LR700A Integrated GNSS Receiver Product Manual

GNSS Products

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Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

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About the Document

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Contents

Table Index

Figure Index

1 Introduction

The LR700A is a multi-system, multi-frequency, integrated GNSS receiver featuring low-power consumption and an all-in-one design. It supports deployment as a base station for applications in lawn mowers, agricultural machinery, and related fields.

1.1. Key Features

1. **All-in-one Design**: Combines GNSS module, cellular module, Zigbee module, Wi-Fi module, and integrated GNSS/cellular/Wi-Fi antennas.
2. **Industrial Ruggedness**: Shock-resistant, impact-proof, drop-resistant, lightning-protected, UV-resistant, and rated IP67 for dust/water ingress protection.
3. **Rapid Deployment**: Simplified installation process minimizes wiring errors and enhances stability.
4. **Ultra-Low Power Consumption**: Typical operational power consumption: ≤ 2.1W.
5. **End-to-Cloud Service**: Enables remote configuration, diagnostics, and troubleshooting, reducing field maintenance.

1.2. Physical Appearance

The integrated GNSS receiver includes:

- One RJ45 Ethernet port
- One TNC connector
- One 7-pin LEMO connector
- One Nano-SIM card slot
- Three LED status indicators

Figure 1: LR700A Integrated GNSS Receiver (Front View)

Figure 2: LR700A Integrated GNSS Receiver (Bottom View)

1.3. Technical Specifications

Table 1: Technical Specifications

Category		Specification	
GNSS	Supported Systems/Frequencies	GPS	L1 C/A, L2C, L5
		GLONASS	L1, L2
		Galileo	E1, E5a, E5b, E6
		BDS	B1I, B1C, B2a, B2b, B2I, B3I
		QZSS	L1 C/A, L2C, L5, L6
		NavIC	L5
MEMS	Accelerometer	Range	±2000mg
		Resolution	1mg
	Inclinometer	Range	±90°
		Resolution	0.01°
Wireless Communication	Cellular	LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28/66 LTE-TDD: B34/38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM/EDGE: B2/3/5/8	
	Wi-Fi	≤ 10 m range	
	Zigbee	≤ 400 m range	
Wired Communication	RJ45	HTTPS, NTRIP, Web UI	
	RS485	Modbus protocol support	
	RS232	NMEA 0183, RTCM 3.x protocols support	
Storage		16 GiB	
Electrical Characteristics	Power Input	DC 9–36 V (Typical: 12 V)	
	Typical Power Consumption	≤ 2.1 W	
Interfaces	LEDs	Red (Power), Blue (Satellite), Orange (Signal)	

Category		Specification
	SIM Slot	Nano-SIM
	Connectors	LEMO (Power/RS232/RS485), TNC (Zigbee antenna), RJ45
Cable	Length	Default 2 m (Length can be customized)
Physical	Dimensions	Ø220 × 149 mm
	Weight	2.1 kg
Environmental Adaptability	Operating Temperature	-40 ºC to +85 ºC
	Humidity	0 – 95 % RH
	ESD Protection	Contact discharge: ±8 kV, air discharge: ±15 kV
	Protection Rating	IP67
Power Adapter		12V/3A
Mounting Bracket		90° wall-mountable

1.4. LED Indicator Lights

- Red (Power): Steady ON during normal operation.
- Blue (Satellite):
  Satellite lock: Flashes N times every 3 s (0.4 s interval, N = satellite count), then turns off for 2 s.
  No signal: Flashes once every 5 s.
- Orange (Signal):
  IoT platform connected: Steady ON.
  Connection failed: OFF.

2 Remote Management

Multiple device management methods are provided:

- Cellular-Based Management: When cellular functionality is enabled, the device automatically connects to the IoT platform upon startup.
- Wi-Fi-Based Management: When Wi-Fi functionality is enabled, users can connect to the device's Wi-Fi hotspot.

2.1. Cellular-Based Management (IoT Platform)

Users can manage connected integrated GNSS receiver via the IoT monitoring platform. This platform enhances digital operational efficiency by providing centralized device management capabilities.

Access Method:

1. Use a PC browser to navigate to: https://eueam.acceleronix.io.
2. Enter account credentials to login.

IoT Platform Introduction:

- Dashboard: Visualizes aggregated device data and geographical distribution.
- Device Management:
  View real-time device status.
  Issue control commands (e.g., configure operational modes).
- Organization Management: Administer internal accounts and permissions.

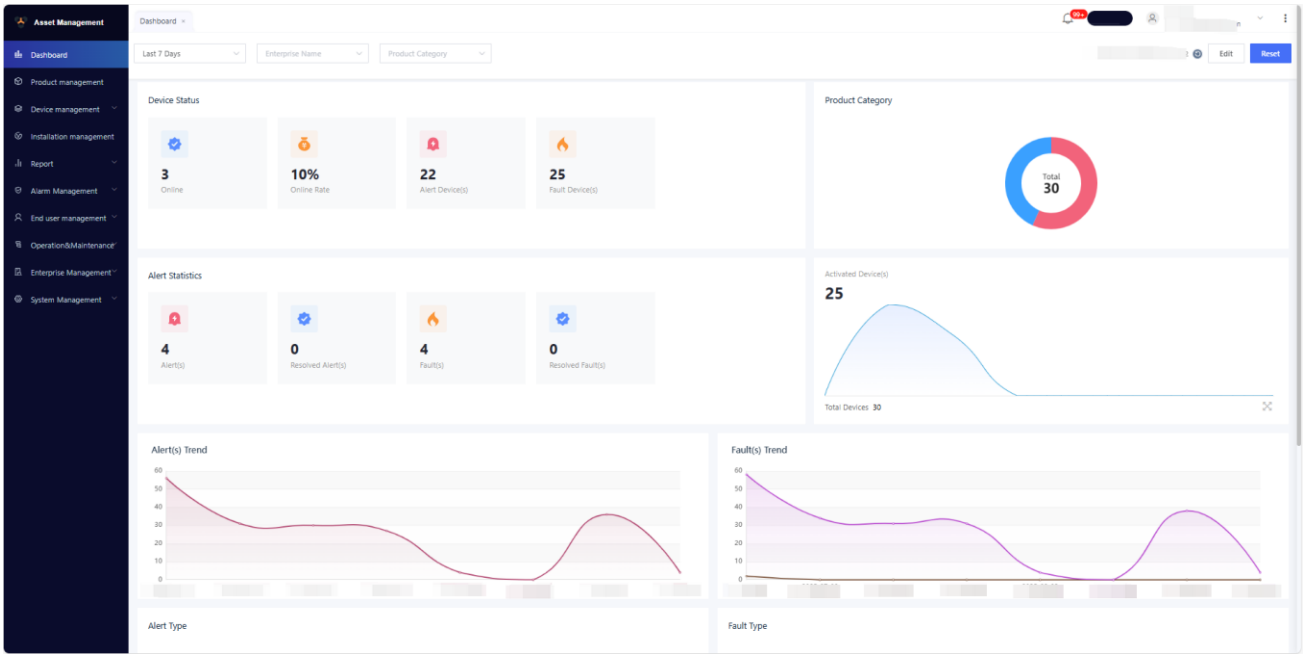

Figure 3: Dashboard

2.2. Wi-Fi-Based Management (Web UI)

Users can connect to the device's Wi-Fi hotspot for local management.

Access Method:

1. Connect to the device's Wi-Fi network.
2. Open a browser and enter:192.168.1.1.
3. Authenticate with credentials.

Web UI Introduction:

- Device Status: Displays real-time operational metrics (e.g., signal strength, satellite count).
- Configuration: Parameter adjustments (e.g., communication settings).
- Diagnostics: Perform network diagnostics and hardware self-tests.
- Firmware Management: Over-the-air (OTA) updates.

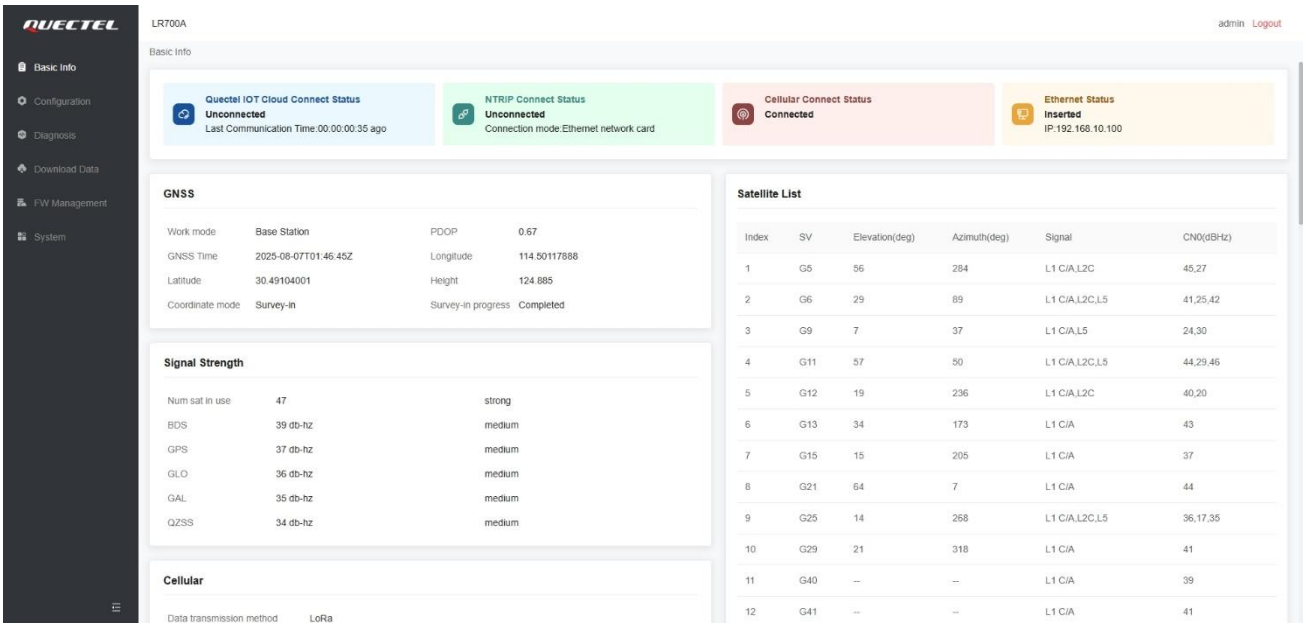

Figure 4: Web UI

3 Field Installation Guide

3.1. Site Selection Criteria

- Stability: Install on geodetically stable ground (minimal deformation risk).
- GNSS Visibility: Open sky view; avoid obstructions.
- Cellular Signal: Ensure stable data transmission.
- EMI Mitigation: Distance from power stations/strong RF sources.
- Multipath Avoidance: Reflective surfaces (e.g., buildings, water) > 50 m away.
- Solar Power (if used): Solar panel facing true south; maximize daily sun exposure.

3.2. Installation Procedure

Refer to *LR700A Integrated GNSS Receiver Installation & Commissioning Guide*.

4 Troubleshooting

Table 2: Troubleshooting

No.	Fault	Troubleshooting
1	All LEDs are off	Verify power supply (9–36 V DC); check cable continuity.
2	Blue LED flashes once every 5 s	Ensure clear sky view; relocate if obstructions exist.
3	Orange LED is off	Confirm Nano-SIM activation (data plan required); validate cellular coverage.

5 Appendix Reference

Table 3: Terms and Abbreviations

Abbreviation	Description
BDS	BeiDou Navigation Satellite System
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
Galileo	Galileo Satellite Navigation System (EU)
GLONASS	Global Navigation Satellite System (Russia)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSM/EDGE	Global System for Mobile Communications Enhanced Data Rates for GSM Evolution
HTTPS	HyperText Transfer Protocol Secure
IoT	Internet of Things
LED	Light Emitting Diode
LTE-FDD	Long Term Evolution Frequency Division Duplex
LTE-TDD	Long Term Evolution Time Division Duplex
MEMS	Micro-Electro-Mechanical System
NavIC	Navigation with Indian Constellation
NTRIP	Networked Transport of RTCM via Internet Protocol
QZSS	Quasi-Zenith Satellite System
RH	Relative Humidity

Abbreviation	Description
RTCM	Radio Technical Commission for Maritime Services
RTK	Real-Time Kinematic
SIM	Subscriber Identity Module
WCDMA	Wideband Code Division Multiple Access
Web UI	Website User Interface