Abeeway
Improve your position

LORAWAN RELAY

The most cost-efficient solution to remove dead spots in your LoRaWAN® network.

The Abeeway LoRaWAN® Relay is able to manage communication of up to 15 devices located in isolated or hard to reach locations such as basements, metallic street cabinets, etc.

The Abeeway LoRAWAN® Relay operates from 3 user replaceable AAA lithium batteries, providing several years of operation depending on configuration settings and daily frame transmission count.

When planning for a public network roll-out, It is well known that coverage for the last 10% of devices easily adds 30% or more to the overall network CAPEX with the classic network densification approach. The additional CAPEX is due to additional network equipment, but also the need to secure additional rooftop hosting and power grid connections. Using battery powered relays to boost the signal from the hard-to-reach devices is a complementary approach that usually significantly optimizes the additional CAPEX, particularly when the density of such devices is low or when they are isolated in small groups.

The Relay itself behaves as a LoRAWAN® class A device with the extended MAC commands defined in the LoRa Alliance TS011-1.0.0 specification: it maintains a low-duty cycle wake-on-radio (WOR) channel, then dynamically switches frequency to collect uplinks from the managed devices and relays the frames to the main LoRaWAN® network. It also collect downlinks from the network and relays them to the relevant device. The relay is equipped with an internal omnidirectional antenna, so the managed devices can be positioned anywhere around it.

The Relay battery life can be estimated precisely from the traffic profile and radio characteristics using our online simulator (scan QR code).
The simulator also estimates the required energy consumption of the managed devices, taking into account the overhead of the wake-up preamble, but also the energy gains resulting from the reduced Tx power and increased datarates (compared to situation without a Relay).

The Abeeway LoRaWAN® Relay is entirely managed from the network using the standard TS011 MAC commands which define which of the discovered devices are managed by each Relay. For easier troubleshooting and experiments, the Relay offers a USB serial terminal compatible with Tera Term. A command activates Bootloader mode and allows to upgrade the Relay firmware using Xmodem also from the USB port. The Relay self-estimates its battery level and reports it to the network using standard class A MAC commands.

Applications:

• Boost signal from LoRAWAN® devices in street cabinets

• Boost signal from underground devices
• Provide indoor coverage in hazardous areas

Product Highlights

• **Compliance:** Fully compliant with LoRa Alliance TS011 1.0.0

• **Remote management:** Remotely managed by Relay-enabled LoRaWAN® Network server

• **Radio specification:** Equipped with LoRaWAN® Class A radio

• **Local interface:** USB command line interface for local troubleshooting and configuration

• **Firmware updates:** Supports firmware upgrades through USB

• **Power source:** User replaceable 3*AA Batteries

• **Mounting options:** Fixture by straps, screws or magnets

• **Antenna:** Omnidirectional antenna

• **Durability:** Waterproof IP68 enclosure and IK08 shock resistance

• **Hazardous environments:** Optional ATEX/IECEx zone 2 or Zone 0 versions.

Physical configuration

Size	112mm x 66mm x 33mm (L x l x h)
Weight	190g
Waterproof capability and resistance	IP68, IK08
Operating temperatures	-20°C to +65°C
Storage temperature	10°C to 30°C (recommended)
Time storage max	12 months
Humidity	< 95% non-condensing

Data communication support

LoRaWAN® Modem	Semtech transceiver SX1262
Protocol	LoRaWAN® Class A
LoRaWAN® Frequency bands [1]	EU868MHz / US915MHz / AS923MHz / AU915 MHz
Configuration	LoRaWAN OTA
RF output power [1]	14 dBm / 19 dBm (max)
LoRaWAN® receiver sensitivity	-130 dBm in SF10

Estimated lifetime

Battery Life:	5 to 10 yrs
Use the provided battery life estimator for your exact use case. An example configuration is provided below - CAD Data Rate of the Default Relay Channel: SF9 BW 125 - 2nd Relay Channel: Disabled - Relay to Gateway Data Rate: SF 10 BW 125 - End-Device to Relay Data Rate: SF7 BW 125 - Number of connected End-Devices: 10	

Standards and Certifications

LoRa Alliance EU868, US915, AS923, IN865, AU915
Radio regulatory certification : EC, FCC, IC, TELEC, IMDA

Power management

Primary battery	3x AA/3.6V (Li-SOCl2) -Nominal capacity 8Ah

Product references

Product	SKU		
ABE RELAY EU868	DEABE700EU	DEABE700EU-Ex0 [2],[4]	DEABE700EU-Ex [3]
ABE RELAY IN865	DEABE700IN	DEABE700IN-Ex0 [2],[4]	DEABE700IN-Ex2 [3]
ABE RELAY US915	DEABE701US	DEABE701US-Ex0 [2],[4]	DEABE701US -Ex [3]
ABE RELAY AS923	DEABE701AS	DEABE701AS-Ex0 [2],[4]	DEABE701AS -Ex [3]
ABE RELAY AU915	DEAB701AU	DEAB701AU-Ex0 [2],[4]	DEAB701AU-Ex2 [3]

(1) Channel frequencies and Transmit output power level are country specific and controlled by the operator

(2) ATEX Zone 0: II 1G Ex ia IIC T4 Ga Ta -20 °C ... +40 °C
II 1D Ex ia IIIC T135°C Da Ta -20 °C ... +40 °C

(3) ATEX Zone 2: II 3G Ex ic nA IIC T4 Gc Ta -20 °C ... +40 °C
II 3D Ex ic tc IIIB T135°C Dc Ta -20 °C ... +40 °C

(4) IECEx: Ex ia IIC T4 Ga
Ex ia IIIC T135°C Da

Abeeway is the market leader in low-power geolocation and a provider of disruptive IoT tracking solutions worldwide. Abeeway offers the most energy-efficient, reliable and flexible geolocation solutions using unique tracking devices and a smart multitechnology location system optimized for long-range and low-power-consumption LoRaWAN® connectivity. Offering the fastest time-to-market, Abeeway delivers a complete end-to-end solution for mass-market IoT sectors for asset tracking and management, process and decision optimization and personal safety. Abeeway is a member of the LoRa Alliance® and part of the Actility Group. Actility Group is a leading provider of LPWA IoT connectivity solutions, tools, business services and applications.