

MX500 All-in-One GNSS Receiver Card

GNSS Receiver + LoRa Comm + 2 x Antennas

Highlights

- ✧ Integrated GNSS module and LoRa module together
- ✧ GNSS antenna and LoRa antenna All-in-One
- ✧ GNSS receiver supports all GNSS system
- ✧ Full frequency band (including BDS-3)
- ✧ Enhanced with anti-spoofing and anti-interference by RAIM
- ✧ Data communication coverage from 100m to 3Km
- ✧ Extra I/O port for external IMU, LIDAR and odometer
- ✧ Compact and Low-powered



Introduction

The MX500 All-in-One GNSS receiver card integrated with GNSS receiver module with antenna and the LoRa communication module with antenna all together, that cater for outdoor auto robot that requires precise positioning assistance, such as auto lawnmower. The GNSS receiver supports all GNSS system, full-frequency band; and empowered with new generation REAL (RANSAC Enhanced Advanced Location) positioning engine; thus, delivering continuous, reliable and high precise positioning, velocity and timing.

The RANSAC (Random Sample Consensus) based RAIM (Receiver Autonomous Integrity Monitoring) algorithm is integrated for the observation anomalies caused by multipath and interference in urban environments. It enhances anti-interference and anti-spoofing capability, and achieving more stable positioning results. With the RTK (Real-time Kinematic) measurement technology, the positioning result with centimeter level accuracy.

Low power consumption LoRa module with 915MHz ISM band, great frequency penetration provides coverage distance with 100m up to 3Km range for data communication that transport RTK differential data from LoRa station to receiver.



MX500 All-in-One GNSS Card Specification

Item	Specification	
GNSS Receiver	Channel	1500
	GPS	L1C/A, L1C*, L2, L5
	GLONASS	G1, G2
	BDS-2	B1I, B2I, B3I
	BDS-3	B1I, B1C*, B2a, B2b*, B3I
	Galileo	E1, E5a, E5b, E6*
	QZSS	L1C/A, L1C, L2, L5, L6 (CLAS*)
	IRNSS	L5
*Extension frequency, corresponding firmware is needed for upgrade		
Horizontal Accuracy (RMS)	Single point	1.5 m
	RTK	1 cm + 1 ppm
Vertical Accuracy (RMS)	Single point	2.5 m
	RTK	1.5 cm + 1 ppm
Speed Accuracy		0.03 m/s
Timing Accuracy		≤ 20 ns
Time to First Fix (TTFF)	Cold start	≤ 30 s
	Hot start	≤ 5 s
	RTK Initialize	≤ 5 s
Data Rate	GNSS measurement	10 Hz
	RTK position	10 Hz
Communication Port	UART	× 3
	PPS	× 1
	Event	× 1
	I2C	× 1
	RTK_STAT/LNA_EN	× 1
GNSS Antenna	GPS	L1 / L2 / L5
	GLONASS	G1 / G2 / G3
	BDS	B1 / B2 / B3 / B1C / B2a / B2b
	Galileo	E1 / E5a / E5b / E6
	QZSS	L-Band
	IRNSS	L1 / L5
	Polarization	RHCP
	Axial Ratio	≤ 3 dB
	V.S.W.R.	≤ 2.0
	Peak Gain	≥ 5 dBic
	Impedance	50 Ω
	Phase Center Error	± 2 mm
	Horizontal coverage angle	360°
	Connector	MMCX
GNSS LNA	Gain	20 ± 2 dB
	Noise Figure	≤ 2 dB
	Passband flatness	± 2 dB
	Supply Voltage	3 ~ 16 VDC
	Current Consumption	≤ 45 mA
	Impedance	50 Ω
	V.S.W.R.	≤ 2.0
	Differential transmission delay	≤ 5 nS
LoRa Antenna	Frequency	902 ~ 928 MHz
	Polarization	Linear
	Gain	≥ 0.5 dBi
	Impedance	50 Ω
	V.S.W.R.	≤ 2.0
	Connector	IPEX
Environmental	Operating Temperature	-40 ~ +85 °C
	Storage temperature	-55 ~ +85 °C
	Humidity (Non condense)	95%
Physical	Dimension	Φ122 x 27.6 mm