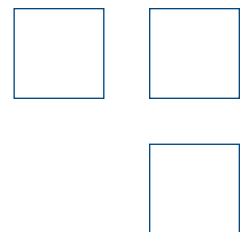


Configuration Software Manual

ST100 Series Thermal Mass Flow Meter



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Introduction

The ST100 Configuration software is a Windows PC application that lets the user easily set up and configure the ST100 Multipoint Flow Meter products. Use this tool for all instrument commissioning activity. Note that the software application serves both ST100 Series and MT100 product lines. This manual, however, covers operation with ST100 only (software version 3.1.0.x).

Installation

Find the Software Configurator MSI install file in the Software folder on the product documentation CD or downloaded over the web. The file can be identified by name – *ST MT100 Configurator v3100.msi*. Copy this file to a location on your PC designated for ST100 documentation.

Run the MSI installer file (make sure you have administrative rights to install) and follow the on-screen instructions to complete the installation. The installation process places an application shortcut icon of a stylized meter face on the Windows desktop:  The installer also creates a folder in the Start Menu named *Fluid Components Intl*, which contains another program shortcut.

Running the PC Configuration Application

Connect the host PC via USB or Ethernet as required for the application:

- Use **Ethernet** for remote applications in which the host PC communicates with the instrument over an Ethernet network. Refer to “Advanced Setup Tab Screens” on page 7 for info on setting Ethernet address values. Connect the instrument to a 100Base-T compatible network switch or hub using a Cat-5 Ethernet patch cable.
- Use **USB** for local host PC connection to the instrument. Connect the instrument to the PC USB port using the USB cable provided (Type A to Type A, male-male; passive, straight-through type).

The ST100 USB and Ethernet connectors are located on the customer interface board as shown in the figure below (remove blind lid for access).

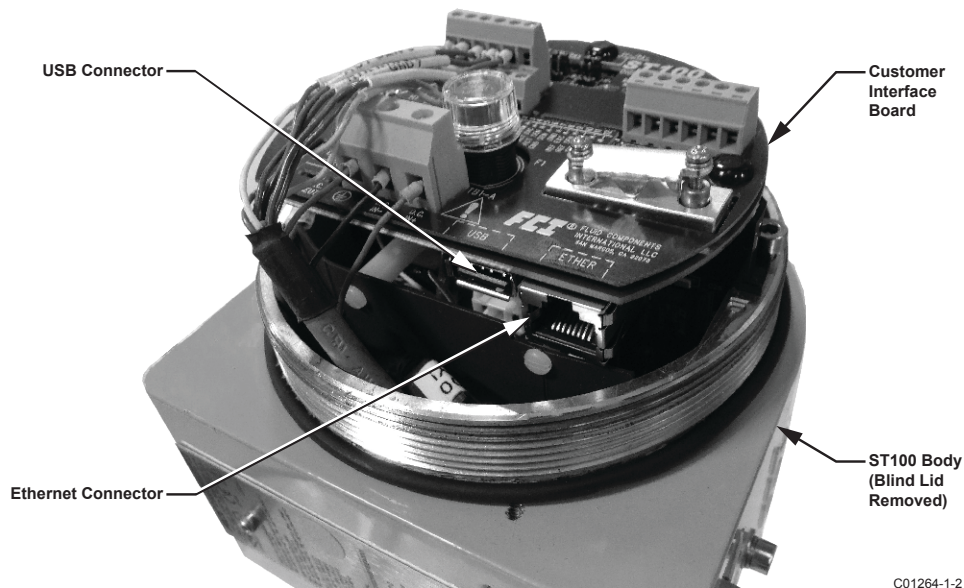
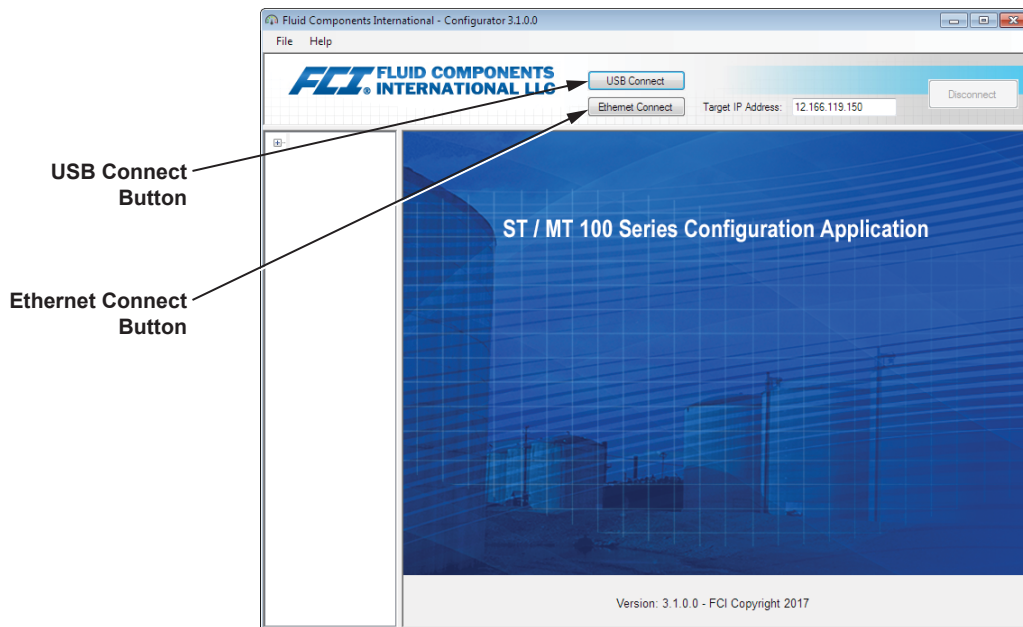


Figure 1 – USB & Ethernet Connectors on Customer Interface Board (Digital Interface Shown)

Note: To avoid any connection problems make sure the ST100 is fully booted before connecting to the PC USB port and/or launching the ST100 Configuration software.

Caution: A host PC connection is intended for temporary use only. Do not make the PC/network connection part of the permanent installation.

Double click the ST100 Configurator icon. The application opens to the Welcome screen as shown in the figure below. Click the appropriate connect button, **USB Connect** or **Ethernet Connect**, at the top of the screen to let the PC communicate with the instrument (with cable connection already made).

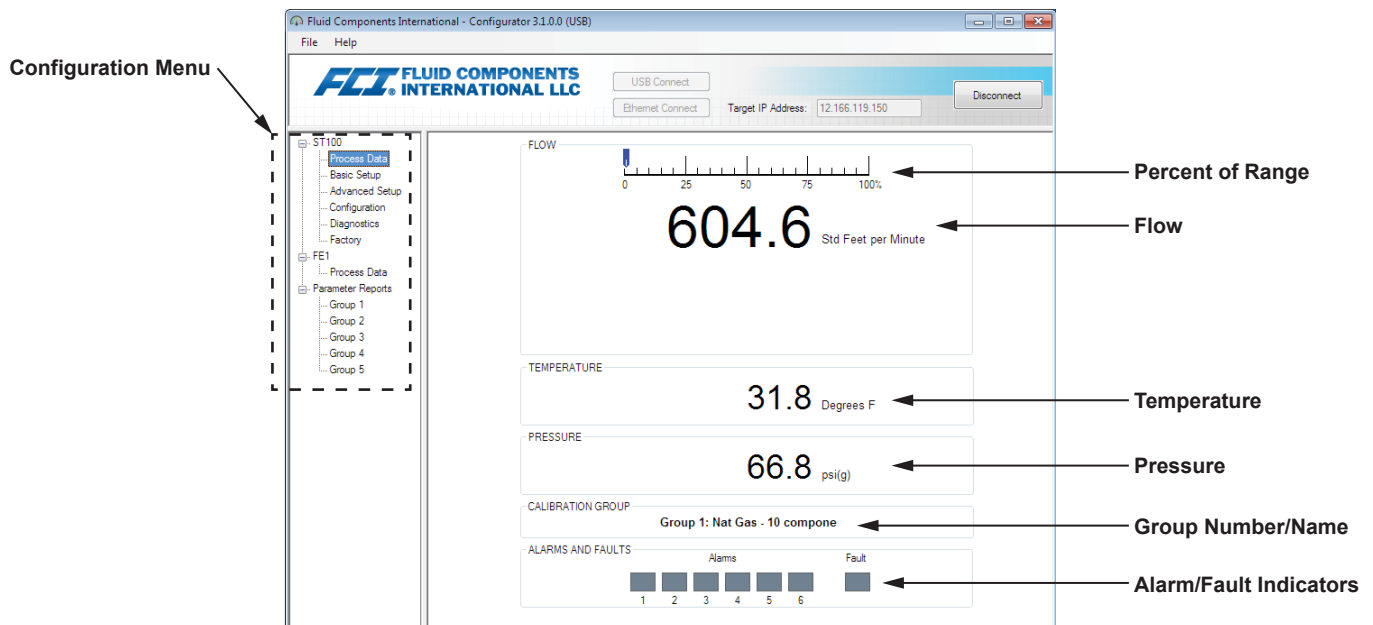


C01381-1-2

Figure 2 – Welcome Screen

Once connected, the application window shows the Process Data screen as shown in the figure below. The displayed information, which is the same as that shown on the HMI front panel display, includes the following:

- Flow as percent of range (scale)
- Flow with engineering units
- Total Flow (if Mass or Volumetric units used)
- Temperature
- Pressure (for STP Series only)
- Calibration Group **number** and Group **name**
- Alarm/Fault indicators



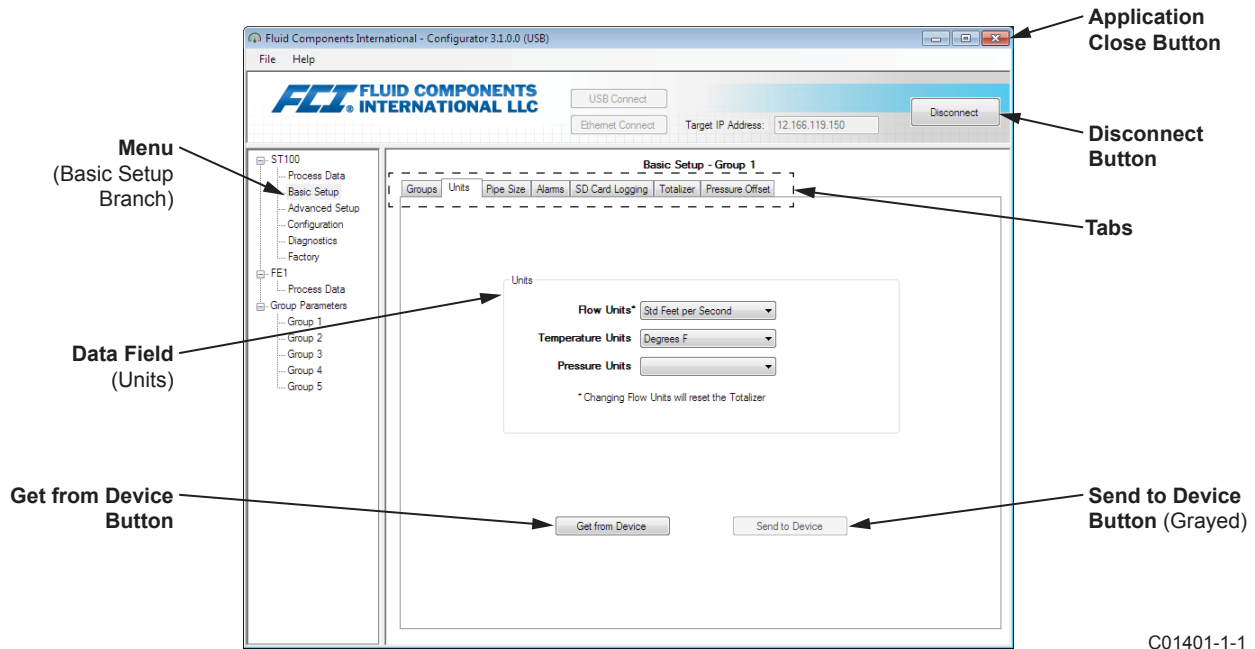
C01261-2-1

Figure 3 – Example Process Data Screen

Configuration Software Basics

The ST100 is set up using a configuration menu arranged in a hierarchical tree structure on the left side of the window. Select a menu item to see the related tabs on the right side of the window. Within the tab area parameter data is typically organized into one or more data fields, which are set off with a thin divider line or a thin box outline.

Many screens show **Get from Device** and/or **Send to Device** buttons at the bottom portion of the window. These buttons are shown if the window tab includes parameter data that can be retrieved from the instrument for display (**Get from Device**) and/or transmitted to the instrument for programming (**Send to Device**). The **Send to Device** button is normally grayed out (inactive) initially until a change is made in a data field. Once a parameter change is detected, the **Send to Device** button becomes active as shown by its solid appearance.



C01401-1-1

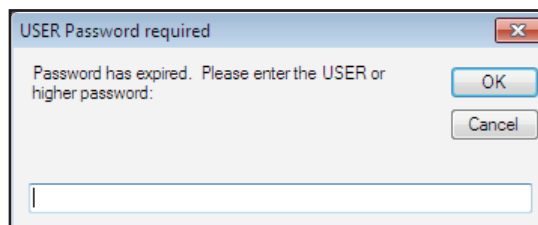
Figure 4 – Basic Application Screen Elements

Click **Disconnect** to break the connection between the PC and ST100. Click the application window *Close* button or type ALT+F4 (with the application window having the focus) to quit the application altogether.

Note: Once the PC's configuration software is communicating with the instrument, some HMI display items/menus are inactive due to control being handed over to the configuration application. For example, front panel selection of groups in the Service menu (HMI Setup mode) is inactive. Inactive HMI display menu items are shown with an asterisk (for example, **Select Group***).

Password Protection

To protect against unwanted/unauthorized change, two levels of password protection are provided: *User* and *Factory*. The User level password is associated with common user-accessed parameters that can only be changed after entering the User password. The Factory level password is associated with more sensitive programming that can only be modified by the factory or its representatives. The dialog box for password entry is shown below. When prompted, type the password and then click **OK**. The User password is: 2772. The password is also shown in this manual with the tab summary tables.



Basic Setup Tab Screens

Select the **Basic Setup** branch on the menu tree to access basic setup items. The **Groups** tab is the first of several tabs across the top of the screen. Each tab provides a particular menu within the **Basic Setup** branch.

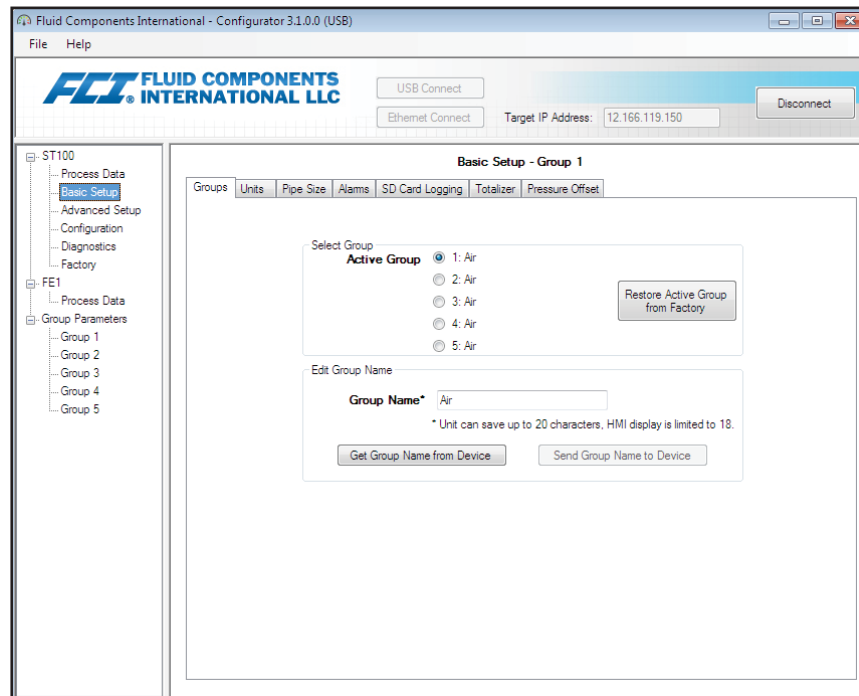


Figure 5 – Example Groups Tab (Basic Setup)

The table below summarizes the tabs within the **Basic Setup** branch.

Table 1 – Basic Setup Tabs

Tab Name	Tab Description	Password Level
Groups	Select and name groups. Switching between established groups takes place immediately once the radio button is clicked (no password required).	User
Units	Select flow and temperature units.	User
Pipe Size	Select pipe type and dimensions.	User
Alarms	Select and set alarm requirements.	User
SD Card Logging	Select logging requirements.	User
Totalizer	Select and reset Totalizer requirements.	User
Pressure Offset	Lets users enter a compensating pressure offset value so that the instrument's pressure reading matches the reading from an external trusted reference.	User

[User password 2772]

To verify the current configuration of any setup parameter, click **Get from Device** on any of the Setup menus. After changing any of the setup parameters, click **Send to Device**. Click **Get from Device** again to verify the parameter(s) change. Observe that the changed parameters are now displayed. The remaining **Basic Setup** tab screens are shown below.

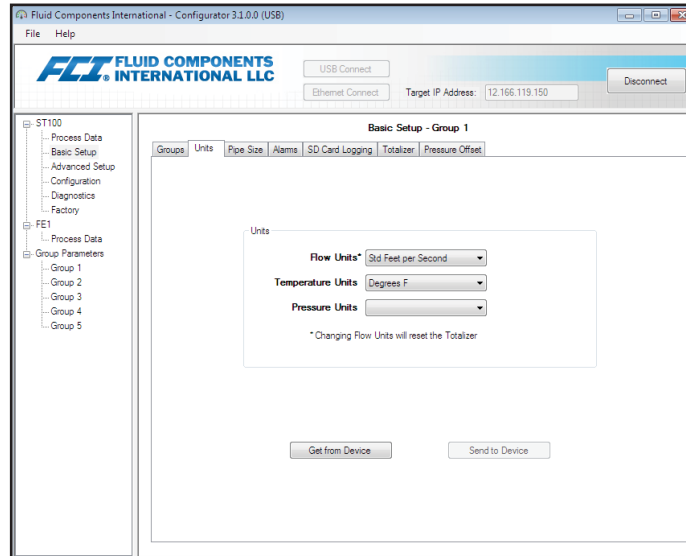


Figure 6 – Example Units Tab (Basic Setup)

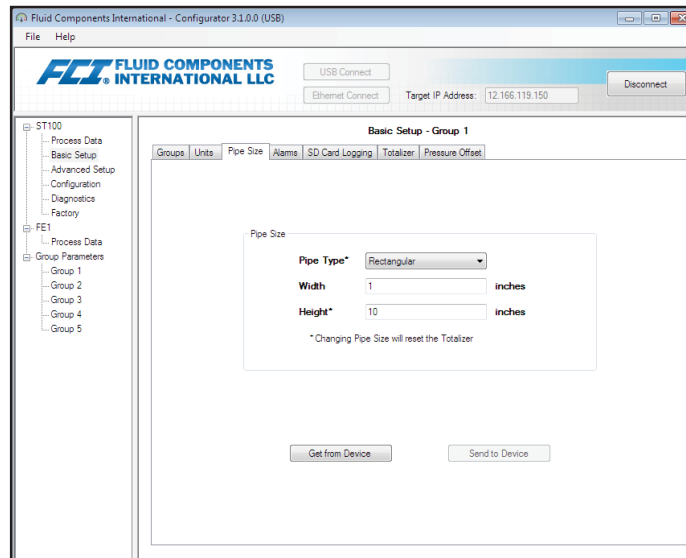


Figure 7 – Example Pipe Size Tab (Basic Setup)

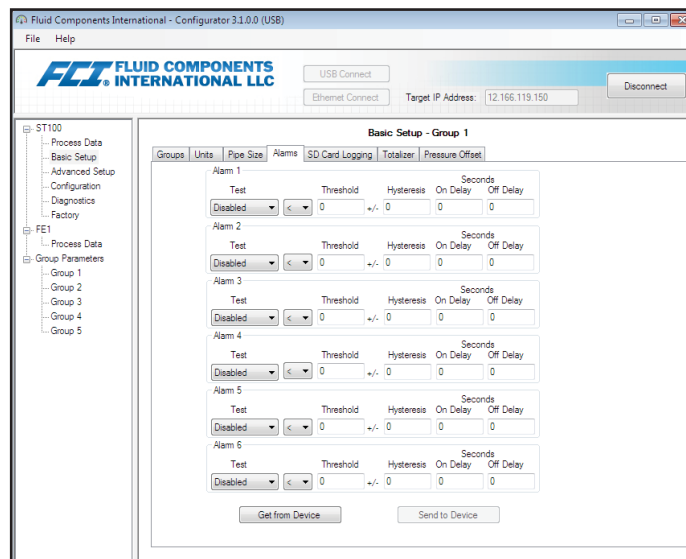


Figure 8 – Example Alarms Tab (Basic Setup)

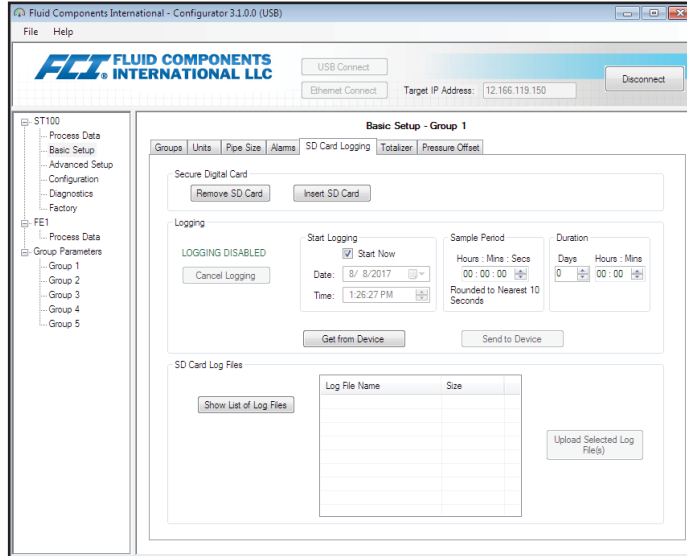


Figure 9 – Example SD Card Logging Tab (Basic Setup)

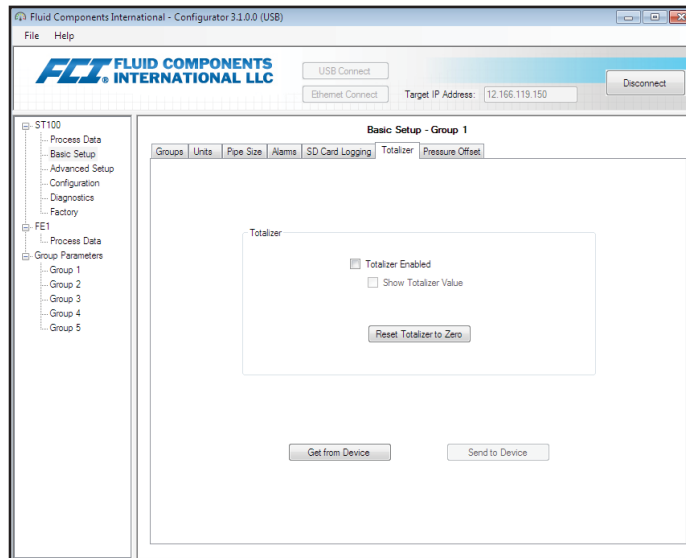


Figure 10 – Example Totalizer Tab (Basic Setup)

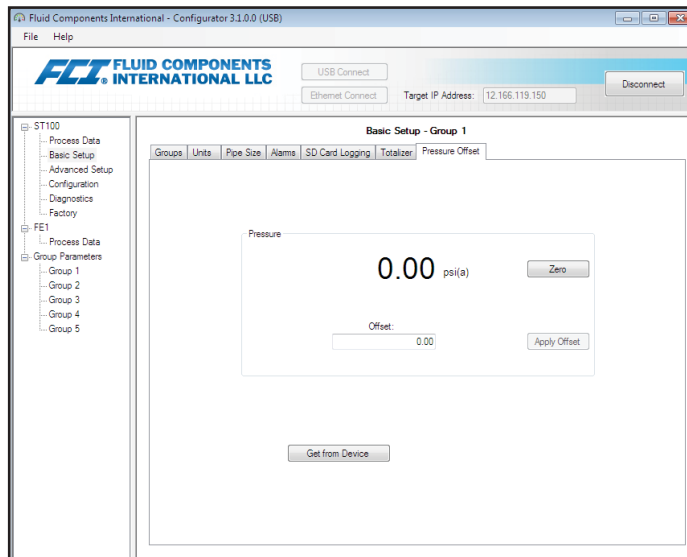


Figure 11 – Example Pressure Offset Tab (Basic Setup)

Advanced Setup Tab Screens

Select the **Advanced Setup** branch on the menu tree to access advanced setup items. The **User Parameters** tab is the first of several tabs across the top of the screen. Each tab provides a particular menu within the **Advanced Setup** branch.

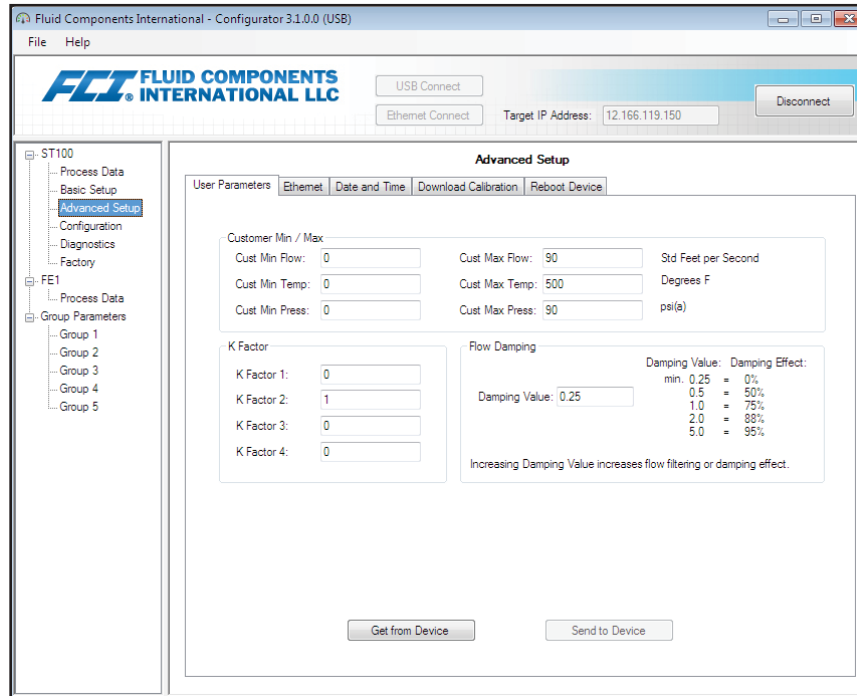


Figure 12 – Example User Parameters Tab (Advanced Setup)

The table below summarizes the tabs within the **Advanced Setup** branch.

Table 2 – Advanced Setup Tabs

Tab Name	Tab Description	Password Level
User Parameters	Shows min/max process variable limits, K Factor, and Flow Damping ¹ (increase in value = increase in flow damping).	User
Ethernet	Sets Ethernet address values (unit IP address, gateway address, and subnet mask).	User
Date and Time	Set Clock date and time. Lets users copy the system (host PC) time and transmit it to the instrument's battery-backed real time clock.	User
Download Calibration	Lets users download a full calibration to their ST100 via a text file. Contact FCI to obtain the .txt file that was generated by the factory linearization software (Cal2).	User
Reboot Device	Lets users perform a warm boot of the ST100.	User

Note 1. Flow damping smooths out flow signal output. Flow response is reduced with high flow damping values.

[User password 2772]

To verify the current configuration of any setup parameter, click **Get from Device** on any of the Setup menus. After changing any of the setup parameters, click **Send to Device**. Click **Get from Device** again to verify the parameter(s) change. Observe that the changed parameters are now displayed. The remaining **Advanced Setup** tab screens are shown below.

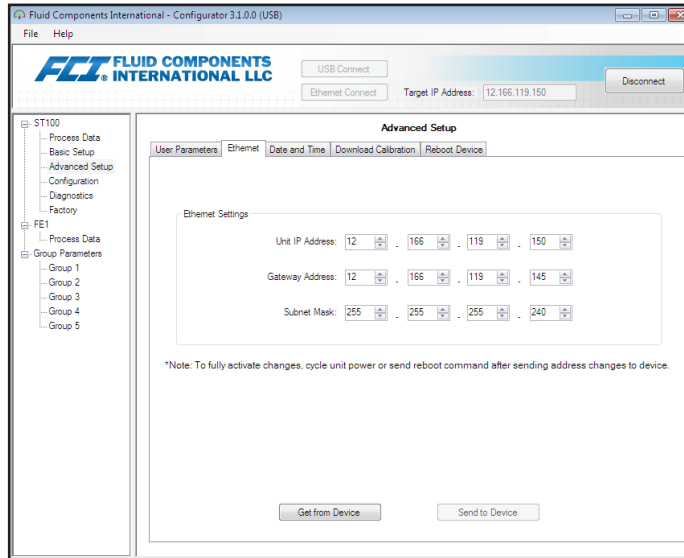


Figure 13 – Example Ethernet Tab (Advanced Setup)

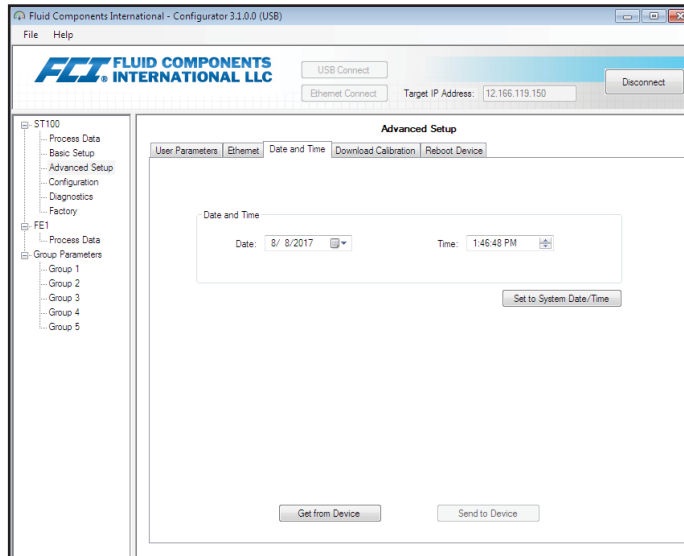


Figure 14 – Example Data and Time Tab (Advanced Setup)

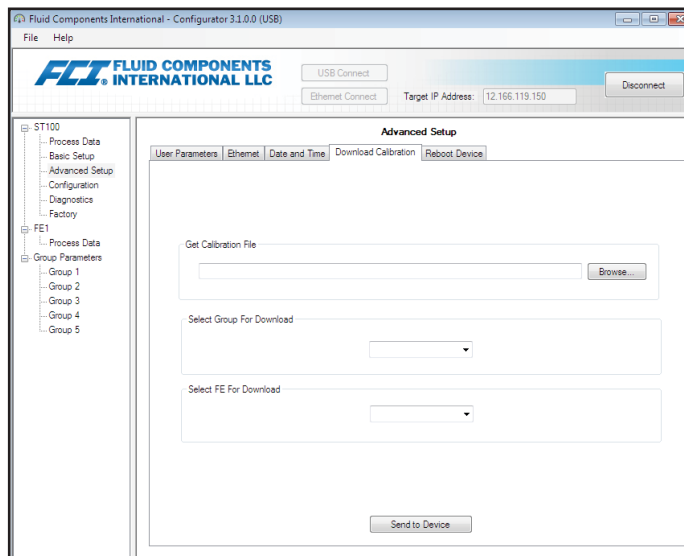


Figure 15 – Example Download Calibration Tab (Advanced Setup)

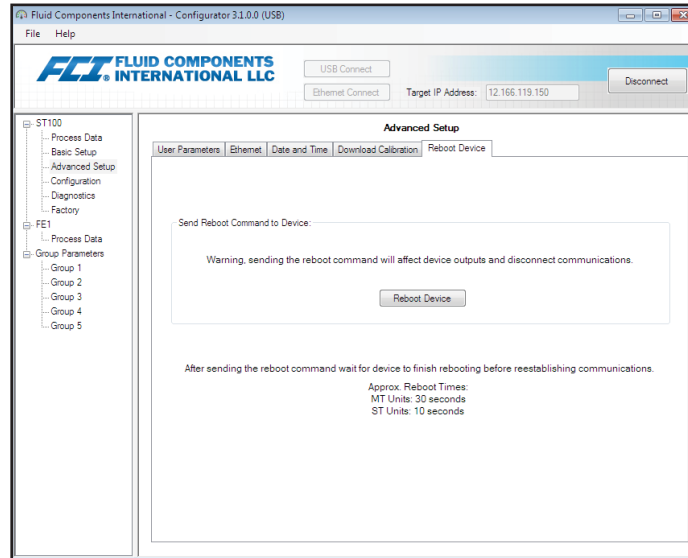


Figure 16 – Example Reboot Device Tab (Advanced Setup)

Configuration Tab Screens

Select the **Configuration** branch on the menu tree to access configuration setup items. The **Output** tab is the first of several tabs across the top of the screen. Each tab provides a particular menu within the **Configuration** branch. **For ST100 units with AST only** (shown with AST label in menu tree): The **AST Power Mode** tab is added to the configuration setup screens.

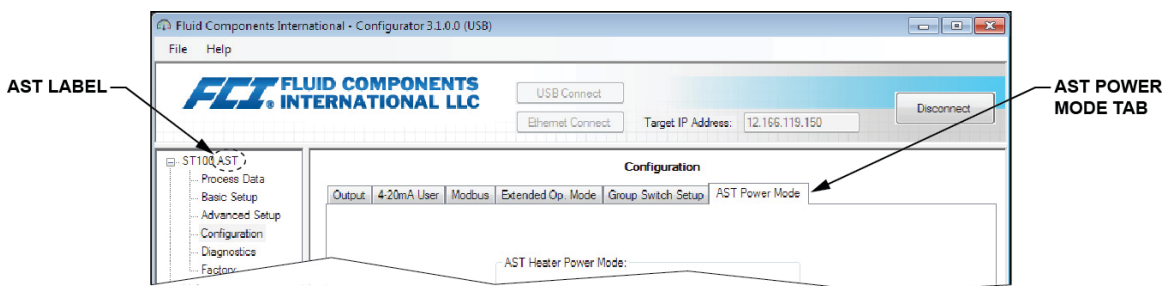
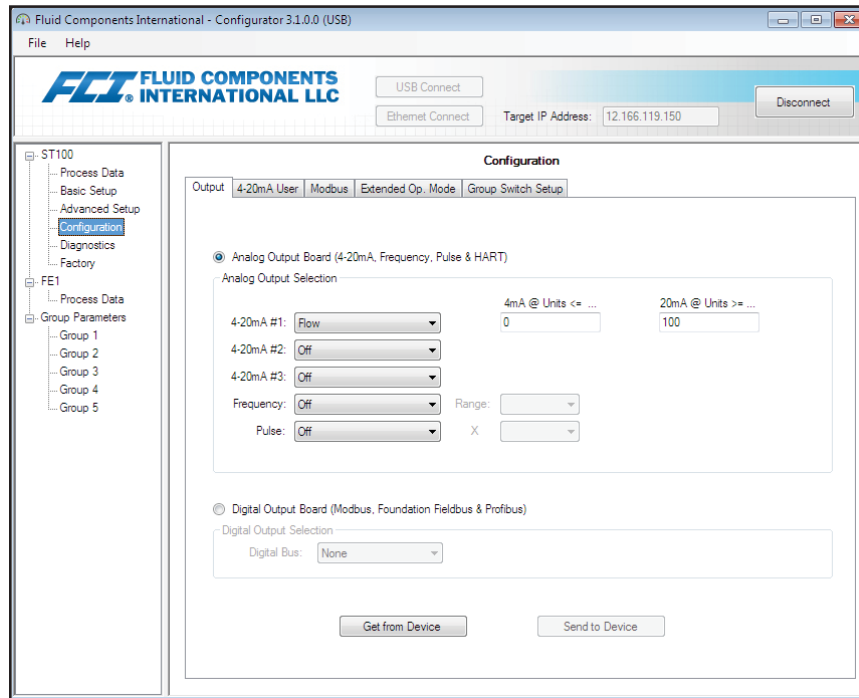


Figure 17 – Example Output Tab (Configuration)

The table below summarizes the tabs within the **Configuration** branch.

Table 3 – Configuration Tabs

Tab Name	Tab Description	Password Level
Output	Analog Output board: Sets 4-20 mA channel configuration ¹ and Frequency and Pulse output configuration. Digital Output board: Selects Modbus or FF/Profibus ² .	User
4-20mA User	Manual mA Output loop check; configure/enable NAMUR fault.	User
Modbus	Sets Modbus communication parameters.	User
Extended Op. Mode	Expands flow measurement capabilities by providing 3 additional modes of operation. Refer to Extended Operation Modes in main manual 06EN003400 for detailed information.	User
Group Switch Setup	Sets up automatic calibration group switching depending on an external 4-20 mA output driving the ST100 auxiliary input port. Refer to External Control Group Switching (EGS) in main manual 06EN003400 for detailed information.	User
AST Power Mode	For ST100 units with AST only: Sets heater mode (Constant Delta T [AST] or Constant Power) and max. heater current for AST (90 mA or 105 mA). The max. current value forms the threshold at which the instrument switches over to Constant Power mode.	User

Note 1. To set **HART** operation, select *HART Flow* from 4-20 mA #1 drop-down list (in *Analog Output Selection* field).

Note 2. Digital busses (includes HART, Modbus, and FF/Profibus) are mutually exclusive, meaning only one can be active at a time. Attempting to enable HART when Modbus or FF/Profibus is in effect causes the Digital Bus Deactivation Warning dialog to display: Click **OK** to make the change and force the Digital Output Selection to *None* or click **Cancel** to leave the setting unchanged. Attempting to enable Modbus or FF/Profibus when HART is in effect causes the HART Deactivation Warning dialog to display: Click **OK** to make the change and force the 4-20 mA #1 Selection to *Flow* or click **Cancel** to leave the setting unchanged.

[User password 2772]

To verify the current configuration of any setup parameter, click **Get from Device** on any of the Setup menus. After changing any of the setup parameters, click **Send to Device**. Click **Get from Device** again to verify the parameter(s) change. Observe that the changed parameters are now displayed. The remaining **Configuration** tab screens are shown below.

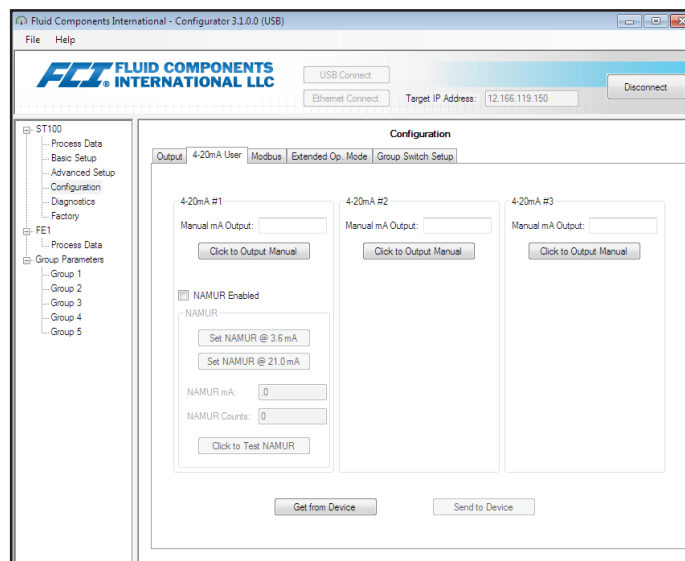


Figure 18 – Example 4-20mA User Tab (Configuration)

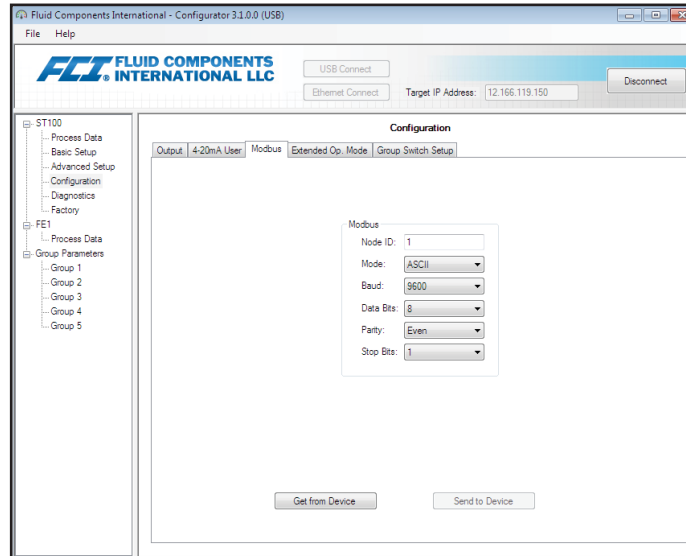


Figure 19 – Example Modbus Tab (Configuration)

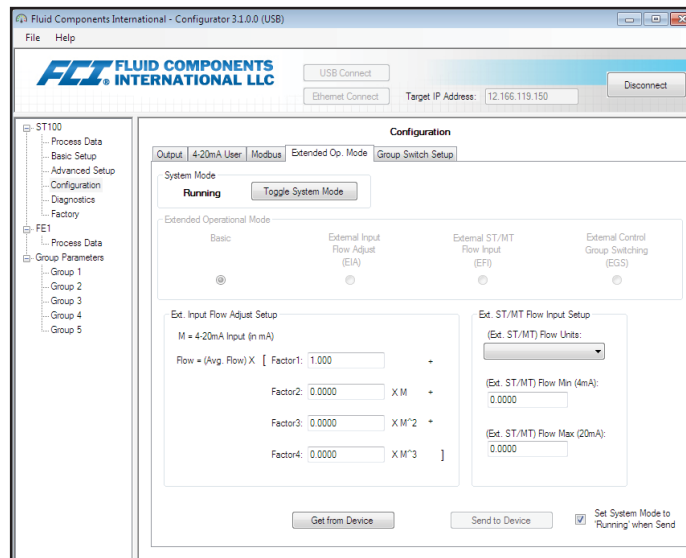


Figure 20 – Example Extended Op. Mode Tab (Configuration)

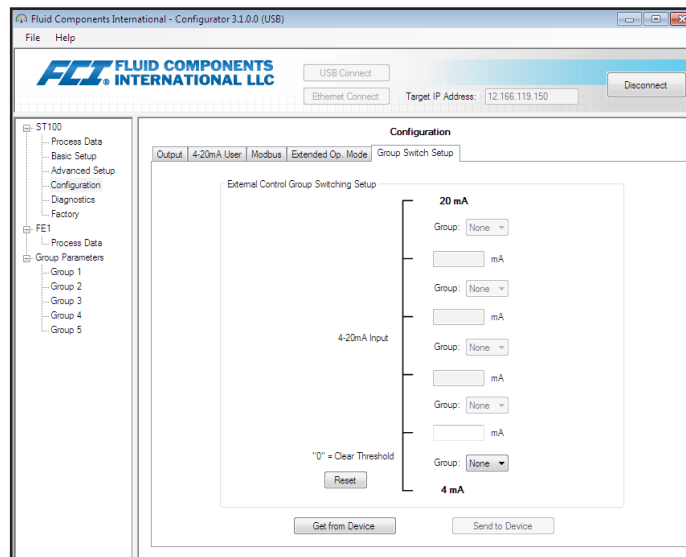


Figure 21 – Example Group Switch Setup Tab (Configuration)

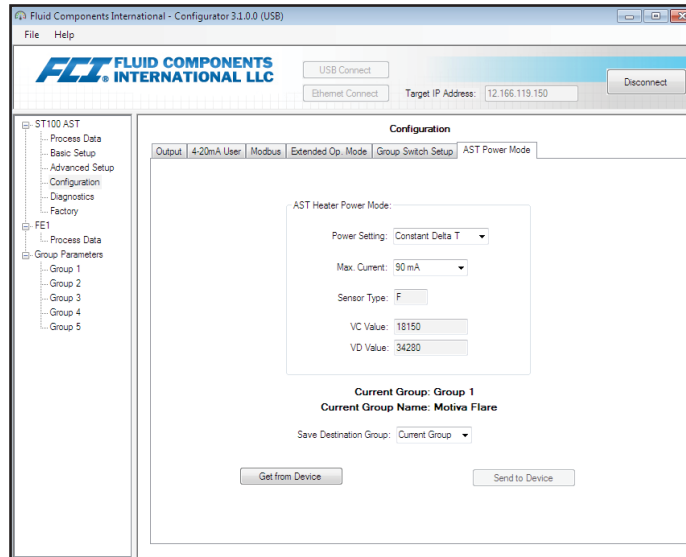


Figure 22 – Example AST Power Mode Tab (Configuration)

Diagnostics Tab Screens

Select the **Diagnostics** branch on the menu tree to access diagnostic items. The **Status** tab is the first of several tabs across the top of the screen. Each tab provides a particular menu within the **Diagnostics** branch. The table below summarizes the tabs within the **Diagnostics** branch.

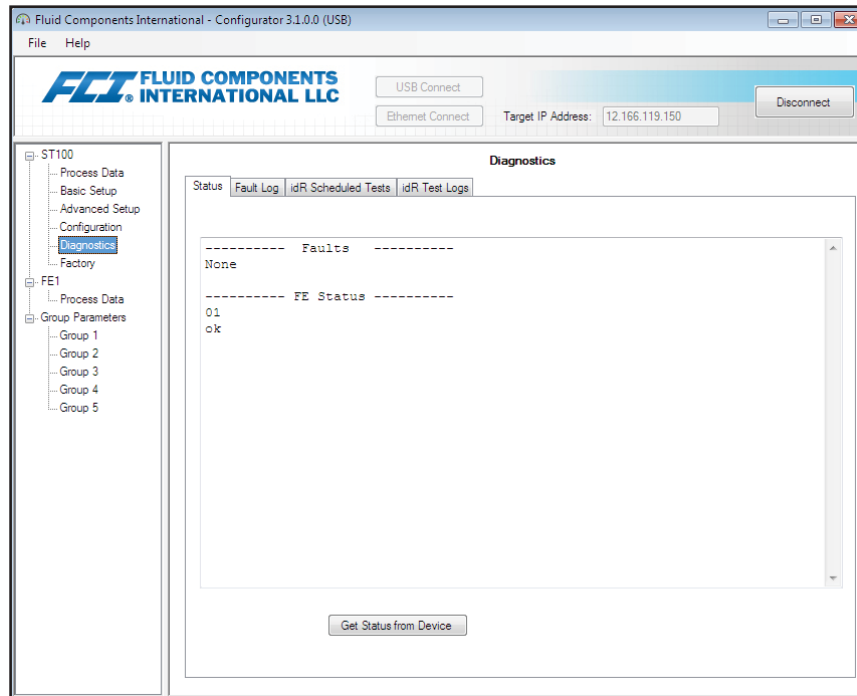


Figure 23 – Example Status Tab (Diagnostics)

Table 4 – Diagnostics Tabs

Tab Name	Tab Description	Password Level
Status	Indicates system status and fault flags.	Read only
Fault Log	Shows fault history. Click Get Fault Logs from Device to list the faults in the scrollable text box. Click Clear Fault Log to clear the log.	User
idR Scheduled Tests ¹	For internal Delta R (idR) resistance check – Select FE (FE1 or, for dual-point models, FE2), set pass/fail criteria, set FE output mode during test, schedule periodic idR test, display previous idR test results, and start idR test on-demand. Test results display in FEx idR Test Results field (table format) when finished.	User
idR Test Logs	Click Get Test Log from Device to show idR test results in the scrollable text box. Click Clear Test Logs to clear the log.	User

[User password 2772]

The remaining **Diagnostics** tab screens are shown below.

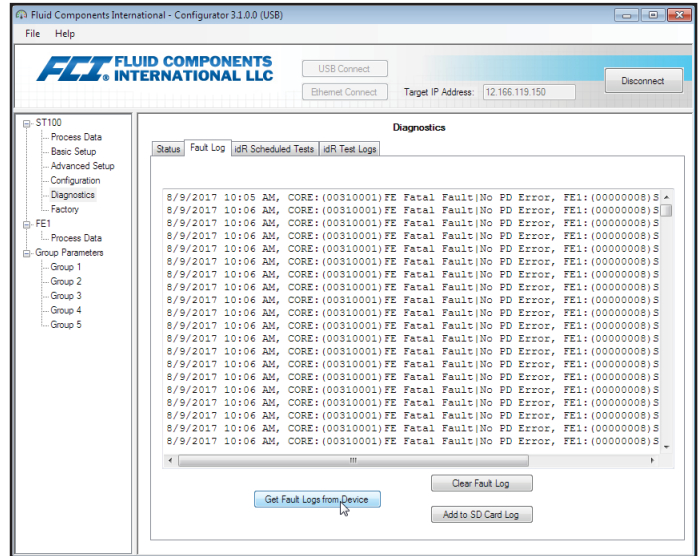
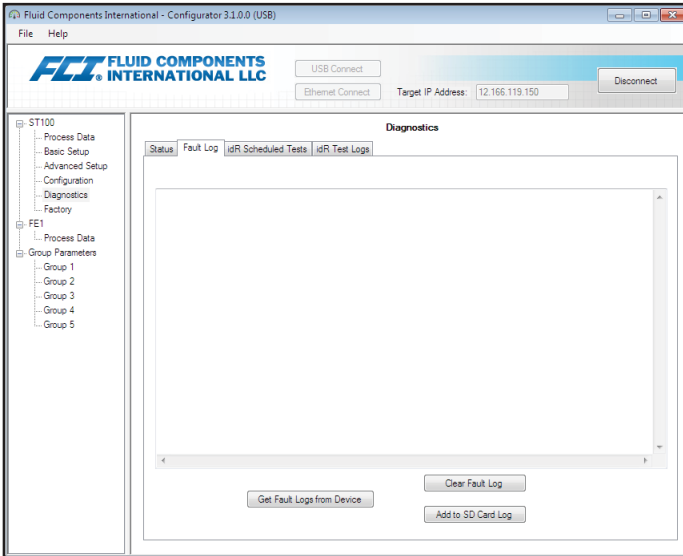


Figure 24 – Example Fault Log Tab and Example Fault Log List (Diagnostics)

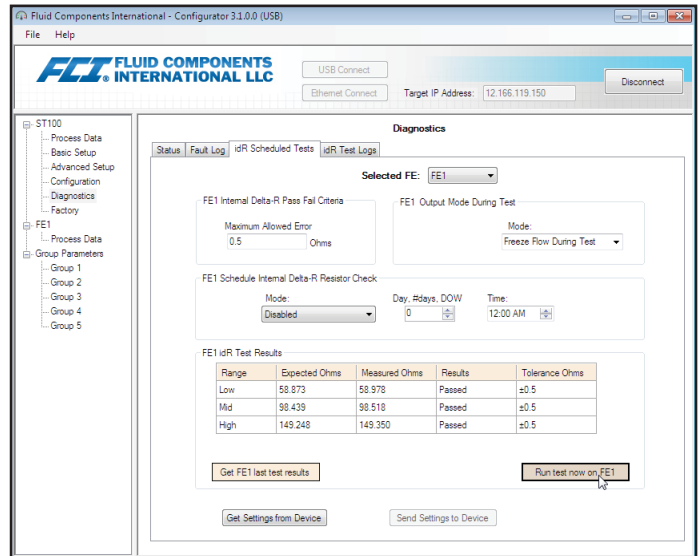
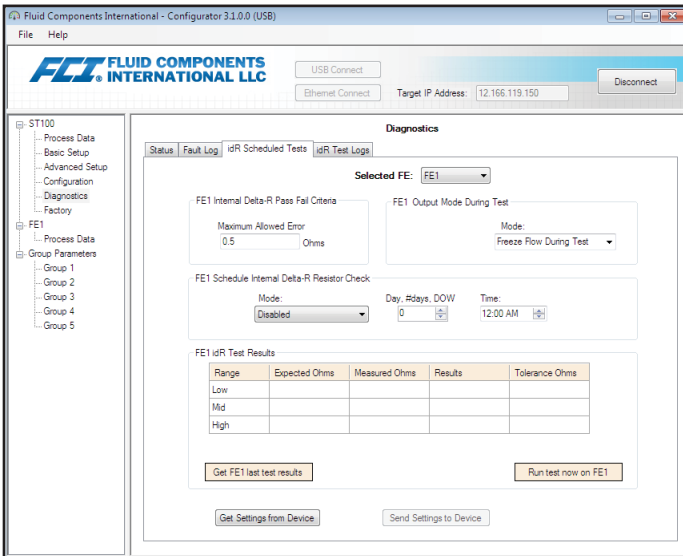


Figure 25 – Example idR Scheduled Tests Tab and Example idR On-Demand Test Results Display (Diagnostics)

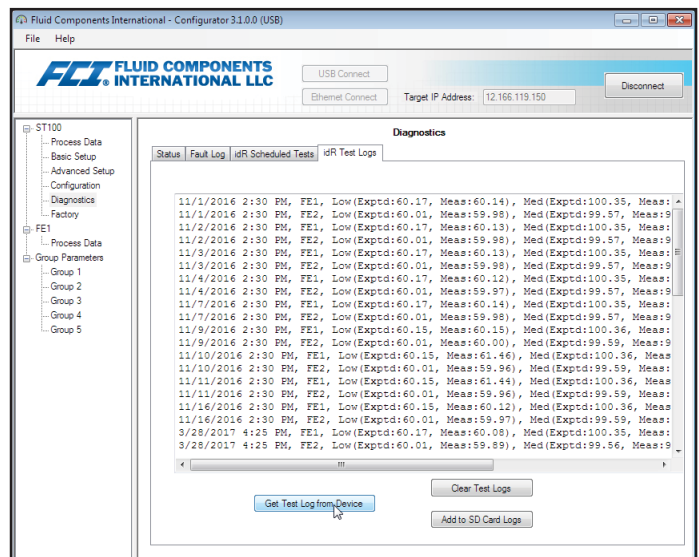
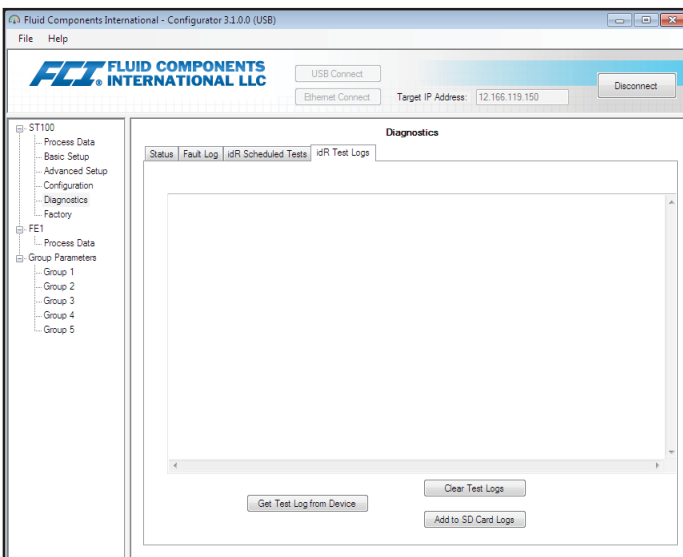


Figure 26 – Example idR Test Logs Tab and Example idR Test Log List (Diagnostics)

Factory Tab Screens

The **Factory** branch on the menu tree provides factory-only setup items. Only the factory or its representatives can change data in this group.

Table 5 – Factory Tabs

Tab Name	Tab Description	Password Level
Factory Parameters	Factory use only. (Calibrated Min/Max data.)	Factory
Identification	Factory use only. (Instrument ID data and unit MAC address.)	Factory
4-20mA Factory	Factory use only. (4-20 mA output DAC count scaling and manual output control, plus 4-20 mA input raw A/D counts and gain & offset adjustment.)	Factory
Options	Factory use only. (Option inventory: HMI display, FEs [2 max. for ST100]), and pressure sensor type.	Factory
HART	Factory use only. (HART ID info: electronics revision, HART ID, int. HART rev.)	Factory
Memory	Factory use only. (Erase various memory spaces.)	Factory
Reset idRs	Factory use only. (Run idR check for selected FE, and then set <i>Measured Ohms</i> values as new baseline for <i>Expected Ohms</i> values [click Reset Expected idR Values]).	Factory

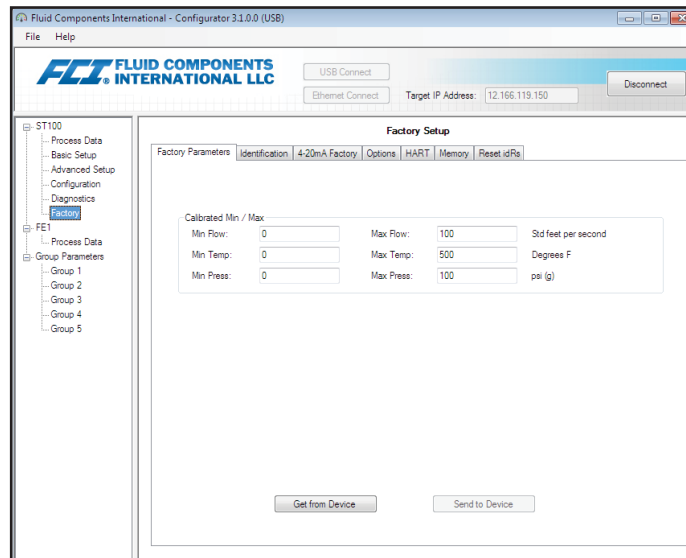


Figure 27 – Example Factory Parameters Tab (Factory)

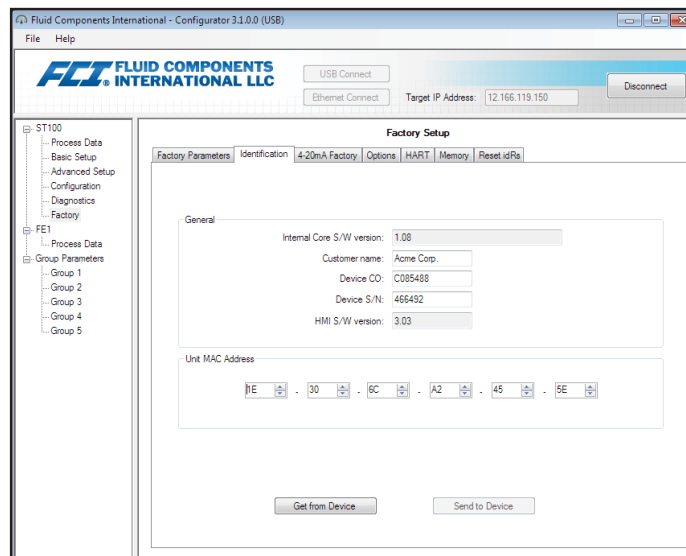


Figure 28 – Example Identification Tab (Factory)

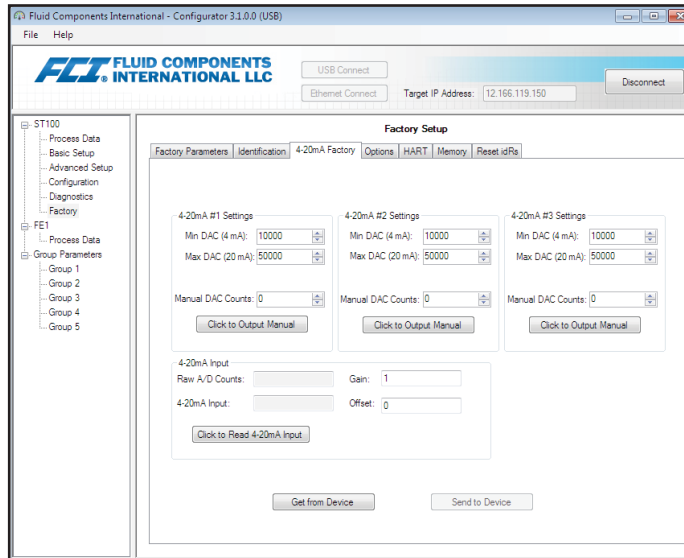


Figure 29 – Example 4-20mA Factory Tab (Factory)

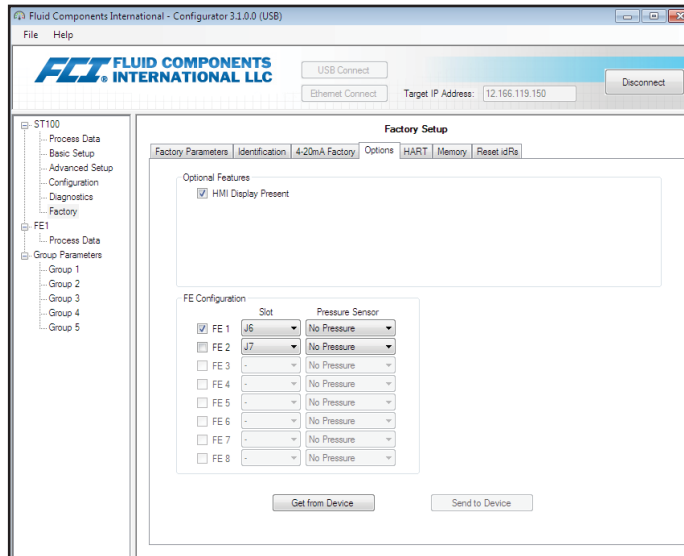


Figure 30 – Example Options Tab (Factory)

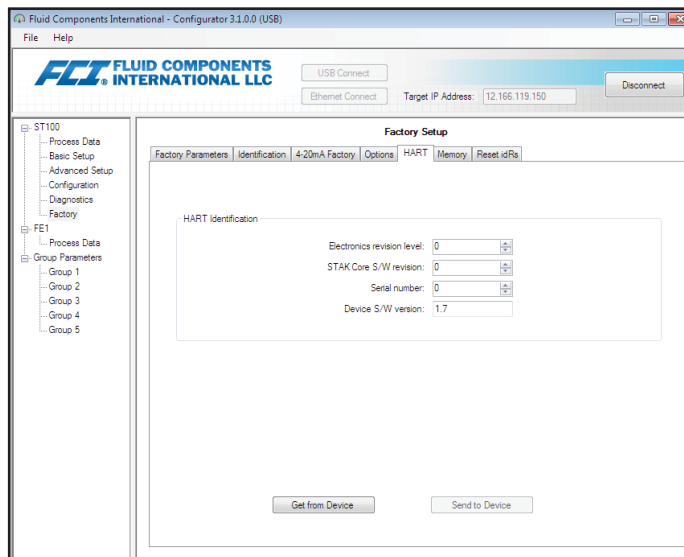


Figure 31 – Example HART Tab (Factory)

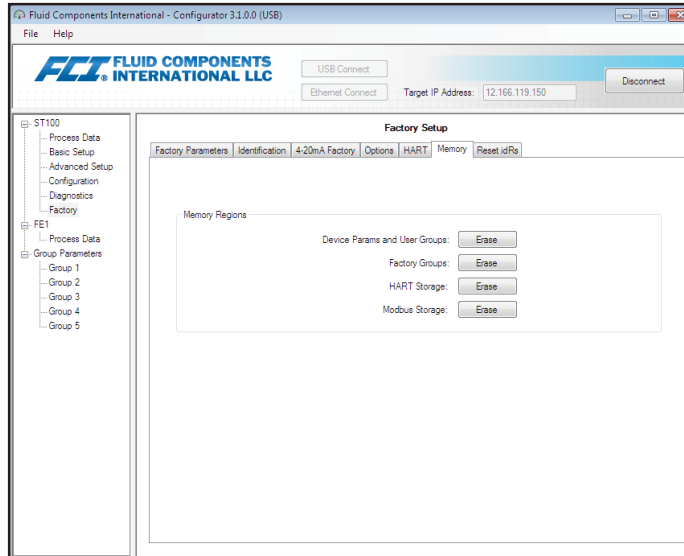


Figure 32 – Example Memory Tab (Factory)

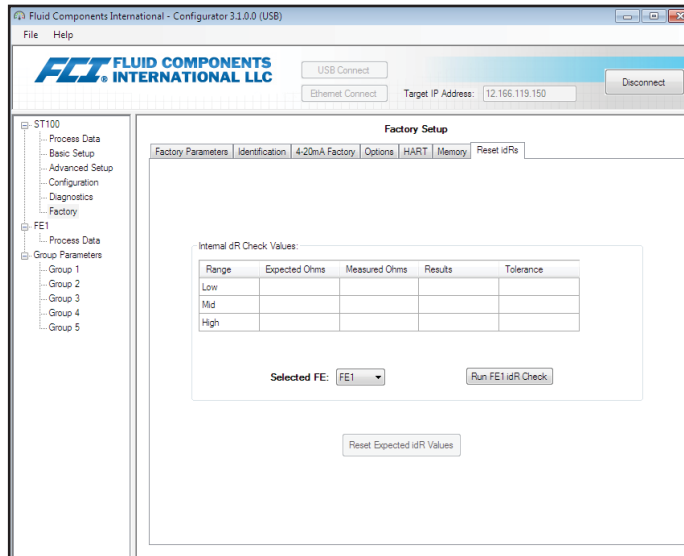


Figure 33 – Example Reset idRs Tab (Factory)

FE1-FE2 Process Data

Depending on the system configuration (options) the application menu tree shows FE process data for either FE1 only or, for ST100 Series models with dual point flow elements, FE1 and FE2. For the purpose of this discussion we will focus on **FE1**—the FE2 process data screen is similar. Select the **FE1 Process Data** branch on the menu tree. The figure below shows an example FE1 Process Data screen.

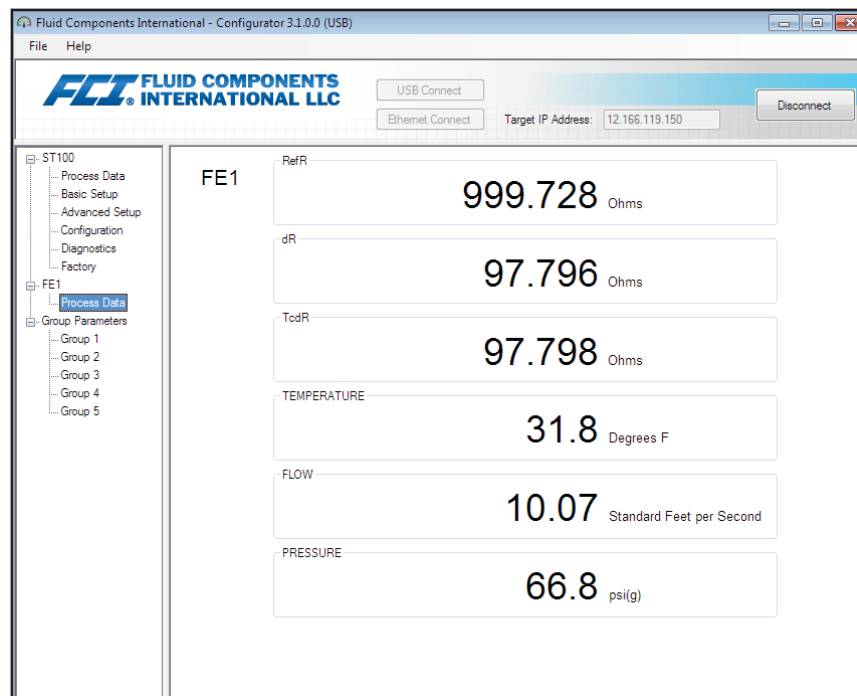


Figure 34 – Example Process Data Screen (FE1)

This screen displays the real time values of the following flow element parameters:

- RefR – Reference RTD resistance
- dR – Delta resistance between the active and reference RTDs
- TCdR – Temperature Compensated dR value
- Temperature – Real time temperature value
- Flow – Real time flow value
- Pressure – Real time pressure value (applies to STP models only)

This screen can be helpful when diagnosing system faults.

Parameter Reports

A **Parameter Reports** screen (under *Group Parameters* in the menu tree) displays the calibration and configuration information saved in the ST100 unit for a particular calibration group numbered 1-5. Selecting a parameter report for a particular calibration group displays that group's info/data. Similar to other setup menus there is a **Send Changes to Device** button to transmit (to ST100) any parameter change. Use of the **Send** button, however, is a factory-only operation that requires the Factory level password.

Destination	Parameter Name	Parameter Value
CORE	Date and Time:	7/30/3331 11:15:20 AM
CORE	Unit Serial Number:	442759
CORE	Cust Number:	
CORE	Cust Name:	Acme Corp.
CORE	Core Version:	1.08
CORE	HMI Version:	3.03
CORE	MAC Address:	1E.30.6C.A2.45.5E
CORE	HART Serial Number:	0
CORE	Ext Op Mode:	1
CORE	Ext Op Submode:	0
CORE	4-20mA Inp. Adj Gain:	1
CORE	4-20mA Inp. Adj Offset:	0
CORE	EFI Flow Min.:	0
CORE	EFI Flow Max.:	0
CORE	EFI Flow Units:	0
CORE	EGS Threshold1:	0
CORE	EGS Group1 ID:	0
CORE	EGS Threshold2:	0
CORE	EGS Group2 ID:	0
CORE	EGS Threshold3:	0
CORE	EGS Group3 ID:	0
CORE	EGS Threshold4:	0
CORE	EGS Group4 ID:	0
CORE	EGS Group5 ID:	0

Figure 35 – Example Parameter Report, Group 1

Destination	Parameter Name	Parameter Value
CORE	Date and Time:	7/30/3331 11:17:33 AM
CORE	Unit Serial Number:	442759
CORE	Cust Number:	
CORE	Cust Name:	Acme Corp.
CORE	Core Version:	1.08
CORE	HMI Version:	3.03
CORE	MAC Address:	1E.30.6C.A2.45.5E
CORE	HART Serial Number:	0
CORE	Ext Op Mode:	1
CORE	Ext Op Submode:	0
CORE	4-20mA Inp. Adj Gain:	1
CORE	4-20mA Inp. Adj Offset:	0
CORE	EFI Flow Min.:	0
CORE	EFI Flow Max.:	0
CORE	EFI Flow Units:	0
CORE	EGS Threshold1:	0
CORE	EGS Group1 ID:	0
CORE	EGS Threshold2:	0
CORE	EGS Group2 ID:	0
CORE	EGS Threshold3:	0
CORE	EGS Group3 ID:	0
CORE	EGS Threshold4:	0
CORE	EGS Group4 ID:	0
CORE	EGS Group5 ID:	0

Figure 36 – Example Parameter Report, Group 5

Customer Service/Technical Support

FCI provides full in-house technical support. Additional technical representation is also provided by FCI field representatives.

By Mail

Fluid Components International LLC
1755 La Costa Meadows Dr.
San Marcos, CA 92078-5115 USA
Attn: Customer Service Department

By Phone

Contact the area FCI regional representative. If a field representative is unable to be contacted or if a situation is unable to be resolved, contact the FCI Customer Service Department toll free at 1 (800) 854-1993.

By Fax

To describe problems in a graphical or pictorial manner, send a fax including a phone or fax number to the regional representative. Again, FCI is available by facsimile if all possibilities have been exhausted with the authorized factory representative. Our fax number is 1 (760) 736-6250; it is available 7 days a week, 24 hours a day.

By Email

FCI Customer Service can be contacted by email at: techsupport@fluidcomponents.com.

Describe the problem in detail making sure a telephone number and best time to be contacted is stated in the email.

International Support

For product information or product support outside the contiguous United States, Alaska, or Hawaii, contact your country's FCI International Representative or the one nearest to you.

After Hours Support

For product information visit FCI at www.fluidcomponents.com. For product support call 1 (800) 854-1993 and follow the prerecorded instructions.

Point of Contact

The point of contact for service, or return of equipment to FCI is your authorized FCI sales/service office. To locate the office nearest you, please go to www.fluidcomponents.com.



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