

Panther X1 Indoor Gateway

www.panther.global

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PRODUCT MANUAL

Introduction

Panther X1 is an ultra-low-power and ultra-long-range IoT hotspot gateway that works with different IoT networks. As an information converter for the LoRa communication protocol, Panther X1 helps communicate between network servers and end nodes.

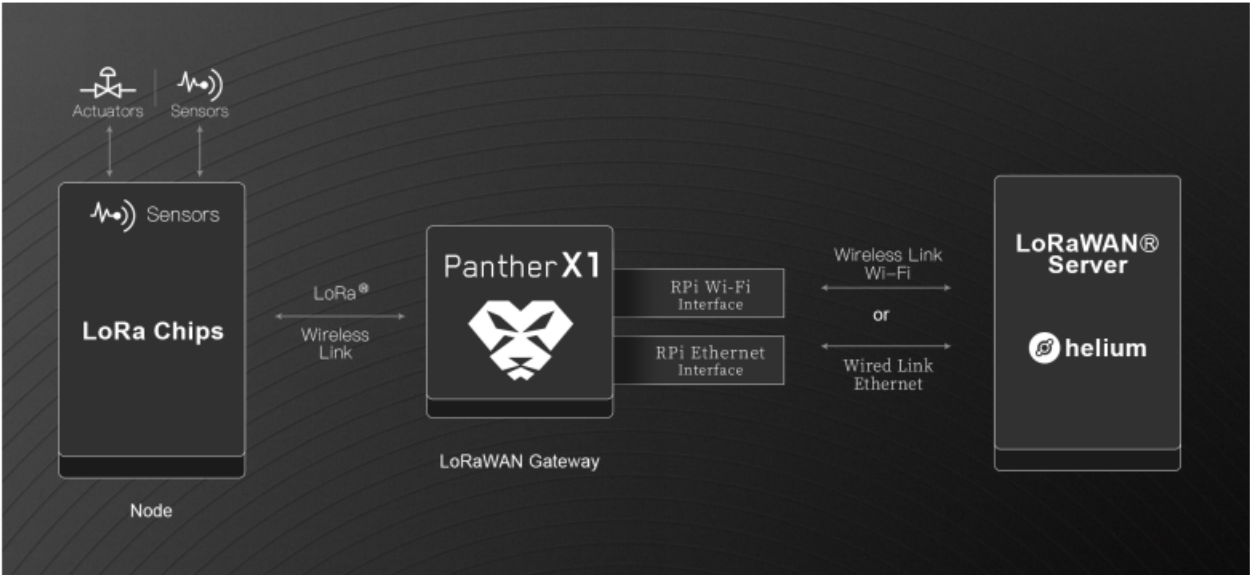


Panther X1, featuring a signal coverage of around 10-20 km, runs at an ultra-low power (5W) and can connect to over 2,000 LoRaWAN end nodes within its range. It is highly sensitive, safe, reliable, and easy to interact with and can be used for environmental monitoring, asset tracking, smart agriculture, and other long-range ultra-low-power IoT applications.

Compatible with the Helium LongFi network, Panther X1 can be used as a hotspot to obtain Helium currency (HNT). In addition, this device supports instant block synchronisation and remote control. Users can set it up within a minute at ease by using Helium's official application. At the same time, they can change advanced configurations on Panther X Dashboard to make the device more efficient.

Architecture

Panther X1 sends and receives LoRa frames, modulates/demodulates signals, processes LoRa frames and higher-level protocol-related tasks, and eventually transmits data to the LoRaWAN server via Ethernet or WiFi.



Solution

LongFi™ Technology

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

Proof of Coverage (PoC)

Panther X1 hotspot obtains the HNT when the device connects to Helium Mainnet and validates wireless coverage delivered by peers. In addition, through the use of a Proof-of-Coverage (PoC) system, Panther X1 can obtain more HNT when a Panther X1 hotspot is within the coverage of other Panther X1 hotspots.

The coverage is subject to the environment:

- Open ground: 10km or farther
- Built-up area: 1-10km

Fewer HNT can be obtained by a single hotspot, as it can only issue Challenges via the Internet and not participate in PoC.

LoRa

LoRa is a revolutionary RF physical-layer modulation technique 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.

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 LoRaWAN compatible devices, which can be obtained from multiple suppliers and is accredited by the LoRa Alliance for Device Interoperability.



Advantages

Powered by Mature Hardware Solutions: Broadcom BCM2711 quad-core 64-bit 1.5GHz processor; Semtech LoRa chip; 4G memory; 64GB TF card;

Secure and Reliable: With a built-in ECC encryption chip, Panther X1 promises highly secure authentication and reliable connection;

Ultra-low Power: Panther X1 is equivalent to a 5W light bulb in power consumption, with daily consumption of 0.12kWh and a monthly cost of around ¥1.8 (or \$0.28);

Wide Coverage: Featuring enhanced dual-3dBi antennas, Panther X1 offers broader and more stable network coverage, which grants higher efficiency for hotspots to obtain HNT;

Large Storage: With a faster running speed and quicker response offered by 4GB DDR4 RAM, Panther X1 is more efficient in acquiring HNT; its built-in 64GB microSD card allows it to meet the need for the memory of the fast-growing Helium network;

Full-duplex Independent Channel: Both half-duplex and full-duplex modes are supported;

Easy set-up: Easy steps to set up Panther X1;

Hotspot Placement: Easier management and configuration of multiple hotspots;

Instant Synchronization: Quick synchronisation of blocks;

Customisation: Background configuration of data to enhance device efficiency.

Connectors



Package Content

Panther X1 hotspot gateway

2 x3dBi LoRa gateway Antenna

Power Adapter



Product Dimension



Hardware Specifications

Product Name	Panther X1
LoRa Specifications	
LoRa Frequency Band	470~510MHz
LoRa Channel Plan	CN470
Channel Capacity	8 channels
LoRa Output Power	Maximum 30dBm
Receiving sensitivity	-141 dBm @SF12 BW 125kHz -127 dBm @SF7 BW 125 kHz -111 dBm @FSK 50 kbps
Platform	
CPU	Quad-core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz
RAM	4G DDR4
Storage	64GB TF Card
WIFI	IEEE 802. 11b/g/n/ac
Bluetooth	5.0 BLE
Input Voltage	DC 12V
Connectors	
Antennas	SMA Female
Ethernet	RJ45 Ethernet jack (10/100/1000 port)
Power	5.5*2.1mm, 12V DC

Environment Requirements

Environmental	
Operating Temperature	0-50 °C
Storage Temperature	-40-+85 °C
Relative Humidity	20%-90%, non-condensing
Heat Dissipation	Radiator Grille

Lights

Each LED light colour represents the operating status of the device.

Colour	Status
Yellow	Connected to power but not connected to the internet.
Green	Online/device is working properly
Blue	Bluetooth pairing mode to connect to your phone
White	The Firmware is being automatically updated, and this can take several minutes.