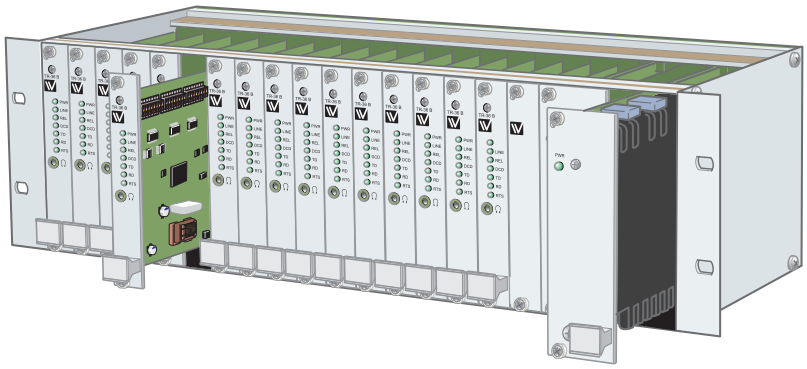
User Guide
6130-2200

RV-07B



19” rack system
PS-20 – Power card

www.westermo.com

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Safety

Before installation:

Read this manual completely and gather all information on the unit. Make sure that you understand it fully. Check that your application does not exceed the safe operating specifications for this unit.

This unit should only be installed by qualified personnel.

This unit should be built-in to an apparatus cabinet, or similar, where access is restricted to service personnel only.

The power supply wiring must be sufficiently fused, and if necessary it must be possible to disconnect manually from the power supply. Ensure compliance to national installation regulations.

This unit uses convection cooling. To avoid obstructing the airflow around the unit, follow the spacing recommendations (see Cooling section).

Before mounting, using or removing this unit:

Prevent access to hazardous voltage by disconnecting the unit from power supply. Warning! Do not open connected unit. Hazardous voltage may occur within this unit when connected to power supply.

Care recommendations

Follow the care recommendations below to maintain full operation of unit and to fulfil the warranty obligations.

This unit must not be operating with removed covers or lids.

Do not attempt to disassemble the unit. There are no user serviceable parts inside.

Do not drop, knock or shake the unit, rough handling above the specification may cause damage to internal circuit boards.

Do not use harsh chemicals, cleaning solvents or strong detergents to clean the unit.

Do not paint the unit. Paint can clog the unit and prevent proper operation.

Do not expose the unit to any kind of liquids (rain, beverages, etc). The unit is not waterproof. Keep the unit within the specified humidity levels.

Do not use or store the unit in dusty, dirty areas, connectors as well as other mechanical part may be damaged.

If the unit is not working properly, contact the place of purchase, nearest Westermo distributor office or Westermo Tech support.

Fibre connectors are supplied with plugs to avoid contamination inside the optical port.

As long as no optical fibre is mounted on the connector, e.g. for storage, service or transportation, should the plug be applied.

Maintenance

No maintenance is required, as long as the unit is used as intended within the specified conditions.

Agency approvals and standards compliance

Type	Approved Agency/ W-mo	Approval / Compliance
Safety	W-mo	EN 60950-1, IT equipment

Type tests and environmental conditions

Electromagnetic Compatibility			
Phenomena	**Test**	**Description**	**Test levels**
Dielectric strength	EN 60950	Signal port to other isolated ports	2 kVrms 50 Hz 1 min
		Power port to other isolated ports	3 kVrms 50 Hz 1 min
		Power port to other isolated ports with rated power <60 V)	2 kVrms 50 Hz 1 min 500 Vrms 50 Hz 1 min for GND
Environmental			
Temperature		Operating	–40 to +70°C
		Storage & Transport	–40 to +70°C
Humidity		Operating	5 to 95% relative humidity
		Storage & Transport	5 to 95% relative humidity
Altitude		Operating	2 000 m / 70 kPa
Reliability predicton (MTBF)	MIL C217F2	Operating	378900 h @ 25°C
Service life		Operating	10 year
Packaging			
Dimension W x H x D			485 x 135 x 180 mm
Weight			2,05 Kg
Degree of protection	IEC 529	Enclosure	IP 20
Cooling			Convection
Mounting			19” Rack

Westermo Teleindustri AB

Declaration of conformity

The manufacturer Westermo Teleindustri AB
SE-640 40 Stora Sundby, Sweden

Herewith declares that the product(s)

Type of product	Model	Art no
Rack	RV-07B	3130-3010

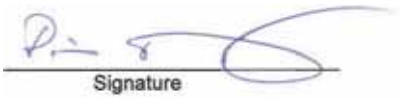
is in conformity with the following EC directive(s).

No	Short name
2006/95 EC	Low Voltage Directive – LVD

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 60950	Safety of information technology equipment	6 (2006)

The last two digits of the year in which the CE marking was affixed: 08



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Description

The RV-07B is a 19" rack which can hold up to 16 Westermo TR-36B modems as well as two PS-20 power supplies. The modem is designed to harsh industrial standards in applications where a number of modems are required in the same location. The rack has passed extensive approvals testing by both Westermo and external test houses, showing the rack can operate in environments with a high level of electromagnetic interference.

Using the RV-07B and TR-36B allows a number of modems to be connected to a back-plane thus eliminating unnecessary wiring and also saving space.

The modems slide into the chassis from the front and connect to the backplane that provides all the connectors for the RS-422/485, RS-232, PSTN and Leased Line interfaces. The RV-07B can be fully powered by either one or two Westermo PS-20 power supplies. With two power supplies, redundant supply is possible. In case of a power failure, the second power supply activates and an alarm signal can be set up through the built-in fault relay.

The RV-07B rack is designed for use with the Westermo TR-36B modem, which is an analogue V.34 PSTN and Leased Line modem supporting modulation data rates up to 33.6 Kbit/s. For more information, please refer to the TR-36B documentation.

- Holds up to 16 TR-36B modems
- RS-232, RS-422 / RS-485 interface
- 2- and 4-wire Leased Line
- Industrial environment transient protection on all interfaces
- Tri-Galvanic isolation (interface/line/supply)
- Redundant power supply and fault relay

Interface specifications

Connector P3

Power RV-07B, External DC Power	
Rated voltage	Depending on which card inserted in the slot.
Operating voltage	Depending on which card inserted in the slot.
Rated frequency	Depending on which card inserted in the slot.
Power consumption	Depending on which card inserted in the slot.
Polarity	Polarity dependent
Redundant power input	No
Isolation to	All other ports 2 kVrms 50 Hz 1 min (GND excluded) GND 500 kVrms 50 Hz 1 min
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

Connector P3 populated with 16 TR-36B modems

Power TR-36B*	
Rated voltage	12 to 48 VDC
Operating voltage	10 to 60 VDC
Rated current	2,0 A @ 12VDC 1,0 A @ 24VDC 0,64 A @ 48VDC
Rated frequency	DC
Power consumption	35 W
Startup current	3,6 Apeak
Polarity	Polarity dependent

* Maximum wire length to external power supply < 10.
External supply current capability for proper startup.

To minimise the risk of interference, a shielded cable is recommended when the cable is located inside 3 m boundary to the rails and connected to this port.

The cable shield should be properly connected (360°) to an earthing point within 1 m from this port. This earthing point should have a low impedance connection to the conductive enclosure of the apparatus cabinet, or similar, where the unit is built-in. This conductive enclosure should be connected to the earthing system of an installation and may be directly connected to the protective earth.

Connector X3,X4

Relay Alarm indication	
Isolation to	Power port 3kV$_{rms}$ 50 Hz 1 min Signal ports 2kV$_{rms}$ 50 Hz 1 min
Connection	Screw connector
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)

Connector P1,P2

Power RV-07B, External AC Power	
Rated voltage	Depending on witch power card in use
Operating voltage	Depending on witch power card in use
Rated current	Depending on witch power card in use
Rated frequency	Depending on witch power card in use
Inrush current, I2t	Depending on witch power card in use
Startup current 1)	Depending on witch power card in use
Polarity	Depending on witch power card in use
Redundant power input	Depending on witch power card in use
Isolation to	All other ports 3 kVrms 50 Hz 1 min
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

RV-07B populated with 16 TR-36B modems and supplied with two PS-20 HV power cards

Power RV-07B, External 230 V	
Rated voltage	100-240 VAC
Operating voltage	90-254 VAC
Rated current	470 mA @ 90 VAC 425 mA @ 100 VAC 310 mA @ 240 VAC 290 mA @ 254 VAC
Rated frequency	AC
Polarity	No polarity protection, an AC-product
Redundant power input	Yes
Isolation to	All other ports 3 kVrms 50 Hz 1 min
Connection	Detachable screw terminal
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

LED indicators

LED RV-07B	Status	Description
+24V (green led)	OFF	24 volt is not present
	ON	24 volt is present

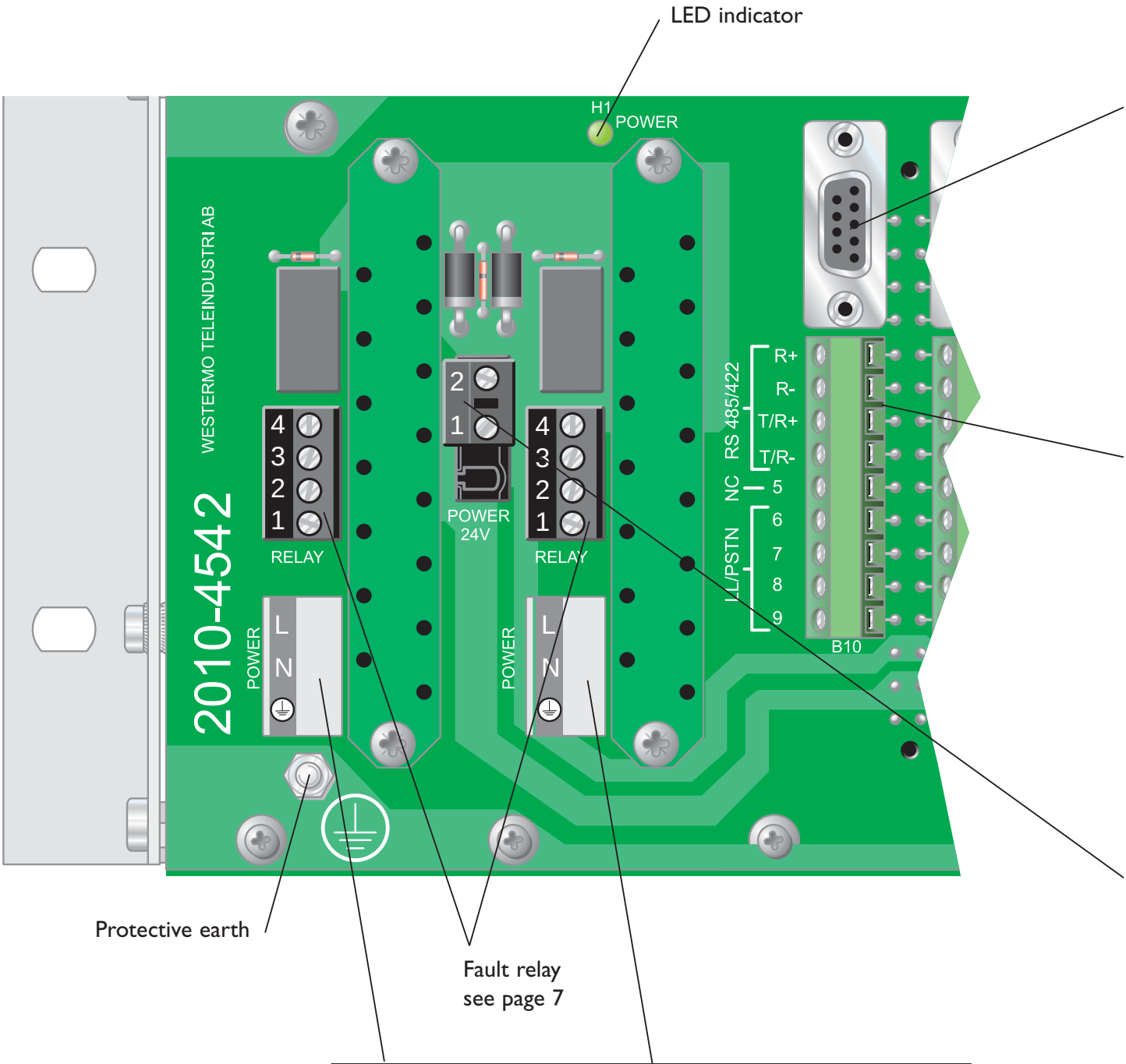
RV-07B with TR-36B

RS-422/485*	
Electrical specification	EIA RS-485 2-wire or 4-wire twisted pair
Data rate	300 bit/s to 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits, 9-12 bits
Protocol	Transparent
Retiming	Yes
Turn around time	<10 µs (half duplex)
Circuit type	TNV-1
Transmission range	≤ 1200 m, depending on data rate and cable type (EIA RS-485)
Settings	120 Ω termination and failsafe biasing 680 Ω
Protection	Installation Fault Tolerant (up to ±60 V)
Isolation to	Power port 3kV$_{rms}$ 50 Hz 1 min PSTN line 2kV$_{rms}$ 50 Hz 1 min Leased line 2kV$_{rms}$ 50 Hz 1 min RS-232 2kV$_{rms}$ 50 Hz 1 min
Connection	Screw connector
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

RS-232*	
Electrical specification	EIA RS-232
Data rate	300 bit/s to 115.2 kbit/s
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits, 9-12 bits
Protocol	Transparent
Retiming	Yes
Circuit type	SELV
Transmission range	Cable length <15 m
Isolation to	Power port 3kV$_{rms}$ 50 Hz 1 min PSTN line 2kV$_{rms}$ 50 Hz 1 min Leased line 2kV$_{rms}$ 50 Hz 1 min RS-422/485 2kV$_{rms}$ 50 Hz 1 min
Connection	9-pin D-sub female (DCE)
Shielded cable	Not required
Conductive housing	Isolated to all other circuits
Miscellaneous	Do not connect RS-232 and RS-422/485 simultaneously

* To minimise the risk of interference, a shielded cable is recommended when the cable is located inside 3 m boundary to the rails and connected to this port.

The cable shield should be properly connected (360°) to an earthing point within 1 m from this port. This earthing point should have a low impedance connection to the conductive enclosure of the apparatus cabinet, or similar, where the unit is built-in. This conductive enclosure should be connected to the earthing system of an installation and may be directly connected to the protective earth.



3-pos Power	Direction*	Description	Product marking
1	In	Protective earth	PE
2	In	AC: Neutral, DC: –Voltage	N
3	In	AC: Line, DC: + Voltage	L

* Direction relative this unit.

9-pos D-sub	Direction*	Description
1	Out	Data Carrier Detect (DCD)
2	Out	Received Data (RD)
3	In	Transmitted Data (TD)
4	In	Data Terminal Ready (DTR)
5	–	Signal Ground (SG)
6	Out	Data Set Ready (DSR)
7	In	Request To Send (RTS)
8	Out	Clear To Send (CTS)
9	Out	Ring Indicator (RI)

9-pos RS-422/485/ PSTN/ Leased line	Direction*	Description	Product marking
1	In	R+ (EIA RS-485 A')	R+
2	In	R– (EIA RS-485 B')	R–
3	In/Out	T+ (EIA RS-485 A)	T/R+
4	In/Out	T– (EIA RS-485 B)	T/R–
5	–	Not used	NC
6	In/Out	PSTN /LL 4-wire transmit/ LL 2-wire Receive/transmit	–
7	In/Out	PSTN /LL 4-wire transmit/ LL 2-wire Receive/transmit	–
8	In/Out	LL 4-wire Receive/ LL 2-wire Receive/transmit at LL PSTN backup	–
9	In/Out	LL 4-wire Receive/ LL 2-wire Receive/transmit at LL PSTN backup	–

2-pos External	Direction*	Description	Product marking
1	In	Common voltage	COM
2	In	+ Voltage	+V

* Direction relative this unit.

Public Switched Telephone Network (PSTN)	
Electrical specification	Public Switched Telephone Network
Data rate	300 bit/s to 33.6 kbit/s
Protocol	B103, B212, V21, V22, V22B, V23C, V32, V32B, V34
Circuit type	TNV-3
Isolation to	Power port 3kV$_{rms}$ 50 Hz 1 min PSTN line 2kV$_{rms}$ 50 Hz 1 min Leased line 2kV$_{rms}$ 50 Hz 1 min RS-422/485 2kV$_{rms}$ 50 Hz 1 min RS-232 2kV$_{rms}$ 50 Hz 1 min
Connection	Screw connector
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

Leased Line (LL)	
Electrical specification	2- or 4-wire Leased Line
Data rate	300 bit/s to 33.6 kbit/s
Protocol	B103, B212, V21, V22, V22B, V23C, V32, V32B, V34
Transmission range	PSTN 30 dB Leased Line max 40 dB
Protection	Installation Fault Tolerant (up to ±60 V)
Isolation to	Power port 3kV$_{rms}$ 50 Hz 1 min PSTN line 2kV$_{rms}$ 50 Hz 1 min RS-422/485 2kV$_{rms}$ 50 Hz 1 min RS-232 2kV$_{rms}$ 50 Hz 1 min
Connection	Screw connector
Connector size	0.2 – 2.5 mm^2 (AWG 24 – 12)
Shielded cable	Not required

Fault relay*

Relay	Direction	Description	Product marking
1	In/Out	Signal	1
2	In/Out	Normally closed	2
3	In/Out	Normally open	3
4		Not in use	4

* The switch is incorporated with a user configurable fault contact (STAT pins) that enables network and switch faults to be highlighted, see below.

The fault contact is a potential free, normally closed solid-state component and therefore requires power to control the device. As standard the fault contact will always highlight Power Supply Failure.

Description

PS-20 – Power card

The PS-20 is a 90-254 VAC power supply designed to power the RV-07 and the RV-07B racks. The power supply is designed to harsh industrial standards in applications where a number of modems are required in the same location. The rack has passed extensive approvals testing by both Westermo and external test houses, showing the rack can operate in environments with a high level of electromagnetic interference.

- Industrial environment transient protection
- Tri-Galvanic isolation
- Redundant power supply

Interface specifications

Power PS-20 HV	
Rated voltage	100 to 240 VAC
Operating voltage	90 to 254 VAC
Mains/line current at 90VAC	1,6A
Output current	0 to +50°C 4,2A 70°C 3,2A
Rated frequency	50 – 60 Hz
Start-up current at 230VAC	< 20A
Polarity	Polarity independent
Connection	RV-07B

PS-20 HV is intended to be insert into RV-07B.

Location of LED's

LED PS-20 HV	**Status**	**Description**
PWR (green led)	OFF	PS-20 HV has no power
	ON	PS-20 HV has power

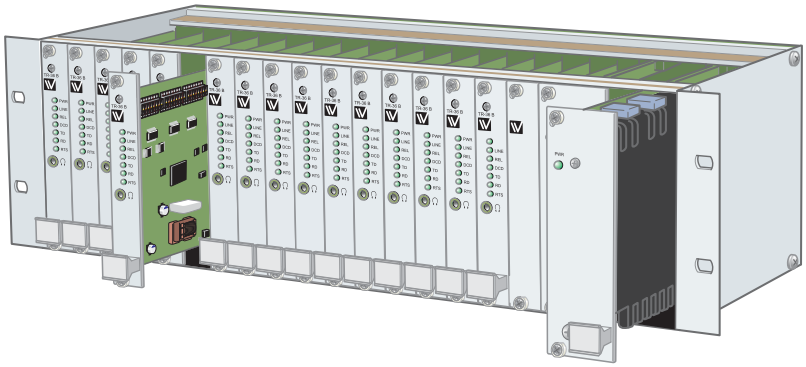
Type tests and environmental conditions

Electromagnetic Compatibility			
Phenomena	**Test**	**Description**	**Test levels**
CE	EN 50082-1	Emission	
	EN 55011	Emission	Class B
CE	EN 61000-6-2	Immunity	Class 3
	EN 61000-4-2	Immunity	
	EN 61000-4-3	Immunity	
	EN 61000-4-4	Immunity	
	EN 61000-4-5	Immunity	
	EN 61000-4-6	Immunity	
	EN 61000-4-11	Immunity	
CE	EN 60950	Safety	Protection Class 1
	UL1950		
High voltage test	EN 60950	Input-output	4,3 kV DC
		Input-PE	2,2 kV DC
		Output-PE	0,7 kV DC
UL	1950		E 153809
Environmental			
Temperature		Operating	0 to +70°C
		Storage & Transport	-20 to +85°C
Climatic test	IEC 68-2-38		
Reliability prediction (MTBF)		Operating At full load	270000h (5V-220000h)
Service life		Operating	10 year
Shock and Vibration	EN 60068-2-6		Acceleration 2g
Power supply Maintenance-free			Yes
Packaging			
Dimension W x H x D			30 x 100 x 160 mm
Weight			0,55 kg
Degree of protection	IEC 529	Enclosure	IP 20
Cooling			Convection
Mounting			RV-07B 19”Rack

Mounting /Removal

Before mounting or removing the unit:

This unit has one separate protective earthing terminal (marked with "symbol"), while the unit is provided with two mains supply connectors. The grounding terminal of these mains supply connectors is a functional earthing point only Prevent access to hazardous voltages by disconnecting the unit from AC/DC mains supplies and all other electrical connections. A protective earthing conductor should be connected to the protective earthing terminal and have a cross-sectional area of at least 1.5 mm^2. Prevent damage to internal electronics from electrostatic discharges (ESD) by discharging your body to a grounding point (e.g. use of wrist strap).



Mounting

This unit should be horizontally mounted with screws in the holes located in the left and right hand brackets on the unit.

Connect the protective earthing conductor to the protective earthing terminal, before connection of any AC/DC mains supply or other electrical connections.

As this unit uses convection cooling, it is important to avoid obstructions that prevent normal vertical airflow through the unit. For this reason a clearance of 1U below and 2U above the unit is recommended. These clearance distances should be increased if heat from another unit is likely to cause an undesirable rise in temperature. Under no circumstances should the air temperature around the unit exceed 15 degrees C above the operating temperature of any modem installed in it. The unit should be installed in a cabinet that has suitable fans and filters so that good airflow is maintained without the ingress of dirt or dust.

Removal

Disconnect all AC/DC mains supplies and other electrical connections before the removal of protective earthing conductor from the protective earthing terminal.

Note:

- Always add modems from one end in the rack.
- To ensure proper galvanic connection between front panels, do not leave empty slots between modems.

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