

Tek-FC 8000FX *Custody Transfer Field Mount Flow Computer*



Quick Start Guide

1. Before you begin

This document is a quick start guide for the Tektrol's Tek-ACONFIG software when used with the Tektrol's 8000FX Custody Transfer Field Mount Flow Computer.

- **Reading this guide will help you:**

Install the software and Establish communications with the flow computer and review mounting and wiring diagrams. The quick start guide does not provide instrument installation or specific instructions on all the software's capabilities. For that information, refer to the instrument's manual(s) and the Tek-ACONFIG software help system.

2. Unpack

Tek-FC 8000FX Custody Transfer Field Mount Flow Computer

3. Receiving the Instrument

Available for 8000FX are the following items:

- Tek -FC 8000FX Custody Transfer Field Mount Flow Computer
- The Tek-ACONFIG software startup guide

Manuals and software are available for download at tektrol.com. If you have questions, contact Tektrol LLC at: +1 847-857-6076



Warning !

Tektrol strongly recommends changing passwords before first use/login on this equipment.

4. Software Installation and Connection

Download and install the latest version of Tek-ACONFIG software from Tektrol.com. Once software has been installed proceed to establish physical connection with Tek-FC 8000FX flow computer.

- **Communication Connections**

Refer to the instrument manual for installation and wiring instructions for hardware installations.

Communication Connections for 8000FX Flow Computer: A USB, serial or Ethernet can be used to establish initial communications with the instrument. Enclosure versions will include a local CHIT port.

i NOTE

See CHIT/USB Connection for additional configuration information.

Refer to Figure 4-1 for a picture of CPU pointing to both USB and Ethernet ports.

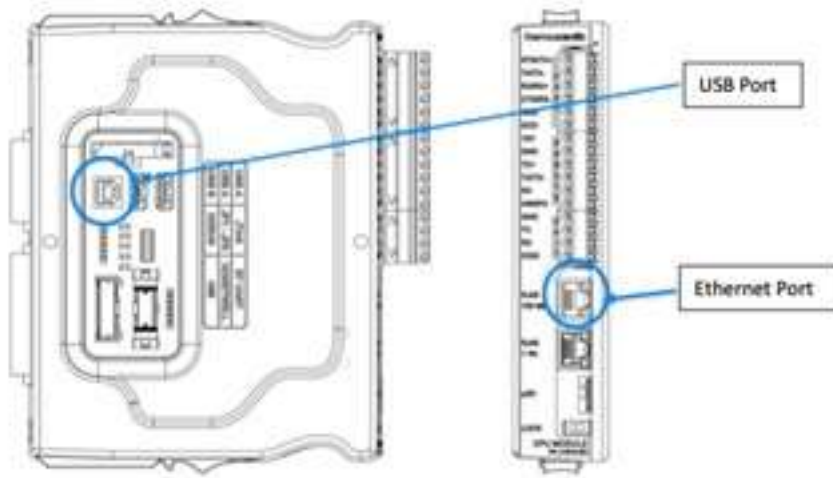


Fig 4-1 CPU USB and Ethernet Ports

• CHIT/USB Connection

When connecting locally to an 8000FX via CHIT or USB be sure the CHIT USB box is checked marked. Default mode is checked. If connecting via Bluetooth CHIT USB must be un-checked to enable connectivity. See Figure 4-2.



Fig 4-2 CHIT/USB Enable

Quick Start Guide

5. Power Supply

Module I/O (inputs/outputs)

- AI: Analog Input
- AO: Analog Output
- DI: Digital/Discrete Input
- DO: Digital/Discrete Output PI: Pulse Input

The Tek-FC 8000 FX hardware is a cost-effective solution for measurement and control, remote data acquisition, and processing tasks. It has a user-friendly modular design and can be easily integrated into new and existing systems. It comes in 3-slot and 7-slot versions, which can be daisy chained for a total of 8 chassis. Power consumption is low due to the use of low power CMOS components. The hardware is highly flexible and can be configured to match the specific installation site with several levels of expansion provided by optional I/O boards connected via the RS485 bus. Each I/O board has terminal blocks for field wiring termination and built-in surge protection prevents damage to the input circuitry. Optional I/O boards may be connected to the backplane via the RS485 bus, providing additional expansion in the following increments:

- Non-Iso Combo-2PI/DI/DO; 4 DI/DO; 1DO/DI/FO; 5AI; 1AO; 1 RTD
- Iso Combo-4-PI/DI/DO; 4-DI/DO; 4AI; 1AO; 1RTD
- Iso Analog In-12 AI
- Iso Analog Out- 6AO
- Digital In- 8 DI
- Relay DO- 8 DO
- ISO PI/DI/DO- 6PI; 4DI; 4DO

• Switch Inputs

The following statements apply to both 3 and 7 slot chassis versions:

The main chassis, (Chassis 0) will house the CPU. The addressing rotary switch on this backplane, (SW1), should be set to 0. There is a max of one CPU per system, which may include up to a total of 8 chassis, including the main chassis. Each additional chassis should be addressed via it's addressing rotary switch on the backplane, (SW1). For example, the first expansion chassis will be address 1. If a second expansion chassis is added, it's address will be 2, and so on. Communication modules may only be added to slots 1 and 2 of the main chassis. There is a max of 2 comm modules per system.

i NOTE

Slots 1 and 2 will also accept IO modules if no communication modules are present.

IO modules may be inserted into slots 1-6 on the main chassis and slots 0-6 on each additional expansion chassis . The only limit to how many of each type of IO module is the number of available slots in the system, up to the max of 7 additional expansion chassis.

- **Board Addressing and Activity Indication**

Boards are automatically assigned an address according to what slot they are plugged in. There are no jumpers, rotary switches, or software configuration necessary. Once you have installed the board, use the Tek-ACONFIG software to perform an I/O scan (Miscellaneous > System Control > I/O Rescan > Restart).

8000FX I/O boards have a green LED that indicates activity. This LED is not present on the communication modules or the CPU. The LED can be interpreted as shown in the table below.

LED	Indication
Blinking slowly	Board is receiving messages from the system CPU and communication is established
Blinking quickly	Board does not recognize message from the CPU. communication is not established

Table 5-1. I/O Board activity indicator LED

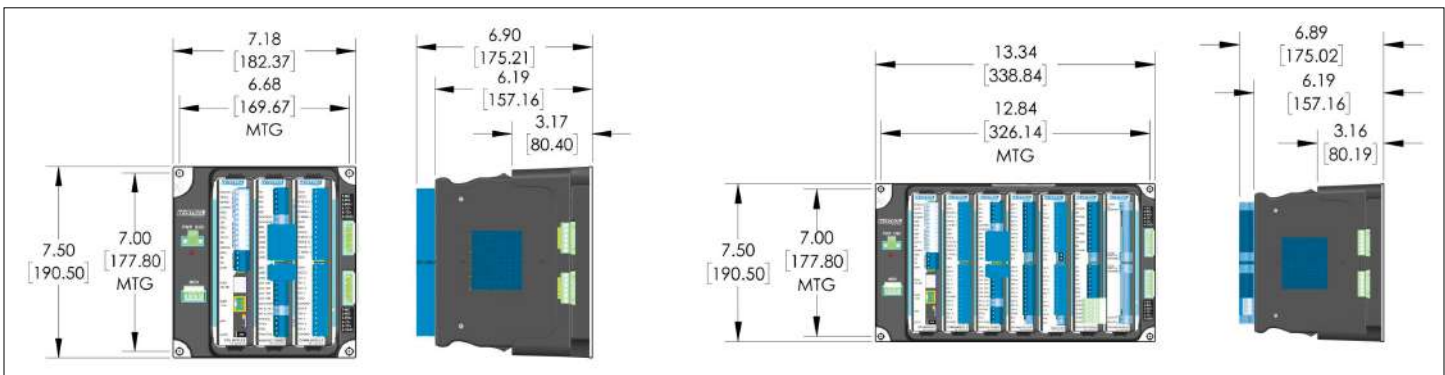


Table 5-2. Chassis Dimensions for 8000FX3 and 8000FX7 with Modules

6. Wiring

- Chassis Wiring

i NOTE

3-slot backplane and 7-slot backplane boards share the same wiring diagrams.

Quick Start Guide

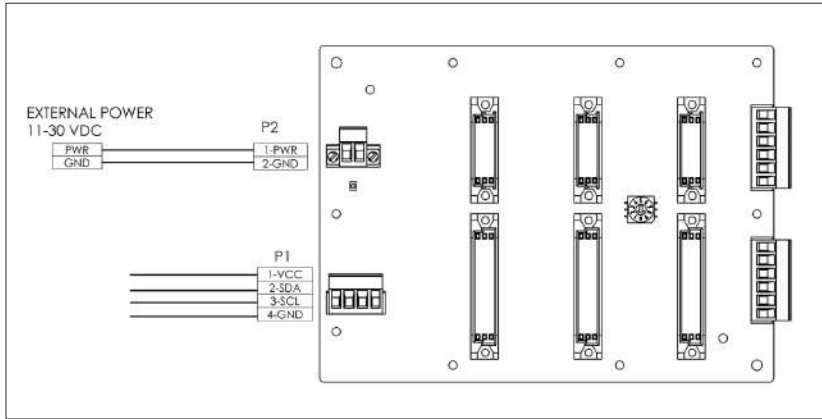


Fig 6-1 3 Slot backplane board

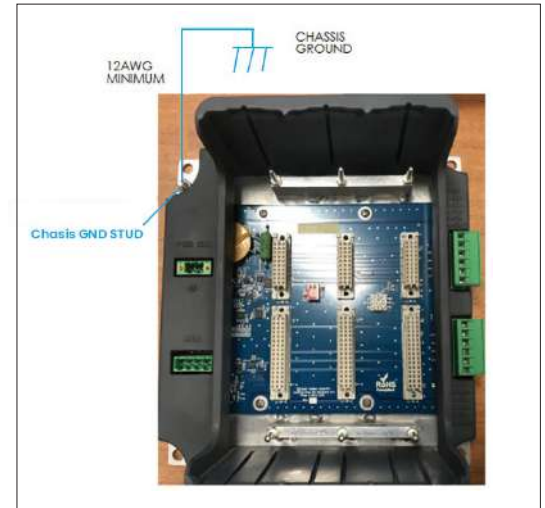


Fig 6-2 3 Slot backplane chassis ground stud

i NOTE

3-slot backplane and 7-slot backplane boards share same surge ground wiring diagrams.

- Daisy Chain Connection of 8000FX Backplanes

All chassis ground studs of backplane boards are connected to the same chassis ground point and switches in different backplane boards should be set to different numbers.

i NOTE

3-slot backplane and 7-slot backplane boards share the same wiring diagrams.

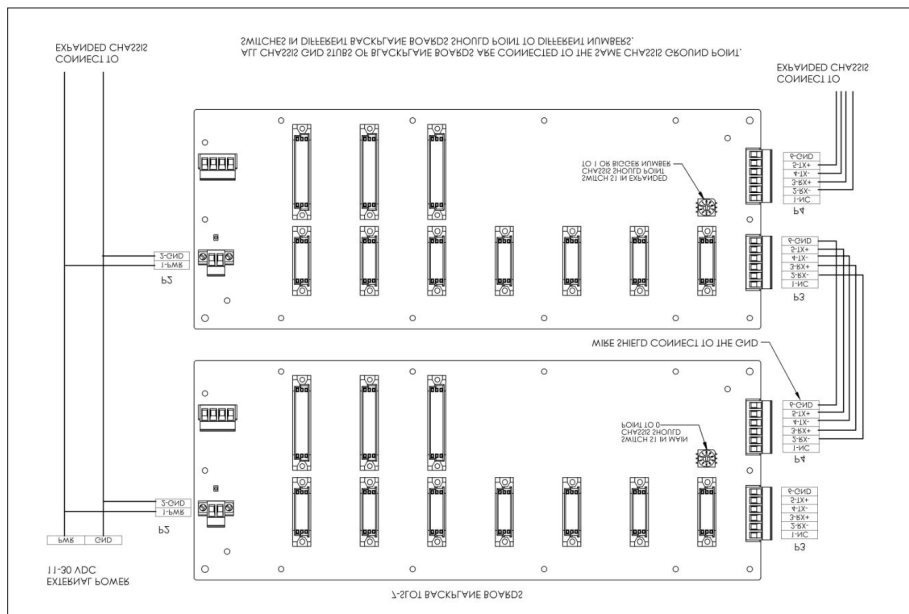


Figure 6-3. 7 slot backplane daisy chain

• CPU Model Wiring

The 8000FX CPU board host port to user interface with 4-wire and 2-wire RS485

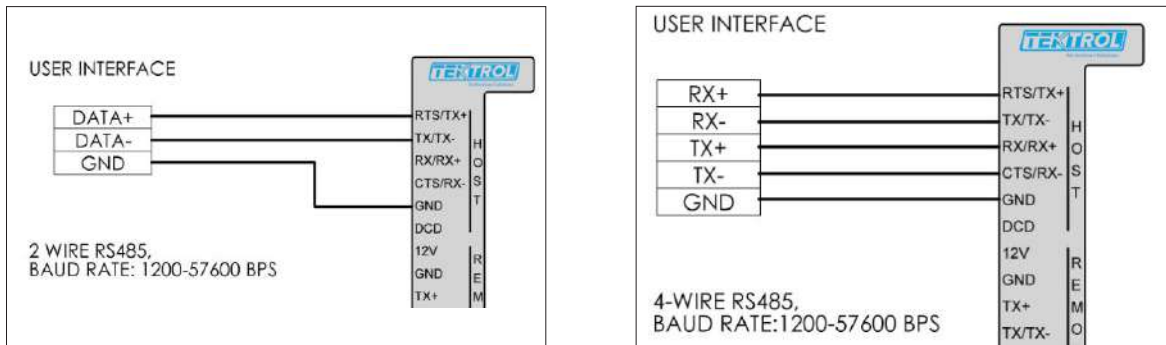


Figure 6-4. 8000FX CPU Host port 4-wire and 2 wire RS485

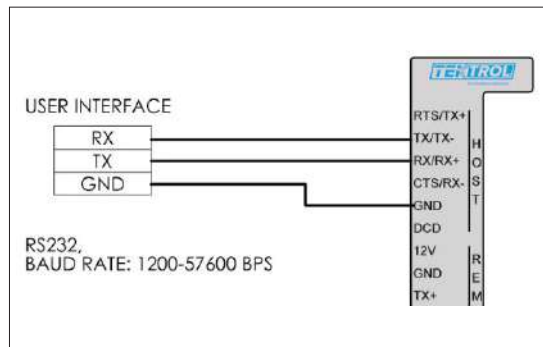


Figure 6-5 CPU Host Port RS232

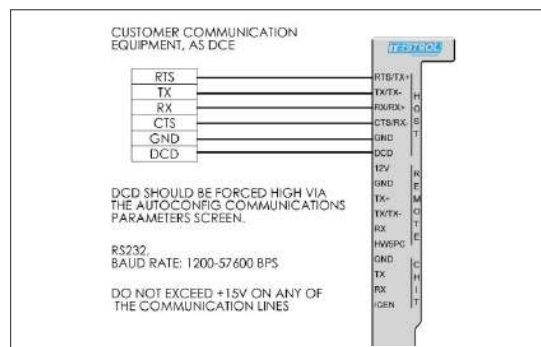


Figure 6-6 CPU Host to DCE

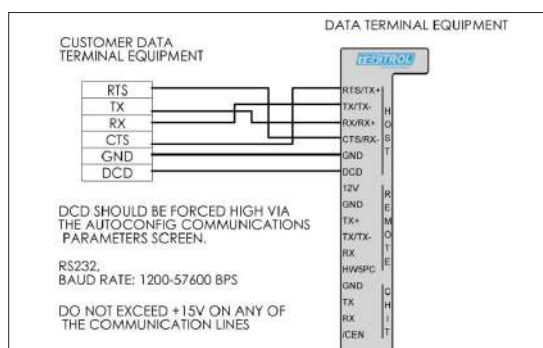


Figure 6-7 CPU Host to DTE

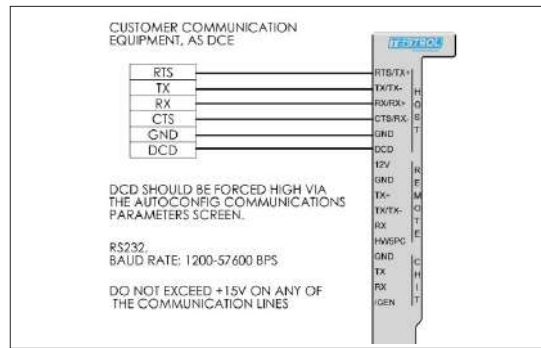


Figure 6-8 CPU Remote port to user interface RS232

Quick Start Guide

When the “Hardware Lockout” option in System Control Table #31 via Tek-ACONFIG is enabled, this switch provides a simple means to protect the Tek-FC 8000FX from any external Modbus writes through any of the instruments communications ports. When enabled, a user must physically unlock the units cabinet (if equipped) with a key and reset the switch to disable the Lockout option in order to calibrate or change any of the units parameters. When maintenance has been completed, the user must set the switch back to “Lock”, close and physically lock the unit.

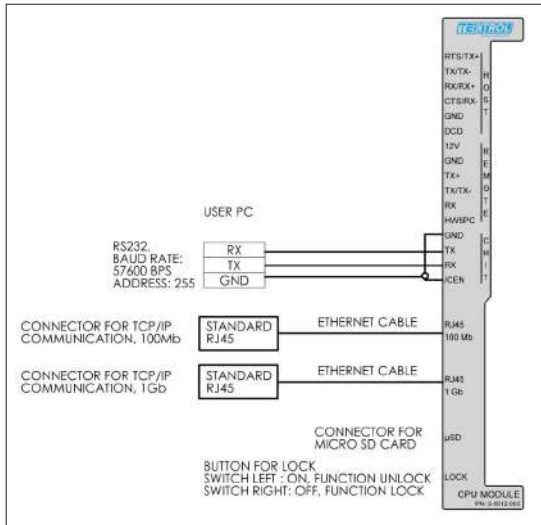


Figure 6-9 8000FX CPU CHIT

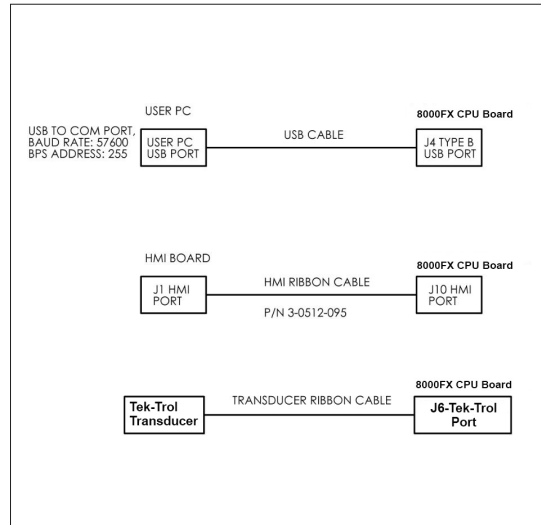


Figure 6-10 CPU HMI and USB and Ethernet Ports

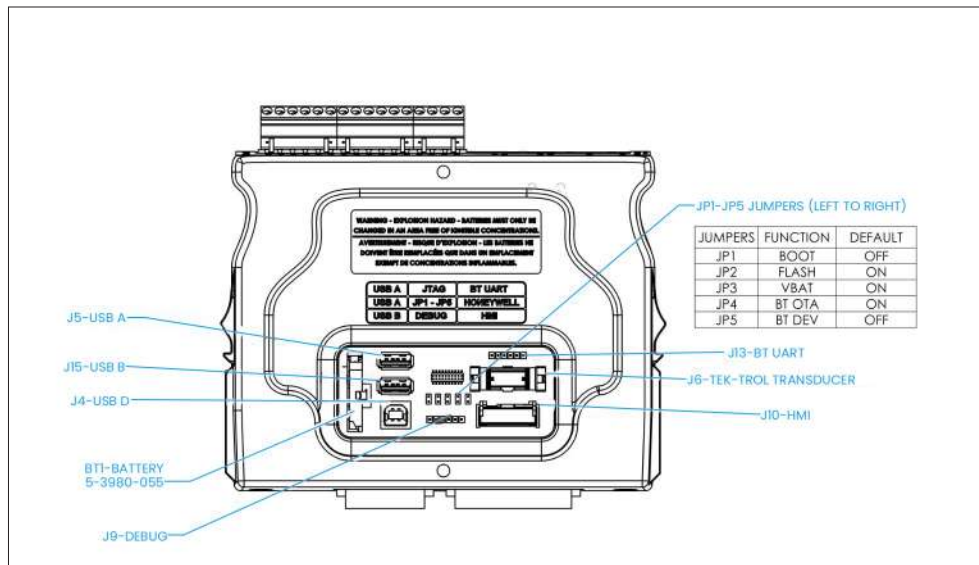


Figure 6-11. 8000FX CPU Board side view

• **Communication Module Wiring**

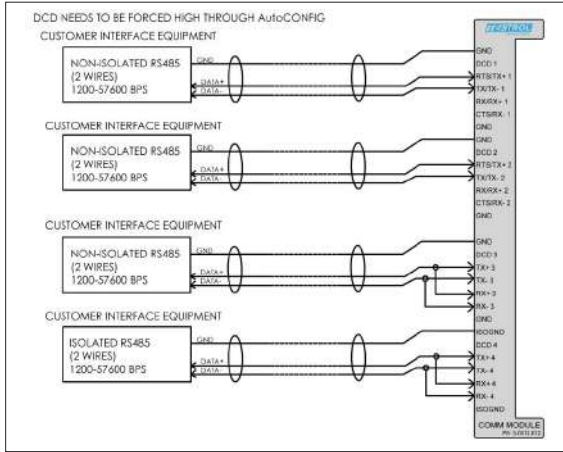


Figure 6-12. 8000FX Comm 2-Wire RS485

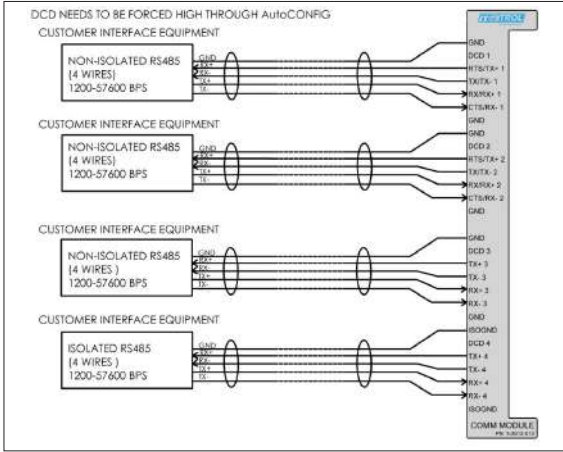


Figure 6-13. 8000FX Comm 4-wire RS485

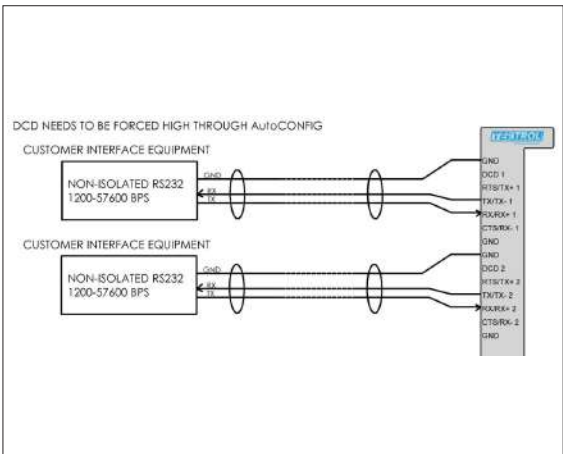


Figure 6-14 8000FX Comm 2-wire RS232

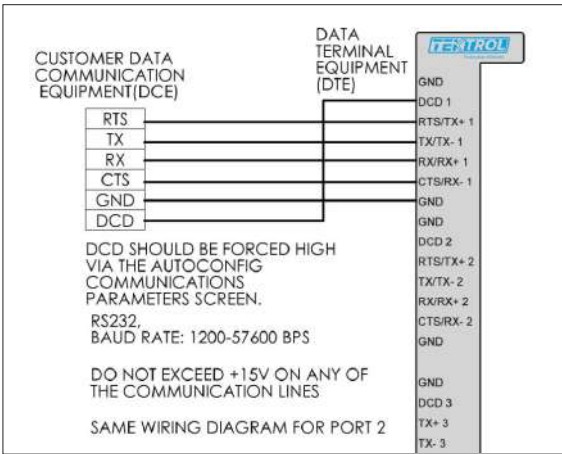


Figure 6-15. 8000FX RS232 to customer DCE

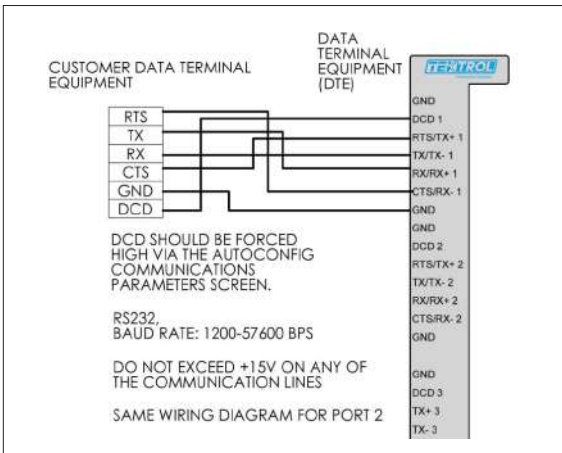


Figure 6-16. 8000FX RS232 to customer DTE

Quick Start Guide

- **Non-isolated Combo Module Wiring**

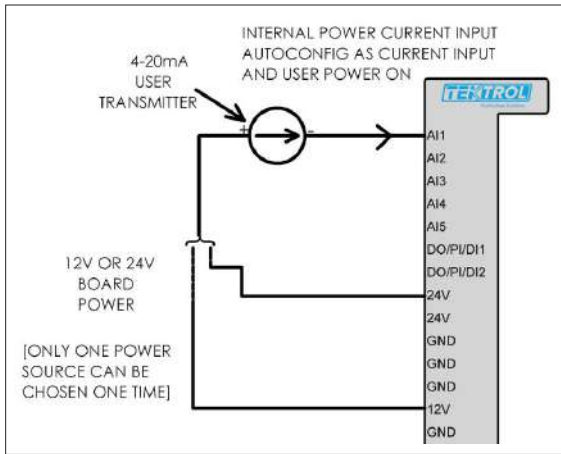


Figure 6-17. 8000FX 4-20mA current input (internal power)

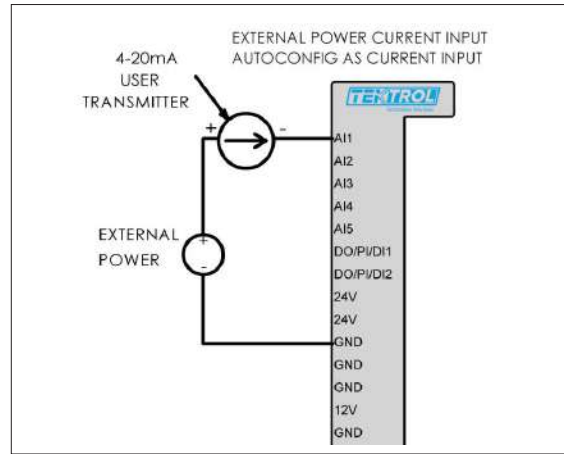


Figure 6-18. 8000FX 4-20mA current input (external power)

- **Discrete Output (Non-iso)**

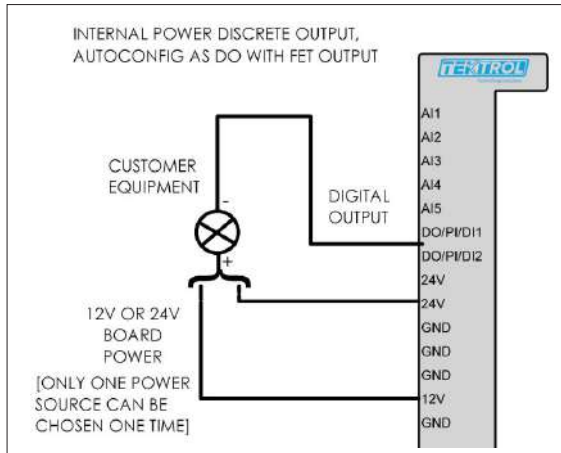


Figure 6-19. Non-iso DO as FET w/internal power

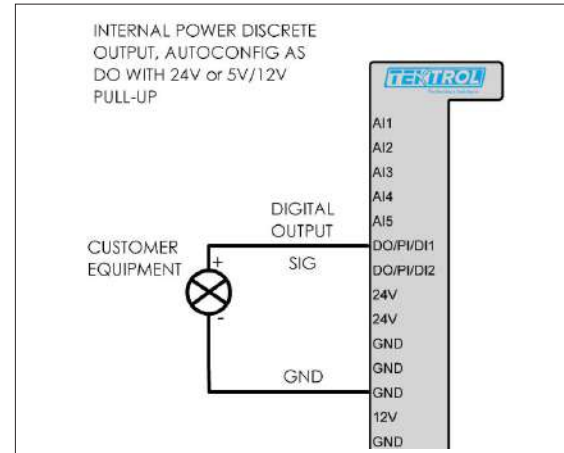


Figure 6-20. Non-iso DO w/24V or 5V/12V pull-up

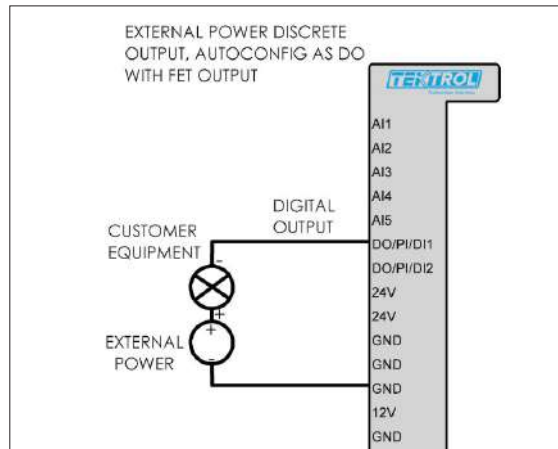


Figure 6-21. Non-iso DO as FET w/external power

• **Analog Output (Non-iso)**

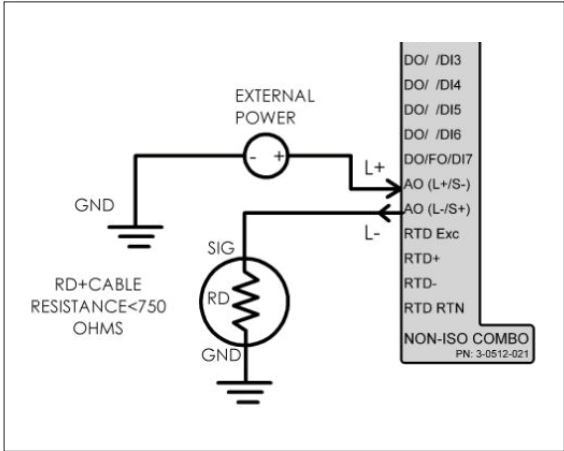


Figure 6-22. Analog out with external power

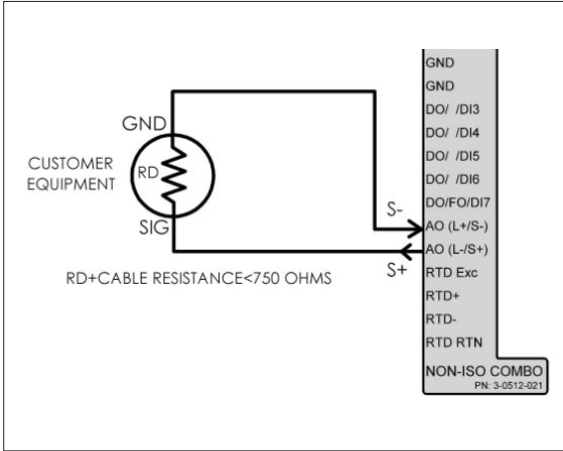


Figure 6-23. Analog out with self/internal power

• **RTD Wiring (Non-iso)**

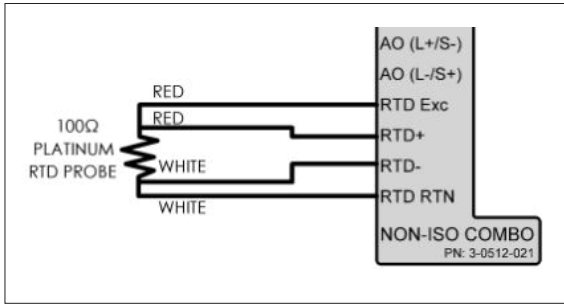


Figure 6-24. 4-wire RTD

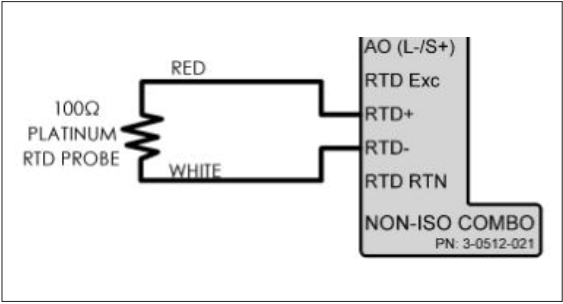


Figure 6-25. 2-wire RTD

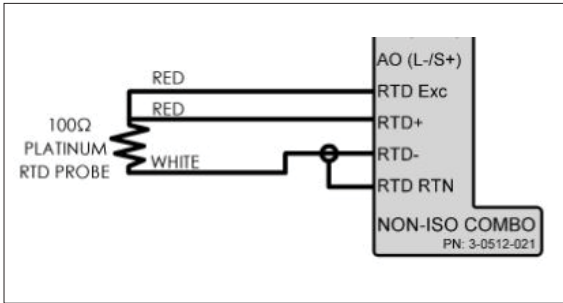


Figure 6-26. 3-wire RTD

Quick Start Guide

- Isolated Combo Module Wiring

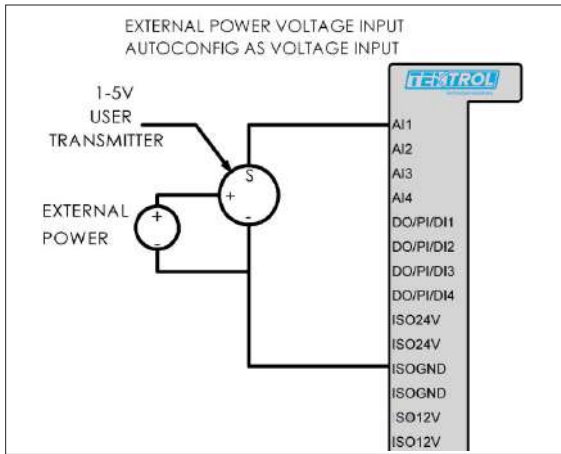


Figure 6-27. 1-5V voltage input with external power

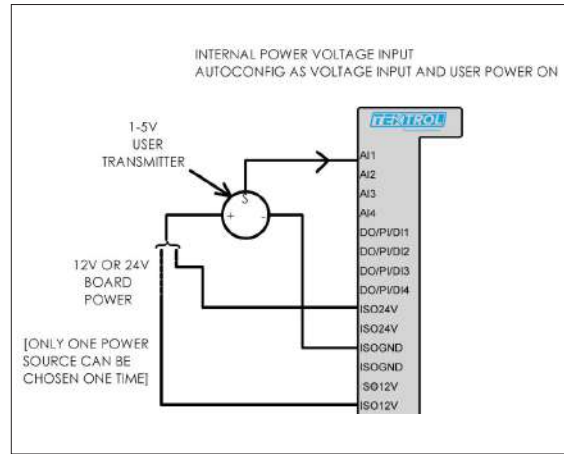


Figure 6-28. 1-5V voltage input with internal power

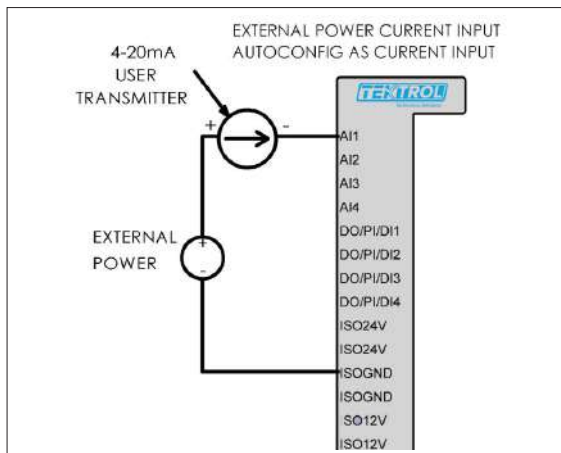


Figure 6-29. 4-20mA current input with external power

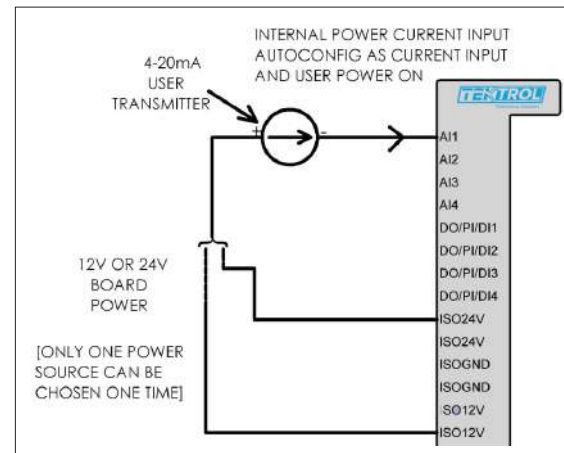


Figure 6-30. 4-20mA current input with internal power

- Discrete Input (Iso-Combo)

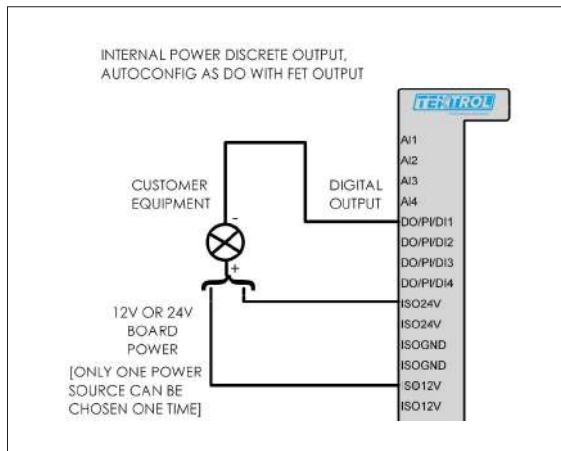


Figure 6-31. FET Discrete Output-internal power

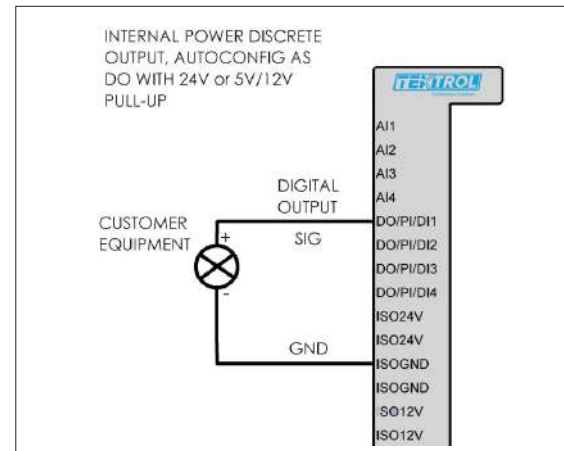


Figure 6-32. Discrete output with 24V or 5V/12V pull-up

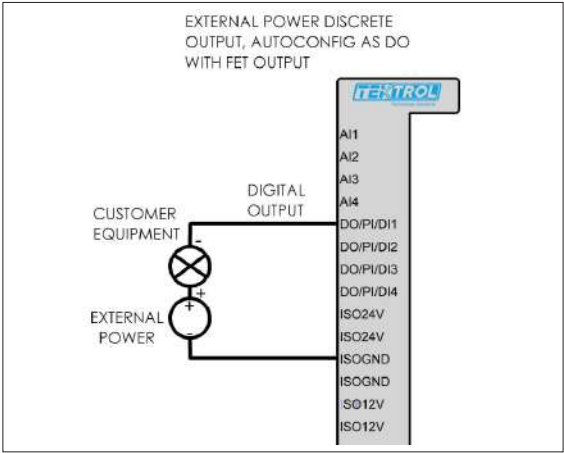


Figure 6-33. FET discrete output with external power

- Pulse/Accumulator Input (Iso-combo)

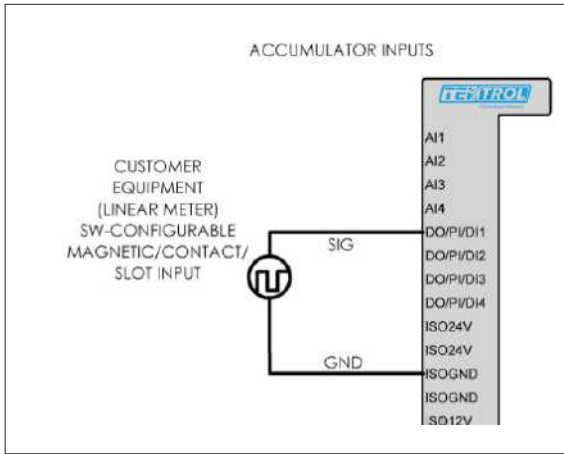


Figure 6-34. Pulse input

- Discrete Input (Iso-Combo)

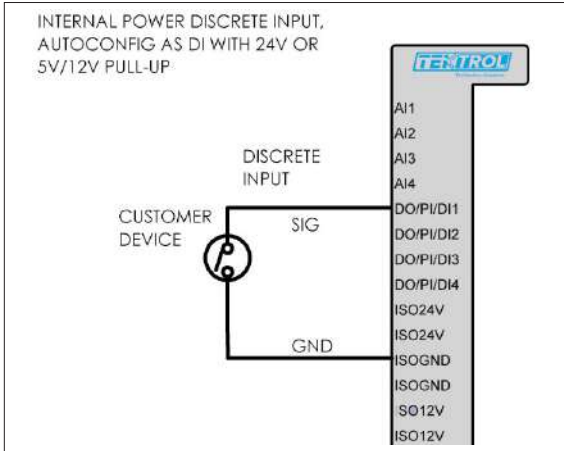


Figure 6-35. Discrete input with 24V or 5V/12V pull-up

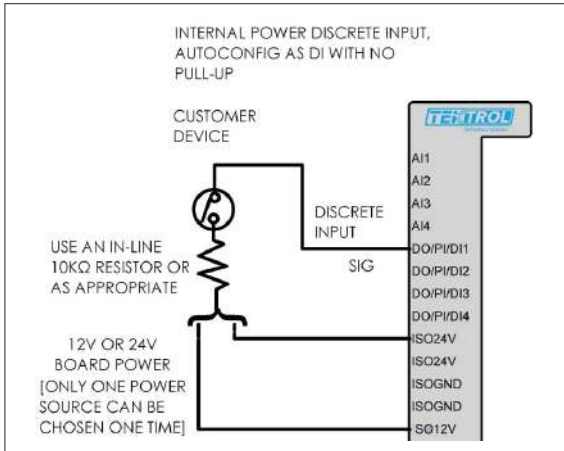


Figure 6-36. Discrete input with no pull-up

Quick Start Guide

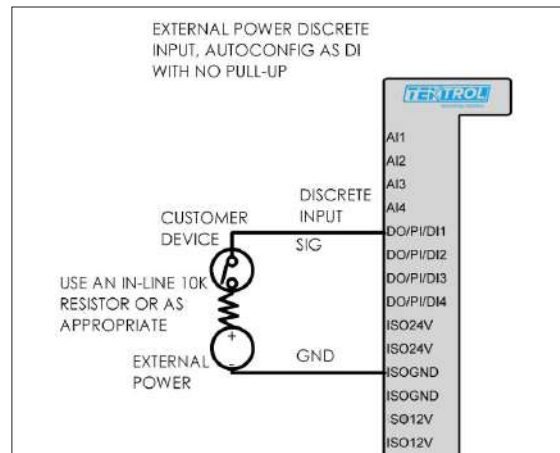


Figure 6-37. Discrete input no pull-up (external power)

- **Analog Output (Iso-combo)**

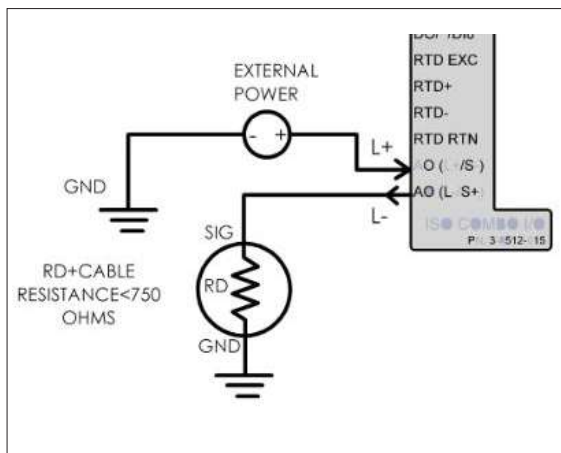


Figure 6-38. Analog output external loop power

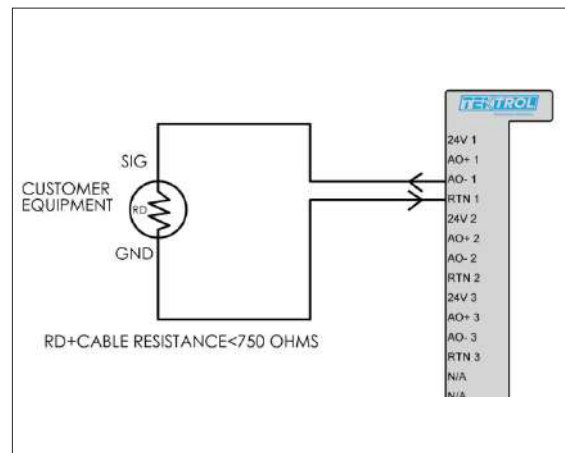


Figure 6-39. Analog output self-power

- **RTD Input (Iso-combo)**

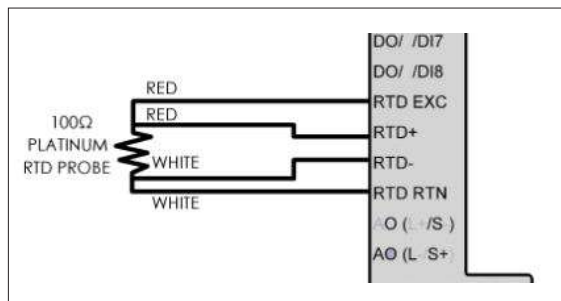


Figure 6-40. 4-wire RTD

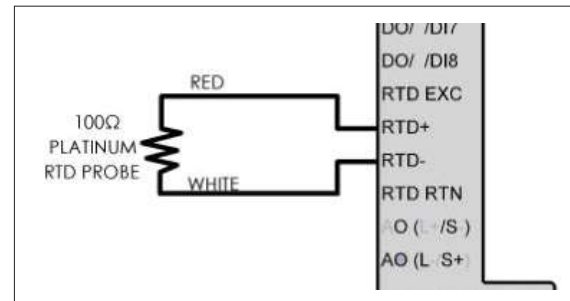


Figure 6-41. 2-wire RTD

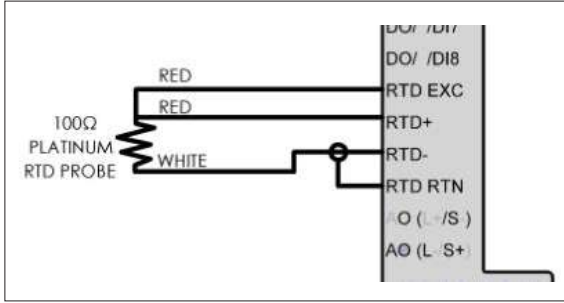


Figure 6-42. 3-wire RTD

• Analog Input Module Wiring

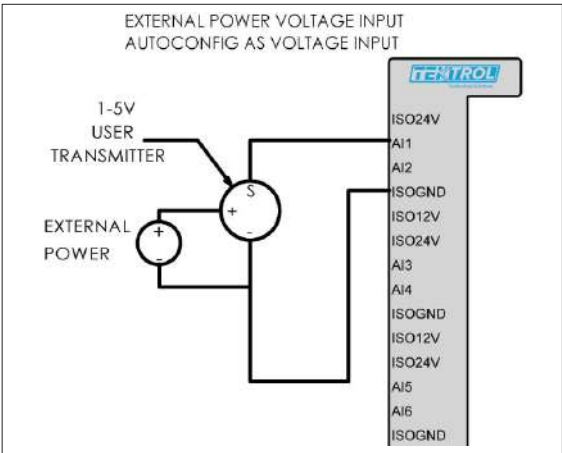


Figure 6-43. 1-5V voltage input with external power

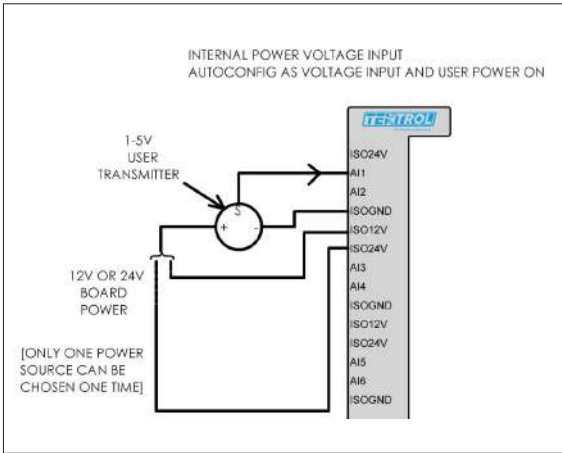


Figure 6-44. 1-5V voltage input with internal power

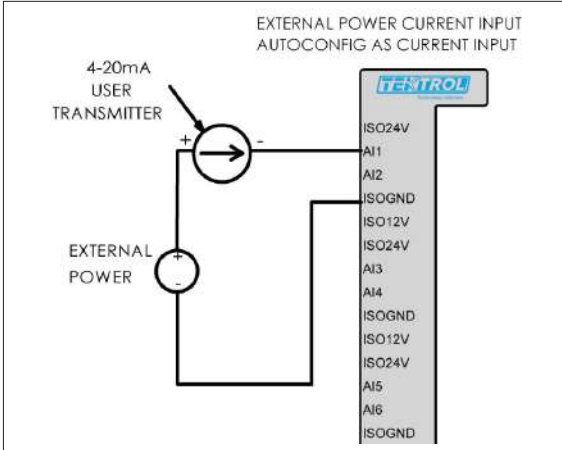


Figure 6-45. 4-20mA current input with external power

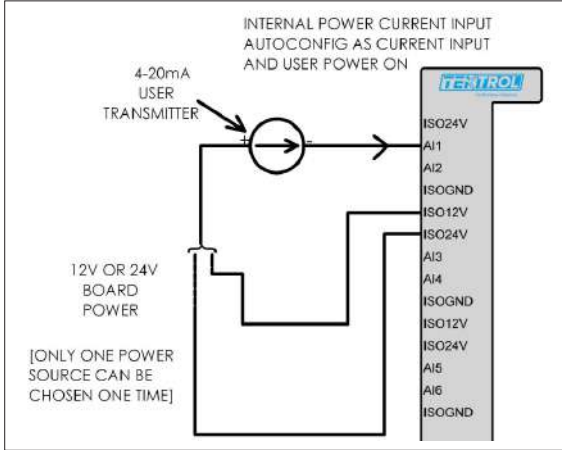


Figure 6-46. 4-20mA current input with internal power

Quick Start Guide

- Analog Output Module Wiring**

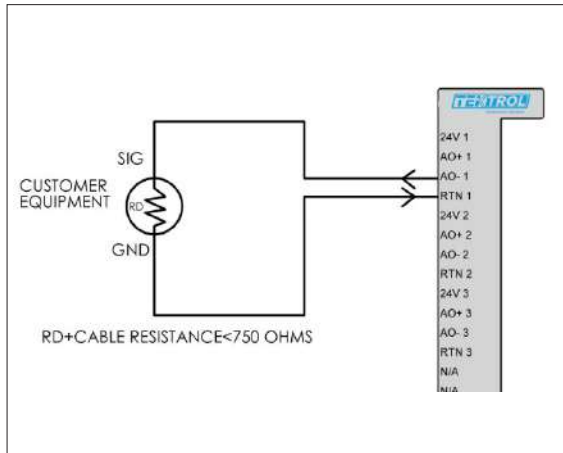


Figure 6-47. Analog output with self-power

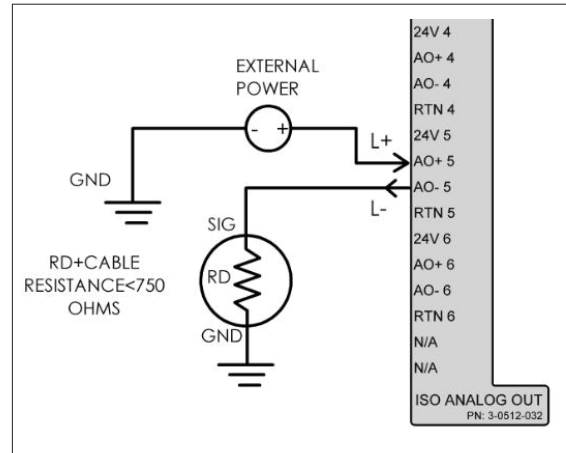


Figure 6-48. Analog output with external loop power

- Discrete Input Module Wiring**

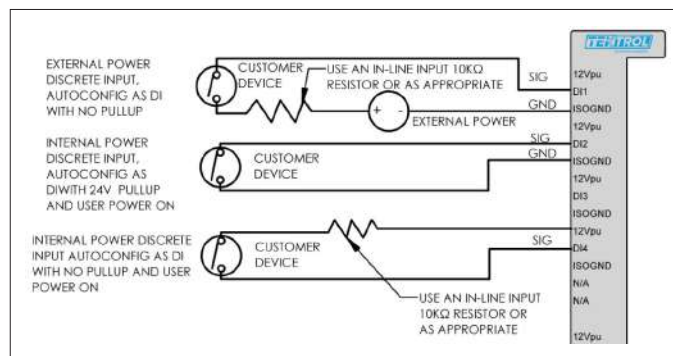


Figure 6-49. Discrete input with external power or board power

- Relay DO Module Wiring**

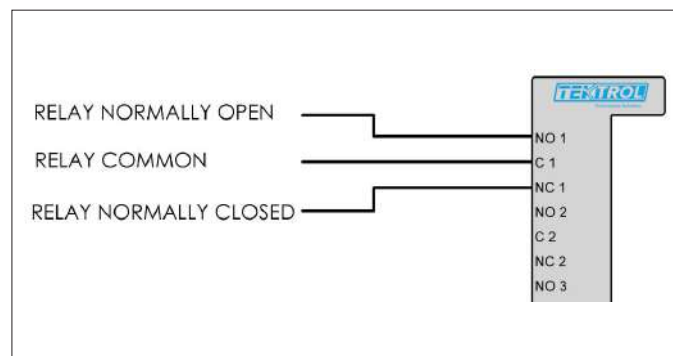


Figure 6-50. Relay DO

• **PI/DI/DO Module Wiring**

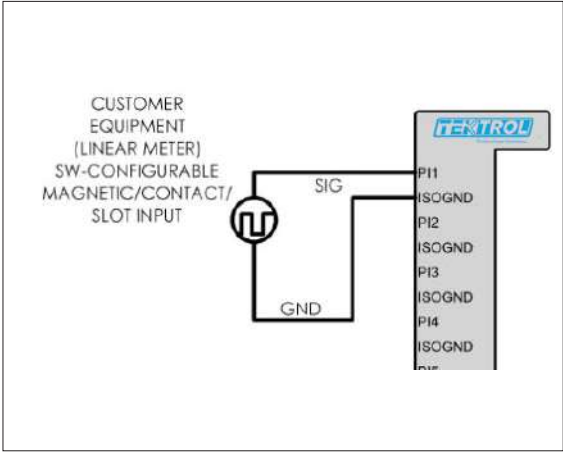


Figure 6-51. Pulse input

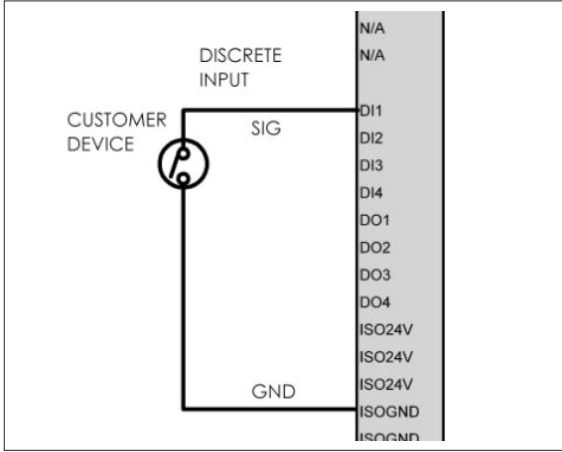


Figure 6-52. Discrete input internal power 24V pull-up

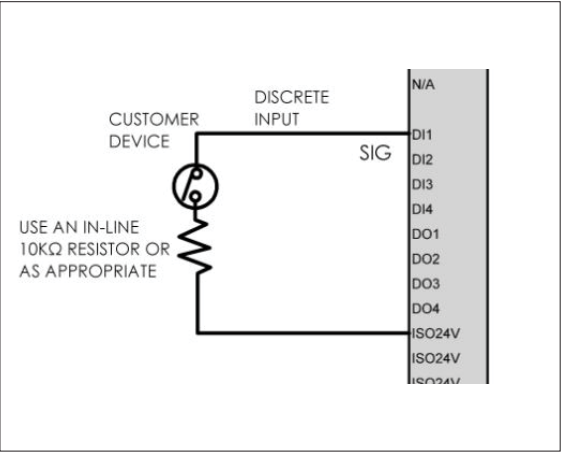


Figure 6-53. Discrete input with internal power no pull-up

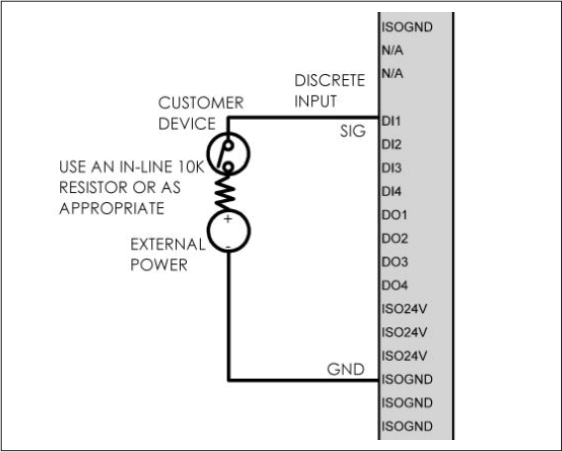


Figure 6-54. Discrete input with external power no pull-up

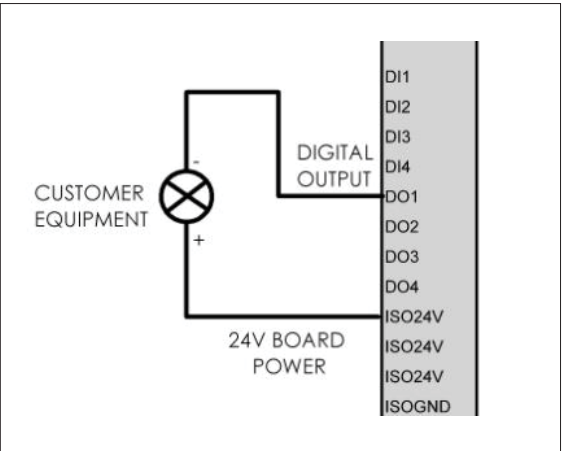


Figure 6-55. FET Discrete output with internal power

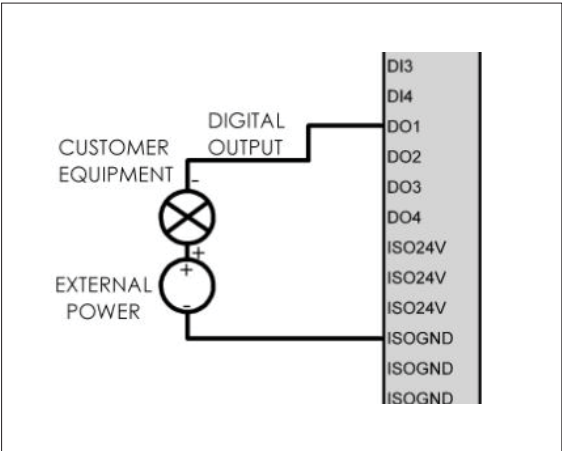


Figure 6-56. FET Discrete output with external power

Quick Start Guide

- **Prover Module Wiring**

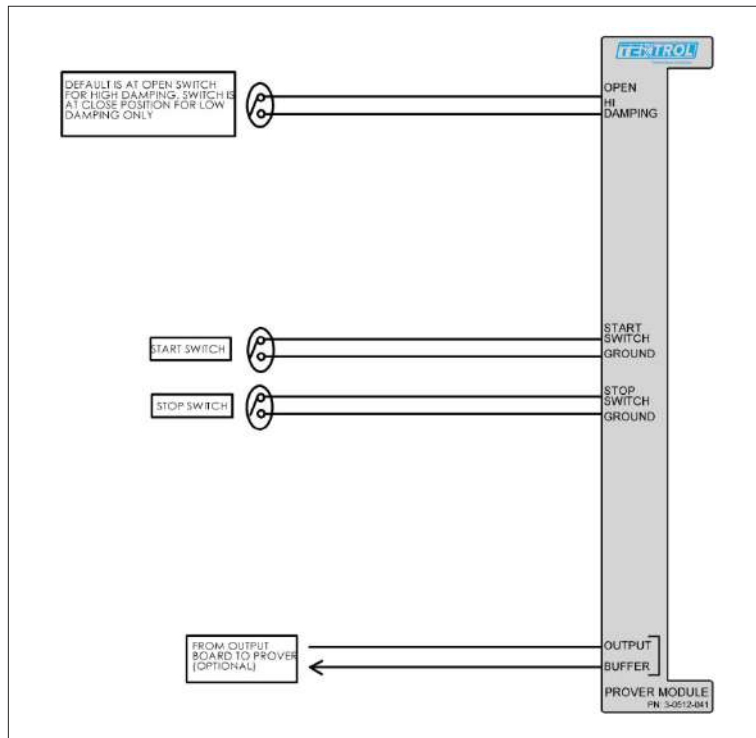


Figure 6-57. Prover board wiring

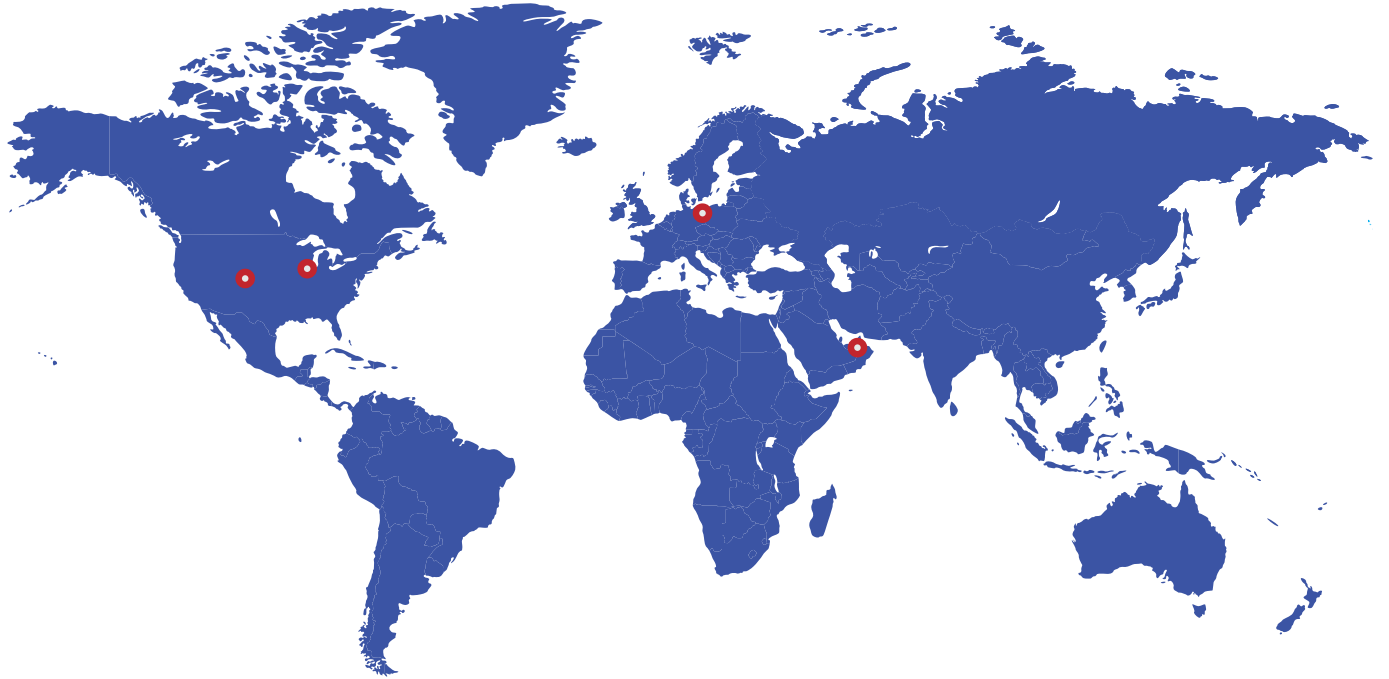
7. Troubleshooting

Symptoms	Solutions
Will the 8000FX flow computer work with Tek-ACONFIG software?	Yes, Tek -ACONFIG interface will support 8000FX , and 3800XP
Does the 8000 FX meet API 21.1 and 21.2 custody transfer standards?	Yes
Do I connect to the 8000FX with the same CHIT cable?	The 8000FX can be connected to via Bluetooth, Ethernet and USB also available is the legacy CHIT connector.
Will 8000 FX be hazardous location certified?	The system is certified Class I, Div. 2.
How much faster is the processor in the 8000FX?	Using the AGA8 Detailed calculation as a gauge the 8000FX can process it 4X faster than the AutoEXEC.
Does 8000 FX support software selectable I/O?	Yes, combination inputs can be configured via Tek -ACONFIG interface software. The 8000 FX supports DO/DI/PI, DO/DI, and DO/DI/FO software selectable inputs.
Can additional chassis be plugged into base chassis?	The 8000FX7 will accept up to 7 additional chassis.

Can I/O modules be interchanged between chassis?	All I/O modules for the 8000FX series including the CPU can be interchanged between chassis.
What communication ports are included on the CPU module?	(2) Ethernet, (1) USB, (1) Serial host, and (1) Serial local port; Ethernet port speeds 1 @ 100 Mbps and 1 @ 1000Mbps.
How many meter runs will the 8000 FX handle?	The limitation of meter runs is based on limitation of hardware. Tek -ACONFIG SW is capable of handling 32+ run configurations.
Does the 8000FX offer wireless communication?	Yes, 8000FX comes with standard with Bluetooth that can be turned on/off via Tek-ACONFIG interface.



Technology Solutions



Tek-Trol LLC

796 Tek Drive Crystal Lake, IL
60014, USA
Sales: +1 847-857-6076

Tek-DPro Flow Solutions

PO Box 121 Windsor, Colorado
80550, USA
Sales: +1 847-857-6076

Tek-Trol Solutions BV

Florijnstraat 18, 4879 AH
Etten-Leur, Netherlands
Sales: +31 76-2031908

Tek-Trol Middle East FZE

SAIF Zone, Y1-067, PO BOX No.
21125, Sharjah, UAE
Sales: +971-6526-8344

Support: +1 847-857-6076

Email: tektrol@tek-trol.com

www.tek-trol.com

Tek-Bar 3800XP