V

X5 STICK

GNSS RECEIVER

USER MANUAL

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INTRODUCTION

This manual contains instructions for configuring and operating the Mettatec X5 Stick GNSS receiver. It is recommended to read this manual to become familiar with the specific functions of the equipment, even if you have previous experience with other GNSS (Global Navigation Satellite System) devices.

For a general introduction to GNSS technology and Mettatec products, visit our website: www.mettatec.com.

OVERVIEW

The Mettatec X5 Stick GNSS receiver integrates into a compact and robust unit:

- Components: GNSS antenna and receiver, battery, and Bluetooth®, Wi-Fi and USB communication technologies. Wi-Fi and USB.
- Function: Works as a quick-setup RTK rover.
- Indicators: A single LED shows the status of operation, communication and charge level.
- Connectivity: Connects wirelessly via Bluetooth to your mobile device (phone or tablet).
- Software: Operates with MettaGo software for RTK measurements.
- Data Logging: Logs GNSS data on the linked mobile device for later email sending or USB transfer.

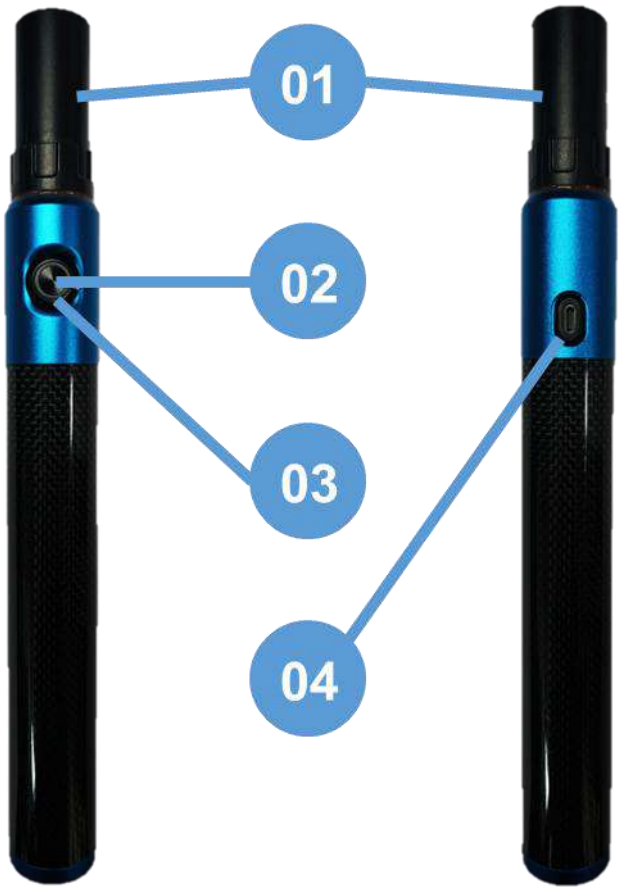
1. X5 STICK GNSS RECEIVER

MettaGo is the comprehensive solution to easily manage and configure your X5 receivers (X5R / X5RT / X5Mobile Pro / X5Stick), centralizing geodetic tools, equipment configurations, synchronization with MettaGo360, and technical documentation on a single platform.

1.1. CONTENT

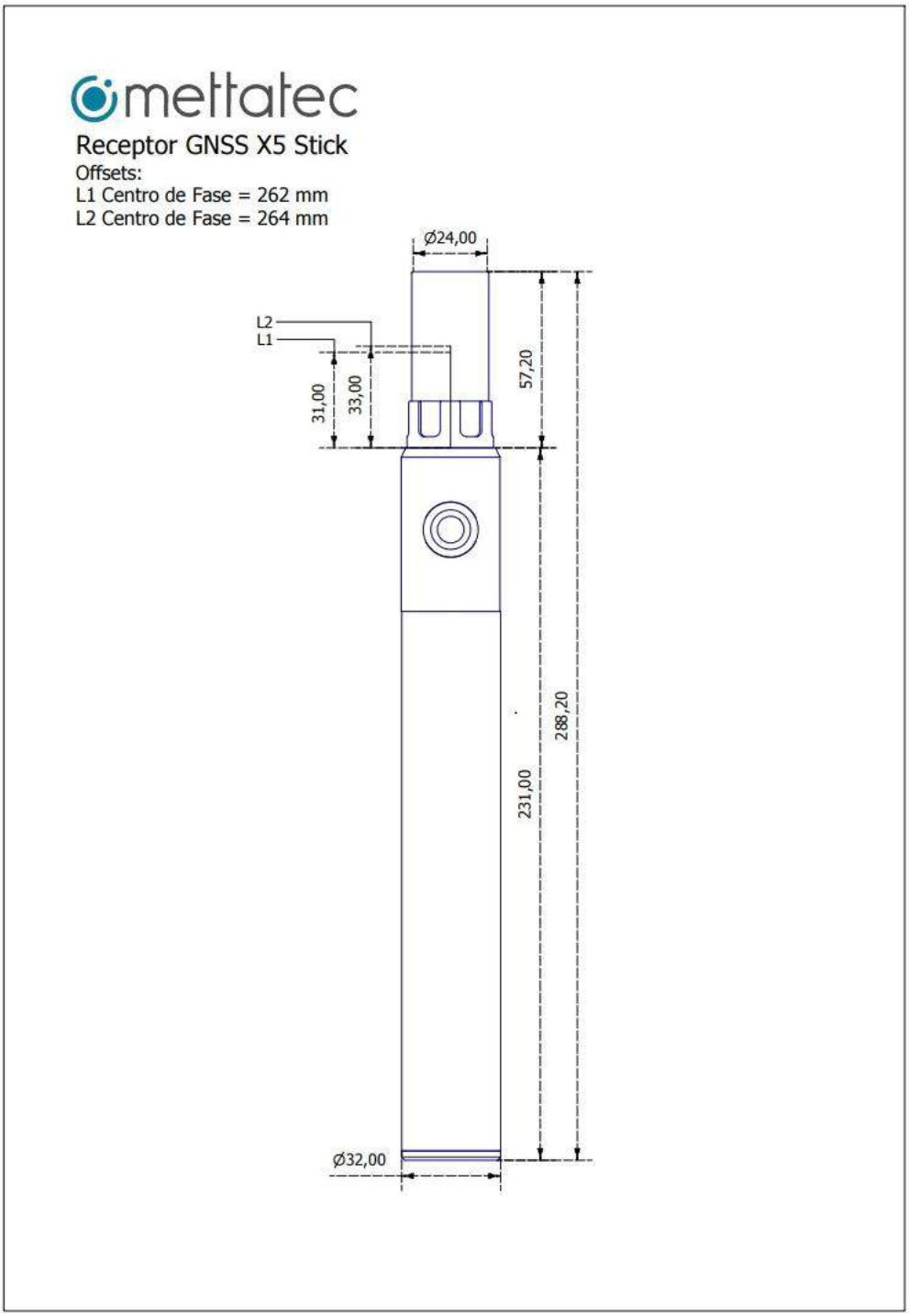
ITEM	CONTENT
01	X5 STICK GNSS RECEIVER
02	USB-C CABLE
03	ADAPTER
04	CASE

1.2. HARDWARE COMPONENTS AND FUNCTIONS



ITEM	COMPONENT	DESCRIPTION
01	GNSS ANTENNA	Allows the reception of multi-constellation GNSS messages for positioning.
02	BUTTON	Power on: Press 2-3 seconds until the LED lights up. Power off: Press 2-3 seconds until the LED turns off. Factory reset: Press 10 seconds or more until the LED lights up. Communication Mode : Press once and visualize the blinking of the LED to link an Android or iOS device.
03	LED	Allows interpreting the status, communication or charging. Status Mode: Blue LED in operation and Green LED in charging. Communication Mode: Blue LED and 1 blink every 1sec: Android Mode Blue LED and 2 blinks every 1sec: iOS Mode Solid Blue LED: Connected to an Android or iOS device Battery charge indicator: Flashing Green LED: 0 - 95% Permanent Green LED: 95 - 100%
04	USB C PORT	USB Mode: Updates the GNSS receiver firmware using the desktop software. Power Bank Mode : To power other devices.

1.3. ANTENNA DIAGRAM



Download of antex METX5STICK.atx file

X5 STICK GNSS receivers integrate the METX5STICK antenna. To ensure accuracy in post-processing, import the antenna model into the post-processing software.

⚠Not all software supports calibrated antennas. Verify compatibility with the GNSS software provider or manufacturer.

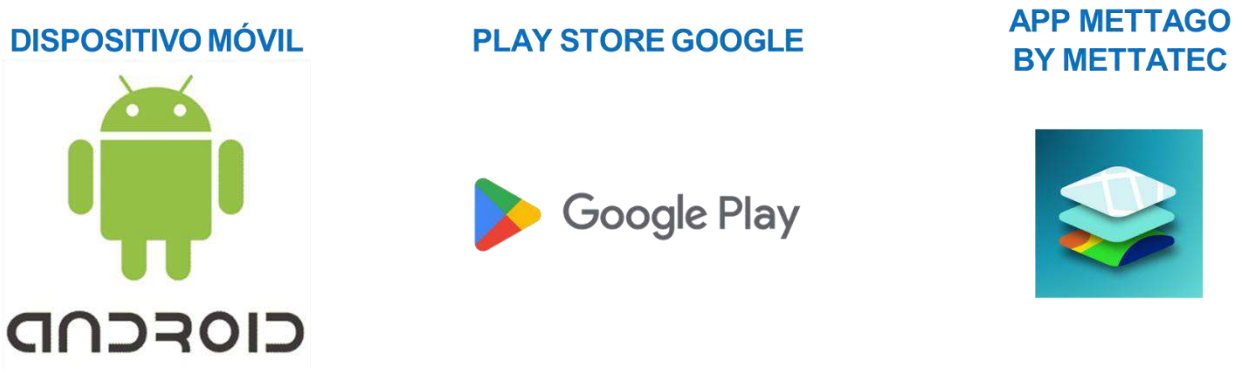
2. METTAGO FIELD SOFTWARE

MettaGo simplifies the management of your X5 Series devices by integrating all essential functions into a single application. From the initial configuration of your X5R, X5RT, X5MOBILE PRO or X5 STICK to the use of geodetic tools in the field, consulting documentation and exchanging data simultaneously with MettaGo 360, MettaGo offers you total control and efficient operation, all from a centralized location.

2.1. INSTALLATION AND ACCOUNT

2.1.1. DOWNLOAD AND INSTALLATION

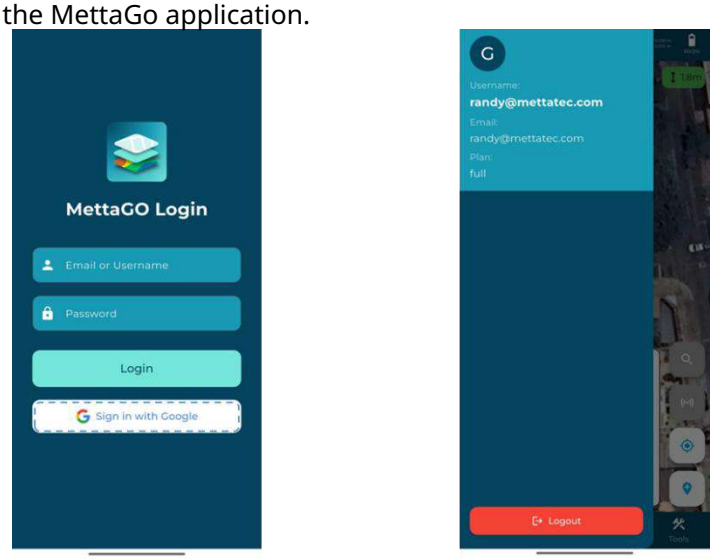
Download the MettaGo application from Mettatec from the Google Play Store. It is available for any Android smartphone or tablet.



- Open the Google Play Store on your Android device.
- Search for "MettaGo" or "MettaGo by Mettatec".
- Select the application and tap Install.

2.1.2. ACCOUNT LINKING

Link your Gmail account to the MettaGo application.



2.2. OPTIONS MENU

MettaGo organizes its functions into four main environments for intuitive operation:

Projects
Manages all your project information.

- o Project creation and management.
- o Coordinate system definition.
- o Point list and file management.
- o General information about the application.

Device
Centralizes linking and communication with your GNSS receivers.

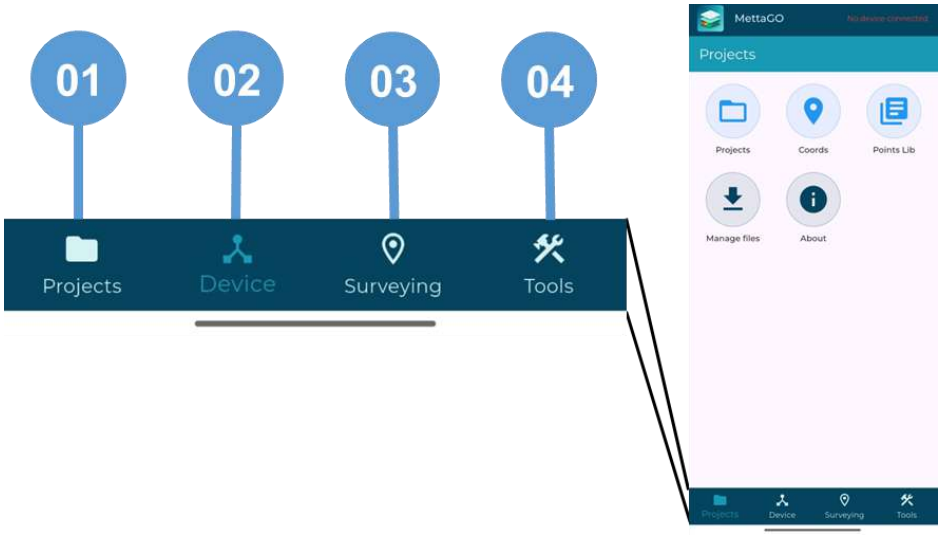
- o Connection of X5R, X5RT, X5MOBILE PRO and X5 STICK equipment.
- o Support for WiFi and Bluetooth connection modes.

Surveying
Contains all the necessary tools for data capture.

- o Positioning parameter configuration.
- o Verification and review of measured or imported points.
- o Base map selection.
- o Data collection in the field.

Tools
Access advanced utilities and complementary services.

- o Calculation of areas and perimeters (polyline, polygon).
- o Direct access to METTAGO 360 and METTA CLOUD.
- o Consultation of technical documentation of the receivers.



ITEM	COMPONENT	DESCRIPTION
01	PROJECTS	Manage your projects.
02	DEVICE	Manage your Mettatec GNSS receivers such as X5 Stick.
03	SURVEYING	Collect and stake out data with multi-map visualization.
04	TOOLS	Direct access to cloud solutions and documentation of our Mettatec GNSS receivers.

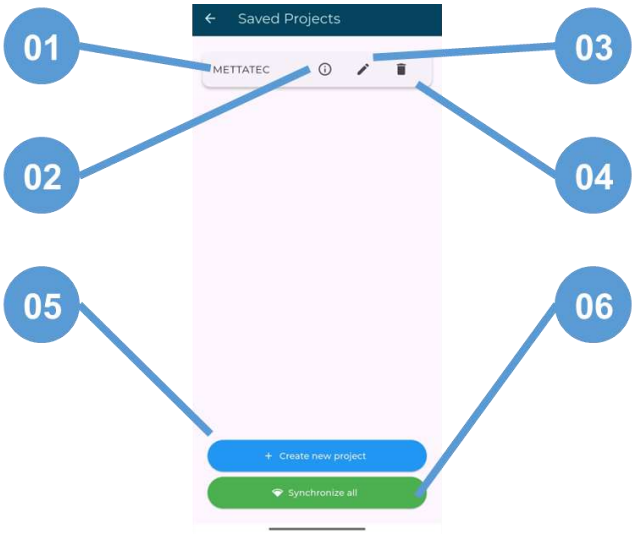
2.2.1. PROJECTS

Projects is the environment that allows you to manage projects (create, edit, delete, select or synchronize projects), select the coordinate system (horizontal and vertical coordinate system), view the list of points (delete, stake out or view polylines or polygons), manage files (import or export in CSV, KML or GeoJson formats) and identify the version of the installed application.

ITEM	COMPONENT	DESCRIPTION
01	APPLICATION	Name of the MettaGo application.
02	CONNECTION	Indicates the connection status (connected or disconnected to the GNSS receiver).
03	PROJECTS	Manages projects.
04	COORDS	Selects the horizontal and vertical coordinate systems.
05	POINTS LIB	Verifies the list of points.
06	MANAGE FILES	Imports or exports files.
07	ABOUT	MettaGo application information.

2.2.1.1. SAVED PROJECTS

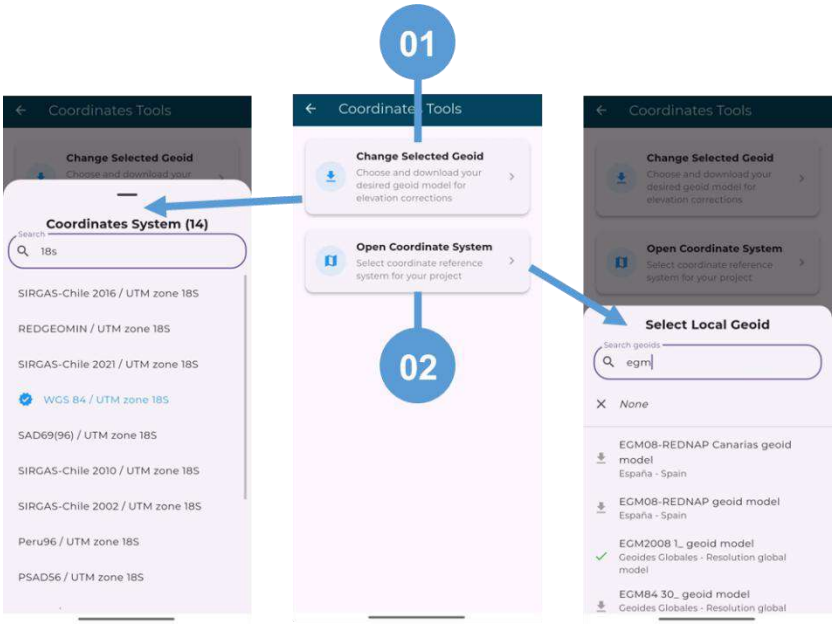
Manage and organize your jobs from this option:



ITEM	COMPONENT	DESCRIPTION
01	PROJECT	Project name. For example: METTATEC
02	INFORMATION	Summary information of the project.
03	EDIT PROJECT	Edit general project information.
04	DELETE PROJECT	Delete project.
05	CREATE NEW PROJECT	Create new project, define operator, description, and horizontal and vertical coordinate system.
06	SYNCHRONIZE ALL	Synchronize MettaGo360 projects with MettaGo

2.2.1.2. COORDINATES TOOLS

Configuration of reference systems for the project:



ITEM	COMPONENT	DESCRIPTION
01	CHANGE SELECTED GEOID	Search and select the geoid model to define the vertical coordinate system.
02	OPEN COORDINATE SYSTEM	Search and select the datum and/or projection to define the horizontal coordinate system.

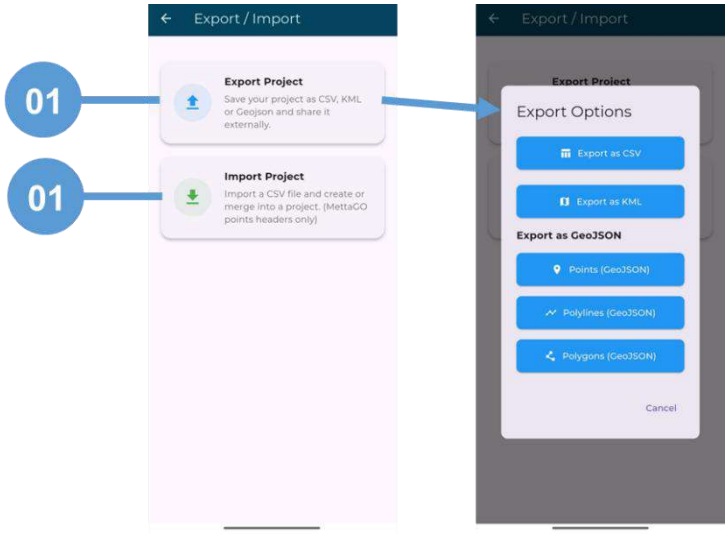
2.2.1.3. POINTS DATABASE

Management and consultation of points captured or imported into the project:

ITEM	COMPONENT	DESCRIPTION
01	DELETE	Deletes the selected point from the database.
02	STAKEOUT	Starts the stakeout process for the selected point.
03	VIEW GEOMETRIES	Displays polylines and polygons created with the tools of MettaGo.
04	FILTER BY CODE	Filters the list of points by specific code.
05	LIST OF POINTS	Displays and selects all points in the current project.
06	CHANGE OF PAGE	Navigate between pages to see all the points in the database.

2.2.1.4. EXPORT / IMPORT PROJECT

Exchange data between MettaGo and other software using standard formats:



ITEM	COMPONENT	DESCRIPTION
01	EXPORT PROJECT	Exports the complete project in standard formats: CSV, KML or GeoJSON.
02	IMPORT PROJECT	Imports points to the current project from files in CSV format.

2.2.1.5. ABOUT

See the technical details of the MettaGo installation:

ITEM	COMPONENT	DESCRIPTION
01	APP VERSION	Shows the name, icon, and current version of MettaGo
02	DATE OF VERSION	Developed by Mettatec on the indicated date. Check the latest version available in the Play Store.
03	TECHNICAL SUPPORT	Direct contact: phone, email and website for technical assistance

2.2.2. DEVICE

Connection and linking management with GNSS receivers:

ITEM	COMPONENT	DESCRIPTION
01	APPLICATION	Application name MettaGo.
02	CONNECTION	Indicates the connection status (connected or disconnected to the GNSS receiver).
03	DEVICE MANUFACTURER	Choose the GNSS manufacturer (Mettatec or other).
04	MODEL	Available models of the X5 Series (X5R, XR5T, X5 Mobile Pro and X5 Stick).
05	SELECT YOUR DEVICE	Select the GNSS receiver linked by Bluetooth. Identified with the Model and MAC. For example: X5 Stick 7BAA
06	UPDATE	Update list of linked and available receivers
07	BLUETOOTH	Automatic connection with the selected GNSS receiver
08	LINKED DEVICES	Shows GNSS receivers previously linked by Bluetooth
09	NEW DEVICES	Shows GNSS receivers available to link
10	WIFI MODE	Alternative connection with GNSS receiver via WiFi

2.2.2.1. VIA BLUETOOTH

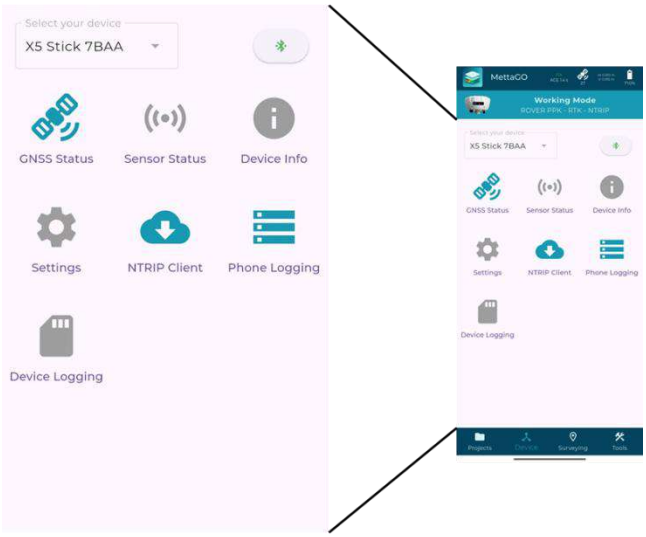
STATUS PANEL

Real-time monitoring of the connected GNSS receiver:

ITEM	COMPONENT	DESCRIPTION
01	APPLICATION	Application name MettaGo.
02	SOLUTION	Solution type: Fix : Maximum precision (centimetric). Requires RTK corrections of quality and has low RMS. Float : Intermediate precision (decimetric). Occurs with weak corrections or unfavorable satellite geometry. DGNSS : Submetric precision. Uses differential corrections of code, not carrier phase. Single : Metric precision. Autonomous positioning without external corrections.
03	SATELLITES	Number of satellites tracked in real time.
04	RMS	Current accuracy: Root mean square error of positioning current (Horizontal and Vertical).
05	BATTERY	Charge level (%) of the GNSS receiver.
06	DEVICE	Identifier image of the connected model
07	WORKING MODE	Current working method configured in the GNSS receiver.

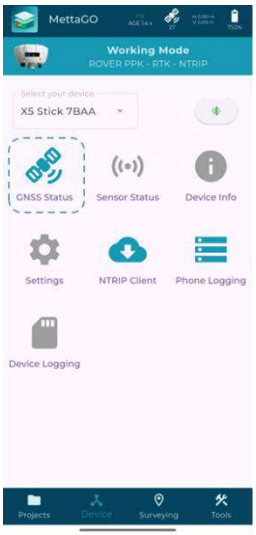
DEVICE PANEL

Configuration of the receiver connected via Bluetooth:

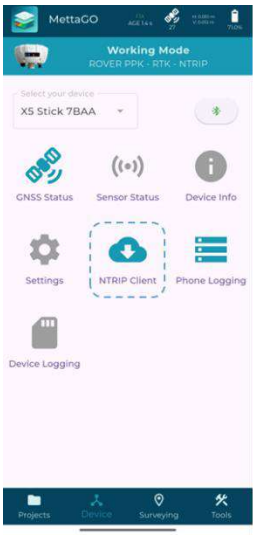


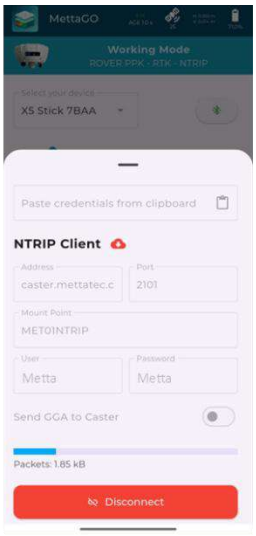
ITEM	COMPONENT	DESCRIPTION
01	SELECT YOUR DEVICE	GNSS receiver connected by bluetooth. For example: X5 Stick 7BAA
02	BLUETOOTH	Disconnect the GNSS receiver.
03	GNSS STATUS	Time, position, RMS, solution, DOP, SNR and plan view.
04	SENSOR STATUS	Not available for X5 Stick.
05	DEVICE INFO	Not available for X5 Stick.
06	SETTINGS	Not available for X5 Stick.
07	NTRIP CLIENT	Connection to RTK correction services via NTRIP
08	PHONE LOGGING	Recording of raw UBX data on the mobile device (available for X5 Stick)
09	DEVICE LOGGING	Not available for X5 Stick.

DEVICE – GNSS STATUS

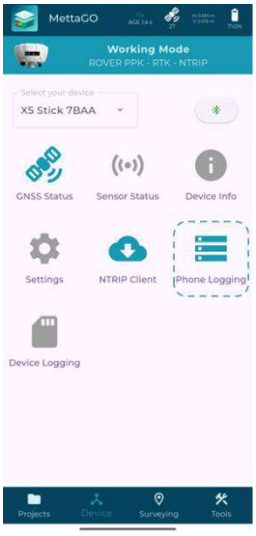


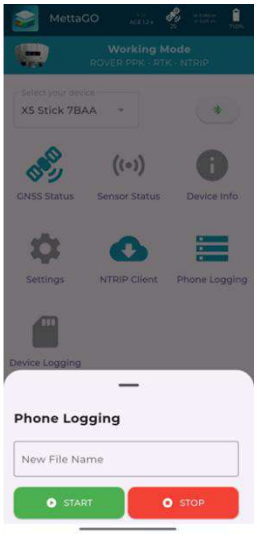
DEVICE – NTRIP CLIENT





DEVICE – PHONE LOGGING





2.2.3. SURVEYING

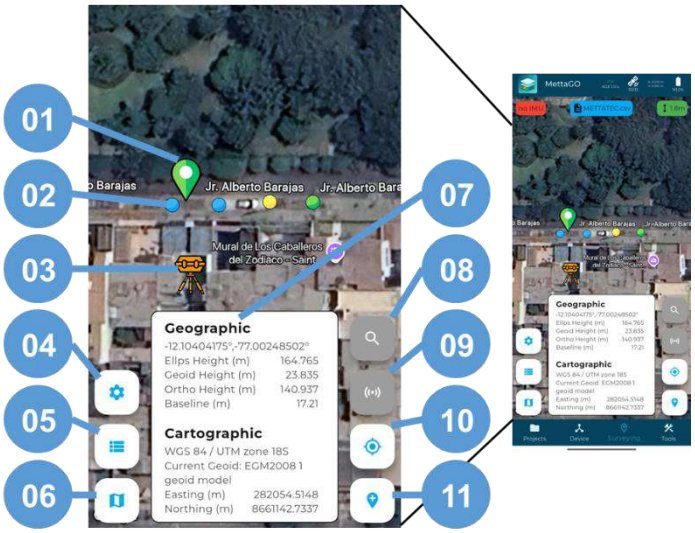
STATUS PANEL

Real-time monitoring of the connected GNSS receiver:

ITEM	COMPONENT	DESCRIPTION
01	APPLICATION	Application name MettaGo.
02	SOLUTION	Solution type: Fix : Maximum precision (centimetric). Requires quality RTK corrections and presents low RMS. Float : Intermediate precision (decimetric). Occurs with weak corrections or unfavorable satellite geometry. DGNSS : Intermediate precision (decimetric). Occurs with weak corrections or unfavorable satellite geometry. DGNSS : Submetric precision. Uses differential code corrections, not carrier phase. Single : Submetric precision. Uses differential code corrections, not carrier phase. Single : Metric precision. Autonomous positioning without external corrections. : Metric precision. Autonomous positioning without external corrections.
03	SATELLITES	Number of satellites tracked in real time.
04	RMS	Current precision: Root mean square error of the current positioning current (Horizontal and Vertical).
05	BATTERY	Charge level (%) of the GNSS receiver.
06	INCLINATION	Degrees of deviation from the vertical axis.
07	PROJECT	Project name. Example METTATEC.
08	ARP HEIGHT	Vertical height to the antenna reference point (ARP).

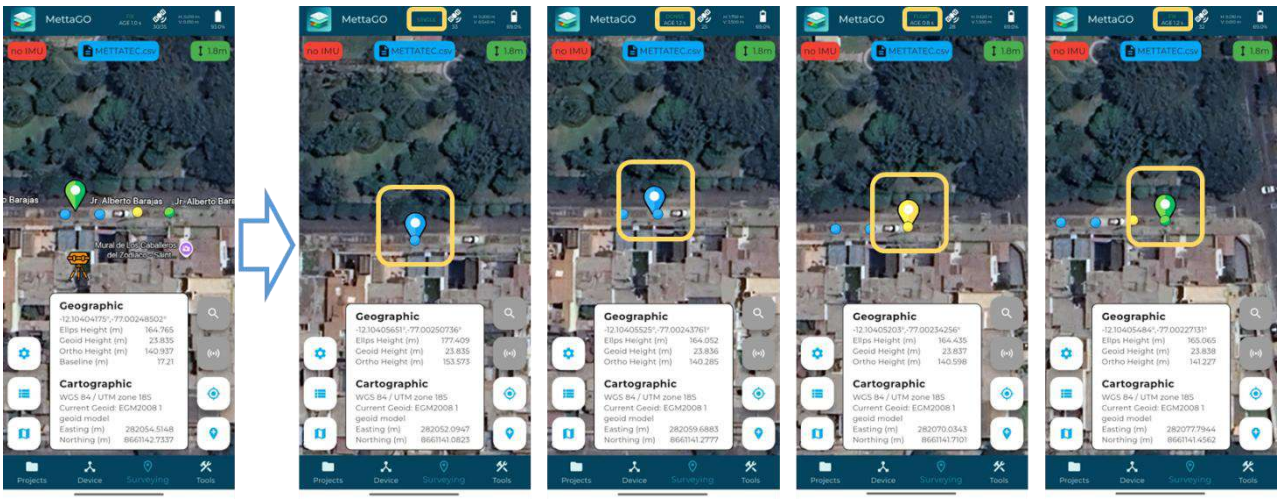
SURVEYING PANEL

Graphical interface for field operation:

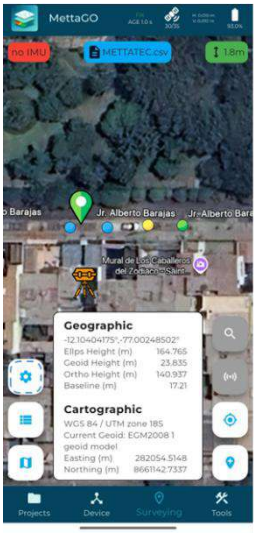


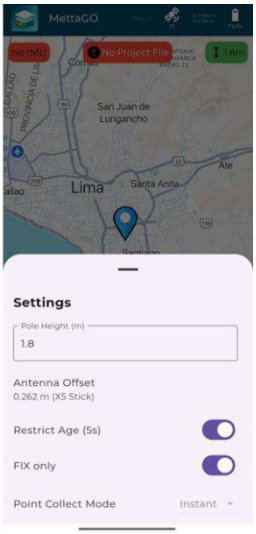
ITEM	COMPONENT	DESCRIPTION
01	LOCATION CURRENT	Displays the current location of the rover. (Green [Fixed], Yellow [Floating], Blue [DGNSS or Single])
02	POINT RAISED	Displays the raised and stored point. (Green [Fixed], Yellow [Floating], Blue [DGNSS or Single])
03	BASE POSITION	Refers to the location of the correction base. (available for rover receiver model X5R, X5RT)
04	CONFIGURATION	Configures ARP height of pole, age restriction and Fixed solution restriction. Displays displacement of phase center connected GNSS antenna.
05	LIST OF POINTS AND STAKEOUT	Displays the raised and/or imported points. Select the point to stake out. Generates polylines or polygons.
06	BASE MAP	Map type selection: Normal, Satellite, Terrain, Hybrid
07	COORDINATES OF CURRENT POSITION	Displays the geodetic coordinates (Latitude, Longitude, Height Ellipsoidal, Geoidal Height and Orthometric Height), correction baseline (available for rover receiver model X5R and X5RT) projection coordinates (East and North) of the survey, and for stakeout the displacements (East, North, Elevation) are added
08	STAKEOUT MODE VISUAL	Displays the direction and distance of the stakeout of a point referred to the current location.
09	INERTIAL SYSTEM (IMU)	Activates and deactivates the IMU of the rover equipment for surveys with inclined poles. (available for rover receiver model X5RT)
10	ZOOM AND CENTERING AUTOMATIC	Performs automatic zoom and centering referred to the current location. You will be able to see the raised points instantly after recording.
11	MEASURE AND RECORD	Measures and records the current location, editing name and description of point.

CURRENT POSITION AND SURVEYED POINT

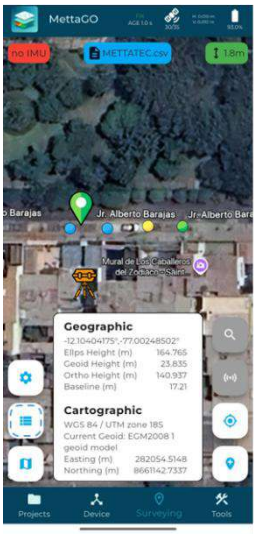


CONFIGURATION

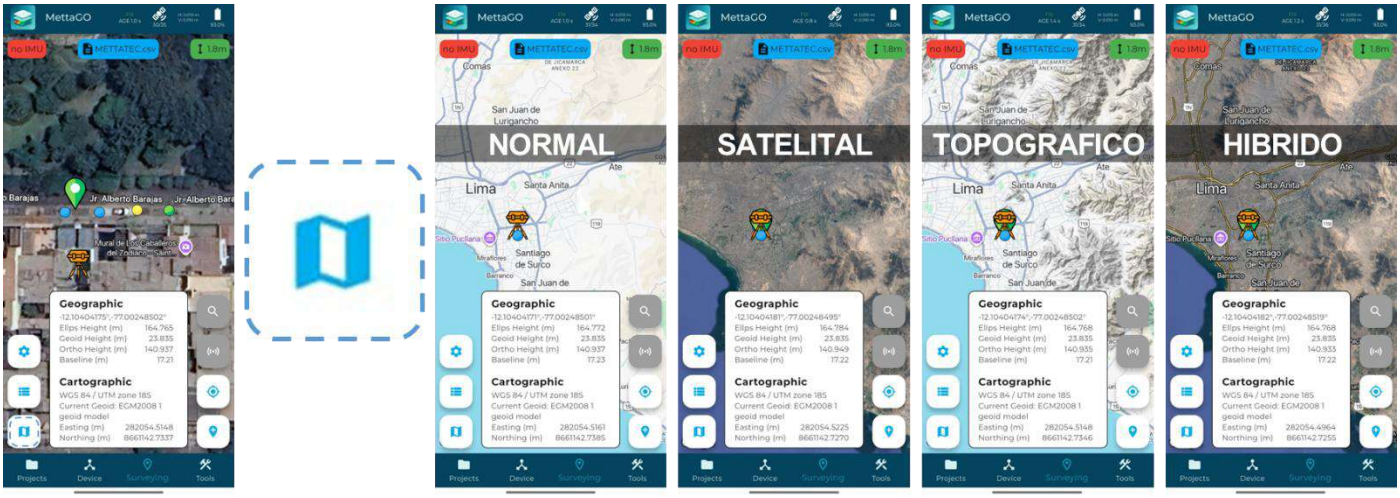




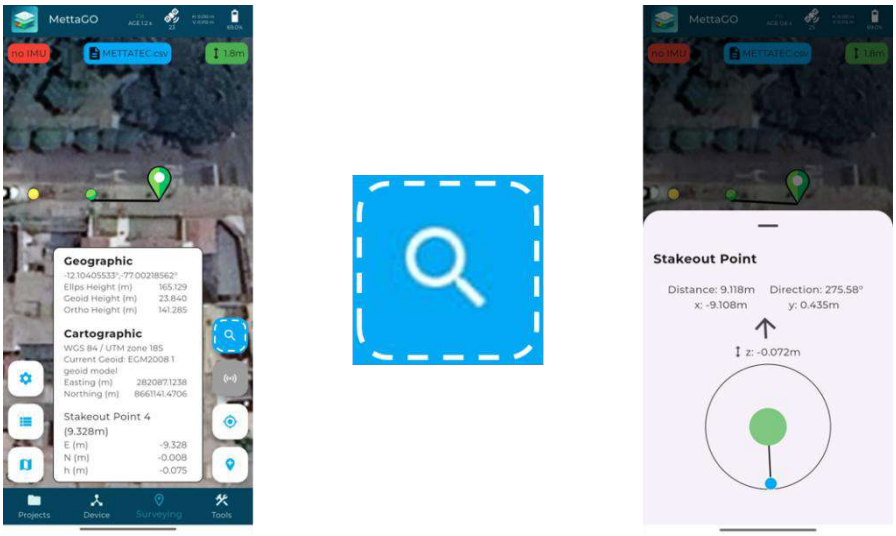
POINT LIST AND STAKEOUT



BASE MAP

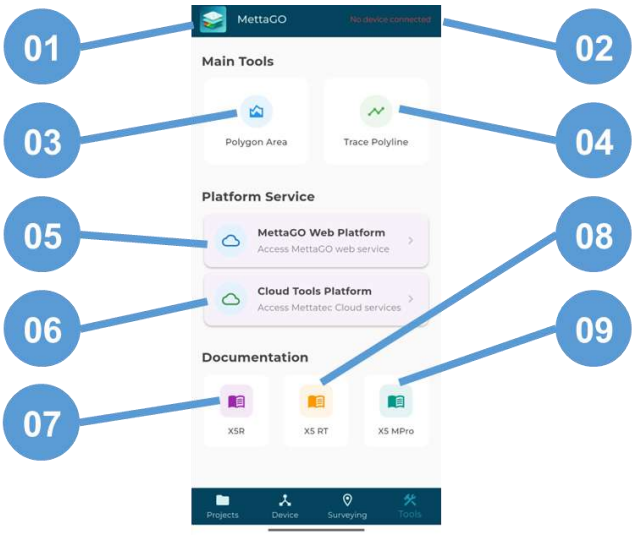


VISUAL STAKEOUT MODE



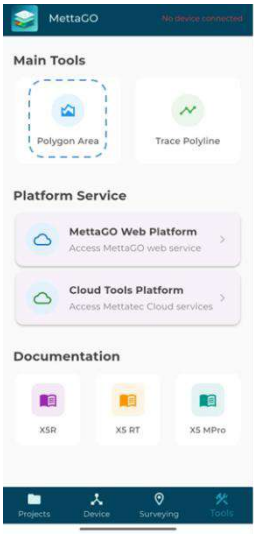
2.2.4. TOOLS

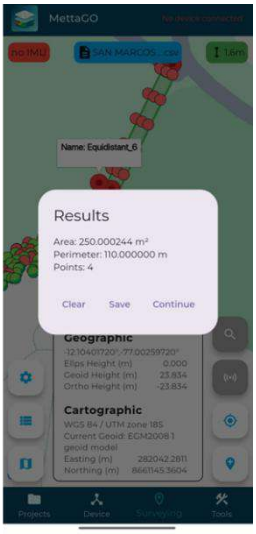
Access to utilities and support resources:



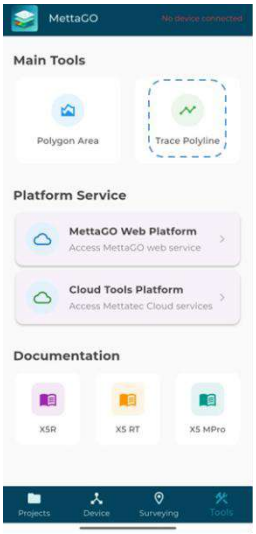
ITEM	COMPONENT	DESCRIPTION
01	APPLICATION	Name of the MettaGo application.
02	CONNECTION	Indicates the connection status (connected or disconnected to the GNSS receiver).
03	POLYGON AREA	Area and perimeter calculation.
04	TRACE POLYLINE	Length calculation
05	METTA GO360	Direct access to the Metta Go360 platform (synchronize with Gmail account)
06	METTA CLOUD	Direct access to the Metta Cloud platform (synchronize with Gmail account)
07	X5R DOCUMENTS	Manuals, tutorials and updates for model X5R.
08	DOCUMENTS X5RT	Manuals, tutorials and updates for model X5RT.
09	DOCUMENTS X5 MPro	Manuals and tutorials for model X5MobilePro.

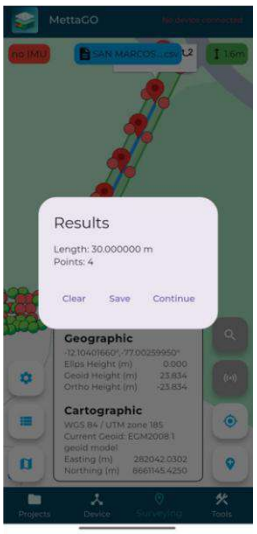
POLYGON AREA



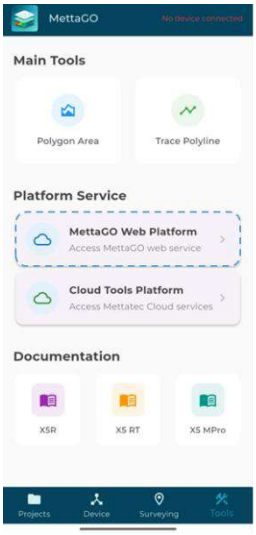


TRACE POLYLINE

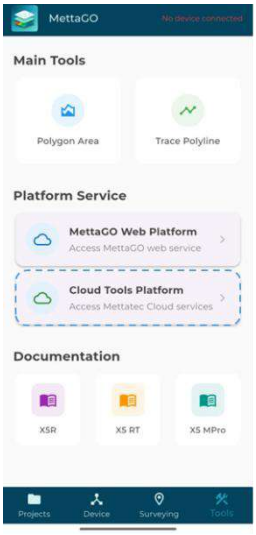


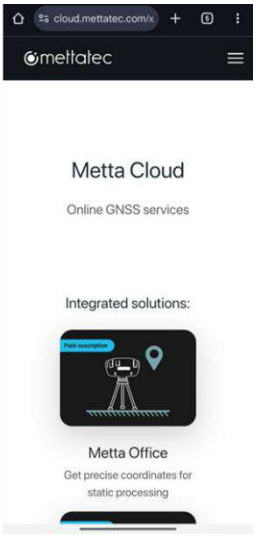


METTA GO360

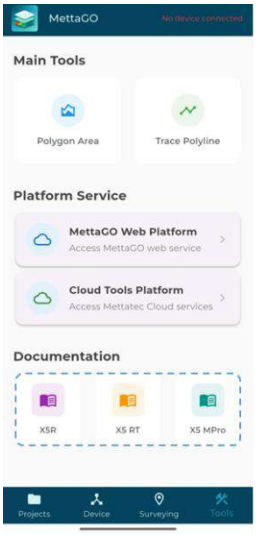


METTA CLOUD





DOCUMENTATION

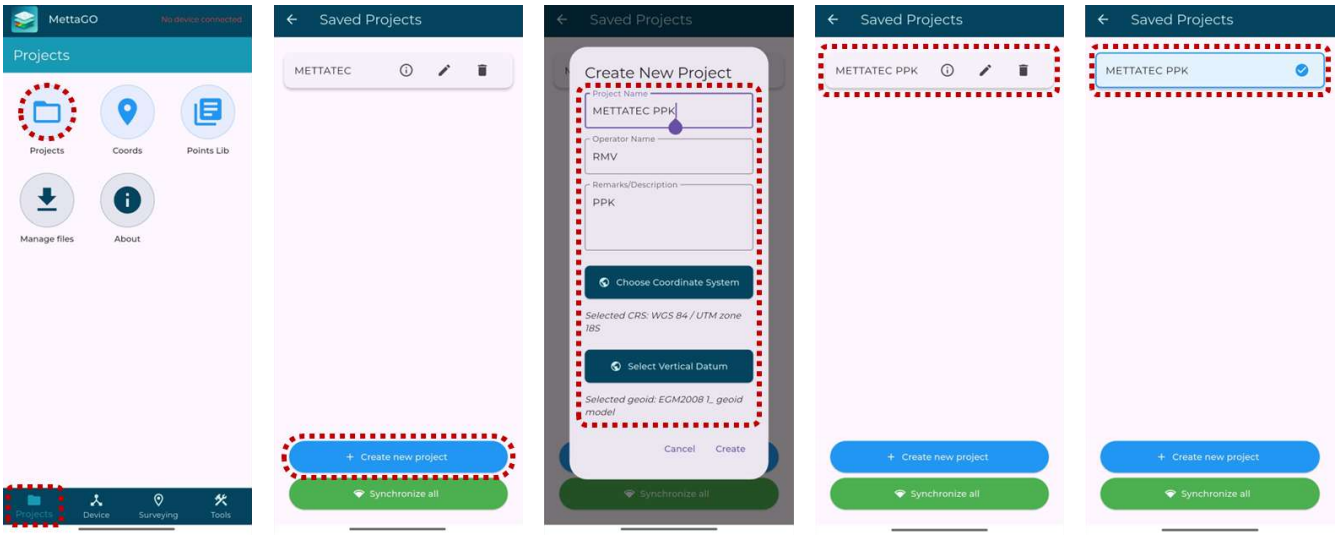


3. WORKFLOW AND METHODS

3.1. PROJECT

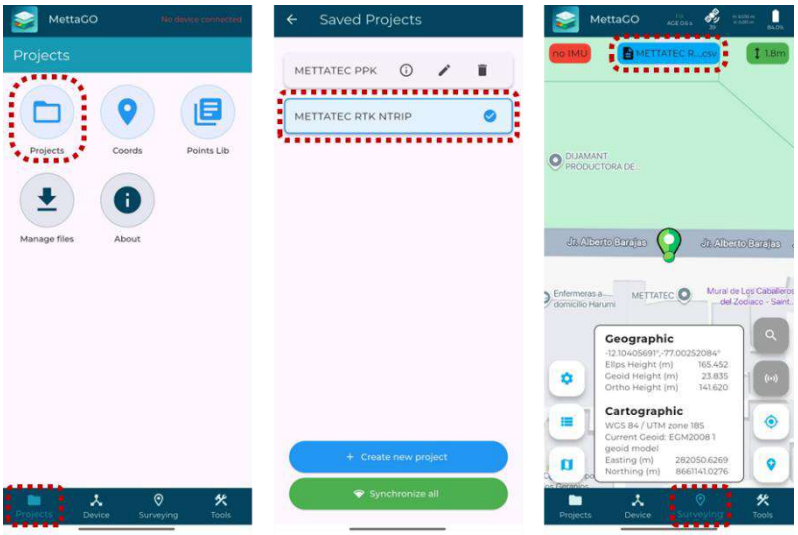
3.1.1. NEW PROJECT

> Menu Projects > Option Projects > Select Create new projec t
> Fill in the requested data including the reference systems > Select created project, example: METTATEC PPK



3.1.2. CURRENT PROJECT

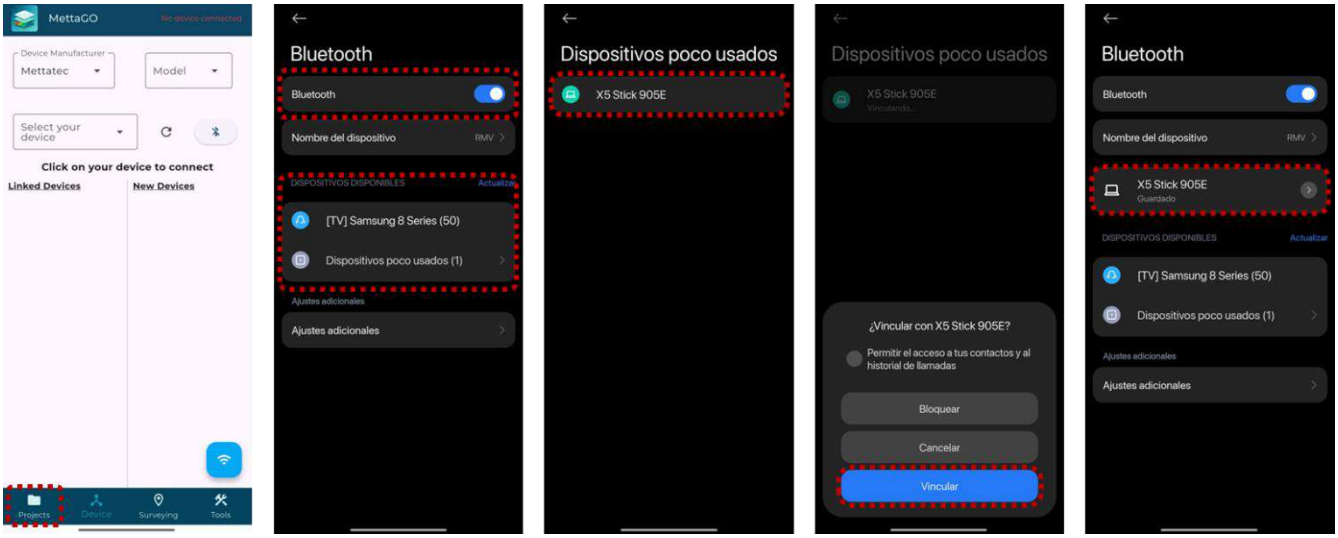
> Menu Projects > Option Projects
> Select created project, example: METTATEC RTK NTRIP



3.2. GNSS RECEIVER CONNECTION

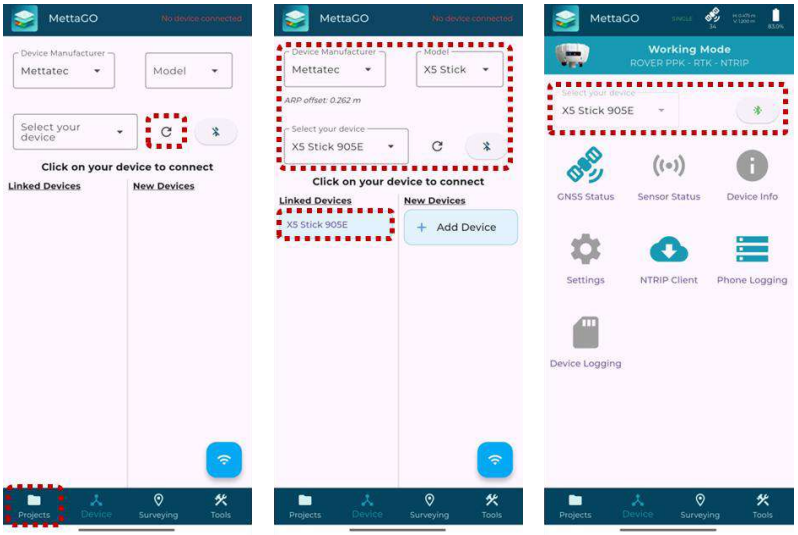
3.2.1. BLUETOOTH PAIRING

> Menu Device (new equipment will not be displayed until linked)
> Mobile device Bluetooth > Search and select GNSS receiver (Model-Mac) > Pair
> Verify linked GNSS Receiver, example: X5 Stick 905E



3.2.2. BLUETOOTH COMMUNICATION

> Menu Device > Update devices via bluetooth > Configure Brand ,Model and Device
> Select Bluetooth icon > Green Bluetooth icon (GNSS device connected)



3.3. PPK ROVER METHOD

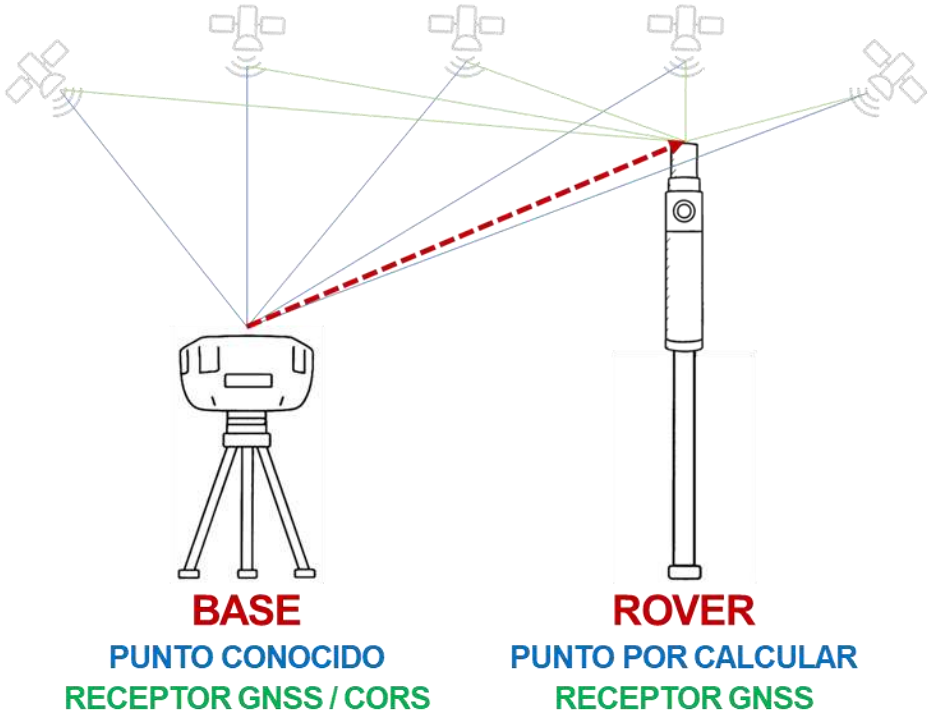
Definition: High-precision (centimetric to millimetric) GNSS positioning method that combines moving measurements with differential correction through post-processing.

Main Features:

- Good accuracy (1-3 cm in optimal conditions) without the need for a real-time connection.
- Field flexibility, does not require a link with the base receiver.
- Mandatory post-processing (between the base receiver and mobile receiver)

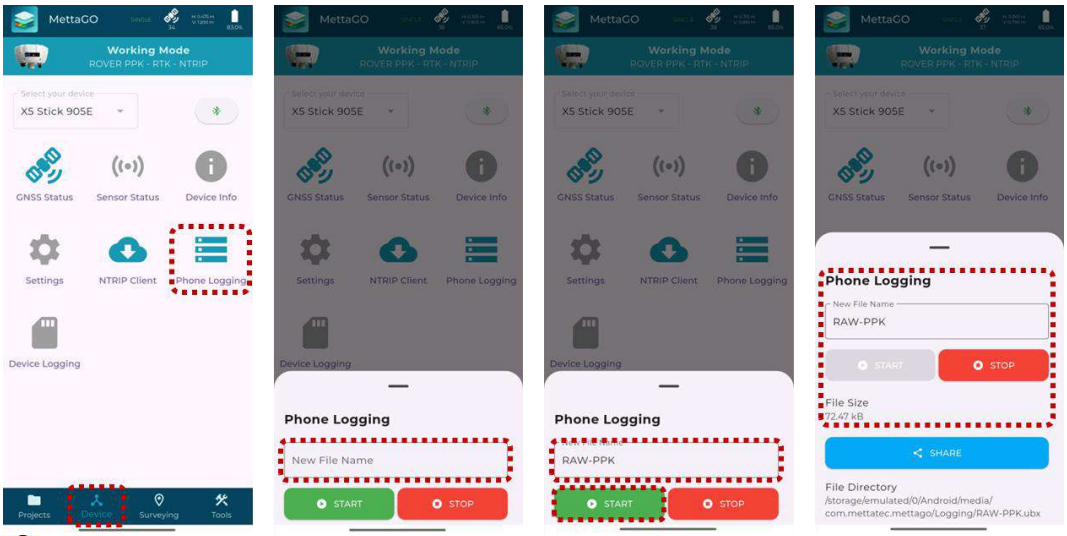
Main Applications:

- Surveys with vehicles, drones or moving equipment.
- Crop mapping and terrain analysis.
- Georeferencing of aerial images (Photogrammetry/LiDAR)
- Dynamic stakeout and machinery control (Construction)



3.3.1. RECORD RAW DATA

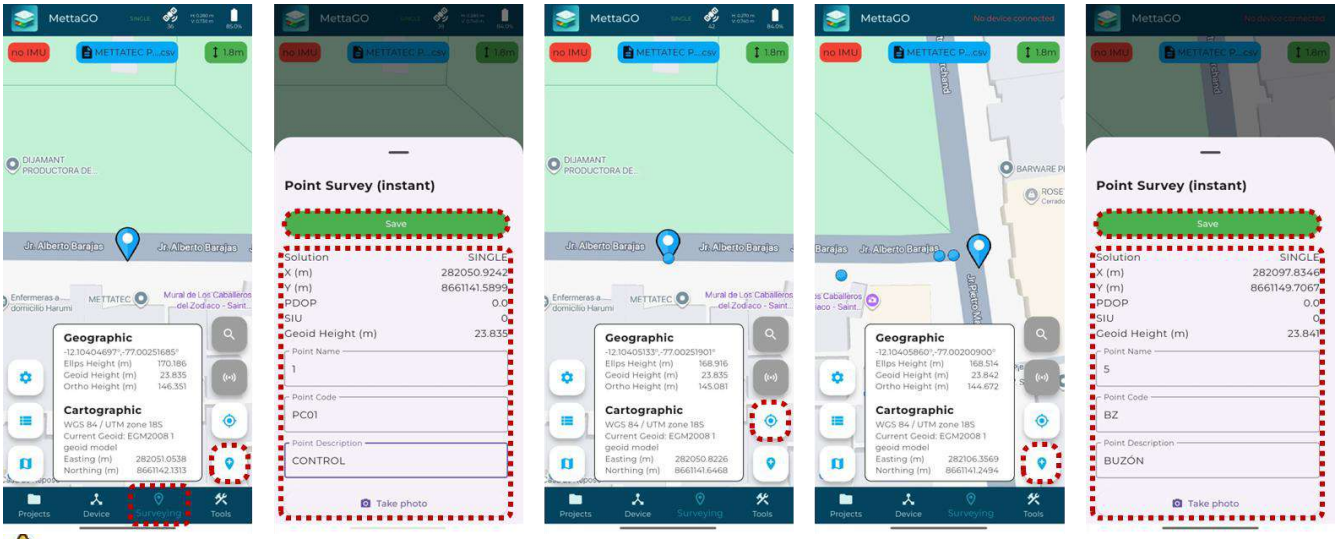
Record raw data in UBX format for PPK processing in MettaOffice software. > Menu Device > Option Phone Logging > Indicate raw data name to record
> Select START > Verify File Size to ensure raw data recording.



⚠Use alphanumeric names of 4 to 8 characters (letters and numbers), avoiding characters special (example: !@#$%^&*), spaces or punctuation marks (example: - _ . ,), accents or diacritics (example: á, ñ, ü). Valid examples: PC01, GPS01 and 1002025.

3.3.2. PPK SURVEY

> Menu Surveying > Prior to surveying, position for a minimum of 10 seconds at the point
> Select Survey icon > Fill in or edit Number , Code and Description
> Select Save and record surveyed point
> Follow the same procedure for each point to survey

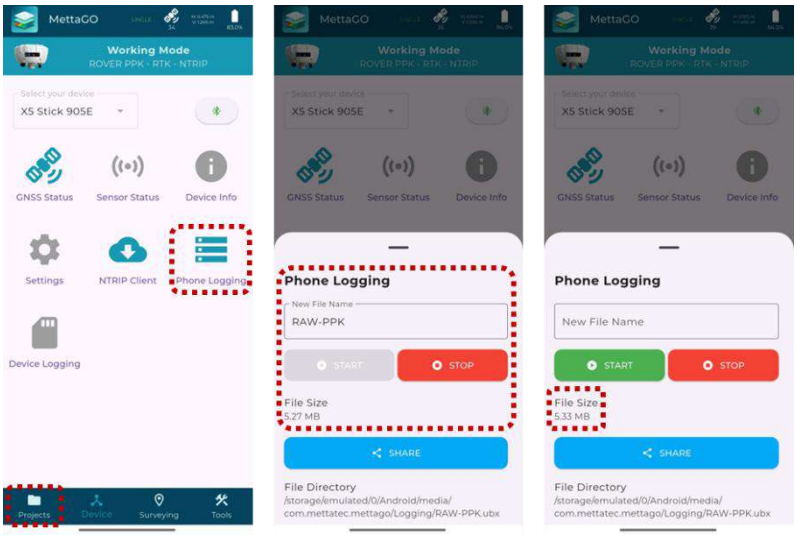


⚠Default PPK recording interval is 0.2 seconds (5 Hz).

⚠ Capture time per point varies depending on the length and quality of the baseline, obstructions of the environment (buildings, trees, topography) and satellite geometry (DOP). Typical reading range of 10 seconds - 10 minutes per point.

3.3.3. STOP RAW DATA

> Menu Projects > Option Phone Logging > Select STOP
> Verify the File Size of the raw data



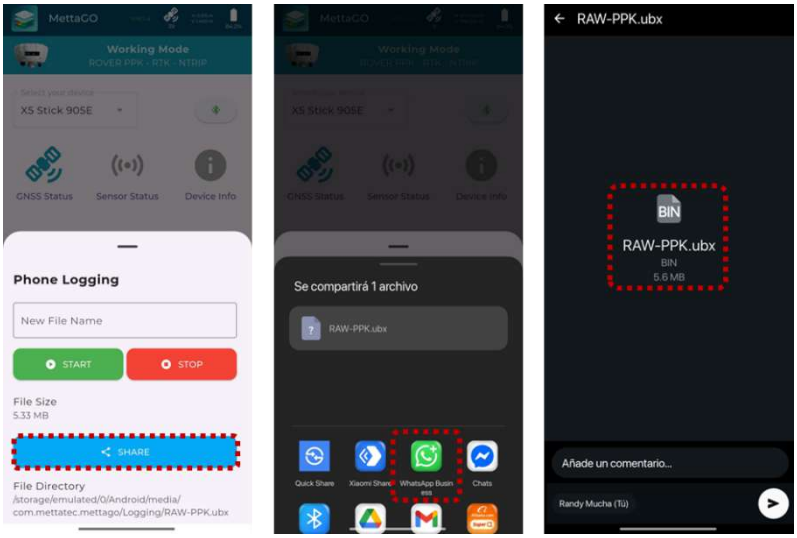
3.3.4. PPK DATA EXPORT

The PPK record generates two essential files for post-processing: RAW DATA + CSV.

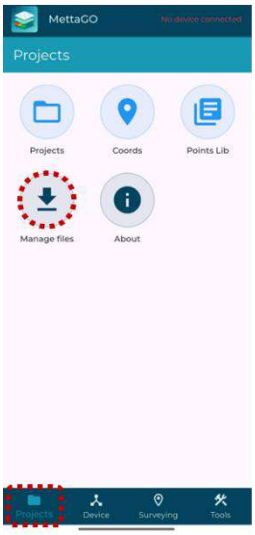
Both are complementary and essential to ensure the accuracy and traceability of the results.

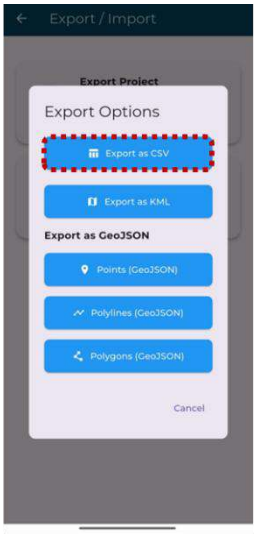
SHARE (RAW DATA + CSV)

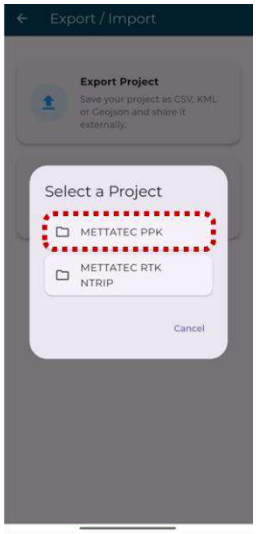
> Select SHARE > Choose the application to share, for example: WhatsApp
> Send RAW DATA, example: RAW-PPK.ubx



> Menu Projects > Manage Files Option > Select Export Project
> Select Export as CSV > Select Project, example: METTATEC PPK



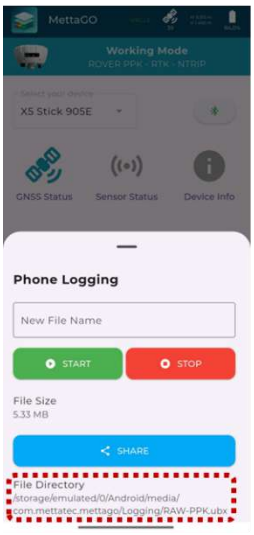


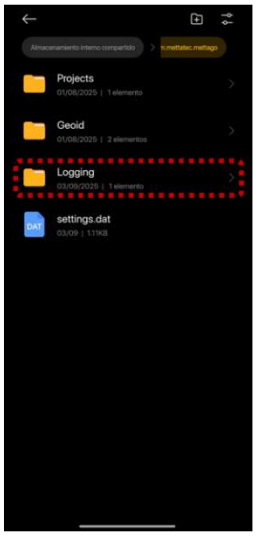


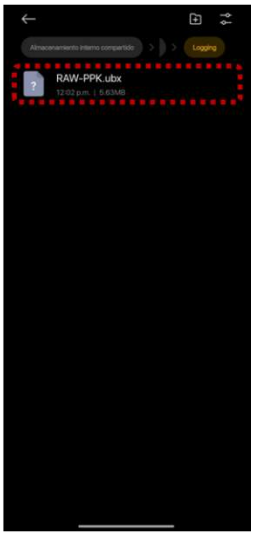
> Choose the application to share, example: WhatsApp
> Send DATA CSV, example: METTATEC PPK.csv

PROJECT PATH (RAW DATA + CSV)

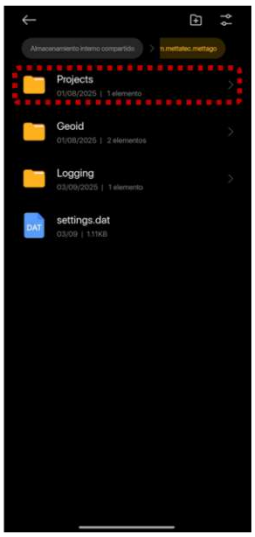
> Phone Logging indicates the path where the files are located >
Application path /storage/emulated/0/Android/media/com.mettatec.mettago
> Section Logging > Select RAW DATA, example: RAW-PPK.ubx
> Copy and paste to a path of the user's choice

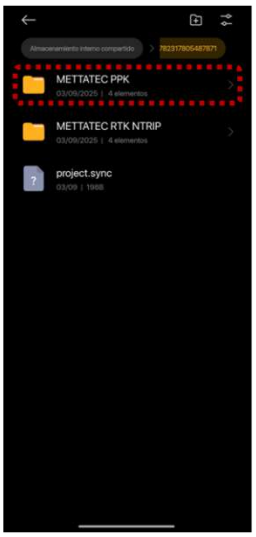


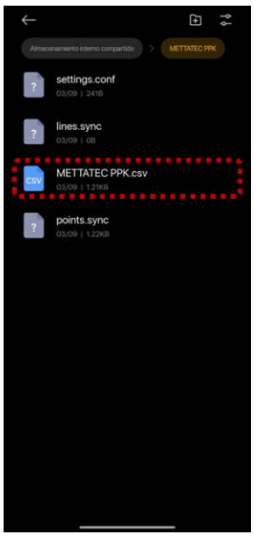




> Application path /storage/emulated/0/Android/media/com.mettatec.mettago
> Section Projects > Select Project, example: METTATEC PPK
> Select CSV DATA, example: METTATEC PPK.csv
> Copy and paste to a path of the user's choice







3.4. RTK NTRIP ROVER METHOD

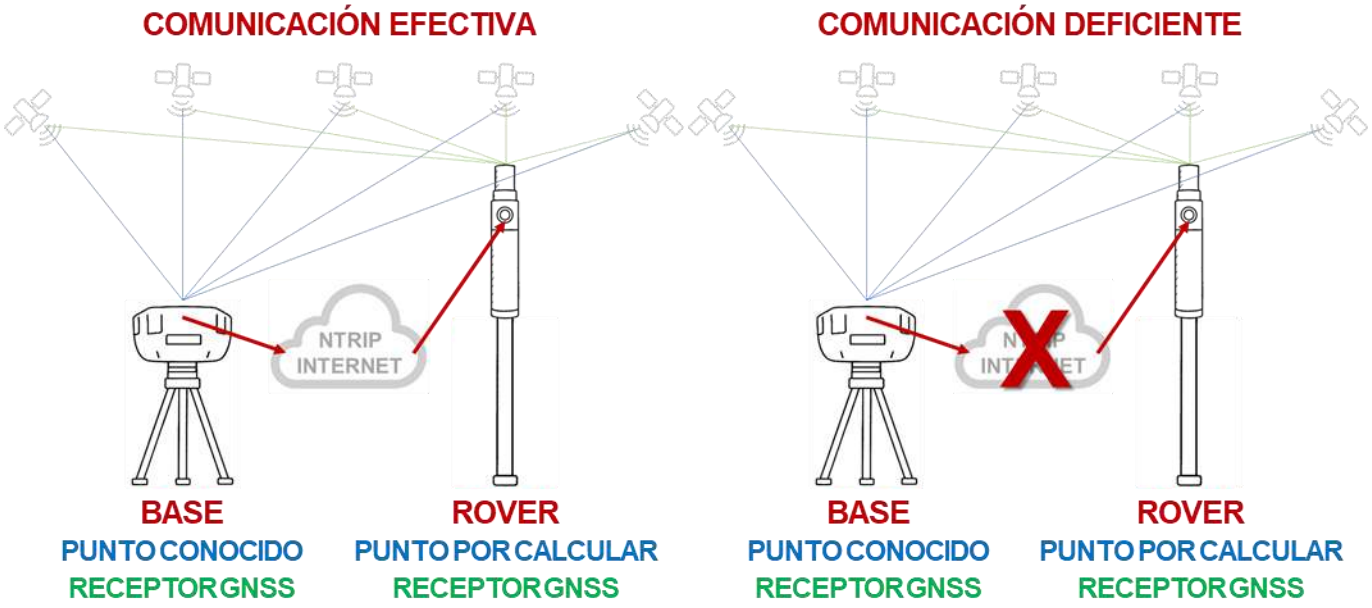
Definition: Real-time GNSS positioning method with centimeter-level accuracy, which uses corrections transmitted via the internet (NTRIP protocol) from a reference station or CORS network.

Main Features:

- o Centimeter-level accuracy in real time (without post-processing).
- o Internet connection required (mobile or WiFi).
- o Eliminates the need for a local physical base.

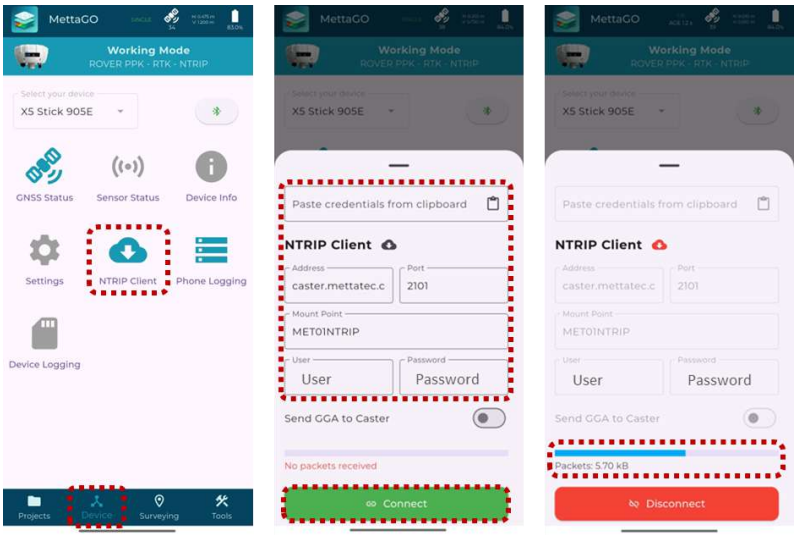
Main Applications:

- o Precise surveying for photogrammetry, LiDAR, bathymetry, among others.
- o Agile surveying for precision agriculture, forests, and cadastre.
- o Auxiliary points for construction and alignment of infrastructures.
- o Monitoring of movements in civil works.



3.4.1. START NTRIP

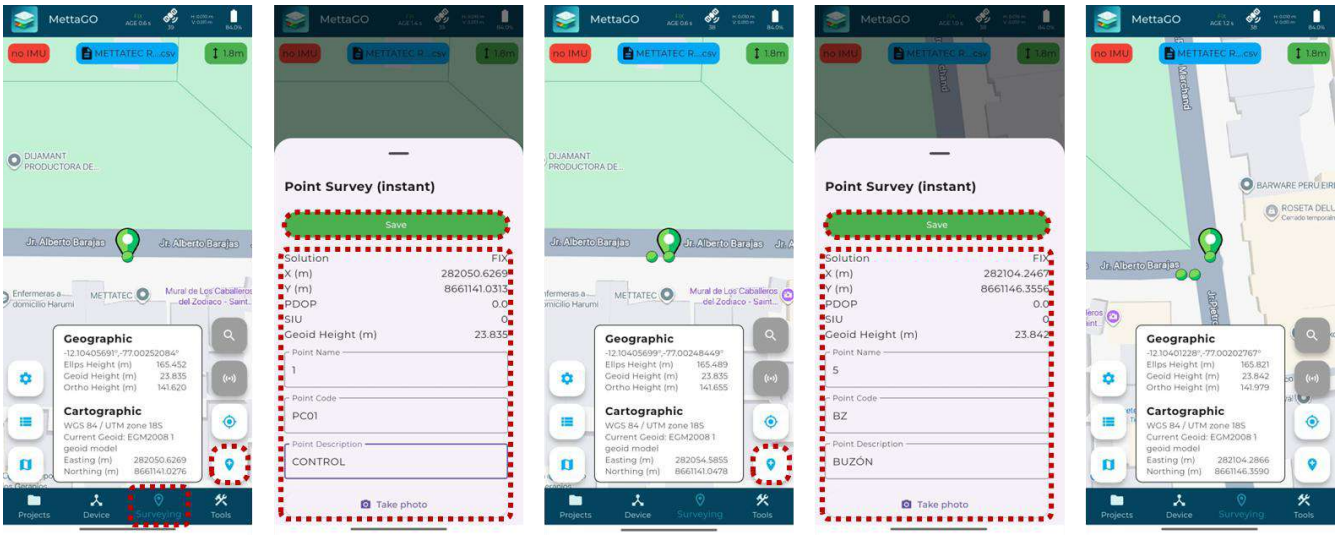
> Menu Projects > Option NTRIP Client
> Enter credentials for an NTRIP server or Metta Caster
(optional copy and paste credentials from Metta Caster) >
Select Connect > Verify reception of corrections with Packets greater than 5.0kB



⚠ To guarantee differential correction through the NTRIP or Metta Caster service, you must have an Internet connection (stable and active on the device) and credentials entered completely and without errors (address, user, password, port, mount point).

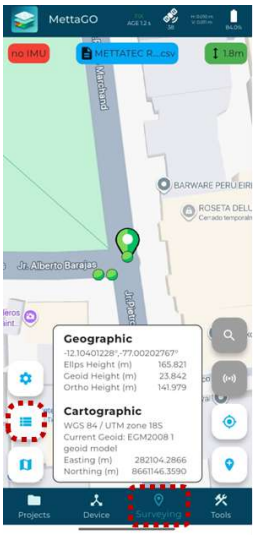
3.4.2. RTK SURVEY

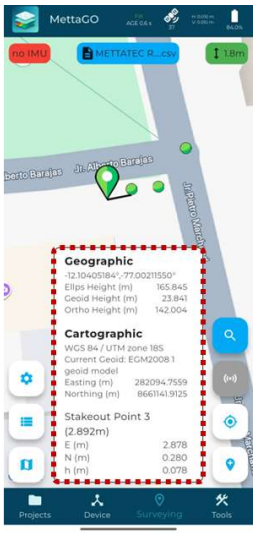
> Menu Surveying > Select Survey icon
> Fill in or edit Number , Code and Description
> Select Save and record surveyed point
> Follow the same procedure for each point to be surveyed



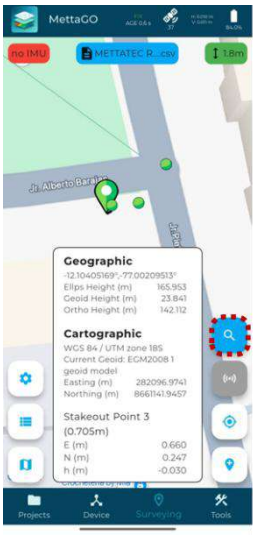
3.4.3. RTK STAKEOUT

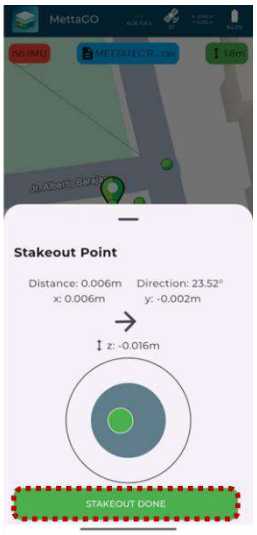
> Menu Surveying > Select point list > Identify and select point to stake out
> Select stakeout icon
> Analyze stakeout by displacements (Δ east, Δ north and Δ height)





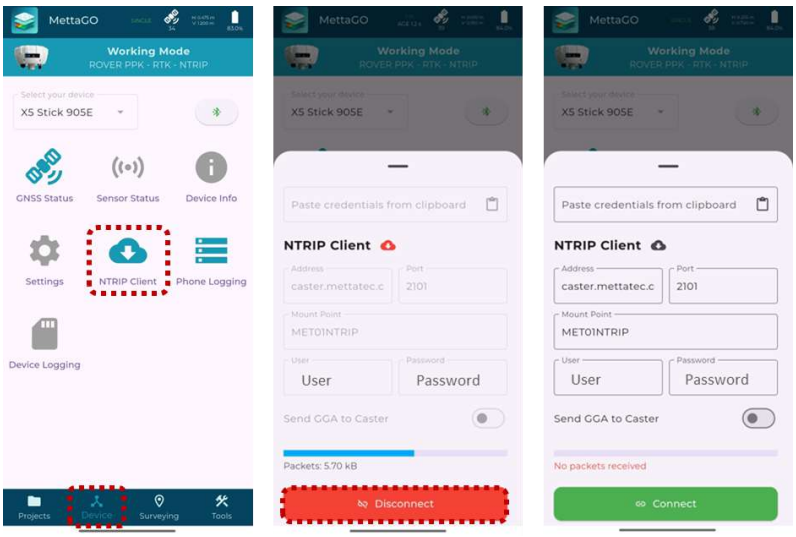
> Near the stakeout point we move to visual stakeout > Select visual stakeout icon
> Visualize the stakeout with direction and distance, complementing with displacements (Δ east, Δ north and Δ height)





3.4.4. STOP NTRIP

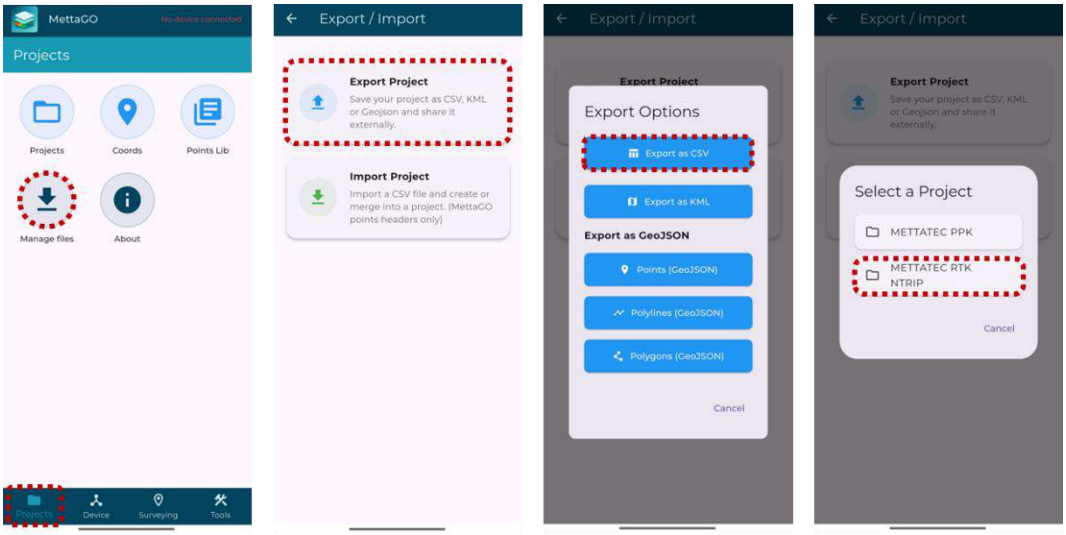
> Menu Projects > Option NTRIP Client
> Select Disconnect



3.4.5. RTK DATA EXPORT

SHARE CSV DATA

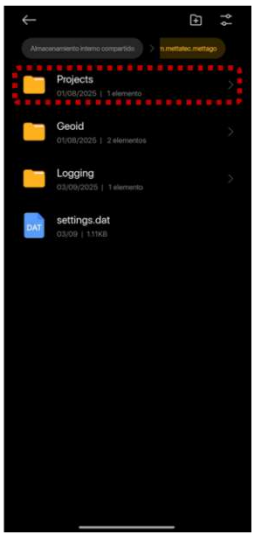
> Menu Projects > Option Manage Files > Select Export Project
> Select Export as CSV > Select Project, example: METTATEC RTK NTRIP

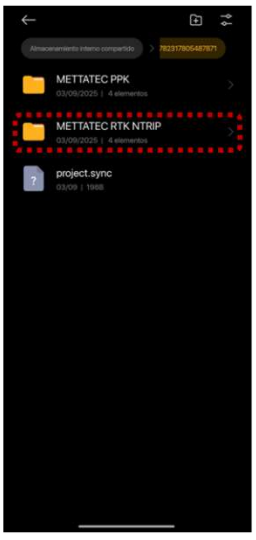


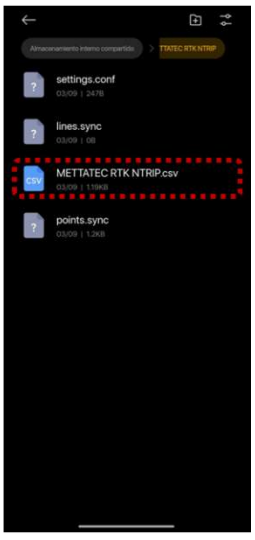
> Choose the application to share, for example: WhatsApp
> Send DATA CSV, for example: METTATEC RTK NTRIP.csv

DATA CSV PROJECT PATH

> Application path /storage/emulated/0/Android/media/com.mettatec.mettago
> Select Projects > Select Project, for example: METTATEC PPK
> Select DATA CSV, for example: METTATEC PPK.csv
> Copy and paste into a user-selected path







3.5. SUPPLEMENTS

3.5.1. IMPORTING POINTS WITH CSV FILE

CSV STRUCTURE

The comma-delimited CSV file must contain the following structure:

name	code	description	date	time	latitude	longitude	altitude	easting	northing	fixtype	PDOP	SIV	LatError	LonError	AltError	GeoidAlt	OrthoAlt	PoleHeight	ID

It can be imported in geographic coordinates or projection coordinates (for example CVS in WGS84 UTM 19S coordinates. Data “Point”, “Code”, “East”, “North”, “Orthometric Height”

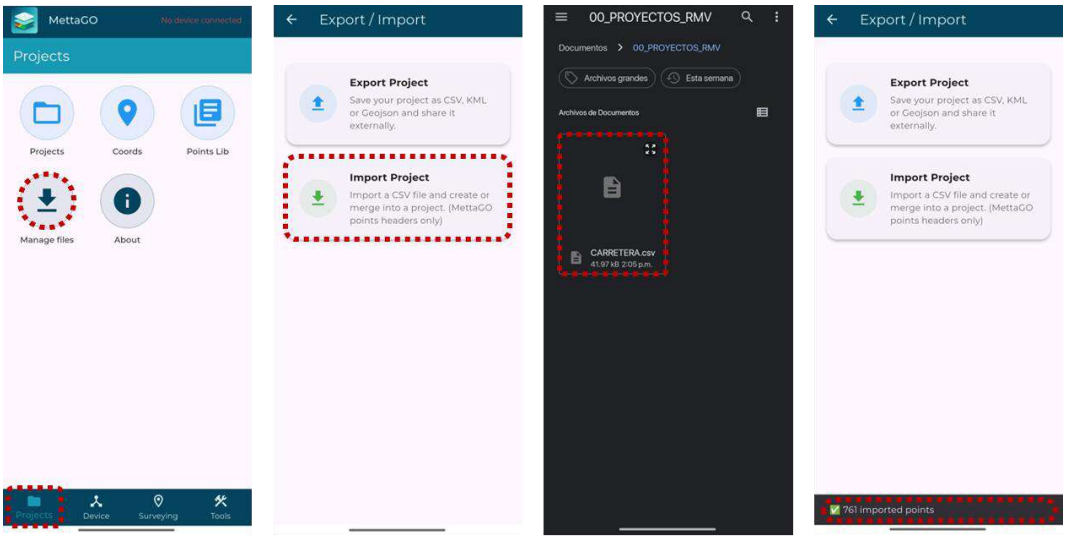
Data Campo

1	8269066	219130.26	3586.17	Eje
2	8269070.2	219129.65	3586.17	Borde
3	8269062	219130.97	3586.11	Borde
4	8269068.2	219153.95	3588.09	Eje
5	8269072.7	219154.04	3588.09	Borde
6	8269064.1	219153.68	3587.85	Borde
7	8269062.6	219172.17	3589.6	Eje
8	8269058.8	219170.29	3589.88	Borde
9	8269066.5	219174.6	3590.28	Borde
10	8269067.3	219174.95	3591.75	Relleno
11	8269074.1	219178.25	3594.87	Relleno
12	8269052.8	219169.34	3587.93	Relleno
13	8269048.2	219192.53	3592.86	Eje
14	8269049.5	219194.16	3592.77	Borde
15	8269045.7	219191.61	3592.9	Borde
16	8269056	219199.96	3597.84	Relleno
17	8269037.8	219182.95	3589.08	Relleno
18	8269051.3	219195.34	3595.01	Relleno
19	8269031.6	219215.99	3595.94	Eje
20	8269029	219215.36	3595.86	Borde
21	8269033.4	219217.5	3596.13	Borde

CSV Estructura

name	code	description	date	time	latitude	longitude	altitude	easting	northing
1	Eje							219130.260	8269066.030
2	Borde							219129.650	8269070.170
3	Borde							219130.970	8269062.000
4	Eje							219153.950	8269068.190
5	Borde							219154.040	8269072.730
6	Borde							219153.680	8269064.080
7	Eje							219172.170	8269062.630
8	Borde							219170.290	8269058.790
9	Borde							219174.600	8269066.480
10	Relleno							219174.950	8269067.330
11	Relleno							219178.250	8269074.050
12	Relleno							219169.340	8269052.780
13	Eje							219192.530	8269048.210
14	Borde							219194.160	8269049.480
15	Borde							219191.610	8269045.690
16	Relleno							219199.960	8269056.020
17	Relleno							219182.950	8269037.800
18	Relleno							219195.340	8269051.290
19	Eje							219215.990	8269031.640
20	Borde							219215.360	8269029.010

> Menu Projects > Option Manage Files > Select Import Project
> Select CSV file, example: HIGHWAY.csv > Confirmation of point import



VERIFICATION OF IMPORTED POINTS

> Menu Surveying > Option Point List > Verify the number of points and their coordinates

TECHNICAL SPECIFICATIONS

GNSS	
Channels:	**184**
Time to first fix:	20 s (cold), 2 s (hot)
Frequency:	1 Hz to 5 Hz
Supported formats:	RTCM3.X (input) NMEA (output) Raw Data in RINEX (for PPK and PPP-Static)
Supported constellations:	GPS (L1C/A, L2C) GLONASS (L1OF, L2OF) Galileo (E1B/C, E5b) Beidou (B1I, B2I)
RTK Precision:	Horizontal: 7 mm + 1 ppm Vertical: 13 mm + 1 ppm
PPK Precision:	Horizontal: 6 mm + 1 ppm Vertical: 1.2 mm + 1 ppm

Design and Construction	
Dimensions:	360 mm x 32 mm
Weight:	275 g
Operating temperature:	-20 °C to 65 °C

Connectivity and Power	
Bluetooth:	4.2 BLE
Port:	USB-C
Power:	5V DC
Maximum Consumption:	500 mA
Average Consumption:	200 mA
Battery:	5000 mAh
Autonomy:	9 h in normal mode

X5 STICK

GNSS RECEIVER

USER MANUAL

Version 1
Revision RMV
September 2025