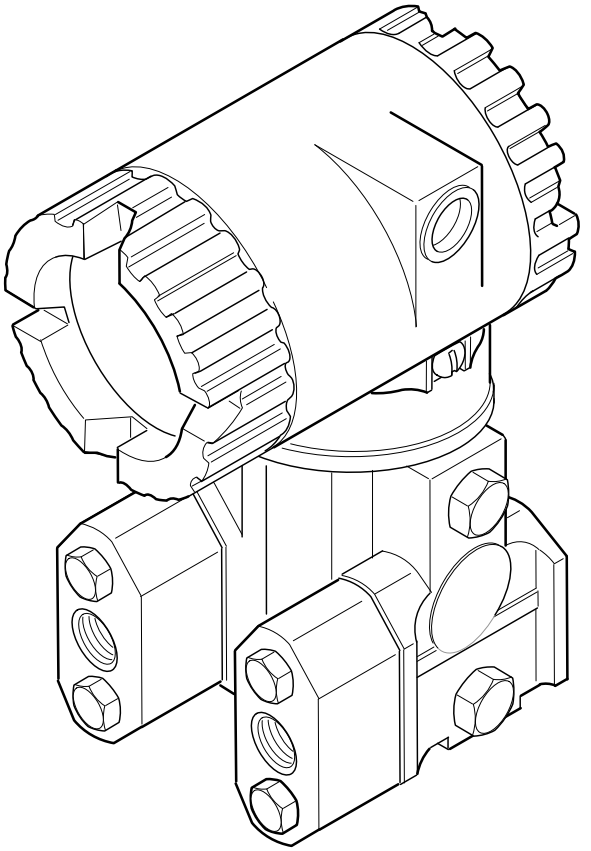
Invensys (Foxboro) IMV25 Multivariable Setup



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IMV25 Overview

This document discusses the use of the Invensys (Foxboro) IMV25 multi-variable. For the sake of clarity, the Invensys IMV25 will hereafter be referred to as the Foxboro IMV25 or the IMV25.

This document concentrates solely on applications using the Foxboro IMV25 or instances when the Foxboro unit is used in concert with an ABB 267CS (XMV) external multi-variable (i.e., a multi-tube application). Various configuration changes are required by the ABB XMV when used with the Foxboro units. These changes are detailed in this document.

Wiring, software configuration and Modbus addressing will be covered for both G4 and G3 generations.

G4 FCU Technology

The following section discusses installation and configuration of the Foxboro IMV25 with respect to Totalflow G4 devices (XFC^{G4}/XRC^{G4}). In some applications (i.e., multi-tube), the IMV25 may be used in conjunction with the more familiar ABB XMVs.

NOTE: Pay special attention to the screen shots discussing changes to the ABB XMV when used in conjunction with the Foxboro units.

Step 1 Electrical Installation of the Foxboro IMV25

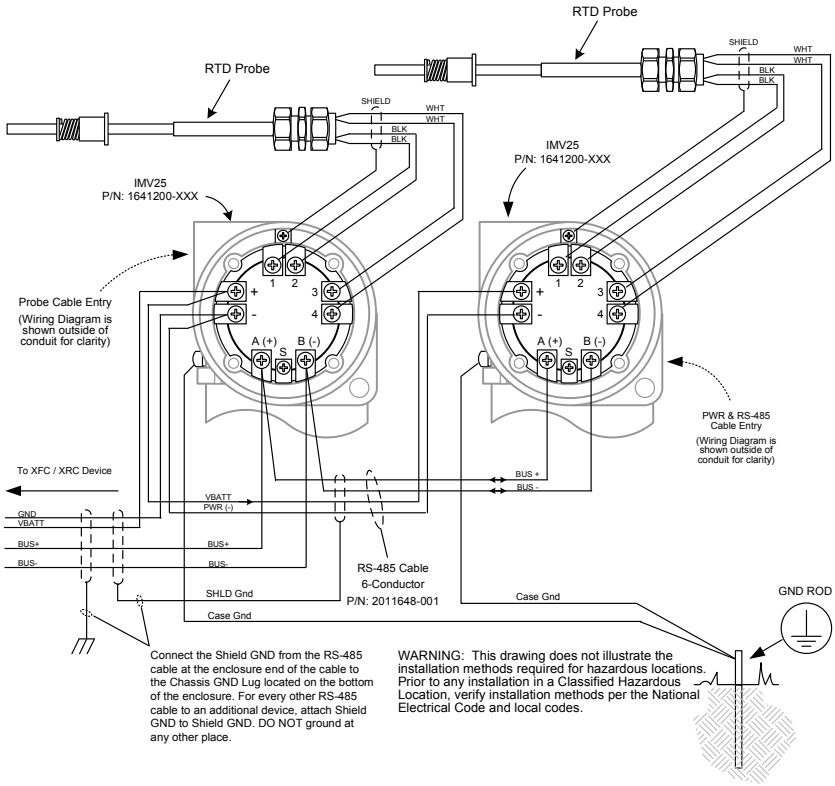


Figure 1 Foxboro IMV25 Wiring and Grounding Recommendations

Step 2 RTD Wiring for the Foxboro IMV25

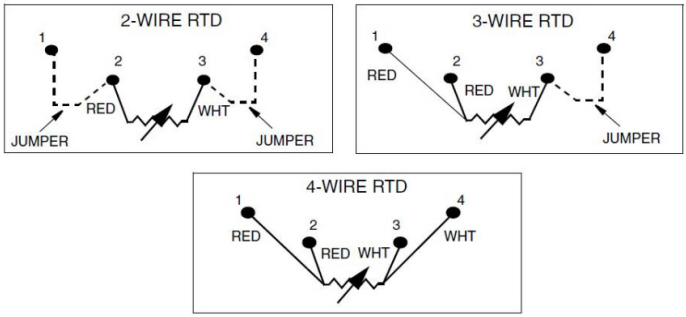


Figure 2 Foxboro IMV25 Wiring for 2, 3 and 4 Wire RTDs

Step 3 Software Configuration of the Foxboro IMV25

In a multi-tube application, the user may find it necessary to employ a mix of Foxboro IMV25s and ABB 267CS XMVs; however, there are several issues that need to be addressed when using the two units on a common RS-485 Modbus communication link.

3A In the Communications Setup tab (Figure 3), the user needs to select 16-Bit Word Swapped for the Register Format.

- Foxboro IMV25 must be set to 16-Bit Word Swapped
- ABB XMV must be set to 16-Bit Word Swapped

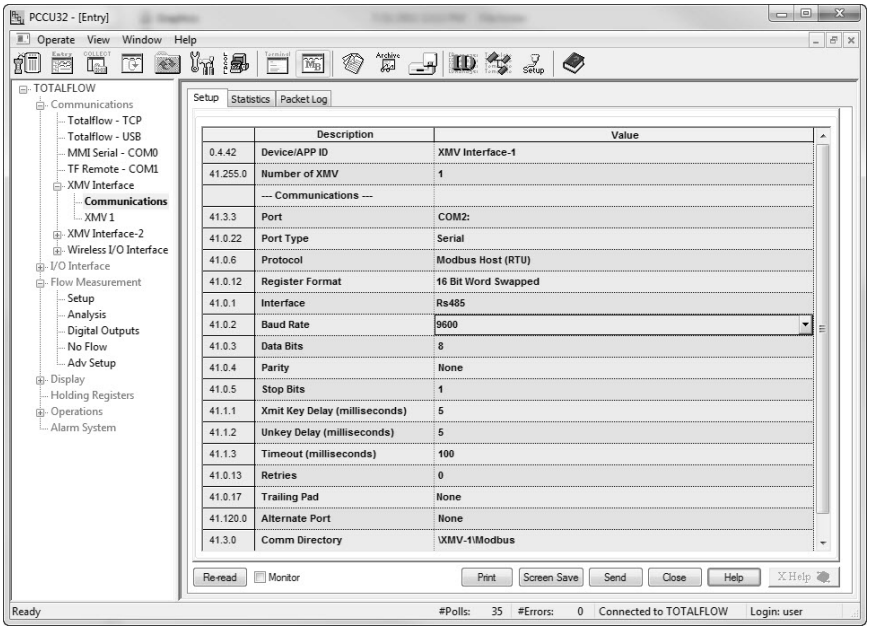


Figure 3 Register Format Changes to 16-Bit Word Swapped

3B Factory Units:

- Foxboro IMV25 must be set to English
- ABB XMV must be set to Metric

3C Display Scroll:

- Foxboro IMV25 must be set to Disabled
- ABB XMV must be set to Enabled (if the XMV has a display)

3D Modbus Register:

- Foxboro IMV25 must be set to 401
- ABB XMV must be set to 401

Setting the ABB Modbus Register to 401 informs the ABB XMV to look for the 16-Bit Word Swapped register format.

3E Timeout (Milliseconds):

- Foxboro IMV25 must be set to 100

Baud rate is assumed to be 9600. In the examples below, XMV 1 is an ABB XMV (Figure 4) and XMV 2 (Figure 5) is a Foxboro IMV25. Both are being used together in a 3-tube application; the third tube is supported by the host flow computer.

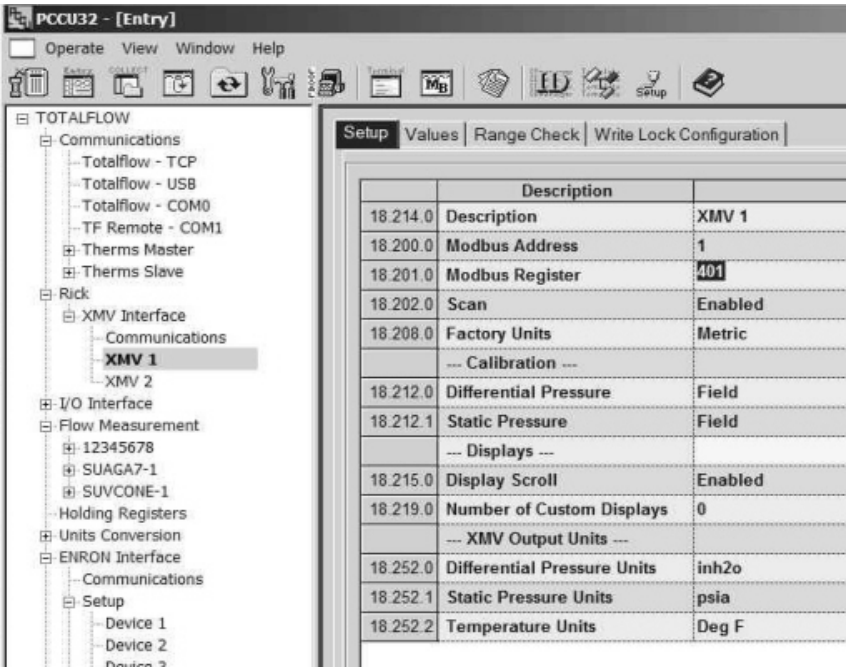
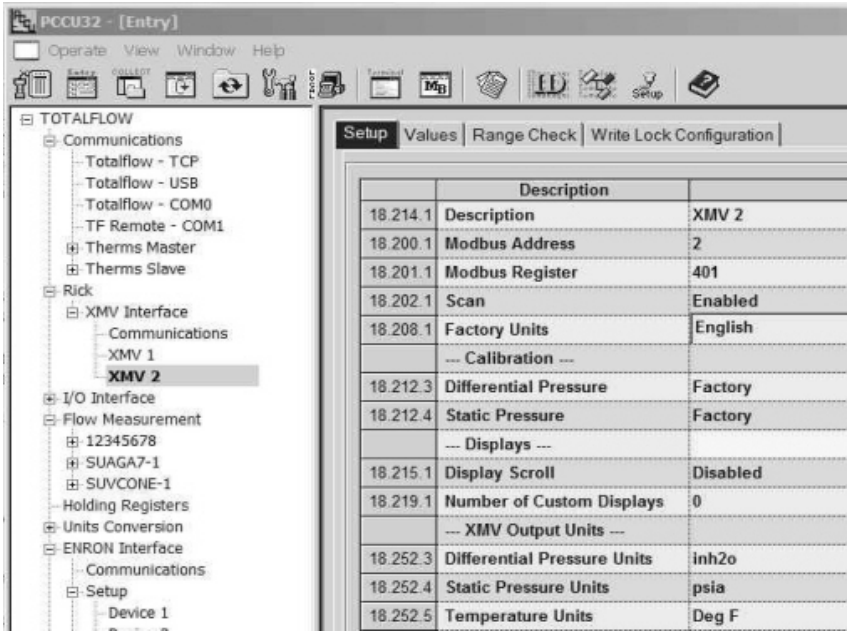


Figure 4 XMV 1 (ABB 267CS XMV) 401, Metric Units and Enable Display Scrolling



	Description	
18.214.1	Description	XMV 2
18.200.1	Modbus Address	2
18.201.1	Modbus Register	401
18.202.1	Scan	Enabled
18.208.1	Factory Units	English
	--- Calibration ---	
18.212.3	Differential Pressure	Factory
18.212.4	Static Pressure	Factory
	--- Displays ---	
18.215.1	Display Scroll	Disabled
18.219.1	Number of Custom Displays	0
	--- XMV Output Units ---	
18.252.3	Differential Pressure Units	inh2o
18.252.4	Static Pressure Units	psia
18.252.5	Temperature Units	Deg F

Figure 5 XMV 2 (Foxboro IMV25) 401, English Units and Disable Display Scrolling

Step 4 Changing the Modbus Address of the Foxboro IMV25

If only one multi-variable is being connected to the com port, the user will not have to perform these steps. All IMV25 units ship with a default Modbus address of 1.

Requirements:

- A laptop with PCCU32 installed. Use PCCU 7.17 or later.
- An appropriate converter (i.e., RS-232 to RS-485, USB to RS-485, etc.). Totalflow stocks an RS-232 to RS-485 converter (Part #: 1800255-001).
- A single Foxboro IMV25 unit.

Only one unit at a time can be connected to the laptop. Additionally, only one unit at a time can have its Modbus address modified.

Figure 6 displays the wiring connection from the serial port on a laptop to the Foxboro IMV25.

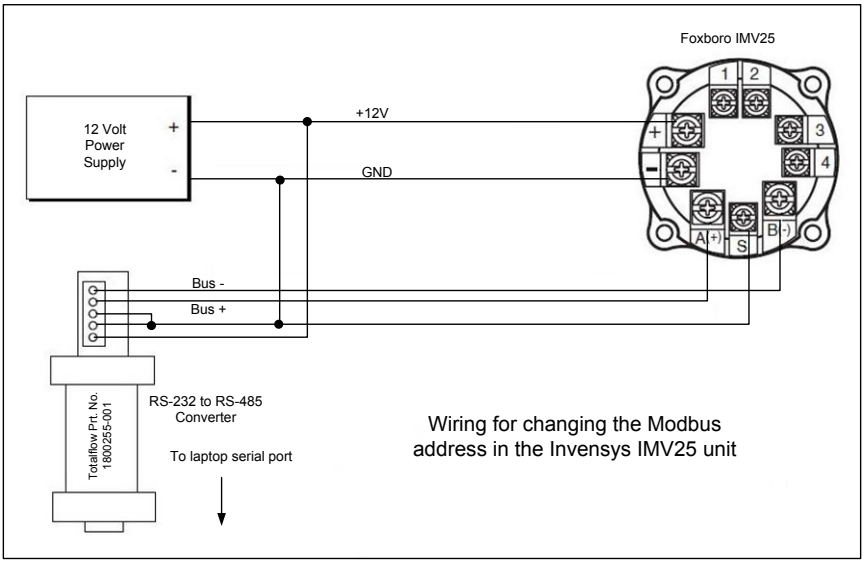


Figure 6 Foxboro IMV25 Recommended Wiring for Modbus Address Change

Step 5 Using TFModbus to Change the IMV25 Modbus Address

Before using TFModbus to change the IMV25's Modbus address, the user must copy IMV25.ini into PCCU32's TFModbus sub-folder. A copy of IMV25.ini can be obtained by contacting Totalflow Customer Service at 1-800-442-3097, option 2.

The following steps will walk the user through changing the IMV25's Modbus address using PCCU32's TFModbus tool.

5A Open PCCU32. Click the TFModbus toolbar icon (Figure 7). This will bring up the various Modbus drivers. If the user has copied IMV25.ini into the TFModbus sub-folder, it should be included in the list of .ini files.

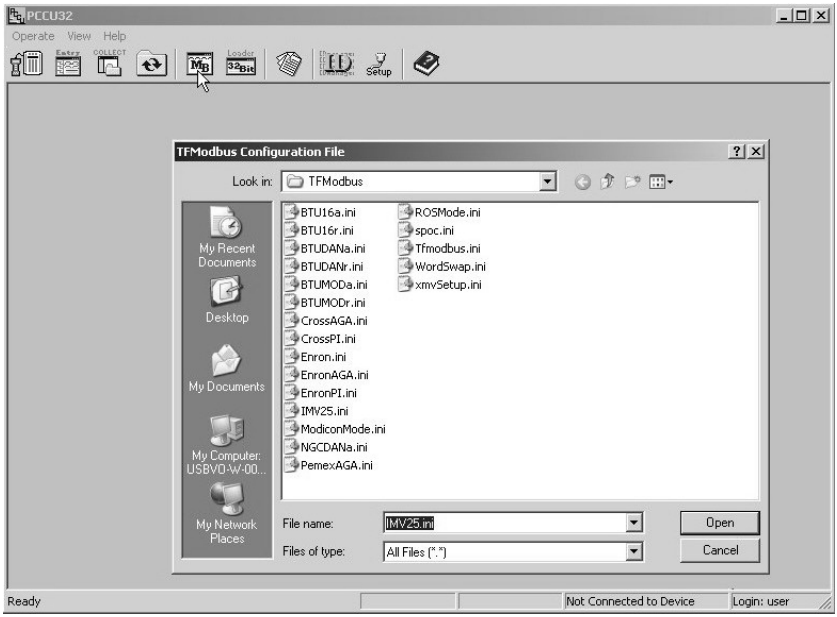


Figure 7 Activate TFModbus Tool

5B Highlight IMV25.ini (Figure 8). Upon completion, click Open.

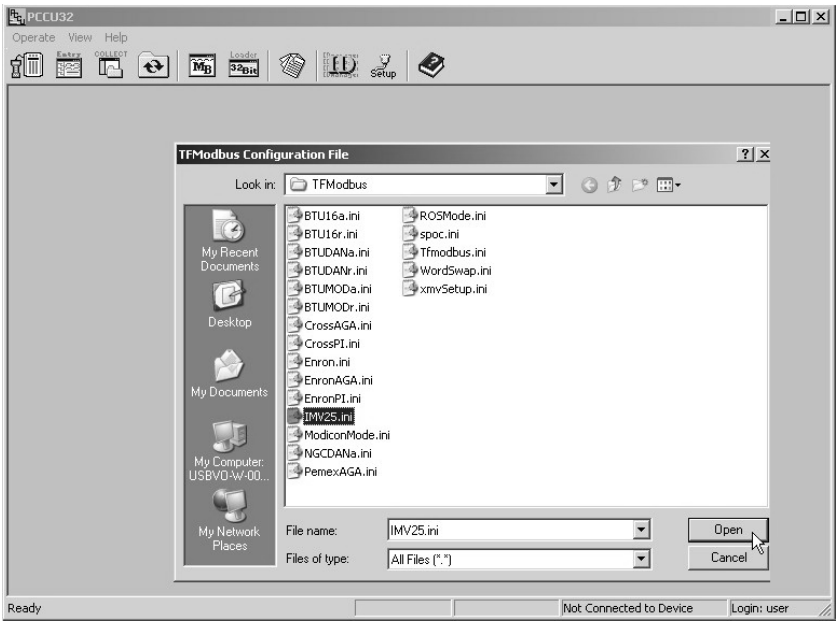


Figure 8 Select IMV25.ini to Change Modbus Address

5C The next screen (Figure 9) enables the user to set and check the IMV25 Modbus address. Read the instructions on the initial Start Here tab.

- Clicking the Set XMV 2 tab will set the attached IMV25 to a Modbus address of 2. The baud rate is assumed to be 9600 baud, and the Response Delay is set to zero milliseconds.
- DP, AP, Temp and the modified Modbus address will be displayed.

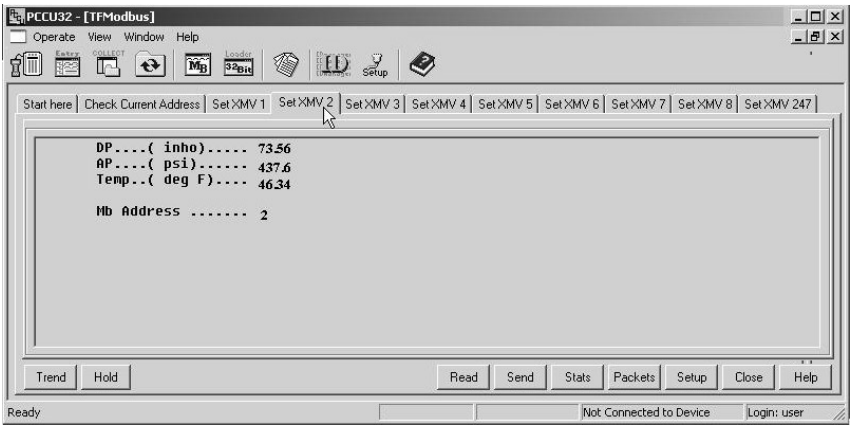


Figure 9 Setting the Foxboro IMV25 to Modbus Address 2

If additional help is needed to use the TFModbus tool, refer to the Help screens by clicking the Help button.

Step 6 Electrical Installation of ABB 267CS XMV

It is not the intent of this document to discuss the installation of the ABB XMV. Figure 10 is included for completeness and the user's convenience.

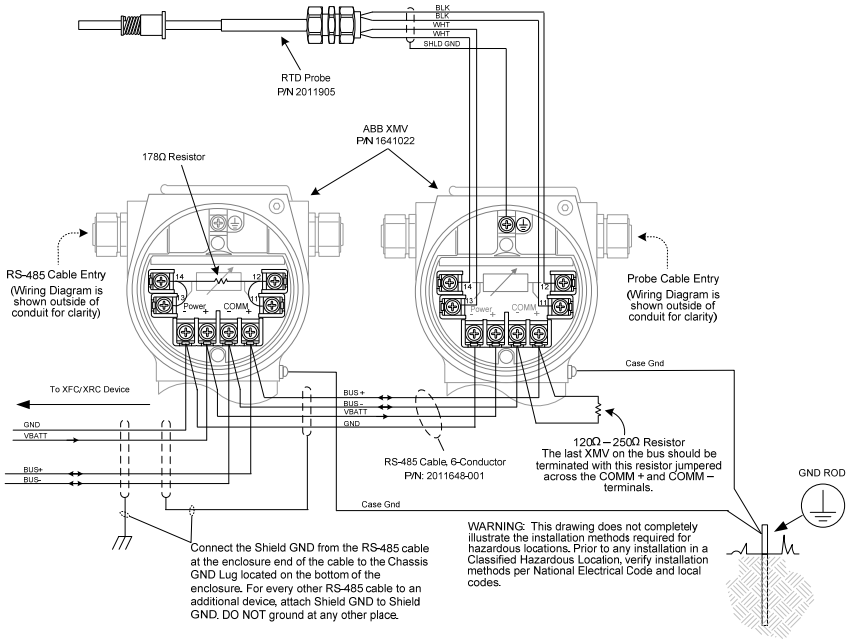


Figure 10 ABB 267CS XMV Wiring and Grounding Recommendations

Step 7 Software Configuration of the ABB XMV

Changes to the ABB XMV configuration are only required when the XMV is used in conjunction with the Foxboro IMV25. For an explanation of the software configuration changes, refer to step 3.

Step 8 Using TFModbus to Change the Modbus Address of the ABB 267CS XMV

Requirements:

- A laptop with PCCU32 installed. Use PCCU 7.17 or later.
- An appropriate converter (i.e., RS-232 to RS-485, USB to RS-485, etc.).
- A single ABB XMV unit.

Only one unit at a time can be connected to the laptop and have its Modbus address modified.

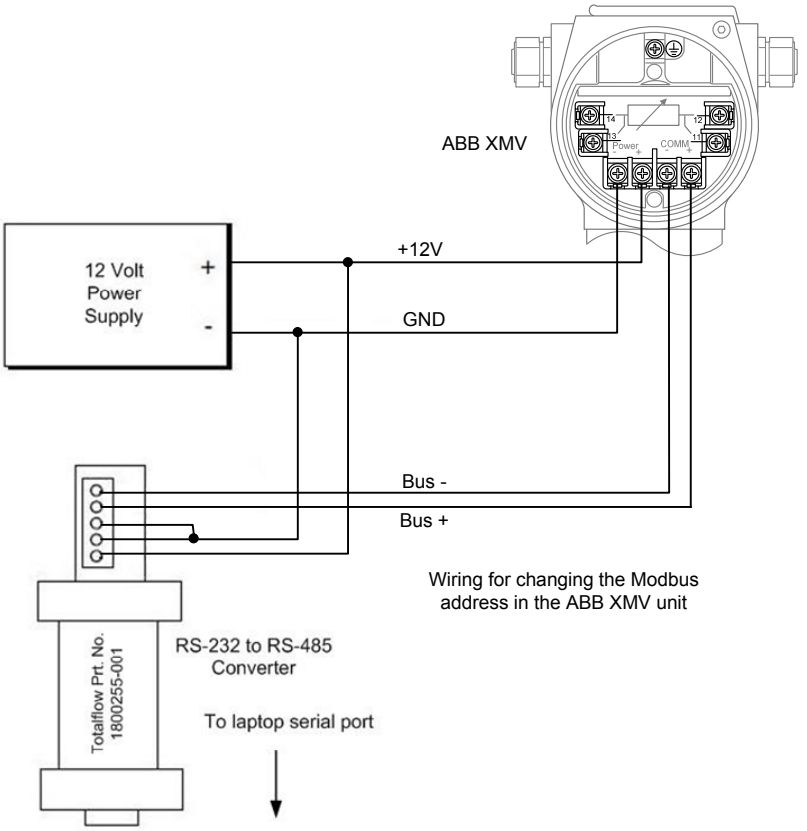


Figure 11 ABB 267CS XMV Recommended Wiring for Modbus Address Change

Before using TFModbus to change the XMV's Modbus address, the user must ensure that the xmvSetup.ini is in PCCU32's TFModbus sub-folder. If the file is not present, a copy can be obtained by contacting Totalflow Customer Service at 1-800-442-3097, option 2.

The following steps will walk the user through changing the XMV's Modbus address using PCCU32's TFModbus tool.

8A Open PCCU32. Click the TFModbus toolbar icon, MB (Figure 12). This will bring up the various Modbus drivers.

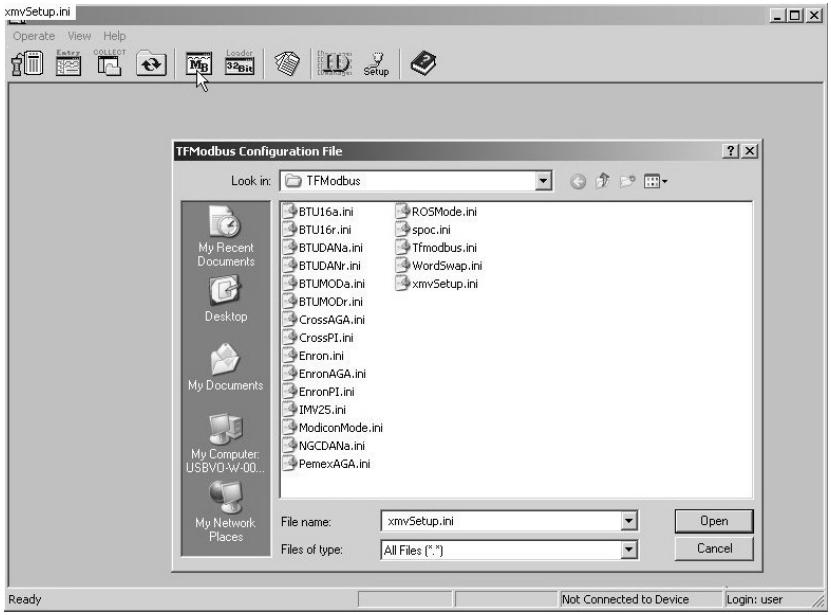


Figure 12 Activate TFModbus Tool

8B Highlight the xmvSetup.ini (Figure 13). Click Open.

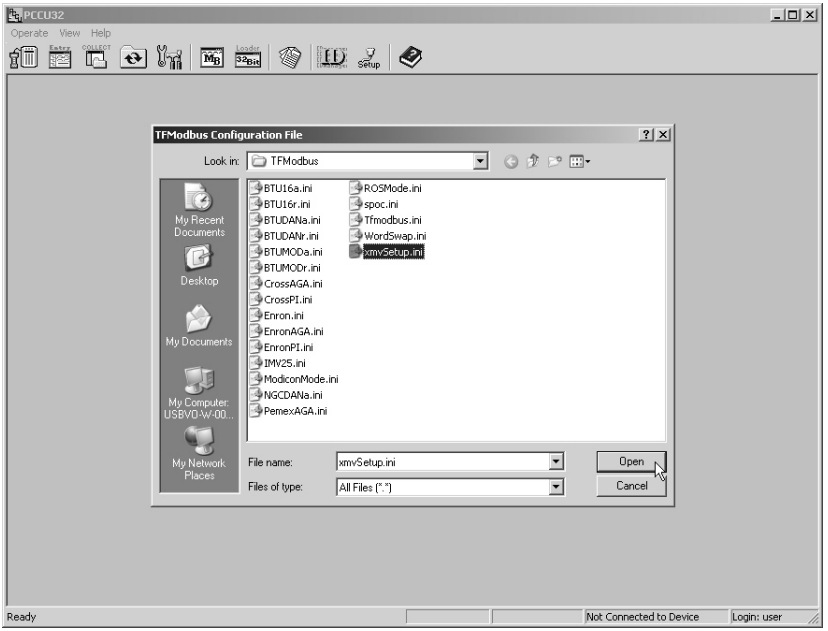


Figure 13 Select xmvSetup.ini to Change Modbus Address

8C The next screen (Figure 14) enables the user to set the ABB XMV Modbus address. Read the instructions on the initial screen.

Example:

- Clicking the XMV 2 tab will set the attached XMV to a Modbus address of 2. The baud rate is assumed to be 9600 baud, and the Response Delay is set to 20 milliseconds.
- DP, AP, Temp and the modified Modbus address will be displayed to the user.

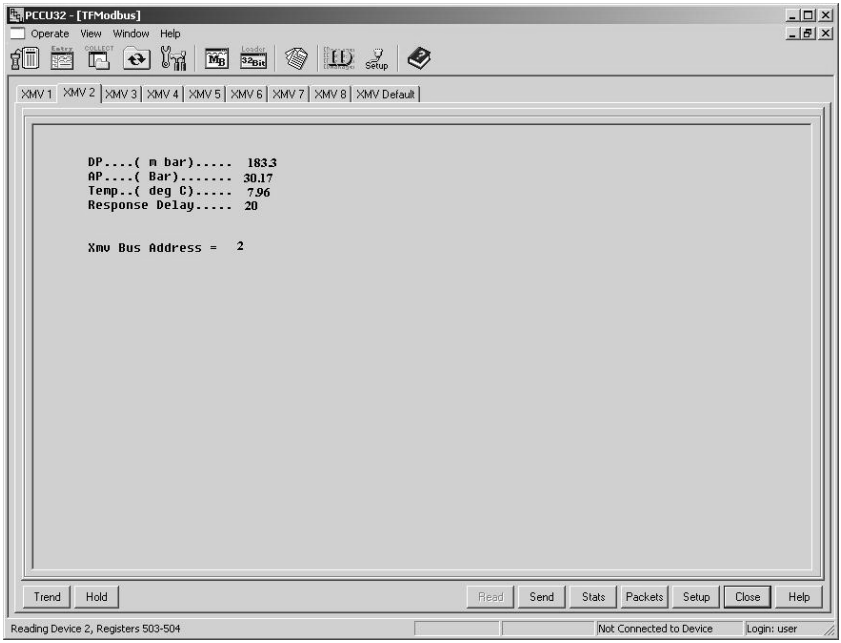


Figure 14 Setting the ABB XMV to Modbus Address 2

If additional help is needed to use the TFModbus tool, refer to the Help screens by clicking the Help button.

G3 Flow Computer Considerations

Many of the same installation and configuration issues regarding the G4 units are applicable to the G3 devices (XFC/XRC). In the older G3 units, the XMV Interface application is turned on as a separate application (Application Slot #8) in the Application tree-view. It is then associated with a specific communication port. In the G4 world, the XMVs are turned on as communication application (i.e., under the Communication applications in the Application tree-view).

As this is the case, the same settings used for G4 devices will apply to the G3 devices.

G3 FCU Example

In the following example, a G3 XFC was loaded with the 2101050-028 Flash (a very basic Flash) and 2100961-006 station files. These station files (or configuration files) support four tubes. The first tube is associated with the host XFC. The remaining tubes are supported with multi-variables. Tubes 2 & 4 are supported using an ABB XMV, while tube 3 uses the Foxboro IMV25 multi-variable.

The station files established Com2 as a Modbus Host to support the multi-variables.

A The user will need to set the Register Format to 16-Bit Word Swapped (Figure 15).

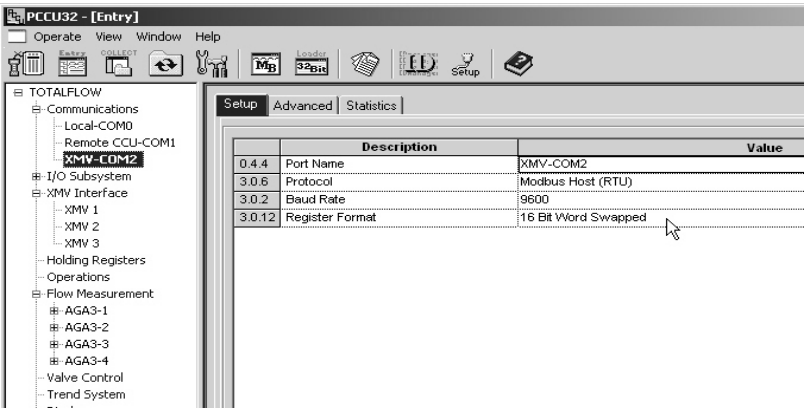


Figure 15 Register Format Changes to 16-Bit Word Swapped

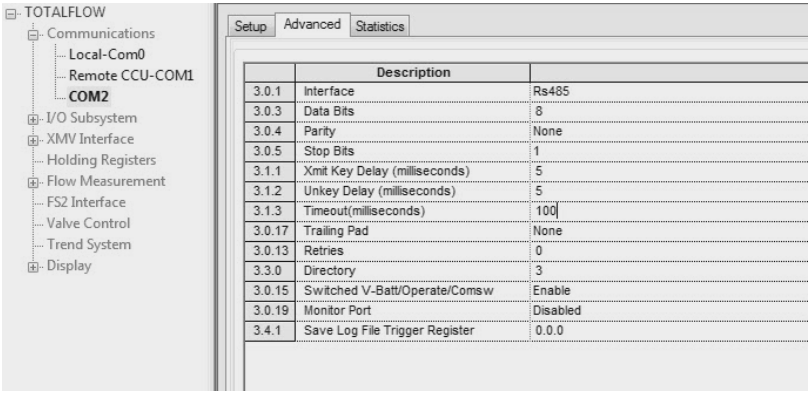


Figure 16 Advanced Tab

Under the XMV Interface, the user will need to modify a few settings for XMV 2, the Foxboro IMV25 (Figure 17).

B Under the XMV Setup, the Factory Units must be set to English.

C Display Scroll must be set to Disabled.

D Modbus Register should be set to:

- Foxboro IMV25 must be set to 401
- ABB XMV must be set to 401

Setting the ABB Modbus Register to 401 informs the ABB XMV to look for the 16-Bit Word Swapped register format.

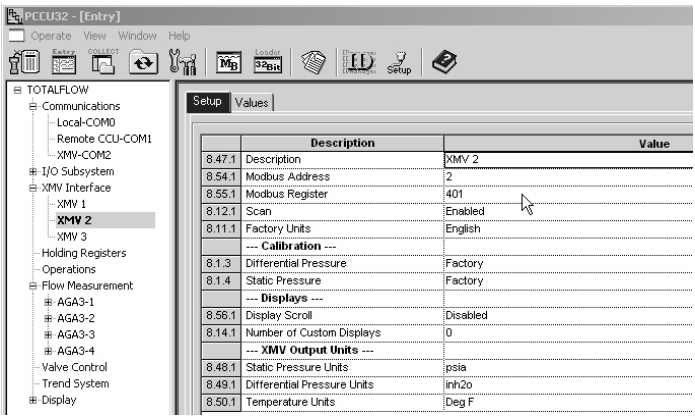


Figure 17 XMV 2 (Foxboro IMV25) 401, English Units and Disable Display Scrolling

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