



Lynx 5500 Series

Industrial Gigabit switch



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1. General Information

1.1. 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.

1.2. About This Guide

This guide is intended for installation engineers and users of the Westermo products.

It includes information on safety and regulations, a product description, installation instructions and technical specifications.

1.3. Software Tools

Related software tools are available at www.westermo.com/support/software-tools.

1.4. License and Copyright for Included FLOSS

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.

1.5. WeOS

This product runs WeOS (Westermo Operating System). Instructions for quick start, configuration and factory reset are found in the WeOS user documentation at www.westermo.com.

2. Safety and Regulations

2.1. Warning Levels

Warning signs are provided to prevent personal injuries 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

Table 1. Warning levels

2.2. Safety Information

Before installation:

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



WARNING - HAZARDOUS VOLTAGE

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.

Before powering up, a protective earthing conductor must be connected to the protective earthing terminal. Westermo recommends a cross-sectional area of at least 4 mm² on the protective earthing conductor.

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

Disconnect all network connectors and cable distribution system connectors, including power supply, before disconnecting the protective earthing terminal.



WARNING - PROTECTIVE FUSE

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

Replacing the internal fuse, if applicable, must only be performed by Westermo qualified personell. Viper and RFR products have no internal fuse.



WARNING - POWER SUPPLY CONNECTION

There are safety regulations on how to connect the product to the power supply.



WARNING - REDUCE THE RISK OF FIRE

To reduce the risk of fire, use only no. AWG 26 or larger telecommunication line cord. Regarding power cable dimensions, refer to the user guide for detailed information.



CAUTION - HOT SURFACE

Be aware of 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.

Westermo's products are fanless and use convection cooling. To avoid obstructing the airflow around the product, follow the spacing recommendations.



CAUTION - CLASS 1 LASER PRODUCT

Do not look directly into a fibre optical port or any connected fibre, although the product is designed to meet the Class 1 Laser regulations and complies with 21 CFR 1040.10 and 1040.11.



CAUTION - HANDLING OF SFP TRANSCEIVERS

SFP transceivers are supplied with plugs to avoid contamination inside the optical port. They are very sensitive to dust and dirt. If the fibre is disconnected from the product, the protective plugs on the transmitter/receiver must be connected. The protective plugs must be kept on during transportation. The fibre optics cables must be handled the same way.



CAUTION - CORROSIVE GASES

If the product is placed in a corrosive environment, it is important that all unused connector sockets are protected with a suitable plug, in order to avoid corrosion attacks on the gold plated connector pins.



CAUTION - ELECTROSTATIC DISCHARGE (ESD)

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



CAUTION - CABLE TEMPERATURE RATING

For minimum temperature rating of the cable to be connected to the field wiring terminals, refer to the user guide for detailed information.

2.3. Care Recommendations

Follow the care recommendations below to maintain full operation of the 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.
- Do not use harsh chemicals, cleaning solvents or strong detergents to clean the product.
- 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.

2.4. 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 the 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.



Figure 1. WEEE symbol for treatment of product disposal

2.5. Compliance Information

2.5.1. Agency Approvals and Standards Compliance

Type	Approval/Compliance
EMC	<ul style="list-style-type: none">• EN/IEC 61000-6-1, Immunity residential environments• EN/IEC 61000-6-2, Immunity industrial environments• EN/IEC 61000-6-3, Emission residential environments• EN/IEC 61000-6-4, Emission industrial environments• EN 50121-4/IEC 62236-4, Railway signalling and telecommunications apparatus
Safety	<ul style="list-style-type: none">• EN/IEC 61010-1, -2-201, Safety requirements for electrical equipment for measurement, control, and laboratory use
Marine	<ul style="list-style-type: none">• DNV GL rules for classification - Ships and offshore units

Table 2. Agency approvals and standards compliance

2.5.2. FCC Part 15.105 Notice

This product 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 product 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 product does cause harmful interference to radio or television reception, which can be determined by turning the product 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 unit and receiver
- Connect the product 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

2.5.3. AREMA

The product has been tested according to AREMA Part 11.3.3, 11.5.1 and 11.5.2.

Port	Test	Remark
DC Power	$3 \times U_N, 80 \text{ ms}$	$U_N (\text{max})=24 \text{ VDC}$ when powered from a vital signal battery

Table 3. AREMA Part 11.3.3 C.4. - Signal equipment surge withstand capability for DC input port

	Class C	Class D	Class E	Remarks
Temperature	×	×	×	
Relative humidity	×	×	×	
Vibration	×	×	×	
Mechanical shock	×	×	×	
Dielectric strength			×	Tested with 1.5 kVAC rms

Table 4. AREMA Part 11.5.1. - Environmental Class

	External	Internal
Enclosure port		
Radiated RF immunity	X	X
Power Frequency Magnetic Field	X	X
Pulse Magnetic Field	X	X
DC power port		
EFT/Burst	X	X
Surge (1.2/50µs)	-	X
Conducted RF	X	X
DI-, DO-port		
EFT/Burst	X	X
Surge (1.2/50µs)	-	X
Conducted RF	X	X
Ethernet ports		
EFT/Burst	X	X
Surge (1.2/50µs)	X	X
Conducted RF	X	X

Table 5. AREMA Part 11.5.2. - Exposure Class

AREMA Part 11.3.3.E. - Equipment surge withstand documentation DC power port

1. Maximum normal circuit voltage when powered from a vital signal battery is 24 VDC otherwise 48 VDC
2. Surge protection clamping voltage is 87.1 VDC
3. Maximum energy handling capability is 5 J, 1 ms

2.5.4. Corrosive Environment

This product has been successfully tested in a corrosion test according to IEC 60068- 2-60, method 3. This means that the product meets the requirements to be placed in an environment classified as ISA-S71.04 class G3.



CAUTION - CORROSIVE GASES

If the product is placed in a corrosive environment, it is important that all unused connector sockets are protected with a suitable plug, in order to avoid corrosion attacks on the gold plated connector pins.

2.5.5. Simplified Declaration of Conformity

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



Figure 2. The European conformity marking

3. Product Description

3.1. Product Description

The Lynx 5500 series is the most compact high-performance industrial Ethernet switch series on the market. It has been developed with the needs of current and future industrial data network, combining outstanding performance, durability and reliability these switches are ideal for handling big data and high bandwidth requirements typically found within transportation, manufacturing, energy, smart cities and other applications.

Integrating hardware, software and network design support tools, this next generation switch platform offers advanced capabilities, the lowest total cost of ownership and will create the most reliable and resilient networks.

The switch is engineered to maintain uninterrupted data communication, even in exceptionally harsh environments. Tested and certified to withstand extreme temperatures, vibrations and shocks, these switches only use industrial grade components which contributes towards a market leading mean time between failure (MTBF), maximized service life, and reduced operational and life cycle costs.

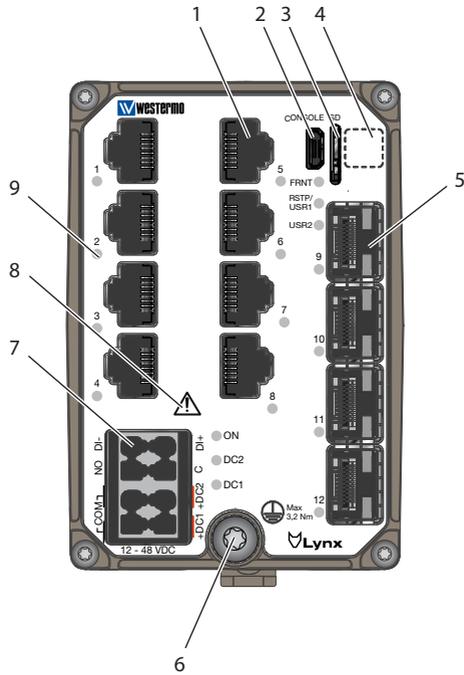
By providing full gigabit speed on all 12 ports, four flexible SFP ports and layer 2 and layer 3 functionality, a broad range of applications are possible. Powered by the next generation WeOS operating system, which ensures robust operation and support for an expanding range of protocols and features. The Lynx 5512 features intuitive set-up and configuration, removing the need for specialized IT support or training, and enabling easy and cost-efficient installation. In addition, recognizing the growing sophistication of cyberattacks, an extensive suite of cyber security tools is available.

The switches are also prepared for routing acceleration, extended cybersecurity and time synchronization IEEE 1588v2 applications, making them an ideal solution to meet future security and bandwidth requirements.¹

3.2. Available Models

Art. no.	Model	Gigabit TX ports	Gbit SFP ports	Software	Rated voltage
3643-0300	Lynx 5512-F4G-T8G-LV	8	4	L2	24-48 VDC
3643-0305	Lynx-5512-E-F4G-T8G-LV	8	4	L3	24-48 VDC

3.3. Hardware Overview



No.	Description	No.	Description
1	Gigabit ports	2	Console port
3	Micro SD	4	Label with QR code ^a
5	Gigabit SFP Ports	6	Protective earth terminal
7	Power Input and I/O connection	8	Warning symbol, see warning in Power Input and I/O Connection [13]
9	LED indicators		

^aThe base MAC address and production date of the product is included in the front label QR code

Figure 3. Location of interface ports and LED indicators

3.4. Connector Information

3.4.1. Power Input and I/O Connection

Illustration	Position	Product marking	Direction	Description
	1 - I/O connection	DI+	Input	Digital in positive
		DI-	Input	Digital in negative
		C	Output	Relay output common
		NO	Output	Relay output normally open
	2 - Power input	+DC1	Input	DC1 positive
		+DC2	Input	DC2 positive
		COM	Input	Common
		COM	Input	

Table 6. Power input and I/O connection

Unit condition	Status NO- C
Unpowered / pre-operational or Alarm active	OPEN
Operational and Alarm inactive	CLOSED

Table 7. I/O connection status output



WARNING - POWER SUPPLY CONNECTION

There are safety regulations on how to connect the product to the power supply.

3.4.2. Console Port

The console port can be used to connect to the CLI (Command Line Interface). The console connector is a micro USB cable that connects to a FTDI FT232R USB to serial converter internally. For drivers, refer to www.ftdichip.com and download the appropriate VCP driver

3.4.3. Micro SD

To insert the micro SD card correctly, turn the gold plated pins to the left side.

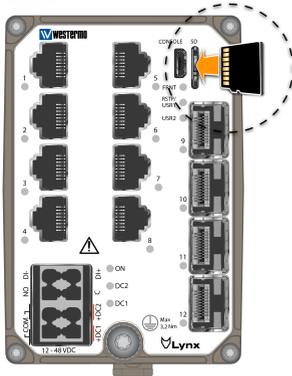


Figure 4. Insertion of micro SD card

3.4.4. SFP Transceivers

The product supports UL and IEC certified transceivers only. See Westermo's modular transceivers datasheets 100 Mbit and 1 Gbit for supported SFP transceivers, which can be downloaded from the product support pages at www.westermo.com/support/product-support..

Each SFP slot can hold one SFP transceiver. See "Transceiver User Guide 6100-0000" for transceiver handling instructions, which also can be downloaded from the product support pages at www.also.com/support/product-support.



CAUTION - HANDLING OF SFP TRANSCEIVERS

SFP transceivers are supplied with plugs to avoid contamination inside the optical port. They are very sensitive to dust and dirt. If the fibre is disconnected from the product, the protective plugs on the transmitter/receiver must be connected. The protective plugs must be kept on during transportation. The fibre optics cables must be handled the same way.

3.4.4.1. Cleaning SFP Transceivers

In the event of contamination, the optical connectors in the SFP transceivers should only be cleansed with recommended cleaning fluids below and correct cleaning equipment.

- Methyl, ethyl, isopropyl or isobotyl alcohol
- Hexane
- Naphtha

3.5. LED Indicators

LED	Status	Description
ON	OFF	Product has no power
	GREEN	All OK, no alarm condition
	RED	Alarm condition, or until product has started up. (Alarm conditions are configurable, see WeOS user documentation)
	BLINK	Location indicator ("Here I am!"). Activated when connected to WeConfig tool, or upon request from web or/and CLI. RED BLINK during boot indicates pending cable factory reset.
RSTP/ USR1	Configurable, see WeOS user Guide	
FRNT	OFF	FRNT disabled
	GREEN	FRNT OK
	RED	FRNT error
	BLINK	Product configured as FRNT focal point
DC1	OFF	Product has no power
	GREEN	Power OK on DC1
	RED	+DC1 input voltage is below operating voltage limit
DC2	OFF	Product has no power
	GREEN	Power OK on DC2
	RED	+DC2 input voltage is below operating voltage limit
USR2	Configurable, see WeOS user Guide	
TX/FX ports	OFF	No link
	GREEN	Link established
	GREEN FLASH	Data traffic indication
	YELLOW	Port alarm and no link. Or if FRNT or RSTP mode, port is blocked.

Table 8. LED indicators

3.6. Dimensions

Dimensions are stated in mm and are regardless model.

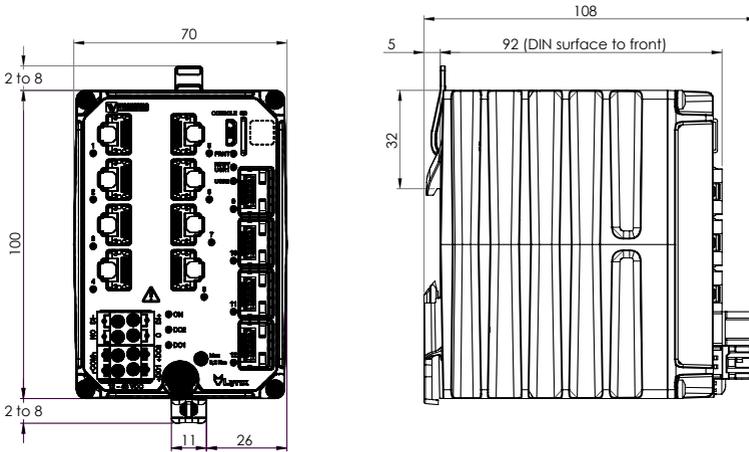


Figure 5. Dimensional drawing

4. Installation

4.1. Mounting

This product should be mounted on a 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet or similar. It is recommended that the DIN-rail is connected to ground. Snap on the product to the DIN-rail according to the figure.

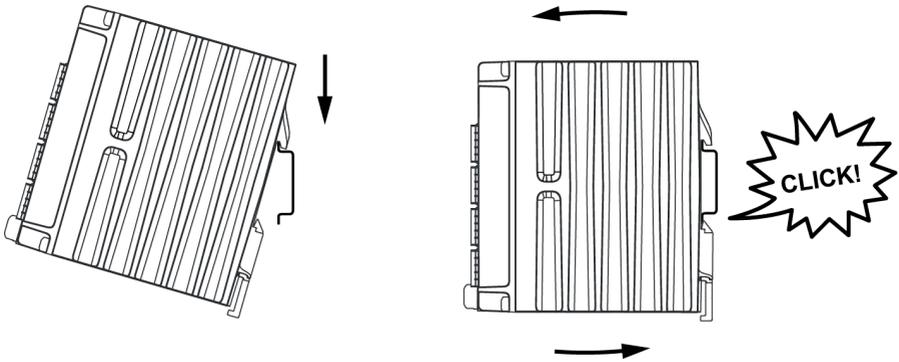


Figure 6. Mounting of product

4.2. Removal of Product

To remove the product either push the support pin down, or press down the support at the back with a screwdriver.

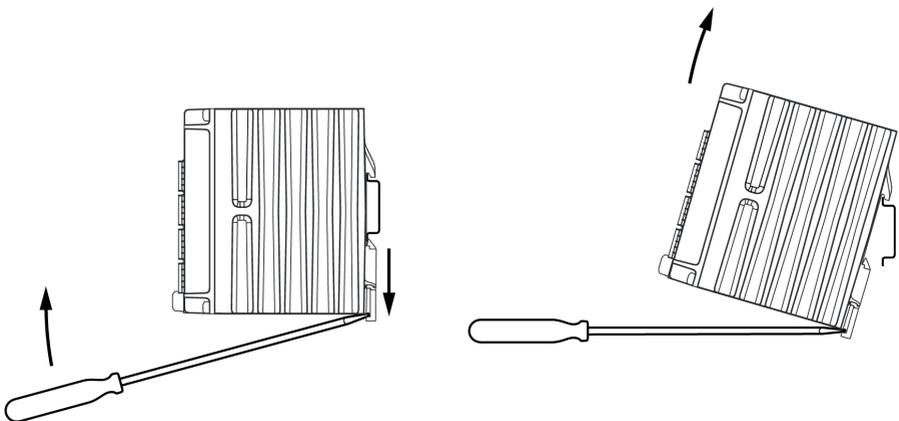


Figure 7. Removal of product

4.3. Earth Connection

For correct function, the earth connection needs to be properly connected to a solid ground. See the figure below. Torque: 3.2 Nm.

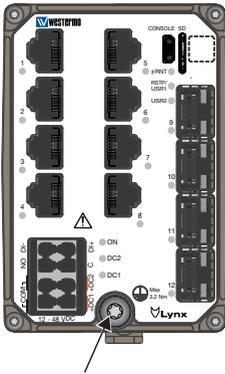


Figure 8. Earth connection

4.4. Cooling

This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules. Minimum spacing 25 mm (1.0 inch) above / below and 10 mm (0.4 inches) left / right the unit. Spacing is recommended for the use of unit in full operating temperature range and service life.

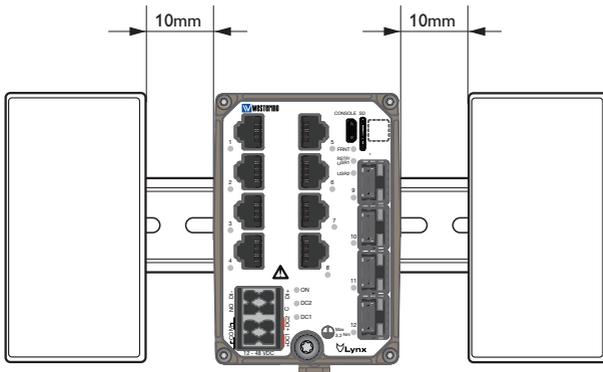


Figure 9. Minimum spacing of product

5. Specifications

5.1. Interface Specifications

DC, Power port	
Rated voltage ^a	12-48 VDC, Class III (SELV/PELV)
Operating voltage	9.6-60 VDC
Rated current	1.86 A at 12 VDC 0.48 A at 48 VDC
Fuse rating Component: U2	Denote time-delay fuse 4A(T)
Rated frequency	DC
Inrush current, I _t ^c	0.087 A ² s at 12 VDC 0.137 A ² s at 24 VDC 0.400 A ² s at 48 VDC
Startup current ^b	2x nominal current
Polarity	Reverse polarity protected
Redundant power input	Yes
Isolation	All other ports
Connector	Detachable screw terminal
Conductor cross section (flexible)	0.2-2.5 mm ² (AWG 24-12)
Stripping length cable	10 mm
Cable temperature rating	-40 to + 74 °C
Circuit type	SELV
Shielded cable	Not required

^aOnly CE-compliant Class III power supplies with SELV/PELV output shall be used with the product

^bRecommended external supply current capability for proper startup

I/O connection, Digital input	
Isolation to	All other ports
Connector	Detachable screw terminal
Conductor cross section	0.2 -2.5 mm ² (AWG 24 - 12)
Stripping length cable	10 mm
Circuit type	SELV
Maximum voltage/current	60 VDC, I _{IN} ≤ 2.9 mA at 60 VDC
Voltage levels	Logic one: >8 VDC Logic zero: <5 VDC

I/O connection, Relay output

Connect resistance	Maximum 30 Ω
Isolation to	All other ports
Connector	Detachable screw terminal
Conductor cross section	0.2-2.5 mm ² (AWG 24-12)
Stripping length cable	10 mm
Circuit type	SELV
Maximum voltage/current	60 VDC/80 mA

Ethernet TX^a

Electrical specification	IEEE std 802.3
Data rate	10 Mbit/s, 100 Mbit/s, 1000 Mbit/s, manual or auto
Duplex	Full or half, manual or auto
Circuit type	SELV
Transmission range	Up to 100 m with CAT5e cable or better
Isolation	All other ports
Cabling	Shielded cable CAT5e or better is recommended
Conductive chassis	Yes

^a10/100/1000 Mbit/s ports are no. 1 to 8



NOTE

The product is to be connected to internal Ethernet networks without exiting a facility and being subjected to TNVs.

SFP ports^a

Optical/Electrical specification	IEEE std 802.3
Data rate	100 Mbit/s, 1000 Mbit/s ^b
Duplex	Full or half, manual or auto
Transmission range	Depending on transceiver
Connector	SFP slot holding fibre transceiver

^aSFP ports are 9 to 12

^b100 Mbit/s or 1000 Mbit/s transceiver supported

Console port

Electrical specification	USB 2.0 device interface
Data rate	Up to 480 Mbps (high-speed mode)
Circuit type	SELV
Maximum supply current	100 mA
Connector	USB Micro B connector in device mode

Micro SD

Electrical specification	Secure Digital 2.0
Circuit type	SELV
Maximum supply current	100 mA
Connector	Micro SD connector

5.2. Type Tests and Environmental Conditions

Environmental phenomena	Basic standard	Description	Test levels
ESD	EN 61000-4-2	Enclosure	Contact: ± 8 kV Air: ± 15 kV
Fast transients	EN 61000-4-4	DC power port	± 2 kV, direct coupling
		Earth port	
		I/O port	± 2 kV, capacitive coupling clamp
		Ethernet ports	
Surge	EN 61000-4-5	DC power port	L-E: ± 2 kV, 12Ω , $9 \mu\text{F}$, $1.2/50 \mu\text{s}$ L-E: ± 2 kV, 42Ω , $0.5 \mu\text{F}$, $1.2/50 \mu\text{s}$ L-L: ± 0.5 kV, 2Ω , $18 \mu\text{F}$, $1.2/50 \mu\text{s}$ L-L: ± 1 kV, 12Ω , $9 \mu\text{F}$, $1.2/50 \mu\text{s}$ L-L: ± 1 kV, 42Ω , $0.5 \mu\text{F}$, $1.2/50 \mu\text{s}$
		I/O port	L-E, L-L: ± 1 kV, 12Ω , $9 \mu\text{F}$, $1.2/50 \mu\text{s}$ L-E, L-L: ± 2 kV, 42Ω , $0.5 \mu\text{F}$, $1.2/50 \mu\text{s}$
		Ethernet ports	L-E: ± 2 kV, 2Ω , Direct on shield, $1.2/50 \mu\text{s}$
Power frequency magnetic field	EN 61000-4-8	Enclosure	300 A/m continues, DC, 16.7, 50, 60 Hz 1000 A/m 10 s, 50, 60 Hz
Pulsed magnetic field	EN 61000-4-9	Enclosure	300 A/m
Damped oscillatory magnetic field	EN 61000-4-10	Enclosure	30 A/m (peak)
Conducted CM disturbances	EN 61000-4-16	DC power port	30 V rms to 3 V rms, 15 to 150 Hz 3 V rms, 150 Hz to 1.5 kHz 3 V rms to 10 V rms, 1.5 to 15 kHz 30 V rms, 15 to 150 kHz
		I/O port	
		Ethernet ports	
Mains frequency voltage	EN 61000-4-16	DC power port	30 V rms continuous, DC, 16.7, 50 and 60 Hz, 300 V rms for 1 s
		I/O port	
		Ethernet ports	
Ripple on DC power supply	EN 61000-4-17	DC power port	10% of U_N , 33.3, 100 and 120 Hz, 10 min
Damped oscillatory wave	EN 61000-4-18	DC power port	CM: ± 2.5 kV $200 \Omega/0.5 \mu\text{F}$, 1 MHz CM: ± 2 kV $50 \Omega/0.5 \mu\text{F}$, 10 MHz DM: ± 2.5 kV $200 \Omega/0.5 \mu\text{F}$, 1 MHz
		I/O port	CM: ± 2.5 kV $200 \Omega/0.5 \mu\text{F}$, 1 MHz DM: ± 2.5 kV $200 \Omega/0.5 \mu\text{F}$, 1 MHz
		Ethernet ports	CM: ± 2.5 kV 200Ω , 1 MHz, Direct on shield
Radiated RF immunity	EN 61000-4-3	Enclosure	20 V/m, 80% AM (1kHz) at 80 MHz to 2.7 GHz, spot freq: 80, 160, 380, 450, 900, 1600, 1850 MHz

Environmental phenomena	Basic standard	Description	Test levels
	IEEE Std C37.90.2		10 V/m, 80% AM (1 kHz) at 2.7 to 6 GHz, spot freq.: 2150, 3800 MHz 20 V/m, pulse keying (2 Hz) at 80 MHz to 1 GHz, spot freq.: 1732, 1800 MHz 10 V/m, pulse keying (2 Hz), spot freq.: 2310, 2450, 5800 MHz 20 V/m, PM 200 Hz square at 900 MHz
Conducted RF immunity	EN 61000-4-6	DC power port	10 V, 0.15 to 80 MHz, spot freq.: 2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz
		Ethernet ports	
		I/O port	
		Earth port	
Radiated RF emission	CISPR 16-2-3	Enclosure	Class B (Residential), 30 MHz to 6 GHz DNVGL-CG - Bridge and Deck Zone, 0.15 to 2000 MHz FCC Part 15 B, Class B, 30 MHz to 20.5 GHz
	IEC 60945		
	ANSI C63,4		
Conducted RF emission	CISPR 16-2-1	DC power port	Class B (Residential), 0.15 to 30 MHz DNVGL-CG - Bridge and Deck Zone, 10 kHz to 30 MHz
		Ethernet ports	Class B (Residential), 0.15 to 30 MHz
Compass safe distance	IEC 60945	Enclosure	
Supply voltage surge	AREMA	DC power port	$3 \times U_N$, 80 ms (72V)
Power supply failure	DNVGL-CG-0339	DC power port	U_N -100%, 30 s
Power supply variation	DNVGL-CG-0339	DC power port	$1.3 \times U_N$ (62.4 VDC), $0.75 \times U_N$ (18 VDC), 15 min
Immunity to conducted low frequency interference	DNVGL-CG-0339	DC power port	3 Vrms, 0.05 to 10 kHz
Insulation resistance	DNVGL-CG-0339	Power port (DC) to all other ports	500 VDC, 60 s
		I/O port to all other ports	
	IEEE 802.3	Ethernet ports to all other ports	
Dielectric strength	AREMA	Power port (DC) to all other ports	2121 VDC, 60 s 1500 VAC rms, 60 s
		I/O port to all other ports	

Environmental phenomena	Basic standard	Description	Test levels
	Westermo	Power port (DC) to all other ports	1500 VAC rms, 60 s
		I/O port to all other ports	
	IEEE 802.3	Ethernet ports to all other ports	
Impulse withstand	IEEE 802.3	Ethernet ports to all other ports	2.4 kV

Table 9. EMC and electrical conditions

Environmental phenomena	Basic standard	Description	Test levels
Temperatures	EN 60068-2-1 EN 60068-2-2 EN 60068-2-14	Operational	-40 to +74°C (-40 to +165°F) ^a
		Storage and transport	-55 to +85°C (-67 to +185°F)
Humidity	EN 60068-2-30	Operational	5-95% relative humidity
	EN 60068-2-78	Storage and transport	93% RH, 96 hours
Device reliability class	IEC 61850-3		Class 1: Temporary loss of communication and/or communication errors can be tolerated
	IEEE 1613		
Corrosive gases	IEC 60068-2-60	Operational	Method 3, 21 days ^b
Altitude		Operational	2000 m/70 kPa
MTBF	MIL-HDBK 217F		506,000 hours
	Telcordia		955,000 hours
Vibration ^c	IEC 60068-2-6 (sine)	Operational	5 to 20 Hz, 1,3 mm 20 to 200 Hz, 1 g 20 sweep cycles in each axis, 1 octave/min
			Class 2, 10 to 150 Hz at 2 g 20 sweep cycles in each axis, 1 octave/min
			5 to 8 Hz at ± 7.5 mm 8 to 500 Hz at 2 g 5 sweep cycles in each axis (3 × 5), 1 octave/min
		Non-operational, resonance test	2 to 13.2 Hz at ± 1 mm 13.2 to 100 Hz at 1 g 1 sweep cycle in each axis, 1 octave/min
	IEC 60068-2-64 (random)	Operational	2.3 m/s ² random, 5 to 2000 Hz, 3 × 1.5 h
		Operational, endurance test	1 g random, 2-100 Hz, 3 × 150 min
Shock ^c	IEC 60255-21-2	Operational	Class 2, 30g/11ms, 3 × 6 shocks (half sine)
	IEEE 1478		200 m/s ² , 11 ms, 3 × 6 shocks (saw tooth)
Bump ^c	IEC 60255-21-2	Operational	Class 2, 20g/16 rms, 6 × 1000 bumps
Enclosure	EN 61010-1	Aluminum	Fire enclosure
Weight			690 gr
Degree of protection	EN 60529	Enclosure	IP40
Cooling			Convection

Environmental phenomena	Basic standard	Description	Test levels
Overvoltage category	EN/IEC 61010-1		OVC II
Pollution degree	EN 61010-1		PD2
Location	EN 61010-1		Indoor

^aRefer to "Safety and Regulations" chapter regarding touch temperature

^bMethod 3, 21 days corresponds to Harsh Industrial Environment G3 which is defined in ANSI/ISA 17.04: 2015

^cThe power and I/O cables need to be fastened 200 mm or closer to the unit. The same recommendation applies to the Ethernet cables.

Table 10. Environmental and mechanical conditions

6. Revision Notes

Revision	Date	Change description
Rev. A	2019-12	First revision



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