# global sources Panther X2 Hotspot Helium HNT Blockchain Miner User Manual



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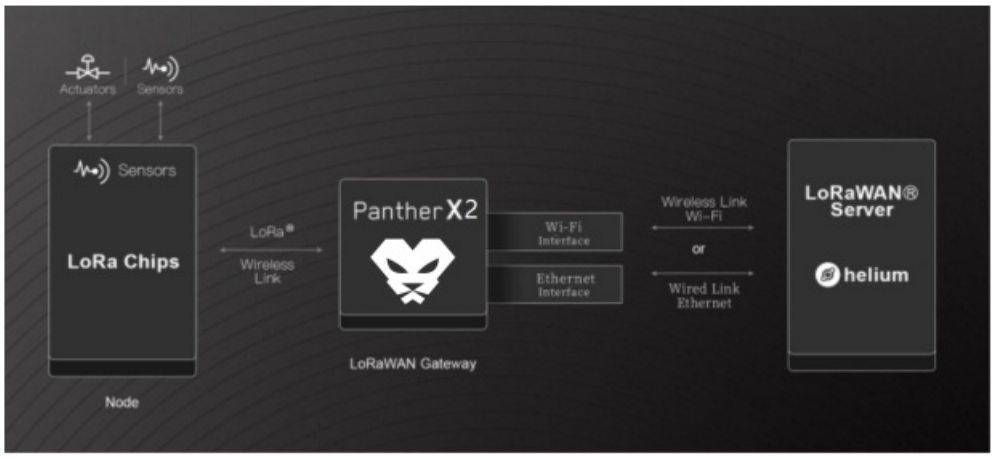
## Product description

Since E-Sun Electronics Limited launched the Panther X1 Hotspot, the product has been a big success and welcomed by most users for its exclusive advantages such as abundant storage, full-duplex LoRa mode, multi-hotspot management configuration, high-speed synchronization, and advanced customization. As E-Sun Electronics Limited focuses on building a series of high-quality products in the Internet of Things field in the future, the team has been committed to continuously advancing the research, development, and iteration of Panther X series products. Following the successful launch of Panther X1, we completed the research and development of Panther X2 Hotspot and launched it to the public. Panther X2 has a 4-core high-performance processor, ultra-low power consumption, and ultra-long-distance IoT hotspot gateway. In addition, as an information converter for the LoRa communication protocol, Panther X2 acts as a bridge between network servers and end nodes. Panther X2, featuring a signal coverage of around 10-20 km, runs at an ultralow- power (5W) and can connect to over 2,000 LoRaWAN end nodes within itsrange. It is susceptible, safe, reliable, and easy to interact with and can be used for environmental monitoring, asset tracking, smart agriculture, and other long-range ultra-low-power IoT applications. Panther X2 is compatible with the Helium LongFi network and can be used as a hotspot to obtain Helium digital token, HNT. In addition, the device supports block synchronization and remote control. Users can use the official Helium application to complete the Panther X2 in one minute quickly.

### Architecture




Panther X2 sends and receives LoRa data, modulates/demodulates signals, processes LoRa data and higher-level protocol-related tasks, and eventually transmits data to the server via Ethernet or Wi-Fi.

**Solution**
LongFiTM Technology Helium LongFi is a technical architecture that combines advanced wireless technology LoRaWAN and Helium blockchain. LongFi is optimized for the coverage and battery life of IoT devices.

**Proof of Coverage (PoC)**

The Panther X2 Hotspot obtains the digital token HNT when the device is connected to the Helium mainnet and is used to verify the wireless coverage provided by the peer. Using a proof of coverage mechanism, Panther X2 Hotspots can obtain more HNT when Panther X2 Hotspots are within the coverage range of other Panther X2 Hotspots. The coverage depends on the use environment: l Open area: 10 kilometers or more. l Built-up areas: 1~10 kilometers. A single hotspot obtains fewer HNT because it can only issue challenges through the Internet and not participate in the proof of coverage mechanism.

**About LoRa**

LoRa is an innovative radio frequency physical layer modulation technology that provides long-range wireless connectivity, excellent power supply efficiency, extremely high receiver sensitivity, full spread spectrum, and secure, encrypted transmission. It is operated on free industrial, scientific, and medical (ISM) radio bands with 863-870 MHz frequency spectrum and its subsets reserved for Europe, the Middle East, Africa, and India, and 902-928 MHz for the Americas and Asia-Pacific countries/regions. The ISM band primarily used in China is 470-510MHz.

**About LoRaWAN**

LoRaWAN is a Media Access Control (MAC) layer protocol developed by the LoRa Alliance, serving as a supplement to the physical layer implementation of LoRa. It draws support from an established ecosystem of LoRaWANcompatible devices, which can be obtained from multiple suppliers and is accredited by the LoRa Alliance for Device Interoperability. LoRaWAN defines the network's communication protocol and system architecture, while the LoRa physical layer enables the long-range communication link. As a result, the protocol and network architecture have the most influence in determining the battery lifetime of a node, the network capacity, the quality of service, the security, and the variety of applications served by the network.

**Advantages**

High-performance configuration: Powered by the latest quad-core Cortex- A55 1.8GHz processor; Semtech LoRaWAN chip; 4GB DDR4 memory; 32GB eMMC and 64GB TF card; Secure and trustworthy: With a built-in ECC encryption chip, Panther X2 promises highly secure authentication and reliable connection;! Comprehensive Coverage: Featuring enhanced 3dBi antennas, Panther X2 offers broader and more stable network coverage

More extensive RAM and storage: 4GB DDR4 with faster-running speed and shorter response time, built-in 32GB eMMC and 64GB TF card, Panther X2 meets the RAM and storage requirements brought by the rapid development of Helium network; Easy setup: Easy steps to set up Panther X2; Hotspot Placement: Easier management and configuration of multiple hotspots;

## Connectors


## Product specifications

| | |
|---|---|
| **Product name** | **Panther X2** |
| **LoRa Specifications** | |
| **LoRa Channel Plan** | **AS923/ S915** |
| **LoRa Frequency Band** | **923MHz/915MHz** |
| **Channel capacity** | **64 /7 channels** |
| **LoRa output power** | **Maximum 27dBm** |
| **Receiving sensitivity** | **-141 dBm @SF12 BW 125kHz)**<br>**-127 dBm @SF7 BW 125 kHz)**<br>**-111 dBm @FSK 50 kbps** |
| **Platform** | |
| **CPU** | **Quad-core Cortex-A55 up to 1.8GHz** |
| **Memory** | **DDR4 4GB** |
| **Storage** | **eMMC 32GB+ TF Card 64GB** |
| **Wi-Fi radio** | **2.4GHz 802.11 b/g/n** |
| **BLE radio** | **BLE 5.2** |
| **Input Voltage** | **DC 12V 2A** |
| **Connectors** | |
| **LoRa Antenna** | **RP-SMA-K** |
| **Ethernet** | **RJ45 Gigabit** |
| **Power** | **5.5*2.1mm, 12V DC** |

## Environment requirements

| | |
|---|---|
| **Environment** | |
| **Operating temperature** | **0°C ~ +40°C** |
| **Storage Temperature** | **-10°C ~ +70°C** |
| **Relative Humidity** | **5%RH ~ 95%RH (non-condensed relative humidity) 20%~90%, no n-condensing** |
| **Heat Dissipation** | **Radiator grille** |

**Indicators**


| Indicator light | Status |
|---|---|
| Power | Steady light: Power on No light: Power off |
| Status | Steady light: The system operates normally<br>Blinking light: System is booting (Bluetooth operations are possible) |
| Internet | Steady light: Connected to the Helium network No light: Not connected to the Helium network |
| Bluetooth | Steady light: Bluetooth has been paired successfully No light: Bluetooth pairing is off |

## Dimensions


**Box contents**

## FCC Caution.

§ 15.19 Labelling requirements. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

§ 15.21 Information to user. Any Changes or modifications not expressly approved by the party responsible for compliancecould void the user's authority to operate the equipment. § 15.105 Information to the user.

Note: This equipment 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 equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment 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 equipment and receiver.
- Connect the equipment 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.

**RF warning for Mobile device:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated withminimum distan ce 20cm between the radiator & your body.

## Documents / Resources

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|  | global sources Panther X2 Hotspot Helium HNT Blockchain Miner [pdf] User Manual ESUNPANTHER-X2, ESUNPANTHERX2, 2A3OGESUNPANTHER-X2, 2A3OGESUNPANTHERX2, Panther X2 Hotspot Helium HNT Blockchain Miner, Panther X2, Hotspot Helium HNT Blockchain Miner |