TB-D5016-HIM-008

Termination Board 16+16 positions for HIMA HIMax® with Analog Input card X-AI 32 01 (signal duplication to DCS)

Characteristics:

General description:

This Termination Board (TB) provides direct connection between the I/O Card of the system and D5000 / D6000 Series modules.
The Intrinsically Safe protection and signal isolation between Safe and Hazardous Area, is provided by D5000 Series Associated Apparatus. The 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:

Number of positions	*Features*
16+16	1) Power Supply voltage redundancy; 2) HART multiplexing; 3) Abnormal supply voltage signaling; 4) Cumulative module fault signaling; 5) Signal duplication to generic DCS.

Supported HIMA HIMax I/O Cards:

I/O Card Type	*CB Type*	*I/O Card Model*	*Channels per I/O Card*	*CBs per board*	*Channels per board*	*Supported GM Modules(*)*
Analog Input	*X-CB 008 03, X-CB 008 04*	*X-AI 32 01*	*32*	*1(**)*	*32*	*D5014D, D5072D, D6014D, D6072D Duplication*

(*) Do not mix D5000 Intrinsically Safe barriers with D5000 Relay modules or D6000 isolators on same termination board.
(**) Signal is duplicated to a generic DCS.

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 mm².
2 LEDs indication: green color, one for supply 1 and one for supply 2.
Protection fuse: 4 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 * 10^6 / 1 * 10^5 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 mm².

I/O card interface:

Connection: one 96 poles male connector DIN 41612-R (require female mating connectors).
Cable type: X-CA 005.

DCS interface:

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

HART Multiplexing:

Connection: 34 poles male connectors (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.

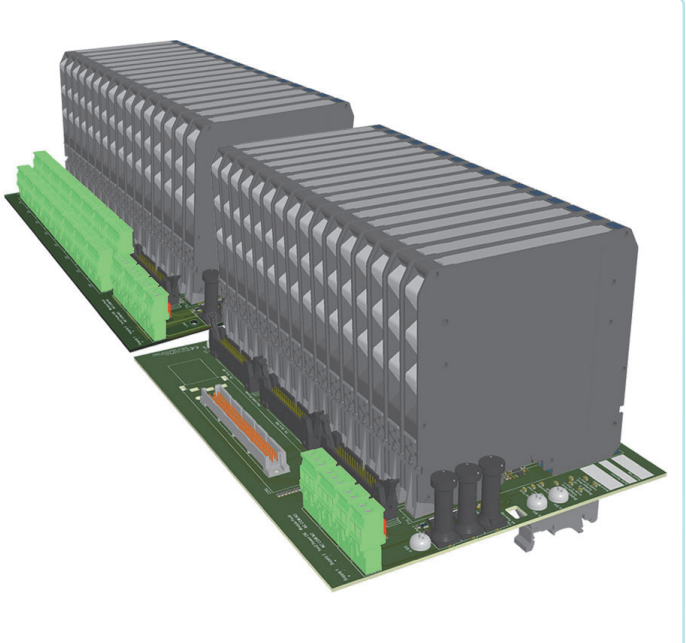
Mounting:

Hardware included for mounting on wall and single DIN rail.
Two flat ribbon 34-poles cables included for PCB connection.
Weight: about 800 g (excluding modules and mounting options).
Location: Safe Area / Ordinary locations.
Dimensions: Width 534 mm, Depth 176 mm, Height 125 mm.

Features:

- HIMax AI Cards board interfaces.
- Signal duplication to a generic DCS.
- 16+16 positions Termination Board for up to 32 channels.
- 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.

Image:



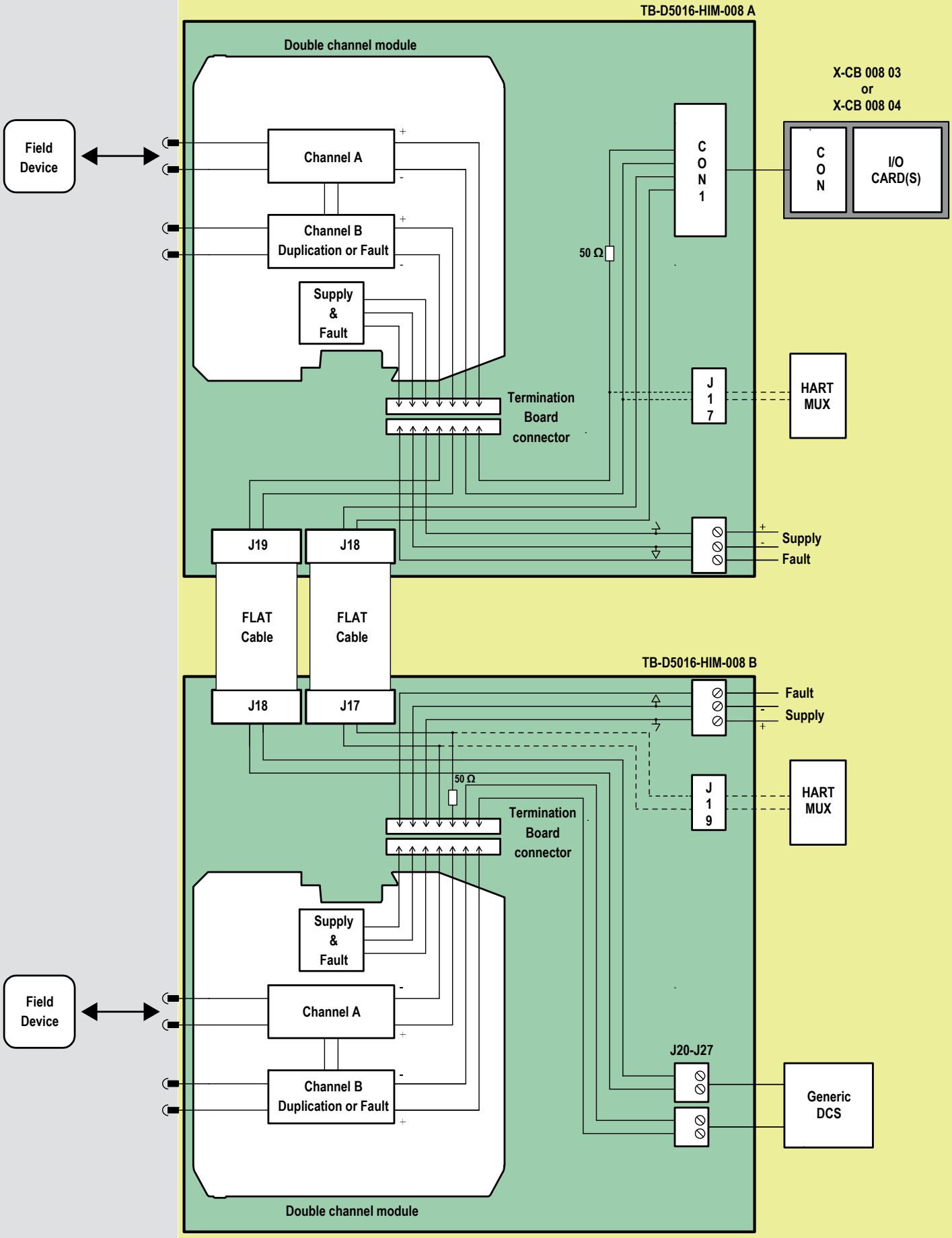
Ordering Information:

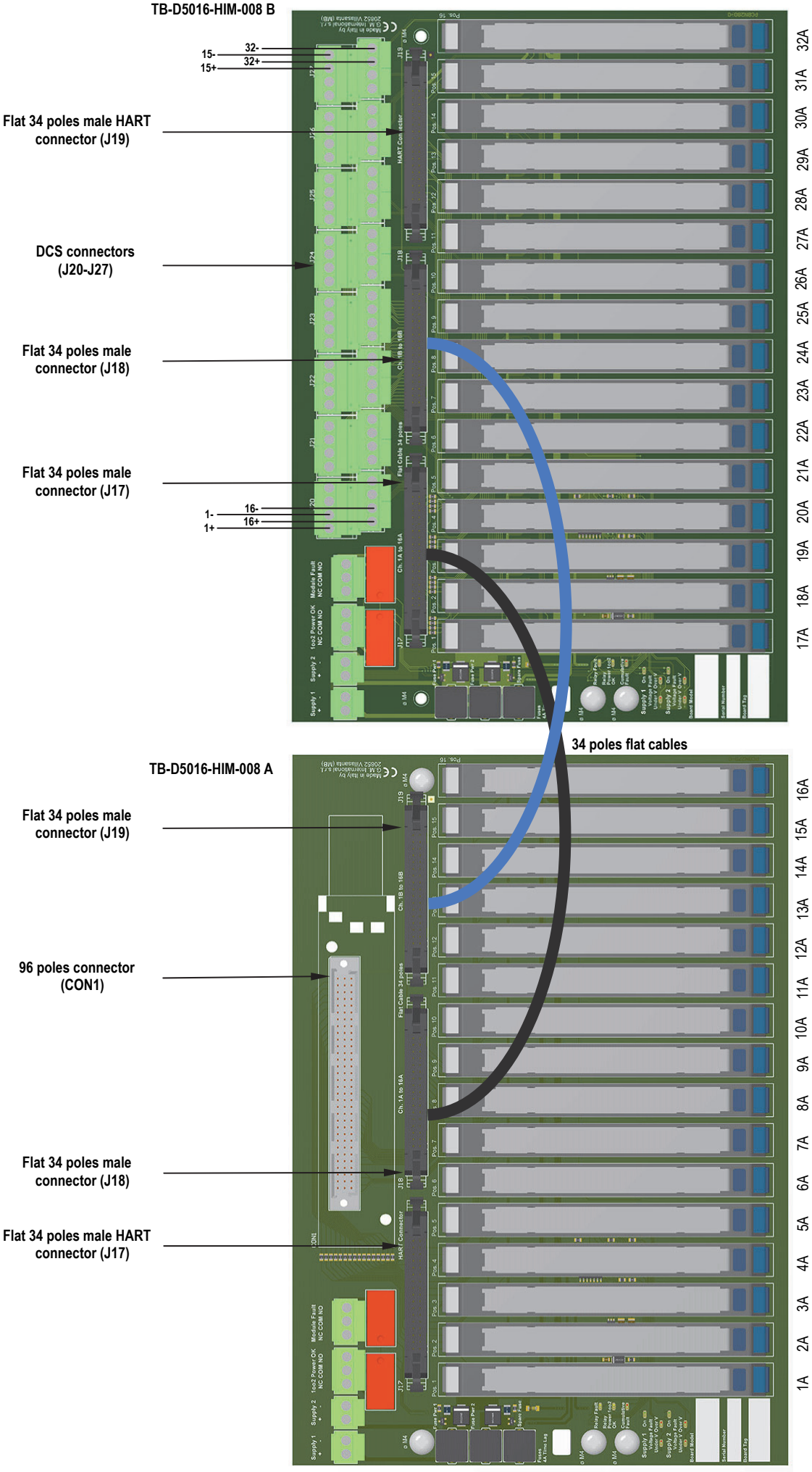
Model:	TB-D5016-HIM-008

Loop Diagrams:

FIELD | SAFE AREA

Note : Do not mix D5000 Intrinsically Safe barriers with D5000 Relay modules or D6000 isolators on same termination board.




TB-D5016-HIM-008 B
15-
32-
32+
15+
Flat 34 poles male HART connector (J19)
DCS connectors (J20-J27)
Flat 34 poles male connector (J18)
Flat 34 poles male connector (J17)
1-
16-
16+
1+
32A
31A
30A
29A
28A
27A
26A
25A
24A
23A
22A
21A
20A
19A
18A
17A
34 poles flat cables
TB-D5016-HIM-008 A
Flat 34 poles male connector (J19)
96 poles connector (CON1)
Flat 34 poles male connector (J18)
Flat 34 poles male HART connector (J17)
16A
15A
14A
13A
12A
11A
10A
9A
8A
7A
6A
5A
4A
3A
2A
1A

Connections table to Interface Cards:

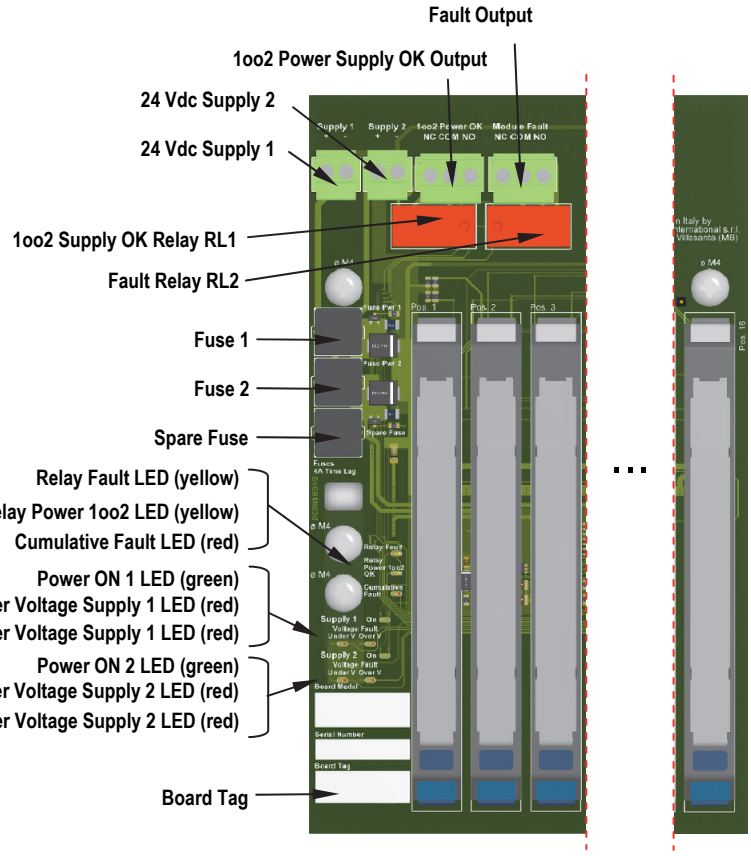
MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CHANNEL NUMBER	DCS CARD(S) CHANNEL NUMBER	MODULE CHANNEL POSITIVE (+) CONNECTION	MODULE CHANNEL NEGATIVE (-) CONNECTION	HART MULTIPLEXING CONNECTOR POSITIVE (+) PIN NUMBER	HART MULTIPLEXING CONNECTOR NEGATIVE (-) PIN NUMBER	NOTES
1	1A	1	-	b1 (CON1)	a1-a28 (CON1)	1 (J17)	2 (J17)	CON1: • Poles a29-a32, c1-c32 are not connected. J17: • Poles 33, 34 are not connected.
	1B	-	1	5 (J20)	6 (J20)	-	-	
2	2A	2	-	b2 (CON1)	a1-a28 (CON1)	3 (J17)	4 (J17)	
	2B	-	2	7 (J20)	8 (J20)	-	-	
3	3A	3	-	b3 (CON1)	a1-a28 (CON1)	5 (J17)	6 (J17)	
	3B	-	3	5 (J21)	6 (J21)	-	-	
4	4A	4	-	b4 (CON1)	a1-a28 (CON1)	7 (J17)	8 (J17)	
	4B	-	4	7 (J21)	8 (J21)	-	-	
5	5A	5	-	b5 (CON1)	a1-a28 (CON1)	9 (J17)	10 (J17)	
	5B	-	5	5 (J22)	6 (J22)	-	-	
6	6A	6	-	b6 (CON1)	a1-a28 (CON1)	11 (J17)	12 (J17)	
	6B	-	6	7 (J22)	8 (J22)	-	-	
7	7A	7	-	b7 (CON1)	a1-a28 (CON1)	13 (J17)	14 (J17)	
	7B	-	7	5 (J23)	6 (J23)	-	-	
8	8A	8	-	b8 (CON1)	a1-a28 (CON1)	15 (J17)	16 (J17)	
	8B	-	8	7 (J23)	8 (J23)	-	-	
9	9A	9	-	b9 (CON1)	a1-a28 (CON1)	17 (J17)	18 (J17)	
	9B	-	9	5 (J24)	6 (J24)	-	-	
10	10A	10	-	b10 (CON1)	a1-a28 (CON1)	19 (J17)	20 (J17)	
	10B	-	10	7 (J24)	8 (J24)	-	-	
11	11A	11	-	b11 (CON1)	a1-a28 (CON1)	21 (J17)	22 (J17)	
	11B	-	11	5 (J25)	6 (J25)	-	-	
12	12A	12	-	b12 (CON1)	a1-a28 (CON1)	23 (J17)	24 (J17)	
	12B	-	12	7 (J25)	8 (J25)	-	-	
13	13A	13	-	b13 (CON1)	a1-a28 (CON1)	25 (J17)	26 (J17)	
	13B	-	13	5 (J26)	6 (J26)	-	-	
14	14A	14	-	b14 (CON1)	a1-a28 (CON1)	27 (J17)	28 (J17)	
	14B	-	14	7 (J26)	8 (J26)	-	-	
15	15A	15	-	b15 (CON1)	a1-a28 (CON1)	29 (J17)	30 (J17)	
	15B	-	15	5 (J27)	6 (J27)	-	-	
16	16A	16	-	b16 (CON1)	a1-a28 (CON1)	31 (J17)	32 (J17)	
	16B	-	16	7 (J27)	8 (J27)	-	-	

Connections table to Interface Cards:

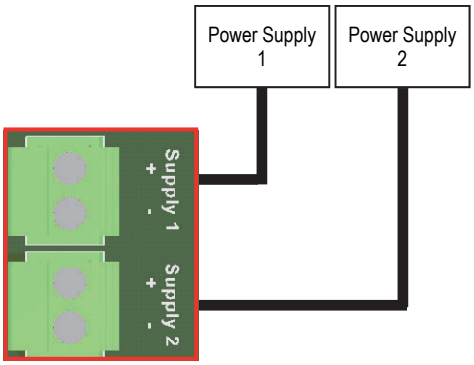
MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CHANNEL NUMBER	DCS CARD(S) CHANNEL NUMBER	MODULE CHANNEL POSITIVE (+) CONNECTION	MODULE CHANNEL NEGATIVE (-) CONNECTION	HART MULTIPLEXING CONNECTOR POSITIVE (+) PIN NUMBER	HART MULTIPLEXING CONNECTOR NEGATIVE (-) PIN NUMBER	NOTES
17	17A	17	-	b17 (CON1)	a1-a28 (CON1)	1 (J19)	2 (J19)	CON1: • Poles a29-a32, c1-c32 are not connected. J19: • Poles 33, 34 are not connected.
	17B	-	17	1 (J20)	2 (J20)	-	-	
18	18A	18	-	b18 (CON1)	a1-a28 (CON1)	3 (J19)	4 (J19)	
	18B	-	18	3 (J20)	4 (J20)	-	-	
19	19A	19	-	b19 (CON1)	a1-a28 (CON1)	5 (J19)	6 (J19)	
	19B	-	19	1 (J21)	2 (J21)	-	-	
20	20A	20	-	b20 (CON1)	a1-a28 (CON1)	7 (J19)	8 (J19)	
	20B	-	20	3 (J21)	4 (J21)	-	-	
21	21A	21	-	b21 (CON1)	a1-a28 (CON1)	9 (J19)	10 (J19)	
	21B	-	21	1 (J22)	2 (J22)	-	-	
22	22A	22	-	b22 (CON1)	a1-a28 (CON1)	11 (J19)	12 (J19)	
	22B	-	22	3 (J22)	4 (J22)	-	-	
23	23A	23	-	b23 (CON1)	a1-a28 (CON1)	13 (J19)	14 (J19)	
	23B	-	23	1 (J23)	2 (J23)	-	-	
24	24A	24	-	b24 (CON1)	a1-a28 (CON1)	15 (J19)	16 (J19)	
	24B	-	24	3 (J23)	4 (J23)	-	-	
25	25A	25	-	b25 (CON1)	a1-a28 (CON1)	17 (J19)	18 (J19)	
	25B	-	25	1 (J24)	2 (J24)	-	-	
26	26A	26	-	b26 (CON1)	a1-a28 (CON1)	19 (J19)	20 (J19)	
	26B	-	26	3 (J24)	4 (J24)	-	-	
27	27A	27	-	b27 (CON1)	a1-a28 (CON1)	21 (J19)	22 (J19)	
	27B	-	27	1 (J25)	2 (J25)	-	-	
28	28A	28	-	b28 (CON1)	a1-a28 (CON1)	23 (J19)	24 (J19)	
	28B	-	28	3 (J25)	4 (J25)	-	-	
29	29A	29	-	b29 (CON1)	a1-a28 (CON1)	25 (J19)	26 (J19)	
	29B	-	29	1 (J26)	2 (J26)	-	-	
30	30A	30	-	b30 (CON1)	a1-a28 (CON1)	27 (J19)	28 (J19)	
	30B	-	30	3 (J26)	4 (J26)	-	-	
31	31A	31	-	b31 (CON1)	a1-a28 (CON1)	29 (J19)	30 (J19)	
	31B	-	31	1 (J27)	2 (J27)	-	-	
32	32A	32	-	b32 (CON1)	a1-a28 (CON1)	31 (J19)	32 (J19)	
	32B	-	32	3 (J27)	4 (J27)	-	-	

Termination Board description:

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.

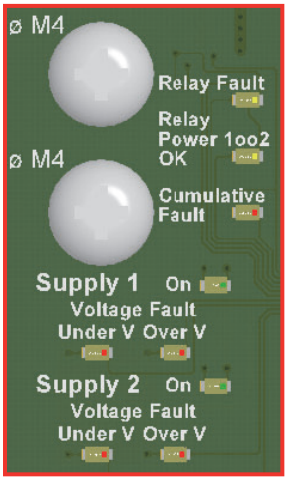


Power Supply redundancy:



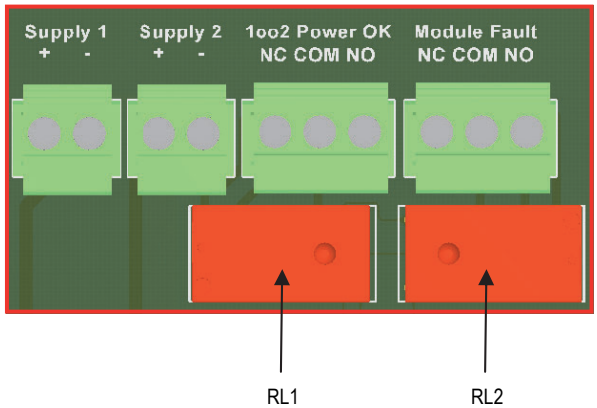
LED Signaling:
Meaning of LEDs on termination boards:

TAG	LED COLOR	MEANING
Supply 1 On	GREEN	The LED is on when the Supply 1 is present, regardless of its voltage
Supply 1 Under V	RED	The LED is on when the Supply 1 is under-voltage (<18 V)
Supply 1 Over V	RED	The LED is on when the Supply 1 is over-voltage (>30 V)
Supply 2 On	GREEN	The LED is on when the Supply 2 is present, regardless of its voltage
Supply 2 Under V	RED	The LED is on when the Supply 2 is under-voltage (<18 V)
Supply 2 Over V	RED	The LED is on when the Supply 2 is over-voltage (>30 V)
Cumulative Fault	RED	The LED is on when at least one module/barrier reported a fault
Relay Power 1oo2 OK	YELLOW	The LED is on when both supply voltages are within the regular range (>18 V and <30 V)
Relay Fault	YELLOW	The LED is on when the following two conditions hold: 1. at least one voltage supply is within the regular range (>18 V and <30 V) 2. no module/barrier fault is reported



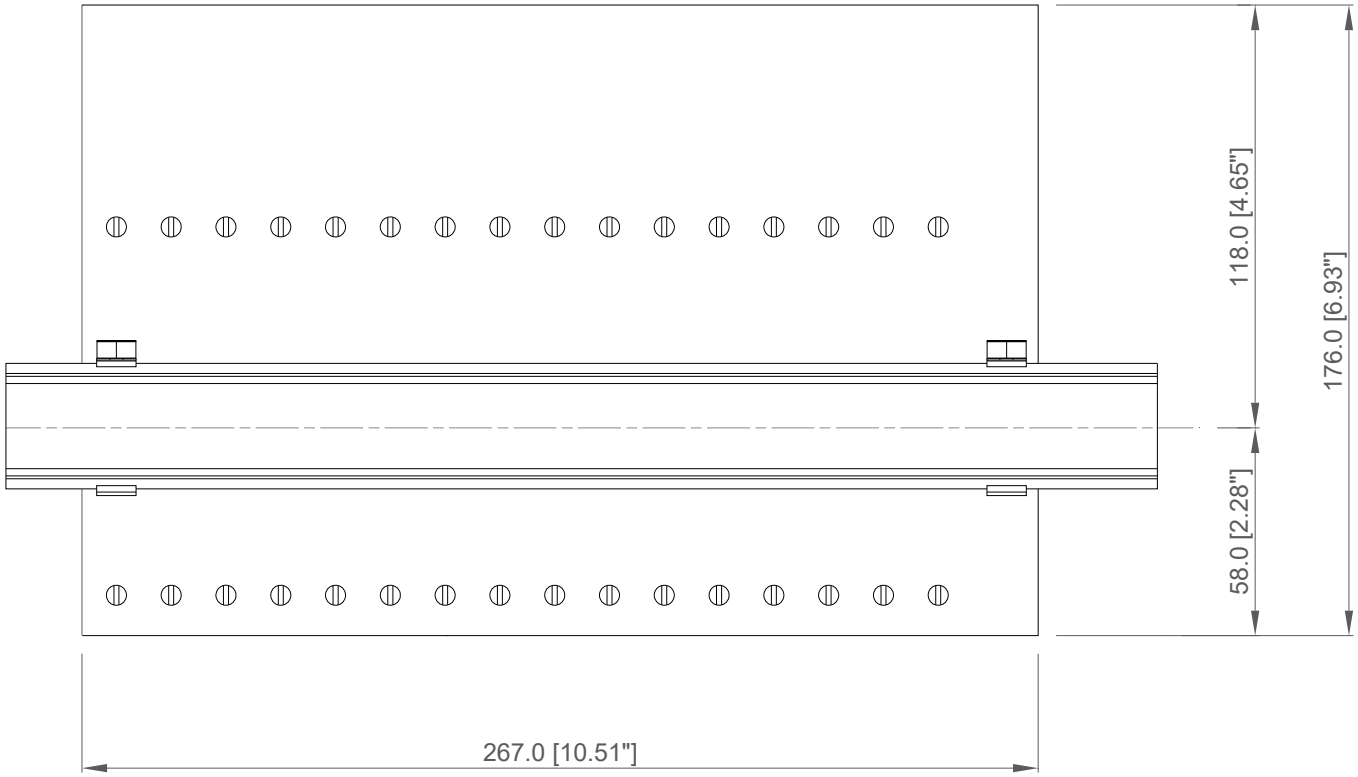
Relay Activation Conditions:
The two relays are activated according to the following rules:

TAG	ACTIVATION
1oo2 Power OK (RL1)	The relay is energized when both supply voltages are within the regular range (>18 V and <30 V), i.e. when "Relay 1oo2 Power OK" yellow LED is on.
Module Fault (RL2)	The relay is energized when the following two conditions hold: 1. at least one voltage supply is within the regular range (>18 V and <30 V) 2. no module/barrier fault is reported Therefore, the relay is energized when the "Fault" yellow LED is on.

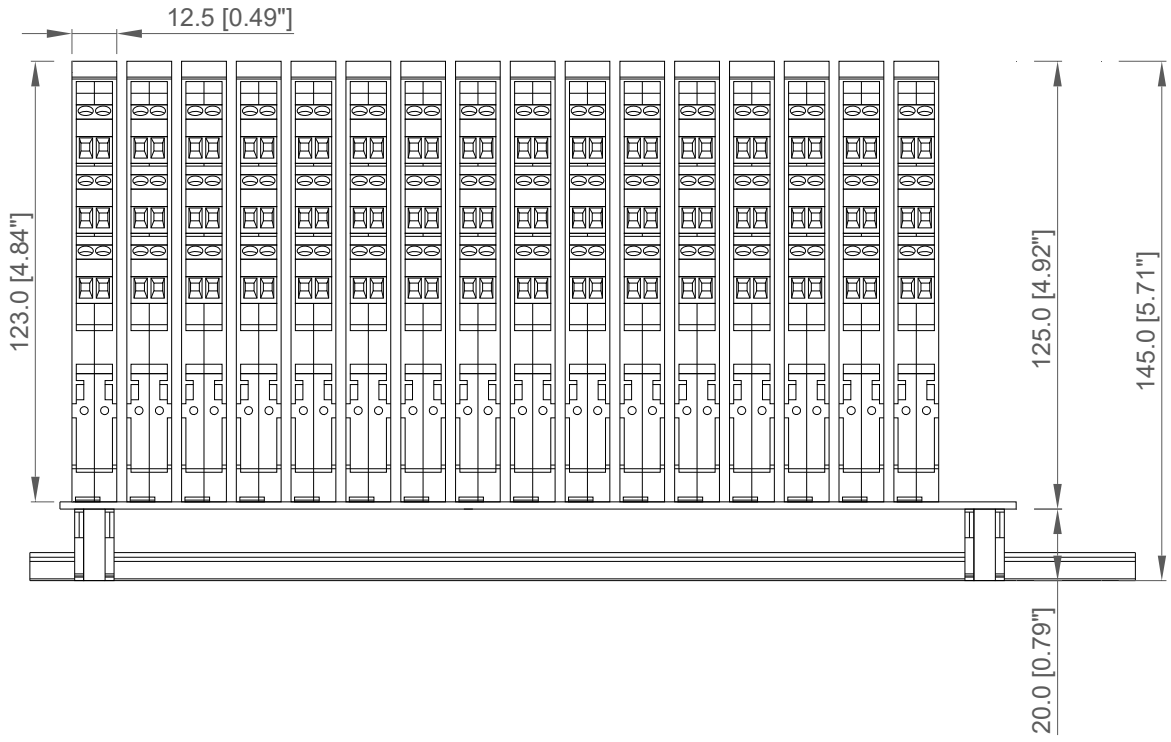


DIN Rail mounting overall dimensions:

Bottom view



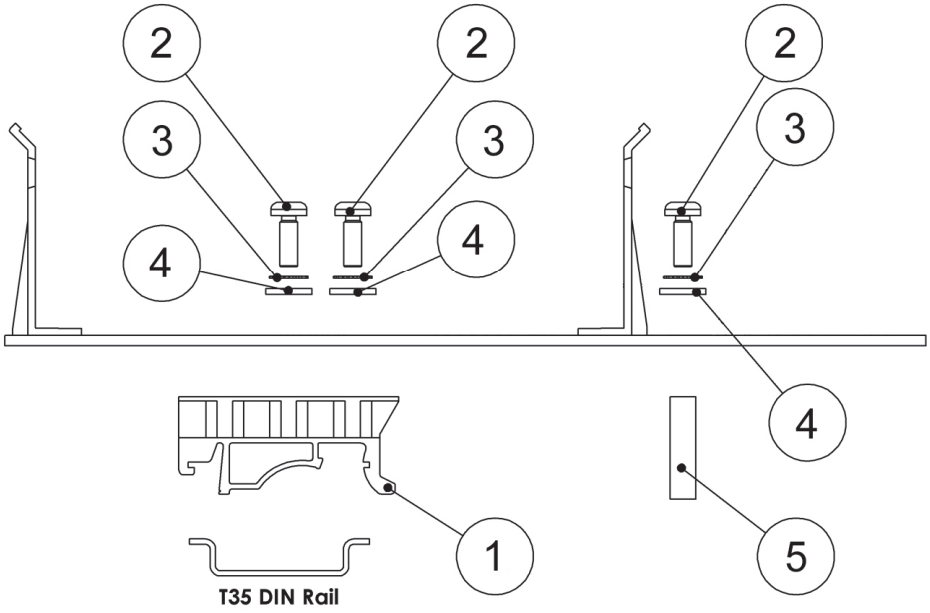
Side view

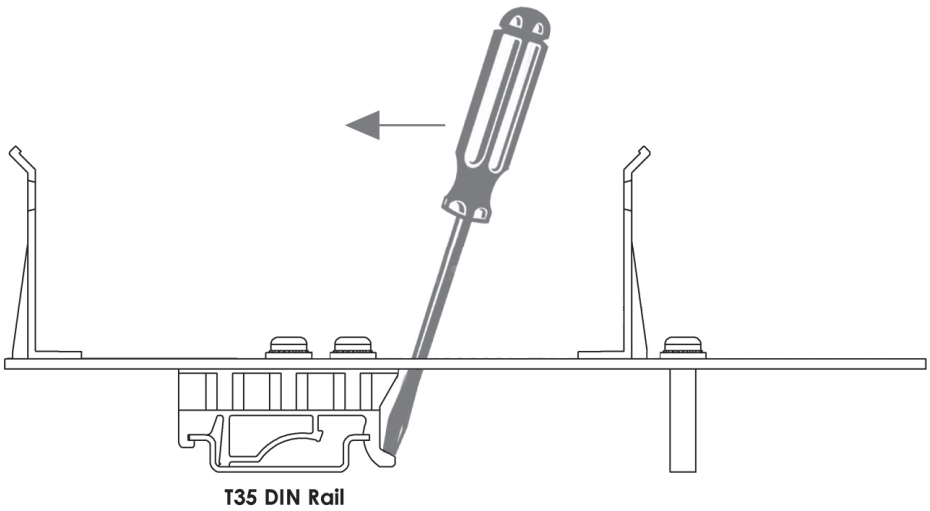


All dimensions are expressed in millimeters [inches]

DIN Rail mounting features:

Mounting features kit TB-OPT-001

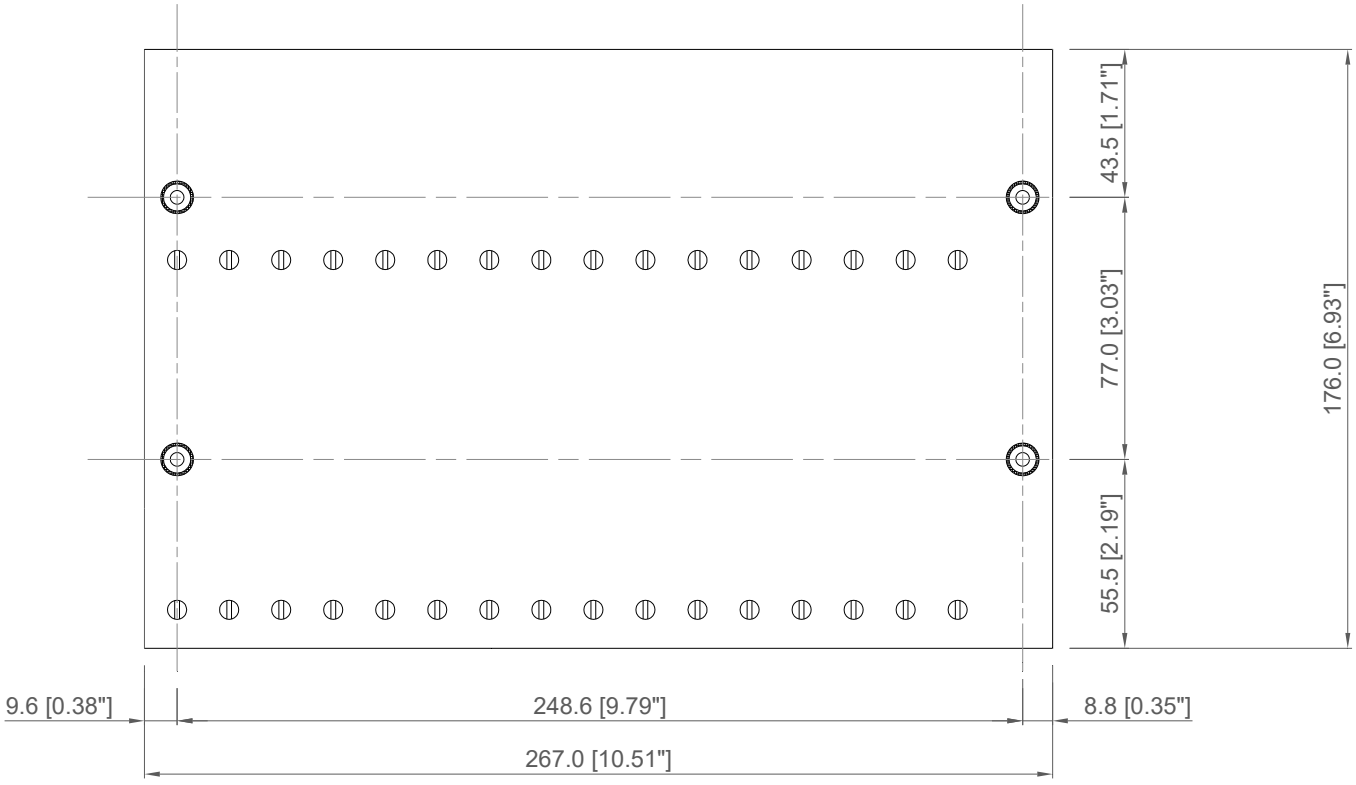




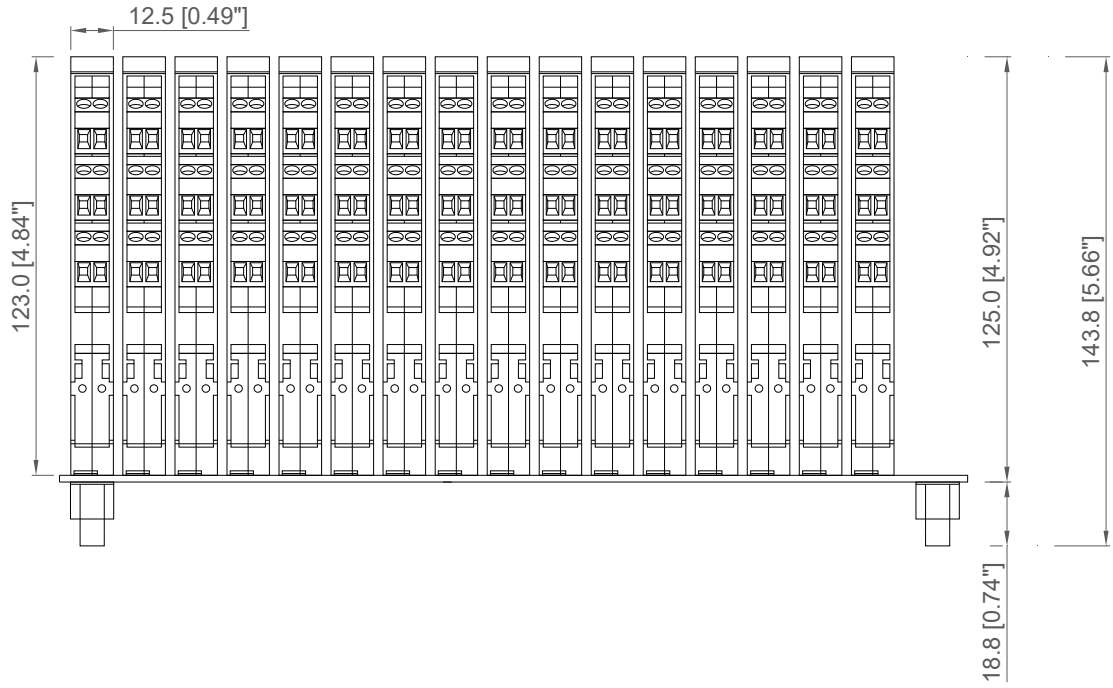
Ref. Nr	Q.ty	Description	Material
1	2	T35 Din Rail Adapter	PA
2	6	3.5 x 9.5 Self tapping screw	Stainless Steel
3	6	M3 External Tooth loch Washer	Stainless Steel
4	6	M3 Washer	Stainless Steel
5	2	6 c 20 Spacer	PA

Wall mounting overall dimensions for M4 self tapping screw:

Bottom view



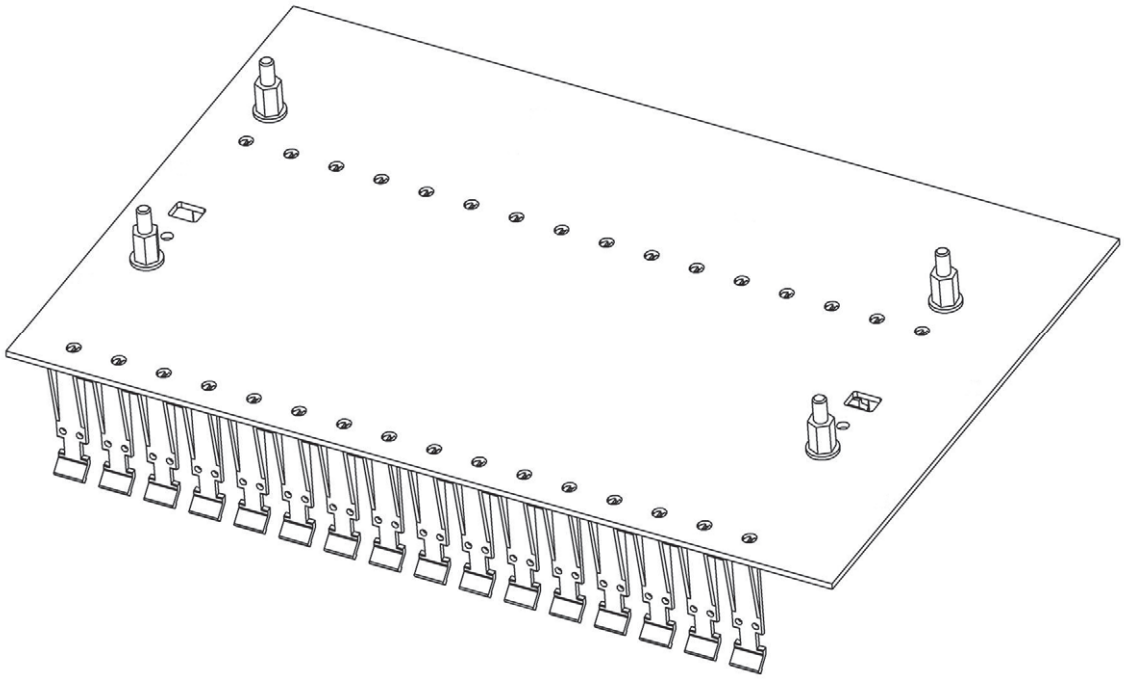
Side view

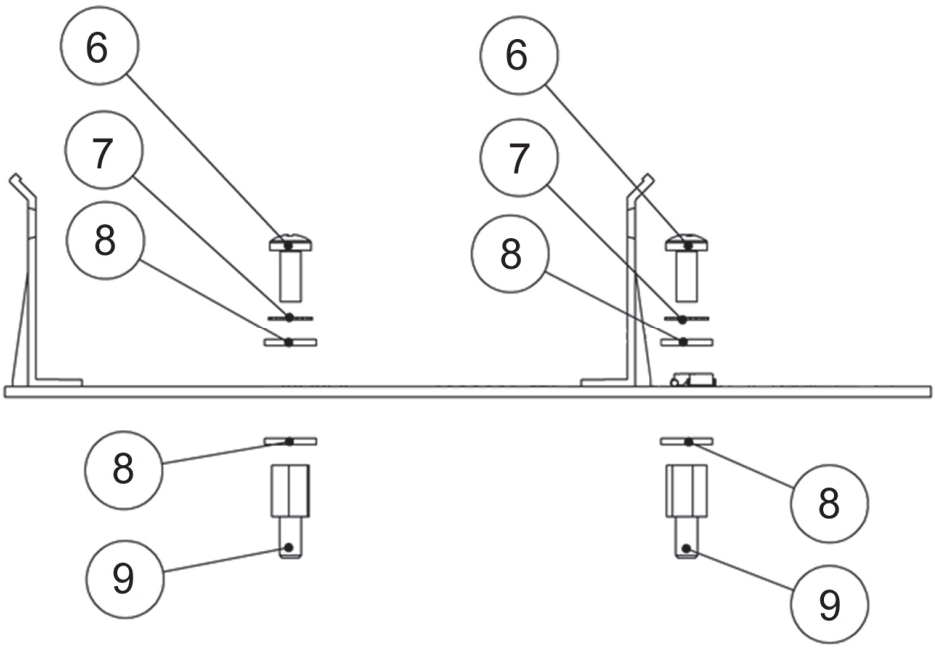


All dimensions are expressed in millimeters [inches]

Wall mounting features for M4 self tapping screw:

Mounting features kit TB-OPT-001

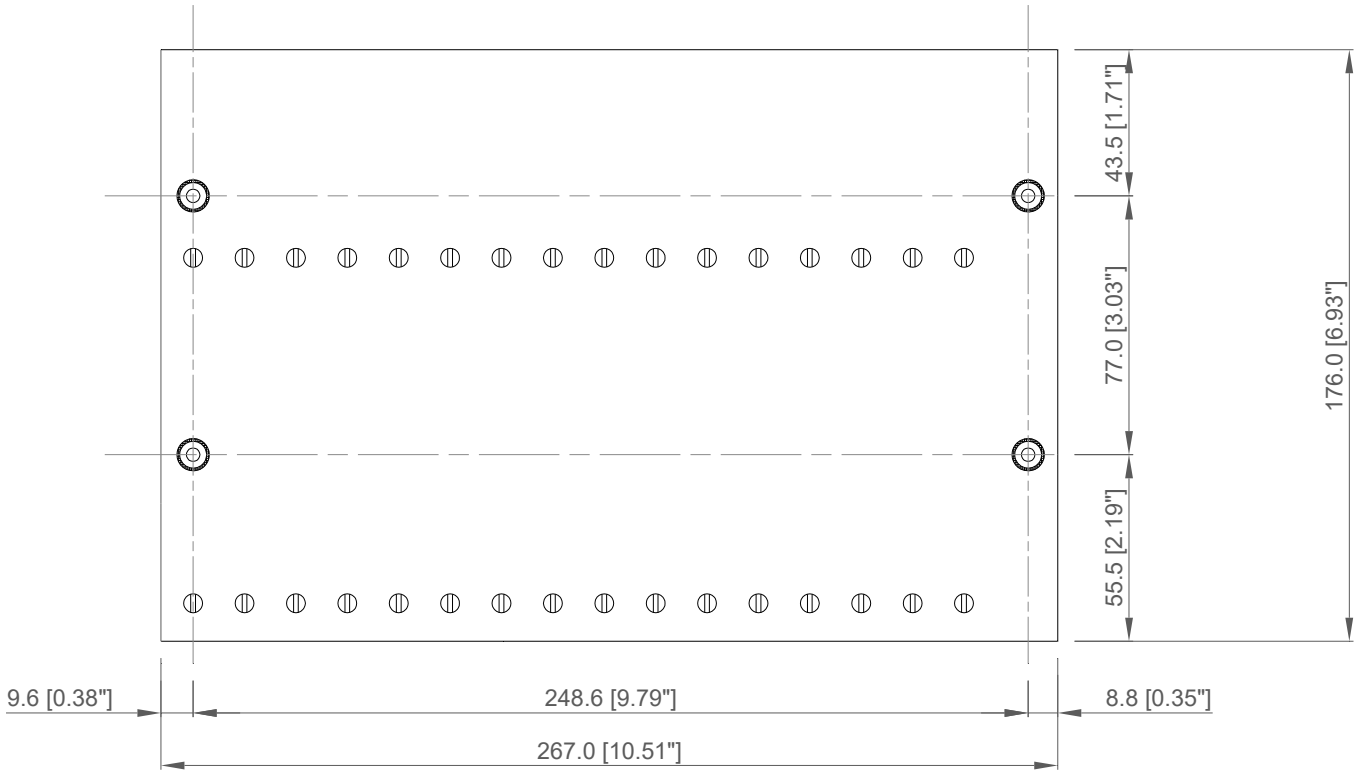




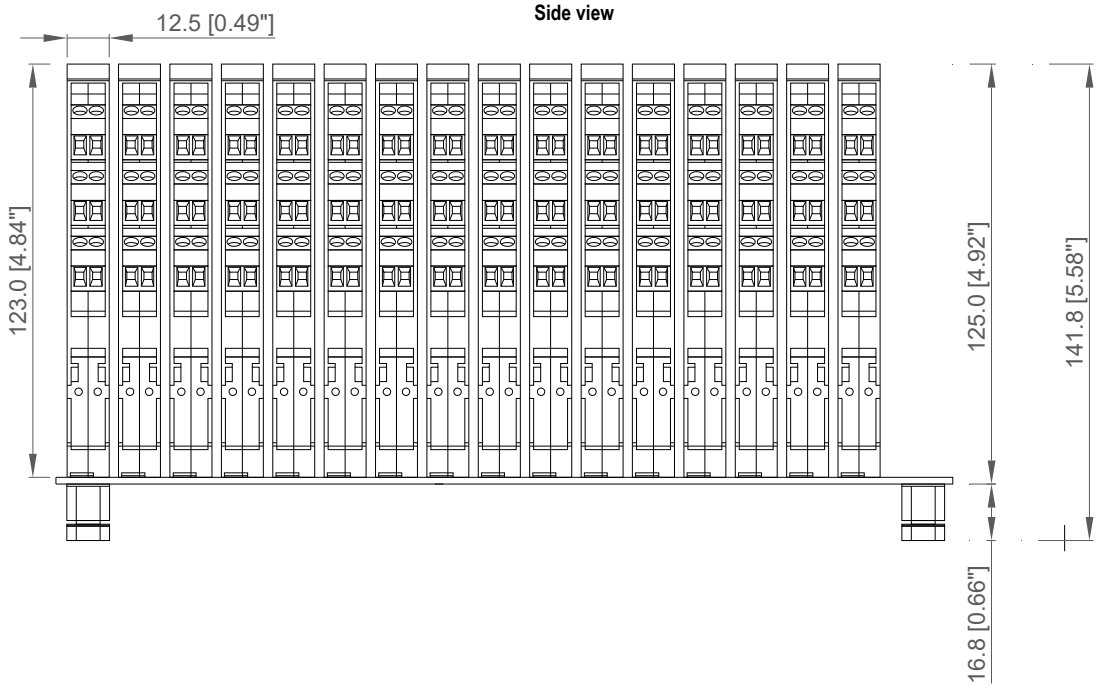
Ref. Nr	Q.ty	Description	Material
6	4	M4 x 8 Screw	Stainless Steel
7	4	M4 External Tooth lock Washer	Stainless Steel
8	8	M4 Washer	Stainless Steel
9	4	Self Tapping Spacer	NI - Plated Brass

Wall mounting overall dimensions for M4 thread screw:

Bottom view



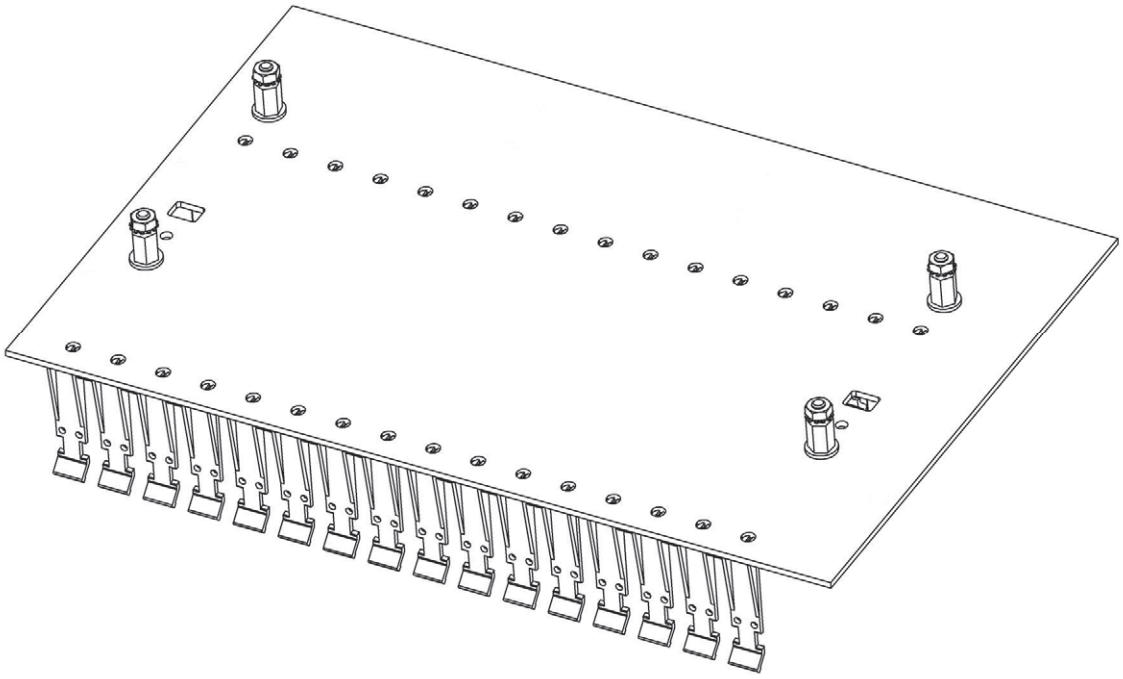
Side view

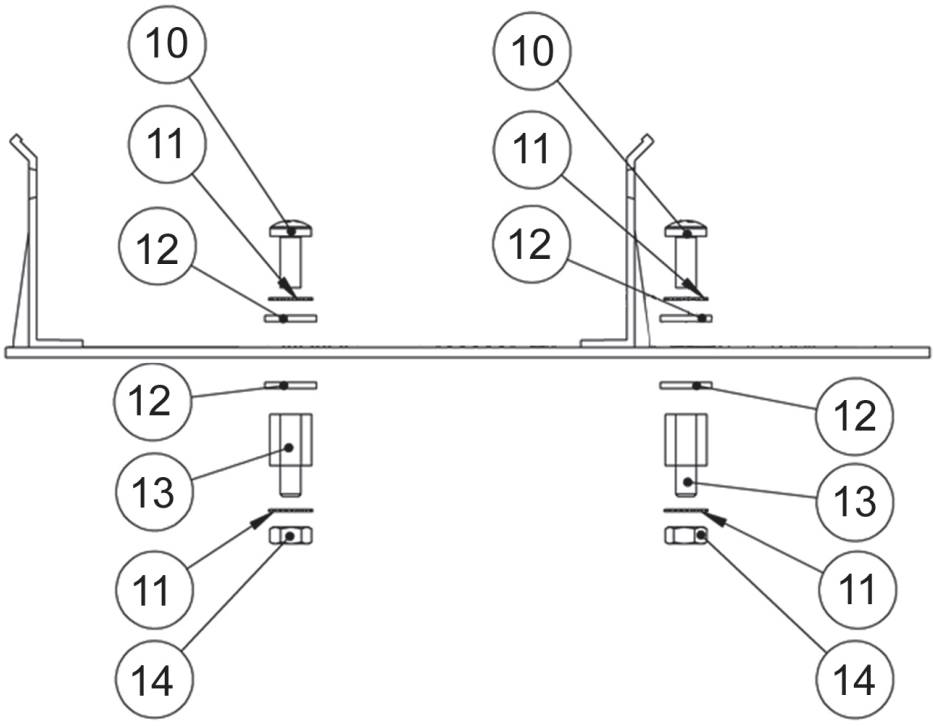


All dimensions are expressed in millimeters [inches]

Wall mounting features for M4 thread screw:

Mounting features kit TB-OPT-001





Ref. Nr	Q.ty	Description	Material
10	4	M4 x 8 Screw	Stainless Steel
11	8	M4 External Tooth lock Washer	Stainless Steel
12	8	M4 Washer	Stainless Steel
13	4	Threaded Spacer	NI - Plated Brass
14	4	M4 Nut	Stainless Steel