

X5 Multi-band GNSS Receiver

Precise PPK, RTK and NTRIP solution with centimeter accuracy



With just a few seconds of setup, the X5 GNSS Receiver is one of the fastest ways to take centimeter-grade measurements. By connecting your phone to the X5 over Bluetooth® or WiFi, you can setup and operate the X5 GNSS Receiver. The X5 GNSS Receiver works with common GIS software including SW Maps, SurvPC, Field Genius, and any GIS software that supports NMEA over Bluetooth.



This device can be used in three modes:

- GNSS Positioning also known as 'Rover'
- GNSS Positioning with RTK (10 mm accuracy) also known as 'Rover with RTK Fix'
- GNSS Positioning with NTRIP (10 mm accuracy) receives streaming correction data from a NTRIP caster to apply as real-time corrections to a GNSS receiver.
- GNSS Base Station

1. SPECIFICATIONS

Mechanical	• Dimensions: 138 x 138 x 85 mm • Weight: 650g • Operation temperature: -40 to 85 °C • Enclosed Design IP67 - Protected from limited dust ingress and water spray
Electrical	• Input voltage: 4.75 - 5.5 V • Internal antenna DC bias: 3.3 V • Peak current consumption: 2500 mA • Average current consumption: 500 mA • Current limit on USB OTG: 2000 mA • LiPo 6Ah with fast 1A charging • More than 15h autonomous work in base mode • More than 20h autonomous work in rover mode



Radio RTK	• LoRa Spread Spectrum • Global license-free ISM 433MHz band • Air rate: 19.2 kbps • Transmission power: 30 dBm • Antenna gain: 4dbi • Max distance: 10 km	
Connectivity	• Wi-Fi 2.4 GHz 802.11b/g/n • Bluetooth V4.2 BR/EDR	
Data	• Position output NMEA, RXM (for RINEX) • Data logging UBX file with events • Internal storage compatible up to 64 GB	
GNSS	• Concurrent reception of GPS, GLONASS, Galileo and BeiDou • Receives both L1C/A and L2C bands • 184-channel U-Blox engine • Signal tracked GPS/QZSS L1 C/A, L2 GLONASS L1OF, L2 BeiDou B1I, B2I Galileo E1-B/C, E5b • Number of channels 184 • Update rate up to 10 Hz GNSS • Time to First Fix: 25s (cold), 2s (hot) • Max Altitude: 50km (31 miles) • Max Velocity: 500m/s (1118mph) • Horizontal Position Accuracy: 10mm with RTK	
Host	• Dual-core 32-bit LX6 microprocessor • Up to 240MHz clock frequency • 16 MB of flash storage • 520 kB internal SRAM • Integrated 802.11 b/g/n WiFi transceiver • Integrated dual-mode Bluetooth® (classic and BLE) • Hardware accelerated encryption (AES, SHA2, ECC, RSA-4096)	
Antenna	Constellations	GPS, BEIDOU, GLONASS, GALILEO
	Nominal frequency	GPS: L1C/A, L1C, L2P, L2C, L5 BDS-2: B1I, B2I, B3I BDS-3: B1I, B3I, B1C, B2a, B2b GLONASS: G1, G2, G3



		Galileo: E1, E5b, E5a, E5 AltBoC, E6c QZSS: L1C/A, L2C, L5, L1C SBAS: L1C/A
	Frequency Range	1165-1278/1559-1612MHz
	V.S.W.R	≤ 2
	Phase center (mm)	<2 mm
	Impedence	50 Ω
	Polarization	RHCP
Antenna LNA	LNA Gain	38 $\pm$ 2dB
	V.S.W.R	<2
	Noise Figure	<1.0
	DC Voltage	3.3~18V
	Current	25~40 mA
Antenna Environmental conditions	Working Temp	-40°C~+85°C, 10%~95% RH
	Storage Temp	-55°C~+100°C, 10%~95% RH
	Vibrations	Sine sweep @1.5mmAM 10~55Hz Each Axis

2. PORTS DESCRIPTION

Micro-USB C	● Powering the device ● Charging battery ● Flashing and programming firmware ● Debugging
Antenna Connector	● SMA connector for 433MHz LoRa antenna



Push Button	Mode Selector In ROVER or BASE Mode • Pushing less than 1 second: Device asserts timemark • Pushing 2 seconds: device enters configuration mode • Pushing 5 seconds: device change working Mode Rover/Base In Configuration Mode • Push: Device returns to the BASE or ROVER Mode
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3. LEDS DESCRIPTION

NET	WiFi & Bluetooth • Blinking: Bluetooth waiting for connection • Solid: Bluetooth connected • Fading: WiFi Enabled
RF	LoRa Radio Rx/Tx • Blinking: Transmitting or receiving data
BASE	Logging indicator while in ROVER Mode • 1 blink every 5 seconds: logging data to SD card Fixed Position indicator while in BASE Mode • Blinking: Device is set to Base Mode and a survey is being conducted • Solid: survey is complete and the unit begins broadcasting RTCM correction data.
TM	Timemark • Solid while button is being pushed
BAT	Battery Level Indicator • Blue: 80 – 100% • Green: 20 – 80% • Red: 0 – 20%



SAT	Pulse per second (PPS) Blinking at 1Hz: GNSS fix is achieved. The receiver has detected enough satellites to obtain a rough location.
RTK	RTCM data Reception - Off: no RTCM correction data is received. - Blinking: RTK Float is achieved. - Solid: RTK Fix is achieved.

4. WORKING MODES

Rover Mode	Bluetooth is enabled under the name of X5 Receiver Rover-XXXX where “XXXX” represents the device’s MAC
	It can be used with the SW Maps App when the device outputs NMEA messages. Max. recommended rate is 5Hz to avoid Bluetooth data collisions.
	For PPK it is required to output RXM and TIM2 messages. Use “Logging defaults for RINEX” in Configuration Mode.
	Correct Data logging to the SD card starts when the logging and PPS Indicator blink. They both are required for correct *.ubx data in order to get RINEX data after processing.
	If data logging was paused by entering Configuration Mode, it is resumed in this mode.
Base Mode	Bluetooth is not enabled in this mode
	RTK LED indicator will be always off
	Datalogging to SD card is enabled
Configuration Mode	During this mode, datalogging to the SD card is paused. In order to resume datalogging, push the mode selector button.
	WiFi is available under the name of “Metta-X5” and can be Connected by using the password “123456789”



	Can be used only with the Metta X5 App or accessing by using a web browser with the IP address http://192.168.4.1
	Update Firmware OTA available

5. METTA X5 APP

- The Metta X5 Receiver should be in configuration mode.
- Connect phone/tablet with device through WiFi using SSID and password.
- Open the “Metta X5” App (Only Android supported)
- The app will display this message if the phone is not connected to the Metta X5 device.



- The app will display this message if the phone is connected to the Metta X5 device.



Note: If the phone is connected to “Metta-X5” WiFi but the app displays not connected message, close and open the app or give the permissions needed.

- Click on the “Configure device” button.
- There are three sections: GNSS, Base and System Configuration.
- Click “Save Configuration” button in order to save all the modifications.
- Click “Exit and reset” to cancel modifications or to return to ROVER/BASE mode after save the configuration.

6. USING METTA X5 PPK WITH SW MAPS

- Select “Reset to Surveying Defaults” on the Metta X5 App - Message rates
- Put the device in ROVER mode
- First, pair the device in the Bluetooth Settings on your phone’s configuration.
- Open the SW Maps app and select “Bluetooth GNSS”
- Search the paired device and select it. Determinate the “instrument height” and choose “Generic NMEA” on “Instrument Model” and click “Connect”



- f. Select “Skyplot” or “GNSS Status” in the app in order to see the info from the device.

7. UPDATING METTA X5 FIRMWARE OTA

- a. Put the device into Configuration Mode
- b. You can use the app or PC accessing to the device using web navigator to <http://192.168.4.1>
- c. Select the *.bin file provided by Metta Technologies

Add Firmware: ⓘ

Seleccionar archivo

Sin archivos...leccionados

Upload

- d. Click on Upload and wait until Device Resets
- e. You can check the firmware version on the top of the configuration page.

