

Geodetic GNSS Receiver

R26 User Manual



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User Notice

1. Before using this product, please read all the user information provided with the product carefully to understand the use method and precautions of this product.
2. During the outdoor installation of the geodesic GNSS receiver, the R26 receiver and related accessories should be properly waterproofed for a long time. The GNSS antenna must be placed in an outdoor open air environment during use or testing.
3. Care should be taken to avoid the product falling on the ground or being strongly impacted by other objects.
4. Do not disassemble or install the antenna or plug or unplug the serial cable and other connecting cables after the battery power is turned on.
5. Please connect your device strictly according to the requirements in the manual.
6. When installing the antenna outdoors, the user should take appropriate lightning protection measures to prevent lightning strikes.
7. If the equipment is damaged due to force majeure (lightning strike, high voltage, collision), it does not belong to the scope of our company's free maintenance.
8. Please do not disassemble the casing of this product by yourself, otherwise the warranty will be voided

Foreword

Welcome to the geodetic GNSS receiver. This manual mainly describes how to use the geodetic GNSS receiver in detail.

Technical Support:

From the date of purchasing Shanghai Allynnav Technology Co.,Ltd. products, users will enjoy the technical services and upgrade policies provided by Shanghai Allynnav Technology Co.,Ltd. for a long time.

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User suggestion:

Regarding the deficiencies in this manual, please send an email to support@allynav.cn, we will serve you wholeheartedly.

Company Profile

Shanghai Allynnav Technology Co.,Ltd. is a high-tech enterprise integrating R&D, production, sales and service. Based on Beidou satellite navigation, it expands Beidou industry applications and is committed to providing customers with all-round and multi-field Beidou high-precision navigation and positioning. system solution.

Shanghai Allynnav Technology Co.,Ltd. follows the development trend of the world's four major satellite navigation systems, comprehensively deploys high-precision industry application promotion, and fully meets the differentiated application needs of different industries.Product applications cover precision agriculture, intelligent transportation, mechanical control, deformation monitoring, geographic information, Surveying and mapping engineering and many other high-precision fields.

The company's main core personnel have won the national provincial and ministerial level scientific and technological progress awards many times, and have more than 10 years of experience in product development, industry application, product promotion and technical services in the satellite navigation industry. The main products and services cover high-precision GNSS boards, high-precision Beidou/GNSS receivers, wireless data transmission equipment, integrated navigation products, deformation monitoring systems, automatic driving systems, intelligent navigation, variable control and other products, and provide solutions and related products. Software custom development applications, etc.

1.Product Description

Shanghai Allynnav Technology Co.,Ltd. is a high-precision RTK product mainly used in precision agriculture, construction machinery industry, RTK measurement industry to receive satellite signals and determine ground space position . The device consists of a large-capacity battery, inertial navigation module, GNSS antenna, satellite positioning module, Bluetooth, radio module, and storage module. It adopts radio communication to realize differential data forwarding to the board for differential calculation to obtain accurate positioning and orientation information. The Bluetooth module and the Android measurement software realize the connection between the mobile terminal and the all-in-one computer, and complete the relevant parameter configuration work.

The geodetic GNSS receiver can be used as RTK mobile station or RTK base station; high precision, low power consumption, small size, easy to carry and operate. It can meet the positioning needs of various industries, such as mechanical control, surveying and mapping engineering, precision agriculture, geographic information, water surveying, engineering surveying, mine surveying, aerial photography, drones, etc.

Technical advantages:

- (1) Small size and high integration, the system can integrate large-capacity battery, inertial navigation module, GNSS antenna, satellite positioning module, Bluetooth, radio module, storage module;
- (2) High precision and low power consumption, using Beidou, GPS, GLONASS, Galileo and other four-system multi-frequency systems to ensure positioning accuracy in a variety of complex environments;
- (3) Standard DC12V charging voltage, with positive and negative polarity reverse protection function;
- (4) Connect to the network via bluetooth, built-in compatible 2.0 and 4.0 bluetooth module, the measurement software can realize CORS connection, measurement stakeout and other functions;
- (5) Standard inertial navigation module, fast calibration, realizes inertial navigation RTK function, used for tilt measurement, etc.;

- (6) The base station and the mobile station can be interchanged, and the equipment can be used as both a base station and a mobile station for surveying and mapping;
- (7) Built-in 8G large-capacity memory card, which can store important job data in real time;

2. Technical Parameter

Signal Tracking:

BDS: B1I , B2I , B3I , B1C*/B2a* (* is optional)

GPS: L1 , L2 , L5

GLONASS: L1 , L2

Galileo : E1 , E5a , E5b

QZSS: L1 , L2 , L5

Accuracy Index:

Stand-alone Positioning (RMS):

Plane: 1.5m

Elevation: 2.5m

DGPS positioning maximum allowable error (RMS):

Plane: 0.4m

Elevation: 0.8m

RTK maximum allowable error (RMS):

Horizontal: ($\pm 8 \text{ mm} + 1 \text{ ppm}$) RMS

Elevation: ($\pm 15 \text{ mm} + 1 \text{ ppm}$) RMS

Static maximum allowable error:

Flat: ($\pm 2.5\text{mm}+0.5\text{ppm}$) RMS

Elevation: ($\pm 5\text{mm}+0.5\text{ppm}$) RMS

Maximum allowable error of speed measurement (RMS): 0.03 m/s

Signal Tracking :

Cold start time: <45s

Hot start time: <30s

Recapture: <1s

Physical Properties

Working temperature: -20°C ~ +60°C

Storage temperature: -25°C ~ +60°C

Physical size: 136mm X136mmX147mm

Weight: 1.16kg

Shock and Vibration: 2m drop resistance

Indication: 4 LED power indicator

Buttons: 2 buttons

Electrical Parameters

Power consumption: $\leq 4.0\text{W}/10.5\text{W}$

Endurance time (lab environment): $\leq 21\text{h}/11.5\text{h}$

voltage : DC 9-36 V

Battery capacity : 9900mAh

Storage capacity : 8G

Data Interface:

Data output: NMEA-0183, RTCM

Data refresh rate: default 1 Hz, up to 20 Hz

Baud rate: 9600 ~ 460800

Interface mode: 1 9-pin aerial plug connector, 1 radio antenna TNC connector

Configuration List

R26 Radio Deluxe Edition				
name	model	quantity	unit	Remark
R26 receiver	Radio inertial navigation version	1	Single	
12V power adapter	12V / 3A	1	Single	
Rod antenna	QT450GT	1	piece	
Nine core aerial plug download setting line	Short	1	piece	
DC to nine-pin charging cable		1	piece	
Handbook (including charger)	LP80	1	Single	
Handbook bracket		1	Single	
Altimeter		1	Single	
Extension rod	Carbon Fiber	1	piece	
RTK instrument case (with lining)	350*240*115	1	Single	

3. Appearance introduction

3.1 Appearance of R26 product



3.2 R26 function indication

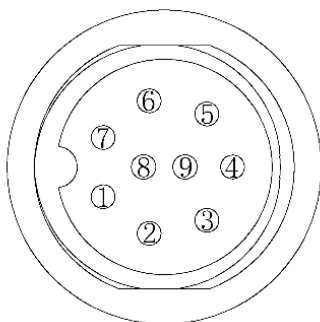
3.2.1 Interface function

R26 receiver interface

Contains a nine-core aerial plug and a TNC interface.

The definition of the connector is as follows:

POW/COM: used for receiver charging and data exchange between the board and the receiver backplane;



3.2.2 Panel function



R26 receiver panel indicator unit

Contains four indicators and two buttons.



Indicator light:

POW Power Indicator	<p>Press and hold the power button for 2 seconds to turn on the power. After turning on the power, the 4 lights flash once, and then the POW light is always on, which means the boot is successful.</p> <p>Press and hold the power button for 2 seconds to shut down. When shutting down, the 4 lights flash once, and then the indicator light goes out, which means the shutdown is successful.</p>
SA satellite indicator	<p>RTK is fixed, SA light is always on, otherwise it is off</p>
LINK Radio data link indicator light	<p>Flashes once every 1 second when transmitting and receiving differential data, otherwise off</p>
STO memory card indicator	<p>Press the static record button for 5 seconds, the first 10 seconds are always on, and the next 1 second flashes once</p>



: switch button



: Static mode toggle button

4. Working Mode Configuration Instructions

R26 baseboard firmware R2X M_V1.0.5 presets 6 working modes and 2 control states.

LS-GNSS-R2X M_V1.0.6 (firmware version)
ID:R26 (device model)
PN: 312605801090767 (device PN code)
SN:1121112088 (device SN code)
COM1 38400bps (external CONFIG debug port baud rate)
COM2 115200bps (internal GNSS port baud rate)
COM3 115200bps (internal IMU port baud rate)
COM4 38400bps (internal radio port baud rate)
COM5 115200bps (internal bluetooth port baud rate)
MODE 6 (current working mode)
REC 0 (current recorder status)
DTON 1 (current differential link status)
CTRL 1 (current control state)
2022/06/20 11:27:15 (date time)

Operating mode:

A0 ——Debug mode: In this mode, the built-in inertial navigation, radio, and mainboard can be configured through the CONFIG port.

A1 —— Rover mode

A2 ——Radio mobile station mode: You can switch the working channel of the radio station through the plus and minus buttons

A3 ——Base station mode / CORS mobile station mode //Need to open the base station or open the mobile station through the software of Surveying and Mapping

A4 ——Inclination (Inertial Navigation) measurement mode

A5 ——Static observation mode: The baud rate of COM port and CONFIG port will automatically become 460800

A6 ——Default mode: restore factory default parameter configuration

Control Mode:

CTRL0 : Valid in MODE5 mode, the user can customize the static record statement in this state

CTRL1 : Valid in MODE5 mode, only the default static record statement can be loaded in this state

5.Parameter configuration and firmware upgrade

5.1 Parameter configuration

Motherboard:

Built-in UM482 board, which can be configured through the instructions of the UM4B0 board. Factory default baud rate: COM1 38400/COM2 115200/COM3 115200

Bottom plate:

It can be configured separately by commands common to the chassis and commands for each module.

COM1 external debug port

COM2 internal UART connection GNSS board C OM2

COM3 internal UART connection inertial navigation

COM4 internal UART connection radio

COM5 internal UART connection bluetooth

6. Precautions for use

1. The receiver GNSS antenna must be installed in an outdoor open air environment (to avoid blocking), otherwise the device will not work properly.

2. The power supply voltage of the receiver must be 7~35VDC.

3. The cables of the receiver must be firmly connected, and no virtual connection is allowed. Otherwise, the normal operation of the system will be affected.

4. Precautions for electromagnetic environment, GNSS equipment may be interfered by other radio equipment, such as wireless bridges, wireless

Line routing, cameras, walkie-talkies, car alarms, cell phone signal jammers, etc. may interfere with GNSS signals and electricity.

If the signal of the station is used, the electromagnetic environment needs to be considered in the working area.

5. When configuring the receiver, please ensure that the power supply and positioning of the receiver are normal.

6. Please complete the cable connection related to the receiver before powering on.

7. The equipment needs to take waterproof, dustproof and lightning protection measures when working.

7. After-sales service

From the date of purchasing Lianshi's products, users will enjoy the technical services and upgrade policies provided by Shanghai Allynnav Technology Co.,Ltd. for a long time.

Company technical service hotline: 021-61200180

Complaint hotline: 021-61200180

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The company's website is: <http://www.allynnav.cn>, users can also learn about the latest developments of Lianshi's software, download the latest versions of related products and related technical information on the website.

8. FCC Statement

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

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

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

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

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.