Jooby Gateway LoRaWAN

Specifications

Gateway for data acquisition in LoRaWAN networks

Part number: Jooby Gateway LoRaWAN 400 EU
Jooby Gateway LoRaWAN 402 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
- 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
- Accessories

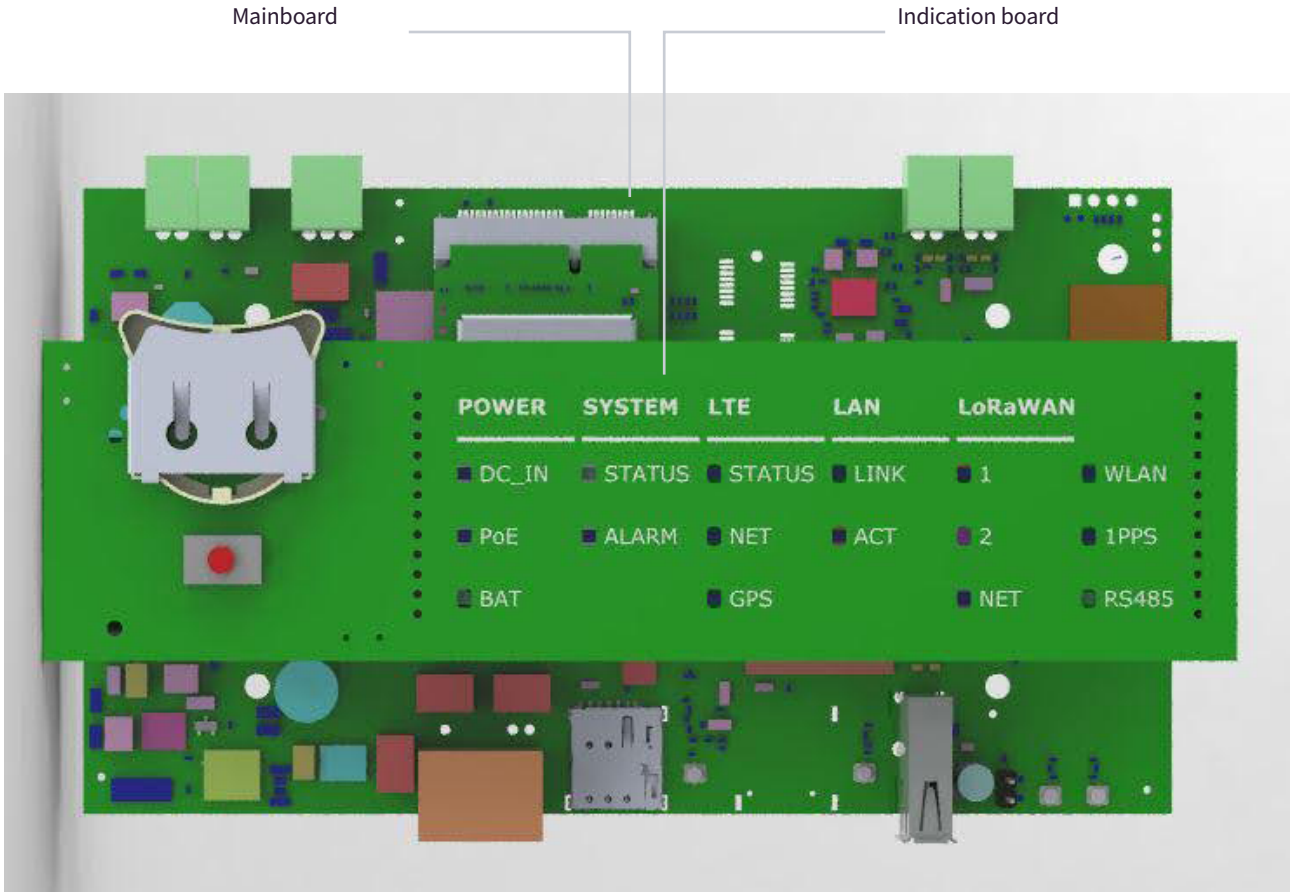

Figure 1: Dual circuit board

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:	400 EU — 3 x N-Type connectors for external antennas, 1 PoE port and 2 reserve ports; 402 EU — 4 x N-Type connectors for external antennas, 1 PoE port and 1 reserve port
Weight (including cable):	2.30 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 402 EU

Dual circuit board Interfaces

MainBoard

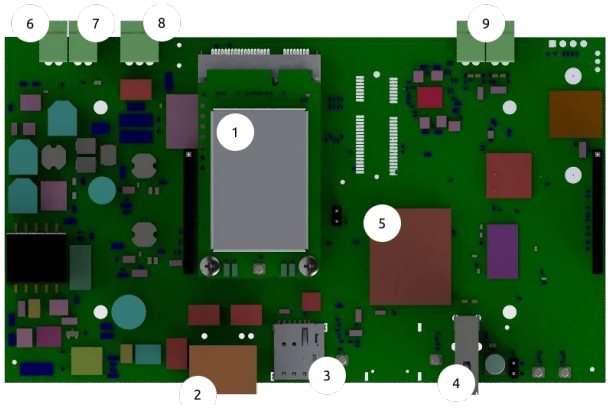

Figure 5: MainBoard

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 (optional)
7. Power supply connector (DC 12-16.5V) (optional) (15V+/-10% is needed for charge pump system if available)
8. RS485 (optional)
9. Tampers (optional)

Indication board

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

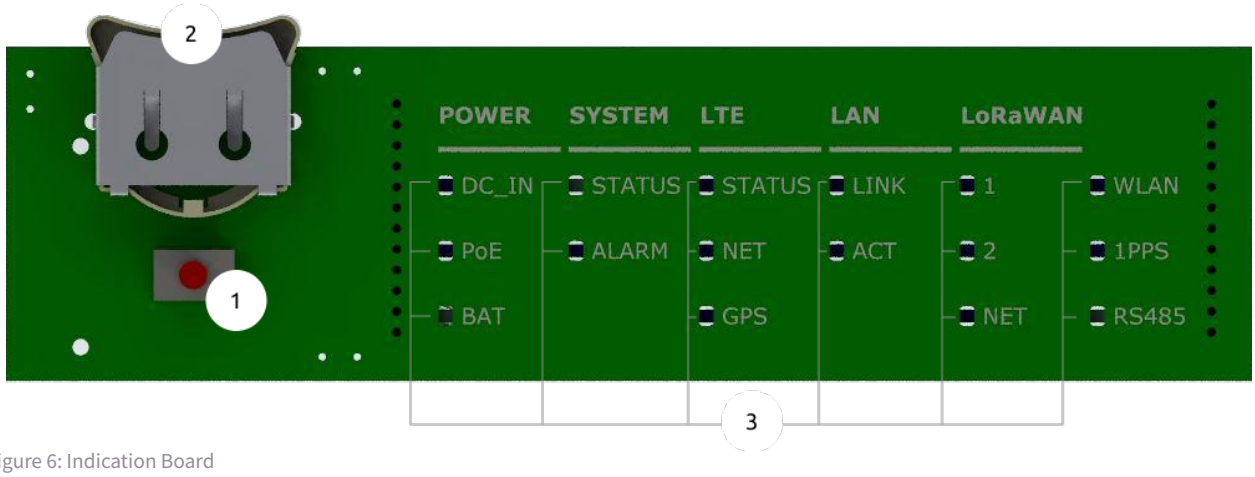

Figure 6: Indication Board

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, Fully charged - green

SYSTEM

LEDs name	Function	Colour
STATUS	Status Indication of Gateway	Normal work mode / Successful loading – green 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 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 red – transmit 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	EU868, US915
400	C002E2W0L1G12A00010	✓		✓	✓	✓	✓
402	C002E2W0L2G12A00010		✓	✓	✓	✓	✓

Certification

Main Specifications (default models)

Feature	Specifications
Computing	Arm Cortex-A7, DDR3 RAM 512MB, 8GB eMMc (optional 16GB eMMc)
LoRaWAN	• **Module:** SX1302 / SX1303 Mini PCIe Card (maximum of two) • **Channels:** 8 Channels (Optional: 16 channels) • **RX Sensitivity:** Typical sensitivity level (EU868/US915): -141 dBm at SF12 BW 125 kHz -127 dBm at SF7 BW 125 kHz -111 dBm at FSK 50 kbps • **TX Power:** 22dBm (Max) • **Frequency:** EU868, US915, on request – AS923, AU915, KR920, IN865
LTE	Supports Quectel EG915N - LTE-FDD(B1/B3/B7/B8/B20), GSM (EGSM900/DCS1800)
Power Supply	PoE (IEEE 802.3af/at-Compliant) - 42~57VDC
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	2.3 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	• EU868, US915 • on request— AS923, AU915, KR920, IN865
Transmit Power	22dBm (Max)
Receiver Sensitivity	Typical sensitivity level (EU868/US915): • 141 dBm at SF12 BW 125 kHz • 127 dBm at SF7 BW 125 kHz • 111 dBm at FSK 50 kbps

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

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

Network:

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