize Gas %

Gas-Mix

Gas Type: Gas Mix

Methane	0.000000
Carbon Dioxide	0.000000
Nitrogen	0.000000
Propylene	0.000000
Propane	0.000000
Butane	0.000000
Ethane	0.000000
Ethylene	0.000000
Air	0.000000
Argon	0.000000
Oxygen	0.000000
Helium	0.000000
Hydrogen	0.000000
Pentane	0.000000
Hexane	0.000000
Heptane	0.000000
Octane	0.000000
Nonane	0.000000
1-Butane	0.000000
TOTAL	100%

Normalize Gas %

Gas-Mix

Gas Type: O&G Mix

Methane	0.000000
Carbon Dioxide	0.000000
Nitrogen	0.000000
Propylene	0.000000
Butane	0.000000
Ethane	0.000000
Ethylene	0.000000
Air	0.000000
Argon	0.000000
Oxygen	0.000000
Helium	0.000000
Hydrogen	0.000000
Pentane	0.000000
Hexane	0.000000
Heptane	0.000000
Octane	0.000000
Nonane	0.000000
1-Butane	0.000000
TOTAL	100%

Normalize Gas %

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In the first example, Methane has been chosen from the list of gas options. The last two options are "STD Mix" and "O&G Mix". When the "STD Mix" or "O&G Mix" options are chosen, a series of additional gas concentration fields will appear. Each field is labeled according to the gases available in that menu. A default amount will appear in each field, but these can be changed to any percentage between 0.000000 and 100.000000. All remaining gases not used in the Gas Mix must be changed to 0.000000. The total for the gases chosen for the mix must equal 100.000000%.

i NOTE! If the total of the gases is greater or less than 100.000000%, an alarm will show. Adjust the percentages until 100.000000% is achieved.

Normalize Gas Percentage

In the scenario where the desired gas mix does not total to an even 100%, use the "Normalize Gas %" button to scale the gas mix proportionally so that the total results in 100%.

4-20mA Output: Channels 1 & 2

Channel 1: This analog 4-20mA output is programmed for flow.

Channel 2: This analog 4-20mA output is configurable for either flow or temperature.

Though the TM500 will be scaled for the specific application coming from the factory, TM500 View™ allows the operator to easily re-scale the 4-20mA output as needed.

Digital Input Select

This menu allows the user to choose between Reset Total or None.

Digital Output Select

This menu allows the user to choose between dedicating the Output to Pulse, Alarms, or None. If the Digital Output is set to Pulse, see "Pulse Output Configuration" below.

Pulse Output Configuration

If "Pulse Output" is selected, it can be programmed in three different ways using the pull-down menu "Pulse Option":

- Maximum flow and maximum frequency
- Pulses per Unit
- Units per Pulse

Configuration Screen Logs

Turning on the Daily Total 24 Hour Log, Setting the Contract Time, Clearing the 24-Hour Total and Setting Real Time Clock functions are done in the Configuration screen shown on p. 16.

Daily Total On/Off

After installation and during the setup of your meter, the user must turn on the Daily Total function.

Fig. 3.10: Turning on Daily Total Function and setting Contract Time

Setting the Contract Time

Resetting the Contract Time is done using the Daily Total On/Off window as seen in the figure above. The default Contract Time is midnight, but the user can change the Contract Time in this window, if needed. The user-defined Contract Time defines when the Daily Total 24 Hour Log is recorded each day.

Clear 24 Hrs Total

This will clear all records for the 24-Hour Totals Log.

Set RTC (Real Time Clock)

The user has the option of setting the date/time manually in the provided fields or to use the “Load current date/time from PC” button which pulls the current date and time automatically from your PC’s data. To set the date and time, click the “Set Date/Time to Meter” button.

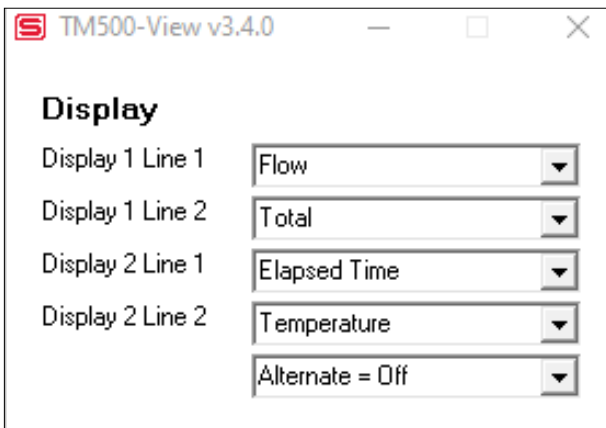
Fig. 3.11: Setting the Real Time Clock (RTC)

Display Setting

The information displayed on the front panel of the TM500 can be configured by clicking on the "Display Setting" button in the lower right portion of the Configuration Screen in Fig, 4.7. The four drop-down boxes can be used to select the data to present on Screen 1 and Screen 2 of the flow meter display. By selecting "Alternate", the screen automatically switches between the data screens.

With the top four drop-down boxes, the user can choose the data to display on the meter's LCD display screen. By selecting "Alternate = On", the screen automatically switches between the data screens.

Fig. 3.12: Display Setting

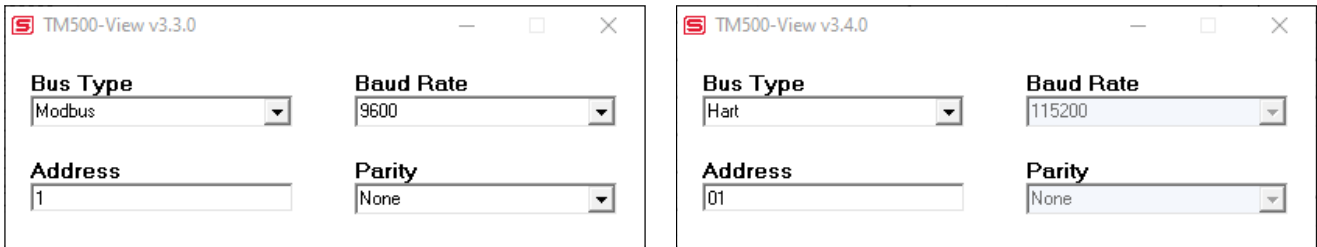


Serial COM Settings

The serial communication settings can be accessed by clicking on the "Serial COM Settings" button in the lower right portion of the configuration screen in Fig. 4.7. Use this function to adjust the settings of the TM500 serial communication options..

NOTE: This is only available on meters with the RS485 or HART serial communication options.

Fig. 3.13: Select Serial Communication Window



Gas-Mix™ Gas Menu

Each TM500 flow meter is calibrated in the factory and pre-programmed with the gas specified in the order. If the Gas-Mix option is ordered, the pure or gas mixture gas can be changed. To choose what gas or gas mixture flow for the TM500 to monitor, select from the list of gases under Gas-Mix:

Fig. 3.14: Gas-Mix™ Menu

Gas-Mix	
Gas Type	Gas Mix
Methane	60.000000
Carbon Dioxide	40.000000
Nitrogen	0.000000
Propylene	0.000000
Propane	0.000000
Butane	0.000000
Ethane	0.000000
Ethylene	0.000000
Air	0.000000
Argon	0.000000
Oxygen	0.000000
Helium	0.000000
Hydrogen	0.000000
Pentane	0.000000
Hexane	0.000000
Heptane	0.000000
Octane	0.000000
Nonane	0.000000
I-Butane	0.000000
Ammonia	0.000000
Chlorine	0.000000
CO	0.000000
Decane	0.000000
Ethanol	0.000000
H2S	0.000000
Isopentane	0.000000
Methanol	0.000000
N2O	0.000000
R125	0.000000
R134a	0.000000
R143a	0.000000
R22	0.000000
R32	0.000000
SF6	0.000000
SO2	0.000000
Water	0.000000
Acetone	0.000000
Benzene	0.000000
1-Butyne	0.000000
Propadiene	0.000000
Ozone	0.000000
TOTAL	100%

Normalize Gas %

NOTE: A list of pure and mixed gases available on the TM500 flowmeter are kept on the Sierra website at www.sierrainstruments.com.

When the "Gas-Mix" option is chosen, a series of additional gas concentration fields will appear. These fields are labeled "CH4%", "CO2%", etc. A default amount will appear in each field, these can be changed to any percentage between 1 and 100. The total for the gases in the Gas-Mix must equal 100% or an error will occur.

NOTE: If the total of all gases is greater or less than 100%, an alarm will show. Adjust the percentages until 100% is achieved.

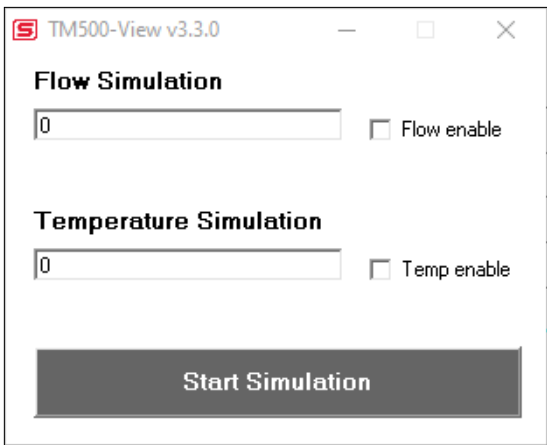
TM500-View Software

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Simulation Mode

After clicking on "Simulation", a password will be requested. Enter the password and then the Simulation screen will be shown.

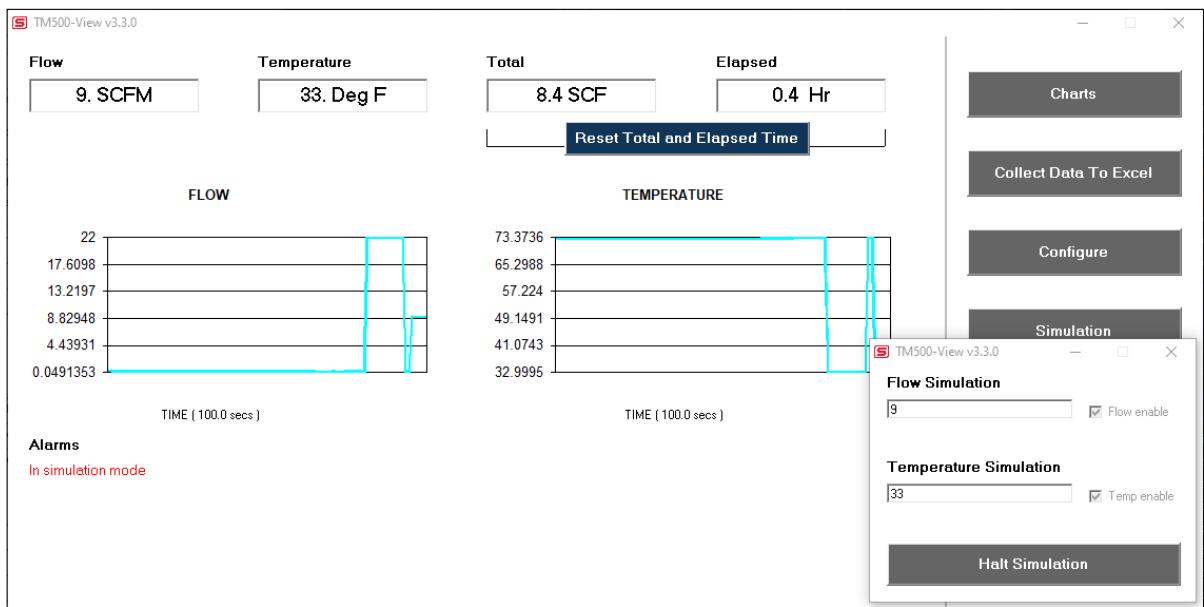
Fig. 3.15: Simulation Mode Window



The simulation mode simulates flow rate or temperature. Click on the required data and enter a value. Simulation mode allows users to verify the operation of the analog output, digital outputs and totalizer at simulated flow rates and temperature.

Enter the value, select the corresponding checkbox, and press "Start Simulation".

Fig. 3.16: Simulation Running



In Simulation mode, all TM500 outputs and the Totalizer respond as if in normal measurement mode. Click "Halt Simulation" to end.

TM-Cal™

TM-Cal™ is performed to verify the proper operation of the TM500 flow meter. From the Main menu, click on the "TM-Cal" button to access the TM-Cal™ Menu Window.

Fig. 3.17: TM-Cal™ Test Menu Window

On the TM-Cal™ Menu, there are fields to enter information about the person performing the test, meter tag information, and any other important information may be entered into the comments area.

A drop-down menu allows the user to choose between these two options:

Flow goes to Zero during TM-Cal™

Flow holds the last value during TM-Cal™

Please note that the test will take about four minutes. If the "go to zero" option is chosen, the flow measurement will stop and go to zero for this period. If the "hold value" option has been chosen, the totalizer will continue to increment..

The user can also specify a particular folder name and location for the data to be stored in a log to access test results at later times.

When ready to start, click the "Perform TM-Cal" button.

TM500-View Software

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Fig. 3.18: Running a TM-Cal™ Test

TM500-View v3.3.0

TM-Cal Settings

Performed By

NB

Meter TAG

1234

Comments

TEST

Test Type

Hold last flow value

Log File

c:\users\nburnam\Documents\TM-Cal_55log.txt

Browse File

Test

TM-Cal Value

7.94

Time Remaining

288 s

Result

Stop TM-Cal

View TM-Cal Log

View Certificate

A Pass/Fail message for the TM-Cal™ test will be displayed at the test conclusion.

Fig. 3.19: TM-Cal™ Results Window

TM500-View v3.3.0

TM-Cal Settings

Performed By

NB

Meter TAG

1234

Comments

TEST

Test Type

Hold last flow value

Log File

c:\users\nburnam\Documents\TM-Cal_55log.txt

Browse File

Test

TM-Cal Value

0.35

Time Remaining

000 s

Result

TM-Cal Pass (-0.73)

Perform TM-Cal

View TM-Cal Log

View Certificate

TM-Cal™ Certificate

The TM-Cal™ Certificate function displays the latest certification. When performing a TM-Cal™ test, all the data is logged into a log file with all pertinent data, including the serial number. A laptop or PC can be used to perform the TM-Cal™ test on the TM500 meter. When a TM-Cal™ certificate is requested, the program will search the log file for the specific serial number and will display only the last check performed.

Fig. 3.20: TM-Cal™ Certificate


SIERRA

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 sales@sierrainstruments.com

TM-Cal™ CERTIFICATE
 CALIBRATION VALIDATION

TM-Cal™ Performed on:	December 16 2025 13:06:47
Firmware version:	TM500 v10.1
Meter Serial Number:	F04495
TM-Cal™ Results:	Pass
TM-Cal™ :	-0.51
Test Temperature:	86.7 F
Tag #/Meter Location:	12345
Test performed by:	Jane Doe
Additional Comments:	Well #3

TM-Cal™ is a calibration routine that validates the flow meter's calibration accuracy by testing
 * Repeatability of sensor
 * Repeatability of sensor electronics
 * Confirms Calibration Algorithms
 At the conclusion of the test, the meter will display a pass/fail message and the TM-Cal™ data.
 A "pass" result confirms the meter is measuring accurately.
 TM-Cal™ limits: ± 0 - 0.8 Pass, ± 0.8-1.0 Warning, > ± 1.0 Fail

Configuration:

Pipe Diameter:	4.02 In	Gas Select:	Single Gas
Customer STP:	60.0 Deg F & 14.70 Psia		Butane 100.000000%
4-20 mA Range:	0 - 589 SCFM		
Zero Flow Cutoff:	0 SCFM		
Previous TM-Cal™ Value:	-0.14		
Previous TM-Cal™ Result:	Pass		
Previous TM-Cal™ Date:	12/8/25 14:8:0		
GHV [BTU/FT3]:	3378.1		
Density[Kg/M3]:	2.5387		

TM-Cal™ Log

The "View TM-Call Log" button allows the operator to view a log of previous TM-Cal™ tests that have been executed on the meter.

Fig. 3.21: TM-Cal™ Log

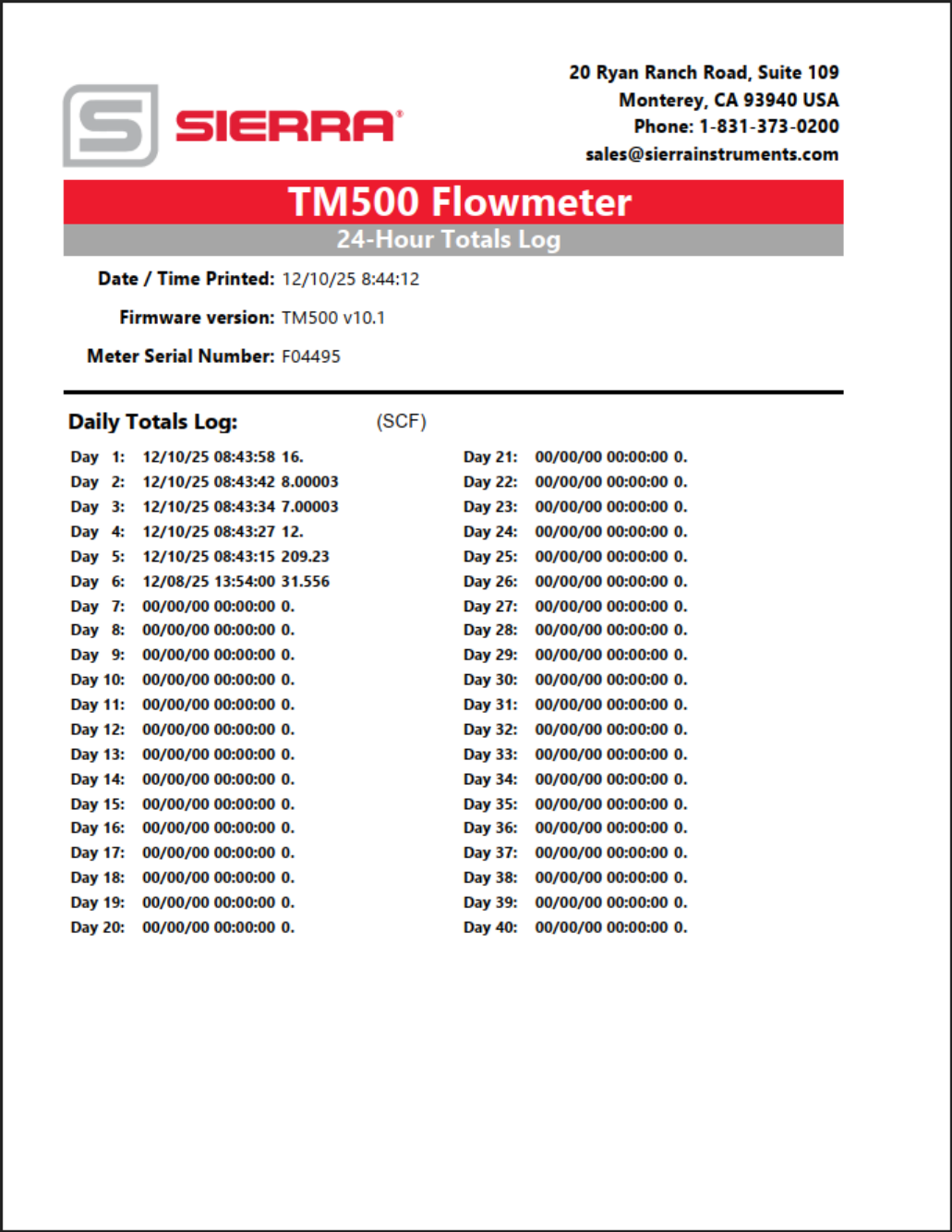
TM500-View v3.3.0

Ser.Nb	Date	Time	Verify	PASS/FAIL	Temp	Perform by:	TAG	Comments
-----	October 31	2023	12:31:55	-0.73	TM-Cal PASS	83.0 F NB	1234	TEST

24 Hour Log

Pressing the 24 Hour Log button in the View Log section of the main screen produces a list of flow totals. The list of 40 24-hour totals is provided in a pdf document starting with yesterday's flow total. The start time begins and is reset at the Contract Time. The Daily Total function must be turned on to log the 24-hour totals. Daily Total On/Off, Setting the Contract Time, Clear 24 Hrs Total and Set RTC (Real Time Clock) functions are set in the Configuration screen, see p. 23. The log features can also be set through the TM500 front panel display menu.

Fig. 3.22: 24 Hour Log Example



Configuration Log

Clicking the Meter Configuration button located in the View Log section of the main screen produces a log of the meter's current configuration. The log is in pdf form and includes the following information:

- Current date/time
- Meter's firmware version and serial number
- Meter settings for temperature, pressure, etc
- Application or process factory-set values
- Alarm settings - Gas mix information

Fig. 3.23: Configuration Log Example


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TM500 Flowmeter

Configuration Log

Date / Time Printed: 12/16/25 11:23:00

Firmware version: TM500 v10.1

Meter Serial Number: F04495

FT4X Configuration:

Flow unit: NM3/Hr Temperature unit: Deg C Pressure unit: Psia Cutoff: 0.000 NM3/Hr Filter: 0.8 Sec Pipe ID: 101.600 mm Density: 1.370 Kg/M3 Gross Heating Value: 0.00 BTU/Ft3 Ref Temp: 15.6 Deg C Ref pressure: 14.89 Psia Hi Flow Alarm: ---- Lo Flow Alarm: ---- Hi Temp Alarm: ---- Lo Temp Alarm: ---- 4-20 mA selected: Flow 20 mA: 1000.0 NM3/Hr 4 mA: 0.0 NM3/Hr Kfactor: 0%	Gas SelectX: Single Gas Oxygen 100.000000%
--	---

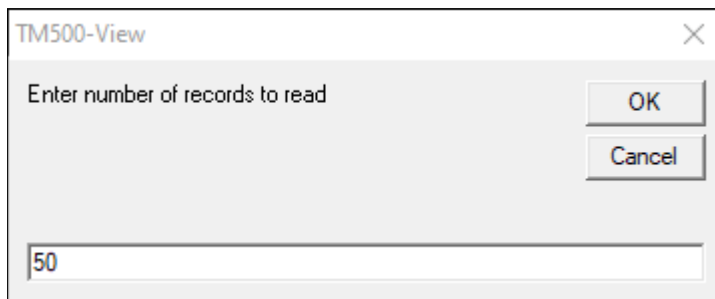
TM500-View Software

Operations

Event Log

Clicking the Event Log button located in the View Log section of the main screen produces a log of the meter's events. Event logs with date/time stamps include all changes to flow meter settings (4- 20mA scaling, pipe size, gas composition), alarms, and power on/off events. The Event Log button will open windows requesting the number of records to be accessed and which record must start the list. This data will be produced in a PDF document.

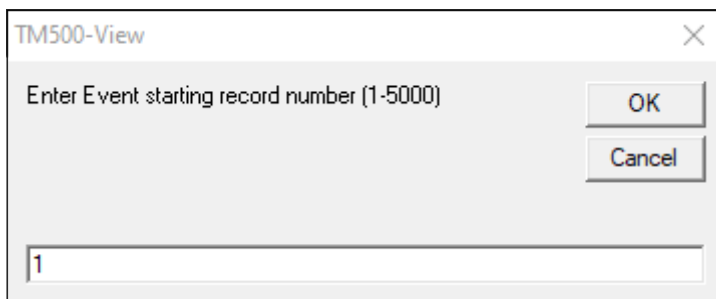
Fig. 3.24: Enter Number of Records to be Viewed in Log



The screenshot shows a dialog box titled "TM500-View" with a close button (X) in the top right corner. The main text inside the dialog is "Enter number of records to read". Below this text is a text input field containing the number "50". To the right of the input field are two buttons: "OK" and "Cancel".

Enter the number of records that you would like to view in the log.

Fig. 3.25: Enter Record Number to Begin the Log



The screenshot shows a dialog box titled "TM500-View" with a close button (X) in the top right corner. The main text inside the dialog is "Enter Event starting record number (1-5000)". Below this text is a text input field containing the number "1". To the right of the input field are two buttons: "OK" and "Cancel".

Enter the number of the record that you would like to have at the beginning of the log. This event will start the log and all subsequent events will follow. Any previous events will be excluded from this viewing of the log.

The BLM Log pdf document includes the following information:

- Current date/time
- Meter's firmware version
- Meter's serial number
- Instances of power on/off of meter
- Instances that an Alarm has occurred
- Setting of the Real Time Clock
- Changes to meter's configuration or settings
- Changes to the gas mix information
- Resets (total or CRC)

Fig. 3.26: Event/Alarm Log Example



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TM500 Flowmeter

Event Log

Date/Time: 12/16/25 11:35:36

Firmware Version: TM500 v10.1

Meter Serial Number: F04495

Events Log:

Rec#	Date/Time	Events
1	12/16/25 11:35:06	Ref pressure set to 14.696
2	12/16/25 11:34:58	Ref temp set to 60.01
3	12/16/25 11:34:54	Output filter set to 0.7 sec
4	12/16/25 11:34:51	Cutoff set to 10.
5	12/16/25 11:34:47	Pipe ID set to 4.02
6	12/16/25 11:34:37	Hi temp Alarm On
7	12/16/25 11:34:37	Ref.temp set to Deg F
8	12/16/25 11:34:35	Flow Unit set to SCFM
9	12/16/25 11:34:29	Gas set to Butane
10	12/16/25 11:34:28	Gas set to Oxygen

TM500-View Software

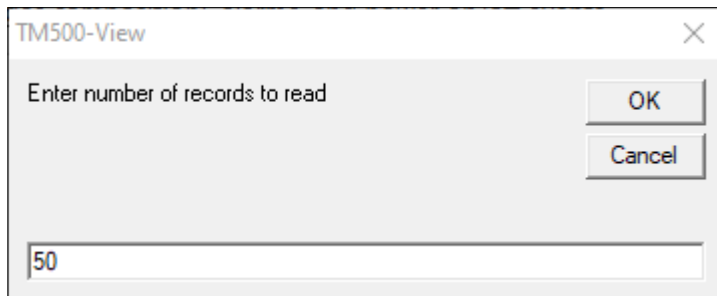
Operations

BLM Log

After clicking on the button marked "BLM Log" located in the box marked "View Log" from the main screen, the operator can view a 7-year history log of the meter's flow, temperature, and total data.

The BLM Log button will open a series of windows requesting the number of records to be accessed and which record must start the list. This data will be provided in a pdf document.

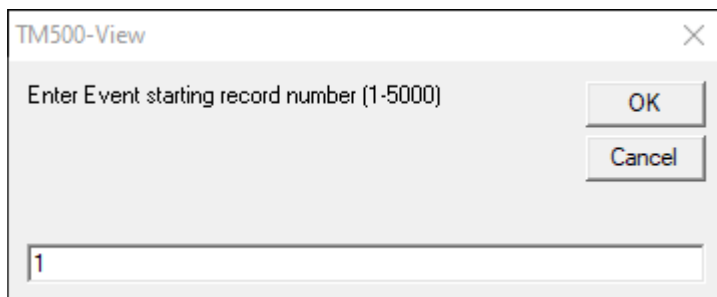
Fig. 3.27: Enter Number of Records to be Viewed in Log



The screenshot shows a dialog box titled "TM500-View" with a close button (X) in the top right corner. The main text inside the box is "Enter number of records to read". Below this text is a text input field containing the number "50". To the right of the input field are two buttons: "OK" and "Cancel".

Enter the number of records that you would like to view in the log (default is 50).

Fig. 3.28: Enter Record Number to Begin the Log



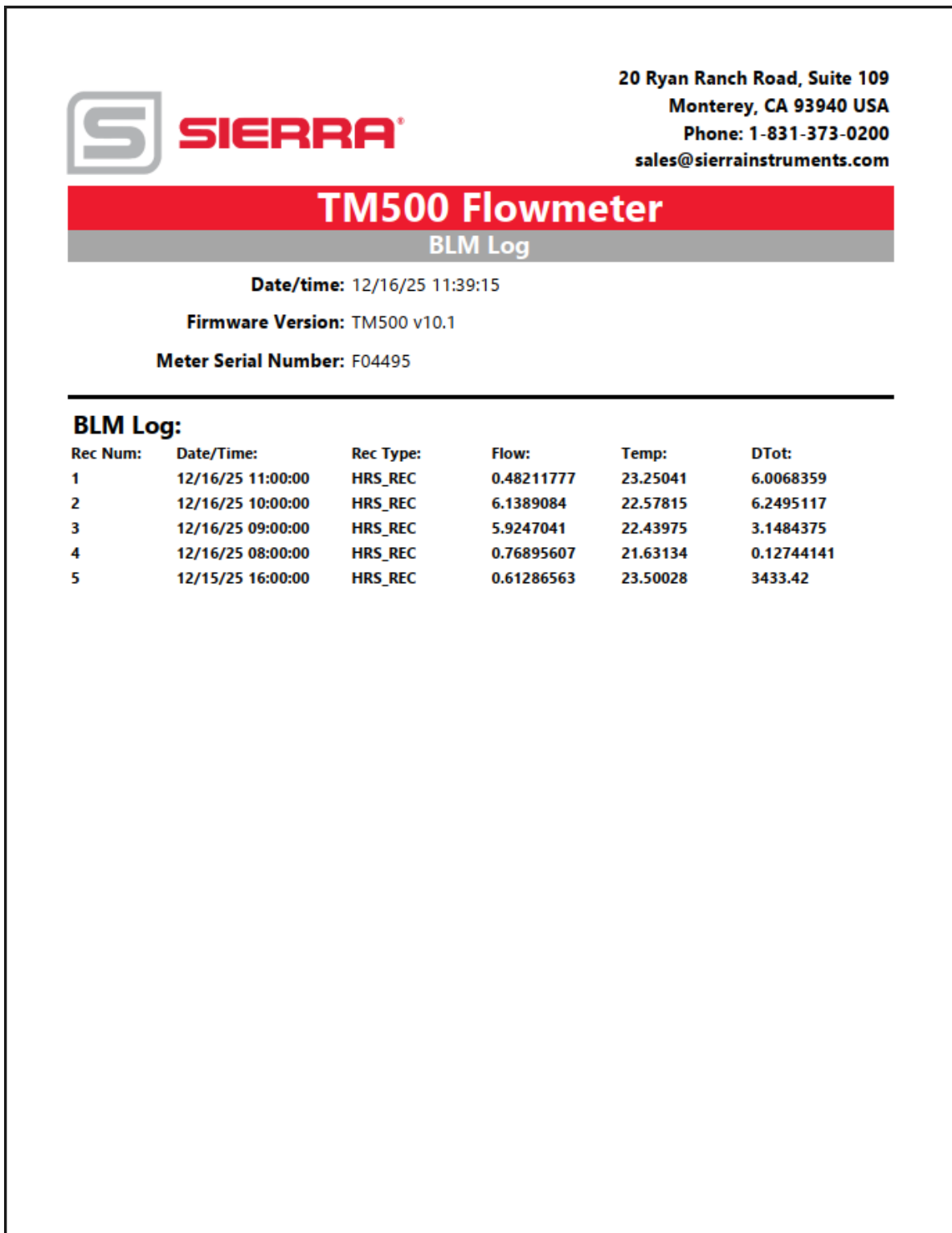
The screenshot shows a dialog box titled "TM500-View" with a close button (X) in the top right corner. The main text inside the box is "Enter Event starting record number (1-5000)". Below this text is a text input field containing the number "1". To the right of the input field are two buttons: "OK" and "Cancel".

Enter the number of the record that you would like to have at the beginning of the log. This event will start the log and all subsequent events will follow. Any previous events will be excluded from this viewing of the log.

The BLM Log pdf document includes the following information:

- Current date/time
- Meter's firmware version
- Meter's serial number
- Record number
- Date/time stamp of record
- Rec_Type: Indicates if the type of data in the Log is recorded hourly or daily
- Flow: the average hourly Flow rate
- Temperature: the average hourly Temperature
- DTot: Hourly Flow Total when the record type is HRS_REC (Hourly Record) and Daily Flow Total when the record type is DAY_REC (Daily Record)

Fig. 3.29: BLM Log Example



TM500-View Software

Definition

Definition

COM	Communication
CSV	Current Sense Voltage
DMM	Digital Multimeter
ID	Inner Diameter
mA	Milliamps
PC	Personal Computer
RTD	Resistance Temperature Detector
STP	Standard Temperature and Pressure
TSI	Temperature Sense Current

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