Quick Install Guide

This Quick Install Guide is applicable for models: QuadraTherm® 640i /780i equipped with a Foundation Fieldbus interface.

A copy of this Quick Install Guide, the device description (DD) files, the 640i/780i Series Foundation Fieldbus manual, and the individual product manuals are included on the digital communication information CD included in your shipment. This information is also available for download.

This quick install guide is intended to offer specific setup information for customers who already use Foundation Fieldbus (FF-BUS). To get more technical information on Foundation Fieldbus, go to www.fieldbus.org and click on the End User Resources button and then choose the Technical References button.

Wiring Connections

Power Requirements: The 640i/780i meters use 24 VDC (+/-10%) at 1 Amp. Because of the current needed, the meter cannot be powered off the H1 network. The separate 24 VDC (+/-10%) power supply is connected to terminals 1 and 2 (See Figure 1).
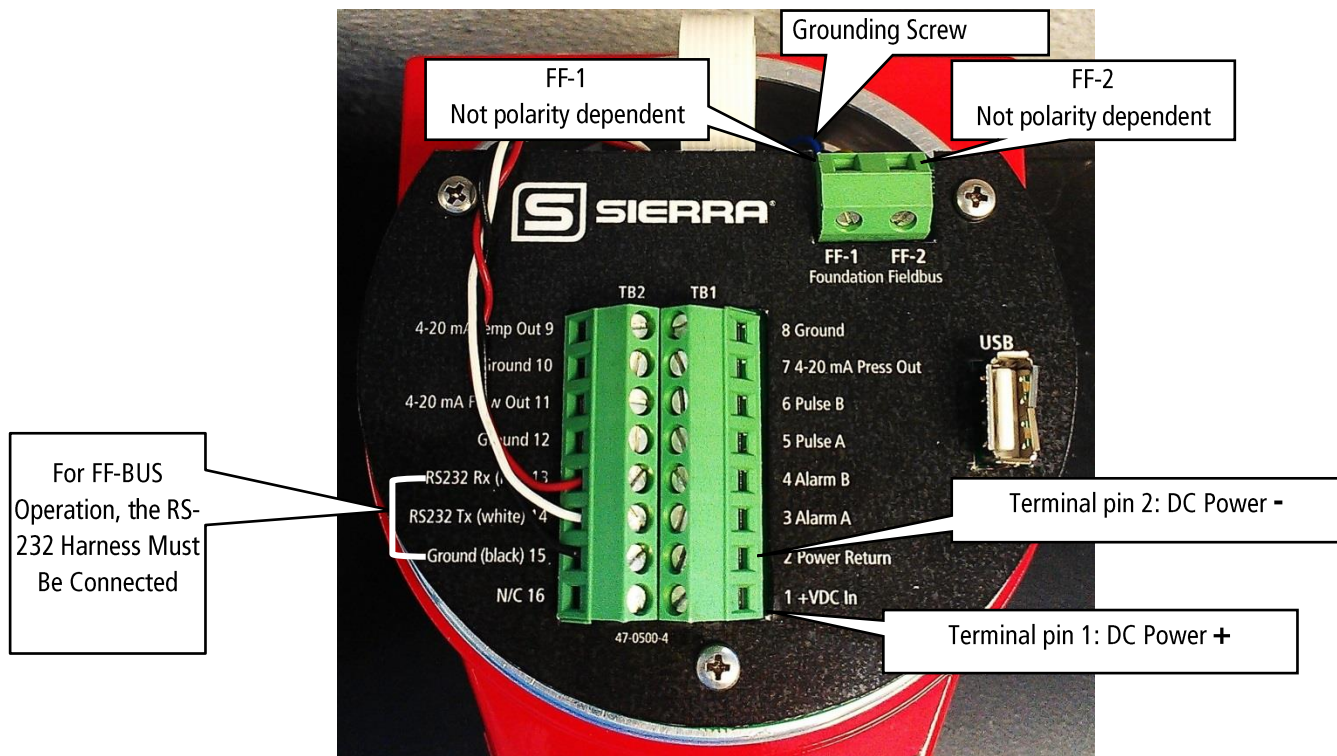

Figure 1: Basic Meter Connections

Data Connections: The Foundation Fieldbus H1 Network connections are labeled as FF-1 and FF-2 (See Figure 1). These are not polarity dependent. If multiple shield grounds are being used, use the earth grounding screw shown in Figure 1.

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Connecting to the QuadraTherm 640i/780i Foundation Fieldbus

1. Connect the 24 VDC (+/-10%) power supply to terminal pins 1 and 2 as shown in Figure 1.
2. Connect your Foundation Fieldbus network to FF-1 and FF-2 shown in Figure 1.

Adding SIERRA_DEVICE to Your H1 Network

1. Load the DD files for this instrument into your host system (PC, PLC, DCS, HMI, etc.).
2. Start the FF-BUS host.
3. The 640i/780i will show up on the device list as SIERRA_DEVICE.
4. Sierra set the node address to 247. We suggest you change it to suit your application.
5. AI1(Flow), AI2 (Temperature), AI3 (Pressure), and AI4 (Total) are already configured at Sierra.
6. At this point, the tag names and configuration may be changed for your application.

To change your configuration variables from the factory default, see the 640i/780i Foundation Fieldbus instruction manual.

Foundation Fieldbus Interface Configuration

The 640i/780i FF-BUS interface uses a MODBUS to FF-BUS translator board inside the meter. This allows the user to configure most of the variables accessible to the MODBUS interface. If changes are needed, the Transducer Block can be configured to access other Modbus variables. See the full QuadraTherm640i/780i Foundation Fieldbus manual for instructions.

AI/AO Blocks

The Foundation Fieldbus transducer block (SIERRA_TB) provides four analog inputs, AI1 through AI4, and one analog output, AO (See AI/AO blocks in Table 1). These variables have been pre-configured as shown below in Table 1. However, the user can reconfigure them as needed.

AI/AO Blocks	Primary Value	Channel	Data Type	Analog Signal
AI1	PV1	1	32 bit Float/Real	Flow Rate
AI2	PV2	2	32 bit Float/Real	Temperature
AI3	PV3	3	32 bit Float/Real	Pressure
AI4	PV4	4	32 bit Float/Real	Total
AO	Final Value	5	Not Assigned	Not Assigned

Table 1: Factory AI/AO Blocks

MODBUS_REGS (1 through 4)

The Transducer Block also has four groups of Modbus registers that can be used for static setup inputs and outputs for variables such as Alarm Mode, Gas Type Index, Flow Unit Index, or Pressure Unit Index in the meter. This data is not cyclic as it only updates occasionally and might not be accessible to all devices on the fieldbus. The data type is an unsigned short integer, Byte order 0-1. To change these, see the QuadraTherm 640i/780i Foundation Fieldbus manual. All the variables in Table 2 have been pre-configured to be accessible in FF-BUS.

Variable	MODBUS_REGS Group	REG_START ADDRESS	NUM_OF_REGS
Alarm status	1	8	10
Gas name ASCII Char 1-2			
Gas name ASCII Char 3-4			
Gas name ASCII Char 5-6			
Gas name ASCII Char 7-8			
Gas name ASCII Char 9-10			
Gas name ASCII Char 11-12			
Gas name ASCII Char 13-14			
Gas name ASCII Char 15-16			
Gas index			
Flow units ASCII Char 1-2	2	18	10
Flow units ASCII Char 3-4			
Flow units ASCII Char 5-6			
Flow units ASCII Char 7-8			
Flow unit - index			
User full scale – low word			
User full scale – high word			
Totalizer units Char 1-2			
Totalizer units Char 3-4			
Totalizer unit - index			
Temp. units ASCII Char 1-2	3	28	7
Temperature unit - index			
Pressure units ASCII Char 1-2			
Pressure units ASCII Char 3-4			
Pressure units ASCII Char 5-6			
Pressure units ASCII Char 6-7			
Pressure unit - index			
Alarm active	4	61	2
Alarm mode			

Table 2: Factory Static Modbus Registers

Below (Figure 2) is an example of what these MODBUS_REGS_1, 2, 3, 4 actually look like on NI-FBUS Configurator. Shown here in Hex: MODBUS_REGS_1 has the Alarm Status (ox0=off), Gas Name in ASCII, Gas Index (ox1=Argon). MODBUS_REGS_2 has the Flow Units in ASCII, Flow Unit Index (ox1= SCFM), and so on.
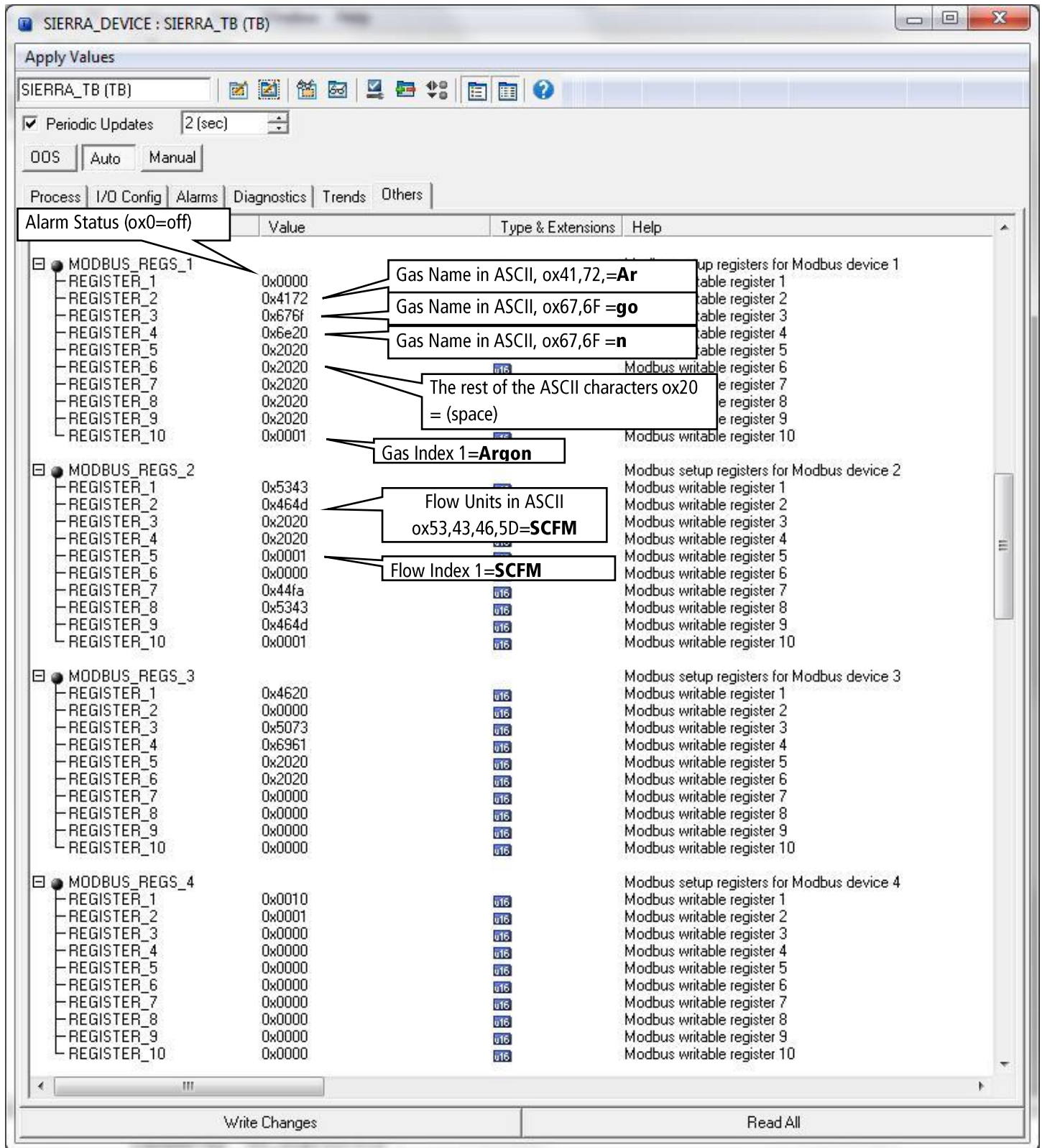

Fig. 2: Modbus Registers displayed in NI-FBUS Configuration

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