

GR-U01, u-blox M10-based

Concurrent 4 GNSS

Smart Antenna

Overview

GR-U01 is an easy to use, low power, industrial grade GNSS smart antenna with exceptional sensitivity and acquisition time for all L1 GNSS signals.

GR-U01 is able to concurrently track 4 GNSS (GPS, Galileo, GLONASS, Beidou), QZSS and SBAS. Thanks to this capability, maximum number of satellites are visible and thus maximum position availability and better accuracy even in typical GPS difficult environments. Especially, this plug and play smart antenna is achieved in a small and compact dimension.

Interfaces such as USB/TTL/RS232 are available. MOQ-based customization are welcome.

Applications

- FCC AFC for Wi-Fi 6E AP
- Navigation (autos, trucks, trains, boats, etc.)
- ELD (Electronic Logging Device)
- Speeding (trace analysis)
- Tracking (person, assets, trucks, trains, boats etc.)
- Timing (precise clock, FEMTO cell, traffic lights etc.)

Features

- Powered by u-blox M10 chip
- Concurrent tracking of multi-satellite navigation systems
 - GPS/GALILEO/GLONASS/BEIDOU/QZSS
 - SBAS (WAAS, EGNOS, MSAS, GAGAN)
- Augmentation support:



- SBAS (WAAS, EGNOS, MSAS, GAGAN),
- QZSS (L1S SLAS, Sub-meter Level Augmentation Service)
- Higher update rate option (default 1Hz), up to
 - 5 Hz for GPS+GAL+GLO+BDS B1C
 - 8 Hz for GPS+GAL+BDS B1C
 - 5 Hz for GPS+GAL+BDS B1I
 - 7 Hz for GPS+GAL+GLO
 - 10 Hz for GPS+GAL
 - 18 Hz for GPS only
- Sensitivity
 - Acquisition: -148dBm (GPS + others)
 - Tracking: -167dBm (GPS + others)
- Anti-jamming, RF interference and jamming detection and reporting
- Anti-spoofing, Spoofing detection and reporting
- Low power: 16mA at continuous tracking
- Electrical interface support: USB, RS232, TTL
- Connector: PS2, Microfit, RJ45, DB9, USB etc.
- Cable length: 0.1m ~ 15m.
- Power supply options: 12V/24V
- Backup battery support for faster position fix
- LED for position fix indication
- IPX7 Waterproof
- Built-in magnet
- Compatible with GPSD PPS support
- Linux/Android support
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85°C

Technical Specifications

Receiver Performance Data⁺

Receiver Type	u-blox M10 engine GPS, SBAS: L1 C/A: 1575.42MHz, QZSS: L1 C/A, L1S: 1575.42MHz Galileo: E1-B/C: 1575.42MHz, GLONASS: L1OF:1598.0625~1605.375MHz BeiDou (or BD): B1I: 1561.098 MHz B1C: 1575.42 MHz SBAS:WAAS,EGNOS,MSAS, GAGAN
Horizontal Position Accuracy	1.5m, including SBAS & QZSS; (CEP, 50% 24hr static, -130dBm, >6 SVs for each GNSS)
Velocity Accuracy	0.05 m/s (speed) <0.3° (heading) (50%@30m/s)
Time Pulse Signal Accuracy	30ns (RMS), <60ns (99%) 0.5ms for PPS over USB
Time Pulse Frequency	Default 1 Hz, Configurable: 0.25 Hz ~ 10 MHz
Time To First Fix	Autonomous, (50% -130dBm) Hot start Cold start 1 s 28 s: GPS+GAL 23s: GPS+GAL+GLO 27s: GPS+GAL+BDS B1I (default) 28s: GPS+GAL+BDS B1C 23s: GPS+GAL+GLO+BDS B1C
Sensitivity (Autonomous)	GPS+GAL or +more -148dBm (acquisition) -167dBm (tracking)
Max. Navigation.	5 Hz for GPS+GAL+GLO+BDS B1C 8 Hz for GPS+GAL+BDS B1C

Update Rate	5 Hz for GPS+GAL+BDS B1I 7 Hz for GPS+GAL+GLO 10 Hz for GPS+GAL 18 Hz for GPS only Default 1Hz
Max. Altitude	80,000 m
Max. Velocity	< 500m/sec (1,800 km/hr)
Protocol Support	UART: N,8,1; bauds 4800, 9600 19200, 38400 (default),, 57600, 115200, 230400, 460800, 921600bps; NMEA 0183 v2.1, v2.3, v4.0, v4.10 and v4.11 (default) GGA, GLL, GSA, GSV, RMC, VTG, TXT
Augmentation Support	SBAS: WAAS, EGNOS, MSAS, GAGAN QZSS
Dynamics	<4g

⁺: according to GNSS IC spec

Electrical Data

Power Supply	3.3 ~ 5.5 VDC
Power Consumption Acquisition/Tracking	(29 GNSS SVs fixed for tracking) USB: 59/56 mA RS232: 22/19 mA TTL: 19/16 mA
Protocols	NMEA, u-blox proprietary

Environmental Data

Operating temperature	-40 ~ 85°C except battery: -20~60°C
Storage temperature	-40 ~ 85°C except battery: -20~60°C
Operating humidity	5% ~ 95% non-condensing
Waterproof	IP67

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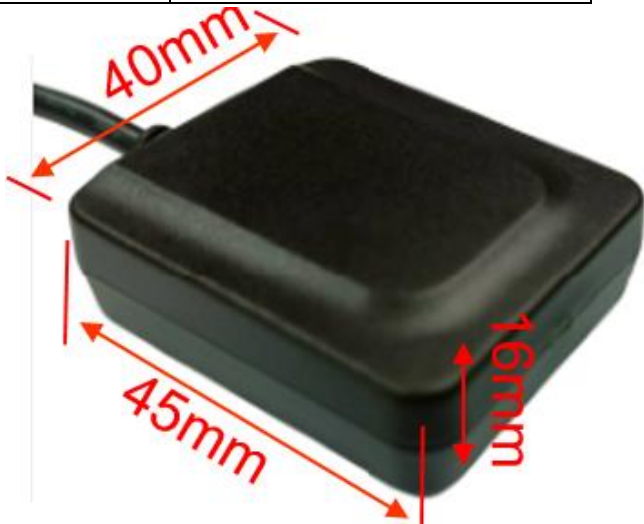
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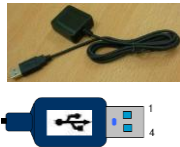
Technical support: service@navisys.com.tw

Other Data

Cable Length	1.5m for GR-U01U 3m for GR-U01R <1m for GR-U01T
Dimension	40 x 45 x 16 (mm)
Weight	93.3 g, 4-pin Nano-Fit, 4m, RS232



Interfaces

GR-U01 T/R/P	GR-U01U/W
	
Mini-Din 6-pin PS/2 Male Plug	USB type A, Male Plug

GR-U01C

USB type C, Male Plug

	GR-U01T	GR-U01R	GR-U01P	GR-U01U/W
1	GND	GND	GND	VDD 5V
2	VCC	VCC	VCC	D-
3	TXD-TTL	TX-RS232	TX-RS232	D+
4	RXD-TTL	RX-RS232	RX-RS232	GND
5	1PPS-TTL	1PPS-RS232 ⁵	1PPS-TTL	-
6	PWR_CTRL	PWR_CTRL	PWR_CTRL	-

GR-U01C			
A1	GND	B1	GND
A4	VBUS	B4	VBUS
A5	CC	B5	-
A6	D+	B6	-
A7	D-	B7	-
A9	VBUS	B9	VBUS
A12	GND	B12	GND

§: Please be noted that the RS232 line transceiver would introduce 0.3us pulse skew to the PPS signal of RS232 model.

The GR-U01W makes PPS events visible to a compatible USB host system; they appear as DCD state changes to the PL2303 driver. Time precision will be limited by the USB polling interval, usually 0.5millisecond

Ordering Information

GR-U01X, X=T, R, P, U, C, W, etc.

T	TTL; mini-din 6-pin male connector
R/P	RS232; mini-din 6-pin male connector R: 1PPS is RS232 level P: 1PPS is TTL level
U	Prolific USB; type A connector
C	Prolific USB; type C connector; Support OTG
W	Prolific USB, PPS connected to DDC; type A connector

* MOQ-based customizations are welcome.

* For non-standard demand (12V/24V power supply, connector, cable length, baud rate etc.), please specify them when ordering.

*This document is subject to change without notice.