

METEOTRACKER+ APP (ANDROID)

Advanced environmental monitoring App with multi-sensor support, real-time visualization, archive, data sharing, CSV export, MeteoPhoto and remote live track.

User Manual



Table of contents

1. Overview	3
2. What is new	4
3. Installation	5
4. Performing Measurement Sessions	5
4.1. MeteoTracker	7
4.1.1. Connecting to the App	7
4.1.2. Settings Configuration	7
4.1.3. Starting a Session	7
4.1.4. Calibration and Speed Monitoring	7
4.1.5. Static Session Mode	7
4.1.6. Taking a MeteoPhotos	8
4.1.7. Closing a Session	8
4.2. MT-IR	8
4.2.1. Operation	8
4.3. MT-Air Quality	8
4.3.1. Device activation and Session Start	8
4.4. MT-WP (Water Probe)	9
4.4.1. Device activation and Session Start	9
5. Variables measured	9
5.1. MeteoTracker (weather)	9
5.2. MT-AQ (air quality)	10
5.3. MT-IR (surface temperatures)	10
5.4. MT-WP (water temperature)	10
6. Settings and privacy	11
6.1. Settings	11
6.2. Privacy	12
7. Viewing data	12
7.1. Live Track	12
7.1.1. Primary tabs	12
7.1.2. Secondary tabs	14
7.1.2.1. Combo Tab and the Timeline Navigation (MT Tab only)	14
7.1.2.2. Data, Graph and Map tabs	15
Map tab	16
7.2. Session archive	17
7.2.1. Primary tabs	19
7.2.2. Secondary tabs	19
7.2.2.1. Statistics tab	19
7.2.2.2. MeteoPhoto tab	20
8. Features and technical details	20

8.1. CSV download	20
8.2. MeteoPhoto	21
8.3. Vertical Temperature Gradient	22
8.4. Altitude: periodic, automatic fix and manual fix	23
8.5. Offline data management	24
8.6. Tunnel data acquisition (data acquisition without GNSS signal)	24
8.7. Remote Live Track	24
8.8. Guard Time and Auto-pause	25
8.9. Editing session fields and adding notes	26
9. Specifications and accuracy	27
9.1. Weather data (MeteoTracker)	27
9.2. Air Quality data (MT-AQ)	28
9.3. Surface temperature (MT-IR)	29
10. FAQs and Troubleshooting	31
10.1. FAQs	31
10.2. Troubleshooting	31

1. Overview

MeteoTracker+ is an advanced Android application for environmental monitoring based on location-driven measurement sessions. It enables real-time acquisition, visualization, and analysis of environmental data using one or multiple sensor devices.

The app supports four devices: MeteoTracker (weather), MT-Air Quality (air quality), MT-Infrared (surface temperature), and MT-Water Probe (water temperature), which can operate independently or simultaneously within the same session.

Key features include real-time data visualization, session-based data logging, graphical and map-based analysis, session archive, CSV export, MeteoPhoto, and Remote Live Track. The app also provides advanced functionalities such as vertical temperature gradient calculation and data acquisition in the absence of GNSS signal.

This manual describes the application structure, sensor integration, measurement workflows, and data analysis tools.

2. What is new

The new **MeteoTracker+ App** introduces several new features and improvements compared to the previous MeteoTracker App.

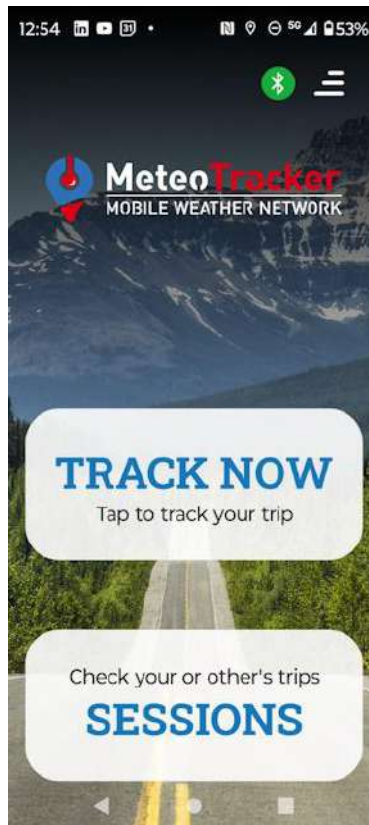
The main structural change is the introduction of **multi-sensor support**, which enables the management - either simultaneously or independently - of four different sensor devices: **MeteoTracker** (MT, weather), **MT-Air Quality** (MT-AQ), **MT-Infrared** (MT-IR, infrared surface temperature), and **MT-Water Probe** (MT-WP).

In addition, several new functionalities have been introduced, as summarized in the table below, all within a completely redesigned interface.

FEATURES	NEW METEOTRACKER+ APP Android	OLD METEOTRACKER APP Android
Multi-sensor management Supports MeteoTracker, Air Quality, Infrared, and Water sensor devices	✓	✗
My Team Tab For citizen science projects	✓	✗
Combo Tab – Interactive Map & Graph Tapping a point on the map highlights the corresponding graph point with numeric values, and vice versa	✓	✗
MeteoPhoto Tab A session-based gallery that displays all MeteoPhotos captured during a specific measurement session.	✓	✗
All variables plottable All measured variables selectable and plottable through interactive graphs using dedicated drop-down menus	✓	
Data recorded inside tunnels When GNSS signal is absent, data are recorded based on the time-interval set by the user	✓	✗
MSL pressure Pressure at sea level is calculated from actual measured pressure and altitude	✓	✗
Periodic altitude auto recalibration Actual altitude is periodically retrieved from a web server to compensate for weather and location-related atmospheric pressure variations	✓	✗
Air density Calculated from measured pressure, temperature, and humidity	✓	✗
Distance covered during the session Session Length, computed and displayed in real-time and in post-session statistics	✓	✗
Session notes or comments Users can add notes or comments via the dedicated feature in the sessions list	✓	✗
Bluetooth signal and battery level monitoring Opening the "Option" hamburger menu, the BT signal and battery levels are displayed	✓	✗

3. Installation

- Download the **MeteoTracker+** app from Google Play (here the direct link: <https://play.google.com/store/apps/details?id=com.iotopon.meteotracker>).
- Install the app and grant all required permissions.



⚠ Important: ensure that background access is enabled and any battery-saving restrictions are disabled.

4. Performing Measurement Sessions

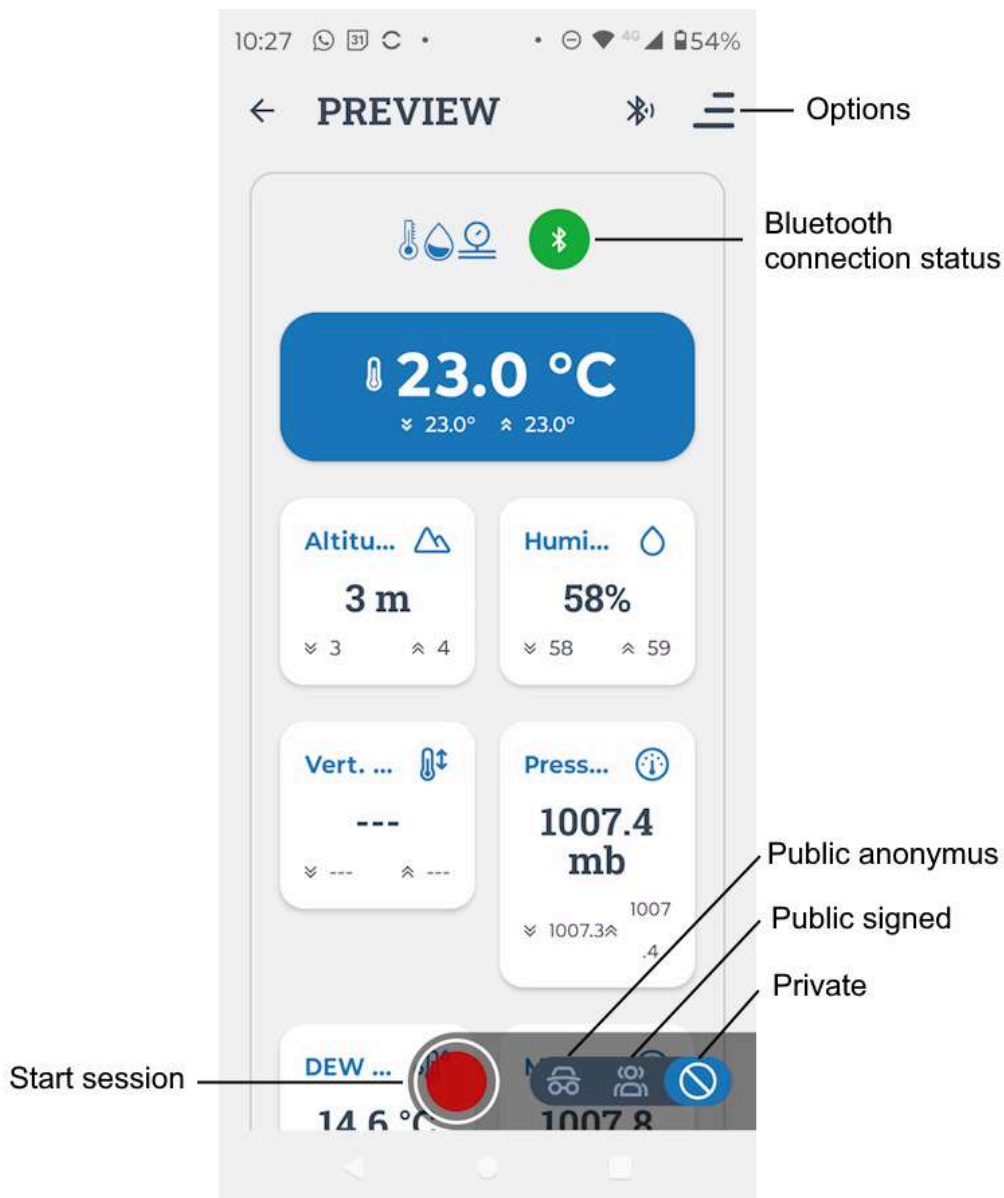
Ensure that the sensor device (**MT**, **MT-IR**, or **MT-AQ**) is in advertising mode:

- **MT and MT-IR:** press the ON button → BT ADV LED blinking
- **MT-AQ:** ON selector set to the left and wait for initial power up cycle (about 2 minutes)

i Note: no manual pairing is required

From the home screen:

- Tap **“TRACK NOW”**
- The **PREVIEW** screen opens
- The BT connection status on the App turns to green
- The BT ADV LED stops blinking (MT and MT-IR), indicating successful connection



Privacy Settings

Select one of the following privacy levels using the control at the **bottom of the screen**:

- Public Anonymous
- Public Signed
- Private

i Note: for detailed information on privacy levels and data usage, refer to **Section 5.2**.

4.1. MeteoTracker



4.1.1. Connecting to the App

After a few seconds, the MeteoTracker device automatically connects to the application. Once connected, the measured values are displayed on the **PREVIEW screen**.

4.1.2. Settings Configuration

To modify default settings (e.g., measurement units, sampling frequency, etc...):

- Tap the options icon (hamburger menà) in the top-right corner
- Select and adjust the desired parameters

4.1.3. Starting a Session

Press the red blinking button at the bottom of the screen

4.1.4. Calibration and Speed Monitoring

After starting the session, a calibration notice is displayed.

The speed monitoring function requires a minimum of 7 data points recorded at speeds greater than 7 km/h.

Data acquisition begins only after these conditions are met.

4.1.5. Static Session Mode

To perform a static session:

- Open Settings
- Enable the Static Session option (selector to the right)

i Note: Static sessions are automatically set to Private. This prevents indoor or otherwise unreliable measurements from being uploaded to the public database.

4.1.6. Taking a MeteoPhotos

MeteoPhoto is a feature that allows you to take a picture with the weather data measured at that moment automatically overlaid in the header or footer of the image.

4.1.7. Closing a Session

To close a session, tap one of the following:

- The **back button** of the phone
- The **back arrow** at the top of the screen
- The **dedicated button** at the bottom of the screen

4.2. MT-IR



4.2.1. Operation

The operating procedure is identical to that described in Section 2.1 (MeteoTracker).

i *Note: when the MT-IR device is the only device connected to the application (i.e., no MeteoTracker device is connected), the speed monitoring function is not activated, since infrared measurements are not affected by any thermal inertia.*

4.3. MT-Air Quality



4.3.1. Device activation and Session Start

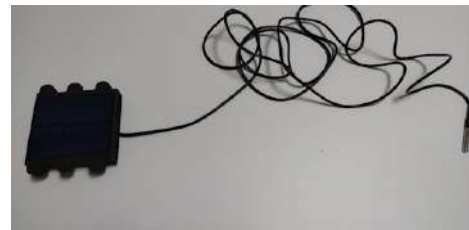
To activate the device:

- Move the **ON/OFF selector** located on the left side
- After activation, allow **3–4 minutes** for the device to complete its internal auto-calibration.
- Then, move the **MT-AQ selector in the app** to the right. Sensor values will appear on the screen.
- To start and close a measurement session, follow the same procedure as for **MT devices**.

⚠ Warning: Before the auto-calibration phase is completed, sensor values may not appear when moving the app selector to the right.

i Note: When the **MT-AQ device** is the only device connected to the application, the speed monitoring function is not activated, as air quality measurements are not affected by initial data inaccuracies.

4.4. MT-WP (Water Probe)



4.4.1. Device activation and Session Start

Connect the MT-WP to the MT-Air Quality through the USB connector.

5. Variables measured

5.1. MeteoTracker (weather)

- Temperature
- Relative Humidity

- Atmospheric pressure
- Mean Sea Level atmospheric pressure
- Vertical Temperature Gradient
- Dew-point
- Humidex Index (comfort index)
- Solar Radiation Indicator
- Air Density

i **Note:** for accuracy data, see section 8

5.2. MT-AQ (air quality)

- PM10, PM4, PM2.5, PM1, PM0.5 ($\mu\text{g}/\text{m}^3$ and $\text{number}/\text{cm}^3$ - PM0.5 only $\text{number}/\text{cm}^3$)
 - O3 and NO2 (only continuous mode, see section 8 for details)
 - CO2
 - AQI (European)
-

5.3. MT-IR (surface temperatures)

- Surface temperature
-

5.4. MT-WP (water temperature)

- Water temperature
-

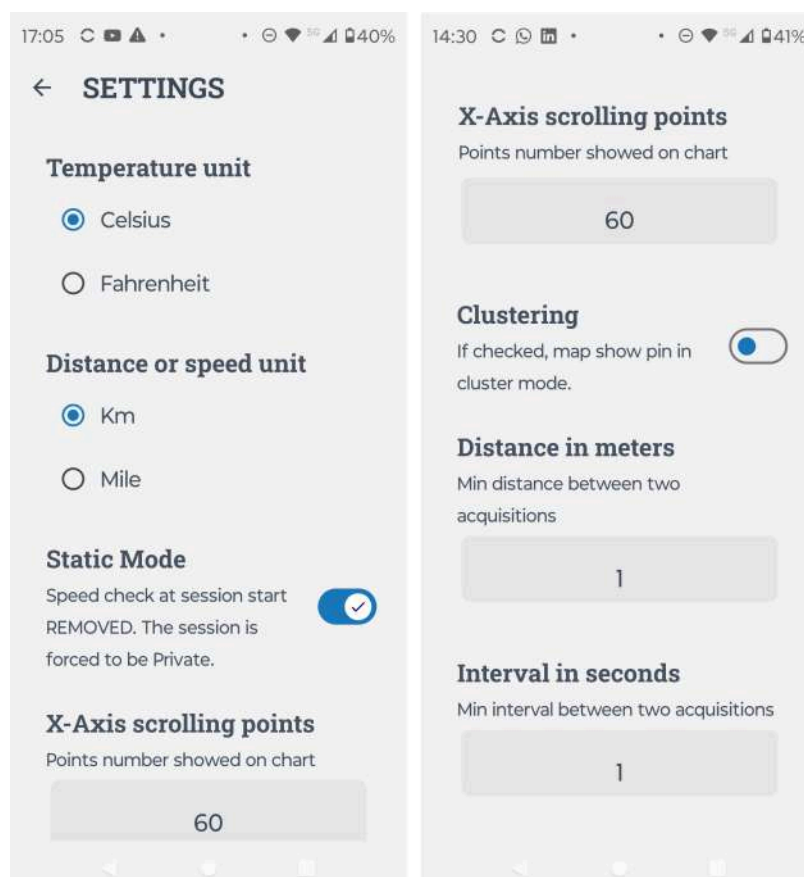
6. Settings and privacy

6.1. Settings

- Open the **Options screen** by tapping the hamburger menu. Here you can view the list of available entries, the MeteoTracker Bluetooth signal level (dependent on the distance between the MT device and the phone) and the MeteoTracker battery level. The same information is also shown for MT-AQ and MT-IR
- Select “Settings.”
The following settings are available:
 - ❖ Temperature unit (Celsius or Fahrenheit)
 - ❖ Distance and speed units (km or mile)
 - ❖ Static mode (OFF → speed monitoring active | ON → speed monitoring OFF)
 - ❖ X-axis scrolling points (select the number of points to be shown when the plot zoom is activated in the Graph Tab)
 - ❖ Clustering (keep it OFF)
 - ❖ Distance in meters (distance between 2 acquisitions)
 - ❖ Interval in seconds (time interval between 2 acquisition)

i Note: Data acquisition is triggered by whichever limit is reached first (distance or time interval). For example, with a distance of 10 m and a time interval of 3 s:

- If 12 m are traveled in 3 s, acquisition occurs after 10 m
- If 5 m are traveled in 4 s, acquisition occurs after 3 s



6.2. Privacy

Three privacy levels are available:

- **Public Signed:** the session author's nickname is publicly visible on the MeteoTracker dashboard and interactive map. The nickname can be changed on the MeteoTracker dashboard (app.meteotracker.com).
- **Public Anonymous:** the session is publicly visible, but the author's nickname is hidden
- **Private:** the session is visible only to the author

The privacy level is set by selecting one of the three options at the bottom of the **PREVIEW** screen before starting a session



7. Viewing data

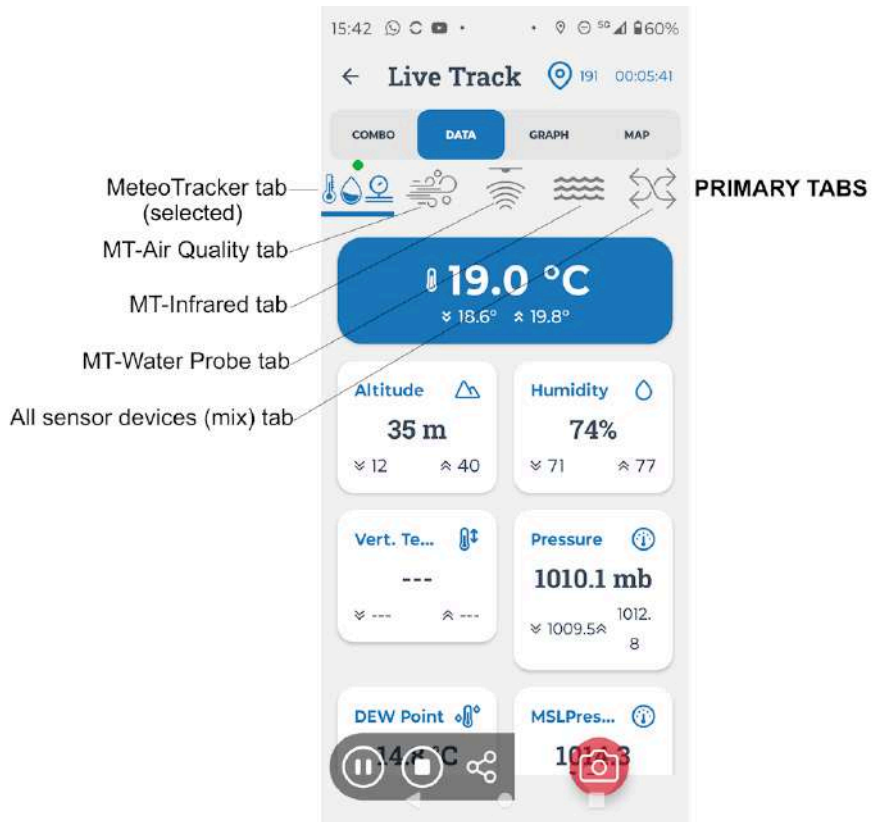
7.1. Live Track

Once the session starts, data visualization is organized into two levels of tabs:

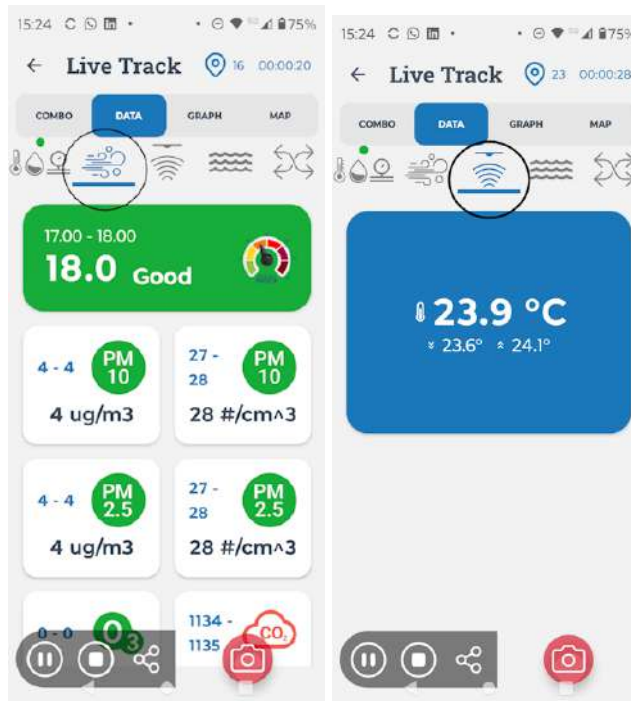
- **Primary tabs:** used to select the sensor device (**MT, MT-AQ, MT-IR, MT-WP**)
- **Secondary tabs:** used to select the visualization type (**Combo, Data, Graphs, Map**)

7.1.1. Primary tabs

MeteoTracker Tab (secondary Tab shown in the picture below: Data)



MT-Air Quality and MT-Infrared Tabs (secondary Tab: Data)



7.1.2. Secondary tabs

7.1.2.1. Combo Tab and the Timeline Navigation (MT Tab only)

The **Combo** tab provides integrated data visualization, **combining numeric, graph, and map views on a single screen.**



Combo Tab: Timeline Navigation (with Auto Return to Live)

Timeline Navigation is a feature that allows analysis of past measurements by correlating the numeric, map, and graph sections within a single screen.

- Tapping a point on the map highlights the corresponding point on the graph and displays the related value in the numeric section.
- Tapping a point on the graph highlights the corresponding point on the map and displays the related value in the numeric section.
- After 10 seconds, the displayed data automatically reverts to real-time values.

In the numeric section of the screen, the values measured in the selected point are displayed



Tapping a point in the graph the correlated marker in the map is highlighted. And viceversa

7.1.2.2. Data, Graph and Map tabs

Data tab

The **Data** tab displays measured values in numeric format.

Maximum and minimum values recorded during the session are shown in a smaller font size.

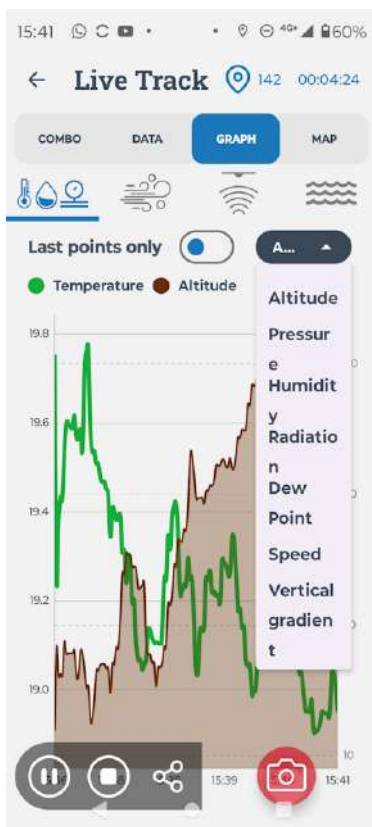


Graphs Tab

The Graphs Tab displays plots of the measured values (two plots available, with temperature values as a fixed default).

Two plots are available, with one dedicated to temperature values, which cannot be replaced by other variables.

According to the selected Primary Tab (sensor device), the list of measured (plottable) variables is available in a drop-down menu.



Map tab

The **Map tab** displays measured data on the map using colored markers based on a chromatic scale. The following numerical values are also shown:

- Speed
- Temperature
- Relative humidity
- Altitude
- Infrared temperature
- Total distance travelled

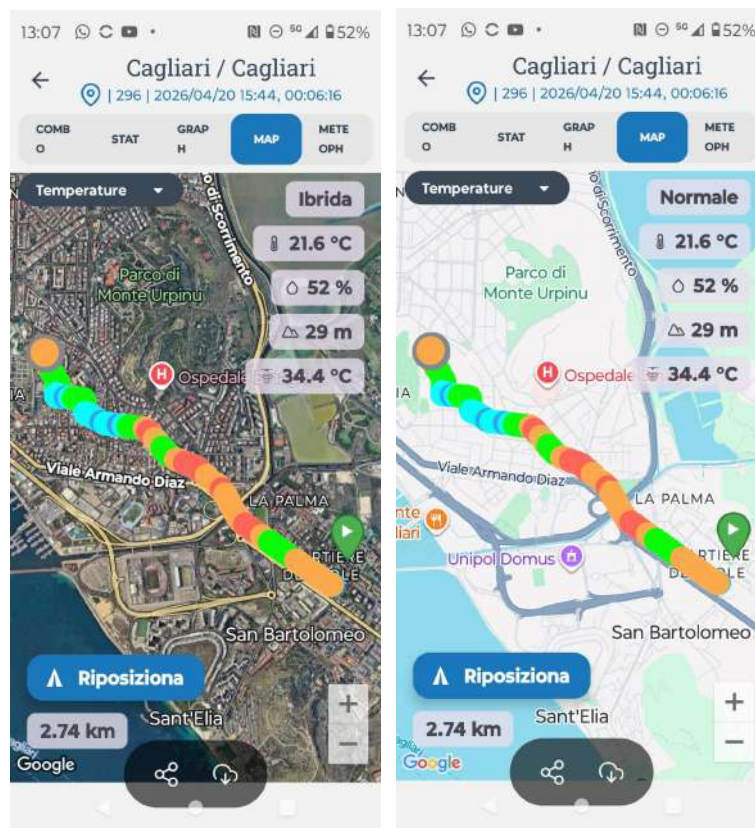
The variable displayed on the map can be selected from the drop-down menu in the upper-right corner:

- Temperature

- Infrared temperature
- PM10 concentration

Four map formats are available:

- Standard
- Satellite
- Hybrid
- Terrain



7.2. Session archive

The **Session Archive** is divided into three categories (tabs):

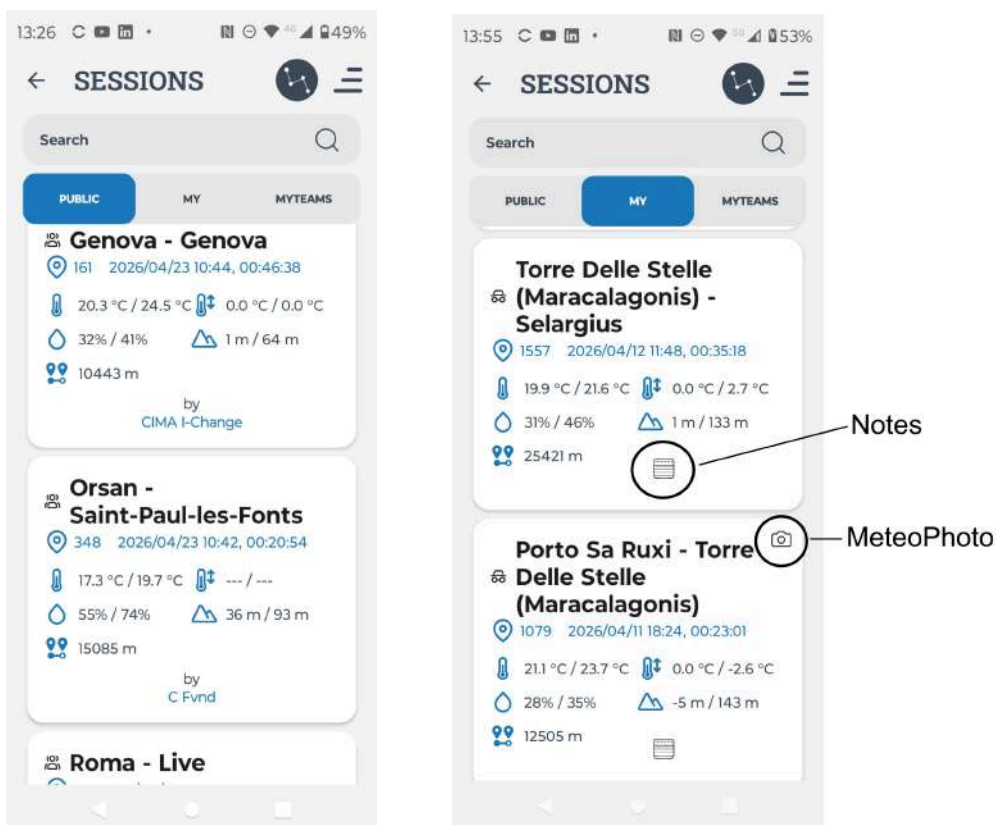
- **Public:** Displays all publicly available sessions
- **My:** Displays all sessions collected by the user (both public and private)
- **My Team:** Displays sessions collected by project members (visible only to project administrators)

The sessions are displayed as a sequence of cards summarizing the main session data:

- Start and end locations
- Number of points
- Date and time of session start
- Session duration
- Maximum and minimum values recorded during the session
- Distance travelled
- Author name, if not anonymous

In MY session list:

- the MeteoPhoto icon indicates that MeteoPhotos were taken in that session
- Tapping on the notes icon, a form is opened for annotating observations and comments



The listing structure is based on pagination: the first **100 sessions** are displayed initially. When scrolling to the end of the list, additional sessions are automatically loaded in batches of **100**, following chronological order.

7.2.1. Primary tabs

Same as LIVE TRACK tabs

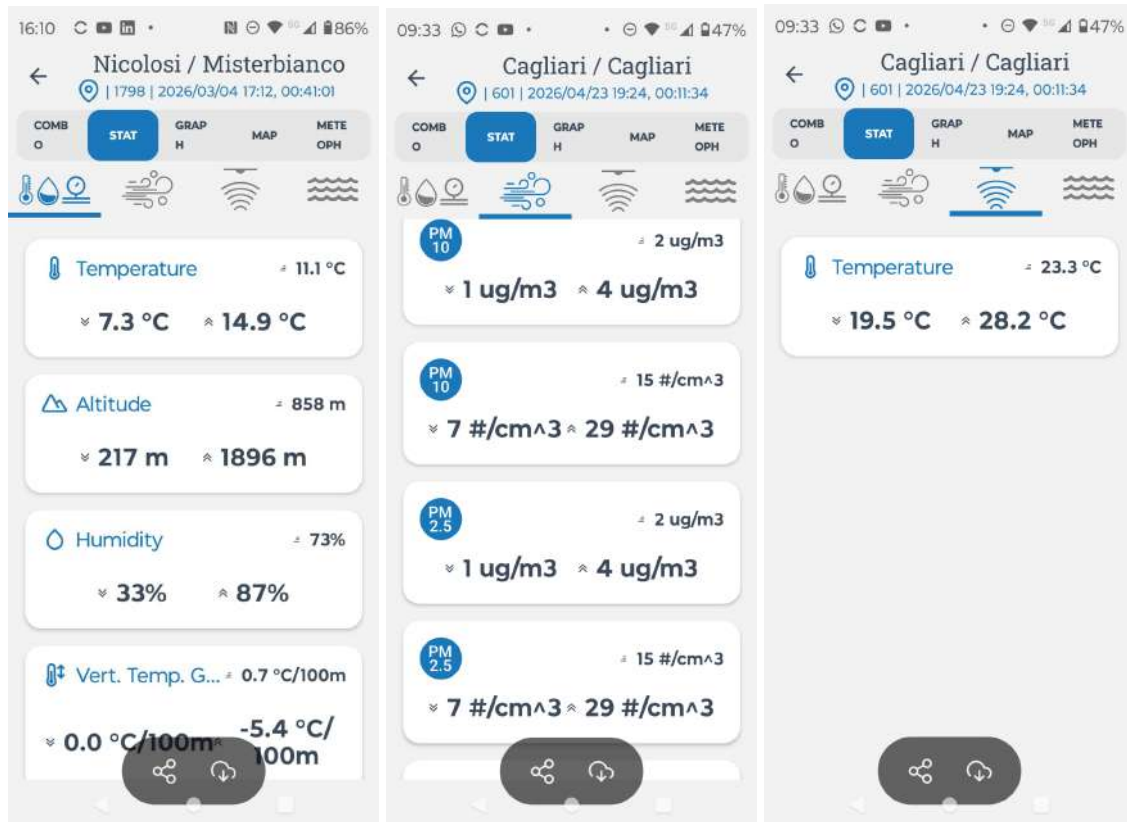
7.2.2. Secondary tabs

The secondary tabs structure is very similar to the **Live Track** ones. The only differences are:

- The “**Statistics**” tab replaces the “**Data**” tab
- The addition of the “**MeteoPhoto**” tab, which provides a gallery of the MeteoPhotos taken during the session

7.2.2.1. Statistics tab

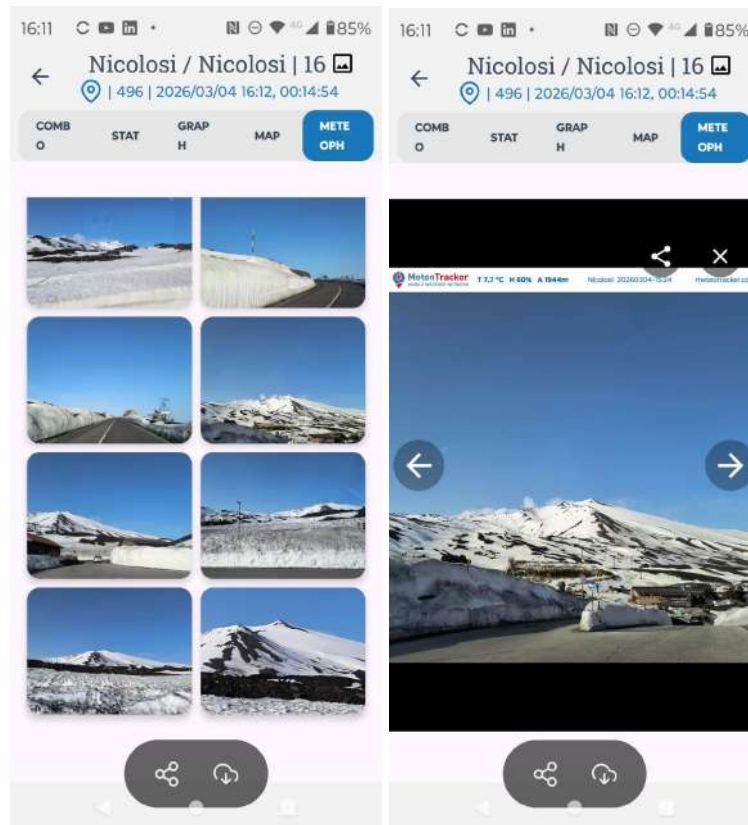
The **Statistics tab** displays the maximum, minimum and average values of the variables measured in the session. A Statistic tab is generated for each device used in the session (MT, MT-Air Quality, MT-Infrared and MT-Water Probe)



7.2.2.2. MeteoPhoto tab

The **MeteoPhoto tab** displays the gallery of MeteoPhotos taken during the session. To open a picture, tap its preview.

The share button allows you to share the MeteoPhoto via its link.



8. Features and technical details

8.1. CSV download

Personal (My tab) and team (MyTeam tab) sessions can be downloaded directly from the app, not only from the MeteoTracker dashboard (app.meteotracker.com).

- Open the session of interest
- Tap the download icon at the bottom of the screen



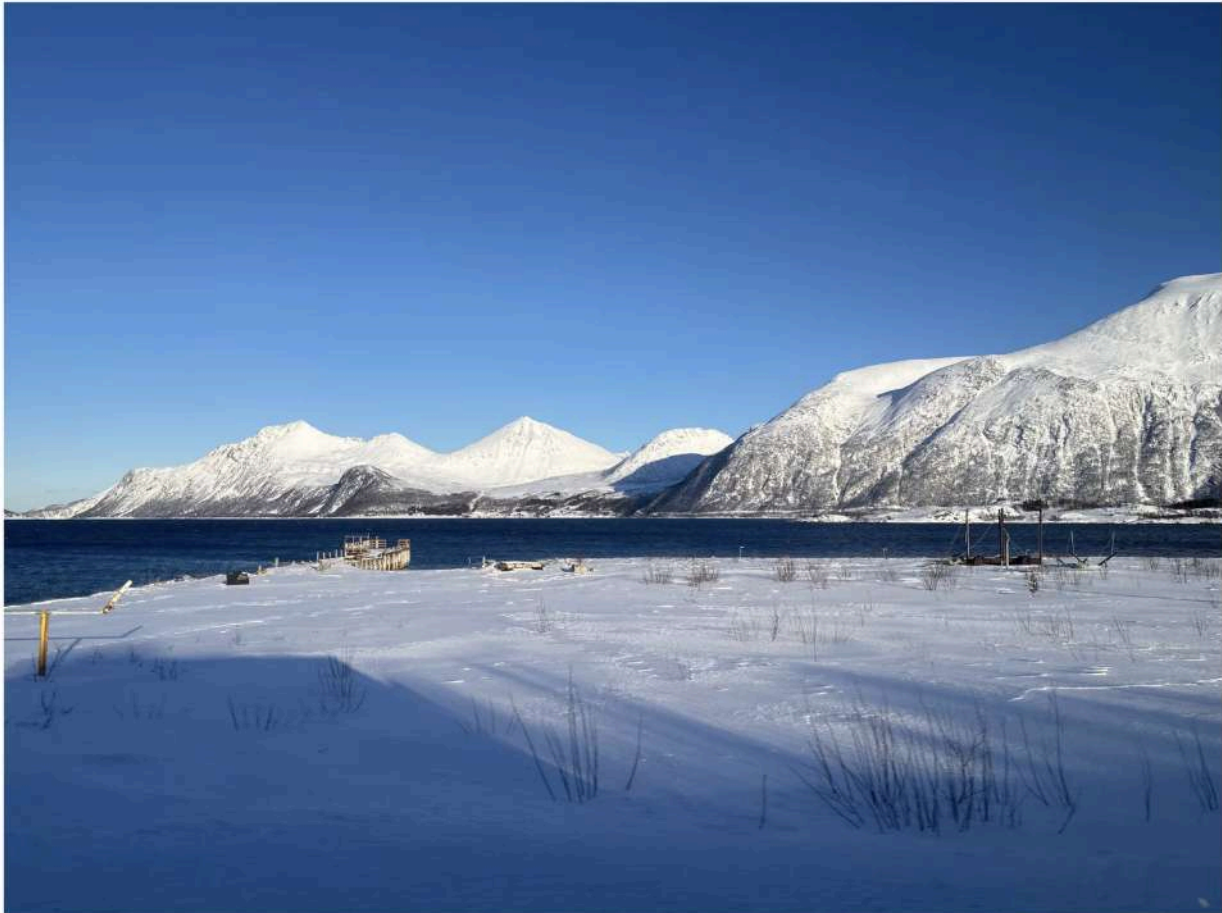
	A	B	C	D	E	F	G	H	I	J	
l	Time	Lat	Lon	Temp[°C]	Hum[%]	Alt[m]	Press[mbar]	DP[°C]	θ[K]	HDX[°C]	Air den
2	2026-04-10T22:44:56+02:00	39.1985067	9.15319	21.3	47	8.1016.2			10.311.9	22.9	
3	2026-04-10T22:44:58+02:00	39.1984017	9.1509217	20.4	50	9.1016.1			10.311.21.8	1.2	
4	2026-04-10T22:44:58+02:00	39.1984017	9.1509217	20.4	50	9.1016.1			10.311.21.8	1.2	
5	2026-04-10T22:44:59+02:00	39.1984017	9.1509217	20.4	50	9.1016.1			10.311.21.8	1.2	
6	2026-04-10T22:45:00+02:00	39.19951	9.1506933	20.3	50	9.1016.1	9.9	310.8	21.7		
7	2026-04-10T22:45:01+02:00	39.19951	9.1506933	20.3	50	9.1016.1	9.9	310.8	21.7		
8	2026-04-10T22:45:02+02:00	39.1996417	9.15047	20.3	50	9.1016.1	9.9	310.8	21.7		
9	2026-04-10T22:45:04+02:00	39.1996417	9.15047	20.3	51	7.1016.3			10.310.9	21.8	
0	2026-04-10T22:45:06+02:00	39.1997433	9.1502967	20.3	51	7.1016.3			10.310.9	21.8	
1	2026-04-10T22:45:07+02:00	39.1997433	9.1502967	20.3	51	7.1016.3			10.310.9	21.8	
2	2026-04-10T22:45:09+02:00	39.1998433	9.1501433	20.3	51	7.1016.2			10.310.9	21.7	
3	2026-04-10T22:45:10+02:00	39.1998433	9.1501433	20.3	51	7.1016.2			10.310.9	21.7	
4	2026-04-10T22:45:11+02:00	39.19994	9.149945	20.3	51	7.1016.2			10.310.9	21.7	
5	2026-04-10T22:45:12+02:00	39.19994	9.149945	20.3	51	8.1016.2			10.310.9	21.7	
6	2026-04-10T22:45:13+02:00	39.19994	9.149945	20.3	51	8.1016.2			10.310.9	21.7	
7	2026-04-10T22:45:14+02:00	39.2000633	9.1497233	20.2	51	8.1016.2			10.310.8	21.7	
8	2026-04-10T22:45:15+02:00	39.2000633	9.1497233	20.2	51	8.1016.2			10.310.8	21.7	
9	2026-04-10T22:45:16+02:00	39.2000633	9.1497233	20.2	51	8.1016.2			10.310.8	21.7	
0	2026-04-10T22:45:18+02:00	39.200215	9.1494883	20.2	51	7.1016.2			10.310.8	21.6	
1	2026-04-10T22:45:19+02:00	39.200215	9.1494883	20.2	51	7.1016.2			10.310.8	21.6	
2	2026-04-10T22:45:20+02:00	39.200215	9.1494883	20.2	51	7.1016.2			10.310.8	21.6	
3	2026-04-10T22:45:21+02:00	39.2003533	9.149275	20.2	51	7.1016.3			10.1.310.9	21.6	
4	2026-04-10T22:45:22+02:00	39.200365	9.1491083	20.2	51	6.1016.3			10.1.310.9	21.6	
5	2026-04-10T22:45:23+02:00	39.200365	9.1491083	20.2	51	6.1016.3			10.1.310.9	21.6	
6	2026-04-10T22:45:24+02:00	39.200365	9.1491083	20.2	51	6.1016.3			10.1.310.9	21.6	
7	2026-04-10T22:45:25+02:00	39.200365	9.1491083	20.2	51	6.1016.3			10.1.310.9	21.6	
8	2026-04-10T22:45:27+02:00	39.200225	9.1490567	20.2	52	7.1016.2			10.1.310.9	21.6	
9	2026-04-10T22:45:28+02:00	39.200225	9.1490567	20.2	52	7.1016.2			10.1.310.9	21.6	
0	2026-04-10T22:45:29+02:00	39.2000033	9.148995	20.2	52	9.1016.1			10.1.310.9	21.6	
1	2026-04-10T22:45:30+02:00	39.2000033	9.148995	20.1	51	11.1016			10.310.7	21.6	
2	2026-04-10T22:45:31+02:00	39.2000033	9.148995	20.1	51	11.1016			10.310.7	21.6	
3	2026-04-10T22:45:32+02:00	39.199775	9.14888	20.1	51	11.1016			10.310.7	21.6	
4	2026-04-10T22:45:33+02:00	39.199775	9.14888	20.1	51	11.1016			10.310.7	21.5	
5	2026-04-10T22:45:34+02:00	39.199775	9.14888	20.1	51	11.1016			10.310.7	21.5	
6	2026-04-10T22:45:36+02:00	39.19953	9.1487767	20.1	52	12.1016			10.310.7	21.5	
7	2026-04-10T22:45:37+02:00	39.19953	9.1487767	20.1	52	12.1016			10.310.7	21.5	
8	2026-04-10T22:45:38+02:00	39.1992767	9.1486767	20.1	52	11.1016.1			10.310.7	21.5	
9	2026-04-10T22:45:39+02:00	39.1992767	9.1486767	20	52	11.1016.1			10.310.6	21.4	
0	2026-04-10T22:45:40+02:00	39.1992767	9.1486767	20	52	11.1016.1			10.310.6	21.4	
1	2026-04-10T22:45:41+02:00	39.1992767	9.1486767	20	52	11.1016.1			10.310.6	21.4	
2	2026-04-10T22:45:43+02:00	39.1988467	9.1485017	20	52	12.1016			10.310.6	21.5	
3	2026-04-10T22:45:44+02:00	39.1988467	9.1485017	20	52	12.1016			10.310.6	21.5	
4	2026-04-10T22:45:45+02:00	39.1988467	9.1485017	20	52	12.1016			10.310.6	21.5	
5	2026-04-10T22:45:46+02:00	39.1986367	9.148405	20	52	11.1016			10.310.6	21.4	
6	2026-04-10T22:45:47+02:00	39.1986367	9.148405	20	52	11.1016			10.310.6	21.4	
7	2026-04-10T22:45:48+02:00	39.1986367	9.148405	20.1	52	10.1016.1			10.310.7	21.5	
8	2026-04-10T22:45:49+02:00	39.1986367	9.148405	20.1	52	10.1016.1			10.310.7	21.5	
9	2026-04-10T22:45:50+02:00	39.1984633	9.1483567	20.1	52	10.1016.1			10.310.7	21.5	

8.2. MeteoPhoto

MeteoPhoto is a feature that allows pictures to be taken during a session, with the weather data measured at that moment displayed in the header or footer of the picture.

The MeteoPhoto gallery is available in the App, in the dedicated tab, when a session is opened from the history list (see sub-section 6.2.2.2).

The MeteoPhoto gallery is also available on the MeteoTracker website, where MeteoPhotos can be filtered by country/region, time, author, and category: <https://meteotracker.com/meteophoto/>



8.3. Vertical Temperature Gradient

The **Vertical Temperature Gradient (VTG)** indicates how the temperature varies vs. altitude, when climbing or descending. The rigorous definition is “the vertical component of the temperature gradient” (the vertical gradient is a vector).

The MeteoTracker+ app computes the Vertical Temperature Gradient (VTG) using the following **algorithm**:

- The altitude variation is continuously monitored.
- If the altitude changes by more than 20 m within 40 seconds, the temperature difference between the lowest and highest altitudes is calculated. This difference is then divided by the altitude variation to determine the Vertical Temperature Gradient (VTG), which is displayed in the corresponding card (blinking value).
- If the altitude variation is insufficient, no VTG value is displayed.

A positive VTG indicates a thermal inversion, meaning that temperature increases with altitude.

8.4. Altitude: periodic, automatic fix and manual fix

This feature corrects **altitude errors** that may develop during a session. In fact, since altitude is calculated **barometrically**, pressure changes caused by weather evolution or movement across different areas can introduce inaccuracies.

For example, an atmospheric pressure decrease of **3 mbar** over one hour (e.g., due to an incoming cold front) can result in an altitude overestimation of approximately **25 meters**.

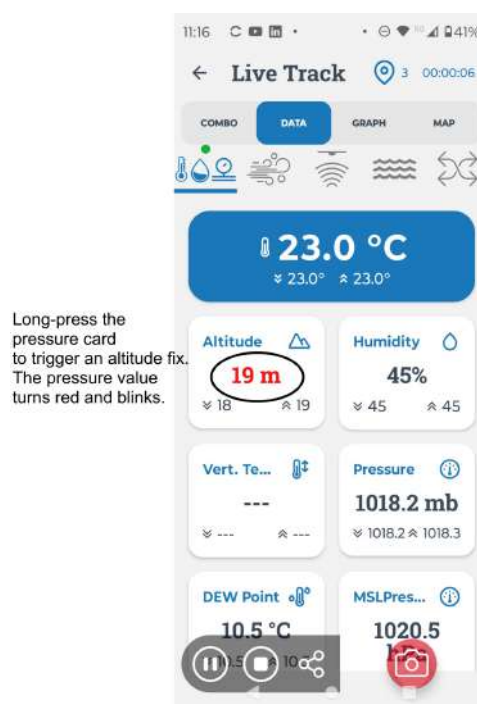
To compensate for these effects, the MeteoTracker+ app performs an **automatic altitude fix** every 10 minutes. An altitude fix consists of querying an online service to retrieve the correct altitude at the user's current coordinates.

In addition, **the user can perform a manual fix by long-pressing the altitude card**.

A blinking red value indicates that an altitude fix has been performed.

Summary of pressure–altitude management:

- When a **session starts**, an altitude fix is performed, associating the actual altitude and the measured pressure.
- **Mean Sea Level (MSL)** pressure is calculated with the barometric formula and displayed in the related card on the Data tab
- **Altitude variations** are then calculated barometrically, using the relationship between pressure changes and altitude changes.
- A **new altitude fix** is automatically performed every 10 minutes.
- A **manual altitude fix** can be triggered by long-pressing the pressure card.
- A **red, blinking value** indicates that an altitude fix is being performed.
- **MSL pressure is recalculated** at each altitude fix



8.5. Offline data management

When data collection is carried out in areas without data coverage (no internet connection):

- Measured values are stored locally on the smartphone
- Altitude fix is performed using GNSS altitude data, which is typically less accurate than the web-based service
- Once the data connection is restored, the offline data are automatically uploaded to the server, and the start and end location names of the session are retrieved

8.6. Tunnel data acquisition (data acquisition without GNSS signal)

The MeteoTracker+ app allows data collection even when a GNSS signal is unavailable, such as when traveling through tunnels.

When the GNSS signal is lost, data acquisition is automatically triggered based on the time interval set by the user.

Data collected in the absence of GNSS are not displayed on the map, as no coordinates are available. However, the MeteoTracker software infrastructure reconstructs their position by placing these data points along the segment connecting the tunnel entrance and exit.

Values measured inside tunnels are excluded from the database statistics to avoid altering the weather dataset. By refreshing the session list (up-down swipe), these values are also removed from the session statistics in the *My* tab.

8.7. Remote Live Track

The Remote Live Track feature allows MeteoTracker+ users to visualize, in real time, sessions carried out by other users. The interface is the same as that used for a standard Live Track session.

Live sessions can be accessed either from the **Public Sessions** tab or via a **direct link** shared by other MeteoTracker+ users while a measurement session is ongoing. The direct link can be generated from the Live Track tab.



8.8. Guard Time and Auto-pause

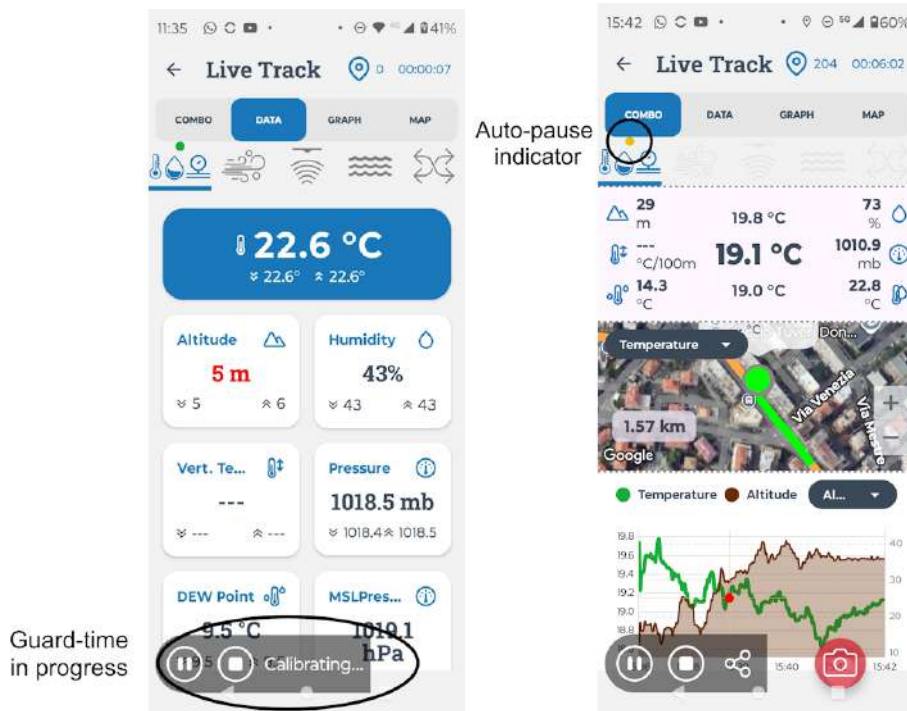
The Guard Time and Stop Time features are designed to preserve data quality by preventing inaccurate data from being recorded.

Guard Time

- **Purpose:** to discard initial data that may be unreliable (e.g., when the MeteoTracker device has been overheated inside a vehicle exposed to sunlight).
- **How it works:** the system monitors vehicle speed and enables data acquisition only after at least 10 measurement points have been recorded at a speed of 7 km/h or higher.

Auto-pause

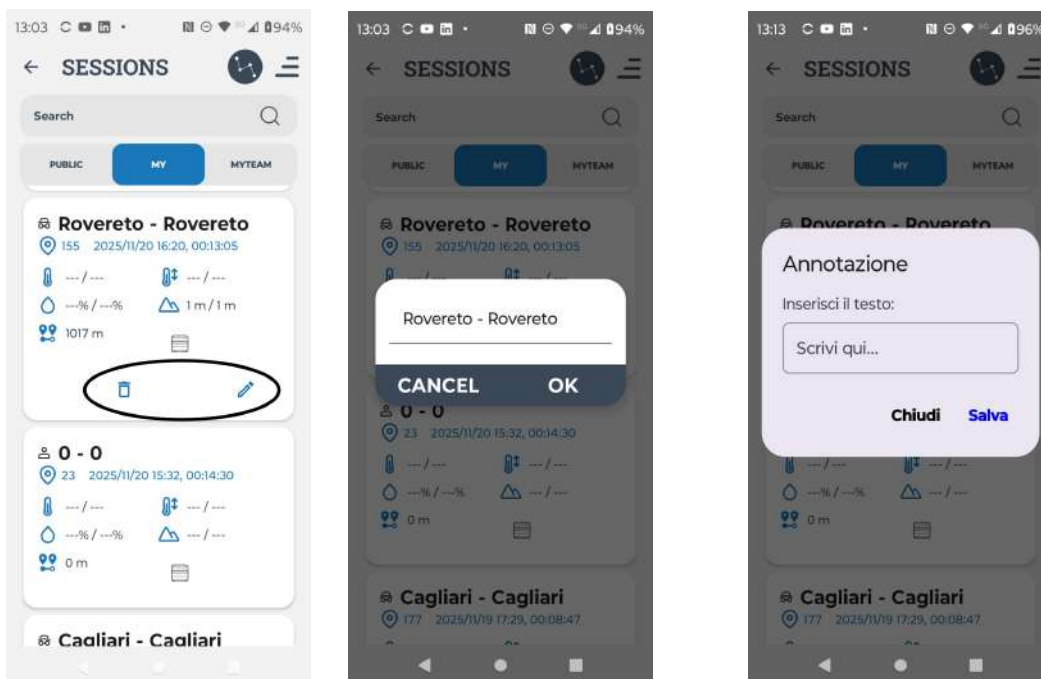
- **Purpose:** To pause data acquisition when an excessive increase in temperature is detected while the vehicle is stationary.
- **How it works:** When the vehicle speed drops to zero, the MeteoTracker+ app begins monitoring temperature. If a variation greater than ± 0.5 °C is detected, data recording is paused. When the vehicle starts moving again, the Guard Time algorithm is applied before data acquisition resumes.



8.9. Editing session fields and adding notes

By long-pressing the session card, editing of the start and end locations is enabled. The 'Delete session' function is also available.

To **add a note** (observations, comments, etc.) to a session, tap the notepad icon on the session card in the My list. An editable form will open. Tap "Save" to store the annotation.



9. Specifications and accuracy

9.1. Weather data (MeteoTracker)

- **Air temperature**
 - accuracy: +/- 0.1° C typ (sensors) | +/- 0.4° C under solar radiation with speed > 10 km/h
 - Measurement speed: ≥ 15 °C variation detected over a 30 s interval at 20 km/h, under a stepped temperature change of 30 °C.
- **Relative Humidity**
 - Accuracy: 1% (typ)
 - operative range: from 0% to 100%
- **Pressure**
 - Accuracy: +/- 0.03 mbar (relative) | +/-0.50 mbar (absolute)
- **MSL Pressure**
 - Accuracy: +/- 1 mbar
- **Dew-point temperature**
 - Accuracy: +/-0.5° C
- **Altitude above sea level - QNH**
 - accuracy: +/- 10 m (accuracy may be impacted by accuracy of the web service used for altitude fix)
- **Vertical thermal gradient**
 - +/- 0.5° C/ 100 m
- **Solar Radiation Intensity Indicator**
 - Accuracy: N.A.
- **Speed**
 - Accuracy: N.A. (smartphone GNSS receiver dependant)

SAMPLING FREQUENCY

- Up to 0.3 Hz

9.2. Air Quality data (MT-AQ)

PMx (SPS30 Sensirion)

1.1 Specification Overview

Parameter	Conditions	Value	Units	
Mass concentration range	-	0 to 1'000	µg/m ³	
Mass concentration size range	PM1.0	0.3 to 1.0	µm	
	PM2.5	0.3 to 2.5	µm	
	PM4	0.3 to 4.0	µm	
	PM10	0.3 to 10.0	µm	
Mass concentration precision ^{1,2} for PM1 and PM2.5 ³	0 to 100 µg/m ³	±10	µg/m ³	
	100 to 1000 µg/m ³	±10	% m.v.	
Mass concentration precision ^{1,2} for PM4, PM10 ⁴	0 to 100 µg/m ³	±25	µg/m ³	
	100 to 1000 µg/m ³	±25	% m.v.	
Maximum long-term mass concentration precision limit drift	0 to 100 µg/m ³	±1.25	µg/m ³ / year	
	100 to 1000 µg/m ³	±1.25	% m.v. / year	
Number concentration range	-	0 to 3'000	#/cm ³	
Number concentration size range	PM0.5	0.3 to 0.5	µm	
	PM1.0	0.3 to 1.0	µm	
	PM2.5	0.3 to 2.5	µm	
	PM4	0.3 to 4.0	µm	
	PM10	0.3 to 10.0	µm	
Number concentration precision ^{1,2} for PM0.5, PM1 and PM2.5 ³	0 to 1000 #/cm ³	±100	#/cm ³	
	1000 to 3000 #/cm ³	±10	% m.v.	
Number concentration precision ^{1,2} for PM4, PM10 ⁴	0 to 1000 #/cm ³	±250	#/cm ³	
	1000 to 3000 #/cm ³	±25	% m.v.	
Maximum long-term number concentration precision limit drift ²	0 to 1000 #/cm ³	±12.5	#/cm ³ / year	
	1000 to 3000 #/cm ³	±1.25	% m.v. / year	
Sampling interval	-	1±0.04	s	
Typical start-up time ⁵	number concentration	200 – 3000 #/cm ³	8	s
		100 – 200 #/cm ³	16	s
		50 – 100 #/cm ³	30	s
Sensor output characteristics	PM2.5 mass concentration	Calibrated to TSI DustTrak™ DRX 8533 Ambient Mode		
	PM2.5 number concentration	Calibrated to TSI OPS 3330		
Lifetime ⁶	24 h/day operation	> 10	years	
Acoustic emission level	0.2 m	max.	25	dB(A)
Long term acoustic emission level drift	0.2 m	max.	+0.5	dB(A) / year
Additional T-dependent mass and number concentration precision limit drift ²	temperature difference to 25°C	typ.	±0.5	% m.v. / °C
Weight	-	26.3 ±0.3	g	

CO2 (Sensirion SCD4X)

1.1 CO₂ Sensing Performance

Default conditions of 25 °C, 50 % RH, ambient pressure 1013 mbar, default periodic measurement and 3.3 V supply voltage apply to values in the table below, unless otherwise stated.

Parameter	Conditions	Value
CO ₂ output range ¹	-	0 – 40'000 ppm
SCD40 CO ₂ measurement accuracy ²	400 ppm – 2'000 ppm	± (50 ppm + 5% of reading)
SCD41 CO ₂ measurement accuracy ²	400 ppm – 5'000 ppm	± (40 ppm + 5% of reading)
Repeatability	Typical	± 10 ppm
Response time ³	τ _{63%} , typical	60 s
Accuracy drift per year with automatic self-calibration algorithm enabled ⁴	Typical	± (5 ppm + 0.5 % of reading)

Table 1: SCD40 and SCD41 CO₂ sensor specifications

EPA INDEX (ZMOD4510 Renesas)

Table 7. Typical ZMOD4510 Sensor Module Accuracy Achievable

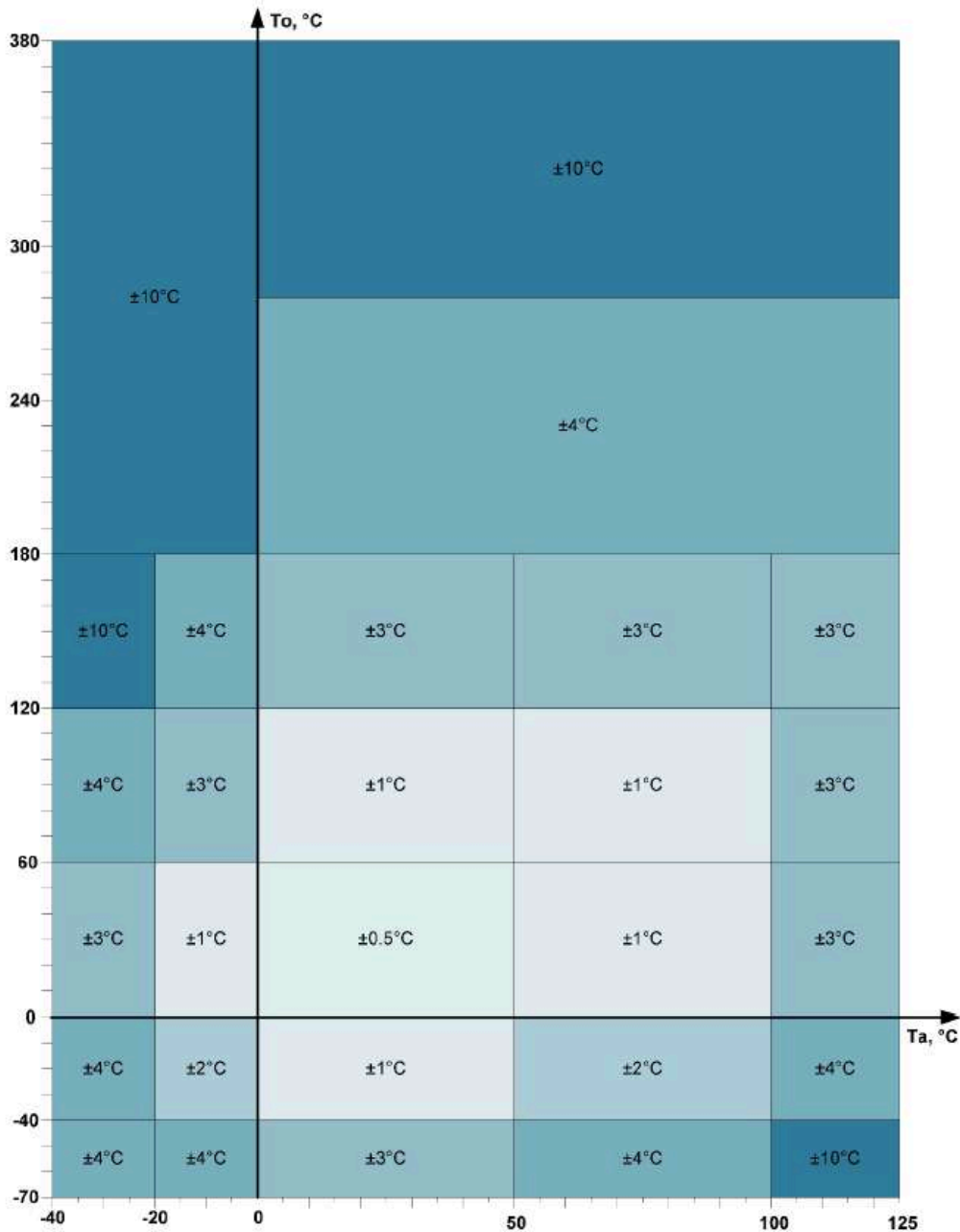
Parameter	Conditions	Minimum	Typical	Maximum	Unit
Accuracy	Without additional calibration		±50		AQI
Consistency	Part-to-Part Variation		±50		AQI
Durability to Siloxanes	Change in sensitivity during 15,000 ppm·h exposure with D4 and D5		±8		%

i Note: the Zmod sensor requires long calibration time before getting consistent data so it fits well static, long-lasting measurement sessions, while its accuracy can be degraded in intermittent use case. So, no frequent power cycling should be performed. As a consequence, mobile, intermittent, usage can be problematic as far as accuracy is concerned.

9.3. Surface temperature (MT-IR)

- **Surface temperature (To)**
 - **accuracy:** +/- 0.5° C typ (sensors) in wide temperature range – 0°C...+50°C for both Ta (air temperature) and To (surface temperature) - see matrix below

- **resolution:** 0.02 °C
- **range:** -40°C | +125°C for sensor temperature ▪ -70°C | +380°C for object temperature



10. FAQs and Troubleshooting

10.1. FAQs

Can I view only my own sessions in the MeteoTracker app, or can I also see sessions from other users?

In the MeteoTracker app, you can view both your own sessions and those shared by other users. Sessions recorded in **public mode** are visible to everyone. Also, MeteoTracker+ includes a **Live Sharing** feature, which lets you view ongoing sessions in real time using the same interface as your own sessions.

Can a single sensor device be used on its own?

Yes, each sensor device can be used independently. You can operate a single device on its own without needing to connect or use the others, with the exception of the **MT-WP**, which must be connected to the **MT-AQ** via its USB port to operate.

What is the maximum distance allowed between the sensor device and the smartphone?

The typical range is between 3 and 45 meters, depending on the environment. Since the sensor devices communicate with the smartphone via Bluetooth, the maximum distance is influenced by several factors. The most significant is the presence of obstacles—especially metal surfaces—which can greatly reduce signal strength. Under normal operating conditions, however, Bluetooth coverage is generally not an issue.

10.2. Troubleshooting

MeteoTracker device not returning to ADV mode after session closing

If the MeteoTracker device does not return to ADV mode after closing a session (ADV LED not blinking), ensure that the Preview screen is closed.

To restore ADV mode, navigate back to the app home screen (the **“TRACK NOW”** and **“SESSIONS”** screen).

MeteoTracker device not returning to ADV mode after moving back to home screen

In some cases, even after returning to the app home screen, the MeteoTracker device may not switch back to ADV mode and may appear unresponsive.

This can occur if the Bluetooth connection between the smartphone and the MeteoTracker device remains active, preventing the device from returning to ADV status.

Solutions (alternative options):

- Turn off Bluetooth on your smartphone, **or**
- Reset the MeteoTracker device by pressing and holding the ON button for 15 seconds, until the red reset LED starts blinking.

REFERENCES

- [MeteoTracker documentation](#)
- www.meteotracker.com
- info@meteotracker.com
- <https://www.linkedin.com/showcase/meteotracker/>