Eric's TopoTracker

Create and Manage Your Individual GPX Tracks

Eric's TopoTracker is unique software for cyclists, hikers, trail riders and other outdoor enthusiasts and can be used all around the world. You can plan, create and manage individual routes off the beaten paths and in areas with no trails at all.

TopoTracker transfers GPX and other tracks into a database where they are transformed and instantly included into a routable individual trail network. These tracks may come from different sources:

- TopoTracker can produce so-called „topo tracks" on the basis of the topography even off existing trails
- Tracks can be sketched and edited directly in TopoTracker based on the map information
- Self recorded GPS tracks from a GPS device or smartphone can be included
- Millions of GPS tracks are available as tour recommendations on the internet and are easy to import with just on mouse click
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The tracks from various sources can be combined and optimized and then transferred to a TopoTracker database. When imported into the database, duplicate routes are automatically eliminated and the routes are stored in a normalized form regardless of the resolution of the underlying GPX file. The altitude data are also normalized and original direction of a track plays no role during database import. In the database you will gradually create your own routable trail network from your favorite routes. Like in standard GPS software you can create routes between any start and destination points on your own route network. With a mouse click, you can create a GPX track that you can save or transfer directly to your GPS device or smartphone. It is useful to create separate databases for different activities and not to mix routes for hiking and trekking biking. You never have to worry about many different GPX files on your computer. The route network in the Eric's TopoTracker databases can always be edited and optimized later on.

TopoTracker provides routable databases, like compilation of official tour bike routes in Germany on the TopoTracker server, which you can load and install with one mouse click and use it in parts or completely for your own projects.

Topotracker is usable worldwide and uses the very sophisticated and detailed digital maps of the OpenStreetMap Association. Jonathan de Ferranti and Christoph Hormann provide an excellent global elevation model:
http://www.viewfinderpanoramas.org/Coverage%20map%20viewfinderpanoramas_org3.htm

User agreement

This program is provided "as is". Roedern-Consulting is not responsible for any damages that can be attributed to the TopoTracker software. You are cautioned that you use TopoTracker at your own risk. Although Roedern-Consulting strives to provide a error free product, no guarantee is given by Roedern-Consulting or a representative. This refers in particular to the maps and the elevation data, which are loaded from third-party providers.

Eric's Topotracker is freeware. Download, installation and use is free of charge. Commercial use to Topotracker is not permitted. Roedern-Consulting reserves all rights to this program and its contents.

If you have ideas for improvements or need support when using Eric's TopoTracker, please contact:

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Installation

Eric's TopoTracker runs on Windows 64 bit systems with Windows 7 or higher version installed. The Windows InternetExplorer 10 or higher must be installed to integrate the browser window with the Microsoft Bing AirView data. You must have the necessary user rights for the installation. Since the map and the elevation data are only loaded during use, TopoTracker requires a permanent Internet connection.
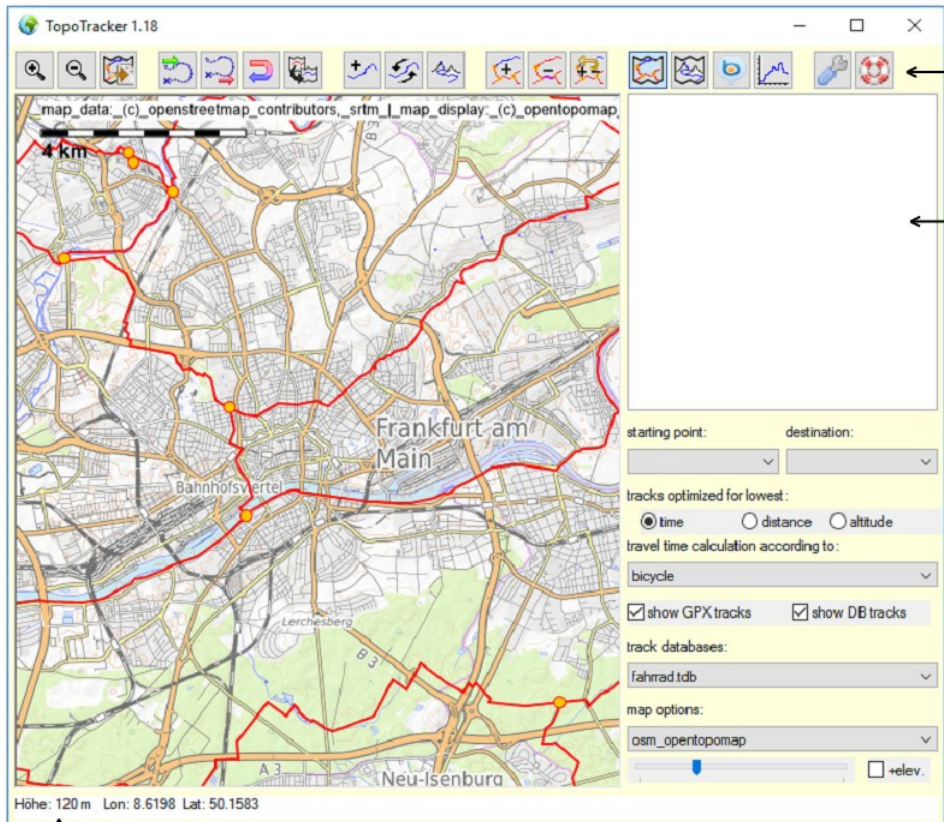
Download the installation file "topotracker64_setup.exe" from the https://www.topotracker.de website via the download link "Eric's TopoTracker Download" and execute the setup program. If Windows or your anti-virus software should report a threat during the download and / or the installation process, you must reject all these warnings in order to install Eric's Topo-Tracker correctly. You can install the Topotracker program file anywhere on your computer, but you should use the suggested folder.

After successful installation, please start TopoTracker via the shortcut icon on your desktop. The program will ask you to download and install the latest version of Topotracker. This is done with every program call, if a newer version of Eric's Topotracker is available on the server. The installation of the latest version takes only one second and the program starts automatically.

You can manually assign GPS track files with the extension .gpx or .kml or .kmz in Windows explorer settings. By double click a file in the explorer Topotracker will open and will show the track.

Eric's TopoTracker Menu Buttons and Map Functions

Move Map and Zoom Map in/out:

Rotate the **mouse wheel** or use the **magnifying buttons** to zoom in and out. Press and drag the mouse wheel to move the map. This can also be done by dragging with the left mouse button when the mouse pointer is not located over a track.

Copies the current map image into the clipboard

Blue GPX Tracks

Import GPX Tracks:

Press this menu button and select a GPX, KML or KMZ track file. The tracks from the file are loaded and the map view is focused on the newly loaded blue GPX tracks. Blue GPX tracks have a light blue line; the track start is indicated by a green dot, the end with a red dot.

Export GPX-Tracks:
Select the blue GPX tracks and/or the red DB tracks you want to export to a GPX file. Press this menu button and select a folder and specify a filename. The selected tracks are stored in this file and can be copied from there to a GPS device. If you have selected multiple non-contiguous tracks, you will be warned as this may be confusing when displayed on an external GPS device.

Transfer red DB Tracks to GPX tracks:
Select the red DB tracks you want to transfer to blue GPX tracks. Pressing this menu button transforms the selected DB tracks into blue GPX tracks. The red tracks in the database are preserved. The blue GPX tracks can now be edited manually, for example. If you have selected several non-connected red tracks you will be warned.

Run and show selected tracks directly in another map software
For this functionality, you must have another map application installed on your computer, e.g. Gramin's, BaseCamp. In Windows Explorer (formerly file manager), you can link the '.gpx' file extension to BaseCamp or other map software so that a double-click on a GPX file opens it immediately in the linked program.

Once you have done this, you can select red DB tracks or blue GPX tracks in Eric's Topo-Tracker, and press this menu button to open them directly in the previously linked program. If you have selected several non- connected tracks you will be warned.

Commands and functions of GPX tracks directly in map window

Pre-selection of GPX tracks:
Mouse pointer over track, track gets dark blue

Selection of GPX tracks:
Left mouse click on pre-selected dark blue track, all way points of the selected track are shown as yellow dots. You can select any number of tracks one by one. If a single track is selected, corresponding information like distance etc. is displayed in the upper right with light blue background color.
With **"Ctrl + A"** all GPX tracks are selected.
Lasso: By pressing the Shift key, you can also use the left mouse button to draw up a window / lasso in which the GPX tracks are selected.

De-selection of GPX tracks:
"Left click" on an already selected GPX track cancels the selection of this single track. Clicking on a **"blank area"** removes the selection of all previously selected GPX tracks.

Delete GPX tracks:
By pressing the **"Del"** key on your keyboard all selected GPX tracks are removed.

Splitting a track into two GPX tracks:
Use the mouse to spot a point in a GPX track where you want to split up the track and press the right mouse button. You have to hit the track within 40 m in order to find a location for splitting.

Connect the endpoints of two GPX tracks:
Move the mouse to pointer to the overlaying track endpoints and press the right mouse button to connect the two separated tracks to one single track. If the overlaying track endpoints are in a maximum distance of 40 m, the tracks will be connected. The track direction does not play any role in this function, i.e. you can also connect two end points or starting points.

 Create or edit a GPX-Track:
By pressing this menu button, you can create a new GPX track or edit a previously selected GPX Track.

Create a new GPX track:
If no GPX track is selected, a new GPX track is created. With a **left mouse click**, you will place the waypoints in the map one after the other. In order to achieve high accuracy, it is recommended to select a large map scale. You can move and zoom the map while editing it with the mouse wheel.

Edit existing GPX track:
If a single GPX track was selected before pressing the edit menu button, the editing function continues at the end (red point) of the selected track. If you want to edit at the track's starting point, you must reverse the track direction. To edit a track in the middle, you must split it first.

If the editing function is active, use the "**Del**" key to delete the last point.

By pressing the menu button again or by pressing the "**Esc**" key, the editing function is finished.

By finishing the editing function, the track is "harmonized", which means that unnecessary waypoints are removed and others are added to represent an elevation profile.
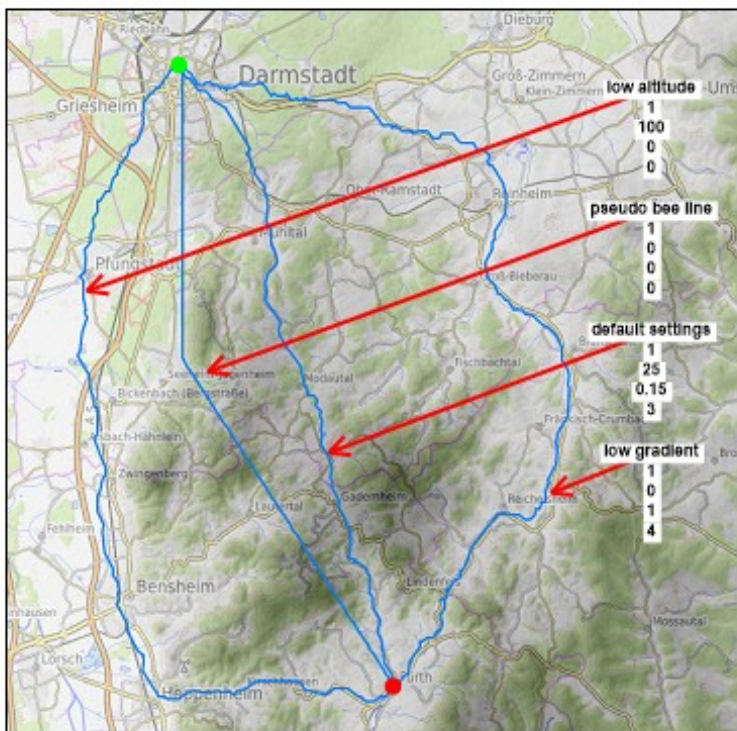

 Reverse GPX track direction:
This menu button reverses the direction of a previously selected GPX track. The green and red markings of the start and end points are interchanged.

Create GPX tracks optimized by the terrain's topography (elevation data):
Eric's TopoTracker has a unique feature that allows you to calculate tracks between a set start and finish point using the topography. Calculation parameters for weighting distance, altitude difference and steepness of the terrain can be determined by the operator. The default parameters usually results in a good compromised route where the distance to go, the altitude difference to overcome and the terrain steepness is in a good balance. The operator can play with the parameters and can compare the different results on the map. Since these Topotracks are only calculated on the basis of distance and elevation data and do not take map information like roads into account, the calculated topotracks go "cross-country" and, in some cases, even across waterways. These topotracks, however, provide an excellent guide for manually creating a nice road based track on the map.

1. Activate the **topotrack** function by pressing the menu button.
2. While holding down the **left mouse** button, drag a rectangular area within you want to calculate the topotracks.
3. A window for editing the optimization parameters is displayed; slide it into a suitable area on your screen.
4. Set a **target point** of the track by pressing the **"Ctrl-key"** together with the **right mouse** button. A target point matrix is calculated (may take some time for large areas, red status line) and when calculation is finished the target point is displayed as a red rectangle on the map.
5. Set a **starting point** of the track with the just by a "**right mouse click**", the topotrack is displayed immediately. You can set several starting points resulting in topotracks going to the same target point.

Default parameters

You can also change the parameters and calculate an alternative topotrack between the last selected start and destination point by pressing "new track calculation" in the parameter window.
All weightings refer to distance "1". The higher the weighting is for vertical distance, the

more the algorithm tries to minimize it even is this leads a longer distance. A weighting of 25 the vertical distance means that 1 meter positive vertical distance corresponds to 25 horizontal distance meters. A weighting for the gradient leads to the avoidance of steep gradients. This effect is further enhanced by the choice of a high potency for the gradient. Since topotracks are calculated incrementally from elevation points, one does not get a proper bee line, but only a "pseudo bee line", if all adjustable parameters are set to 0. For a proper bee line you simply create a track between two points manually.
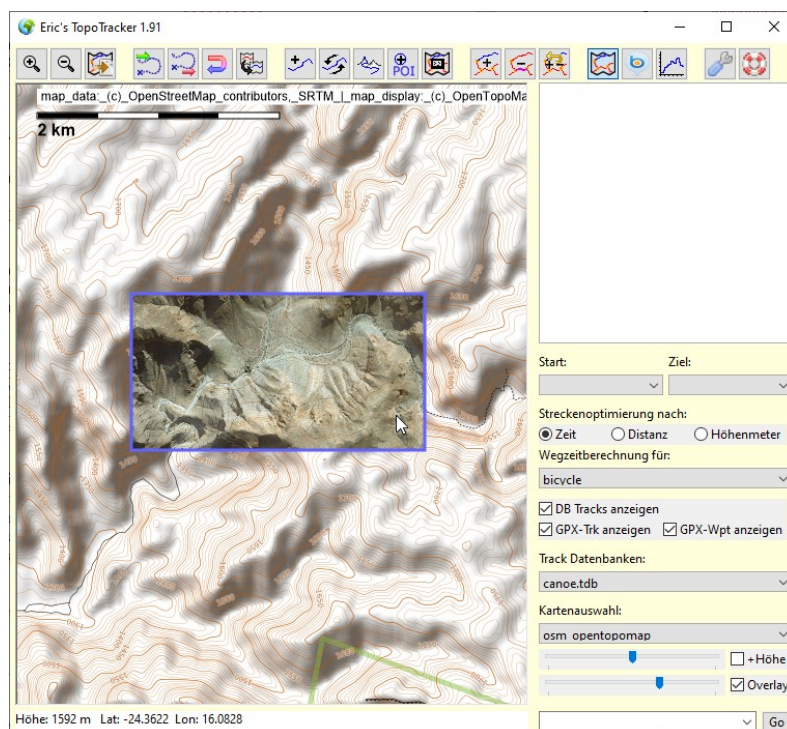
Waypoints oder Placemarks:

Add manuallyPOI (Point of Interest) to the map. After deactivating the button you can name the POI bei clicking the right mouse button. POIs are saved with the GPX-Export button.

Import **Overlay Images from the clipboard:**

Copy image into the clipboard. Press button to import image to the map.The image will be connected and scaled with the map. You can adjust the size and the position of the image manually by using the buttons in the image together wit der **"Ctrl-key"**. Adjust fading with the Overlay regulator on the right. Overlay will only b e shown if the Overlay-Checkbox is checked. With Overlays you can integrate satellite images into you map. Overlays are saved automatically and can be deleted with the "**Del-key**". With a "**right mouse click**" you can name an overlay.

Red database tracks

In contrast to direction-dependent GPX tracks stored in individual files, any number of DB tracks is managed in a database. Once a database is created it can be selected via the selection

track databases:

germany_tour_cycling.tdb

field "Track Databases" on the right side.

It is useful to create separate databases for different activities and, for example, do not mix routes for hiking and trekking biking. Databases are generated under menu Settings/Tools, see below.

A database is "fed" with GPX tracks, which can come from different sources: Tracks from the Internet, recorded tracks and manually drawn tracks can be combined and imported. An individual route network is assembled and growing according to your wishes and needs.

The created route network in the database is routable which means you can create any route between a starting point and a destination point. With one mouse click, you can create a GPX track that you can save or transfer directly to your GPS device or smartphone.

Add GPX tracks to a track database:

To add one or more blue GPX tracks to a database, select one or more blue tracks and press the menu button. The direction of a GPX track is insignificant for the DB transfer. The blue tracks are "harmonized", unnecessary waypoints are removed and waypoints representing an altitude height profile are added. Furthermore, duplicate tracks are eliminated on a route. Those parts of the track which already exist in the database are eliminated to. The GPX tracks are now being transferred to red DB tracks. If red tracks intersect, a node is automatically inserted at this point. DB track functions are executed directly in the database and, unlike GPX tracks, no manual file saving is necessary. **Do not add too many GPX tracks in one step of the database and check the import result!**

Delete DB Tracks:

DB tracks can only be deleted via this menu function. Select one or more red tracks and press the menu button. The selected routes are deleted after further inquiry. You do not have to save the database manually and the nodes are recalculated automatically.

Undo-Function for the database add or delete:

This menu button will undo the last database add or delete step.

<p align="center">**Commands and functions of DB Tracks directly in map window**</p>

Pre-selection of DB tracks:
Move mouse pointer above red track, track will change color to purple.

Selection of DB Tracks:
Left mouse click on a pre-selected purple DB track, all way points of the selected track are shown as yellow dots. You can select any number of tracks one by one.

Lasso function:
By pressing the **Shift key**, you can also use the **left mouse button** to draw up a window / lasso within the DB tracks are selected. The lasso function for DB tracks is only possible if no GPX-Tracks are loaded or the GPX Track display is switched off by un-checking the checkbox on the right.

Deselection of DB Tracks:
"Left click" on an already selected DB Track cancels the selection of this single track. Clicking on a **"blank area"** removes the selection of all previously selected DB Track and GPX tracks .

Manually insert a node in a DB track:
Select a single DB track. Move the mouse pointer to the position where you want to insert a node and press the right mouse button. If the mouse pointer is within 40 m from a red track and at least 100 m away from the next node, a node is inserted at that point. To keep this node permanently you must name this node. Otherwise nodes are being deleted automatically by the next database change when all the nodes are being recalculated.

Name a node in DB track database:
Move the mouse pointer over the node you want to name. The node will change the color from orange to red. Press the right mouse button, a window will appear where you can enter , any name like "Home", "Frankfurt", etc. You can only save a unique name in the database. The node names are displayed in the map when the mouse pointer is over a named node.
The named nodes appear in the "Starting point" and "Destination" selection lists on the right side. These can be used to create a route directly, taking into account the parameters below (shortest time, shortest distance, or lowest altitude distance).

<p align="center">**Create a route with a Track database:**</p>

Basically, a route is only complete and usable if corresponding information is displayed in the top right window with a light red background! Such a route can be directly exported as a GPX track or can be converted into a GPX track within TopoTracker.
A route can be created in three different ways:

1) You can directly select the DB tracks one by one with the left mouse button. The order you select the DB tracks will determine the direction of the route. Routes may not have gaps, may not being branched, and you can't select the same track twice. You can always de-select tracks and add new ones. Only if information is displayed in the window a route is passable from starting to destination point.

2) A **double click with the left mouse button** on a node sets it as the start node. The point is displayed with a green dot. By double-clicking on another node, this node will turn into a target node and has a red dot. The route between start and destination nodes is determined according to the settings of the parameters.
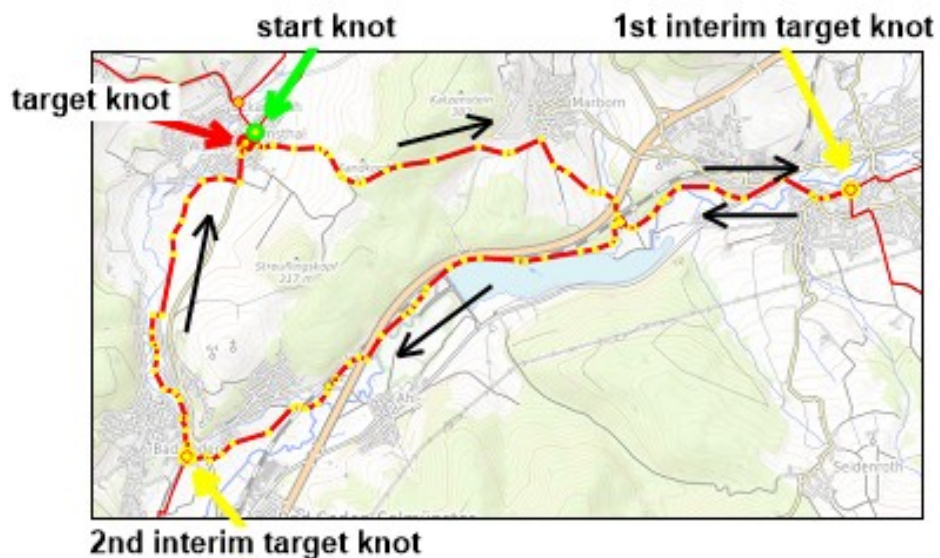
tracks optimized for lowest:

◉ time   ○ distance   ○ altitude

You can also set intermediate destinations by double-clicking on more nodes. These are then represented as yellow circles. The first node of a route, the start node is al-ways green, the last destination node, always red. By double-clicking on a node that has already been marked, this node will be deleted as a target from the route. A dou-ble-click in an empty map area deletes all node markers and and deselects all tracks. A node can only be marked once, what implies, that a start node can never be a destina-tion node, or an intermediate node can be activated more than one time. To plan a round trip with a common start and destination node, add a new (auxiliary) node to the route in the close vicinity of the start node. You can then use this as a destination node. When using intermediate nodes, DB tracks can also be used several times, e.g. outward and return. As long as nodes are marked, you can redraw the route by reusing

tracks optimized for lowest:

the route optimization option.   ◉ time   ○ distance   ○ altitude

3) If there are named nodes in your track database, they are listed in the "Starting point" and "Destination" selection lists on the right. By selecting a starting and destination node from the corresponding lists, a route can be created directly, taking into account route optimization options below.

Copy one or multiple TDB tracks from one database to another

If you have not yet created a target database, create a database in Extras / TrackDB tools.

1. Switch to the source database on the right side in the track database selection list
2. Select the tracks to copy by left mouse click or the lasso function.
3. Convert selected DB tracks to GPX tracks using the function.
4. Switch to the target database on the right side in the track database selection list, the GPX tracks will remain unchanged.
5. Select the GPX tracks and transfer to the target database with the function.

This method allows you to add a whole database to another in one step.

Map Display, Altitude Diplay, Air View, Elevation Profile

 The map display is switched to the altitude display in grayscale. Different map displays types can be selected on the right side in the selection list "map selection" on the right side.

Use the slider on the right side to adjust the brightness of the map image and generate a cross-fade with the gray scale elevation by selecting "+ Height".

In the altitude representation with grayscale, a window appears in which you can adjust the display as well as the parameters for this display. The two sliders in this window will limit the minimum and the maximum altitude for the grayscale display. The button "automatic" sets the sliders automatically, so that the lowest altitude in the map area is black and the maximum altitude is represented by white. You can invert black and white by setting the check box.

 A second window with a Microsoft Bing Airview browser shows up. The center of the Airview display corresponds to the mouse pointer in the map and so does the zoom level. You can also move or zoom the Airview image directly in the browser window. This functionality requires the installation of Microsoft Internet Explorer 10 or later on your computer.

 A second window for the display of elevation profiles shows up. The profiles of one selected blue GPX track or one selected red DB Track are displayed. If you move the mouse pointer with left mouse button over the elevation profile the corresponding location is show on the map with a cross.

<p style="text-align:center">Options, Settings und Tools</p>

A window with different tabs shows up:

Settings: You can select the menu language, metric or English measurements, and some setting of the screen display.

GPX tools: Expert functions for manual editing of blue GPX tracks. These and other features are automatically applied when transferring blue GPX tracks to track DB tracks. The settings here have no effect on the automatic transfer.

Track DB tools:

Load or create TrackDB:
Before a track database is available in topotracker, it must be created here, or an existing one must be integrated. After that onetime process the database is available in the main window in the selection list on the right under Track Databases. To laod an an existing TrackDB please select a TrackDB file and load it by pressing the "Save" button. However, you can also enter a new name and "Save" to create a new blank database. Regardless of the directory, a database must have a unique filename and can only be loaded once.
If you want to delete a database, you must do this by manually deleting the corresponding database file.
Although you can save the database files in any folder, you should limit yourself to the suggested folder "... \ Topotracker \ TrackDBs \".

Load track databases from the server:
Eric's Topotracker provides TrackDBs with track networks for different activities (tour cycling Germany) on the Topotracker server which you can use completely or in parts for your own projects. Select a TrackDB from the drop-down list on the server, and then load and install them by pressing the button. Because the server databases are constantly updated, you should re-download them from time to time to have the latest version. Each download overwrites an existing TrackDB of the same name on your computer. The loaded TrackDBs should therefore not be edited, since your changes will be lost during the download. You should only transfer tracks from the download databases into your own databases.

Parameter to calculate the travel time:

The parameters which can be selected in the main window on the right can be changed here, or new parameters, for further activities can be added. The parameters must be entered separated by semicolon. Speed should be the average speed of the corresponding activity without breaks in km/ h.

Formula for travel time:

Travel time = (horizontal distance [m] + altitude up [m] * weighting altitude up + altitude down [m] * weighting altitude down)/ 1000 / average speed

Check the integrity of the Track database:
Since this function automatically runs when adding and deleting tracks in a TrackDB, manual operation is usually not needed. If check box "TrackDB tracks harmonize" is ticked, all way points of all tracks in a database are recalculated. This can take some time for larger databases.

Automatic Removal of side tracks < 500m:
If checked during integrity check short "dead-end roads" from the existing route network would be deleted automatically. If the end knot is named the dead-end will not being deleted.
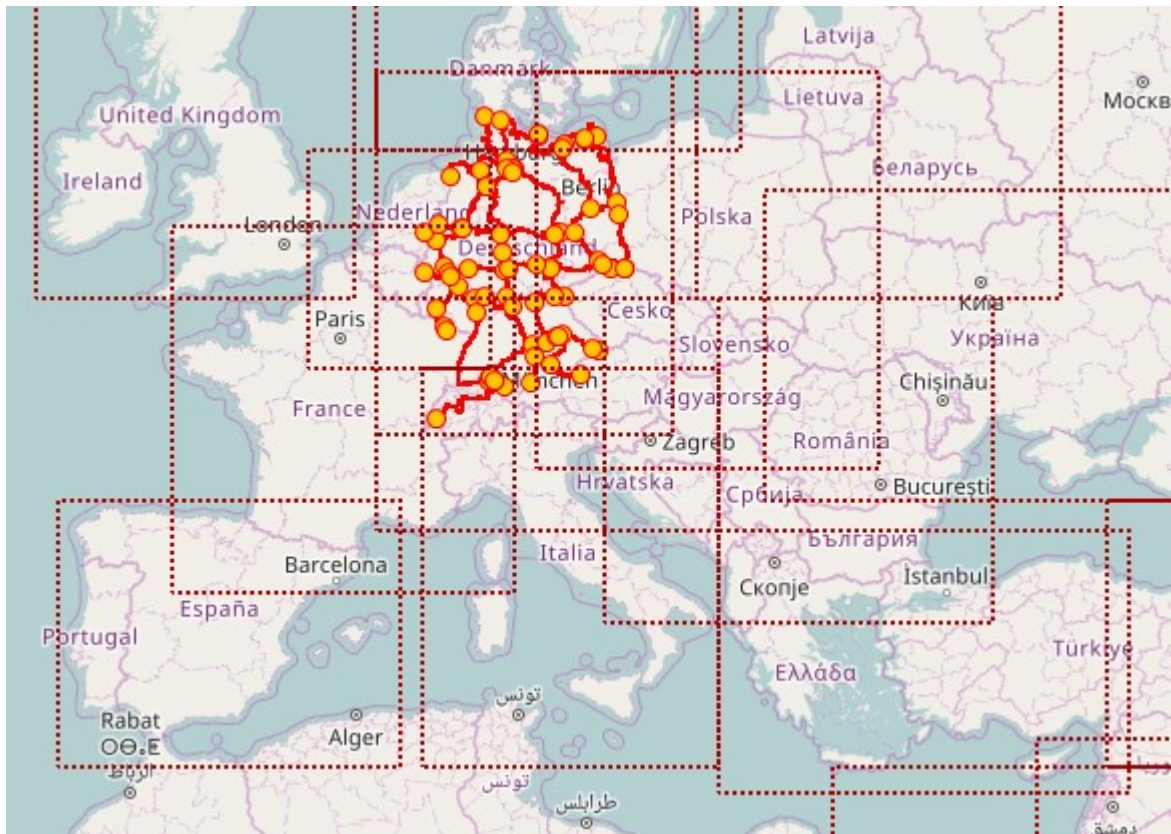
Map and elevation:
Import Elevation data from HGT files:
This feature allows you to add elevation data automatically from http://viewfinder-panoramas.org to Topotracker. The elevation model is available in latitudes from about 60 ° north to about 60 ° south worldwide. Since the elevation data covers huge amounts of data, TopoTracker can not hold all data in the memory. A favorable area is roughly as large as France or Germany. You can load many areas, for example, one for each country or state, and these areas should overlap generously. Topotracker will automatically load the area into memory when you click on it.

Load a height range:
1. Press this button to start the function and to display all loaded elevation data areas loaded before.
2. Move the map with the middle mouse button and zoom into the desired.
3. Use the left mouse button to pull up a window for the area you wish to load the elevation data. It is useful to choose an area for a country / state. The areas can and should overlap generously.
4. Download and installation may take some time while the status line turns red. You can not use Topotracker during this time.

Überlappende Höhendatenbereiche für Europa

Delete Maps not used more then x days:
This feature helps to reduce the hard disk space for the map cache. Map tiles which haven't been used for a number of days can be deleted.

 Help and "About" Information for Eric's Topotracker

Emergency backup of the TrackDB database files

For the (very rare) case that a database file becomes corrupt and can no longer be opened by Topotracker, you can move back to automatically created backup files of the TrackDB databases. These are stored in the same folder as the original database and have the suffix "* .tdb-bak". Exit TopoTracker, delete the corrupt file in Windows File Explorer and rename the extension of the backup file to "* .tdb".