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# Lynx 3000 Series Gen2

Managed Ethernet switches and routers

WeOS

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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 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 https://www.westermo.com/support/product-support.

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

## 1.6. Integrity Seal

To ensure that the product package has not been opened, there is an integrity seal. If the seal is unexpectedly broken or missing contact your support channel for advice.

## 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.



**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.

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 $mm^2$.

Upon removal of the product, disconnect the product from the power supply and all other communication ports before disconnecting the protective earthing conductor, or the connection to earth via the DIN-rail.



**HAZARDOUS VOLTAGE**

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



**PROTECTIVE FUSE**

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

Replacing the internal fuse must only be performed by Westermo qualified personnel.



**POWER SUPPLY CONNECTION**

There are safety regulations governing the power source that can be used in conjunction with the product. Refer to chapter Interface Specifications.



**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 chapter 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.



**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.



**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 optic cable is disconnected from the product, a protective plug must be used on the transmitter/receiver. The protective plug must be kept on during transportation. The fibre optic cable must be handled the same way.



**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.



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

**CABLE TEMPERATURE RATING FOR FIELD TERMINAL WIRES**
There may be a requirement on the minimum temperature rating of the cable to be connected to the field wiring terminals, see chapter Interface Specifications.

## 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.
- 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, the 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.

Proper disposal of the product helps minimize hazardous substances and prevents potential negative impacts on both the environment and human health.



*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** | • EN/IEC 61000-6-2, Immunity industrial environments<br>• EN/IEC 61000-6-4, Emission industrial environments |
| **Environmental**[a.] | • NEMA TS 2, Traffic Controller Assemblies with NTCIP Requirements<br>• AREMA; Communications and Signals manual[b.] |
| **Security**[c.] | • IEC 62443-4-2, Security level 2 |
| **Safety** | • EN/IEC/UL 61010-1, -2-201, Safety requirements for electrical equipment for measurement, control, and laboratory use |
| **Trackside** | • EN 50121-4/IEC 62236-4, Railway signalling and telecommunications apparatus |
| **Marine** | • DNV GL rules for classification - Ships and offshore units |

[a.] Applicable for non-PoE models only

[b.] Valid for Lynx-3510(-E)-F4G-T6G-LV, Lynx-3510(-E)-F2G2.5-F2G-T6G-LV and all form factor B models (Lynx-3518)

[c.] Valid for Lynx 3306, 3310 and 3510 models

*Table 2. Agency approvals and standards compliance*

### 2.5.2. AREMA

Lynx-3510(-E)-F4G-T6G-LV, Lynx-3510(-E)-F2G2.5-F2G-T6G-LV and all form factor B models (Lynx-3316, -3318 and -3518) have been tested according to AREMA Part 11.3.3, 11.5.1 and 11.5.2.

| Port | Test | Remark |
|---|---|---|
| DC Power | 3 x $U_N$, 80 ms | $U_N$ (max)=24 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** | X | X | X | |
| **Relative humidity** | X | X | X | |
| **Vibration** | X | X | X | |
| **Mechanical shock** | X | X | X | |
| **Dielectric strength** | | | X | Power and I/O: 1.5 kVAC<br>Ethernet: 0.6 kVAC |

*Table 4. AREMA Part 11.5.1. - Environmental Class*

| | External | Internal |
|---|---|---|
| **Enclosure port** | | |
| Radiated RF immunity<br>Power Frequency Magnetic Field<br>Pulse Magnetic Field | X<br>X<br>X | X<br>X<br>X |
| **DC power port** | | |
| EFT/Burst<br>Surge (1.2/50µs)<br>Conducted RF | X<br>-<br>X | X<br>X<br>X |
| **DI-, DO-port** | | |
| EFT/Burst<br>Surge (1.2/50µs)<br>Conducted RF | X<br>-<br>X | X<br>X<br>X |
| **Ethernet ports** | | |
| EFT/Burst<br>Surge (1.2/50µs)<br>Conducted RF | X<br>X<br>X | X<br>X<br>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 58.1 VDC
3. Maximum energy handling capability is 2 J, 1 ms

### 2.5.3. FCC Part 15.105 Class A Notice

This product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment.

This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the users own expense.

### 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.

**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 declaration of conformity and other detailed information is available at www.westermo.com/support/product-support.



*Figure 2. The European Conformity Assessment marking*

# 3. Product Description

## 3.1. Product Description

The Lynx 3000 series Gen2 comprises compact, high-performance managed Ethernet switches and routers for mission-critical OT networks. Based on the Lynx 3000 generation 2 platform, the range provides layer 2 switching and layer 3 routing, with Ethernet speeds up to 2.5 Gbit/s and a choice of copper, SFP and PoE configurations.

Engineered for demanding environments, Lynx 3000 Gen2 devices feature rugged, fanless IP40 full-metal housings and operate from -40 to +70 °C. Industrial-grade components and testing for vibration, shock, humidity, corrosive gases and electrical disturbances support high availability and a long service life. Available certifications and type-test compliance support deployment in industrial, marine and trackside environments.

The range extends from models for standard industrial connectivity to multi-gigabit variants for bandwidth-intensive applications. Support for resilient layer 2 networks, advanced layer 3 routing and network segmentation enables customers to address different requirements using a common product family. This simplifies network design, configuration and lifecycle management across sites and applications.

Selected PoE models provide a total power budget of up to 240 W, delivering power and data over a single cable. This simplifies the installation of HD cameras, wireless access points and other powered industrial devices. Advanced PoE management enables remote monitoring and control of connected equipment.

Powered by WeOS, Lynx 3000 series Gen2 provides comprehensive functionality for network redundancy, routing, segmentation, management and security. Secure boot verifies software integrity during startup, while the Trusted Platform Module (TPM) provides a hardware root of trust for protecting cryptographic keys and sensitive data. VPN, stateful firewall and IEEE 802.1X capabilities help protect network access and communications. Lynx 3306, Lynx 3310 and Lynx 3510 Gen2 variants are certified to IEC 62443-4-2 Security Level 2.

Available in two mechanical designs with flexible mounting options, the Lynx 3000 series Gen2 is suited to transportation, manufacturing, energy, smart cities and other critical infrastructure applications requiring secure connectivity, high availability and long-term reliability.

## 3.2. Available Models

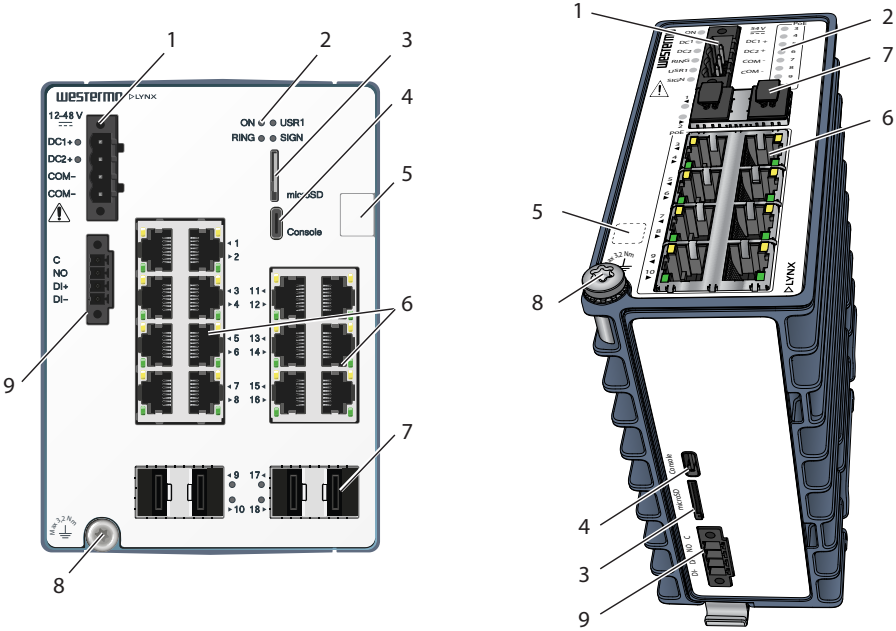
| Art. no. | Model[a.] | SFP ports | RJ45 ports (PoE) | Other ports & interfaces |
|---|---|---|---|---|
| **Form factor A - 6 ports** | | | | |
| 3627-1600 | Lynx-3306-F2G-T4-LV | 2 x 1 Gb | 4 x 100 Mb | - |
| 3627-1610 | Lynx-3306-E-F2G-T4-LV | | | |
| **Form factor A - 10 ports** | | | | |
| 3627-1560 | Lynx-3310-F2G-T8-LV | 2 x 1 Gb | 8 x 100 Mb | - |
| 3627-1561 | Lynx-3310-F2G-T8-LV-CC | | | |
| 3627-1570 | Lynx-3310-E-F2G-T8-LV | | | |
| 3627-1571 | Lynx-3310-E-F2G-T8-LV-CC | | | |
| 3627-1520 | Lynx-3510-F2G-T8G-LV | | 8 x 1 Gb | I/O, micro SD |
| 3627-1521 | Lynx-3510-F2G-T8G-LV-CC | | | |
| 3627-1530 | Lynx-3510-E-F2G-T8G-LV | | | |
| 3627-1531 | Lynx-3510-E-F2G-T8G-LV-CC | | | |
| 3627-1540 | Lynx-3510-F2G2.5-T8G-LV | 2 x 2.5 Gb | | |
| 3627-1541 | Lynx-3510-F2G2.5-T8G-LV-CC | | | |
| 3627-1550 | Lynx-3510-E-F2G2.5-T8G-LV | | | |
| 3627-1551 | Lynx-3510-E-F2G2.5-T8G-LV-CC | | | |
| 3627-1500 | Lynx-3510-F2G-P8G-LV | 2 x 1 Gb | 8 x 1 Gb (8 x PoE+, 802.3at) | |
| 3627-1501 | Lynx-3510-F2G-P8G-LV-CC | | | |
| 3627-1510 | Lynx-3510-E-F2G-P8G-LV | | | |
| 3627-1511 | Lynx-3510-E-F2G-P8G-LV-CC | | | |
| 3627-1580 | Lynx-3510-F2G2.5-P8G-LV | 2 x 2.5 Gb | | |
| 3627-1590 | Lynx-3510-E-F2G2.5-P8G-LV | | | |
| 3627-0620 | Lynx-3510-F4G-T6G-LV | 4 x 1 Gb | 6 x 1 Gb | |
| 3627-0630 | Lynx-3510-E-F4G-T6G-LV | | | |
| 3627-0640 | Lynx-3510-F2G2.5-F2G-T6G-LV | 2 x 1 Gb 2 x 2.5 Gb | | |
| 3627-0650 | Lynx-3510-E-F2G2.5-F2G-T6G-LV | | | |

[a.] E = extended level (layer 3), non-E = standard level (layer 2), CC = conformal coating

| Art. no. | Model[a.] | SFP ports | RJ45 ports (PoE) | Other ports & interfaces |
|---|---|---|---|---|
| **Form factor B - 18 ports** | | | | |
| 3627-4020 | Lynx-3518-F4G-T14G-LV | 4 x 1 Gb | 14 X 1 Gb | I/O, micro SD |
| 3627-4030 | Lynx-3518-E-F4G-T14G-LV | | | |
| 3627-4060 | Lynx-3518-F2G2.5-F2G-T14G-LV | 2 x 1 Gb<br>2 x 2.5 Gb | | |
| 3627-4070 | Lynx-3518-E-F2G2.5-F2G-T14G-LV | | | |

[a.]E = extended level (layer 3), non-E = standard level (layer 2), CC = conformal coating

## 3.3. Hardware Overview




Illustrated by a Lynx-3518-F4G-T14G-LV and a Lynx-3510-F2GP8G-LV

*Figure 3. Location of interface ports and LED indicators*

| No. | Description | No. | Description |
|---|---|---|---|
| 1 | Power port | 2 | LED indicators |
| 3 | Micro SD[a.] | 4 | Console port |
| 5 | Label with data matrix[b.] | 6 | Ethernet TX ports |
| 7 | SFP ports | 8 | Protective earth terminal |
| 9 | I/O port[a.] | | |

[a.] Not applicable for all models

[b.] The front label provides MAC address and production date

## 3.4. Connector Information

### 3.4.1. Power Input

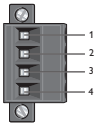
| Illustration | Position | Product marking | Direction | Description |
|---|---|---|---|---|
|  | 1 | DC1+ | Input | Supply voltage |
| | 2 | DC2+ | Input | Supply voltage |
| | 3 | COM- | Input | Common |
| | 4 | COM- | Input | Common |



*Table 6. Power input*

**POWER SUPPLY CONNECTION**
There are safety regulations governing the power source that can be used in conjunction with the product. Refer to chapter Interface Specifications.

### 3.4.2. I/O Connection

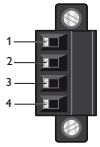
| Illustration | Pin no. | Product marking | Direction | Description |
|---|---|---|---|---|
|  | 1 | C | Output | Relay output common |
| | 2 | NO | Output | Relay output normally open |
| | 3 | DI + | Input | Digital in + |
| | 4 | DI - | Input | Digital in - |



*Table 7. I/O connection*

The relay output is a potential free, opto-isolated, normally open, solid-state relay. This can be configured to monitor various alarm events within the unit, see *WeOS User guide*. An external load in series with an external voltage source is required for proper functionality. For voltage/current, see Interface Specifications.

The Digital in is an opto-isolated digital input, which can be used to monitor external events. For voltage/current, see Interface Specifications.

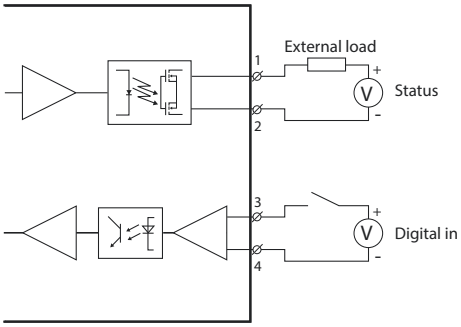



*Figure 4. Digital in*

### 3.4.3. Console Port

The console port can be used to connect to the CLI (Command Line Interface). The console connector is a USB-C 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.

### 3.4.4. SFP Transceivers

The product supports UL/IEC/CSA certified transceivers only. See Westermo's modular transceivers datasheets 100 Mbit, 1 Gbit and 2.5 Gbit SFP transceivers, which can be downloaded from the product support pages at www.westermo.com/support/product-support.

To maximize the life length of SFPs, it may be necessary to limit the operating temperature, see table Type Tests and Environmental Conditions [30].

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

In the event of contamination, the optical connectors in the SFP transceivers should only be cleaned by the use of forced nitrogen and some kind of cleaning stick. Recommended cleaning fluids are methyl-, ethyl-, isopropyl- or isobutyl alcohol, hexane or naphtha.

**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 optic cable is disconnected from the product, a protective plug must be used on the transmitter/receiver. The protective plug must be kept on during transportation. The fibre optic cable must be handled the same way.

## 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 *WeOS5 User Guide*) |
| **DC1** | OFF | Product has no power |
| | GREEN | Power OK on DC1 |
| | RED | Input voltage on DC1 is below rated voltage limit |
| **DC2** | OFF | Product has no power |
| | GREEN | Power OK on DC2 |
| | RED | Input voltage on DC2 is below rated voltage limit |
| **RING** | OFF | All ring protocols are disabled |
| | GREEN | All ring protocols are OK |
| | RED | A ring protocol has an error |
| | FLASH | Green flash: All ring protocols are OK. The device acts as master/focal-point/root.<br>Red flash: A ring protocol has an error. The device acts as master/focal-point/root. |
| **USR1** | Configurable, see *WeOS5 User Guide* | |
| **SIGN** | OFF | Product has no power |
| | GREEN | Approved software |
| | RED | Not approved software |
| **TX/FX ports** | OFF | No link |
| | GREEN | Link established.<br>Green flash: Data traffic indication |
| | YELLOW | Port alarm, or port is set in blocking state by link reduncancy protocol<br>Yellow flash: Location indicator ("Here I am"). Function activated via WeConfig tool, or web or CLI. |
| **PoE**[a.] | OFF | No PoE output |
| | GREEN | PoE output active<br>Green flash: Error or negotiating power output |

[a.] Only available for PoE models

*Table 8. LED indicators*

### 3.6. Dimensions

Dimensions are stated in mm and are regardless of model.

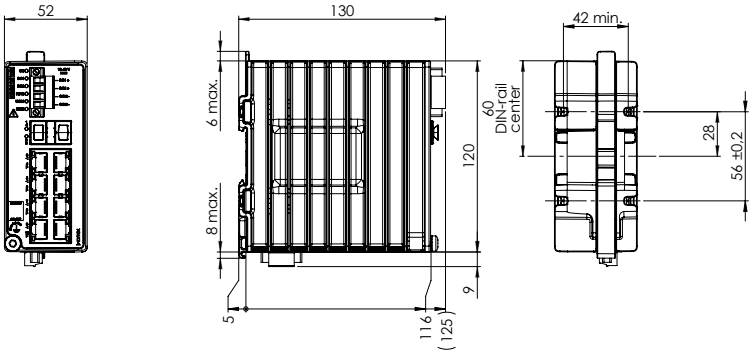



*Figure 5. Dimensional drawing - Form factor A*

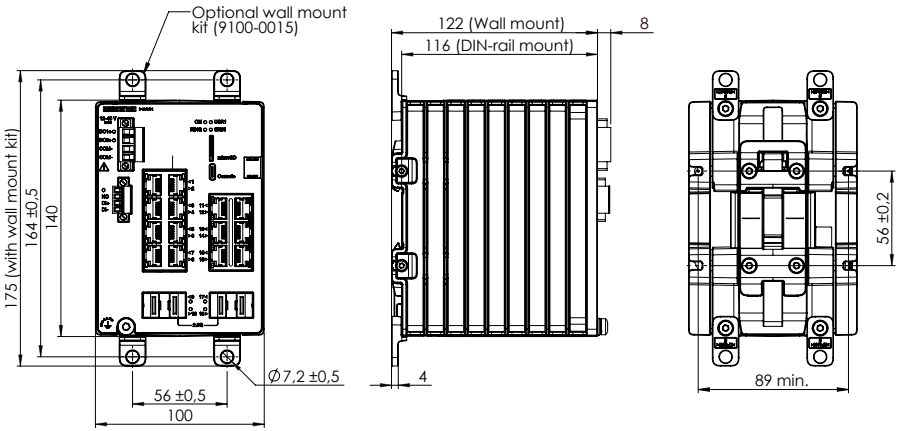



*Figure 6. Dimensional drawing - Form factor B*

### 4.1. Mounting

This product should be mounted on a TH 35-7.5 rail or TH 35-15, according to IEC/EN 60715 standard, which is horizontally mounted inside an apparatus cabinet or similar dry location.

1. To mount the product, first push the support pin down, then towards the front of the product to lock the support pin.
2. Then, place the product on to the DIN-rail. First the upper part, then the lower part of the product.
3. Lastly, push the support pin forward to lock the product to the DIN-rail. Make sure the products is secured to the DIN-rail.

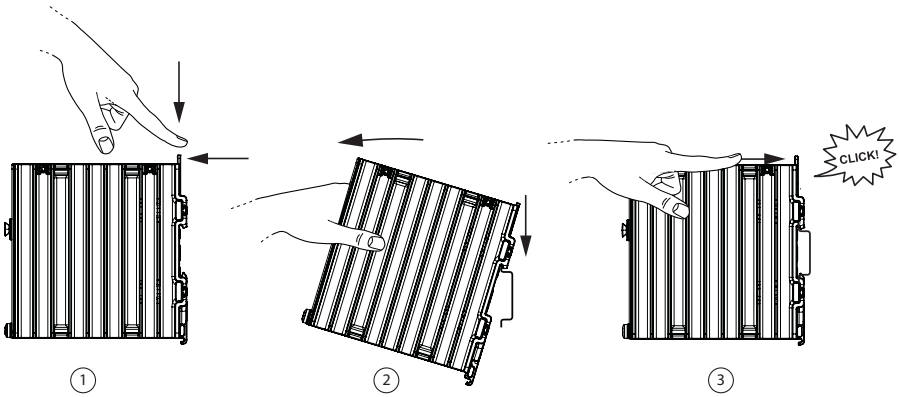



*Figure 7. Mounting of product*

### 4.2. Removal of Product

To remove the product, either push the support pin down and towards the front of the product, or press down the support at the back with a screwdriver and lift off the product from the DIN-rail.

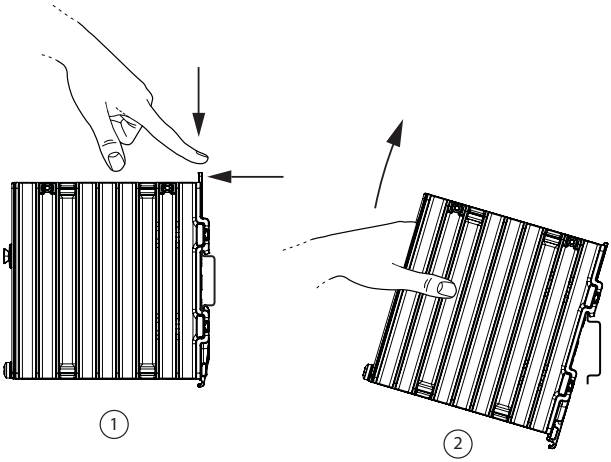



*Figure 8. Removal of product by pushing the support pin*

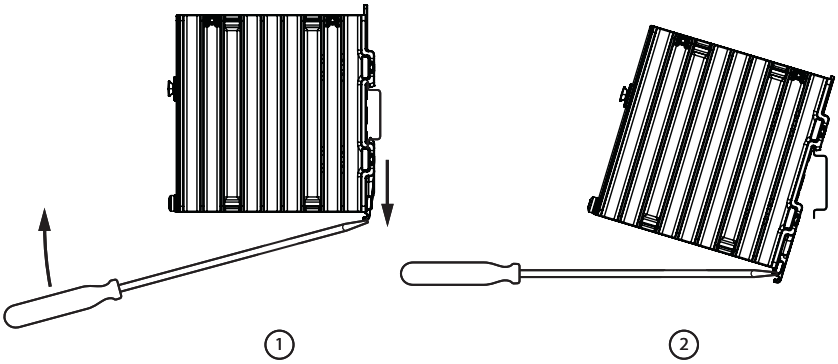



*Figure 9. Removal of product with screwdriver*

### 4.3. Panel Mounting

The product can be mounted to a panel with cage nuts made for 5.3 mm square holes with a 1-1.6 mm panel thickness.

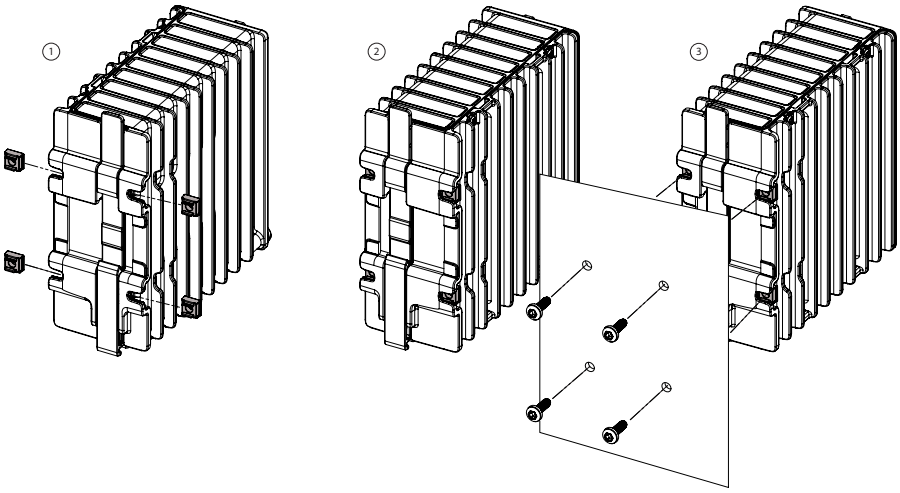
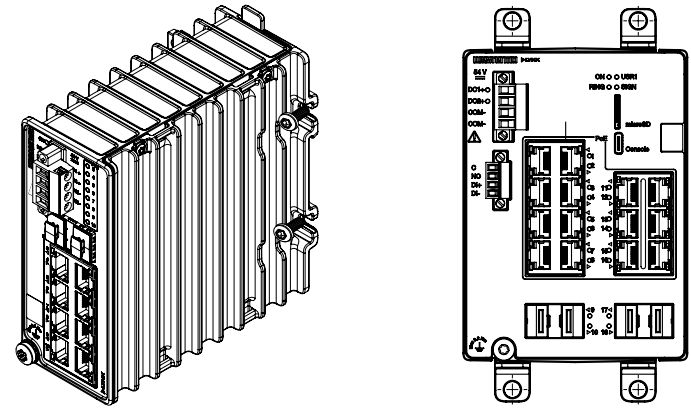



*Figure 10. Panel mounting with cage nuts*

### 4.4. Wall Mounting

All products can be mounted to a wall with screws. Form factor B products can also be wall mounted with brackets (sold as accessories).

*Figure 11. Wall mounting with screws, and with brackets*



### 4.5. Cable Strap

Form factor A has loops on the right side that cable straps can be attached to, to help collecting the connector cables and lead them aside.

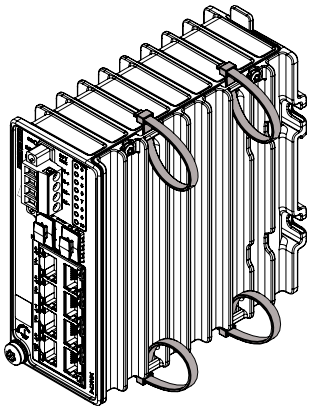


*Figure 12. Cable straps*

## 4.6. Functional Earth Connection

For correct function, the earth connection needs to be properly connected to a designated PE rail. Torx: T25 and torque: 3.2 Nm.

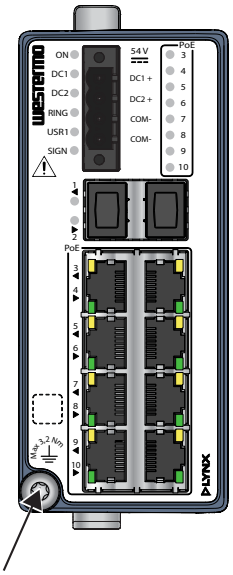



*Figure 13. Earth connection*

## 4.7. Cooling

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

the unit, a minimum spacing of 25 mm (1.0 inch) above and below, and 10 mm (0.4 inches) left and right of the unit must be fulfilled.

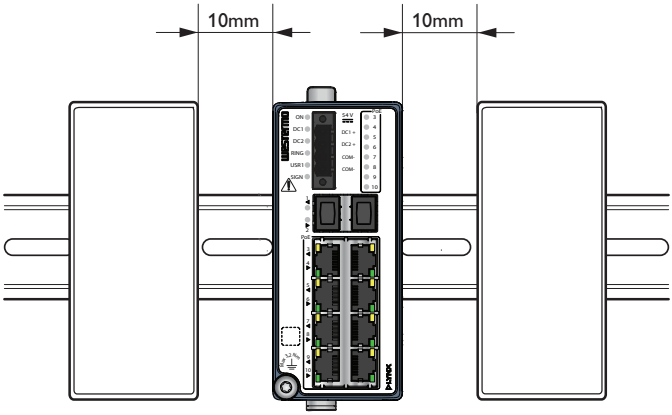



*Figure 14. Minimum spacing of product*

## 4.8. Ambient Temperature

Ambient temperature affects the life length of electronic components. Prolonged exposure to high temperatures can reduce the overall life length. See temperature information in Type Tests and Environmental Conditions [30] for more information.

## 5.1. Interface Specifications

| Art.no 3627- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Port number | | | | | | | | | |
| 0620 to 0630<br>1520 to 1531 | F1G | | | | T1G | | | | | |
| 0640 to 0650 | F2.5G | | F1G | | | | | | | |
| 1500 to 1511 | F1G | | T1G<br>P30W | | | | | | | |
| 1540 to 1551 | F2.5G | | T1G | | | | | | | |
| 1570 to 1571 | F1G | | T100 | | | | | | | |
| 1580 to 1590 | F2.5G | | T1G<br>P30W | | | | | | | |
| 1600 to 1610 | F1G | | T100 | | | | - | | | |

*Table 9. Port specification for form factor A of Lynx 3000 series Gen2*

| Art.no 3627- | 1 to 8 | 9 | 10 | 11 to 16 | 17 | 18 |
|---|---|---|---|---|---|---|
| | Port number | | | | | |
| 4020 to 4030 | T1G | F1G | | T1G | F1G | |
| 4060 to 4070 | T1G | F1G | F2.5G | T1G | F2.5G | F1G |

*Table 10. Port specification for form factor B of Lynx 3000 series Gen2*

| Fibre ports - F1G - SFP ports | |
|---|---|
| **Connector** | SFP slot holding fibre transceiver |
| **Optical/Electrical specification** | IEEE std 802.3 |
| **Data rate** | 1 Gbit/s<br>100 Mbit/s with smart SFP module |
| **Duplex** | Full or half, manual or auto |
| **Transmission range** | Depending on transceiver |

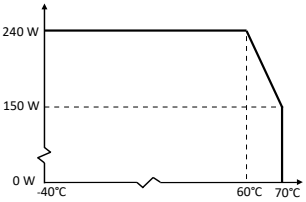
| Fibre ports - F2.5G - SFP ports | |
|---|---|
| **Connector** | SFP slot holding fibre transceiver |
| **Optical/Electrical specification** | IEEE std 802.3 |
| **Data rate** | 2.5 Gbit/s<br>1 Gbist/s<br>100 Mbit/s with smart SFP module |
| **Duplex** | Full or half, manual or auto |
| **Transmission range** | Depending on transceiver |

| Copper ports - T1G - Ethernet TX | |
|---|---|
| **Connector** | RJ-45 |
| **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** | Non-PoE products: TVN-1<br>PoE products: SELV |
| **Transmission range** | Up to 100 m with CAT5e cable or better |
| **Isolation** | Non-PoE products: all other ports<br>PoE products: All other ports except other PoE ports and DC power port |
| **Cabling** | Shielded cable CAT5e or better is recommended |
| **Conductive chassis** | Yes |

| Copper ports - T100 - Ethernet TX | |
|---|---|
| **Connector** | RJ-45 |
| **Electrical specification** | IEEE std 802.3. |
| **Data rate** | 10 Mbit/s, 100 Mbit/s, manual or auto |
| **Duplex** | Full or half, manual or auto |
| **Circuit type** | Non-PoE products: TNV-1<br>PoE products: SELV |
| **Transmission range** | Up to 100 m with CAT5e cable or better |
| **Isolation** | Non-PoE products: all other ports<br>PoE products: All other ports except other PoE ports and DC power port |
| **Cabling** | Shielded cable CAT5e or better is recommended |
| **Conductive chassis** | Yes |

| PoE - P30W | |
|---|---|
| **Standard** | IEEE 802.3at; "PoE+" |
| **Type** | 2 |
| **Class** | Up to 4 |
| **2P/4P** | 2 pair, mode A |
| **LLDP** | No |
| **Output voltage** | 50-57 VDC[a.] |
| **Output power** | Max 30 W |
| **Cabling** | Shielded cable CAT5e or better is recommended |
| **Conductive chassis** | Yes |

[a.] Follows the input voltage

| PoE - Total PoE budget | |
|---|---|
| **Total output power 240 W, form factor A** | <br>Max 240 W at -40°C to +60°C (-40°F to 140°F)<br>Linear derating with 9 W/°C (5 W/°F) between +60°C to +70°C (+140°F to 158°F)<br>Max 150 W at +70°C (+158°F) |

| Other interfaces - DC, Power port (non-PoE models) | | |
|---|---|---|
| **Rated voltage**[a.] | 12 to 48 VDC, Class III (SELV/PELV)[b.] | |
| **Operating voltage** | 9.6 to 60 VDC | |
| **Rated current** | Form factor A; Lynx-3510(-E)-F4G-T6G-LV and Lynx-3510(-E)-F2G2.5-F2G-T6G-LV: Max 1.1 A at 12 VDC, max 0.27 A at 48 VDC<br>Form factor A, all others: Max 0.6 A at 12 VDC, max 0.16 A at 48 VDC<br>Form factor B: Max 1.2 A at 12 VDC, max 0.29 A at 48 VDC | |
| **Fuse rating**[c.] | Denote time-delay fuse | 4.0 A(T) |
| **Rated frequency** | DC | |
| **Inrush current, $I^2t$**[d.] | Form factor A:<br>175 $mA^2s$ at 12 VDC<br>287 $mA^2s$ at 48 VDC<br><br>Form factor B:<br>43 $mA^2s$ at 12 VDC<br>782 $mA^2s$ at 48 VDC | |
| **Startup current** | 2 x nominal current | |
| **Polarity** | Reverse polarity protected | |
| **Redundant power input** | Yes | |
| **Isolation** | All other ports | |
| **Connector** | Detachable screw terminal connector | |
| **Conductor cross section (flexible)** | 0.2-2.5 mm² (AWG 30-12). Use copper conductors only. | |
| **Stripping length cable** | 10 mm | |
| **Cable temperature rating** | For minimum temperature rating of the cable to be connected to the field wiring terminals minimum + 90 °C | |
| **Circuit type** | SELV | |
| **Shielded cable** | Not required | |

[a.] Only CE-compliant Class I or Class II power supplies with SELV/PELV output shall be used with the product

[b.] This equipment is considered equivalent to Class III equipment, even though the internal voltage of switching transformer exceeds the specified level of 6.3.1 in EN/IEC/UL 61010-1. The voltage at the accessible part does not exceed the limit of 6.3.2 in EN/IEC/UL 61010-1 during a single fault condition.

[c.] These products are supplied with an internal fuse and must not be changed or modified

[d.] Measured for 1 second at startup

| Other interfaces - DC, Power port (PoE models) | | |
|---|---|---|
| **Rated voltage**[a.] | 54 VDC, Class III (SELV/PELV)[b.] | |
| **Operating voltage** | 802.3at (PoE+)/802.3ab (PoE++): 53 to 57 VDC<br>802.3af: 48 to 57 VDC<br>No PoE usage: 12 to 57 VDC | |
| **Rated current** | Form factor A: Max. 4.8 A<br>Form factor B: PoE models not available | |
| **Fuse rating**<br>[c.] | Denote time-delay fuse | Form factor A: 6.3 A(T)<br>Form factor B: PoE models not available |
| **Rated frequency** | DC | |
| **Inrush current, $I^2t$**[d.] | Form factor A: 320 $mA^2s$ at 54 VDC<br>Form factor B: PoE models not available | |
| **Startup current** | 2 x nominal current | |
| **Polarity** | Reverse polarity protected | |
| **Redundant power input** | Yes | |
| **Isolation** | All other ports except Ethernet TX port | |
| **Connector** | Detachable screw terminal connector | |
| **Conductor cross section (flexible)** | 0.2-2.5 mm² (AWG 30-12). Use copper conductors only. | |
| **Stripping length cable** | 10 mm | |
| **Cable temperature rating** | For minimum temperature rating of the cable to be connected to the field wiring terminals minimum + 90 °C | |
| **Circuit type** | SELV | |
| **Shielded cable** | Not required | |

[a.] Only CE-compliant Class I or Class II power supplies with SELV/PELV output shall be used with the product

[b.] This equipment is considered equivalent to Class III equipment, even though the internal voltage of switching transformer exceeds the specified level of 6.3.1 in EN/IEC/UL 61010-1. The voltage at the accessible part does not exceed the limit of 6.3.2 in EN/IEC/UL 61010-1 during a single fault condition.

[c.] These products are supplied with an internal fuse and must not be changed or modified

[d.] Measured for 1 second at startup

| Other interfaces - I/O connection, Digital input[a.,b.] | |
|---|---|
| **Isolation to** | All other ports, except relay output |
| **Connector** | Detachable screw terminal connector |
| **Conductor cross section** | 0.2-1.5 mm² (AWG 24-16). Use copper conductors only. |
| **Stripping length cable** | 10 mm |
| **Circuit type** | SELV |
| **Maximum voltage/ current** | 60 VDC, $I_{IN} \leq 2.9$ mA at 60 VDC |
| **Voltage levels** | Logic one: >8 VDC<br>Logic zero: <5 VDC |

[a.] Not applicable for Lynx 3306 and Lynx 3310 models

[b.] External circuits connected to I/O connectors shall be SELV-rated circuits, galvanic isolated from mains

| Other interfaces - I/O connection, Relay output[a.,b.] | |
|---|---|
| **Connect resistance** | Maximum 30 Ω |
| **Isolation to** | All other ports, except digital input |
| **Connector** | Detachable push-in terminal |
| **Conductor cross section** | 0.2-1.5 mm² (AWG 24-16). Use copper conductors only. |
| **Stripping length cable** | 10 mm |
| **Circuit type** | SELV |
| **Maximum voltage/ current** | 60 VDC/80 mA |

[a.]Not applicable for Lynx 3306 and Lynx 3310 models

[b.]External circuits connected to I/O connectors shall be SELV-rated circuits, galvanic isolated from mains

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

| Other interfaces - Console port | |
|---|---|
| **Electrical specification** | USB 2.0 device interface |
| **Data rate** | Emulates UART, settings 115200 bps |
| **Circuit type** | SELV |
| **Maximum supply current** | 100 mA |
| **Connector** | USB-C connector in device mode |

| Other interfaces - Micro SD[a.] | |
|---|---|
| **Electrical specification** | Secure Digital 2.0 |
| **Circuit type** | SELV |
| **Maximum supply current** | 100 mA |
| **Connector** | Micro SD connector |

[a.]Not applicable for Lynx 3306 and Lynx 3310 models

## 5.2. Type Tests and Environmental Conditions

| Environmental phenomena | Basic standard | Description | Test levels |
|---|---|---|---|
| **ESD** | EN 61000-4-2 | Enclosure | Contact: ±6 kV<br>Air: ±8 kV |
| **Fast transients** | EN 61000-4-4 | Power port | ± 2 kV, 5 kHz, 100 kHz<br>Direct coupling |
| | | Earth port | |
| | | I/O port | ± 2 kV, 5 kHz, 100 kHz<br>Capacitive coupling clamp |
| | | Ethernet ports | |
| **Surge** | EN 61000-4-5 | Power port | L-E: ± 1 kV, 12 Ω, 9 µF, 1.2/50 µs<br>L-E: ± 2 kV, 42 Ω, 0.5 µF, 1.2/50 µs<br>L-L: ± 0,5 kV, 2 Ω, 18 µF, 1.2/50 µs<br>L-L: ± 1 kV, 12 Ω, 9 µF, 1.2/50 µs<br>L-L: ± 1 kV, 42 Ω, 0,5 µF, 1.2/50 µs |
| | | I/O port | L-E: ± 2 kV, 42 Ω, 0.5 µF, 1.2/50 µs<br>L-E: ± 1 kV, 12 Ω, 9 µF, 1.2/50 µs<br>L-L: ± 1 kV, 42 Ω, 0.5 µF, 1.2/50 µs<br>L-L: ± 1 kV, 12 Ω, 9 µF, 1.2/50 µs |
| | | Ethernet ports | L-E: ± 2 kV, 2 Ω, direct on shield, 1.2/50 µs |
| **Power frequency magnetic field** | EN 61000-4-8 | Enclosure | 100 A/m, 16.7, 50 and 60 Hz<br>300 A/m DC |
| **Pulsed magnetic field** | EN 61000-4-9 | Enclosure | 300 A/m |
| **Radiated RF immunity** | EN 61000-4-3 | Enclosure | 20 V/m, 80 MHz to 2,7 GHz<br>10 V/m, 2.7 to 6 GHz |
| **Conducted RF immunity** | EN 61000-4-6 | Power port | 10 V, 80% AM, 1 kHz, 0.15 to 80 MHz<br>Spot frequencies: 2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz |
| | | Earth port | |
| | | I/O port | |
| | | Ethernet ports | |
| **Radiated RF emission** | CISPR 16-2-3 | Enclosure | Class A (30 MHz to 6 GHz)<br>DNV-CG; Bridge and Deck Zone (0.15 to 6 GHz)<br>Class A, FCC Part 15 B (30 MHz to 8 GHz) (non-PoE models)<br>Class A, FCC Part 15 B (30 MHz to 7 GHz) (PoE models) |
| | ANSI C63,4 | | |
| **Conducted RF emission** | CISPR 16-2-1 | Power port | Class A (0.15 to 30 MHz) |
| | ANSI C63.4 | | DNV-CG - Bridge and Deck Zone (0.01 to 30 MHz) |
| | | | Class A, FCC Part 15 B (0.15 to 30 MHz) |
| | CISPR 22 | Ethernet ports | Class A (0.15 to 30 MHz) |
| **Compass safe distance** | IEC 60945 | Enclosure | Minimum safe distance to:<br>Standard compass: 15 cm |

| Environmental phenomena | Basic standard | Description | Test levels |
|---|---|---|---|
| | | | Steering compass: 10 cm |
| **Power supply failure** | DNV-CG-0339 | Power port | $U_N$-100%, 30 s |
| **Power supply variation** | DNV-CG-0339 | Power port | 1.3 x $U_N$ (62.4 VDC), 0.75 x $U_N$ (18 VDC), 15 min |
| **Supply surge withstand capability**[a.] | AREMA | Power port | 3 x $U_N$ (24 VDC), 80 ms |
| **Immunity to conducted low frequency interference** | DNV-CG-0339 | Power port | 3 Vrms, 0.05 to 10 kHz |
| **Insulation resistance (non-PoE models)** | DNV-CG-0339 | Power port and Ethernet ports to all other ports, incl. chassis | 500 VDC, 60 s |
| | | I/O port to all other ports incl. chassis | |
| | IEEE 802.3 | Ethernet ports to all other ports incl. chassis | |
| **Insulation resistance (PoE models)** | DNV-CG-0339 | Power port and Ethernet PoE ports to all other ports, incl. chassis | 500 VDC, 60 s |
| | | I/O port to all other ports incl. chassis | |
| | IEEE 802.3 | Power port and Ethernet PoE ports to all other ports, incl. chassis | |
| **Dielectric strength (non-PoE models)** | DNV-CG-0339 | I/O port to all other ports, incl. chassis | 1500 VAC rms, 60 s |
| | DNV-CG-0339 | Power port to all other ports, incl. chassis | 2250 VDC, 60 s |
| | IEEE 802.3 | | |
| | IEEE 802.3 | Ethernet ports to all other ports incl. chassis | |

| Environmental phenomena | Basic standard | Description | Test levels |
|---|---|---|---|
| **Dielectric strength (PoE models)** | DNV-CG-0339 | I/O port to all other ports, incl. chassis | 1500 VAC rms, 60 s |
| | DNV-CG-0339 | Power port and Ethernet PoE ports to all other ports, incl. chassis | 2250 VDC, 60 s |
| | IEEE 802.3 | | |

[a.] Applicable for Lynx(-E)-3510-F4G-T6G-LV, Lynx(-E)-3510-F2G2.5-F2G-T6G-LV and all form factor B models (Lynx-3518)

*Table 11. EMC and electrical conditions*

| Environmental phenomena | Basic standard | Description | Test levels |
|---|---|---|---|
| **Temperatures** | EN 60068-2-1<br>EN 60068-2-2 | Operational | -40 to +70 °C (-40 to +158 °F)<br><br>*Limitation:*<br>-Copper SFP is -40 to +65 °C (-40 to +149 °F)<br>-PoE, see Interface Specifications [24] Total PoE budget |
| | | Storage and transport | -40 to +85 °C (-40 to +185 °F)[a.] |
| **Cooling** | | | Convection, see Mounting [19] for instructions |
| **Humidity** | EN 60068-2-30 | Damp heat, cyclic | +25 to 55 °C, 95% RH<br>2 cycles (12+12 hours) = 48 hours |
| **Corrosive gases** | IEC 60068-2-60 | Operational | Method 3, 21 days[b.] |
| **Altitude** | | Operational | 2000 m/80 kPa |
| **MTBF hours** | Telcordia SR-332, issue 3 | | Lynx-:<br>3306(-E)-F2G-T4-LV and 3510(-E)-F2G-T8G-LV(-CC): 1,035,000 h<br>3310(-E)-F2G-T8-LV(-CC): 1,138,000 h<br>3510(-E)-F2G2.5-F2G-T6G-LV and 3510(-E)-F4G-T6G-LV: 1,022,000 h<br>3510-F2G-P8G-LV(-CC) and 3510(-E)-F2G2.5-P8G-LV: 638,000 h<br>3518(-E)-F4G-T14G-LV and 3518(-E)-F2G2.5-F2G-T14G-LV: 1,071,000 h |
| | MIL-HBDK-217F | | Lynx-:<br>3306(-E)-F2G-T4-LV, 3510(-E)-F2G-T8G-LV(-CC) and 3510(-E)-F2G2.5-T8G-LV(-CC): 879,000 h<br>3310(-E)-F2G-T8-LV(-CC): 974,000 h<br>3510(-E)-F4G-T6G-LV and 3510(-E)-F2G2.5-F2G-T6G-LV: 662,000 h<br>3510-F2G-P8G-LV(-CC) and 3510(-E)-F2G2.5-P8G-LV: 583,000 h<br>3518(-E)-F4G-T14G-LV and 3518(-E)-F2G2.5-F2G-T14G-LV: 460,000 h |
| **Vibration**[c.] | IEC 60068-2-6 (sine) | Operational | 5 to 8 Hz at ± 7.5 mm<br>8 to 500 Hz at 2 g<br>5 sweep cycles in each axis (3 x 5), 1 octave/min |
| | IEC 60068-2-64 (random) | Operational | 5 Hz: 0.02 $(m/s^2)2/Hz$<br>600-2000 Hz: 0.001 $(m/s^2)2/Hz$<br>RMS: 3.6 $m/s^2$<br>3 axis, 90 min/axis<br><br>2-13.2 Hz: 12 dB/oct<br>13.2-100 Hz: 0.011 $g^2/Hz$<br>RMS: 1 g |

| Environmental phenomena | Basic standard | Description | Test levels |
|---|---|---|---|
| | | | 3 axis, 150 min/axis |
| **Shock** | IEC 60068-2-27 | Operational | 10 g/11 ms, 3 x 6 shocks, saw-tooth<br>10 g/ 30 ms, 3 x 6 shocks, half-sine<br>15 g/11 ms, 3 x 6 shocks, half-sine |
| **Enclosure** | EN 61010-1 | Aluminum | Fire enclosure |
| **Weight** | | | Form factor A: 1100 gr<br>Form factor B: 1930 gr |
| **Degree of protection** | EN 60529 | Enclosure | IP40 |
| **Overvoltage category** | EN/IEC 61010-1 | | OVC II |
| **Pollution degree** | EN/IEC 61010-1, EN 50124-1 | | PD2 macro and micro environment |
| **Location** | EN/IEC 61010-1 | | Indoor |

[a.] -55 to +85 °C (-48,3 to +185 °F) for Lynx-3510(-E)-F4G-T6G-LV and Lynx-3510(-E)-F2G2.5-T6G-LV

[b.] Method 3, 21 days corresponds to Harsh Industrial Environment G3 which is defined in ANSI/ISA 17.04: 2015

[c.] The 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 12. Environmental and mechanical conditions*

# 6. Revision Notes

| Revision | Date | Change description |
|---|---|---|
| Rev. B | 2026-11 | Images of form factor B updated |
| Rev. A | 2026-06 | First revision |

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**6627-2220 REV B** 2026 11 @ Westermo Network Technologies AB, Sweden