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Mr. Lucian
Sales manager

Wechat

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

3.5 STAIH#A, S#A Simplex Analog Input

The Simplex Analog Input (STAI) terminal board is a compact analog input terminal board that accepts 10 analog inputs and two analog outputs, and connects to the pack. The 10 analog inputs accommodate two-wire, three-wire, four-wire, or externally powered transmitters. The two analog outputs are 0-20 mA. Only with the Mark VIe PAICH2, one analog output jumper can be configured to 0-200 mA current. High-density Euro style box terminal blocks are used. An on-board ID chip identifies the board to the pack for system diagnostic purposes.

Compatibility

Board Revision	Mark VIe PAIC	Mark VIeS YAIC	Comments
STAIH1A	Yes	No	Fixed terminals
STAIH2A	Yes	No	Plug in terminals
STAIS1A	Yes	Yes	Fixed terminals, IEC 61508 safety certified with YAIC
STAIS2A	Yes	Yes	Plug in terminals, IEC 61508 safety certified with YAIC
STAIS3A	No	Yes	No terminal block

3.5.1 Installation

The STAI plus a plastic insulator mounts on a sheet metal carrier that then mounts on a DIN-rail. Optionally, the STAI plus insulator mounts on a sheet metal assembly and then bolts directly to a cabinet. There are three types of terminals available as follows:

- STAI_1A has a permanently mounted Euro-style terminal block with 48 terminals.
- STAI_2A has a right angle header accepting a range of commercially available pluggable Euro-style terminal blocks, with a total of 48 terminals.
- STAI_3A does not have any terminal block, allowing for field wiring to be directly soldered to the board.

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

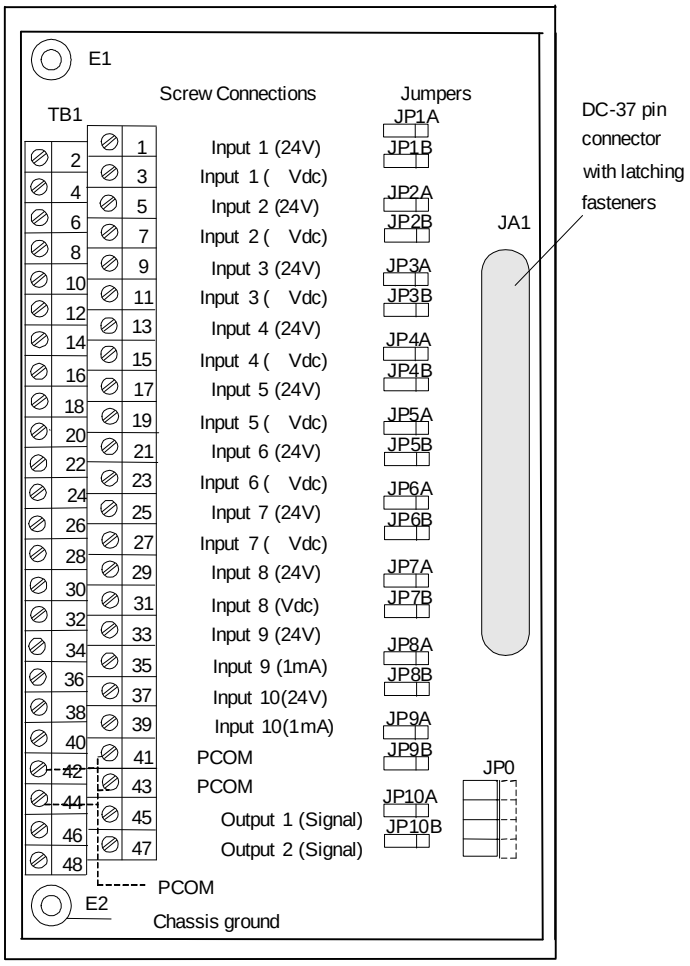
The following types of analog inputs and outputs can be accommodated:

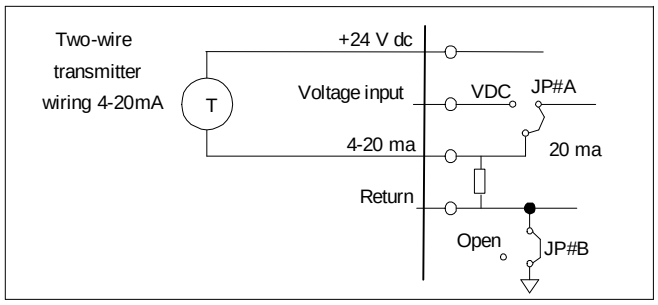
- Analog input, two-wire transmitter
- Analog input, three-wire transmitter
- Analog input, four-wire transmitter
- Analog input, externally powered transmitter
- Analog input, voltage ±5 V, ±10 V dc
- Analog input, current 4-20 mA
- Two analog outputs, 0-20 mA current
- Only with the Mark VIe PAICH2: one analog output, 0-200 mA current

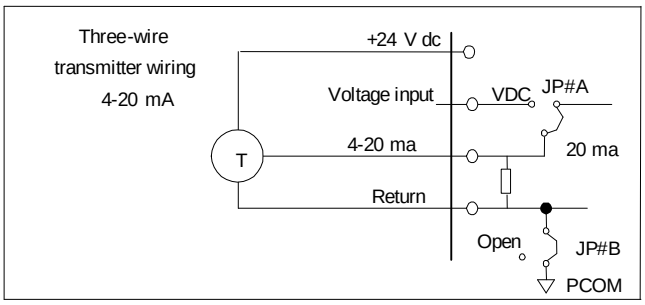
Wiring, jumper positions, and cable connections display on the wiring diagram.

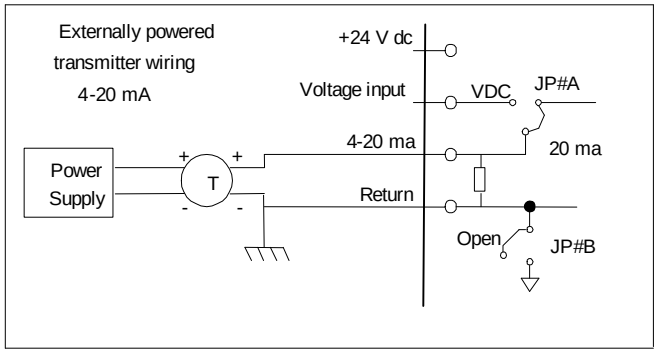
Jumpers Vdc/20mA	Jumpers Open/Return	Circuit	Screw Connections
			Input 1 (20mA)
JP1A	JP 1B	Input 1	Input 1 (Return)
			Input 2 (20mA)
JP2A	JP 2B	Input 2	Input 2 (Return)
			Input 3 (20mA)
JP3A	JP 3B	Input 3	Input 3 (Return)
			Input 4 (20mA)
JP4A	JP 4B	Input 4	Input 4 (Return)
			Input 5 (20mA)
JP5A	JP 5B	Input 5	Input 5 (Return)
			Input 6 (20mA)
JP6A	JP 6B	Input 6	Input 6 (Return)
			Input 7 (20mA)
JP7A	JP 7B	Input 7	Input 7 (Return)
			Input 8 (20mA)
JP8A	JP 8B	Input 8	Input 8 (Return)
20mA/1mA			
			Input 9 (20mA)
JP9A	JP 9B	Input 9	Input 9 (Return)
			Input 10(20mA)
JP10A	JP 10B	Input 10	Input 10(Return)
			PCOM
			PCOM
JP0			Output 1 (Return)
No jumper		Output 1	Output 2 (Return)
		Output 2	

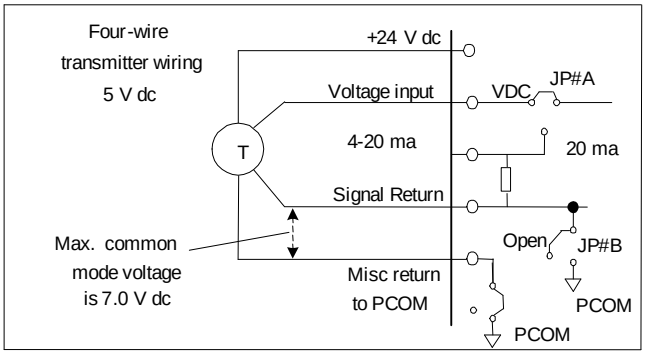
STAI Analog Input Terminal Board











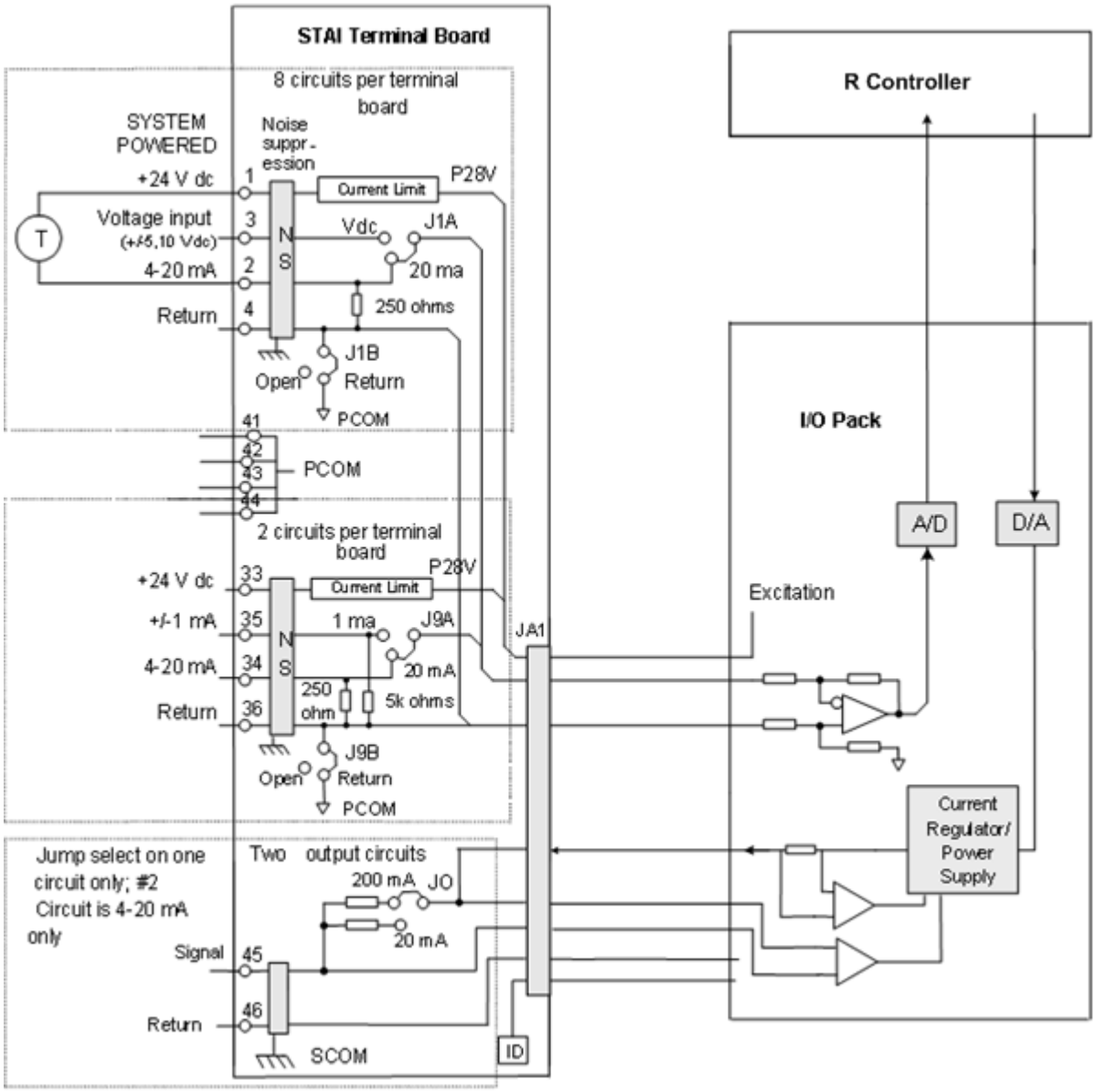
3.5.2 Operation

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. One of the two analog output circuits is 4-20 mA, and the other can be jumper configured for 4-20 mA or 0-200 mA (only with the Mark VIe PAICH2).

Note The 200 mA output is not supported by the Mark VIeS YAIC.

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

Quantity Inputs	Analog Input Types	Quantity Outputs	Analog Output Types
8	±10 V dc, or ±5 V dc, or 4-20 mA	1	4-20 mA or 0-200 mA (only with the Mark VIe PAICH2)
2	4-20 mA, or ±1 mA	1	0-20 mA



3.5.3 Specifications

Item	STAI Specification
Number of channels	12 channels with 10 Analog Inputs (AI) and 2 Analog Outputs (AO)
AI types supported	Inputs 1 to 8: ±5 V dc, ±10 V dc, or 4–20 mA Inputs 9 to 10: 4–20 mA or ±1 mA
Input accuracy	±0.1% of full scale over the full operating temperature range
Maximum lead resistance	15 Ω maximum two-way cable resistance, cable length up to 300 m (984 ft).
Outputs	24 V dc outputs rated at 21 mA each
Load on output currents	800 Ω max burden for 4-20 mA output Only with Mark VIe PAICH2: 50 Ω max burden for 200 mA output
Size	15.9 cm high x 10.2 cm wide (6.25 in x 4.0 in)
Technology	Surface mount

3.5.4 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 I/O pack creates a diagnostic alarm (fault) if any one of the eight outputs goes unhealthy.
- Each cable connector on the terminal board has its own ID device that is interrogated by the I/O pack. 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 I/O pack and a mismatch is encountered, a hardware incompatibility fault is created.

3.5.5 Jumper Configuration

The terminal board is configured by jumpers. For the 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.
- Jumper JP0 sets output 1 to either 20 mA or 0-200 mA (only with the Mark VIe PAICH2)