



Viper-008

Unmanaged 8-port Ethernet Switch

General Information

Legal Information

The contents of this document are provided “as is”. Except as required by applicable law, no warranties of any kind are made in relation to the accuracy and reliability or contents of this document, either expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Westermo reserves the right to revise this document or withdraw it at any time without prior notice.





Under no circumstances shall Westermo be responsible for any loss of data or income or any special, incidental, and consequential or indirect damages howsoever caused.

More information about Westermo can be found at www.westermo.com

Safety and Regulations

Warning signs are provided to prevent personal injury and/or damages to the product.

The following levels are used:

Level of warning	Description	Consequence personal injury	Consequence material damage
 WARNING	Indicates a potentially hazardous situation	Possible death or major injury	Major damage to the product
 CAUTION	Indicates a potentially hazardous situation	Minor or moderate injury	Moderate damage to the product
 NOTICE	Provides information in order to avoid misuse of the product, confusion or misunderstanding	No personal injury	Minor damage to the product
 NOTE	Used for highlighting general, but important information	No personal injury	Minor damage to the product

Before Installation

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



SAFETY DURING INSTALLATION

The product must be installed and operated by qualified service personnel and installed into an apparatus cabinet or similar, where access is restricted to service personnel only.

Refer to chapter Compliance Information to see the required level of qualified service personnel according to safety standards.

Before energising and connecting communication cables to the product, ensure a protective earthing conductor is first connected to the protective earthing terminal (only valid for metallic housings). Westermo recommends a cross-sectional area of at least 4 mm².

Upon removal of the product, disconnect the product from the power supply and all other communication ports before disconnecting the protective earthing conductor



HAZARDOUS VOLTAGE

Do not open an energized product. Hazardous voltage may occur when connected to a power supply.



PROTECTIVE FUSE

The power supply wiring must be sufficiently fused. The fuse must be IEC 60127 certified and rated for T1.25 A and 250 V.

It must be possible to disconnect manually from the power supply. Ensure compliance to national installation regulations.

This product has no internal fuse and should be connected via an external fuse for protection.



REDUCE THE RISK OF FIRE

To reduce the risk of fire, use only telecommunication line cords with a cable diameter of AWG 26 or larger. Regarding power cable dimensions, see Interface Specifications.



HOT SURFACE

Be aware that the surface of this product may become hot. When it is operated at high temperatures, the external surface may exceed Touch Temperature Limit according to the product's relevant electrical safety standard.



ELECTROSTATIC DISCHARGE (ESD)

Prevent electrostatic discharge damages to internal electronic parts by discharging your body to a grounding point (e.g. use a wrist strap).

Care Recommendations

Follow the care recommendations below to maintain full operation of product and to fulfill the warranty obligations:

- Do not drop, knock or shake the product. Rough handling above the specification may cause damage to internal circuit boards.
- Use a dry or slightly water-damp cloth to clean the product. Do not use harsh chemicals, cleaning solvents or strong detergents.
- Do not paint the product. Paint can clog the product and prevent proper operation.

If the product is used in a manner not according to specification, the protection provided by the equipment may be impaired.

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

Product Disposal



This symbol means that the product shall not be treated as unsorted municipal waste when disposing of it. It needs to be handed over to an applicable collection point for recycling electrical and electronic equipment.

By ensuring this product is disposed of correctly, you will help to reduce hazardous substances and prevent potential negative consequences to both environment and human health, which could be caused by inappropriate disposal.

Compliance Information

Agency Approvals and Standards Compliance

Type	Approval / Compliance
EMC	EN 61000-6-1, Immunity residential environments
	EN 61000-6-2, Immunity industrial environments
	EN 61000-6-4, Emission industrial environments
	EN 50121-3-2, Railway applications - EMC: Rolling stock - Apparatus
	EN 50121-4, Railway signalling and telecommunications apparatus
	IEC 62236-4, Railway signalling and telecommunications apparatus
Environmental	EN 50155, Railway applications - Electronic equipment used on rolling stock
	EN 61373, Railway applications - Rolling stock equipment, shock and vibration tests
	EN 50124-1, Railway applications - Insulation coordination
	IEC 60028-2-27, (shock 10 g, 11 ms), IEC 60068-2-64
	IEEE 1478, Environmental conditions for transit rail car electronic equipment
Fire protection	EN 45545-2, Fire protection on railway vehicles
Safety	EN/IEC/UL 62368-1, Safety Requirements for audio/video, information and communication technology equipment

EN/IEC/UL 62368-1 Notice

This product has been tested and found compliant to EN/IEC/UL 62368-1, Safety for Communication Technology. In accordance with the definitions of the standard, this product shall be handled by ordinary personnel. Energy source classifications are according to following:

EN/IEC/UL 62368-1 notice		
Electrical energy source	Power port	ES1 (at 24 VDC) ES3 (at 110 VDC)
	Serial port	ES1
	Ethernet port	ES1, TNV-1
Power source	Power port	PS3
Thermal energy source	Enclosure	TS1
Mechanical energy source	Enclosure	MS1 (MS3 for wall or ceiling mounting)
Radiation energy source	N/A	N/A

FCC Part 15.105 Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ⚡ Reorient or relocate the receiving antenna
- ⚡ Increase the separation between the equipment and receiver
- ⚡ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- ⚡ Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity

Hereby, Westermo declares that this product is in compliance with applicable EU directives and UK legislations. The full declaration of conformity and other detailed information is available at www.westermo.com/support/product-support.



Type Tests and Environmental Conditions

Phenomena	Test	Description	Test levels
ESD	EN 61000-4-2	Enclosure contact	± 6 kV (crit A)
		Enclosure air	± 8 kV (crit A)
RF field AM modulated	IEC 61000-4-3	Enclosure	20 V/m 80% AM (1 kHz), 80 - 2500 MHz (crit A) 10 V/m 80% AM (1 kHz), 2700 - 6000 MHz (crit A)
Fast transient	EN 61000-4-4	Ethernet ports	± 2 kV (crit A)
		Power port	± 2 kV (crit A)
		Earth port	± 2 kV (crit A)
Surge	EN 61000-4-5	Fault port	± 2 kV line to earth (crit A)
		Ethernet ports	± 2 kV line to earth (crit A)
		Power port	± 2 kV line to earth, ± 2 kV line to line (crit A)
RF conducted	EN 61000-4-6	Ethernet ports	10 V 80% AM (1 kHz), 0.15 - 80 MHz (crit A)
		Power port	10 V 80% AM (1 kHz), 0.15 - 80 MHz (crit A)
Power frequency magnetic field	EN 61000-4-8	Enclosure	1000 A/m 50 Hz 300 A/m 16.7 Hz, 60 Hz, DC (crit A)
Pulse magnetic field	EN 61000-4-9	Enclosure	300 A/m (crit A)
Voltage dips and interruption	EN 50155	DC power ports	10 ms interruption, 100 ms ±40% voltage variation
Radiated emission	CISPR 16-2-3 ANSI C63.4 (FCC part 15)	Enclosure	Class B (30 - 6000 MHz)
Conducted emission	CISPR 16-2-1	DC power port & Ethernet ports	Class B
Dielectric strength	EN 50155	Ethernet ports to other isolated ports	500 VAC 1 min
		Power & Fault port to other isolated ports	1500 VAC 1 min
Temperature	EN 60068-2-1	Operating	-40 to +70°C
	EN 60068-2-2	Storage & Transport	-40 to +85°C
Humidity	EN 60068-2-30	Operating	5 to 95% relative humidity
		Storage & Transport	5 to 95% relative humidity
Altitude		Operating	2000 m / 70 kPa
Reliability prediction (MTBF)	MIL-C217F2, GB	Operating	150 years @ 20 °C 147 years @ 40 °C 135 years @ 60 °C
Service life		Operating	10 years
Vibration, random simulated long life	IEC 60068-2-64, Cat. 1 class B (EN 61373)	Not Operating	Vertical: 7.9 m/s ² Transverse: 7.9 m/s ² Longitudinal: 7.9 m/s ² 3 x 5 h
Vibration, random functional	IEC 60068-2-64, Cat. 1 class B (EN 61373)	Operating	Vertical: 1.0 m/s ² Transverse: 1.0 m/s ² Longitudinal: 1.0 m/s ² 3 x 10 min
Shock, half sine pulses	IEC 60068-2-27, Cat. 1 class B (EN 61373)	Operating	Vertical: 50 m/s ² Transverse: 50 m/s ² Longitudinal: 50 m/s ² 30 ms, 3 x 6 shocks

Phenomena	Test	Description	Test levels
Shock, sawtooth	IEC 60068-2-27, Cat. 1 class B (IEEE1478-2001)	Operating	Vertical: 100 m/s ² Transverse: 100 m/s ² Longitudinal: 100 m/s ² 11 ms, 3 x 6 shocks
Enclosure	UL 94	Nickel coated zinc	Flammability class V-1
Dimension W x H x D			175 x 100 x 53,4 mm
Weight			0.9 kg
Degree of protection	IEC 529	Enclosure	IP 65 when all ports are protected/ connected else IP 40
Cooling			Convection
Mounting			DIN Rail or wall mounted

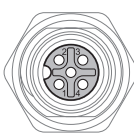
Description

Viper-008 is a unmanaged switch developed for rail and industrial applications. To meet the environmental requirements from rail and harsh industrial applications the switch has rugged M12 Ethernet connectors and full metal housing. The IP65 sealed metal case make it robust and allows for the surrounding air temperature to be between -40 to +70°C. There are no sensitive or fragile components, hardening the product against shock and vibration making these units suitable for rolling stock usage. The power supply operates over a wide input range from 24 to 110 VDC.

Interface Specifications

Power and fault relay port PWR	
Rated voltage	24 to 110 VDC
Operating voltage	16.8 to 143 VDC (14.4 to 154 VDC for 100 ms)
Rated current	110 mA @ 24 VDC 33 mA @ 110 VDC
Rated frequency	DC
Inrush current, I ² t	Max 0.02 A ² s @ 24 - 110 VDC
Polarity	Reverse polarity protected
Startup current*	300 mA @ 16.8 VDC
Redundant power input	No
Isolation to	Connections X1 - X8 and to ground, 1500 VAC. Fault relay belongs to the same isolation group as the power supply lines (fault relay signals are also contained within PWR).
Connection	4 pin male M12 connector with A-code
Connector size	M12, recommended cable area 0.5 mm ² recommended (minimum 0.25 mm ²), cable dimensions depend on choice of M12 connector
Shielded cable	Not required, twisted pair is recommended
Fault relay resistance	< 10 Ω

* If external power supply is used it must meet specified startup current.

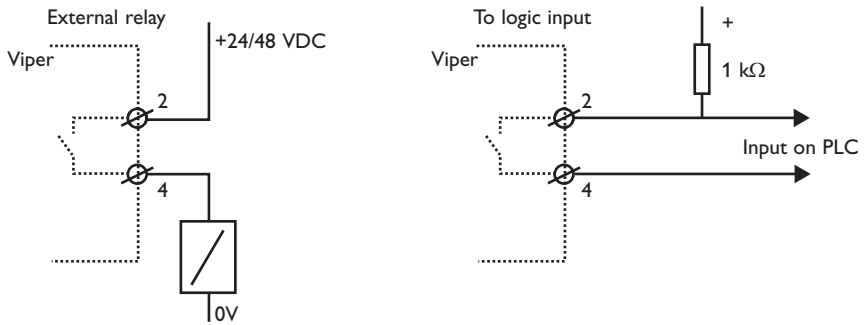
 M12 A-Coded Power Connector	Position	Direction	Description
	1	U+	Positive supply voltage
	2	Out	Alarm relay (status) +
	3	0 V	Negative supply voltage
	4	Out	Alarm relay (status) -
Housing	Shield	Chassis of product (ground)	

Fault Contact

The Viper switch is equipped with a potential free normally closed fault contact. The fault contact is a solid state component (relay) that requires power to work and it is transient protected. Additionally, the fault contact is opened when any of the following conditions is met:

- No voltage on the power supply pin, a voltage level outside the legal voltage range or current limitation on the voltage source is applied on the power input.

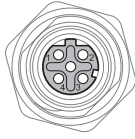
Description of how connection to the fault contact could be done is shown below. The relay is closed when the unit is OK and open at failure. The relay is of semiconductor type (no moving parts). It is specified for max current 250 mA continuous, 500 mA peak (10 ms), operational voltage up to 110 V, protected by a 150 VDC-varistor, ON-resistance less than 10 Ohm, and leakage current max 1 μ A.



Service Port

The service port should not be used by non other than the Westermo Technical Support team. Do not connect any device or cable to the Service Port.

Ethernet TX port X1 to X8	
Electrical specification	IEEE std 802.3.
Data rate	10 Mbit/s or 100 Mbit/s
Duplex	Full or half
Circuit type	TNV-1
Transmission range	100 m
Isolation to	Other Ethernet ports, 500 VAC PWR, 1500 VAC
Galvanic connection to	None, except for shielded contact to housing
Connection	4-pole M12 female with D-code
Shielded cable	Not required, twisted pair is recommended
Conductive chassis	Yes
Number of ports	8 Ethernet (X1-X8)

	Position	Direction	Description
	1	Out	Transmit Data +
	2	In	Receive Data +
	3	Out	Transmit Data -
	4	In	Receive Data -
Housing	Shield	Chassis of product (ground)	

Auto MDI/MDI-X mode is supported. The table shows signals in MDI mode.

Location of Interface Ports, LEDs

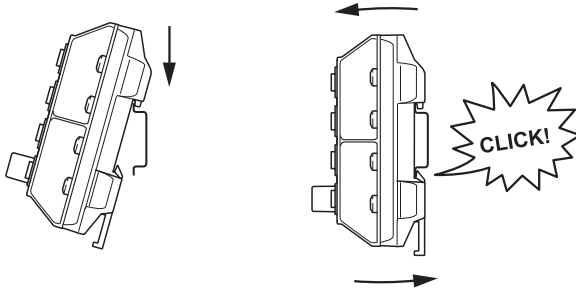
LED indicators

LED	Status	Description
PWR	GREEN	Unit indicates no fault
	RED	Unit indicated fault
X1 to X8	OFF	No Link
	GREEN	Link is up
	GREEN FLASH	Data is transmitted



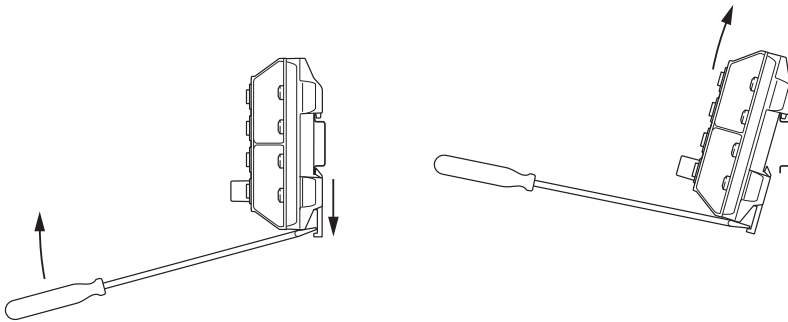
Mounting, DIN-rail

This unit can be mounted on 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet or similar. Snap on mounting, see figure.



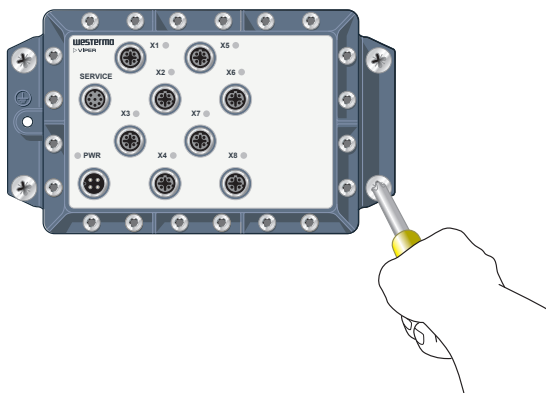
Removal

Press down the support at the back of the unit using a screwdriver. See figure.



Wall Mounting

There are four 6 mm bore holes intended for mounting the unit. The unit can be mounted vertical or horizontal. Use four M6 screws with 12 mm washer on a flat and stable surface.



Removal

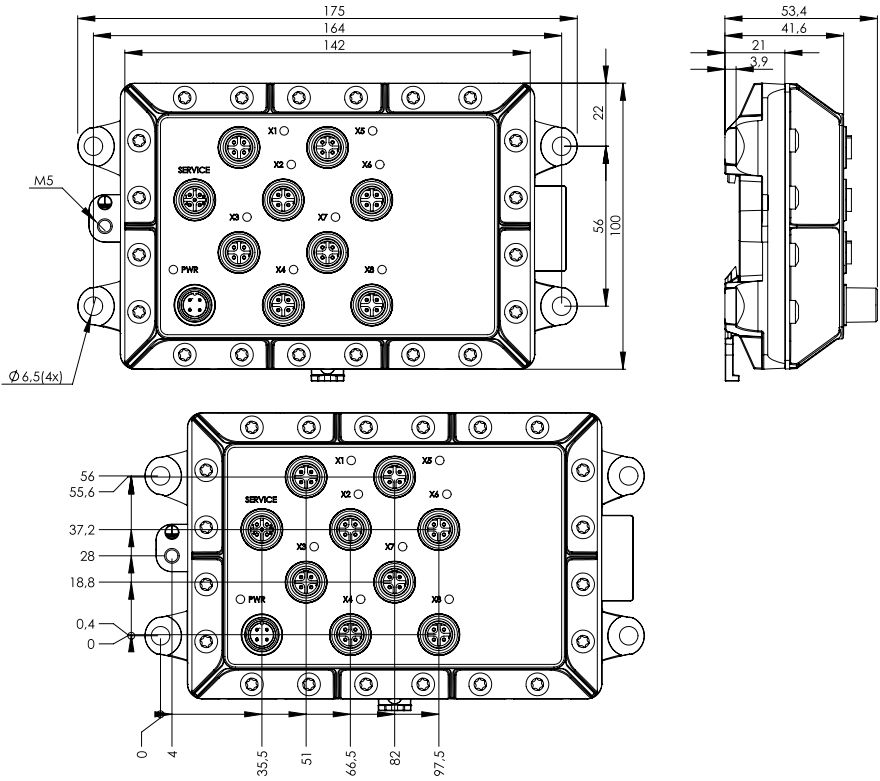
Disconnect all cables and unscrew the unit from the wall.

Cooling

This unit uses convection cooling. Avoid obstructing the airflow around the unit. Spacing is recommended for the use of unit in full operating temperature range and service life.

Dimensions

Measurements are stated in millimeters.



WESTERMO

Westermo • Metallverksgatan 6, SE-721 30 Västerås, Sweden

Tel +46 16 42 80 00 Fax +46 16 42 80 01

E-mail: info@westermo.com

www.westermo.com