QLM290P (03)

Smart antenna device with RTK, LoRa and LTE functions

Product overview

The QLM290P (03) is a quad-band, multi-constellation smart antenna device with RTK, GNSS, LoRa and LTE functions. It integrates Quectel's high-precision LG290P (03), LoRa and global-version LTE modules, plus a high-performance full-band GNSS antenna.

Receiving signals from global and regional GNSS constellations including GPS, GLONASS, Galileo, BDS, NavIC, QZSS and SBAS, the LG290P (03) features multi-mode quad-band RTK algorithms for fast, reliable high-precision positioning in challenging environments such as urban canyons and heavily-obstructed areas.

Acting as a rover station, QLM290P (03) uses its built-in LTE module to provide real-time, continuous centimeter-level positioning. For offline-coverage areas, the module enables deployment of short-range base and rover stations, supporting point-to-point short-range data transmission over the 863-928 MHz LoRa band.

It fits high-precision navigation applications: precision agriculture, mining, surveying and mapping, and assisted driving.



Multi-constellation System

Operating Temperature Range: -40 to +85 °C

High update rate

Quad-band

Key features

- Multi-GNSS constellation for GPS, GLONASS, Galileo, BDS, QZSS and NavIC
- Concurrent reception of L1, L2, L5 and E6 GNSS quad-band signals
- Integrated RTK positioning function ,LoRa and LTE communication function
- Integrated diplexer/SAW filters for enhanced anti-interference performance
- Support RS-422, RS-485, RS-232 or UART TTL interface
- Built-in high-performance GNSS full-frequency antenna

Version: 1.0.0
Status: Preliminary

GNSS features

Parameters	Specifications
Supported bands	GPS: L1 C/A, L1C*, L5, L2C GLONASS: L1, L2 Galileo: E1, E5a, E5b, E6 BDS: B1I, B1C, B2a, B2b, B2I, B3I NavIC: L5 QZSS: L1 C/A, L1C*, L5, L2C SBAS: L1
Default GNSS constellations	GPS + GLONASS + Galileo + BDS + QZSS + NavIC
Number of concurrent GNSS	5 + QZSS
SBAS	WAAS, EGNOS, BDSBAS, MSAS, GAGAN and SDCM
Horizontal position accuracy	Autonomous①: 0.7 m RTK②: 0.8 cm + 1 ppm
Vertical positioning accuracy	Autonomous①: 2.5 m RTK②: 1.5 cm + 1 ppm
Velocity accuracy③	0.03 m/s
Accuracy of 1PPS signal (1σ)③	5 ns
RTK convergence time②	5 s
TTFF (without AGNSS)③	Full cold start: 28 s Warm start: 28 s Hot start: 1.7 s
Update rate	Default: 10 Hz Maximum: 20 Hz

Modes & frequency bands

Parameters	Specifications
LTE-FDD	B1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/66
LTE-TDD	B34/38/39/40/41
GSM	B2/3/5/8

LoRa features

Parameters	Specifications
Chip	LLCC68
Band	863–928 MHz
Transmit power	20 dBm

Notes:
1. *: Under development/In progress.
2. ①: CEP 50%, 24 hours static, instrument configuration: L1 + L5, Galileo E1 + E5a, BDS B1I + B2a; -130 dBm.
3. ②: CEP 50%, with active high-precision antenna in an open-sky environment and within 1 km of the base station.
4. ③: Tested at room temperature, with typical operating voltage, and satellite signal of -130 dBm configured by the instrument.
5. ④: Tested with two external LNA with 18.5 dB gain and 0.85 dB noise figure (During the sensitivity test of tracking, ensure that there are no less than 12 satellites for GPS L1 and L5, 10 satellites for BDS B1I and B2a, and 10 satellites for Galileo E1 and E5a).

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Hardware specifications

Parameters		Specifications
Dimensions		ϕ120 mm
Weight		Approx. 220 g
Temperature range	Operating temperature	-40 °C to +85 °C
	Storage temperature	-40 °C to +95 °C
Interfaces	RS-422 (optional)	× 1 Default: 460800 bps
	RS-422 (optional)	× 1 Default: 460800 bps
	RS-422 (optional)	× 1 Default: 460800 bps
	UART TTL (optional)	× 1 Default: 460800 bps
Antenna type		Active integrated antenna: 70 mm × 70 mm

Software specifications

Parameters	Specifications
Protocols	NMEA 0183/RTCM 3.x

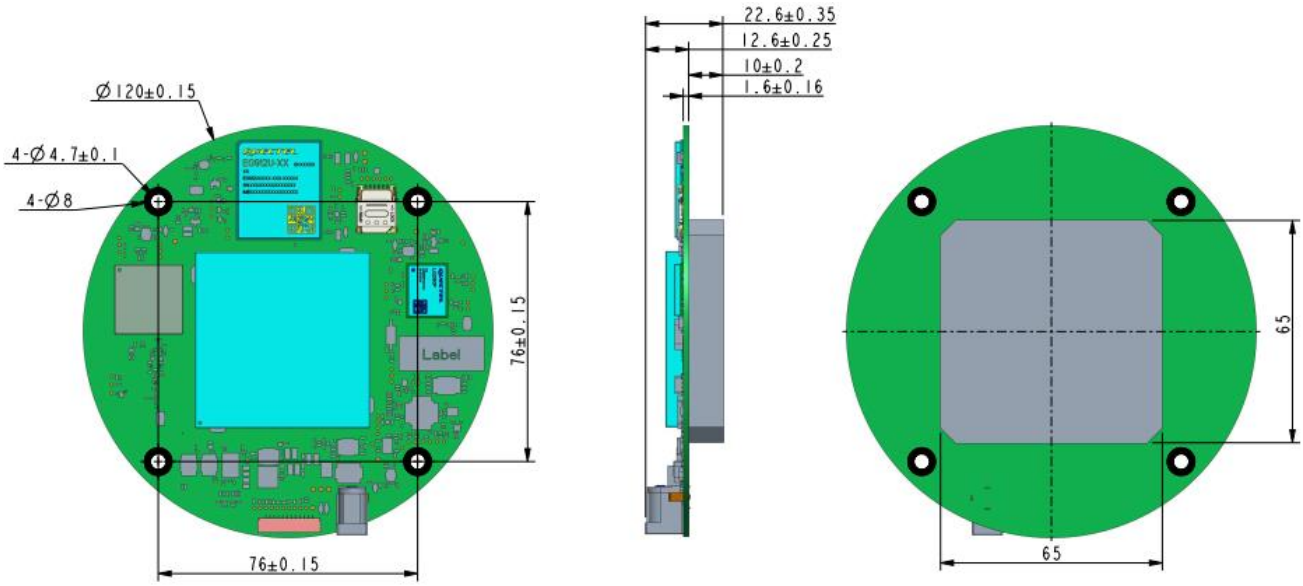
Electrical characteristics

Parameters	Specifications
Supply voltage range	4.8–36 V, typ.: 5 V
Power consumption (@ Default GNSS constellations, 5 V)	TBD

Notes:
TBD: To be determined..

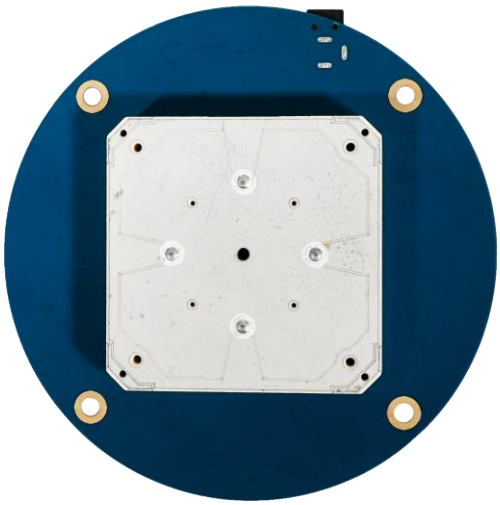
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Size & appearance



Unlabeled tolerance: +/-0.2mm





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