

KC22

LoRaWAN EB Collector

Standardized Device Manual



VERSION
1.0

DOCUMENT
Device Manual

Revision History

Version	Change Description
1.0	Current published version

Contents

1. Product Description

2. Application areas

3. Main features

4. Parameters

5. Dimensions and Interfaces

6. Model List

6.1 Model example

6.2 Model component breakdown

6.3 Complete model meaning

7. Network topology

8. Working mode

8.1 EB configure collection and upload tasks

8.2 Communication Test

8.3 Network access

9. Installation

10. Standard

11. Parameter Modification

11.1 Configuration Parameter Address Table

12. ThinkLink Thing Model

12.1 Device Template

13. Contact Us

1. Product Description

KC22 is a high-performance, low-power data transmission unit (DTU) independently developed by ManThink. It supports battery power supply and flexible configuration, and is specially designed for long-distance, low-power Internet of Things applications. Product Integration High Performance MCU and LoRa®RF chip, using standard M-Bus interface to communicate with external devices, via LoRaWAN®The protocol stably uploads business data to the cloud application platform.

Based on LoRa®Wireless Technology, KC22 support standard LoRaWAN®The network has the advantages of long communication distance, strong anti-interference ability and extremely low power consumption. Built-in 4 14505 lithium batteries can provide stable operation for devices for years, which is suitable for applications where wiring is difficult or unattended for a long time.

KC22 compatible with ManThink and third party LoRaWAN®The gateway can be seamlessly connected to IoT platforms such as ThinkLink, ChirpStack, and The Things Network(TTN) to realize data collection and remote control of M-Bus interface devices.

The product has built-in Edge-Bus(EB) virtual machine, which supports the generation of lightweight firmware through EB compilation and the remote download to the device through the over-the-air firmware upgrade (FUOTA) mode. With the help of EB virtual machine, KC22 can quickly adapt to various M-Bus Protocol devices, and locally realize core business logic processing such as Change Report (COV), exception alarm, data reorganization, etc., greatly enhancing the flexibility and intelligence level of the system.

2. Application areas

- Industrial field, M-Bus interface equipment
- Water meter/Heat Meter metering meter reading
- Hydrometeorological monitoring

3. Main features

- Support M-Bus interface
- 4× 2700 mAh ER14505 lithium sub-batteries, 10800mAh of electricity
- Support for EB virtual machines
- Support remote upgrade via LoRaWAN communication
- Support ThinkLink/ChirpStack/TTN platform docking
- Support US902,AU915,AS923,EU868,EU433,CN470 LoRaWAN standards
- **Compatible with all M-Bus-based communication protocols**

4. Parameters

Item	Value
INTERFACE	
Joint Type	1 PG7 interface
Wiring quantity	2 MBus wires (battery version) 1 VCC,1 GND,2 M-Bus wires (DC5-24V power supply)
Display	None

Item	Value
WIRELESS PARAMETERS	
Protocol	Standard LoRaWAN®Agreement
Regional Standards	CN470/EU433/EU868/AS923/AU915/Us902
Transmit power	Maximum Support 22dBm (parameter can be changed)
Receiving sensitivity	-142dBm(SF=12,BW=125kHz)
Working mode	OTAA/ABP Class A (battery version) ClassC (DC 5-24v normally supplied)

Item	Value
CONFIGURATION	
Test /Trigger mode	Magnet trigger 2 seconds trigger heartbeat data 6 seconds trigger network
Parameter Configuration	By NS issue instruction

Item	Value
PHYSICAL CHARACTERISTICS	
Power supply mode	Battery 10800mAh/DC 5-24V power supply
Sleep current	< 5uA
emission current	< 110mA (22dBm transmit power)
Working Temperature	-40°C ~85°C
Relative humidity	≤95% (no condensation)
Protection level	IP65
Material &Color	ABS + PC, White
Dimensions	120mm 72mm 28mm
Installation method	Wall Hanging

5. Dimensions and Interfaces

Number	Interface Description	Specific details
1	LoRa Antenna interface	inner hole outer screw, according to different LoRaWAN standard match
2	Wiring Port	PG7 waterproof connector
2 M-Bus connectors (battery powered)		
VCC,GND,2 M-Bus interfaces (DC5-24V powered)		

6. Model List

6.1 Model example

KC228-A1-AS923-N

6.2 Model component breakdown

- **KC228: product series and RF band.**
 - KC22 identifies a second-generation IP65 DTU.
 - 8 identifies the 800 MHz-and-above RF version for EU868, AS923, AU915 and US902.
 - Other band option: 4 identifies the 400 MHz RF version for EU433 and CN470.
- **-A1: functional interface and power configuration.**
 - A identifies an M-Bus interface.
 - 1 identifies a built-in 10800 mAh battery.
 - Other power option: 2 identifies external DC 5–24 V input.
- **-AS923: LoRaWAN regional standard.**
 - AS923 means that the device supports the LoRaWAN AS923 regional parameters.
 - Other regional codes are CN470, EU433, EU868, AU915 and US902; US902 denotes the LoRaWAN US915 (902–928 MHz) regional parameters.
- **-N: default version.**
 - N identifies the default version.
 - Other values are reserved for customized or special versions.

6.3 Complete model meaning

The complete meaning of KC228–A1–AS923–N is:

This is a second-generation IP65 DTU in the 800 MHz-and-above RF class. It provides an M-Bus interface, includes a 10800 mAh battery, supports the LoRaWAN AS923 regional standard, and uses the default final version code N.

7. Network topology

KC22 is a terminal device that conforms to the standard LoRaWAN protocol, and its normal operation depends on the complete LoRaWAN network support. Users can deploy with ManThink or other third-party LoRaWAN gateways, and need to access the LoRaWAN network server (NS) for device communication and management.

KC22 is compatible with LoRaWAN Network platforms and supports seamless access to standard Network servers such as ThinkLink, ChirpStack, and The Things Network(TTN). Through the ThinkLink platform of ManThink , users can easily configure the object model, quickly realize data analysis, business function development, card view display and various custom business logic, greatly improving the efficiency of project landing.

The LoRaWAN network topology is as follows:

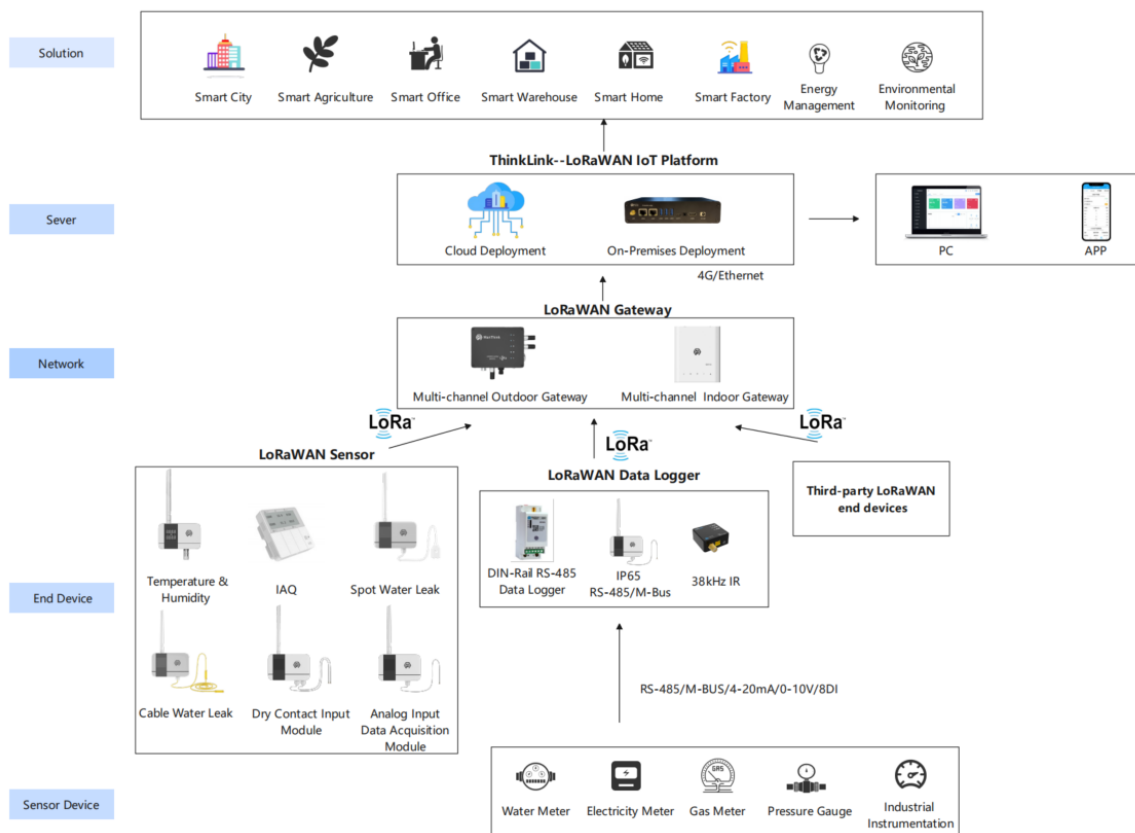


Figure 7. Network topology

8. Working mode

8.1 EB configure collection and upload tasks

KC22 has a built-in EB virtual machine, which can implement various business logic of meter reading by calling SDK and TS code. EB instructions for use:

EB-compiler compilation instructions

8.2 Communication Test

Magnet trigger, contact 2s -4s, you can trigger a packet of upstream measurement data

8.3 Network access

Magnet trigger, contact 6s-8s, you can trigger a packet of network data.

9. Installation

- Use the drill to fix the back plate to the Wall (keep the back plate Arrow Up)

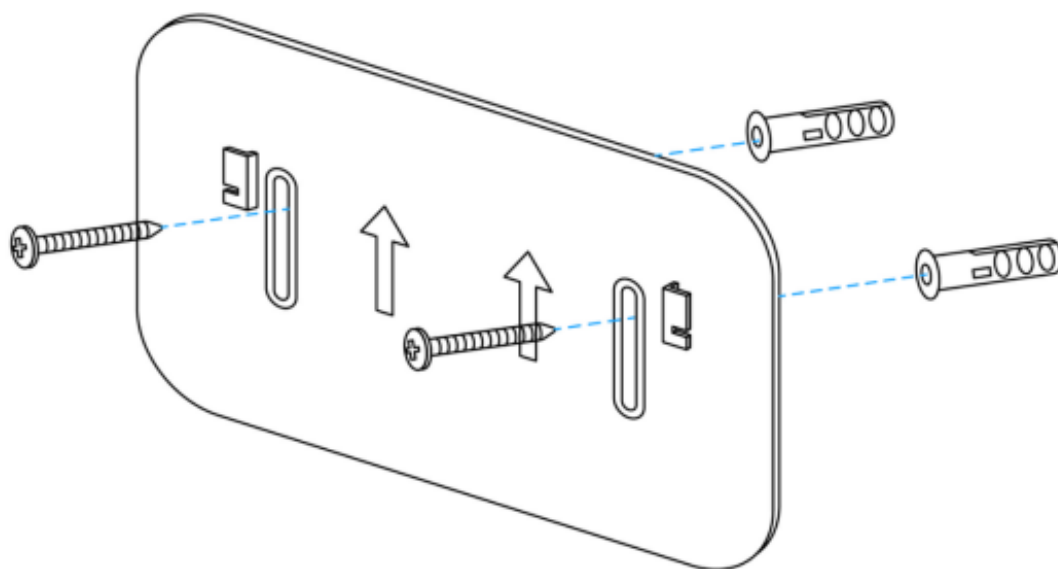


Figure 9. Installation

- Hatch the product on the back plate (slide down after aligning the groove on the back of the sensor with the convex part of the back plate)

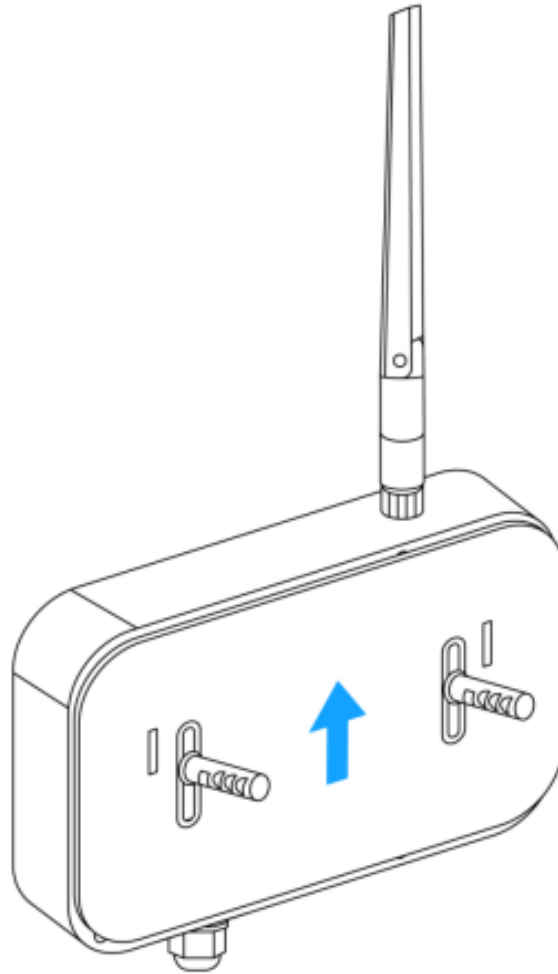


Figure 9. Installation

- DC5-12V power supply, connect the power supply VCC and GND to the VCC and GND of the docking device, pay attention to the voltage matching.
- Connect the two wires of the M-Bus of the device to the two wires of the M-Bus of KC22

10. Standard

The format of the communication protocol is customized through EB Compilation. We recommend that you use the protocol format standard recommended by ManThink.

\\PTL-D01 ManThink Technology IoT Terminal Application Layer General Protocol V1.5

11. Parameter Modification

Refer to Chapter 5 of PTL-D01-Internet of Things Terminal Application Layer General Protocol V1.3 for parameter modification. Parameter modification is delivered through Port 214.

PTL-D01 ManThink Technology IoT Terminal Application Layer General Protocol V1.5

11.1 Configuration Parameter Address Table

AN-25100106 EdgeBus App Parameter Manual

12. ThinkLink Thing Model

Log in to <<https://thinklink.manthink.cn>>

12.1 Device Template

Battery powered KC21 should use the template of MT-EB-BATTERY and DC powered KC21 should use the template of MT-EB-POWER. The models already mounted as follows:

- Thing Model: MT-EB
- RPC:

\[MT ACT] action: Used to execute operations such as reset, join, redo, and reading parameters

\[MT ACT] transparent: Transparent RPC; hexadecimal data can be sent via port 51, which will be forwarded to sub-devices through the RS485 interface, and responses from the sub-device will be returned

\[MT SET] app para: Set EB parameters

\[MT ACT] debug modbus: Online Modbus debugging by entering information such as 485 address and Modbus function code

ALARM: Used for alarm functionality; trigger rules must be configured to enable full alarm features

13. Contact Us

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