www.westermo.com

Viper 408

Managed 8-port Ethernet Switch

General Information

Legal Information

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

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This product includes software developed by third parties, including Free/Libre Open Source Software (FLOSS). The specific license terms and copyright associated with the software are included in each software package respectively. Please visit the product web page for more information.

Upon request, the applicable source code will be provided. A nominal fee may be charged to cover shipping and media. Please direct any source code request to your normal sales or support channel.

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 by qualified service personnel and built in to an apparatus cabinet or similar, where access is restricted to service personnel only.

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

During installation, 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, ensure that the protective earthing conductor is disconnected last.

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

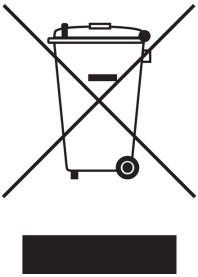
Follow the care recommendations below to maintain full operation of product and to fulfill the warranty obligations:

- 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 61000-6-3, Emission residential 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
	E-Mark, Road Vehicles, E1 no: 10 R - 047216*
Environmental	EN 50155 Railway applications - Electronic equipment used on rolling stock
	EN 61373 - Railway applications - Rolling stock equipment. Shock and vibration tests
	IEEE 1478 - Environmental conditions for transit rail car electronic equipment
	EN 50124-1 - Railway applications - Insulation coordination
	IEC 60068-2-27, (shock 10 g. 11 ms), IEC 60068-2-64
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

Note * _ Applicable only for 3641-6360

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 - 2700 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 EN 60068-2-2	Operating	-40 to +70°C
		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-HDBK- 217F, GB	Operating	118 years @ 25°C 116 years @ 40°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

Phenomena	Test	Description	Test levels
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
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 50 mm
Weight			0.9 kg
Degree of protection	IEC 529	Enclosure	IP 65 when all ports are protected/ connected
Cooling			Convection
Mounting			Wall mounted

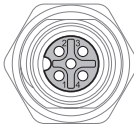
Description

Viper-408 is a 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 switch fullfill IP65 degree of protection when all ports are protected/connected. Our unique FRNT (Fast Recovery of Network Topology) technology is the fastest protocol on the market to reconfigure a network in the event of any failure of a link or hardware. Real-time properties are implemented in order to achieve determinism for real time critical applications. Viper-408 supports QoS (Quality of Service) with four priority queues and strict priority scheduling as well as HoL (Head of Line Blocking Prevention). All to assure that the data network is deterministic.

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 for 100 ms)
Rated current	140 mA @ 24 VDC 40 mA @ 110 VDC
Rated frequency	DC
Inrush current, I^2t	Max 0.02 A^2s @ 24 - 110 VDC
Startup current *	300 mA @ 16.8 VDC
Polarity	Reverse polarity protected
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
Operating voltage	Up to 110 VDC
Max continuous current	250 mA

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

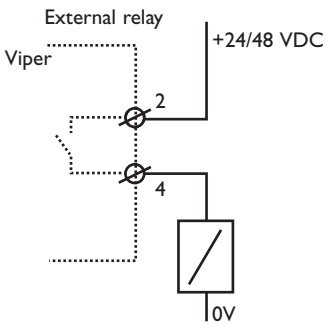
	Position	Direction	Description
 M12 A-Coded Power Connector	1	U+	Positive supply voltage
	2	Out	Alarm relay (status) +
	3	0 V	Negative supply voltage
	4	Out	Alarm relay (status) -
	Housing	Shield	Chassis of product (ground)

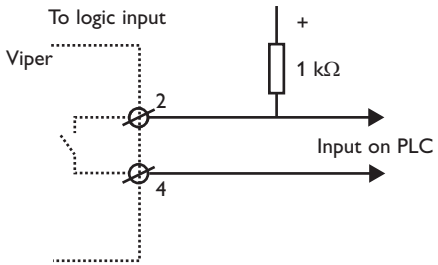
Fault Contact

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.
- Link alarm i.e. missing link on any Ethernet port that has link alarm enabled.
- Redundancy Mode activated i.e. one or more FRNT link is down.

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 µA.





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.

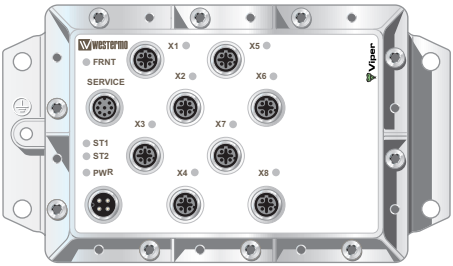
Ethernet TX port X1 to X8	
Electrical specification	IEEE std 802.3. 2000 Edition
Data rate	10 Mbit/s or 100 Mbit/s, manual or auto
Duplex	Full or half, manual or auto
Circuit type	TNV-1
Transmission range	150 m
Isolation to	Other Ethernet ports, 500 VAC PWR, 1500 VAC
Galvanic connection to	None, except for shielded contact to housing
Connection	4-pole M12 female with D-code
Shielded cable	Not required, twisted pair is recommended
Conductive housing	Nickel plated zinc, metal housings of X1-X8 also connected to the housing
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)

Location of Interface Ports, LEDs

LED indicators

LED	Status	Description
PWR	GREEN	Unit indicates no fault
	RED	Unit indicated fault
	FLASH	Connected to IP Configuration tool
FRNT	OFF	FRNT is not enabled or not supported
	GREEN	FRNT is running and the switch is configured as member switch in the ring.
	GREEN FLASH	FRNT is running and the switch is configured as Focal Point
	RED	FRNT Error
ST1	GREEN	Indicates STP root
ST2	NC	
X1 to X8	OFF	No Link
	GREEN	Link is up
	GREEN FLASH	Data is transmitted
	YELLOW ON	Port larm and no link. If RSTP/FRNT mode are activated, port is blocked.



Configuration

The units can easily be configured via the onboard Web based configuration tool. Local IP addresses can also be configured by using the Westermo IP Configuration tool, from the IP Configuration tool it is then possible to browse into the unit for further configuration.

IP Address

When delivered, the default IP address of the Viper is 192.168.2.200.

Default gateway 192.168.2.200

If the default address of the unit is valid in the connected network it is possible to access the unit directly from a web browser.

Change Local IP Address

The local address of Viper can be configured using the IP Configuration tool, then it is possible to browse into the unit for further configuration. The IP Configuration program is available on the CD or for download from the Westermo web page: http://www.westermo.com, choose Downloads/Software/Ethernet/Ethernet switches Name: IP config Westermo.zip

Install the software and start the application from a PC on the network connected to the same network as the Viper. Make sure that the Default IP of the configuration software (see figure below) is in the same subnet as your PC.

If you are not sure about the subnet - consult your network administrator. IP Config version must me 10.0.0 or higher.

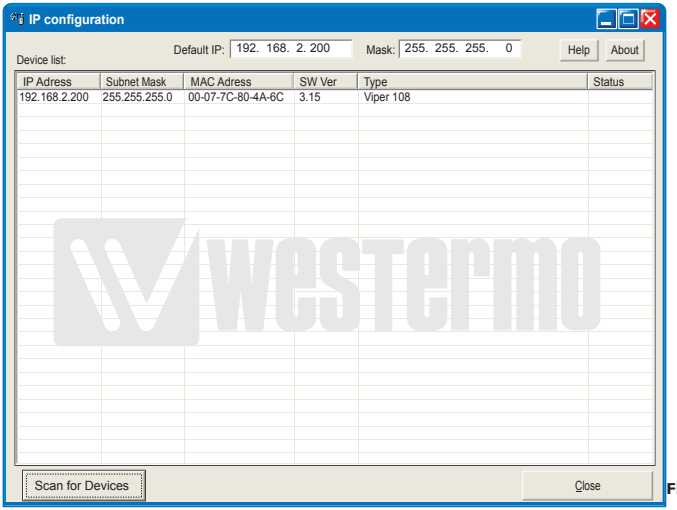


Figure 1

By clicking the “Scan for Devices” button the IP Configuration tool will detect the switches/routers in the network. The software will list all Westermo managed switches or routers connected to the network. Information as in the figure 1 will appear for each detected unit connected to the same network as your PC.

If you only want to change the IP address and the subnet mask, this can be done within the IP config tool.

By clicking the listed Viper that you wish be re-configured you will be asked if you would like to access via web figure 2. Click the abort button, enter the preferred IP address, Subnet mask and IP gateway address and click the Set button to confirm the settings in the unit (see figure 3).

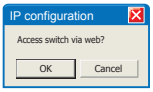
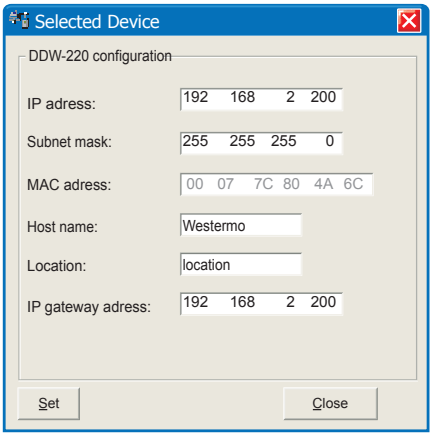


Figure 2

If you are not sure about the settings - consult your network administrator.



Click the Close button to get back to main view. You will then be asked if you would like to quit. Click the OK button, figure 4, and you will be back to the main view of the IP Configuration program(see figure 1).

Figure 3

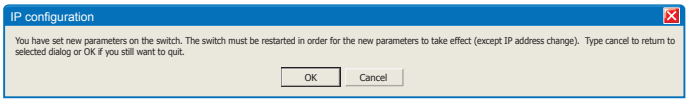
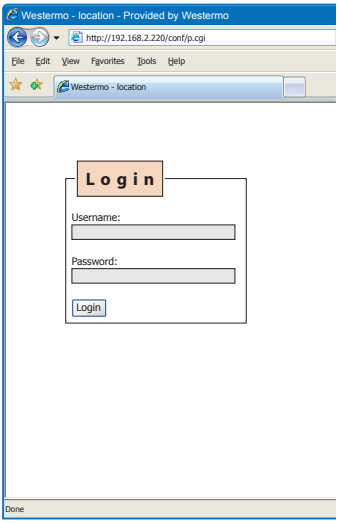


Figure 4

Click the Scan for switches button again and the settings you configured will appear in the list. Now you can access the Viper via the browser for further configuration by clicking the unit with an IP address that fits your subnet. Figure 2 will appear and when you click the OK button and a web browser will be opened and redirected to the Viper unit log in page (see figure 5).



Log in via Web

You will be prompted with a Login screen where the default settings for Username and Password are:

Username: admin
Password: westermo

Figure 5

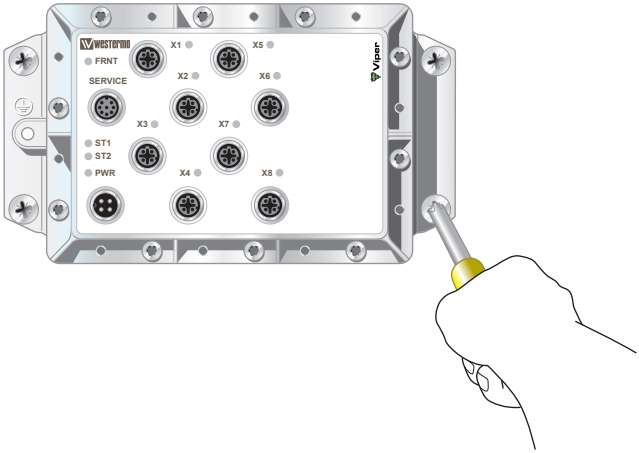
The unit can be easily configured via the on-board Web based configuration tool. The network interface and switch properties can be configured and stored. The Web tool also has an extended integrated help function describing all configuration options.

Max 10 characters can be used in the login. The following characters are not valid.

ASCII 34 = "
ASCII 35 = #
ASCII 39 = ”
ASCII 40 = (
ASCII 92 = \

Mounting

There are four 6 mm bore holes intended for mounting the unit. The unit can be mounted vertical or horizontal. The unit is wall mounted.



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.

Removal of Protective Caps

Protective caps shall only be removed using a Torx T40 bit or a flat-blade screwdriver (1.2 × 8 mm). Carefully insert the tool into the slot of the protective cap and turn it counter-clockwise until the cap can be removed.

NOTE

Do not use any other tools, as they may damage the protective cap or the connector.

Factory Reset

The factory reset option restores the switch to its original factory condition.
The switch will be restored using the following settings.

- IP address 192.168.2.200
- Subnet mask 255.255.255.0
- Gateway 192.168.2.1
- All Ethernet ports are enabled and set to Auto Negotiate
- All applications are disabled
- Password reset to westermo

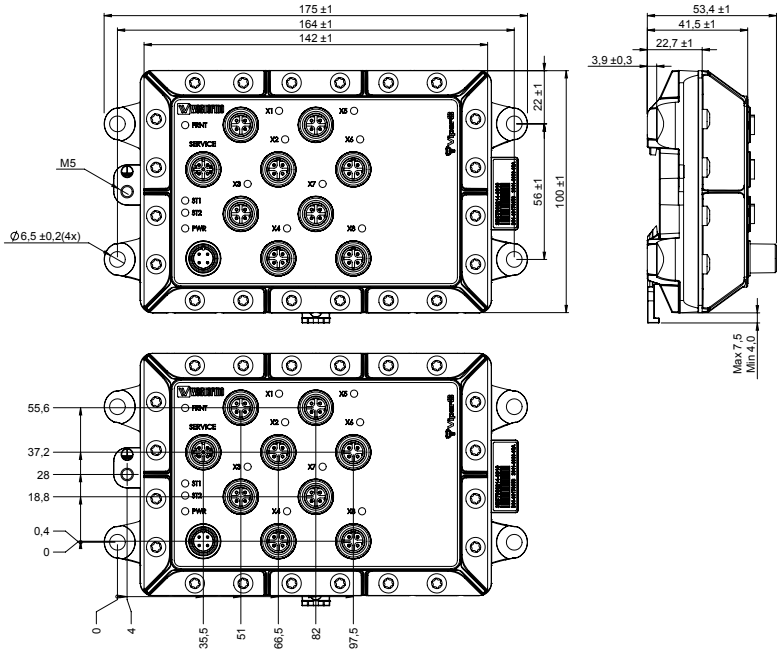
To perform a Factory Reset follow the procedure below. Read all steps before starting. If you have any doubts whether the reset is performed or not, do NOT unplug the power supply, wait for confirmation according to step 5.

1. Disconnect the power
2. Connect cables between port x1-x6 and port x2-x5.
3. Apply power
4. Wait for approx imately 90 seconds. (Some LED will flash during start up
5. When the Green LED's on all Ethernet ports are constantly on, then remove the cables connected to port x1-x6 and x2-x5.
6. It is now safe to remove the power and restart the switch.
7. When the switch has started up it will have the default settings.

If the power is removed before the factory reset has finished, the switch may be come unusable.

Dimensions

Measurements are stated in millimeters.



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