



## WOLF GATEWAY · LINUX EDGE CONTROLLER

# Wolf-2DALI

2 DALI-2 Buses · Integrated Bus Power · RS-485 Modbus RTU

|                     |                                                         |
|---------------------|---------------------------------------------------------|
| <b>DALI</b>         | 2 independent DALI-2 buses · ≤64 control gear each      |
| <b>BUS POWER</b>    | integrated · 200 mA @ 16 V per bus, software-switchable |
| <b>FIELD BUS</b>    | RS-485 Modbus RTU                                       |
| <b>NETWORK</b>      | 10/100 Ethernet · optional 4G/LTE                       |
| <b>SOFTWARE</b>     | Wolf-OS platform · Wolf-App automation                  |
| <b>POWER</b>        | 21–30 V DC (24 V nominal)                               |
| <b>INSTALLATION</b> | DIN-rail · –40 to +55 °C                                |

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## 1 Introduction

The **FoxIoT Wolf-2DALI** is a Linux-based industrial edge controller in the Wolf Gateway family. It pairs the Wolf motherboard with a 2DALI expansion card that adds **two independent DALI-2 buses with integrated bus power**, plus an **RS-485 Modbus RTU** port. Each bus addresses up to 64 control gear with its own commissioning, scenes, and groups, so one unit covers two lighting zones. The gateway runs lighting standalone with local Lua rules, or bridges both buses to your cloud, SCADA, or BMS — via MQTT, REST, or Modbus TCP over Ethernet or 4G/LTE.

The hardware runs **Wolf-OS** (the Linux platform) and **Wolf-App** (drop-in automation software, including the DALI stack). Expansion cards are detected automatically at boot, so the platform configures its drivers without manual setup.

**DALI-2 conformance.** The Wolf-2DALI is **DALI-2 compatible** — it implements DALI-2 control-device, control-gear, and input-device messaging, commissioning, groups, scenes, and DT1 emergency-lighting tests. It is **not a certified DALI product** and is not listed in the DiiA product database. "DALI" and "DALI-2" are trademarks of the Digital Illumination Interface Alliance.

### 1.1 Key features

- 2 × independent DALI-2 buses — up to 64 control gear per bus (128 total), each with its own commissioning, groups, and scenes.
- Integrated DALI bus power — 200 mA @ 16 V per bus, software-switchable on or off, so no external DALI supply for typical installations.
- Per-bus current measurement — read bus load from the data model to flag overload or wiring faults and see remaining headroom.
- DALI features — control gear, input devices, commissioning, groups, scenes, and DT1 emergency-lighting function and duration tests.
- RS-485 Modbus RTU field bus — MQTT / REST / Modbus TCP on the network side.
- 10/100 Ethernet, optional 4G/LTE (mini-PCIe modem + SIM).
- Runs Wolf-OS and Wolf-App, automatic expansion-card detection.
- DIN-rail, 21–30 V DC (24 V nominal), –40 to +55 °C.

### 1.2 Typical applications

- **Smart lighting control** — commission luminaires across two DALI-2 zones, organise them into groups and scenes, and switch or dim from a BMS or cloud over Modbus TCP, REST, or MQTT.
- **Emergency-lighting compliance** — schedule and run DT1 function and duration tests, read results from the data model, and report status upstream or by email — no separate test controller needed.
- **DALI ↔ Modbus / cloud bridge** — bring third-party or legacy DALI installations onto Modbus TCP or MQTT. Local Lua rules keep lighting running if the network drops.
- **Mixed installations** — drive lighting on the DALI buses and poll meters or inverters on the RS-485 Modbus RTU port from the same controller.

**About this manual.** This manual covers the **hardware** of the Wolf-2DALI — installation, wiring, power, and the on-board DALI and RS-485 ports. Software (operating system, networking, the DALI stack, automation, cloud) is documented separately: see the **Wolf-OS** and **Wolf-App** manuals listed below.

## Related documents

| Document                     | Link                                                                                                        |
|------------------------------|-------------------------------------------------------------------------------------------------------------|
| Datasheet / product overview | <a href="https://foxiot.eu/products/wolf-gateway/wolf-2dali">foxiot.eu/products/wolf-gateway/wolf-2dali</a> |
| Wolf-OS (platform)           | <a href="https://foxiot.eu/products/wolf-gateway/wolf-os">foxiot.eu/products/wolf-gateway/wolf-os</a>       |
| Wolf-App (automation)        | <a href="https://foxiot.eu/products/wolf-gateway/wolf-app">foxiot.eu/products/wolf-gateway/wolf-app</a>     |
| First-time setup guide       | <a href="https://foxiot.eu/wolf-setup">foxiot.eu/wolf-setup</a>                                             |
| Firmware releases            | <a href="https://foxiot.eu/firmware/wolf-gateway">foxiot.eu/firmware/wolf-gateway</a>                       |

## 2 Safety

Read and understand this manual before installation or maintenance. The following guidance protects personnel and equipment.

### 2.1 General safety guidelines

- Only qualified personnel should install, wire, or service the device.
- Use appropriate personal protective equipment when working with electrical components.
- Do not operate the device if it appears damaged or has been exposed to moisture.
- Ensure all wiring and connections comply with local regulations and standards.
- Keep the working area clean and free of conductive materials.

### 2.2 Electrical installation safety

**Low-voltage device.** The Wolf-2DALI is a low-voltage controller — the supply is 21–30 V DC (24 V nominal) and the DALI buses are SELV, with a bus voltage of about 16 V. Power it from an isolated SELV supply and keep all field wiring within these limits. The DALI bus is **not** a mains circuit — do not connect mains voltage to the D– / D+ terminals.

- **DIN-rail mounting** — mount on a 35 mm DIN rail inside an electrical cabinet, secured so the unit cannot shift or fall.
- **Low-voltage wiring** — power the unit from an isolated (SELV) supply. Use appropriate low-voltage wire for power and the DALI buses. Do not route low-voltage signal wiring alongside high-voltage cables.
- **DALI bus** — DALI is polarity-free at the gear, but on this card the terminals are marked D– / D+ for clarity. Each bus is current-limited to 250 mA. Do not parallel the two buses, and do not connect a second DALI power supply to a bus whose integrated power is switched on.

- **Modbus data line** — use 120  $\Omega$  twisted-pair cable on the RS-485 lines. The card has a fixed on-board 120  $\Omega$  terminator, so the unit must sit at one physical end of the bus — terminate the far end with 120  $\Omega$  and leave mid-bus devices unterminated.

## 2.3 Handling, storage & environment

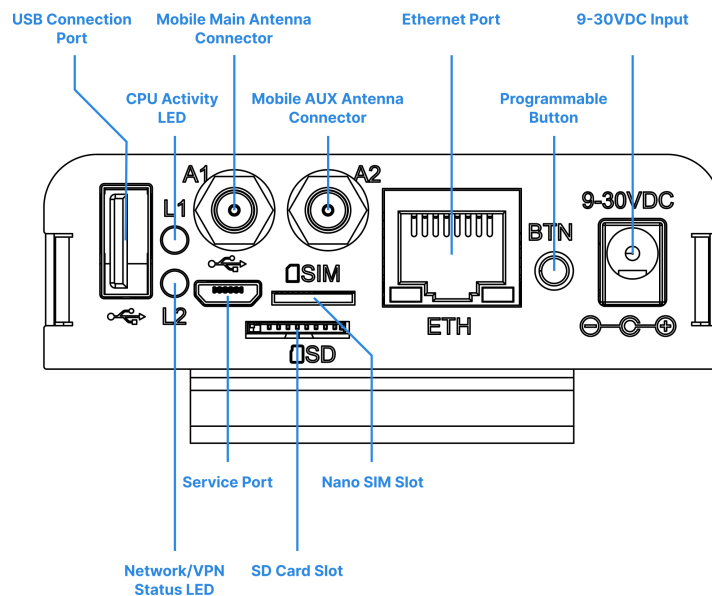
Handle with care to avoid mechanical shock. Store in the original packaging in a clean, dry place within the rated temperature range. The device is for indoor cabinet use. Outdoor installation is possible only inside a suitably rated weatherproof enclosure (IP65 or higher). Avoid excessive humidity/condensation, direct sunlight or radiant heat, and corrosive gases, dust, or vibration.

## 3 Specifications

### 3.1 Connectors and ports

The unit has two connection sides. The motherboard carries the network, power, and storage ports. The expansion card carries the field connections — the two DALI buses, the RS-485 port, and power.

Network and storage connect on the motherboard front:

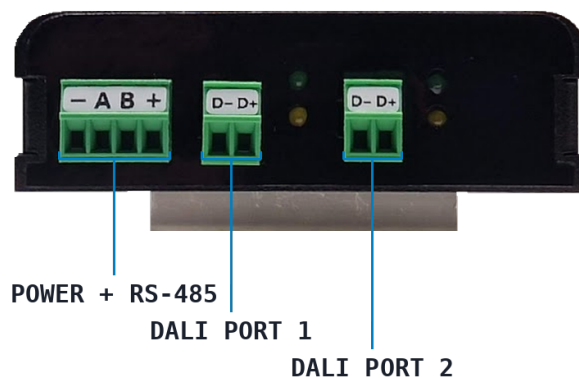


*Wolf-2DALI front ports*

| Front Port   | Function                                                         |
|--------------|------------------------------------------------------------------|
| USB          | USB 2.0 host, software-switchable power, over-current protection |
| Service Port | Micro USB 2.0 — console and firmware upgrade                     |
| ETH          | 10/100 Mbps Ethernet (RJ45)                                      |
| A1 / A2      | 4G/LTE antenna connectors — A1 main, A2 Rx-diversity (optional)  |
| Nano SIM     | SIM slot for the LTE modem                                       |
| SD           | Micro-SD card slot, software-switchable power                    |
| BTN          | User-programmable button                                         |
| L1 / L2      | Programmable status LEDs — L1 heartbeat, L2 user                 |
| 21–30 VDC    | DC jack (2.1 / 5.5 mm) power input                               |

**Supply is 21–30 V DC, not 9–30 V.** The Wolf-2DALI needs **21–30 V DC (24 V nominal)** to power its integrated DALI bus supplies. The DC-jack silkscreen reads "9–30 VDC" because the front panel is shared across the Wolf Gateway family — for this product, the 21–30 V DC range in this table is authoritative. Below 21 V the DALI buses will not be powered.

Field wiring connects on the expansion card:



*Wolf-2DALI expansion-card connectors*

| Connector     | Function                                                          |
|---------------|-------------------------------------------------------------------|
| – A B +       | Power (–, +) 21–30 V DC · RS-485 A (+) / B (–)                    |
| D– D+ (bus 1) | DALI-2 bus 1 · integrated bus power, ≤64 control gear             |
| D– D+ (bus 2) | DALI-2 bus 2 · integrated bus power, ≤64 control gear             |
| TX / RX LEDs  | Traffic indicators — one TX and one RX LED per DALI bus (4 total) |

**RS-485 polarity.** On this connector A is positive (non-inverting) and B is negative — the common industry convention. The RS-485 standard's A/B lettering is a well-known source of confusion (often cited as the opposite), so if a device won't communicate, try swapping A and B.

## 3.2 Motherboard

| Parameter   | Value                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------|
| CPU         | NUC980 ARM926EJ-S @ 300 MHz                                                                                     |
| Memory      | 128 MB DDR II                                                                                                   |
| Storage     | 128 MB NAND Flash                                                                                               |
| Ethernet    | 10/100 Mbps RJ45                                                                                                |
| USB         | Micro USB 2.0 (FW upgrade) + USB 2.0 host (software-switchable power, over-current protection, 1 A)             |
| SD Card     | Micro-SD slot with detection, software-switchable power                                                         |
| SIM         | Nano SIM (for LTE modem)                                                                                        |
| Mini PCIe   | USB 2.0 + GPIOs, software-switchable power (4G/LTE/NB-IoT/WiFi modules)                                         |
| Crypto      | Hardware acceleration — AES-256, RSA-2048, SHA-512, ECC-256, HMAC, RNG (Linux software is not limited to these) |
| RTC         | Real-time clock (battery backup optional)                                                                       |
| Sensors     | Onboard PCB temperature, input voltage monitoring                                                               |
| Status LEDs | 2× programmable (heartbeat + user by default)                                                                   |

### 3.3 Expansion card (2DALI)

| Parameter       | Value                                                                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DALI buses      | 2 × independent, DALI-2 compatible                                                                                                                                                                                                                                                           |
| Control gear    | Up to 64 addresses per bus (128 total)                                                                                                                                                                                                                                                       |
| Bus power       | Integrated PSU, 200 mA @ 16 V steady-state per bus, each switchable on/off in software · sources up to 250 mA while a control device pulls the line low to signal · TVS-clamped and fuse-protected · add an external DALI PSU only if the connected gear needs more than 200 mA steady-state |
| Bus diagnostics | Per-bus DALI current measurement (overload / wiring-fault detection), readable from the data model                                                                                                                                                                                           |
| DALI features   | Control gear, input devices, commissioning, groups, scenes, DT-specific config including DT1 emergency-lighting function and duration tests                                                                                                                                                  |
| DALI signalling | 1200 bps, Manchester-coded · bus voltage ~16 V (idle high 9.5–22.5 V) · 250 mA pull-down limit                                                                                                                                                                                               |
| Status LEDs     | One TX and one RX LED per DALI bus (4 total)                                                                                                                                                                                                                                                 |
| RS-485          | ±15 kV HBM ESD, ±30 V bus protection (on-board TVS), 120 Ω termination (built-in, fixed), on-board fail-safe bias                                                                                                                                                                            |
| Card detection  | On-board EEPROM (auto-detected by the platform at boot)                                                                                                                                                                                                                                      |

### 3.4 Communication & network

| Parameter         | Value                                                                               |
|-------------------|-------------------------------------------------------------------------------------|
| Field bus         | RS-485 Modbus RTU, 300–115200 bps (standard rates)                                  |
| Ethernet          | 10/100 Mbps RJ45                                                                    |
| Cellular          | Optional 4G/LTE — Quectel EC25-EUX (mini-PCIe) + nano-SIM                           |
| Network protocols | MQTT, REST, Modbus TCP — client, server, and transparent RTU↔TCP gateway (Wolf-App) |
| Remote access     | VPN — WireGuard (built-in) · OpenVPN (Wolf-OS package)                              |

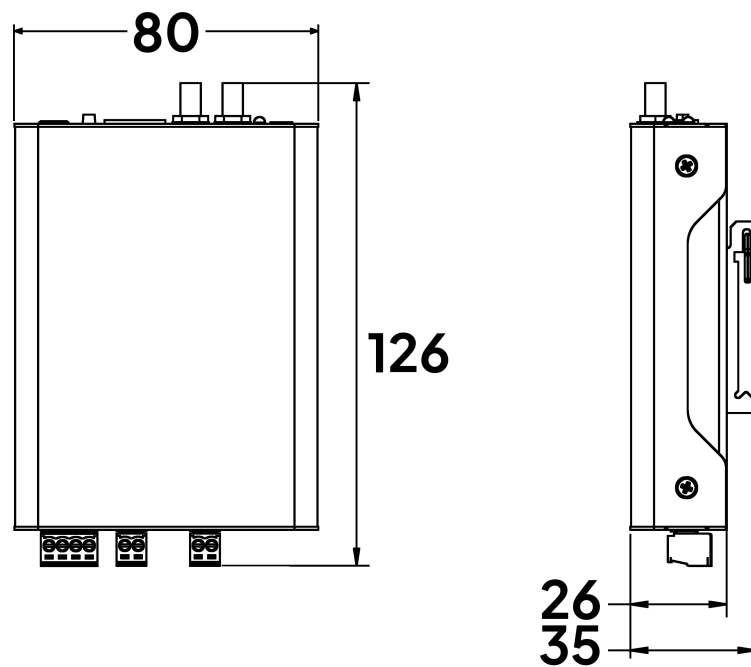
### 3.5 Power

| Parameter                  | Value                                                                                                                                                                         |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input range                | 21–30 V DC (24 V nominal) — DC jack (2.1 / 5.5 mm) or – / + terminals (one source only)                                                                                       |
| DALI bus power             | Integrated, 200 mA @ 16 V steady-state per bus (software-switchable), up to 250 mA during signalling pull-down · TVS-clamped and fuse-protected · drawn from the input supply |
| Reverse-voltage protection | Yes                                                                                                                                                                           |

The higher input range (21–30 V DC) feeds the integrated DALI bus supplies. The optional 4G/LTE modem and the energized DALI buses draw additional power depending on bus load and network state.

### 3.6 Mechanical & environmental

| Parameter             | Value                   |
|-----------------------|-------------------------|
| Mounting              | DIN-rail                |
| Dimensions            | 126 × 80 × 35 mm        |
| Weight                | ~350 g                  |
| Operating temperature | –40 to +55 °C           |
| Storage temperature   | –40 to +75 °C           |
| Humidity              | 5–90 % (non-condensing) |



*Wolf-2DALI mechanical dimensions (mm)*

## 4 How It Works

### 4.1 Platform & expansion card

The Wolf motherboard runs Wolf-OS (the Linux platform) and Wolf-App (the ready automation software, which includes the DALI stack), while the 2DALI expansion card provides the two DALI buses and the RS-485 port. Wolf-OS identifies the card at boot via an on-board EEPROM and loads the right drivers automatically — no manual configuration of the ports. Two programmable status LEDs (L1 heartbeat, L2 user) indicate platform operation, and four LEDs on the card show TX and RX traffic per DALI bus.

## 4.2 Two independent DALI buses

Each bus is a complete, independent DALI-2 line addressing up to 64 control gear (128 total across both buses), with its own commissioning, groups, and scenes. The card carries an integrated bus supply for each bus — 200 mA at about 16 V steady-state, switchable on or off in software — so typical installations need no external DALI power supply. The supply sources up to 250 mA briefly while a control device pulls the line low to transmit, and is TVS-clamped and fuse-protected. Switch a bus's integrated power off and feed it from an external DALI PSU only when the connected gear draws more than the 200 mA steady-state budget. The card measures each bus's current, so the data model reports load, flags an overload or wiring fault, and shows how much headroom is left. DALI signalling is 1200 bps Manchester-coded, polarity-free at the gear.

## 4.3 Commissioning, scenes & emergency lighting

Wolf-App commissions the control gear on each bus, assigns short addresses, and organises gear into groups and scenes. It reads every gear's status from the data model and runs DT1 emergency-lighting function and duration tests on schedule, logging the results to the data model for reporting upstream, so a separate emergency-lighting test controller is not needed. The test schedule is itself a Lua rule — it is set up in the rule engine, using the engine's timers, like all custom behaviour, and runs locally on the controller. Rules can also send the results out directly by email: a report on a schedule, with the results attached as a file, or an alert when a luminaire fails a test. Email goes through the customer's own SMTP account — there is no FoxIoT mail relay.

## 4.4 Communication

The RS-485 port runs Modbus RTU to field devices — meters, inverters, and other RS-485 equipment in mixed installations, and M-Bus meters through an M-Bus gateway. On the network side, Wolf-App exposes both DALI buses and the RS-485 devices over MQTT, REST, or Modbus TCP via Ethernet or an optional 4G/LTE modem. When the network is offline, local Lua rules keep the lighting running and resync status when the link returns.

The card carries a **fixed** on-board 120  $\Omega$  terminator, so the Wolf-2DALI must sit at one physical end of the RS-485 bus. Terminate the far end with 120  $\Omega$  and leave any mid-bus devices unterminated.

# 5 Installation

Read the [Safety](#) section before installing.

Disconnect all power before wiring. Double-check polarity and that every connection is secure before powering on.

- 1. Unpack and inspect** the device for transport damage, and check the model and ratings.
- 2. Mount** — first hook the top edge of the clip over the top of the 35 mm DIN rail, then press the unit down to compress the top spring and push the bottom in against the rail. The spring then presses the unit firmly against the rail.
- 3. Wire the DALI buses** — connect each lighting zone to its D– / D+ terminals. Keep each bus on one pair, observe the 200 mA steady-state bus-power budget, and leave the integrated bus power on unless an external DALI PSU is fitted — see [Connectors and ports](#) under [Specifications](#).

4. **Wire RS-485** (mixed installations) and the power terminals to the pluggable connector.
5. **Network** — connect Ethernet, or fit the nano-SIM and connect the antenna to A1 for 4G/LTE. A second antenna on A2 (Rx-diversity) is recommended for better reception.
6. **Power** — apply 21–30 V DC, via the DC jack or the – / + terminals on the expansion card. Use only one source — do not connect both at the same time.
7. **Configure** — commission the DALI buses and set up connectivity and automation in **Wolf-App**. See [Software & Configuration](#) and the [first-time setup guide](#).

**Controller removal.** To remove the unit, push it down to compress the top spring clip, then pull the bottom edge toward you and lift it off the rail — no tool needed.

## 6 Software & Configuration

The Wolf-2DALI has no display — apart from the programmable button, all setup and operation happen in software, including DALI commissioning, groups, scenes, and emergency-lighting tests. This hardware manual does not duplicate the software documentation. For networking, secure updates, the DALI stack, automation, and cloud connectivity, use the dedicated manuals:

- **Wolf-OS** — the Linux platform: networking, secure updates, system services. See [foxiot.eu/products/wolf-gateway/wolf-os](https://foxiot.eu/products/wolf-gateway/wolf-os).
- **Wolf-App** — drop-in automation and the DALI stack: commissioning, groups, scenes, DT1 emergency-lighting tests, cloud/BMS connectivity, MQTT / REST / Modbus TCP, and rules. See [foxiot.eu/products/wolf-gateway/wolf-app](https://foxiot.eu/products/wolf-gateway/wolf-app).
- **First-time setup** — step-by-step at [foxiot.eu/wolf-setup](https://foxiot.eu/wolf-setup).
- **Firmware releases** — bundles and changelogs at [foxiot.eu/firmware/wolf-gateway](https://foxiot.eu/firmware/wolf-gateway).

## 7 Maintenance

The device is designed for indoor cabinet use and needs minimal maintenance.

- **Cleaning** — disconnect power, then wipe the enclosure with a dry or slightly damp lint-free cloth, no solvents or abrasives.
- **Connectors** — periodically inspect the power, DALI, and network connections, and clean oxidation or debris with electronics-approved contact cleaner or compressed air.
- **Periodic inspection (every 12 months)** — check for mechanical damage, secure mounting, and loose cables, and confirm the recommended firmware version.
- **Firmware** — Wolf-OS and Wolf-App update in-field as signed bundles. Do not remove power during an update. Releases and changelogs: [foxiot.eu/firmware/wolf-gateway](https://foxiot.eu/firmware/wolf-gateway).

**Do not open the enclosure.** There are no user-serviceable parts inside. Opening it voids the warranty — see [Warranty limitations](#).

## 8 Troubleshooting

Hardware-side checks for common field issues. Software diagnostics — networking, DALI commissioning, automation, and logs — are covered in the [Wolf-OS](#) and [Wolf-App](#) manuals.

| Symptom                                                  | Check                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>L1 green LED not blinking</b>                         | By default L1 (green) blinks as a heartbeat. At boot it stays solid, then begins blinking after ~30 s. If it never starts, measure the – / + terminals: confirm 21–30 V DC, correct polarity, and that voltage stays within limits (over-voltage can cause permanent damage).                                                                                                                                                                                                                                                                                                         |
| <b>No DALI communication on a bus</b>                    | Confirm the bus's integrated power is switched on in Wolf-App, or that an external DALI PSU is fitted. Measure the D– / D+ terminals — an idle bus reads about 16 V. Check the bus-current reading in the data model: near 0 mA means no gear is drawing power (open line or unpowered gear), and a reading at the 250 mA limit means an overload or a short. Keep each bus on one twisted pair and within 300 m.                                                                                                                                                                     |
| <b>DALI gear not found during commissioning</b>          | Confirm the gear is wired to the correct bus and powered. The two buses are independent — gear on bus 1 is not visible to bus 2. A bus addresses up to 64 control gear — beyond that, move gear to the second bus. Re-run commissioning in Wolf-App after fixing wiring.                                                                                                                                                                                                                                                                                                              |
| <b>Bus current reads at the limit / overload flagged</b> | The integrated supply provides 200 mA steady-state per bus (up to 250 mA during signalling pull-down). Gear drawing more than the 200 mA steady-state budget, or a short across D– / D+, trips the limit. Disconnect gear to isolate the fault, or add an external DALI PSU if the connected gear genuinely needs more than 200 mA steady-state.                                                                                                                                                                                                                                      |
| <b>No Modbus RTU comms</b>                               | Wire A (+) to every device's A (+) and B (–) to B (–), polarity consistent along the whole chain. Use twisted-pair cable of the correct impedance, with A/B on the same pair. The card has an on-board 120 Ω terminator at its end — check that the far end of the line is terminated too. The "–" terminal also serves as the RS-485 signal ground — as good practice, run a signal-ground wire linking "–" between devices so they share a common reference. Once wiring is confirmed correct, check baud rate, stop bits, and parity — parity is the most common misconfiguration. |
| <b>No Ethernet</b>                                       | Check the RJ45 cable and switch port. The RJ45 connector has built-in link/activity LEDs — confirm the link LED shows a connection. IP and DHCP configuration is covered in the <a href="#">Wolf-OS docs</a> .                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Can't reach the device / IP unknown</b>               | Boot into recovery mode for a fixed IP, or factory-reset to restore defaults (network reverts to DHCP). See the <a href="#">first-time setup guide</a> .                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>No 4G/LTE</b>                                         | Confirm the SIM is seated and the antenna connected (main antenna on A1). Most LTE problems are not hardware: the SIM PIN must be removed before inserting the card, the operator must have activated the data service, and the APN must be correct. Wolf-App configures the modem automatically — see the <a href="#">setup guide</a> .                                                                                                                                                                                                                                              |

## 9 Ordering Information

| Item                  | Order code          | Description                                              |
|-----------------------|---------------------|----------------------------------------------------------|
| Wolf-2DALI            | GW-WOLF-DALI-R1     | 2 DALI-2 buses (integrated bus power), RS-485 Modbus RTU |
| Wolf-2DALI-LTE        | GW-WOLF-DALI-R1-LTE | As above, with 4G/LTE modem (Quectel EC25-EUX)           |
| Plug-in power adapter | ACC-PSU-24P         | 24 V DC, 1.5 A (2.1 / 5.5 mm jack)                       |
| DIN-rail PSU          | ACC-PSU-24D         | 24 V DC, 1.5 A                                           |
| LTE antenna           | ACC-ANT-M-LTE       | Magnet-mount, for the -LTE variant                       |

Order through [hello@foxiot.eu](mailto:hello@foxiot.eu) or your distributor.

## 10 Warranty, Support & RMA

### 10.1 Warranty conditions

FoxIoT OÜ provides a limited warranty for **36 months from the date of purchase**, covering defects in materials and workmanship under normal use, in accordance with this manual and the product's environmental specifications. During the warranty period FoxIoT will repair or replace defective units at no charge, provided the product has not been modified, misused, or subjected to adverse conditions.

- Valid only for original products from FoxIoT OÜ.
- Proof of purchase may be required.
- Warranty service is limited to repair or replacement.
- The warranty does not cover associated costs such as removal, reinstallation, or transportation.

Independent of the warranty period, FoxIoT provides security updates for at least **5 years** from the product's release, as required by EU CRA 2024/2847.

### 10.2 Warranty limitations

The warranty does **not** apply in the following cases:

- Physical damage from mishandling, impact, fire, or water exposure.
- Damage from improper installation, incorrect wiring, or operation outside the specified limits.
- Modifications or repairs by unauthorized personnel.
- Normal wear and tear.
- Software issues related to non-standard configurations.

The warranty is void if the product has been opened or tampered with in any way not approved by FoxIoT OÜ.

## 10.3 Technical support

Contact our support team through:

|               |                                                          |
|---------------|----------------------------------------------------------|
| Email         | <a href="mailto:support@foxiot.eu">support@foxiot.eu</a> |
| Support hours | Monday–Friday, 10:00–16:00 EET (Estonian time)           |
| Languages     | English, Estonian                                        |

Have your device's serial number, firmware version, and a clear description of the problem ready when contacting support.

## 10.4 RMA process (Return Material Authorization)

To return a product for repair or replacement you must obtain a valid **RMA number** from support — devices returned without one are not accepted.

1. Contact technical support to report the issue.
2. Provide the serial number, a clear description of the issue, and proof of purchase.
3. Receive an RMA number and return instructions.
4. Package the product carefully to prevent shipping damage and include the RMA number.
5. Send the unit to the return address provided by support.

Returns through an authorized reseller or distributor must still be submitted to FoxIoT support to obtain an RMA number. The reseller manages end-customer logistics and documentation. Direct end-customer returns are accepted after support verifies the purchase channel and warranty eligibility.

## 11 Compliance & Standards

The Wolf Gateway platform is designed and documented to EU industrial and cybersecurity requirements. Product security information is published per the EU Cyber Resilience Act (Regulation 2024/2847).

### 11.1 Product cybersecurity context

The Wolf platform applies a defense-in-depth strategy:

- **Signed firmware** — Wolf-OS and Wolf-App ship as digitally signed bundles. The updater verifies each bundle's signature before installing it.
- **Secure remote access** — use the built-in VPN (OpenVPN, WireGuard) for remote management. Do not expose management interfaces directly to the public internet.
- **Intended environment** — install inside a locked electrical cabinet, on a segmented automation network behind a firewall.
- **Security updates** — provided for at least 5 years, per EU CRA 2024/2847. Report vulnerabilities to [security@foxiot.eu](mailto:security@foxiot.eu).

| Topic                   | Detail                                                           |
|-------------------------|------------------------------------------------------------------|
| Directives              | EMC 2014/30/EU · RoHS 2011/65/EU · WEEE 2012/19/EU               |
| Cyber Resilience        | EU CRA (Reg. 2024/2847) — product security information published |
| Secure boot & updates   | Signed Wolf-OS / Wolf-App firmware bundles                       |
| Vulnerability reporting | security@foxiot.eu — coordinated disclosure                      |

Product Security Information (CRA-UI-001) and signed firmware releases are published at [foxiot.eu/legal/security](https://foxiot.eu/legal/security). Report vulnerabilities to [security@foxiot.eu](mailto:security@foxiot.eu).

**Disposal (WEEE).** Do not dispose of this device with household waste. At end of life, return it to a designated WEEE collection point or to FoxIoT OÜ — see [recycling & disposal](#).

### Revision History

| Version | Date       | Notes            |
|---------|------------|------------------|
| 1.0     | 2026-06-17 | Initial release. |