SimSail

User Manual

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SimSail

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http://www.simsail.net

SimSail is a **free** software for navigation, weather analysis, sailing route planning and performance analysis.

SimSail is a digital **simulation** tool because it artificially reproduces the operation of a sailboat in its environment using a computer program, for study, explanation or forecast purposes. This assertion is true for the navigation (charts and boat movement), the environment (air and water) and the routing. In navigation software, everything is a representation of reality to study past situations, explain the current situation and predict future situations.

Regarding routing, the method of isochrones is described in **artificial intelligence** as an optimization meta heuristic based on a greedy algorithm. The greedy algorithm makes an optimal choice at each step (isochrone) with the idea of finding the optimal solution to solve the problem as a whole. However, this approach fails to find the best route with certainty. Indeed the algorithm makes decisions only according to the information available to it at each step, without taking into account the overall problem. This assertion is true for all navigation software doing routing.

Like OpenCPN, which has chosen sobriety, SimSail presents an **interface** that is quite different from other software: there is no menu or ribbon at the top, there are not many icons accessing to all functions and there are also no different workspaces (navigation, weather, routing, etc.). Almost all windows close with the cross located at the top right. There is a single icon bar and a single workspace. Like any simulation tool, SimSail requires a bit of time to operate. The interface tries to reduce the complexity of the software by grouping the functions and allowing quick access to the most used functions. To access a function, either there is an icon, or there is a right click on something which brings up a context menu, or you click on the icon located at the top left (or [TAB] key) which opens a window Parameters. Several icons have a function accessible by a right click and also by the mouse wheel. There are also several keyboard shortcuts ([F1] key to list them).

It is quite amazing to read very expensive software manuals which present through hundreds of pages every function detail but which never explain how the routing is calculated! This **manual** is limited to the essentials, through several objectives: list the functionalities, how to connect SimSail to a navigation system, explain how the routing is calculated and explain certain features such those that require purchases (gribs from Great-Circle®, nautical charts from ScanNav®) or internet access (HD coastlines and bathymetry).

Attached to the program are the history of the different versions and the licenses of the third-party components.

SimSail is not to replace any skill of a skipper.
At sea, the skipper has the responsibility for the crew and the boat and therefore the last word… not SimSail.

Features

Only Windows 10 & 11 (64 bytes), minimum 8 GB of memory

Cartography

- Mercator projection and with full scrolling in longitude (infinite map)
- Coordinates in WGS84 format
- Everything is in orthodromy
- World coastlines with coastal cities and capitals
- Nautical raster charts **SnMap** (sold by ScanNav),**BSB** and **MBTiles**
- Nautical vector charts **S-57** and **CM-93** (Ed 2)
- Terrestrial maps Google, IGN (France), OpenStreetMap, Microsoft Bing, ArcGIS
- Overlay of terrestrial maps and nautical charts
- Bathymetry (European Marine Observation and Data)

Navigation

- Connection to instruments (serial or wifi) with display of the boat and navigation data
- Configurable repeaters with graphs
- VMG graph to adjust its angles, upwind and downwind
- Simulator to configure the 60 repeaters
- Recording of selected NMEA data
- Laylines upwind and downwind
- AIS (Automatic Identification System) with list of targets and CPA/TCPA
- Full replay of navigation including AIS targets (with NMEA data)
- Tides at many locations in the world with tide graph
- Sun and moon rise and set
- World magnetic declination
- Navigation objects (circle, line, figure, mark, text, RBL, ERBL)
- Performance tests at sea for periods of time
- Complete tool of measure of distance

Weather

- Grib file of wind (edition 1 and 2) with display of wind, gusts, isobars, precipitation, humidity, total cloud cover, temperature and convection
- Grib files of currents and waves (edition 1 and 2)
- All gribs of wind and current can be modified in intensity and lag
- Synoptic situation (Analysis & Forecast - Low & High & Fronts) from Canada to Turkey
- Perpetual current atlas for the area from Belgium to Spain
- SHOM tidal streams included
- Direct request of gribs from Great Circle (subscription required at Great Circle)
- Email requests for Saildocs and Great Circle
- Weather graph
- Water and air particle trajectory
- Weather pointer

Routing

- Automatic routing or control of all parameters
- Routing sailing, sailing without spinnaker, dual with sailing and motoring with fuel consumption and, motoring only
- Cargo ship routing with polar
- Routing by Isochrones, at the best course or on the route
- Routing on multiple legs of route
- Routing from the boat and/or to the active waypoint
- Routing with multi gribs of wind and current
- Historical routing
- Sensitivity tests
- Imposed waypoint (pivot point on isochrone)
- Integration of the current into all routing calculations (wind and boat)
- Avoidance of coasts and barriers defined by the user
- Avoidance of thunderstorms, weak or strong wind, high waves, period of waves
- Multiple routings by scan of variables (polar, wind – strength & lag, current – strength & lag, time of departure and several boats)
- Numerous tools of visualization of the routing (display of all conditions met on a route step by step and global statistics)
- More than 500 polars provided with possibility to modify them[1]
- Configurable set of sails
- Export of progress table
- Routing time step from 1 min to 6 hours
- 4 modifiable configurations for the same boat for quick access (cruising, regatta, etc.)
- Loss of speed for tacks integrated in the calculations

Functionalities

- Automatic backup of the working environment
- NMEA data converter in CSV format
- NMEA statistics to configure data reception (multiplexer or other)
- Monitoring a race fleet
- Languages: French, English, Dutch, Spanish, Italian
- Routes, marks, barriers and traffic separation devices in GPX format
- Compatible with high definition screens (High DPI)
- Borderless window, with integrated icon bar, to maximize workspace
- Several icon sets with themes

[1] some come from www.sailgrib.com

Development

The author is single-handedly developing SimSail using Microsoft Visual Studio Community 2026. SimSail is written in C++ 64 bits Unicode using the Win32 API and Direct2D GUI.

The Win32 API is the original platform for native Windows C/C++ applications that require direct access to Windows and hardware. It does not require any managed runtime environments like .NET and WinRT (for UWP apps for Windows 10). The Win32 API is therefore the platform of choice for applications that need performance at the highest level.

Direct2D is a hardware-accelerated, immediate-mode 2D graphics API that delivers high performance and high-quality rendering for 2D geometry, bitmaps, and text.

The SimSail program consists of approximately 204436 lines of code, of which approximately 25% is for cartography and navigation, 50% is for weather and routing, and 25% is for graphics.

License

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This means that nothing is guaranteed, not even your satisfaction. If you are not satisfied, no need to tell me, uninstall it, that's all. On the other hand, satisfaction messages, error reports as well as development ideas are welcome (Contact tab on the website).

Install

SimSail is in two folders:

- The program and non-modifiable files are under C:\Programs;
- Data, which includes the grib files, the routes, the barriers and all the parameters are under User\Documents\SimSail.

Interface

Most of the buttons on the main bar have three functions. We select with a **left click** and we change the function of a button with a **right click**. The **mouse wheel** changes the file or type involved: for example, on a wind icon, the wheel changes the grib. On the raster chart icon, we alternate between BSB and SnMap or on the vector chart icon, we alternate between S-57 and CM-93.

The icon set can be changed (Parameters dialog box > Interface).

	LEFT CLICK		RIGHT CLICK
	Access to all control settings		
	Show the arrows of the wind		Arrows on the grid of definition of the grib
	Show wind gusts		
	Display the wind gradient in 10 colours		Gradient of wind with figures
	Show the cloud cover with numbers		Cloud cover without figures
	Show the convection with numbers		Convection without figures
	Show the precipitation with numbers		Precipitation without figures
	Show the humidity with numbers		Humidity without figures
	Show the temperature with numbers		Temperature without figures
	Show the isobars		Pressure gradient
	Show the waves		Waves on the grid of definition of the grib
Date	Set the date at the moment		
	Show the arrows of currents		Gradient of currents
	Show the tides stations		
	Show the coastlines		Coastlines with map grid
	Show vector charts (S-57 or CM93)		Vector charts options
	Show raster charts (BSB or SnMap)		Raster charts with map grid
	Show MBTiles charts		
	Show terrestrial maps from internet		Terrestrial maps from the cache
	Bathymetry		Bathymetry with safe depth
	Show the waypoints and the navigation objects		Waypoints in small, medium and big format
	Centre the boat on the screen		The boat is immobile (the chart moves)

	Show the repeaters		Open the configuration of the repeaters
	Show the AIS targets on the screen		Display the list of the targets in a window
	Switch to MOB mode		

The [**F1**] key displays all keyboard shortcuts.

The [**TAB**] key opens the window that controls all parameters.

The [**SPACE**] bar launches the routing.

Icons and themes

The icon set can be changed (window Parameters > Interface). Themes are proposed. You can mix an icon set with a specific theme.

Icons can be added manually. They must be in the same format and have the same name as the original icons. See the subfolders of C:\Programs\SimSail\Data\Icons.

Themes can be added or edited manually. See the folder C:\Programs\SimSail\Data\Themes.

Outdoor touchscreen

A second screen can be connected to the PC running SimSail. This screen can be located in the cockpit of the boat when the main screen is in the cabin, at the chart table. This screen can be touch-sensitive, visible in full sunlight and waterproof.

SimSail only manages one display at a time but this display can change depending on whether you are watching SimSail on a PC screen or on an external screen.

In order for SimSail to be used on an outdoor touchscreen, the icons can be enlarged. Go to Parameters > Options > Outdoor Display. If the display is enabled, an icon appears at the bottom of the screen. This icon can be moved around the window. Clicking on this icon switches the display between the PC screen and the external screen.

Small screen

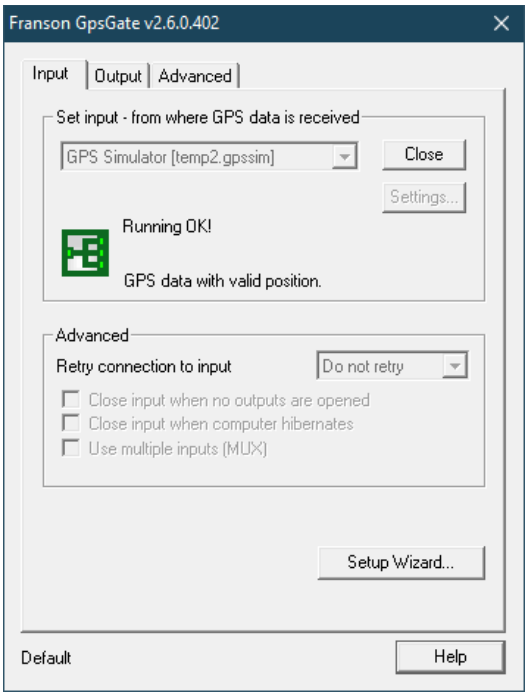
SimSail requires a minimum screen size of 1140 x 768 pixels. When approaching this size, not all icons are visible. Press the **[TAB]** key and go to Settings > Options > Interface and change the button size. A size of 24 pixels might be correct.

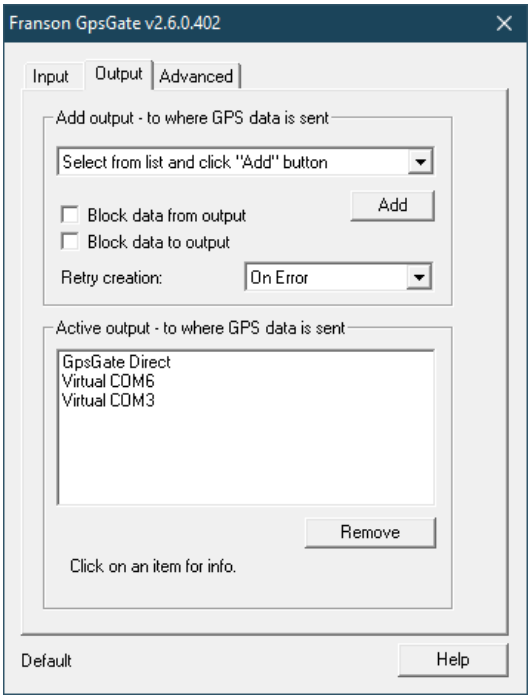
Another option, depending on the screen type, is to change the DPI (dots per inch). Search the internet for "How to change the DPI on Windows 11?"

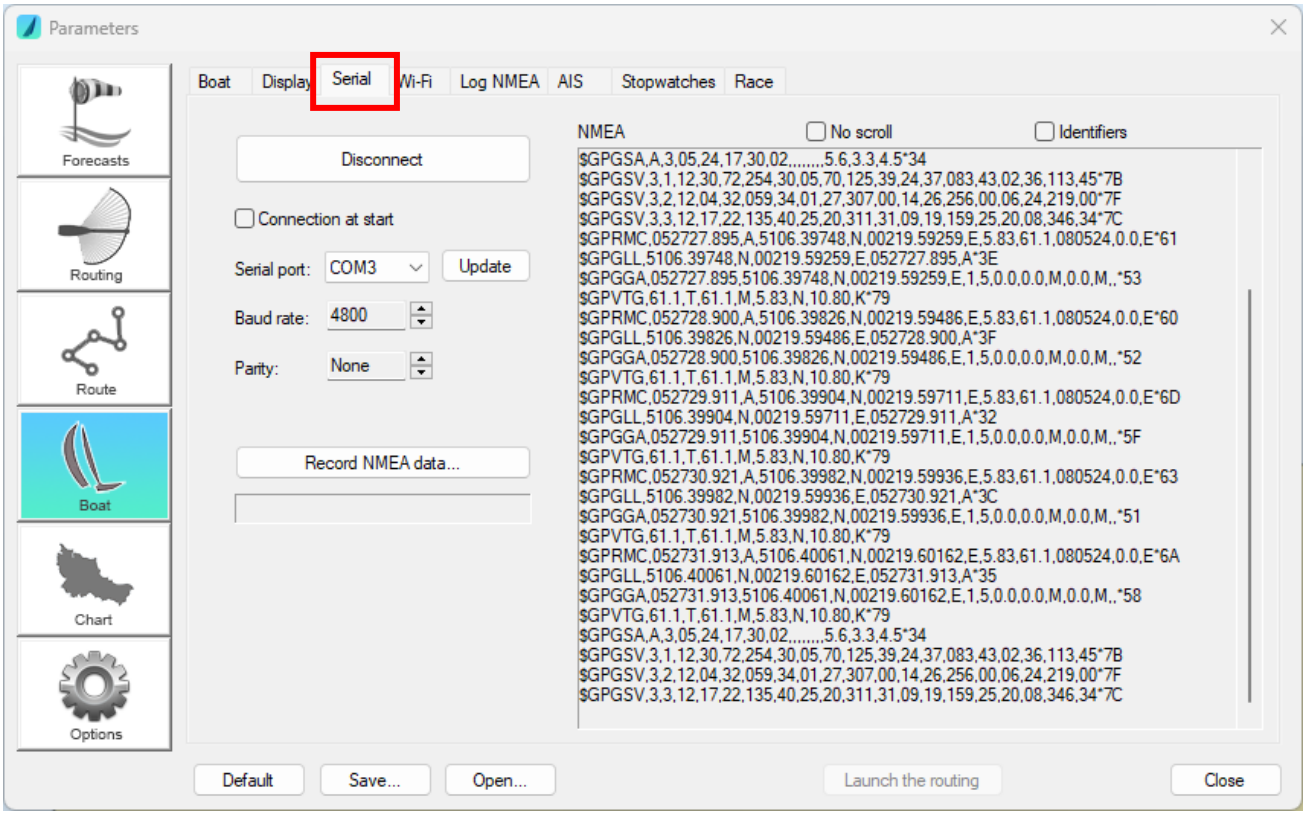
Connexion to a Navigation System

SimSail can receive data from a GPS or a navigation unit or from another instrument emitting NMEA 0183 sentences on a serial port (or USB port with serial port emulator) or by Wi-Fi (“Wi-Fi” tab ").

To receive a serial port, for example, install the “gps-gate splitter” software from https://gpsgate.com/gpsgate-splitter.







It might be necessary to disconnect the antivirus for a Wi-Fi connection (especially in UDP mode) or to give the required authorizations (IP address and port).

A click on the circle at the top right of the screen of SimSail refreshes the screen automatically or not.

- Green: connected to GPS and auto refresh.
- Orange: connected to GPS and screen not refreshed.
- Red: not connected to GPS.

In navigation mode, click the icon to refresh the screen. If SimSail is receiving NMEA data, the icon turns green. During a routing calculation, automatic screen refresh is disabled.

If the letter S appears in the connection symbol, SimSail is in Simulation mode.

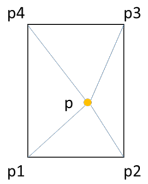
Algorithm of Routing

SimSail reads the gribs (editions 1 and 2) of wind and current. SimSail reads the data of the SHOM. SimSail can route with a unique wind (constant on the earth) that may vary in intensity and direction.

The routing can use several gribs of wind and current. SimSail computes the wind and the current depending on the priority of the selected gribs (Parameters > Forecasts > Wind Grib and Parameters > Forecasts > Current).

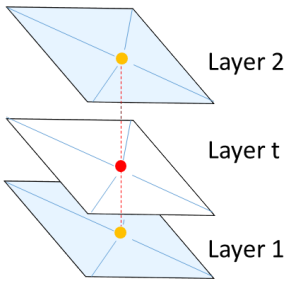
The gribs of wind and current can be modified in intensity and in time (lag). In general, 115% is a good value for a grib of wind. In the Channel, the real current is often stronger than the files (gribs or SHOM).

The grib of wind and the grib of current are linearly interpolated in space and time. It means that, for any position, SimSail interpolates four grid points that surround the position to calculate. If one point is missing, SimSail takes the closest point of the grid, p1, p2, p3 or p4.



This **interpolation** is performed for the previous layer of the grib and for the next layer. The result interpolates the two layers as a function of time. Example, the wind grib provides the data for 8:00 and 9:00. The calculation seeks a value for 8:00 (between the four grid points that surround the wanted point) and 9:00. Then, the final result is that for the time searched between 8:00 and 9:00.

Because the **currents** of the SHOM are based on an irregular grid, the interpolation of these currents is questionable in certain cases (in particular for the tidal front between zones of different density of current points). The method that would be the fairest (kriging) requires several calculation passes and would require more calculation time than a user is willing to allow. Interpolation on a regular grid like gribs is therefore preferable to interpolation on an irregular grid. This is why, in many cases, a current grib is preferable or the choice of the perpetual current atlas derived from current gribs compiled and related to the tidal times of reference ports.



The **polar** of the boat is interpolated using two methods to choose from: a linear interpolation between the points in the polar file and a method of bicubic splines over the entire range of values. Linear interpolation induces small errors halfway between defined points. Since polynomial interpolations give very random results at the ends of the ranges of values, spline interpolation is preferred for the accuracy of the results. There is however a price to pay which is that the polar is completely defined on all the rows and columns of its values.

Wind values greater than those in the polar file are not extrapolated. If the polar stops at 20 kt wind, then a boat speed for a 24 kt wind will be that of a 20 kt wind. This is a limit to be taken into account in strong winds because the sea conditions can significantly reduce the performance of the boat. In general, the polars from speed prediction programs (Velocity Prediction Program) are optimistic in light and strong winds. The polar editing tool ([P] key) allows each line to be corrected individually by assigning a percentage to it.

It is advisable to check that the polar interpolated using the bicubic spline method is consistent. Otherwise, uncheck the “bicubic spline interpolation” option.

The polar can be modified in intensity. When cruising (furling, sprayhood, loaded boat, rear gantries, dirty and/or unprepared hull, sub-optimal sail trim, etc.), it will be wise to set a coefficient well below 100%. The intensity of the polar may be different at night. This is the case when cruising while under canvas or leaving the driving of the boat to the pilot. In SimSail, night is when the centre of the sun is below 12° below the horizon.

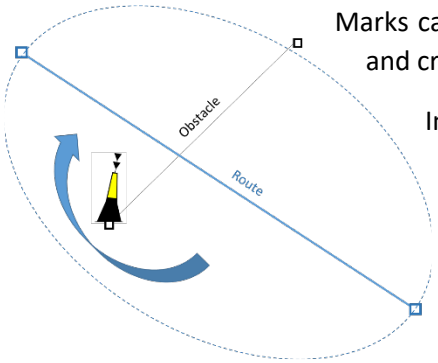
The upwind angle can be degraded. This is very useful because even by degrading the entire polar, it does not reflect that outside of optimal regatta conditions, a sailboat goes upwind with a degraded angle of several degrees. This is also true for driving under autopilot. The same is true for the downwind angle of descent (useful for driving the asymmetric spinnaker under autopilot).

SimSail can route multiple **route** segments. There is no limit to the number of segments. A right click on the map brings up a menu that offers to create a route. You can move, add and delete all **waypoints**. You can ask to check if a waypoint is on land (Parameters > Route > Route). Note that routing cannot begin if the starting waypoint is on land. A waypoint on land appears differently from the others (solid circle). No route segment may be less than 0.5 nautical miles. This is the low limit of SimSail whose time step for routing can go down to 1 minute.

SimSail performs all its calculations in orthodromy (a great circle arc on the surface of the earth which guarantees the shortest route).

SimSail avoids the **coasts** formed by the world coastline. The quality of the coast is configurable (Parameters > Route > Obstacles). The higher it is, the more precise the calculation but the longer the calculation time. The quality of the coast taken into account in the routing calculations (Parameters > Route > Obstacles) is different from the quality of the map displayed on the screen, which depends solely on the zoom level.

SimSail avoids user-created **obstacles** (called barriers in the software). There are several ways to create obstacles: by creating a road and converting it into an obstacle (Parameters > Route > Route) or by creating an obstacle manually (right click on the map then new barrier). All the points of the obstacles are modifiable (deletion, addition, displacement). All obstacles can be saved to be recalled later (right click on one of the points of a barrier).



Marks can be passed on a specific side. Create a route that passes over a mark and create a barrier of two points (one of them is the mark).

In this case, the mark is let to starboard.

Traffic Separation Devices (**TSS**) are not obstacles for SimSail routing. By creating a route that takes the form of a TSS, it can be converted to TSS format and obstacle format (Parameters > Route > Route). You can also create a route in navigation software, import it into SimSail and convert it to TSS and obstacle. In fact, any file in GPX format is either a route, a DST, or an obstacle for SimSail. It depends on where the file is stored. If a GPX file is in the "Routes" folder, it will be considered a route. The same file located in the “Barriers” folder will be considered as an obstacle. And the same file located in the “Tss” folder will be considered as a TSS.

SimSail can avoid weak or strong **wind areas** (Parameters > Forecast > Wind Grib → Surface wind on route).

SimSail can route under motor when boat speed becomes low under sail (Parameters > Boat > Boat). The fuel consumption on the route is calculated.

SimSail offers **three routing methods**, a best heading method, a stay on course method and the isochrone method (Parameters > Routing > Method).

1) The **“best heading” method** is very basic. At each time step, SimSail tries to reach the next waypoint by following the closest course (the best course). When the inbound tack is on the other tack, SimSail tacks or gybes. When the course is completely into the wind, SimSail turns constantly, with each time step. When it encounters the coast or an obstacle, the routing stops. This method is very limited but allows you to see what a boat would do if it only had instant weather information. This method therefore does not calculate an optimal route, unlike the isochrone method.

2) The **"on the route" method** does not leave the choice to the boat to leave the route. If the routing is for a sailboat with a headwind and the engine is possible, then the engine will be used. This method however has a limit, routing into the wind without an engine. In this case, the routing deviates from the route. This routing method is effective for merchant ship routing (select the polar called "Cargo").

3) The **isochrone method** is more computationally expensive but gives optimal results. At each time step, the boat tries many directions and continues the same process from each of them. A line that joins all the routing points that allow the boat to arrive at a time t is called isochrone (literally "same time"). Isochrones are calculated successively until an isochrone line comes close enough to the end waypoint of a route leg. In this case, each routing point of the last isochrone seeks to join directly or indirectly (with possible tacking or gybing) the arrival waypoint of the segment. The optimal route is calculated from the routing point that arrives fastest at the last waypoint and back up to the starting waypoint. The result shows that the direct route is rarely the fastest.

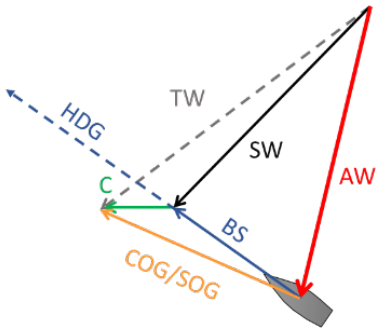
Whatever is the method, SimSail estimates the time step for each segment of the route. For each, SimSail pre determines a time step by taking the polar and by performing a ratio between different speeds (near, reaching and bearing). On average, for a quality routing "normal" (Parameters > Routing > Method → Quality) SimSail seeks to calculate about thirty isochrones. The time step is proportional to the length of each segment. This ensures optimal results.

The time step should be commensurate with the **precision** of wind gribs and current and that of the polar. In practice, it is best to avoid extremes. A routing time step of 15 minutes on a 16-day wind grib is extreme. It is the same for a time step of 6 hours when the wind file has a very high definition (AROME model of Météo France for example). Everything is a matter of judgment. In both cases, the result is not wrong. It is even just scientifically but as the data are not consistent, the interpretation is questionable.

In the isochrones method, in manual mode, the aperture angles and their number can be changed as well as the time step. In this case, the time step is the same for all segments.

Overall, it is best to use for the isochrones method the automatic mode and adjust the quality of the routing between from "Ultra Low" to "Ultra High". The choice of quality "Normal" gives good results (speed of calculation versus accuracy of routing).

Each **routing point** is calculated as follows.



The wind (TWD and TWS: True Wind Direction and True Wind Speed) and current (CD and CS: Current Direction and Current Speed) are interpolated to the precise position of the point and specific time point. SimSail tests all selected gribs files starting with the one that has the highest priority and continues until a grib is valid in space and in time for the point.

The current is then combined with the wind to achieve a surface wind (SWD and SWS: Surface Wind Direction and Surface Wind Speed). This gives a wind angle in the polar which is interpolated to get the boat speed (BS: Boat Speed). If the tested angle is too close to the upwind or downwind, the optimum angle of upwind or downwind is retained (VMG angle). The speed and the boat heading are combined with the current to obtain a speed and a course (SOG and COG). The apparent wind values are calculated (AWA, AWS: Apparent Wind Angle and Apparent Wind Speed).

The tack time is taken into account using Parameters > Boat > Boat → Tacking. Two parameters are needed: the loss of speed when tacking and the time taken to regain speed before tacking. The loss in tack is interesting only for short upwind routes.

If the boat speed (on water - BS) is below a set value, SimSail drives **motor** if this option is selected (Parameters > Boat > Boat). SimSail routes with the engine when the wind data are not available and if the "No routing outside the grib" is not selected.

The sea state can be taken into account due to a percentage rate defined in Parameter > Forecasts > Sea state. The upwind can slow the boat and downwind may accelerate it. The crosswind is neutral in all cases (no effect of this parameter). The gribs of waves are not taken in account in the routing.

At the start of a route segment and according to the selected options, SimSail sweeps many angles. SimSail eliminates some of which are abnormal, e.g. those between the upwind (0°) and the optimal angle of upwind to this wind force (VMG) and those between the downwind (180°) and the optimal angle of descent this wind force (VMG). The optimal angles upwind and downwind are calculated precisely for all wind strengths. For example, if the polar contains the values for 10 kt and 12 kt, and the wind from the surface of gribs is 10.37 kt and tested angle is 20° (very close to the wind) during scanning, the point of routing will take into account the optimal angle for the wind strength (10.37 kt), for instance 42.18°.

Routing points that arrive behind the preceding isochrone are removed from the calculation. It is the same for the points that cross behind the isochrone being calculated. This is necessary to avoid the exponential inflation of routing points. Indeed, the first isochrone may be based on the calculation of 70 points (70 different directions from the first waypoint). But if the routing adds each time 70 new points to the previous point, the calculation time can exceed the life expectancy of the user (the fourth isochrones has already more than 24 million of routing points). The calculation algorithm so cleans routing points to maintain reasonable number. Nevertheless, a route of one segment (two waypoints, a start and a finish) calculates around 30000 routing points in a few seconds and give the optimal route with 30 isochrones.

The process of eliminating "bad" routing points on an isochrone relies on two different methods. The first, fast, consists of eliminating points that are too close together after a Delaunay triangulation and those that

are behind the best points (to be kept). The second, slower but more complete, is based on the analysis of an “alpha shape” after a regular triangulation. See Wikipedia for all these terms.

Another way to reduce the computing time is to isolate the routing in an ellipse that passes through the departure and arrival waypoints (Parameters > Routing > Method → Ellipse). The "ellipse" option is available in the isochrones method. The width of the ellipse is configurable. The number of routing points is proportional to the aperture of the ellipse. When this option is not selected, routing points are more numerous.

Routing stops when SimSail has found an optimal route. However SimSail can also stop when there is no solution for the route: this is the case when the routing cannot circumvent the coast or an obstacle, or when it cannot avoid a zone of minimum or maximum wind, or that it arrives outside of a grib of wind (in space or in time). A window is then displayed to specify the reasons that blocked the routing. It is then necessary either to widen the ellipse, or to uncheck a constraint, or to change the route by adding a waypoint which circumvents the coast, or to further reduce the time step by increasing the quality of the routing in automatic mode or by switching to auto mode. It is up to the user to discern which parameter to change so that the routing arrives at the last waypoint of the route.

SimSail can simulate the passage of a front using **unique wind** (Parameters > Forecast > Single wind). When selecting multiple dates, the wind may change in strength and direction. The change is gradual and extends over the entire duration of a period (between two dates). The unique Wind mode is interesting for regatta organizers who want to test different hypotheses long before wind gribs are available. We can also test certain strategic hypotheses.

SimSail can **sweep routing parameters** like polar, wind and current in intensity and offset and start time (Parameters > Routing > Sweep 1).

SimSail can route **several boats** at the same time on a course and give the result of the compensated times (Parameters > Method > Scan 2). This option is useful for regatta organizers looking for balanced courses between large and small boats and also between upwind and downwind.

SimSail can perform **historical routings**. In this case, all wind gribs located in the gribs folder are selected. For each calculation, SimSail takes the grib with the most recent information. For example, if the folder includes the same grib taken 24 hours apart (say the same one every morning), SimSail calculates the routing by taking 24 hours of information from the first grib then 24 hours from the next grib, etc. The routing found is the fastest route of all the calculated routes. In the case of a trip lasting several days, weeks or months, the daily routing (on board or not) takes into account the last downloaded grib and calculates the route according to the upcoming forecasts. Once arrived at the destination, you can launch a historical routing with all the gribs taken each day and thus determine the optimal route for the entire journey. This method works for around-the-world routings.

SimSail can perform **sensitivity tests** to parameter variations. 3 tests are available: boat polar variation, wind force variation and wind offset variation. If the option is checked (Parameters > Routing > Method), SimSail performs a first routing with the selected parameters and then performs two additional routings, one with the negative variation (example: polar decreased by 10%) and one with the positive variation (example: polar increased by 10%). These last two routings form a colored or hatched area. If the routing remains in the colored or hatched area, this means that the routing is not very sensitive to the variations studied. If the routing significantly leaves the area, this means that a variation of the parameter studied (polar, wind force or wind offset) changes the routing.

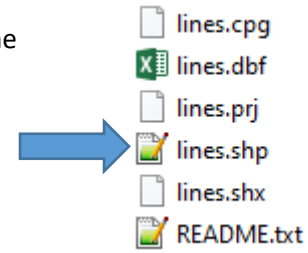
Special Installations

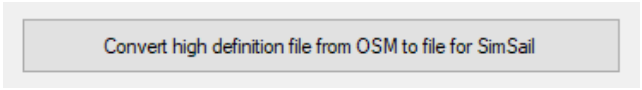
Coastlines very high definition

SimSail is delivered with 5 levels of details got from http://www.soest.hawaii.edu/pwessel/gshhg.

A very high level can be added with the support of OpenStreetMap.

1) Open SimSail with Administrator rights.
2) Go to Parameters > Chart > Shorelines.
3) The link "OpenStreetMap Data" https://osmdata.openstreetmap.de/download/coastlines-split-4326.zip downloads via the internet browser a file "coastlines-split-4326.zip".
4) Unzip this file to get the “coastlines-split-4326” folder. This folder includes the following files:
5) Now click on the button:





6) Choose the “lines.shp” file.
7) SimSail converts this file and creates a new "poly-o-1.dat" file located in SimSail's "Data\Gshhs" folder (normally under C:\Programs\SimSail).

Charts SnMap from ScanNav

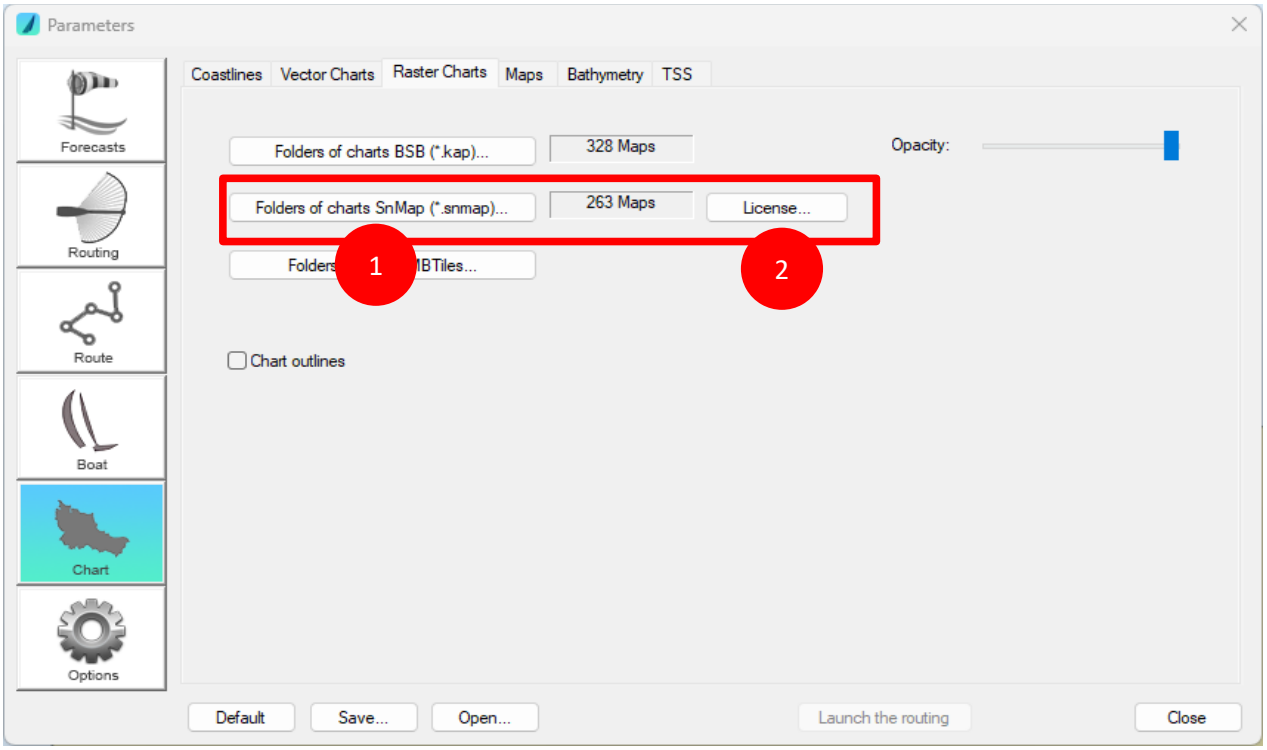
These raster charts offer must be purchased on ScanNav website at https://www.scannav.com

This raster charts offer is derived from data provided by the SHOM, UKHO, BSH and IIM/Navimap. Charts are updated twice a year. Although the look is similar, they are not scanned from paper charts, but issued from the printing films, which eliminates manipulation errors, and facilitates regular updates. Each pack includes the integrality of existing paper charts, and is available by download. The Planning Charts pack is available free of charge for any license up-to-date of less than one year. Charts updates: Updates are free for one year, and half price after.

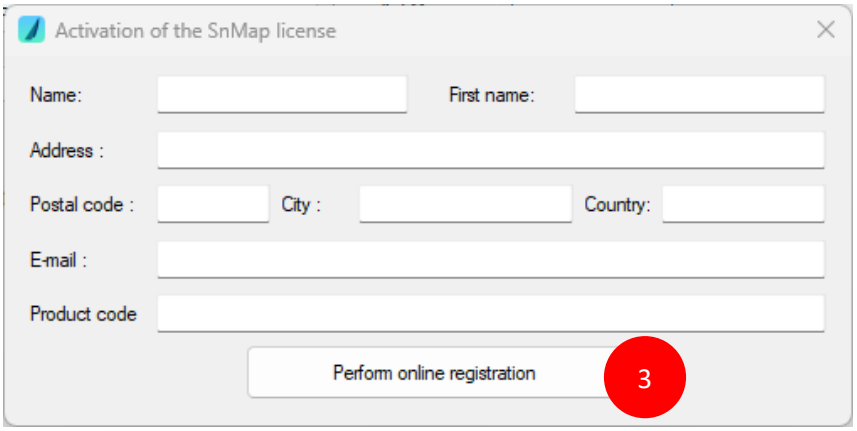
- Channel: from the Belgian border to Pointe St Mathieu, Channel Islands included (SHOM)
- Atlantic: from Pointe St Mathieu to the Spanish border (SHOM)
- Mediterranean: from the Spanish border to the Italian border, including Corsica (SHOM)
- United Kingdom + Ireland (UKHO)
- Spain + Portugal (UKHO
- Azores, Madeira, Canary Islands, Cape Verde (UKHO)
- Lesser Antilles: From Grenada to Puerto Rico (UKHO + SHOM + NOAA)
- Italy (NaviMap-IIM)
- Croatia (UKHO)
- Netherlands + Belgium (UKHO)
- Germany (BSH)

When purchasing, in the comments of the order form, you should mention that the charts are for SimSail. With the link provided in response to the purchase, choose the zip file.

1) Unzip the zip and place the maps in one or more folders then specify these folders to SimSail.



2) To install SnMap maps, open the “License…” dialog while connected to the Internet. Complete the form and register online. Maps are now visible on screen.



This procedure should be repeated for each new pack of charts.

SimSail strongly encourages the use of these charts.

Bathymetry

Open Parameters > Route > Bathymetry.

1) To install a bathymetry file, click on the “European Marine Observation and Data” link. The link opens the browser to https://portal.emodnet-bathymetry.eu/#
2) In "Catalogue", select “EMODnet Bathymetry” and then “DTM Tiles”. Then select "Tile structure and download". A grid appears on the map. Click on the desired tile.
3) Download the ESRI ASCII file. The downloaded file looks like "E4_2022.asc.zip".

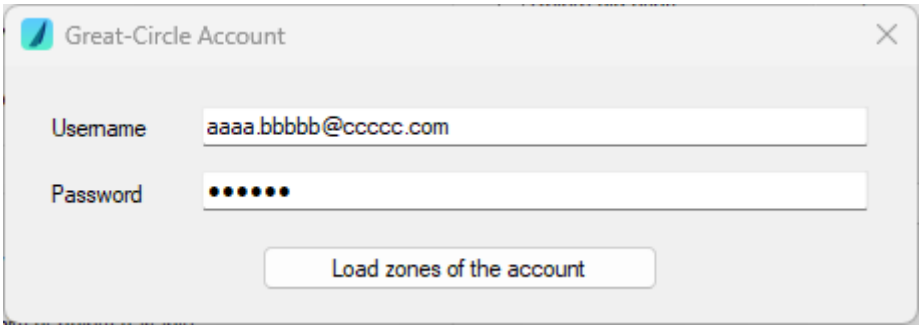
4) Unzip the “E4_2022_mean.asc” file into a folder.
5) Convert this file by clicking on the button "Convert EMODnet file to depth file for SimSail". The file converted and adapted to SimSail will be placed in "Documents\SimSail\Bathy".

The depth is displayed in the status bar on the right side. Please note, the depth depends on the reference frame which is often not the same as the reference frame on nautical charts (lower waters).

Direct access to the grib files of Great-Circle

The Great-Circle service is only available when an account is valid, after a subscription has been taken out (https://www.squid-sailing.com). It allows direct downloading from SimSail of grib files covered by the subscription taken out with Great-Circle.

1) Go to Parameters > Options > Gribs.
2) Click on the “Great Circle Account” button. Enter your login and your password.
3) Click on the “Load zones from subscription” button.



4) With SimSail, right click on the chart and click "Create an area for download". With the mouse, draw an area while keeping the left button pressed. The area can then be modified with the mouse in position and size by placing the mouse on the edges of the area or in the area to move it entirely.
5) When the area is correct, right click then select "Request a grib". A window appears which allows you to make a request by email or to download the gribs directly if the user has a Great-Circle account https://www.squid-sailing.com

You can create a download configuration. Create an area for download. Modify it as much as necessary then right-click “Request a grib”. The grib selection window appears. Select the desired gribs with their parameters. Then, at the bottom of this window, press the “Create…” button. Give the configuration a name. Creating a download configuration allows you to download the relevant gribs very quickly. Right-click on the map anywhere then select “Download Gribs” and select the desired configuration. The download of all gribs in the area begins. When all downloads are completed, the wind grib is displayed on the screen. This function is very practical. With only 3 clicks (1 click to open SimSail, 1 right click for “Download Gribs” and a final click to choose configuration, the gribs download and display in SimSail.

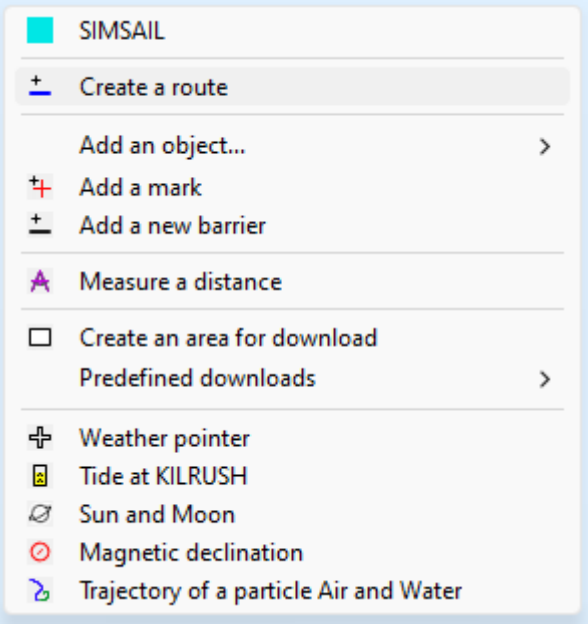
The Great-Circle service is by far the best for an affordable price.

https://www.squid-sailing.com/fr/content/91-tableau-abonnements-squid

Miscellaneous

Route

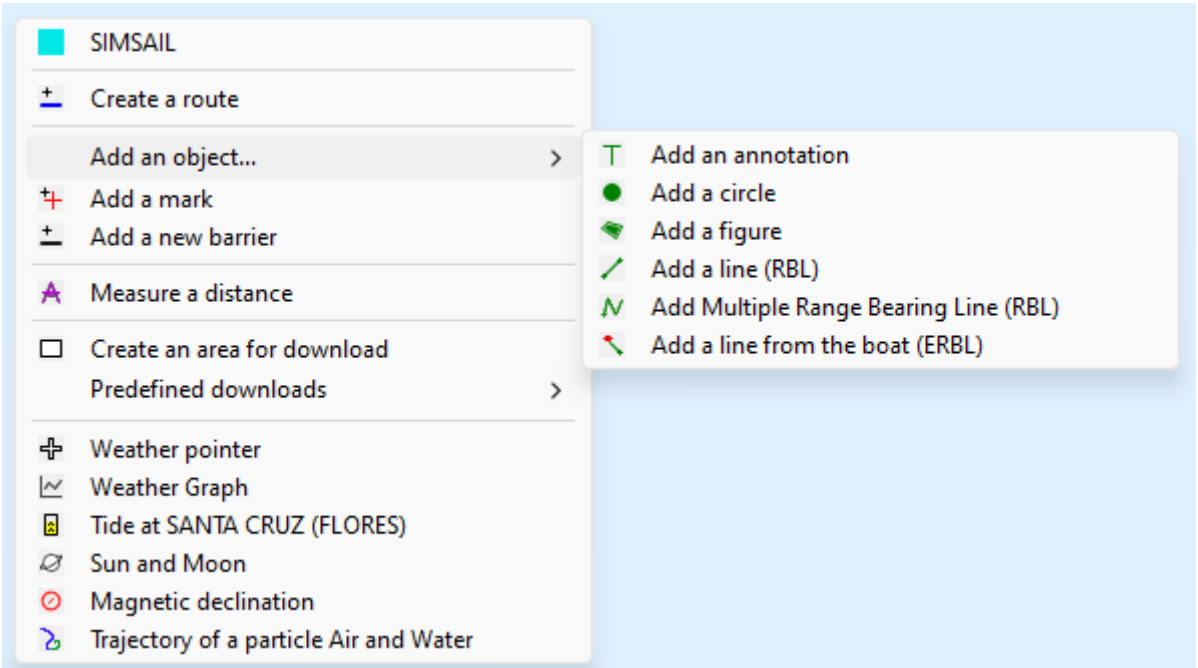
To create a route, right-click on the map to access the following menu:



Left click to add points and either right click to end the route or [ESC] key. All points are re positionable. Other points can be added or deleted. Side barriers can be added. Right-clicking on a route element (point or segment) displays a drop-down menu. A dotted segment in the road means that this segment is not entirely at sea. The route is displayed in a great circle arc.

Navigation objects

Navigation objects are accessible by right-clicking on the map.

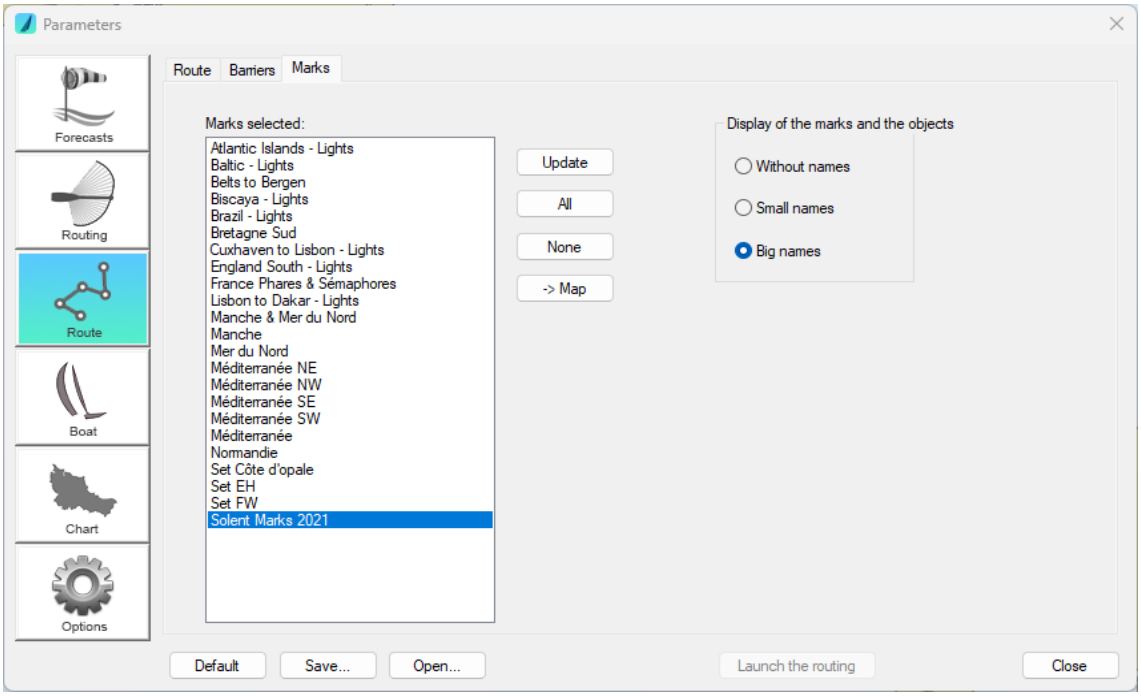


They are displayed if the icon is selected. Different shapes exist. They are all recorded automatically and are thus found during the next SimSail session, except for the EBRL (Electronic Bearing Range Line), i.e. the lines from the boat.

The objects all have a small pink square. With a right click on it or a double click, you access a dialog box where the options can be modified.

Marks

The marks are of two types.
1) They can be saved in a file accessible from the Parameters window:



These mark files, in gpx format, are located in the folder User\Documents\SimSail\Marks.

These files make it possible to cover a navigation area. The symbol displayed on the map is a simple cross. You cannot move these marks or delete them, the only functionality being to display or not all the marks contained in the file.

These marks are especially useful in two cases: a regatta where the marks are provided (Solent area for example) or those who take the marks from their GPS into a file.

2) Marks of the same type can be created using a right-click on the “Add Mark…” card. These marks can be moved, modified or deleted individually. They are automatically saved in SimSail.

Overall, SimSail offers 3 possibilities to score something:

- by a navigation object;

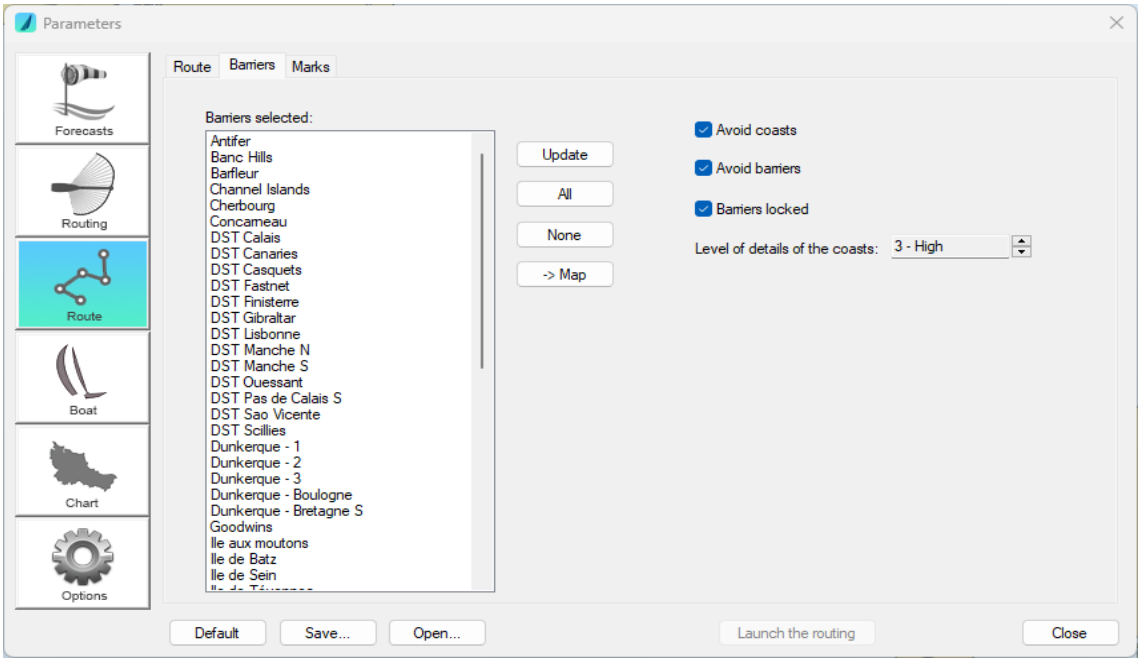
- by marks from a GPX file;

- by individually created marks.

Barriers

Barriers are used to limit routing. Right click to create a barrier. And right click on an element of a barrier to modify it, save it or delete it. The edition is identical to the road.

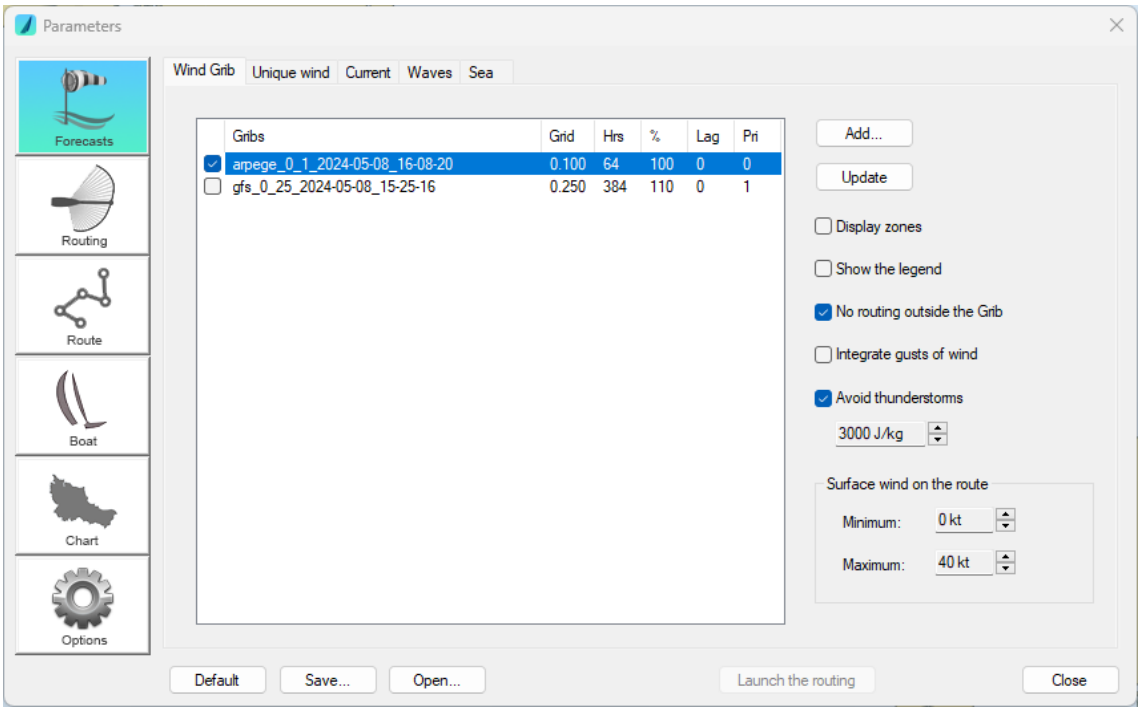
Barriers are saved in GPX format and are accessible from the Parameters window:



The barrier files are located in the folder User\Documents\SimSail\Barriers.

Configure wind, current and wave gribs

Gribs are accessible from the Parameters window:



The behavior of wind gribs is identical to current gribs and wave gribs.

The grib can be selected or not (checkmark to the left of the name). Only selected gribs will be taken into account for routings.

Only one grib of wind, or of current or of waves can be displayed on the screen. You can either go to Parameters and select the one you want to display, or more simply, rotate the mouse wheel on the icon (wind, current or wave).

Double-clicking a grib name displays that grib and deselects all others.

% | Lag |Pri

%: Left-clicking on a grib's percentage allows you to change its strength (80% to 120%). If you want to avoid modifying the value of the gribs after each loading, you can go to Parameters > Options > Gribs.

Lag (offset): left clicking on the offset value allows you to advance or delay the grib (from - 6 hours to + 6 hours). By default, the value is 0, which means no time lag.

Pri (Priority): left-clicking on the value changes the priority of the grib. Routing examines gribs in the order specified in this window.

These 3 parameters are automatically saved.

Set of sails

It is possible to modify the set of sails, have several and select the one you want. Go to Parameters > Boat > Boat → Set of Sails → “Edition” button. You can delete a sail (right click on its name) or add one (Add button).

Set of Sails names must be short enough to be displayed correctly with the routing. The best is to choose a code. For example: M for mainsail, J for Jib, S for symmetrical spinnakers, A for asymmetrical ones.

Note that the set of sails is not limited to one sail. With other navigation software that has this functionality, it is the sails that appear. Example, there is an entry for the mainsail and an entry for a large jib. In SimSail, carrying both at the same time will result in a single entry (for example M0-J1 for M with zero reef and jib 1). So, in SimSail, it's the sail configurations that are interesting.

Once a set of sails is selected, you can click on the shape to colour the graphic. If no sail set is selected, then clicking on the shape clears the colour. When filling the shape, you can hold down the [CTRL] key to colourize continuously.

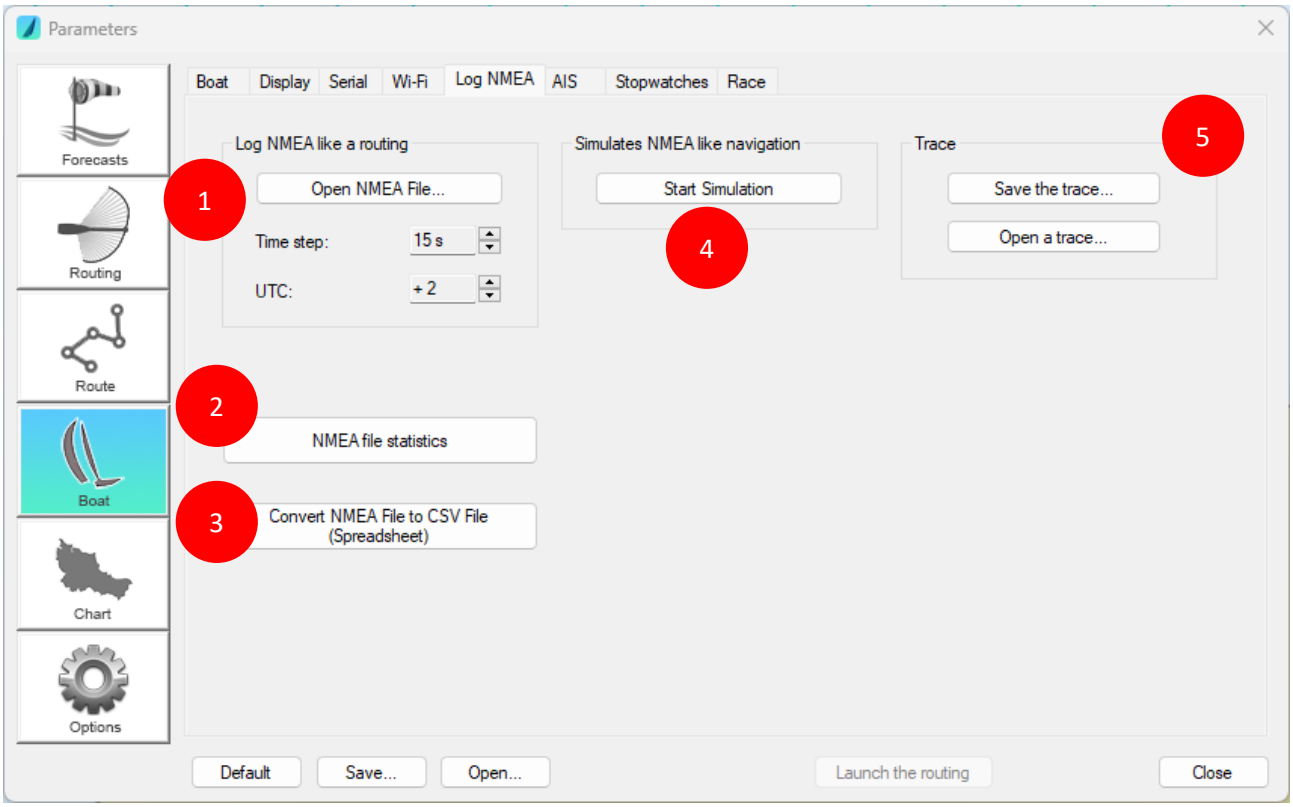
Log NMEA

NMEA data is that received by SimSail after a successful connection. Only NMEA 0183 is read by SimSail, not NMEA 2000.

This data can be saved. This must be done manually for each SimSail session. Go to Parameters > Boat > Serial or Wi-Fi.

The recorded data constitutes a text file that can be opened with a text editor such as Notepad++ for example. NMEA data files are saved by default in the folder User\Documents\SimSail\Trace.

Then, once recorded, this data can be used in different ways:



1) Log NMEA as routing

The data is returned in the form of a routing. Each time step includes all the information collected. There is therefore both the trace on the map, the information at each time step and the overall routing statistics. The AIS targets are visible but displayed with dots. The repeaters are inaccessible. The real ship continues to be connected and visible on the map.

2) NMEA file statistics

This gives statistics on a NMEA file. The frequency of NMEA 0183 talkers are given. This is useful for the configuration of the emitters of NMEA sentences.

3) Convert NMEA file to CSV file (Spreadsheet)

All NMEA data from the boat is converted into a table but without any information on AIS targets. The separator for this tabbed file type is the semicolon (;). You can open this file with a spreadsheet such as Excel from Microsoft or Calc from LibreOffice.

4) Simulates NMEA like navigation

There are around sixty possible repeaters. They are all displayed on the right of the screen and are digital (there is no analog repeater). To configure on land without NMEA reception, it is possible to use this function. By default, without a route, SimSail plots a route between Le Havre in France and Cowes in the United Kingdom. But another route can be set and launch this type of simulation.

Repeaters are arranged in a table. The number of repeaters is accessible by right-clicking on the Repeaters icon .

Each repeater is accessible by right-clicking on it. A dialog box then appears where you can change the data received and its color. Everything is saved automatically.

On certain repeaters where the mouse cursor turns into a hand, a left click brings up a graph of the selected data.

5) Trace

The recording of the trace is not automatic in SimSail. The file recorded is in the GPX format.