Instruction

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PCMV Intelligent Field Device Configurator for use with IMV25-D, IMV25-T, IMV30-D, and IMV30-T Multivariable Transmitters

Schneider Electric™

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Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER
DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION
CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

1. Introduction

Overview

The PCMV Intelligent Field Device Configurator is a software package providing remote bidirectional communication with the Foxboro IMV25 and IMV30 Multivariable Transmitters. It configures all parameters in the transmitters (including configuration for flow rate applications in the IMV30), whereas only limited transmitter configuration capability is available from the optional display on the transmitter. Features of the configurator include:

- Capability to read all measurements
- Ability to set up the transmitter for any pertinent application
- Capability to configure flow rate data (IMV30 only)
- Test modes to read predicted flowrate and density (IMV30 only)
- Accurate reranging without recalibration
- Full screen device database display
- Enhanced device diagnostic capability
- Field-proven FSK communication
- Communication that does not affect output when reading measurements
- User-configurable measurement data graphical trend display
- Capability to reconfigure, copy, and clone databases
- Capability to upload and download device databases
- Capability to print out device databases
- Unlimited device database storage on diskette or hard disk
- Offline configuration (preconfiguration) for FoxCom devices only at this time.

The configurator hardware/software package is designed to run from a PC with the following suggested minimum specifications:

- Windows® ME, Windows NT Workstation 4.0 (SP5+), Windows 2000 Professional (SP1), or Windows XP

NOTE

It does not run with Windows 3.1, Windows 95, or Windows CE.

- 400 MHz Pentium® with 64 MB RAM (128 MB RAM for Windows 2000 professional)
- 4X CD-ROM drive (8X recommended)
- Microsoft® mouse or compatible pointing device
- 20 MB of available hard disk space
- Internet Explorer 5.5 or greater.

Standard Equipment with the HART® Modem

The standard equipment with the HART modem includes the following items:

- Configurator software (1 CD)

- One HART external modem (can be attached by Velcro strips to back side of laptop computers)
- One 5-foot cable (desktop PC to modem)
- One 1-foot cable (laptop PC to modem)
- One 5-foot cable for connecting the modem to device loop wiring or for connecting the optional power supply to a device
- Velcro strips
- Instructions
- Two test clips.

Standard Equipment with the FoxCom™ Modem

The standard equipment with the FoxCom modem includes the following items:

- Configurator software (1 CD)
- One external modem (can be attached by Velcro® strips to back side of laptop computers)
- One 5-foot cable (desktop PC to modem)
- One 1-foot cable (laptop PC to modem)
- One 5-foot cable for connecting the modem to device loop wiring or for connecting the optional power supply to a device
- Velcro strips
- Instructions
- Two test clips.

Optional Equipment

The power supply option (120 V ac to 24 V dc converter) is used with devices that require a 24 V dc supply. The option is not required to power the modem because the power for the modem is obtained through the serial port connection to the PC.

PCMV Software Modules

There are three primary software modules automatically installed during the installation of PCMV software. For details of these modules, see “PCMV Software Modules” on page 17.

Reference Documents

For additional and related information, refer to the documents listed in Table 1.

Table 1. Reference Documents

Document	Description
B0193XX	Checklist for FoxCom Measurement Integration
DP 020-432	Dimensional Print – IMV25 and IMV30 Multivariable Transmitter
MI 020-350	Instruction – Wiring Guidelines for Foxboro Intelligent Transmitters
MI 020-382	Instruction – IMV25-T and IMV30-T (HART) Multivariable Transmitter
MI 020-432	Instruction – IMV25-D and IMV30-D (FoxCom) Multivariable Transmitter
MI 020-427	Instruction – Intrinsic Safety Connection Diagrams
PL 009-018	Parts List – IMV30 Multivariable Transmitter
PL 009-019	Parts List – IMV25 Multivariable Transmitter

2. Quick Start

PCMV Configurator

The PCMV configurator software package configures all parameters in the IMV25 and IMV30 Transmitters (including configuration for flow rate applications in the IMV30), whereas only limited transmitter configuration capability is available from the optional display on the transmitter.

PCMV Software Modules

There are three primary software modules automatically installed during the installation of PCMV software.

PCMVcfg

The PCMVcfg module is used for communications with the transmitter and for both configuration and calibration of the transmitter. It also can be used to view transmitter status and diagnostics. When connected to an IMV30 transmitter, it also has a transmitter flow rate equation test feature which allows you to enter any values of differential pressure, static pressure, and process temperature (within range), download them to the transmitter, and have the transmitter report back the calculated flow rate for those conditions.

PCMVa (IMV30 only)

The PCMVa module is used to begin the flow rate configuration process by allowing user entry of the differential pressure range, static pressure range, and process temperature range over which the flow rate equations are configured and valid.

Following a valid flow rate configuration, it provides the resultant valid flow rate and density ranges for the configuration and presents this data in both graphs and tables.

PCMVa also includes a test function to allow you to enter any combination of differential pressure, static pressure, and process temperature (within range), and read the predicted flow rate and density computed from the transmitter flow rate equations and running in the PCMVa configurator. This is accomplished without the need to download and upload information to and from the transmitter.

PCMVb (IMV30 only)

The PCMVb module is used to configure all details of the flow rate application, including fluid, primary device type, flow measurement standard, pipe and primary device materials, pipe and primary device bore sizes, and so forth. It also displays the calculated density and flow rate at normal operating conditions, using comprehensive equations from Richard Miller's *Flow Measurement Engineering Handbook* and contains an extensive fluid properties database for over 275 fluids.

PCMV Software Installation

Insert the CD into the CD drive on your personal computer. The software has an autostart feature so that if you wait a short while, it automatically starts. Follow the on-screen instructions. If it does not automatically start, use Windows Explorer and double click on the `Setup` icon. If you have a previous version of PCMV already installed and want to upgrade to the latest version, follow the instructions for removing the old software first. Do **not** use the standard Windows uninstall program. Then proceed with the installation of the new version. Also, assure that no other programs are assigned to the comport you specify.

Communications with the Transmitter

Communication between your personal computer and the transmitter requires a modem. This is the same modem used with the PC10 and PC20 Configurator software packages. If you need to purchase this modem, contact Global Customer Support.

3. Installation

Configurator Hardware Installation

⚠ WARNING
EXPLOSION HAZARD The modem shipped with the configurator is not intrinsically safe and should not be connected directly to an intrinsically safe circuit. It is permissible to connect these modems to the nonhazardous side of an intrinsically safe barrier. Failure to follow these instructions can result in death or serious injury.

NOTE

1. All hardware supplied wit Schneider Electric PC10 or PC20 configurator software packages can be used with this configurator. Just load the PCMV software into your personal computer and use your existing Schneider Electric hardware. All connections between the computer, the device, and the modem are identical to those used with the PC-Based Schneider Electric configurators.
2. Use an external modem. Other brands of HART modems may not support PCMV. If you need to purchase a modem, contact Global Customer Support.

Attaching the Modem to the Serial Port

Attach your modem to your computer serial port (COM1 or COM2). If the computer serial port has a 25-pin connector, use a 25-to-9-pin adapter.

Connecting the Modem to a Field Device

NOTE

1. The loop must have a minimum of 250 ohms between the power supply and the attachment of the modem. Also, two or more transmitters cannot share the same load.
2. The Schneider Electric optional power supply contains the required 250 ohm load.

Figure 1. Transmitter with Remote Power Supply

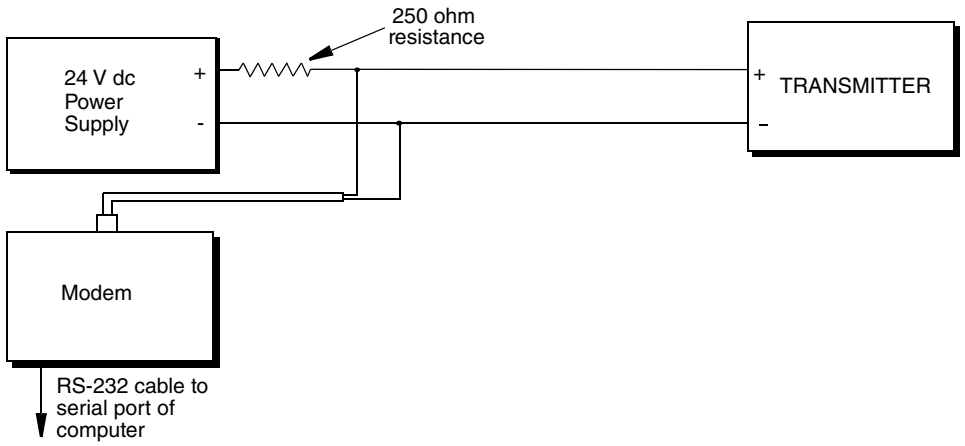


Figure 2. HART Transmitter with Optional Power Supply

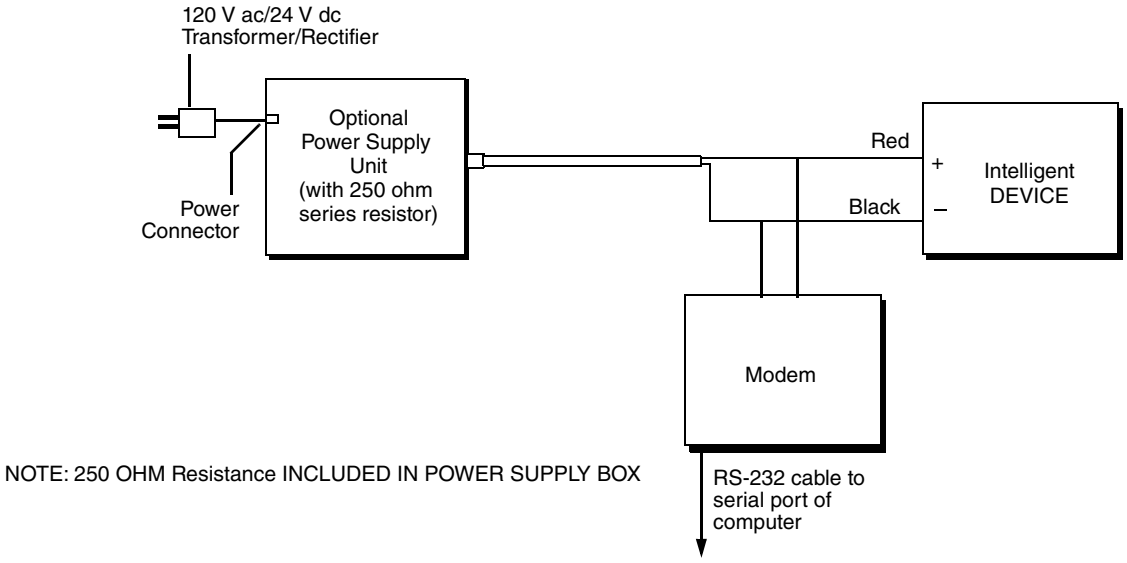
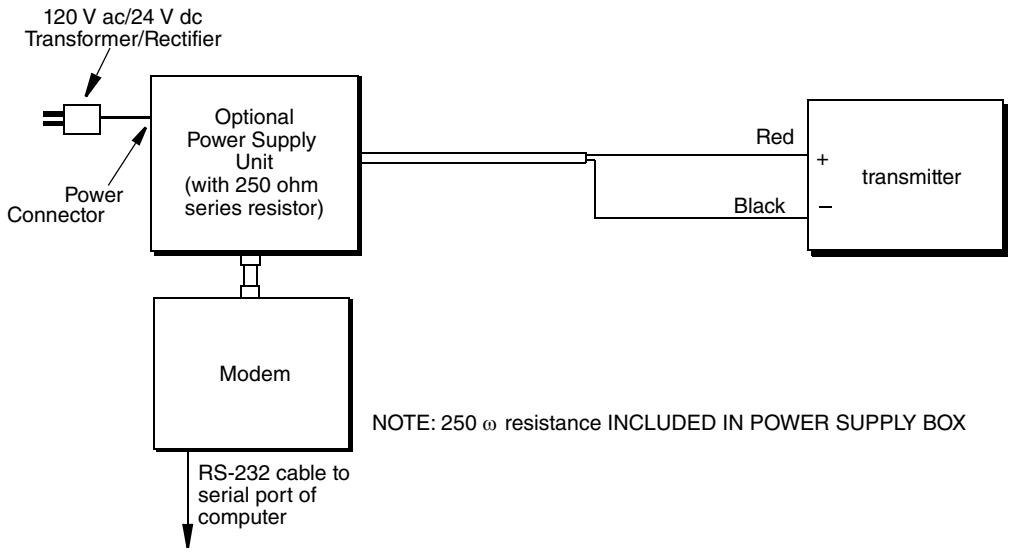


Figure 3. FoxCom Transmitter with Optional Power Supply



Configurator Software Installation

Perform installation while running the standard Windows installation program. Close all other running programs before starting your installation.

Insert the CD in your computer. It is designed to start automatically. If it does not start after a short while, use Windows Explorer to locate the `Setup.exe` file on the CD and double-click on it. Then follow instructions to install the configurator program.

The installation procedure is automatic and prompts you for necessary information. The installation program verifies that the PC has the hardware and memory necessary to load and run the configurator.

NOTE

If you are installing a new version of the PCMV software on a PC that already has PCMV installed, you must uninstall the old version first. You can do this via the "Remove" feature in PCMV or the standard Windows uninstall program. Then follow the installation procedures above. During the "Remove" procedure, you have the opportunity to save your database. During the "Installation" procedure, you have the opportunity to use your old database.

4. Operation

Starting the Configurator Program

To start the program, double-click the configurator icon or access the program from the `Start` menu.

General Information

Because the program can perform a variety of functions, some menu items may be missing or "grayed out." Missing menu items are never allowed for the connected device. Grayed out items are not allowed under the present condition but may be allowed under different conditions. For example, `Connect to Device` would be available for a device that was not connected but grayed out for a device that was already connected.

Top Level Menu Screen (not connected to device)

The Top Level Menu screen, shown in Figure , is displayed when your computer is not connected to a device or when no preconfiguration data is loaded onto a window. This screen has pull-down menus for selecting the various functions. Explanations of the menus and functions appear in Table 2.

Figure 4. Top Level Menu Screen (when not connected to a device)

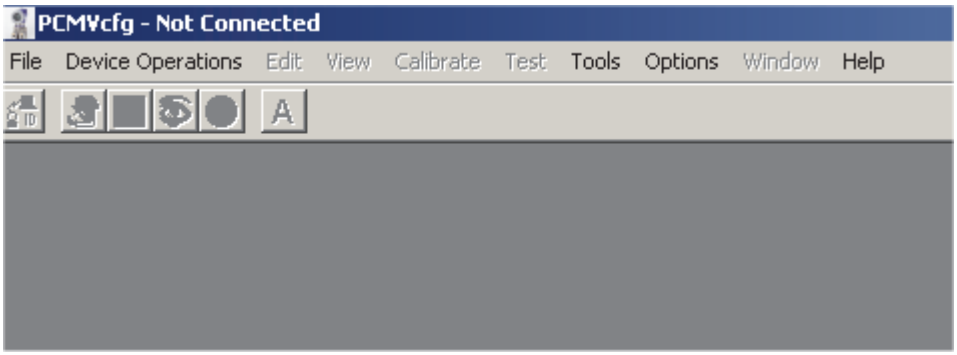


Table 2. Top Level Menu – Description of Functions

Top Level Menu Pick	Submenu Pick	Description
File	New...	Creates a preconfiguration database using one of several default databases as a template.
	Open...	Opens an existing configuration database.
	Exit	Quits the application.
Device Operations	Connect to Device...	Connects to a device.

Table 2. Top Level Menu – Description of Functions (Continued)

Top Level Menu Pick	Submenu Pick	Description
Tools	Edit Application Design Conditions...	Accesses configuration of flow and density parameters (IMV30 only).
	Configuration Report...	Accesses a copy of a configuration database that can be produced in hard copy form or that can be e-mailed for ordering or troubleshooting.
	Options	Connect at Startup - Enables connection to a device at startup.
		Confirm Device Connect - Enables a confirmation before connection to a device.
		AutoDisconnect after NoComs - Enables an automatic disconnect upon problem connecting to a device.
Options	Access Level Password	Accesses advanced troubleshooting functions. These functions are only used in consultation with Schneider Electric.
Help	About	Displays the software version number of the configurator.

Preconfiguring a Device (offline configuration)

The PCMV Configurator enables you to create a new configuration file from one of several default databases, from a previously created and saved file, or from the configuration of a connected device. You can then download the new configuration to a connected device or save it to a file.

— NOTE

When opening a `.cfg` file that was created on a different PC, a PCMVb record is present in the configuration (`.cfg`) file. The record is automatically added to the PCMVb database when you run through PCMVb.

To start from a default database, select `New` in the `File` menu and then select the `Device Type`, `Protocol`, and `Model` that most closely meets your requirement. To start from a previously created and saved file, select `Open` from the `File` menu and select the desired file.

— NOTE

To access `New` or `Open` in the `File` menu, you must not be connected to a device.

When you have finished your new configuration, use `Save As` in the `File` menu to save it.

Connecting to a Device

To connect to a device, first hardwire to your device. If the `Connect at Startup` option is configured, the configurator automatically connects to the device upon startup. If the `Connect at Startup` option is not configured, select `Connect to Device` in the `Device Operations` menu. The Company ID and Connection Details screen appears. See Figure 5.

`Company ID` is rarely required. It is only used to distinguish between two transmitter data bases on your computer with the same Tag Number. An example of when you might use this feature is if you have a transmitter with the same tag number at each of two plants. The data base for transmitter FT101 at Plant 1 can be distinguished from the data base of transmitter FT101 at Plant 2 by establishing Company IDs of Plant 1 and Plant 2. The addition of a Company ID can be done in the Device Configuration Identifier Tab Screen.

In `Connection Details`, specify `HART` if connecting to a transmitter with HART communication protocol and `FOXCOM` if connecting to a transmitter with FoxCom communication protocol. `DEMO` enables you to simulate a transmitter when one is not connected. The DEMO program represents a transmitter with FoxCom communications but most screens are identical to those with HART communications.

If you selected `HART` or `FOXCOM`, you are asked to specify the `COM` port to which you are connecting. If you selected `DEMO`, the only selection in the picklist is `MV` (for multivariable).

If you selected `HART`, when you click on the `OK` button, you are asked to specify the polling address. Select `0` unless you are using multidrop communication.

Figure 5. Company ID and Connection Details Screen



Also see “Online Configuration - connected to a transmitter” on page 46.

Top Level Menu Screen (connected to a device)

The Top Level Menu screen, shown in Figure , is displayed when connected to a device or when preconfiguration data is loaded onto a window. This screen has pull-down menus for selecting the various functions. Explanations of the menus and functions appear in Table 3.

Figure 6. Top Level Menu Screen (when connected to a device)

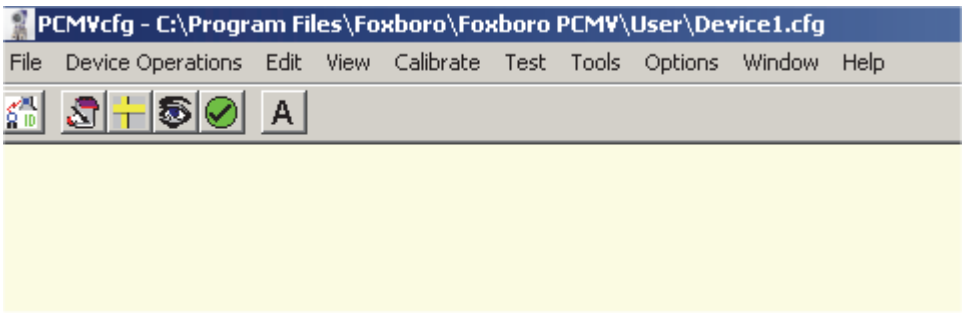


Table 3. Device Top Level Menu – Description of Functions

Top Level Menu Pick	Submenu Pick	Description
File	Save	Saves the active document.
	Save As...	Saves the configuration to a file.
	Exit	Quits the application.
Device Operations	Disconnect from Device	Disconnects from a device.
	Download Configuration	Downloads the configuration file to the connected device.
Edit	Copy	Copies logged data to the computer clipboard.
	Device Configure...	Edits the configuration database.
	Compare...	File vs File - Compares the current configuration against a stored database.
		Device vs File - Compares the current configuration against the values in the device.
View	Toolbar	Shows or hides the toolbar.
	Status Bar	Shows or hides the status bar.
	Activity Log	Shows or hides the activity log.
	Scan Data	Continuously displays the measurement or raw input data.
	Trend Measurements	Displays a trend graph.
Calibrate	Calibration...	Performs a calibration procedure.
Test	Device Status...	Displays status and diagnostic information from the device.
	Output Override...	If configured to 4-20 mA output, sets output to a specific mA value to test other devices in the loop. If configured to Digital output, sets output to a specific digital value to test I/A Series® system wiring and displays.
	Scan Raw Inputs...	Displays raw inputs for some types of device.
	Test Device Equations...	Displays flow data and enables you to see the results of changing D/P, A/P, and RTD raw inputs (INV30-D only)
	Go Online	Places the device in on-line mode.
	Go Offline	Places the device in off-line mode.
	Get ID	Re-establishes the connection with the device.
	Get ID (w/reload)	Resynchronizes the database back to the device.
Tools	Edit Application Design conditions...	Accesses configuration of flow and density parameters (IMV30 only).
	Configuration Report	Accesses a copy of the configuration database that can be produced in hard copy form or that can be e-mailed for ordering or troubleshooting.[(a)]
	Options	Connect at Startup - Enables connection to a device at startup.
		Confirm Device Connect - Enables a confirmation before connection to a device.
		AutoDisconnect after NoComs - Enables an automatic disconnect upon problem connecting to a device.
Options	Access Level Password	Accesses advanced troubleshooting functions. These functions are only used in consultation with Schneider Electric.
Window	Cascade	Arranges windows so they overlap.
	Tile Horizontal	Arranges windows as horizontal tiles.
	Tile Vertical	Arranges windows as vertical tiles.
	Arrange icons	Arranges icons at the bottom of the window.
Help	About	Displays the software version number of the configurator.

Toolbar, Status Bar, and Activity Log

The program is equipped with a toolbar at the top of the screen, a status bar at the bottom, and an activity log just above the status bar. Any of the three can be shown or hidden at any time by using the `View` menu. The icons on the toolbar are shown in Figure 7. A listing of the features and descriptions for the toolbar is given in Table 4



Figure 7. Toolbar Icons

Table 4. Toolbar Features and Descriptions

Item	Feature	Description
1	Get ID (Reconnect)	Reconnect to the device.
2	Configuration	Access Configuration menus.
3	Calibration	Access Calibration menus.
4	Scan Measurements	Access Measurements screen.
5	View Status	Access Status screen.
6	Application Design Conditions	Access Flow Configurator menus.

The status bar displays, from left to right, the mode, the current device state, and the device version number. The activity log displays a list of events and the time they took place.

Downloading a Configuration File to a Device

After connecting to a transmitter, an existing `.cfg` file can be downloaded to the transmitter. If the `.cfg` file contains PCMVb information, the program checks to see if the tag number record exists in the PCMVb database on the computer hard drive and allows you to create or update the record in the database using data from the `.cfg` file.

1. Select `Download Configuration` from the `Device Operations` menu.
2. On the Save Configuration to a Device screen, click on the browse button for a list of the available configuration files. Double click on your selection. The Save Configuration to a Device screen reappears.
3. Click on the `Next` button. The User Changeable Data Screen is displayed.

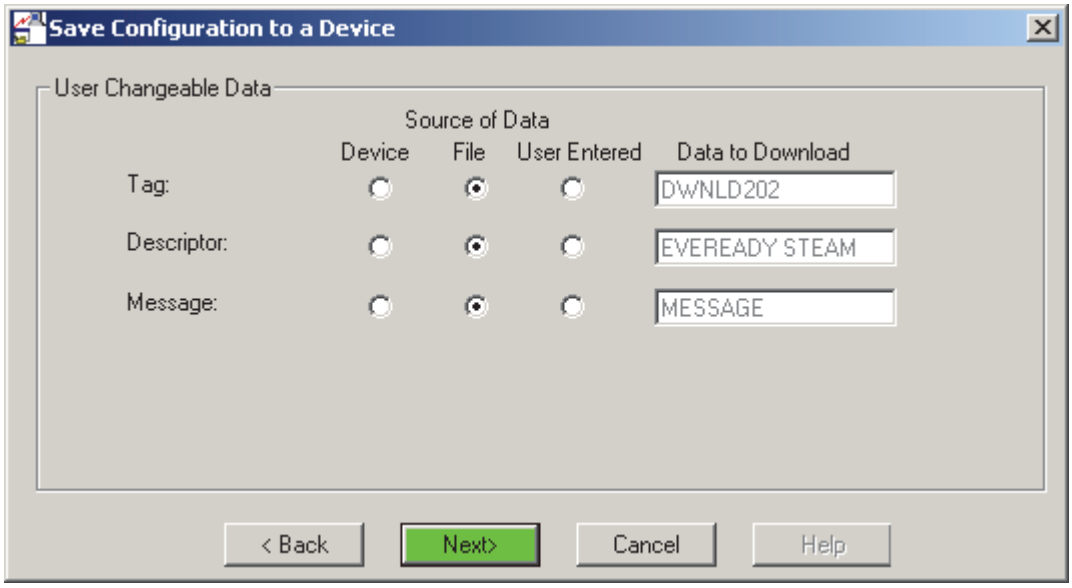
NOTE

If the same or similar file is required for several transmitters, you can download the file to each transmitter and then, after editing, save it under the appropriate `Tag` (for HART) or `Tag Number` (for FoxCom) as explained in the next step.

4. From this screen specify the source of the `Tag`, `Description`, and `Message` (for HART transmitters) or of the `Tag Number`, `Device Name`, `Tag Name`, and `Location` for FoxCom transmitters. Select each to be from the connected `Device`, the selected `File`, or `User Entered` data. Figure 8 shows a Sample User Changeable Data Screen for HART transmitters.

5. When done, click on the `Next` button. The Calibration to Download screen is displayed showing the device calibration and file calibration data.
6. Select `Use Device Calibration` or `Use File Calibration` and click on the `Download` button.

Figure 8. Sample User Changeable Data Screen for an IMV30-T (HART) Transmitter



Scanning Measurements

Once the configurator is connected to your device, you can display the Scan Data screen. This screen continuously reads and displays the current values of the equivalent mA output (in percent), measurements, and calculations and the status of each. When connected to a FoxCom transmitter, the screen also shows which values are available for display on the I/A Series system.

To display this screen, select `Scan Data` and then `Measurements` from the top level `View` menu. You can also access `Scan Measurements` via the Scan Data icon on the toolbar. A sample Scan Data screen for a HART transmitter is shown in Figure 10 and that for a FoxCom transmitter in Figure 10.

Figure 9. Sample Scan Data Screen for IMV30-T (HART) Transmitter

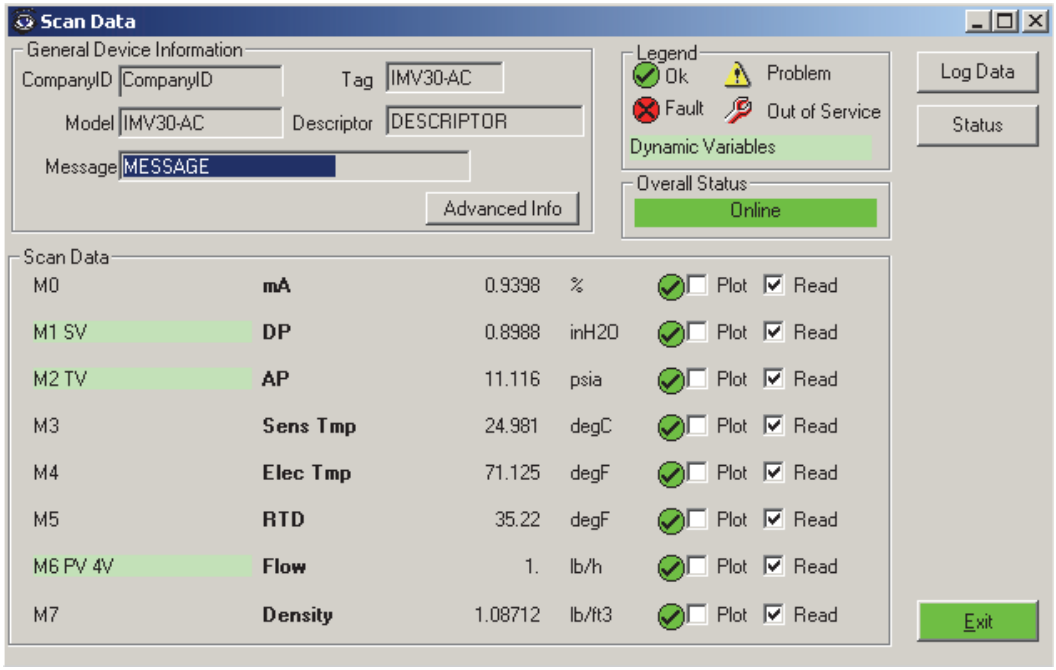
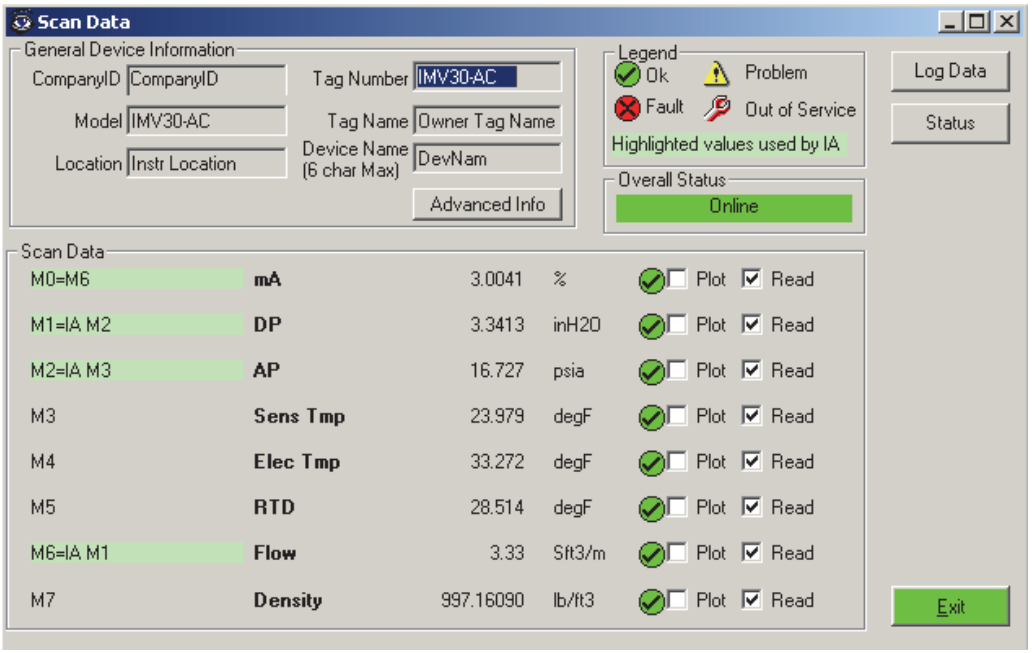


Figure 10. Sample Scan Data Screen for IMV30-D (FoxCom) Transmitter



Explanation of Measurement Designations

The measurement designations M0 through M7 are used for measurements and calculations as listed below:

M0 = (mA) Equivalent mA output in percent

M1 = (D/P) Differential pressure

M2 = A/P) Absolute pressure

M3 = (STMP) Sensor temperature

M4 = (ETMP) Electronics temperature

M5 = (RTD) RTD temperature

M6 = (FLOW) Flow calculation (IMV30 only)

M7 = (DENS) Density calculation (IMV30 only)

Explanation of Highlighted Values

The measurements/calculations that are highlighted are the ones:

- On HART transmitters - selected as the HART primary, secondary, tertiary, and 4th measurements
- On FoxCom transmitters - selected for display in the I/A Series system and for display on the optional transmitter LCD display. For example, in Figure 10, measurement `M3` is displayed as I/A Series system measurement `IA M3`.

Explanation of Status Symbols

The “check mark” symbol in a green circle indicates that everything is OK with the measurement; the “X” symbol in a red circle, that there is a fault with the measurement; the “!” symbol in a yellow triangle, that there is some problem with the measurement; and the “Wrench” symbol, that the measurement is out of service (configured off). Examples of problem measurements (“!” symbol) are a measurement that is out of valid range and a calculation that relies on a measurement which is out of valid range.

Reading and Plotting Data

You can add (or delete) any measurements/calculations that you are interested (or not interested) in from the scan and plot (or not plot) the curve of any you are interested (or not interested) in by selecting or deselecting the `Read` and `Plot` boxes at the right of the screen.

Advanced Info Button

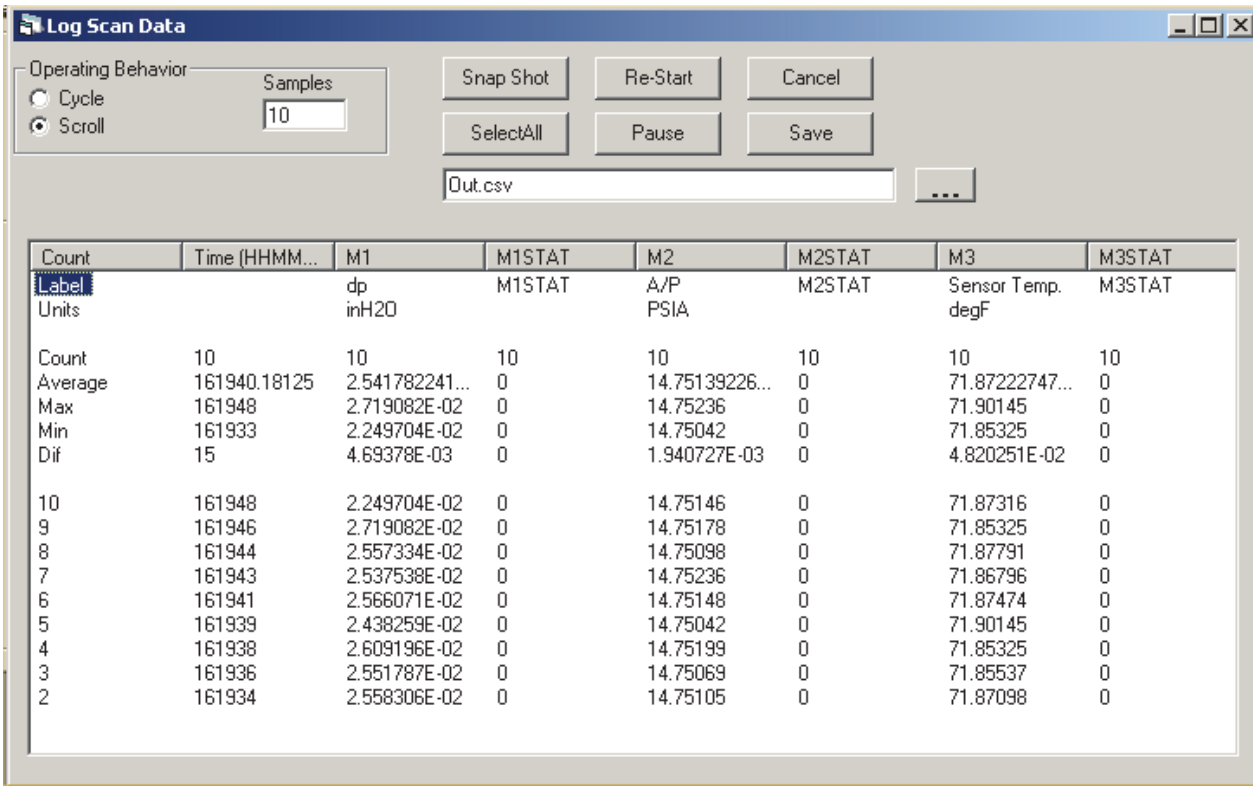
The `Advanced Info` button gives you the sensor ID, electronics serial number, manufacturing information, and device information. Clicking on the `General Info` button brings you back to the original display.

Log Data Button

The `Log Data` button enables you to create a log of the data you have selected to scan with your Scan Data screen. This log also shows the count, average, maximum, minimum, and difference of the readings. Pressing this button produces the Log Data Screen. See Figure . Using this screen, you can present the information in different ways.

In `Samples`, you can set the number of readings shown at one time. In the `Cycle - Scroll` selection, you can establish the order of presentation of the readings. You can stop the process with the `Pause` button which then becomes the `Start` button to continue the readings. At any time you can restart the process with the `Restart` button. The `Snap Shot` button records the next number of readings (established in the Samples field) and stops the process. The `Select All` button places the readings on your computer clipboard. You can save the data at any time with the `Save` Button. The `Cancel` button returns you to the Scan Data screen.

Figure 11. Sample Log Data Screen



Count	Time (HHMM...	M1	M1STAT	M2	M2STAT	M3	M3STAT
Label		dp	M1STAT	A/P	M2STAT	Sensor Temp.	M3STAT
Units		inH2O		PSIA		degF	
Count	10	10	10	10	10	10	10
Average	161940.18125	2.541782241...	0	14.75139226...	0	71.87222747...	0
Max	161948	2.719082E-02	0	14.75236	0	71.90145	0
Min	161933	2.249704E-02	0	14.75042	0	71.85325	0
Dif	15	4.69378E-03	0	1.940727E-03	0	4.820251E-02	0
10	161948	2.249704E-02	0	14.75146	0	71.87316	0
9	161946	2.719082E-02	0	14.75178	0	71.85325	0
8	161944	2.557334E-02	0	14.75098	0	71.87791	0
7	161943	2.537538E-02	0	14.75236	0	71.86796	0
6	161941	2.566071E-02	0	14.75148	0	71.87474	0
5	161939	2.438259E-02	0	14.75042	0	71.90145	0
4	161938	2.609196E-02	0	14.75199	0	71.85325	0
3	161936	2.551787E-02	0	14.75069	0	71.85537	0
2	161934	2.558306E-02	0	14.75105	0	71.87098	0

Status Button

The `Status` button provides similar information to that produced by the Device Status Function which is described on page 49.

Scanning Raw Inputs

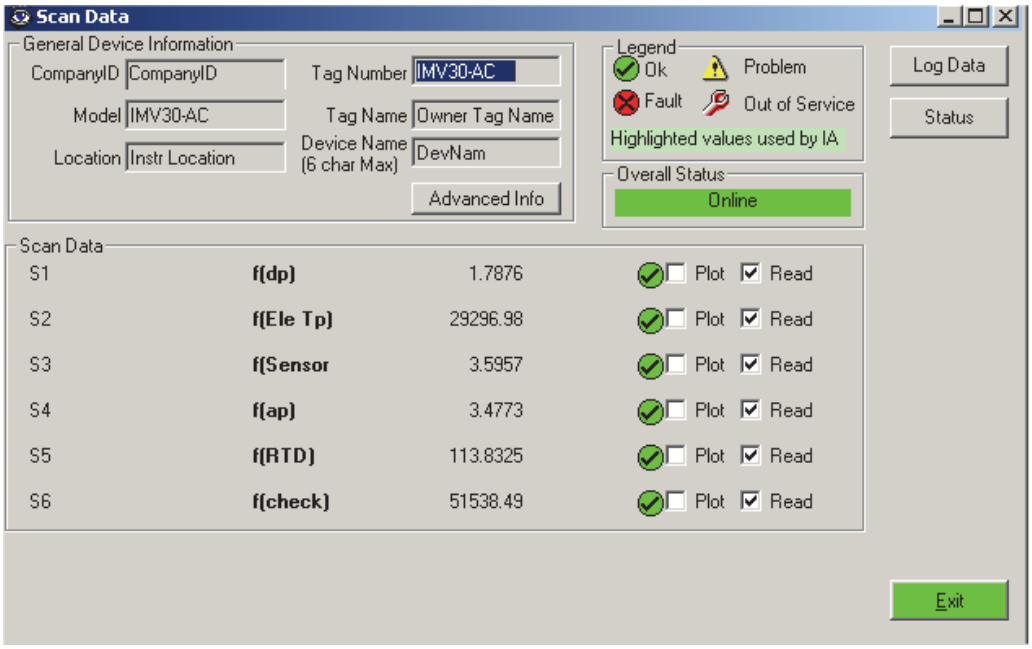
Once the configurator is connected to your device, you can display the Scan Raw Inputs screen. This screen continuously reads and displays the current values of raw inputs to your device. The values are primarily used in troubleshooting problems by Global Customer Support.

S1 = D/P input (unitless)
S2 = ETMP input (unitless)
S3 = STMP input (unitless)
S4 = A/P input (unitless)
S5 = RTD input (ohms)
S6 = Validation of inputs S1, S3, and S4

The Scan Raw Input function is accessed by selecting `Scan Data` from the top level `View` menu and then selecting `Raw Inputs` or by selecting `Scan Raw Inputs` from the top level `Test` menu. A sample Raw Inputs screen for a HART transmitter is shown in Figure 12.

F.or information on the `Advanced Info`, `Log Data`, and `Status` buttons, see “Sample User Changeable Data Screen for an IMV30-T (HART) Transmitter” on page 28.

Figure 12. Sample Scan Raw Inputs Screen for an IMV30-T (HART) Transmitter



Reading and Plotting Data

You can add (or delete) any measurements/calculations that you are interested (or not interested) in from the scan and plot (or not plot) the curve of any you are interested (or not interested) in by selecting or deselecting the `Read` and `Plot` boxes at the right of the screen.

Explanation of Status Symbols

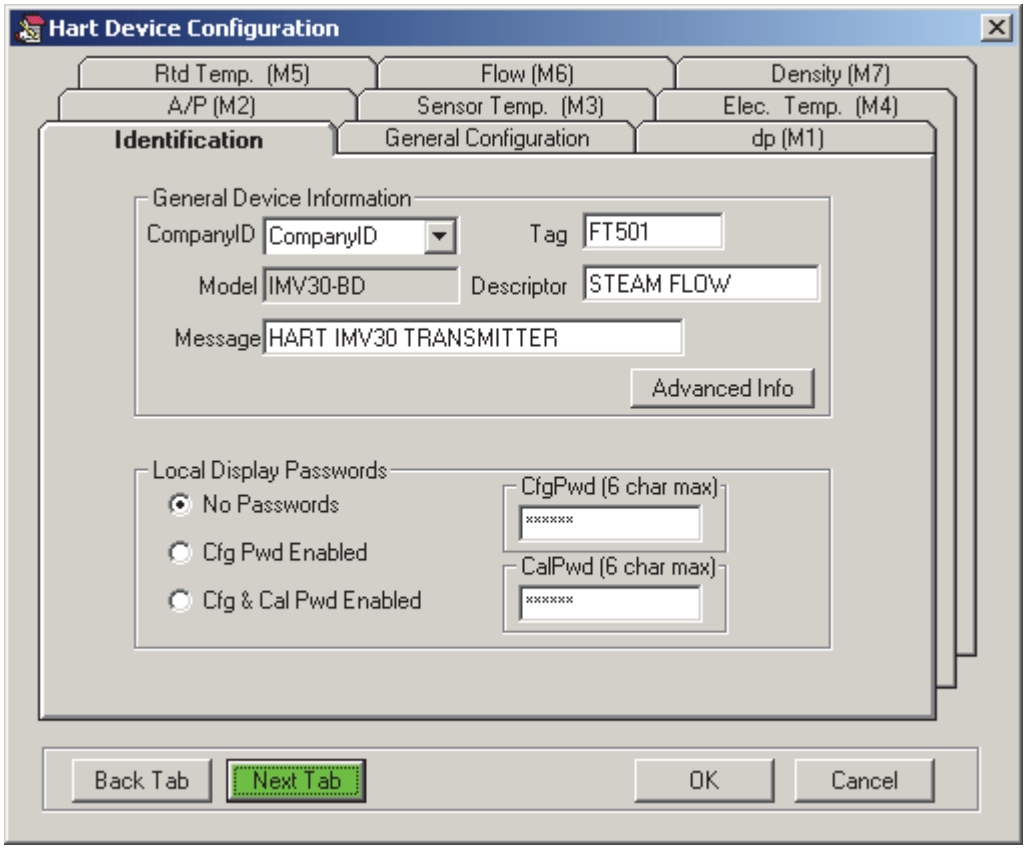
The “check mark” symbol in a green circle indicates that everything is OK with the measurement; the “X” symbol in a red circle, that there is a fault with the measurement; the “!” symbol in a yellow triangle, that there is some problem with the measurement; and the “Wrench” symbol, that the measurement is out of service (configured off).

Configuration Function

The Configuration function allows editing of the device database. This function is accessed via the top level `Edit` menu or by the Configuration icon on the toolbar. Nine tabs are selectable from this screen for an IMV30; seven for an IMV25. Upon accessing the configuration function, the `Identifier` tab is displayed. See Figure for a HART device screen or Figure for a FoxCom device screen.

HART Identifier Tab Screen

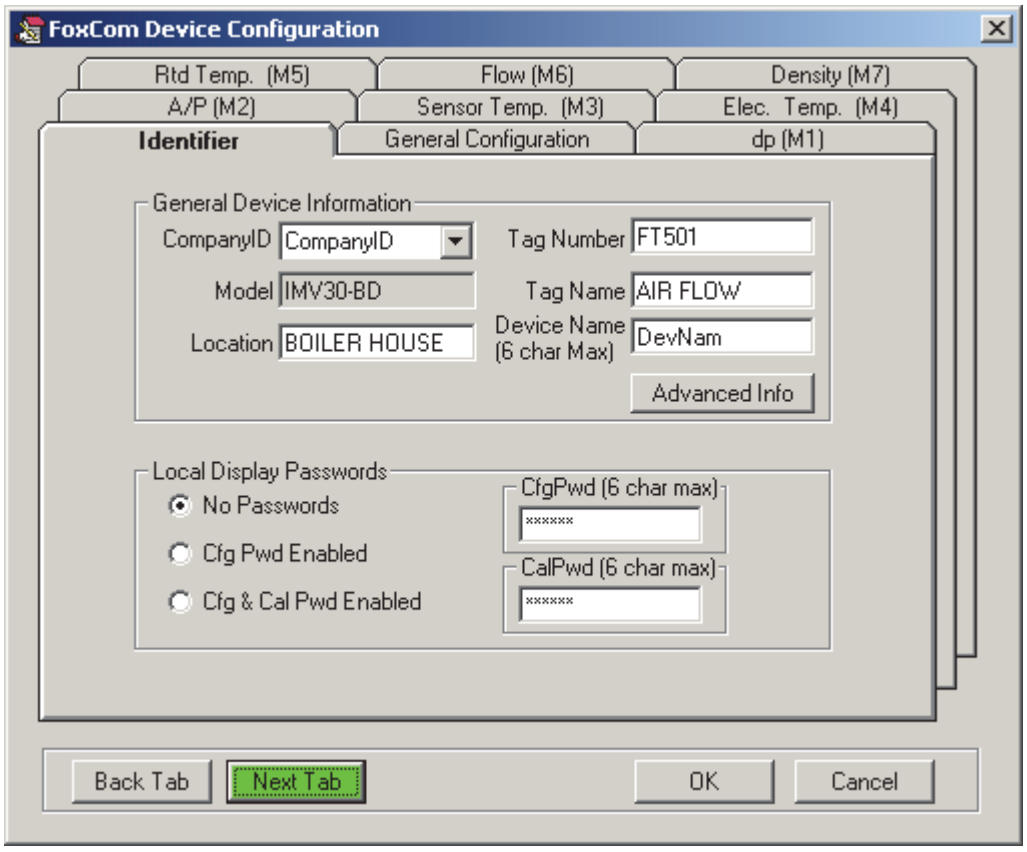
Figure 13. Sample Identifier Tab Screen for an IMV30-T (HART) Transmitter



Field	Entry
General Device Information	
CompanyID	Rarely required. Only used to distinguish between two transmitters data bases on your computer with the same Tag Number.
Model	Shows the model number and sensor code of the device (IMV30-BD, for example).
Tag	Enter maximum of 8 characters. The Tag Number is used to identify your device in PCMVa.
Descriptor	Enter maximum of 16 characters. Optional, used for reference only.
Message	Enter maximum of 31 characters. Optional, used for reference only.
Advanced Info Button	Shows the sensor ID number, the electronic serial number, and a manufacturing number.
Local Display Passwords	
CfgPwd	Enter the password that allows you to change the configuration at the local display.
CalPwd	Enter the password that allows you to change both the configuration and calibration at the local display.

FoxCom Identifier Tab Screen

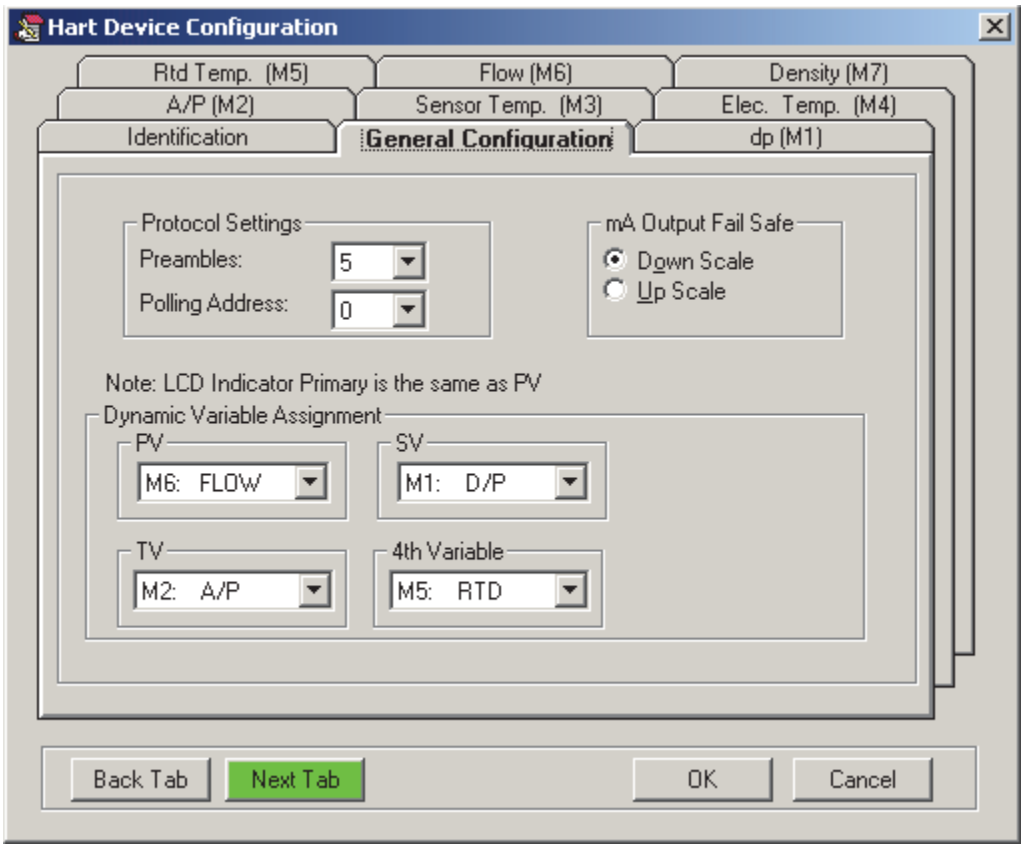
Figure 14. Identifier Screen for an IMV30-D (FoxCom) Transmitter



Field	Entry
General Device Information	
CompanyID	Rarely required. Only used to distinguish between two transmitters data bases on your computer with the same Tag Number.
Model	Shows the model number and sensor code of the device (IMV30-BD, for example).
Location	Enter maximum of 14 characters. Optional, used for reference only.
Tag Number	Enter maximum of 12 characters. The Tag Number is used to identify your device in PCMVa.
Tag Name	Enter maximum of 14 characters. Optional, used for reference only.
Device Name	Enter maximum of 6 characters.
Advanced Info Button	Shows the sensor ID number, the electronic serial number, and a manufacturing number.
Local Display Passwords	
CfgPwd	Enter the password (6 characters maximum) that allows you to change the configuration at the local display.
CalPwd	Enter the password (6 characters maximum) that allows you to change both the configuration and calibration at the local display.

HART General Configuration Tab Screen

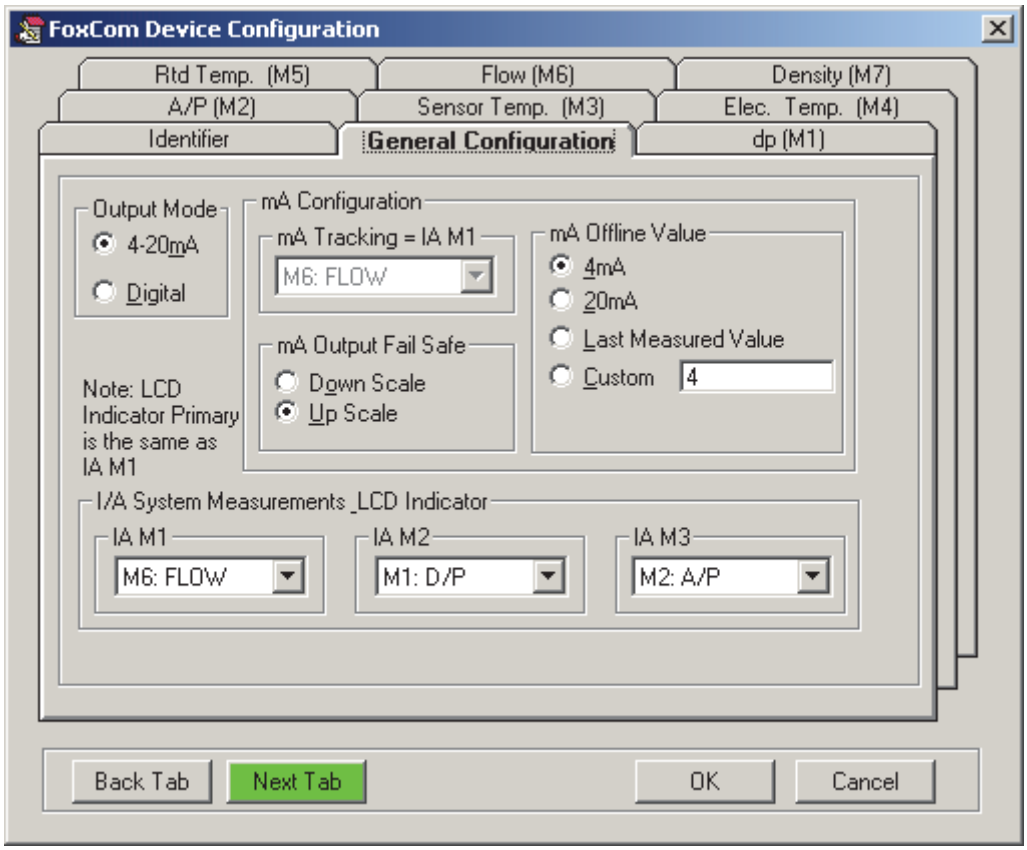
Figure 15. General Configuration Tab Screen for an IMV30-T (HART) Transmitter



Field	Entry
Protocol Settings	
Preambles	Select Preambles setting from 3 to 20.
Polling Address	Select Polling Address from 0 to 15.
mA Output Fail Safe	Select `Downscale` or `Upscale`
Dynamic Variable Assignment	
PV	For each variable, assign as D/P, A/P, STMP, ETMP, RTD, FLOW, or DENS.
SV	
TV	
4th Variable	

FoxCom General Configuration Tab Screen

Figure 16. General Configuration Tab Screen for an IMV30-D (FoxCom) Transmitter



Field	Entry
Output Mode	Select `Digital` or `4-20 mA`.
mA Configuration (Selectable only in 4-20 mA Output mode	
mA Tracking	Device Display - Select `M1 = D/P`, `M2 = A/P`, `M3 = STMP` (sensor temp), `M4 = ETMP` (electronics temp), `M5 = RTD`, `M6 = FLOW`, or `M7 = DENS`. (a) (b) (c)
mA Output Fail Safe	Select `Down Scale` or `Up Scale`.
mA Offline Value	Select `4 mA`, `20 mA`, `Last Measure Value`, or `Custom`. If `Custom`, specify value.
I/A System Measurements	Specify the measurement/calculation for `IA M1`, `IA M2`, or `IA M3`. (a) (b) (c)

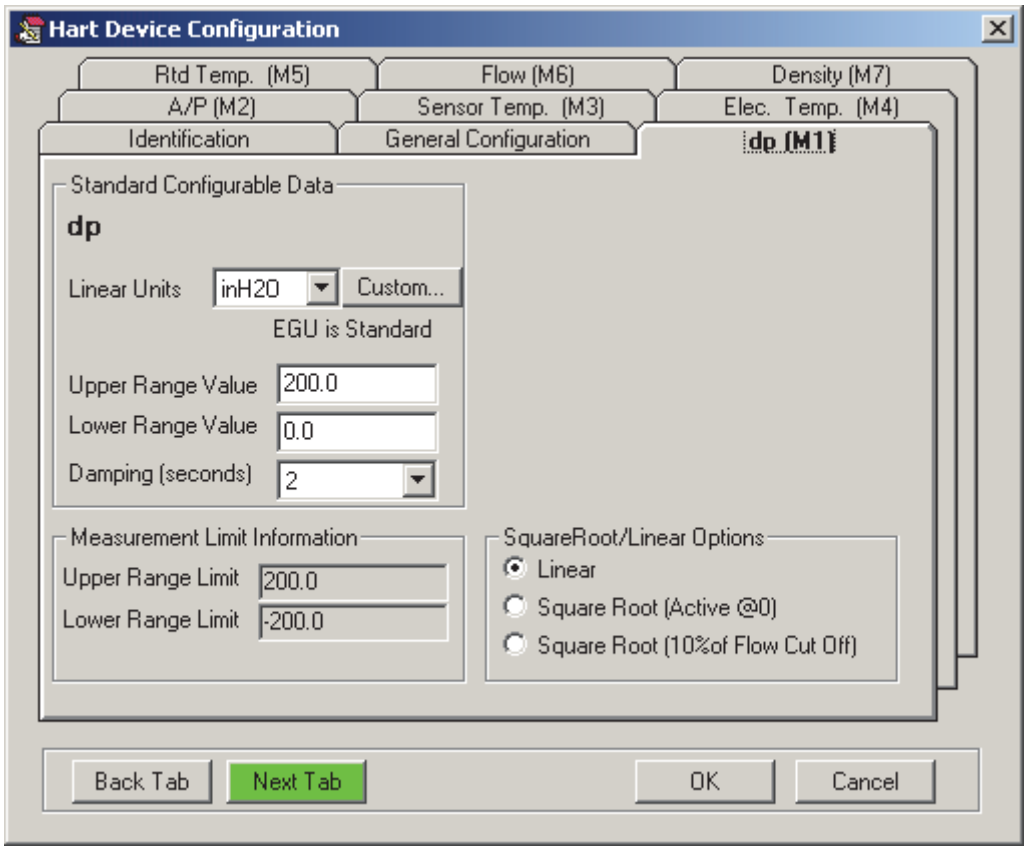
a. `IA M1`, `IA M2`, and `IA M3` are I/A Series system specific. They correspond to M1, M2, and M3 in the I/A Series system but not to other distributed control systems or calibration devices such as Beta Max.

b. `mA Tracking` is the same as `IA M1`. The selection can be changed from either field.

c. `IA M1`, `IA M2`, and `IA M3` also determine the measurements available for display on the transmitter optional indicator. `IA M1` is the default standard variable displayed. `IA M2` and `IA M3` can be display by pressing the `Enter` button on the indicator.

DP (M1) Tab Screen

Figure 17. DP (M1) Tab Screen for an IMV30 Transmitter

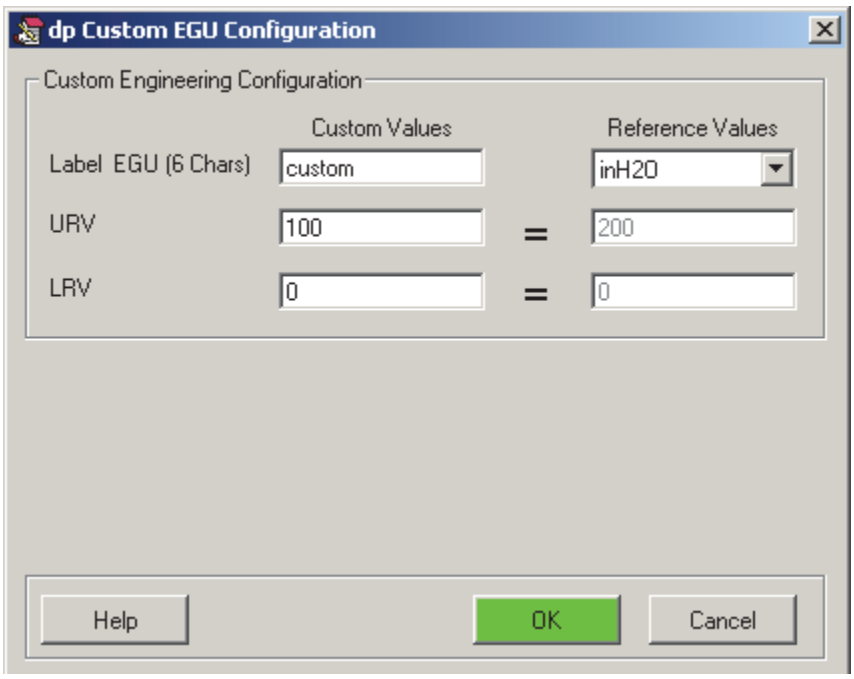


Field	Entry
Std Configurable Data	
Units	Select from menu of pressure units.
Custom Button	Enables use of custom units. See Figure 18.
Lower Range Value	Enter the value at which the device outputs 4 mA. (a)
Upper Range Value	Enter the value at which the device outputs 20 mA. (a)
Damping	Enter one of eight choices from No Damping to 32 seconds.
Meas. Information	
Lower Range Limit	Shows the Lower Range Limit of the device.
Upper Range Limit	Shows the Upper Range Limit of the device.
Square Root/Linear Options	Select `Linear`, `Square Root (Active @0)`, or `Square Root (10% of Flow Cut Off)`. (b)

a. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement/

b. Set option to `Linear` when M6 is used to calculate flow.

Figure 18. Sample dp Custom EGU Configuration Screen

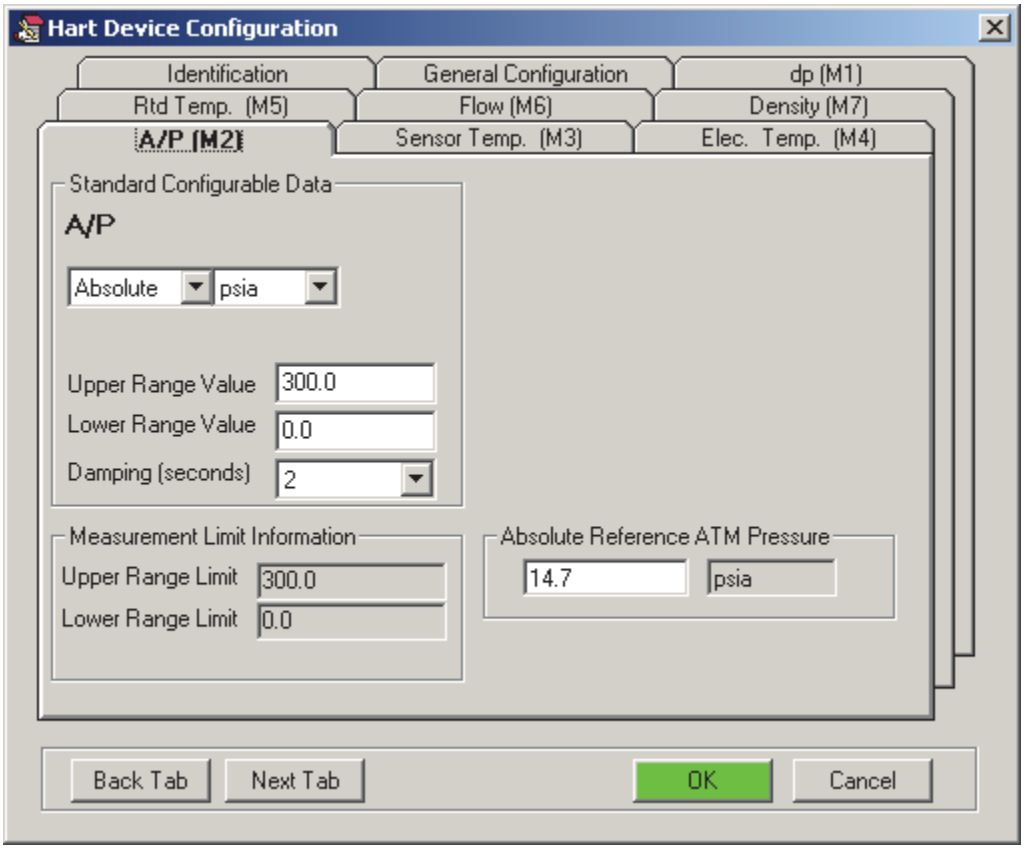


Field	Entry
Custom Eng Config	
Label EGU - Custom Value	Enter the name of your custom units (6 characters maximum).
Label EGU - Reference Value	Select a reference unit that is convenient for conversion to your custom unit.
URV - Custom Value	Enter the value in custom units equal to the URV value in the reference units selected.
LRV - Custom Value	Enter the value in custom units equal to the LRV value in the reference units selected.

The custom units and the upper and lower range values in those units then appear on your DP (M1) Tab Screen.

AP (M2) Tab Screen

Figure 19. AP (M2) Tab Screen for an IMV30-D



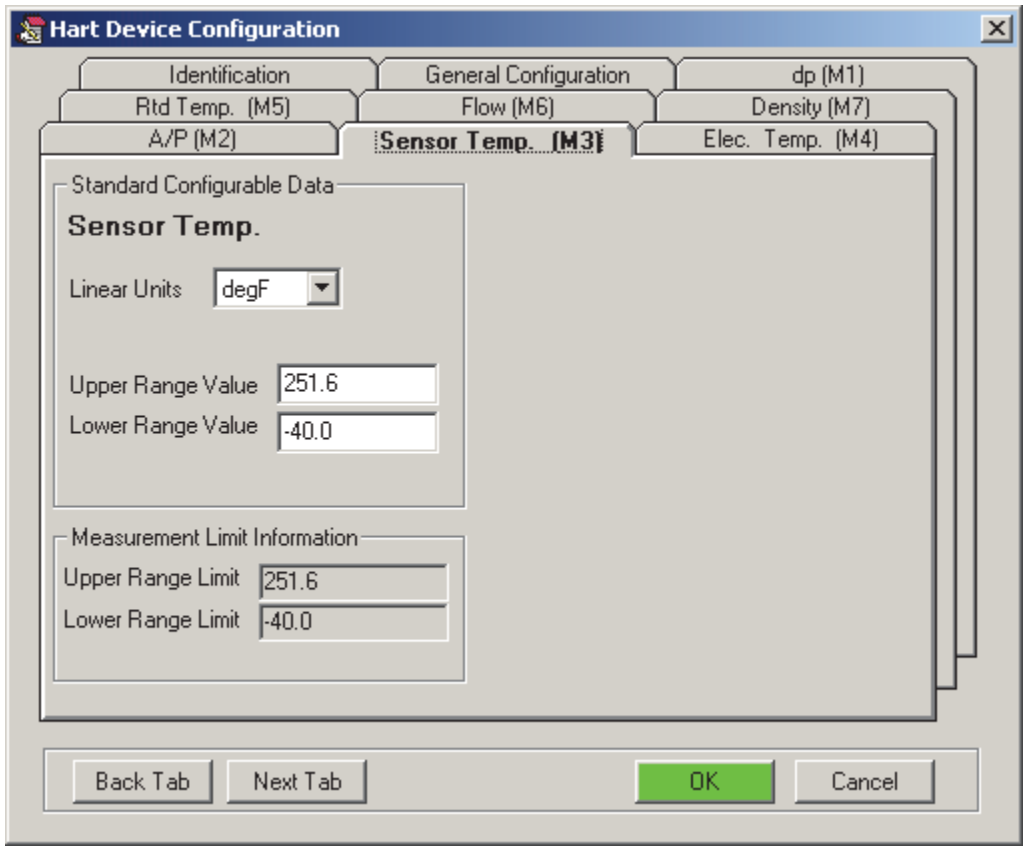
Field	Entry
Std Configurable Data	
Units	Select `Absolute` or `Gauge` pressure and then select the unit type from the menu of pressure units. (a)
Lower Range Value	Enter the value at which the device outputs 4 mA. (b)
Upper Range Value	Enter the value at which the device outputs 20 mA. (b)
Damping	Enter one of eight choices from No Damping to 32 seconds.
Meas. Information	
Lower Range Limit	Shows the Lower Range Limit of the device.
Upper Range Limit	Shows the Upper Range Limit of the device.
Absolute Reference ATM Pressure	Enter the ambient atmospheric pressure. (a)

a. Gauge pressure is equal to absolute pressure minus the value entered in `Reference ATM Pressure`. It is not referenced to varying atmospheric pressure.

b. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement.

Sensor Tmp (M3) Tab Screen

Figure 20. Sensor Tmp (M3) Tab Screen for an IMV30-D



Field	Entry
Std Configurable Data	
Units	Select degF, degR, degC, or degK from menu of temperature units.
Lower Range Value	Enter the value at which the device outputs 4 mA. (a)
Upper Range Value	Enter the value at which the device outputs 20 mA.(a)
Meas. Information	
Lower Range Limit	Shows the Lower Range Limit.
Upper Range Limit	Shows the Upper Range Limit.

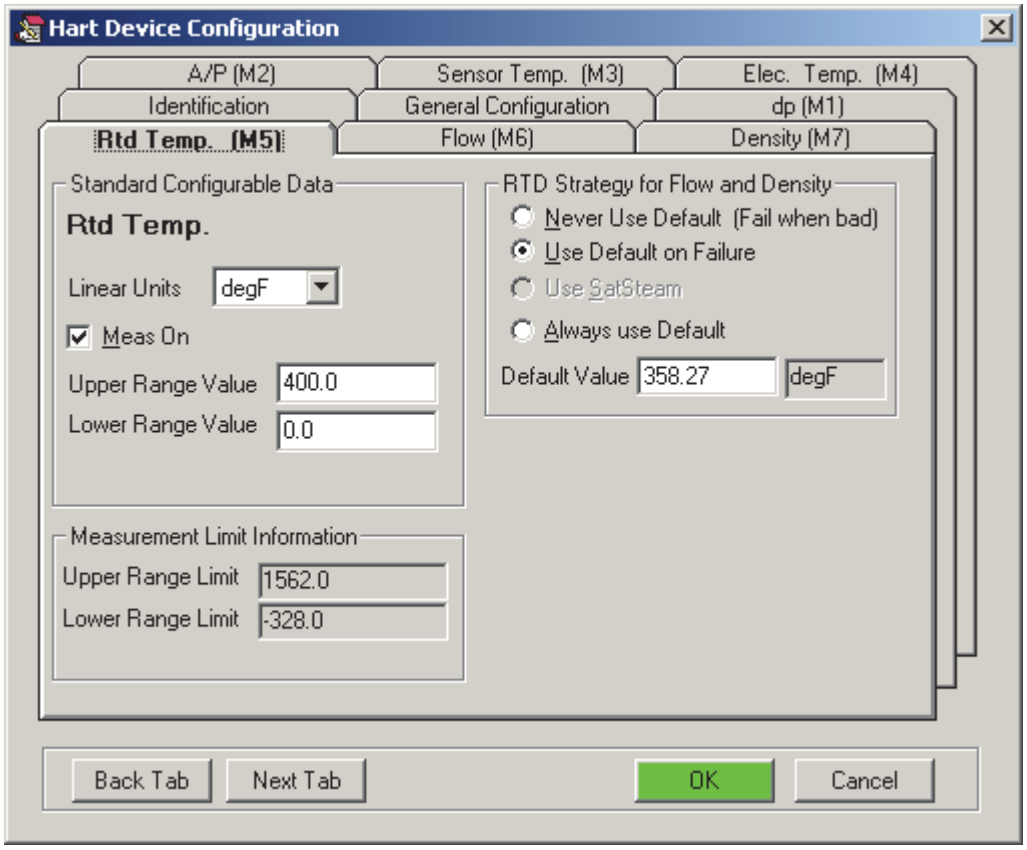
a. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement.

Electronics Tmp (M4) Tab Screen

Similar to the Sensor Tmp (M3) Tab screen immediately above.

RTD Tmp (M5) Tab Screen

Figure 21. RTD Tmp (M5) Tab Screen for an IMV30-D



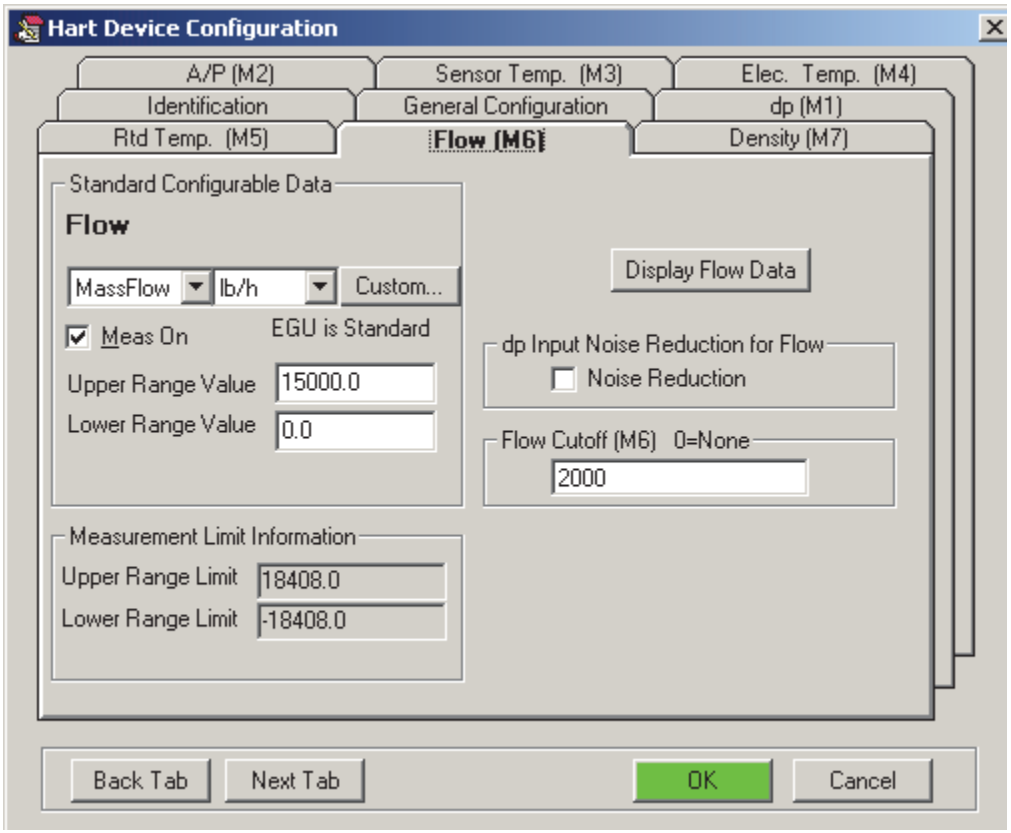
Field	Entry
Std Configurable Data	
Units	Select degF, degR, degC, or degK from menu of temperature units.
Meas. On	√ = RTD Measurement On; Blank = Measurement Off.
Lower Range Value	Enter the value at which the device outputs 4 mA. (a)
Upper Range Value	Enter the value at which the device outputs 20 mA. (a)
Meas. Information	
Lower Range Limit	Shows value of Lower Range Limit.
Upper Range Limit	Shows value of Upper Range Limit.
RTD Strategy for Flow and Density	Select Never Use Default, Use Default on Failure, Always Use Default, or Use SatSteam. (b)
Default Value	Enter the default value (in units specified).

a. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement.

b. If RTD is not used, deselect Meas On and choose Always use Default. If RTD is used, select Meas On and choose any one of the remaining three RTD strategies. If fluid, selected in PCMVb is saturated steam, RTD Strategy for Flow and Density defaults to Use Sat Steam (transmitter calculates saturation temperature).

Flow (M6) Tab Screen (IMV30 only)

Figure 22. Flow (M6) Tab Screen



Field	Entry
Std Configurable Data	
Units	Select `Mass Flow`, `Volume`, or `Std Vol`. Then select from menu of units based on that selection.
Custom Button	Enables use of custom units. See Figure 23.
Meas. On	√ = Flow Measurement On (a); Blank = Measurement Off.
Lower Range Value	Enter the value at which the device outputs 4 mA. (b)
Upper Range Value	Enter the value at which the device outputs 20 mA. (b)
Meas. Information	
Lower Range Limit	Shows value of Lower Range Limit.
Upper Range Limit	Shows value of Upper Range Limit.
Display Flow Data	Displays current flow data.
Noise Reduction	√ = Low flow reduced noise (linearizes the equation for dp's <4% upper equation limit entered in PCMVa).
Flow Cutoff (M6)	Enter flow cutoff value.

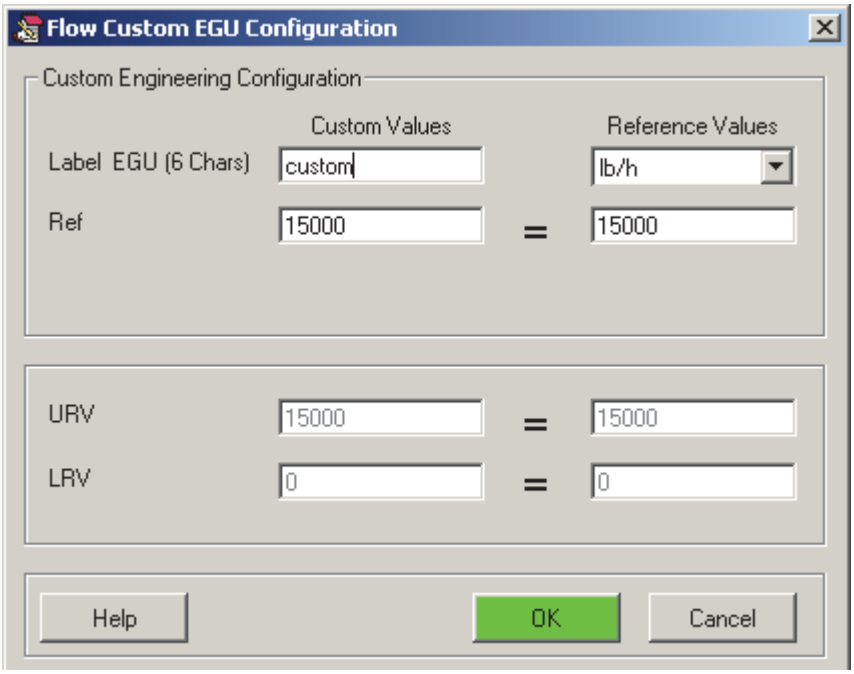
a. Flow measurement and density measurement must both be On or Off.

b. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement.

— NOTE —

Flow calculation requires additional configuration. See "Flow Configuration".

Figure 23. Sample Flow Custom EGU Configuration Screen

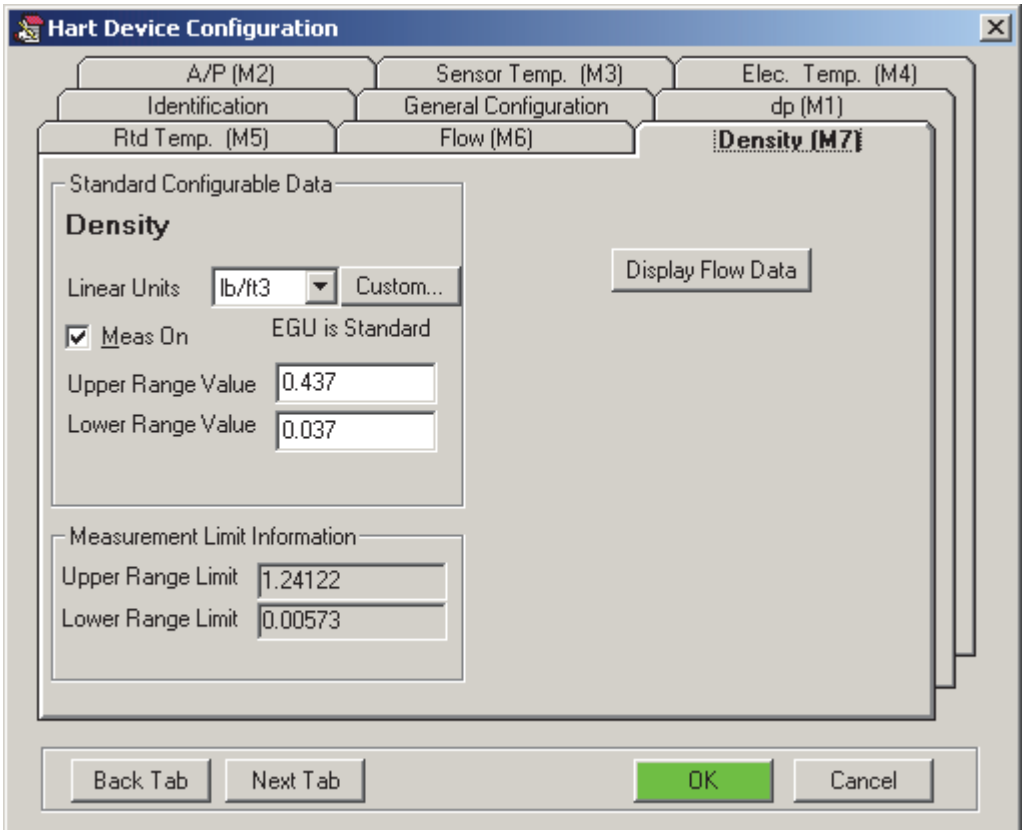


Field	Entry
Custom Eng Config	
Label EGU - Custom Value	Enter the name of your custom units (6 characters maximum).
Label EGU - Reference Value	Select a reference unit that is convenient for conversion to your custom unit.
Ref - Reference Value	The value of the URV in the units selected appears as a default value. You can change this to a number that is convenient for your conversion (for example 1 or 1000).
Ref - Custom Value	Enter the value in custom units equal to the reference value in reference units.

The custom units and the upper and lower range values in those units then appear on your Flow (M6) Tab Screen.

Density (M7) Tab Screen (IMV30 only)

Figure 24. Density (M7) Tab Screen



Field	Entry
Std Configurable Data	
Units	Select from menu of units.
Custom Button	Enables use of custom units. See Figure 23.
Meas. On	√ = Flow Measurement On (a); Blank = Measurement Off.
Lower Range Value	Enter the value at which the device outputs 4 mA. (b)
Upper Range Value	Enter the value at which the device outputs 20 mA. (b)
Meas. Information	
Lower Range Limit	Shows value of Lower Range Limit.
Upper Range Limit	Shows value of Upper Range Limit.
Display Flow Data	Displays current flow data.

a. Flow measurement and density measurement must both be On or Off.

b. These values are applicable when 4-20 output mode is assigned to this measurement. They also set the points at which the optional indicator flashes to indicate an out-of-range condition if this is the primary measurement.

NOTE

Density calculation requires additional configuration. See “Flow Configuration”.

Saving Configuration Information

A configuration can be created or revised when connected to a transmitter and the configuration file saved. Configuration can also be done in an offline mode and the configuration saved to a file and downloaded to a transmitter at a later time.

Offline Configuration - not connected to a transmitter

When you save a configuration, using the Save or Save As functions, PCMV creates a file with a `.cfg` extension. This file contains all your configuration information. When configuring an IMV30 transmitter, the user flow rate information entered in PCMVb is also automatically saved as a record on the hard drive of the computer used to create the configuration. It is saved by tag number (for a given Company ID). If you save the IMV30 configuration after returning from PCMVb, the user-entered information from PCMVb is also saved in the configuration file. This allows a flow application configuration to be done offline on one computer and moved to another computer.

Online Configuration - connected to a transmitter

The transmitter can be configured directly by making desired changes and selecting `OK` on the configuration tab screens in PCMVcfg and selecting `Download Using PCMVcfg` after using PCMVb (on an IMV30 transmitter).

After downloading, save your configuration to a file as described above in the Offline Configuration section. A PCMVb database record is also saved on the PC hard drive.

Some of the detailed information entered in the PCMVb section of the configurator, such as the flow measurement standard and primary device details, are not downloaded and stored in the transmitter. Instead, the configurator uses this entered information to calculate a set of application-specific coefficients that are downloaded to the IMV30 transmitter to configure it for its intended application.

If you save the IMV30 configuration after returning from PCMVb, the user-entered information from PCMVb is also saved in the configuration file. This allows a flow application configuration to be done offline on one computer and moved to another computer.

When connecting to a transmitter, PCMV initially reads the existing database in the transmitter. If you already have a `.cfg` file for an IMV30 transmitter, do not immediately save this database to the `.cfg` file because some of the PCMVb data that may have been saved in the `.cfg` file will be lost. This happens because the file is overwritten by data from the transmitter that does not have all the PCMVb information. The file still has all the correct coefficients and is a valid file for downloading to a transmitter. It just does not contain some of the user inputs.

— NOTE —

If the file has been saved properly, it should be >85 kB in size.

To update an existing file by uploading from the transmitter and at the same time avoiding the loss of any PCMVb information, perform the following:

- Open PCMVa and select `Enter Design Conditions (PCMVb)`
- A message is displayed that states that the tag number record has been ‘found’ or ‘not found’.

- If the record is 'found', on the hard drive and even if you do not need to change any data in PCMVb, step through using `NEXT` and `SAVE` buttons and then save to your `.cfg` file. This transfers the PCMVb information from the record to the `.cfg` file.
- If the record is 'not found', the PCMVb configuration for this tag number transmitter has never been done on this PC or the `.cfg` file with PCMVb data has never been opened by PCMV on this PC.
  When record 'not found' is displayed, you can open any tag number displayed and proceed to check and edit all PCMVb data. Alternatively, you can cancel and exit PCMVb if you decide to retrieve an existing `.cfg` file which has PCMVb data and either open or download it in order to use previously saved PCMVb data.

Copy Function

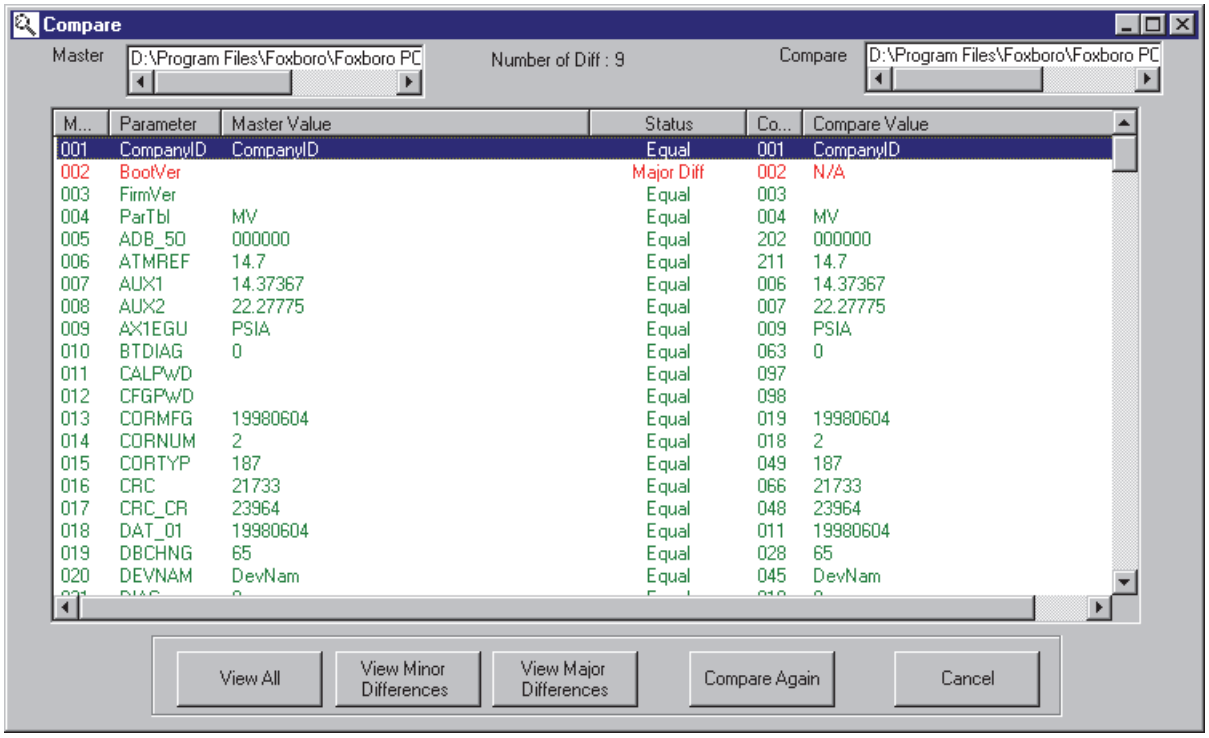
The Copy function allows you to copy logged data onto the computer clipboard for printout or other uses. The Copy function is accessed via the top level `Edit` menu.

Compare Function

The Compare function allows you to compare values of various parameters in one file with those in another or with those in the connected device. The Compare function is accessed via the top level `Edit` menu. You are asked to select `File vs File` or `File vs Device`. If you select the former, you are asked to specify the first and then the second files to be compared. If you select the latter, you are asked to specify the file to be compared with the connected device.

A sample of a Compare screen is shown in Figure . All parameters, whose values are equal are shown in green; those that are different, are shown in red. The number of differences are shown at the top of the screen. To view only those parameters with significant but minor differences, select `View Minor Differences`. The number of differences is less than when viewing all differences. To view only those parameters with major differences, select `View Major Differences`. To go back to viewing all differences, select `View All`. To update the comparison, select `Compare Again`.

Figure 25. Sample Compare Screen



Calibration Function

With this function, you can perform the following calibrations:

- mA Output: 4 mA and 20 mA
- DP:Cal @ Zero dp
  Cal @ LRV
  Cal @ URV
  Cal @ 1 User Entered point, Last Cal Point: xxxx
  Cal @ 2 User Entered points, Last Lower Cal Pt: xxxx/Upper Cal Pt: yyyy
- AP:Cal @ ATM
  Cal @ LRV (See note)
  Cal @ URV
  Cal @ 1 User Entered point, Last Cal Point: xxxx
  Cal @ 2 User Entered points, Last Lower Cal Pt: xxxx/Upper Cal Pt: yyyy
- RTD:Cal @ 1 User entered point

NOTE

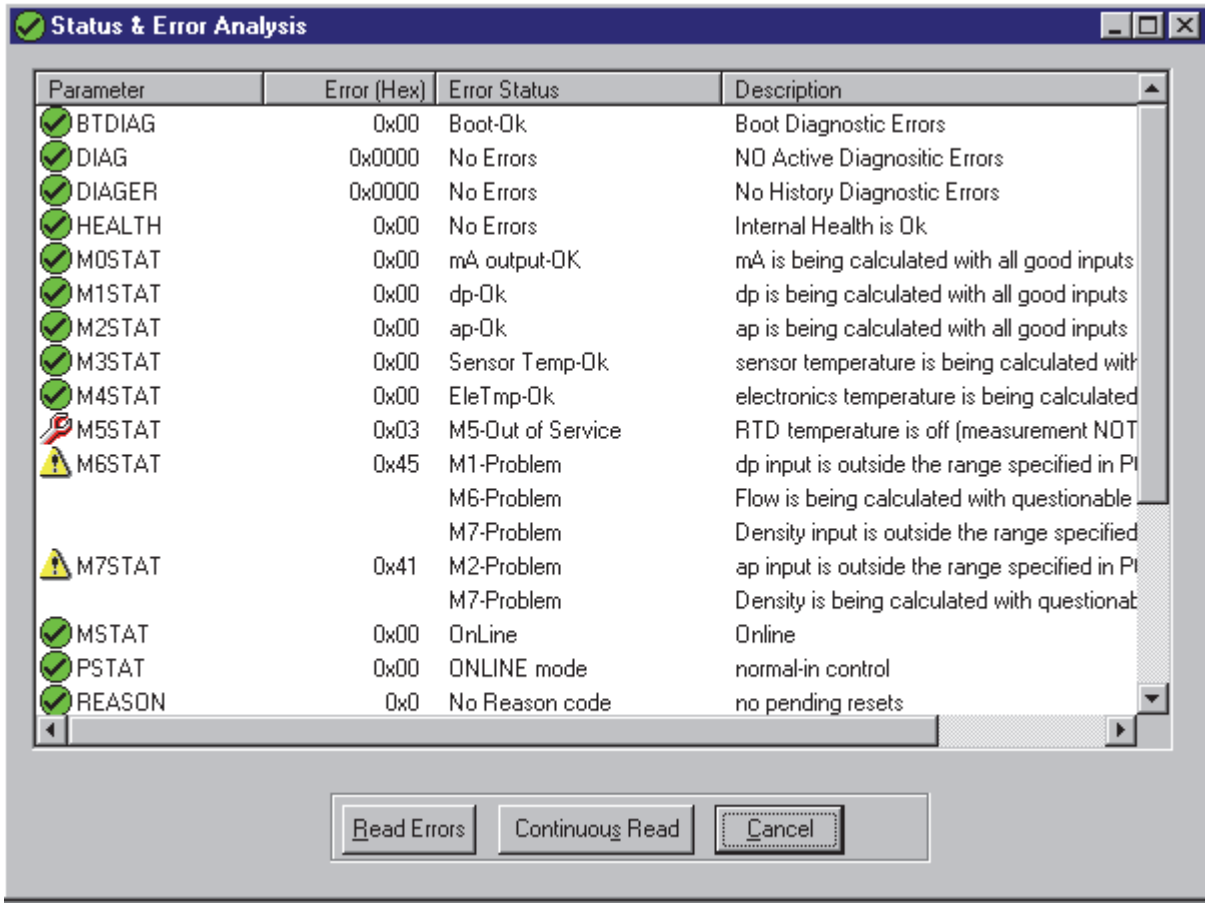
Only calibrate AP at LRV if the LRV pressure is applied to the transmitter. An absolute pressure transmitter should not be calibrated at 0 if it is vented to atmosphere. If vented to atmosphere, use `Cal at 1 user entered point` and enter the current barometric pressure.

The Calibration function is accessed via the top level `Calibrate` menu.

Device Status Function

The Device Status function interrogates the connected device and displays the error number (hex) and the error status or the notation `No Errors`. The function is accessed via the top level `Test` menu or the View Status icon on the toolbar. A sample Status & Error Analysis screen is shown in Figure . To update the data on the screen, click on the `Read Errors` button. To have the data continuously updated, click on the `Continuous Read` button.

Figure 26. Sample Status & Error Analysis Screen



Output Override

The transmitter can be set to output a mA value to test or adjust other devices in the loop. Also, when your device is configured for FoxCom Digital Output, the device can be set to output a digital value to test I/A Series system wiring and displays. The values of `IA M1`, `IA M2`, and `IA M3` can be set. The Output Override function is accessed via the top level `Test` menu. When you are finished, click the `Apply` button. The `Reread` button can be used to manually refresh the display. See Figure 28 for a HART device screen or Figure for a FoxCom device screen.

Figure 27. Sample Output Override Screen for an IMV30-T (HART) Transmitter

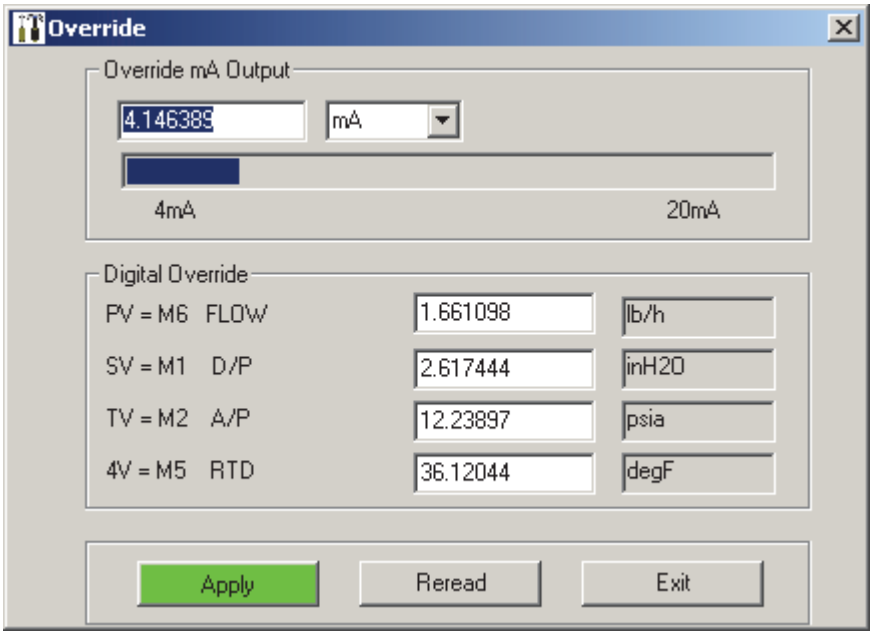
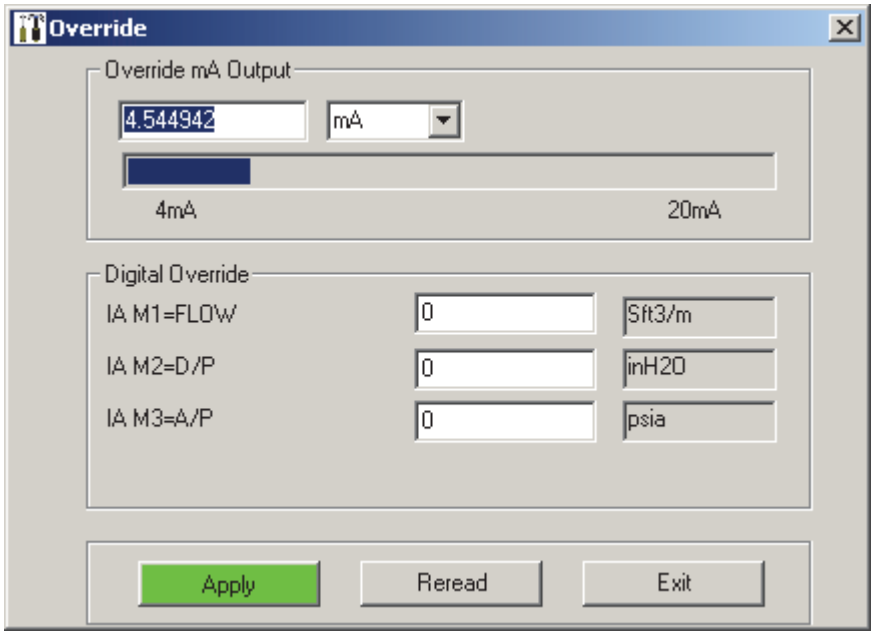


Figure 28. Sample Output Override Screen for an IMV30-D (FoxCom) Transmitter



Go On-line Function

All functions normally return to on-line status unless the device was disconnected during operation. However, this function enables you to force the device back to on-line mode if necessary. The Go On-line function is accessed via the top level `Test` menu.

Go Off-line Function

Normally, the device should remain on-line. However, this function enables you to force the device off-line if necessary. The Go Off-line function is accessed via the top level `Test` menu.

Get ID Function

The Get ID function re-establishes the connection with the device. This function is accessed via the top level `Test` menu.

Get ID (w/reload) Function

The Get ID (w/reload) function resynchronizes the database back to the device. This function is accessed via the top level `Test` menu or from the `GetID (RE-CONNECT)` icon on the toolbar.

Access Level Password

The Access Level Password enables you to access advanced troubleshooting functions. This function is only used in consultation with Schneider Electric. Access Level Password is located in the top level `Options` menu.

Configuration Report Function

The Configuration Report function enables a configuration database file to be accessed. You then can print a hard copy or e-mail it to Global Customer Support for ordering or troubleshooting. The Configuration Report function is accessed via the top level `Tools` menu.

NOTE

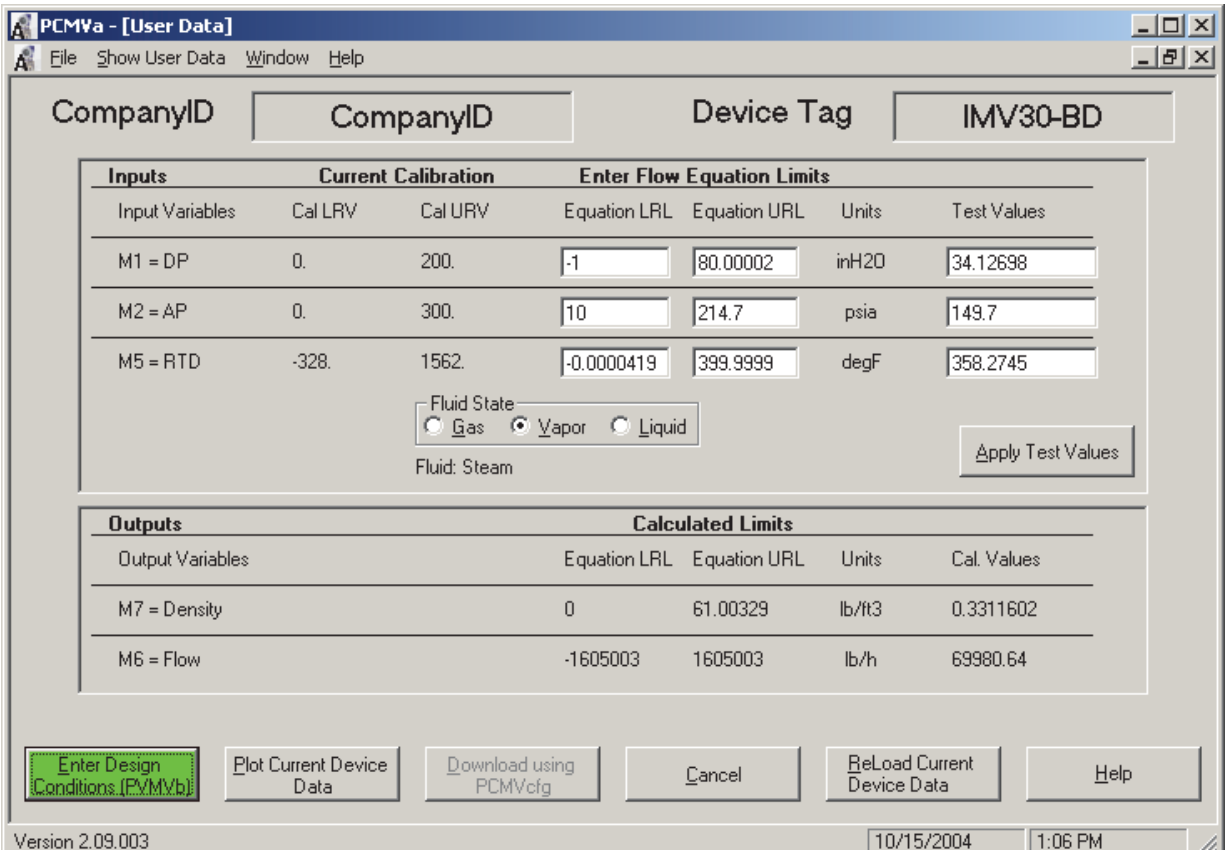
This function is available for transmitters with FoxCom communications only at this time.

Functions Limited to an IMV30 Transmitter

Flow Configuration

To configure your device for flow or density calculations, you must configure the flow application as well as the Flow Tab screen or Density Tab screen described above. To access the Flow Configurator, select `PCMVa)` from the top level `Tools` menu or via the Create Flow Coefs icon on the toolbar. The Flow Configurator Main Menu screen is displayed. It shows the information that has been previously configured. A sample of this screen is shown in Figure 29.

Figure 29. Sample Flow Configurator Main Menu Screen



To reconfigure this information:

1. Specify the `Fluid State` as `Gas`, `Vapor`, or `Liquid`. A `Gas` is a fluid that is in the gaseous state at ambient pressure and temperature, such as oxygen. A `Vapor` is a fluid that is in the liquid state at ambient pressure and temperature, such as steam. Steam requires specifying `Vapor`.
2. Change the three pair of `Flow Equation Limits` as necessary. These values:
   - Establish the region in which the flow and density calculations are valid and accurate.
   - Must be within the range limits displayed on the configuration tab screens.

   The following notes are recommendations by Schneider Electric:

NOTE

1. Enter limit slightly (5%-10%) wider than the application limits.
2. Avoid entering pressure and temperature limits that cross fluid state changes.
3. If doing your configuration on the bench rather than in the process, your pressure and/or temperature may be outside your specified operating range limits and you will get an error message. You can ignore this message.
4. For zero-based flow applications, enter a slightly negative value for DP `Equation LRL`. This prevents unwanted alarms when venting to zero.

5. Enter AP `Equation LRL` of 10 psia or greater (or approximate value in your units) unless your application requires a pressure less than 10 psia.

---

3. Select `Enter Design Conditions (PCMVb)` (green box). A message is displayed that states that the tag number record has been 'found' or 'not found'.
   a. If the record is 'found', continue with Steps 4 through 9.

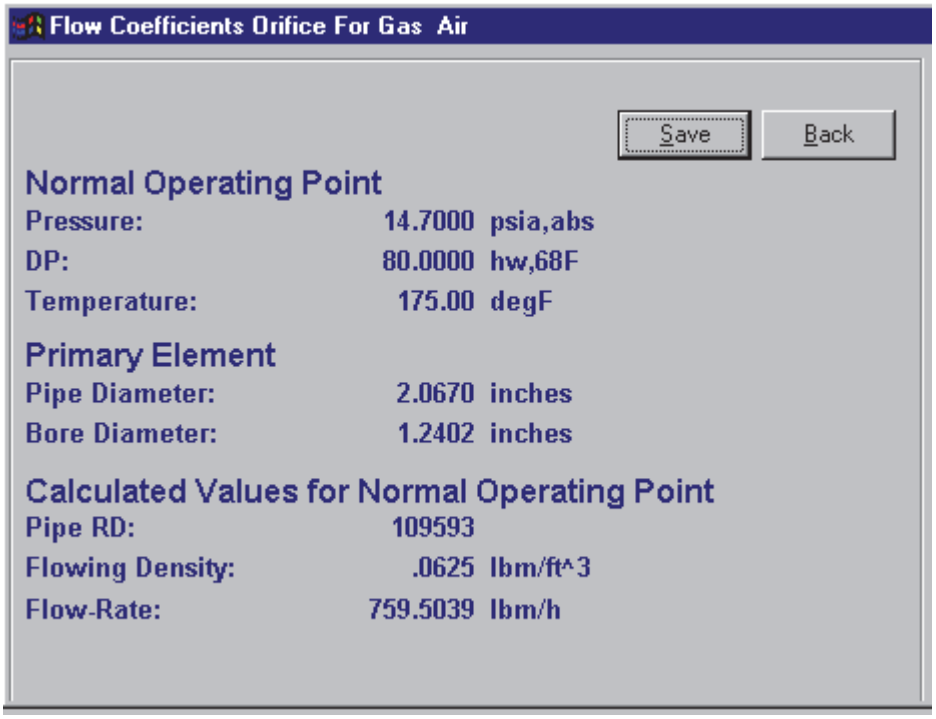
NOTE

Even if you do not need to change any data in PCMVb, it is important that you step through each of the steps.

---

   b. If the record is 'not found', it means that the PCMVb configuration for this tag number transmitter has never been done on this computer or that the `.cfg` file with PCMVb data has never been opened by PCMV on this computer. This requires one of the following actions:
      - Open any tag number that is listed and edit all PCMVb data or
      - Cancel and exit PCMVb and retrieve an existing `.cfg` file which has PCMVb data. Open or Download it in order to use previously saved PCMVb data.
4. On the Differential Producers screen, select the flow measuring device as `Orifice`, `Venturi`, `Nozzle`, `Fixed Geometry`, `Multiport Averaging Pitot (MAP)`, `Compact Orifice`, or `V-Cone®` (`McCrometer® Div Ketema®`). Then click on `Next`.
5. At the next display, further define your device. Then continue to click on `Next` to define the `Standard` (if orifice), `Pipe Material`, and `Primary Element Material`, `Pressure Tap`, and `Special Factors`.
6. The program then leads you to other screens to configure parameters for your liquid, gas, or vapor application.
7. At the end of your configuration, you are presented a screen that enables you to save your changes. See Figure . From this screen, select `Save`. This saves your configuration and returns to the Flow Configurator Main Menu screen.
8. Select `Download Using PCMVcfg` (green box) to download your configuration to the transmitter. The Flow Calculations screen is displayed. If you are sure you are ready to download the new data, select `Download new data to xmtr`. (green box)
9. Save your configuration to your PC as a `.cfg` file.

Figure 30. Sample Screen to Save PCMVb Changes



Test Flow Equations Function

Following the completion of the flow configuration, either before or after downloading the data to the transmitter, you can test the benefits/consequences of various D/P, A/P, and/or RTD values from the Flow Configurator Main Menu screen. To use this function, enter your test values in the `Test Values` boxes and select `Apply Test Values`. The results are shown in the `Cal Values` boxes directly below. You can do this as many times as you want.

However, if you change the `Fluid State` and `Flow Equation Limits` (steps 1 and 2), you must select `Create New Flow Calculations (PCMVb)` and repeat Steps 1 through 8 in Flow Configuration before using the test function again. This test function utilizes the flow equations but runs them in the PCMV configurator. This provides you with a fast and easy test function without the delay of download and upload to the transmitter and without taking the transmitter off-line. Refer to "Test Device Equations Function" on page 54 to test the transmitter.

Plotting Transmitter Data

From the Flow Configurator Main Menu screen, select `Plot Current Xmtr Data` to access graphs and tables of flow and density data. Refer to Figure 29.

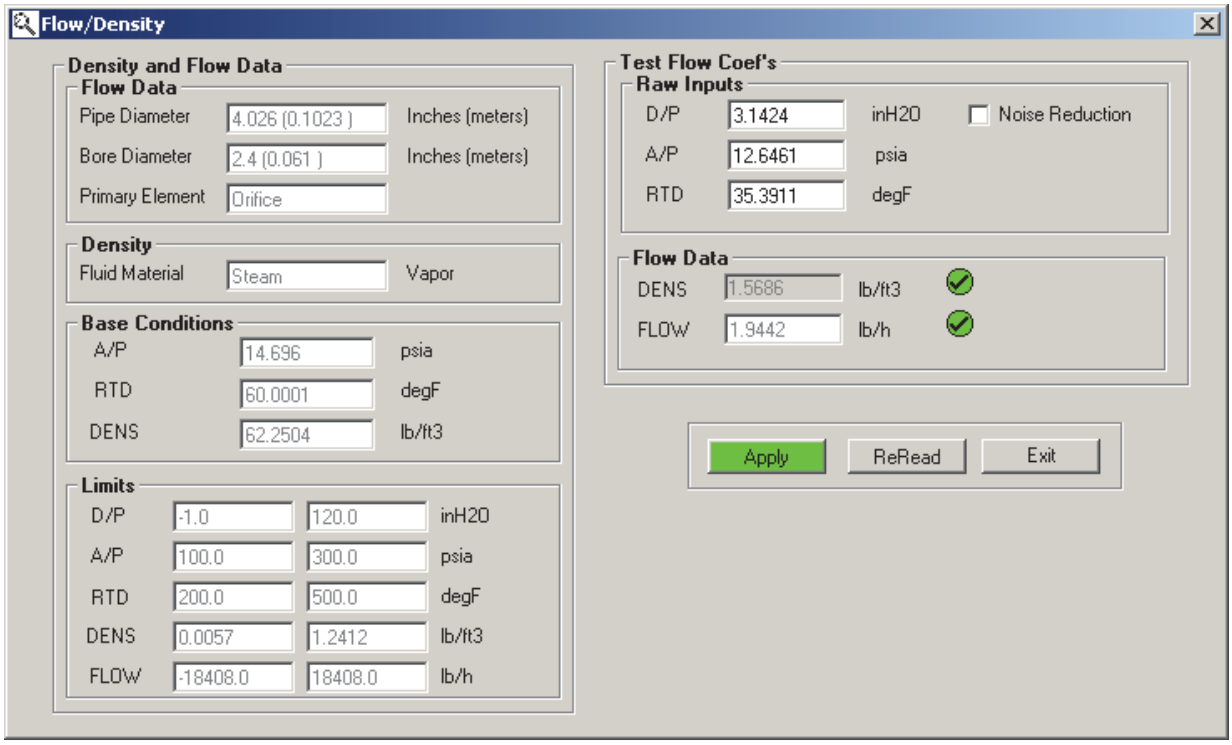
Test Device Equations Function

The Test Device Equations Function enables you to substitute entered values for raw sensor inputs and display the calculated flow and density values outputted from the transmitter. The Test Device Equations function is accessed via the top level `Test` menu. To use this function, enter test values in the `Raw Inputs` boxes and select `Apply`. The results are shown in the `Flow Data` boxes directly below. The `ReRead` button can be used to manually refresh the display.

NOTE

Because the flow equations reside in the IMV30 (not in the computer used for the PVMV configurator), there is a short wait before the results are displayed. Also refer to “Test Flow Equations Function” on page 54.

Figure 31. Sample Test Device Flow Equations Screen



PCMVa Function

The PCMVa function enables you to access the Flow Configurator program. `PCMVa` is located in the top level `Tools` menu.

NOTE

The Flow Configurator can also be accessed from the Create Flow Coefs icon.

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Schneider Electric Systems USA, Inc.
38 Neponset Avenue
Foxboro, MA 02035
United States of America
http://www.se.com

Global Customer Support
Inside U.S.: 1-866-746-6477
Outside U.S.: 1-508-549-2424
https://pasupport.schneider-electric.com

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