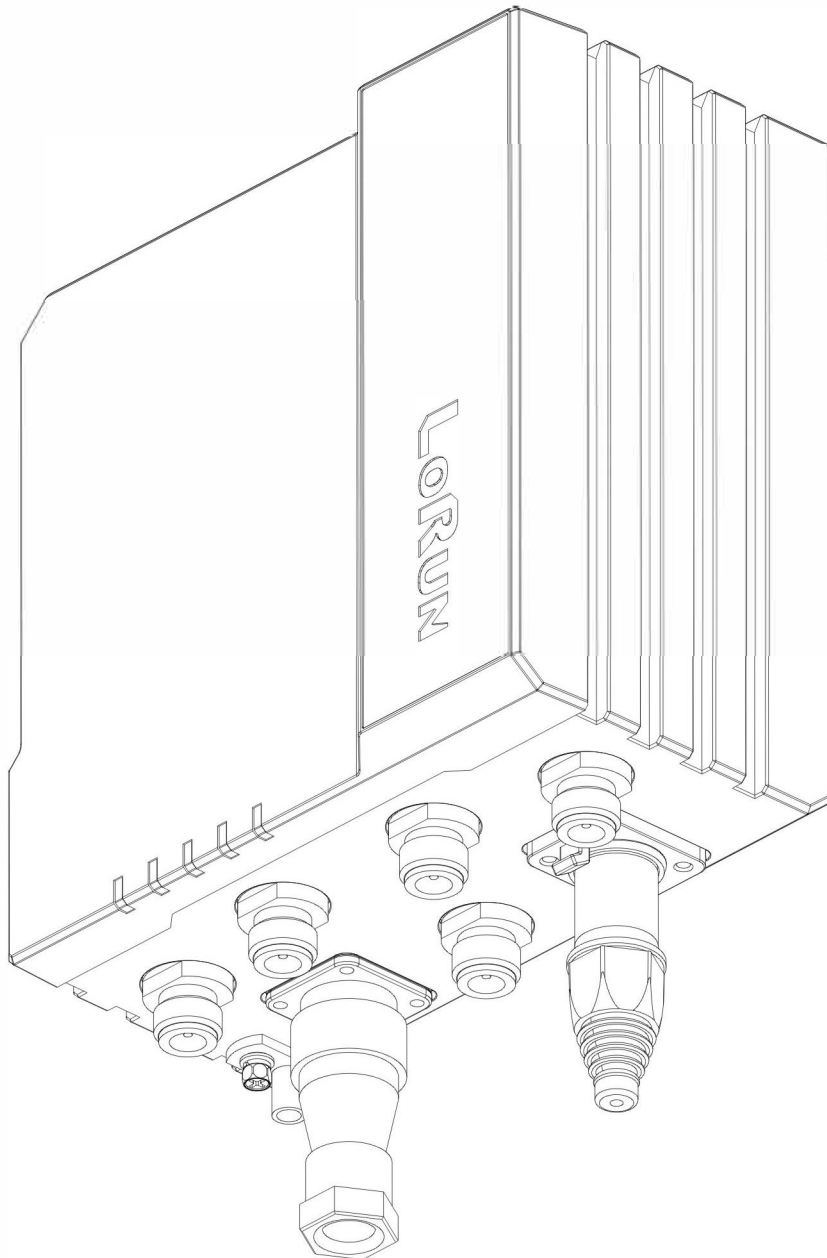


# LoRUN G500

Datasheet V1.1



# Product overview

## Brief introduction

Our LoRun products are part of the integrated LoRaWAN solution, including gateway, node module, terminal application equipment and other core network hardware products.

LoRun gateway is a series of low power, low cost, long distance, wireless transmission Internet of things gateway based on LoRaWAN protocol, specially used for: high communication requirements, strong anti-jamming ability, high sensitivity, low power consumption, many access nodes and scattered characteristics of terminal equipment, and suitable for outdoor thunderstorm weather and other characteristics. It can be widely used in urban management, urban construction and transportation, command community park, modern agriculture, industry, mining and other fields.

LoRun G500 Gateway is a branch of our Gateway Series products.



## Main Characteristics

- Large capacity of nodes.

A single gateway can support up to 100,000 nodes.

- Multi-gateway network alternate

When the gateway is abnormal in the multi-gateway network, the node can enter the network through the adjacent gateway to ensure the stability.

- Node roaming

Legitimate nodes are mobile within the coverage of the gateway.

- Support Half-duplex and full duplex uplink and downlink

The maximum can be supported by 16 upstream access channels and 2 downlink transmission channels.

- Wide coverage radius

Urban 5km and suburban 15km coverage can be realized.

- POE power supply

Support standard Ethernet port power supply and DC12V dual power supply.

- Power-off alarm

Support for power-off alarm function.

- Configuration Management based on wifi

It provides a convenient and reliable way of low cost operation for the management and maintenance of base station system.

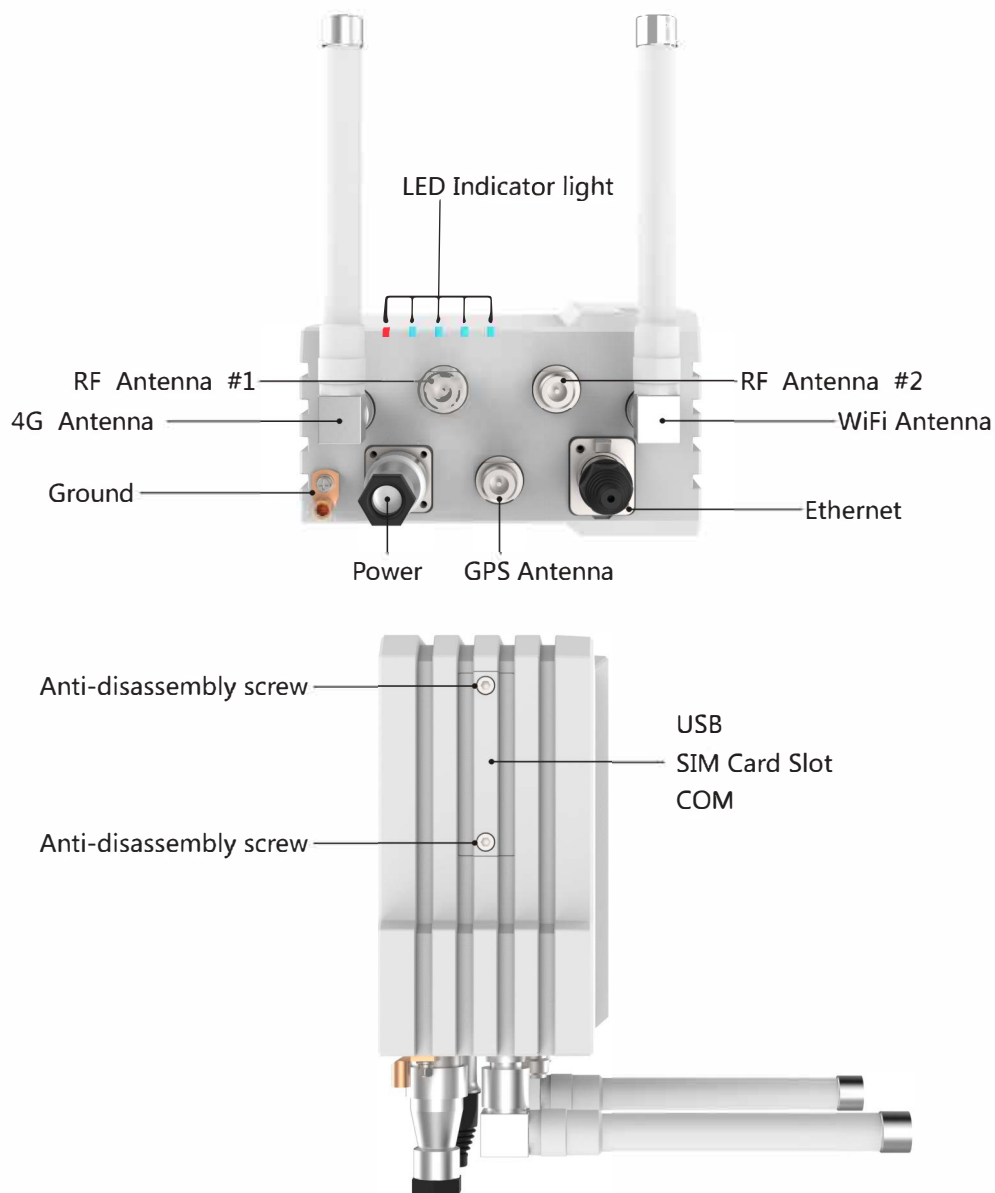


Figure 2. LoRun Gateway Port

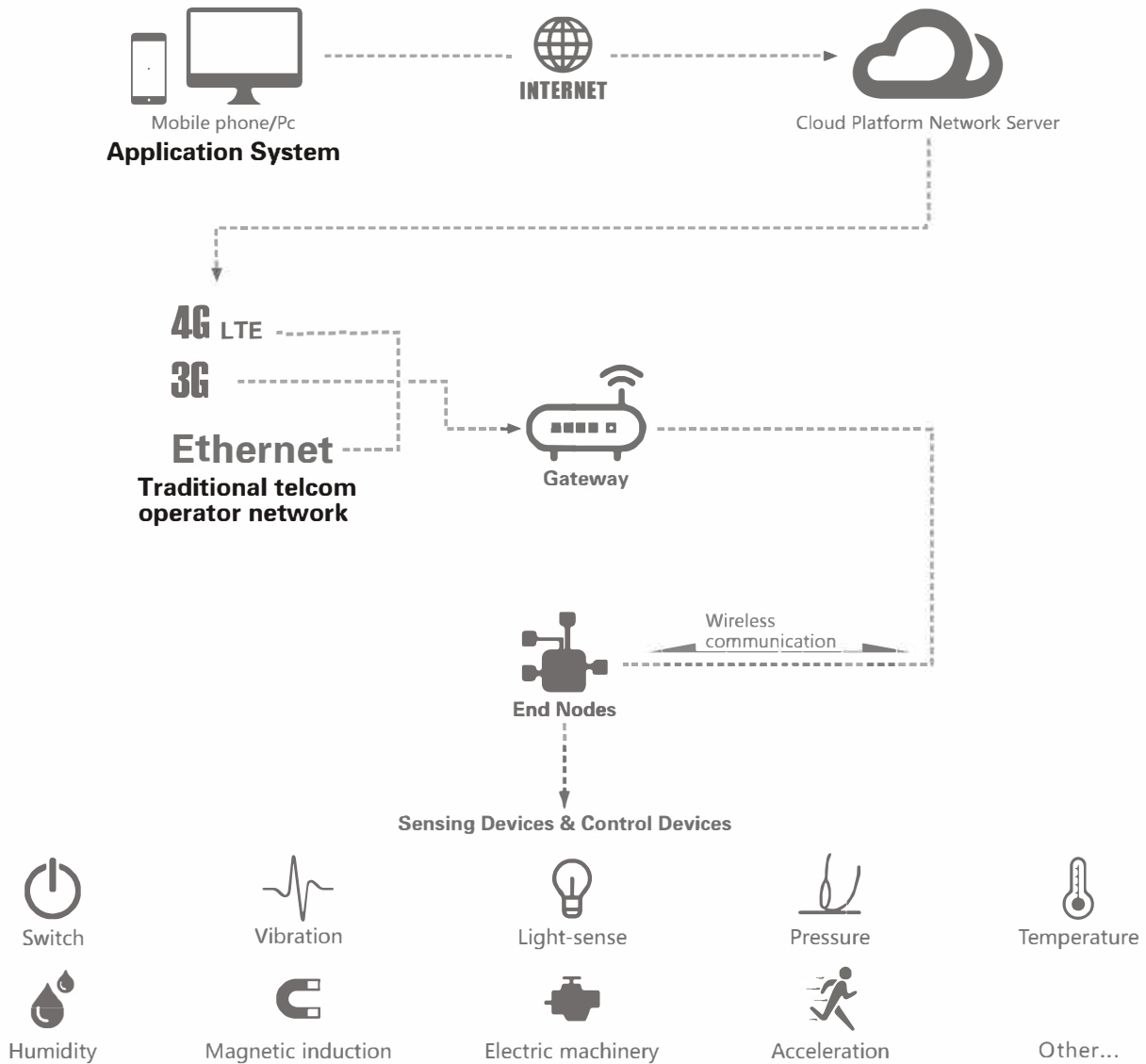


Figure 3. LoRun Solution

The LPWAN of our company supports both up-and-down bidirectional data transmission. From top to bottom, the sensor collects data, after the sensor device collects data, it is transmitted to the Internet of things base station through the node module of the Internet of things, then uploaded to the cloud platform of the Internet of things via 3G / 4G /Wired broadband operator network to realize the docking with the user platform. From top to bottom, the user platform sends instructions or messages to the Internet of things cloud platform via the Internet of things, and then transmits to the Internet of things base station via 3G / 4G / wired broadband network. Then through the Internet of things transmission network sent to the control device connected with the Internet of things terminal module, so as to achieve control of the control device.

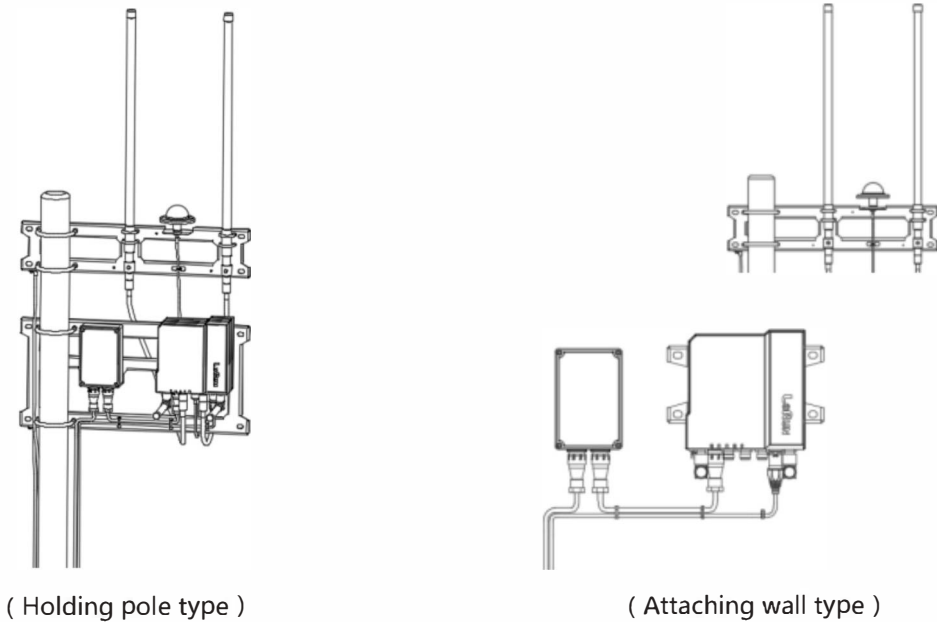


Figure 4. Installation diagram

The LoRun G500 gateway standard design provides two general installation methods:

1. Holding pole type: the mainframe, power supply and antenna module are first fixed to the backplane, the backplane is fixed through the holding pole, and the installation position can be adjusted flexibly according to the needs of the gateway deployment;
2. Attaching wall type: the bracket is fixed to the wall by expansion screw, and the mainframe is fixed to the bracket through the anti-disassembly screw. The antenna is set up independently, the bracket is small and the installation is flexible.

According to the site environment and construction requirements, flexible adoption of these two types of installation.

The following considerations should be taken into account in the installation and use of base station products:

- ※ The erection of the base station needs to choose the height within the coverage area, preferably the place where the commanding height is chosen, and at the same time, it is necessary to take certain lightning protection measures.
- ※ The erection of the base station needs to provide power supply for the city.
- ※ There is a need for wired broadband access to the erection of base stations.
- ※ The antenna of base station can choose whether to use omnidirectional antenna or directional antenna according to the actual situation.
- ※ The installation of this equipment must be carried out by professional personnel, strictly comply with the construction requirements of communications products.

The Internet of things gateway based on LoRaWAN protocol can connect sensors or terminals into the network on a large scale, so as to achieve large-scale deployment of some Internet of things applications. The star structure simplifies the interaction among devices, users and networks. Its low power consumption and wide area network guarantee the communication within a few kilometers, so it is very suitable for the Internet of things communication and the construction of a private LoRa network. The terminal equipment data is uploaded to the cloud and displayed to the user experience terminal, which realizes a variety of hybrid networking systems. The following focuses on the features of our LoRun gateway.

**Table 1. Characteristics and advantages of gateways**

Specification	Parameters
<b>LoRun G500 Gateway</b>	
Use environment	City level, outdoor deployment
Installation mode	Holding pole type, Attaching wall type
Outdoor protection	Waterproof and dustproof
	Lightning Protection(Power terminal: 10KA; RF terminal: 8KV)
	Prevention of SF salt spray and corrosion
Maximum number of access points	100,000pcs
Coverage radius	Urban 5Km, suburb 15km
Receiver sensitivity	-140 dbm@ SF12 / BW 123kHz
Power management	Support for DC-In12V
	Support for POE power supply
	Support power off alarm
LED status indication	Power\ STATUS\ ETH\ GPS\ 4G working status
	Support network signal strength step state display
	Support for debugging, forwarding process status display
Intelligent software	Intelligent software
	SF configurable function
	Watchdog management
	Cloud platform for real-time reporting of network signal strength
System security protection	The upgrade package contains kernel images and device trees
Remote management	Can be managed through the background, remote connections, view the device status log income.
	Support remote upgrade, convenient system maintenance
<b>LoRun G500 Gateway</b>	
Protection grade	Ip66
Exterior design	Patent design, personality customization
Multi-group extended interface	Maximum support for 2 RF communication modules
	Up to 16 uplink channels and 2 downlink channels
	Data transmission in two different frequency bands can be realized at the same time.
Multiple debugging configuration modes	Micro usb connection
	COM port connection
	WIFI connection

**Table 2.Product model**

SKUs(CN433)	CEC-GW-30-1	CEC-GW-30-2
Uplink	4G LTE All-Netcom and 10	10/100M Ethernet
Full duplex mode	Reservation, optional	

※ The custom development of gateway in different regions and bands can be realized by adopting RF module of different frequency bands.

**Table 3. product specification parameters**

Specifications	Description	
<b>Physical characteristics</b>		
Protection grade	Ip66	
Structure size (H.W.D)	178mm*178mm*100mm	
weight	2.2kg	
color	platinum	
material	ADC12 aluminum	
Installation type	Holding pole type, Attaching wall type	
Working temperature	commercial grade 0~60°C	industrial grade-40~85°C
Working humidity	0-90% RH	
Heat dissipation mode	Natural heat dissipation (no fan)	
<b>Electrical characteristics</b>		
Processor	ARM Cortex A8/1GHz	
Memory	512MB	
Flash	4GB	
<b>External interface</b>		
Ethernet	Rj45 YT Push buckle type	
GPS antenna interface	N-type waterproof joint	
RF Antenna Interface	N-type waterproof joint	
WIFI antenna interface	N-type waterproof joint	
4G antenna interface	N-type waterproof joint	
Sim card slot	push to push	
USB	micro usb	
COM	micro usb	
<b>Power supply</b>		
Input voltage	12 VDC (11.5V-14.0V) ; POE IEEE 802.3af/at (max 30W)	
Power management	power-off alarm	
Lightning protection	Earth ground copper nose terminal	
<b>GPS</b>		
Positioning time service	Built-in GPS module	
Location mode	GPS, Beidou	

LED indicator lamp	
Power	When the power is on, the red light is always on, indicating that the power supply is normal.
STATUS	Blue light flashing, system running normally
ETH	Blue light flickering, Ethernet in normal working condition
GPS	The GPS is in the position state when the blue lamp flashes
4G signal intensity	If SNR < -100dBm, the LED scintillation period is 4s, 2s bright 2s extinction If -100dBm < SNR < -85dBm, The flicker period of LED lamp is 2s. If -85dBm < SNR < -75dBm, the flicker period of LED lamp is 1s. If -75dBm < SNR < -65dBm ,the flicker period of LED lamp is 0.2s.(flash). If -65dBm < SNR, LED long bright.
Operating system	
Firmware	Based on Linux
Protocol	
Communication protocol	LoRaWAN V1.0.2
Safety system	
Secure encryption	AES128

**Table 4. RF performance parameters**

Specifications	Description
Receiving sensitivity	-140dBm @SF12/BW 125KHz
RF power	24dBm (250mW) (Typical) @433MHz/470MHz/510MHz/868MHz/915MHz/923MHz;

**Table 5. Level of protection against lightning**

Port	Test item 1	Test item 2	Test item 3	Conclusion
RF1、RF2	Surge 1.2/50µS-8/20µs	Common mode to ground	8KV 2Ω ±5T	Pass
4G	ESD	Contact	8KV	Pass
		Air	15KV	Pass
WIFI	ESD	Contact	8KV	Pass
		Air	15KV	Pass
Power	Surge 1.2/ (50µS-8/20)µs	Common mode to ground	6KV 2Ω ±5T	Pass
	Surge 8/20µs	Differential mode to ground	10KA 0.5Ω ±5T	Pass
		Differential module positive to negative Common mode 12V to PE	10KA 0.5Ω ±5T	Pass



**Table 5. GPS antenna specification**

Specifications	Description
<b>Electrical Specifications</b>	
Freq Range	1575.42±1MHZ
VSWR	≤2.0
Impedance	50 Ω
Polarization	Right-handed polarization
LNA Specification	Level I and II
LNA Gain(Without cable)	38dB
Noise Figure	≤1.5dB
DC Voltage	3.0±0.3VDC ; 5.0±0.5VDC 3.3±0.3VDC
DC current	≤20mA
Interference suppression	20dB(f0±140MHz)
<b>Mechanical Specifications</b>	
Dimension	60* φ 85 mm
Weight	0.18kg
Connector	N-Male
Housing	White
<b>Environmental specifications</b>	
Working Temp	-40°C~+85°C
Storage Temp	-40°C~+90°C
Vibration Sine sweep	1g(0-p) 10~50~10Hz each ax
Waterproof IP 66 M	GB 4208-84, Seal,Prevent water seepage













**Table 7. LoRa antenna specification**

Specifications	Description	
<b>Electrical Specifications</b>		
Freq Range	433/470/868/915/923MHz	
Gain	2.5±1dBi	
Horizontal Beam width	360°	
Vertical Beam width	55±3°	55±3°
VSWR	≤1.5	
Impedance	50Ω	
Polarization	Vertical polarization	
Power(max)	100W	
Connector	N-J	
Lightning Protection	DC contact with the ground	
<b>Mechanical Specifications</b>		
Dimension	Φ16*160 mm	
Weight	0.3kg	
Rated Wind Velocity	36.9 m/s	
Operational Humidity	< 95%	
Operating temperature	-40~55°C	
Radome material	FRP material	

## Technical Support

Please contact LoRun gateway technicians should you have more questions.

Table 8. Packing list

Serial number	Picture	Name	Quantity (PCS)	Remarks
1		main engine	1	
2		GPS antenna	1	
3		GPS feeder	1	
4		4G/WiFi Antenna	1or2	Standard: 1 Selection: 2
5		LoRa Omnidirectional Antenna	1or2	Standard: 1 Selection: 2
6		RF feeder	1	
7		Wall bracket	1	
8		N -type Connector	2	
9		Gateway fixed bracket	1	
10		Antenna fixed bracket	1	
11		Product manual	1	
12		Certificate of qualification, warranty card	1	

**This manual is subject to updating without prior notice**