



Quick Install Guide

This Quick Install Guide is applicable for SmartTrak® models: 100, 101, and 140 with Foundation Fieldbus.

A copy of this Quick Install Guide, the device description (DD) files, the SmartTrak® 100 Foundation Fieldbus manual, and the SmartTrak 100 Series product manual are included on the digital communication information CD included in your shipment. The information is also available for [download](#).

This 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 SmartTrak® instrument uses a 24 VDC $\pm 10\%$ power supply. See Table 1 on the right for minimum current requirements. It may be supplied via the DB15 connector or the power terminal blocks on the FF-BUS module (See Figure 1 below). See [SmartTrak® 100 Instruction Manual](#) for more detail on using the DB15. Consult the device mA current requirements in Table 1 to ensure power requirements are met.

SmartTrak® Instrument	Minimum mA Current Requirements
M100L	230
M100M	230
M100H	230
C100L	500
C100M	800
C100H	1260

Table 1: Minimum Current Requirements

Data Connections: The Foundation Fieldbus H1 network connections are labeled as FF-1 and FF-2 on the data terminal block (See Figure 1).

Connecting to the SmartTrak® Foundation Fieldbus Module

1. Connect the Foundation Fieldbus network to FF-1 and FF-2 on data terminal block (See Figure 1). The FF-1 and FF-2 are not polarity dependent.
2. Connect the 24 VDC power supply to power terminal block as shown below in Figure 1.

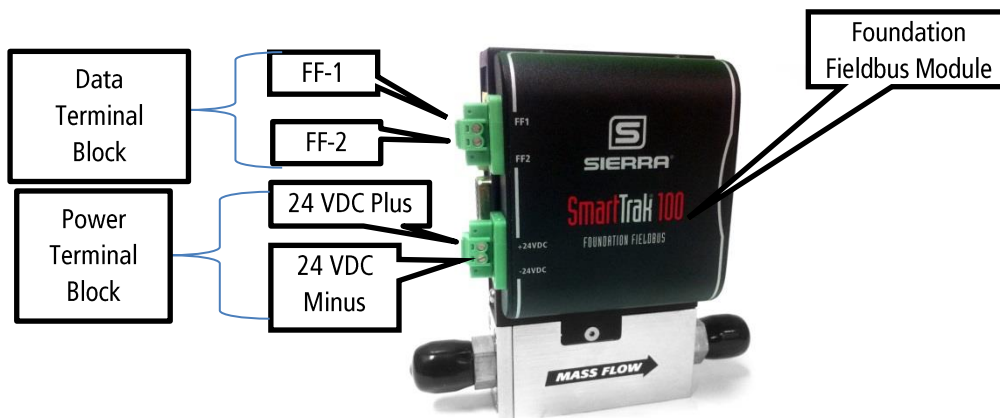


Figure 1: Connection Points

Adding the SmartTrak® to a Foundation Fieldbus 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 SmartTrak® will show up on the device list as SIERRA_DEVICE.
4. Sierra has set the node address to 247. We suggest you change it to suit your application.
5. AI_1,2,3,4 and AO are already configured for flow, total, set point read, full scale and set point write (See Table 2).
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 SmartTrak 100 Foundation Fieldbus [Instruction Manual, Chapter 5](#).

Changing the Fieldbus Interface Configuration

The SmartTrak® FF-BUS interface module uses a Modbus to FF-BUS translator board. 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 SmartTrak 100 Foundation Fieldbus [Instruction Manual](#) for details.

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 2). These are all configurable as 16 or 32 bit integers or float data types (See Data Type in Table 2)*. These variables have been pre-configured as shown below in Table 2. However, the user can reconfigure them as needed.

Table 2: Pre-Configured Variables

AI/AO Blocks	Primary Value	Channel	Data Type	Data
AI1	PV1	1	Float (2 two bytes registers), Byte order 1-0-3-2	Flow Rate
AI2	PV2	2	Unsigned long integer, Byte order 1-0-3-2	Total
AI3	PV3	3	Float (2 two bytes registers), Byte order 1-0-3-2	Set Point Read
AI4	PV4	4	Float (2 two bytes registers), Byte order 1-0-3-2	Full Scale
AO	Final Value	5	Float (2 two bytes registers), Byte order 1-0-3-2	Set Point Write

*Although flow rate, total, set point read, and full scale are **outputs** of the SmartTrak, by Foundation Fieldbus convention these are called analog **inputs** (AI1-AI4).

Table 2: 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 Valve Power, Gas Type Index, Valve Mode, or for resetting the totalizer. 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 SmartTrak 100 Foundation Fieldbus [Instruction Manual](#). All the variables in Table 3 have been pre-configured to be accessible in FF-BUS.

MODBUS_REG Factory Defaults	MODBUS_REGS	REG_START ADDRESS	NUM_OF_REGS
Valve Power	1	8	1
Gas Type Index	2	33	4
Valve Mode Index			
Flow Unit Index			
Set Point Source Index			
Sensor Health Data	3	131	3
Zero Instrument			
Meter Factory Defaults			
Total Decimal Points	4	141	6
Firmware Rev.			
Device Type			
Serial Number Low Word			
Serial Number Hi Word			
Reset Total			

Table 3: Pre-Configured Variables

In Figure 2 below, an example shows what these MODBUS_REGS_1, 2, 3, 4 actually look like on the NI_FBUS Configurator. MODBUS_REGS_1 has the Valve power (3200). MODBUS_REGS_2 has the Gas Type Index (1=air), Valve Mode index (1=Auto), Flow Unit index (2=SCCM), and so on.

The screenshot displays the NI_FBUS Configurator interface with a tree view of MODBUS registers. Callouts point to specific values:

- MODBUS_REGS_1**: REGISTER_1 = 3200 (Valve Power)
- MODBUS_REGS_2**: REGISTER_1 = 1 (Gas type index), REGISTER_2 = 1 (Valve Mode index), REGISTER_3 = 2 (Flow Unit index), REGISTER_4 = 0 (Set point source Index)
- MODBUS_REGS_3**: REGISTER_1 = 4912, REGISTER_2 = 165, REGISTER_3 = 165
- MODBUS_REGS_4**: REGISTER_2 = 2044, REGISTER_3 = 100, REGISTER_4 = 29588, REGISTER_5 = 2, REGISTER_6 = 1

Figure 2: TB Block Engineering Unit Setup