

**Characteristics:**

**General description:**

This Termination Board (TB) provides direct connection between the I/O Card of the system and D5000 Series modules. Intrinsically Safe protection and signal isolation between Safe and Hazardous Area are provided by D5000 Series Associated Apparatus. 24 Vdc Power Supply of the TB is connected to two plug-in terminal blocks, for a redundant power supply. The power supply for modules is given by TB power bus.

**Termination Board general characteristics:**

Termination Board Model	Number of positions	Features
TB-D5016-TRI-008	16	1) Power Supply voltage redundancy; 2) Abnormal supply voltage signaling; 3) Cumulative module fault signaling; 4) HART Multiplexing.

**Supported TMR I/O Cards:**

I/O Card Model	I/O Card Type	Number of channels per I/O Card	Number of I/O Cards per board	Number of channels per board	Supported GM Modules
3701	Analog In	32	1/2 (*)	16	D5011S D5014S
			1	32	D5011D D5014D

(\*) Two TB-D5016-TRI-008 boards are necessary to provide 32 channels to I/O card (16 channels each).

**Features:**

- 3701 AI Cards, 32 ch. board interface.
- 16 positions Termination Board for up to 32 channels.
- (0)2-10 V signals.
- HART connectors available.
- Lower cables installation and maintenance costs.
- Power supplies fault monitoring.
- Spare fuse provided.
- Mounting hardware provided for:
  - Wall mounting, M4 thread screw;
  - Wall mounting, M4 self tapping screw;
  - Single Din Rail mounting kit.

**Ordering Information:**

Model: TB-D5016-TRI-008

**Technical Data:**

**Supply:**

24 Vdc nom (20 to 30 Vdc) reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.  
**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.  
**2 LEDs indication:** green color, one for supply 1 and one for supply 2.  
**Protection fuse:** 2 A time lag (spare fuse provided on Termination Board).

**Fault detection:**

1) **Preventive - abnormal supply voltage:** supply 1 or supply 2 is < 18 Vdc (Under Voltage, UV) or > 30 Vdc (Over Voltage, OV).  
 2) **Critical - abnormal supply voltages or cumulative fault:** both supplies are in under (< 18 Vdc) or over (> 30 Vdc) voltage condition OR cumulative fault indication (about presence of short or open field circuit for any DO channel).  
**LED fault signaling (for both case 1 and 2):** 2 red LEDs (UV and OV of supply 1); 2 red LEDs (UV and OV of supply 2); a cumulative fault red LED.  
**Relay fault signaling (one for each case 1 or 2):** a voltage free NE SPDT - 1 Form C relay contacts (de-energized in fault condition), with the following characteristics:  
**Contact material:** AgCdO.  
**Contact rating:** 2 A 36 Vac 72 VA, 2 A 48 Vdc 80 W (resistive load).  
**Mechanical / Electrical life:** 30 \* 10<sup>6</sup> / 1 \* 10<sup>5</sup> operation, typical.  
**Coil status LED indication:** yellow color, turn on when coil is energized.  
**Connection:** by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm<sup>2</sup>.

**I/O card interface:**

**Connection:** Two ELCO 8016, 56 poles receptacle connectors (require plug mating connectors).

**HART Multiplexing:**

**Connection:** Two 34 poles male connector (requires female mating connector).

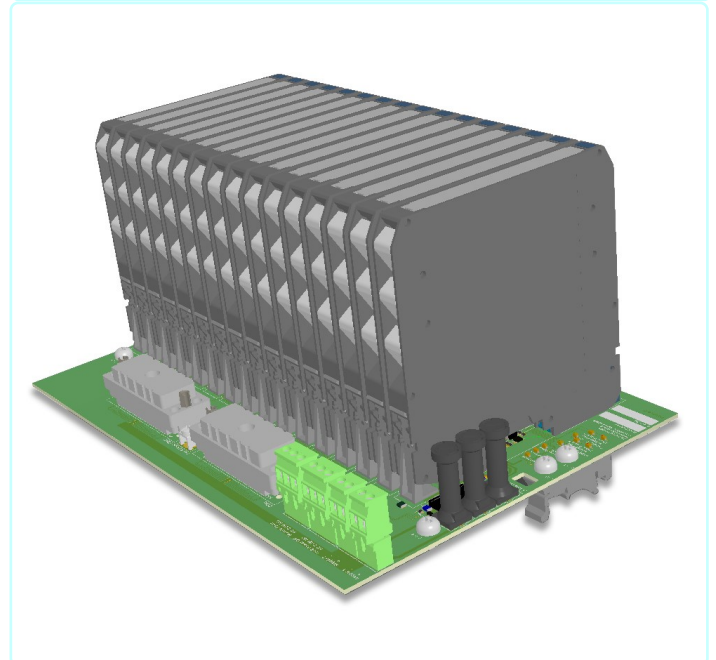
**Environmental conditions:**

**Operating:** temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.  
**Storage:** temperature limits – 45 to + 80 °C.

**Mounting:**

Hardware included for mounting on wall and single DIN rail.  
**Weight:** about 400 g (excluding modules and mounting options).  
**Location:** Safe Area / Ordinary locations.  
**Dimensions:** Width 267 mm, Depth 176 mm, Height 125 mm.

**Image:**

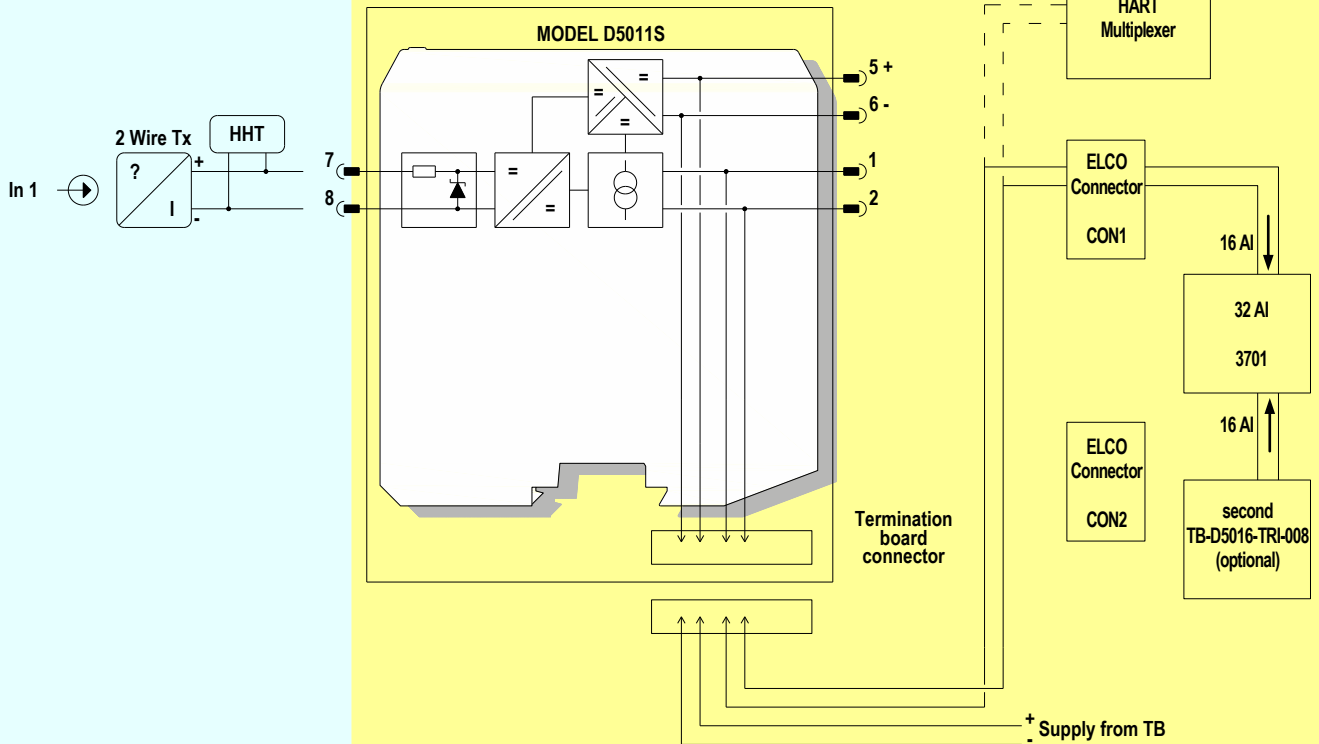


# Loop Diagrams for 3701 (32 AI) Interface Card:

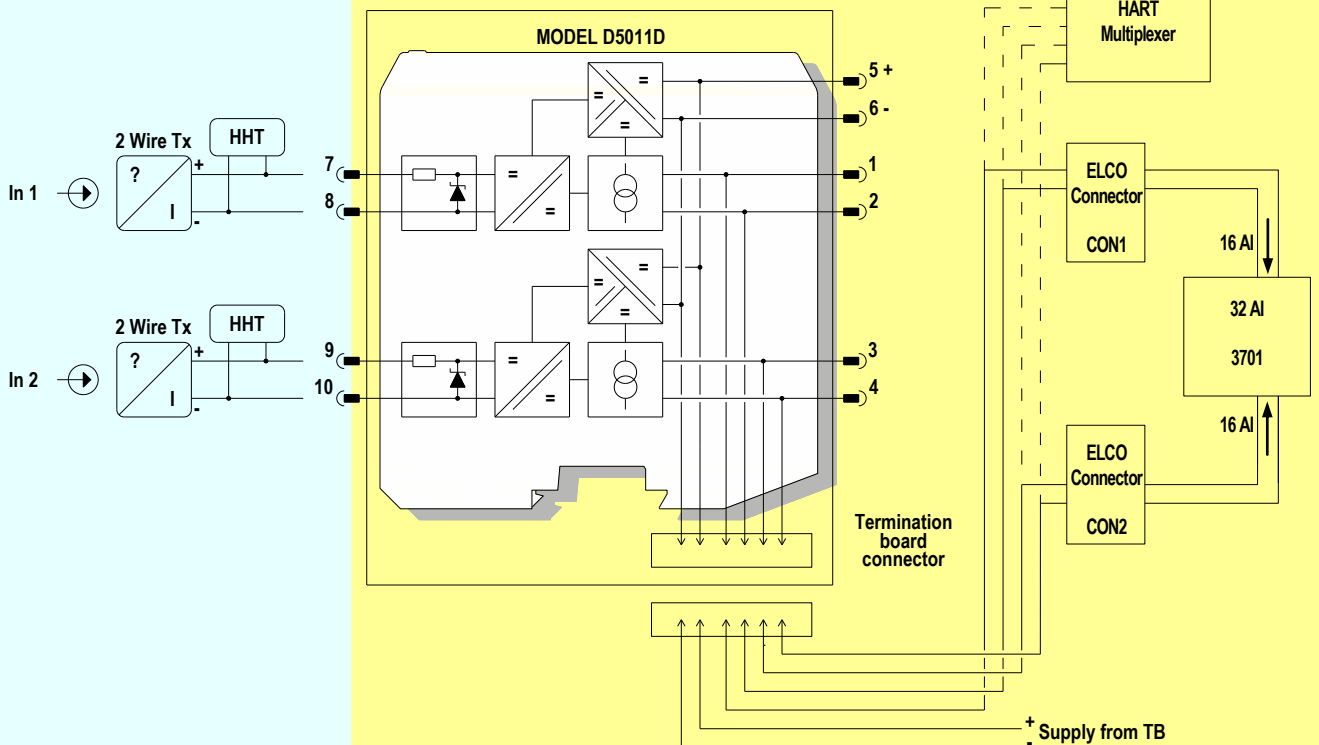
HAZARDOUS AREA

SAFE AREA

Position 1 to 16 for single channel AI module



Position 1 to 16 for double channel AI module

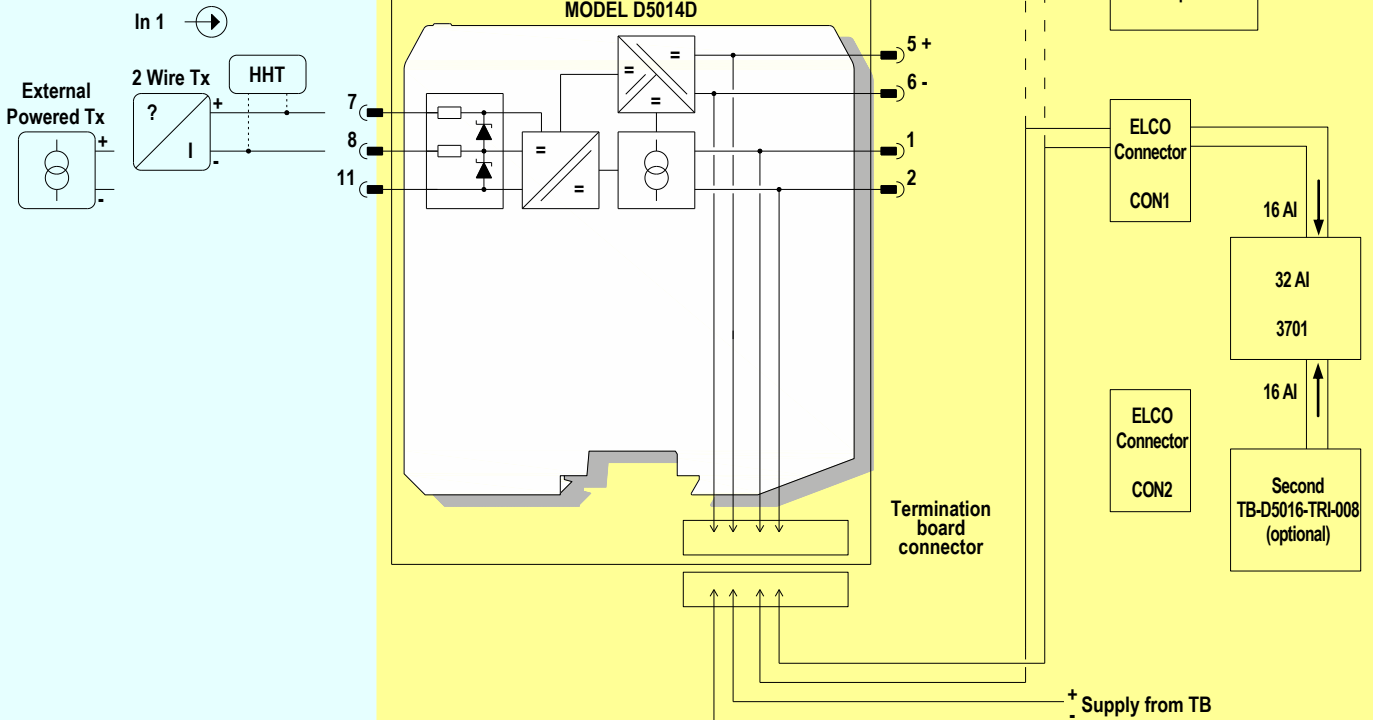


# Loop Diagrams for 3701 (32 AI) Interface Card:

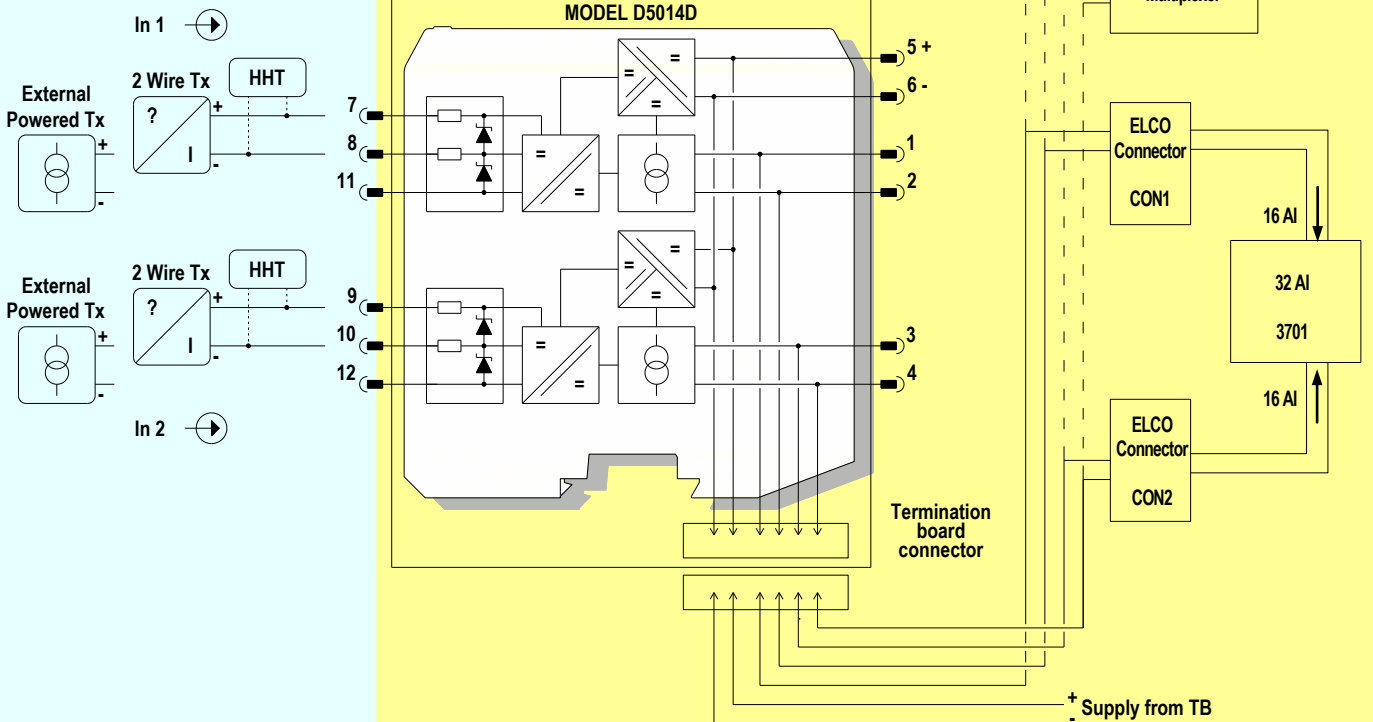
HAZARDOUS AREA

SAFE AREA

Position 1 to 16 for single channel AI module



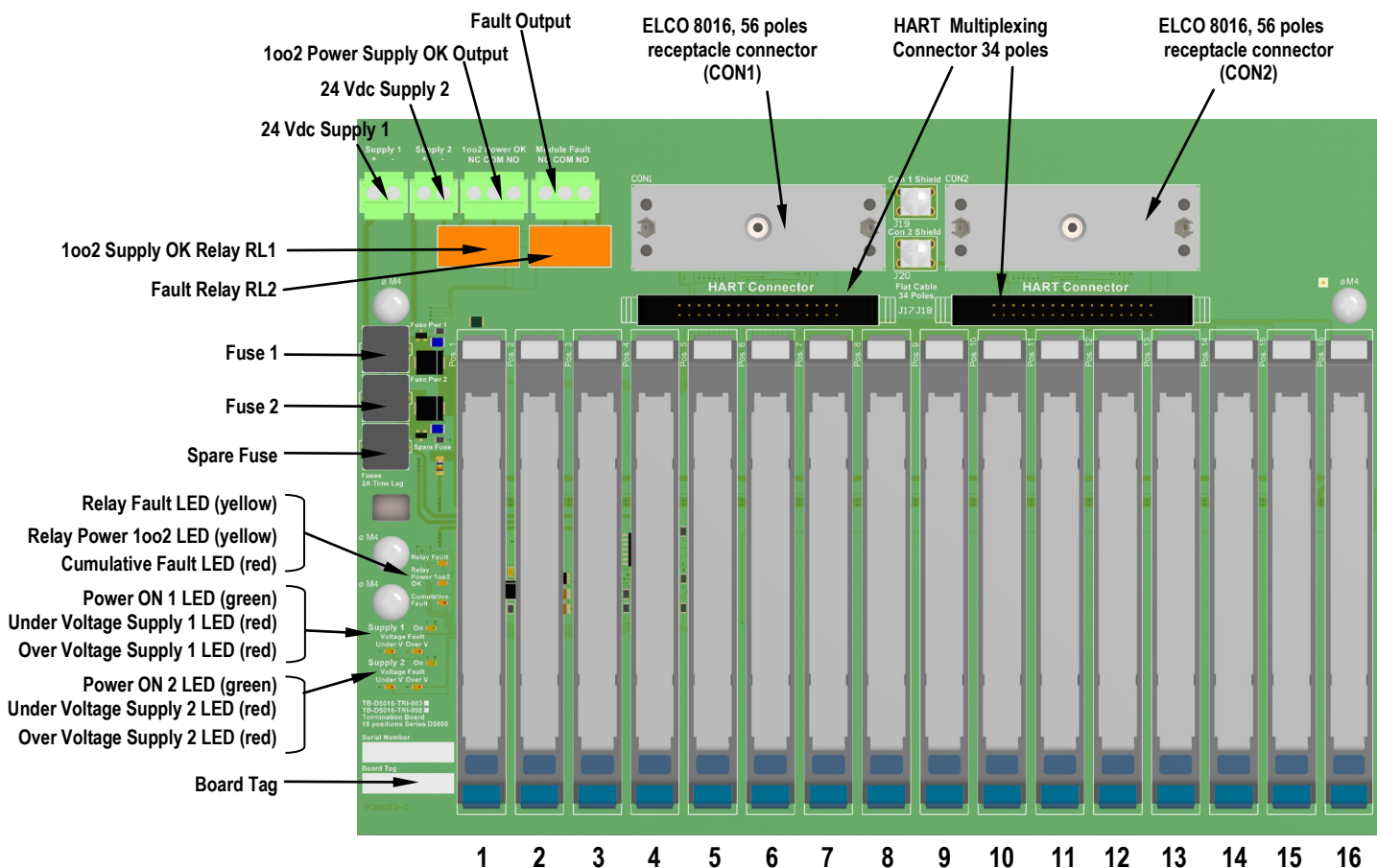
Position 1 to 16 for double channel AI module



## SAFE AREA / ORDINARY LOCATION

**Note:**

Relay contact is defined Normally Closed (NC) or Normally Open (NO) when RL1 or RL2 relays are de-energized (that is, coil status LED is turned off). Relay is de-energized in fault status.



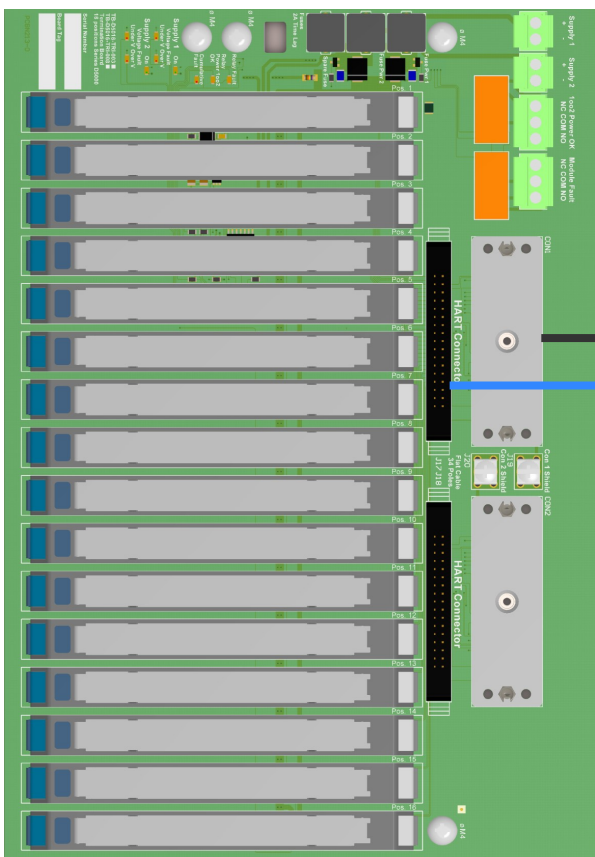
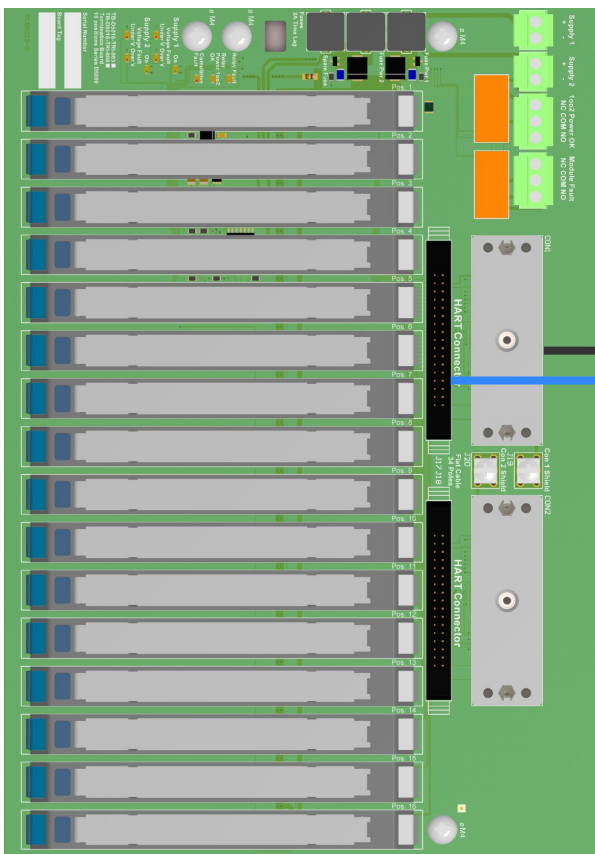
## HAZARDOUS AREA / LOCATION

**Termination Board Connections (for single channel modules):**

**Configuration:**

Board	I/O Card Ch	ELCO
First	1-16	Small key Pos. 1 Large key Pos 5
Second	17-32	Small key Pos. 1 Large key Pos 5

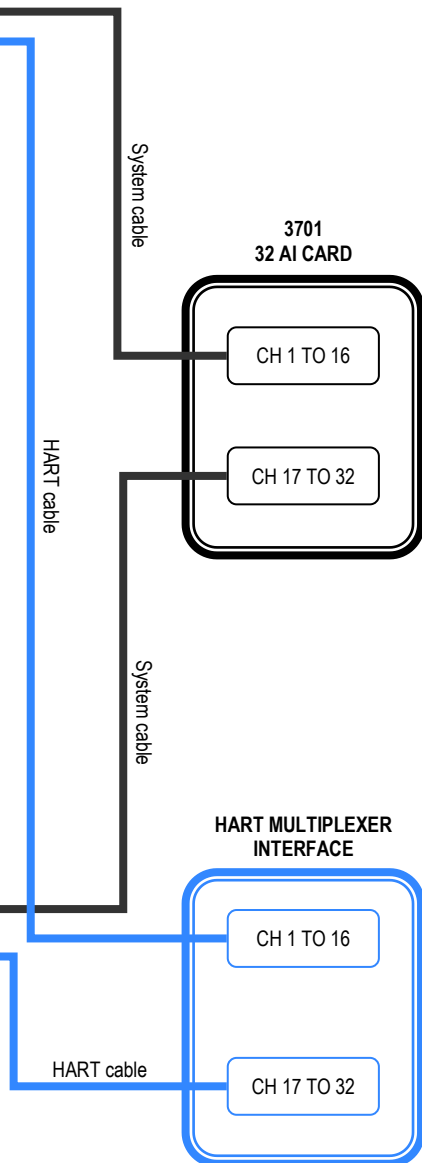
First Board for channels 1 to 16



Second Board for channels 17 to 32

**HAZARDOUS AREA / LOCATION**

**SAFE AREA / ORDINARY LOCATION**



**Termination Board Connections (for double channel modules):**

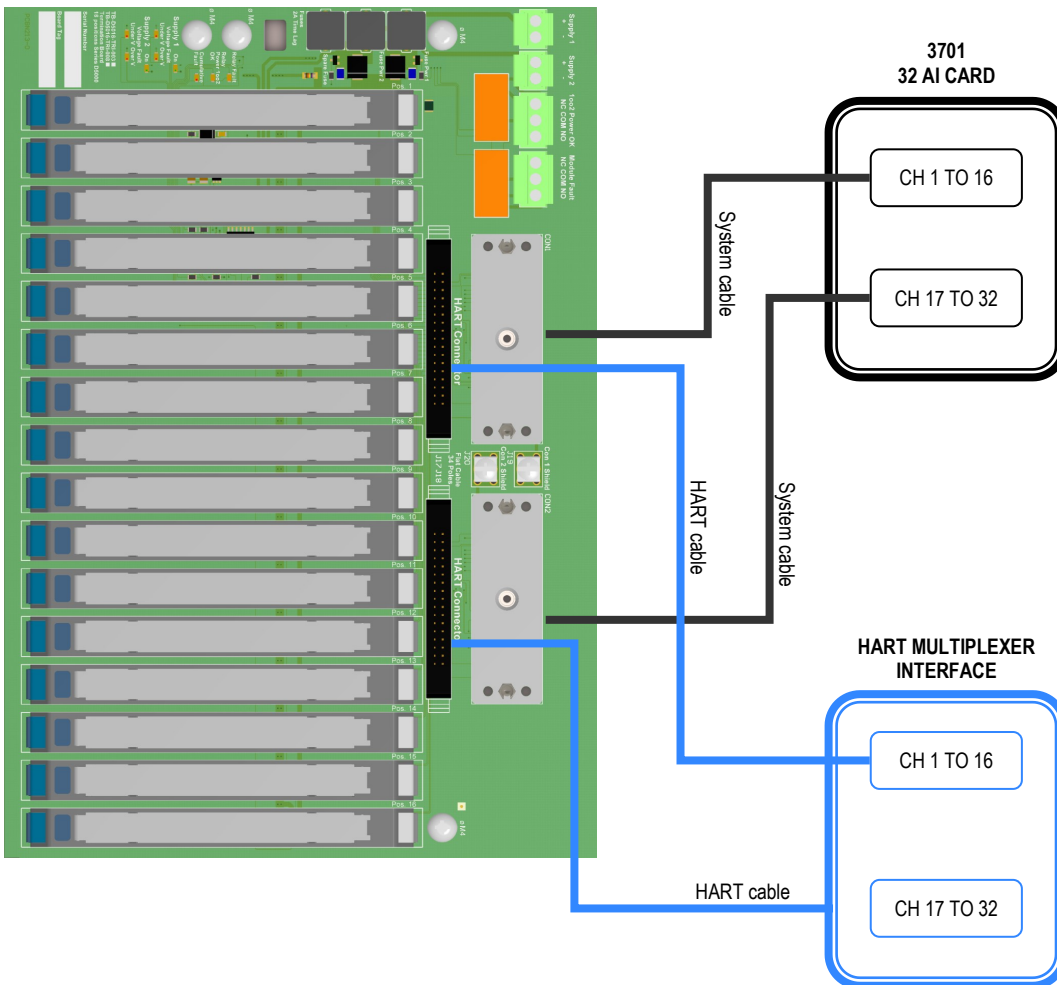
**ELCO Configuration:**

CON	I/O Card Ch	ELCO
CON1	1-16	Small key Pos. 1 Large key Pos 5
CON2	17-32	Small key Pos. 1 Large key Pos 5

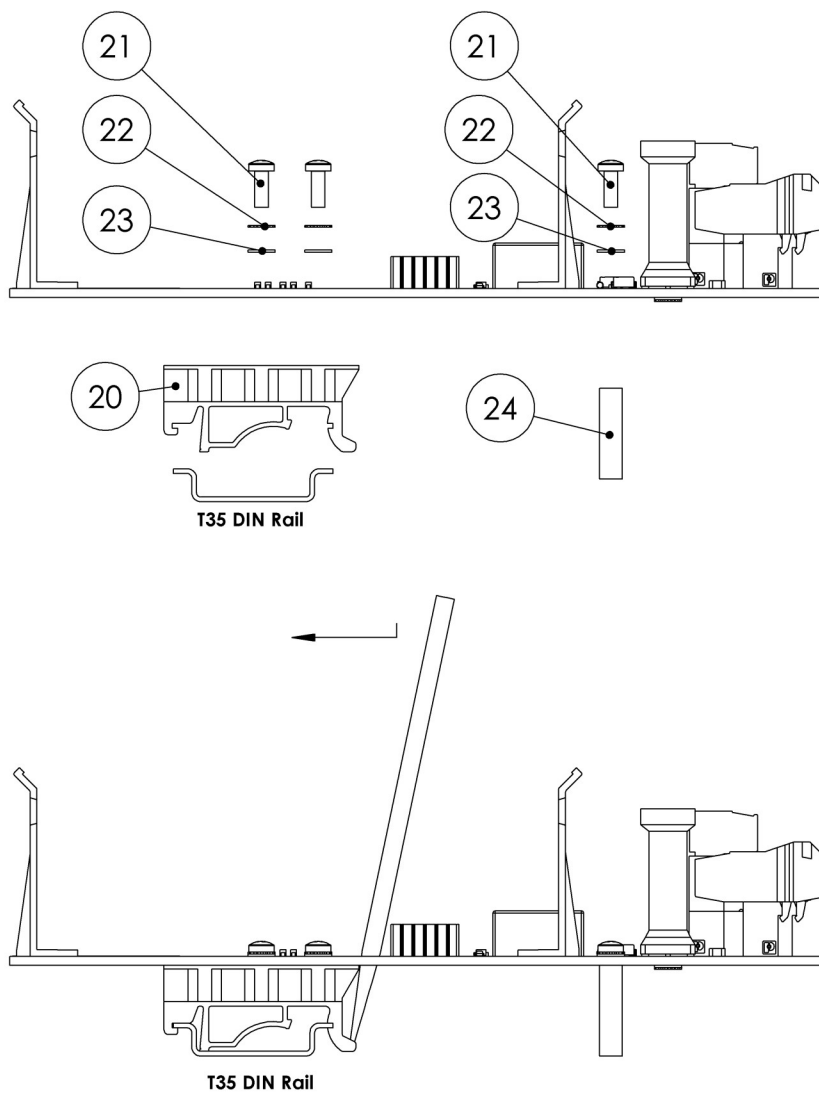
Board for channels 1 to 32

**HAZARDOUS AREA / LOCATION**

**SAFE AREA / ORDINARY LOCATION**



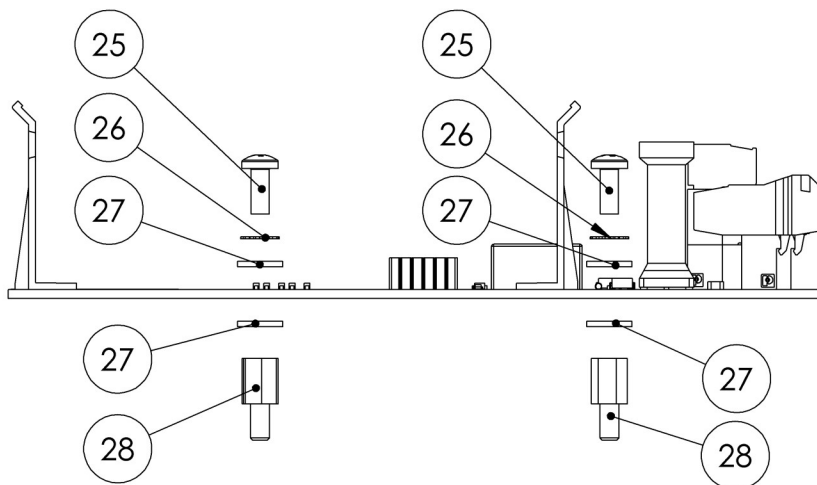
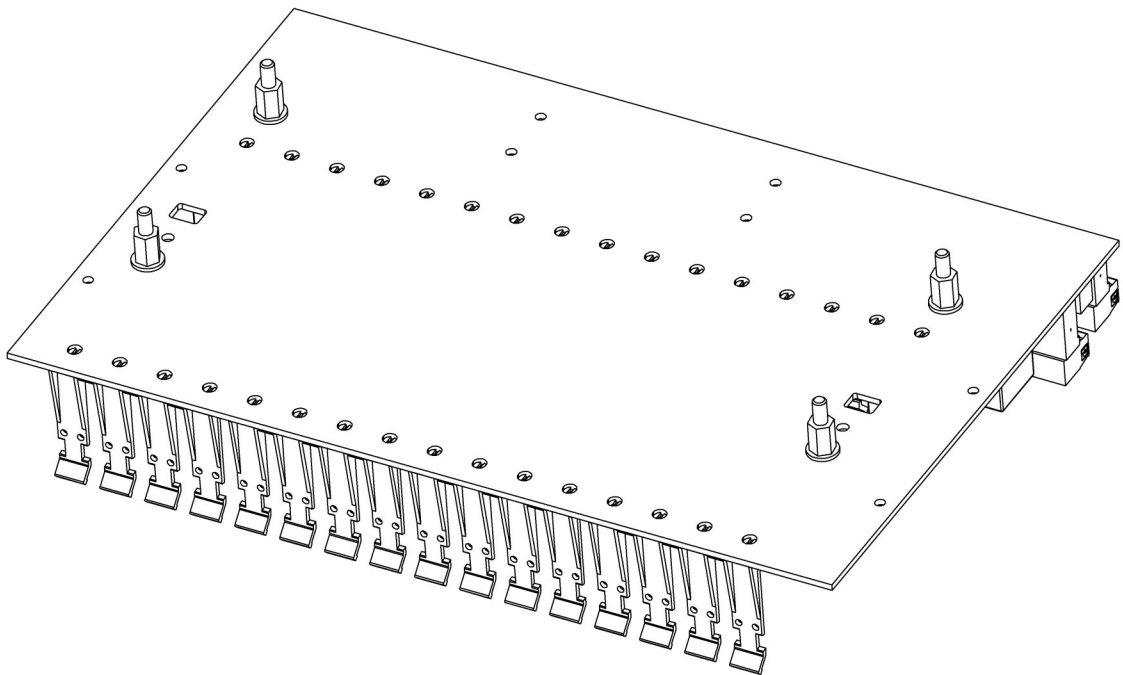
## 16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001



### 1. T35 DIN RAIL MOUNTING

Item	Ref.Nr.	Q.ty	Description	Material
1	20	2	T35 Din Rail Adapter	PA
2	21	6	3.5x9.5 Self Tapping Screw	Stainless Steel
3	22	6	M3 External Tooth lock Washer	Stainless Steel
4	23	6	M3 Washer	Stainless Steel
5	24	2	6x20 Spacer	PA

## 16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001

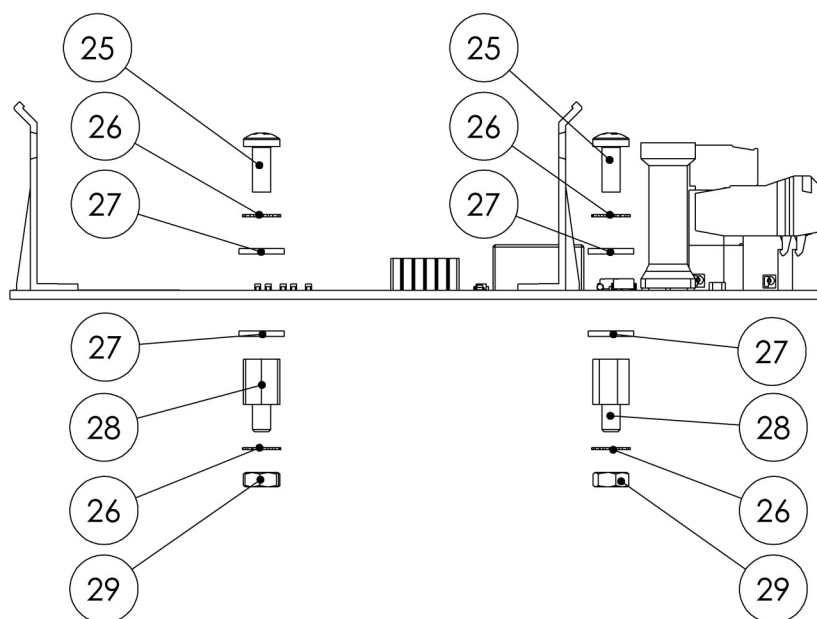
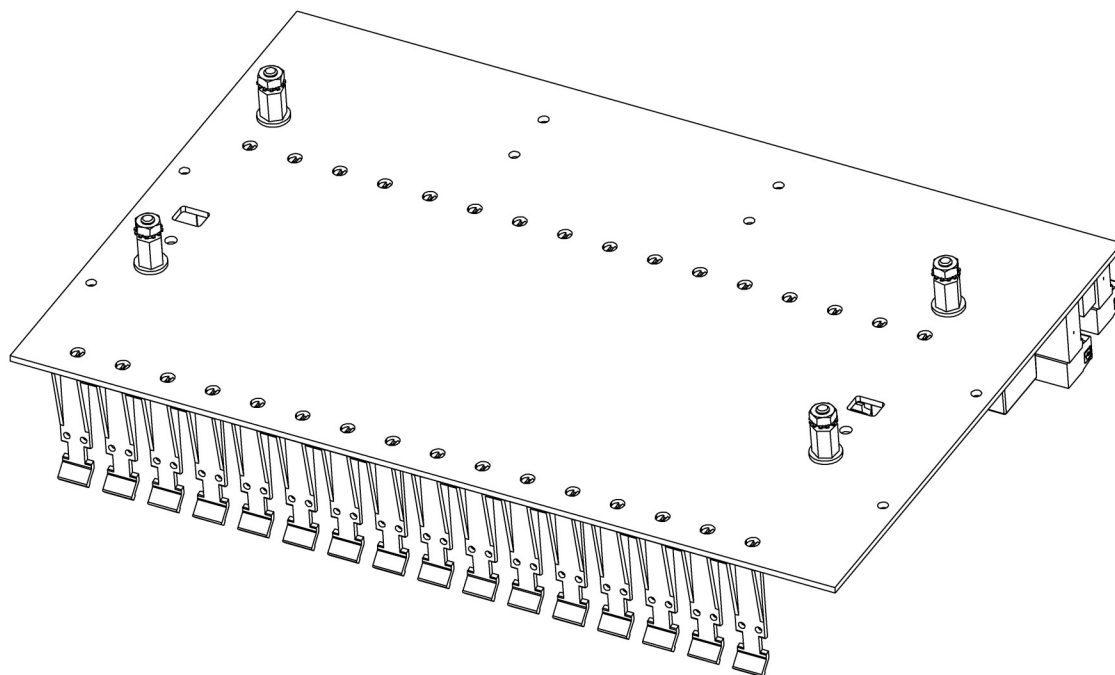


### 2. WALL MOUNTING WITH SELF TAPPING SCREW

Item	Ref.Nr.	Q.ty	Description	Material
6	25	4	M4x8 Screw	Stainless Steel
7	26	4	M4 External Tooth lock Washer	Stainless Steel
8	27	8	M4 Washer	Stainless Steel
9	28	4	Self Tapping Spacer	Ni-Plated Brass





## 16 POSITION TERMINAL BOARD D5000 SERIES MOUNTING FEATURES KIT TB-OPT-001





### 3. WALL MOUNTING WITH M4 SCREWS

Item	Ref.Nr.	Q.ty	Description	Material
10	25	4	M4x8 Screw	Stainless Steel
11	26	8	M4 External Tooth lock Washer	Stainless Steel
12	27	8	M4 Washer	Stainless Steel
13	28	4	Threaded Spacer	Ni-Plated Brass
14	29	4	M4 Nut	Stainless Steel

Connections table to 3701, (32 ch) AI Interface Card:

FIELD DEVICE	MODULE TYPE	MODULE FUNCTION	MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD CHANNEL NUMBER	INTERFACE CARD CONNECTOR PIN NUMBER	HART MULTIPLEXING CONNECTORS PIN NUMBER	NOTE
 	SINGLE CHANNEL MODULES  D5011S D5014S	Analog IN	1 of board 1	1	1	(+) AA (CON1) (-) LL (CON1)	(+) 1 (J17) (-) 2 (J17)	<ul style="list-style-type: none"> <li>• Interface Card Connector CON1: ELCO 816, 56 poles receptacle connector. CON2 not used</li> <li>• Unconnected poles: E, A, NN, JJ, y, n, d, V, K, D, KK, w, e, DD, k, R.</li> <li>• Chassis Ground provided on pins: T, H, w, FF.</li> <li>• configured as current output.</li> </ul>
			1 of board 2	1	17	(+) AA (CON1) (-) LL (CON1)	(+) 1 (J17) (-) 2 (J17)	
			2 of board 1	2	2	(+) z (CON1) (-) EE (CON1)	(+) 3 (J17) (-) 4 (J17)	
			2 of board 2	2	18	(+) z (CON1) (-) EE (CON1)	(+) 3 (J17) (-) 4 (J17)	
			3 of board 1	3	3	(+) p (CON1) (-) v (CON1)	(+) 5 (J17) (-) 6 (J17)	
			3 of board 2	3	19	(+) p (CON1) (-) v (CON1)	(+) 5 (J17) (-) 6 (J17)	
			4 of board 1	4	4	(+) h (CON1) (-) l (CON1)	(+) 7 (J17) (-) 8 (J17)	
			4 of board 2	4	20	(+) h (CON1) (-) l (CON1)	(+) 7 (J17) (-) 8 (J17)	
			5 of board 1	5	5	(+) e (CON1) (-) b (CON1)	(+) 9 (J17) (-) 10 (J17)	
			5 of board 2	5	21	(+) e (CON1) (-) b (CON1)	(+) 9 (J17) (-) 10 (J17)	
			6 of board 1	6	6	(+) W (CON1) (-) S (CON1)	(+) 11 (J17) (-) 12 (J17)	
			6 of board 2	6	22	(+) W (CON1) (-) S (CON1)	(+) 11 (J17) (-) 12 (J17)	
			7 of board 1	7	7	(+) L (CON1) (-) F (CON1)	(+) 13 (J17) (-) 14 (J17)	
			7 of board 2	7	23	(+) L (CON1) (-) F (CON1)	(+) 13 (J17) (-) 14 (J17)	
			8 of board 1	8	8	(+) M (CON1) (-) B (CON1)	(+) 15 (J17) (-) 16 (J17)	
			8 of board 2	8	24	(+) M (CON1) (-) B (CON1)	(+) 15 (J17) (-) 16 (J17)	
			9 of board 1	9	9	(+) BB (CON1) (-) MM (CON1)	(+) 17 (J17) (-) 18 (J17)	
			9 of board 2	9	25	(+) BB (CON1) (-) MM (CON1)	(+) 17 (J17) (-) 18 (J17)	
			10 of board 1	10	10	(+) CC (CON1) (-) HH (CON1)	(+) 19 (J17) (-) 20 (J17)	
			10 of board 2	10	26	(+) CC (CON1) (-) HH (CON1)	(+) 19 (J17) (-) 20 (J17)	
			11 of board 1	11	11	(+) t (CON1) (-) x (CON1)	(+) 21 (J17) (-) 22 (J17)	
			11 of board 2	11	27	(+) t (CON1) (-) x (CON1)	(+) 21 (J18) (-) 22 (J18)	
			12 of board 1	12	12	(+) j (CON1) (-) m (CON1)	(+) 23 (J17) (-) 24 (J17)	
			12 of board 2	12	28	(+) j (CON1) (-) m (CON1)	(+) 23 (J17) (-) 24 (J17)	
			13 of board 1	13	13	(+) f (CON1) (-) c (CON1)	(+) 25 (J17) (-) 26 (J17)	
			13 of board 2	13	29	(+) f (CON1) (-) c (CON1)	(+) 25 (J17) (-) 26 (J17)	
			14 of board 1	14	14	(+) Z (CON1) (-) U (CON1)	(+) 27 (J17) (-) 28 (J17)	
			14 of board 2	14	30	(+) Z (CON1) (-) U (CON1)	(+) 27 (J17) (-) 28 (J17)	
			15 of board 1	15	15	(+) P (CON1) (-) J (CON1)	(+) 29 (J17) (-) 30 (J17)	
			15 of board 2	15	31	(+) P (CON1) (-) J (CON1)	(+) 29 (J17) (-) 30 (J17)	
			16 of board 1	16	16	(+) N (CON1) (-) C (CON1)	(+) 31 (J17) (-) 32 (J17)	
			16 of board 2	16	32	(+) N (CON1) (-) C (CON1)	(+) 31 (J17) (-) 32 (J17)	

Connections table to 3701 (32 ch) AI Interface Card:

FIELD DEVICE	MODULE TYPE	MODULE FUNCTION	MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD CHANNEL NUMBER	INTERFACE CARD CONNECTOR PIN NUMBER	HART MULTIPLEXING CONNECTORS PIN NUMBER	NOTE
 	DOUBLE CHANNEL MODULES	Analog IN	1	1A	1	(+) AA (CON1)	(+) 1 (J17)	
							(-) LL (CON1)	
			2	1B	2	(+) AA (CON2)	(+) 1 (J18)	
						(-) LL (CON2)	(-) 2 (J18)	
			3	2A	3	(+) z (CON1)	(+) 3 (J17)	
						(-) EE (CON1)	(-) 4 (J17)	
			4	2B	4	(+) z (CON2)	(+) 3 (J18)	
						(-) EE (CON2)	(-) 4 (J18)	
			5	3A	5	(+) p (CON1)	(+) 5 (J17)	
						(-) v (CON1)	(-) 6 (J17)	
			6	3B	6	(+) p (CON2)	(+) 5 (J18)	
						(-) v (CON2)	(-) 6 (J18)	
			7	4A	7	(+) h (CON1)	(+) 7 (J17)	
						(-) l (CON1)	(-) 8 (J17)	
			8	4B	8	(+) h (CON2)	(+) 7 (J18)	
						(-) l (CON2)	(-) 8 (J18)	
			9	5A	9	(+) e (CON1)	(+) 9 (J17)	
						(-) b (CON1)	(-) 10 (J17)	
			10	5B	10	(+) e (CON2)	(+) 9 (J18)	
						(-) b (CON2)	(-) 10 (J18)	
			11	6A	11	(+) W (CON1)	(+) 11 (J17)	
						(-) S (CON1)	(-) 12 (J17)	
			12	6B	12	(+) W (CON2)	(+) 11 (J18)	
						(-) S (CON2)	(-) 12 (J18)	
			13	7A	13	(+) L (CON1)	(+) 13 (J17)	
						(-) F (CON1)	(-) 14 (J17)	
			14	7B	14	(+) L (CON2)	(+) 13 (J18)	
						(-) F (CON2)	(-) 14 (J18)	
			15	8A	15	(+) M (CON1)	(+) 15 (J17)	
						(-) B (CON1)	(-) 16 (J17)	
			16	8B	16	(+) M (CON2)	(+) 15 (J18)	
						(-) B (CON2)	(-) 16 (J18)	
17	9A	17	(+) BB (CON1)	(+) 17 (J17)				
			(-) MM (CON1)	(-) 18 (J17)				
18	9B	18	(+) BB (CON2)	(+) 17 (J18)				
			(-) MM (CON2)	(-) 18 (J18)				
19	10A	19	(+) CC (CON1)	(+) 19 (J17)				
			(-) HH (CON1)	(-) 20 (J17)				
20	10B	20	(+) CC (CON2)	(+) 19 (J18)				
			(-) HH (CON2)	(-) 20 (J18)				
21	11A	21	(+) t (CON1)	(+) 21 (J17)				
			(-) x (CON1)	(-) 22 (J17)				
22	11B	22	(+) t (CON2)	(+) 21 (J18)				
			(-) x (CON2)	(-) 22 (J18)				
23	12A	23	(+) j (CON1)	(+) 23 (J17)				
			(-) m (CON1)	(-) 24 (J17)				
24	12B	24	(+) j (CON2)	(+) 23 (J18)				
			(-) m (CON2)	(-) 24 (J18)				
25	13A	25	(+) f (CON1)	(+) 25 (J17)				
			(-) c (CON1)	(-) 26 (J17)				
26	13B	26	(+) f (CON2)	(+) 25 (J18)				
			(-) c (CON2)	(-) 26 (J18)				
27	14A	27	(+) Z (CON1)	(+) 27 (J17)				
			(-) U (CON1)	(-) 28 (J17)				
28	14B	28	(+) Z (CON2)	(+) 27 (J18)				
			(-) U (CON2)	(-) 28 (J18)				
29	15A	29	(+) P (CON1)	(+) 29 (J17)				
			(-) J (CON1)	(-) 30 (J17)				
30	15B	30	(+) P (CON2)	(+) 29 (J18)				
			(-) J (CON2)	(-) 30 (J18)				
31	16A	31	(+) N (CON1)	(+) 31 (J17)				
			(-) C (CON1)	(-) 32 (J17)				
32	16B	32	(+) N (CON2)	(+) 31 (J18)				
			(-) C (CON2)	(-) 32 (J18)				

- Interface Card Connector CON1, CON 2: ELCO 816, 56 poles receptacle connector.
- Unconnected poles: E, A, NN, JJ, y, n, d, V, K, D, KK, w, e, DD, k, R.
- Chassis Ground provided on pins: T, H, w, FF.
- configured as current output.