

SHRA HART® Enabled Analog Input/Output

Functional Description

The Highway Addressable Remote Transducer (HART) Enabled Analog Input/Output (SHRA) terminal board is a compact analog input terminal board that accepts 10 analog inputs and two analog outputs, and connects to the PHRA or YHRA pack. It allows HART messages to pass between the PHRA and a HART enabled field device. The 10 analog inputs accommodate two-wire, three-wire, four-wire, or externally powered transmitters. The two analog outputs are 4-20 mA. Only a simplex version of the board is available.

High-density Euro-block type terminal blocks are used. An on-board ID chip identifies the board to the PHRA or YHRA for system diagnostic purposes.

Compatibility

Board Revision	Mark VIe IS220PHRA	Mark VIeS IS200YHRA	Comments
SHRAH1A	Yes, all versions	No	Fixed terminals
SHRAH2A	Yes, all versions	No	Pluggable terminals
SHRAS1A	Yes, all versions	Yes, all versions	Fixed terminals, IEC 61508 safety certified with YTCC
SHRAS2A	Yes, all versions	Yes, all versions	Pluggable terminals, IEC 61508 safety certified with YTCC

Mr. Lucian

Sales manager

Joyoung International Trading Co., Ltd

Whatsapp/Wechat: +86 18106906650

Email: Lily@htechplc.com

Mobile: +86 18106906650

Website: www.xm-dcs.com

Address: Room 1503, Building B, Diamond Coast,
No. 96 Lujiang Road, Siming District, Xiamen Fujian

Wechat



Installation

The PHRA I/O pack works with the SHRA. The I/O pack plugs into the D-type connector and communicates with the controller over Ethernet. Only simplex systems are supported. All revisions of SHRA are compatible with all PHRAs.

The SHRA plus a plastic insulator mounts on a sheet metal carrier that then mounts on a DIN-rail. Optionally, the SHRA plus insulator mounts on a sheet metal assembly and then bolts directly to a cabinet. There are two types of Euro-block terminal blocks available as follows:

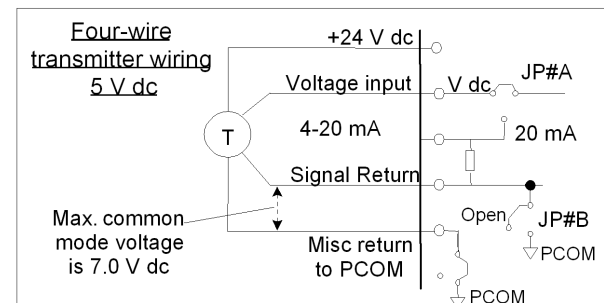
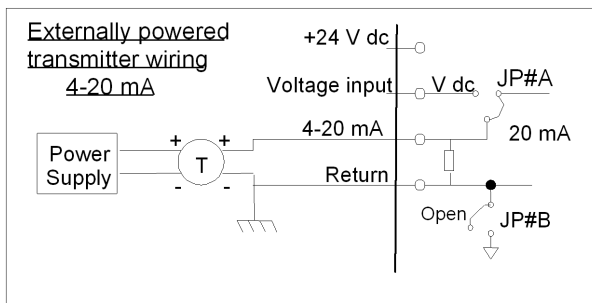
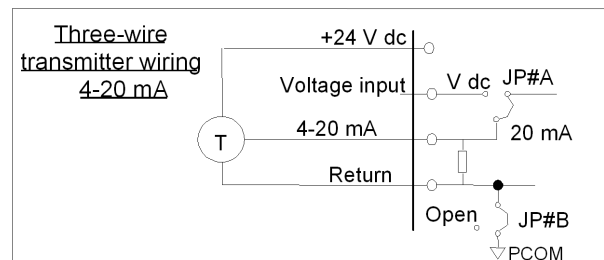
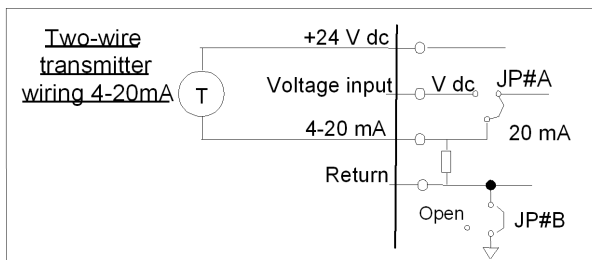
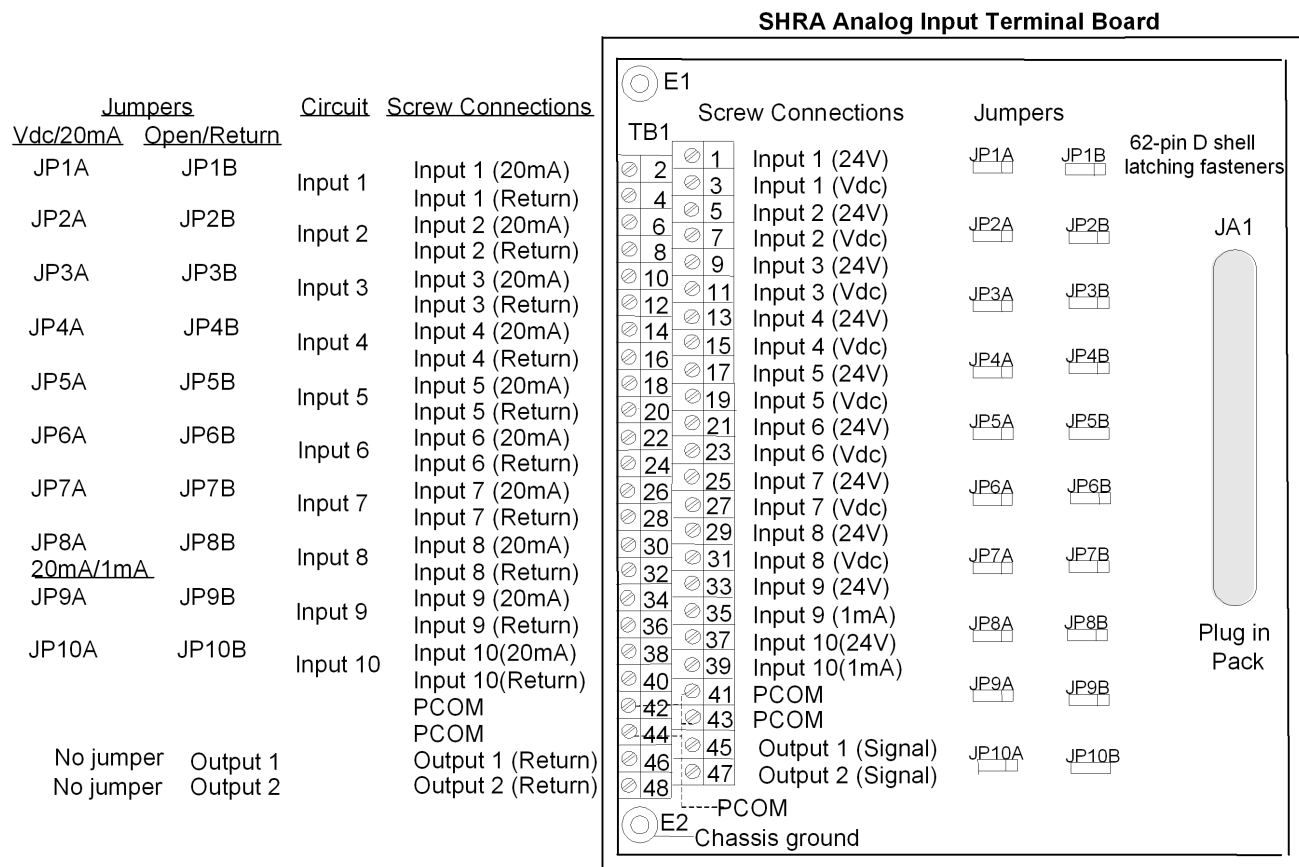
- SHRA1A has a permanently mounted terminal block with 48 terminals.
- SHRA2A has a right angle header accepting a range of commercially available pluggable terminal blocks, with 48 terminals.

Typically #18 AWG wires (shielded twisted-pair) are used. I/O cable shield termination is provided adjacent to the terminal blocks.

The following types of analog inputs/outputs can be used:

- Analog input, two-wire transmitter
- Analog input, three-wire transmitter
- Analog input, four-wire transmitter
- Analog input, externally powered transmitter
- Analog input, voltage ± 5 V dc
- Analog output, 4-20 mA current

Wiring, jumper positions, and cable connections display in the following figure.



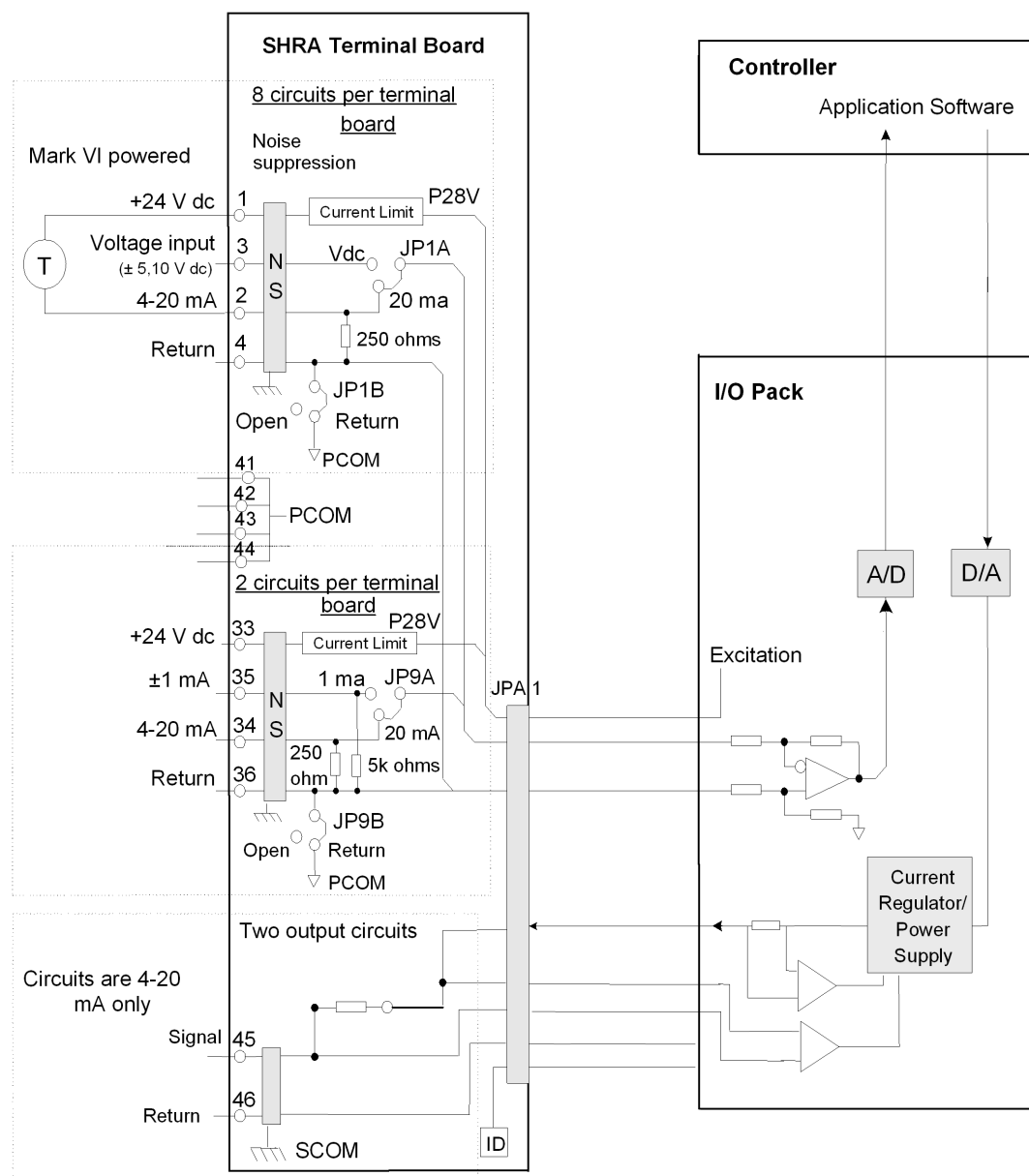
SHRA Wiring, Cabling, and Jumper Positions

Operation

On the terminal board, 24 V dc power is available on the terminal board for all the transmitters (transducers). There is a choice of current or voltage inputs using jumpers. HART communication is only possible with the inputs set as 4-20 mA inputs, it will not take place on an input set as ± 5 V dc or ± 1 mA. The two analog output circuits are 4-20 mA. There is only one cable connection, so the terminal board cannot be used for TMR applications.

The following table displays the analog input/output capacity of the SHRA terminal board.

Quantity	Analog Input Types	Quantity	Analog Output Types
8	± 5 V dc, or 4-20 mA	2	4-20 mA
2	4-20 mA, or ± 1 mA		



SHRA Terminal Board, and PHRA / YHRA I/O Packs

Specifications

Item	Specification
Number of channels	12 channels (10 AI, 2 AO)
Input span, transmitters	1 - 5 V dc across a precision resistor (usually 250 Ω)
Maximum lead resistance to transmitters	15 Ω maximum two-way cable resistance, cable length up to 300 m (984 ft), 24 V outputs provide 21 mA for each connection
Outputs	24 V dc outputs rated at 21 mA each
Load on output currents	800 Ω burden for 4-20 mA output with PHRA or YHRA pack
Physical	
Size	15.9 cm high x 17.8 cm wide (6.25 in x 7.0 in)
Technology	Surface-mount
Temperature	-30 to 65°C (-22 to 149 °F)

Diagnostics

Diagnostic tests are made on the terminal board as follows:

- The board provides the voltage drop across a series resistor to indicate the output current. The PHRA creates a diagnostic alarm (fault) if any one of the two outputs goes unhealthy.
- Each cable connector on the terminal board has its own ID device that is interrogated by the PHRA. The ID device is a read-only chip coded with the terminal board serial number, board type, revision number, and the JR, JS, JT connector location. When this chip is read by the PHRA and a mismatch is encountered, a hardware incompatibility fault is created.

Configuration

Configuration of the terminal board is by means of jumpers. For location of these jumpers refer to the installation diagram. The jumper choices are as follows:

- Jumpers JP1A through JP8A select either current input or voltage input
- Jumpers JP1B through JP8B select whether the return is connected to common or is left open
- Jumpers JP9A and JP10A select either 1 mA or 20 mA input current
- Jumpers JP9B and JP10B select whether the return is connected to common or is left open

All other configuration is for the PHRA or YHRA, and is done from the ToolboxST application.