

User Manual

Product Name: Outdoor LoraWAN Gateway
Model Name: DSGW-010C

Revision History

Specification		Sect.	Update Description	By
Rev	Date			
1.0	2020-01-30		New version release	
1.1				

Approvals

Organization	Name	Title	Date

1 Introduction	3
1.1 Purpose& Description	3
1.2 Product Feature Summary	3
1.3 LongFi™ Technology.....	3
1.4 Proof of Coverage.....	3
1.5 Hardware block diagram	4
2 Mechanical Requirement.....	4
2.1 Drawings	4
2.2 Interface.....	5
2.3 installation	5
3 Electrical Requirements.....	6
3.1 Hardware Information	6
3.2 Performance Requirement	6
4 Software functions.....	9
4.1 Initialization.....	9
4.2 Clock Calibration.....	9
4.3 Main and auxiliary power supply switching.....	9
4.4 LED:	9
4.5 Key	9
5 Certification.....	10
6 FCC	11

1 Introduction

1.1 Purpose& Description

Earn HNT cryptocurrency by mining Helium and building coverage for The People's Network using the DSGW-010C HNT Outdoor Hotspot Miner. Anyone can join The People's Network and provide hundreds of square miles of wireless network coverage, while mining HNT on the Helium Blockchain just as hotspot miners do.

The Outdoor HNT Hotspot Miner opens up a plethora of opportunities, such as the ability to mount a hotspot to the side of buildings, houses and roofs. It's an ideal solution for wider coverage applications across villages, towns and cities.

1.2 Product Feature Summary

- Support the POE switch power supply
- Support IEEE802.3-2012 Type 1, the IEEE802.3-2012 Type 1 requires a power supply device (PSE) to provide 44 to 57V, and the power of the powered device (PD) must not exceed 12.95 W and the current does not exceed 350 mA.
- CPU: Quad-core Cortex A35
- 2GB on-board RAM
- 32GB eMMC
- Base on the LoRa Concentrator Engine: Semtech SX1302
- TX power up to 27dBm, RX sensitivity down to -139dBm @SF12, BW125kHz
- LoRa Frequency band support: RU864, IN865, EU868, US915, AU915, KR920, AS923.
- Support Wi-Fi 2.4G/5G IEEE 802.11b/g/n/ac
- Support BLE5.0
- Support GPS, GLONASS, Galileo and QZSS
- Support OTA
- One WAN variable network port
- RoHS/WEEE compliance(Lead-free)

1.3 LongFi™ Technology

Helium LongFi™ is a technology architecture that combines a leading wireless technology, LoRaWAN, and the Helium Blockchain. LongFi™ is optimised for miles of range, and long battery life for IoT devices.

1.4 Proof of Coverage

The HNT Outdoor Hotspot Miner earns HNT Helium tokens when devices connect, and for validating wireless coverage delivered by peers. Using a system called Proof-of-Coverage, Hotspot Miners earn more HNT when they're in range of other miners, but need to be at least 300 meters apart.

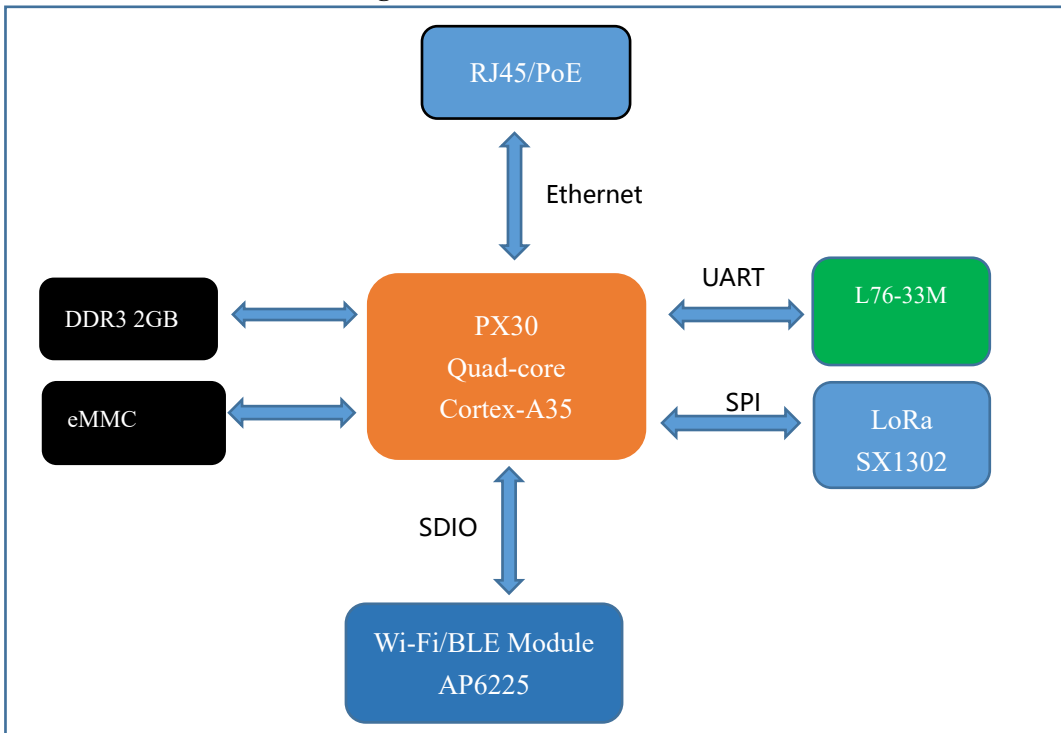
The range depends on the environment:

Rural areas: ~10 miles or more.

Dense areas: ~ 1 mile.

Single HNT Hotspot Miners earn less as they can only issue Challenges over the internet, and can't participate in Proof-of-Coverage.

1.5 Hardware block diagram

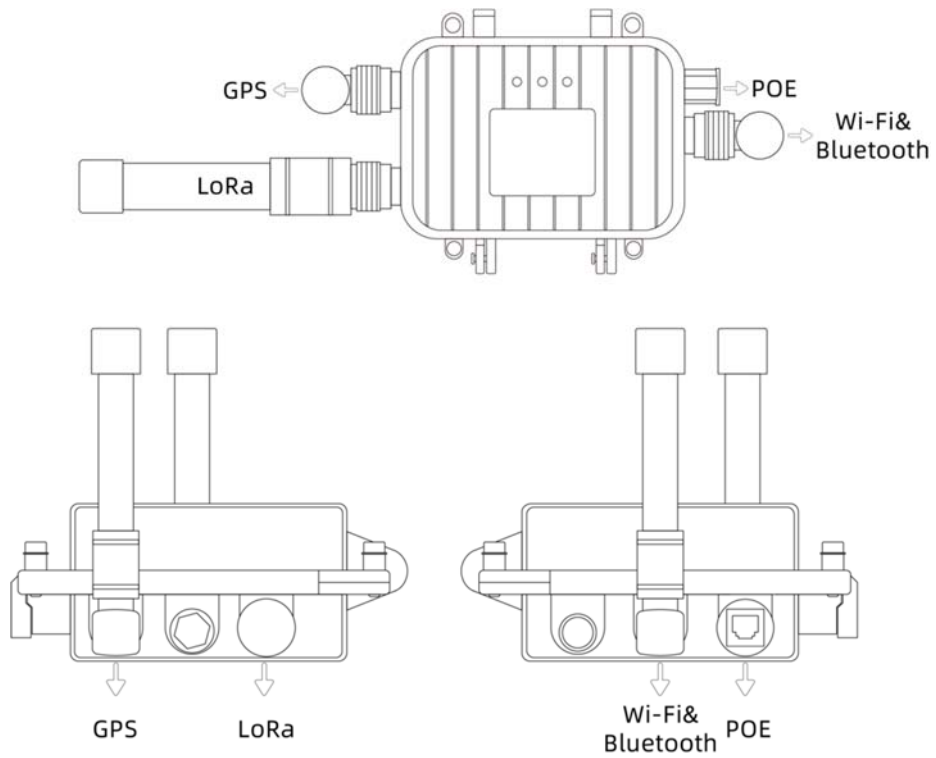


2 Mechanical Requirement

2.1 Drawings



2.2 Interface



2.3 installation



3 Electrical Requirements

3.1 Hardware Information

Category	Specifications
CPU	Quad-core Cortex-A35
RAM	2GB
ROM	eMMC 32GB
System	Linux
Security module	ATECC608
Power Supply Port	Support DC input , input Voltage range is 4.75V to 5.25V. Power seat aperture is 3.5mm. The needle diameter is 1.35 mm and is positive. Power adapter: 100-240V,50/60HZ, Output is 5V/2A
Reset button	The reset button inside gateway, After pressing the reset button for more than 5 seconds, the Wi-Fi unit will be restored to the factory settings.
Network Interface	The network interface supports CAT-5/CAT-5E to transmit data and POE Power Supply (voltage range is 44~ 57V). It is WAN/LAN variable.
Indicator LEDs	1).Power LED normally on when powered on (green) 2).Network LED normally off when connected (red) 3). Card indicator (yellow)
TF card	Up to 128GB
Temperature rise	In the environment of 25 degrees, the surface temperature of the product shell does not exceed 45 degrees.
Operating Temperature	0°C~65°C
storage temperature	-10°C~70°C
Humidity range	10% RH ~85% RH
atmospheric pressure	76Kpa~106Kpa
waterproof level	IP66
Certification	FCC, CE, IC

3.2 Performance Requirement

Wi-Fi RF Performance	<ul style="list-style-type: none"> • 2.4GHz WLAN standard: IEEE802.11b/g/n Frequency Range: 2.4~2.4835GHz(2.4GHz ISM Band) Channels: Ch1~Ch13 (For 20MHz Channels) Modulation: <ul style="list-style-type: none"> 802.11b (DSSS): DBPSK, DQPSK, CCK; 802.11a/g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64; Data Rate: <ul style="list-style-type: none"> 802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps;
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	<p>802.11n (HT20): MCS0~MCS7 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7 13.5~150Mbps; Frequency offset: +/-30KHz Sensitivity: 802.11b@11Mbps: -86dBm@10% PER 802.11g@54Mbps: -74dBm@10% PER 802.11n@HT20_MCS7 : -69dBm@10% PER 802.11n@HT40_MCS7 : -67dBm@10% PER Transmit Power: 802.11b: 17±1.5dBm @11MHz 802.11g: 15±1.5dBm @54MHz 802.11n: 15±1.5dBm @HT20 MCS7 802.11n: 14.5±1.5dBm @HT40 MCS7</p> <ul style="list-style-type: none"> • 5GHz WLAN standard: IEEE802.11a/n/ac Frequency Range: 5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.73GHz; 5.735~5.835GHz(5GHz ISM Band) Channels: Ch36, Ch40, Ch44, Ch48; Ch52~Ch64; Ch100~Ch140; Ch149~Ch165(For 20MHz Channels) Modulation: 802.11a (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11ac (OFDM): BPSK, QPSK, QAM16, QAM64, QAM256; Data Rate: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7 13.5~150Mbps; 802.11ac (VHT20): MCS0~MCS8 6.5~86.7Mbps; 802.11ac (VHT40): MCS0~MCS9 13.5~200Mbps; 802.11ac (VHT80): MCS0~MCS9 29.3~433.3Mbps; Frequency offset: +/-30KHz Sensitivity: 802.11a@54Mbps: -72dBm@10% PER 802.11n@HT20_MCS7 : -69dBm@10% PER 802.11n@HT40_MCS7 : -67dBm@10% PER 802.11n@VHT80_MCS9 : -57dBm@10% PER Transmit Power: 802.11a: 13±2dBm @54MHz 802.11n: 13±2dBm @HT20 MCS7 802.11n: 13±2dBm @HT40 MCS7
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	<p>802.11ac: 12±2dBm @VHT80 MCS9</p> <ul style="list-style-type: none"> • Wireless Security: WPA/WPA2, WEP, TKIP, and AES • Working mode : Bridge、Gateway、 AP Client • E.i.r.p (Equivalent Isotopically Radiated power) (mW)<100mW
Bluetooth RF Specification	<ul style="list-style-type: none"> • Bluetooth Specification: Bluetooth v2.1 +EDR/4.0/4.2 • Frequency Range:2.4~2.4835GHz(2.4GHz ISM Band) • Channels: <ul style="list-style-type: none"> Bluetooth Classic: Ch0~Ch78 (For 1MHz Channels); Bluetooth Low Energy: Ch0~Ch39 (For 2MHz Channels); • Power Classes <ul style="list-style-type: none"> Bluetooth Classic: Class1; Bluetooth Low Energy: Class1.5; • Data Rate & Modulation <ul style="list-style-type: none"> BR_1Mbps: GFSK; EDR_2Mbps: π/4-DQPSK; EDR_3Mbps: 8DPSK; LE_1Mbps: GFSK; • TX Power: 2~8dBm • Receiving Sensibility: <ul style="list-style-type: none"> BR@1M : -80dBm@0.1% BER EDR@3M : -70dBm@0.1% BER BLE : -80dBm@30.8% BER • Frequency offset: +/-30KHz • Bandwidth (MHz):2MHz • E.i.r.p (Equivalent Isotopically Radiated power) (mW)<10mW
LoRa Performance	<ul style="list-style-type: none"> • Supports class A, C • Frequency band support • RU864, IN865, EU868, US915, AU915, KR920, AS923 • TX power up to 27dBm, • RX sensitivity down to -139dBm @SF12 • Frequency offset: +/-1KHz • BandWidth:125kHz
GPS Performance	<ul style="list-style-type: none"> • Supported Bands <ul style="list-style-type: none"> GPS L1 C/A: 1575.42 MHz GLONASS L1: 1602.5625 MHz BeiDou B1I : 1561.098 MHz Galileo E1:1575.42 MHz • Default GNSS Constellation: GPS + GLONASS • Number of Concurrent GNSS: 3 • Channels <ul style="list-style-type: none"> 33 Tracking Channels 99 Acquisition Channels

	210 PRN Channels <ul style="list-style-type: none"> • Horizontal Position Accuracy: Autonomous: < 2.5 m CEP • Velocity Accuracy: Without Aid: < 0.1 m/s • Acceleration Accuracy: Without Aid: < 0.1 m/s² • TTFF@-130dBm with EASY™ Cold Start: <15s Warm Start: <5s Hot Start: <2s • TTFF@-130dBm without EASY™ Cold Start: <32s Warm Start: <30s Hot Start: <2s • Timing Accuracy: 1pps<100ns • Reacquisition Time:<1S • Sensitivity: Acquisition: <-149dBm Tracking: <-167dBm Re-acquisition: <-161dBm
Ethernet	WAN port: 10M/100Mbps

4 Software functions

4.1 Initialization

After power on, the power indicator flashes at a frequency of 1Hz until the system starts up.

4.2 Clock Calibration

After the system is started and connected to the network, time synchronization is performed immediately, and then every 24 hours.

4.3 Main and auxiliary power supply switching

The adapter input is the main power supply, and the POE is the auxiliary power supply. When the main power supply is input, the auxiliary power supply is automatically cut off.

4.4 LED:

name	Color	states
power	green	Start: 1Hz frequency flashing Normal: flashes off for 1 second every 15 seconds.
Sub-device	orange	communication: 2Hz flashing, 50% duty No communication: off
Internet	red	Internet available: off No network: long on

4.5 Key

name	operation	function
Reset key	Short press(less than 1s)	reset device
Function key	Short press(less than 1s)	Pair Sub-device
	Long press	factory reset

5 Certification

TECHNICAL REPORT



Report No.: TW2107216S

File reference No.: 2022-04-02

Applicant: Hangzhou Roombanker Technology Co., Ltd.

Product: waterproof industrial gateway

Model No.: DSGW-010, DSGW-010-1, DSGW-010-2, DSGW-010-3, DSGW-010-4, DSGW-010-5, DSGW-010-6, DSGW-010-7, DSGW-010C

Trade mark: N/A

Test Standards: IEC 60529:1989+A1:1999+A2:2013

Test Conclusions: Pass
Please refer to 5.1 and 5.2 for details.

Approved by

Jack Chum

Jack Chum

Manager

2022-04-02

Dated:

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

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6 FCC

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

FCC Radiation Exposure Statement The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located for operating in conjunction with any other antenna or transmitter.