

Cartograph Maps Pro 2.5.0

Manual

Version 0.2, 26th June 2019

<http://www.cartograph.eu>

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Introduction

The Cartograph Maps Pro app is a **multi-platform** map viewing application available for Android, iOS, macOS, Windows, and Windows Phone. The main features of the app are:

- Full support for Mapsforge offline vector maps.
- Support for offline (RMAP, SQLite, Locus, Oruxmaps) and online (OpenStreetMap.org, WMS, etc.) raster maps.
- Support for offline hill shading-, relief-, and slope maps.
- Background track recording.
- Support for points of interest and waypoints.
- Voice/sound alerts along routes.
- Basic route planning.

Download and Updates

The Cartograph app can be downloaded here:

<http://www.cartograph.eu/download>

Contact Information

We are always looking forward to feature requests, ideas, and other comments. The fastest way to reach us is by email or with the contact form which can be found here:

<http://www.cartograph.eu/contact>

Please **include all relevant information** in your message such as **system** (e.g. "Android 7.1"), and used **device** (e.g. „iPhone 8“).

We also have a Facebook site:

<https://www.facebook.com/Cartograph.eu/>

User Interface

Cartograph offers a similar user experience across all platforms.

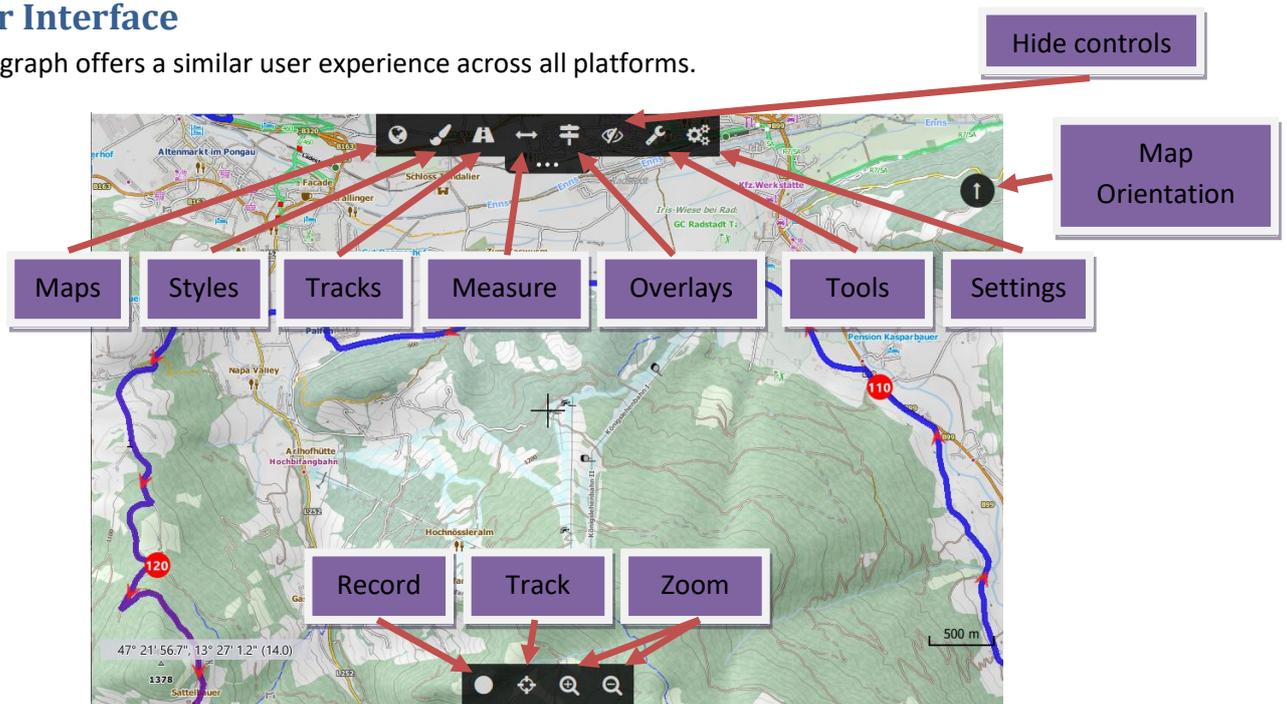


Figure 1: User interface

The main view consists of a top toolbar which allows access to maps, styles, tracks, and settings, the main map view, and a bottom toolbar with recording and map controls. The top- and bottom toolbars have optional handles for hiding the toolbars (the handles can be activated and deactivated in the General Settings).

Map interaction

The following map interactions are supported:

- **Zooming:** pinch gesture, double click, mouse wheel, +/- keyboard keys.
- **Moving:** dragging, keyboard left/right/up/down direction keys.
- **Manual rotation:** touch gesture.
- **Map refresh:** F5 key.
- **Popup menu:** long press gesture, right mouse button.

Note: If the keyboard interaction does not work then focus the map by clicking once on the map.

The following shortcuts are available for quickly accessing the various Cartograph features:

- **CTRL+,:** App settings.
- **CTRL+m:** Maps manager.
- **CTRL+s:** Styles manager.
- **CTRL+t:** Track manager.
- **CTRL+o:** Overlays manager.
- **CTRL+f:** Search for POI.
- **CTRL+l:** Map layer style.
- **CTRL+=:** Zoom in.

- **CTRL+R:** Refresh the map.

Map popup menu

The map popup menu opens with a right click or long touch on the map. The popup can be disabled in the General Settings. The items shown in the map popup menu can be modified using the “Map popup entries” option.

The following entries are available:

- **Distance marker start:** Shows a selection dialog for setting the route’s start position. This entry is only visible when a route is loaded. The following options are available:
 - **Route start position:** Sets the start position to the route’s start position.
 - **Current position:** Sets the start position to the current GPS location.
 - **Selected position:** Sets the start position to the location where the map popup has been opened.
- **Split route:** This entry shows a selection dialog for splitting the loaded route into multiple routes. This entry is only visible when a route is loaded. The following options are available:
 - **Current position:** Splits the route at the current GPS location.
 - **Selected position:** Splits the route at the location where the map popup has been opened.
- **Add waypoint:** Adds a new waypoint at the click location. This entry is only visible during track editing/recording.
- **Add photo waypoint:** Adds a new photo waypoint at the location. This entry is only visible during track editing/recording.
- **Add bookmark:** Adds a bookmark at the location.
- **Center map here:** Centers the map at the location.
- **Coordinate to clipboard:** Copies the location’s latitude/longitude to the system clipboard.
- **Altitude:** Shows the altitude of the location.
- **Switch map:** Shows a list of maps available for the location.
- **Navigate here:** Shows the navigation tools (see “Searching/calculating a route”).
- **What’s here:** Shows a list of POIs which are under or close to the location.
- **Set map center here:** Sets the visible map center from the screen center to this position. The map center is automatically reset to the screen center when the Cartograph app is restarted.
- **Measure distance:** Shows a tool for measuring the distance from the position.
- **Distance map center:** Shows the distance from the position to the map center.

Top toolbar

The top toolbar has the following entries:

- **Maps:** The maps menu provides access to all map related options.
 - **Manage maps:** Import, add, remove, and edit maps.
 - **Reload map/overlay:** Reloads (redraws) the map/overlay.
 - **Screenshot:** Takes a screenshot of the current map view.
 - **Map language:** If the current map supports languages then this menu allows selecting the map language.

- **Download elevation data:** This menu allows downloading of elevation data for the currently visible region.
 - **3D map snapshot:** Shows a 3D snapshot of the current map view.
- **Styles:** The styles menu provides access to styles.
 - **Manage styles:** Import, add, and remove styles (Mapsforge render themes).
 - **Toggle night/day:** Toggle between night and day map rendering modes.
 - **Map/overlay layer style:** If a Mapsforge map is loaded then this option allows selecting different layers and layer options from the Mapsforge render theme.
- **Tracks:** The tracks menu provides access to track- and route related options.
 - **Manage tracks:** Import, export, upload, and edit tracks and routes.
 - **Draw track:** Draw a track on the map.
 - **Route waypoints:** Shows a list of waypoints along the loaded route. This menu is only visible when a route is loaded.
 - **Go to route start:** Goes to the route start. This menu is only visible when a route is loaded.
 - **Routing:** Opens a view with routing options like route deviation and waypoint voice alerts. This menu is only visible when a route is loaded.
 - **Route altitude profile:** Shows the route's altitude profile. This menu is only visible when a route is loaded.
 - **Reverse route:** Reverses the loaded route. This menu is only visible when a route is loaded.
 - **Search route:** Search a route between points.
 - **Clear all tracks:** Removes all loaded tracks from the map.
 - **Live tracking:** Shows options for live tracking, e.g. sharing location information with others.
- **Measure:** The measuring tool allows measuring of distances between two points.
- **Overlays:** The overlay menu provides means for viewing and searching bookmarks, points of interest (POIs), and addresses.
 - **Hide all overlays:** Shows/hides all overlays.
 - **Manage overlays:** Add, remove, and edit overlays. An overlay groups a set of points of interests or bookmarks.
 - **Add bookmark:** Adds a bookmark.
 - **Show bookmarks:** Shows a list of all bookmarks.
 - **Search POI:** This option allows searching for POIs and addresses.
 - **Go to coordinate:** Go to a specific latitude/longitude coordinate.
 - **Remove all overlays from map:** Removes all overlays from the map.
 - **Clear search results:** Removes all search results from the map.
- **Hide controls:** This option hides all controls (e.g. the top- and bottom toolbars).
- **Tools:** The tools menu provides tools like a magnifier, screen lock, etc.
 - **Screen lock:** Locks the screen without turning the screen off.
 - **Magnifier:** Shows a magnifier glass for zooming into specific map regions.
 - **File manager:** Shows the internal file manager. This field is only available in iOS and Windows Store apps.
 - **Wifi uploader:** Shows the WiFi Uploader. This field is only available in iOS and Windows Store apps.

- **Settings:** The settings menu provides access to the app’s settings, as well as links to tutorials and manuals.
 - **Settings:** Shows the general app settings.
 - **Sensor settings:** Shows GPS sensor related settings.
 - **Map popup entries:** Shows a dialog for managing the map popup menu entries (see “Map popup entries”).
 - **Getting started/help:** A link to the Cartograph help website.
 - **User manual:** A link to this document.
 - **How to videos:** A link to a playlist with video tutorials for the Cartograph app.
 - **Facebook:** A link to the Cartograph Facebook site.
 - **Check for updates:** Checks the Cartograph update server for app updates. This option is only available on the macOS and Windows versions of the app (non-store versions).
 - **Info:** Shows the Cartograph version info, a link to the privacy policy, and the change log.

Note: The top toolbar can be hidden in the general app settings (see “General Settings”).

Bottom toolbar

The bottom toolbar changes depending on currently loaded tools and the application state. By default the following buttons are visible:

- **Record:** Starts/stops track recording.
- **Track:** Tracks the current location so that the map center is on the current location. When the map is manually moved then tracking is automatically disabled.
- **Zoom:** Zoom in/out the map using fixed zooming steps.

Map orientation button

The map orientation button allows switching between different map orientation modes:

- **Compass:** The map is rotated towards the magnetic north pole.
- **GPS:** The map is rotated into the heading (moving) direction. The moving direction is calculated by the device’s GPS sensor.
- **Rotate +/- 90°:** Rotates the map 90 degrees clock- or counter clockwise.
- **Manual:** The map can be manually rotated.
- **Route:** Rotates the map around the loaded route so that the map’s rotation is always in the route’s direction. **Note:** This feature is experimental.
- **Off:** Map rotation is disabled. The top of the map points towards north.

File management

All application data like tracks and routes, categories, waypoints, etc. are stored in a single database “maindb.sqlite” which is located in the application document’s folder. This database has the same format on all platforms¹.

The storage location of other files like maps, styles, overlays, etc. is platform dependent due to different sandboxing strategies. The following Sections describe the storage locations on all platforms.

Android

On Android all files are stored in the directory “Cartograph Pro” on the external phone storage. The directory structure is as follows:

- **cached_dem**: This directory contains SRTM elevation data files.
- **cached_icons**: This directory contains icons (e.g. for waypoints, bookmarks).
- **cached_maps**: This directory contains cache files of maps. Files deleted from this directory are automatically recreated.
- **cached_media**: This directory contains media files like audio recordings.
- **cached_styles**: This directory contains sub-directories with imported (Mapsforge) styles.
- **Exported tracks**: This directory contains tracks (gpx, kml, etc.) which were exported from the app.
- **Offline maps**: This directory contains offline maps which were downloaded within the app.
- **Offline overlays**: This directory contains offline overlays which were downloaded within the app.
- **Screenshots**: This directory contains screenshots taken in the app.

Offline maps and overlays can be located **anywhere** on the device (including the SD card) and will **not** be copied to the Cartograph folder.

iOS

On iOS all user files are stored in the app’s document folder (without sub-directories). Offline maps, overlays, and other files are always copied to this folder due to sandboxing restrictions. Also map cache files are located in this folder. Mapsforge styles, icons, and media files are stored in a different location which is not accessible by the user.

Cartograph offers different means to import and export files on iOS:

Apple iTunes File Sharing

iTunes file sharing allows quick exchange of files between devices using iTunes. Further details can be found here: <https://support.apple.com/en-ie/HT201301>.

¹ Theoretically it can be exchanged (copied) between different devices and platforms but the paths to map and other files can be invalid though.

iOS “Open in”

The iOS “Open in” feature is supported by many iOS apps (like DropBox, Safari, OneDrive, etc.). This feature works as follows:

1. Open the app which contains the file (e.g. DropBox).
2. Find the “Open in” feature in the app (usually this is named “Export”, or “Share”).
3. After selecting “Open in” in the app, the Cartograph app will automatically open and load the selected file.

The “Open in” feature works only with registered file types (see Section “Supported File Types”).

Wifi Uploader

The Wifi uploader is described here: “WiFi Uploader”.

iOS 11 Files App

The Files app which is available starting with iOS 11 can be used to copy files into the Cartograph documents directory.

Apple macOS

There exist two different macOS versions of the Cartograph app:

1. Downloaded from the Cartograph website. This version has the same file management properties as the Windows desktop version (see: “Windows desktop”).
2. Downloaded from the Apple Mac Store.

The version downloaded from the Mac Store underlies Apple’s sandboxing restrictions. Thus, all files are stored in the sandbox which is located under “~/Library/Containers/eu.cartograph2.pro.mac/Data/”.

Windows desktop

On Windows all files are stored in the directory “Cartograph Pro” in the user’s “Documents” folder. The directory structure is as follows:

- **cached_dem**: This directory contains SRTM elevation data files.
- **cached_icons**: This directory contains icons (e.g. for waypoints, bookmarks).
- **cached_maps**: This directory contains cache files of maps. Files deleted from this directory are automatically recreated.
- **cached_media**: This directory contains media files like audio recordings.
- **cached_styles**: This directory contains sub-directories with imported (Mapsforged) styles.
- **Exported tracks**: This directory is created by default but it is not used.
- **Offline maps**: This directory contains offline maps which were downloaded within the app.
- **Offline overlays**: This directory contains offline overlays which were downloaded within the app.
- **Screenshots**: This directory is created by default but it is not used.

Offline maps and overlays can be located **anywhere** and will **not** be copied to the Cartograph folder.

Windows Store and Windows Phone

In the Windows Store/Windows Phone version all user files are stored in the app's document folder (without sub-directories). Offline maps*, overlays*, and other files are always copied to this folder due to sandboxing restrictions. Files can be imported using the Windows file dialogs (file pickers) or the WiFi uploader (see here: "WiFi Uploader").

* **Note:** If the map or overlay files are located on an external storage device (like an SD card) then it is possible to prevent copying the file to the app's directory (details see here: "Advanced Settings"). **On some systems this can lead to problems.** Thus we recommend to always copy the files to the app's directory.

WiFi Uploader

The WiFi uploader offers means to download and upload files between the Cartograph app and a web browser. The WiFi uploader is available on **iOS** and **Windows Phone**.

The WiFi uploader can be found in the tools main menu → "WiFi uploader". After pressing the "Start WiFi uploader" button an address of the format "http://192.168.1.100:2000" is shown. Enter this address in your web browser.

Note: Both devices have to be in the same WiFi network.

Note: If the WiFi uploader cannot be started then try to select a different port.

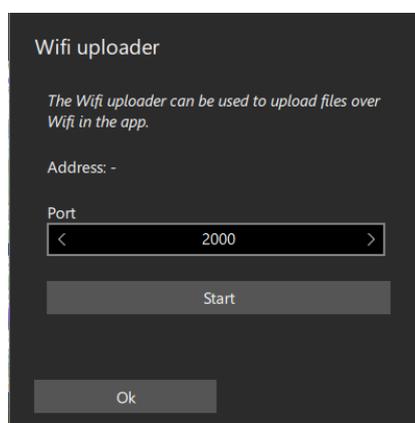


Figure 2: WiFi uploader

Supported File Types

The following file types are registered by the Cartograph app on mobile systems:

- **Maps:** .rmap, .sqlite, .onlinemap (see https://www.cartograph.eu/help_onlinemapimport), .tms, .map, .zip
- **Styles:** .zip
- **Overlays:** .poi
- **Tracks and routes:** .gpx, .kml

Supported URL schemes

URL schemes are only available on mobile platforms. They allow easy downloading of files from websites into the Cartograph app by simply clicking a link on the website.

- **Maps:** “cartograph-map”, “cartograph-map-s”, “orux-map”, “backcountrynav-action-map”.
- **Styles:** “cartograph-theme”, “cartograph-theme-s”, “orux-mf-theme”, “backcountrynav-action”.
- **Overlays:** “cartograph-overlay”, “cartograph-overlay-s”.

The “*-s” schemes (e.g. “cartograph-overlay-s”) use HTTPS instead of HTTP.

Examples:

- “cartograph-map://www.cartograph.eu/mymap.map” is translated to “http://www.cartograph.eu/mymap.map”.
- “cartograph-map-s://www.cartograph.eu/mymap.map” is translated to “https://www.cartograph.eu/mymap.map”.

Importing files

Files (maps, styles, overlays, etc.) can be imported by the following means:

- **File picker:** using the “Import offline map/overlay/track, etc.” option.
- **Drag&drop** the file into the Cartograph app (available in the desktop version only).
- **Url schemes** (see “Supported URL schemes”, only available on mobile platforms).
- **Platform specific means** like iOS “Open in”, Windows Store file associations, etc.
- **WiFi uploader** (see “WiFi Uploader”).

Maps

The map manager (see Figure 3) manages all maps in the app:

- **Search:** The map list can be filtered/searched by text using this tool.
- **Sort:** Sorts the maps based on name, date added, type, etc.
- **Filter:** The maps can be filtered by:
 - **All maps:** Shows all maps.
 - **Online maps:** Shows online maps only.
 - **Offline maps:** Shows offline maps only.
 - **Overlays:** Shows overlay maps only.
- **More:** Shows a menu with general options (details are in the Sections below):
 - **Import offline map.**
 - **Add online map:** Add an online map from a list of pre-installed online maps.
 - **Add online map manually:** Add an online map manually using the map’s url.
 - **Add multi-map.**

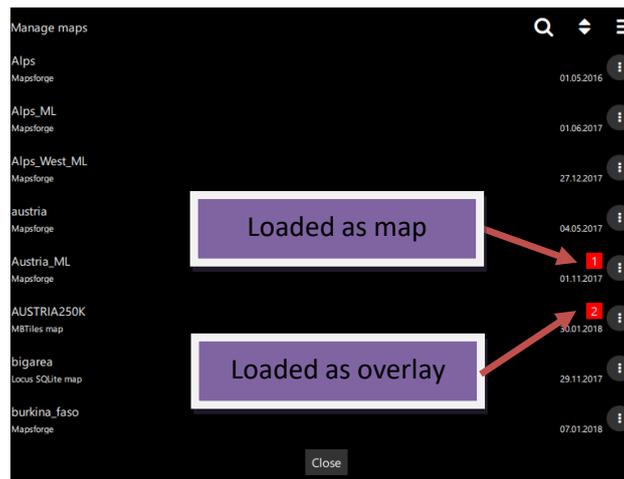


Figure 4: Loaded indicator

Map edit dialog

The map edit dialog allows editing of map details. The dialog is shown when editing maps and when adding new online- and multi-maps.

Common fields

- **Name:** The map name.
- **Comment:** Comments about the map.
- **Attribution:** Map attribution (e.g. copyright, usage rights, etc.).
- **Folder:** The logical folder the map is located in. Folders can be used for instance for grouping maps into logical units like “Asia”, “Europe”, “Hike”, etc.
- **Automatic map switching:** If enabled then this map is considered for automatic map switching on map borders.
- **Is overlay:** If checked then the map is handled as an overlay map.
- **Latitude/Longitude/Zoom:** The default map center (latitude, longitude) and zoom level.
- **Min./max. zoom:** The map’s minimum and maximum zoom levels.
- **Cache size:** The map’s cache file size in number of tiles.
- **Cache file:** The map’s cache file name. The cache file stores rendered tiles for faster map rendering.

Offline map fields

- **Map filename:** The file name of the map.
- **Bounding box:** The map’s bounding box.
- **Date modified:** The date the map file was modified.
- **File size:** The file size of the map file.

Mapsforge multi-map fields

- **Select maps:** This button opens a dialog with a selection list of Mapsforge maps. The selected Mapsforge maps are combined into a single map during map rendering.

Online map/WMS fields

- **Map type:** The map type. Possible options are “WMS” (Web Map Service), and “Online” (standard slippy tile maps).
- **Map url:** The map’s url. The urls can contain the following placeholders:
 - **{x}, {y}, {z}**: The maps x/y and zoom coordinates (slippy tile format).
 - **{ts}**: The requested file size in pixels (optional).
 - **{minlon}, {maxlon}, {minlat}, {maxlat}**: The top left and bottom right coordinates of the requested area. These fields are used for WMS maps.
- **Projection:** The map projection (for WMS maps).
- **Headers:** An optional list of headers which are sent to the server together with the map request. Each line is a header. The key and value are separated by a “:”.

Hill shading overlay fields

- **Magnitude:** This value influences the appearance of the hillshading layer.

Relief overlay fields

- **Min./max. altitude:** The minimum and maximum altitudes that are used for color blending. Often these values are equal to the minimum and maximum heights of the loaded map.
- **Color mode:** A list of different relief color profiles.

Note: Custom relief colors can be imported by copying a file named “color_*.txt” into the Cartograph “Misc” directory (respectively documents directory on iOS and Windows Store). Each line of the file has to be formatted as follows (red, green, blue, and alpha have to be in the range 0-255):

Percentage (0-100);Red;Green;Blue;Alpha

Example file:

```
0.00;51;102;0;255
12.50;129;195;31;255
25.00;255;255;204;255
50.00;244;189;69;255
62.50;102;51;12;255
75.00;102;51;0;255
100.00;255;255;255;255
```

Adding online maps

Online maps can be added by manually entering all details (see “Map edit dialog”) or by means of a definition file (see “Adding multiple online maps”). Cartograph also ships with a set of pre-defined online maps.

Adding multiple online maps

Multiple online maps can be added using a map definition file as described here:

https://www.cartograph.eu/help_onlinemapimport.

Downloading maps

The Cartograph app ships with a set of basic Mapsforge maps which can be downloaded from a web server. These maps offer only a simple set of features (e.g. no elevation data). Please take a look at the Section “Map sources” for more map sources.

Maps can be downloaded directly in the Cartograph app using the internal downloader and URL schemes (see “Supported URL schemes”). On most platforms the Cartograph app has to stay in foreground and the screen has to be unlocked during download. Thus it is recommended to download maps with the system’s web browser and then import the downloaded file manually into the app.

Oruxmaps SQLite offline maps notes

Cartograph supports Oruxmaps SQLite offline maps. These maps consist of two files – an .xml file holding the map definition and a .db file containing the map data. The **xml and db file have to have the same name**. For example for the file “My Map.xml” the corresponding second file must be named “My Map.db”. Only the xml file has to be imported into Cartograph. **There are also some platform specific peculiarities for Oruxmaps files:**

- **Windows and macOS desktop, Android:** Both files can be located anywhere on the device.
- **macOS App Store:** Both files have to be located in the user’s “Download” folder due to sandboxing restrictions.
- **All other platforms:** Both files have to be copied into the app’s document directory (see “File management” for details).

Possible rendering problems with RMAP and Oruxmaps maps

RMAP and Oruxmaps map file formats support different map projection types. If your map does not render correctly then contact us (if possible include a download link to the map) so that we can add support for your map projection type.

Map sources

The following Sections list different offline map sources.

Mapsforge Maps

- <http://www.OpenAndroMaps.org>: very good offline maps for outdoor activities. The maps should be used together with the Mapsforge render themes provided on their site.
- <http://freizeitkarte-osm.de/android/en/index.html>
- <https://www.androidmaps.co.uk/>

SQLite based raster maps

- <https://www.openslopemap.org/download/>: Slope maps (especially for skiing and avalanche risk planning).
- <https://wiki.openstreetmap.org/wiki/DE:Locus>: OpenSeaMap.org offline raster overlay maps.

Styles/Render themes

Only Mapsforge maps support styling/render themes. Cartograph ships with a basic set of render themes. More styles can be downloaded from here:

- <https://www.openandromaps.org/en/legend/elevate-mountain-hike-theme>
- <http://freizeitkarte-osm.de/android/en/design.html>

Managing styles

Clicking on a style entry opens a menu:

- **Set as map style:** Sets the style as the map style.
- **Set as overlay style:** Sets the style as the overlay map style.
- **Delete:** Deletes the style.
- **Edit:** Shows an edit dialog with the following fields:
 - **Name:** The name of the style.
 - **Filename:** The filename of the style.
 - **Hillshading support:** If checked then the map is rendered with hillshading. Hillshading slows down map rendering significantly.
 - **Layers:** Opens a dialog with Mapsforge layer options. Mapsforge layers allow customization of map rendering like emphasize of bicycle routes, rendering of amenities, etc.
- **Clone:** Creates a copy of the style.

When a style is activated then a red rectangle is shown, where “1” means activated for the map layer, and “2” means activated for the overlay map layer.

Routes and Tracks

This Section describes all route and track related tasks, such as track management, search, and navigation.

Track Management

Tracks and routes are managed in folders. The root folder (“-“) always contains all tracks. When a folder is removed then all tracks from this folder are moved to the root folder (the tracks are not deleted).

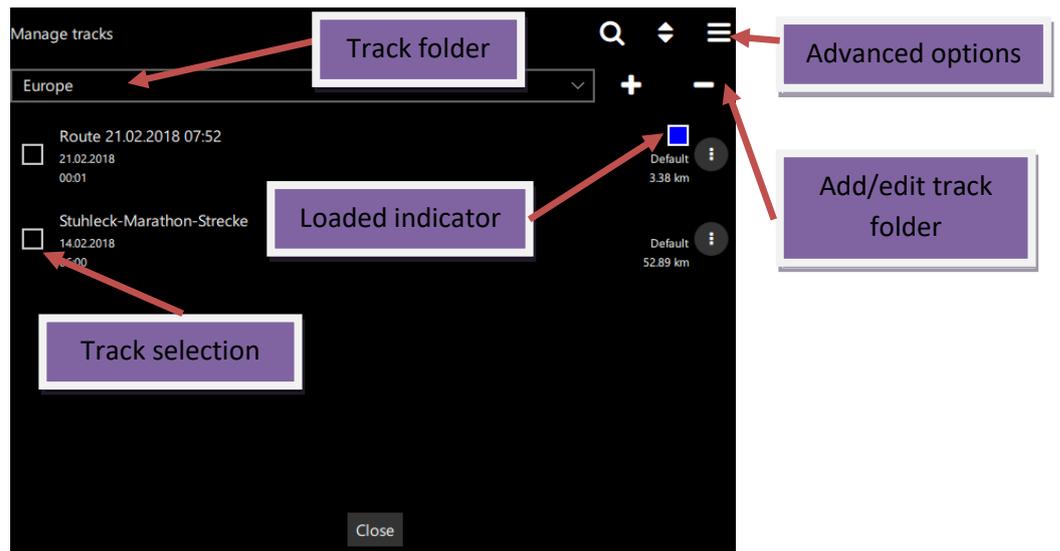


Figure 5: Track management

The indicator rectangle (blue in Figure 5) indicates whether a track is loaded. The color of the rectangle matches the default color specified in the settings (see “Tracks Settings”). It defines how the track is loaded (e.g. as route, as editing/selected track, or as normal track).

The **track selection checkbox** marks a track (but does not load it!). Marked tracks can then be used for batch processing operations which are described in the next Sections.

Clicking on a track entry opens a menu with the following entries:

- **Remove from map:** Removes (unloads) the track from the map. This option is only visible if the track is loaded.
- **Go to start:** Moves the map’s center to the track’s start position. This option is only visible if the track is loaded.
- **Load as track/route:** Loads the track in the map. This option is not visible if the track is already loaded in the map.
- **Edit track:** This entry opens the track drawing tools (see “Track drawing”). This option is invisible during track recording.
- **Edit metadata:** This option opens a view for editing the track’s metadata (for instance name, styling, category, etc. More details see: “Editing track metadata”).
- **Waypoints:** Opens a view containing a list of the track’s waypoints.
- **Graph:** Shows a graph for the track.
- **Statistics:** Shows the track’s statistics, such as distance, duration, ascent time, etc.
- **Upload:** Uploads the track to a web service (for instance Strava.com).
- **Export:** Exports the track to a file. Depending on the platform this option also supports sharing by email or with other apps.
- **Clone:** Clones the track, including all media and waypoints.
- **Delete:** Deletes the track, including all associated media.
- **Fix height:** Fixes the altitude for each track point based on an external elevation source (e.g. SRTM data).

The “**Advanced options**” menu on the top right provides the following options:

- **Import tracks:** Opens a file picker for importing tracks and routes from files.
- **Remove all from map:** Removes all tracks from the map.
- **Remove selected from map:** Removes all selected tracks from the map. This option is only available if at least one track’s checkbox is checked.
- **(De-) Select all:** (De-) Selects all tracks in the current folder (e.g. checks all checkboxes).
- **Filter:** This option opens a dialog with filter options (e.g. for showing only tracks with a specific category).
- **Delete selected:** Deletes all selected tracks permanently. This option is only available if at least one track’s checkbox is checked.
- **Load selected:** Loads all selected tracks in the map. This option is only available if at least one track’s checkbox is checked.
- **Edit selected:** This option opens a dialog which allows batch editing of all selected tracks. Options include the track category, and the track folder. This method can also be used to move tracks between folders. This option is only available if at least one track’s checkbox is checked.
- **Merge selected:** Merges all selected tracks into a single new track. This option is only available if at least one track’s checkbox is checked.

Editing track metadata

The track’s metadata includes the track name, category, and styling. The following options are available:

- **Name:** The track’s name.
- **Category:** The track category. New categories can be added with the “+” button (see “Track category manager”).
- **Comment:** An arbitrary description of the track.
- **Folder:** The folder which contains this track.
- **Custom styling:** If selected then the track is drawn using custom styling.
- **Line width:** The custom line width. This option is only visible when custom styling is active.
- **Line color:** The custom line color. This option is only visible when custom styling is active.

Track category manager

The track category manager is used for adding, editing, and removing track categories. The default category is represented by a red indicator rectangle.

Track Recording

Cartograph supports background track recording. When a track is loaded as selected (e.g. after track editing or from a previous recording) then a menu is shown when starting track recording with the following options:

- **Continue track:** Continues recording to the current track's segment.
- **New segment:** Creates a new track segment in the current track.
- **New track:** Creates a completely new track.
- **New track (remove last from map):** Creates a completely new track and removes the last recorded track from the map.

Route altitude profile

The route altitude profile is available when a route is loaded. The map's center is visualized by a blue dot on the profile.

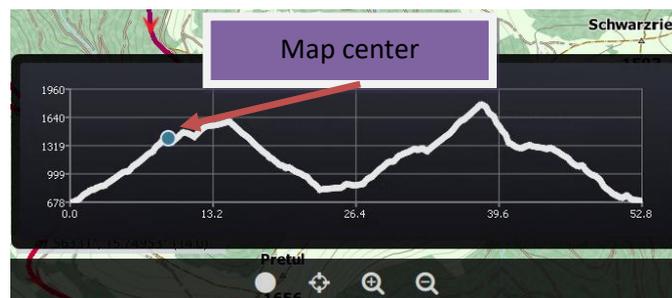


Figure 6: Route altitude profile

Waypoints

Tracks and routes can have multiple waypoints. A waypoint is represented by an icon on the map. Cartograph supports icon-, photo-, and audio waypoints. Press-and-holding on a waypoint icon opens a popup menu with the following options:

- **Details:** Opens a view with the waypoint's details. This view is also opened when the waypoint's icon is pressed without holding.
- **Move map here:** Centers the map on the waypoint.
- **Navigate here:** Opens the navigation options (see: "Searching/calculating a route").
- **Measure distance:** Shows the distance measuring tool.
- **Distance current pos:** Shows the distance from the waypoint to the current position.
- **Distance map center:** Shows the distance from the waypoint to the map center.

The following waypoint fields are available when adding, editing, and viewing a waypoint:

- **Distance to map center:** The distance from the waypoint to the map center.
- **Visible:** If selected then the waypoint is visible in the map.
- **Moveable:** If selected then the waypoint can be moved around the map by the mouse.
- **Name:** The waypoint's name.
- **Category:** The waypoint category (details about managing categories can be found here: "Waypoint category manager").
- **Comment:** A description or other text.
- **Website:** A website link.

- **Latitude, longitude, altitude:** The position of the waypoint.
- **Fix height:** This button can be used to fix the waypoint's altitude data.
- **Date:** The date and time of the waypoint.
- **Distance:** An arbitrary distance value supplied by the user. This could for instance be the distance to the track start.

Moving waypoints

Waypoints can be moved directly on the map when the track is in editing mode (e.g. during track drawing and track recording). The waypoint can be moved by press and dragging.

Waypoint media manager

Each waypoint can have **multiple** media files (photos, audio). The media manager can be started by selecting the image icon on the top right as shown in Figure 7.

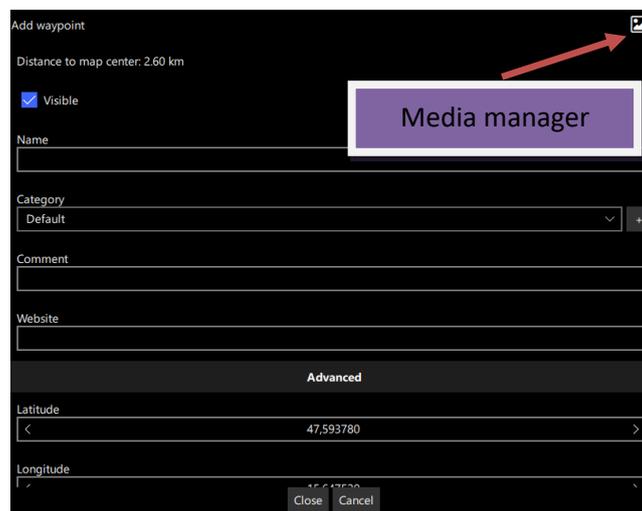


Figure 7: Waypoint edit view

Figure 8 shows the media manager.

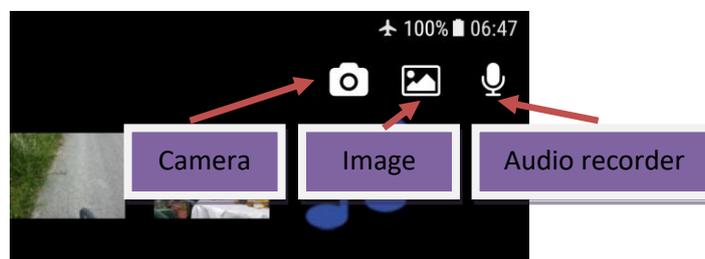


Figure 8: Media manager

The following media import options are available:

- **Camera:** Captures an image with the system camera. This option is only available on Android and iOS.
- **Image:** Import an image from the gallery.

- **Audio recorder:** Opens the audio recorder (see “Audio recorder”).

When clicking on a media file then a popup with the following options is shown:

- **View/play:** Views the photo or plays the audio file.
- **(De-)Select:** When this option is selected then the underlying image is used as an icon for the waypoint. If it is de-selected then the standard icon is used again. This option is only available for photos.
- **Delete:** Deletes the media file.

Audio recorder

The audio recorder can be used for recording short audio samples.

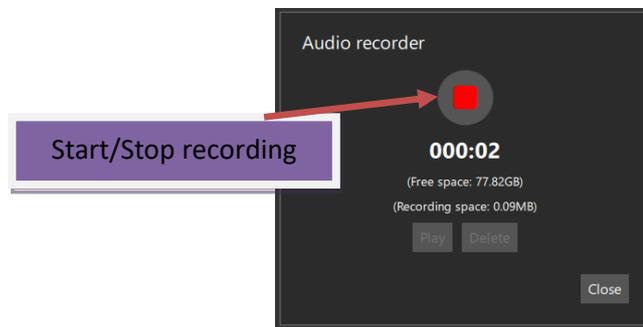


Figure 9: Audio recorder

Waypoint category manager

The waypoint category manager is used for adding, editing, and removing waypoint categories. The default category is represented by a red indicator rectangle.

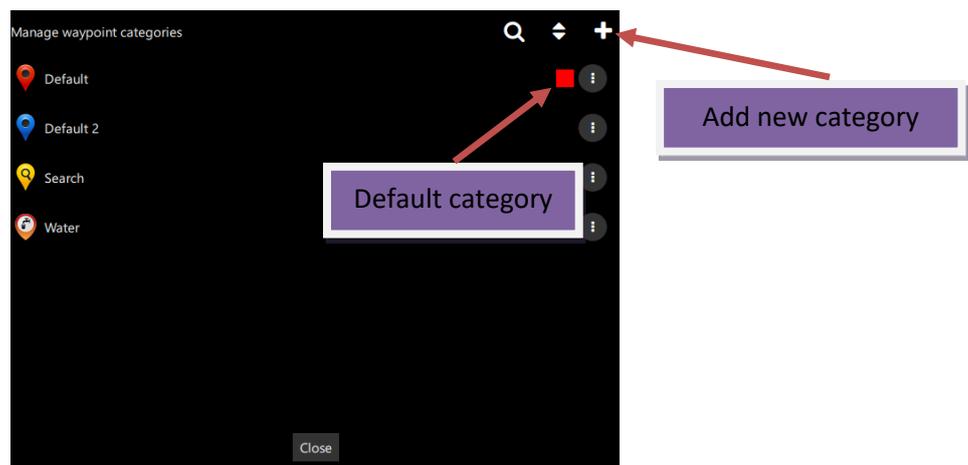


Figure 10: Waypoint category manager

Track drawing

The track drawing function can be used for creating and modifying tracks. Figure 11 shows the screen when track drawing is activated.

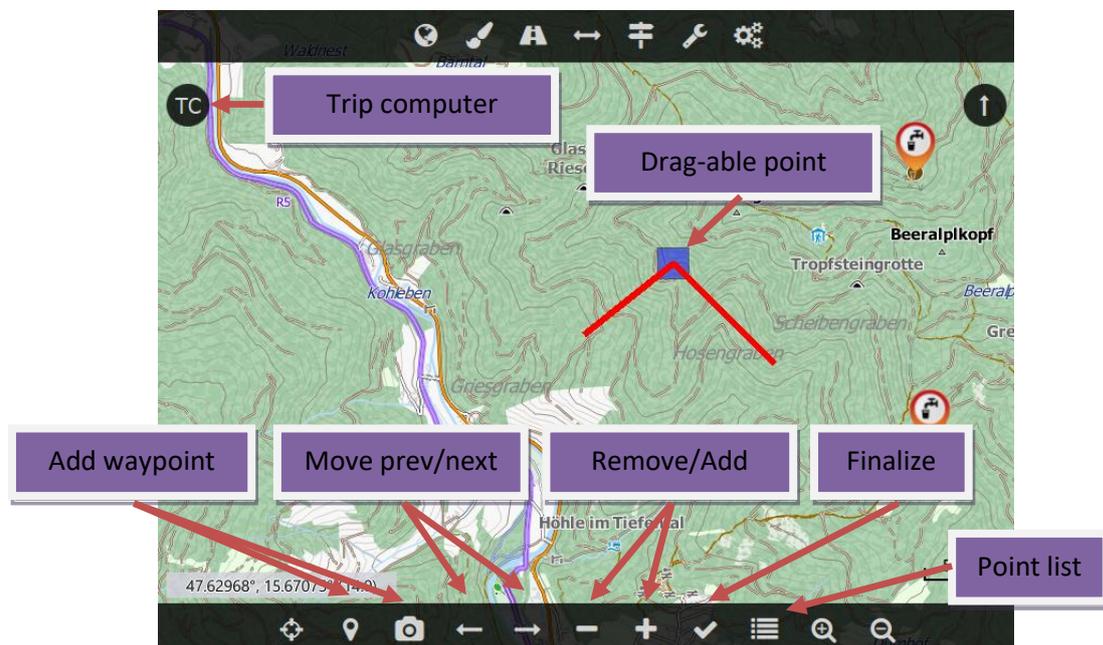


Figure 11: Track drawing

The following controls are available during track drawing:

- **Trip computer:** The trip computer shows the current tracks distance. Details about the trip computer can be found here: “Trip computer”.
- **Add waypoint:** These controls allow adding normal or photo waypoints to the track.
- **Move previous/next:** These controls allow moving backward and forward in the list of track points. The active track point is visualized by a **blue rectangle** which can be dragged on the map.
- **Remove/Add:** Removes the current selected track point or adds a new track point after the current track point.
- **Finalize:** This option saves the track and ends the track drawing mode.
- **Point list:** Shows a list of all track points. Here also the properties (position, time, temperature, etc.) of each track point can be modified individually.

Searching/calculating a route

A route is calculated by defining a set of route points (green icons in Figure 12). Route points can be moved by press-and-dragging. A route point can be deleted by clicking on the point.

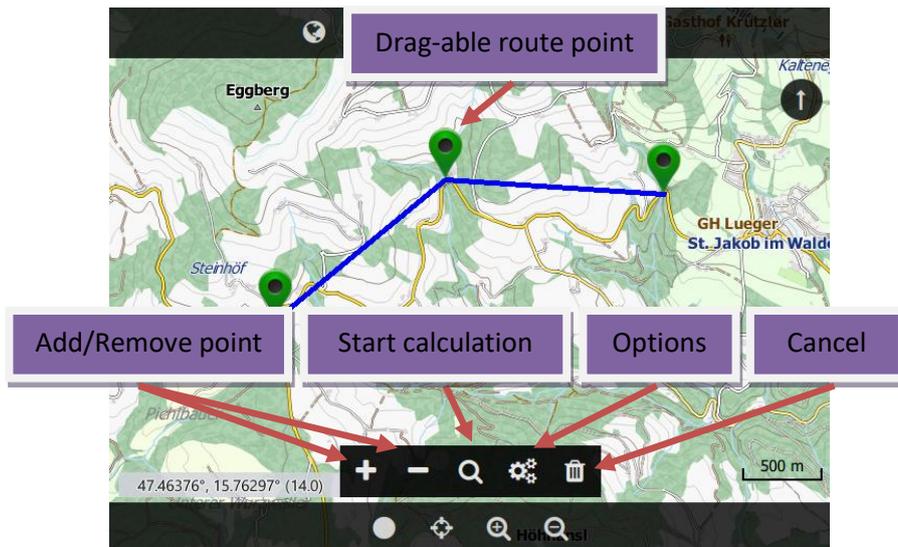


Figure 12: Route calculation

The following options are available:

- **Add/remove point:** Adds a new route point or removes the last route point.
- **Start calculation:** Starts route calculation based on the route points.
- **Options:** Shows options for the route calculation. Options include the calculation source, road type, and other properties.
- **Cancel:** Stops route calculation and removes all route points.

After route calculation has finished an “**Accept route**” option is shown (see Figure 13). Pressing this icon finishes route calculation and loads the route. If the calculated route does not fit then it can be modified by adding, removing, or dragging route points.

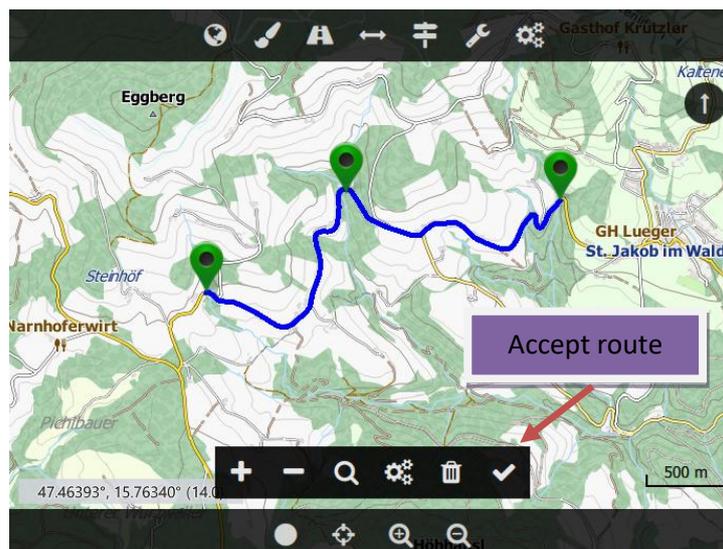


Figure 13: Calculated route

Routing/Navigation

Note: This feature is experimental.

Note: Routing works only when the screen is active.

Cartograph supports basic means for route navigation and alerts. The main purpose of the navigation module is to alert the user when arriving at waypoints or when the current position is too far away from the route. The module does not support turn-by-turn navigation.

The routing module consists of three Sections:

Waypoint alerts

An alert is played when moving close to a waypoint. The following options are available:

- **Enable:** Enables waypoint alerts.
- **Distance:** The maximum distance between the current position and the waypoint which triggers an alert.
- **Max. alert count:** The maximum number of alerts triggered for each waypoint.
- **Use sound:** If selected then a sound file is played instead of the voice command.
- **Text:** The voice command. This option is only available when “Use sound” is not selected.
- **Select sound:** Select the sound file to play. This option is only available when “Use sound” is selected.

Route range alerts

An alert is played when the route range is left, e.g. the distance between the current position and the route gets too big. The following options are available:

- **Enable:** Enables route range alerts.
- **Alert interval:** The interval with which the sound is be played.
- **From/to:** The range within the alert will be played. If the current location is outside the range then no sound is played.



- **Use sound:** If selected then a sound file is played instead of the voice command.
- **Text:** The voice command. This option is only available when “Use sound” is not selected.
- **Select sound:** Select the sound file to play. This option is only available when “Use sound” is selected.

Routing alerts *EXPERIMENTAL*

Routing alerts are played based on routing information like turn-by-turn commands or junctions. The following options are available:

- **Enable:** Enables routing alerts.
- **Use instructions stored in route:** If selected then the routing instructions stored in the route are used. This option is only visible if the route contains routing instructions.

The following settings are only available if “Use instructions stored in route” is not selected:

- **Turn alert distance:** The distance when a turn alert is triggered. E.g. “200 meters” means that an alert is triggered 200 meters before a left or right turn.
- **Turn detection threshold:** This value defines the minimum angle (in degrees) of a turn. If the angle between three route points is greater than this value then the move is interpreted as a turn. The turn direction is always calculated based on the route direction.
- **Use sound:** If selected then a sound file is played instead of the voice command.
- **Turn left/right (text):** The voice command. This option is only available when “Use sound” is not selected.
- **Select sound (left/right):** Select the sound file to play. This option is only available when “Use sound” is selected.

Trip computer

The trip computer is active during track recording and track drawing. It can be shown and hidden by pressing the “TC” button on the top left of the screen.

Modifying the trip computer

The trip computer’s look and feel can be modified as follows:

1. Make sure that the trip computer is visible.
2. Press and hold (about 2 seconds) the “TC” button.

A new view will open with the following options:

- **Size:** A factor by which the trip computer is scaled.
- **Position:** The location of the trip computer (top, center, bottom).

New trip computer fields can be added by pressing the “+” button on the top right. Fields can be removed with the “-” button next to each field.

Live tracking

Live tracking allows to share the current location and to poll the location of other users. Cartograph currently supports three tracking services:

1. GPSies.com.
2. Cartograph tracking server.
3. Custom tracking servers.

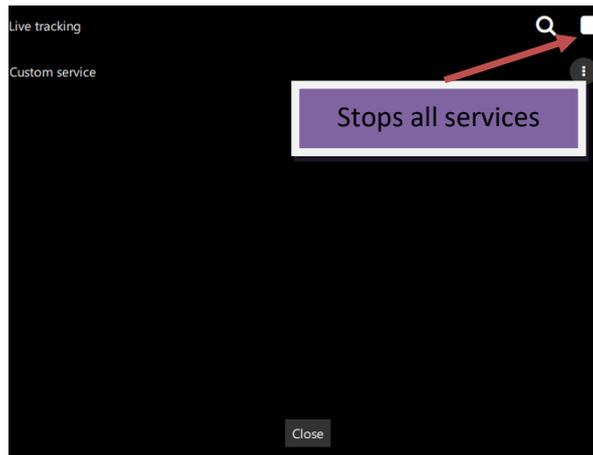


Figure 14: Live tracking

Custom live tracking service

The custom live tracking service exchanges data with your web server (the web server implementation is not part of the app). The following options are available:

- **Send own position:** The current location is sent to the server.
- **Poll other devices:** The location of other users is polled from the server.
- **Sending interval:** The interval with which the position data requests are scheduled for the server. The actual sending interval depends on the global settings (see “Live Tracking Settings”).
- **Polling interval:** The interval with which the position data is polled from the server.
- **Visualize user’s paths:** If selected then the paths of other users are drawn in the map.
- **Polling url:** The web server script address which provides position data from other users.
- **Sending url:** The web server script address which receives the current location.

Polling variables

- **{tf}:** The last request UTC timestamp in seconds.

Sending variables

- **{lat}:** latitude.
- **{lon}:** longitude.
- **{alt}:** altitude.
- **{cad}:** cadence.
- **{hf}:** heart frequency.
- **{pt}:** point UTC timestamp in seconds.
- **{st}:** request UTC timestamp in seconds.
- **{cal}:** calories (kCal).
- **{course}:** course (°).
- **{dst}:** distance (meter).
- **{speed}:** speed (km/h).
- **{power}:** power (Watt).
- **{temp}:** temperature (°C).
- **{lightint}:** light intensity (lux).
- **{hum}:** humidity(%).

- **{ap}**: air pressure (mBar).
- **{steps}**: steps

Bookmarks, POIs, and Overlays

Cartograph supports different kinds of overlays:

- **Bookmark overlays:** A bookmark overlay contains a set of waypoints. Bookmarks can be manually added on the map, or imported from files (e.g. a GPX file). A bookmark is a waypoint without an associated track.
- **Mapsforge POI overlays** (see “Mapsforge POIs”).

Clicking on an entry in the overlay manager opens a popup with the following options:

- **Load:** Loads the selected overlay in the map.
- **Edit metadata:** Shows a view for editing the metadata. The metadata includes:
 - **Name:** The overlay’s name.
 - **Visible:** If checked then the item is visible on the map.
 - **Moveable:** If checked then the item can be moved on the map using the mouse.
 - **Default category:** The overlay’s category. By default the category’s icon is displayed on the map.
 - **Min. zoom:** The minimum zoom level for displaying the overlay. If the zoom level is lower than the minimum zoom then the overlay is not displayed.
 - **Max. zoom:** The maximum zoom level for displaying the overlay. If the zoom level is greater than the maximum zoom then the overlay is not displayed.
- **Delete:** Deletes the overlay.
- **Show bookmarks:** Shows all bookmarks in the overlay. This item is only visible for bookmark overlays.
- **Export:** Exports all bookmarks in the overlay to a file. This item is only visible for bookmark overlays.
- **Clone:** Clones the overlay (including all bookmarks in the overlay). This item is only visible for bookmark overlays.
- **Options:** Shows Mapsforge POI options (details see “Mapsforge POIs”). This item is only visible for Mapsforge overlays.
- **Visible:** Shows a list of overlay items in the visible map region. This entry is only visible when at least one item is visible in the map.

A red indicator rectangle is shown on the overlay list when the overlay is loaded in the map.

Bookmarks

Bookmarks are managed/grouped in bookmark overlays. New overlays can be added in the overlay manager (top right icon → “Add bookmark overlay”) or by importing a file (e.g. GPX) in the overlay manager.

Bookmarks can be added by different means:

- From the map’s popup menu (see “Map popup menu”).
- From search results (see “POI/Address search”).
- In the bookmarks’ list (“+” button).

Bookmarks can be moved on the map using press-and dragging. Bookmarks have the same properties as waypoints, except that they are not attached to a track. More details about bookmark fields can be found under “Waypoints”.

Mapsforge POIs

A Mapsforge POI database contains points of interest for a certain region. The visible Mapsforge POI categories can be edited in the Mapsforge POI options view (see Figure 15).

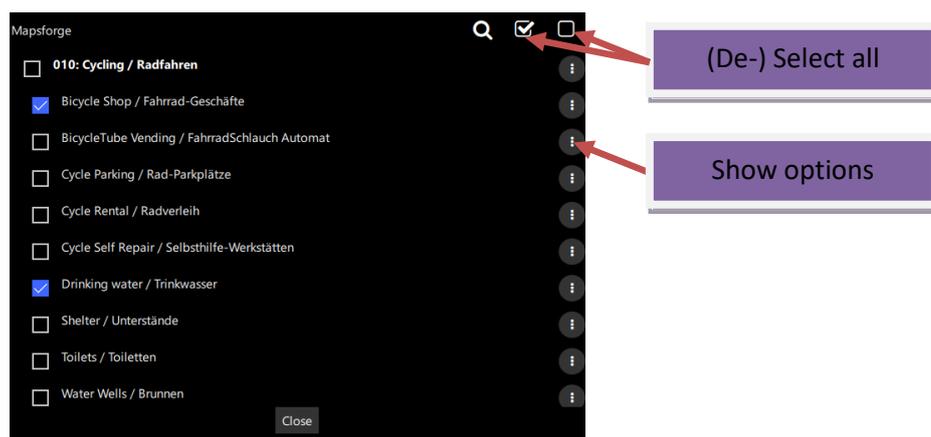


Figure 15: Mapsforge POI options

If no entry (checkbox) is selected then **all entries** are used (shown in the map, used for searching, etc.). It is possible to assign different icons to each entry using the “**Show options**” menu.

POI/Address search

The POI search searches for points of interests and addresses (route search functionality is described here: “Searching/calculating a route”).

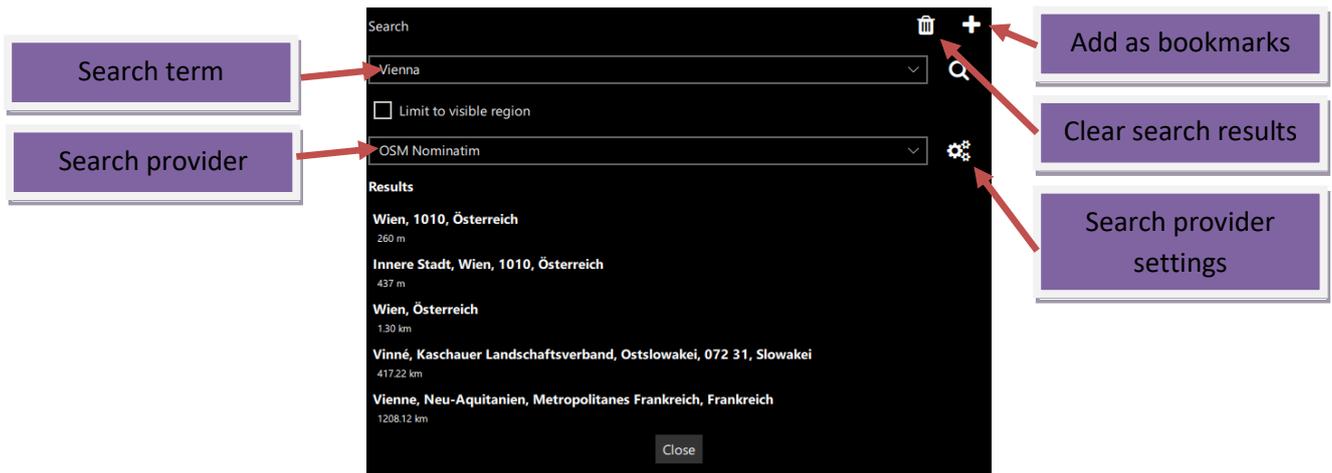


Figure 16: POI/Address search

POIs can be searched using online sources (OpenStreetMap Nominatim), or in bookmarks and other overlays². The “**Limit to visible region**” option limits the search results to the currently visible map region.

Pressing a search result icon on the map opens a popup menu with the following options:

- **Details:** Shows the search result’s details.
- **Move map here:** Moves the map’s center to the search result.
- **Clear search results:** Clears all search results.
- **Add as bookmark:** Adds the search result as a bookmark.
- **Navigate here:** Starts the navigation view (see “Searching/calculating a route”).

Settings

There are two settings views: one for general settings and one for sensor (GPS) settings.

App Settings

The following settings are available:

General Settings

- **Keep screen on:** If selected then the screen is kept active. Keeping the screen on significantly increases power usage.
- **Map scalebar:** Shows a map scalebar in the bottom right on the map.
- **Map center cross:** Shows a cross in the map center.
- **Multi-window mode:** Uses multiple windows for displaying maps, tracks, etc. The Cartograph app should be restarted when changing this setting. This setting is only available on desktop platforms.
- **Map coordinate info:** Show the map’s center coordinate in the bottom left on the map.
- **Show altitude data on map:** Shows the current altitude below the map center.
- **Compass:** Shows the compass/map orientation button in the top right on the map.

² Searching in Mapsforge POI files can take some seconds especially for large search regions.

- **Show top toolbar:** If selected then the top toolbar is shown. If this option is not selected then a menu button is shown in the top left on the map.
- **Show top/bottom toolbar handle:** Shows a handle below/above the toolbar which can be used for hiding and showing the toolbar.
- **Enable map popup:** Enables the map context menu. This menu pops up when right-clicking on the map or long pressing on the map.
- **Stop tracking when map is touched:** Stops GPS tracking when the map is touched.
- **Stop compass and tracking when in background.**
- **Language:** Here the application language can be manually selected. The app should be restarted (killed) after changing the language.
- **Auto controls fade out time:** A value greater than zero defines the number of seconds until the main screen controls auto fade out.
- **Auto screen lock time:** A value greater than zero defines the number of seconds until the screen is locked (the map is still displayed but touch input is blocked).
- **Small manager font size:** Defines the text size of small text in the various managers.

Overlay Settings

- **Show waypoint names:** Shows the waypoint's name above the waypoint.
- **Cluster overlays:** Clusters overlays if they overlap.
- **Max. overlay items:** This number limits the maximum number of items shown for each overlay. This number should be kept as small as possible because too many overlay items occlude the map and degrade performance.
- **Max. search results:** The maximum number of search results returned.
- **Reverse geo-code mode:** Defines where reverse geo-coding functions (such as "What's here") look for data.
- **Reverse geo-code provider:** Defines which service is used for reverse geo-coding.
- **Reverse geo-code POIs:** Includes POIs in the reverse geo-code search.
- **Reverse geo-code ways:** Includes ways (streets) in the reverse geo-code search.

Units

- **Temperature unit:** Possible units are Celsius (°C), Fahrenheit (°F), and Kelvin (K).
- **Distance metric:**
 - **Metric:** meter, kilometer.
 - **Imperial:** foot, miles.
 - **Nautic:** meter, nautic miles.
- **Coordinate mode:** The coordinate mode defines how geo-coordinates are shown.
 - **Decimal:** Shows signed decimal coordinates, e.g.: (-10.22, 12.33).
 - **Decimal+direction:** Shows unsigned decimal coordinates, e.g. (10.22S, 12.33E).
 - **Degrees:** Shows signed coordinates in degrees, e.g.: (-10° 10' 5", 12° 2' 3").
 - **Degrees+direction:** Shows unsigned coordinates in degrees, e.g.: (10° 10' 5" S, 12° 2' 3" E).
- **Show coordinate seconds:** Show the seconds in degrees coordinate mode (e.g. 10° 10.234 S, 12° 2.123 E).
- **Coordinate projection:** The coordinate projection (such as WGS:84) used for all coordinates. The list of projections can be modified using the **Manage projections** button.

Tracks Settings

- **Show route direction markers:** Show small arrows along routes which indicate the route direction.
- **Show routing dialog when recording:** Shows the routing dialog when track recording is started.
- **Visualize route elevation:** If the route contains elevation data then the slope is visualized by red to blue gradients.
- **Show route distance markers:** Shows route distance markers.
- **Route distance marker interval:** This value defines the interval of the route distance markers.
- **Track export format:** This option defines the default track export format (such as gpx, kml, etc.). This option is only available on mobile platforms. On desktop platforms the format is determined based on the file extension.
- **Track opacity:** The opacity (transparency) of tracks and routes.
- **Default track width:** The default track line width.
- **Default track color:** The default track line color.
- **Default route width:** The default route line width.
- **Default route color:** The default route line color.
- **Selected track width:** The selected/recording/editing track line width.
- **Selected track color:** The selected/recording/editing track line color.
- **Map direction marker:** The symbol used as direction marker during track recording.
- **Import segments as tracks:** If selected then each track segment (from a GPX file) is imported as a new track.
- **Create sub folder for tracks:** If selected then for each track a new track folder is created. This option is only visible when “Import segments as tracks” is active.
- **Use plain Garmin symbols:** If selected then Garmin waypoint symbols are used instead of the default waypoint symbols.
- **Waypoint marker size:** The size of waypoint marker icons.

Live Tracking Settings

- **Sending interval:** The global interval in seconds used for sending position data.
- **Sending queue size:** The number of position data packets queued before they are sent over the network.
- **Number of retries:** The number of sending retries if sending fails (e.g. due to lack of internet connection).

Both, the sending interval and queue size affect the network communication and thus energy usage.

Map Settings

- **Overlay opacity:** This value specifies the opacity of the overlay map. A value of “0” means that the map is completely transparent and “1” means that the map is opaque.
- **Automatic map switching:** Automatically switch between maps near map boundaries. Automatic map switching also has to be enabled for each map individually (see “Editing track metadata”).
- **Mapsforge text scale:** This value specifies the scaling factor of text in Mapsforge maps. A higher value means bigger text.

- **Mapsforge user scale:** This value specifies the scaling factor of all elements in Mapsforge maps. A higher value means bigger drawings (for instance thicker lines).
- **Mapsforge tile size:** This value specifies the tile size of Mapsforge tiles in 256 pixel steps. The bigger the tile size, the slower the rendering process. Recommended values are between 256 and 768 pixels.
- **Map tile size:** This value specifies the tile size used for map rendering in 256 pixel steps. The recommended value is 256 pixels.
- **Reload map:** This button reloads the whole map. The map should for instance be reloaded when the Mapsforge or map tile size is changed.
- **Raster maps sub-tile count:** This value defines the maximum number of tiles which are used for calculating missing tiles when zooming out of the map. A lower value increases performance but can lead to empty regions (incompletely rendered tiles).
- **High quality raster rendering:** If checked then high quality rendering is used at the cost of slower rendering speeds.
- **Limit map zoom level to min/max:** Limits the map zoom levels to the levels defined in the each map's properties (see "Map edit dialog").
- **Render curved text:** Render curved text in Mapsforge maps. This slows down the rendering process.
- **Alternative map mouse mode:** This option uses an alternative map interaction mode for devices which have problems with the default mode.

Hillshading Settings

- **Interpolation overlap:** If selected then overlaps between tiles are interpolated.
- **Shading algorithm:** Here the algorithm used for hill shading can be selected.

Advanced Settings

- **Screen scaling factor:** This factor specifies the scaling of all user interface elements (buttons, etc.). A higher value results in bigger elements. The app has to be restarted (killed) after changing this value.
- **Light theme:** Uses a light (bright) theme for the Cartograph user interface.
- **Theme accent color:** The accent color of the user interface.
- **Front button color:** The color of the top- and bottom toolbar icons.
- **Export/Import app database:** This function can be used to export and import the "maindb.sqlite" database. This option is only available on desktop platforms and Windows Store. The app database can also be manually copied (see "File management").

Sensor Settings

The following settings are available:

- **High accuracy mode:** If enabled then a higher accuracy mode is used on some mobile devices at the cost of higher energy consumption.
- **Location provider:** Here the GPS source can be selected.
 - **Default source:** This is usually the built-in GPS source on mobile devices. On desktop systems this entry can be used for GPS mice which are connected via a COM port.

- **Web server source:** The web server source allows sending location information to the app using HTTP GET commands. The command syntax is:
`"http://localhost:<port>/?lat=48.051&lon=16.328&ts=1000000&alt=100&hacc=20&vacc=500&dir=20&speed=10"`.
 - **lat:** Latitude.
 - **lon:** Longitude.
 - **ts:** Time stamp in seconds since epoch.
 - **alt:** Altitude in meters.
 - **hacc:** Horizontal accuracy in meters.
 - **vacc:** Vertical accuracy in meters.
 - **dir:** Heading (with respect to magnetic north).
 - **speed:** Speed in meters per second.
- **GPS min. distance:** The minimum distance between two measurements. If the distance between two measurements is lower than this value then the new value is ignored.
- **GPS min. interval:** The minimum interval between two measurements in milliseconds. If the time between two measurements is lower than this value then the new value is ignored.
- **Min. GPS accuracy:** The minimum vertical accuracy of a measurement in meters. If the measurement's value is higher than the accuracy then the measurement is ignored.
- **GPS COM port:** This field contains the COM port string (e.g. "COM10") of the GPS mouse. This field is only available on desktop systems.
- **Web server port:** The port number used for the web server GPS source. Make sure that the port number is not used by another application (else the web server will fail to start).

Map popup entries

In this view the entries of the map's popup menu can be modified. The default entries can be hidden by un-checking the respective checkboxes.

Custom entries to websites can be added using the "+" symbol on the top right. Custom entries can use placeholders "{lat}" and "{lon}" for the position's latitude and longitude. The following example shows how to use the placeholders:

- **Name:** "My webservice".
- **Website:** "http://www.mywebservice.com?latitude={lat}&longitude={lon}".

Frequently Asked Questions

My RMAP/Oruxmaps offline map shows rendering errors. How can I fix this?
 See here: "Possible rendering problems with RMAP and Oruxmaps maps".

App Change Log

The full change log of the Cartograph application can be accessed here:
<https://www.cartograph.eu/downloads/changelog.txt>.