MeshTower-V2

Solar-Powered Outdoor Mesh Hub

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Document Version

Version	Time	Description	Remark
Rev. 1.0	2025-06-16	Preliminary version	Richard
Rev. 2.0	2026-03-26	New BMS, 30dBm	Richard

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Content

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1. Description

1.1 Overview

MeshTower is outdoor solar-powered node with simultaneous 1W LoRa transmit power, Bluetooth and GNSS communication, integrating a 10W solar panel and 3 x 2800mAh lithium batteries. Housed in an IP66-rated waterproof metal enclosure and designed for -20°C to 60 ° C environments, it thrives in harsh conditions. Offering pole/wall-mount flexibility, it's ideal for remote monitoring and off-grid communication — delivering solar endurance and industrial resilience.

MeshTower is categorized into the following variants :

Module	Frequency	TX
MeshTower V2	863~928MHz	22dBm
MeshTower V2H	863~928MHz	30dBm

1.2 Features

- Maximum 1W LoRa transmission power
- 3*2800mAh wide-temperature battery (-20°C to 60°C).
- 10W solar input, adjustable panel angle.
- Supports DC 18-24V and USB-C PD3.0(20V) input.
- Dual Support for LoRa & Bluetooth.
- Excellent Low-Power Efficiency.
- IP66-rated metal enclosure, waterproof & flame-retardant.

1.3 Typical Applications

- Environmental Monitoring Systems
- Smart Agriculture & Livestock Farming
- Asset Management and Tracking
- Outdoor Emergency Solutions
- Solar Street Lighting Systems
- Industrial Infrastructure Monitoring

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2. Specifications

Table3.1: General specification

Parameters	Description
RF chip	Nordic nRF52840(BLE), SX1262(LoRa)
Chip Memory	1M ROM; 256kB PSRAM
Wireless	BLE, LoRa
GNSS Module(Optional)	Quectel L76K (Optional)
Battery Capacity	3*2800mAh
Battery Type	Li-ion Battery
Voltage Input	DC 18-24V(XT30), PD3.0 20V(USB-C)
Panel Voltage	18V/10W
MAX TX Power	30dBm
Interface	SMA female jack(2.4G/GNSS), N-K(LoRa), USB-C, XT30(Solar), SD card slot
Operating Temperature Range	-20~60℃
Protection Rating	IP66
Dimensions	Enclosure: 125 (+40ANT) * 125 * 52 mm; Solar Panel: 340*220 mm
Weight	1.50kg
Enclosure	Aluminum

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3. Electrical Characteristics

3.1 Power Input

The Solar/DC input supports both solar panel and DC power sources, with a requirement that the **Voc**(open-circuit voltage) must exceed 18V not exceed 24V. The USB-C port only enables charging functionality when it detects a PD3.0 protocol with a 20V input voltage; a 5V input is solely for powering the MCU.

Table3.1: Voltage Input

Input Method	Parameter
Solar Panel	18V/10W
DC	18V-24V
USB-C(Charging)	PD3.0, 20V
USB-C(MCU)	5V

3.2 Charging Current

Table3.2: Changing Current

Method	Current	Description
Solar Panel	0.55A	Depends on the solar panel's power and voltage. The minimum is >0, while the maximum = $\mathbf{P_{solar}}$/ $\mathbf{V_{solar}}$
DC@18V	1.5A	Constant-current charging at 1.5A, tapering down when battery voltage reaches 4.2V
USB-C(PD3.0)	1.5A	Constant-current charging at 1.5A, tapering down when battery voltage reaches 4.2V

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4. RF Characteristics

4.1 RF module power consumption

The test data comes from the standalone test results of the HT-N5262M, using the sample code from the official Heltec nRF5240 library.

Table5.1: Transmit power

Mode	Condition	868/915MHz
LoRa_TX	5dBm	53mA
	10dBm	64mA
	15dBm	81mA
	20dBm	114mA
	25dBm	166mA
	30dBm	245mA
BT	UART	12mA
	Scan	4mA
GNSS		40mA
Sleep		300uA

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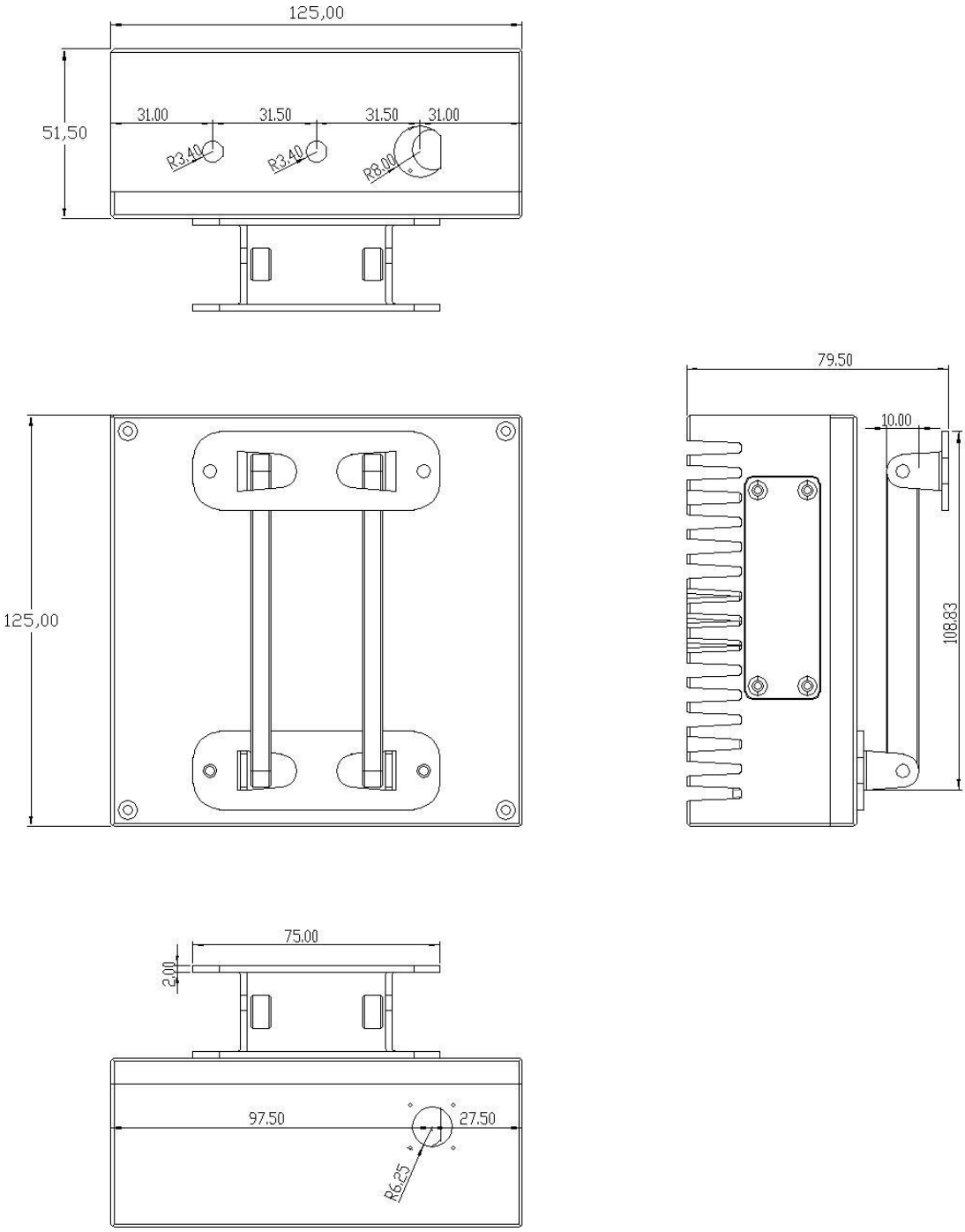
5. Physical Dimensions

5.1 Enclosure



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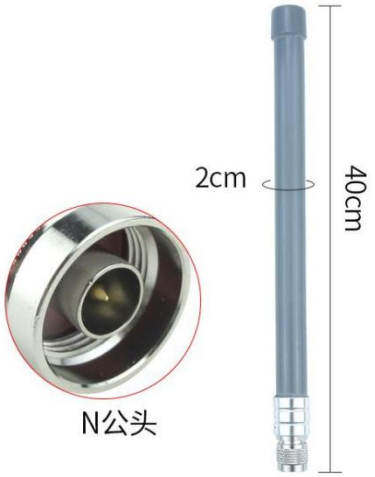
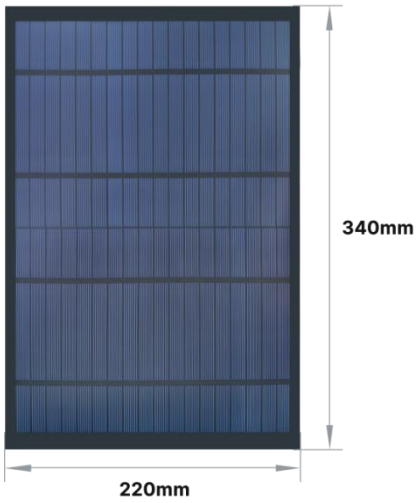
5.2 LoRa Antenna



5.3 Solar Panel



6. Resource

- User Guide
- HT-n5262M Schematic
- MeshTower Resource Station
- Heltec nRF52840 Framework

7. Heltec Contact Information

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