



Chengdu Alinkwise Future Technology Co., Ltd.

D10L/P Low-Power LoRaWAN DTU Specification

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Product Description

The D10L/P is a waterproof, low-power LoRaWAN DTU for battery-powered outdoor data acquisition. It provides two RS485 ports and two controlled DC 12 V outputs. During scheduled or downlink-triggered tasks, it can power external RS485 slave devices, read Modbus RTU data, and report the data to a LoRaWAN gateway and platform.

The DTU integrates a LoRaWAN 1.0.3 protocol stack and supports Class A, OTAA/ABP activation, fixed SF, and ADR. Transmit power, channels, and other LoRaWAN radio parameters are configurable.

The DTU offers flexible configuration, including script editing, custom acquisition tasks, custom heartbeat packets, selectable DC 12 V output ports, and serial-parameter settings. DC 12 V output can be enabled only during acquisition to power slave devices and reduce battery consumption. The built-in watchdog improves stability for unattended operation.

The DTU exchanges data with slave devices through RS485 and can be configured by PC software. It provides quick LoRaWAN network access, wireless data reporting, and serial-data transparent transmission.



Product Features

- D10L transmit power: 22 dBm; D10P transmit power: 27 dBm.
- 2 x DC 12 V outputs (off when no acquisition task is running) and 2 x RS485 interfaces (A+, B-).
- Supports standard LoRaWAN 1.0.3 protocol, Class A mode.
- Supports custom RS485 acquisition tasks and scheduled acquisition.
- Supports RS485 over LoRaWAN transparent transmission.
- Supports custom user communication protocols.
- Supports custom LoRaWAN heartbeat tasks.
- Supports up to 120,000 acquisition/report operations (DC 12 V output load: 5 mA).

Interface Description



No.	Name	Description
1	RS485_1 Interface	RS485_1 interface, including RS485_A, RS485_B, DC 12 V OUT, and GND
2	RS485_2 Interface	RS485_2 interface, including RS485_A, RS485_B, DC 12 V OUT, and GND
3	Button & LED	Short press to wake up; double-click to enter configuration mode; press and hold for 5 s to restore factory settings; LED indicator
4	RF Antenna Port	SMA female connector (external thread, inner hole)

LED Indicator Function Description

No.	Name	Description
1	Working Indicator	Wake-up state: LED blinks every 1 s Low-power mode: LED blinks every 60 s Configuration mode: LED double-blinks Reset: LED blinks every 100 ms Factory reset: LED blinks every 50 ms

Basic Parameters

Parameter	Description
Transmit Power	D10L: -1 to 22 dBm; D10P: -1 to 27 dBm
RF Input Power	< 10 dBm
Bandwidth	125 kHz (fixed)
Spreading Factor	SF7-SF12, 6 levels configurable (5.5/3.1/1.8/1.0/0.6/0.3 kbps)
Receiver Sensitivity	-135 dBm @ SF12, BW 125 kHz
Harmonics	< -40 dBm @ 1 GHz
Frequency Bands	EU433, CN470, CN779, EU868, AS923, AU915, KR920 LoRaWAN global frequency plans
DC 12 V Output	DC 12 V $\pm 5\%$; the two outputs share a maximum current of 100 mA. DC 12 V output is enabled only during data acquisition.
RS485	Fully isolated circuit with built-in 15 kV ESD protection; up to 16 connected devices. Configurable parameters: Data bits: 8; stop bits: 1 or 2; parity: none, odd, or even Baud rates: 2400, 4800, 9600, 19200, 38400, 57600 bps Default configuration: Baud rate: 9600 bps; data bits: 8; stop bit: 1; parity: none

Electrical Specifications

Category	Description
Battery	ER34615M, 14000 mAh
Current	Sleep current $\leq 15 \mu\text{A}$
Service Life	With a 5 mA load on the DC 12 V output, the device supports up to 120,000 acquisition and transmission operations. This limit decreases approximately in inverse proportion as the output current increases. The battery life is about 8 years; actual service life is limited by whichever comes first: operation count exhausted or 8 years.

Physical Characteristics

Item	Description
Dimensions	174mm x 160mm x 75mm
Weight	Approx. 1.5 kg
Ingress Protection	IP67
Operating Temperature	-40 to 85 °C
Operating Humidity	0-95% RH (non-condensing)
Mounting	Wall mount, pole mount, or floor/ground placement
Material	Cast aluminum enclosure with waterproof aviation connectors

Packing List

No.	Name	Qty.	Description
1	Main Unit	1	DTU main unit
2	Cable Harness	2	RS485 cable harness and DC 12 V output cable harness
3	LoRa Antenna	1	Blade antenna or magnetic-mount antenna
4	Pole-Mount Bracket	1	L-shaped pole-mount connector and U-bolt clamp

Revision History

Version	Date	Description
V1.0.0	20240611	Initial release
V1.0.1	20240418	Corrected typos
V1.0.2	20260618	Revised battery life description
V2.0.0	20260630	Document upgraded