JOOBY Gateway LoRaWAN 401 EU / 403 EU
Manual

jooby

INTRODUCTION

This data sheet contains information on the purpose, structure, operation and key technical characteristics of the Jooby Gateway LoRaWAN (hereinafter—Gateway or Device).

This manual will guide you through the installation, operation, and maintenance of the Gateway.

The model description can be found in Table 1.

Table 1

Model Description

JOOBY Gateway LoRaWAN		
	401 EU	**403 EU**
Data transmission technology	LoRaWAN, LTE, GNSS	
LoRaWAN radio frequency band, MHz / LoRaWAN standard	863–873 / EU 868	
LoRaWAN transmitter's radiated power, max mW	14	
LTE transmitter's radiated power	Class 4 (33 dBm ±2 dB) for EGSM900 Class 1 (30 dBm ±2 dB) for DCS1800 Class E2 (27 dBm ±3 dB) for EGSM900 8-PSK Class E2 (26 dBm ±3 dB) for DCS1800 8-PSK Class 3 (23 dBm ±2 dB) for LTE-FDD bands	
LTE frequency band, MHz	698–960 MHz / 1710–2690 MHz	
External LTE antenna gain, dBi	0,3 / 3,3	
External LoRaWAN antenna gain, dBi	8	
External GNSS antenna gain, typical dBi	28 ± 2	
GNSS frequency band, MHz	1559 - 1557	
Channels quantity	8	16
Connection type	Ethernet 10/100	
Special features	Polymer lithium battery 12V*	Polymer lithium battery 12V*
	RS-485 (optionally)	
Operating temperature	from −40 °C to +55 °C	
Case sealing class	IP67	

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*Provides 20 hours of battery life on a full charge under normal conditions

PURPOSE AND TECHNICAL CHARACTERISTICS

The Gateway can perform the following functions, depending on its model:

- The Gateway is an autonomous device, powered via Ethernet (PoE 802.3 af/at, class 4; Mode B (midspan), 4/5(+), 7/8(-). The Gateway can also be powered by an internal battery in absence of external power (optionally). The battery, in turn, can be charged with a built-in charger (optionally).
- The Gateway communicates with radio modules using the LoRaWAN interface over 8 and 16 communication channels with SF5-SF12 modulation at 868 Mhz frequency.
- Connection with the LoRaWAN Network server can be established via Ethernet, LTE-FDD, EDGE, or GPRS networks (optionally WiFi), depending on the model.
- The Gateway has a USB port to install software from a flash drive if its existing software is malfunctioning.
- The Gateway is designed in a metal case made from aluminium alloy. The control module is located inside. Its LED-pcb board indicates the status of the Device's power supply and the operation of its interfaces (see Table 2.1 and Fig. 1).
- Time precision is ensured by the built-in GNSS module and NTP servers within the network, complemented by RTC (real-time clock) error compensation based on environmental temperature. In absence of external power, the Gateway's clock is powered by a lithium battery.
- Automatic software updates from the update server if a new version or settings are available.
- The Gateway has a web UI for remote setup and device management.

Gateway indicators guide

Table 2.1

LED name	Color	Description and purpose
POWER/DC_IN	green	Connected to power source
SYSTEM/STATUS	green red	CPU mode —active mode —power-saving mode
LoRaWAN/1	blue	1. Off—LoRa1 module offline 2. On—LoRa1 module online 3. Flashing—LoRa1 module is active
LoRaWAN/NET	green	LoRa server connection established
LAN/LINK	green	Connected to Ethernet
LAN/ACT	yellow	Ethernet activity
LTE_STATUS	green	On if the module operates as intended
LTE_NET	yellow	GSM modem activity: 1. Off—GSM modem offline 2. On for 200 ms, off for 1,800 ms—looking for network 3. On for 1,800 ms, off for 200 ms—idle 4. Flashing (eight flashes per second)—receiving and sending data
1PPS	green	1. Off—inactive 2. Flashing once per second—active
RS485	green red	—Receiving data via RS485 —sending data via RS485 —off—RS485 is offline
LoRaWAN/2*	blue	1. Off—LoRa2 module offline 2. On—LoRa2 module online 3. Flashing—LoRa2 module is active
POWER/PoE*	green	Powered via Ethernet
GPS*	green	1. Off—inactive 2. On—active
WLAN*	green	1. Flashing once per second—connection terminated 2. On—connected successfully 3. Flashing rapidly—receiving and sending data
POWER/BAT*	green red	Battery charge: —battery charged —battery charging
SYSTEM/ALARM*	red	Unauthorized case opening
*optional		

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See Table 2.2 for the Gateway's technical characteristics

Table 2.2

Attribute	UOM	Value
PoE voltage range	V	42...57
Active power consumption, less or equal	W	10
Total power consumption, less or equal	V•A	10
Absolute clock error per day, less or equal	s	2
Standard clock deviation per day at 25 °C	s	± 0.5
Lithium battery service life (normal operation / no power)	year / hour	10 / 20 000
Dimensions	mm	295 x 220 x 104
Weight, less or equal	kg	2.80

- Users can read the following main parameters from the Dashboard: Gateway external panel indicators; CPU temperature and Gateway internal temperature; tamper and charging statuses; LoRaWAN network analytics; status of other network interfaces.
- Gateway access can be configured via a web UI or SSL for either a single network interface or all of them.
- Users can check the system error log.
- Gateway settings can be saved and restored.
- Vandalism prevention—custom factory settings prevent theft and further operation of the device.
- Gateway settings can be reset to custom or general factory settings, depending on the device. In addition, users can apply custom settings (user passwords, network parameters, etc.).

The Gateway is intended for continuous 24/7 operation both indoors and outdoors.

When operating under the specified conditions, the device is resistant to ambient temperatures from −40 °C to +55 °C and relative humidity of 90% at 25 °C. Mean time to failure with a failure probability of 0.8—at least 24 000 hours.

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Figure 1—Gateway appearance, overall dimensions, and installation dimensions
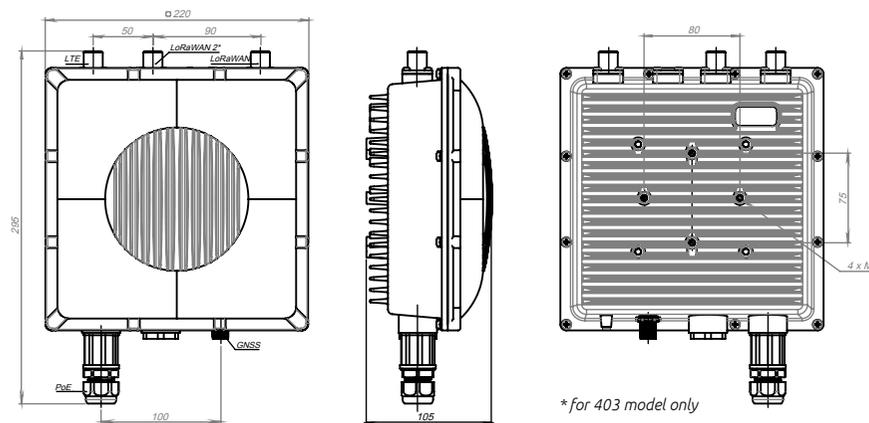
*for 403 model only

PARTS LIST

Name	Quantity	
Gateway	1 pcs	
Manual	1 copy	
Mounting kit	1 pcs	
LoRaWAN antenna	1 (401 EU)	2 (403 EU)
N (male) - N (female) adapter cable for LoRaWAN antenna	1 (401 EU)	2 (403 EU)
LTE antenna	1 pcs	
GNSS antenna, mounting kit	1 pcs	
Li-ion battery with plastic holder	1 set	
Packaging	1 pcs	

Note. Can be shipped in multi-piece transport packaging

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OPERATION AND STORAGE

Before installing the Gateway on site, perform an external examination and ensure that all the required parts are available and there is no mechanical damage.

The Gateway can be installed on flat surfaces / wall or pole mounted, utilizing the special fixtures provided with the device.

Steps to install, connect, and start the Gateway:

1. To mount the Gateway on a flat surface, use the corresponding Mounting kit supplied with the device as shown in Fig.1. To pole mount the Gateway, use the full set of parts from the Mounting kit supplied with the device, and screw it as illustrated in Fig.1 on the back of the Gateway case. The appearance, overall dimensions, and installation dimensions of the Gateway are shown in Fig.1.
2. Detach the screws securing the device cover. Insert the external Ethernet cable into the outer Ethernet plug.
3. Connect the cable from the 12V_IN on the built-in control module to the cable from the battery and check the indicators to ensure that all functional units are powered and operating. The indicator functions are described in Table 1.
4. Attach the cable from the Parts list and connect the LoRaWAN antenna.
5. Attach the GNSS antenna using its cable.
6. Connect the LTE antenna to the corresponding connector (see Fig. 1). Insert the SIM card into the slot. The SIM card must support GSM, LTE, EDGE, and GPRS modes.

Warning! If the dashboard lithium battery is low, replace it with a new lithium battery of the same type (CR2032).

The Gateway can be shipped in packaging via any transportation mode, providing its protection from direct exposure to precipitation. The Gateway can be transported at temperatures ranging from -40 °C to +85 °C. The level of dust, acid, and alkali vapors, aggressive gasses and other harmful contaminants that cause corrosion in storage facilities should not exceed the level of corrosive agents for C1 atmosphere.

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MANUFACTURER'S WARRANTIES

The manufacturer guarantees that the device meets the requirements specified in the technical documentation, provided that the user ensures proper installation and operating conditions. The manufacturer guarantees that the radio equipment can operate in Ukraine as intended without violating the established conditions for the use of Ukraine's radio frequency resource.

Warranty period—24 months from delivery date, but no more than 30 months from manufacture date. During this period, the manufacturer offers warranty repair services for the device. Follow the link to learn more about the conditions and exceptions for warranty service: www.jooby.eu/warranty-en/

Service center:
Telecommunication Technologies LLC. 4D Nebesnoi Sotni Ave., Odesa, 65121, Ukraine. Tel.: +38 (048) 759-09-00.
Email: warranty@infomir.com.

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Conformity Assessment

EU
Hereby, Telecommunication Technologies LLC declares that the Jooby Gateway LoRaWAN is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://jooby.eu/declarations-en/

UK
Hereby, Telecommunication Technologies LLC declares that the Jooby Gateway LoRaWAN is in compliance with the Radio Equipment Regulations 2017. The full text of the EU declaration of conformity is available at the following internet address: https://jooby.eu/declarations-en/

Warning! The Gateway utilizes a lithium battery that is not accessible to users. Only a qualified technician is permitted to open the device and replace this component.

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DAMAGE LOG

Damage registration date	Conclusion	Signature, stamp

LITHIUM **This device contains a lithium battery**	Fire, explosion and severe burn hazard. Do not recharge, crush, disassemble, heat above 212 °F (100 °C), incinerate, short circuit or expose contents to water. Always keep lithium batteries out of reach of children.
	The crossed-out wheeled bin symbol indicates that all electrical and electronic products and batteries must be collected separately at the end of their working life. Do not dispose of these products with unsorted municipal waste: take them for recycling. For information on the nearest recycling point, please contact your local waste authority.

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ACCEPTANCE CERTIFICATE

Gateway:
complies with all design documentation and is recognized as suitable for operation.

The manufacturer reserves the right to modify the design or specifications of the device at their discretion, provided that such changes do not impair its functional characteristics. Hence, the manufacturer reserves the right to alter the appearance and the components outlined in this manual without prior notification to consumers.

Model serial number

Date of sale

_____(_____)

UK CA CE   Manufacturer:
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