DTU-MK-I

IoT Gateway Terminal

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Revision History

Version	Date	Revision content	Revision staff
1.0	2026.03.06	First revision	Evan Lin

1. Product Overview

1.1 Product Purpose

DTU-MK-I is an elevator IoT terminal product developed by Uniquesky Intelligent Technology Co., Ltd. It connects to the elevator main control board via RS232/RS485 interfaces, and collects and processes data output from the control board, including real-time status, service modes, faults, events, alarms, and statistics. The data is then transmitted through a full-network LTE module to an IP-based data server. At the same time, it can receive and process downlink data from the server and send it to the elevator control system via the serial port.

The core function of the DTU-MK-I is to support customized collection and processing of various types of elevator data according to customer requirements, and to report the data to local or cloud-based platform servers.

1.2 Product Model and Appearance

Model No.: DTU-MK-I

1.3 Operating Environment

Operating Power Supply: DC 12V
Operating Temperature: -10 ~ 50°C
Operating Humidity: ≤95%RH

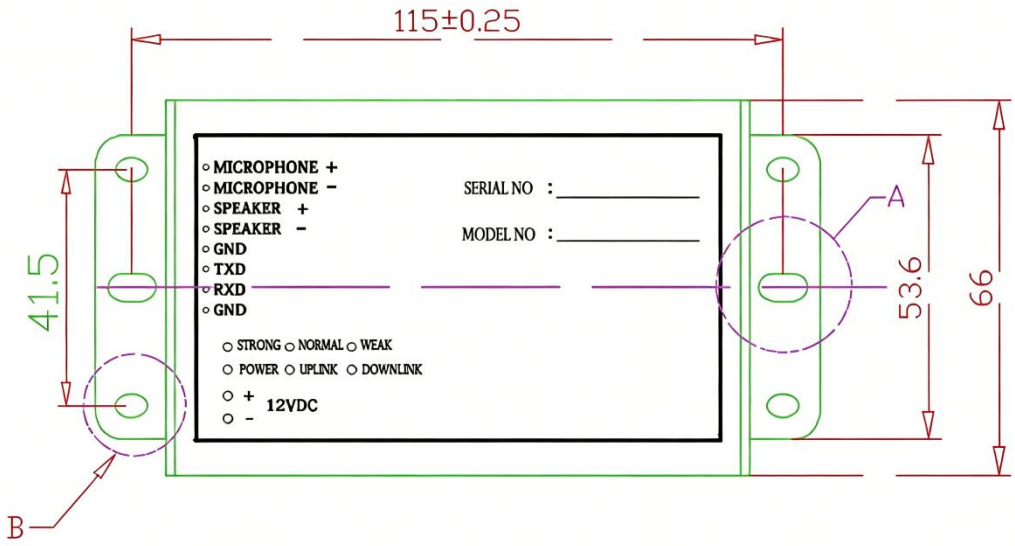
2. Basic Specs

2.1 Device Parameters

Parameter	Description
Main power supply	DC 12V
Device power consumption	≤1W
Network	LTE Cat 4
Operating temperature	-10 ~ 50°C

Operating humidity	≤95%RH
Installation method	wall-mounted, flat placement

2.2 Dimensions



2.3 Port Definition

1. Power Interface: European-style 2-pin connector, with 3.81 mm pitch; wide power input: DC 12V ±20%; ripple ≤ 200 mV

Left Pin	Right Pin
DC 12V +	DC 12V -

2. Signal Interface: European-style 4-pin; 3.81 mm pitch

1	2	3	4	5	6	7	8
Mic+	Mic-	Spk+	Spk-	GND	TXD	RXD	GND

3. Antenna Interface: SMA female connector (for connection to an external SMA male antenna)

4. SIM Card Interface:
   Type: Standard SIM Card
   Size: 25 * 15mm

2.4 Light Indicator

Indicator Light	ID	Color	Indicator Type	State	Description

	1	Green	LTE Signal Strength	Always On/Off	Always On: Good Signal
	2	Yellow		Always On/Off	Always On: Average Signal
	3	Red		Always On/Off	Always On: Poor Signal
	4	Green	Uplink	Flashing	Flashing: Data Uploading
	5	Green	Downlink	Flashing	Flashing: Data Downloading
	6	Red	Power	Always On/Off	Always On: Device Powered

1. Signal Indicator Light:

Green: Indicates good signal quality; module RSSI ∈ [22,31], corresponding to a signal strength of -70 ~ -52 dBm.

Yellow: Indicates average signal quality; module RSSI ∈ [10,21], corresponding to a signal strength of -94 ~ -72 dBm.

Red: Indicates weak signal quality; module RSSI ∈ [0,9], corresponding to a signal strength of -115 ~ -96 dBm.

All LEDs off: Indicates no signal; module RSSI = 99.

2. Data Transmission Uplink Indicator:

When the device sends LTE data to the server, the indicator flashes once regardless of whether the server successfully receives the data. If LTE is not established, data cannot be transmitted and the indicator will not be flashing. In this case, the module may be connected or reconnected or rebooted.

3. Data Transmission Downlink Indicator:

When the device receives data sent from the server, the indicator flashes once.

4. Power Indicator:

When external DC12V power is supplied, the power indicator remains steadily on. When there is no external power supply, the power indicator remains off.

5. DTU Boot:

When the DTU restarts, all LED indicators flash twice. Then, the two green LEDs on the right side (indicating uplink and downlink data transmission) will flash simultaneously. After these two LEDs finish flashing, the DTU startup is complete and normal data transmission begins.

2.5 Supported Frequency Band and Standard

1. Power Interface: European-style 2-pin connector, with 3.81 mm pitch; wide power input: DC 12V ±20%; ripple ≤ 200 mV

Network	Standard	Band
LTE Cat 4	LTE-TDD	B34 / B38 / B39 / B40 / B41
	LTE-FDD	B1 / B3 / B5 / B8

3. Product Appearance

3.1 Top View Front-facing

Front view of DTU-MK-I product, with clear and simple silkscreen markings, and Uniquesky company logo located at the lower right.

3.2 Left Side View

The left-side panel is arranged from left to right with a 8-pin port for communication, with pin 5 and 8 as GND terminals; six LED indicator lights; and a 12V DC power interface.

3.3 Right Side View

The right-side panel includes the SIM card slot, system reset button, and an external antenna SMA interface.

4. Communication Protocol and Software Function

	Name	Description	Remark
1	Device ID	Configurable up to 10 digits; can be set offline	Configure without inserting a SIM card; see Note 2 below: ID setting command
2	Destination IP / Port	Can be configured offline or remotely online	Automatically restarts after online configuration
3	Online Mode	Automatically connects to the server when powered on and data is present	The control board sends a heartbeat packet every 30 seconds; the server will respond accordingly
4	Data Transmission Mode	UDP transmission or TCP transmission	
5	Traffic Monitoring	Automatically monitors downlink data when uplink serial data is present	Prevents false connections; downlink data corresponds to the heartbeat reply in Item 3
6	Signal Loss Auto Restart	Automatically restarts (re-registers) when the signal drops below the minimum threshold	
7	Data Packet Length	Maximum uplink/downlink packet length: 512 bytes; system operates normally	If oversized, packets can be automatically truncated without causing system crash

8	Data Packet Interval	Minimum interval: 1 second; system operates normally	Continuous operation at 1-second intervals must not cause system crash
9	Module Power-Cycle Restart	Downlink data is monitored automatically in real time; if no data is received within 5 minutes, the module automatically restarts. After waiting 10 seconds, power is turned back on, and the above process repeats.	
10	Module Active Heartbeat	The module monitors uplink data received from the lower-level device through the serial port. If no data is received for 6 seconds, it proactively sends one heartbeat packet containing the ID (6 bytes).	This data must be monitored from the server side

5. Technical Data Adaptation and Integration

5.1 Product Takeaway

DTU-MK-I is an elevator IoT terminal product developed by Uniquesky Intelligent Technology Co., Ltd. It connects to the elevator main control board via RS232/RS485 interfaces, and collects and processes data output from the control board, including real-time status, service modes, faults, events, alarms, and statistics. The data is then transmitted through a full-network LTE module to an IP-based data server. At the same time, it can receive and process downlink data from the server and send it to the elevator control system via the serial port.

The technical solution of Uniquesky Intelligent Technology can be adapted to and integrated with any elevator control system or elevator data acquisition interface through protocol matching, in order to meet relevant regional standards or customer requirements, provided the following conditions are satisfied:

- **Signal interface communication protocol specification:**

The communication interface shall be RS232 or RS485 (choose one). The communication protocol may be either a proprietary/custom protocol or the standard Modbus RTU protocol. If a proprietary/custom protocol is used for integration, a detailed protocol specification must be provided.

- **Protocol data packet (message) format:**

The structure of the communication packets must be clearly defined, such as “start symbol + command code + address field + end symbol”, including settings such as master-slave mode and the checksum/validation algorithm.

- **Data acquisition points within the adapted protocol (protocol data points):**

The specific data points required for collection within the protocol must be clearly defined and included.