

# Jooby Gateway LoRaWAN



jooby

Specifications

## Gateway for data acquisition in LoRaWAN networks

Part number: Jooby Gateway LoRaWAN 401 EU  
Jooby Gateway LoRaWAN 403 EU



The Jooby Gateway LoRaWAN series gateways are designed to receive data from radio modules and transmit it to a server. The data is sent to the device via LoRaWAN wireless network and the gateway then transmits it to the server. The data is re-coded and stored as part of the software in the form of user-friendly reports.

Industrial-grade gateway components provide robust data protection, while a set of accessories and mounts guarantees its convenient operation. Special technical solutions regarding configuration can be included in the bundle at the customer's request.

## Features

### Hardware

IP67 industrial Die-Cast Aluminium enclosure with all necessary cable glands

LoRaWAN Concentrator: one module as default for up to 8 channels or dual modules for up to 16 channels — depends on device modification

Power: PoE (802.3af), with Surge Protection, with Lightning Protection

Backup Power: 12V Li-ion Backup Battery (depends on device modification). Provides 20 hours of battery life on a full charge under normal conditions.

Backhaul: LTE and Ethernet

GNSS

## Software

Web UI

## Specifications

### Overview

The overview presents dual circuit board of Jooby Gateway LoRaWAN which consists from Mainboard (JOGL\_CPU) and Indication board (JOGL\_LED). It also refers to the list of components and accessories of the Jooby Gateway LoRaWAN.

- Dual circuit board: Mainboard and Indication board
- Enclosure
- Backup Battery
- Accessories

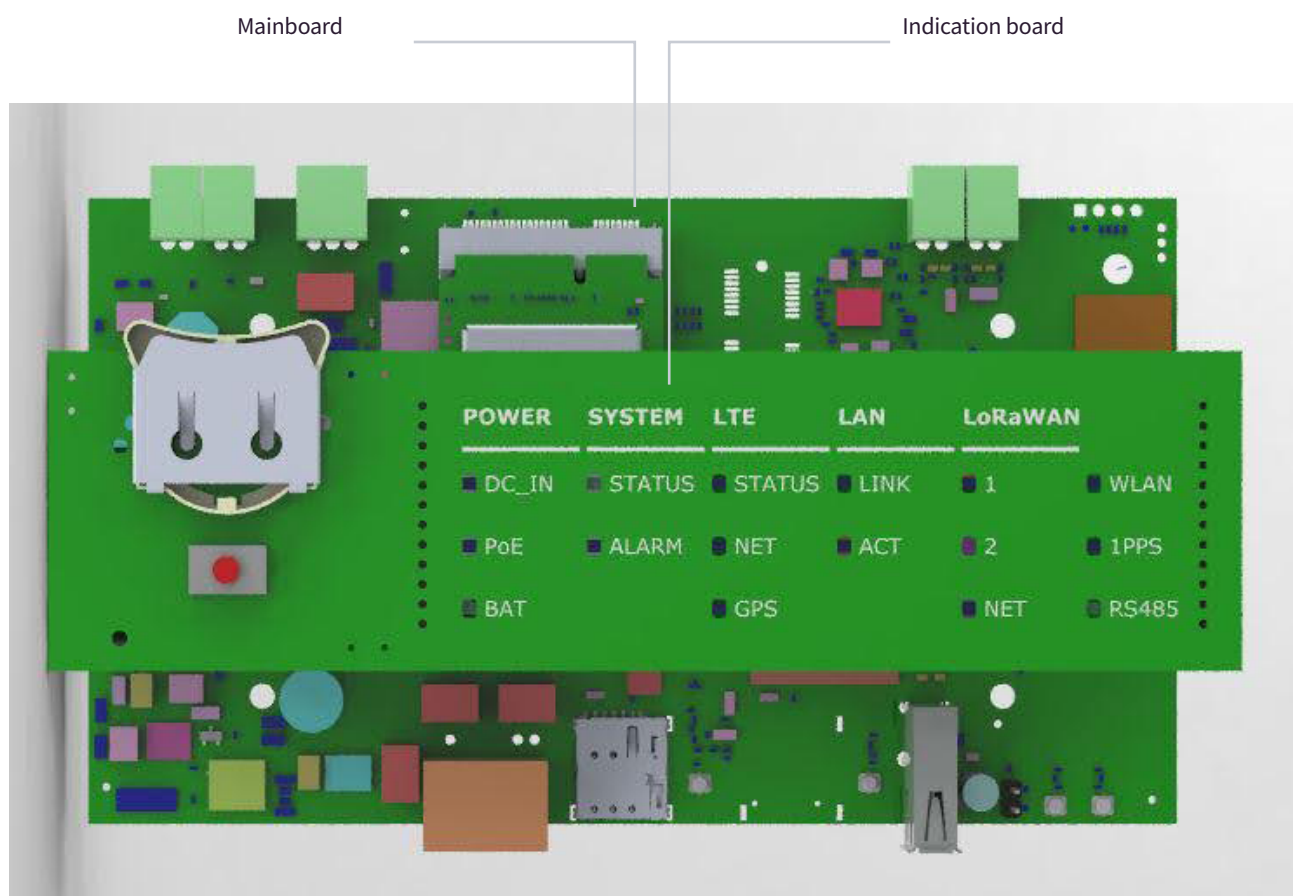


Figure 1: Dual circuit board

## Mainboard (JOGL\_CPU)

|                            |                                                                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| CPU:                       | JOGL Mainboard with Arm Cortex-A7 STM32MP131FAF7 inside (up to 1GHz)                                                             |
| RAM:                       | DDR3-1066 512MB                                                                                                                  |
| Flash                      | 8GB eMMC (16GB eMMC – optional)                                                                                                  |
| Tx Power                   | up to 22dBm                                                                                                                      |
| Rx sensitivity:            | down to -111dBm                                                                                                                  |
| LoRaWAN Concentrator       | one module as default for up to 8 channels or two modules for up to 16 channels (depends on device modification)                 |
| LTE:                       | LTE (1 sim-card, Quectel EG915N - LTE-FDD (B1/B3/B7/B8/B20), GSM (EGSM900/DCS1800)                                               |
| GNSS:                      | Integrated Module into the LTE-module EG915N (if present) or separate module GNSS (GPS/GLONASS/Galileo/BDS/QZSS/SBAS) – optional |
| Tampers:                   | up to 2 pcs – optional                                                                                                           |
| RS-485:                    | optional                                                                                                                         |
| Real-time clock (RTC):     | powered by main power supply of device                                                                                           |
| Power-over-Ethernet (PoE): | basic Ethernet at standard IEEE 802.3u 100Base-TX (Fast Ethernet)                                                                |

## Indication board (JOGL\_LED)

|                    |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------|
| Indication:        | 16 LEDs which indicate the work of different nodes of the Dual circuit board        |
| Functional button  |  |
| Backup battery RTC | Li-ion battery CR 2032 — backup power in the absence of main power for RTC          |

## Enclosure

|                           |                                                                                                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Case:                     | IP67 aluminium ribbed case in white colour                                                                                                                                   |
| Interface:                | 401 EU — 3 x N-Type connectors for external antennas, 1 PoE port and 2 reserve ports;<br>403 EU — 4 x N-Type connectors for external antennas, 1 PoE port and 1 reserve port |
| Weight (including cable): | 2,74 kg                                                                                                                                                                      |
| Dimensions:               | 295mm x 220mm x 105mm                                                                                                                                                        |
| Wall thickness:           | 2 mm                                                                                                                                                                         |
| Support:                  | up to 70~100 mm diameter pole mount                                                                                                                                          |

## Accessories

|                                            |
|--------------------------------------------|
| GNSS Antenna (mounting kit is included)    |
| LoRaWAN Antenna (mounting kit is included) |
| LTE Antenna                                |
| Mounting Kit for enclosure mounting        |



Figure 2: Accessories (on request)

## Hardware

The hardware specification presents the interfacing of Jooby Gateway LoRaWAN both in hardware and dual circuit board interfaces.

### Hardware Interfaces

The images below show the hardware interfaces at the top and bottom of the case.



Figure 3: Hardware Interfaces – Top side



Figure 4: Hardware Interfaces – Bottom side of Jooby Gateway LoRaWAN 403 EU

## Dual circuit board Interfaces

### MainBoard

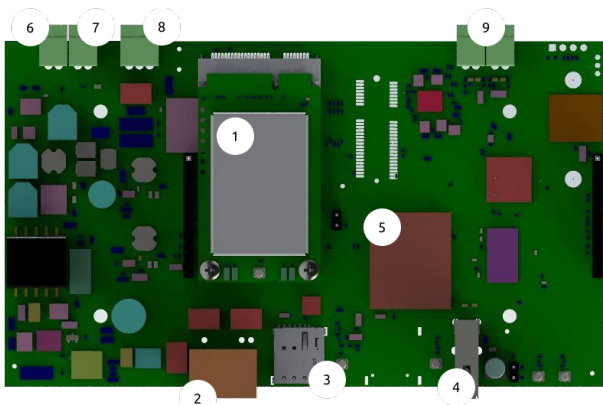


Figure 5: MainBoard

### Description to the Figure 5:

1. Mini PCIe Module LoRaWAN Concentrator
2. Ethernet / PoE
3. nano SIM-card slot
4. USB 2.0
5. CPU
6. Backup Battery connector
7. Power supply connector (DC 12-16.5V) (optional) (15V+/-10% is needed for charge pump system if available)
8. RS485 (optional)
9. Tamper (optional)

## Indication board

The Indication board provides a Functional button (Fn) and 16 x LEDs for status indication

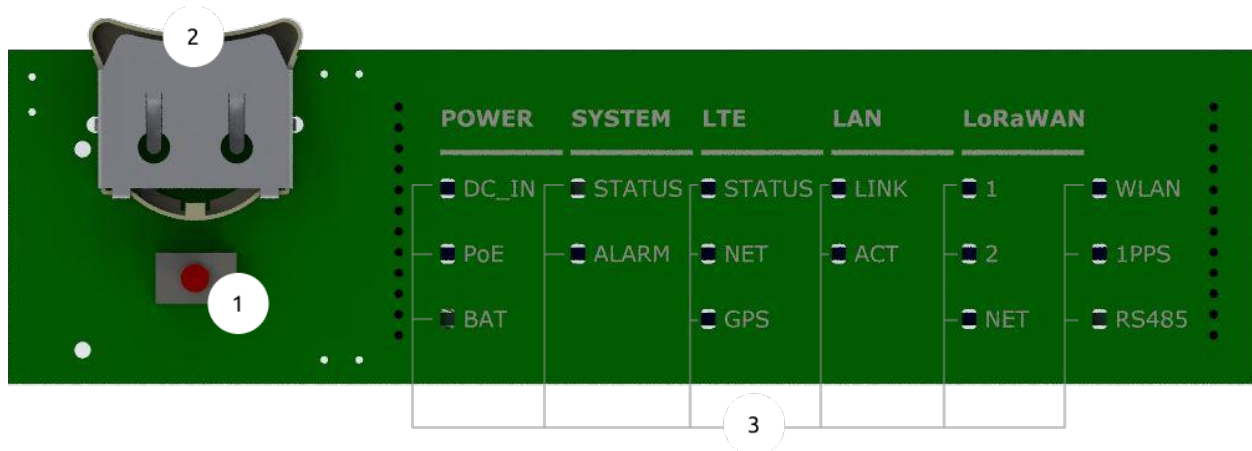


Figure 6: Indication Board

## Description to the Figure:

### 1. Functional button (Fn)

#### Factory Reset:

- **Long press (30 sec)** - System|Status led blinks red;
- When System|Status led lights red, then release Fn - **wait for 30 sec**;
- System|Status starts to blink yellow – **long press (30 sec)**;
- System|Status led and System|Alarm led light red – **release Fn**;
- Gateway was reseted successfully.

#### Switching memory bank:

- **Long press (30 sec)** - System|Status led blinks red;
- When System|Status led lights red, then release Fn - **wait for 30 sec**;
- System|Status starts to blink yellow – **long press (15 sec)**;
- System|Status led lights red – **release Fn**;
- Gateway loads from an alternate memory bank.

### 2. Slot for Li-ion battery CR 2032

### 3. 3 – LED Indicators

The status of the LEDs is described as shown below. Please refer to the print near each LED on the Indication board.

## POWER

| LEDs name | Function                                         | Colour                                               |
|-----------|--------------------------------------------------|------------------------------------------------------|
| DC_IN     | Availability of DC power supply                  | green                                                |
| PoE       | Availability of PoE power supply                 | green                                                |
| BAT       | Charging status of Backup Battery (if available) | Charging in progress – red,<br>Fully charged - green |

## SYSTEM

| LEDs name | Function                                                | Colour                                                       |
|-----------|---------------------------------------------------------|--------------------------------------------------------------|
| STATUS    | Status Indication of Gateway                            | Normal work mode / Successful loading – green<br>Error - red |
| ALARM     | Disconnecting the tamper – Gateway case has been opened | red                                                          |

## LTE

| LEDs name | Function         | Colour                                                                                                 |
|-----------|------------------|--------------------------------------------------------------------------------------------------------|
| STATUS    | LTE is activated | green                                                                                                  |
| NET       | LTE is connected | Yellow led blinks slowly while searching network<br>Yellow led blinks fast during active data transfer |
| GNSS      | GNSS is working  | green                                                                                                  |

## LAN

| LEDs name | Function | Colour |
|-----------|----------|--------|
| Link      | Link     | green  |
| ACT       | Activity | yellow |

## LoRaWAN

| LEDs name | Function                          | Colour                                              |
|-----------|-----------------------------------|-----------------------------------------------------|
| 1         | First LoRaWAN Module is on board  | blue                                                |
| 2         | Second LoRaWAN Module is on board | blue                                                |
| NET       | Connection to server is available | green                                               |
| WLAN      | WiFi is available                 | green                                               |
| 1PPS      | 1PPS signal is available          | green led blinks once per second if available       |
| RS485     | RS485 receive/transmit            | green – receive<br>red – transmit<br>0 – not active |

## Models / Bundles

The table below shows the Jooby Gateway LoRaWAN Models and Control module configurations.

Jooby Gateway LoRaWAN (model name) EU

| Model Name | Control module configuration | 8 Channel LoRaWAN | 16 Channel LoRaWAN | Ethernet Lightning Protection | LTE | GNSS | Backup Battery | EU868, US915 |
|------------|------------------------------|-------------------|--------------------|-------------------------------|-----|------|----------------|--------------|
| 401        | C002E2W0L1G12A00110          | ✓                 |                    | ✓                             | ✓   | ✓    | ✓              | ✓            |
| 403        | C002E2W0L2G12A00110          |                   | ✓                  | ✓                             | ✓   | ✓    | ✓              | ✓            |

## Certification





## Main Specifications (default models)

| Feature               | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Computing             | Arm Cortex-A7, DDR3 RAM 512MB, 8GB eMMC (optional 16GB eMMC)                                                                                                                                                                                                                                                                                                                                                                                                                           |
| LoRaWAN               | <ul style="list-style-type: none"> <li>• <b>Module:</b> SX1302 / SX1303 Mini PCIe Card (maximum of two)</li> <li>• <b>Channels:</b> 8 Channels (Optional: 16 channels)</li> <li>• <b>RX Sensitivity:</b><br/>Typical sensitivity level (EU868/US915):<br/>-141 dBm at SF12 BW 125 kHz<br/>-127 dBm at SF7 BW 125 kHz<br/>-111 dBm at FSK 50 kbps</li> <li>• <b>TX Power:</b> 22dBm (Max)</li> <li>• <b>Frequency:</b> EU868, US915, on request – AS923, AU915, KR920, IN865</li> </ul> |
| LTE                   | Supports Quectel EG915N - LTE-FDD(B1/B3/B7/B8/B20), GSM (EGSM900/DCS1800)                                                                                                                                                                                                                                                                                                                                                                                                              |
| Power Supply          | PoE (IEEE 802.3af/at-Compliant) - 42~57VDC<br>Backup lithium-polymer battery DC-12-10800AH, DC 12.6 V; power connector — 12 V DC                                                                                                                                                                                                                                                                                                                                                       |
| Power Consumption     | 10W (max)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Ethernet              | RJ45 (10/100Mbps) with surge protection, with lightning protection                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Antenna               | 3 or 4 N-Type Connectors (depends on the Gateway model)                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ingress Protection    | IP67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Enclosure Material    | Aluminium                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Weight                | 2.74 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dimensions            | 295mm x 220mm x 105mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Operating Temperature | -40 °C to +60 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Storage Temperature   | -40 °C to +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Operating Humidity    | 0% to 95% (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Storage Humidity      | 0% to 95% (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Installation method   | Pole or Wall mounting                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## RF Specifications LoRaWAN

| Feature              | Specifications                                                                                                                                                                                        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Frequency  | <ul style="list-style-type: none"> <li>• EU868, US915</li> <li>• on request— AS923, AU915, KR920, IN865</li> </ul>                                                                                    |
| Transmit Power       | 22dBm (Max)                                                                                                                                                                                           |
| Receiver Sensitivity | <p>Typical sensitivity level (EU868/US915):</p> <ul style="list-style-type: none"> <li>• 141 dBm at SF12 BW 125 kHz</li> <li>• 127 dBm at SF7 BW 125 kHz</li> <li>• 111 dBm at FSK 50 kbps</li> </ul> |

## Software

### LoRaWAN:

- Select whether to use Packet forwarder or Basic station
- Select the regional parameters
- Configure channel plan
- Enable and configuring LBT
- Support of 2 LoRa concentrators
- Get the statistics

### Network:

- Configure the LTE connection
- Configure the LAN using both DHCP and STATIC
- Set the interface priority
- Enable and configure Firewall

### System:

- Management via Web UI and connection via SSH
- Select the timezone and NTP source – GNSS, DHCP, list
- Support using door sensors
- Power supply monitoring and backup battery discharge control (if available)
- Firmware update