



Product Specification

TBMH-100 MiniHub

BROWAN COMMUNICATIONS

Revision History

[illegible]

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Chapter 1 – Introduction

Purpose and Scope

The purpose of this document is to describe the main functions, supported features, and system architecture of the TBMH100 MiniHub.

Product Features

- Compliance with latest LoRaWAN specification v1.0.3 and Regional Parameters v1.0.3
- 8 concurrent channels for LoRa transmission
- Support the state-of-the-art BasicStation Protocol
- Wi-Fi 802.11 b/g/n (HT20) station mode for backhaul connectivity
- Firmware can be upgraded via OTA (by network server)
- Supports LBT and background scan
- Changeable power plug design
- USB Type C connector for connecting external power source
- Built-in omnidirectional antenna for indoor use

Definitions, Acronyms and Abbreviations

Item	Description
LPWAN	Low-Power Wide-Area Network
LoRaWAN™	LoRaWAN™ is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in a regional, national or global network.
ABP	Activation by Personalization
TBD	To Be Defined

Reference

Document	Author
LoRaWAN Specification v1.0.3	LoRa Alliance
LoRaWAN Regional Parameters v1.0.3	LoRa Alliance
LoRaWAN Backend Interfaces Specification v1.0	LoRa Alliance

Chapter 2 – System Specification

General Hardware Specification

No.	Item	Description
1	Model Name	TBMH100 MiniHub
2	Frequency Band	The following configuration is supported: - US 915 SKU - EU 868 SKU - AS 923 SKU
3	CPU	MCU with integrated Wi-Fi radio
4	Flash	SPI 32mb
5	RF Transceiver	SX1308 with SX1257 (x2)
6	Number of Channels	8 concurrent channels
7	Transmit RF Power	0.5W (up to 27 dBm)
8	Receive Sensitivity	Down to -142 dBm
9	Modulation	Based on LoRaWAN
10	Security	AES 128
11	Wi-Fi Interface	802.11 b/g/n (HT20) client mode
12	Power Supply	5VDC/1A via USB Type C connector
13	Antenna Type	Integrated LoRa and Wi-Fi antennas
14	Indicators	1 status LED
15	Temperature	Operating: 0°C ~ 40°C Storage: -10°C ~ 60°C
16	Humidity	Operating: 10 ~ 85% (Non-Condensing) Storage: 5 ~ 90% (Non-Condensing)
17	Dimensions	80x80x40mm
18	Weight	200g

LoRa Specification

No.	Item	Description
1	Standard	LoRaWAN v1.0.3
2	LoRa MAC commands	LoRaWAN v1.0.3
3	LoRa Classes	- Class A: supported - Class C: supported
4	Activation	Both ABP and OTAA
5	MAC Commands	LoRaWAN v1.0.3

LoRa RF Specification (SX1308 Module)

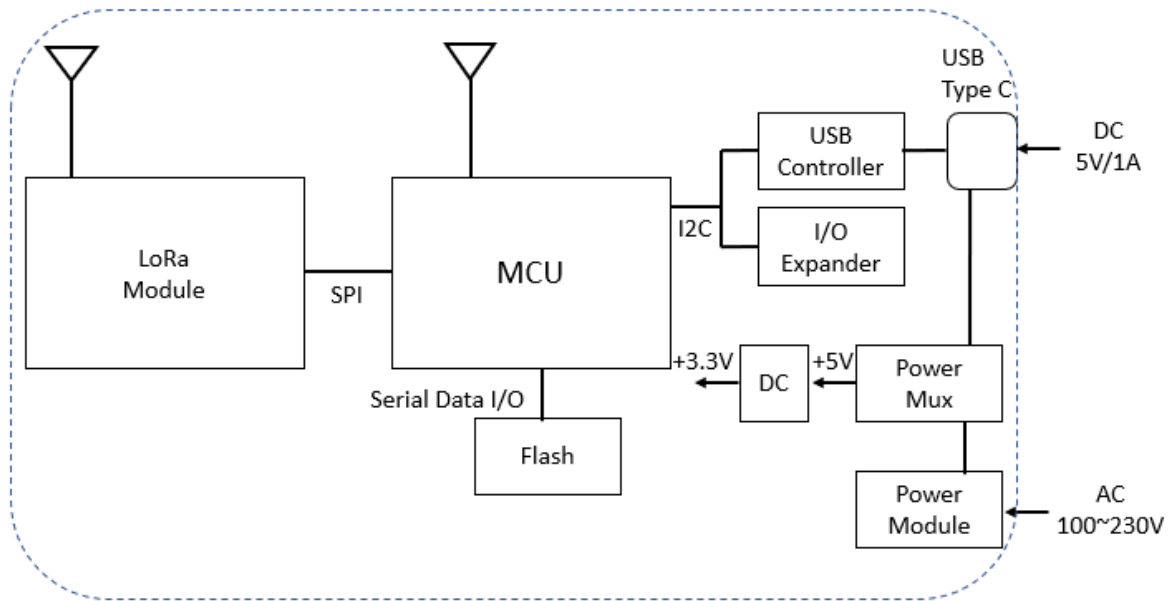
No.	Item	Capability				Remarks
		Min	Typ	Max	Units	
1	Frequency Range	EU868/US915/AS923			MHz	Follows LoRa regional parameters
2	Channel Bandwidth	125/500			KHz	8 uplink + 2 downlink
3	Output Power (TX)			27	dBm	
4	Sensitivity (RX)		-136	-142	dBm	BW=125KHz with SF=10

* All the radio performance is validated from - 0 to 40 °C

General Software Specification

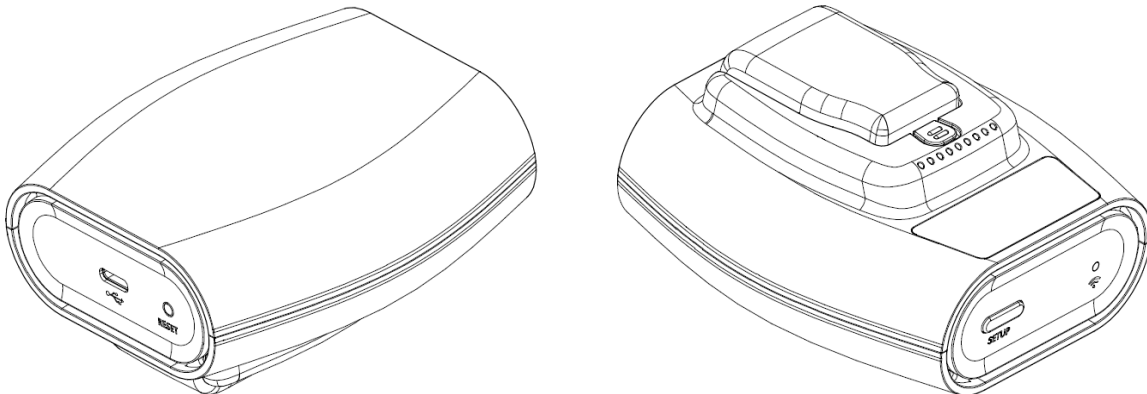
No.	Item	Description
1	Internet Connectivity	Thru Wi-Fi with DHCP client
2	Wi-Fi Configuration	<ul style="list-style-type: none">- Wi-Fi scan- Connected SSID- Network information
3	System Status	<ul style="list-style-type: none">- System information
4	LoRa Information	<ul style="list-style-type: none">- Current LoRa channel configuration and Gateway ID- External network server configuration- Basic Station Protocol
5	Channel Scan	The gateway can scan all supported channels based on ISM band regulation
6	Firmware Upgrade	OTA, based on network server
7	Remote Management	Configured and monitored by network server

Block Diagram



Enclosure Design

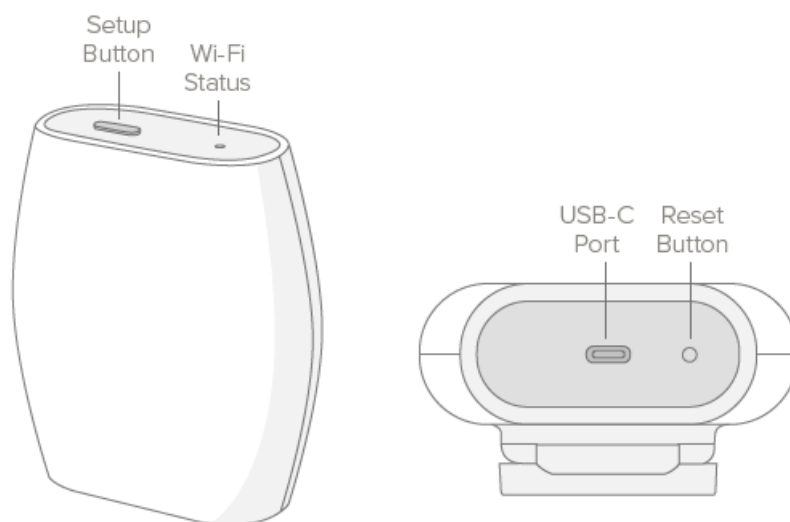
The dimension of MiniHub is 80x80x40mm, with changeable power plug and integrated LoRa and Wi-Fi Antennas.



LED Indicators

LED Indicator	Function	Description
Status	Solid Green	Connected to Wi-Fi and operating correctly
	Solid Orange	Awaiting Wi-Fi network configuration

I/O Ports



Regulatory Specification

Standard
FCC, CE, UL

Chapter 3 – Package

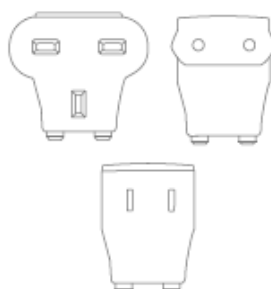
Package Content

No.	Description	Quantity
1	The product	1
2	USB-C to A cable	1
3	Power plug	1

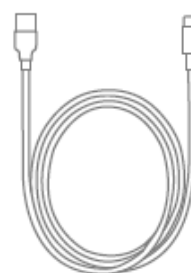
Note: Depending on SKU



Mini Hub



Power Plug Adapters



USB-C to A Cable