Jooby Gateway LoRaWAN

Technical Specifications

Gateway for Data Collection in LoRaWAN networks

Part number: Jooby Gateway LoRaWAN 300 EU

Jooby Gateway LoRaWAN are the devices designed to receive data from radio modules and transmit it to a server. The data is transmitted over the wireless LoRaWAN and, after being transcoded, is stored in the server's software as convenient reports.

Industrial level gateway components ensure the highest data protection level. Devices are easy to use thanks to a set of accessories and mounting. Gateway capacity can be increased with the help of dedicated technical solutions – these can be included in the basic configuration at the customer's request.

Characteristics

Equipment

Plastic enclosure **IP67** with all required cable entry ports	**Power supply:** Power over Ethernet (802.3af/at) with surge and lightning protection
LoRaWAN Concentrator: One module as default for up to **8 channels**	**GNSS**
Data transmission: LTE and Ethernet	

Software

Web UI

Technical Characteristics

Overview

This overview outlines is about a dual Jooby Gateway LoRaWAN circuit board, which consists of the Mainboard (JOGL_CPU) and Indication board (JOGL_LED). This overview also contains a list of components and accessories for the Jooby Gateway LoRaWAN.

Components and Accessories

The Jooby Gateway LoRaWAN consists of included components and optional accessories:

• Dual circuit board: Mainboard and Indication board
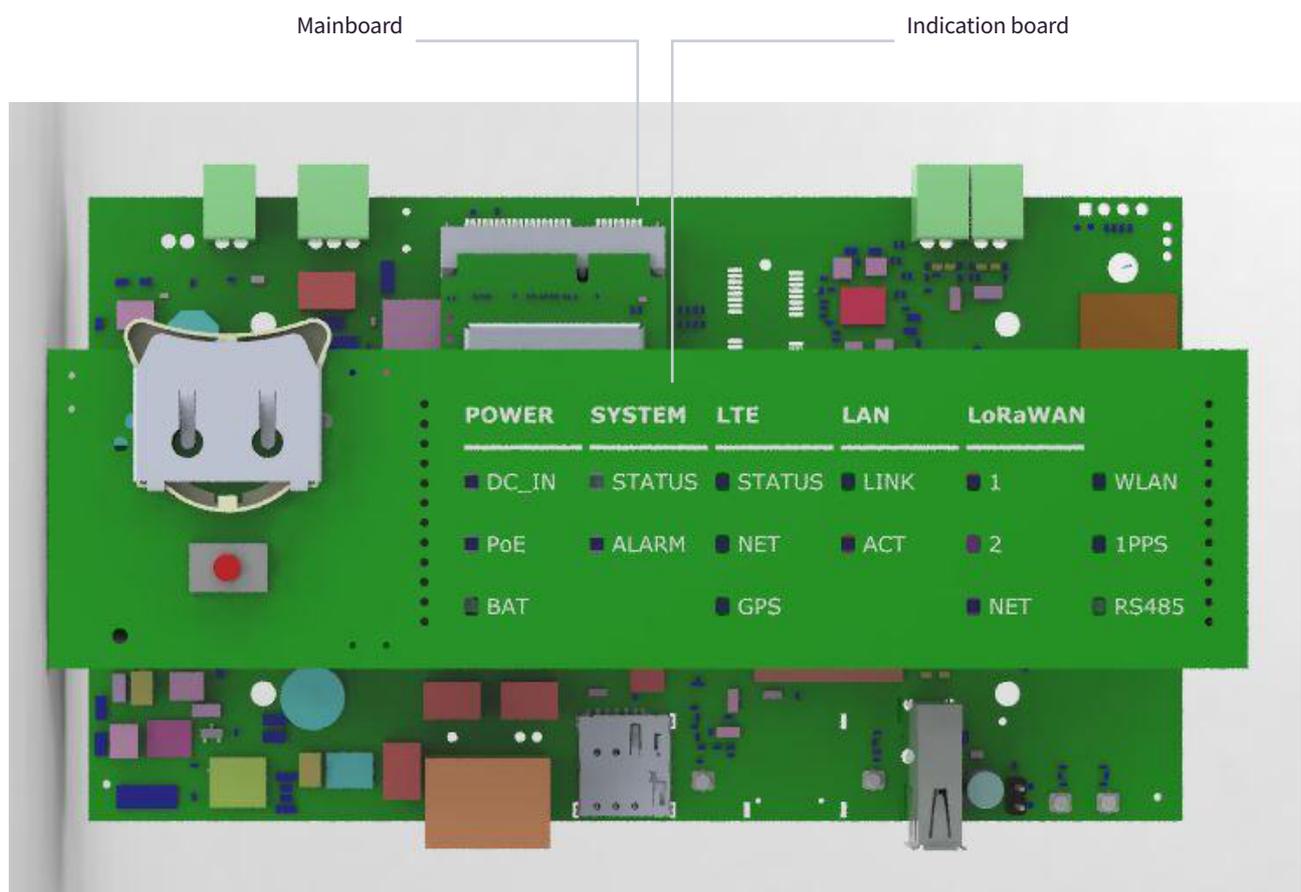
• Plastic enclosure

• Accessories

Mainboard   Indication board

Figure 1: Doubled circuit board

Mainboard (JOGL_CPU)

CPU:	Mainboard JOGL with Arm Cortex-A7 STM32MP131FAF7 (up to 1 GHz)
RAM:	DDR3-1066 512MB
Flash storage:	8GB eMMc (16GB eMMc – optional)
Power Tx:	Up to 22 dBm
Rx Sensitivity:	Up to -111 dBm
LoRaWAN Concentrator:	One default module for up to **8 channels**
LTE:	LTE (1 SIM, Quectel EG915N - LTE-FDD (B1/B3/B7/B8/B20), GSM (EGSM900/DCS1800)
GNSS:	Integrated module in LTE EG915N (if any) or a stand-alone module GNSS (GPS/GLONASS/Galileo/BDS/QZSS/SBAS) – optional
Tampers:	Up to 2 pcs. – optional
RS-485:	Optional
Real-Time Clock (RTC):	✓
Power over Ethernet (PoE):	EEE 802.3af/at, Mode B (midspan), 4/5(+), 7/8(-), 42~57V DC

Indication Board (JOGL_LED)

Indication:	16 LED indicators reflecting the operation of various nodes
Functional button (Fn):	✓
Back-up real-time clock battery:	lithium-ion battery CR2032 – backup power supply in case of main power failure

Enclosure

Case:	plastic HB UL-94 IP67, waterproof, gray
Interface:	1 x N-type connector for antenna, 1 PoE port, built-in GNSS and LTE antennas
Weight (with cable):	Approx. 0.75kg
Dimensions:	263mm x 146mm x 66mm
Support:	Flanges facilitate default mounting on flat surfaces, pole mounting kit

Accessories

LoRaWAN Antenna
Pole mounting kit

Figure 2: Accessories

Hardware

Hardware specifications detail the Jooby Gateway LoRaWAN interface (both the hardware outer interface and the dual circuit board interface).

Hardware outer interfaces

The image below features the hardware interfaces of the Jooby Gateway LoRaWAN enclosure.

Figure 3: Hardware interface – bottom side

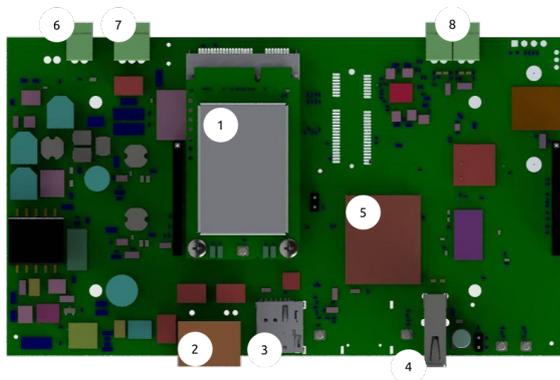# Interfaces of the dual circuit board

Mainboard

Figure 4: Mainboard

Description of Figure 4.

1. Mini PCIe Card 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 interfaces

The indication board has a Functional button (Fn) and 16 x LEDs for status indication.
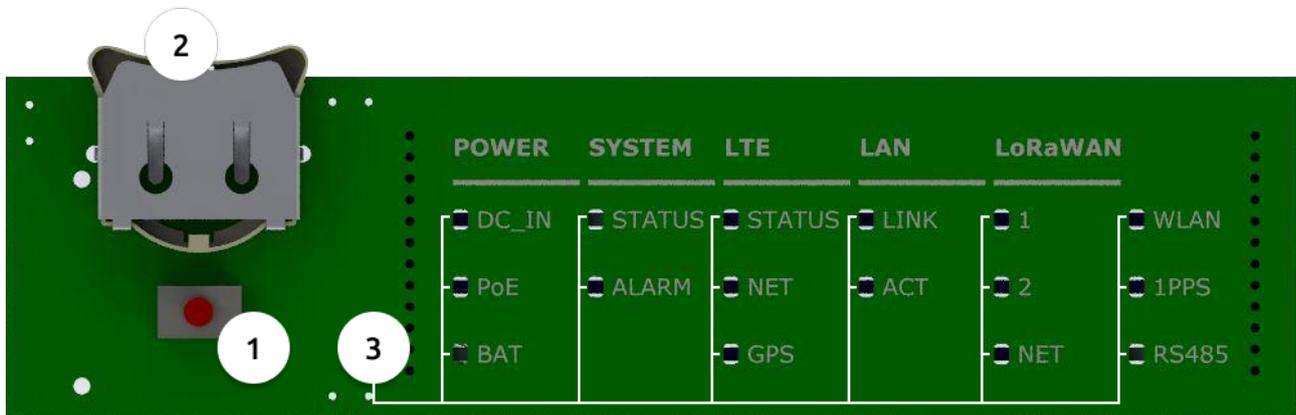

Figure 5: Indication board

Description of Figure 5:

1. Functional button (Fn)

   Factory reset:

   - **Press and hold (30 s)** – System|Status indicator will blink red;
   - When the System|Status indicator lights up red, release Fn button – **wait for 30 s**;
   - System|Status indicator will start blinking yellow – **long-press (30 s)**;
   - System|Status and System|Alarm indicators will light up red – **release Fn button**;
   - The gateway has been successfully reset.

   Switching memory bank:

   - **Press and hold (30 s)** – System|Status indicator will blink red;
   - When the System|Status indicator lights up red, release the Fn button – **wait for 30 s**;
   - System|Status indicator will start blinking yellow – **hold (15 s)**;
   - System|Status indicator will light up red – **release Fn button**;
   - The gateway is loaded from the flash storage.

2. Slot for CR2032 lithium-ion battery
3. LED indicators

The status of the LED indicators is described as shown below. See the text printed next to each LED on the Indication board.

POWER

LED name	Function	Color
DC_IN	Availability of DC power supply	green
PoE	Accessibility of the PoE power supply	green
BAT	Backup battery charging	Charging in progress – red Fully charged – green

SYSTEM

LED name	Function	Color
STATUS	Gateway status indication	Normal operating mode / Successful loading – green Error – red
ALARM	Tamper is disconnected – the gateway enclosure has been opened	Error – red

LTE

LED name	Function	Color
STATUS	LTE enabled	green
NET	LTE connected	Yellow LED blinks slowly while searching for a network Yellow LED flashes during active data transfer
GNSS	GNSS active	green

LAN

LED name	Function	Color
Link	Connection	green
ACT	ACTIVITY	yellow

LoRaWAN

LED name	Function	Color
1	The first LoRaWAN module is on the board	blue
2	The second LoRaWAN module on the board	blue
NET	Server connection available	green
WLAN	Wi-Fi network available	green
1PPS	1PPS signal available	Green LED blinks once per second (if available)
RS485	RS485 receive/transmit	Green – receive Red – transmit 0 – not active

Modeles / Nodes

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

Jooby Gateway LoRaWAN (followed by a model name)

Model name	Control module configuration	8 LoRaWAN channels	Surge protection	Lightning protection	LTE	GNSS	EU868, US915
300 EU	C002E4W0L1G12A00110	✓	✓	✓	✓	✓	✓

Certification

CE IP67 RoHS (WEEE) UKCA

Main Specifications (standard models)

Function	Specifications
Computing	Arm Cortex-A7, DDR3 RAM 512MB, 8GB eMMc (optionally 16GB eMMc)
LoRaWAN	• **Module:** SX1302 / SX1303 Mini PCIe (optionally up to 2) • **Channels:** 8 channels (optionally 16 channels) • **RX Sensitivity:** Usual sensitivity level (EU868/US915): - 141 dBm at SF12 125 kHz bandwidth - 127 dBm at SF7 125 kHz BW - 111 dBm at FSK 50 kbps • **TX Power:** 22 dBm (max.) • **Frequency:** EU868, US915, on request – AS923, AU915, KR920, IN865
LTE	Supports Quectel EG915N - LTE-FDD(B1/B3/B7/B8/B20), GSM (EGSM900/DCS1800)
GNSS	Integrated Module into the LTE-module EG915N
Power Supply	PoE (compatible with IEEE 802.3af/at), Mode B (midspan), 4/5(+),7/8(-), 42~57V DC
Power Consumption	10 W (max.)
Ethernet	RJ45 (10/100 Mbps) with surge and lightning protection
Antenna	1 x N-type connector Built-in antennas GNSS and LTE
Tampering protection	IP67
Enclosure material	ABS, HB UL-94
Weight	Approx. 0.75kg
Dimensions	263mm x 146mm x 66mm
Operating Temperature	-40˚C to +60 ˚C
Storage Temperature	-40˚C to +85 ˚C
Operating Humidity	0% to 95% (no condensation)
Permissible humidity during storage	0% to 95% (no condensation)
Mounting method	Poll mounting or flat surface / wall

Radio Frequency Specifications LoRaWAN

Function	Specifications
Operating Frequency	• EU868, US915 • by request – AS923, AU915, KR920, IN865
Transmit Power	22 dBm (max.)
Receiver Sensitivity	Usual sensitivity level (EU868/US915): • 141 dBm at SF12 125 kHz BW • 127 dBm at SF7 125 kHz BW • 111 dBm at FSK 50 kHz BW

Supported software

LoRaWAN

- Choice to use Packet_Forwarder or Basic_Station
- Select regional parameters
- Customize channel plan
- Enable and configure LBT
- Supports up to 2 LoRa hubs
- Receive statistics

Network

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

System

- Manage via Web UI and connect via SSH
- Select time zone and NTP source – GNSS, DHCP, list
- Support door sensor use
- Monitor power consumption and manage battery discharge
- Update firmware