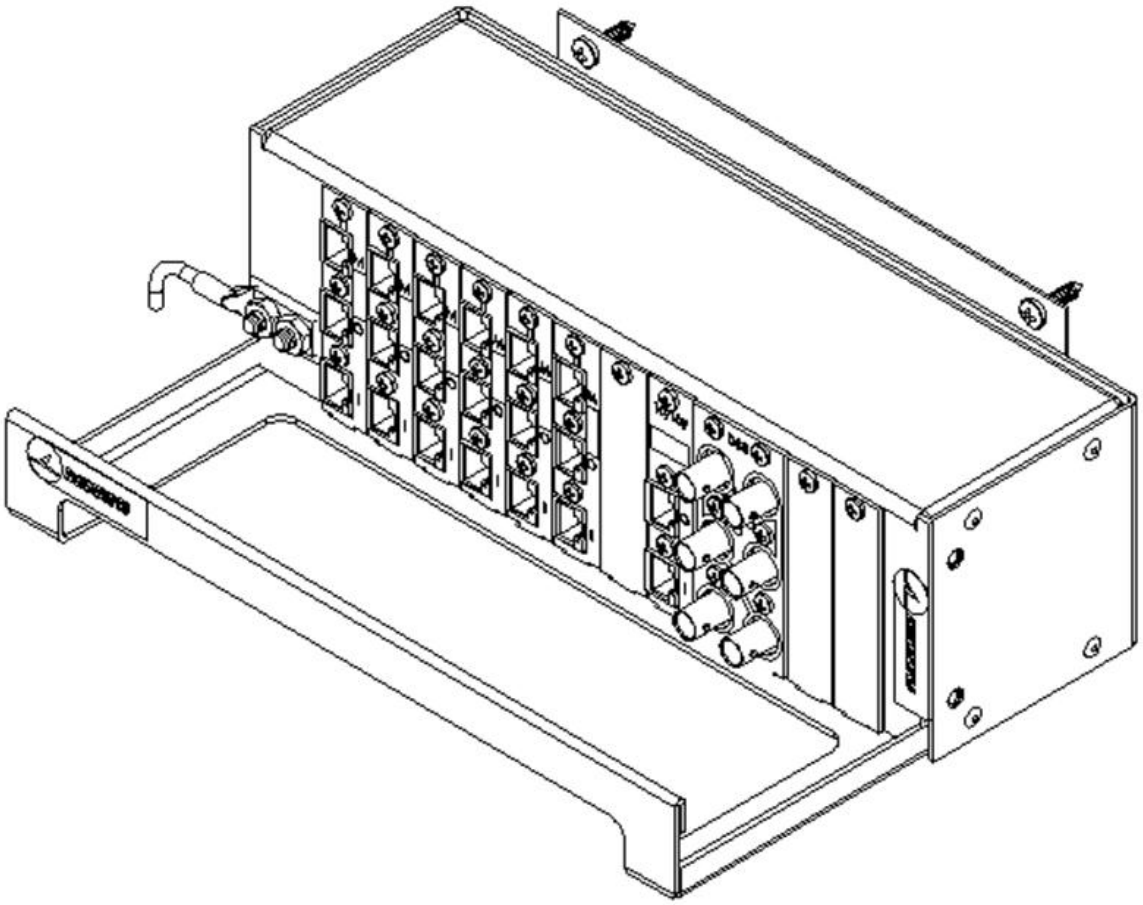
THIS DRAWING HAS BEEN GENERATED AND IS MAINTAINED BY A CAD SYSTEM. CHANGES SHALL ONLY BE INCORPORATED AS DIRECTED BY THE DESIGN ACTIVITY.

REVISIONS

LTR	DESCRIPTION	ECO NUM.	DATE	APPROVED
D	ADD 48VDC PROTECTION MODULE	7757	12/5/08	DWR
E	ADD QUAD CHASSIS OPTION	DD42670	6/5/09	
F	ADD QUAD BOX CONFIGS	9142	9/21/10	DWR
G	REMOVE OBSOLETE REFS	12313	1/20/14	MTH



DRAWN: MLH	DATE 7/16/07	
CHECKED: HS	7/18/07	
ENGR. APPD: DWR	7/18/07	
PROJ. APPD: JN	7/18/07	
APPROVED:		

MATERIAL:

Transtector Systems, Inc.
10701 Airport Road, Hayden, ID 83835
800.882.9110 208.772.8515 www.transtector.com

TITLE: Product Specification DXR
Digital Exchange Rack Protector
Wall Mount – 12 and 4 Positions

SIZE	CAGE	DRAWING NUMBER	REV
A	30992	1400-620-2	G

SCALE = N/A

SURGE SUPPRESSOR MODELS: Digital Exchange Rack Protector – DXR System

Fully configured DXR 12 Chassis and 4 each T1/E1, 2 each 1000BT (page 1)	PN 1101-875-2
T1/E1 Protection Card	PN 1000-1192
DS3 Protection Card	PN 1000-1193
10/100BT Ethernet Protection Card	PN 1000-1194
1000BT Gigabit Ethernet Protection Card	PN 1000-1203
48VDC Protection Card	PN 1000-1271
DXR Quad Box Housing Kit-4 (no protection included, blank covers over each slot)	PN 1000-1188-4
DXR Quad Box Housing populated with 4 T1/E1 protection cards	PN 1000-1305
DXR Quad Box Housing populated with 3 T1/E1, 1 10/100 BT Ethernet protection cards	PN 1000-1306

1. **GENERAL DESCRIPTION:** The Transtector DXR Digital Exchange Rack Protector is ideal for applications that require protection for T1/E1, 10/100BT, 1000BT, 48VDC and DS3 connections. The protection cards utilize silicon avalanche diode technology. The protection system consists of a versatile chassis that can mount to a wall surface or 2U 19" rack frame, with protection cards that load and connect entirely from the front face. The chassis system is available in 12-card wide and 4-card wide configurations. The DS3 and T1/E1 protection cards are optimized for the specific applications and are marked with the type, input connection, output connection and trouble shooting monitor connection. The DS3 card features a direct bond between each BNC ring to the chassis ground for optimum signal integrity and best grounding practice. The DS3 module within the DXR utilizes two individual PCB's to accomplish one interconnect point. By doing this, one complete DS3 circuit can be accomplished. Figure 1 illustrates the circuit schematic detailing the cable crossing that must be employed for DS3 equipment communications. The Ethernet cards provide the best protection and signal transmission integrity available on the market and are marked with the input and output connections. System status monitoring for the Ethernet circuits and protection cards are determined through the network polling functionality built into all standard Ethernet equipment. The DXR pn 1101-875-1 is provided with a fully configured system of four each T1/E1 protection cards, two each 1000BT protection card. A 48VDC module is available in addition to the other modules. The 48VDC module provides 4 pairs of input lines and 4 pairs of output lines. Two RJ-45 connectors are used for the I/O's and are located on the face plate. Unused card slots are covered with a blank plate. The protection circuits offer bi-directional protection, with the optimum protection oriented towards the sensitive equipment connected to the O (output) side. All RJ-45 connected protection configurations offer straight through pin-outs from the input to output connectors. It is up to the user to swap between the Transmit and Receive wire pairs if required. The DXR chassis are intended to be mounted to almost any type of panel surface, as close as possible to the protected equipment and a dedicated set of ground studs are provided that must be bonded to the nearest master ground bar or equipment rack ground bar for proper surge protection functionality. In the unlikely event of surge protection self sacrifice, the individual protection cards will fail short to disrupt communication. The protection cards can be replaced for ease of service. The protection cards incorporate fusing elements to open the circuit for human safety in the event of power line crossing onto the data lines.

2. **ELECTRICAL:**

2.1 DS3 DIGITAL SIGNAL SERVICE PROTECTION CARD:

2.1.1.	**Data Rate**	DS3 45Mb/s
2.1.2.	**Nominal Operating Voltage**	3Vpeak
2.1.3.	**Maximum Continuous Operating Voltage**	5.5Vpeak
2.1.4.	**Connector Style**	75ohm BNC, ring bonded to ground
2.1.5.	**Insertion Loss**	< 0.20dB @ 22.386MHz
2.1.6.	**Return Loss**	<-30dB @ 22.386MHz
2.1.7.	**Isolation/Crosstalk**	< -60dB @ 22.386MHz
2.1.8.	**Monitor Attenuation**	-20dB +/- 1dB @ 22.386MHz
2.1.9.	**Surge Suppression**	< 25Vpeak @ 100A 10/1000μs

2.2 T1/E1 SIGNAL PROTECTION CARD:

2.2.1 Data Rate.....1.544-2.048Mb/s
2.2.2 Nominal Operating Voltage.....3Vpeak
2.2.3 Maximum Continuous Operating Voltage.....6Vpeak
2.2.4 Connector Style.....RJ45 Cat5 unshielded 100ohms
2.2.5 Protected Pins.....(1,2) and (4,5) pass through
2.2.6 Unprotected Pins – Shorted to Ground.....3, 6, 7, 8
2.2.7 Insertion Loss.....< 0.20dB @ 772kHz
2.2.8 Return Loss.....< -30dB @ 772kHz
2.2.9 Isolation/Crosstalk.....< -60dB @ 772kHz
2.2.10 Surge Suppression.....< 25Vpeak @ 100A 10/1000μs

2.3 10/100BT ETHERNET SIGNAL PROTECTION CARD:
2.3.1 Data Rate.....100Mb/s
2.3.2 Nominal Operating Voltage.....5Vpeak
2.3.3 Maximum Continuous Operating Voltage.....6Vpeak
2.3.4 Connector Style.....RJ45 Cat5 unshielded 100ohm, 50ohm single ended
2.3.5 Protected Pins.....(1,2) and (3,6) pass through
2.3.6 Unprotected Pins – Shorted to Ground.....4, 5, 7, 8
2.3.7 Impedance.....85 to 115ohms
2.3.8 Frame Transmission.....100% Transmission @ 100Mb/s
2.3.9 Attenuation.....< -1dB @ 16MHz
2.3.10 Isolation/Crosstalk.....< -60dB @ 32MHz
2.3.11 Surge Suppression.....< 25Vpeak @ 100A 10/1000μs

2.4 1000BT GIGABIT ETHERNET SIGNAL PROTECTION CARD:
2.4.1 Data Rate.....1000Mb/s
2.4.2 Nominal Operating Voltage.....3.3Vpeak
2.4.3 Maximum Continuous Operating Voltage.....6Vpeak
2.4.4 Connector Style.....RJ45 Cat5e unshielded 100ohm
2.4.5 Protected Pins.....(1,2) (3,6) (4,5) and (7,8) pass through
2.4.6 Impedance.....85 to 115ohms
2.4.7 Frame Transmission.....100% Transmission @ 1000Mb/s
2.4.8 Surge Suppression.....< 25Vpeak @ 100A 10/1000μs

2.5 48VDC POWER PROTECTION CARD
2.5.1 Nominal Operating Voltage.....48VDC
2.5.2 Maximum Continuous Operating Voltage.....62Vpeak
2.5.3 Connector Style.....RJ-45 Cat5 unshielded 100ohm, 50ohm single ended
2.5.4 Protected Pins.....(1,2), (3,4) (5,6) and (7,8)
2.5.5 Unprotected Pins.....None
2.5.6 Surge Protection.....<85Vmax @ 100A 10/1000μs

3. ENVIRONMENTAL:
3.1. Operating/Storage Temperature:.....-40°C to +75°C
3.2. Relative Humidity:.....99% (non-condensing)

4. MECHANICAL:
4.1. Rack Chassis Material.....14 gauge aluminum, black powder coat
4.2. Rack Chassis Dimensions;
4.2.1. 12-Wide Chassis..... 4.50" tall, 11.38" wide, 7.95" deep (28.9cm x 11.4cm x 20.2cm)
4.2.2. 4-Wide Chassis..... 3.30" tall, 5.50" wide, 3.70" deep (13.9cm x 8.4cm x 9.4cm)
4.2.3. Weight, 12 wide chassis.....3.5lbs (1.6kg)
4.2.4. 4 wide chassis..... 2lbs (.91kg)

5. APPLICABLE INDUSTRY STANDARDS:

5.1. Bonding and Grounding ..... NEC 800.100 and 830.100
5.2. Safety ..... UL 497A
5.3. Surge Suppression GR-1089-2006
5.4. 10/100BT (Ethernet), 1000BT (Gigabit Ethernet) Communication Protocol ..... IEEE 802.3
5.5. T1/E1 and DS3 Communication Protocol ..... ITU 703

6. INSTALLATION: The DXR products are intended to be installed indoors. Refer to Figure 3 for the 12-wide chassis type and orient the chassis with the ground studs down. Refer to Figure 4 for the 4-wide chassis type and orient the chassis with the ground stud to the left. Note the ground stud hardware on the 4-wide chassis type can be easily moved over to the right side of the chassis. The 4-wide chassis is designed to adapt to 19" rack hole spacing. Mount the DXR as close to the protected equipment as possible with the screws at each corner of the chassis (hardware provided). A dedicated ¼-20 ground hardware on the unit must be connected to the nearest master ground bar system (crimp on lug and hardware provided). All data cabling is connected through the front of the DXR rack chassis. The 12-wide chassis incorporates a unique tray feature with tie down bar that allows easy connector access and ample cable management with strain relief. Each protection card is marked with the respective T1/E1, 10/100BT, 1000BT, 48VDC or DS3 signal type and a white area is provided for the user to mark the field wiring reference designation. Individual protection cards can be installed, added or replaced from the front via a screw along the top edge. The card mounting screw must be securely fastened to assure proper grounding and surge protection. Unused spaces in the DXR-12 rack chassis are protected by blank cover plates. The specific DS3 cable installation is shown in Figure 1 to clarify the communications requirements and cabling for the DXR DS3 protection module.

Optional flanges are available from the factory to convert the DXR 12 chassis to 19" RS-310-C compatible rack mount chassis (refer to figure 3). Remove the four screws that attach the rear panel mount bracket and use those fasteners to attach the rack mount conversion flanges. Mount the DXR into the 19" rack with 4 each 10-32 screws (hardware provided with the flange brackets) and bond the unit to ground as described. Alternate chassis styles are available. Refer to figure 4 for the mechanical details on the Quad-chassis kit option.

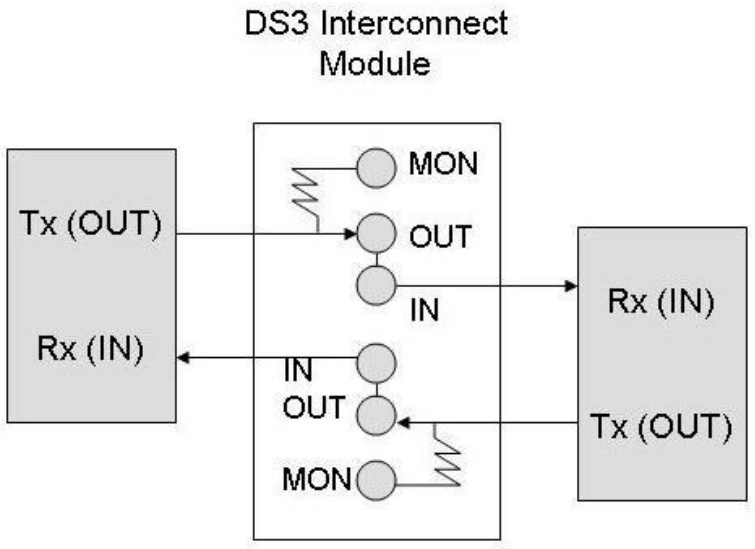


Figure 1 – DS3 Cable Interconnections

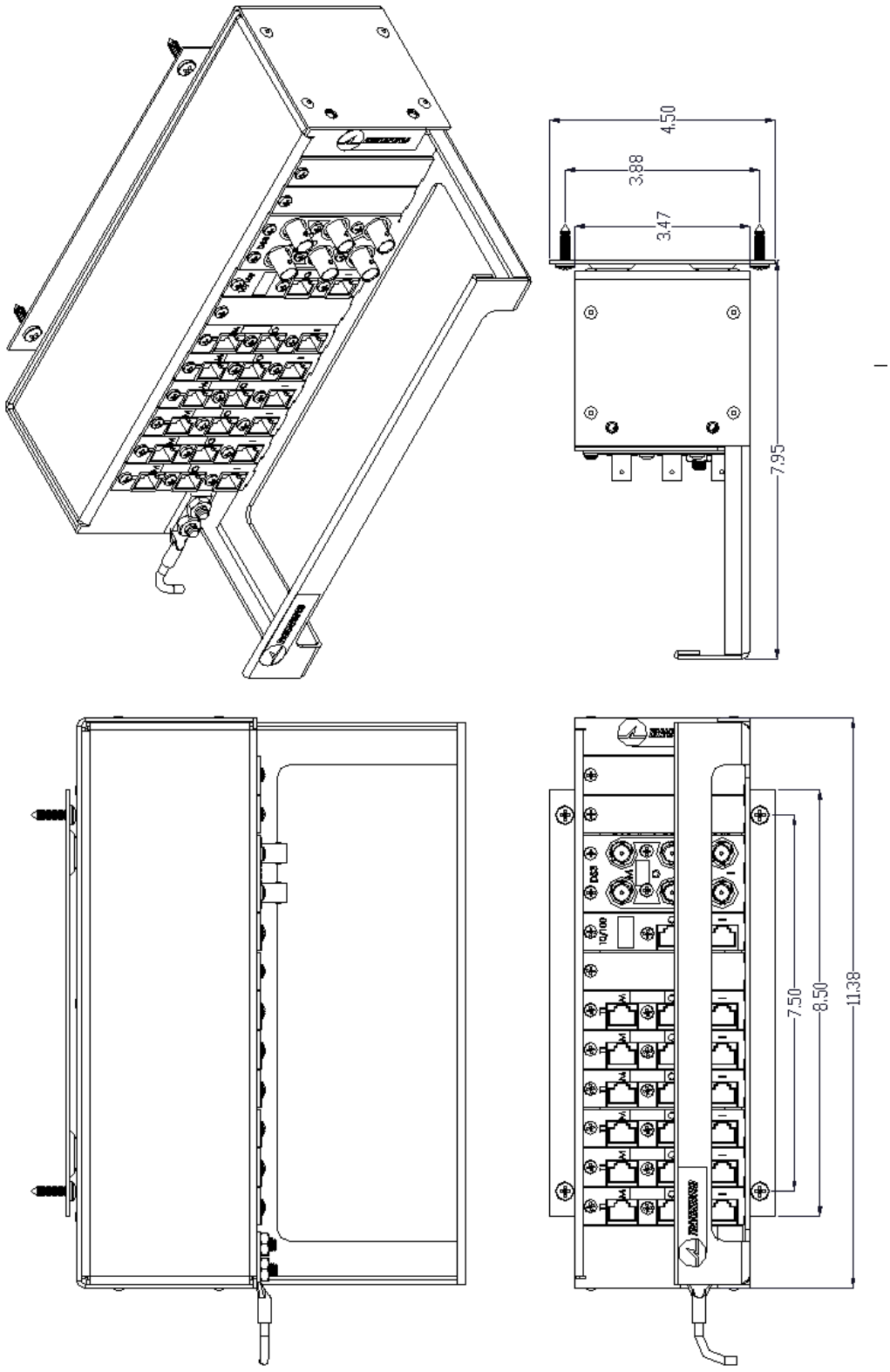


Figure 2. Mechanical outline drawing (inches)

SIZE	CAGE		
A	30992	1400-620-2	G

SCALE = N/A

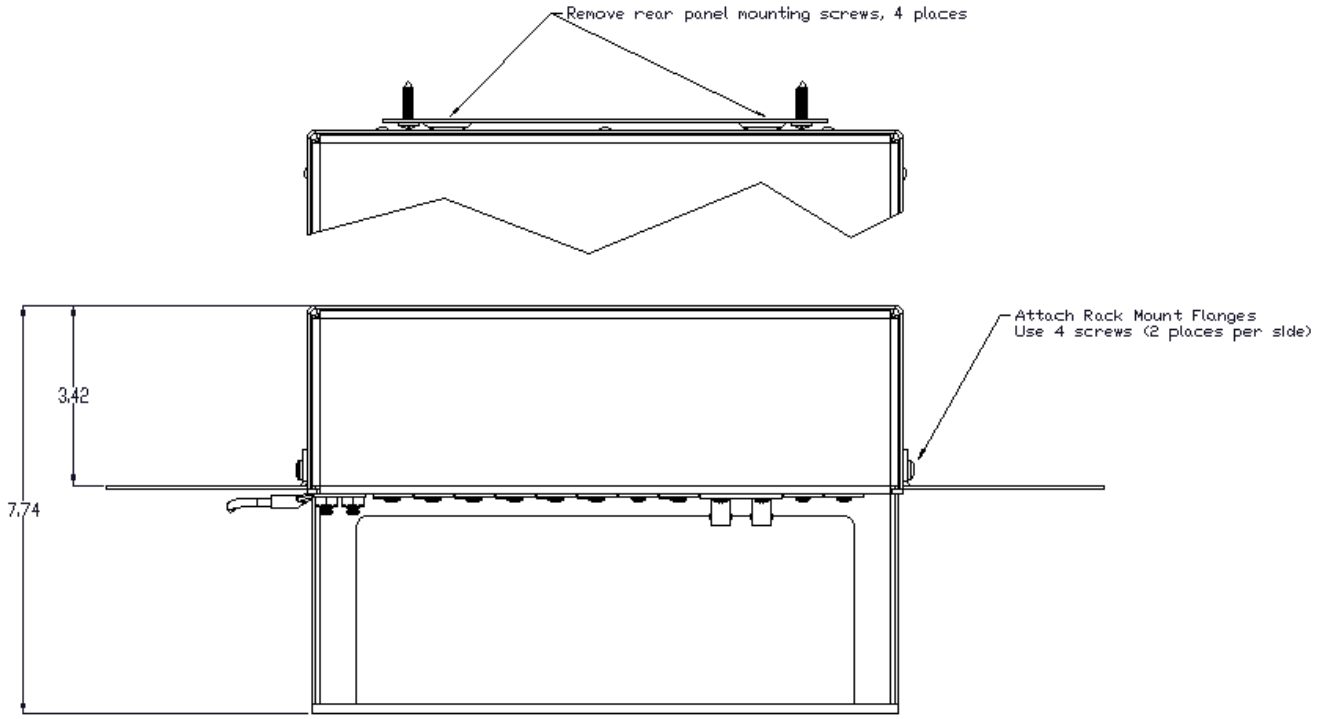


Figure 3. Optional 19” RS-310-C Adapter Mount Flanges (not provided with unit)

SIZE	CAGE		
A	30992	1400-620-2	G

SCALE = N/A

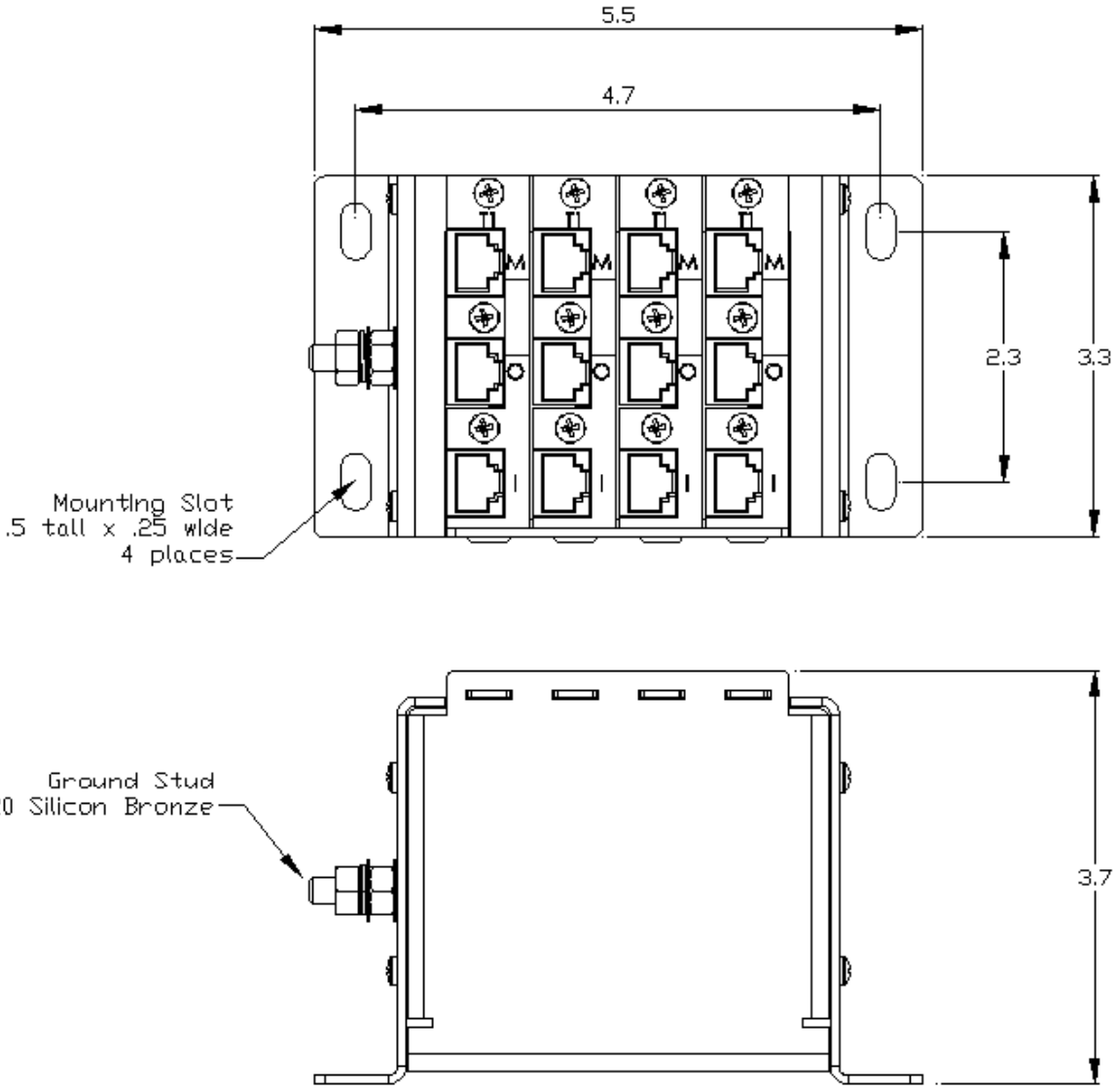


Figure 4. Optional Quad Chassis Style (suppressor card assemblies not included)