

# Vitality™

## User Manual



# Table of Contents

Introduction.....	2
System Requirements.....	2
Vitality™ Main Screen .....	3
Main Menu .....	4
Monitoring Data/Error Log.....	4
Connect to Instrument .....	5
Units and Access Level.....	8
Units .....	8
Access Level.....	8
Instrument Operations .....	10
Configure .....	10
SIL Meters:.....	11
Non-SIL Meters.....	13
Monitor.....	19
LOG .....	21
Graph.....	23
Signals.....	26
Internal Logs .....	28
CAL-TRIM-TEST .....	30
Error Log.....	32
Default Directories.....	33

## Introduction

The **Vitality™** software application enables the users to configure, control, calibrate, monitor, and inspect the flow meters that are based on PanaFlow™ platforms listed below:

- AT600 (V1.4.x and V1.5.x)
- XMT900 (V2.8.x)
- XMT910 (V1.0.x)
- XMT1000 (V4.1.x, V4.2.x.x, V4.3.x.x and V4.4.x.x)

It extends PanaFlow™ measurement and data storage capabilities so that users can capture and store measurement and error data in easily accessible formats. Before installing **Vitality™**, ensure that your system supports minimum system requirements given below:

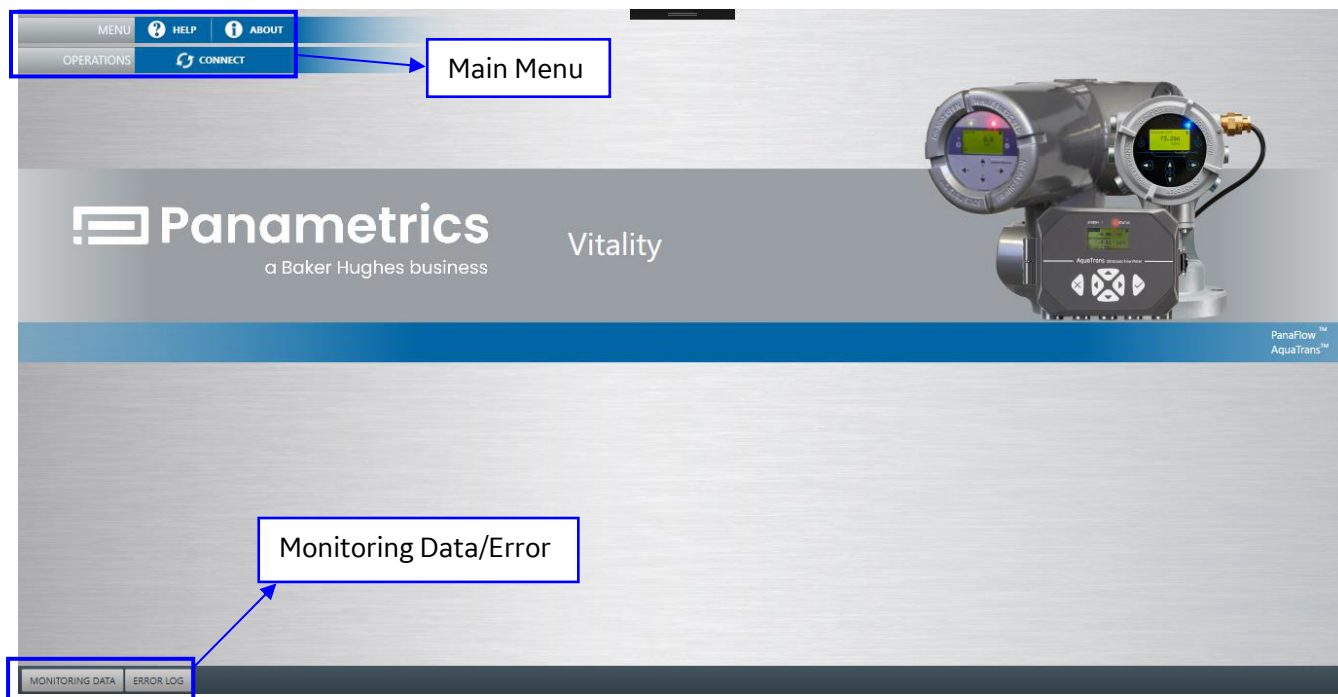
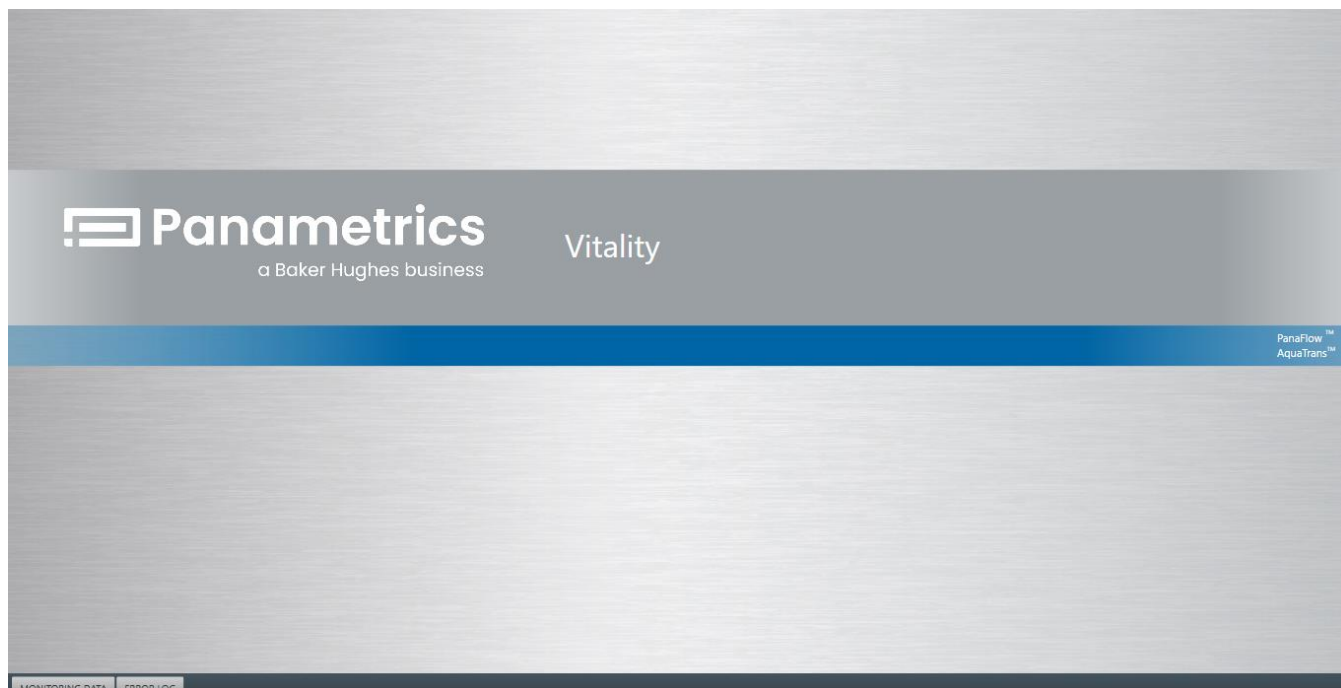
## System Requirements

To run the **Vitality™** software, the hardware and software requirements are listed below:

Component	Windows Vista	Windows 7/10
Processor	1.33 GHz	1.6 GHz
Memory	2 GB	4 - 8 GB
Available Hard disk Space	1 GB	
Available Ports	USB 1.x/2.x/3.x with USB-RS485 converter or RS232 with RS232-RS485 converter	
Screen Resolution	1280 x 1024	

# Vitality™ Main Screen

When you click on the **Vitality™** icon, first you see a splash screen, and then the Main Screen opens. The Main Screen enables the user to establish communication with an instrument and then provides access to various functions of **Vitality™**.



## Main Menu



In the upper left of the screen, the Main Menu offers two bars with three functions shown below:

- Help
- About
- Connect

Clicking on **Help** opens the **Help** document.

Clicking on **About** opens a window with the **Vitality™** software version and date.

**Options** allows the users to select whether or not to commit the log history and select the font size of Monitoring Data Pane.

The **Operations** bar enables user to navigate to various functions **Connect, Configure, Monitor, and Signals** etc. within **Vitality™**. When you first start the **Vitality™**, the submenu **Connect** is the function available to the user until connection is established.

## Monitoring Data/Error Log

At the bottom left of the screen, two buttons allow you to check **Monitoring Data** and/or the Error Log.



For any error the Error Log flashes in red.

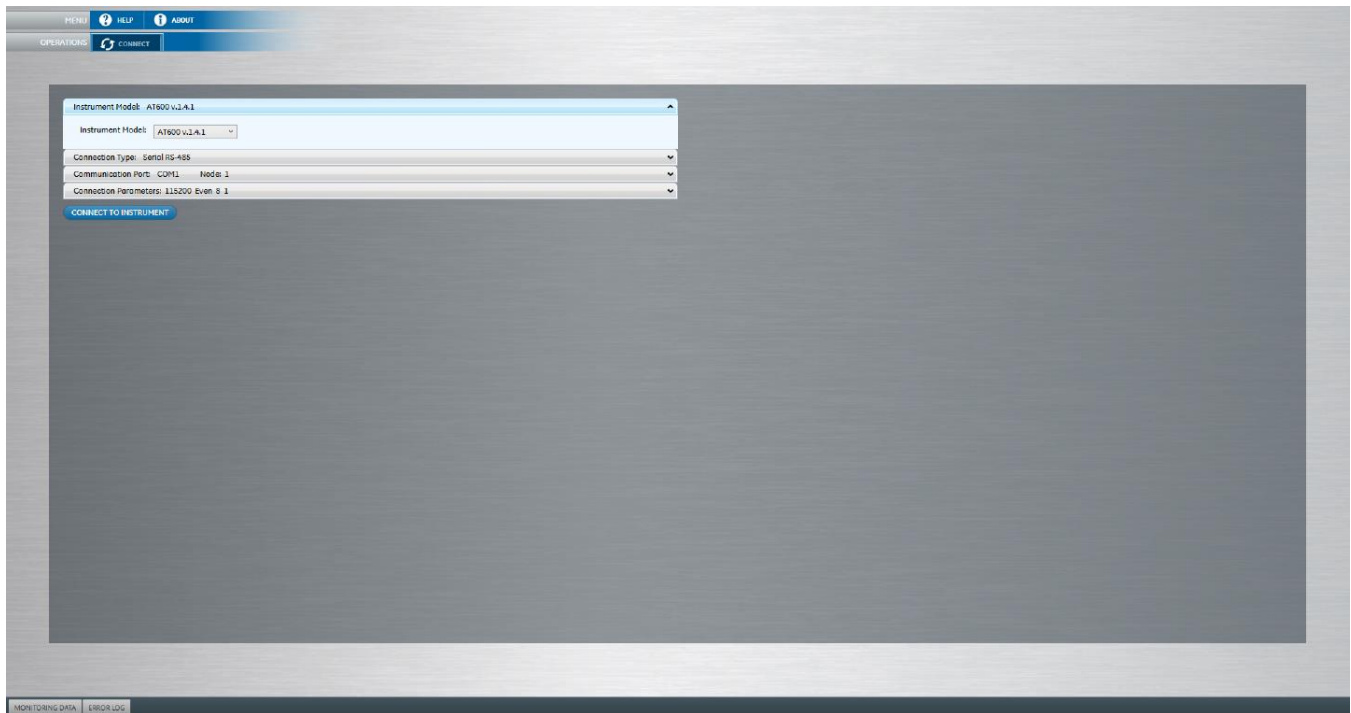
---

**NOTE:** The Main Menu and two buttons (**Monitoring Data/Error Log**) appear when the screen opens, and remain visible while the application is running.

---

## Connect to Instrument

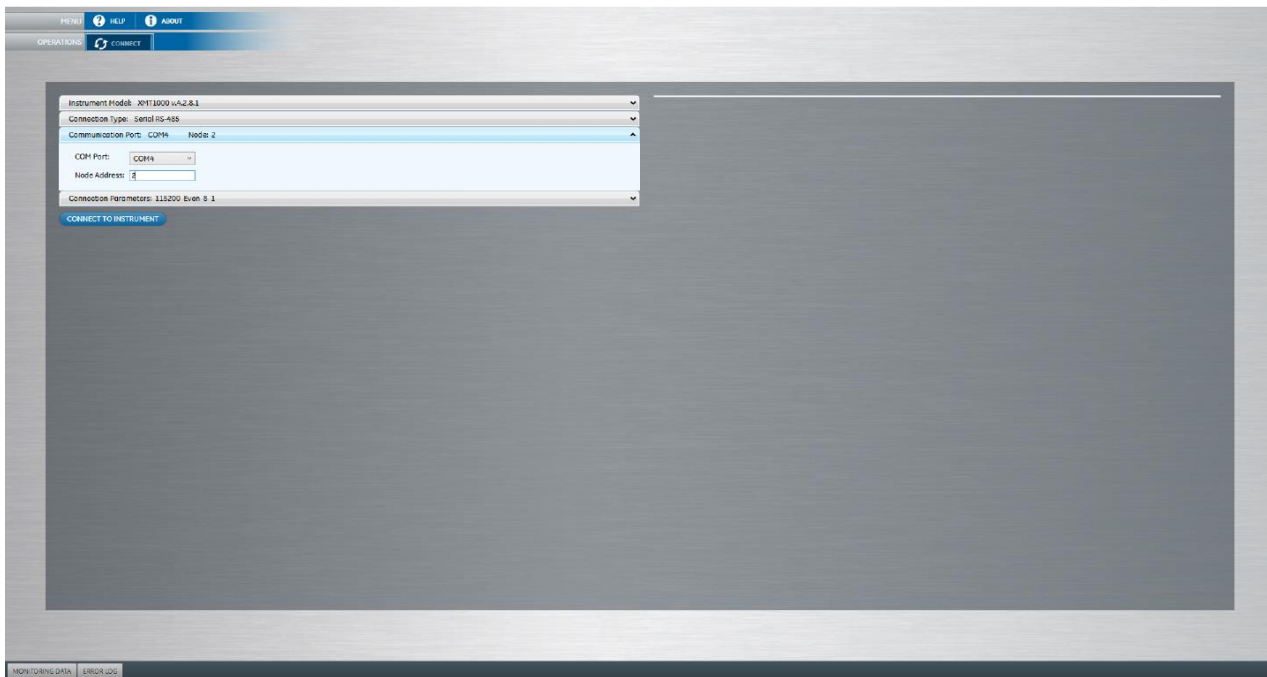
To establish a connection to an instrument, click **Connect** menu. The Connect menu opens on the same window. Now, select the type of Instrument Model you need to connect from the drop-down list.



After selection of an Instrument Model, the following options are displayed:

- Connection Type
- Communication Port and Node
- Connection Parameters (Baud Rate, Parity, Data Bits, and Stop Bits).

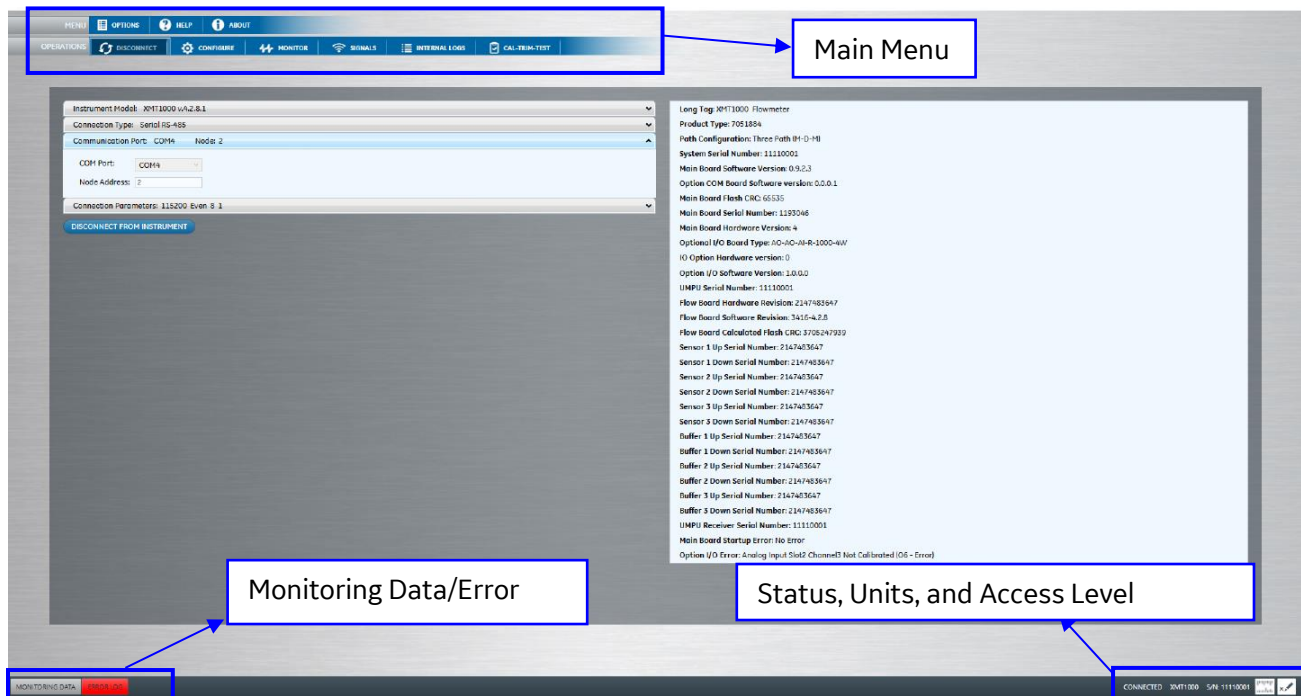
These options enable user to check and ensure **Vitality™** parameters are configured correctly. Use the drop-down list and choose the correct parameters.



Once you are sure the software is accurately configured, click the **Connect to Instrument**.

If the connection is successful, the menu item **Connect** and the **Connect to Instrument** toggles to **Disconnect** and **Disconnect from Instrument** respectively and a list of data appears alongside the connection parameters. This information includes the product, product type and product code, and other relevant data depending on the particular instrument.

**Note:** If Vitality™ does not connect to the instrument, check the Error Log below the main screen. It will flash red for any errors. One possible cause for a connection error would be forgetting to connect to the power supply.



Also, at the Top of the screen, **Main Menu (Menu and Operations)** extends (shown below) and offers a number of other functions depending on the instrument. They include:

- **Menu** ribbon displays **Options** apart from the [Help](#) and [About](#).
- **Operations** ribbon has the following options:
  - Configure
  - Monitor
  - Signals
  - Internal Logs
  - Cal-Trim-Test



At the bottom right of the screen, a ribbon displays information about the connection status (connected or not connected) and the instrument serial number along with buttons to view [Units](#) and [Access level](#). User will also have access to **Monitoring Data** and **Error Log** on the same ribbon.



# Units and Access Level



**Important:** Changing the access level to Service or Factory will change the XMT900 instrument to Safe Mode.

## Units

The **Units** allows the user to view or modify the current measurement units. The user shall have appropriate Access Level to modify any measurement units. Click on **Units** to review or change the units of measurement for totalizer, velocity and pressure. List of available Unites depends on the instrument type.

## Access Level

The **Access Level** allows the user to check the current **Access Level** (user can also know the current access level with the help of the **Access Level button color** or to select an appropriate **Access Level** if required. Availability of different types of access levels depend on the instrument you choose, see the table below. Each level requires a login password except for the Viewer.

Use the drop-down list to select the appropriate level, enter the password, and click Change Access Level.

The **Access Level** is color coded to allow users to easily identify the current access level. The color code configuration follows as below:

Instrument Type	User Access Level	Color Identifier
AT600	Viewer	<input type="text" value="Viewer"/>
	Login User	<input type="text" value="Login User"/>
XMT900	Viewer	<input type="text" value="Viewer"/>
	General User	<input type="text" value="General User"/>
	SIL User	<input type="text" value="SIL User"/>
	Service	<input type="text" value="Service"/>
	Factory	<input type="text" value="Factory"/>
XMT910	Viewer	<input type="text" value="Viewer"/>
	General User	<input type="text" value="General User"/>
	Service	<input type="text" value="Service"/>
	Factory	<input type="text" value="Factory"/>
XMT1000	Viewer	<input type="text" value="Viewer"/>
	Operator	<input type="text" value="Operator"/>
	Admin	<input type="text" value="Admin"/>
	Factory	<input type="text" value="Factory"/>

Use the drop-down list and click on the appropriate access level, enter the password, and click **Change Access Level**.

**Important:** A user with higher access level has access to all the variables and ability to change their values that are accessible to lower access levels irrespective of color code. For example, user with Factory access level can access variables that are accessible by Admin, Operator, General User, etc.

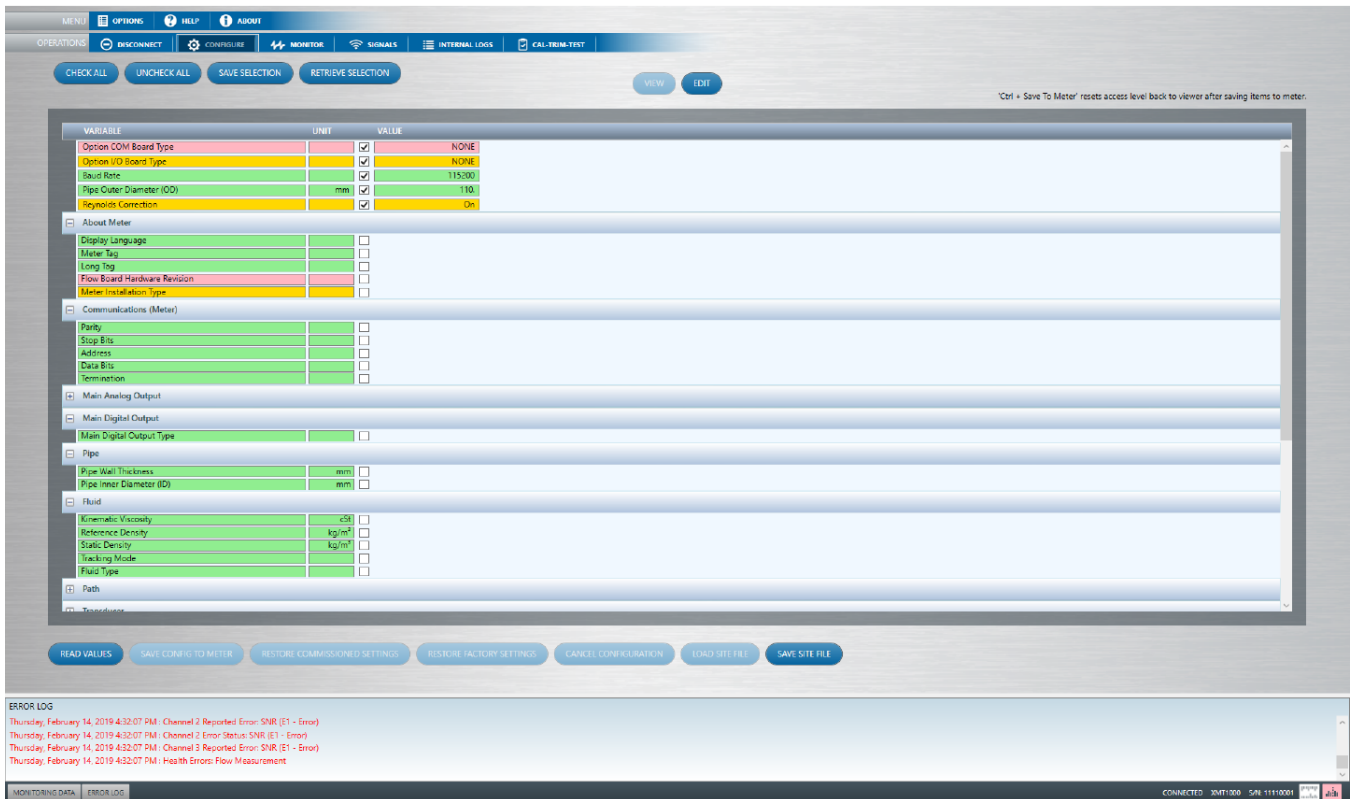
If necessary, click the **Disconnect from Instrument** to stop the connection between **Vitality™** and the instrument. You can then check the connection parameters and click [Connect to Instrument](#) to re-establish the connection.

# Instrument Operations

## Configure

The **Configure** menu allows a user to view and/or edit configuration parameters of a selected flowmeter. The changes that are successfully **Committed/Saved** to meter will be saved to the meter and updated in other screens (like Monitor, Signals etc.) of the **Vitality™**. If any user wants to edit the parameter variables, user must have appropriate **access level** that matches the color of the parameter variable field. Please note that the user with access level **Viewer**, can only view the parameter variables or download the current configuration with the help of **Save site files**.

**Note:** A user at any access level can view all the parameter variable values.



The operations involved to view and/or modify parameter variables are different for **SIL** (XMT900) and **Non-SIL** (AT600, XMT910, XMT1000) Meters.

---

If any changes made to Path Configuration are successfully Committed/Saved to Meter, the same information and related variables will be dynamically updated and/or available in other screens (like Monitor, Signals etc.) of the Vitality™.

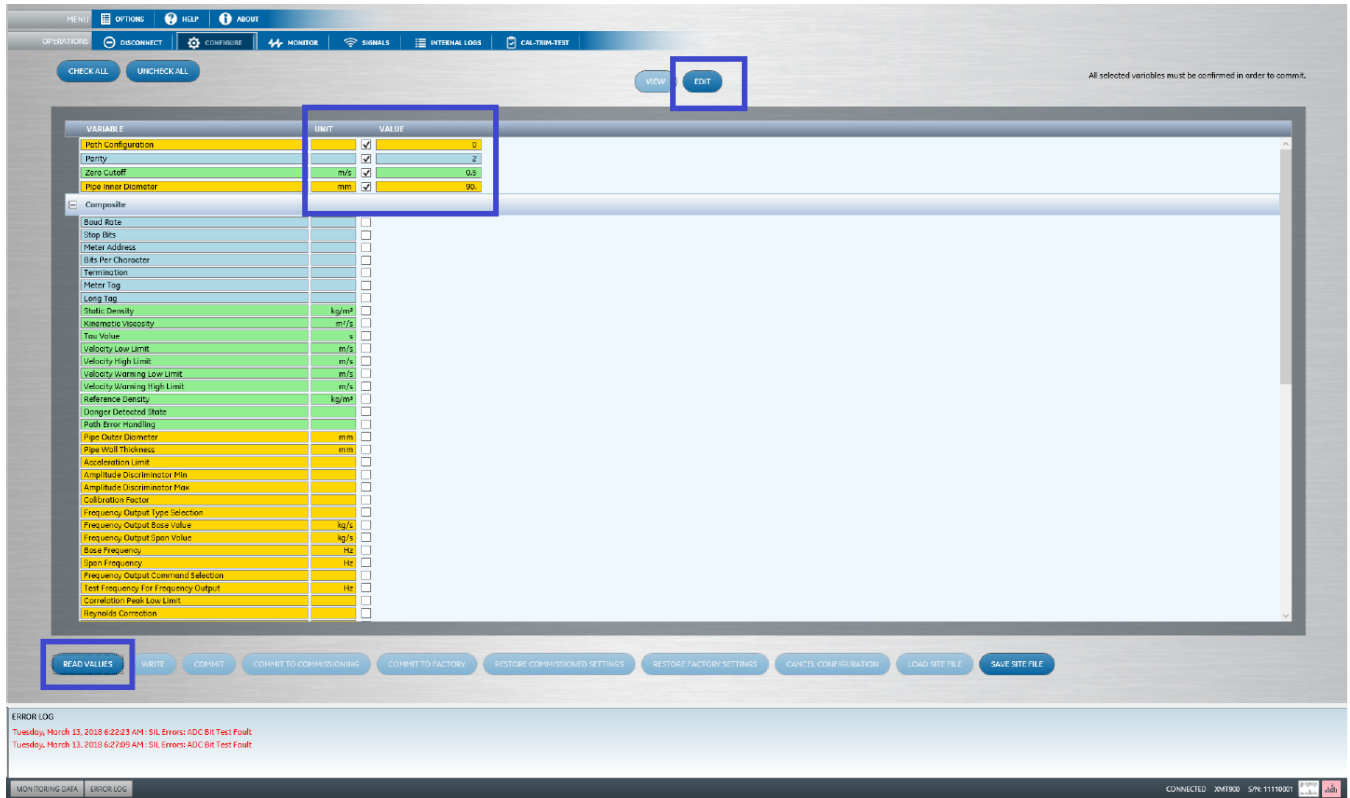
*For LC XMT1000 v.4.3.8 and newer, any change made in Configuration parameters will dynamically update the dependent variables even before saving to meter.*

---

## SIL Meters:

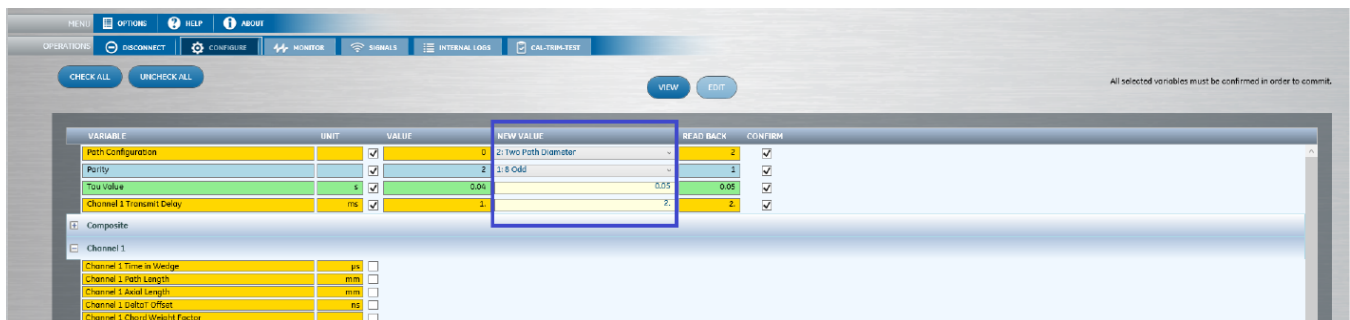
1. Click **Configure** menu and open the list of variable for each parameter (Composite, Channel 1, 2 or 3, SIL Analog Output A, Analog Output B, and Digital Output C or D).
2. Using **checkboxes**, select all the variables you want to view/modify (use **check all** or **uncheck all** buttons to select/deselect all the variables at one click). The selected variables appear on the same window as shown in the figure below.

**NOTE:** If required, user can also change the **Unit** (eg. m/s) of a variable.

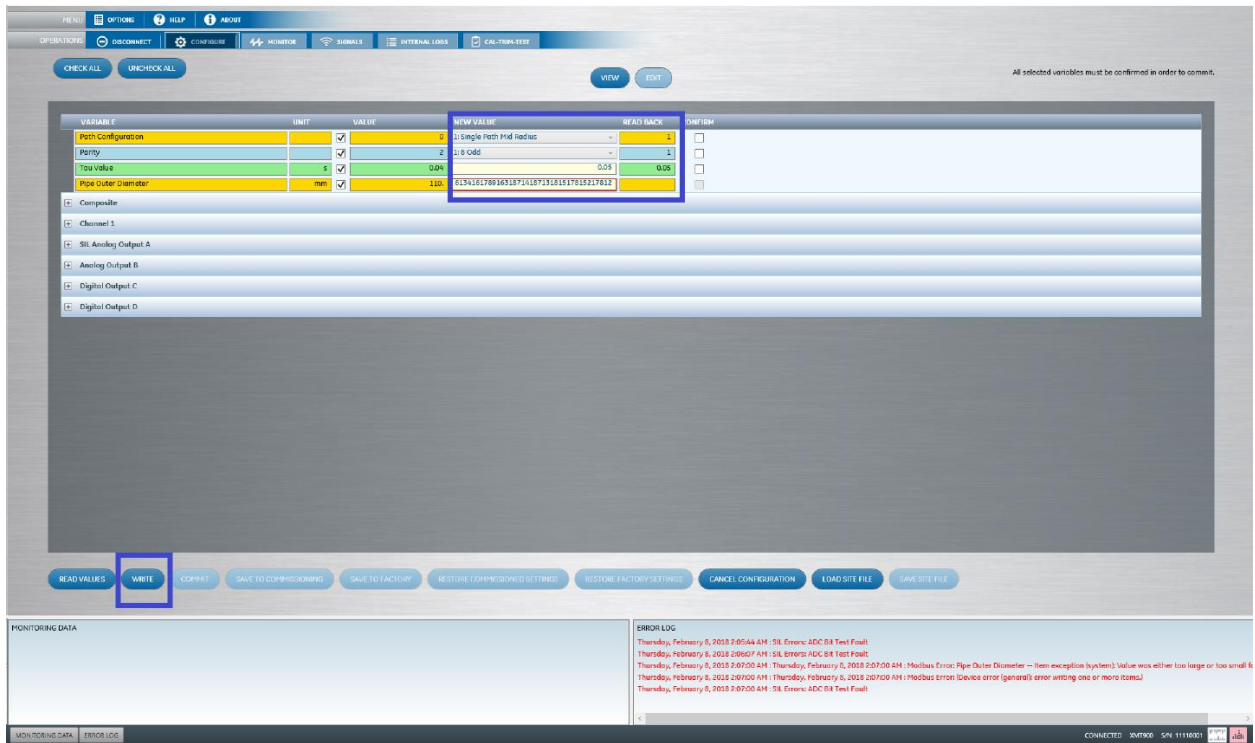


3. Click the **Read Values** on the lower left corner of the window to display the current **value(s)**.
4. If you want to edit/modify the variables, click **Edit**. This will now show the field **New value** in which user can enter valid new value.

**Note:** Login to the correct access level to modify/edit the variables. Make sure the access level color identification matches the parameters/variables field color.

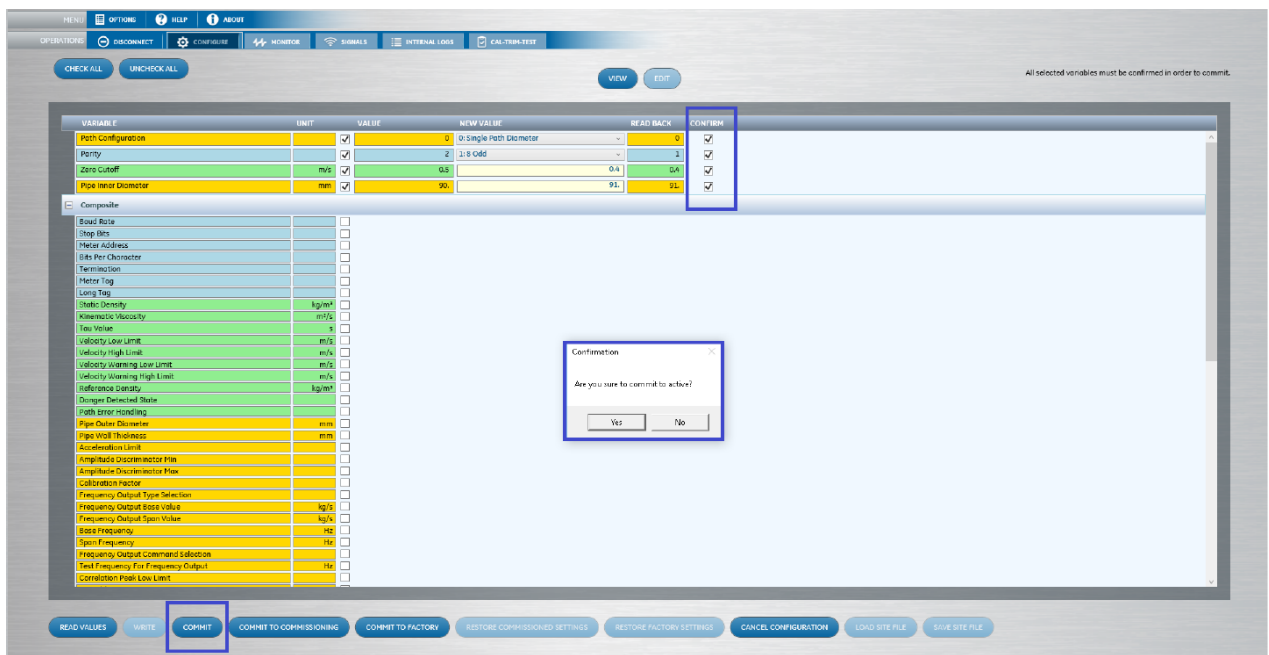


5. Enter/Select a valid new value or select site file (use **Load site file**) if you have previously saved all the configured values in a file.
6. After entering a new value or selecting site file, click **Write** so that the new value will be written in and read back to the user (see the **Read back** field). Make sure that the entered values are valid, otherwise the system will display an error as shown.

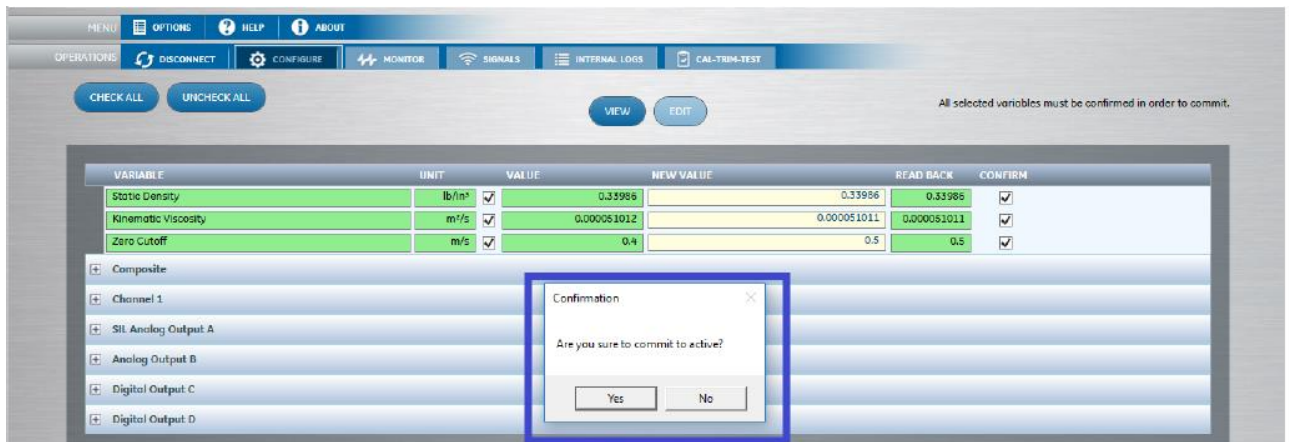


7. Select/Confirm all the variables using **checkboxes** and click **Commit**.

**Important:** You cannot Commit only few of the initially selected variables. If you want to commit only some, uncheck the unwanted variables using checkboxes next to the filled UNIT, or click **CANCEL CONFIGURATION** and repeat the procedure for only the variables you actually wish to change.



- The system will prompt to confirm before making changes. Select **Yes**, so that the new values will be written to the working memory of Flowmeter and dynamically displayed to user.

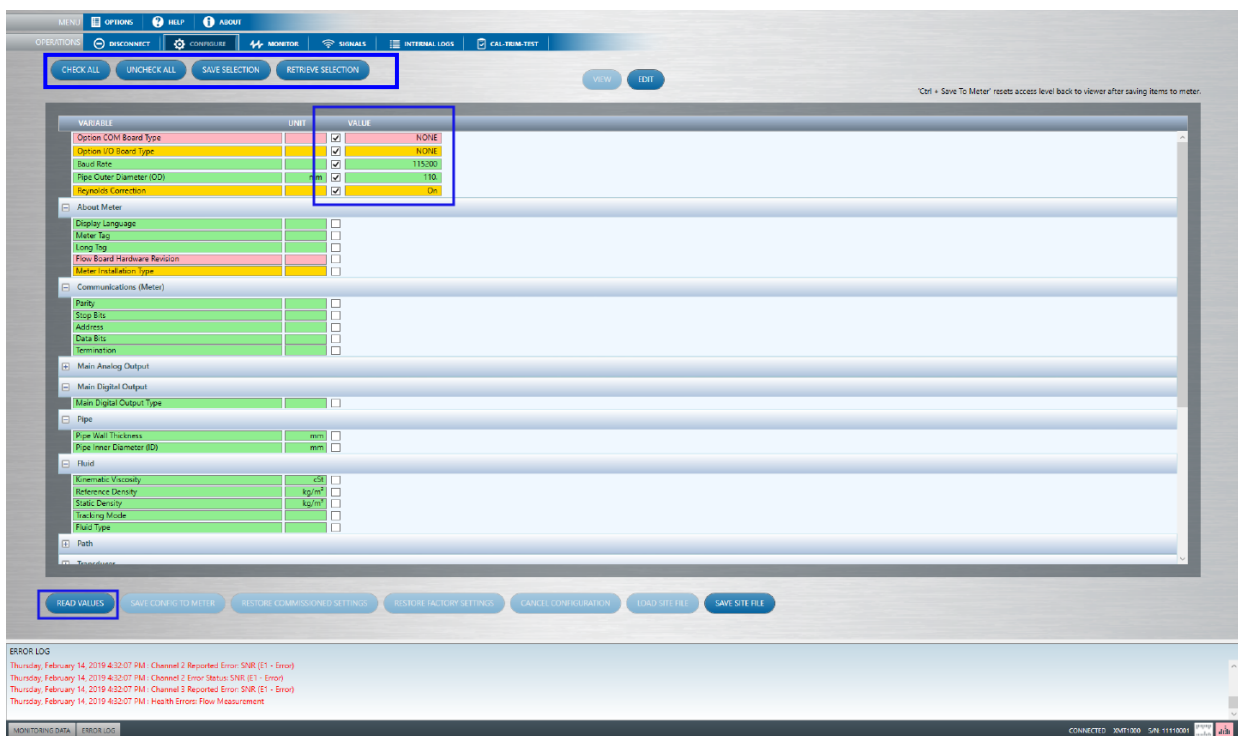


- If you do not want to save the new values to the instrument, click on **Cancel Configuration**.

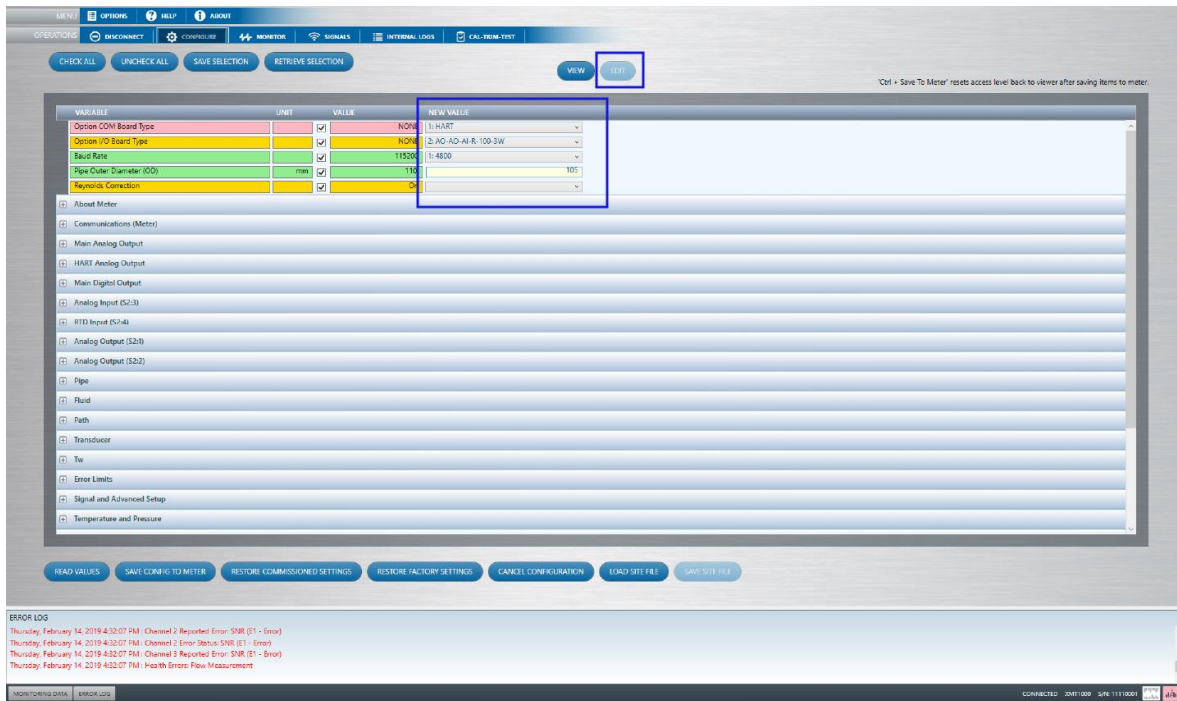
**Important:** The user access level will be changed to Viewer every successful COMMIT or CANCEL CONFIGURATION operation.

## Non-SIL Meters

- Click the **Configure** menu and open the list of variable for each parameter (Composite, Channel 1, 2 or 3, SIL Analog Output A, Analog Output B, and Digital Output C or D).
- Using **checkboxes**, select all the variables you want to view/modify (use **check all** or **uncheck all** to select/deselect all the variables or **Retrieve Selection** at one click). The selected variables appear on the same window as shown in the figure above.



- Click the **Read Values** on the lower left corner of the window to display the current value.
- If you want to edit/modify the variables, click **Edit**. This will now show the field **New value** in which user can enter/select valid new value. User can also change the **Unit** (eg. m/s) of a variable if required.



- Enter a valid new value or select the value from the drop down or select a site file (use **Load site file** button) if you have previously saved all the configured values in a file.

Note: For XMT1000 LC (Liquid Clamp-on): When a user selects the new value from the dropdown, only the applicable variables/parameters will be displayed on the screen. Please see the example below.

Example: If a user selects Meter Installation Type as “Clamp-on” to “Wetted”, only the applicable variables are displayed under Pipe parameter.

OPERATIONS | DISCONNECT | CONFIGURE | MONITOR | SIGNALS | INTERNAL LOGS | CAL-TRIM-TEST

CHECK ALL | UNCHECK ALL | SAVE SELECTION | RETRIEVE SELECTION | VIEW

VARIABLE	UNIT	VALUE	NEW VALUE
Meter Installation Type		<input checked="" type="checkbox"/>	1: Clamp-On

+ About Meter  
+ Communications (Meter)  
+ Main Analog Output  
+ Main Digital Output  
- Pipe

Pipe Outer Diameter (OD)	in	<input type="checkbox"/>
Pipe Wall Thickness	in	<input type="checkbox"/>
Pipe Inner Diameter (ID)	in	<input type="checkbox"/>
Pipe Material		<input type="checkbox"/>
Lining Material		<input type="checkbox"/>

Variables when selected Clamp-On



OPERATIONS | DISCONNECT | CONFIGURE | MONITOR | SIGNALS | INTERNAL LOGS | CAL-TRIM-TEST

CHECK ALL | UNCHECK ALL | SAVE SELECTION | RETRIEVE SELECTION | VIEW | EDIT

VARIABLE	UNIT	VALUE	NEW VALUE
Meter Installation Type		<input checked="" type="checkbox"/>	0: Wetted

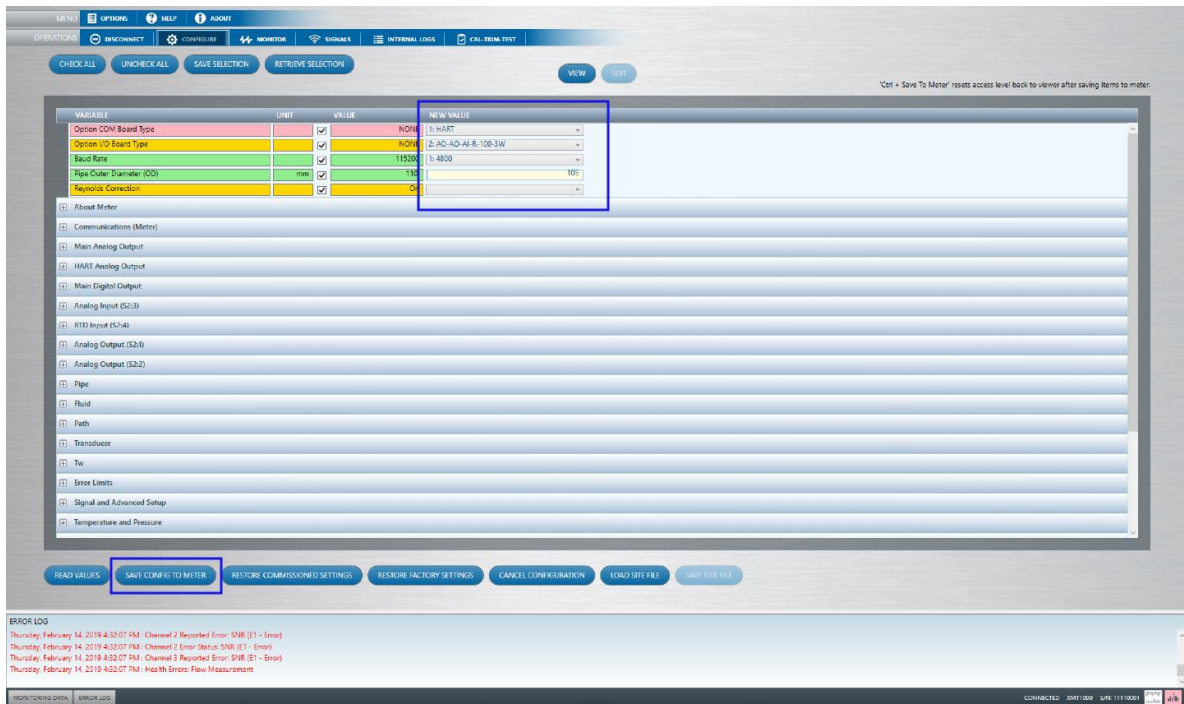
+ About Meter  
+ Communications (Meter)  
+ Main Analog Output  
+ Main Digital Output  
- Pipe

Pipe Outer Diameter (OD)	in	<input type="checkbox"/>
Pipe Wall Thickness	in	<input type="checkbox"/>
Pipe Inner Diameter (ID)	in	<input type="checkbox"/>

Variables when selected Wetted

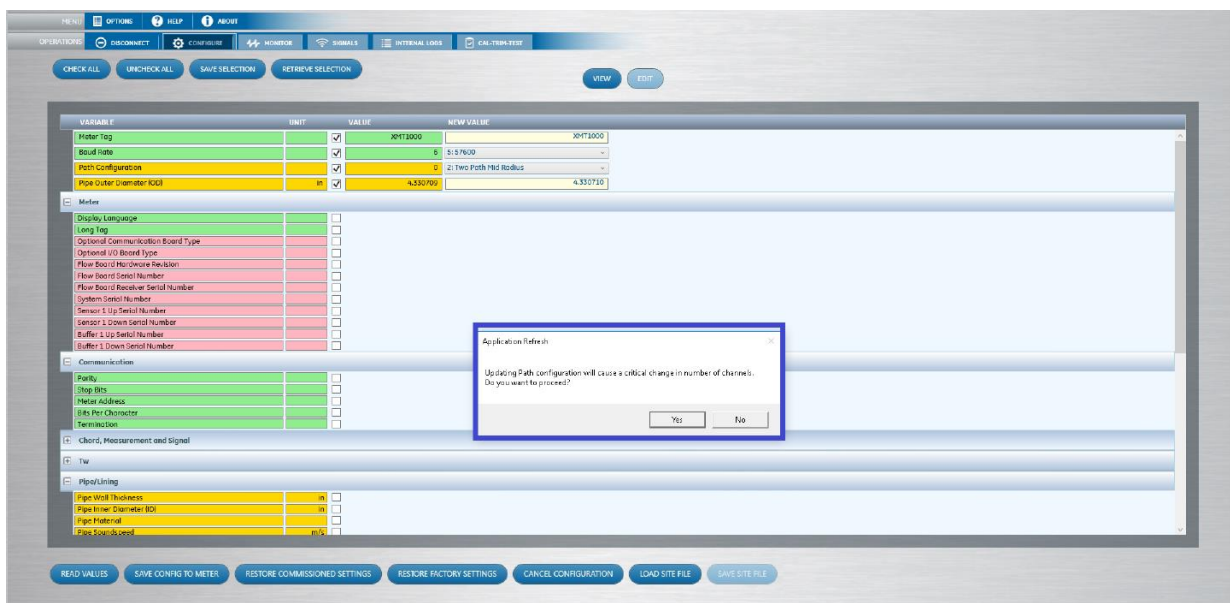


- After entering/selecting a new value or selecting site file, click **Save Config to Meter**. Ensure that the entered values are valid, otherwise the system will display an error as shown.

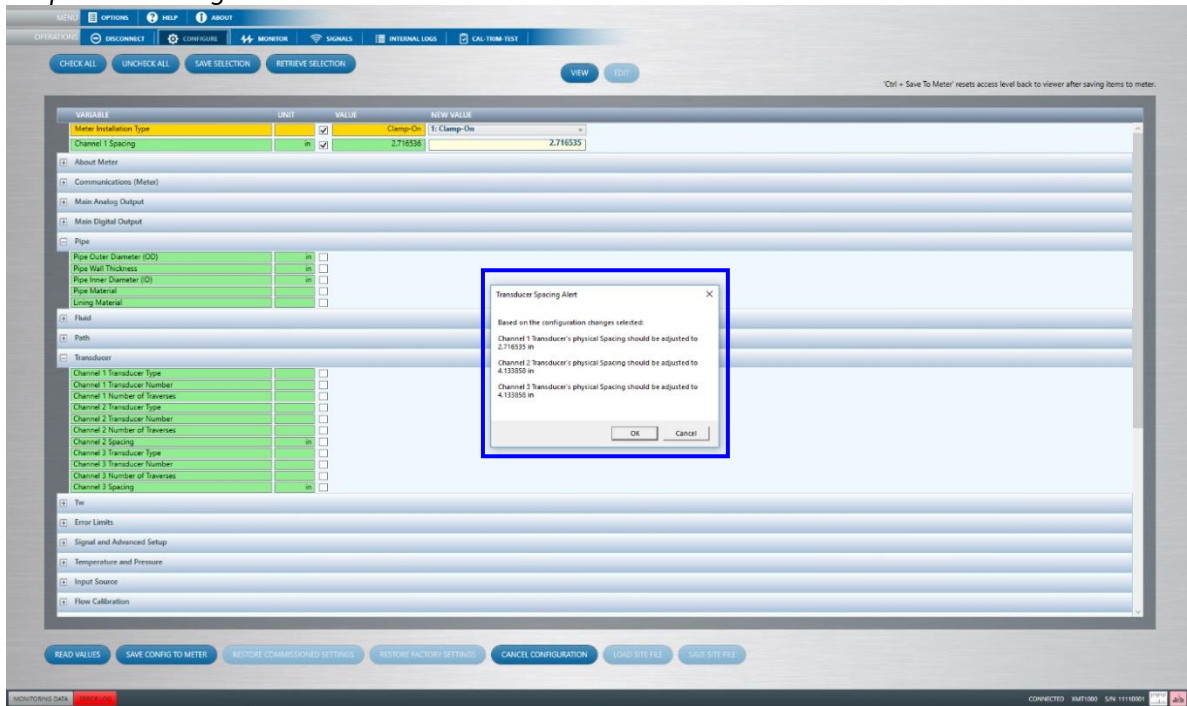


**Note:** Login to the correct access level to modify/edit the variables. Make sure the access level color identification matches the parameter variable field color.

- For some variables like path configuration, the system will prompt to confirm before making changes. Select **Yes**, so that the new values will be written to the working memory of Flowmeter and displayed to user.



**Important:** For XMT1000 LC (Liquid Clamp-on): If you change Channel 1 Spacing variable value, the system will prompt an alert confirming the automatic changes on other related variables. Select OK to confirm the changes or Cancel to retain the old value.



- If you do not want to save the new values to the instrument, click on **Cancel Configuration**.

**Important:**

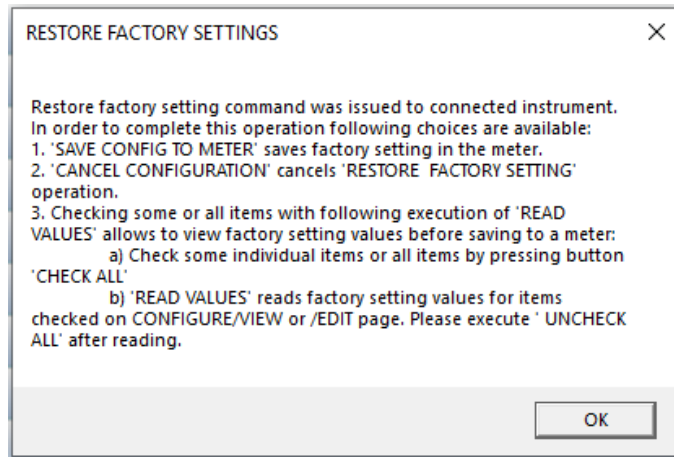
For all meters except XMT1000 LC, the user access level will be changed to VIEWER every successful Save config to meter or Cancel Configuration operation

For XMT1000LC, the user access level will be changed to VIEWER only on clicking Ctrl + Save Config to Meter or Cancel Configuration operation

**Note:** Use **Check All** and **Uncheck All** buttons to select or deselect all the variables at once. Deselected variables will move to their actual position on the screen.

If a Service or Factory level is reached, **Commit to Commissioning/Factory** and **Restore to Commissioning/Factory** will be available. If the **Restore to** function is used, the values must be committed in order for them to be used in the working memory in the Flowmeter, or you can commit the values in Commissioning memory or Factory memory. Only for XMT900 (SIL meter).

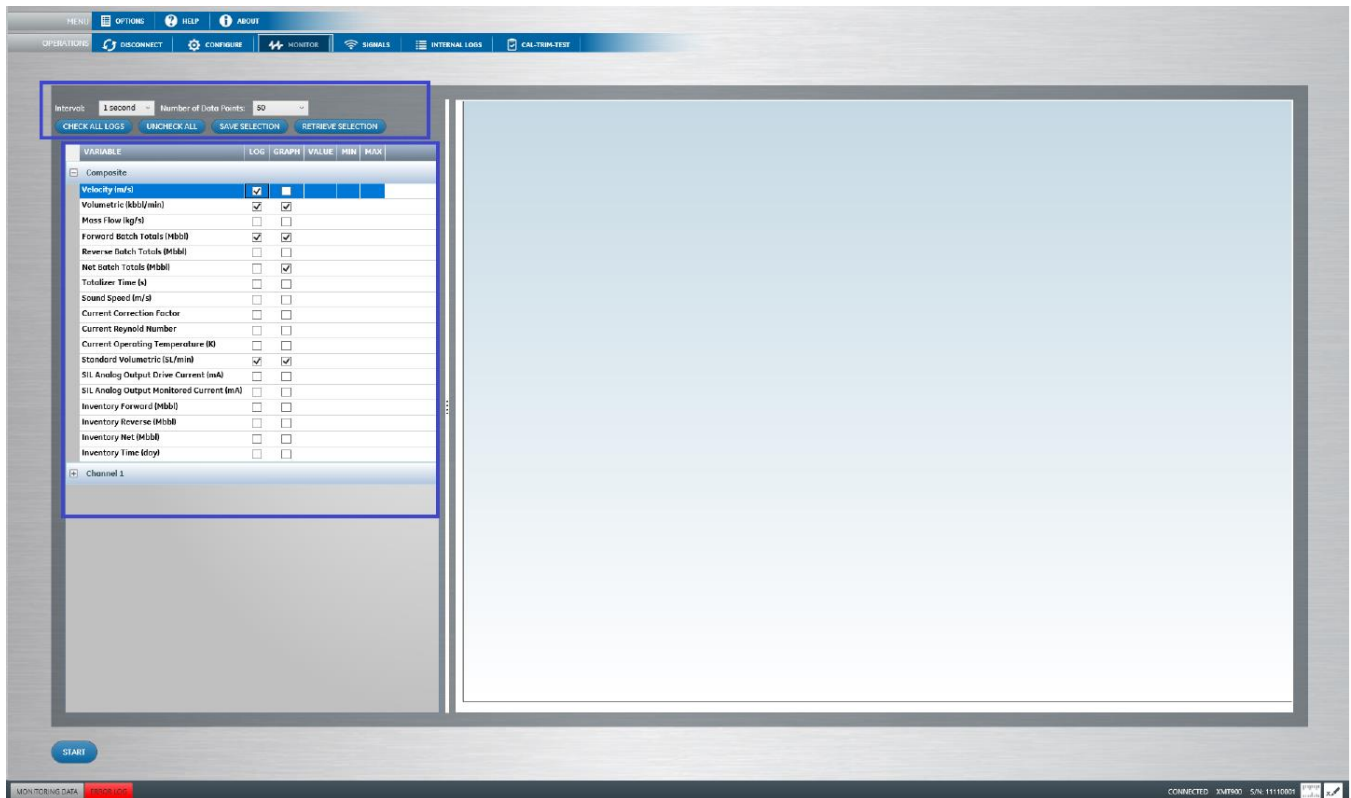
For LC meters, if a user clicks **Restore factory settings/Restore commissioned settings**, below warning message will be displayed. Click **OK** to continue restore settings.



User can also save all the values of the parameters of the flowmeter in file (excel) for later use. Click on **Save site** file and select a location to save and name the file.

## Monitor

The **Data Monitoring** option allows a user to view and/or log flowmeter real-time measurements. After clicking **Monitor**, the window presents a drop-down list of variables for each parameter (composite or channel) so that user can choose the variables for graphing and/or logging.

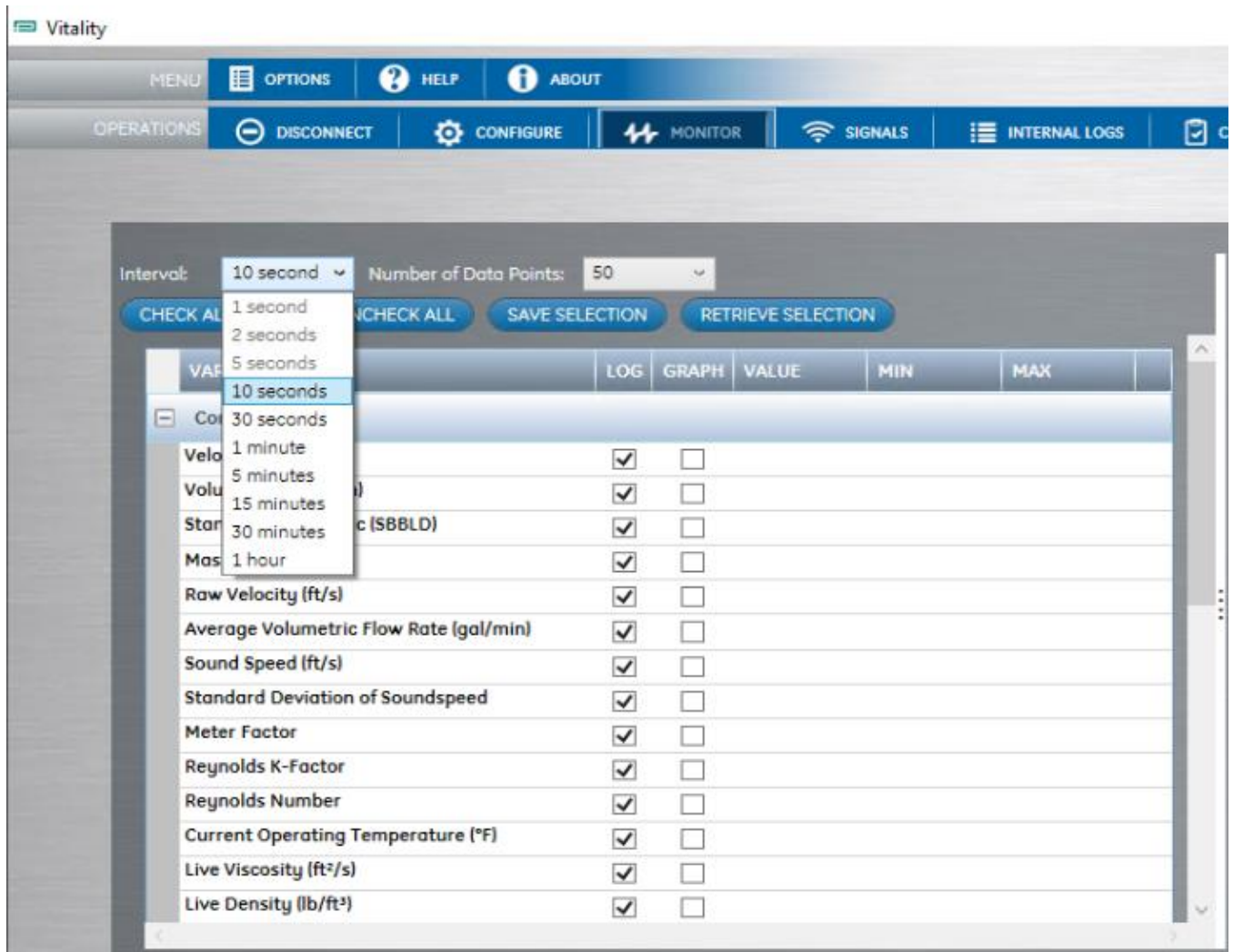


1. Click on each parameter (composite or channel) to expand and select the variables as needed using Checkboxes (use **check all** or **uncheck all** buttons to select/deselect all the variables or **Retrieve Selection** at one click).

**NOTE:** User can only select up to 10 parameter variables to view the Graph.

2. User can also select **time interval** (1, 5, 10 or 30 seconds; 1, 5, 15 or 30 minutes; or 1 hour) or **Number of data points** (50, 100, 150, and 200) if required. Use the dropdown list available on the upper left corner of the window.

**NOTE:** It may take longer to monitor multiple items than selected interval based on a number of items and communications baud rate.

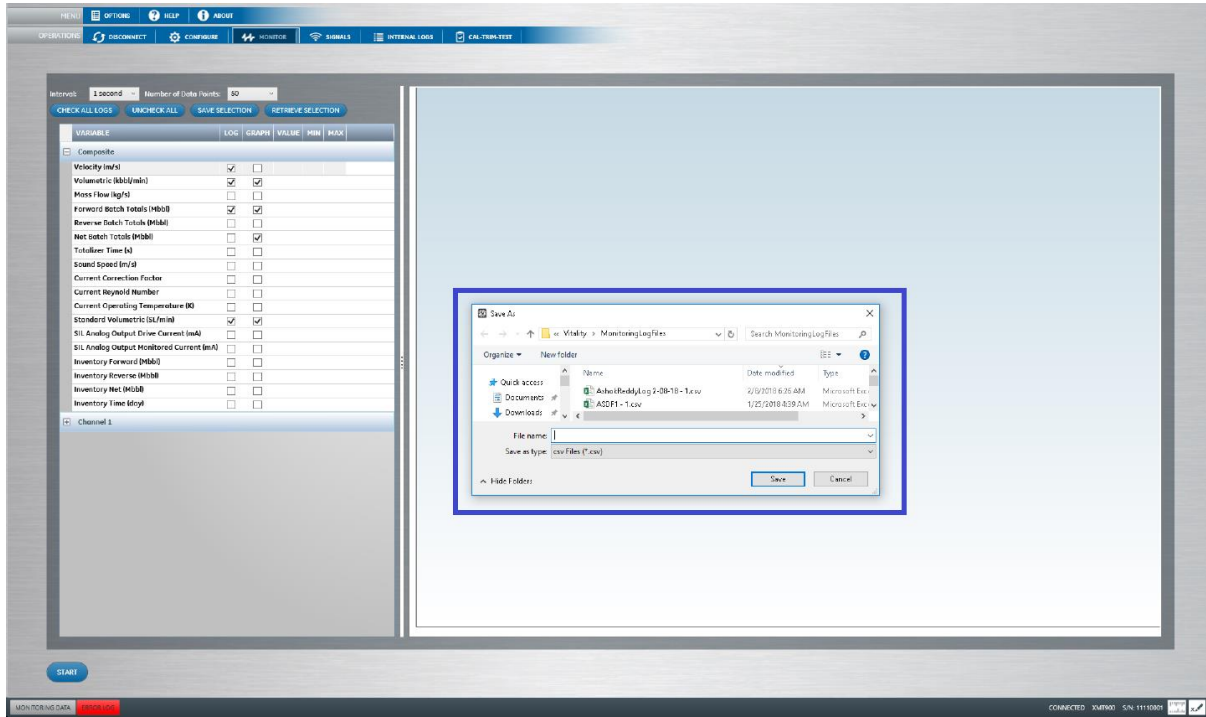


**NOTE:** The interval selection of monitoring log will be disabled/enabled based on the time taken to poll the selected registers for log or graph.

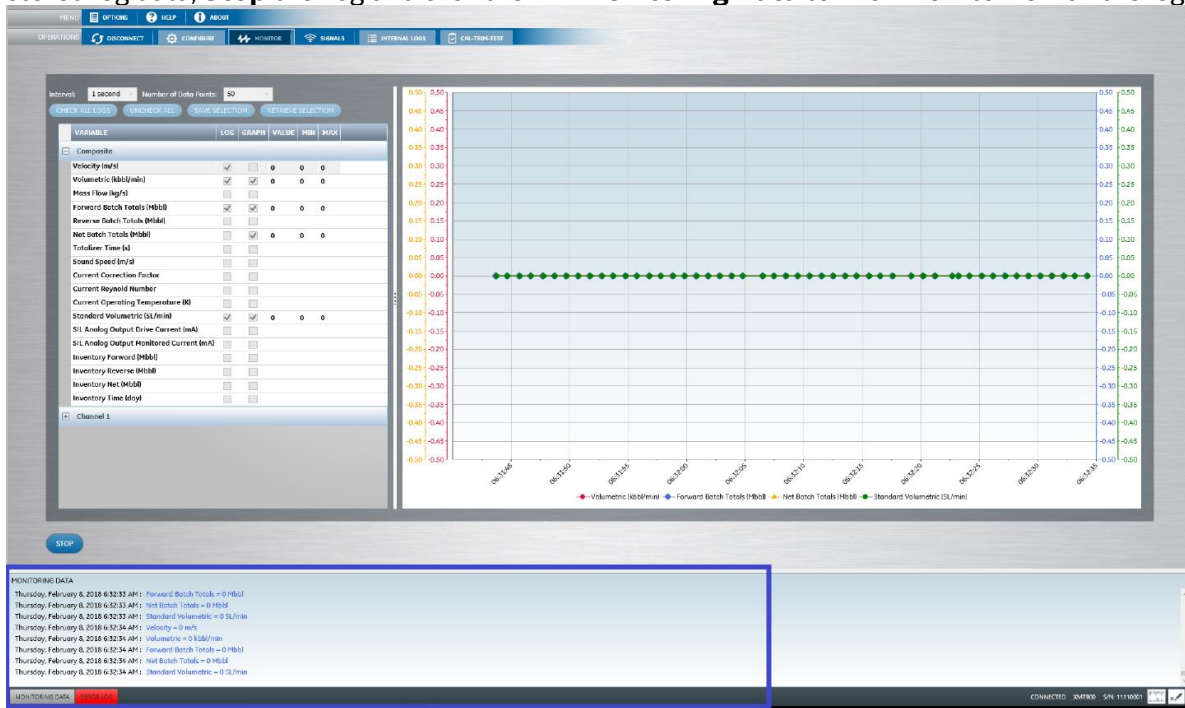
3. User can modify the **Unit** (eg. m/s) of a variable if required.
4. After successfully selecting the variables, click on **Start** to begin the **Log** and **Graph**.

# LOG

1. If user preferred to **log the data**, Vitality™ asks to save the file (CSV) first. The user can either select a desired location or default location will be: <C:\GEData\Vitality\MonitoringLogFiles>.

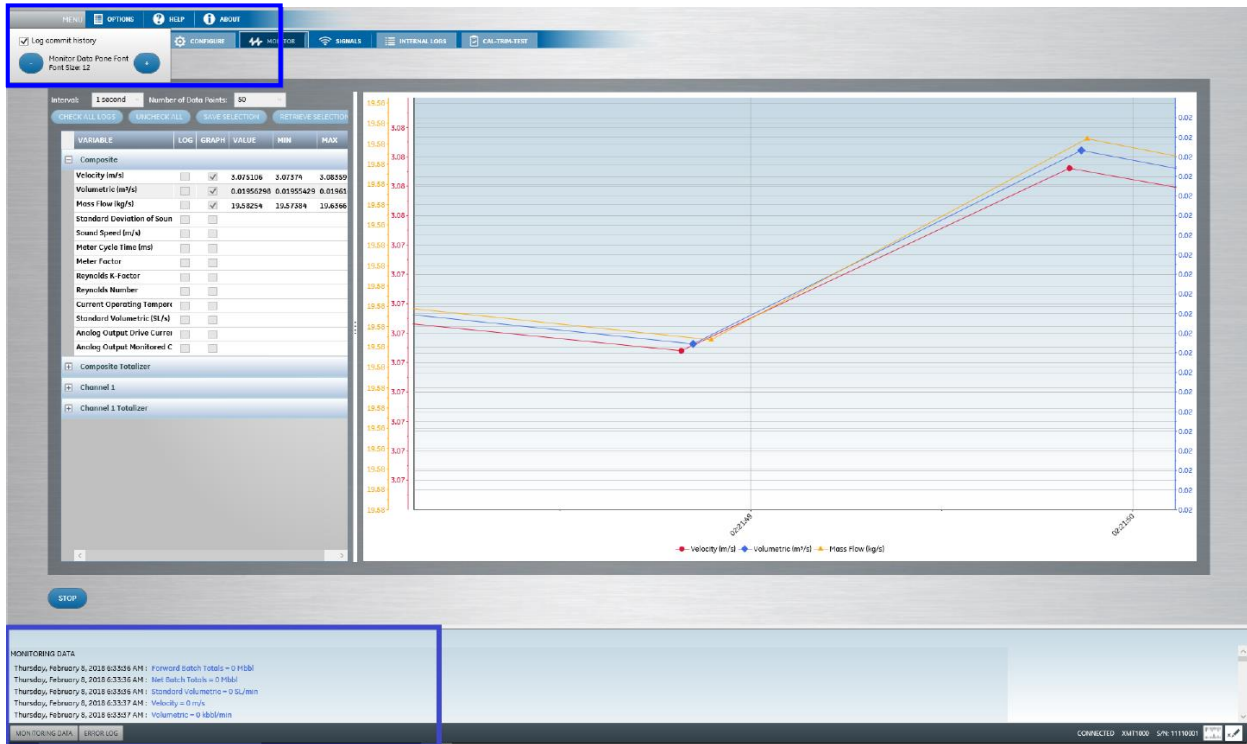


2. Click **Monitoring Data** on left corner of the window to view the log data while running. The log information is only displayed with time stamped for each event but not stored. If you want see all the stored log data, **Stop** the Log and click the link **Monitoring Data** to know how to view all the log data.

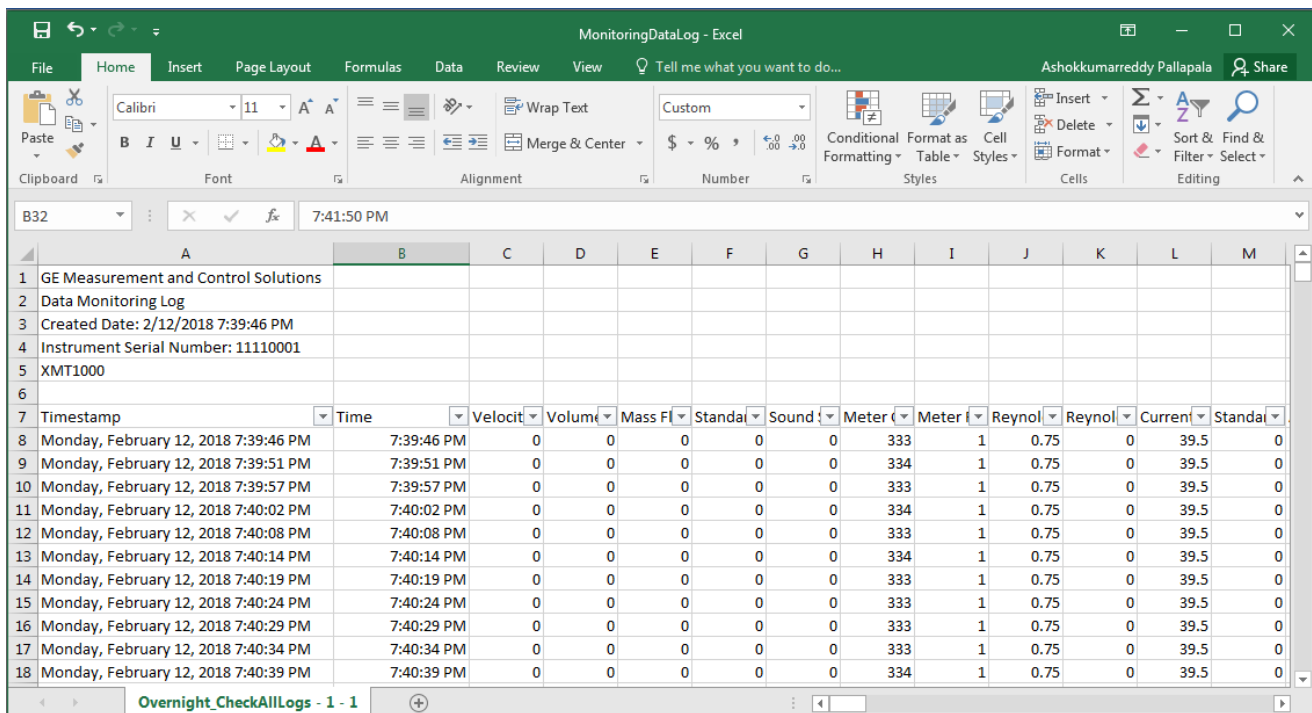


**NOTE:** Expand or collapse MONITORING DATA window at any time for better viewing of Graph while the application is running, or stretch it vertically to view more events.

- In the **Monitoring Data** window, the data will be displayed with the same color that the variable is assigned for **Graph**. If required, use the menu item **Options** (upper left corner) to increase the font size of the data displayed on **Monitoring Data** window.



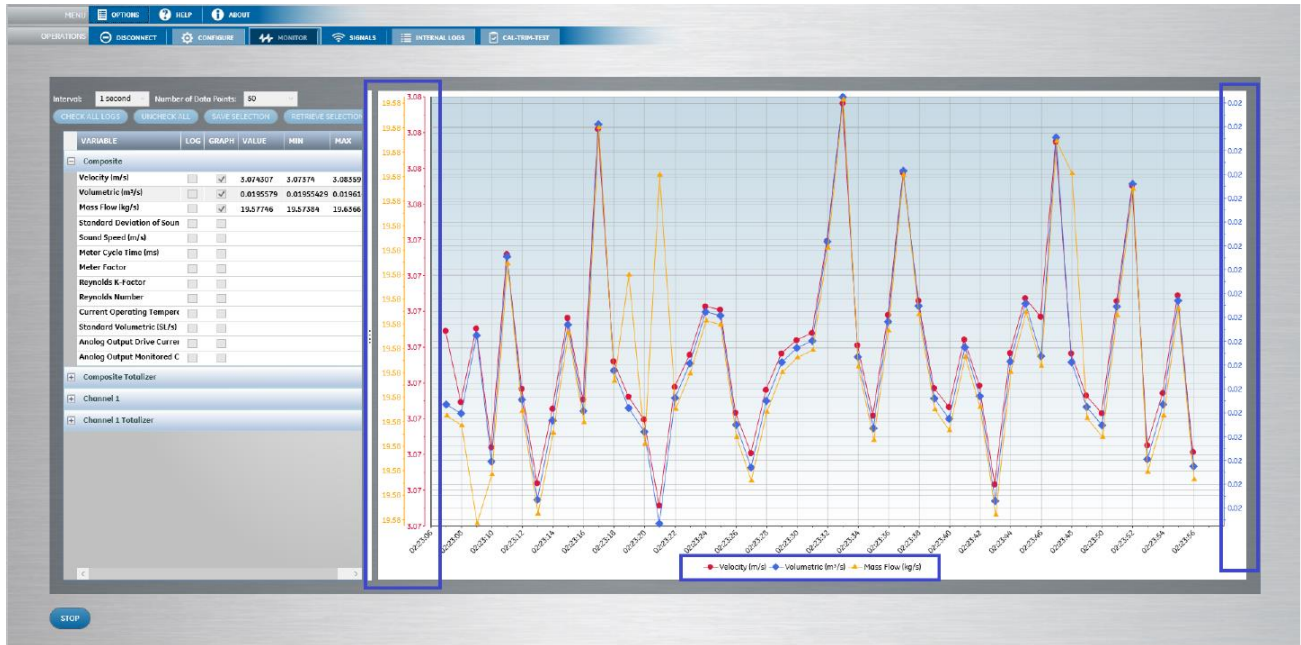
When a user saves **Log to Excel** (either to default folder **C:/GE Data/Vitality/MonitoringLogFiles** or users desired location), it appears similar to the screen below:



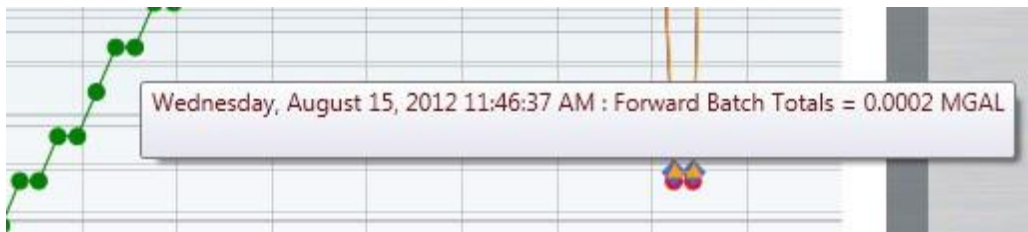
## Graph

1. The **Graph** will be displayed on the right-side of the window with a scale on Y-Axis (both right side and left side to the graph) according to number of decimal units, max, min values selected for the graph.

**Important:** Graph/Scale on Y-Axis for each selected variable will be displayed with a unique color. The color for each parameter is auto-assigned by the system and the same will be displayed on the bottom of the graph for easy reference of the user.



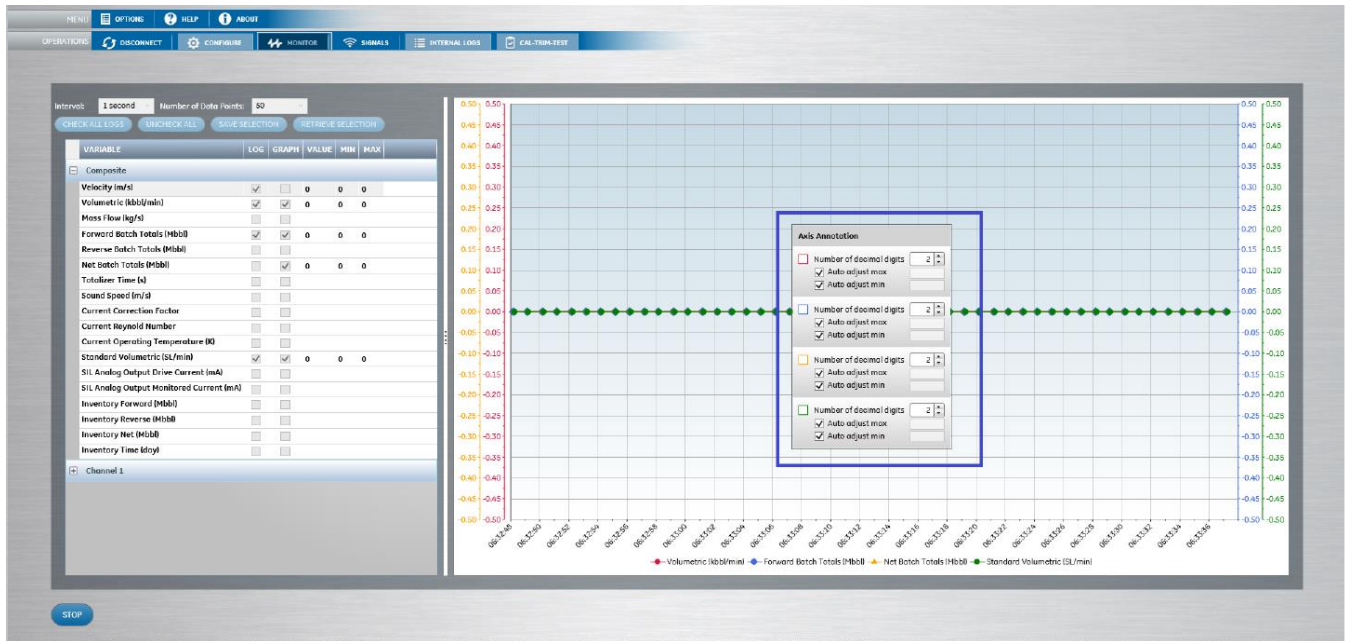
2. Clicking on an individual data point enables you to read the data for that specific point, along with any related errors.



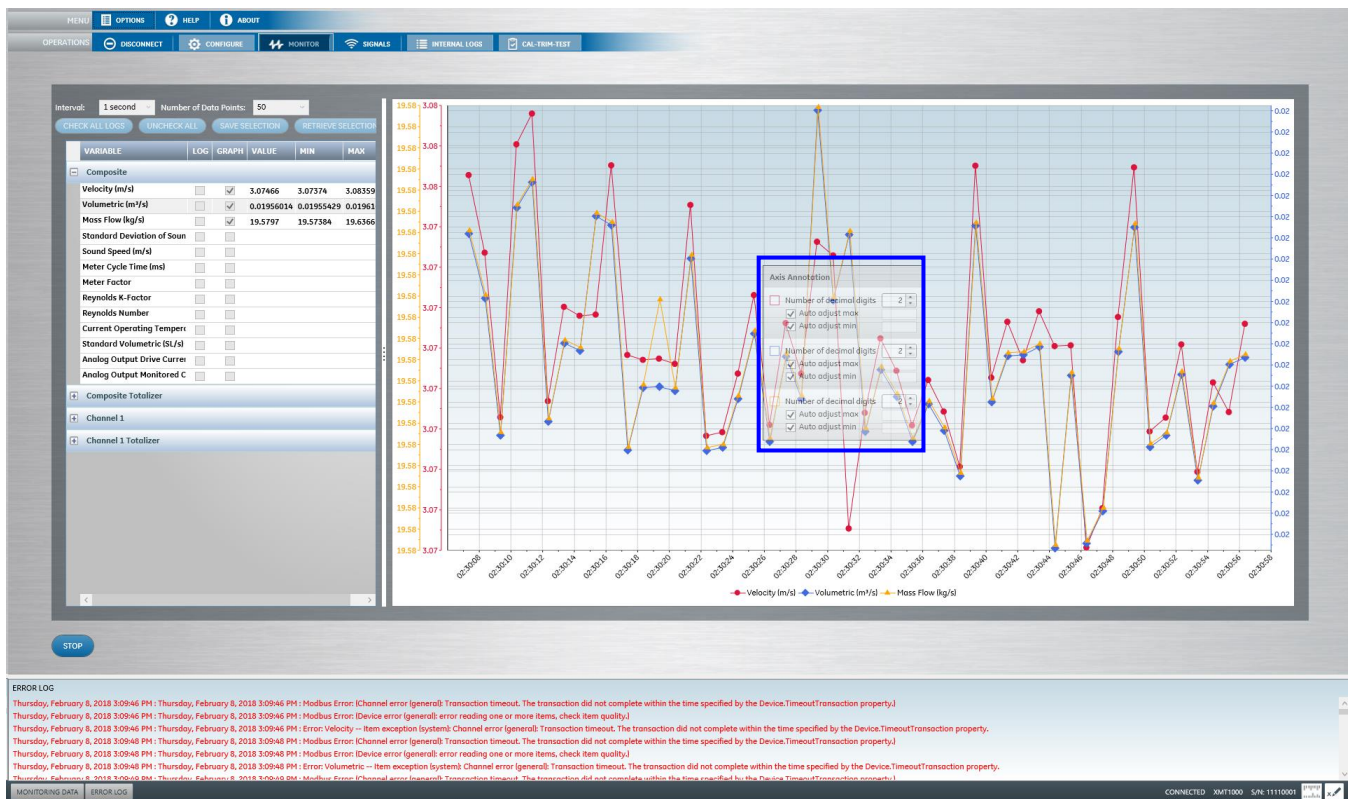
3. If required to modify **time interval** and **Number of data points**, stop the operation, make the changes and then **start** the operation.



- Right-clicking on the graph opens the **Axis Annotation** window that allows user to modify the “Number of decimal digits” or set the “maximum and minimum values” for each variable range in the **Auto adjust max** and **Auto adjust min** text boxes.



If the user moves cursor away from the Axis Annotation window, it becomes partially transparent (as shown below), so that user can focus on a particular data point without obstruction.



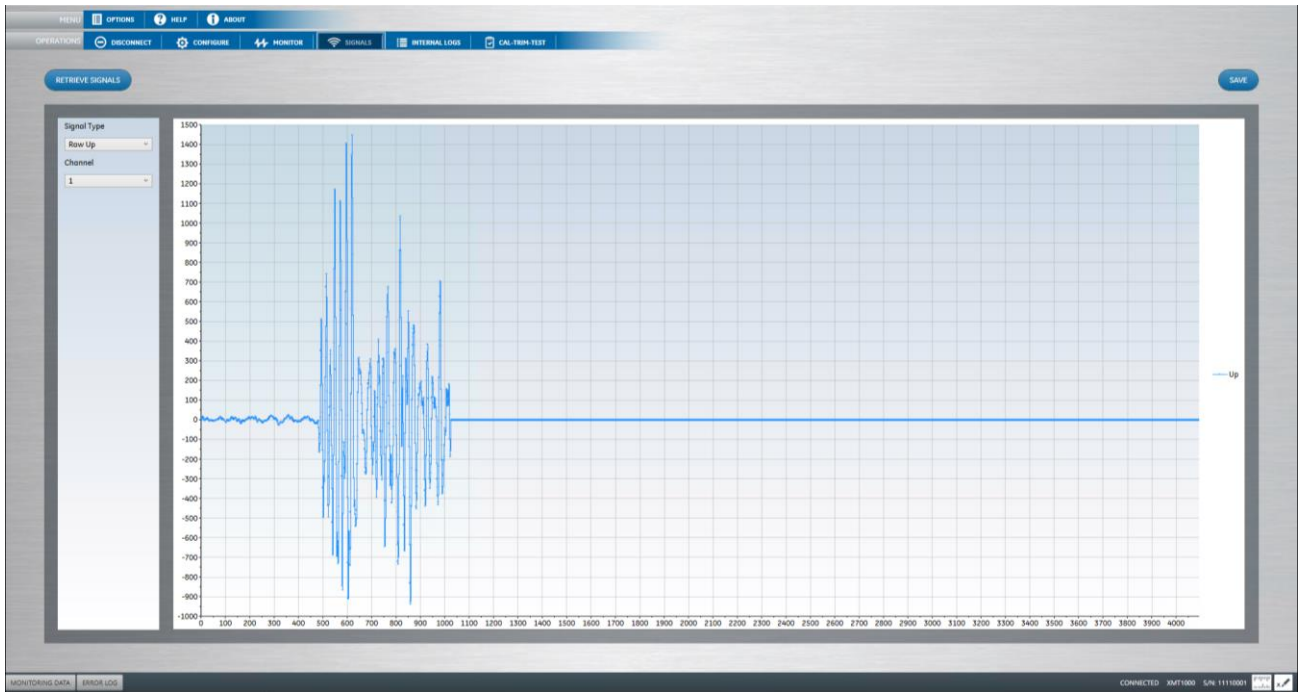
The below listed controls allow users to focus on particular data on the Graph:

- **Zoom** – (Shift + Left Click) lets the user to zoom the information in a selected area.
- **Scale** – (Ctrl + Left Click) lets the user to change the x-axis scale by moving the mouse left or right, or the y-axis scale by moving the mouse up or down.
- **Pan** – (Left Click+Drag Horizontally left or Right) lets the user to view different areas of the graph while zoomed.
- **Reset** – (Double Left Click) returns the graph to its original size (zoom and scale).

Save the current selection of variables in order to save time or easy selection when he/she requires later. Click the **Save Selections** to save them to an Excel file. Load this preset list of variables by clicking **Retrieve Selections** and selecting the Excel file. To clear any currently loaded list, click **Uncheck All**.

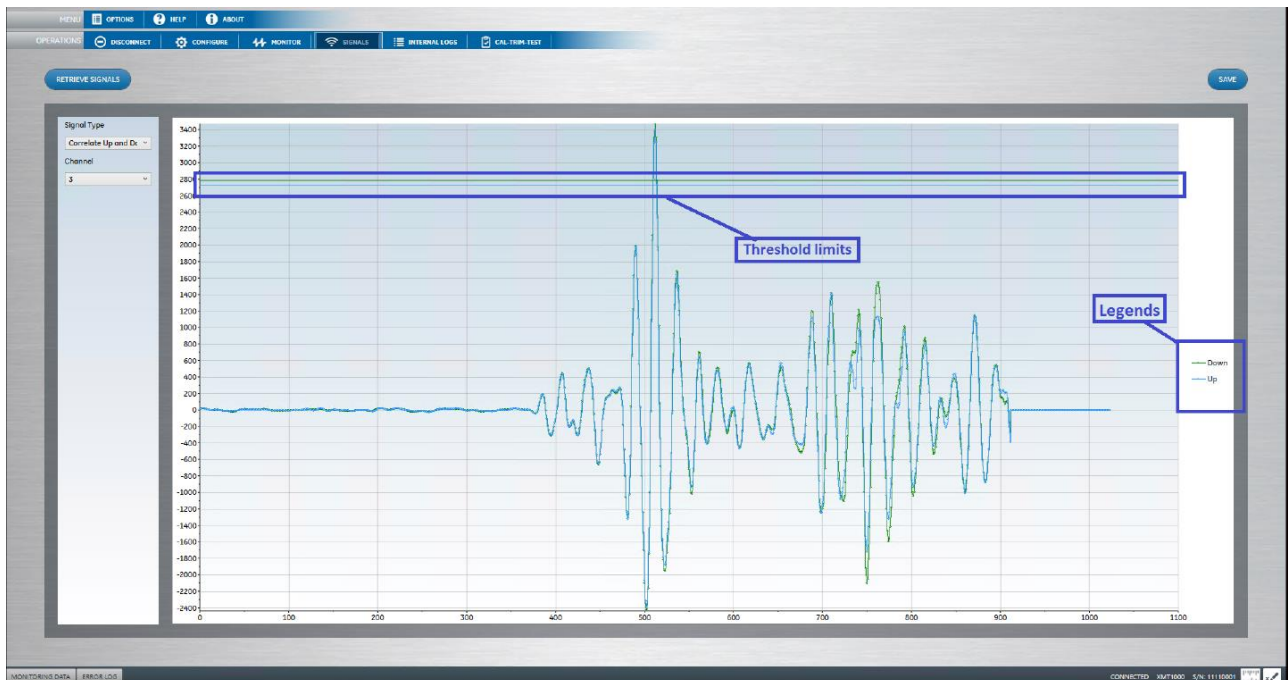
# Signals

This function **Signals** assists a user in retrieving and saving signals data.



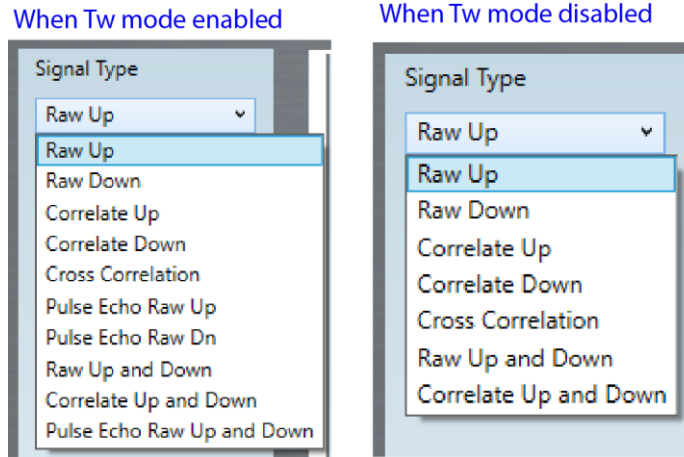
In order to retrieve a signal, do the following:

1. First click **Retrieve Signals**. A window similar to the one above appears. Note that for SIL meters, only a user with [access level](#) "Viewer" can Retrieve the signal, others can only view the previously plotted signals.
2. Use the **Signal Type** and **Channel** drop down menus and choose which signals to plot. The drop-down menu options are displayed based on the instrument user selected.



Plot the concatenated up and down signals for Raw/Correlate/Pulse Echo raw **signal types**. The plotted signals and their threshold limits are identified with legends and horizontal threshold limit lines as shown above.

**Note:** For XMT1000 LC meter, Signal type options are displayed based on the parameter “Tw mode” (enabled or disabled) set in the configure window.

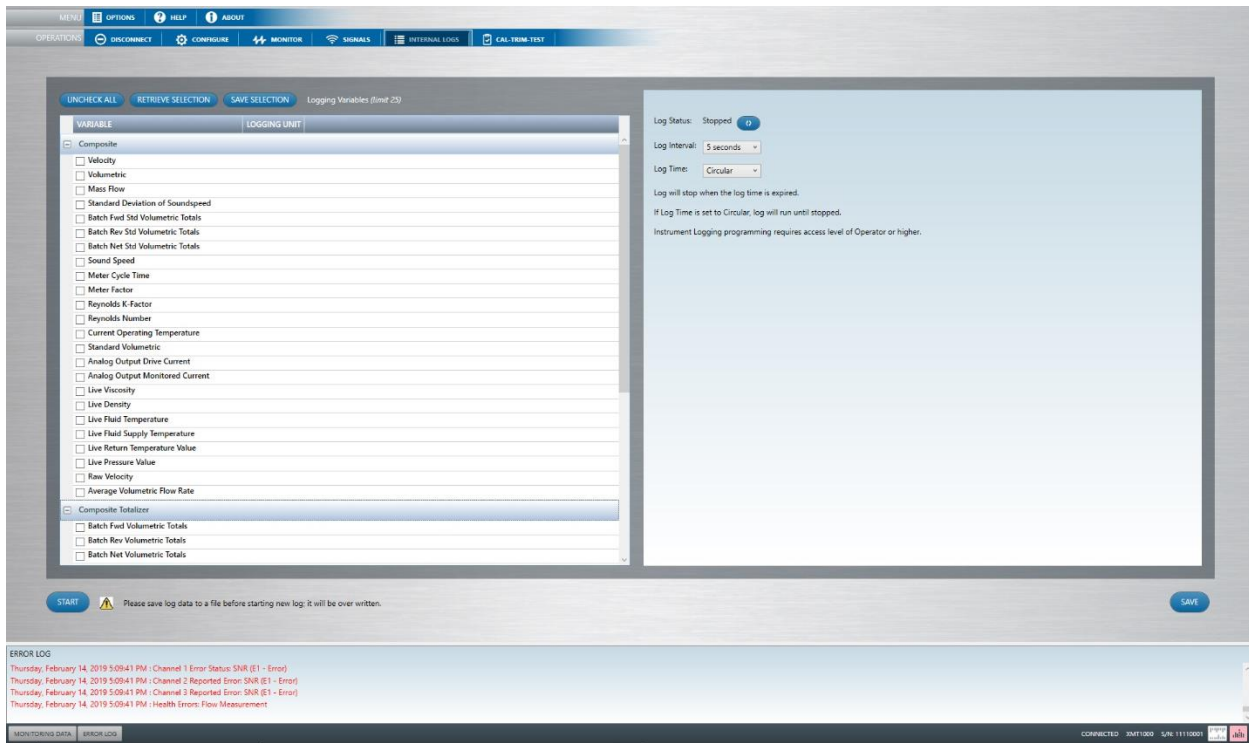


3. If required to save the signal data, click **Save** and select desired file location. The signal data will be saved to an Excel file.

**Note:** Vitality™ retrieves signal data in parallel with monitoring data.

# Internal Logs

The **Internal Logs** menu assists a user to set-up or retrieve an instrument log. If a log is “In Progress” (currently running), the default selections that appear on the page are the parameters selected for the current running log.



Users cannot save or export a running log. They must click the **Stop** on the Data Monitoring screen to save or export log. A log cannot be paused. After clicking **Stop**, make sure to export and save (to Excel) the log data before clicking **Start**. Otherwise, clicking **Start** will erase the old log and **Vitality™** starts logging newly.

To set up a new log, the user shall stop any running log and select logging variables (up to 25) and set the following parameters (the default selections displayed are from the previously run log):

- Log interval (5, 10, and 30 seconds to 1, 5 and 15 minutes, 1 hour and 1 day).
- Log Time (1 minute, 15 minutes, 1 hour, 6 hours, 1 day, 1 month, 6 months and 1 year).

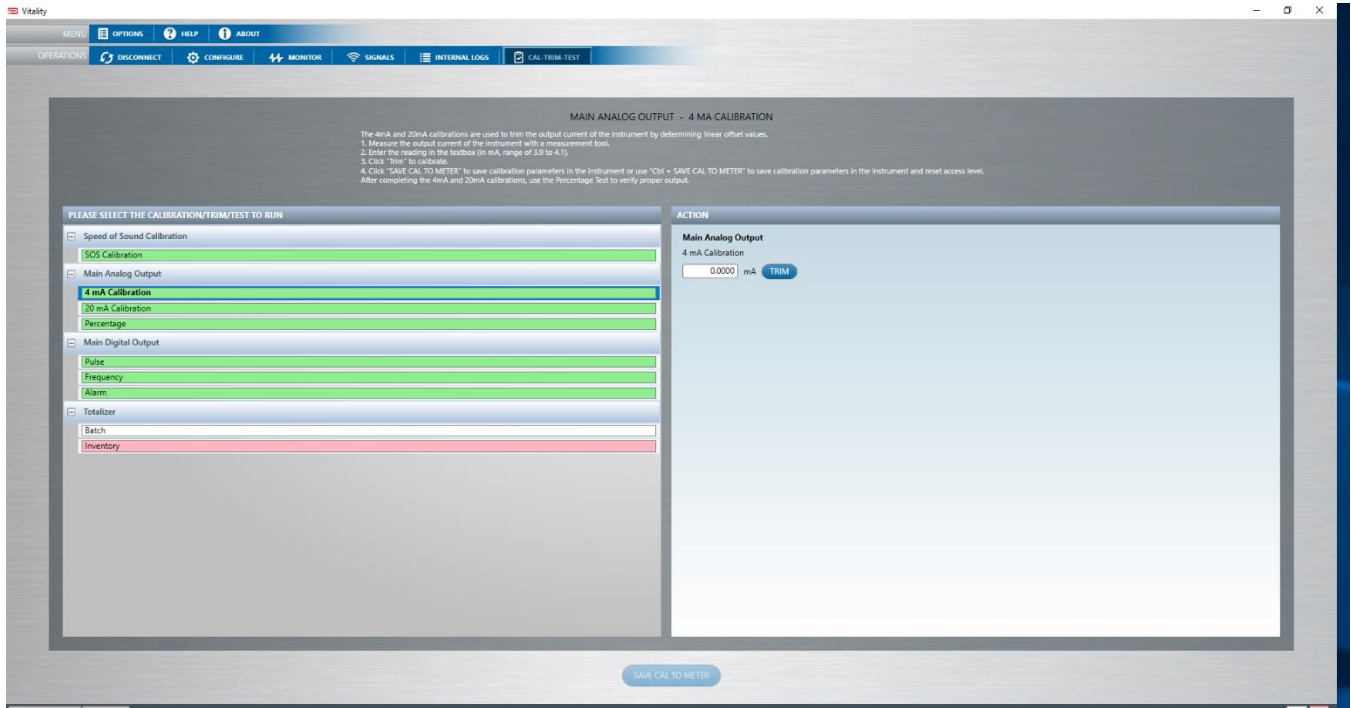
For log time, users can also set the **Circular** option, in which the log will run continuously until stopped. If the log exceeds the memory size, the oldest logs/readings will be overwritten by the recent logs/readings.

Clicking **Save** will retrieve the instrument log and save in an Excel. User can either save the excel file in a desired location or the default location will be, <C:\GEData\Vitality\MonitoringLogFiles>. This saved log includes a monitoring log sheet and an error log sheet. The error log contains up to 30 errors recorded by the instrument and multiple diagnostics variables based on the meter type.



# CAL-TRIM-TEST

The **CAL-TRIM-TEST** submenu assists a user with appropriate [access levels](#) to calibrate and test flowmeters and control the totalizers.



**Note:** To run CAL-TRIM-TEST, a user shall have access level of General User or higher.

Based on the instrument type users can calibrate Analog and HART Output, set Digital Output, stop and reset Inventory and Batch totalizers and Run Switch and Watchdog tests. For each test, a set of directions appears on its page to describe the required steps. Most tests require the use of additional electronic test equipment. If the test does not require external equipment, a Pass or Fail indication appears next to the **Start** and see the [Error Log](#) for additional information.

After successful completion of Analog or HART calibration, if required, user can click on **Save to Meter** so that the Trim Value will be saved and available for later use.

**Important:**

For all meters except XMT1000 LC, the user access level will be changed to VIEWER every successful Save Cal to meter.

For XMT1000LC, the user access level will be changed to VIEWER only on clicking Ctrl + Save Cal to Meter.

**Note:** All the tests are color-coded to indicate the required [Access Level](#).

---

**NOTE:** The CAL-TRIM-TEST also supports calibration of Optional IO Board

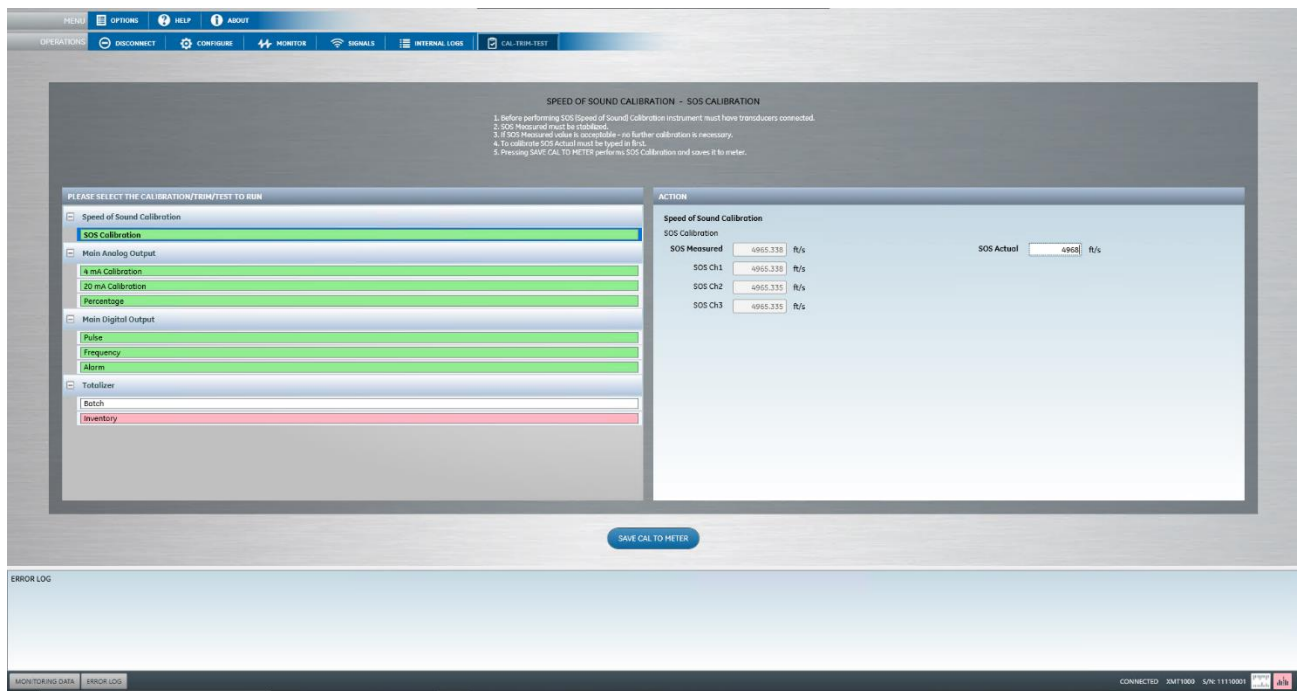
---

## Speed of sound calibration (SOS)

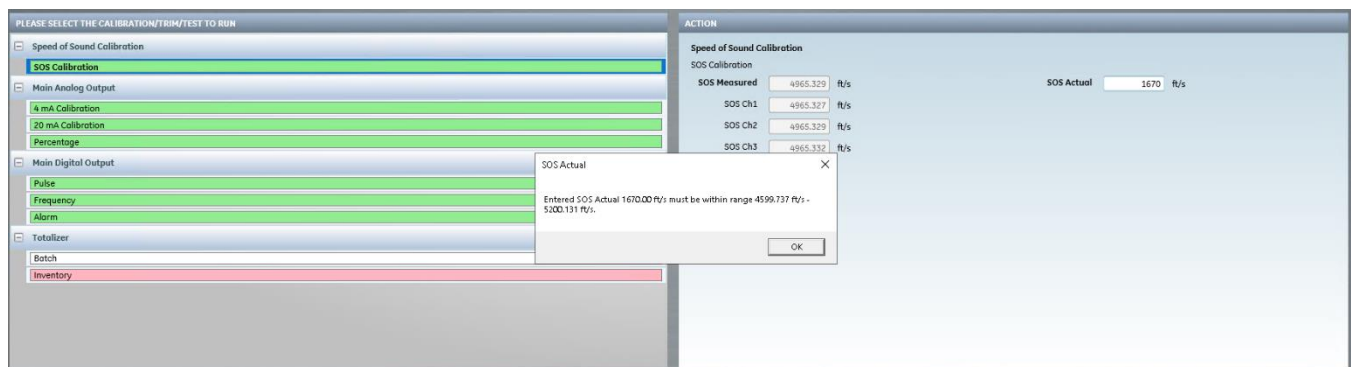
To perform Speed of Sound (SOS) Calibration, the user requires access level of Operator or higher.

Following are the instruction guidelines for the SOS Calibrations:

1. On **Cal-Trim-Test** window, click on **SOS calibration**. A page appears alongside the same window.
2. The SOS Calibration is performed differently for both “clamp-on” and “wetted” meter type configuration being set in the Configure screen
3. Vitality will constantly poll the composite SOS and Chx SOS in the field “**SOS Measured**” and **SOS Chx** fields respectively. These fields are read-only.
4. User will enter the expected SOS in the field “**SOS Actual**”.
5. Click “**SAVE CAL TO METER**” button to perform SOS calibration.



**Note:** SOS Actual input is subject to validation and is expected to be entered within a range defined based on the “Tracking mode” being set either “on” or “off” in the Configuration screen. If the SOS Actual being input is beyond the defined range, then the user is warned with a pop-up message (as shown below) that displays the upper and lower limit (both inclusive) of the user input.

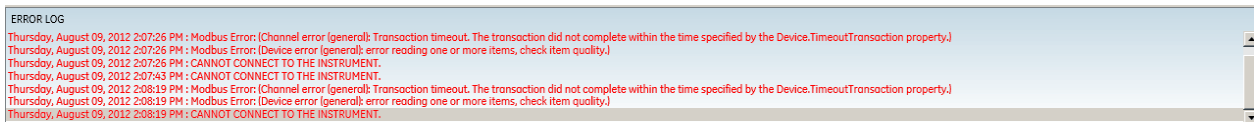




## Error Log

The **Error Log** is at the bottom of the [Main Menu](#) screen. When you click on the Error Log, a pane expands and user can see a list of different error events (that are not communicated with the instrument) occurred during the application running. These registered error events are time stamped and color coded as follows:

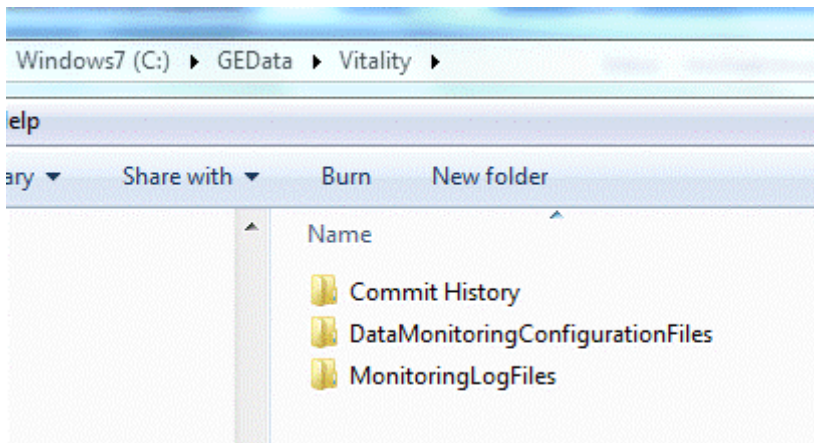
- **Red** – critical error
- **Yellow** – warning/moderate error
- **Black** – informational/expected state



If the Error Log pane is closed when an error occurred, the **Error Log** will flash red to notify the user. Right-click on the log to copy the contents to a text file or clear the error log completely if required.

## Default Directories

To store user data, **Vitality™** has set up three default folders in the directory [C:/GEData/Vitality](#):



- **Commit History** – To store Commit History file which holds changes to meter configuration while performing the [Configure](#) menu option.
- **DataMonitoringConfigurationFiles** – To store Monitoring item selection files;
- **MonitoringLogFiles** – To store log files created by **Vitality™**.

Users also have the option of saving these files in their desired location. Other files (site files and instrument log files) can be saved in any location the user designates.

## Customer Support Centers

### U.S.A.

The Boston Center  
1100 Technology Park Drive  
Billerica, MA 01821  
U.S.A.

Tel: 800 833 9438 (toll-free)  
978 437 1000

E-mail: [mstechsupport@bakerhughes.com](mailto:mstechsupport@bakerhughes.com)

### Ireland

Sensing House  
Shannon Free Zone East  
Shannon, County Clare  
Ireland

Tel: +353 61 61470200

E-mail: [mstechsupport@bakerhughes.com](mailto:mstechsupport@bakerhughes.com)

Copyright 2021 Baker Hughes company.

This material contains one or more registered trademarks of Baker Hughes Company and its subsidiaries in one or more countries. All third-party product and company names are trademarks of their respective holders.

BH076C11 EN A

**Baker Hughes** 