

X27

RTK Smart Antenna

Data sheet



Table of Contents

1. Product Introduction	4
2. Product Features	4
3. Performance Metrics	4
4. Main Functions	7
5. Indicator LED	8
6. External Interfaces	9
7. Product Dimensions	11
8. Product Pictures	11
9. Packing List	12
10. Troubleshooting	13
11. Same Series Comparison	14

Revision History

Version	Date	Modified by	Modified Contents
V1.0	2025-12-12	Chenxian	Initial Version

1. Product Introduction

The X27 is a high-precision intelligent device specifically designed for autonomous driving scenarios. It integrates multiple core functions such as GNSS high-precision positioning, integrated navigation, 4G, Bluetooth, Wi-Fi, TF card data storage, SIM card slot, CAN interface, RS232, RS485 fault detection, and buzzer alerts. Equipped with a small-capacity built-in battery and a buzzer, it can accurately perform fault detection and status indication. Five LED lights provide intuitive feedback on positioning, communication, power, and other working status. Supporting DC 9-36V wide voltage input and equipped with a 10-pin aviation connector harness, it allows flexible reading of TF card data through an electronic switch, meeting diverse hardware integration requirements.

This product is primarily suitable for autonomous driving control systems.

2. Product Features

4G Cat.1	Full Frequency RTK Positioning
Bluetooth	Wi-Fi
CAN	Remote Firmware Upgrade
IMU Navigation	Attitude Data Output
Built-in TF Card Slot	Rover/ Base Station

3. Performance Metrics

Category	Attributes	Description
Main Features	4G Frequency Bands	Global (Check with our sales before placing order)
	Supported Operators	Global (Check with our sales before placing order)
	Communication Modes	TCP、UDP
	Bluetooth	Support BLE 5.2

	Bluetooth Transmission Distance	30 m
	Wi-Fi	Customizable according to customer requirements
	Wi-Fi Transmission Distance	Customizable
Electrical Characteristics	Operating Voltage	9V ~ 36V
	Operating Current	≤200mA @ DC12V
	Built-in Backup Battery	380 mAh @ 3.7V
Environmental Characteristics	Operating Temperature	-20°C ~ +75°C
	Storage Temperature	-40°C ~ +75°C
	Operating Humidity	10% ~ 85%RH, non-condensing
Mechanical Characteristics	IP Rating	IP67
	Device Dimensions	128×128×50.5mm
	Device Weight	295g
	Material	ASA
IMU	Gyroscope	Range: ±125/s
		Bias Repeatability: 0.5/s
		Bias Instability: 5/h
		Angle Random Walk: 0.12/sqrt(h)
	Accelerometer	Range: ±2g
		Bias Repeatability: 20mg
		Bias Instability: 50ug
		Velocity Random Walk: 0.07m/s/sqrt(h)

GNSS	Constellations & Frequency Bands	GPS: L1C/A,L2P,L2C,L5,L1C
		BDS-2: B1I, B2I, B3I
		BDS-3: B1I, B1C, B2a, B2b, B3I
		Galileo: E1, E5b, E5a, E5 AltBoC, E6c
		QZSS: L1C/A, L2C, L5, L1C
		SBAS: L1C/A, L5
		IRNSS*: L5
	Single Point Positioning Accuracy	≤1.5m
	RTK Positioning Accuracy	2.5cm ± 1ppm
	Velocity Accuracy	≤0.02m/s
	Heading Accuracy	0.2/1m baseline
	Auxiliary Dead Reckoning (Error)	3%d (d is the distance traveled)
	Time To First Fix (TTFF)	Cold Start ≤30sec
		Hot Start ≤15sec
	Sensitivity	Tracking: -155 dBm
		Acquisition: -140 dBm
	Update Rate	1 ~ 10Hz (default 1Hz)
	Baud Rate	115200~460800 bps (default 115200 bps)
	Data Format	NMEA 0183
	Differential Data	RTCM 3.3/3.2/3.1/3.0

Others	Explosion-Proof Certification	Can cooperate with customers for explosion-proof certification
--------	-------------------------------	--

4.Main Functions

Category	Function	Description	Status
Main Functions	RTK Positioning	This product supports the NTRIP protocol, achieving high-precision RTK positioning at centimeter-level accuracy by receiving differential signals from a base station.	✓
	JT/T808	Support protocol JT/T 808 - 2013	✓
	SMS Configuration	supports remote adjustment of device working parameters via SMS, allowing users to easily configure the device without connecting to a platform.	✓
	Serial Port Configuration	supports adjusting device working parameters via the external aviation connector interface, providing a more flexible control method.	✓
	JT/T808 Platform Configuration	supports adjusting device working parameters via the JT/T808 platform. Note: This feature requires platform support.	✓
	Rover Mode	In rover mode, the serial port outputs NMEA data.	✓
	Remote Upgrade	supports remote firmware upgrades.	✓
	Bluetooth Configuration	supports connecting to the device via mobile phone Bluetooth to easily adjust device working parameters. Simple and convenient operation.	—
	Base Station Mode	In base station mode, the serial port outputs RTCM data.	—
	Attitude Output	supports sending heading and pitch angle data to a specified platform via JT/T808.	—
	Wi-Fi	supports connecting to the device's Wi-Fi via mobile phone, allowing convenient control and adjustment of device parameters.	—
	TF Card	The TF card is used for storing device operation logs.	—
(Status: ✓ implemented — reserved)			

5.Indicator LED



Indicator LED

No.	Indicator	Color	Definition	LED Display	Status
1	Positioning	Green	No Data / No Antenna Connected	OFF	✓
			No positioning	Flashes every 2s	✓
			Positioning	Flashes every 1s	✓
			RTCM Data Received	flashes 2 times per 1s	✓
			Float	flashes 5 times per 1s	✓
			Fixed	Steady On	✓
2	Communication	Blue	No SIM Card Detected	OFF	✓
			Searching Network / SIM Card Overdue	Steady ON	✓
			Network Registered Successfully	Flashes once every 1s	✓
			Server Connect Successful	Flashes 5 times every 1s	✓
4	Power	Red	External Power Off	OFF	✓
			Power On, Program Running Normally	ON	✓
5	Bluetooth-WIFI	Blue	Bluetooth Not Connected	OFF	✓
			Bluetooth Connected, Idle State	ON	✓

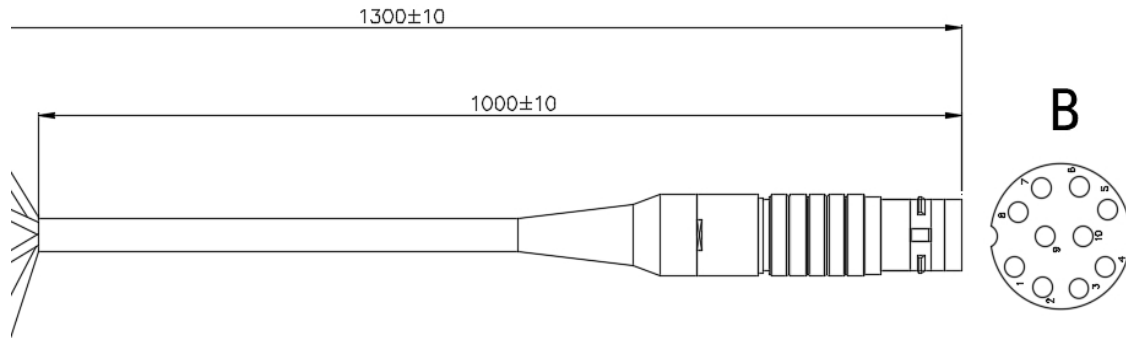
			Sent 1 Complete Protocol Packet	Flashes once	✓
			Correctly Received 1 Complete Protocol Packet	Flashes 3 times	✓
(Status: ✓implemented —reserved)					

6.External Interfaces



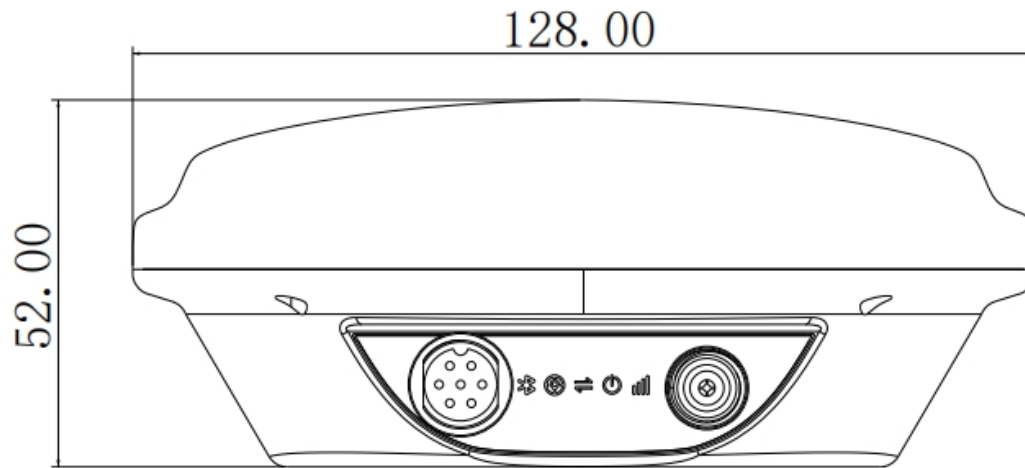
No.	Interface Definition	Function	Status
1	SIM Card Slot	SIM Card Communication	
2	TF Card Slot	Local Data Storage	—
3	Aviation Connector	Data Transmission (Pinout definition in Table 1)	✓
4	Auxiliary Antenna Port	Auxiliary Antenna Connector (TNC Female)	✓
(Status: ✓implemented —reserved)			

Figure 1: Aviation Connector Harness (Bare Wire)

**Table1: Aviation Connector Pinout Definition**

No.	Color	Function	Status
1	Red	Power Input (DC9-36V)	✓
2	Black	GND	✓
3	Blue	MCU RX (RS232 Level, 9600bps)	✓
4	Green	MCU TX (RS232 Level, 9600bps)	✓
5	Yellow	GNSS TX (RS232Level, 115200bps)	✓
6	Orange	GNSS RX (RS232Level, 115200bps)	✓
7	Purple	BOOT0 (Firmware Upgrade Mode Control)	✓
8	Brown	Reserved	—
9	Grey	Reserved	—
10	White	Reserved	—
(Status: ✓implemented —reserved)			

7.Product Dimensions



8.Product Pictures



Front View



Rear View



Top View



Bottom View

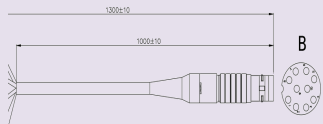
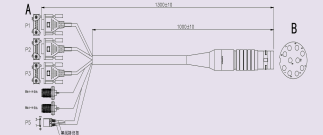


Side View



Third Angle View

9.Packing List

No.	Name	Quantity	Unit	Remark	Pic
1	X27 Terminal	1	unit	Standard	
2	Aviation Connector Harness (Bare Wire)	1	pcs	Standard	
3	Aviation Connector Harness to DB9 (One-to-Three Splitter)	1	pcs	optional	
4	RS232 to USB Cable	1	pcs	optional	
5	SMA to TNC Antenna Cable (5 meters)	1	pcs	optional	
6	Mushroom Antenna with Magnetic Base	1	unit	optional	

10. Troubleshooting

Fault Phenomenon	Possible Causes	Solution
Platform Offline	SIM card service suspended due to unpaid bills	Contact network operator for payment
	Poor SIM card contact	Reinstall SIM card
	Incorrect online parameter settings	Refer to section 11.4 for configuration
	SIM card locked	Contact network operator to unlock the SIM card
	Device in basement/tunnel/weak signal area	Move to an area with better signal
	Changing devices may cause SIM card lock	Contact network operator to unlock the SIM card
Unable to Position	Device installed indoors/by window/in parking lot	Move to an open outdoor area
	Antenna not installed/antenna surface not facing up	Adjust antenna placement
Unable to Get Fixed Solution	SIM card service suspended due to unpaid bills	Contact network operator for payment
	Poor SIM card contact	Reinstall SIM card
	Incorrect RTK account settings	Refer to section 11.3 for configuration
	Incorrect RTK mount point configuration	Use the default WGS84 coordinate system mount point

11. Same Series Comparison

Model No.	Positioning Solution	Function Description
X11	Full Constellation, Full Frequency	Default Version
X11P	Full Constellation, Full Frequency	Support PPP
X27	Full Constellation, Full Frequency	Supports Attitude, IMU