

# Quick Start Guide: Emerson FB1200 Flow Computer



# Device Safety Considerations

## Reading these Instructions

Before operating the device, read these instructions carefully and understand their safety implications. In some situations, improperly using this device may result in damage or injury. Keep this manual in a convenient location for future reference. Note that these instructions may not cover all details or variations in equipment or cover every possible situation regarding installation, operation, or maintenance. Should problems arise that are not covered sufficiently in the text, immediately contact Customer Support for further information.

## Protecting Operating Processes

A failure of this device – for whatever reason -- may leave an operating process without appropriate protection and could result in possible damage to property or injury to persons. To protect against this, you should review the need for additional backup equipment or provide alternate means of protection (such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc.). Contact Remote Automation Solutions for additional information.

## Returning Equipment

If you need to return any equipment to Remote Automation Solutions, it is your responsibility to ensure that the equipment has been cleaned to safe levels, as defined and/or determined by applicable federal, state and/or local law regulations or codes. You also agree to indemnify Remote Automation Solutions and hold Remote Automation Solutions harmless from any liability or damage which Remote Automation Solutions may incur or suffer due to your failure to ensure device cleanliness.

## Grounding Equipment

Ground metal enclosures and exposed metal parts of electrical instruments in accordance with OSHA rules and regulations as specified in *Design Safety Standards for Electrical Systems*, 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code). You must also ground mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

## Protecting from Electrostatic Discharge (ESD)

This device contains sensitive electronic components which be damaged by exposure to an ESD voltage. Depending on the magnitude and duration of the ESD, it can result in erratic operation or complete failure of the equipment. Ensure that you correctly care for and handle ESD-sensitive components.

## Safety First!

Never perform the installation/setup activities described in this document in a hazardous area. Ensure the area is non-hazardous.

### DANGER

**EXPLOSION HAZARD: Never remove end cap(s) in a hazardous location. Removing end cap(s) in a hazardous location could result in an explosion.**

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### DANGER

**EXPLOSION HAZARD: Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.**

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#### **Important**

Only use batteries supplied with the flow computer or sold by Emerson as spare parts for this flow computer. If you substitute a battery you obtain elsewhere **you will void your certification unless it is the identical part from the same manufacturer** as that supplied with the flow computer from Emerson.

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### DANGER

**EXPLOSION HAZARD - Substitution of any components may impair suitability for Class I, Division 1 or Class I, Division 2.**

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### DANGER

**EXPLOSION HAZARD - Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.**

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## Tools Required

Certain tools and equipment are required for installing and servicing the flow computer.

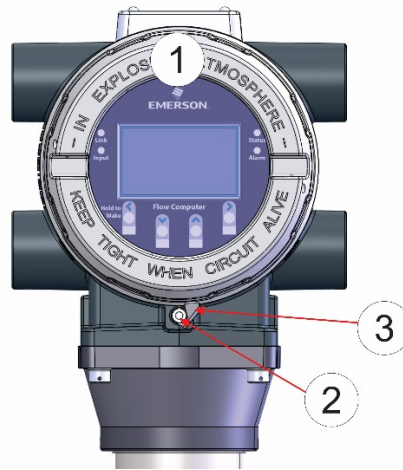
**Table 1: Required Tools**

<b>Tool</b>	<b>Use</b>
Torque wrench	For bolting/mounting the flow computer
2.5 mm hexagonal wrench	For manipulating rotation set screw
3 mm hexagonal wrench	For screw for M4 x 0.7 end cap retaining clamp (ATEX required)
9/16 in hexagonal wrench	For installing/removing 3/4 in NPT conduit plugs
1 1/16 in combination wrench	For installing/removing 3/4 in NPT to M20 thread reducer (ATEX required)
High-wattage soldering iron and solder	For tinning ground connection wire
#1 Phillips-head screwdriver	For screws on HMI module
#2 Phillips-head screwdriver	For screws on other modules and boards
1/8 inch flat-head screwdriver	For 5.08 mm pitch terminal block connections
1/16-inch flat head screwdriver	For 3.81 mm pitch terminal block connections
Laptop PC running Field Tools with FBxConnect configuration software	For software configuration

# Removing/Replacing the Retaining Clamp

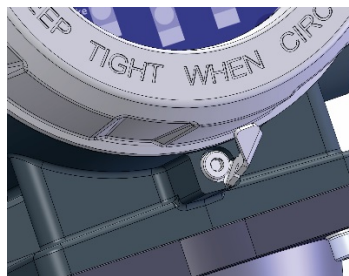
For flameproof ATEX/IEC applications, each end cap includes a retaining clamp which screws down to prevent the end cap from being unscrewed.

## Front End Cap with Retaining Clamp Fitted



- 1 End Cap
- 2 Screw
- 3 Retaining Clamp

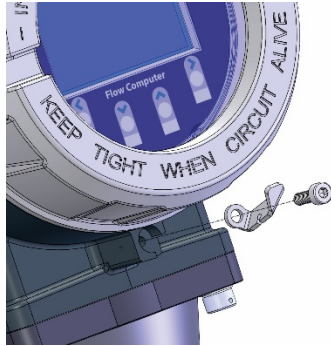
## Retaining Clamp in Place



To loosen or tighten the screw, use a 3mm hexagonal wrench. When tightening, torque to 12 in-lbs (1.4 N m).

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### Retaining Clamp and Screw



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## Removing the Front or Rear End Cap

The flow computer includes two threaded end caps (covers). The front end cap includes a window for viewing the HMI module, while the rear end cap provides access to the terminal plate for power and I/O wiring.

### DANGER

**EXPLOSION HAZARD: Never remove end cap(s) in a hazardous location. Removing end cap(s) in a hazardous location could result in an explosion.**

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1. Remove the retaining clamp (if present). Grasp the end cap (front or rear).

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#### Note

If you need more leverage to open or close an end cap than you can get with your hand, you can place a long screwdriver or other appropriate tool across the two notches in the end cap to act as a pry bar:



2. Unscrew the end cap turning it counter-clockwise until the end cap comes off. Set it aside in a safe location.

Front End Cap



Removing Front End Cap



Rear End Cap



Removing Rear End Cap



## Replacing the Front or Rear End Cap

### DANGER

**EXPLOSION HAZARD: Never remove end cap(s) in a hazardous location. Removing end cap(s) in a hazardous location could result in an explosion.**

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1. Grasp the end cap (front or rear).
2. Carefully align the end cap threads with the threads of the enclosure.

#### **Important**

When replacing the rear end cap, ensure wires connecting to the terminal plate do not get crimped or caught between the end cap threads and the enclosure.

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3. Screw the end cap clockwise (eight full turns) until it is tightly sealed to the enclosure.
4. Replace the retaining clamp (if applicable).

# Bolting Considerations

**⚠ DANGER**

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If the flow computer installation requires assembly of a process flange, manifold, or flange adapters, follow these assembly guidelines to ensure a tight seal for optimal performance characteristics of the flow computer.

Only use bolts supplied with the flow computer or sold by Emerson as spare parts. Refer to the figures, below, for common flow computer assemblies with the bolt length required for proper flow computer installation.

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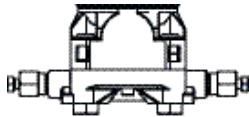
**Note**

For all other manifolds, contact your Emerson Local Business Partner (LBP).

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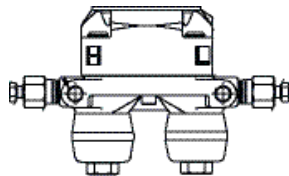
Bolts are typically carbon steel or stainless steel. Confirm the material by viewing the markings on the head of the bolt and referencing [Table 2](#). If bolt material is not shown in the table, contact your local Emerson representative for more information.

*Transmitter with coplanar flange*



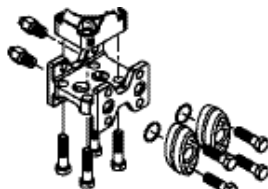
4 x 1.75 in (44 mm)

*Transmitter with coplanar flange and optional flange adapters*



4 X 2.88 in (73 mm)

*Transmitter with coplanar flange and optional flange adapters*



4 x 1.75 in (44 mm)



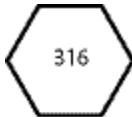


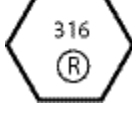
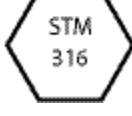
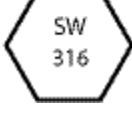
4 x 1.50 in (38 mm)



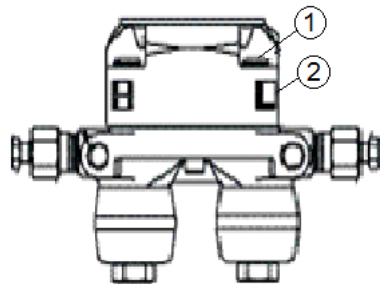
Use the following bolt installation procedure:

1. Carbon steel bolts do not require lubrication. Stainless steel bolts are factory-coated with a lubricant to ease installation. Do not apply any additional lubricant when installing either type of bolt.
2. Finger-tighten the bolts.
3. Torque the bolts to the **initial** torque value using a crossing pattern. See [Table 2](#) for initial torque value.
4. Torque the bolts to the **final** torque value using the same crossing pattern. See [Table 2](#) for final torque value.
5. Verify that the flange bolts protrude through the sensor module before applying pressure.

**Table 2: Torque Values for the Flange and Flange Adapter Bolts**

Bolt material	Head markings	Initial torque	Final torque
Carbon Steel (CS)	 	300 in. -lbs. (33.9 N m)	650 in. -lbs. (73.4 N m)
Stainless Steel (SST)	     	150 in. -lbs. (16.9 N m)	300 in. -lbs. (33.9 N m)

*Proper Bolt Installation*



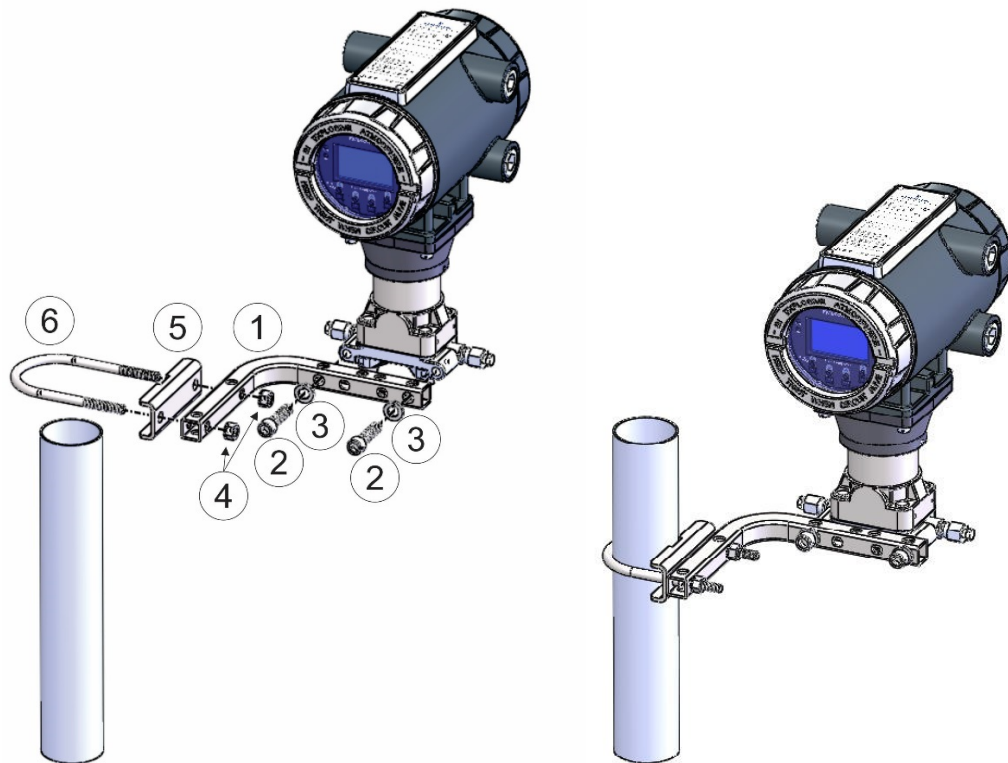
- 1 Bolt
- 2 Sensor module

## Coplanar Mounting Kit

**⚠ DANGER**

**EXPLOSION HAZARD:** Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

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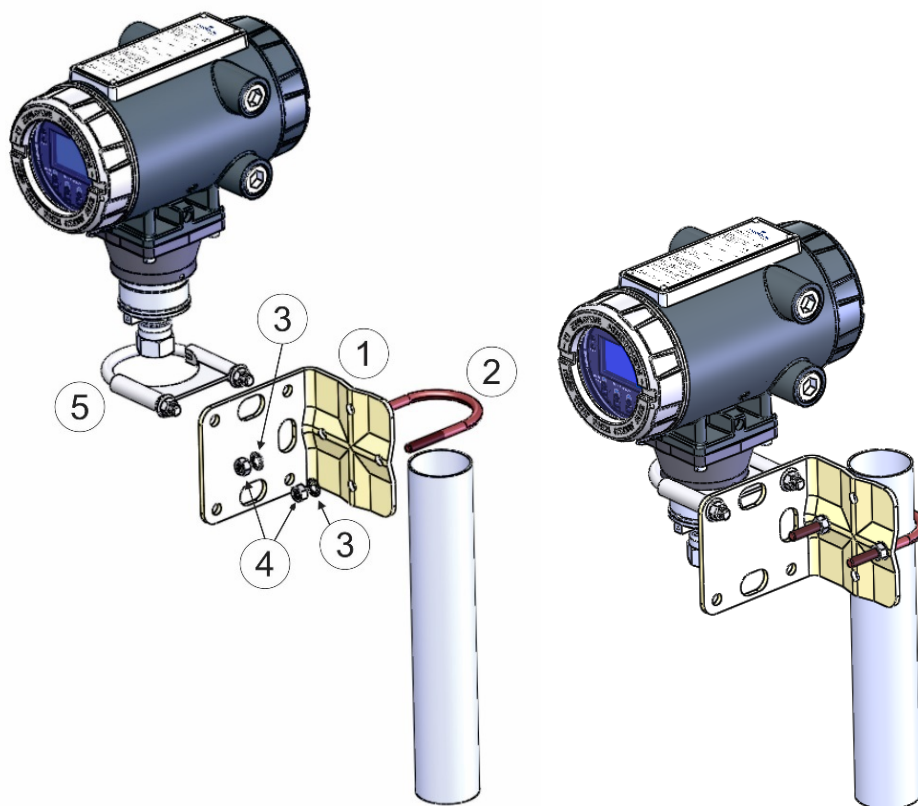


- 1 Tubular L-shaped bracket
  - 2 3/8-16 x 1 1/2 in wire screw (2) – Apply Killark® LUBG-6 anti-seize lubricant to threads. Torque screws to 30 in-lbs (3.4 N m)
  - 3 Split 5/16 washer (2)
  - 4 5/16-18 keps nut (2). Apply Loctite® 222™ Low Strength Purple Threadlocker to nuts. Torque nuts to 30 in-lbs (3.4 N m)
  - 5 U-bolt bracket
  - 6 2-inch diameter pipe U-bolt
-

## Inline Mounting Kit

**⚠ DANGER**

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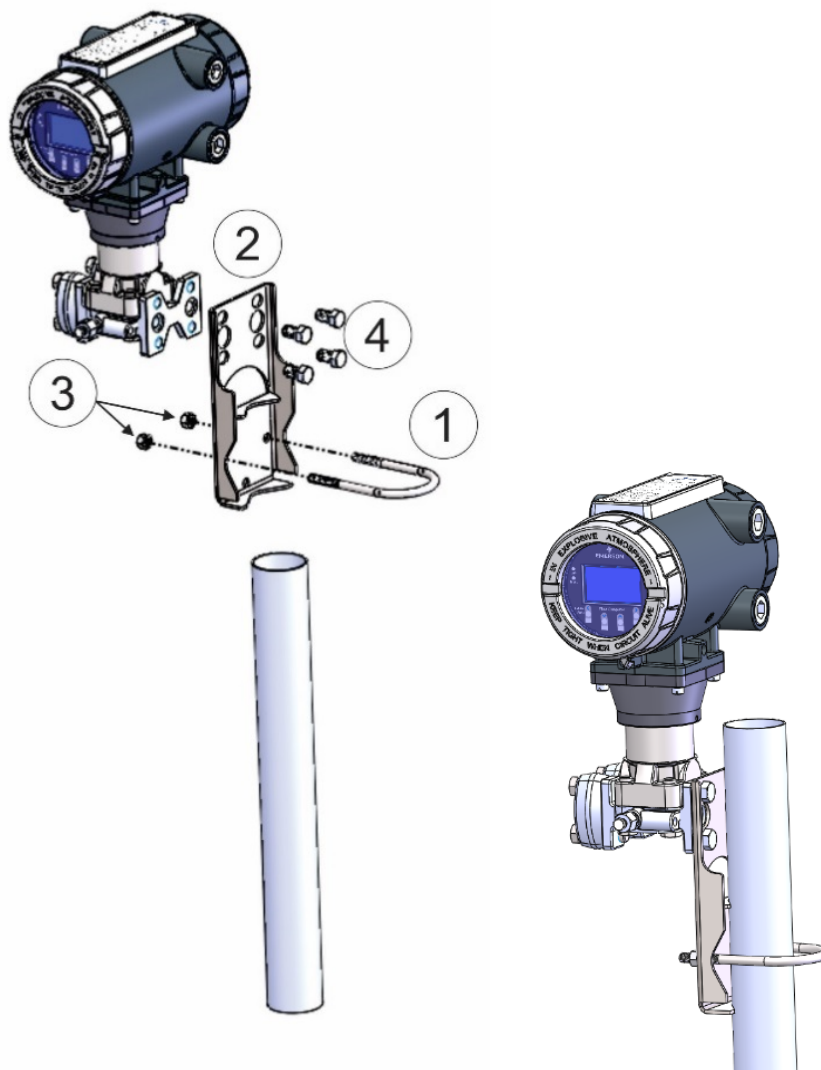
- 1 Pipe mounting bracket
- 2 2 ½ inch x 5/18-18 thread 300-series U-bolt
- 3 5/16 flat lock washer (2)
- 4 5/16-18 300 series passivate hex nut (2) - Apply Loctite 222 Low Strength Purple Threadlocker to threads. Torque nuts to 30 in-lbs (3.4 N m)
- 5 U-bolt clamp assembly - Apply Loctite 222 threadlocker to threads. Torque nuts to 30 in-lbs (3.4 N m)

## Traditional Flange Mounting Kit

**⚠ DANGER**

**EXPLOSION HAZARD:** Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

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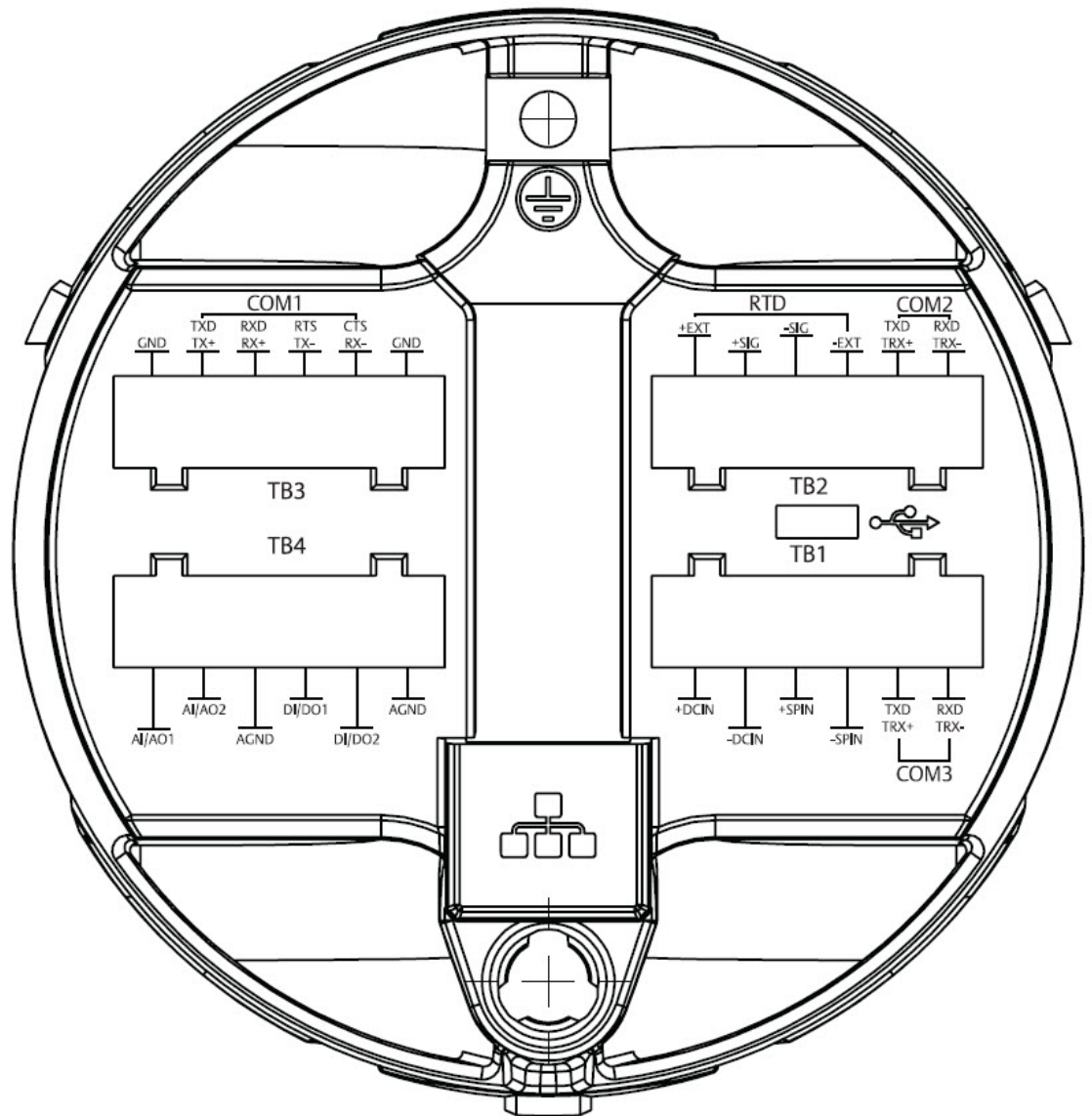
- 1 3.75 in U-bolt assembly with (2) nuts (item 3)
  - 2 Mounting bracket
  - 3 Apply Loctite 222 Low Strength Purple Threadlocker to nuts. Torque nuts to 30 in-lbs (3.4 N m)
  - 4 7/16-20 x .625 cs/zinc cobalt screws (4). Torque to 30 in-lbs (3.4 N m)
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## Terminal Plate

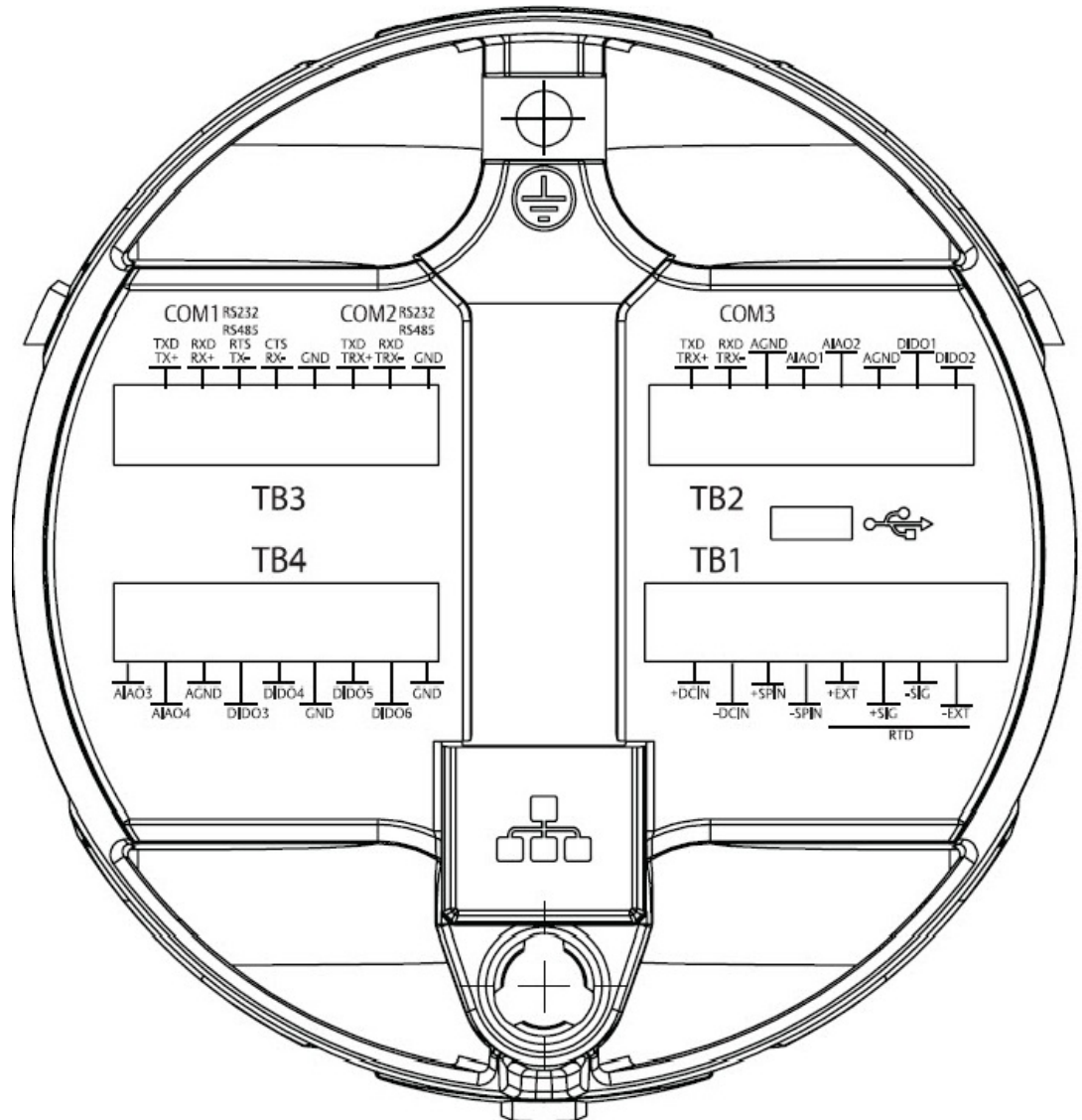
The terminal plate includes the various terminal blocks (TB) for power and I/O connections.

The terminal plate's appearance varies depending upon whether or not you have the optional 6-channel expansion I/O board installed with 3.81 mm pitch connectors; when it is installed there are eight or nine connections per terminal block instead of six 5.08 mm pitch connections. Compare your device to the pictures to see which terminal plate you have.

### 5.08 mm Pitch Connectors



3.81 mm Pitch Connectors



# Grounding

## **⚠ DANGER**

**EXPLOSION HAZARD: Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.**

The flow computer includes a ground lug on the terminal plate.



### 1 Ground Lug

- Once you have installed the unit, run a ground wire between the ground lug and a known good earth ground. You route the ground wire through one of the conduit fittings.
- Use stranded copper wire to earth ground, and keep the length as short as possible.
- Clamp or braise the ground wire to the ground bed conductor (typically a stranded copper AWG 0000 cable installed vertically or horizontally).
- Using a high-wattage soldering iron, tin the wire ends with solder before you insert them into the chassis ground lug.
- Run the ground wire so that any routing bend in the cable has a minimum radius of 30.48 cm (12 inches) below ground and 20.32 cm (8 inches) above ground.
- For more information on grounding or if your installation uses cathodic protection, refer to *Site Considerations for Equipment Installation, Grounding, and Wiring (D301452X012)*.

# Communications Wiring

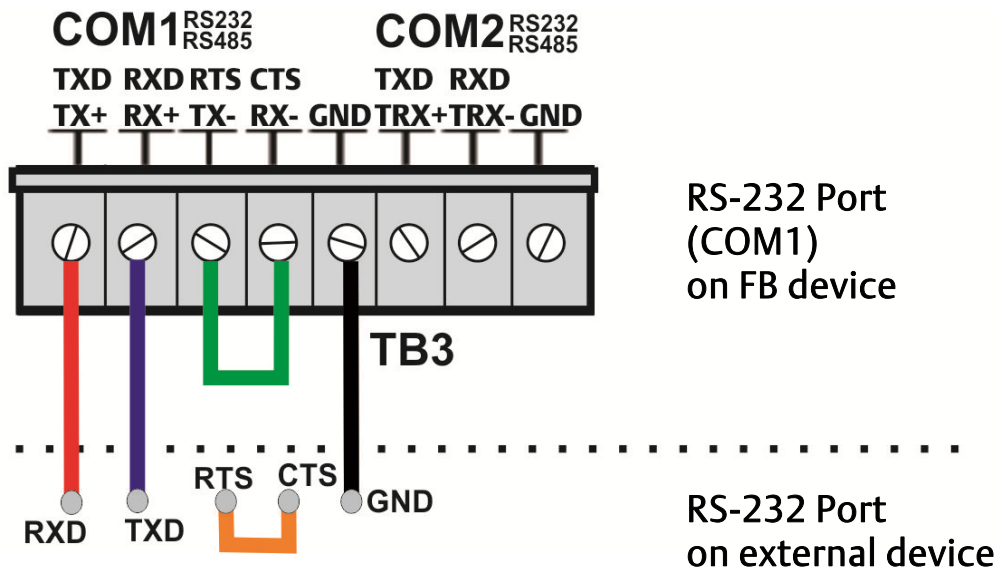
## Notes

- You do not need to add termination resistors; you can configure termination through software selections in FBxConnect.
- You should terminate all shields at chassis ground.

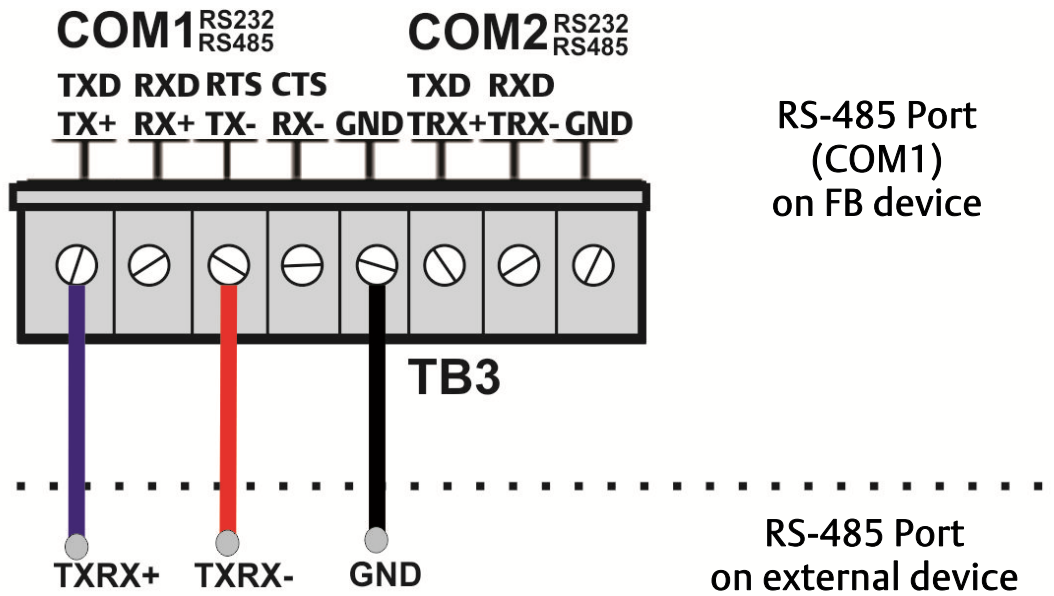
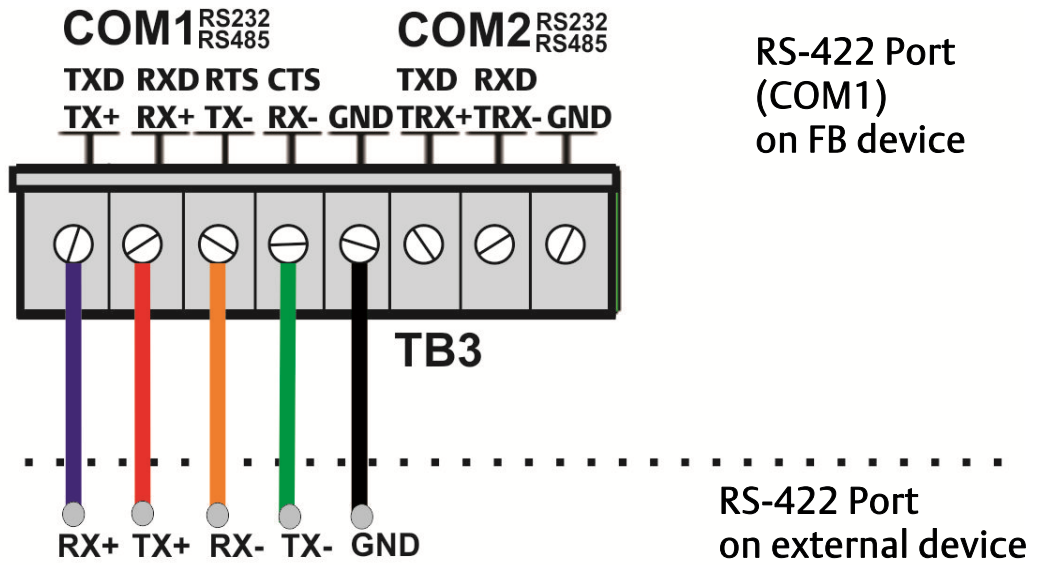
## ⚠ DANGER

**EXPLOSION HAZARD:** Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

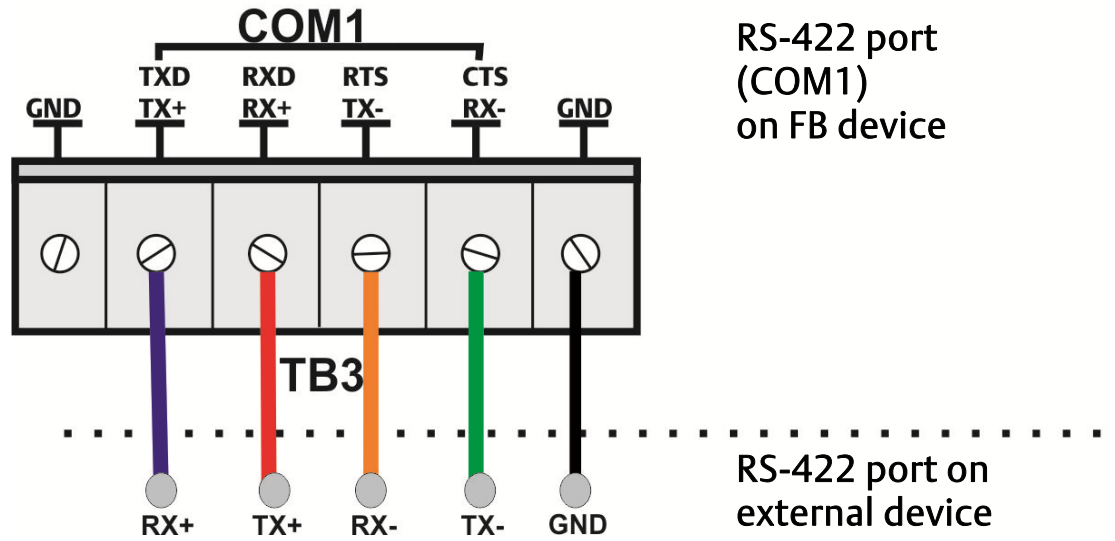
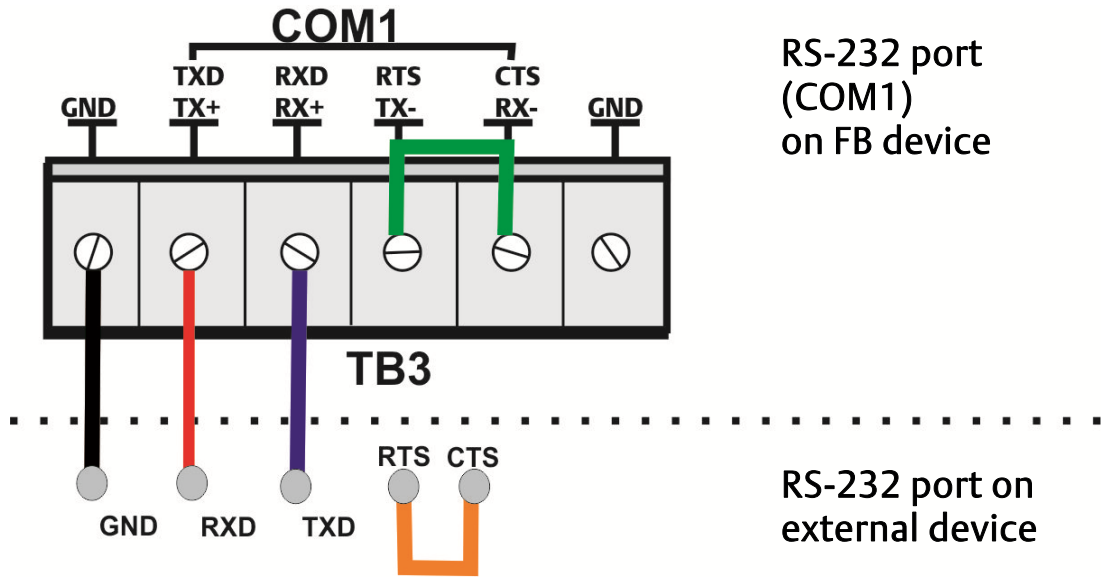
- COM1 (Unit has optional I/O)

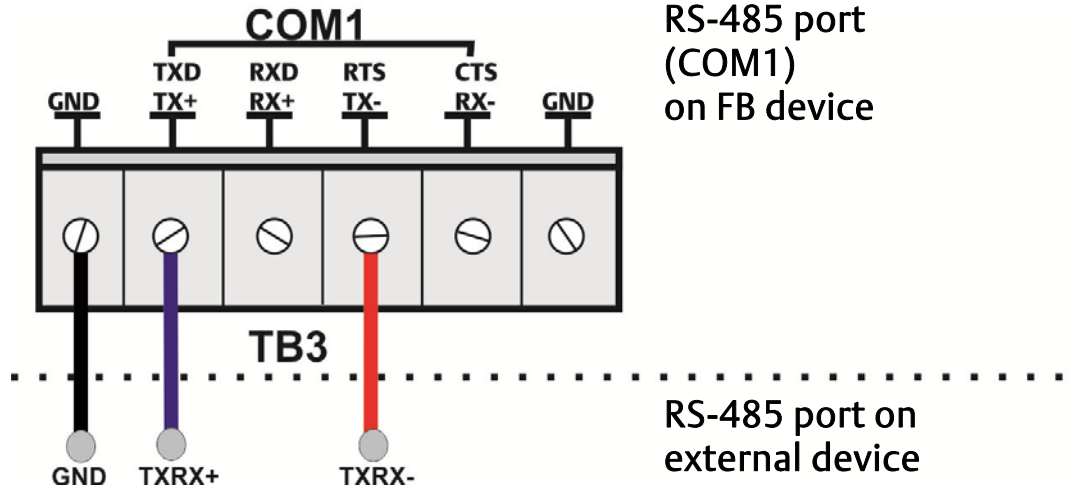




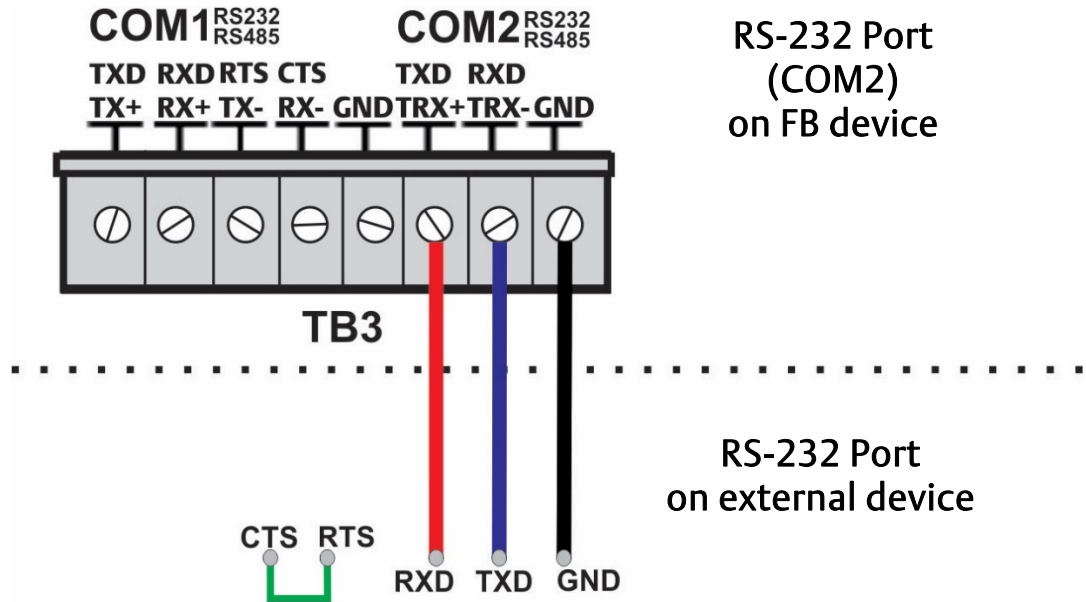


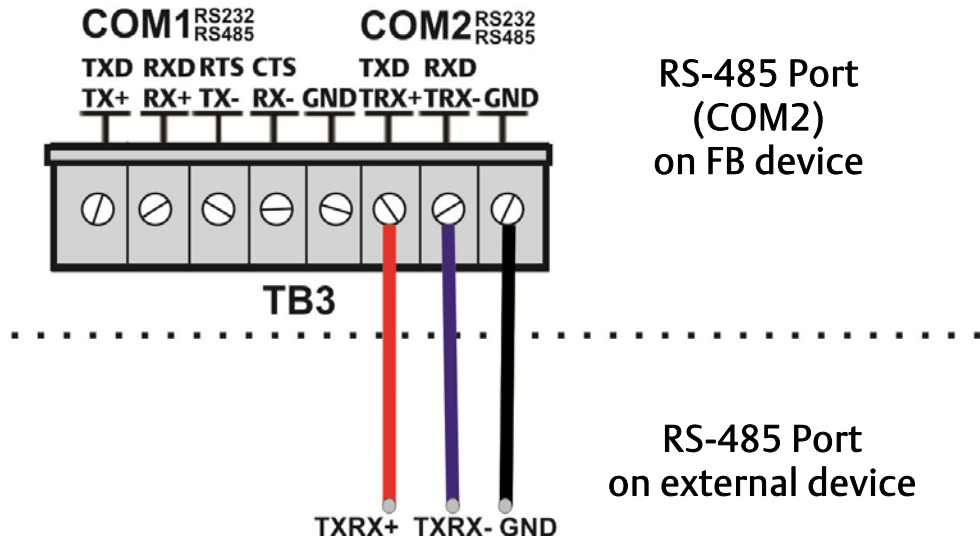
- COM1: (Unit has no optional I/O)



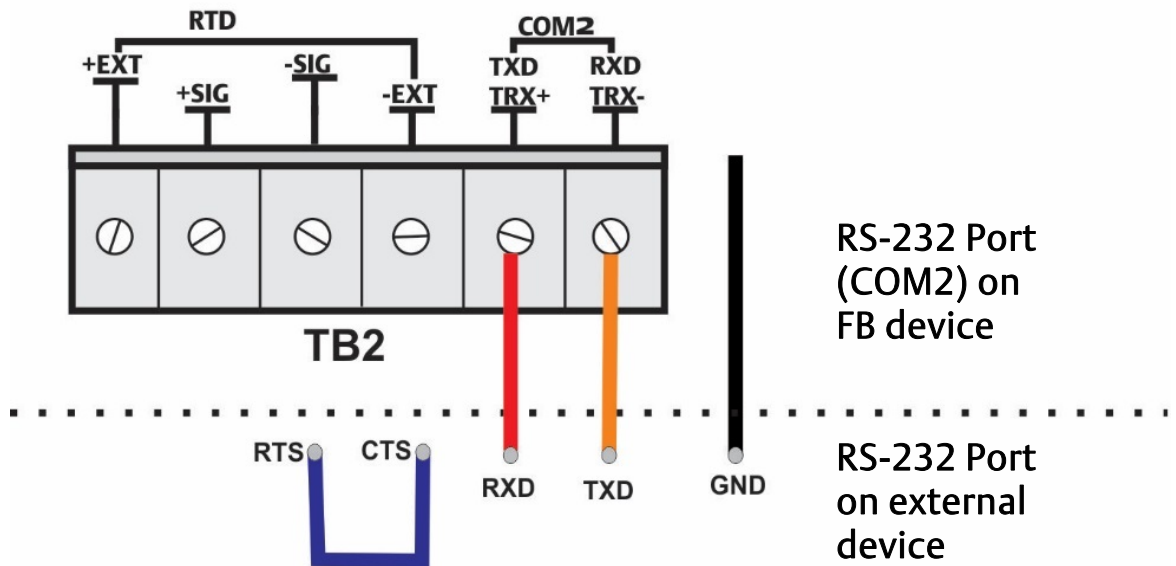


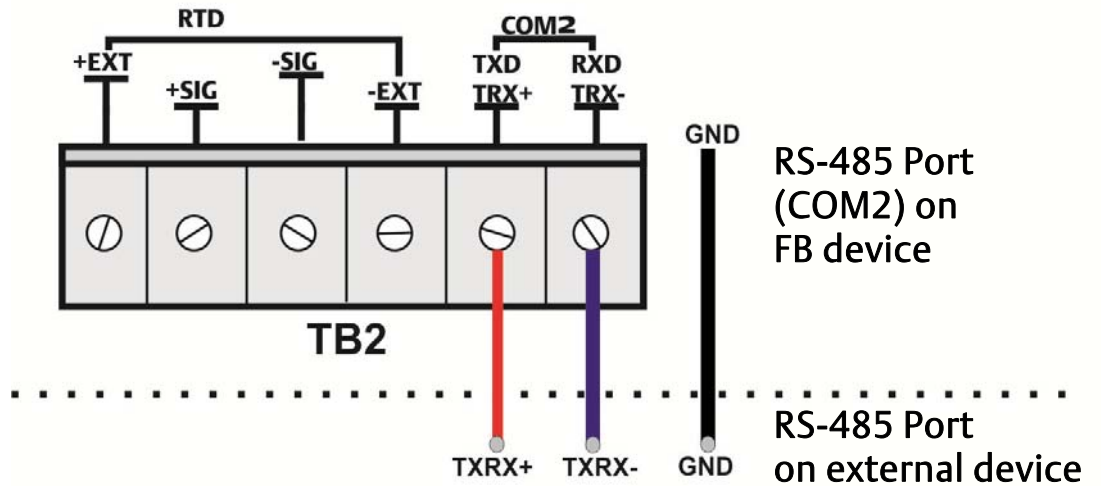
- COM2: (Unit has optional I/O)



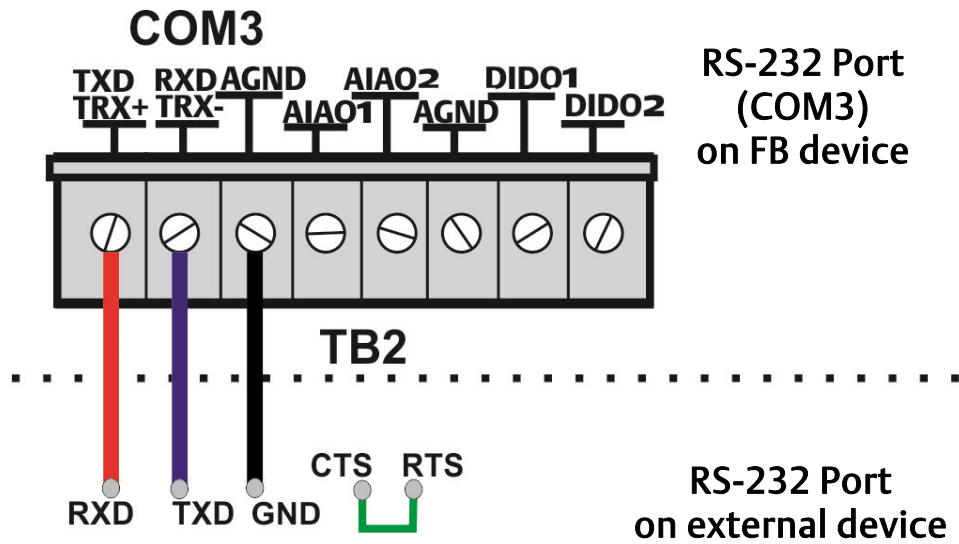


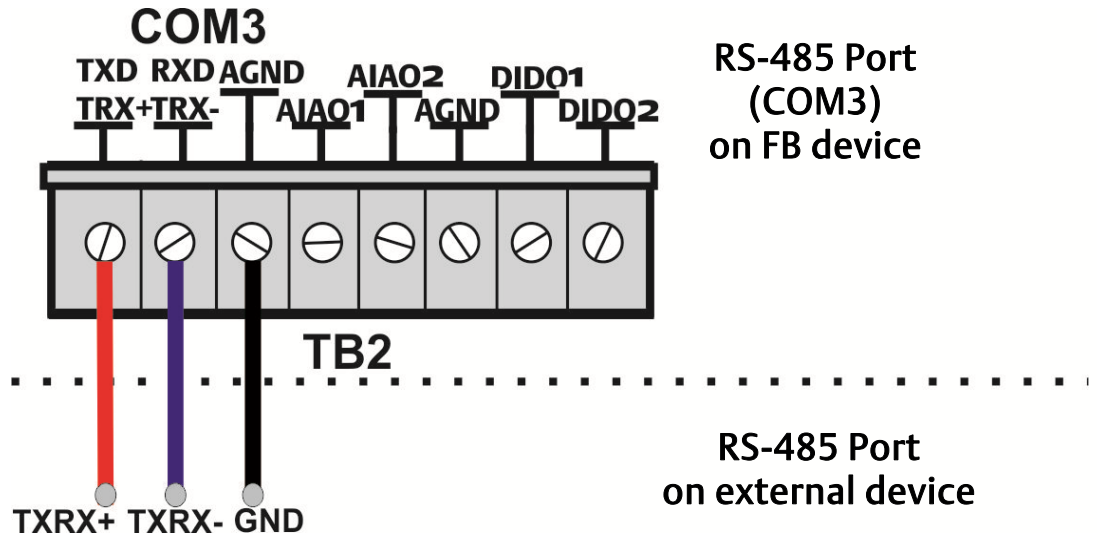
- COM2: (Unit Has no optional I/O)  
 (COM2 does not have its own GND terminal. Use either GND terminal on the COM1 terminal block.)





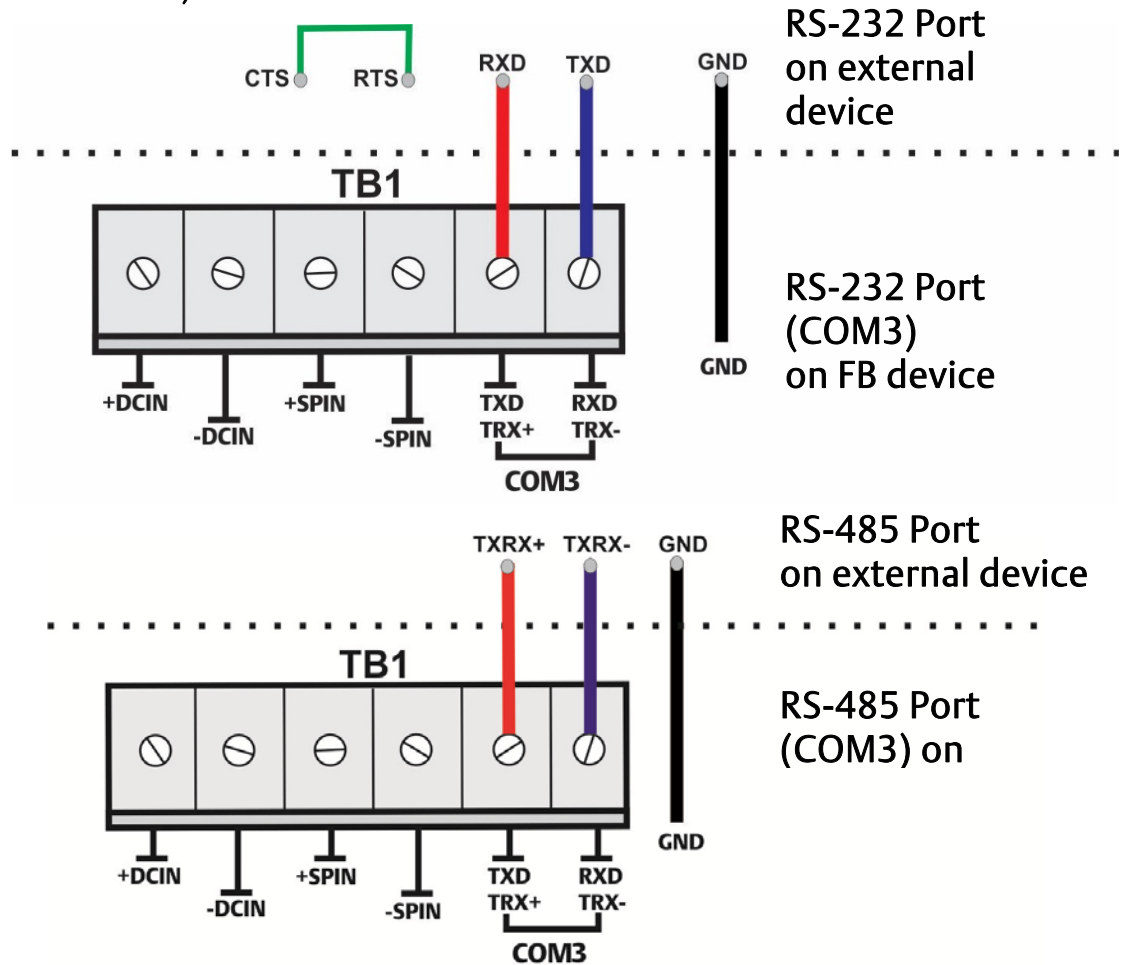
- COM3: (Unit has optional I/O)





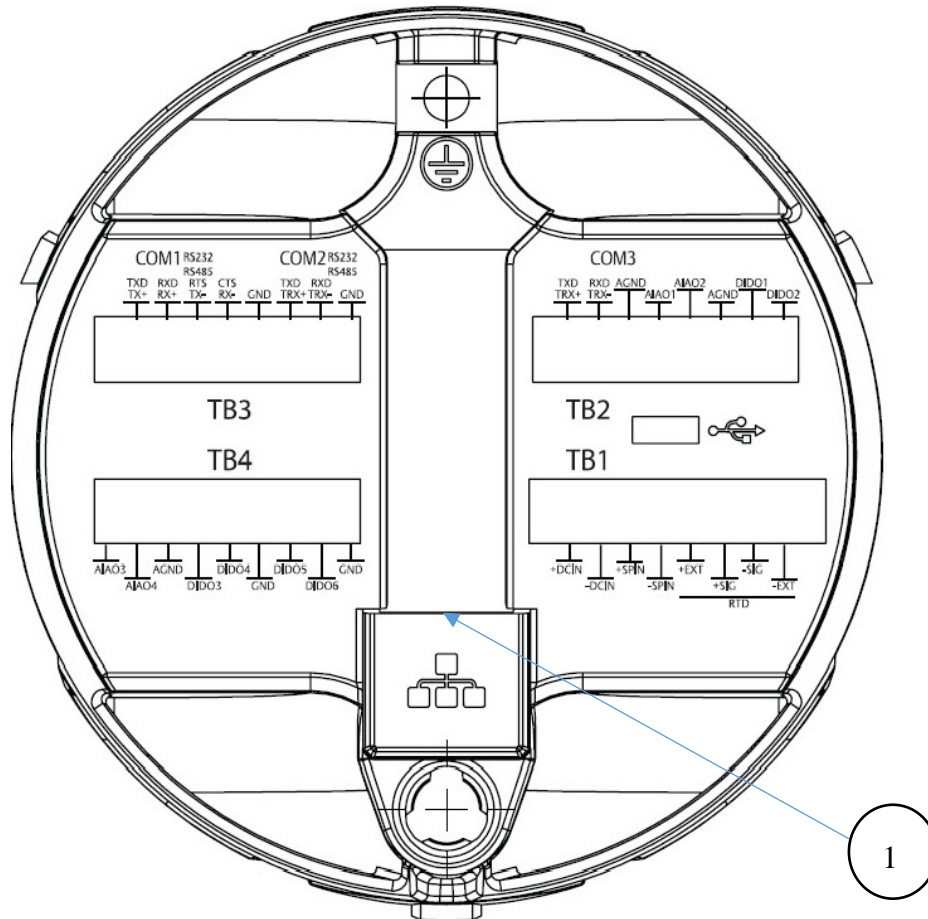
- COM3: (Unit has no optional I/O)

(COM3 does not have its own GND terminal. Use either GND terminal on the COM1 terminal block.)



- **Ethernet**

The Ethernet port is located on the terminal plate.



**1 Ethernet Port**

**Notes**

- The default IP address for the Ethernet port is 192.168.1.10.
- The default port is 20000 for DNP3 communication.
- A jumper enables/disables the Ethernet port – see the instruction manual for details.

# I/O Wiring

**⚠ DANGER**

**EXPLOSION HAZARD:** Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

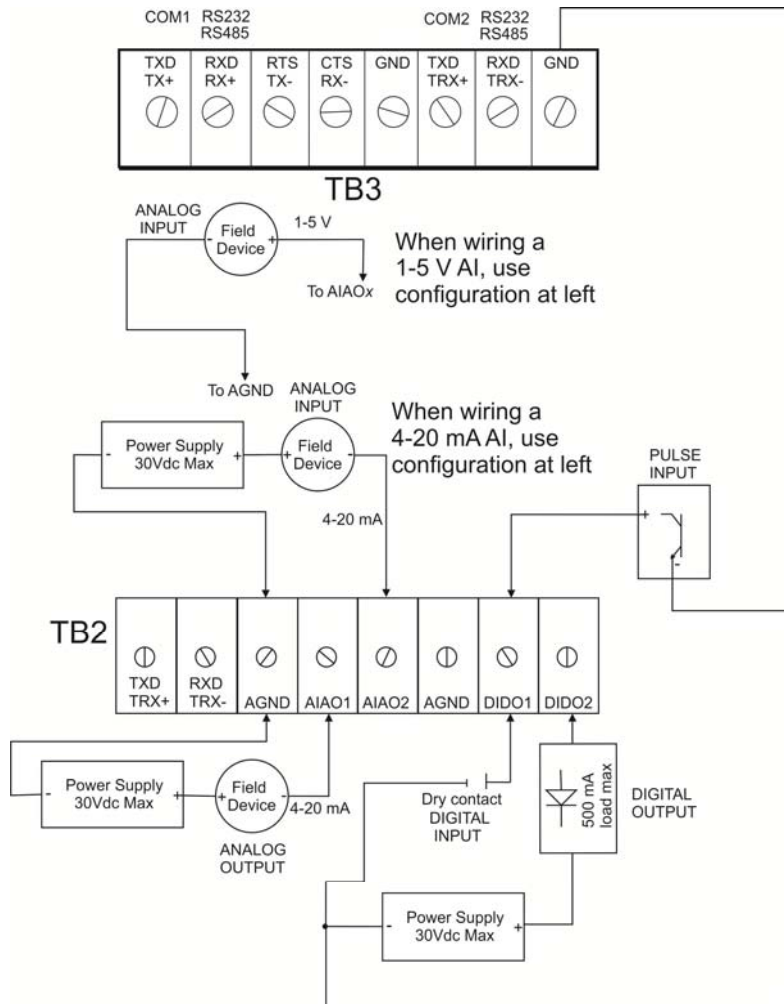
**Note**

You should terminate all shields at chassis ground.

**Note**

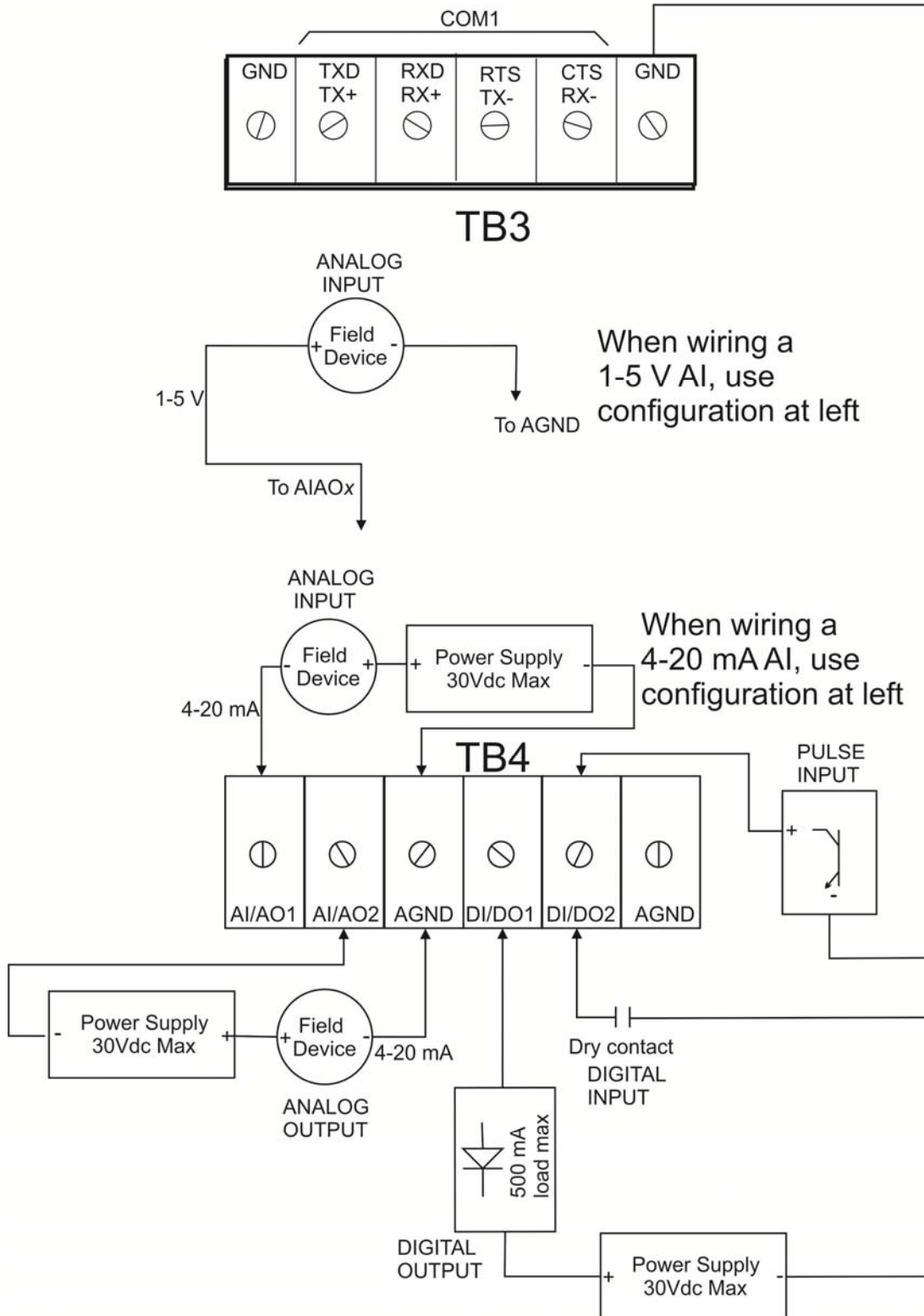
When using a digital output to drive an inductive load (such as a relay coil), place a suppression diode across the load. This protects the DO from the reverse Electro-Motive Force (EMF) spike generated when the inductive load is switched off.

▪ **CPU Base I/O Wiring (when optional I/O also present)**

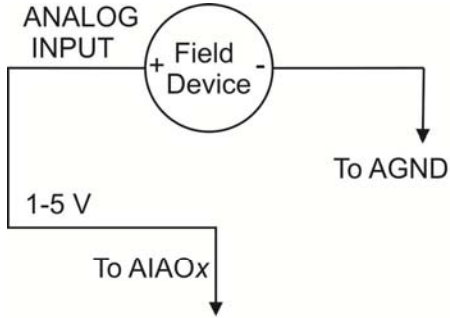




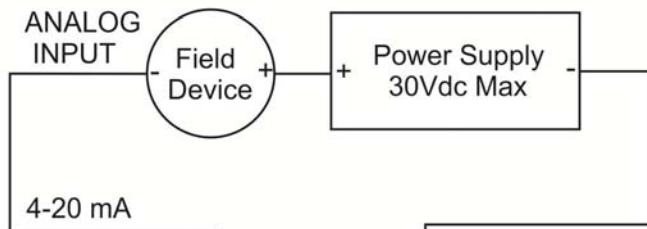
▪ CPU Base I/O Wiring (when optional I/O not present)



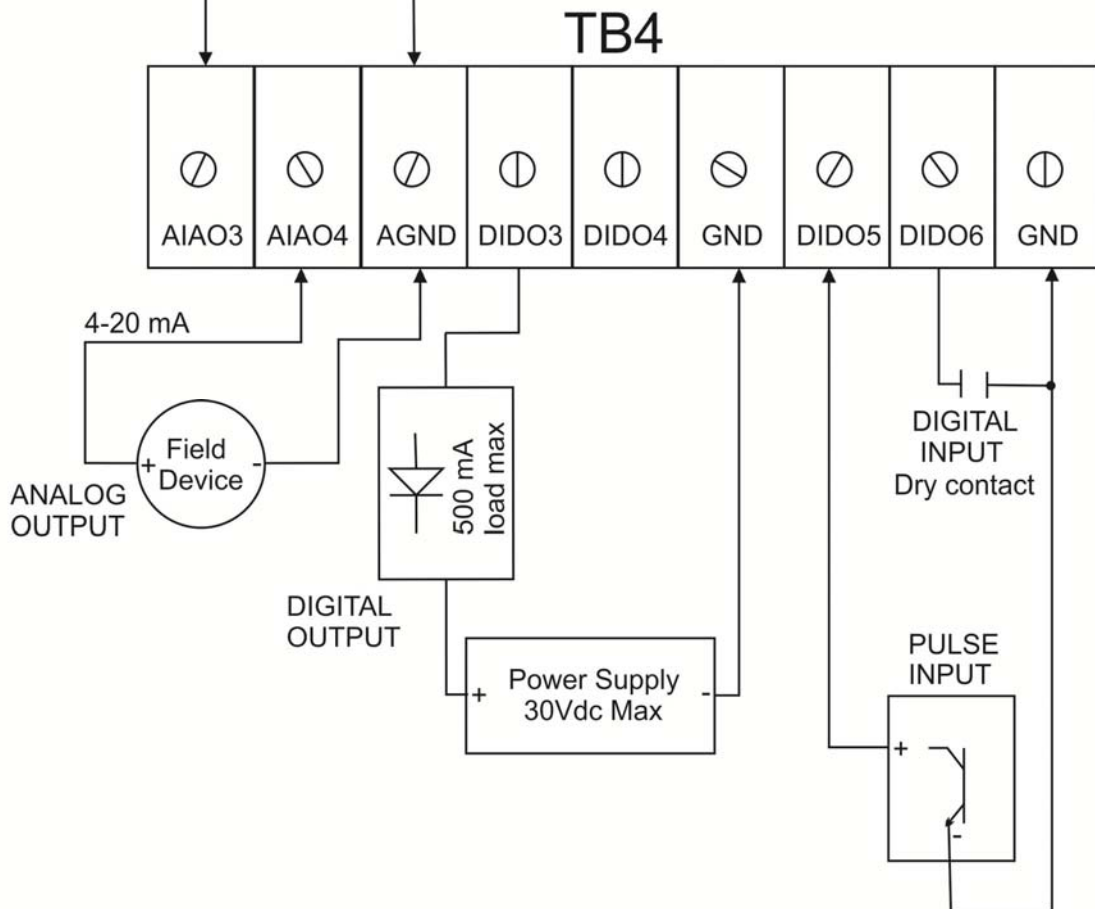
▪ Optional 6-Channel Expansion I/O Board Wiring:



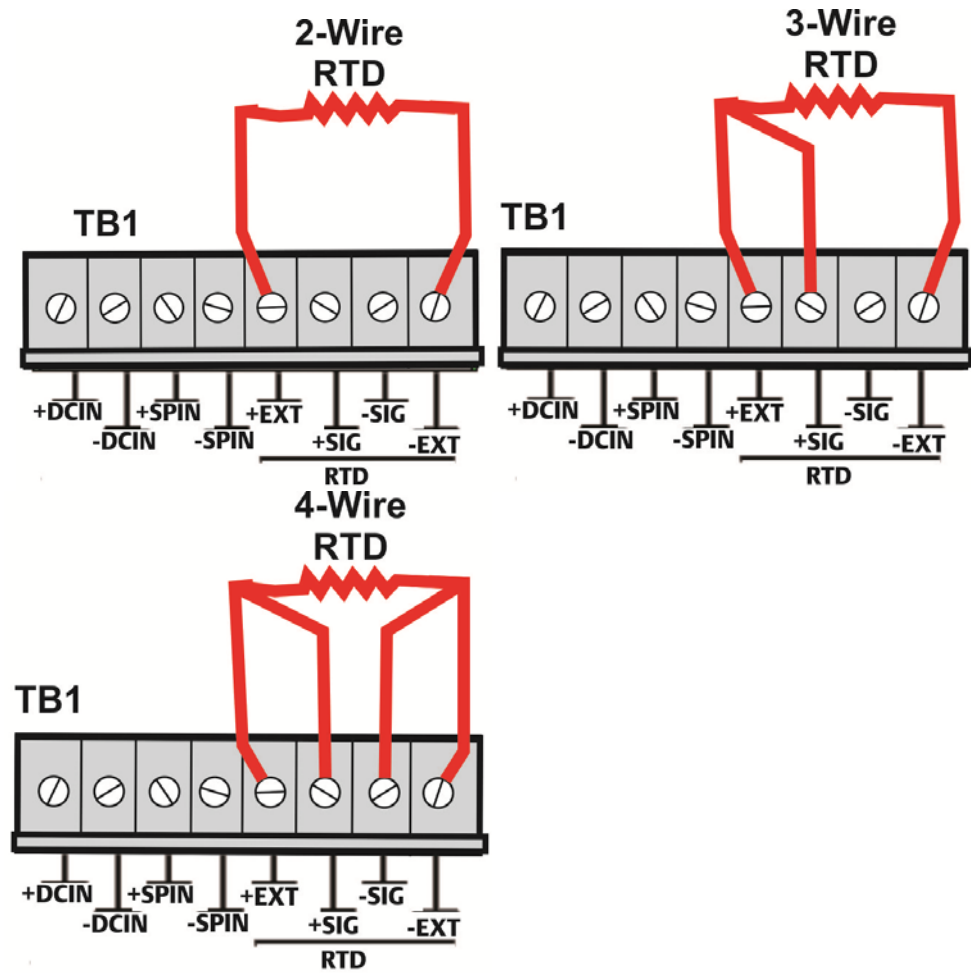
When wiring a 1-5 V AI, use configuration at left



When wiring a 4-20 mA AI, use configuration at left



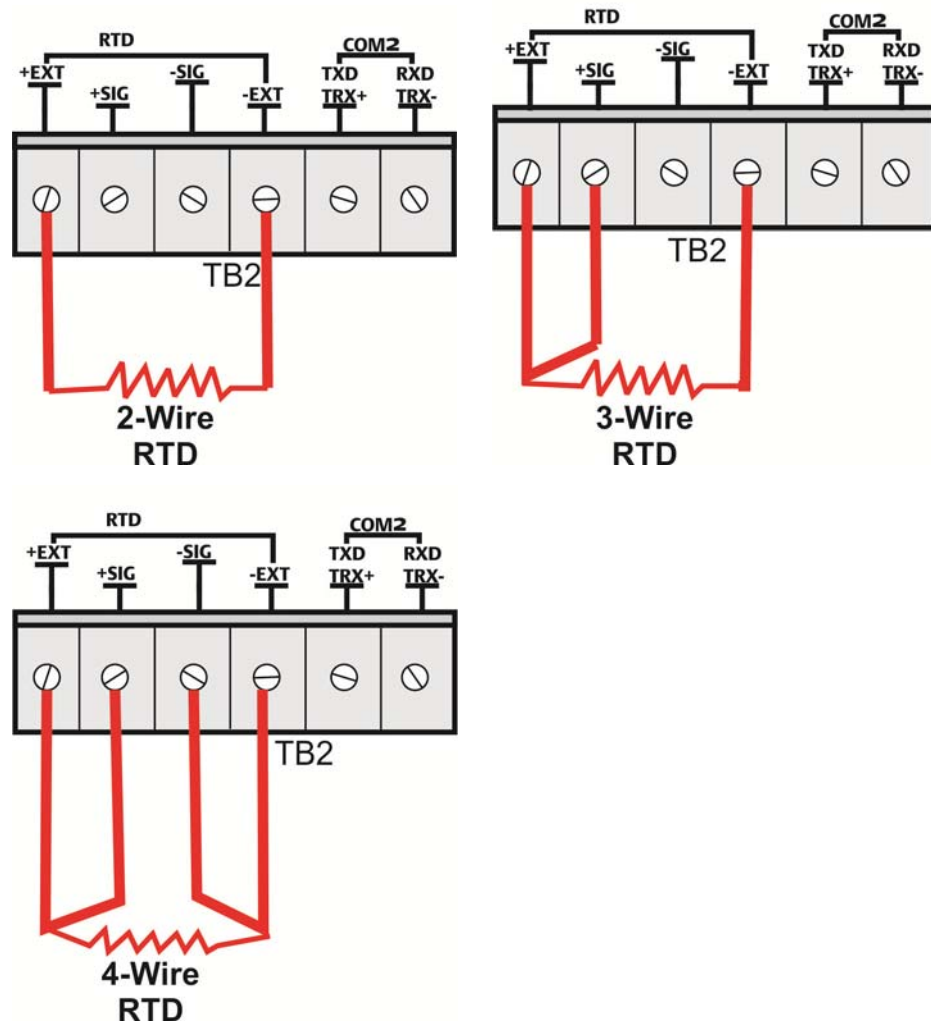
- RTD Wiring (when optional I/O also present):



**Note**

The default configuration is 4-wire RTD; you can change the configuration in FBxConnect.

- RTD Wiring (when optional I/O not present):



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**Note**

The default configuration is 4-wire RTD; you can change the configuration in FBxConnect.

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# Power Wiring

## **⚠ DANGER**

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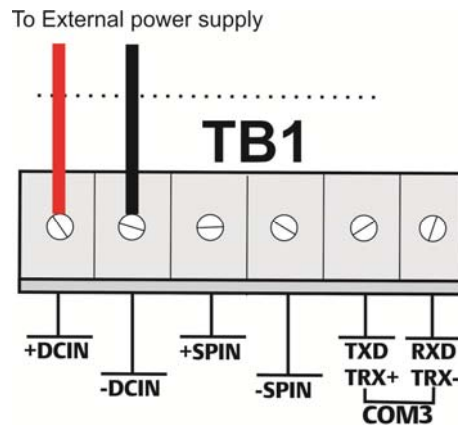
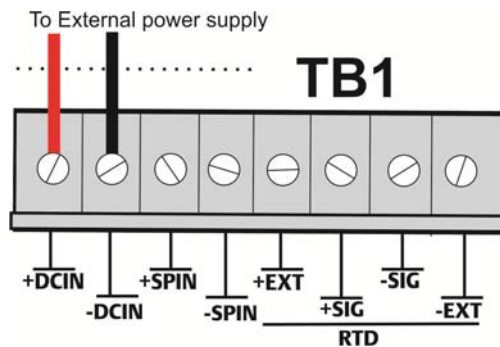
The flow computer accepts DC power with an input voltage range from 5.7 to 30V. The amount of power required depends on installed options.

If your device includes the 6-channel expansion I/O board your terminal block includes eight connectors; if it does not, your terminal block includes six connectors.

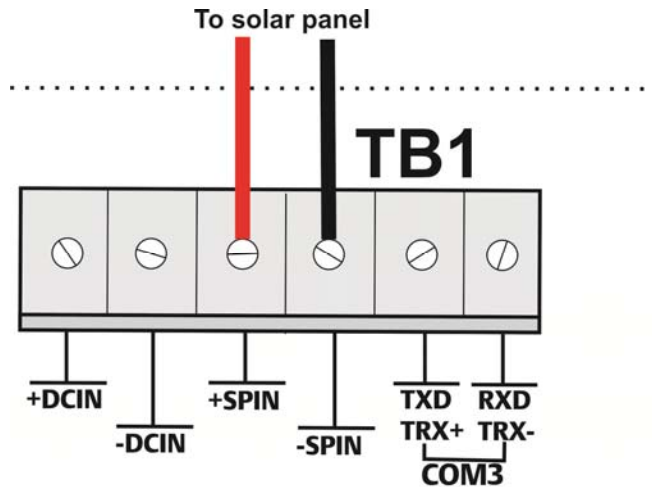
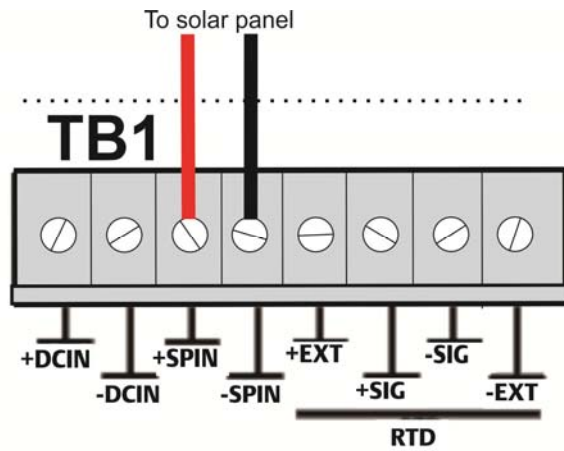
### Note

The picture on the top shows wiring for units with the 6-channel expansion I/O board; the picture on the bottom shows wiring for units without this board.

### ▪ DC Power:



▪ **Solar Power:**



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**Note**

The picture on the top shows wiring for units with the 6-channel expansion I/O board; the picture on the bottom show wiring for units without this board.

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## Connecting the Main Battery Pack

### DANGER

**EXPLOSION HAZARD:** Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

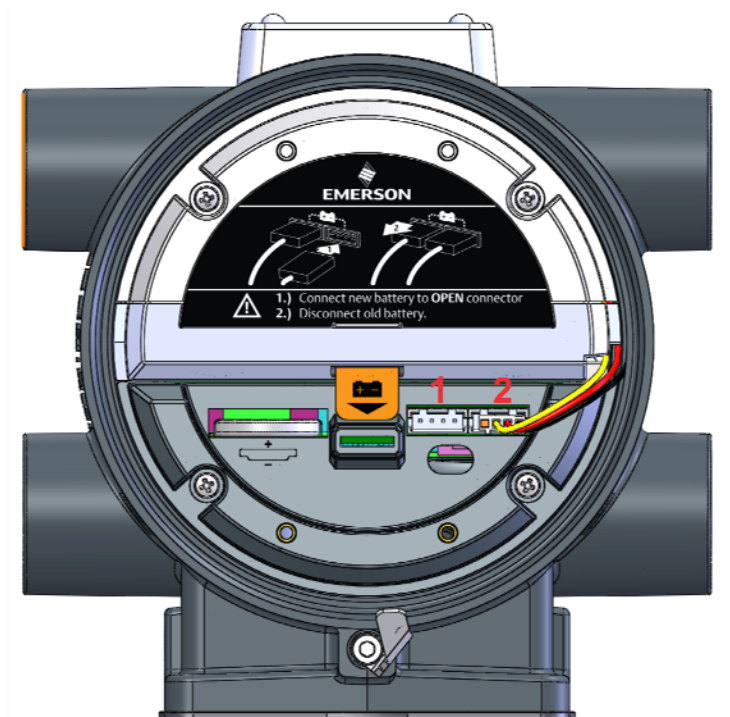
If you purchased one of the battery/solar panel options, note that the device ships with the battery pack **disconnected** to preserve battery life. You need to connect the main battery pack **before** you place the device in service.

The device provides two battery connections, enabling you to hot-swap the battery pack in a non-hazardous location.

1. Remove the front end cap by unscrewing it counter-clockwise.
2. Loosen the four captive fastening screws that hold the HMI module. Carefully pull the module away from the flow computer and off the tab and set it aside.



3. Connect the battery to either of the two connectors.

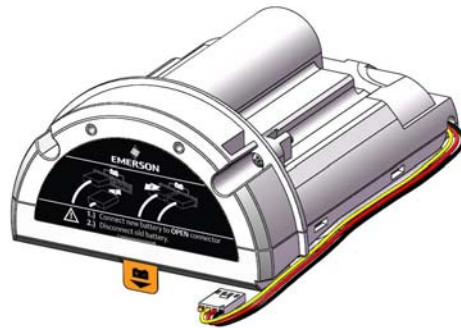


4. Carefully slide the HMI module back onto the tab and tighten the four captive fastening screws.
5. Reattach the end cap. Screw it clockwise (eight full turns) until it is tightly sealed to the enclosure.



## Replacing the Main Battery Pack

Periodically you must replace the main battery pack. FBxConnect provides a battery life indicator to help you monitor battery life.



The device provides two battery connectors, enabling you to hot-swap the battery pack in a non-hazardous location. Slide out the first battery pack (leaving it connected), attach the new battery to the second (available) connector (so both batteries are connected), and then disconnect the old battery pack.

### **⚠ DANGER**

**EXPLOSION HAZARD – Do not replace batteries unless power has been switched off or the area is known to be non-hazardous. Batteries must only be changed in an area known to be non-hazardous.**

### **⚠ WARNING!**

**There are no user-serviceable parts inside the battery pack. Do not open the battery pack as you may damage the battery pack or injure yourself.**

Keep the replacement battery pack handy during the procedure.

1. Remove the front end cap.
2. Loosen the two captive fastening screws on the battery pack.



3. Loosen the two bottom captive fastening screws on the HMI module. Leave the two top screws connected to the battery pack.



4. Grasp the HMI module and gently pull it and the battery pack out of the enclosure, leaving the battery still connected.
5. Connect the new battery to the open connector. Route the wires so they are in the recessed area. Make sure the wires don't get caught in the end cap threads.
6. Disconnect the old battery pack's connector from the unit and set the old battery pack aside.
7. Slide the new battery pack into the unit. Tighten its two captive fastening screws.
8. Loosen the top captive fastening screws on the HMI module to separate it from the old battery pack.
9. Align the HMI module with the new battery pack and the tab on the CPU carrier board (bezel). Gently press the HMI module on, being careful not to pinch the battery wires. Tighten all four captive screws.
10. Replace the front end cap.

## Powering Up/Powering Down the Device

### DANGER

**Do not attempt to connect power or disconnect power from the unit in a hazardous area. Ensure the area is non-hazardous. Failure to do so could result in an explosion.**

---

1. Remove the front end cap.
2. Terminal block TB1 includes connections for DC power (+DCIN, -DCIN) and battery/solar power (+SPIN, -SPIN). Battery power (which is also used with solar power) has its own internal connection.
  - Plug in TB1 to activate DC or solar power. If your device uses an internal battery and it is not connected, connect it as discussed in *Connecting the Main Battery Pack*.
  - Unplug TB1 to deactivate DC or solar power. If your device uses an internal battery, disconnect the main battery.

This turns on (or turns off) power from an external power supply or from the battery pack/solar panel.

---

### Note

When you turn power on, the backlight on the HMI module lights, momentarily turns off and then remains lit while the INPUT LED blinks. After approximately one minute the initialization process finishes and the HMI starts to display live data.

---

## Install Field Tools Configuration Software

You install Field Tools software (which included FBxConnect) on your PC to configure the device.

---

### Important

- AMS Device Configurator (which is part of Field Tools) is **incompatible** with AMS Device Manager: they **cannot** reside on the same machine.
- If you have a previous version of Field Tools already installed on your PC, uninstall it and reboot your PC before you install this new version.
- Before beginning the installation, close all other applications.
- Field Tools **cannot** reside on a computer running any component of OpenEnterprise 2.x, OpenEnterprise 3.x, OpenEnterprise Client/Server, or ObjectServer software.
- TechView and other components of BSI\_Config software **cannot** be installed on a computer running OpenBSI Network Edition versions older than 5.9 Service Pack 2.
- You must have administrative privileges to install Field Tools.
- You must disable User Account Control (UAC) prior to installing Field Tools (you can re-enable it after a successful installation).
- As part of the installation, software from both Eltima and MACTek® is automatically installed. Depending upon your permissions, Windows may require you to confirm these installations before the installation can proceed.

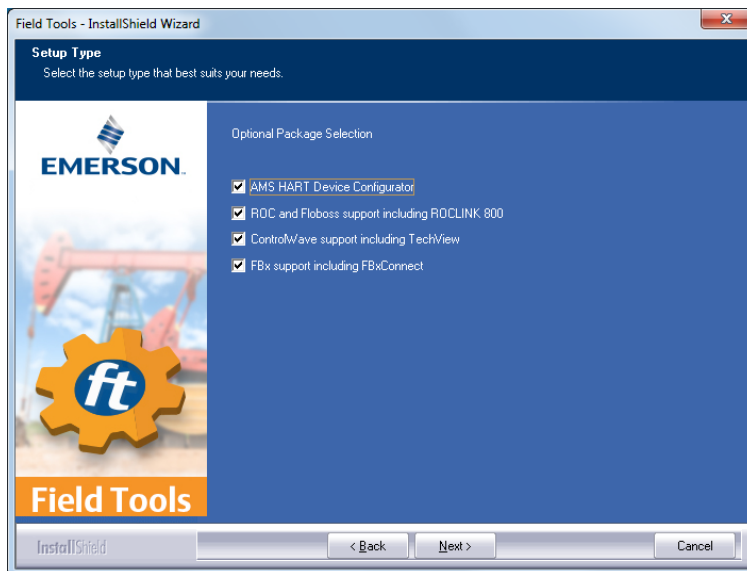
- 
1. Insert the Field Tools DVD into your DVD drive and follow the on-screen directions to install Field Tools on your PC. For details on minimum hardware/software requirements as well as more details on the installation and licensing steps see the *Field Tools Quick Start Guide* (D301703X412).

---

### Note

During Field Tools installation, you must select the **FBx support including FBxConnect** option.

---



2. After software installation re-boot, start Field Tools from either the Windows Start Programs menu or (if you created it) from the desktop icon.
3. Log onto Field Tools.

---

### Important

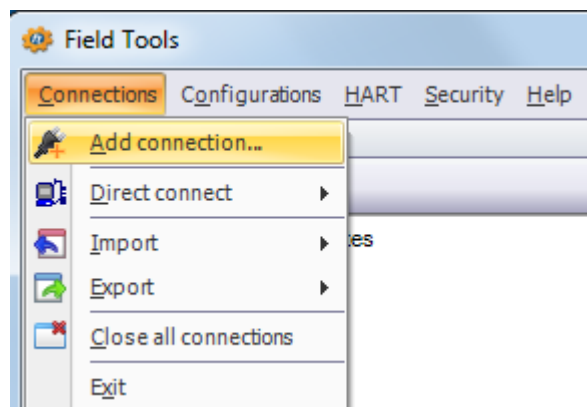
The very first time you login with Field Tools, use the default **username** of **admin** and leave the **password** field blank. Then assign a new password when prompted. See the *Field Tools Quick Start Guide* for any questions you have on changing default passwords after installation.

---

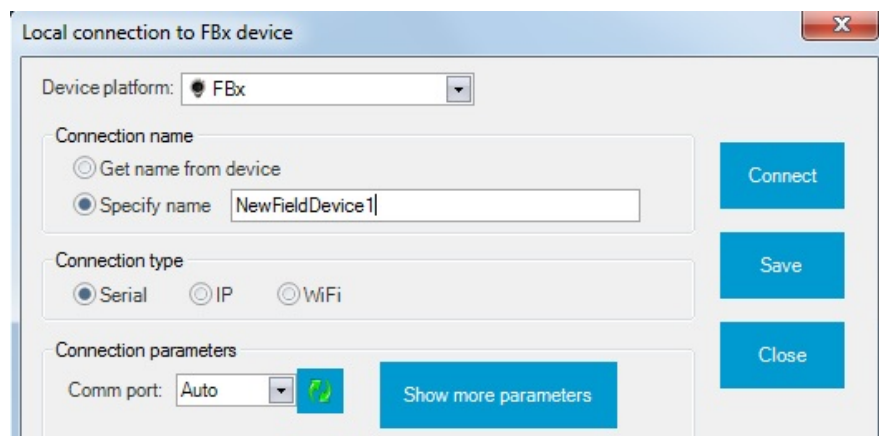
# Establish a Connection and Launch the Setup Wizard

After you start Field Tools you connect to the device and launch the initial setup wizard.

- For a serial connection, connect a serial cable between either COM1 or COM2 on the device and a serial port (or USB/serial adapter) on your PC.
  - WiFi® connections are possible if you purchased the Mobile SCADA option and if your PC supports wireless communication.
  - For Ethernet connections, connect a standard 10/100Base-T Category 5 shielded Ethernet patch cable to the Ethernet port.
1. Click **Connections > Add connection**.

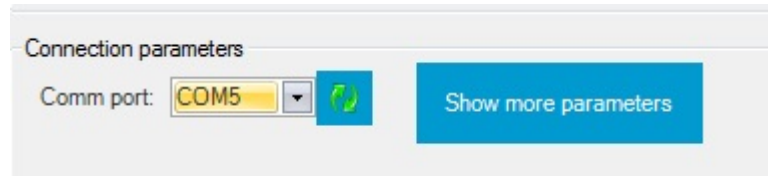


2. Choose **FBx** as the Device Platform.



3. Choose a Connection Type

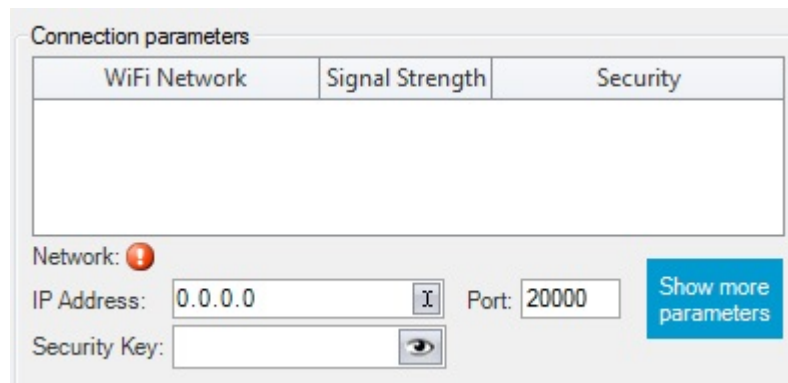
- For **serial**: choose the PC Comm port (or the port for the USB/serial adapter).



- For **WiFi**: choose the default WiFi Network. The format for the WiFi Network (SSID) is similar to WiFi Network:FBxxxx\_serialnumber. Then you must enter the default Security Key: **EmersonFBXX00**. The flow computer's default **IP Address** for WiFi is **192.168.1.10**.

**Important**

You must change the Security Key for your network to something that is different from the default or else anyone reading this document will know your key. If you are connected via IP, you must assign a unique IP address to each device.



- For **IP**: Enter the default IP Address for the Ethernet port of **192.168.1.10**. (Your PC must be able to access this address.)



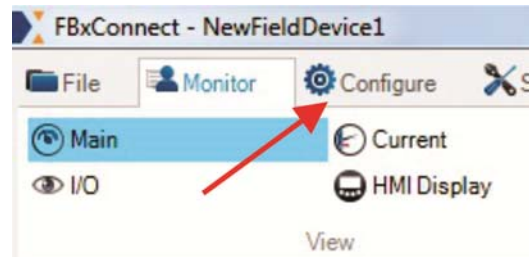
4. Click **Connect**. Field Tools activates the connection and automatically launches the FBxConnect tool.
5. When prompted, enter **admin** for both the Username and Password.

### Important

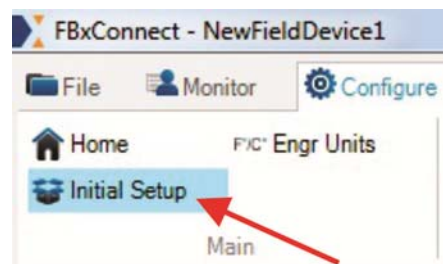
When you finish initial configuration activities, be sure you **change the password for the admin user**. Otherwise, anyone reading this document could gain access to your device.

---

- When FBxConnect opens, click **Configure**.



- Click **Initial Setup** to launch the setup wizard.



- Follow the on-screen instructions to configure the device. Click **Apply** or **Next** to proceed through pages of the wizard or click **Previous** to return to a previous page. When you are done, click **Finish**.

Initial Setup Wizard

Device Name: NewFieldDevice1

Device Description: Explosion Proof Flow Computer

Device Type: FB1200

Time and Date: Wednesday, December 07, 2016 2:35:12 PM

Language: English

Differential Pressure Meters: 1

Linear Meters: 1

Maximum Meters: 2

< Previous Apply Cancel





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