

## 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	1) Power Supply voltage redundancy; 2) Abnormal supply voltage signaling; 3) Cumulative module fault signaling.

### Supported ABB S800 I/O Cards:

I/O Card Type	TU Type	I/O Card Model	Channels per I/O Card	TUs per board	Channels per board	Supported GM Modules(*)
Digital In	TU812	DI810 DI830 DI840 DI880	16	1	16	D5031S, D5032S, D5037S, D5093S, D6001S, D6002S, D6031S, D6032S, D6037S
				2	32	D5031D, D5032D, D5037D, D5093D, D6000D, D6001D, D6031D, D6032D, D6037D
	TU819	DI818	32	1/2	16	D5031S, D5032S, D5037S, D5093S, D6001S, D6002S, D6031S, D6032S, D6037S
				1	32	D5031D, D5032D, D5037D, D5093D, D6000D, D6001D, D6031D, D6032D, D6037D
Digital Out	TU812	DO814	16	1	16	D5040S, D5048S, D5049S, D5090S, D5091S, D5094S, D5095S, D5096S, D5096S-100, D5097S, D5098S, D6001S, D6002S
				2	32	D5040D, D5098D, D6000D, D6001D

(\*) Do not mix D5000 Intrinsically Safe barriers with D5000 Relay modules or D6000 isolators on same termination board.

## Features:

- S800 DI and DO Cards board interfaces.
- 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.

## Ordering Information:

Model: TB-D5016-ABB-001

## 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:** 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<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 25 poles SUB-D male connectors (require female mating connectors).

### 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:

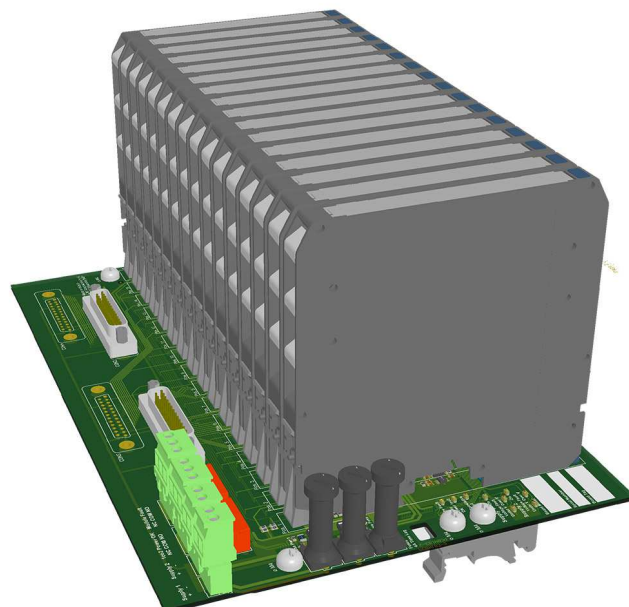
Hardware included for mounting on wall and single DIN rail.

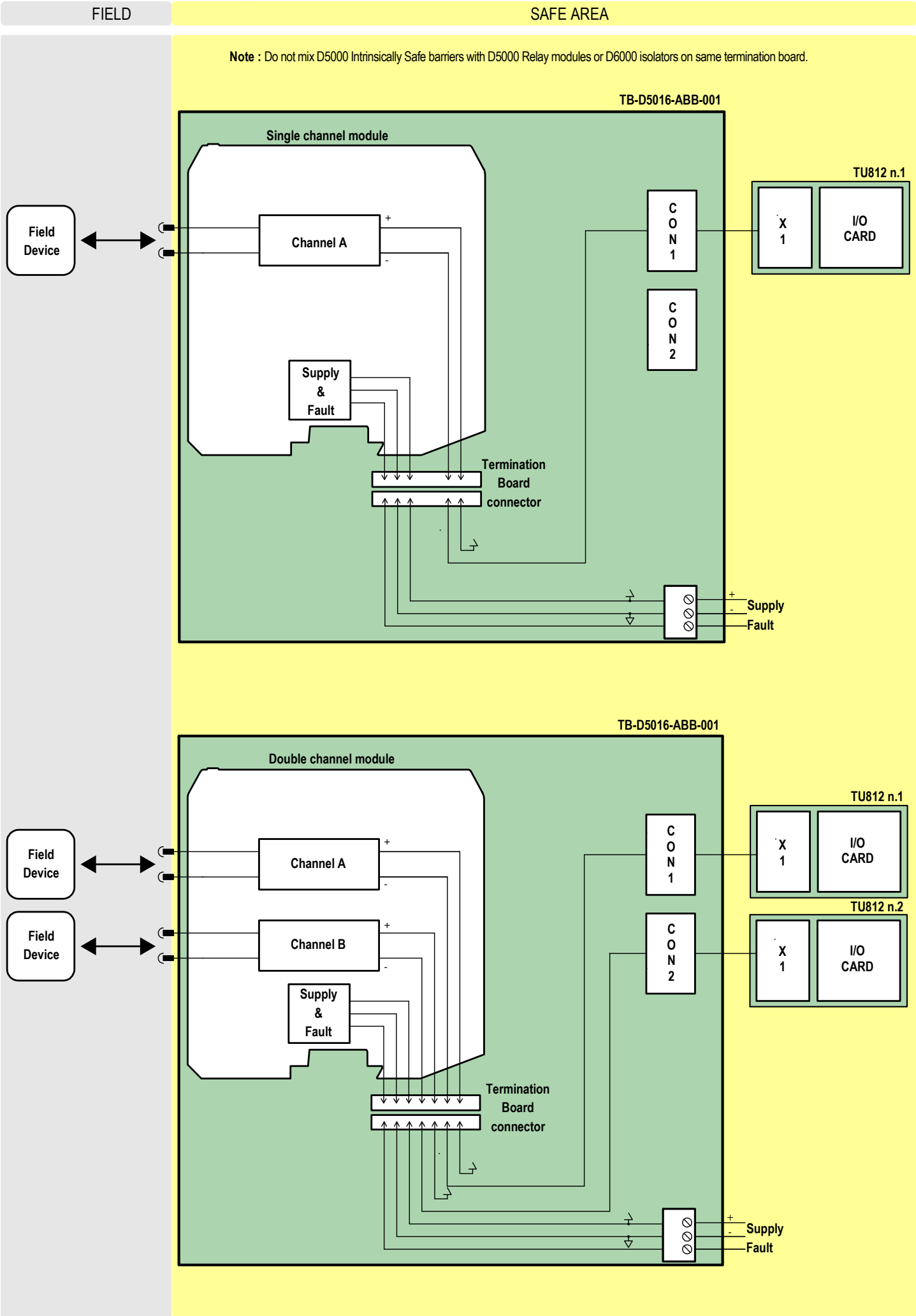
**Weight:** about 400 g (excluding modules and mounting options).

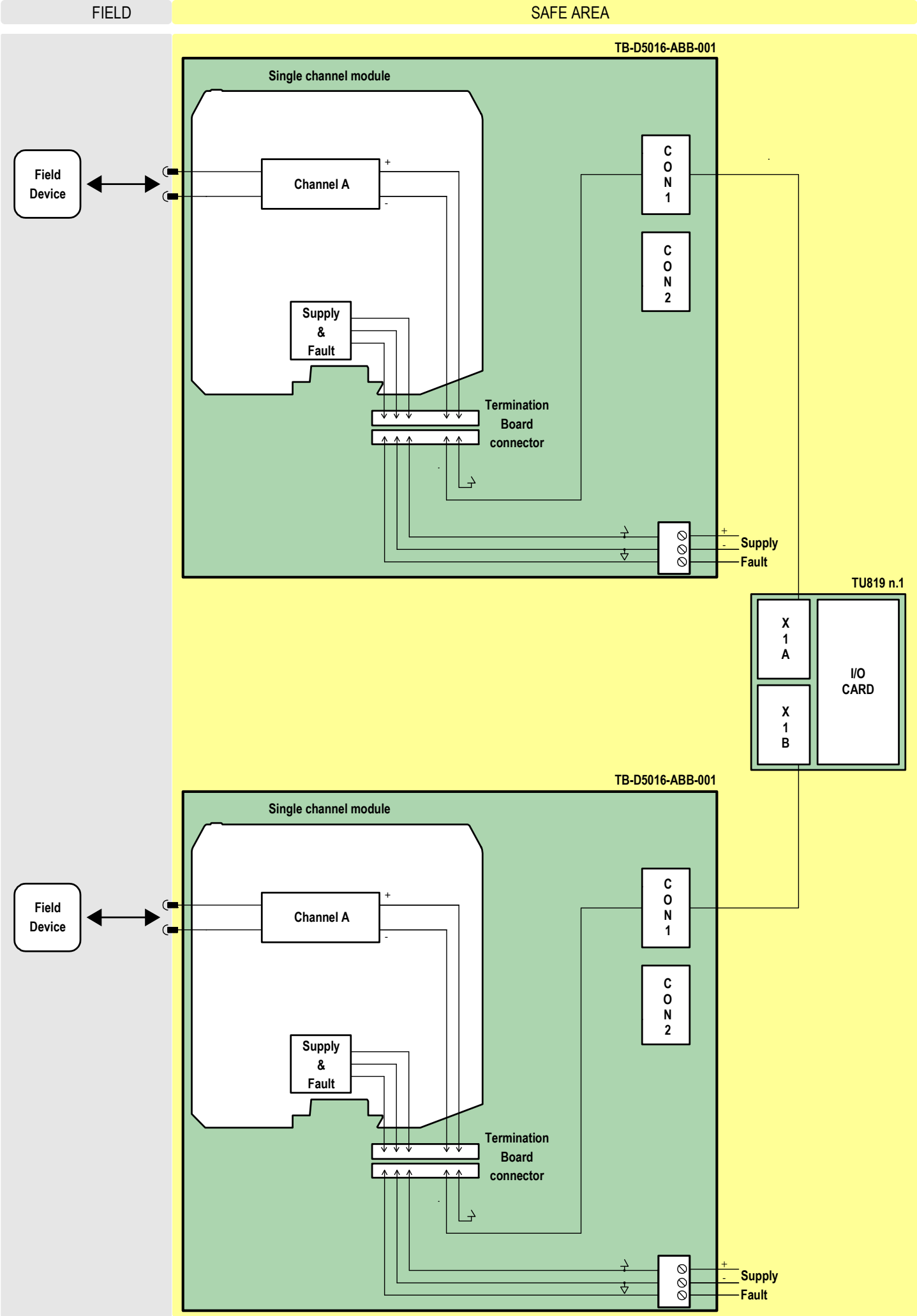
**Location:** Safe Area / Ordinary locations.

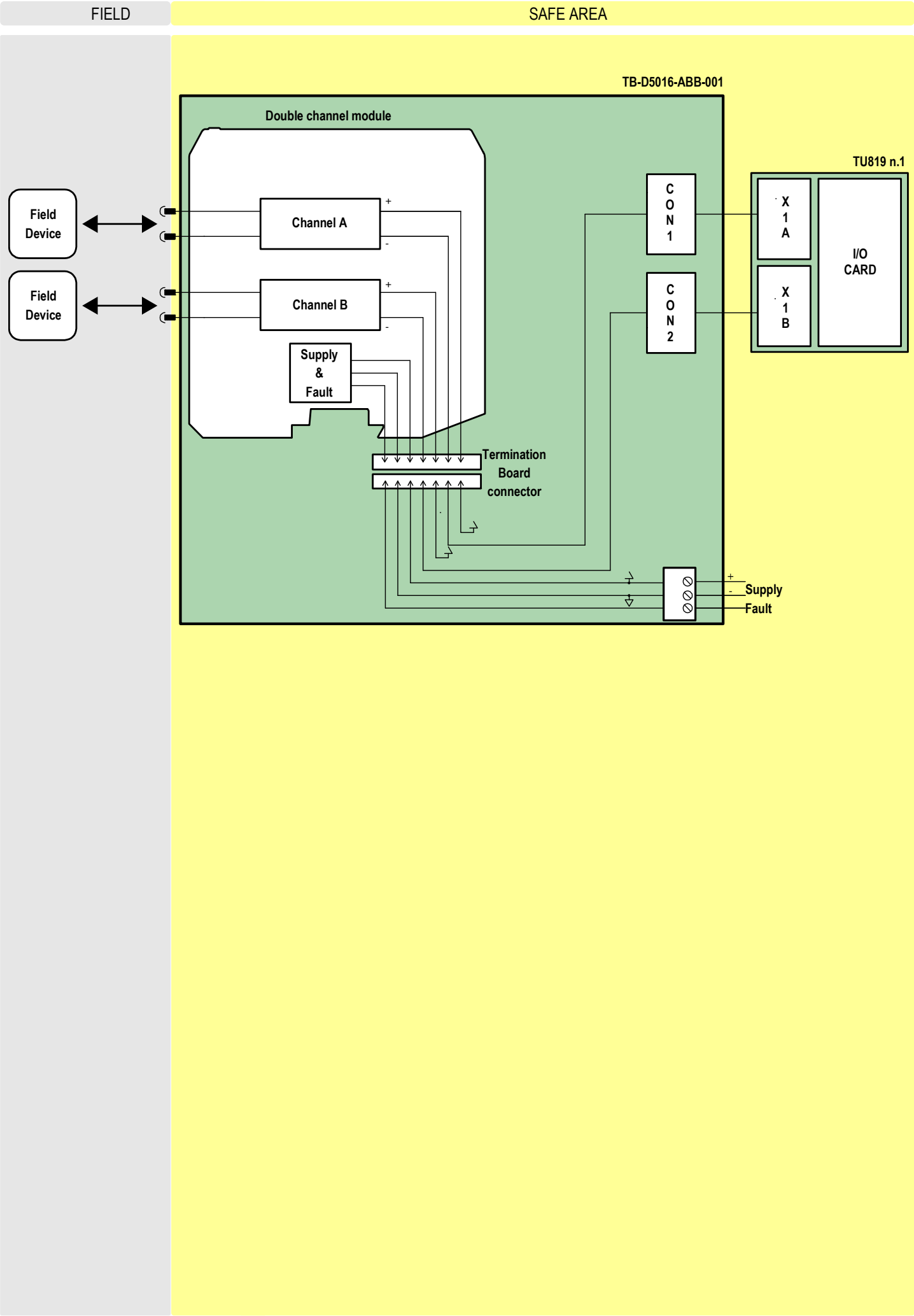
**Dimensions:** Width 267 mm, Depth 176 mm, Height 125 mm.

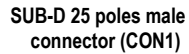
## Image:











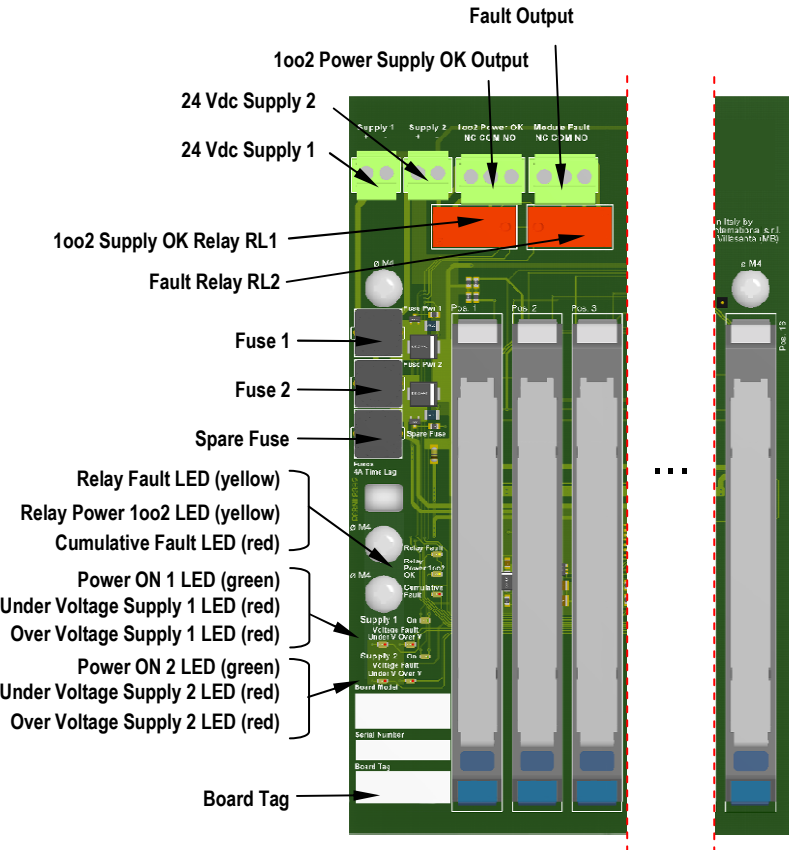
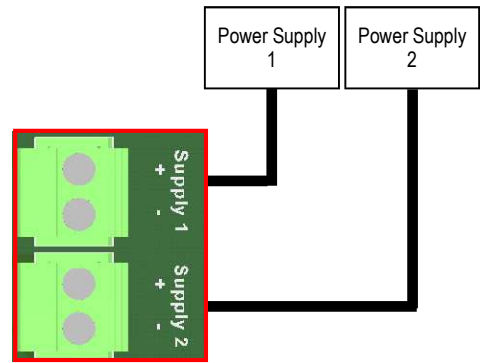
# Connections table to Interface Cards:

MODULE POSITION	MODULE CHANNEL NUMBER	INTERFACE CARD(S) CHANNEL NUMBER (X1-TU812) (X1A-TU819)	INTERFACE CARD(S) CHANNEL NUMBER (X1B-TU819)	MODULE CHANNEL POSITIVE (+) CONNECTION	MODULE CHANNEL NEGATIVE (-) CONNECTION	NOTES
1	1A	1 on TU n.1	17 on TU n.1	+24 Vdc	3 (CON1)	CON1, CON2: • Pole 13 is not connected. • +24 Vdc available on poles: 1, 14, 11, 24. • Ground available on poles: 2, 15, 12, 25.
	1B	1 on TU n.2	17 on TU n.1	+24 Vdc	3 (CON2)	
2	2A	2 on TU n.1	18 on TU n.1	+24 Vdc	16 (CON1)	
	2B	2 on TU n.2	18 on TU n.1	+24 Vdc	16 (CON2)	
3	3A	3 on TU n.1	19 on TU n.1	+24 Vdc	4 (CON1)	
	3B	3 on TU n.2	19 on TU n.1	+24 Vdc	4 (CON2)	
4	4A	4 on TU n.1	20 on TU n.1	+24 Vdc	17 (CON1)	
	4B	4 on TU n.2	20 on TU n.1	+24 Vdc	17 (CON2)	
5	5A	5 on TU n.1	21 on TU n.1	+24 Vdc	5 (CON1)	
	5B	5 on TU n.2	21 on TU n.1	+24 Vdc	5 (CON2)	
6	6A	6 on TU n.1	22 on TU n.1	+24 Vdc	18 (CON1)	
	6B	6 on TU n.2	22 on TU n.1	+24 Vdc	18 (CON2)	
7	7A	7 on TU n.1	23 on TU n.1	+24 Vdc	6 (CON1)	
	7B	7 on TU n.2	23 on TU n.1	+24 Vdc	6 (CON2)	
8	8A	8 on TU n.1	24 on TU n.1	+24 Vdc	19 (CON1)	
	8B	8 on TU n.2	24 on TU n.1	+24 Vdc	19 (CON2)	
9	9A	9 on TU n.1	25 on TU n.1	+24 Vdc	7 (CON1)	
	9B	9 on TU n.2	25 on TU n.1	+24 Vdc	7 (CON2)	
10	10A	10 on TU n.1	26 on TU n.1	+24 Vdc	20 (CON1)	
	10B	10 on TU n.2	26 on TU n.1	+24 Vdc	20 (CON2)	
11	11A	11 on TU n.1	27 on TU n.1	+24 Vdc	8 (CON1)	
	11B	11 on TU n.2	27 on TU n.1	+24 Vdc	8 (CON2)	
12	12A	12 on TU n.1	28 on TU n.1	+24 Vdc	21 (CON1)	
	12B	12 on TU n.2	28 on TU n.1	+24 Vdc	21 (CON2)	
13	13A	13 on TU n.1	29 on TU n.1	+24 Vdc	9 (CON1)	
	13B	13 on TU n.2	29 on TU n.1	+24 Vdc	9 (CON2)	
14	14A	14 on TU n.1	30 on TU n.1	+24 Vdc	22 (CON1)	
	14B	14 on TU n.2	30 on TU n.1	+24 Vdc	22 (CON2)	
15	15A	15 on TU n.1	31 on TU n.1	+24 Vdc	10 (CON1)	
	15B	15 on TU n.2	31 on TU n.1	+24 Vdc	10 (CON2)	
16	16A	16 on TU n.1	32 on TU n.1	+24 Vdc	23 (CON1)	
	16B	16 on TU n.2	32 on TU n.1	+24 Vdc	23 (CON2)	

Termination Board description:

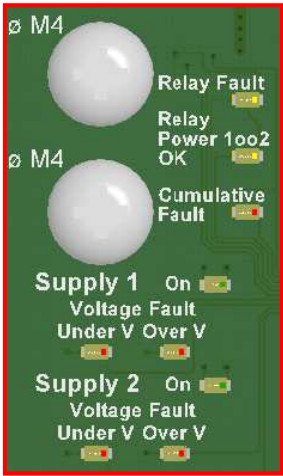
Note:  
Relay contact is defined Normally Closed (NC) or Normally Open (NO) when RL1 or RL2 relays are de-energized (that is, coil status LED is turned off).  
Relay is de-energized in fault status.

Power Supply redundancy:



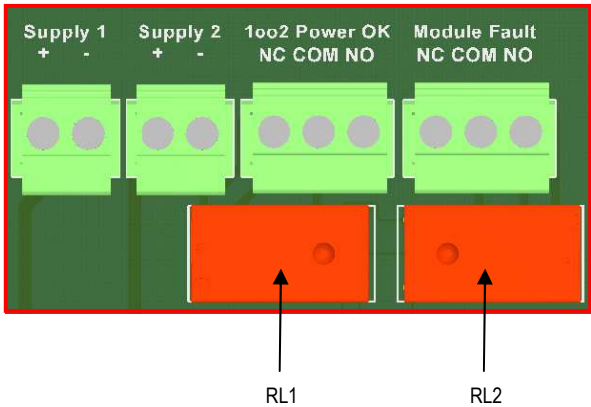
LED Signaling:  
Meaning of LEDs on termination boards:

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 1002 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

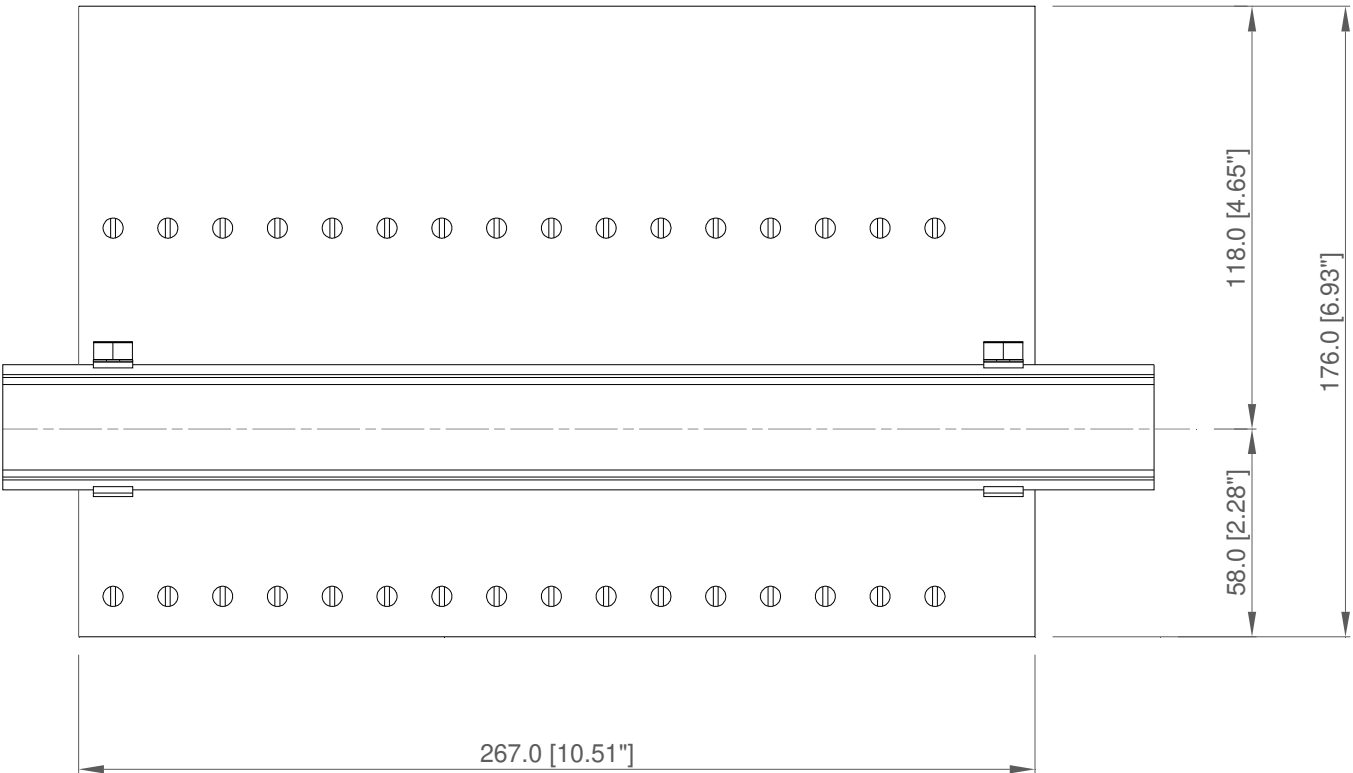


Relay Activation Conditions:  
The two relays are activated according to the following rules:

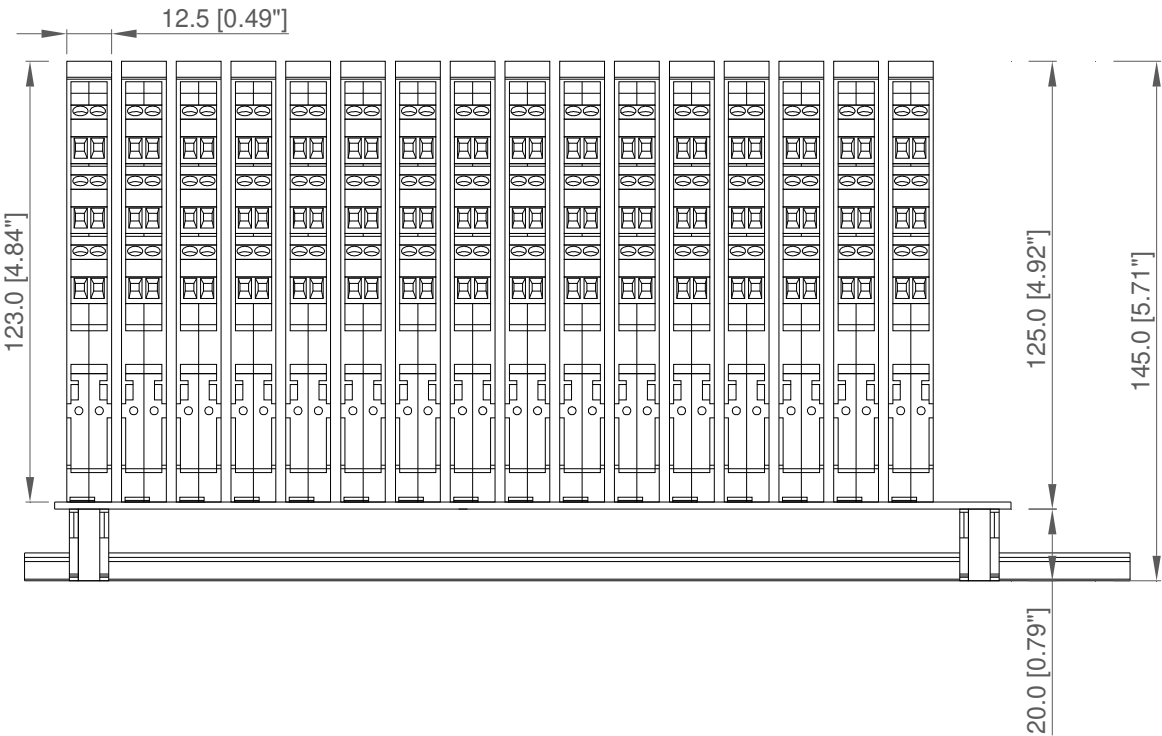
TAG	ACTIVATION
1002 Power OK (RL1)	The relay is energized when both supply voltages are within the regular range (>18 V and <30 V), i.e. when "Relay 1002 Power OK" yellow LED is on.
Module Fault (RL2)	The relay is energized when the following two conditions hold: 1. at least one voltage supply is within 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.



Bottom view



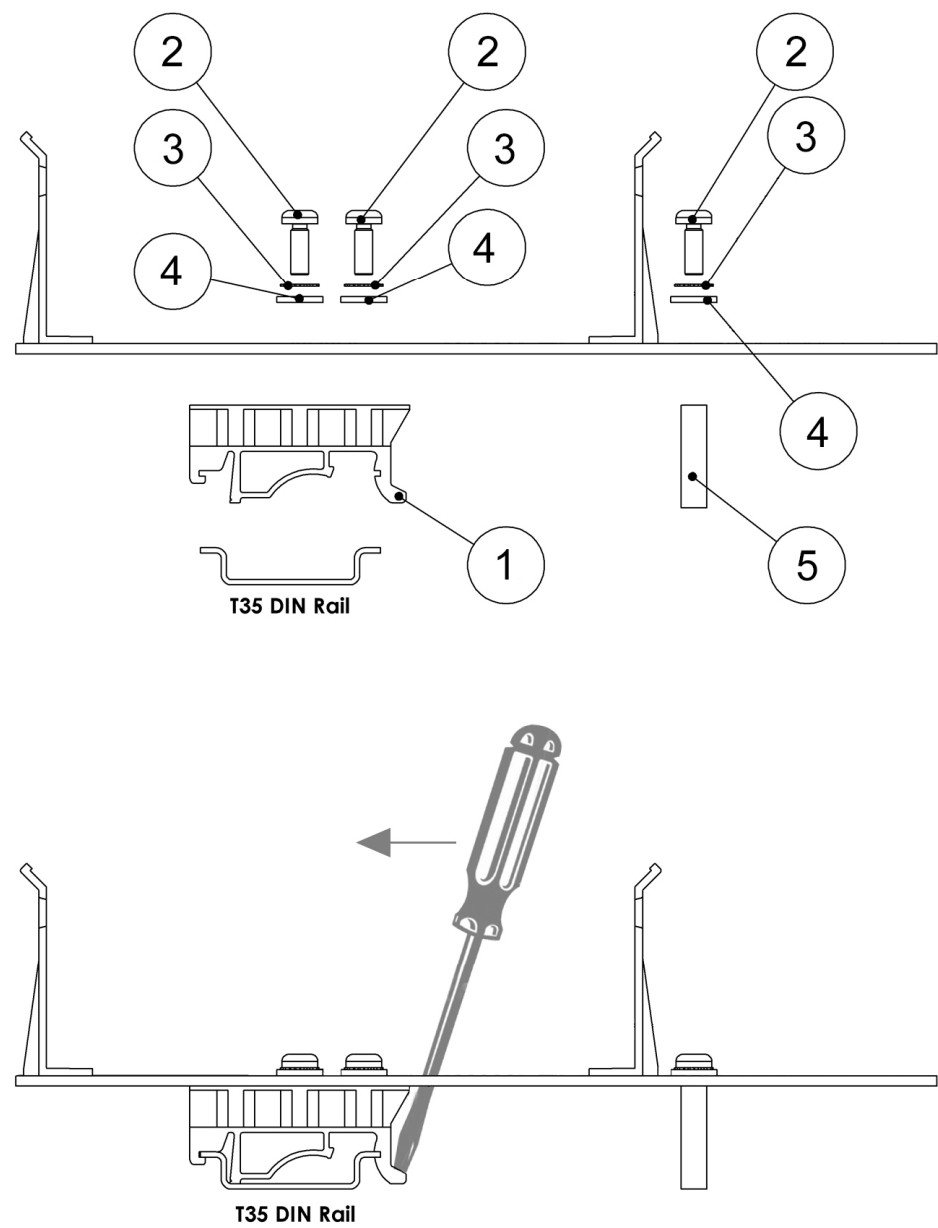
Side view



All dimensions are expressed in millimeters [inches]



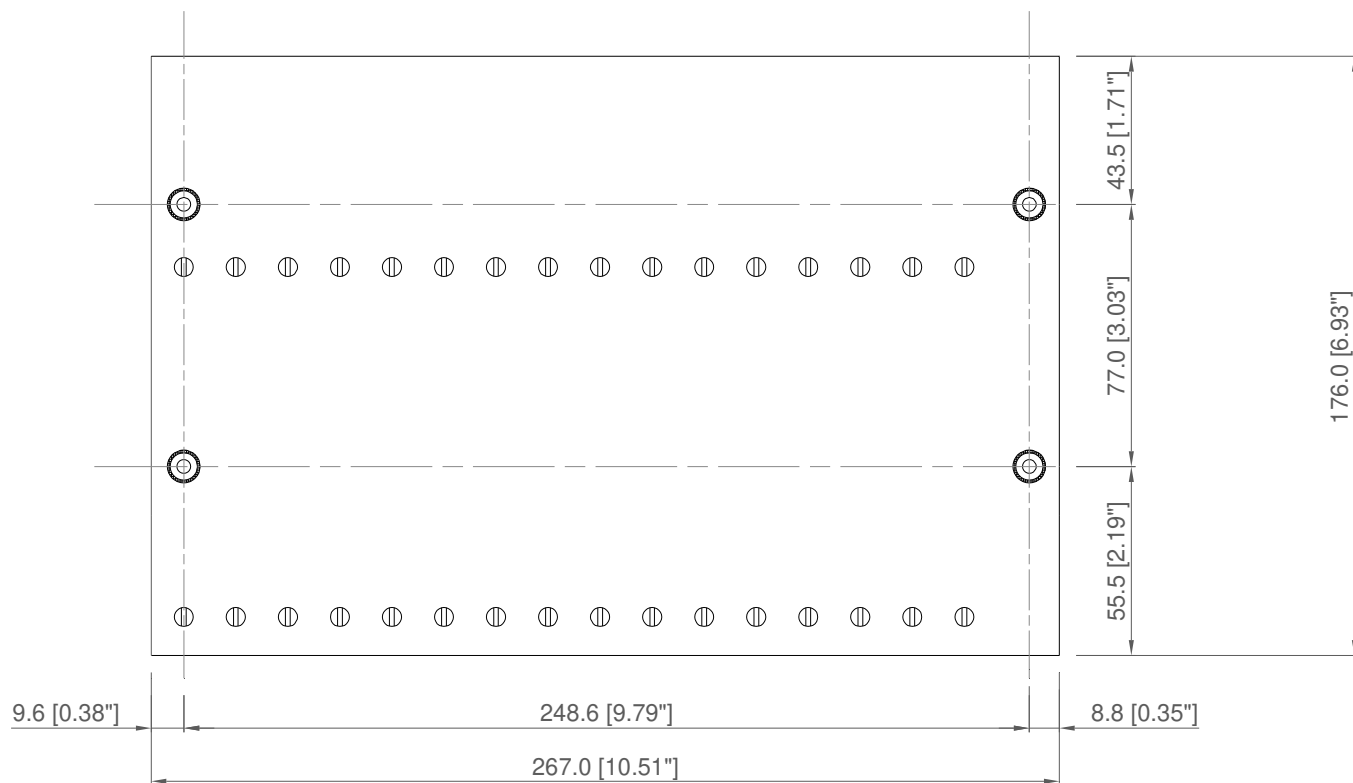
Mounting features kit TB-OPT-001



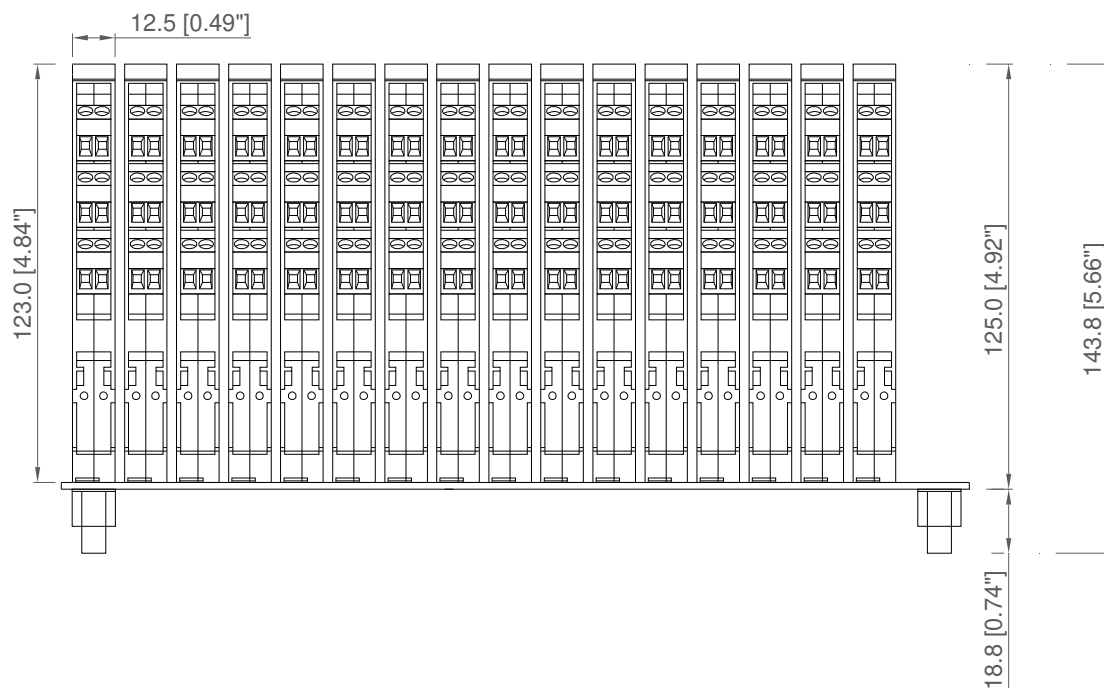
Ref. Nr	Q.ty	Description	Material
1	2	T35 Din Rail Adapter	PA
2	6	3.5 x 9.5 Self tapping screw	Stainless Steel
3	6	M3 External Tooth lock Washer	Stainless Steel
4	6	M3 Washer	Stainless Steel
5	2	6 c 20 Spacer	PA

## Wall mounting overall dimensions for M4 self tapping screw:

Bottom view

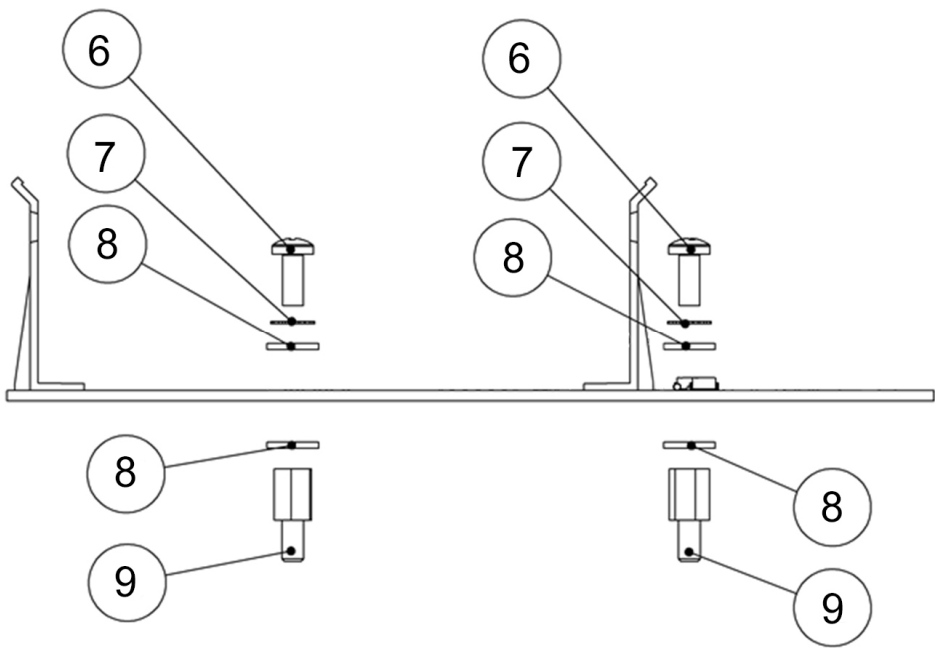
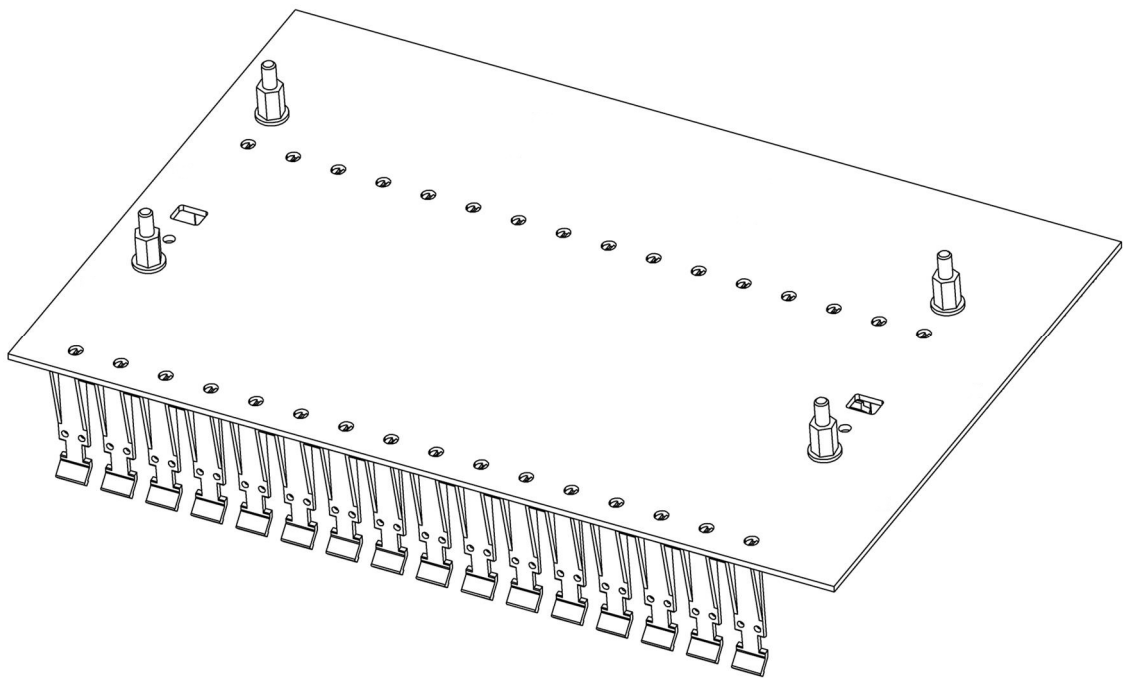


Side view



All dimensions are expressed in millimeters [inches]

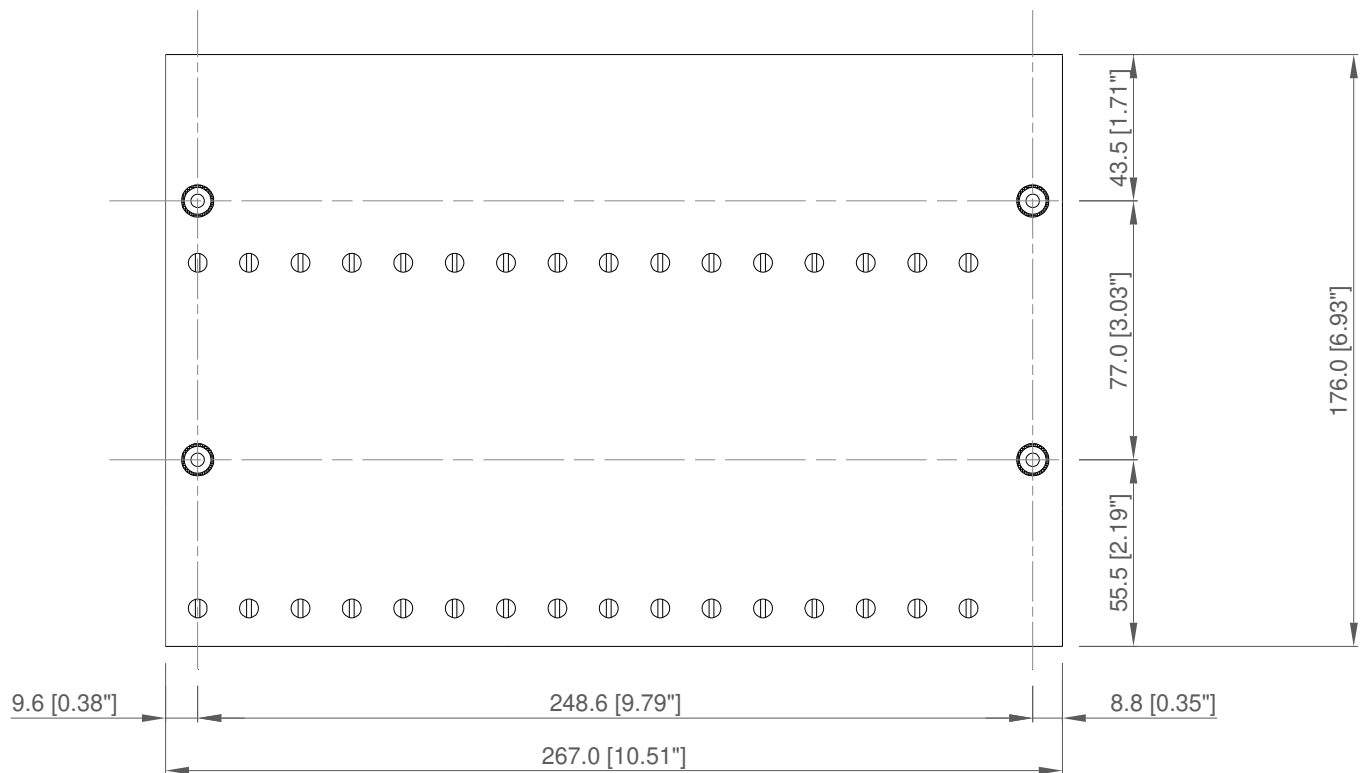
Mounting features kit TB-OPT-001



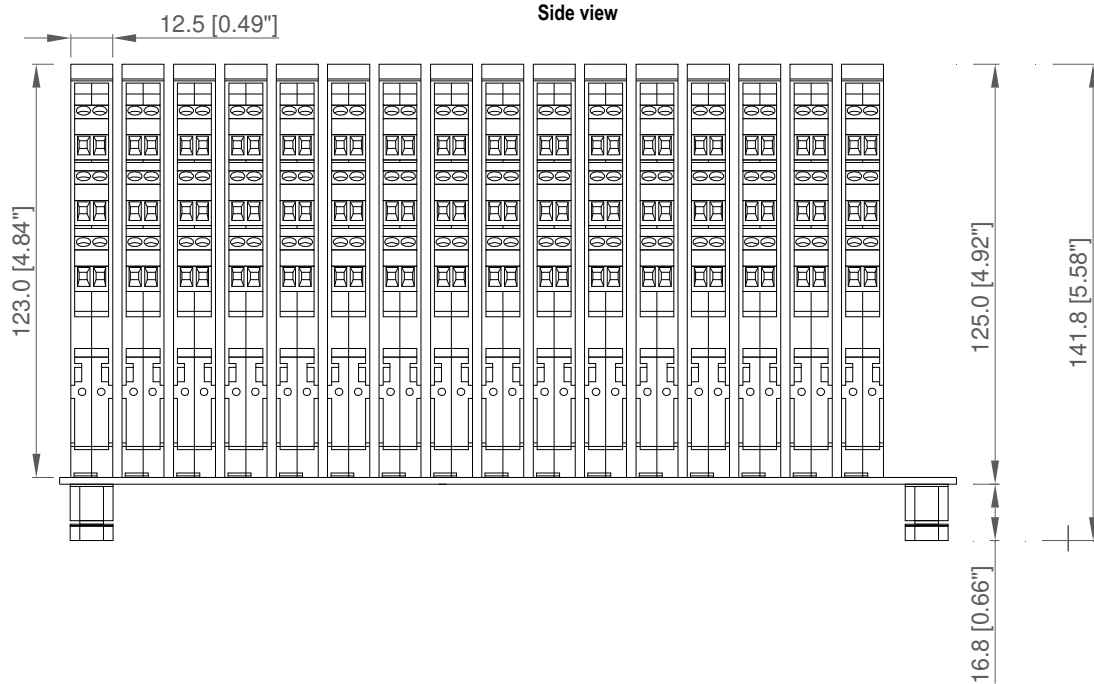
Ref. Nr	Q.ty	Description	Material
6	4	M4 x 8 Screw	Stainless Steel
7	4	M4 External Tooth lock Washer	Stainless Steel
8	8	M4 Washer	Stainless Steel
9	4	Self Tapping Spacer	NI - Plated Brass

## Wall mounting overall dimensions for M4 thread screw:

Bottom view

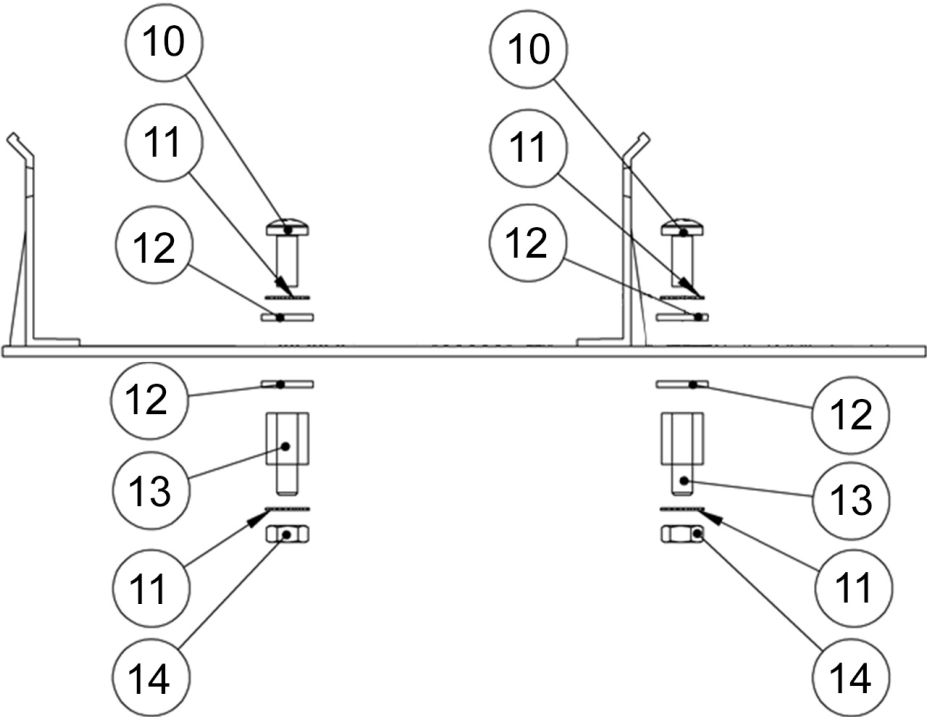
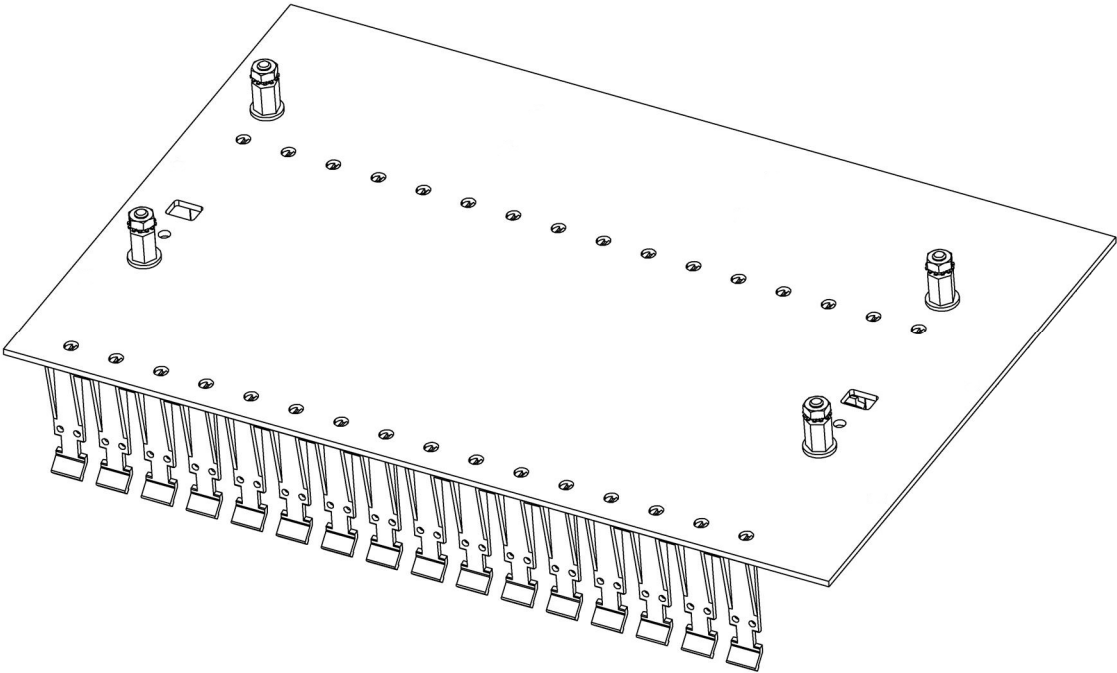


Side view



All dimensions are expressed in millimeters [inches]

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