



Documentation

Version 5.7.3

Need help? Send a mail to support@meltemus.com

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Quick Start

Installation

qtVIm versions for PC (Windows/Linux/MacOS) as well as Raspberry Pi2 and Pi3 are available here:

<http://www.meltemus.com>

Mobile versions (**Android** et **iOS**) are available through their respective stores. More information about mobile versions at the end of this introduction.

Windows: Installing is made through qtVIm's installer, which will choose automatically between 64bits and 32bits releases. It is also compatible with Windows XP.

Linux: Installation is made by uncompressing the gz archive. Then to start qtVIm just run `./qtVIm`. A directory `./qtVIm` containing user data will be created.

MacOS: Install is made by copying the folder "qtVIm" contained in the DMG somewhere on your local disk. Then you can run qtVIm from this local folder. It is not possible to run qtVIm directly from the DMG disk.

Raspberry: In a terminal, un-compress the archive with the command

```
tar zxvf qtVIm-5.7.2-rpi.tar.gz
```

then you can run qtVIm with:

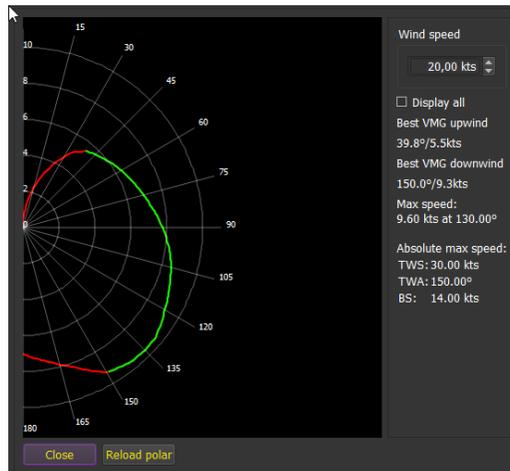
```
cd qtVIm
./qtVIm
```

You can also run: `./qtVIm_touchscreen` for a pure tactile version.

In all cases, you will be asked to download qtVIm's maps (gshhs).

Polar files

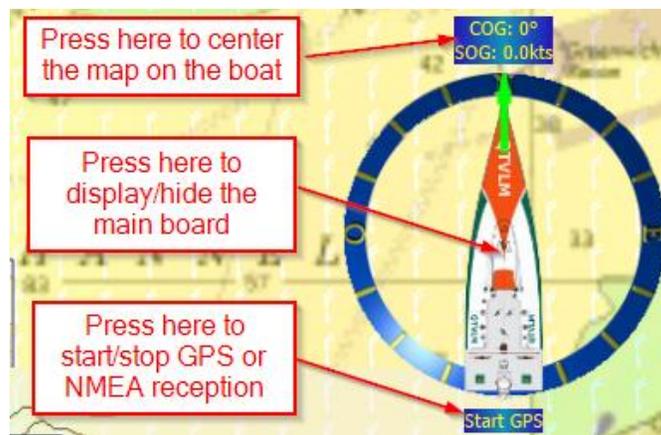
Via the menu "boat->boat settings" you can choose a polar for your boat. qtVlm comes with some typical polar files, and you can easily create or import a personalized one. It is possible to alter a polar by applying a coefficient on it, you can specify delays for tacking and gybing, or under which speed you decide to start the engine, etc. There is also the possibility to define "waves polar", describing the behavior of the boat depending on sea conditions.



[More about polar files](#)

Environment

qtVlm is divided in several areas: the toolbar and the main menu, the map and its objects, instruments and status bar, plus several boards. The main dashboard is displayed or hidden by clicking on the microboard, on the right side of the screen, or through the dedicated icon on the toolbar.



The selection tool can be used to select an area on the map, and can also be invoked with the mouse and the <shift> key.

[More about qtVlm environment](#)

Gribs and Weather Images

qtVlm can open or download a wide number of grib types, being grib 1 or grib 2. There are 3 slots where a grib can be loaded. One can for instance load a Winds grib in the first slot, and a Currents grib in the second one. It can also be used to load gribs with the same data at different resolutions. Data displayed on the map can be configured fully through the grib display control  available in the toolbar. qtVlm will always use the data with the better resolution, regardless of the slot number.

It is also possible to configure custom grib addresses for all three slots, for instance:

qtVlm is **Iridium GO! certified** for Android and iOS. It can request and receive gribs via "Iridium Mail and Web" or XGate applications..

<http://grib.weather4d.com/AromeHD> (Winds HD France)

<http://grib.weather4d.com/MyOcean> (Currents France)

<http://openskiron.org/en/openwrf> (Mediterranean)

ftp://ftp.bsh.de/Stroemungsvorhersagen/grib1/hires_exp/ (Currents Denmark)

qtVlm also allows to display weather images over the map. It accepts all image formats, and up to 8 slots can be pre-configured. Since version 5.7.3 it can also display kml and kmz images for instance from:

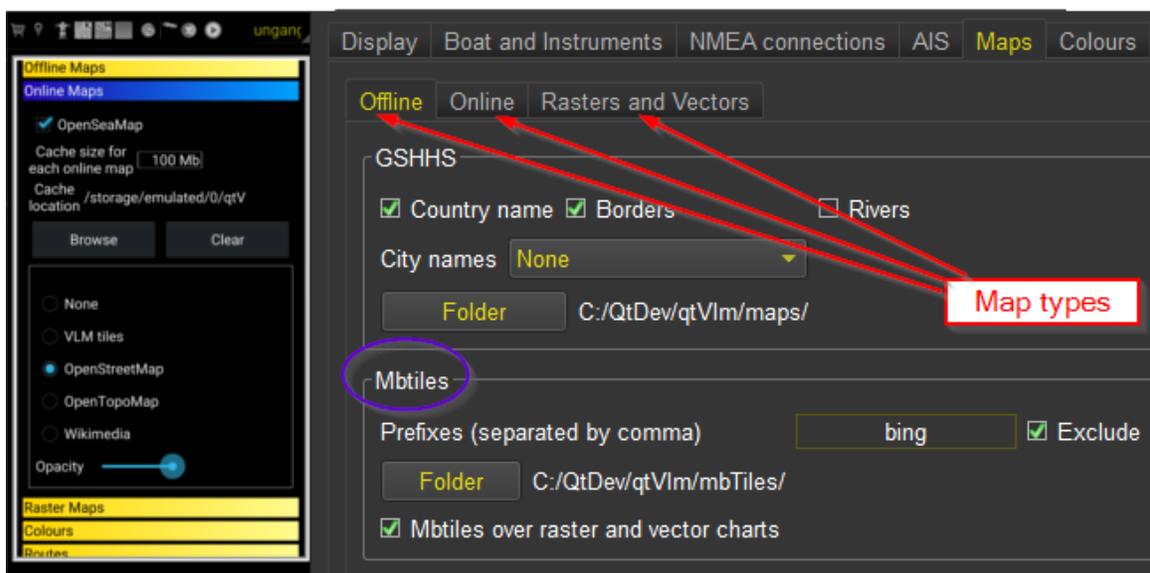
<http://www.opc.ncep.noaa.gov/gis/index.php>

<https://earthdata.nasa.gov/earth-observation-data/near-real-time/rapid-response/modis-subsets>

[More about gribs and weather images](#)

Maps

Several map types are available in qtVlm (menu "qtVlm->Configuration").



Offline maps

These maps are the gshhs maps, which in fact contains the coast lines used by qtVlm in Routes and Routings modules.

Online maps

VLM tiles are the identical to gshhs maps, plus some color to represent altitude.

OpenStreetMap tiles, available on mobile (Android et iOS) only,

OpenSeaMap tiles, which can be displayed over any other type of maps,

Wikimedia tiles,

OpenTopoMap tiles.

Additional maps

qtVlm can also display georeferenced maps in **kap, geotiff, geojpeg, etc** format. A folder containing these maps can be configured, or these maps can just be copied in qtVlm default kaps folder.

Vectors maps (S57) are also supported.

Similarly, qtVlm can read and display maps in **mbtiles** format, that also just must be copied in a dedicated folder.

Other map parameters

The choice between the different map type can be made directly using the toolbar.



The first icon is used to switch between online (lighthouse on) and offline maps (lighthouse off). The two next icons are used to display rasters and/or S57 and/or mbtiles.

An option available in the configuration screen allows to choose whether rasters are displayed over or under mbtiles, in case both maps are available for the area.

Another parameter defines if the grib is displayed over kaps and mbtiles, with which transparency.

[More about maps](#)

NMEA Connections

qtVlm can connect to a lot of various NMEA sources (serial port, internal GPS, GPSD, TCP and UDP). Several sources can be used simultaneously.

Most of NMEA messages are implemented, and are used to feed instruments and/or AIS module.

The screenshot shows the 'NMEA connections' configuration window in qtVlm. The window has a dark theme and a menu bar at the top with options: Display, Boat and Instruments, NMEA connections (selected), AIS, Maps, Colours, Routes, Grib, Internet, and Advanced.

Local sources:

- Use a file: C:/QtDev/qtVlm/sample1.txt (File...)
- Serial port 1: COM5 HHD Software Virtual Serial Port, 9600, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Serial port 2: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Serial port 3: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Internal GPS: All sources, Materialize position accuracy on map

Network sources:

- TCP:**
 - Server 1: [empty], 6493
 - Server 2: [empty], 0
 - Server 3: 127.0.0.1, 5010
- UDP:**
 - Port 1: Any, 1100
 - Port 2: 224.10.10.10, 10110
 - Port 3: 0.0.0.0, 10112
- GPSD:**
 - Server 1: [empty], 2947
 - Server 2: [empty], 0
 - Server 3: 127.0.0.1, 2947

Output Channel:

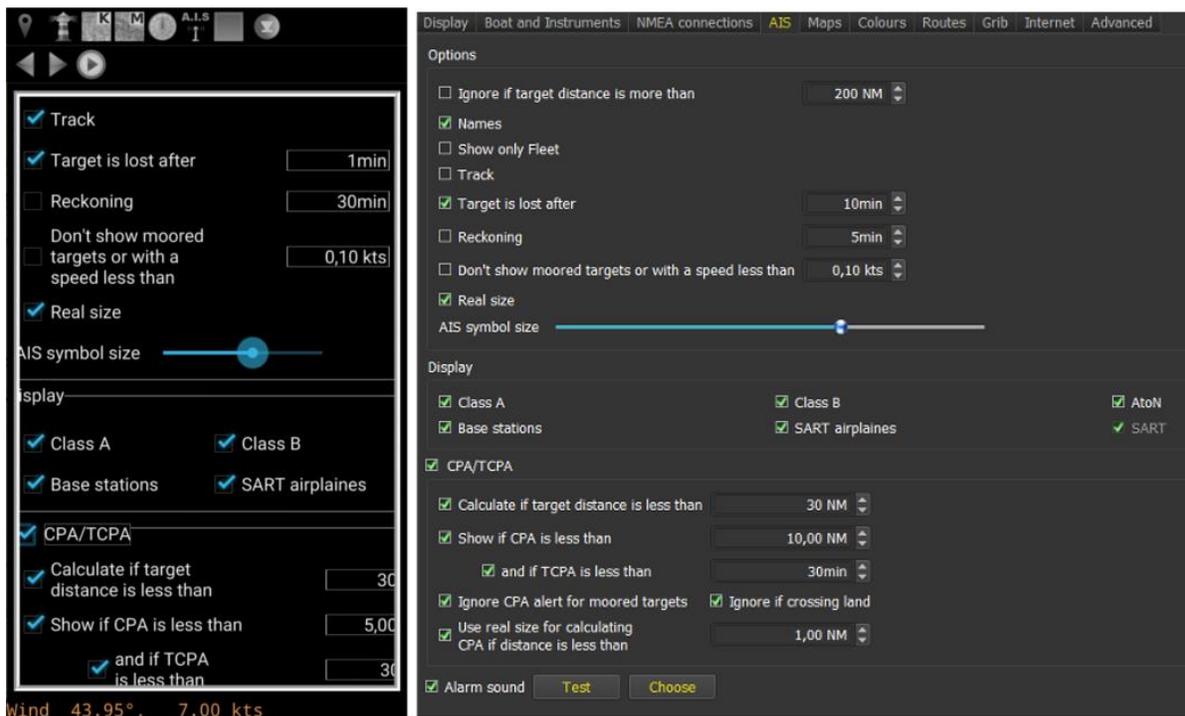
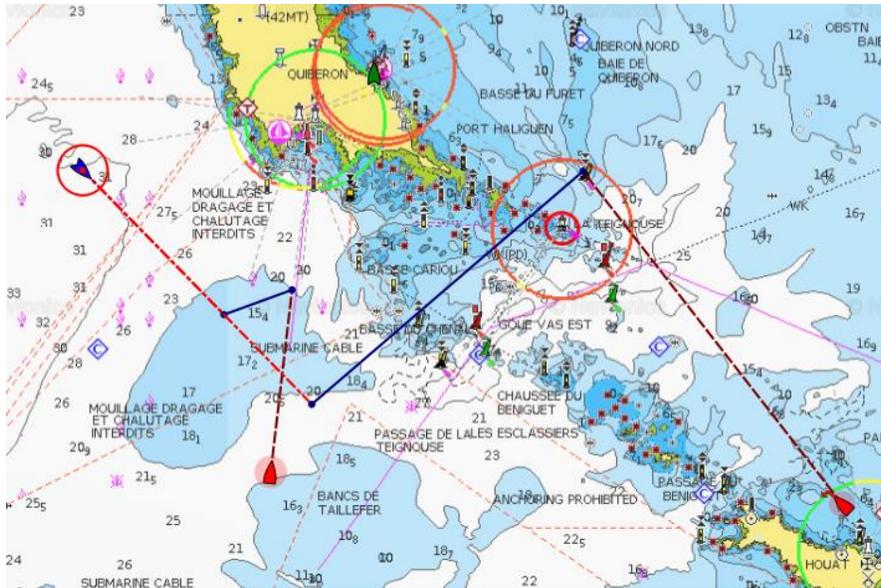
- Output Channel
- Serial port: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control, Retransmit all
- UDP 1: 192.168.0.255, 1100, Retransmit all
- UDP 2: [empty], [empty], Retransmit all
- TCP: 127.0.0.1, 10110, Retransmit all

Treat RMB messages (WP) Display raw NMEA data

[More about NMEA connections](#)

AIS Module

qtVlm allows to display and manage AIS targets received through NMEA sources. It can calculate a CPA and a TCPA and manages configurable alarms.



A simulation mode is proposed in qtVlm, through a collaboration with sinagot.net. It receives real AIS targets via Internet, and allows to simulate sailing between them, using grib's data and polar to move the boat. This mode is accessible via the menu "Boat->Simulation mode".

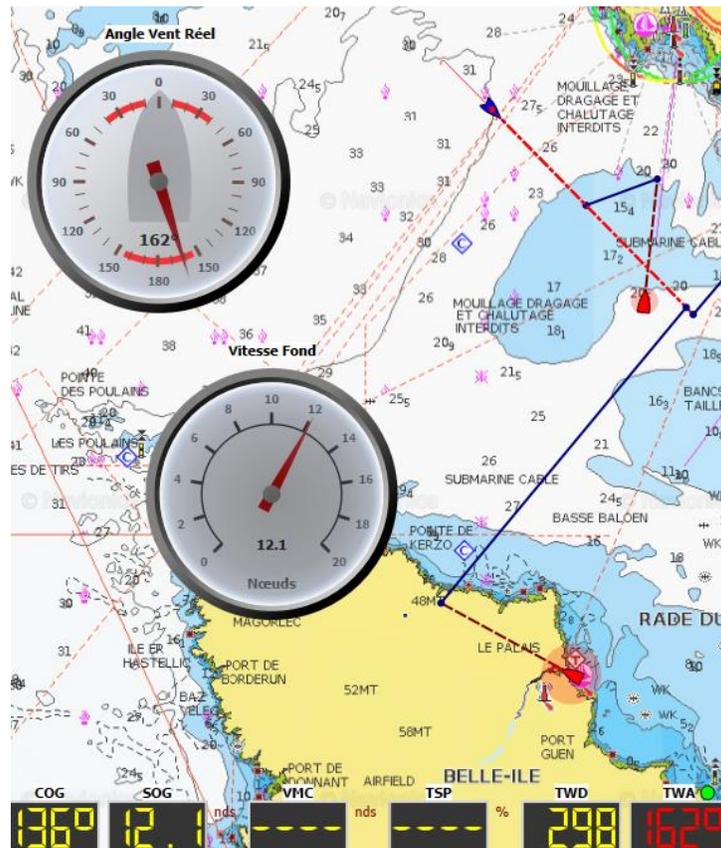
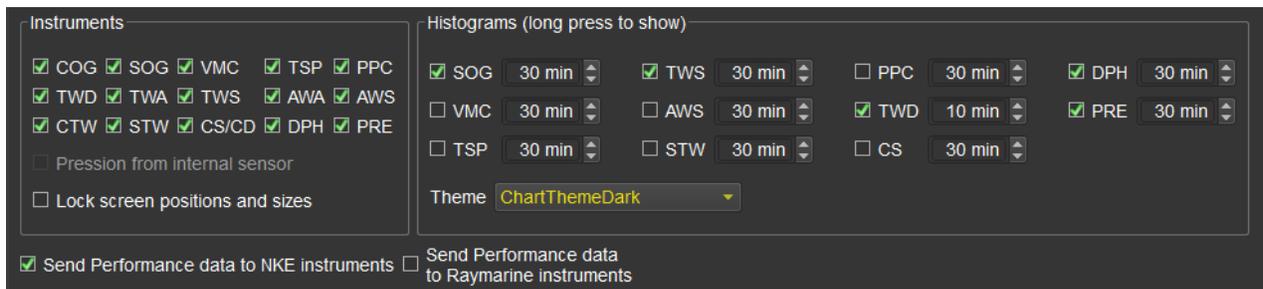
[More about AIS module](#)

Instruments and Board

Most of classical instruments are available in qtVlm. They appear at the bottom of the screen or on the left side, depending on the screen orientation. They can be hidden or shown with the toolbar instrument button .

Dials can be shown and hidden by clicking on the numerical displays. Use long-click to display **histograms**.

Their sizes and positions are managed with the mouse (plus <shift> key for size) or fingers on mobile versions. You can lock their size and positions to avoid moving them while manipulating the map or other objects. It is also possible to select which instruments are displayed.

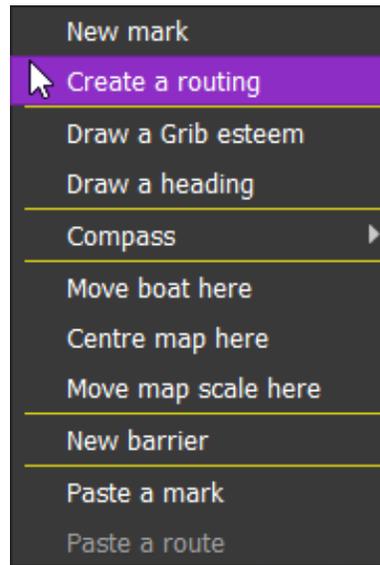


[More about instruments and dashboard](#)

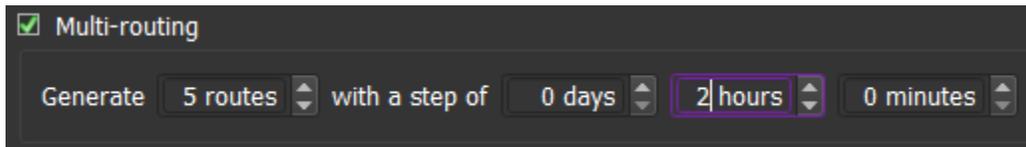
Weather Routing Module

The main qtVlm function is the ability of calculating routings and routes, based on grib data and boat's polar.

Once one or several gribbs and a polar have been loaded, a routing can be very easily generated, for instance by right-clicking on a POI or anywhere on the map.



It is also possible to ask for a multi-routing, in which case qtVlm will generate several routings in order to determine the best starting date and time, based on numerous factors.

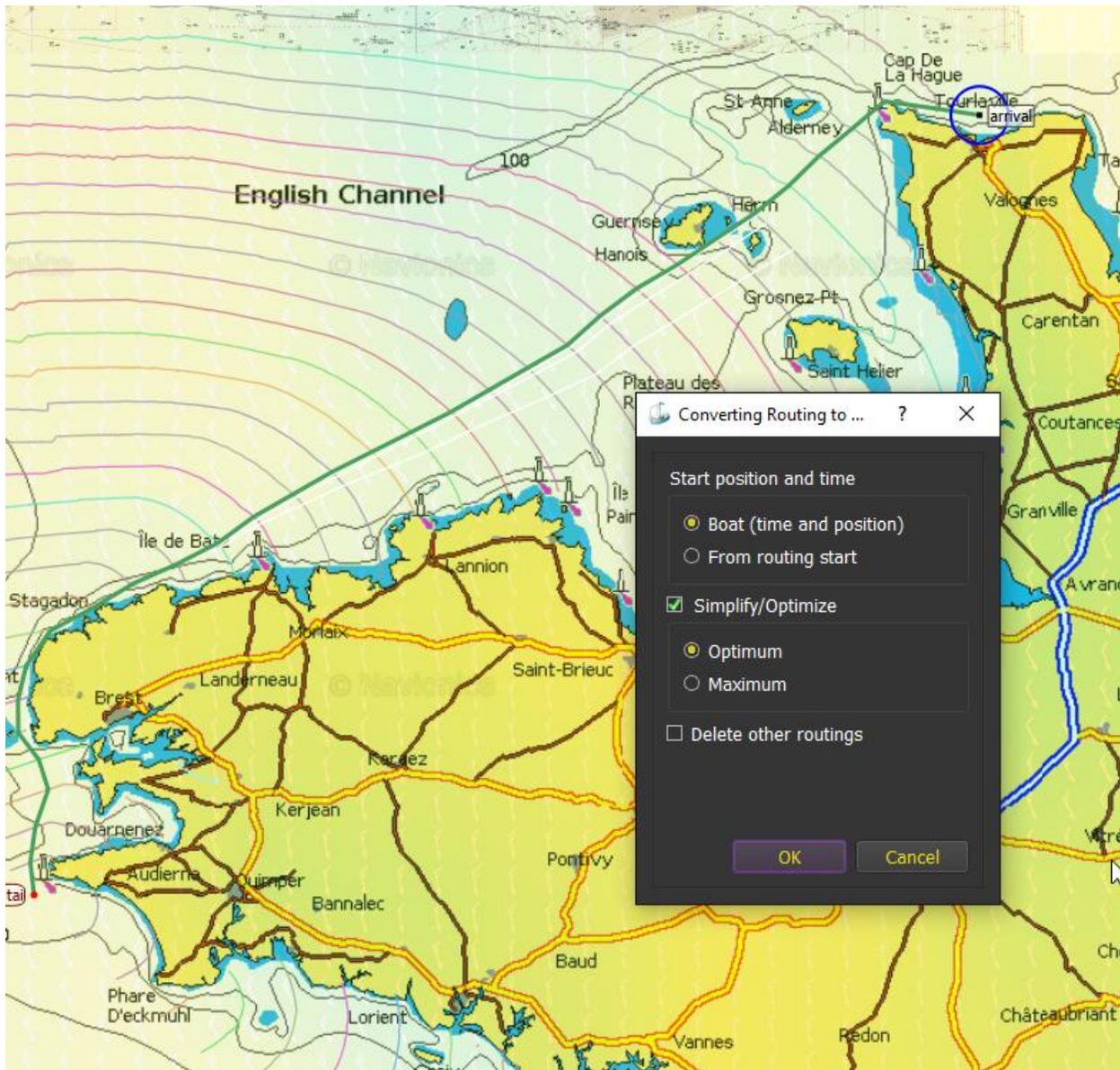


The result of the multi-routing calculation is displayed in a Routes Comparator, that can be exported in CSV format. Columns can be hidden or shown.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed Distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS
Green	Routing1 01 juin-00:22	01/06/2016 00:22	01/06/2016 19:52	0 d 19 h 30 m	85.74 NM	102.14 NM	5.23 kts	5.55 kts	4.75 kts	12.48 kts	17.33 kts	7.36 kt
Blue	Routing1 01 juin-02:22	01/06/2016 02:22	01/06/2016 22:22	0 d 20 h 0 m	85.74 NM	103.39 NM	5.16 kts	5.55 kts	4.55 kts	11.65 kts	16.47 kts	6.27 kt
Red	Routing1 31 mai-18:22	31/05/2016 18:22	01/06/2016 12:52	0 d 18 h 30 m	85.74 NM	99.55 NM	5.38 kts	5.56 kts	5.15 kts	16.26 kts	19.79 kts	11.37 kt
Yellow	Routing1 31 mai-20:22	31/05/2016 20:22	01/06/2016 15:12	0 d 18 h 50 m	85.74 NM	99.89 NM	5.30 kts	5.59 kts	4.97 kts	14.96 kts	18.84 kts	9.25 kt
Purple	Routing1 31 mai-22:22	31/05/2016 22:22	01/06/2016 17:27	0 d 19 h 5 m	85.74 NM	100.68 NM	5.27 kts	5.58 kts	4.74 kts	13.61 kts	18.10 kts	8.28 kt

Pathways can also be used as targets for routing, in which case the routing will follow a path, going to each point in turn.

Once the routing calculation is terminated, it is possible to convert it in a Route, and then optionally to simplify and optimize the resulting route. This can be done automatically if the option "convert to route" is checked before launching the routing calculation.



Many other options are available, like for instance asking for pivot points, calculating inversed isochrones, placing barriers, multi-points routing, etc.

[More about Weather Routing Module](#)

Routes Module

Route in qtVlm allows several navigation modes between POIs (vbvmb, vmg or ortho). It can also display and export in CSV format the route's log containing many information.

The screenshot shows the 'Route details' window in qtVlm. It features a table with columns for various navigation parameters. The 'TWA' column is highlighted in green, and the 'GUSTS' column is highlighted in yellow. The table contains 16 rows of data, each representing a time interval from 13:49 to 15:04 on 12/10/2016. The parameters include TWS, TWA, STW, CTW, SOG, COG, AWS, AWA, CS, CD, GUSTS, RAIN, CAPE, PRESSURE, COMB WAVES HGT, and MAX WAVES HGT.

	TWS	TWA	STW	CTW	SOG	COG	AWS	AWA	CS	CD	GUSTS	RAIN	CAPE	PRESSURE	COMB WAVES HGT	MAX WAVES HGT
12/10/2016 13:49	14.69 kts	40.00°	11.56 kts	283.68°	11.56 kts	283.68°	24.69 kts	-22.48°	N/A	N/A	18.69 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 13:54	14.77 kts	40.00°	11.61 kts	283.86°	11.61 kts	283.86°	24.81 kts	-22.50°	N/A	N/A	18.86 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 13:59	14.86 kts	40.00°	11.66 kts	284.03°	11.66 kts	284.03°	24.94 kts	-22.51°	N/A	N/A	20.03 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:04	14.94 kts	40.00°	11.71 kts	284.21°	11.71 kts	284.21°	25.06 kts	-22.53°	N/A	N/A	20.20 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:09	15.02 kts	40.00°	11.75 kts	284.38°	11.75 kts	284.38°	25.18 kts	-22.55°	N/A	N/A	20.38 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:14	15.10 kts	40.00°	11.76 kts	284.55°	11.76 kts	284.55°	25.27 kts	-22.59°	N/A	N/A	20.55 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:19	15.18 kts	40.00°	11.78 kts	284.72°	11.78 kts	284.72°	25.37 kts	-22.63°	N/A	N/A	20.73 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:24	15.26 kts	40.00°	11.80 kts	284.89°	11.80 kts	284.89°	25.46 kts	-22.66°	N/A	N/A	20.91 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:29	15.34 kts	40.00°	11.82 kts	285.06°	11.82 kts	285.06°	25.55 kts	-22.70°	N/A	N/A	21.08 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:34	15.42 kts	40.00°	11.84 kts	285.23°	11.84 kts	285.23°	25.64 kts	-22.74°	N/A	N/A	21.24 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:39	15.49 kts	40.00°	11.86 kts	285.39°	11.86 kts	285.39°	25.73 kts	-22.77°	N/A	N/A	21.41 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:44	15.57 kts	40.00°	11.87 kts	285.56°	11.87 kts	285.56°	25.82 kts	-22.80°	N/A	N/A	21.56 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:49	15.64 kts	40.00°	11.89 kts	285.73°	11.89 kts	285.73°	25.90 kts	-22.84°	N/A	N/A	21.71 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:54	15.71 kts	40.00°	11.91 kts	285.89°	11.91 kts	285.89°	25.99 kts	-22.87°	N/A	N/A	21.84 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 14:59	15.73 kts	40.00°	11.91 kts	286.12°	11.91 kts	286.12°	26.00 kts	-22.88°	N/A	N/A	21.96 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A
12/10/2016 15:04	15.73 kts	40.00°	11.91 kts	286.37°	11.91 kts	286.37°	26.01 kts	-22.88°	N/A	N/A	22.00 kts	0.00 kg/m2	0.00 J/kg	N/A	N/A	N/A

Great circle distance	900.01 NM	Distance travelled	1,235.42 NM
BS (min/avg/max)	3.25 / 11.76 / 16.59 kts	TWS (min/avg/max)	2.99 / 16.18 / 32.01 kts
TWD (avg)	241°	CAPE (avg/max)	40.89 / 299.80 J/kg
Currents (min/avg/max)		Waves (max)	
Navigation time	4 days 9h 10min	Engine	
Night	1 days 23h 50min (45.5%)	Rain	3 days 2h 30min (70.8%)
Tacks/Gybes	54 / 1	Beating	3 days 7h 25min (75.5%)
Downwind	0 days 13h 45min (13.1%)	Reaching	0 days 12h 00min (11.4%)



[More on Routes Module](#)

POIs and Barriers

POIs (Point of Interest) are point that can be placed in qtVlm. They can be used for a variety of tasks, like start or arrival points for routes or routings. They can also be defined as the active boat's WP, and as such be sent on NMEA output.

Laylines can also be displayed (from grib or NMEA data). Currents are taken into account.



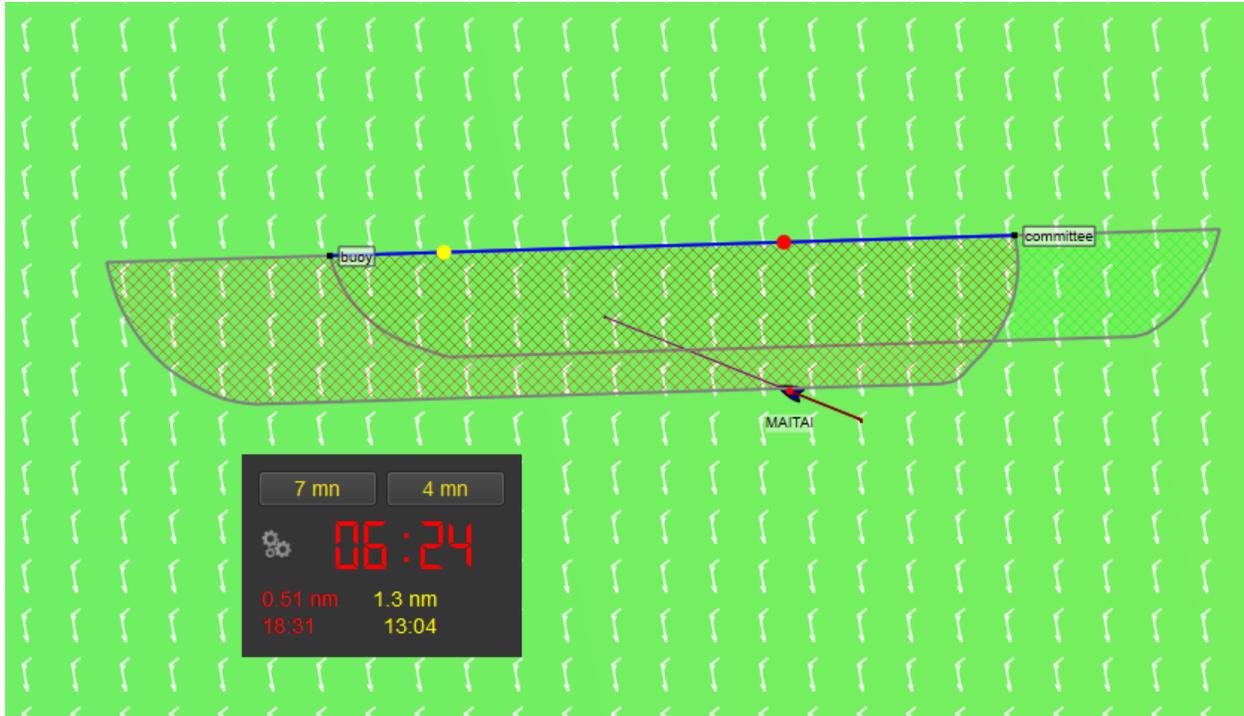
It's also possible to create barriers, that will be avoided by Routings and Routes modules.



[More about POIs and barriers](#)

Start Line Mode

This mode can be activated from "boat" menu. It manages a race chronometer with two configurable tops, and displays time and distance to line. A safety zone can also be displayed over the start line.



Currents and boat dimensions are taken into account.

[More about Start Line Mode](#)

Mobiles Versions (Android and iOS)

Android and iOS versions are available on Google Play Store or Apple Store. While PCs versions are 100% free, the full version must be purchased to benefit from all the functionalities. Once activated, the full version is available for all your devices for this operating system.

The full version activation adds:

- **Routes and Routings** modules, **Rasters**, **S57** and **Mbtiles** modules.
- **Instruments** and **AIS** modules.
- **Iridium** grib requests, and Great Circle (Squid) grib download or requests.

qtVlm on mobiles is designed to be used together with the PC versions. It is possible to load grib, maps and so on, to prepare routes and routings on PC and then transfer all to Android or iOS devices.

To achieve this, on the PC side just go to *qtVlm->export*, then copy the resulting zip file on the mobile device (on iOS this can be done for instance via iTunes or AirDrop), and run the import function. Depending on which options were used, the mobile device will then be in the same configuration, with the same maps, routes, grib, polars, etc.

Mobiles versions are also of course useable without PC at all. All the functions described in this document are available on Android and iOS versions.



[Google Play Store](#)

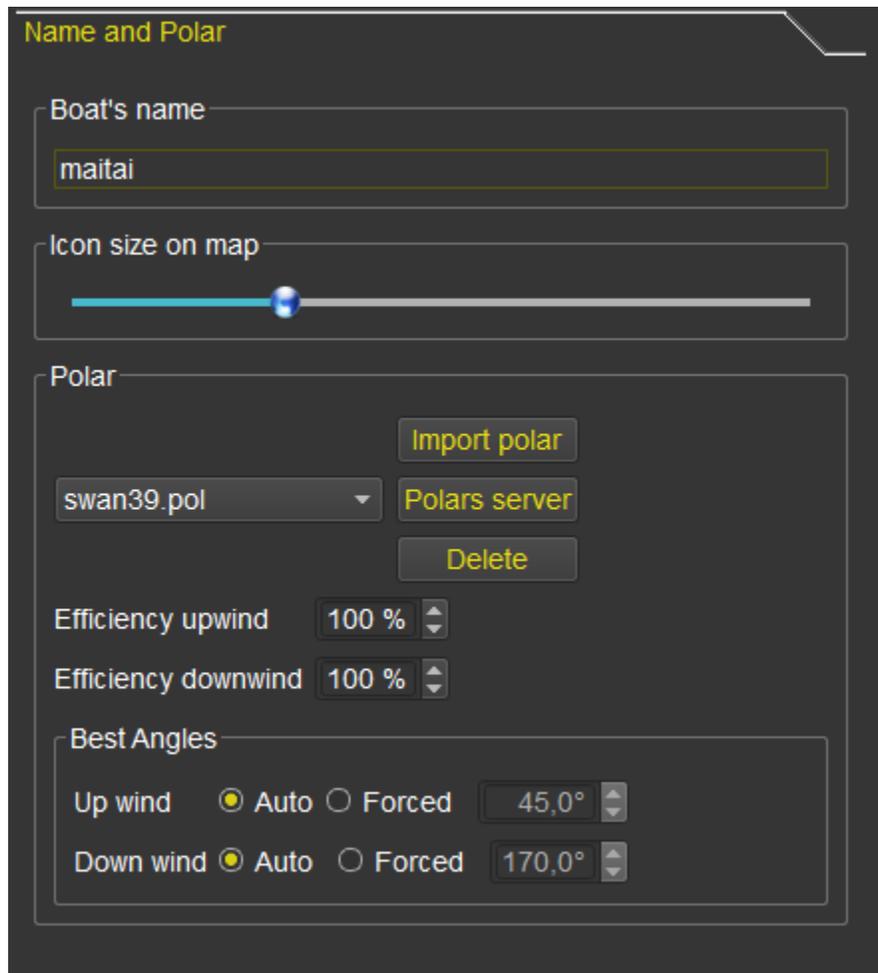


[Apple Store](#)

Polars and boat behavior

Wind Polar

From the menu "Boat->Boat settings", you can select a polar:



To import a custom polar, you can either copy the polar file into qtVlm polar folder, or use the button "import a polar".

You can also request a polar from our server (internet connection required). More than 250 polars available and growing.

Another good source for polars: <http://jjieter.github.io/orc-data/site/>

You can apply efficiency factors (different for upwind and downwind) and choose to force best wind angles values, or to let qtVlm calculate them.

Name and Polar

Waves parameters

Wave polar <None>

Crossed sea parameters

Minimum swell height 1,0 m

Angle between Wind and Swell more than 45°

Default polar efficiency 70%

Boat's behavior in waves can be defined in two ways:

- You can specify a "Waves Polar", that will indicate what gain or loss will be calculated depending on waves angle and height, i.e. which % to apply on the wind polar. Waves Polar can be defined for various TWS (1m waves height has more effect in very light winds). For this calculation, qtVIm uses first "Maximum Waves" height and direction, then if not available it will use "Swell" height and direction, and finally if nothing else is available, it will use "Primary Waves" direction and "Combined Waves" height.
- Crossed Sea: You can define what is crossed sea by entering a minimum height and a minimum angle between wind waves and swell. If wind waves direction is not available (as often), then wind's direction will be used instead. If such a condition is met, a coefficient will be applied on the wind polar.

Engine and penalties for Gybes and Tacks

The screenshot shows a settings window with a dark background and yellow text. The window is divided into several sections by horizontal lines with a diagonal cut-off on the right side. The sections are: 'Name and Polar', 'Waves parameters', 'Engine and Tack Changes', 'Dimensions', 'Navigation simulation mode', and 'Declination'. The 'Engine and Tack Changes' section is expanded and contains the following controls: an 'Engine' sub-section with 'Use engine if boat speed is less than' set to '0,0 kts' and 'Speed with engine' set to '4,0 kts'; a 'Tack Changes' sub-section with a checked checkbox and 'Tacks' set to '90% of polar speed' during '5 cranks'; and a 'Gybes' sub-section with '100% of polar speed' during '1 cranks'. At the bottom of the window, there are buttons for 'Other settings', 'OK', and 'Cancel'. A mouse cursor is visible over the 'Other settings' button.

You can specify that when the boat's speed with sails is under a value, the engine is started, with a boat's speed in that case that will override the polar value.

You can also specify parameters for tacking/gybbing (speed loss and duration). Units are expressed in "Crank", which is qtVlm internal calculation step (by default 5 minutes).

Wind Polar Formats

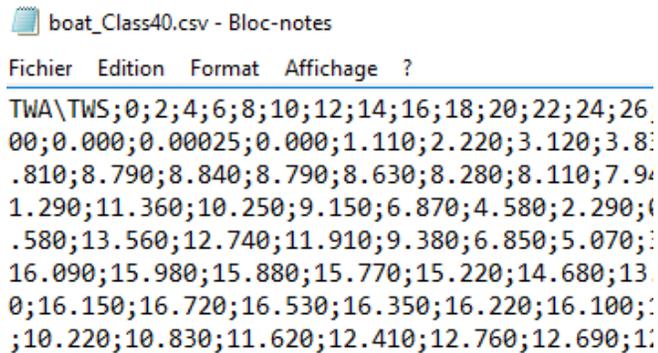
CSV format

CSV is the most commonly used format. You can edit it in a spreadsheet.

A	B	C	D	E	F	G	H	I	J	K	L
TWA\TWS	0	2	4	6	8	10	12	14	16	18	20
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.220	0.440	0.620	0.770	0.910	0.950	0.980	1.010	1.020	1.030
10	0.000	0.440	0.890	1.250	1.530	1.810	1.880	1.950	2.000	2.030	2.050
15	0.000	0.660	1.330	1.870	2.300	2.720	2.830	2.940	3.010	3.040	3.080
20	0.000	0.890	1.780	2.500	3.060	3.620	3.760	3.910	4.000	4.050	4.100
25	0.000	1.110	2.220	3.120	3.830	4.530	4.710	4.890	5.010	5.070	5.130
30	0.000	1.330	2.660	3.750	4.590	5.430	5.650	5.870	6.010	6.080	6.150
35	0.000	1.550	3.100	4.350	5.300	6.240	6.460	6.670	6.810	6.870	6.930
40	0.000	1.750	3.540	4.990	6.090	7.140	7.210	7.350	7.430	7.490	7.560
45	0.000	2.060	4.150	5.780	6.930	8.030	8.070	8.190	8.050	8.120	8.190
50	0.000	2.210	4.450	6.150	7.350	8.200	8.200	8.550	8.670	8.740	8.810

It must start with TWA/TWS or TWA\TWS.

It is basically a simple text file, with fields separated by a semi-column. The decimal separator is the point.



```
boat_Class40.csv - Bloc-notes
Fichier  Edition  Format  Affichage  ?
TWA\TWS;0;2;4;6;8;10;12;14;16;18;20;22;24;26;
00;0.000;0.000;0.000;0.000;1.110;2.220;3.120;3.8
.810;8.790;8.840;8.790;8.630;8.280;8.110;7.9
1.290;11.360;10.250;9.150;6.870;4.580;2.290;0
.580;13.560;12.740;11.910;9.380;6.850;5.070;5
16.090;15.980;15.880;15.770;15.220;14.680;13
0;16.150;16.720;16.530;16.350;16.220;16.100;1
;10.220;10.830;11.620;12.410;12.760;12.690;1
```

The 1st line contains wind speeds in knots. It has to be real wind TWS and not apparent wind). The 1st column contains wind angles (TWA). The table is then filled with a value in each cell that will indicate the boat's speed for that couple TWS/TWA. The steps between TWAs and TWs is free of constraints, but each cell must have a value.

POL format

It is the same as CSV format, except that the separator between field is the <tab> character.

XML format

It the format used by Maxsea. It comes as an XML file.

Waves polar format

Waves polars must have an extension “.polwave.csv”. Since it is a csv file, it can be loaded in as a spreadsheet.

	A	B	C	D	E	F	G
1	TWS=5	0	1	2	5	10	
2	0	100	90	85	80	50	
3	50	100	95	90	85	70	
4	90	100	100	95	95	90	
5	120	100	101	103	105	110	
6	180	100	102	105	110	120	
7							
8	TWS=10	0	1	2	5	10	
9	0	100	90	85	80	50	
10	50	100	95	90	85	70	
11	90	100	100	95	95	90	
12	120	100	101	103	105	110	
13	180	100	102	105	110	120	
14							

Wave Polars can be defined for various TWS. If only one TWS is defined this wave polar will be used regardless of the actual TWS.

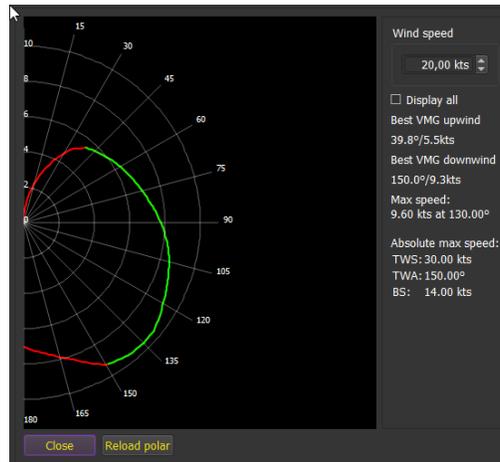
The first cell indicates for which TWS this polar is meant to apply. Data in abscise represent Waves height in meters, and data in ordinate represent angle between waves and boat heading.

Data themselves are the percentage to be applied in that case, as a percentage. In the example above 103% of the polar speed will be used if TWS=10, Wave Height is 2 meters and angle between wave and boat is 120°. Of course, qtVlm will interpolate any intermediate values.

Viewing Polar

Studying polar

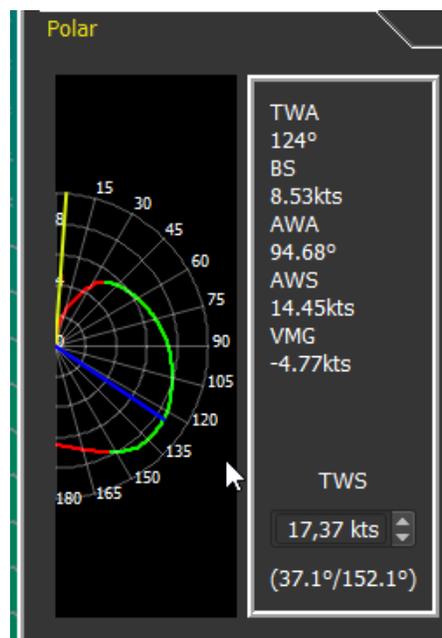
This function is located under the menu "Boat->Polar analysis".



This dialog shows critical angles for the polar (best VMGs). Note that it is possible to modify the polar outside qtVlm in the same time. Just press "Reload polar" each time you save it.

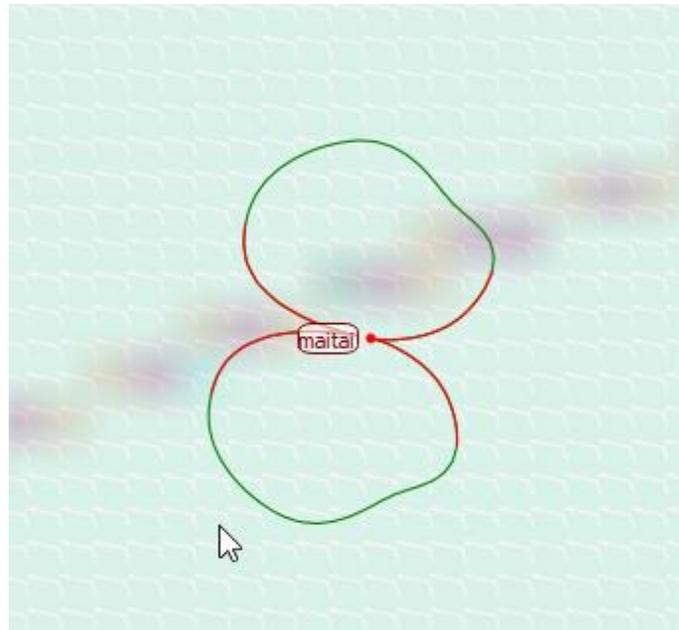
Showing polar in the main dashboard

Polar can also be displayed in the main board. If wind data is available from NMEA sources, the polar will adjust itself automatically to current TWS, allowing to compare theoretical polar speed with actual one.



Showing polar on the map

Polar can also be displayed directly on the map. For this go to the menu "View->show/hide and check the line "show/hide speed polar" (or press "L" key). For the polar to be displayed a grib has to be loaded.

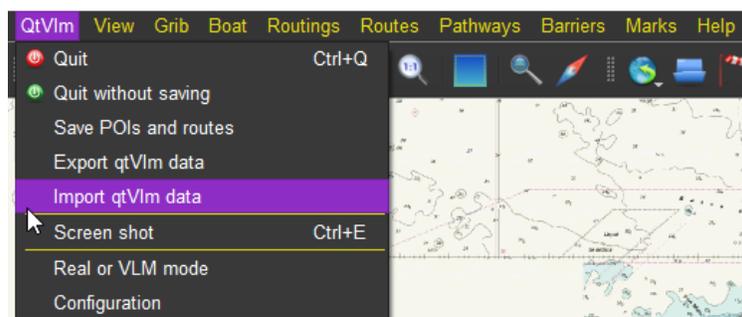


Environment

Menu

qtVlm menu consists in several sub-menus:

QtVlm Menu

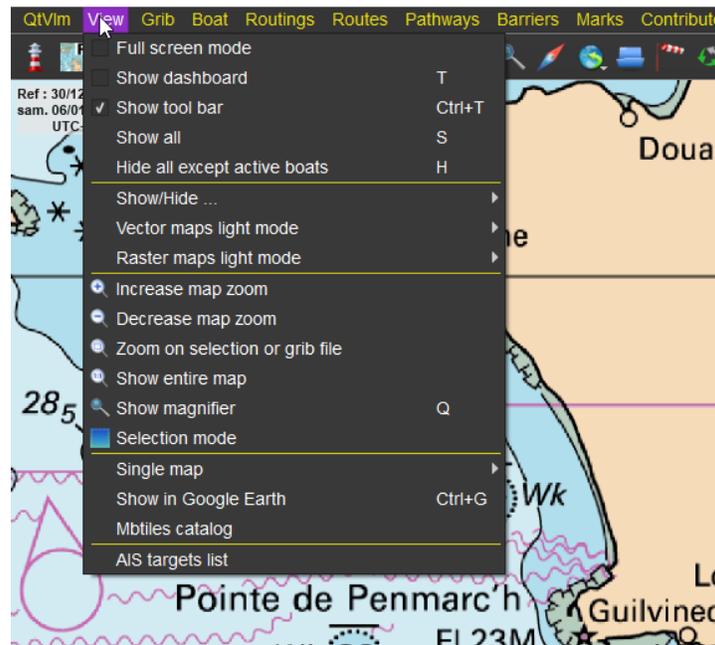


This menu contains the Quit command to close qtVlm (with or without saving data). It also allows to switch from VLM mode to Real mode or vice versa.

It also contains the Export and Import functions, that allows to transfer all or some data from one qtVlm installation to another (PC or mobile).

It also contains the Configuration function, with all qtVlm settings.

View menu

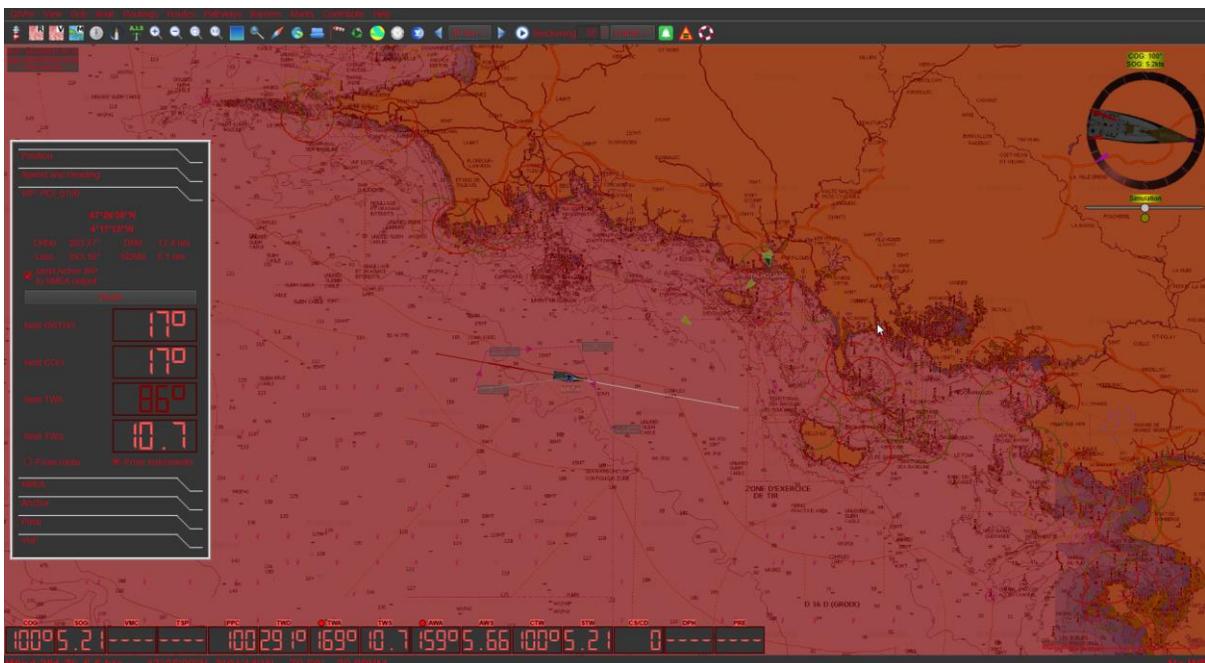


This menu is managing the display status of qtVlm items (POIs, traces, routes, etc.).

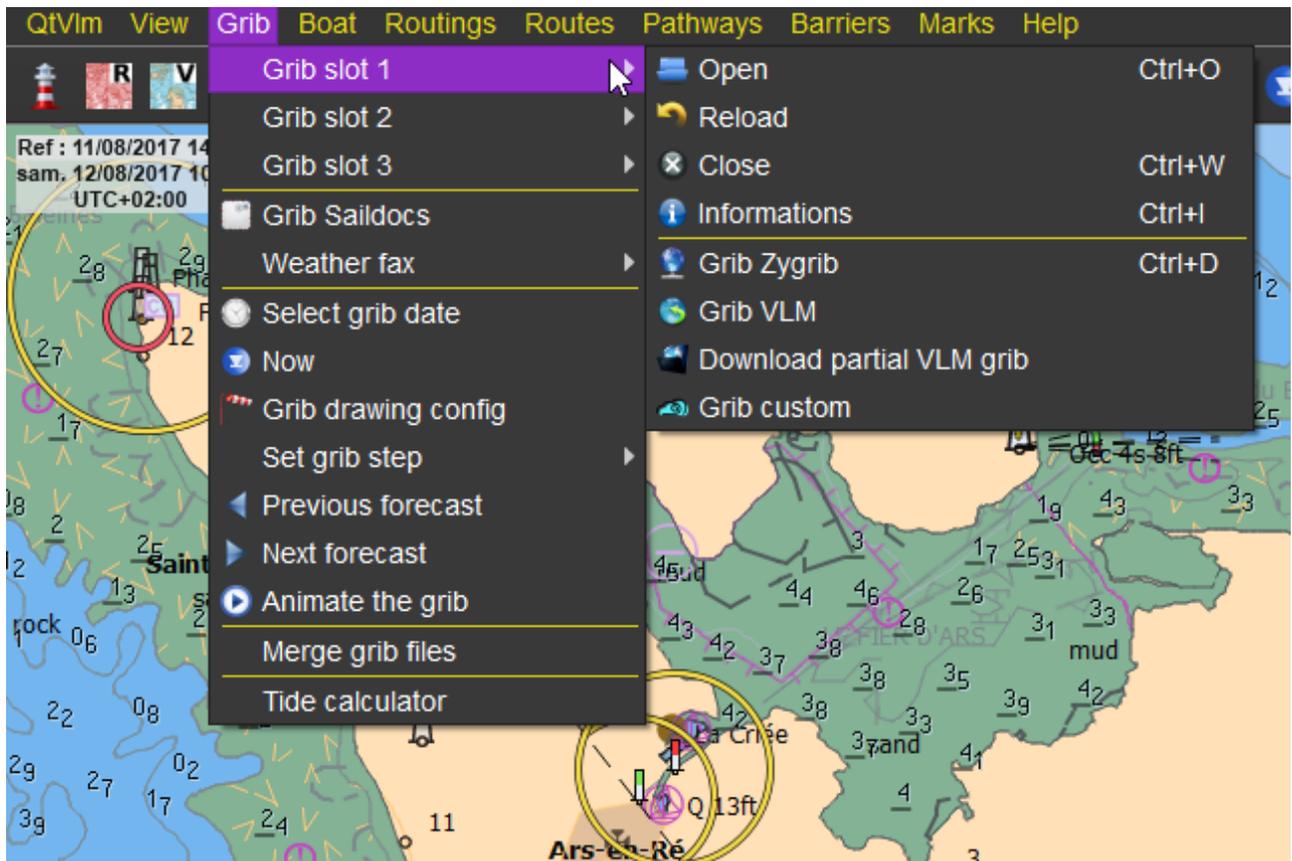
It also allows to display a single kap file (raster map), in which case the quilting mode is deactivated.

There is also a function to display your boat and trace on Google Earth.

You can also choose **night mode** (either from "Vector Maps light mode" or "Raster maps light mode"), in which case qtVlm will change its display theme.



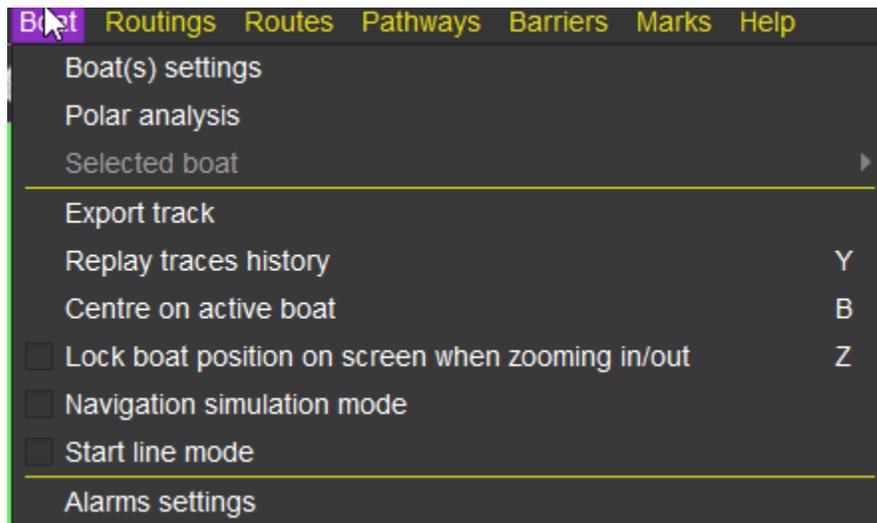
Grib menu



This menu manages grib. Three slots are available, where you can load grib from different sources, containing different data or resolutions.

Various types of download are available. It is also possible to merge grib, for instance to build a single grib containing Winds, Currents and Waves.

Boat menu



This menu manages access to boat settings, where you can for instance specify which polar you want to use. It can also launch the "**Simulation Mode**", and you can define several types of sound **alarms**.

It is also from here that "Start Line mode" can be activated.

Boat settings

Name and Polar

Boat's name
maitai

Icon size on map

Polar

boat_Mono650.csv Import polar Delete

Efficiency upwind 100 %

Efficiency downwind 100 %

Best Angles

Up wind Auto Forced 45,0°

Down wind Auto Forced 170,0°

Waves parameters

Engine and Tack Changes

Dimensions

Navigation simulation mode

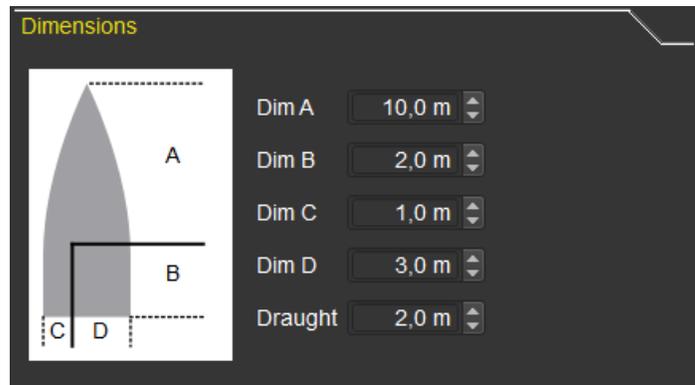
Declination

Other settings OK Cancel

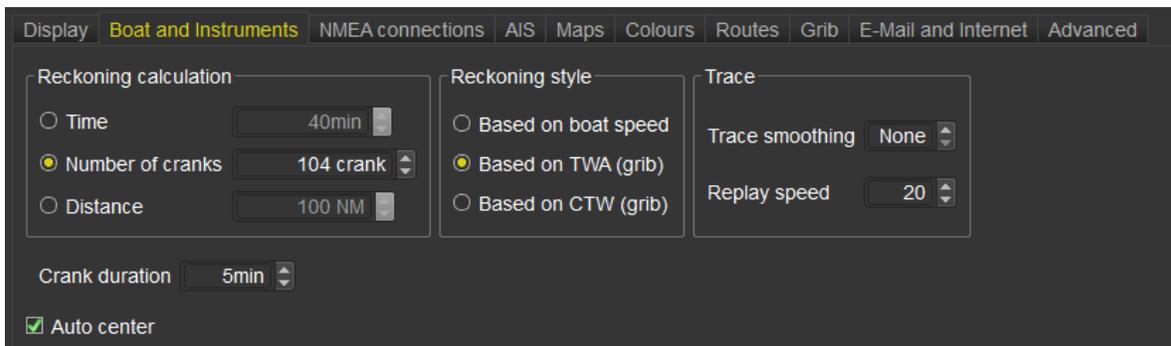
This configuration screen defines various boat parameters, especially concerning wind polar, parameters depending on sea state, engine usage, etc. See [Polars and boat behavior](#) for more info on these settings.

It also allows to set the size of the boat icon displayed on the map. A zero size will display a simple point and the name of the boat.

The GPS antenna placement on the boat is defined, so the physical size of the boat and AIS targets can be taken into consideration when calculating CPA and TCPA (closest point of approach in AIS module), and in Start Line Mode. Draught is not used for the time being.

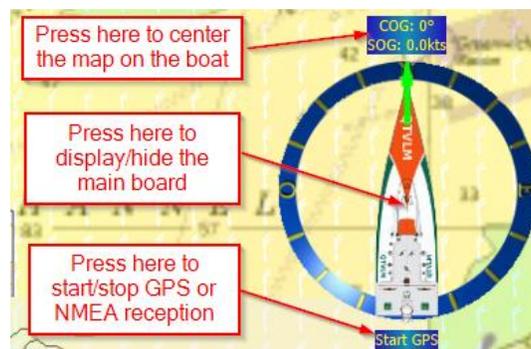


Some other options concerning the boat are also available in the main configuration screen, tab "Boat and Instruments".



Apart from various reckoning and trace options, you can specify here what Crank duration qtVIm will use. This is the internal step qtVIm is using for all calculations. A small value gives more precise results, but will be costlier in CPU, memory and computation times.

You can also specify that you want the boat always centered on the screen, when NMEA reception is activated. You must center the boat on the screen once after zooming or panning to reactivate this option. This can be done from the boat menu, or from the microboard's upper label. After 5mn of inactivity (i.e. not moving the map), the map is again centered on the boat.



Alarms settings

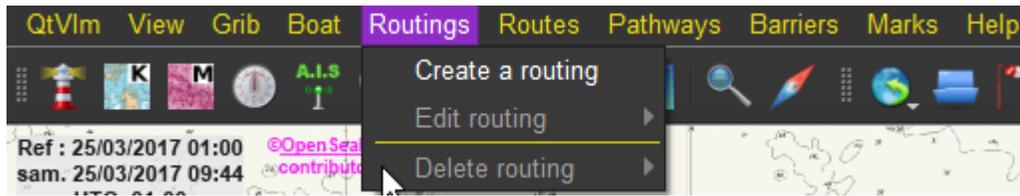
Alarm Condition	Parameter	Value
<input type="checkbox"/> Activate alarm		
<input type="checkbox"/> At that time	Time	01/06/2018 18:37:54
<input type="checkbox"/> on COG condition	COG	315,0°
	Tolerance	5,0°
	During	20 sec
<input type="checkbox"/> on TWA condition	TWA	0,0°
	Tolerance	20,0°
	During	0 sec
<input type="checkbox"/> on SOG condition	Max	100,0 kts
	Min	0,0 kts
	During	0 sec
<input type="checkbox"/> on AWA condition	AWA	0,0°
	Tolerance	20,0°
	During	0 sec
<input checked="" type="checkbox"/> on PPC condition	Less than	80%
	During	5 sec
<input type="checkbox"/> on active WP distance	Distance	1,00 NM
<input type="checkbox"/> on Currents condition	Over than	100,0 kts
<input type="checkbox"/> on Depth condition	Less than	100,0 m
<input type="checkbox"/> on Pressure drop	By	0 hPA
	Since	0 min

Sound alarms can be triggered on several conditions: on time, or if the boat's heading or TWA deviates too much from a defined value. Alarms on speed, depth and currents are also available, as well as an alarm on Polar Efficiency Percentage (PPC), an alarm on AWA, an alarm on distance to active WP, and an alarm on Atmospheric Pressure. Several alarms can be defined at the same time. Some alarms have a delay parameter, that you can use to specify that you want the alarm to ring only if the limit is exceeded for more than that time. If the defined limit is exceeded by more than 1.5 times, the alarm will be triggered regardless of the timer.

Alarm on Atmospheric pressure is available only if the relative instrument and histogram is configured in Instruments settings.

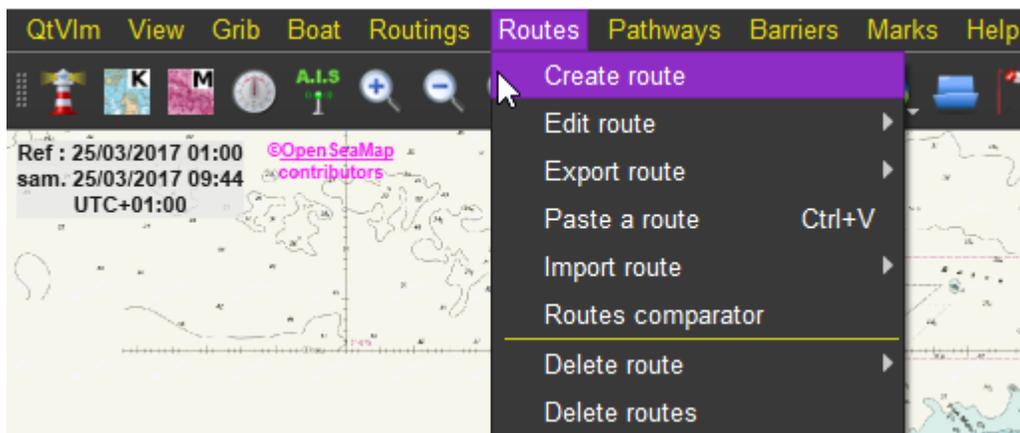
Anchor and AIS alarms are defined in their respective modules.

Routings menu



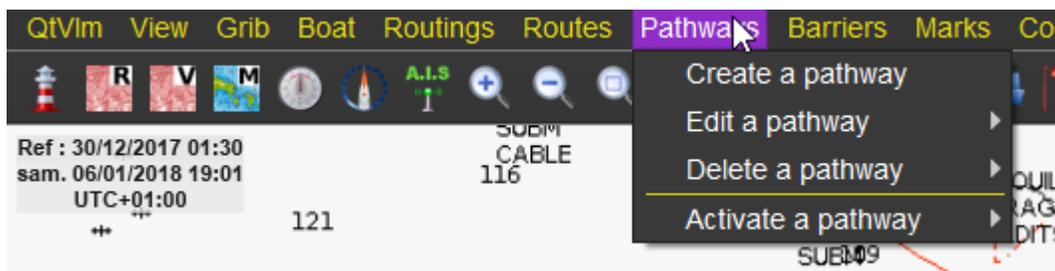
This menu manages routing (creation, edition, deletion). Note that unlike routes, routing are not saved when you close QtVlm, and there is no import/export functions. Routings are meant to be converted in Routes.

Routes menu



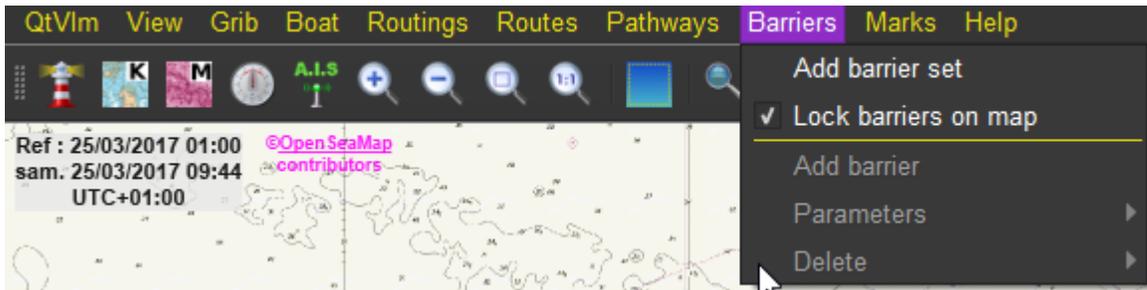
This menu manages routes: creation, deletion, edition, import, export, and comparing.

Pathways menu



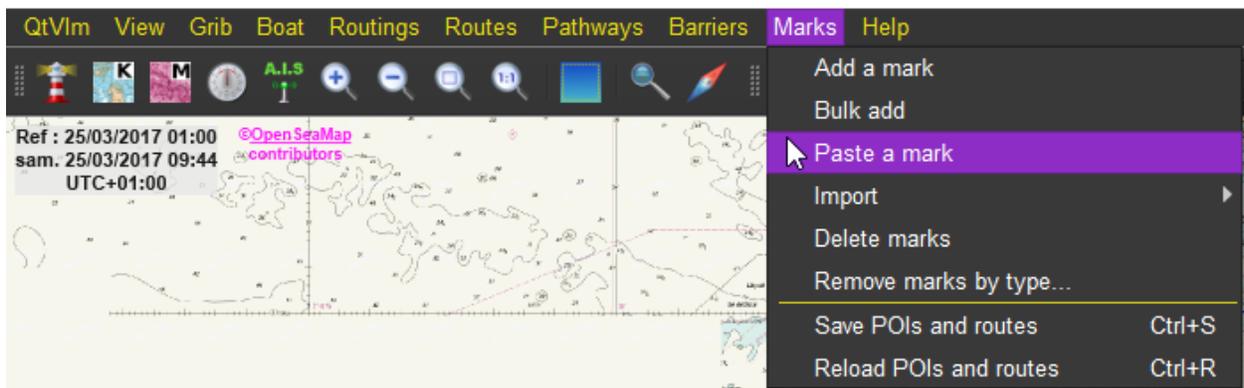
This menu manages pathways, which can be used for multipoint weather routing. A pathway can also be activated. More information on that in [Pathways module](#)

Barriers menu



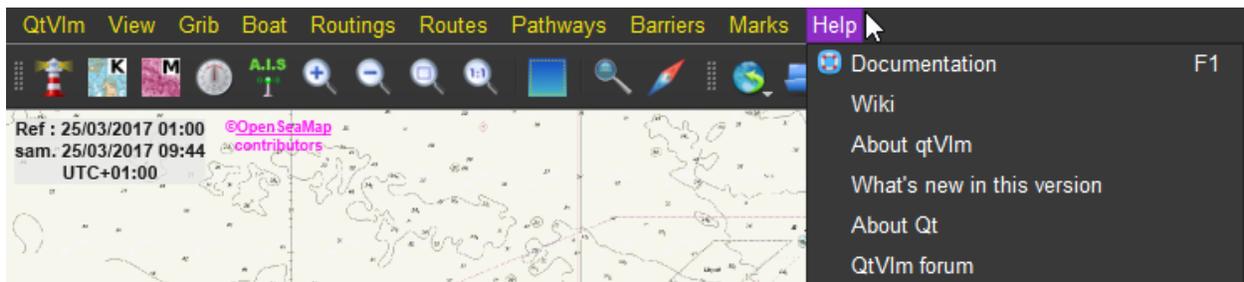
This menu manages barriers. Barriers are meant to materialize no-sail-zones or other forbidden areas. They are avoided by the routing calculations.

Marks menu



This menu manages POIs (Point of Interests). It also allows importing marks from other sources.

Help menu



This menu allows access to various help resources. It also contains the recent modification log for qtVlm.

Toolbar

The toolbar consists in various icons, grouped by themes.

Maps and Instruments icons



This icon switches map types. Lighthouse on is for online maps, while lighthouse off means offline maps.



These icons activate or deactivate Raster maps (Rasters, geotif, etc.), Vector (S57) maps and mbtiles maps quilting.



The first icon hides or shows instruments. The second one hides or displays the main dashboard. The third one activates or deactivates AIS reception.



These four icons are used for zooming the view. You can also use mouse and mouse wheel (or fingers on mobile versions) for that. Note than on **Android**, + and – buttons are replaced with volume+ and volume– physical buttons.



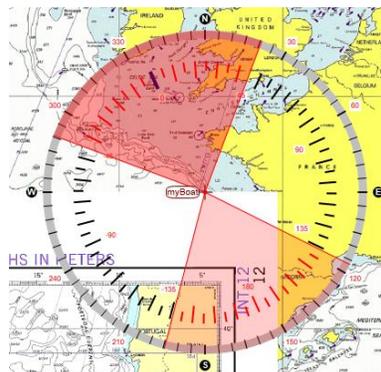
This icon is used to switch to selection mode. It allows to select an area on the map, or a group of POIs for instance. The same action can be achieved with the mouse together with <shift> key (with <ctrl> key it will zoom on the selected area).



This icon activates/deactivates the magnifier.



This icon shows/hide the compass on the map. Please note that the compass can eventually rotate if the device is equipped with a magnetometer sensor. The size of the compass can be changed in the general settings. The center part of the compass is oriented according to wind direction from grib, or from real data if it is centered on the boat and these data are available.



Grib icons



Press long on this icon to get a sub-menu managing various grib download commands.



This icon will open a grib in the first slot.



This icon manages grib display configuration



This icon selects which grib slot (or all) is activated.



This icon hides or shows grib data on map.



This icon allows to choose a date in the grib.



This icon sets the grib's date to now.



These icons are used to move the grib's date forward or backward, according to the defined step.



This icon launches the grib animation.

Boat icons



These icons are used to define the unit and the length for boat's reckoning line.



This icon is used to defined or stop alarms. It appears in green if no alarm is currently triggered.

Barriers icons



This icon can be used to place barriers on the map, that will be avoided by Routings and Routes modules.

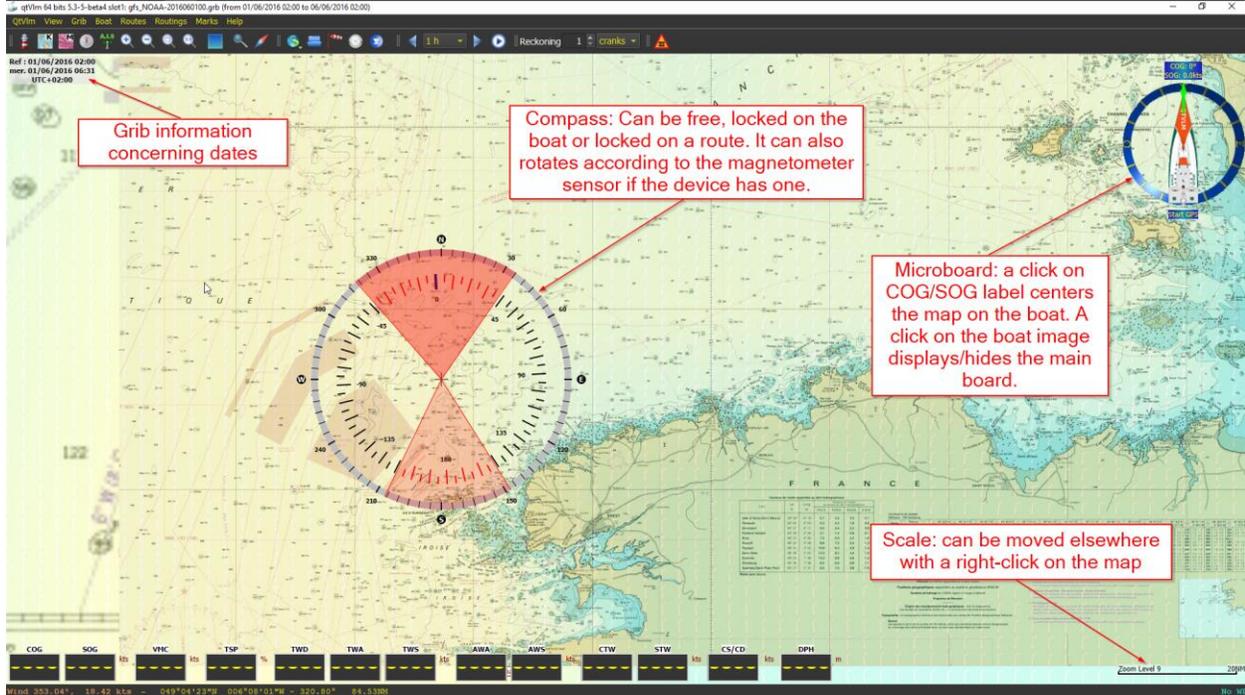


Man Over Board icon



This icon creates a mark with the same symbol at boat position. This mark becomes automatically the active WP, and some information related to it (time since dropped, heading, distance) are displayed in the status bar.

Map and main objects



POIs (points of interest) can be placed on the map with a right-click on the map (or with pinpoint icon  on mobile versions). POIs can be moved with the mouse, or by capturing new coordinates in their editor.

The boat can also be moved with the mouse, or by right-clicking the map and selecting "*move boat here*", if GPS reception is not activated.

You can also display a longitude/latitude grid over the map.

Status bar

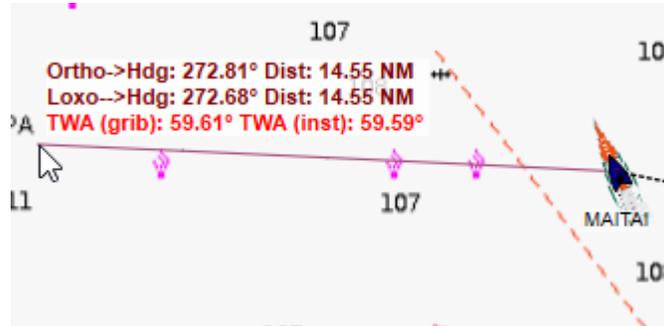
Wind 347.71°, 18.63 kts - 048°11'11"N 006°24'11"W - 280.84° 66.33NM

It contains information from grib data at the mouse position. It can also show other information like distances, coordinates, or running imports. The font size can be specified in the main parameters.

The status bar also displays information about alarms, when they are activated.

Draw a heading

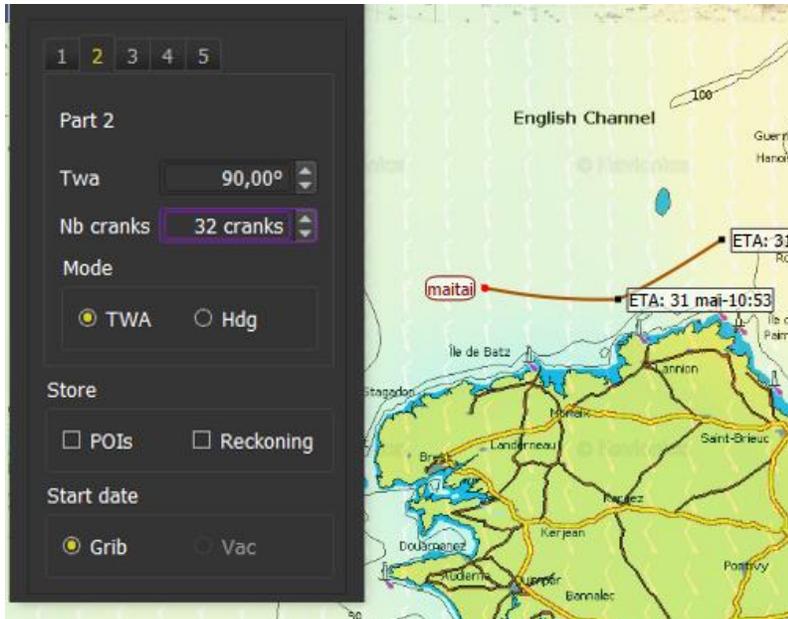
From all objects and directly on the map, the function "draw a heading" can be called, through the contextual menu (or with the pinpoint  on mobile versions).



This function shows orthodromic and loxodromic lines with distances, angles, etc. It will turn red if crossing a land or a barrier. TWA data is also displayed, based on grib and instruments data.

Draw a grib reckoning

From all objects and directly on the map, the function "draw a grib reckoning" can be called, through the contextual menu (or with the pinpoint  on mobile versions).



This function calculates the boat's position based on polar and grib Winds data. Five legs can be defined, either in fix TWA or fix heading mode. Penalties for tack/gybes, and waves parameters are **not** taken in account.

Reckoning

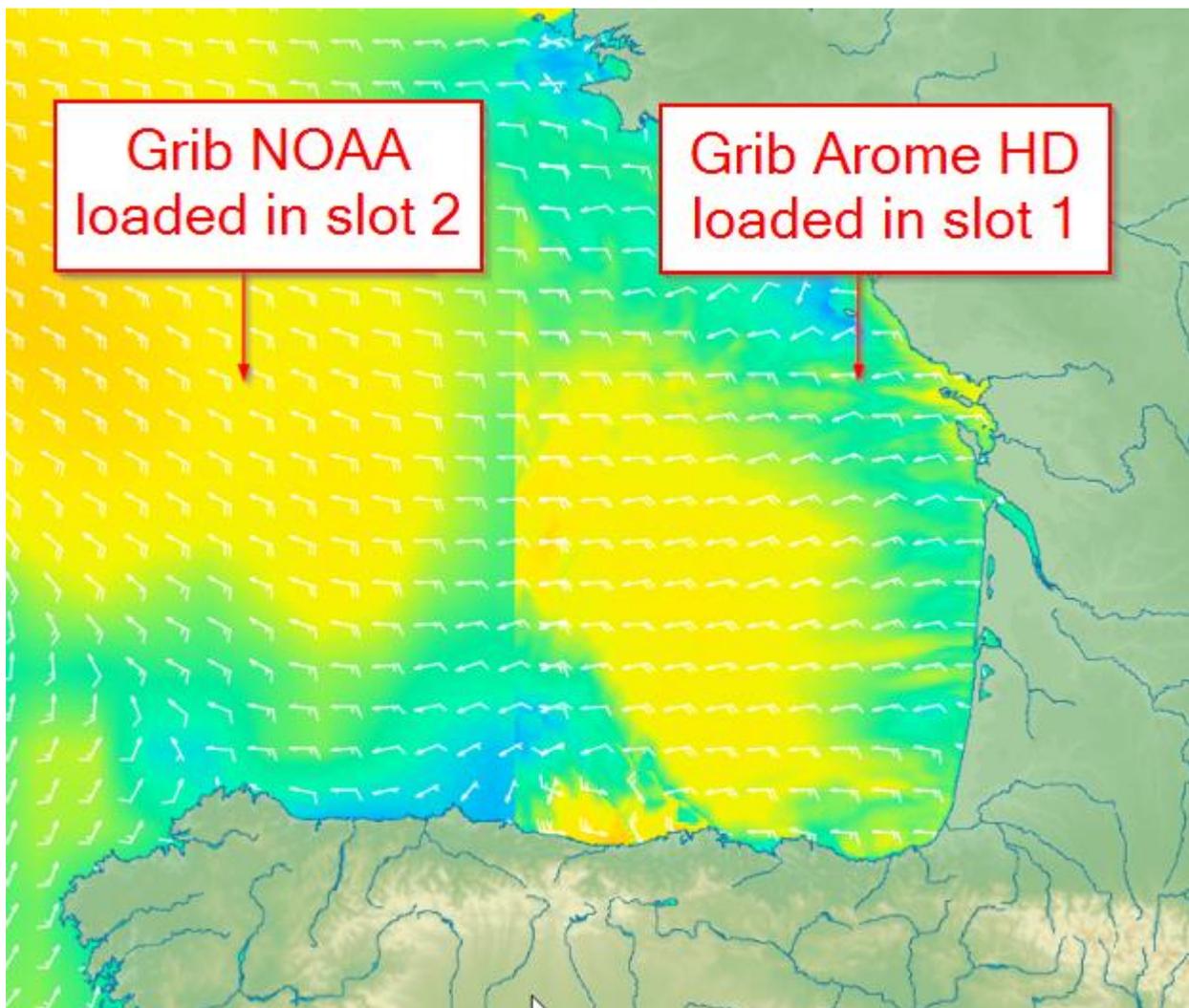
Several types of reckoning are available. The choice is made either in the main configuration dialog (boat tab), or from the boat's contextual menu (right-click). The reckoning length can be specified in number of cranks, duration or distance. Reckoning line flashes if it crosses a land.

- Reckoning based on boat's speed and heading: this is the projection of the instantaneous boat's speed and heading. No grib data is used for the calculation. This is based on COG and SOG. Please note that the boat's icon orientation is based on CTW, if available.
- Reckoning based on boat's TWA: this reckoning assumes boat's TWA will remain the same, and is calculated using grib data and polar. Currents grib data is taken into consideration also, if present.
- Reckoning based on boat's HDG: this reckoning assumes boat's heading will remain the same, and is calculated using grib data and polar. Currents grib data is taken into consideration also, if present.

Gribs and Weather Images

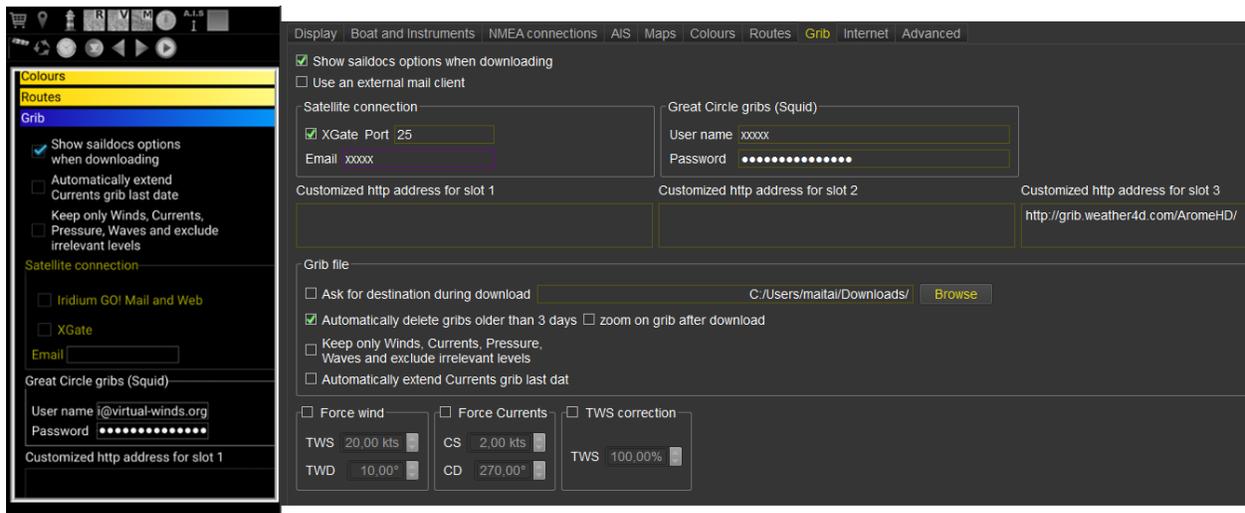
Gribs

qtVIm can use gribs from many sources, in format 1 or 2, compressed or not. Three slots are available for that, so it can manage **three gribs simultaneously**, containing different data or different resolution for the same data. If a grib contains the same data at different resolution, the data with the best resolution is used for calculations and display. qtVIm will switch to the bigger resolution only when the data with the best resolution is exhausted in time or area. You can also force the usage of a single grib slot from the toolbar or from the grib display settings dialog.



In practice, it is usual for instance to load a grib with Winds data in the slot 1, and a grib with Currents data in slot 2, but in fact the slots are equivalent and the order does not matter.

Gribs general options



This configuration screen is available via the menu "qtVlm->configuration", Grib tab.

The folder used to store downloaded gribs can be specified. Beware that by default, all gribs in qtVlm default folder will be deleted if they are older than 3 days. If another folder is specified this cleaning process will not apply.

It is also possible to filter out irrelevant data and keep only useful data used by Routes and Routings modules. This is useful to limit memory usage and therefore be able to load bigger gribs.

The first option relates to **Saildocs**, a service that can send you gribs via email. You can choose if you want to see Saildocs options screen when you generate a request, or use last settings used.

Depending on which platform you are running qtVlm, you can also generate requests via **Iridium**. In this case you must indicate the relevant account information for XGate and/or Iridium Mail and Web.

You can also access directly to your **Great Circle** (Squid) gribs subscriptions. In this case you must indicate your Great Circle account information.

Check "use an external mail client" in "E-Mail and Internet" tab is you are using for instance Outlook.

You can also specify custom addresses (URLs) for downloading gribs.

You can also force Winds and Currents, mainly used for educational purposes.

And finally, you can also apply a correction (%) on all TWS data from gribs.

Gribs opening

From the menu "*Grib->Slot 1 or 2->open*" you can open a grib located on the machine. If a grib is too big to be loaded, you can select a zone on the map before opening it, that will limit the grib to this area. Gribs are automatically reloaded when the application restarts.

qtVlm knows how to read directly (and even merge) compressed files so it is not necessary to uncompress them before.

The button  on the toolbar can be used to open a grib in slot 1.

Beware that qtVlm will delete all gribs in the folder used to open the grib, if they are older than 3 days. This behavior can be changed in the grib general options.

Gribs download

qtVlm can download gribs from various sources, either in slot 1 or 2.

Full VLM grib download

VLM server provides 4 times a day a NOAA grib at a 0.5°/3h resolution, with a duration of 5 days, covering all world. If a selection is made on the map before download, the grib will be limited to this area although the full grib will be downloaded (35 mb).

Partial VLM grib download

It is the same as the full VLM grib, but only the selected zone will be downloaded. You can also do that via the contextual menu of the selection area.

Zygrib download

You can request directly a grib to zygrib server (this option is not available on mobile platforms). You need to select a zone on the map. This action is also available in the selection area contextual menu.

Latitude min Latitude max

Longitude min Longitude max

Resolution Interval Duration

Wind (10 m)
 Gusts

Mean sea level pressure
 Frozen rain (rainfall possible)

Temperature (2 m)
 CAPE (surface)

Temperature min (2 m)
 CIN (surface)

Temperature max (2 m)
 Cloud cover

Potential temperature (sigma 995)
 Relative humidity (2 m)

Total precipitation
 Snow (snowfall possible)

Isotherm 0°C

Atmosphere: geopotential altitude, wind, temperature, theta-e, relative humidity.

Warning : these data increase strongly the size of the GRIB file.

850 hPa
 700 hPa
 500 hPa
 300 hPa
 200 hPa
 All

0%

File size max: 51200 Ko (50Mo) Estimated size : 35 kb

Many options are available, which allow you to choose which data you want, which resolution and duration (maximum 10 days). These grib files also come from NOAA.

Saildocs download

Select a zone on the map, then use its contextual menu to request a Saildocs grib. If the relevant option is checked in the general grib settings, you can select which kind of model, data, duration, etc. you want to request.

The screenshot displays the Saildocs grib settings interface. It features a grid of model selection boxes for GFS, NDFD, NAVGEM, COAMPS, HRRR, WW3, RTOFS, and OSCAR. Each box contains checkboxes for various data types (Wind, Gusts, Pressure, CAPE, HGT500, Temperature, Waves, Rain) and dropdown menus for resolution and duration. The GFS model is selected, and the 'Wind' checkbox is checked. The 'Send EMail' button is highlighted.

Some explanations on the different grib models available here: [gribmodels](#)

Several mails can be received if several models are selected.

If the usage of an external client for email is unchecked in the options, you will need to copy/paste the body of the message and send it to query@saildocs.com, with whatever object (but not empty).

The screenshot shows the email recipient and object of mail form. The email recipient is `query@saildocs.com`. The object of mail is `GFS:50.00N,48.00N,5.00W>2.50W|0.5,0.5|0,3,6..384|WIND`. The body field is empty.

You will then receive an email with the grib as an attachment, which you can open in one of the three grib slots.

Great Circle grib download and requests

If you have indicated your Great Circle account information, you can access directly to you GC grib subscriptions, or generate a mail request eventually through Iridium. To get the following screen, you must select a zone and request a Great Circle grib via the selection contextual menu, or via the Great Circle grib entry available in each grib slot.

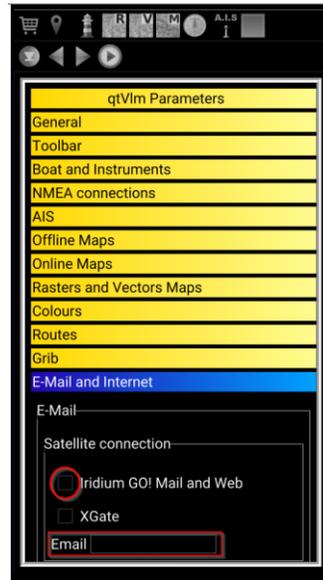
The screenshot shows a software interface with two main panels: "Models" and "Variables".

- Models:** A list of weather models is displayed. "ECMWF-GC 112km" is highlighted in purple. Other models include ECMWF-Hirlam, ECMWF-GC 25km, ECMWF-GC 56km, ECMWF-GC 9km, ECMWF-Pacific (112km, 25km, 56km, 9km), GCWF, GCWF +, GEFS (112km and 56km in All, Average, and Control variants), GEM, GFS (112km, 25km, 56km), Harmonie, and HiRes St. Lawrence.
- Variables:** A section with checkboxes. "All" is unchecked. "Pressure" is unchecked. "Wind 10m" is checked.
- Resolution:** A label "Resolution: 1°" is present.
- Duration and steps:** Two dropdown menus are set to "10 days" and "3 hours".
- Buttons:** At the bottom, there are radio buttons for "Grib V1" (unselected) and "Grib V2" (selected). A progress bar shows "0%". Three buttons are visible: "Download" (highlighted in purple), "SquidMail", and "Cancel".

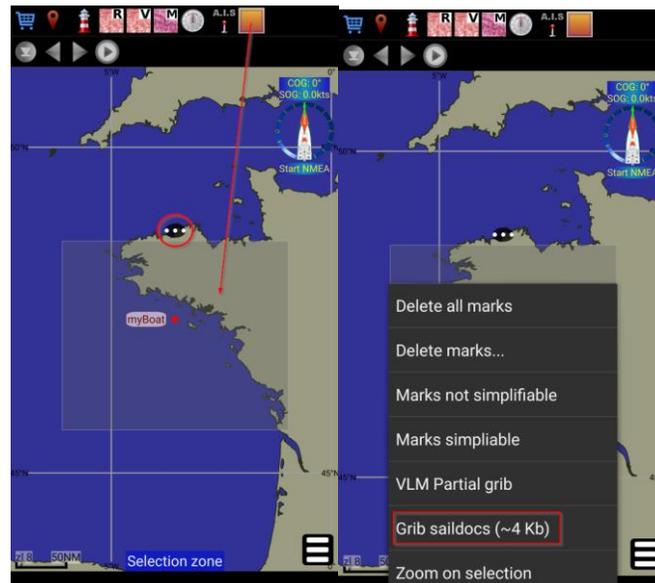
Grib download via Iridium Mail and Web or XGate applications

qtVlm is Iridium GO! certified on Android, and iOS and can generate Saildocs or Great Circle emails requests via « Iridium Mail and Web » (IMW) or XGate applications. On Windows and MacOS only XGate is supported. On Linux these applications do not exist.

Before anything, you must select which application you will use to communicate with satellites:

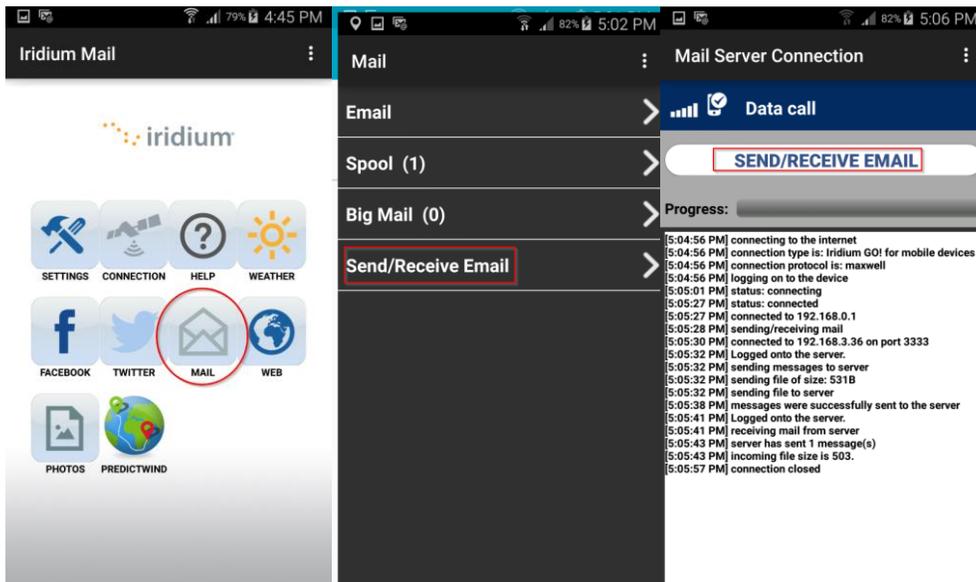


Then select a zone and request a Saildocs grib via the selection contextual menu:

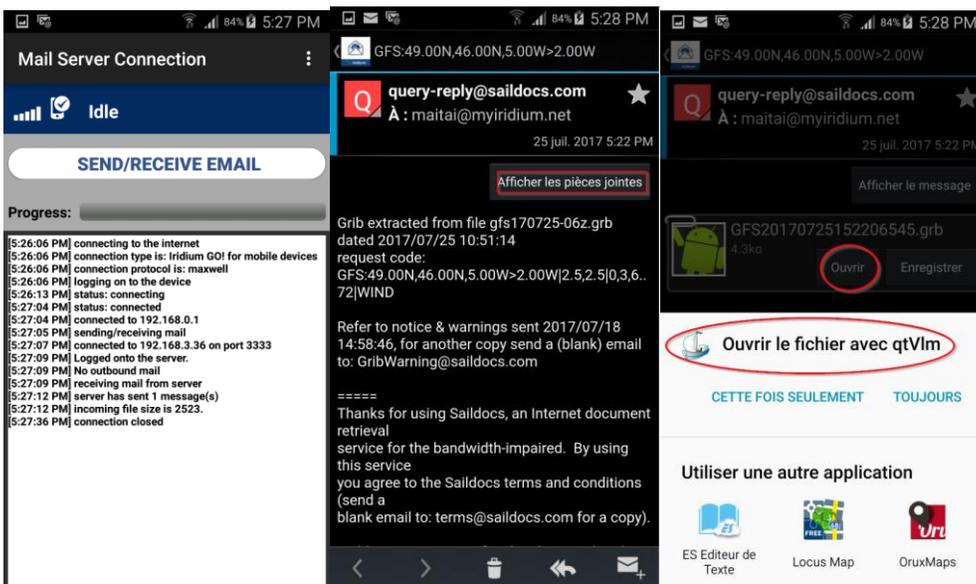


Be careful to not to select a too big area, and that your Saildocs parameters are set to limit grib file size to a minimum.

The mail is then generated and sent automatically to IMW or XGate. On iOS the corresponding application will be opened automatically. Your mail is ready to be send:

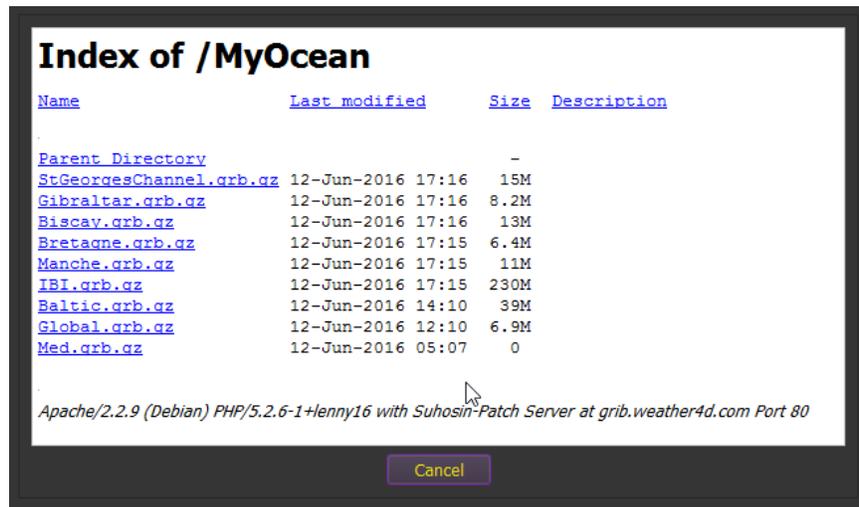


Similarly, the grib reception is made through IMW or XGate. On Android or iOS qtVIm will be proposed to open the attachment:



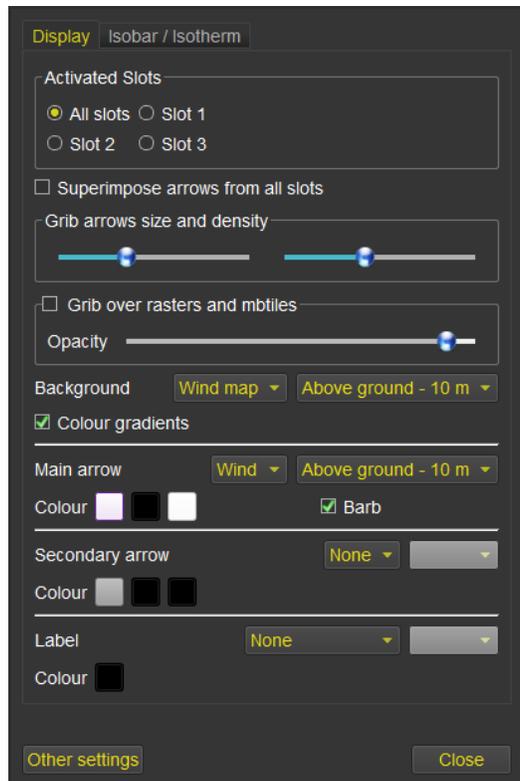
Custom grib download

You can also download in either slots a grib from a customized URL, defined in the grib options dialog.



Grib display configuration

The way grib data is displayed is managed from the menu, or with the icon  in the toolbar. Arrow colors can be defined for each slot, to help comparing models together.



Currents arrows length is proportional to Currents speed.

Setting a grib date, animating the grib



These icons in the toolbar are used to position the grib at a date, to move the date forward or backward, and to launch an animation of the grib.

Merging grib

Via the menu "Grib->merge grib files", you can concatenate grib files together (of the same type 1 or 2), to build a single grib file from many. This is useful for instance to generate a grib file containing Winds, Currents and Waves that will be easier to manipulate or transfer to a mobile device.

If the same type of data with the same date is available in several grib files, the data with the better resolution will be kept.

You can merge compressed files without decompressing them.

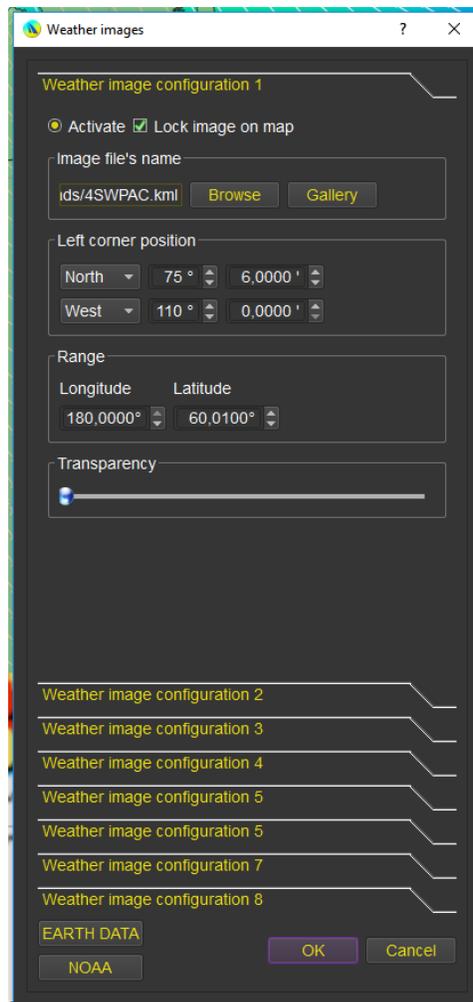
Weather Images

Weather images are either non geo-referenced images (tif, png, jpg, etc), or geo-referenced images (kml or kmz files). qtVlm can keep up to 8 predefined slots. You can find weather images in many places, for instance here: <http://tgftp.nws.noaa.gov/fax/marine.shtml>, or for geo-referenced images for instance here <http://www.opc.ncep.noaa.gov/gis/index.php> or here <https://earthdata.nasa.gov/earth-observation-data/near-real-time/rapid-response/modis-subsets>.

This function is helpful to compare a grib with a prevision made by a real meteorologist.

Opening a weather image

Opening a weather image is made through the menu "Grib->Weather image->Open a weather image".

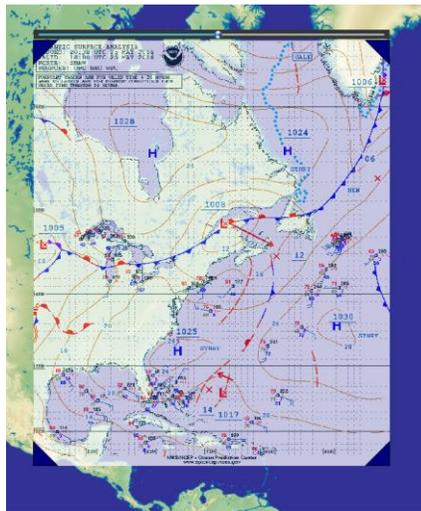


Placing a non geo-referenced weather image on the map.

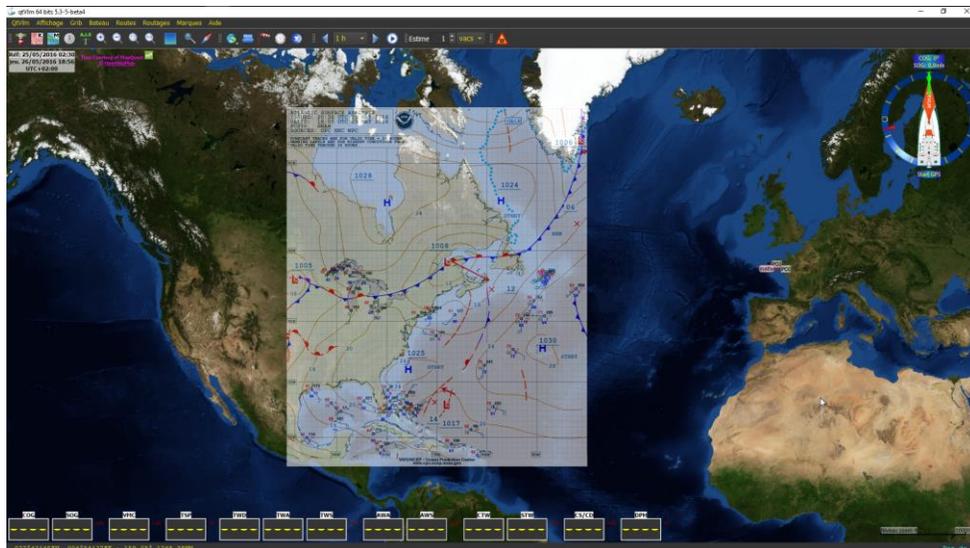
Once a file has been chosen, it is useless to capture coordinates, since it is possible to manipulate the image directly on the screen with mouse or fingers. Make sure the option "Lock image on map" is unchecked to allow that.

qtVIm also accepts URLs directly instead of a file name. In this case the image will be downloaded each time the Ok button is pressed.

Using mouse and the 4 corners, and the transparency slider at the top of the image, position the image where it belongs, with the help of coast lines for instance.



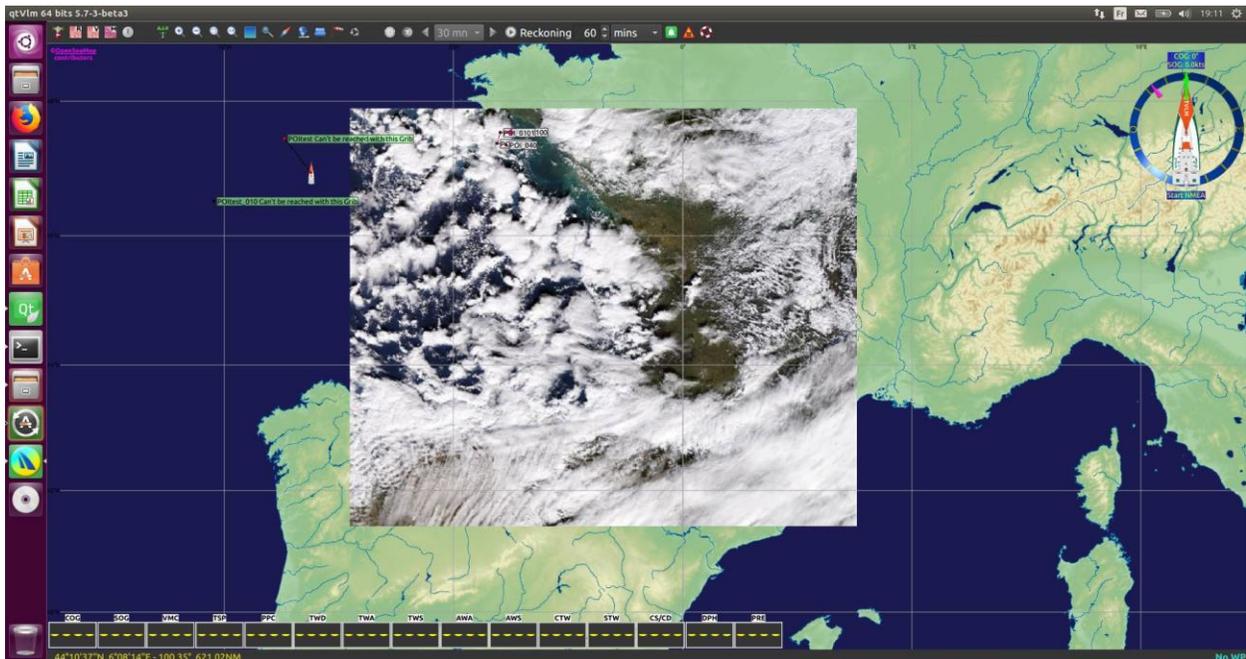
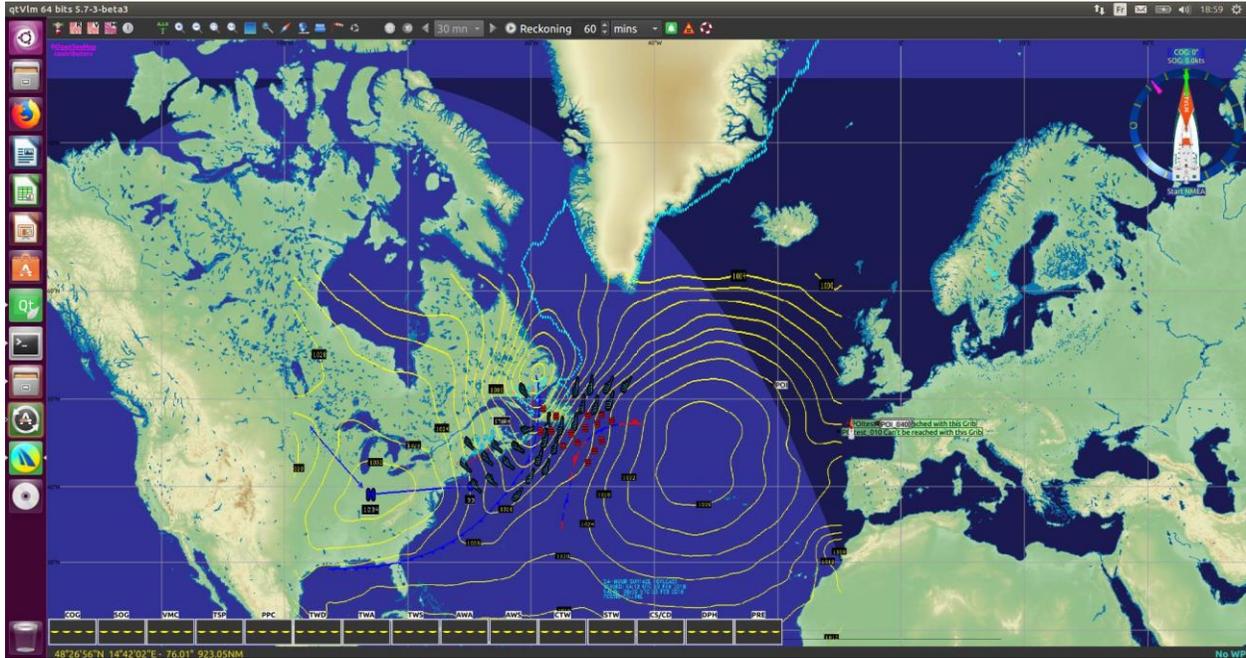
When the image has been correctly positioned and resized, choose the final opacity and lock it back in the configuration dialog.



When this image will need to be updated, qtVIm will remember the position and size of this particular slot (up to 8).

Displaying KML and KMZ geo-referenced images

Similarly, you can specify images files with a kml or kmz extension (can be an url as well, in which case qtVIm will download the file each time Ok button is pressed). These files are already georeferenced, so they will be placed and re-projected on the map automatically. On Android and iOS qtVIm is registered for opening these types of file automatically.



Simulation Mode

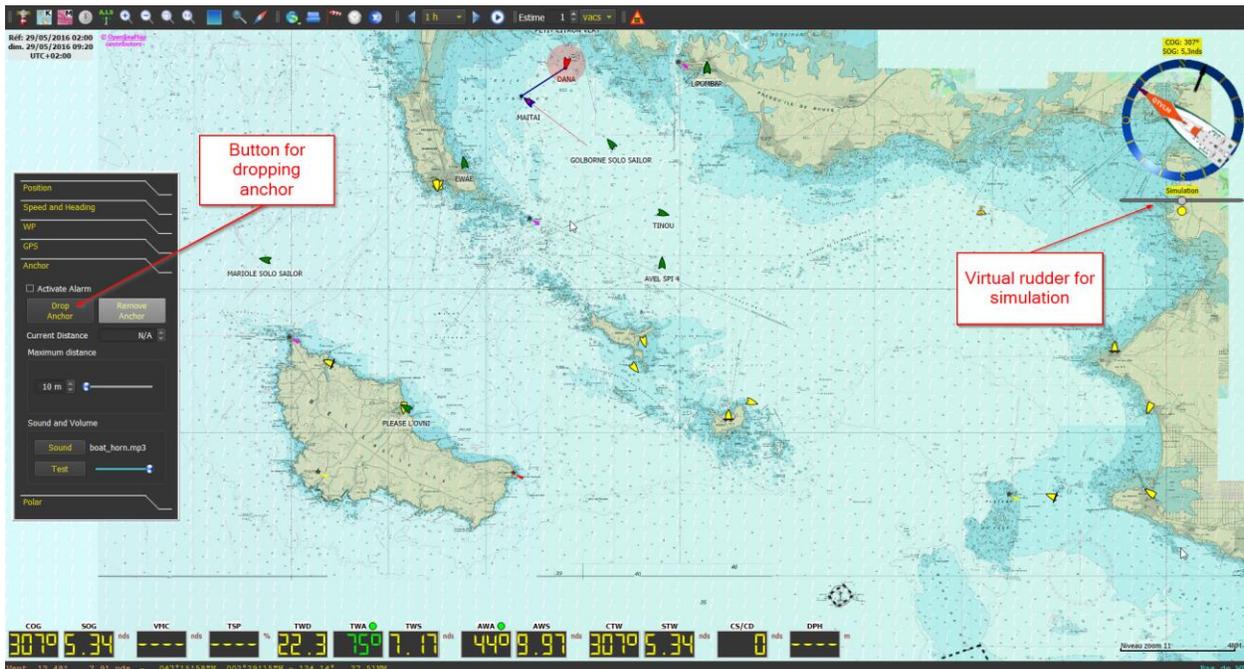
Thanks to a collaboration with sinagot.net, qtVlm offers a Simulation Mode which allows to simulate navigation together with real AIS targets, received via Internet. This mode can be activated with the menu "Boat->Navigation simulation mode".

In this mode, qtVlm sends your virtual position to sinagot.net server, and receives back all AIS targets that are in a 30NM range, plus all other qtVlm boat if any. qtVlm simulation boats will appear in blue. The boat is helmed through a virtual rudder located under the microboard, the boat's speed being calculated based on polar and grib data. Winds and Currents are taken into consideration.

Collisions with land and AIS targets are detected, in which case the penalty is that the simulation stops.

It is also possible to drop the anchor, if the boat is within 500 meters from a coast. Collisions with AIS targets continue to be detected even at anchor.

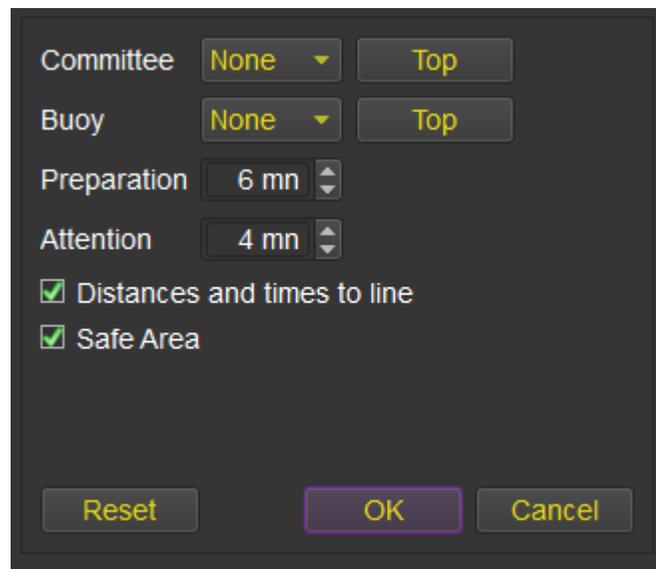
In boat's settings, a parameter allows for randomizing wind data from grib.



Start Line Mode

This mode is activated through "Boat" menu. It displays a chronometer with two configurable tops, "Preparation" and "Attention".

The chronometer can be move anywhere on the screen, unless the general boat option "Lock instruments on screen" is checked.



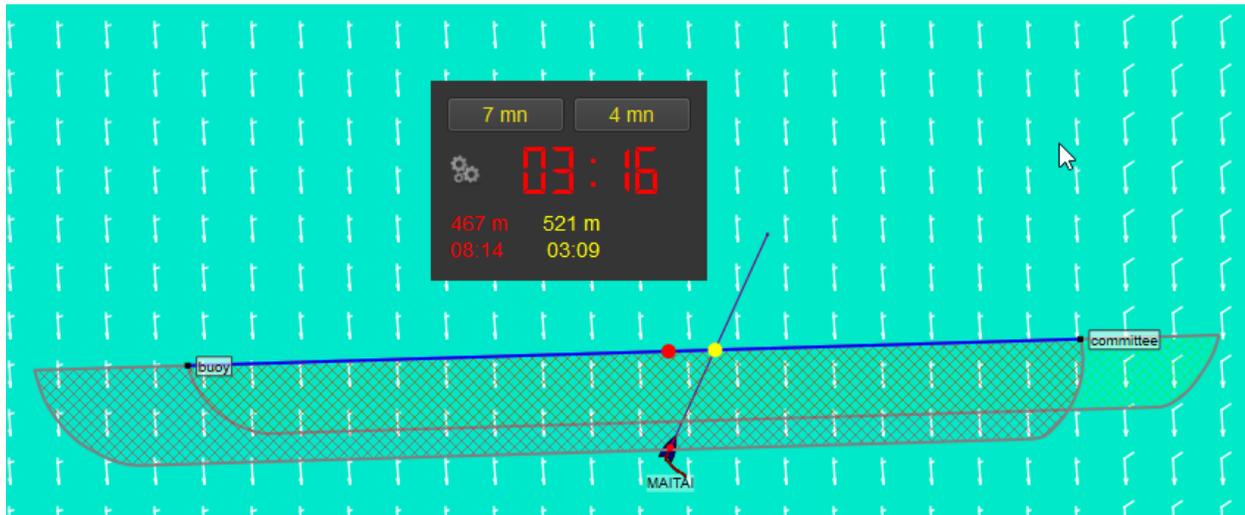
You must select 2 POIs to represent the start line. Please note that "Committee" POI is always considered to be on the **right side** of the line.

You can choose to materialize crossing points on the line. A red dot will show the closest point of the line, and a yellow dot will represent the crossing point of the line at current boat speed and heading. The times to reach these points will be shown in the chronometer.

Currents are taken into consideration. All time calculations are made related to the boat's bow, as defined in boat's settings.

You can also "top" the buoy and committee positions, meaning that the current boat position will be used.

If you choose to display the Safe Area, you will get 2 zones on the start line. The red one represents the area where the line is reachable in time with a port tack, and the green one with a starboard tack.



The 2 zones will be continuously reducing, until the chronometer reaches zero.

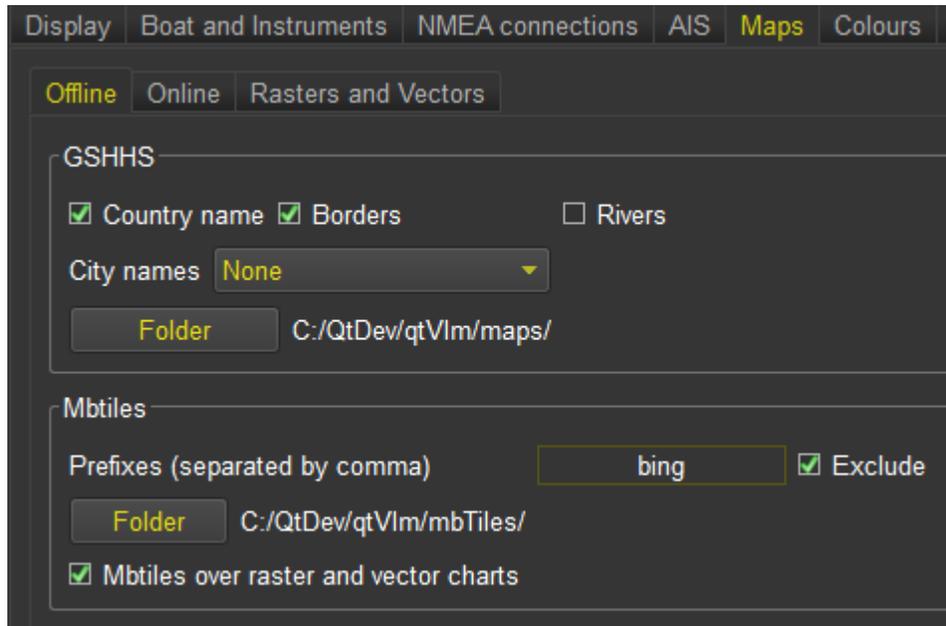
Wind and Currents used for the calculations are taken from boat instruments if available. Otherwise grib data will be used, at the boat's position.

Note that you can also choose to show laylines at Committee and/or buoy.

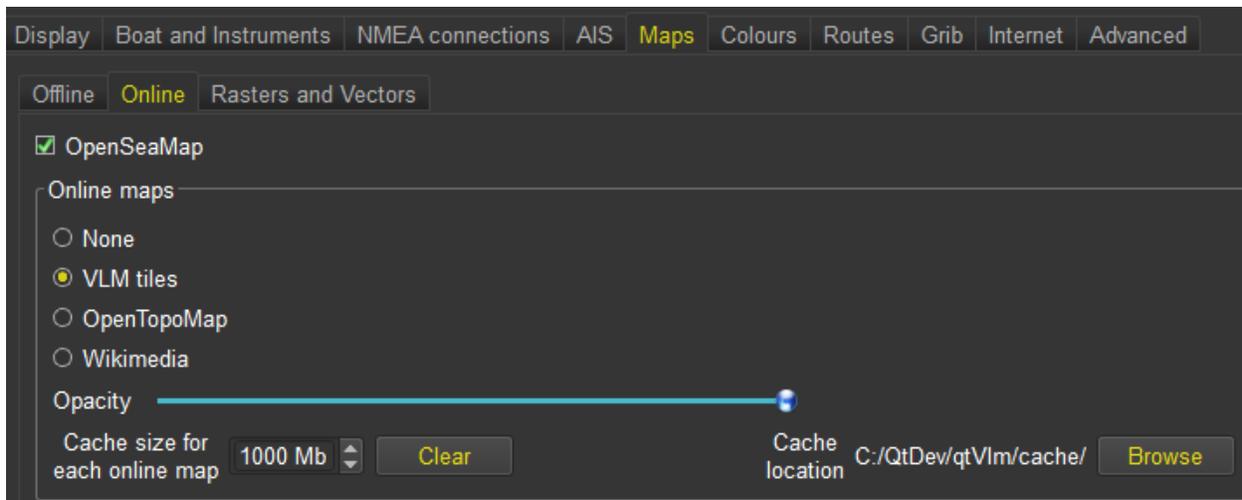
The best side for starting will be indicated by the color of the Committee or Buoy label, which will become green in case it is favored. Some more information is available in the object's tooltip concerning favored side calculations.

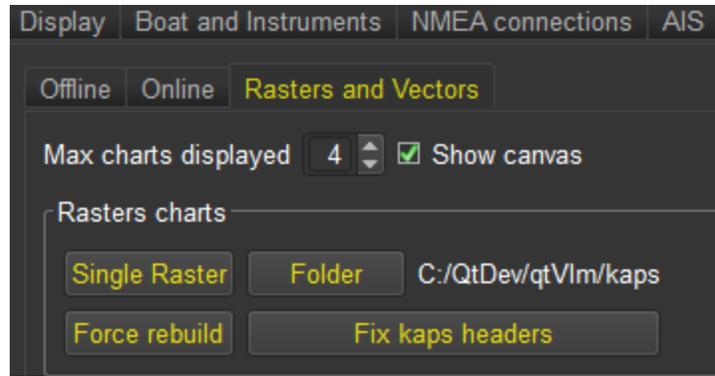
Maps

Maps Configuration



These screens, available through the menu "qtVlm->Configuration", allow to choose which type of maps is displayed, and manages various options for each type.





The toolbar also has 3 icons dedicated to maps. The lighthouse icon switches from gshhs maps and online maps, and the three next icons are used to activate additional maps (Rasters, S57 and mbtiles).

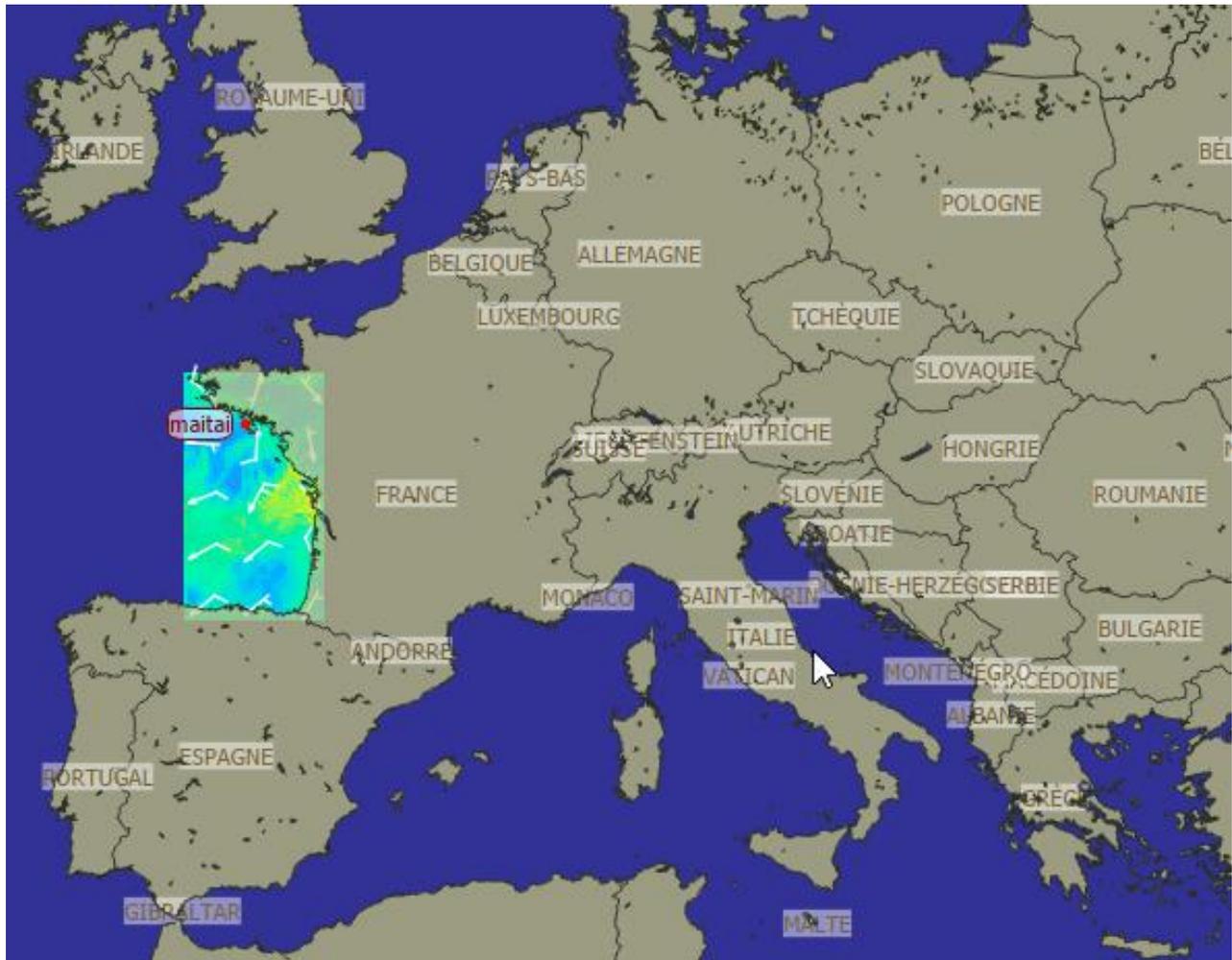
On iOS, several methods are available to transfer maps:

1. You can transfer them in a zip file or individual maps via Airdrop if you have a Mac.
2. You can transfer them via iTunes share folder. Just copy the zip or the maps inside the folder and launch qtVlm, or if it is already launched just run qtVlm->import from iTunes folder.
3. You can send the maps or the zip file with an email and open the attachments with qtVlm
4. You can also export data from a qtVlm PC installation and import it on iOS, by placing the zip containing all exported data in iTunes share folder.

Offline Maps

GSHHS Maps

Gshhs maps consists in coasts lines at different qualities and scales. qtVlm cannot run without them.

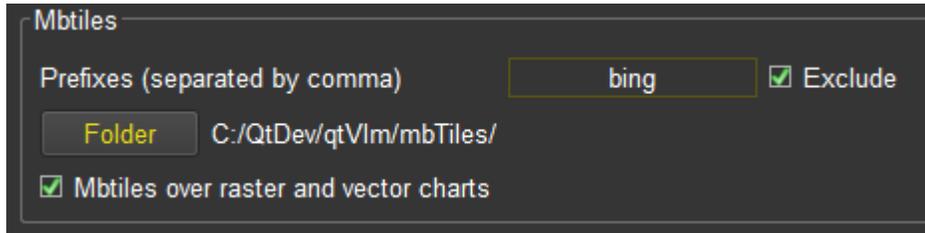


Several parameters are available in the settings, like showing country names, towns, borders and rivers. Land and sea color, coast lines width are configurable too. The location of the maps can be changed, for instance on Android to move them on an external memory card.

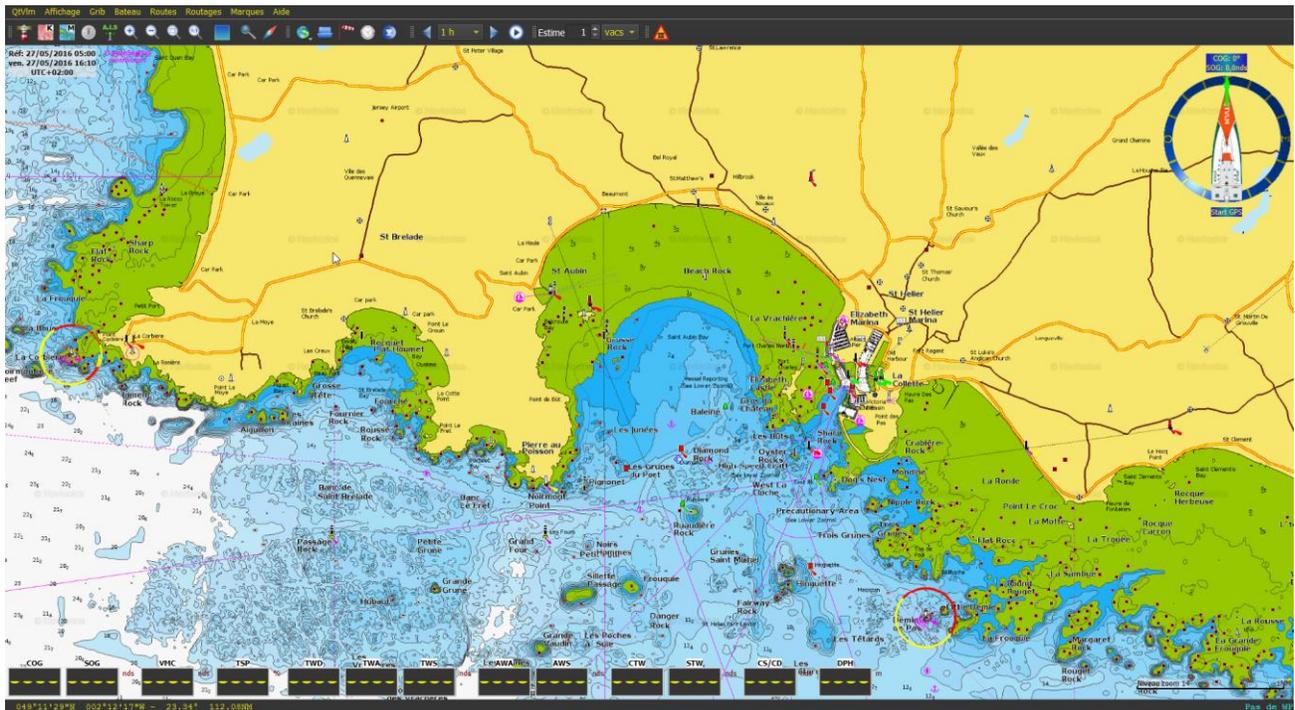
Mbtiles maps

These maps are files with a ".mbtiles" extension that must be copied in qtVlm (configurable) mbtiles folder. They contain tiles, that can be displayed offline without any internet connection.

Mbtiles can also be generated with tools like SASPlanet, Maperitive, Mapbox, etc.



It is possible to indicate one or several prefixes, in that case only mbtiles starting with these prefixes will be displayed. For instance, qtVlm will use only mbtiles with name starting with "ge", or, if "Exclude" is checked, qtVlm will ignore all mbtiles starting with "ge".



It is also possible to **manage and preview installed mbtiles**, via the menu "View->mbtiles catalog".

Online Maps

Online maps need an internet connection for the tiles to be downloaded. A cache system avoids to download tiles each time they are displayed. Several kinds of this maps can be displayed.

The location of the cache together with its maximum size can be configured.

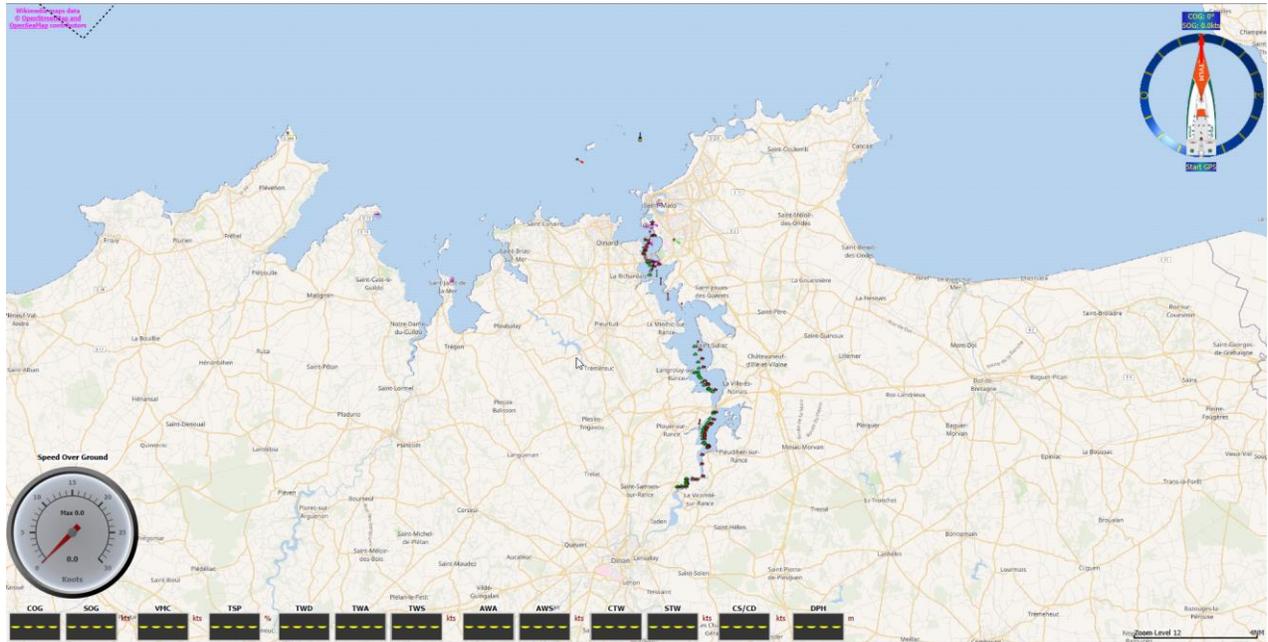
VLM tiles

VLM tiles are based on the same maps as gshhs, but are coming as tiles from VLM server. Rendering is a bit faster than local gshhs, and they also have some coloration for relief.



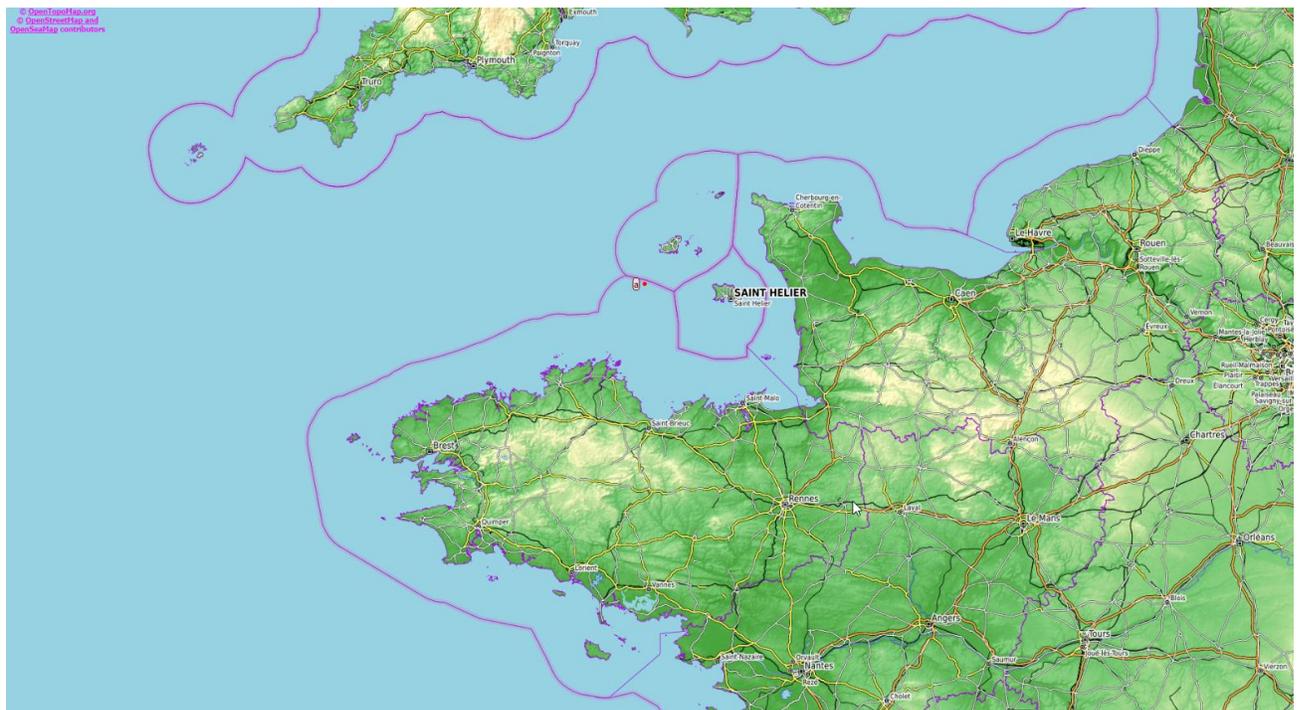
Wikimedia tiles (OSM)

This tiles need to have the gribbs displayed on top of them, with a configurable transparency.



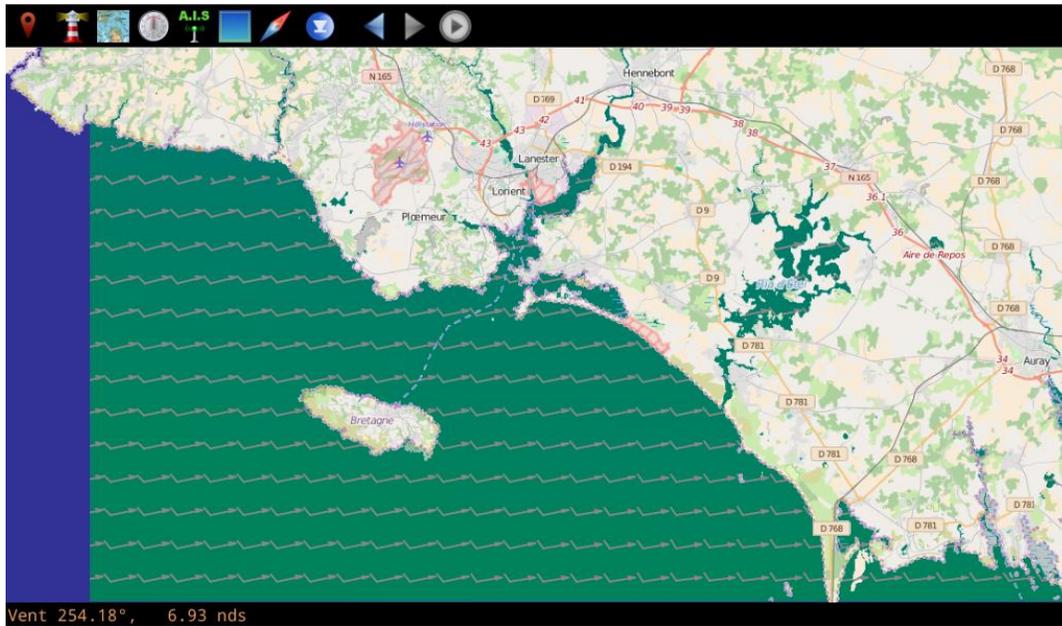
OpenTopoMap tiles

This tiles need to have the gribbs displayed on top of them, with a configurable transparency.



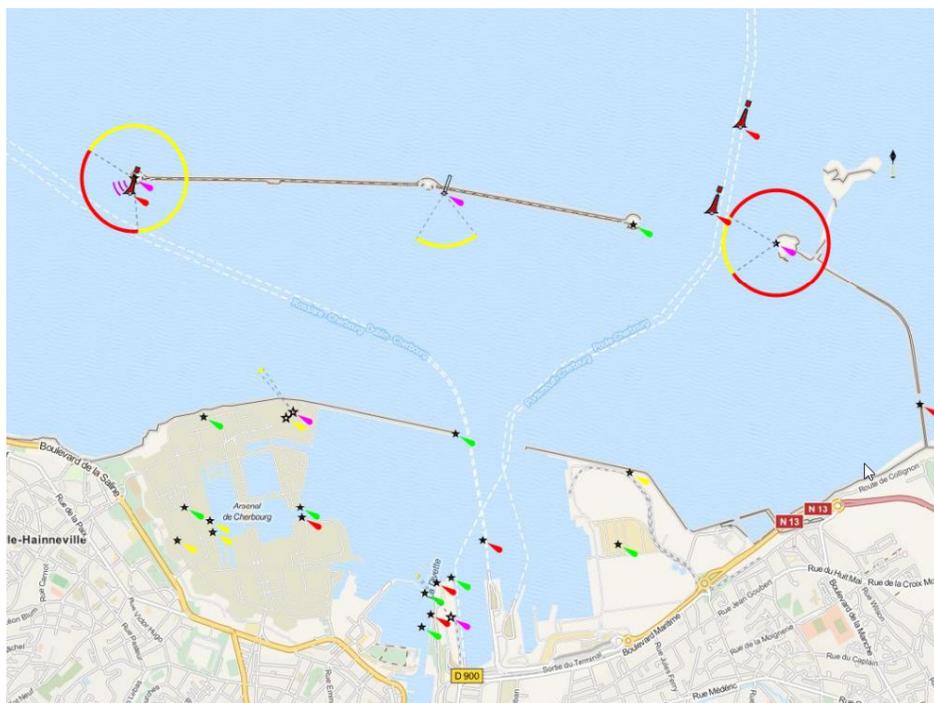
OpenStreetMap tiles

These tiles are available only on mobiles versions (Android and iOS). The sea is transparent and therefore the grib can be displayed “under” them.



OpenSeaMap tiles

These tiles can be displayed over any other types of maps. They contain only sea objects like buoys, lighthouses, etc.

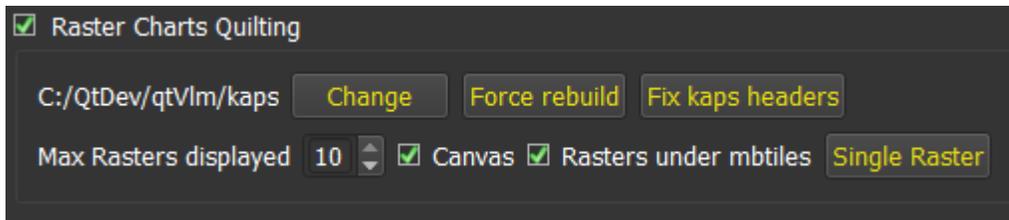


Raster and Vector Maps

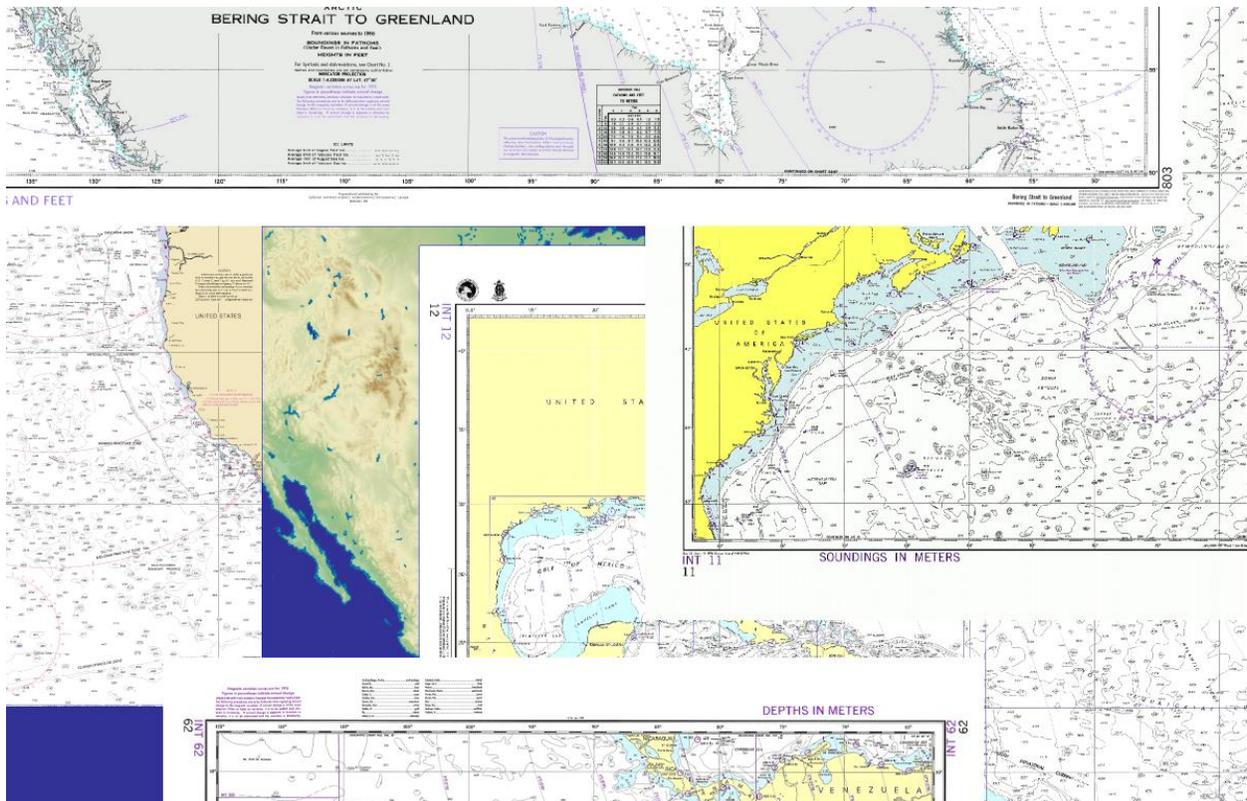
Rasters are offline maps, which need to be installed (i.e. copied) in qtVIm kaps or mbtiles folders. If both maps are displayed, an option is available to decide which map is displayed over the other, in case both are available for the same area.

Rasters maps

These maps are georeferenced images, such as **kap**, **geotiff**, **geojpeg**, etc, and must be placed in qtVIm kaps folder (location can be configured in the parameters). A single raster can be displayed (menu "View->Single raster map"), or qtVIm will automatically choose which raster's to displayed, according to zoom level and resolution. The number of raster's to be displayed simultaneously in quilting mode is configurable (a too big number can slow down the application). On iOS these kind of maps can be imported through iTunes, Airdrop, etc.



There is also a command to automatically fix headers, in some cases these is useful to fix wrong metadata.

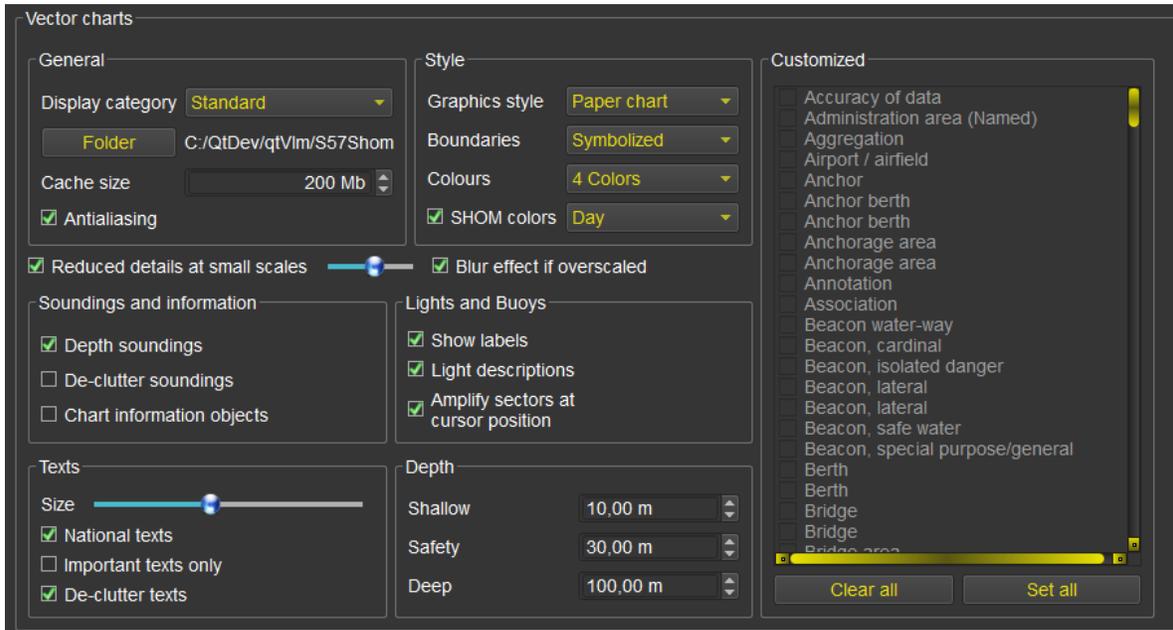


Vector maps

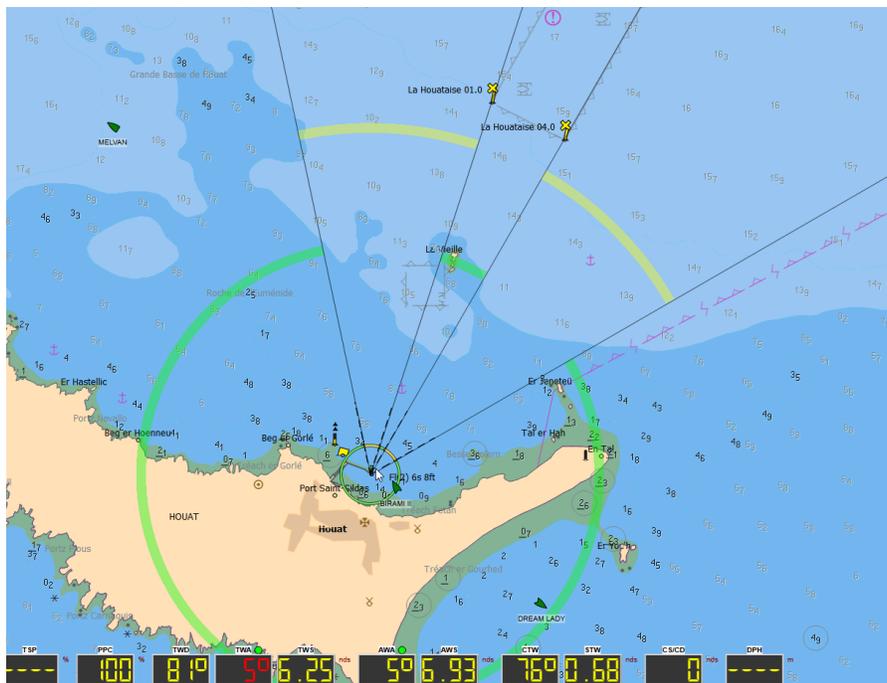
These charts are available for free for some countries like United States, or are sold by various official sites like SHOM for France.

Like Rasters maps, they must be placed in the relevant, configurable qtVlm folder.

Many display options are available:



Lights sectors can be amplified, by hovering on them:



S57 objects can also be queried, through the map contextual menu:

Light (LIGHTS)
 47°23'34"N 2°57'20"W
 (Sector angles are True Bearings from Seaward)

- FL (2) 6s 8 m 6 Nm (198° - 210°)
- FL (2) 6s 8 m 6 Nm (240° - 168°)
- FL (2) 6s 8 m 9 Nm (210° - 240°)
- FL (2) 6s 8 m 9 Nm (168° - 198°)

Beacon, lateral
 47°23'34"N 2°57'20"W

Beacon shape	beacon tower
Category of lateral mark	starboard-hand lateral mark
Colour	green, white
Colour pattern	horizontal stripes
Conspicuous - Visual	not visual conspicuous
Height	11 m
Marks navigational - System of	no system
QUALTY	2
Scale minimum	29999

Depth contour

Scale minimum	44999
Value of depth contour	0 m

Quality of data

Category of zone of confidence data	zone of confidence A2
Information	This area is based from source data diagram on the equivalent paper chart. So, these boundaries should be considered approximate and simplified and the CATZOC value should represent the lowest categorisation assigned to any survey in this area.
Information in national	Cette zone est basée sur le diagramme

NMEA Connections

Configuration

The screenshot shows the 'NMEA connections' configuration window. At the top, there are tabs for 'Display', 'Boat and Instruments', 'NMEA connections', 'AIS', 'Maps', 'Colours', 'Routes', 'Grib', 'Internet', and 'Advanced'. The 'NMEA connections' tab is active.

Local sources

- Use a file: C:/QtDev/qtVlm/sample1.txt
- Serial port 1: COM5 HHD Software Virtual Serial Port, 9600, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Serial port 2: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Serial port 3: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control
- Internal GPS All sources Materialize position accuracy on map

Network sources

Protocol	Port	IP Address	Port
TCP	<input type="checkbox"/> Server 1		6493
	<input type="checkbox"/> Server 2		0
	<input type="checkbox"/> Server 3	127.0.0.1	5010
UDP	<input checked="" type="checkbox"/> Port 1	Any	1100
	<input type="checkbox"/> Port 2	224.10.10.10	10110
	<input type="checkbox"/> Port 3	0.0.0.0	10112
GPSD	<input type="checkbox"/> Server 1		2947
	<input type="checkbox"/> Server 2		0
	<input type="checkbox"/> Server 3	127.0.0.1	2947

Output Channel

- Output Channel
- Serial port: COM1 HHD Software Virtual Serial Port, 4800, No Parity, 8 Bits, 1 Stop Bit, No Flow Control, Retransmit all
- UDP 1: 192.168.0.255, 1100, Retransmit all
- UDP 2: Retransmit all
- TCP: 127.0.0.1, 10110, Retransmit all

Treat RMB messages (WP) Display raw NMEA data

This configuration screen is available via menu "qtVlm->Configuration" and allows to configure NMEA connections. Using several connections simultaneously is allowed.

Serial connections are not available on Android and iOS. Depending on operating system, internal GPS connections might also be impossible.

"Internal GPS only" means that qtVlm should not use internet-based localization systems, but only real GPS fix.

Please note that a GPS-USB on Windows must be configured through a serial port after installation of the relevant GPS-USB driver. On Windows 10 and MacOS, it might be possible to connect to a GPS-USB directly using internal connection.

The position accuracy can be materialized on the map (as a circle), for internal connections only for the time being.

You can specify a server IP address for UDP incoming connections. This address is used only in case of Multicasting, and therefore the default value (0.0.0.0, meaning any IPV4) should be used in most cases. You can also indicate "Any", which stands for any IP addresses (IPV4 and IPV6).

The output channel is used to send current WP information to a navigation system. It can also be used to send performance data to NKE instruments. There is also an option for retransmitting all NMEA data on a port. Since version 5.5.3 a second UDP port is available for output.

Note that if “retransmit all is checked”, qtVlm will resend all NMEA messages on these port, without any filtering. If this option is used for instance on a mobile phone using internal GPS, qtVlm will generate the equivalent NMEA sentences, and therefore this option permits to use the internal Android or iOS GPS on a PC.

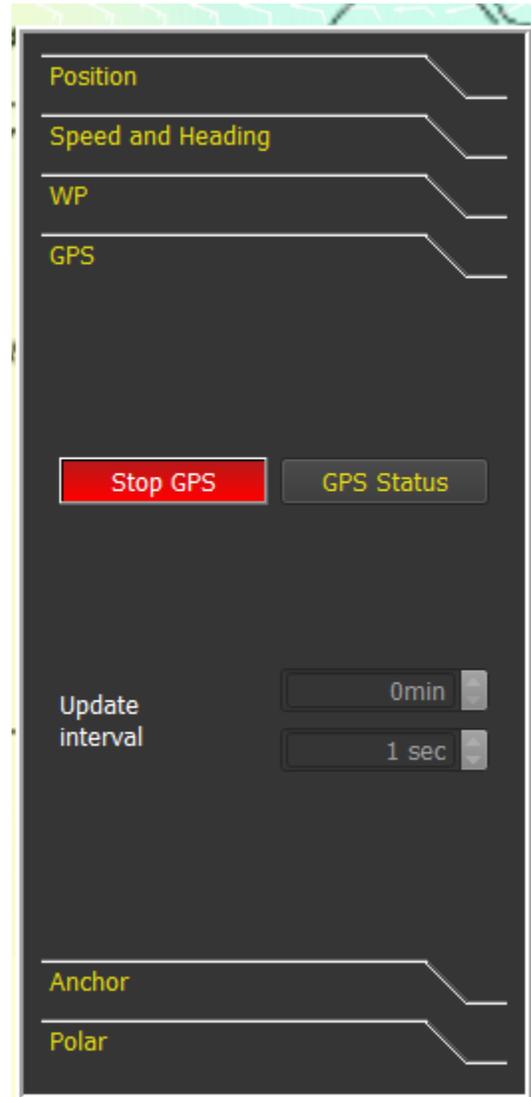
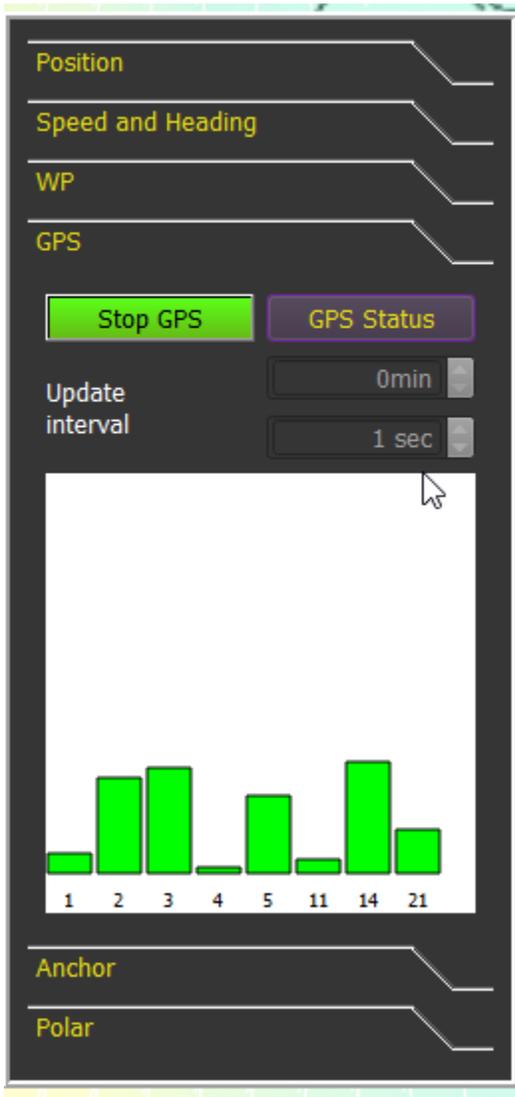
Activation

NMEA connections are activated either with the microboard or with the main board.



The frequency at which qtVlm will update data coming from NMEA connections is configurable in the main board. Especially on Android and iOS, a too small value can have a huge impact on battery consumption.

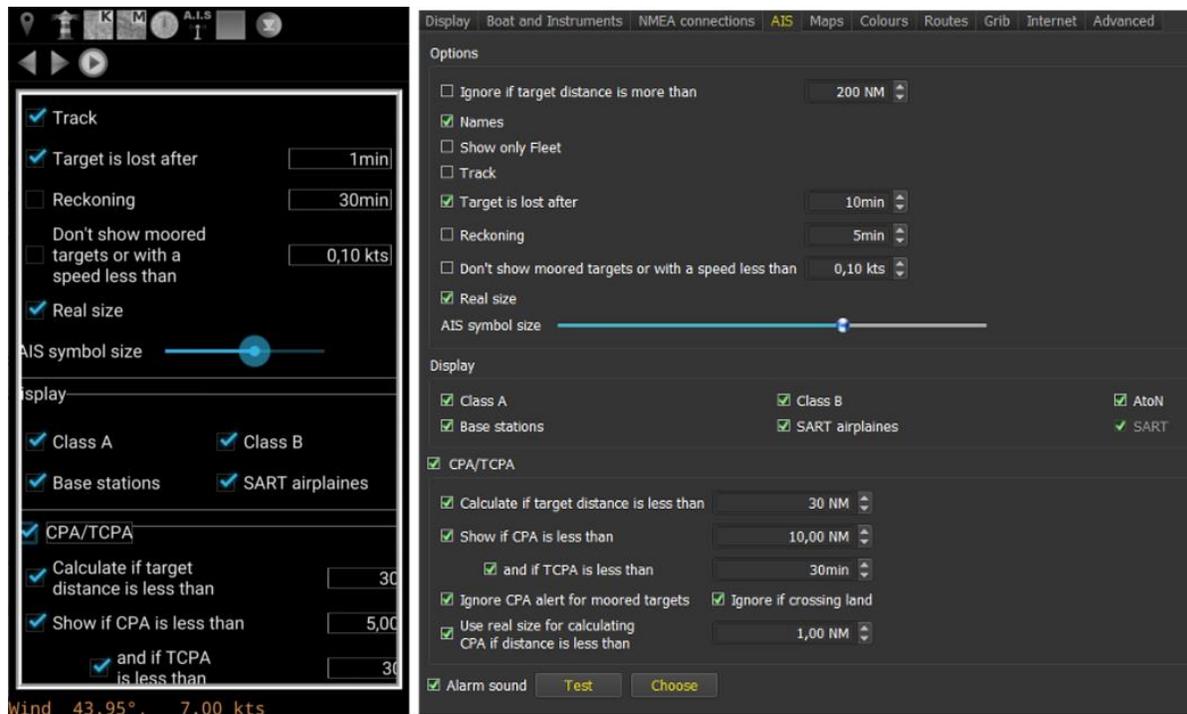
When a position has been found (fix), buttons turn green. If no position has been found yet, buttons are colored in red.



AIS Module

Configuration

Many options are available to tune AIS module.



The first option filters out targets based on their distance to boat. This is especially useful when receiving targets from internet (for instance from GPSD sinagot.net port 2947 or 2948) where the number of targets can increase to 15,000.

It is also possible to filter out targets based on their types, or to display only targets belonging to **fleet**.

Options controlling CPA (Closest Point of Approach) and TCPA (time to CPA) allows to configure alarms (sound and/or visual). Real boat sizes can be used for these calculations. These calculations can be deactivated completely.

The **list of all AIS targets** can be obtained through the “display” menu. From this list, it is possible to display/hide tracks or tracking info, to add remove a target from the fleet, or to center the map on a target.

Usage

Target details

Targets have a tooltip information, which summarize main information concerning it. They also have a contextual menu allowing to display more details. Their color indicates their status (green if all details have been received, yellow otherwise), or if the target is generating a CPA alarm (red in that case). Lost targets, i.e. targets that didn't emit anything during a configurable time, are displayed in grey. They are deleted after 3 times this time.

It is also possible to search and display this target on Marine Traffic (internet connection required).

Other options manage trace's display and reckoning.

GLUECKSBURG DJGD

MMSI 211266780 Class B

Flag: **Germany**

Dimensions: **18m x 6m**

Sailing Boat

047°27'24"N **003°01'54"W**

SOG	COG	HDG
7.10 kts	326°	---°
Distance	Bearing	Turn rate
4.8 nm	51°	---°

CPA	TCPA
4.6 nm	12min 24s

Report age: **18s**

Close

You can also add or remove this target from the fleet. In this case the target will appear a bit darker on the map. You can also decide to display only targets belonging to fleet.

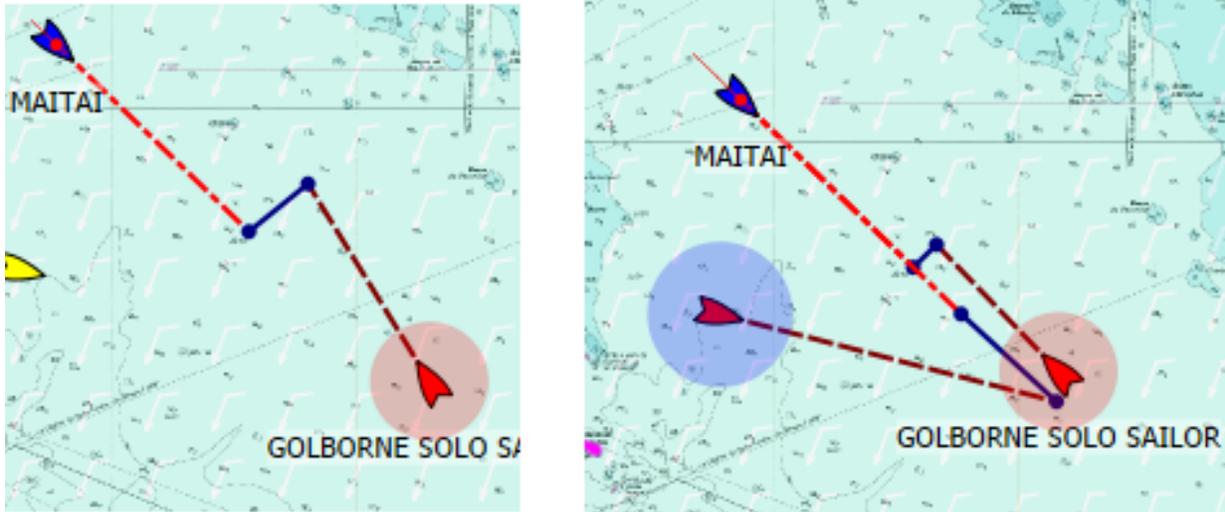
You can also display additional tracking data in the target label:



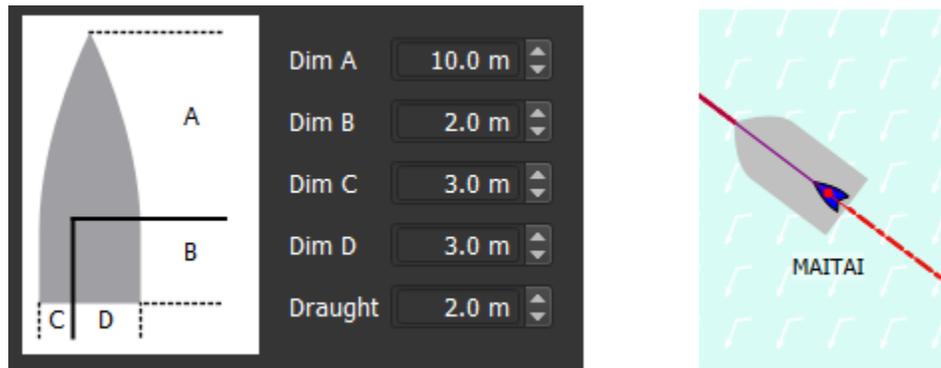
Alarms, CPA, TCPA

Depending on parameters, AIS module will generate sound and visual alarms. A target generating a CPA alert turns red with a flashing dot. A sound (configurable) is also played.

If the sound alarm is deactivated, the visual signal becomes blue. This allows to find which targets are still generating a sound alarm, since they are still red.



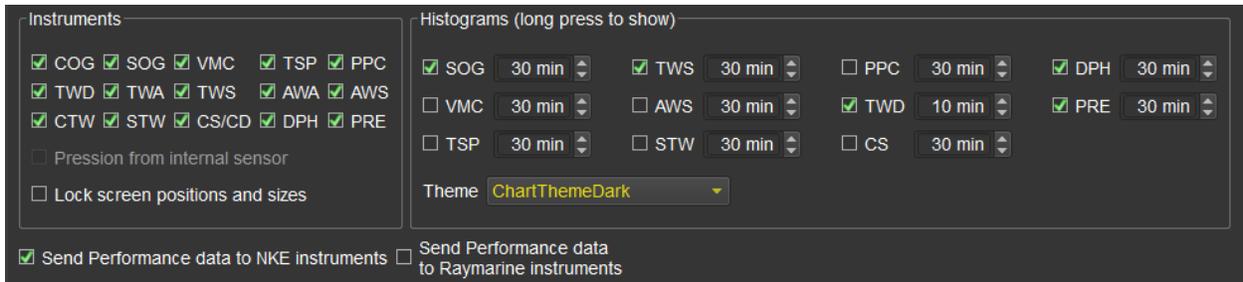
Real boat size can be taken into consideration in CPA calculations, if the distance to the boat is less than a configurable value. Your own boat size has to be defined in your boat settings (menu "Boat->Boat Settings"). Boats are drawn in real size if the zoom level is big enough.



Instruments and Board

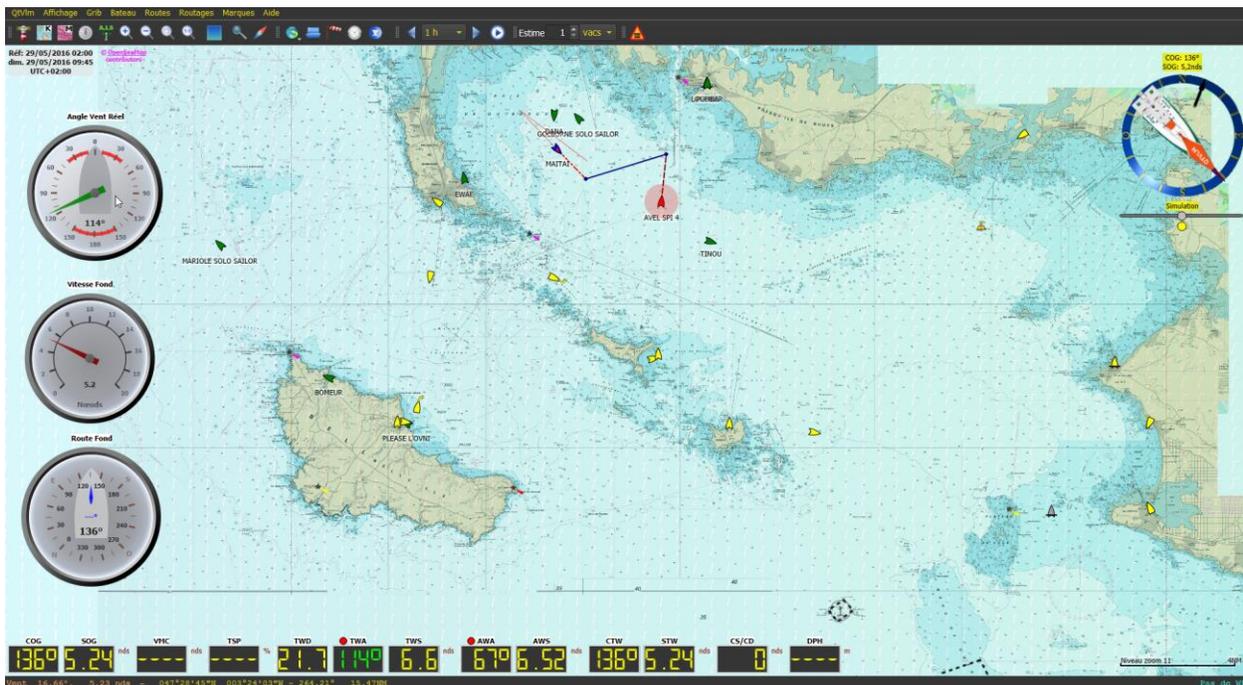
Instruments Configuration

Instruments selection is made through the menu "qtVlm->Configuration", boat and instruments tab.

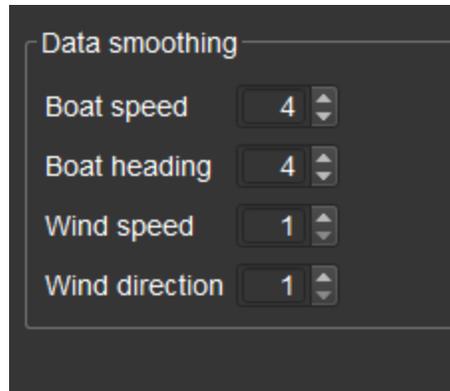


Instruments can also be shown/hidden via the toolbar icon .

Each instrument is made of a **digital display** plus a **dial** and eventually a **histogram**. The dial is displayed/hidden by pressing shortly on the digital display, and the histogram by a long press. Dials and histograms position and size can be adjusted with mouse drag (plus <shift> key for the size). Once dials and histograms are correctly positioned and sized, you can lock them on the screen via the options, to avoid moving them by mistake.



For technical reasons, histograms are not available on Linux 32 bits version.



It is possible to smooth data received for wind speed and direction, and boat speed and direction. The value indicates the number of last received data that should be averaged. As these data are used in all calculations, it allows to carefully tune the sensibility of instruments, for instance Polar Efficiency Percentage (PPC). The default value (1) means not smoothing.

You can also ask qtVIm to send performances sentences on NMEA output port, to be displayed on NKE or Raymarine instruments. These data consist in: theoretical polar speed, opposite track heading with the same TWA, target speeds for CMG and VMG, optimum polar angles for upwind and downwind, and currents direction and speed calculated by qtVIm (based on COG, SOG, CTW, STW).

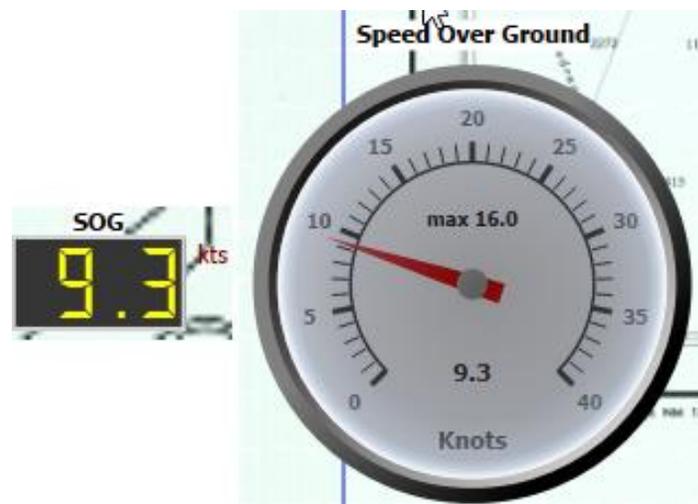
Available Instruments

COG: Course Over ground

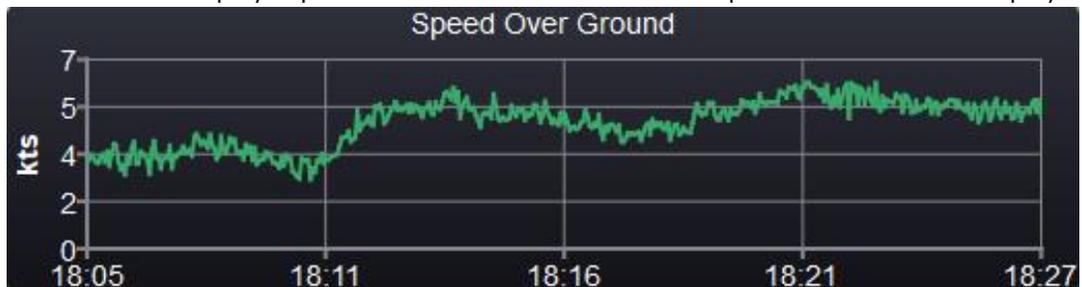


This instrument displays Course Over Ground, plus heading/distance to WP (in blue).

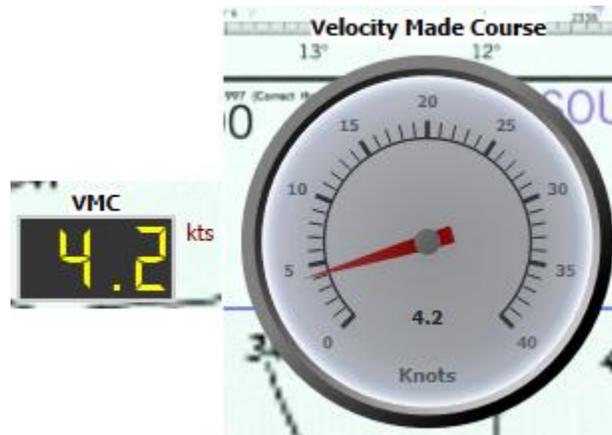
SOG: Speed Over Ground



This instrument displays Speed Over Ground. The maximum speed reached is also displayed.

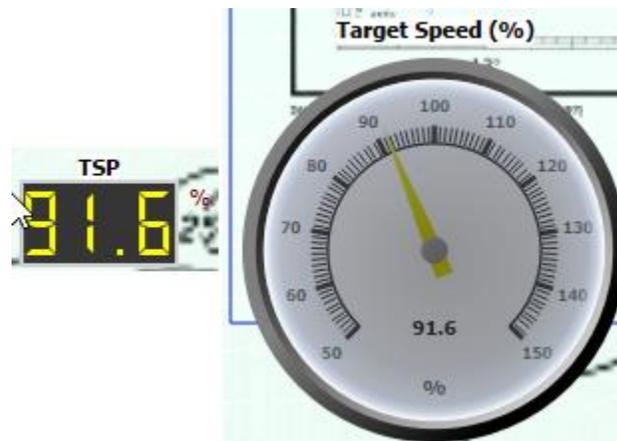


VMC: Velocity Made Course



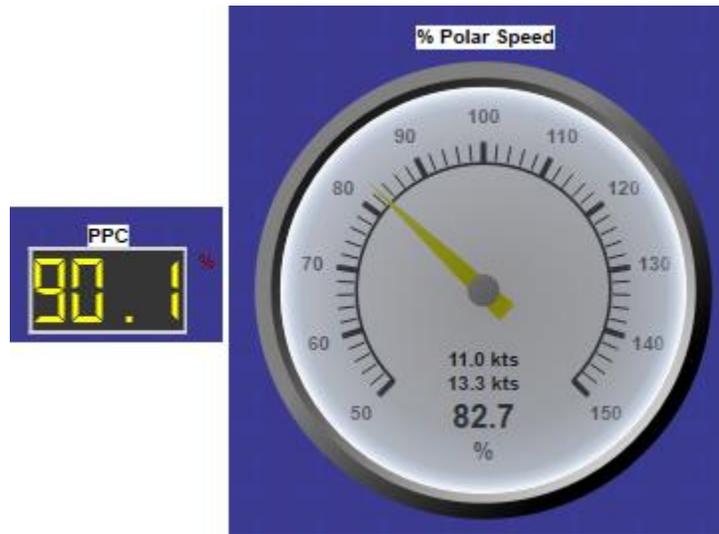
This instrument shows Velocity Made Course, also called VMG toward waypoint.

TSP: Target Speed



This instrument expresses the speed (SOG) in percentage of optimum speed as given by the polar to reach the WP. For instance, for a WP upwind, too much speed means you must luff a bit, while a percentage lower than 100% means you must ease a bit. This information is often more efficient than VMC for the helmsman.

PPC: Polar Percent



This instrument shows the difference between actual speed and theoretical polar speed, as a percentage and as values. It is also possible to send this data through the NMEA output port in order to display it on NKE or Raymarine instruments.

TWD: True Wind Direction

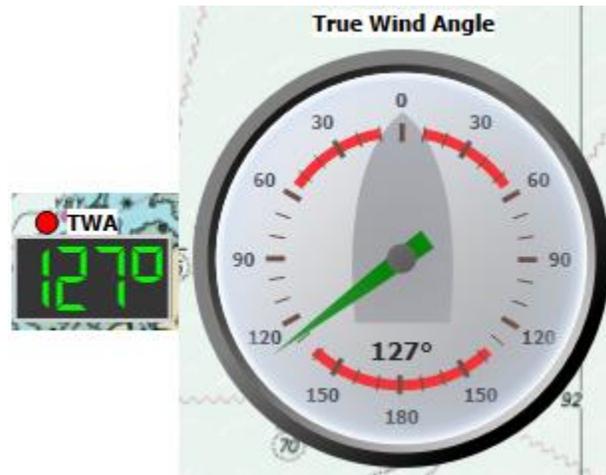


This instrument shows True Wind Direction. If NMEA data do not provide it and if it is possible, qtVIm will calculate it based on COG, SOG and apparent wind data. The arrow's color changes with wind speed, and boat orientation is drawn on background.

Histogram associated with TWD consists in the deviation from the period mean value, which allows you to know if the wind is heading or lifting.

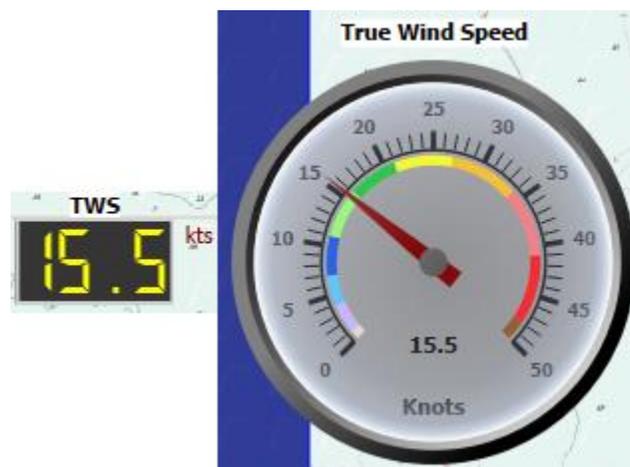


TWA: True Wind Angle



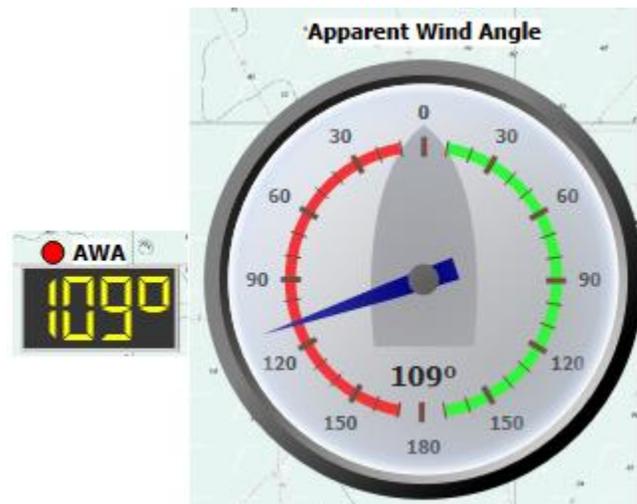
This instrument shows True Wind Angle. If NMEA data do not provide it and if it is possible, qtVIm will calculate it based on COG, SOG and apparent wind data. The value and the arrow is green when TWA is inside the polar VMG limits, red otherwise. The digital display also shows a red or green dot, depending on the tack. The red parts on the dial represent the polar VMG limits, and are recomputed dynamically.

TWS: True Wind Speed



This instrument displays True Wind Speed. If NMEA data do not provide it and if it is possible, qtVIm will calculate it based on COG, SOG and apparent wind data.

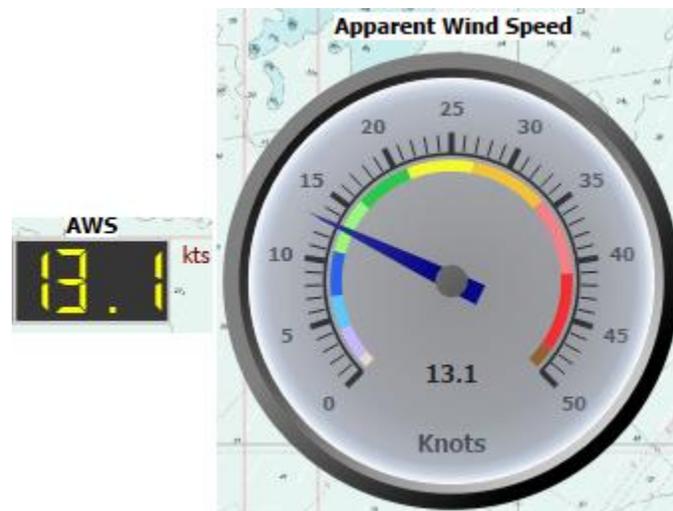
AWA: Apparent Wind Angle



This instrument displays Apparent Wind Angle. If NMEA data do not provide it and if it is possible, qtVIm will calculate it based on COG, SOG and real wind data.

Tack side is represented with a green or red dot over the digital display.

AWS: Apparent Wind Speed



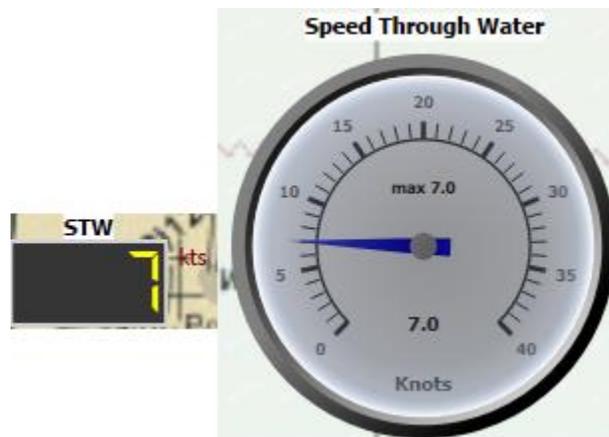
This instrument displays Apparent Wind Speed. If NMEA data do not provide it and if it is possible, qtVIm will calculate it based on COG, SOG and real wind data.

CTW: Course Through Water



This instrument shows Course Through Water. It is different from COG in case of Currents, for instance. It also displays heading/distance toward current waypoint (in blue).

STW: Speed Through Water



This instrument shows Speed Through Water. It is different from SOG in case of Currents, for instance. It also displays the maximum value measured.

CS/CD: Currents Speed and Direction



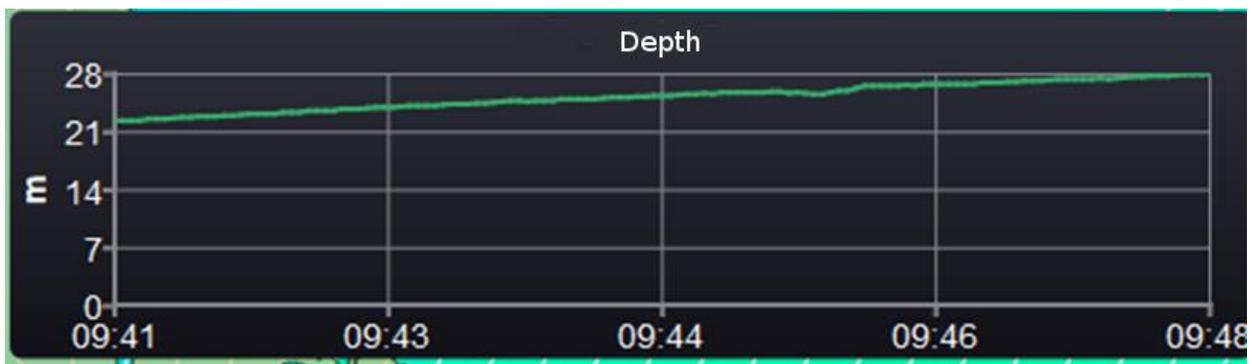
Currents Speed and Direction are either received from NMEA input, or calculated by qtVIm from COG, SOG, CTW and STW. Please note that Currents direction indicates where the Currents goes, contrary to Winds for which direction indicates where wind come from.

The boat orientation is drawn on the background of the dial.

DPH: Depth



This instrument displays depth as received from NMEA data. This instrument has no dial, but historical data can be displayed through its histogram.



PRE: Atmospheric Pressure



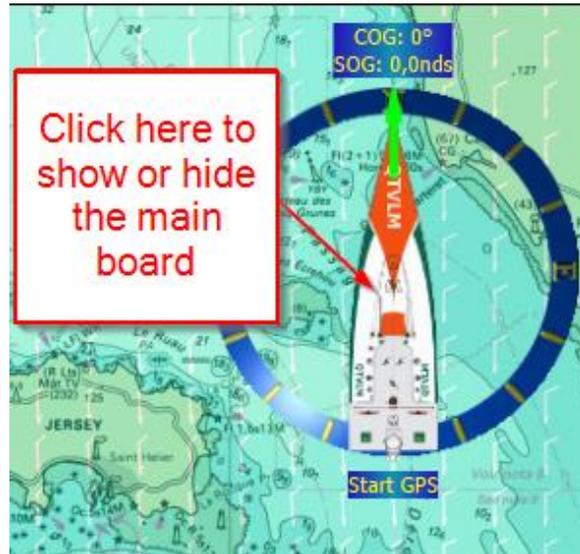
This instrument displays pressure as received from NMEA data or internal sensor. This instrument has no dial, but historical data can be displayed through its histogram.



Boards

Microboard

The main board is shown or hidden by pressing on the boat image in the microboard, or in the main board itself. Since 5.7.2 this instrument is less useful, and therefore can be hidden (from main configuration).

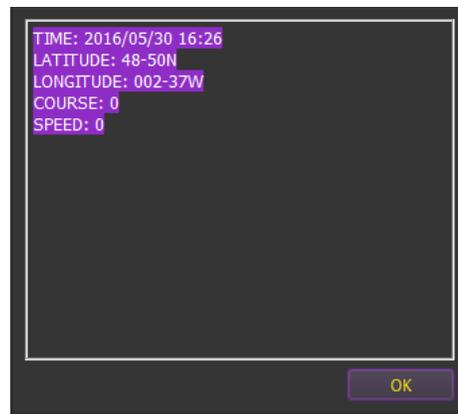


Main Dashboard

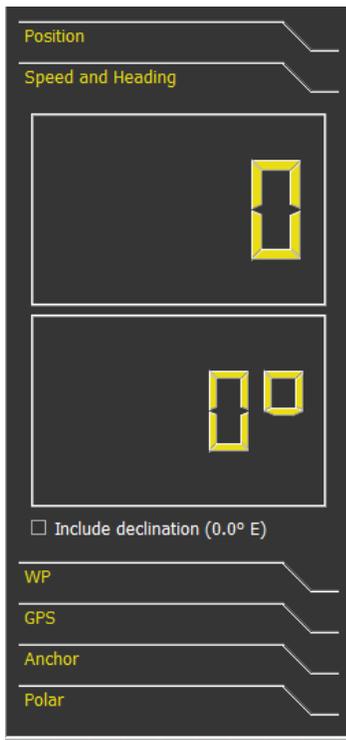
Position tab



This tab shows boat's geographical coordinates. It also allows to move the boat to a precise position by pressing "position" button. You can also reset the boat's trace from here. Button "?" can be used to export coordinates, course and speed in Geodata format. Clicking on the boat image will close the main dashboard.

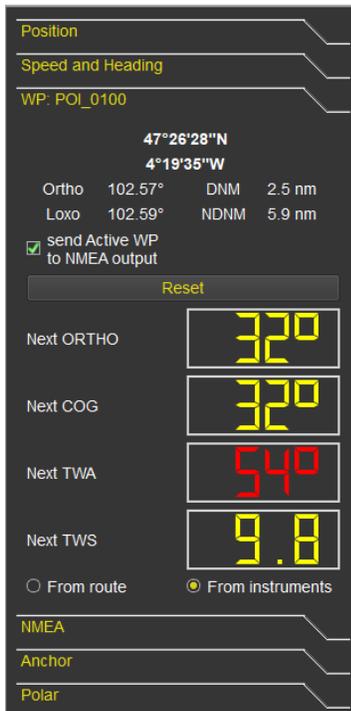


Speed and Heading tab



This tab shows boat's speed and heading.

WP tab



This tab shows active WP information. You can also decide to send these data to NMEA output. DNM (Distance to Next Mark) is displayed, as well as NDNM (Next Distance to Next Mark), i.e. the distance between active WP and next mark, if active WP belongs to an active route or an active pathway.

If active WP belongs to an active route or an active pathway then some other information is displayed, related to next mark rounding. These data can be computed based on active route and grib data, or based on wind data as reported by instruments.

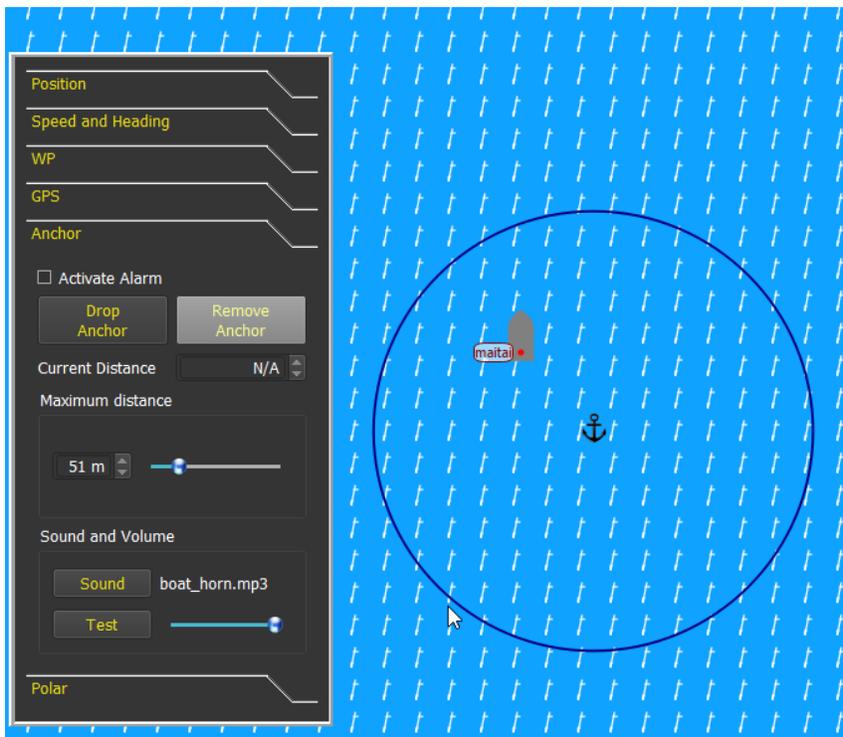
Note that next TWA is red if wind is port side, and green if starboard.

GPS tab



This tab shows and commands GPS activation. See NMEA connections documentation for more info.

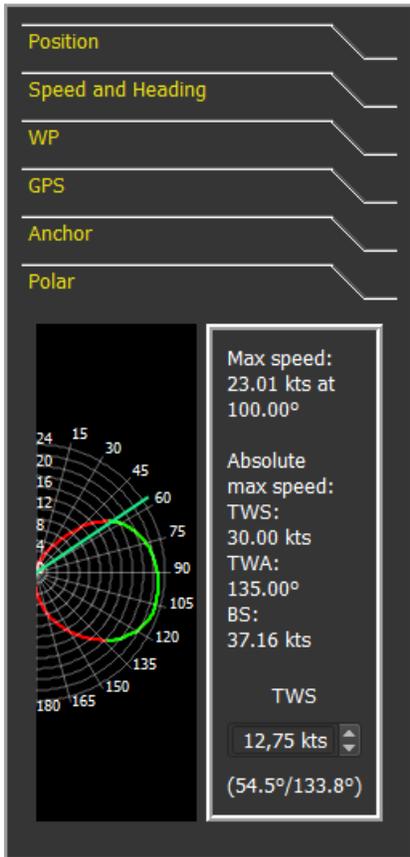
Anchor tab



This manages Anchor Alarm. Anchor is also moveable with mouse.

Alarm will ring whenever the boat's distance to the anchor is larger than the one configured.

Polar tab

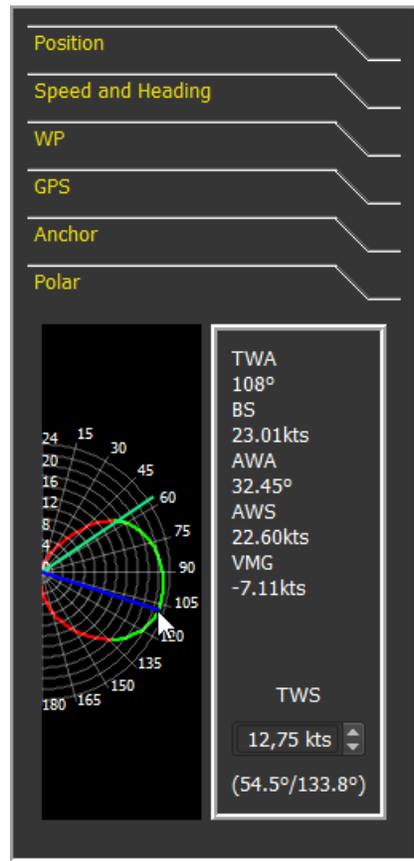


This tab shows boat's polar and display best wind angle upwind and downwind (left image).

You can also click on the drawing to study the polar and show specific values for a given TWA (right image).

If NMEA sources provide TWS, this value will be used when showing the polar in the board.

The polar diagram can also be studied via the menu "*Boat->Polar analysis*".



Weather Routing Module

Introduction

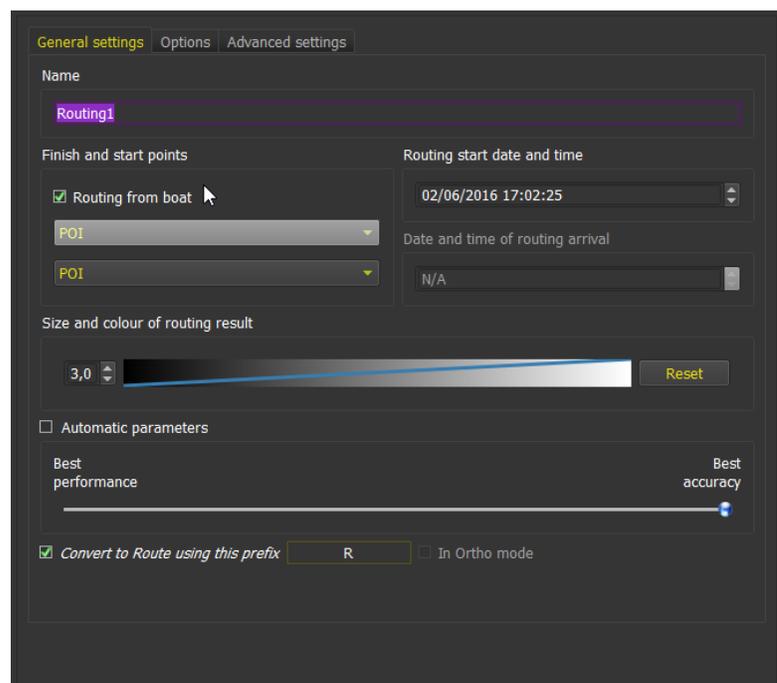
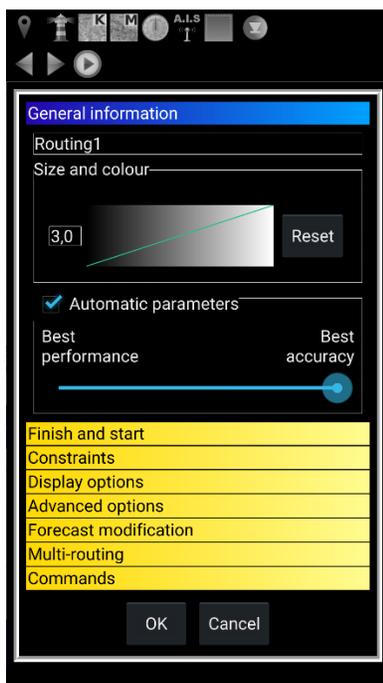
qtVlm uses isochrons method to calculate routings. This method consists in calculating all possible boat positions from a point, using grib data and polar, for a given time (step), and then to re-iterate this calculation until the arrival point is reached.

To generate a routing, qtVlm uses boat's polar (eventually adjusted by a performance coefficient), and grib's data **Winds, Currents, CAPE and Waves**.

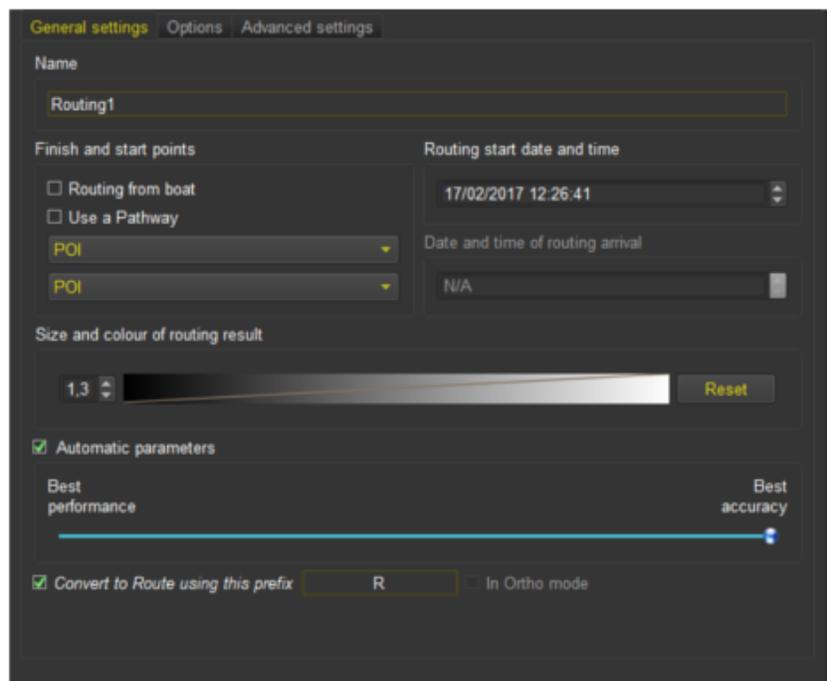
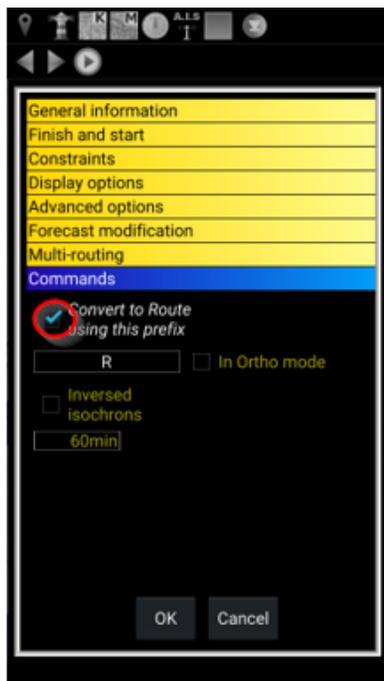
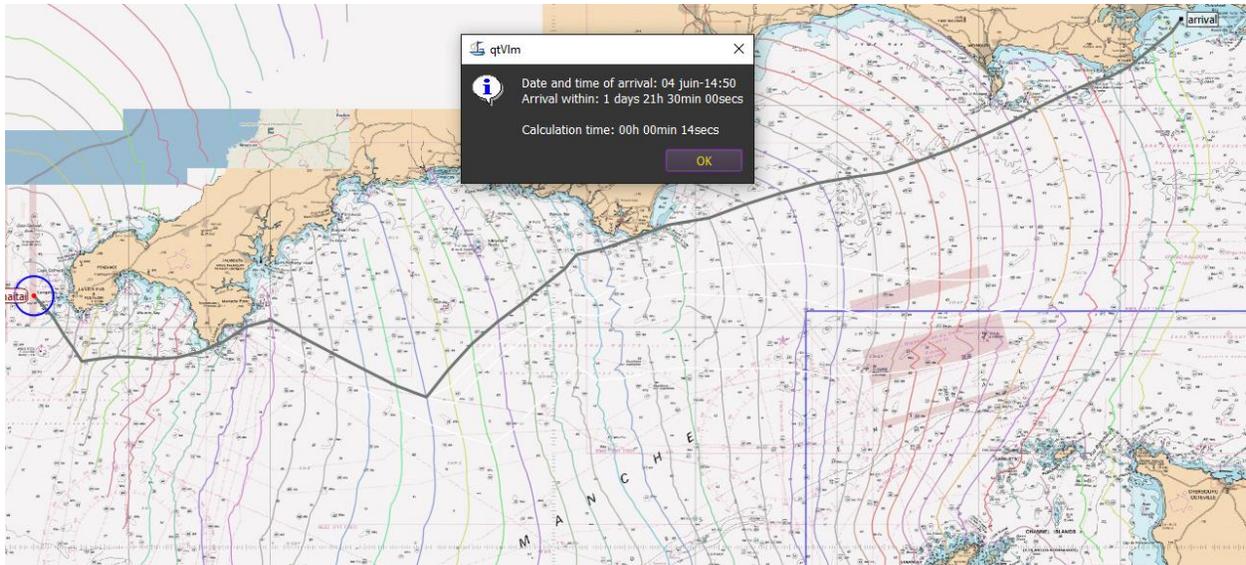
qtVlm has many functions concerning weather routing: pivot point, engine on or off, best starting date calculation (multi-routing), alteration of grib's data (what-if scenario), as well as many parameters to tune calculation precision versus calculation speed, depending of the machine.

Weather Routing creation

Creating a weather routing can be made either via a POI contextual menu, or via a right-click somewhere on the map (for mobiles versions Android and iOS via the pinpoint ), or via the menu "Routings->Create a routing".



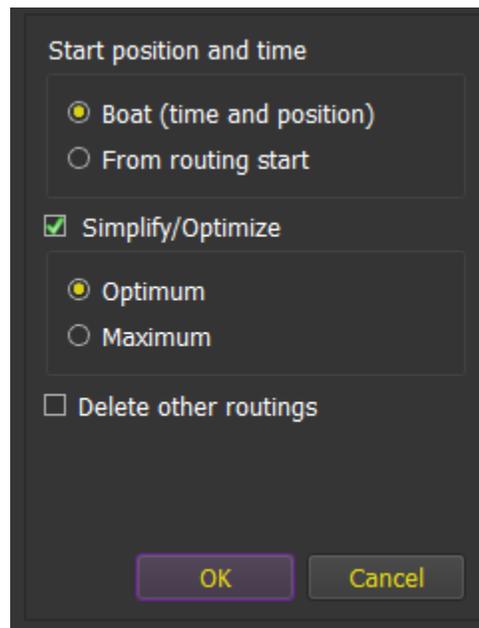
You can in most cases run the routing with default options. Press the OK button, and qtVlm will calculate the best route toward the selected arrival point.



Once the calculation has completed, you can convert this routing in a route, via "Routing->Edit a routing", or via the routing contextual menu.

If this option is checked before the calculation is launched, the conversion in route will take place immediately.

Converting a Weather Routing into a Route



If you change the default starting date of the routing, or didn't start the routing from the boat, you need to select "from routing start".

Conversion process also proposes to automatically simplify/optimize the resulting route. Simplification process will remove all useless points (for instance aligned points). Simplification can be optimum (i.e. it will keep more points), or maximum (which means that the process will try harder to remove points).

At the end of simplification, an optimization phase will be proposed. The process will try to adjust POIs positions between the isochrons, to optimize the final ETA.

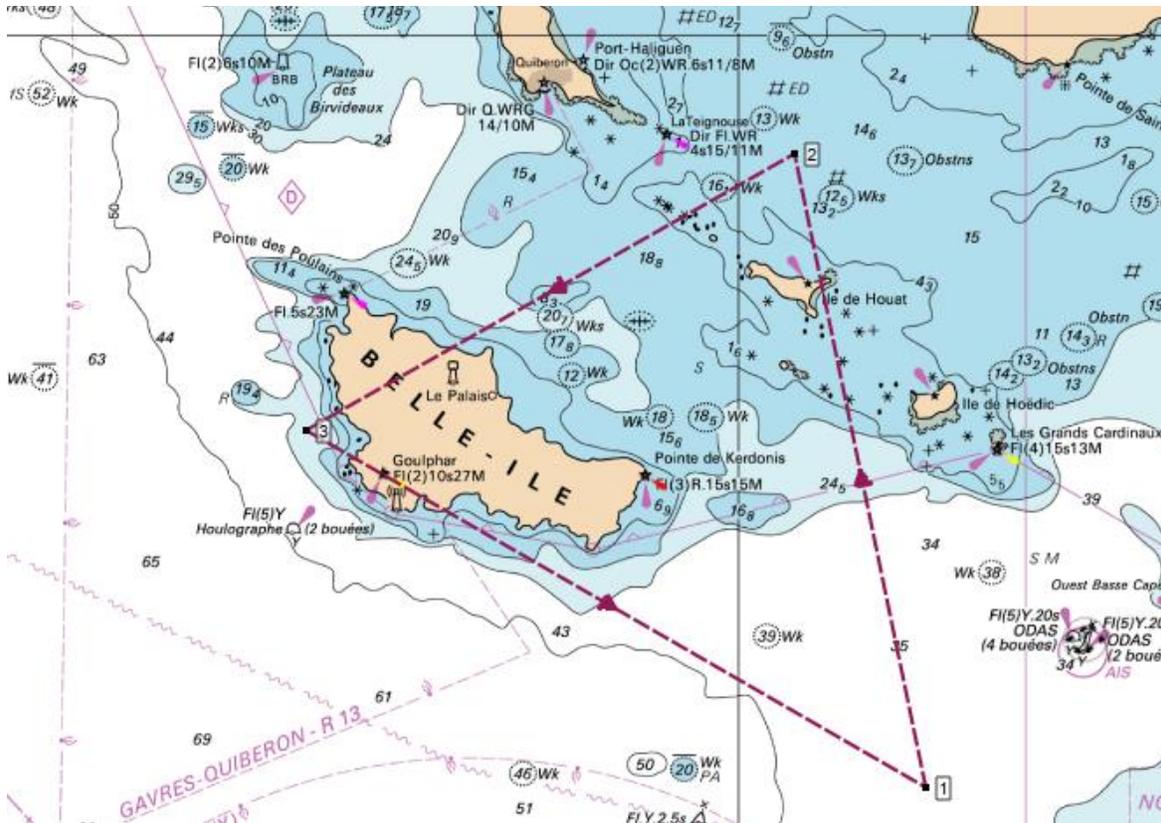
These two phases are by no mean compulsory, but in general it gives better result, by mixing isochrons method with other calculation algorithms.

Conversion to route may produce "red" POIs. These POIs are non simplifiable, because routing module has detected that they are important to avoid coasts or barriers.

See [Routes Module](#) for more details on routes.

Multi-points routing

A multi-points routing will follow a pathway, i.e. will route from one point to another until the end of the pathway. A pathway can optionally be closed.



A POI can belong to several pathways:

Name and type of mark	
<input type="text" value="2"/>	POI
Position	
Latitude	North 47° 26' 56,994" Latitude (dd,dd) 47,449165°
Longitude	West 2° 57' 51,393" Longitude (dd,dd) -2,964276°
<input type="checkbox"/> Route	
Not defined Sequence number in route 0	
<input type="checkbox"/> Not simplifiable Navigation mode VB-VMG Arrival radius 50,00 m	
<input checked="" type="checkbox"/> Pathway	
Pathway	Parcours Not defined Not defined Not defined Not defined Not defined
Sequences	0 0 0 0 0 0
<input checked="" type="checkbox"/> Show layline history shape	

Pathway starting options are carried over to the routing (starting point and dates).

Name

Pathway maitai

Size and colour

1,3 Reset

Pathway start date and time

Last position update time

Fixed date 25/03/2017 11:12:51

Pathway starting point

From boat

From 1st mark

Options

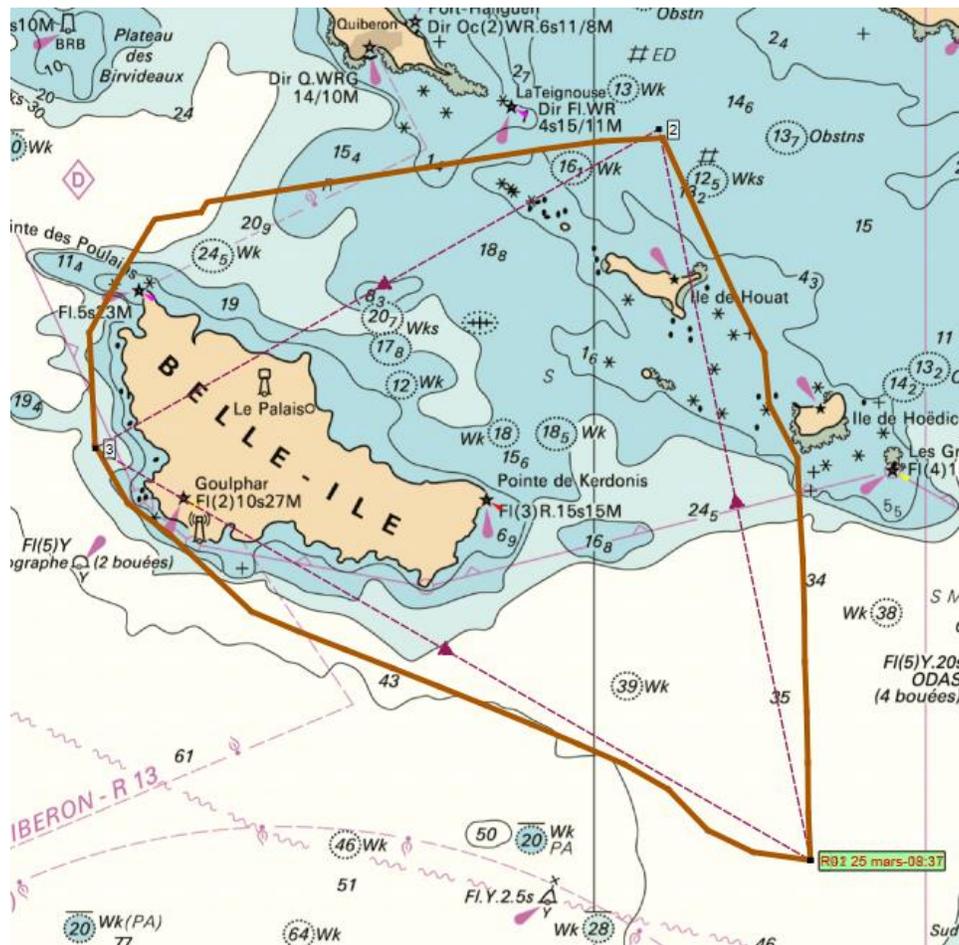
Close pathway

Hide intermediate POIs

Hide pathway and all its POIs

POIs by alphabetical order

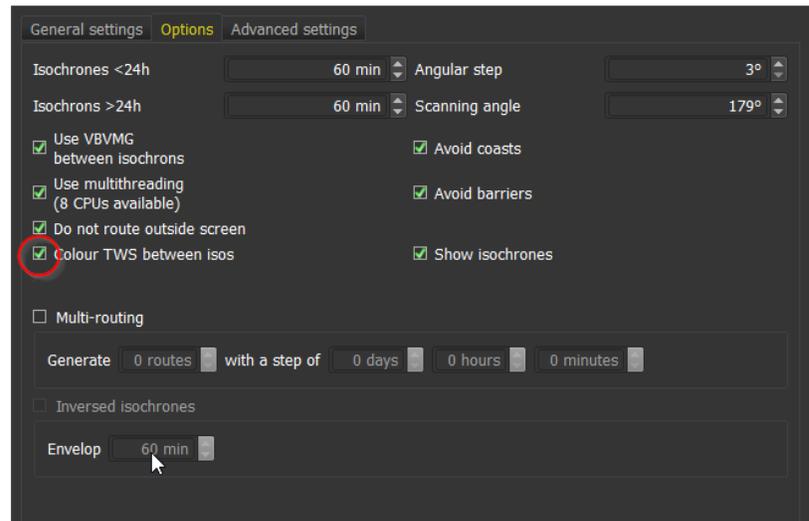
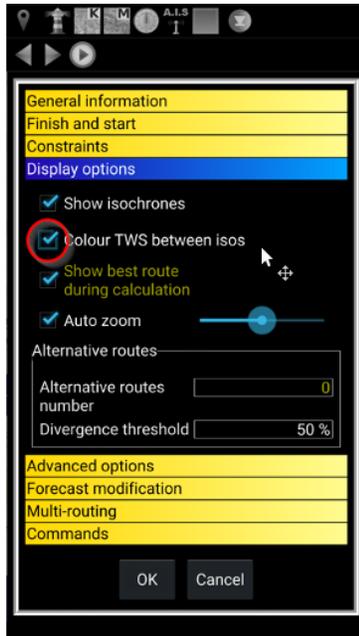
POIs by sequence number



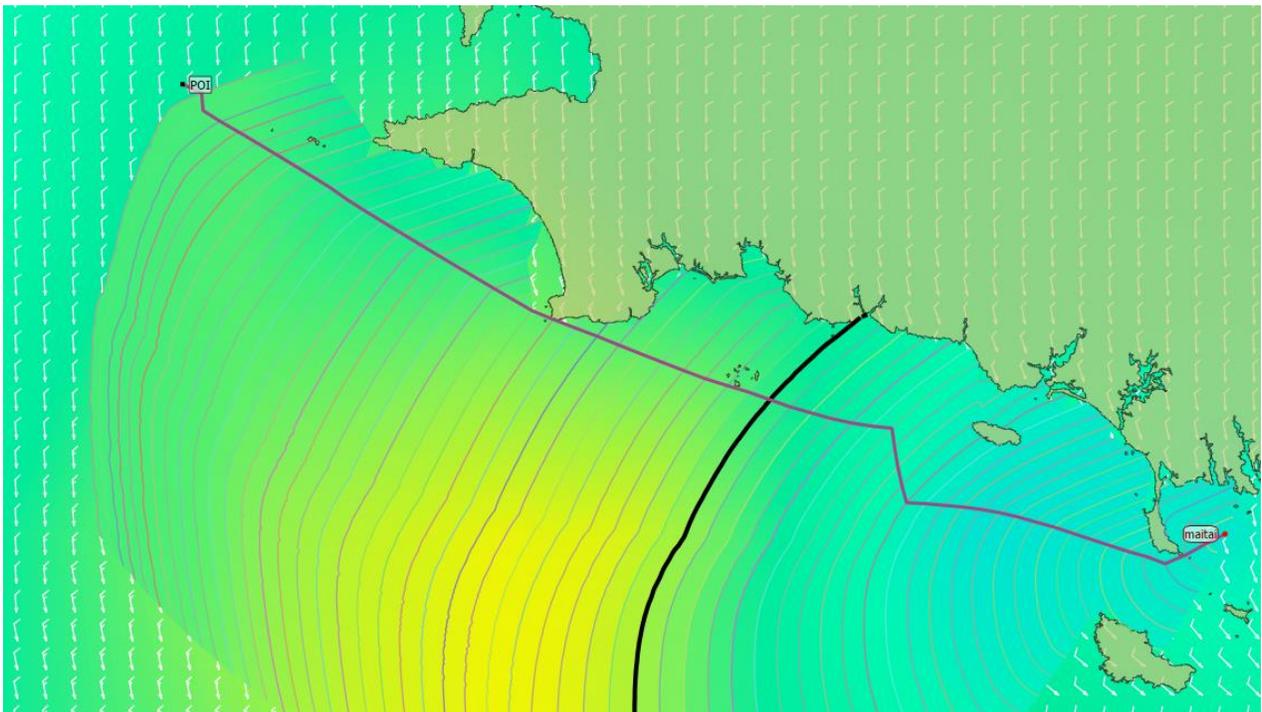
Other Weather Routing Module functions

Before running a routing, or after by editing it, a number of options and actions are available.

Display TWS along and between isochrons

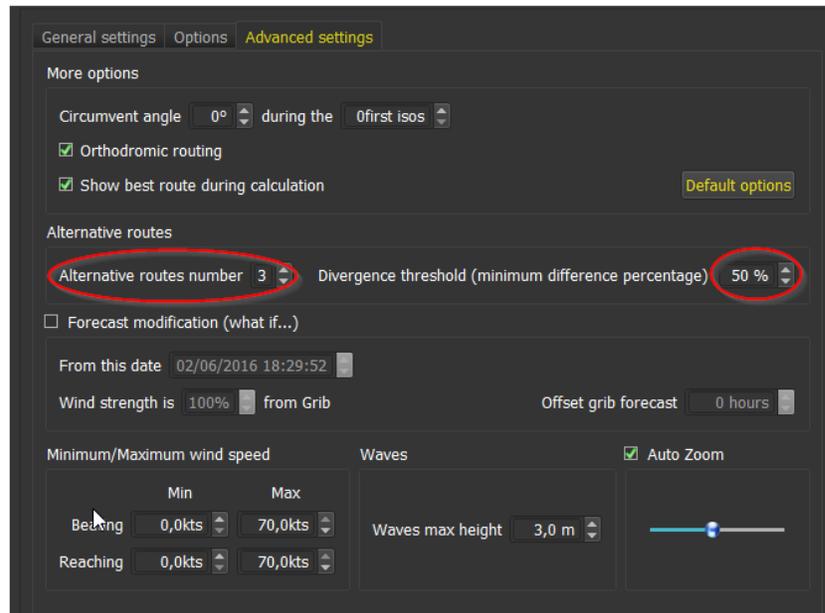
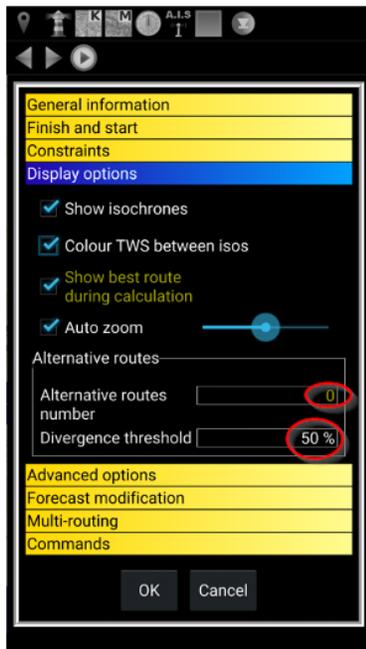


This option allows to display wind speed (TWS) over isochrons. You can also change the grid date and the correspond isochron will be highlighted.



Displaying alternative routes

You can request the routing to find and display alternatives to the main route. This is managed in the routing editor where you can specify a number of alternative routes and with which difference threshold (i.e. they must be completely different at least for the first half if the threshold is set to 50%).



White routes are alternatives to the main green route.

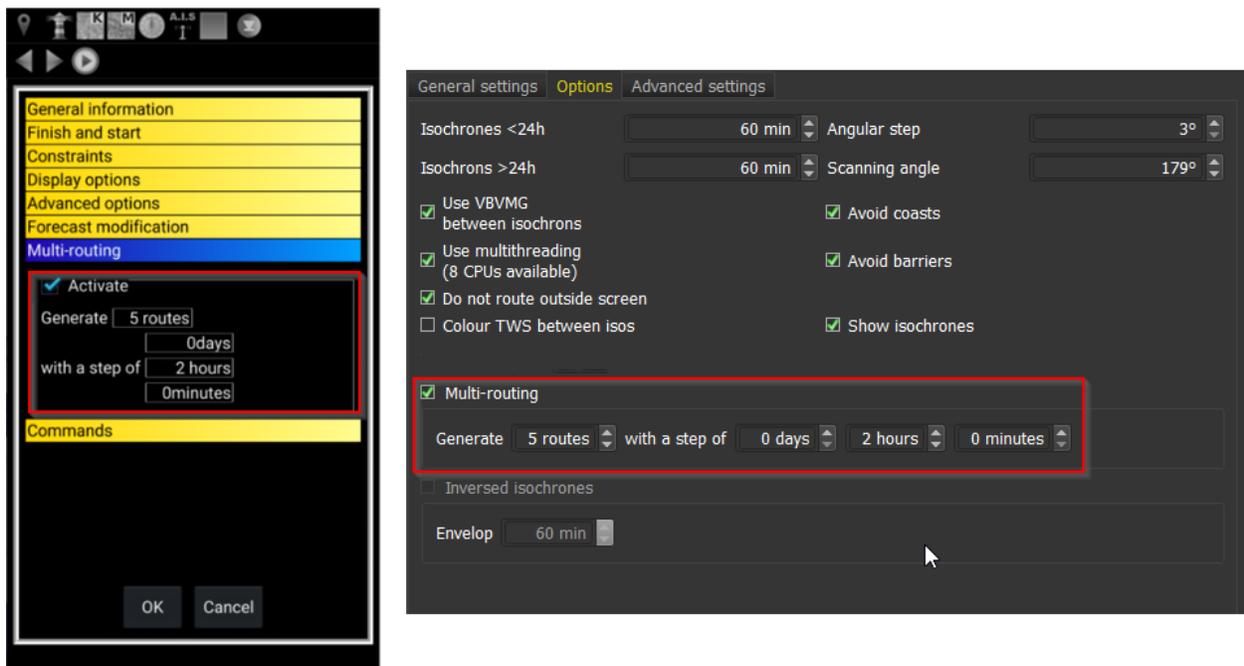


Finding the best starting date: multi-routing

It is common to search for the best starting date and time to reach a destination, based on various criteria like for instance duration, weather conditions during sailing, time with engine, number of tacks and gybes, rain, etc.

The multi-routing function allows to generate several routings at fix time interval, and then to load them in a Route Comparator to compare them based on many criteria.

Since version 5.5.3, it is also possible to request a multi-routing by varying polar efficiency, or applying corrections to wind TWS.



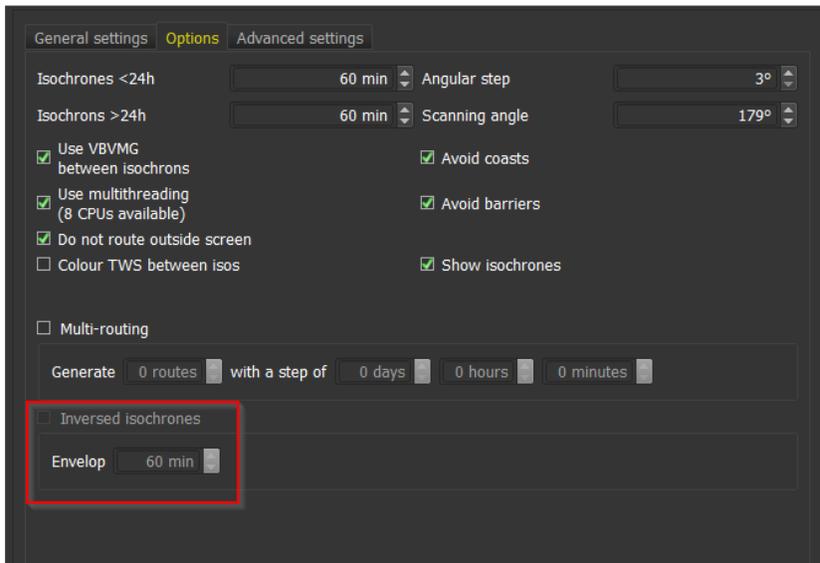
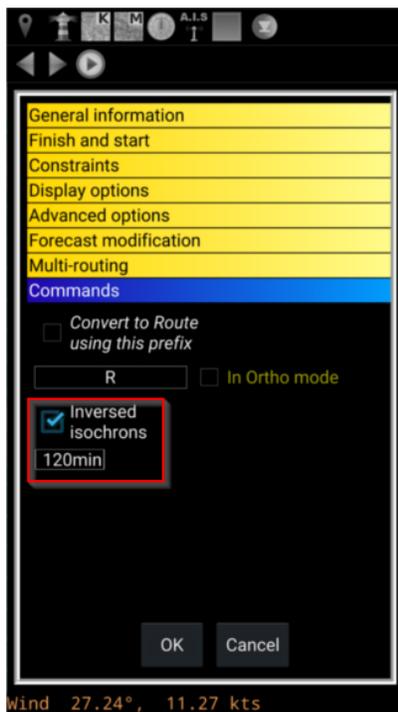
Generated routes are then loaded in the route comparator. Data can be exported in CSV format, to be studied in spreadsheet.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS	Nb Tacks and Gybes	Beating time	Downwind time	Reaching time	Motor time
	Routing2_02 juin-18:53	02/06/2016 18:53	04/06/2016 09:58	1 d 14 h 15 m	147.79 NM	180.53 NM	4.84 kts	6.03 kts	2.71 kts	8.92 kts	13.26 kts	4.15 kts	73	1 d 9 h 15 m	0 d 5 h 0 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2_02 juin-20:53	02/06/2016 20:53	04/06/2016 10:33	1 d 13 h 40 m	147.79 NM	177.04 NM	4.68 kts	6.23 kts	1.73 kts	8.46 kts	14.14 kts	3.06 kts	69	1 d 8 h 10 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2_02 juin-22:53	02/06/2016 22:53	04/06/2016 11:58	1 d 13 h 5 m	147.79 NM	172.02 NM	4.40 kts	5.91 kts	0.86 kts	7.89 kts	14.58 kts	2.12 kts	57	1 d 7 h 35 m	0 d 5 h 25 m	0 d 0 h 5 m	0 d 0 h 0 m
	Routing2_03 juin-00:53	03/06/2016 00:53	04/06/2016 13:13	1 d 12 h 20 m	147.79 NM	170.28 NM	4.43 kts	6.10 kts	0.95 kts	7.43 kts	14.20 kts	2.19 kts	42	1 d 6 h 50 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2_03 juin-02:53	03/06/2016 02:53	04/06/2016 14:58	1 d 12 h 5 m	147.79 NM	171.29 NM	4.59 kts	6.67 kts	2.10 kts	7.02 kts	13.47 kts	2.59 kts	23	1 d 3 h 40 m	0 d 8 h 25 m	0 d 0 h 0 m	0 d 0 h 0 m

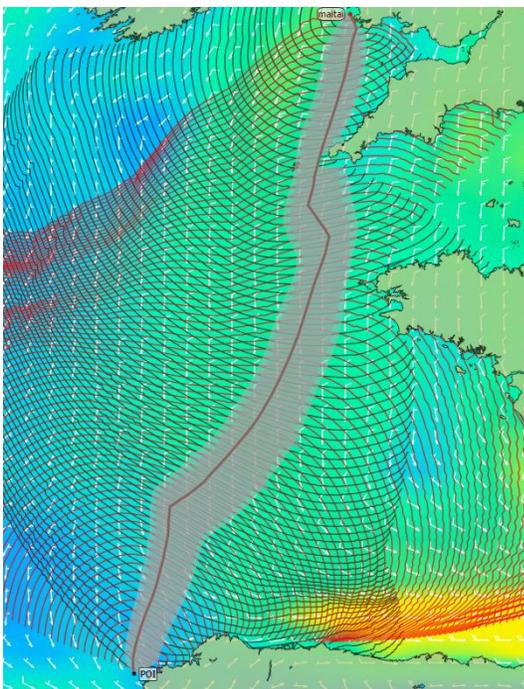
Data provided for comparison are:

ETA, duration, sailed distance, average, maximum and minimum BS, average, maximum and minimum TWS, number of tacks and gybes, beating, upwind and downwind time, engine time, night time, rain, maximum CAPE, and maximum waves height.

Calculating and understanding inversed isochrons



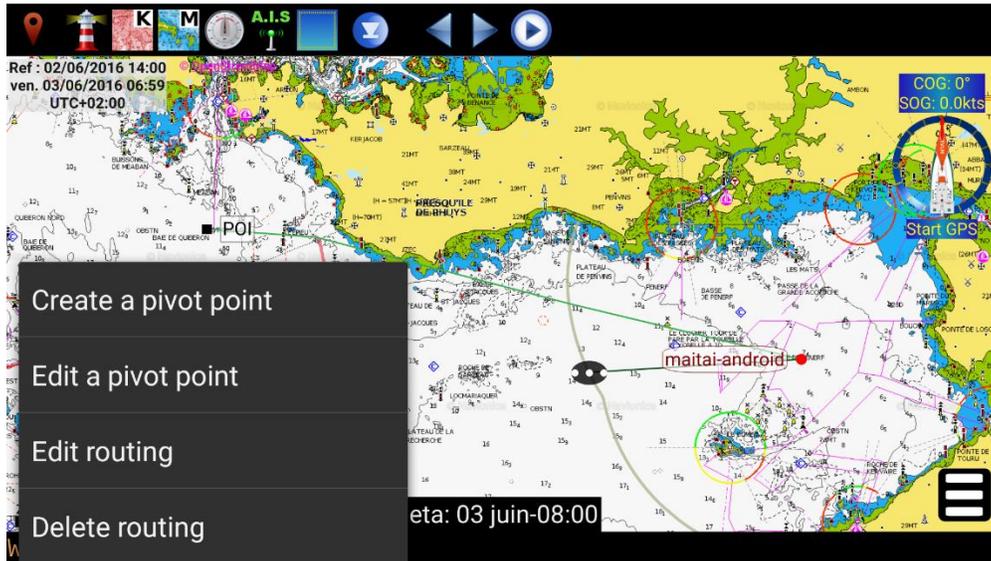
This function calculates inversed isochrons, i.e. it starts from arrival point and date and calculates from where it could have come to be there, and starts again until it reaches starting point. This calculation allows to determine an envelope where regular and inversed isochrons are crossing. This envelop shows where the passage would be equivalent. A thin envelope is a clear sign that there is uncertainty in the routing because the passage found might well disappear on the next grib update.



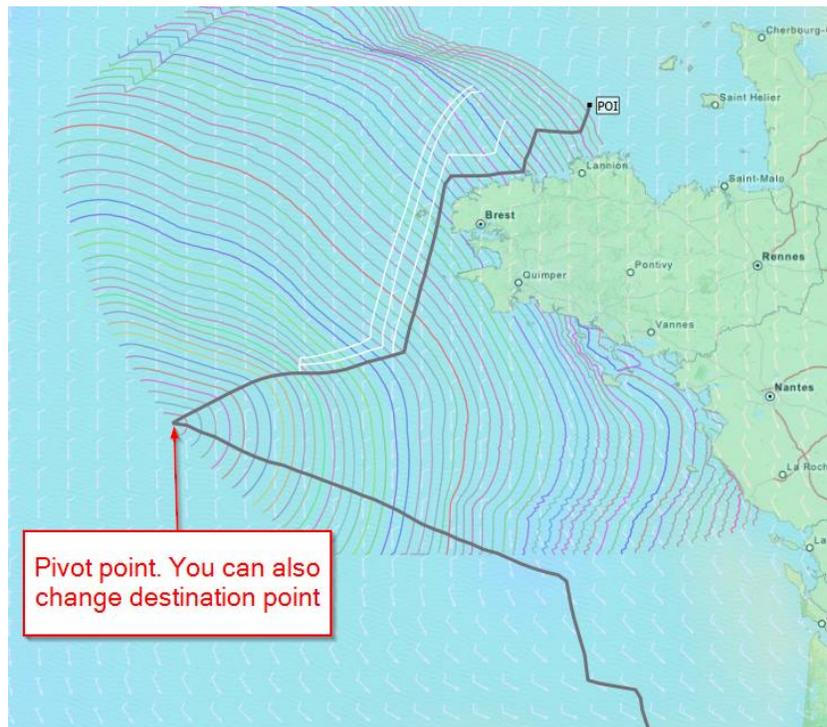
On this image, envelope is regular and large enough. The routing is probably stable and reliable.

Placing and utilizing pivot points

Pivots points are placed on isochrons, at isopoints. Their function is to force the routing to pass by this point, or even to restart from this point and continue routing using another destination. You can chain as many pivots as you want. Pivots points are inserted by pressing on the isochrons and calling their contextual menu.

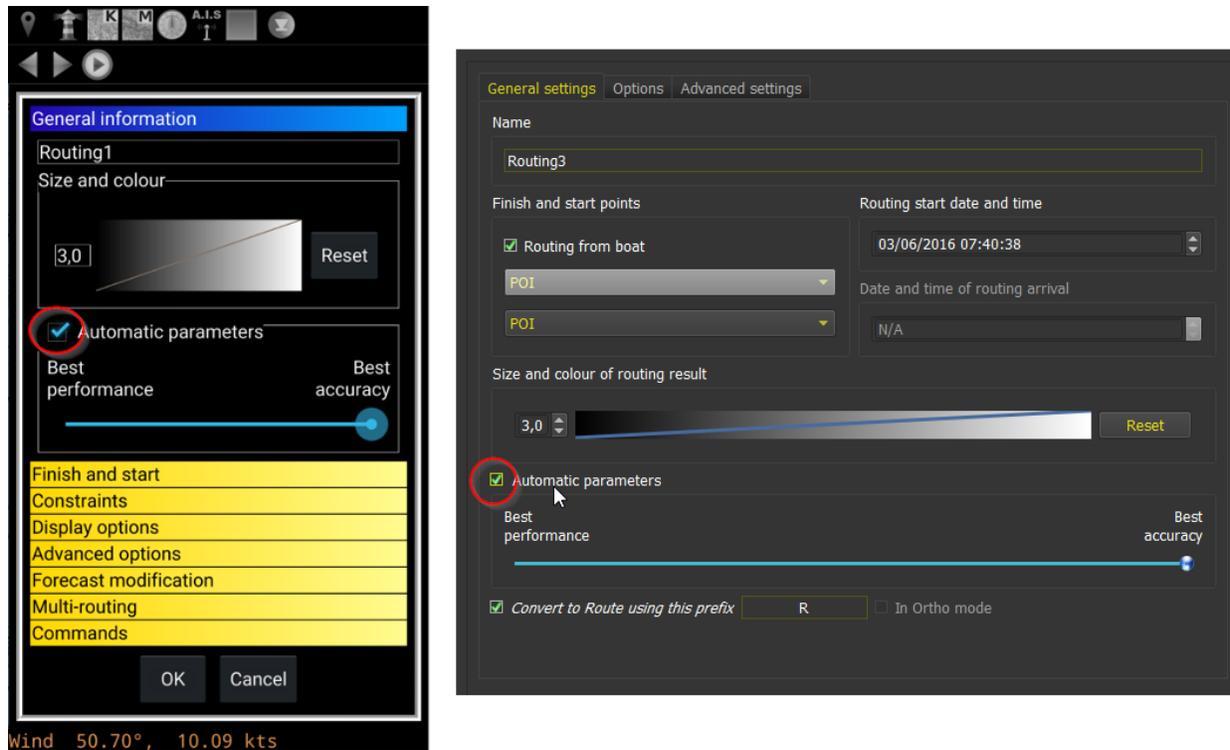


« *Create a pivot point* » will simply restart the routing there, continuing toward the same arrival. « *Edit a pivot point* » allows to edit the routing before, essentially to change arrival point. This function is useful to force passage points, or even to manage U-turns.

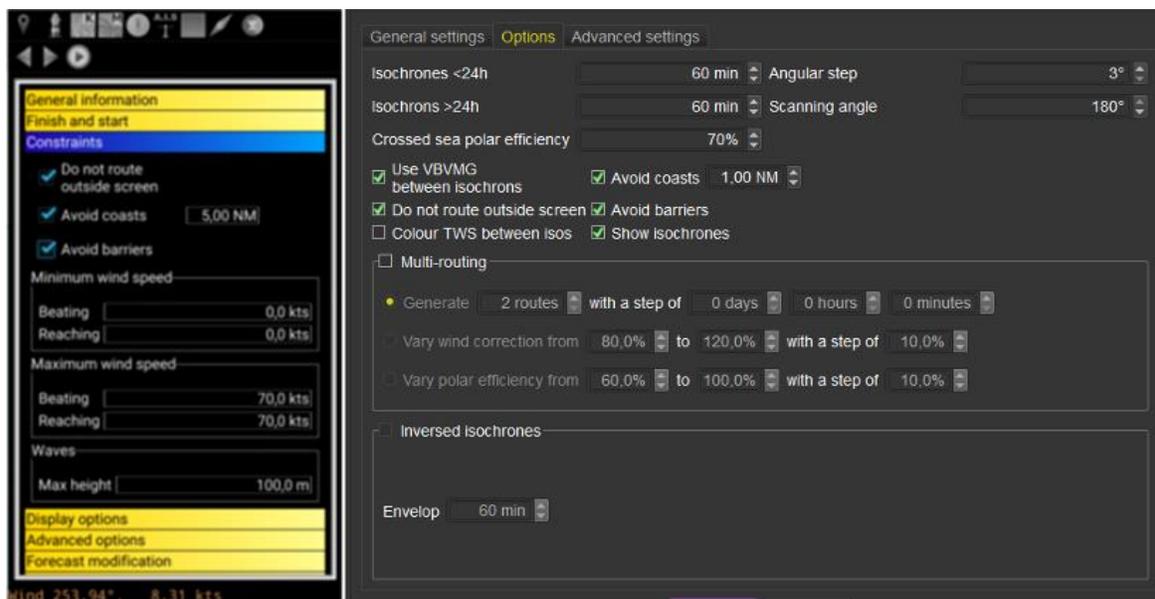


Other options and advanced options

Weather Routing Module allows you to choose automatic settings, depending on your machine resources and power. The slider automatically tunes calculation speed versus calculation precision.

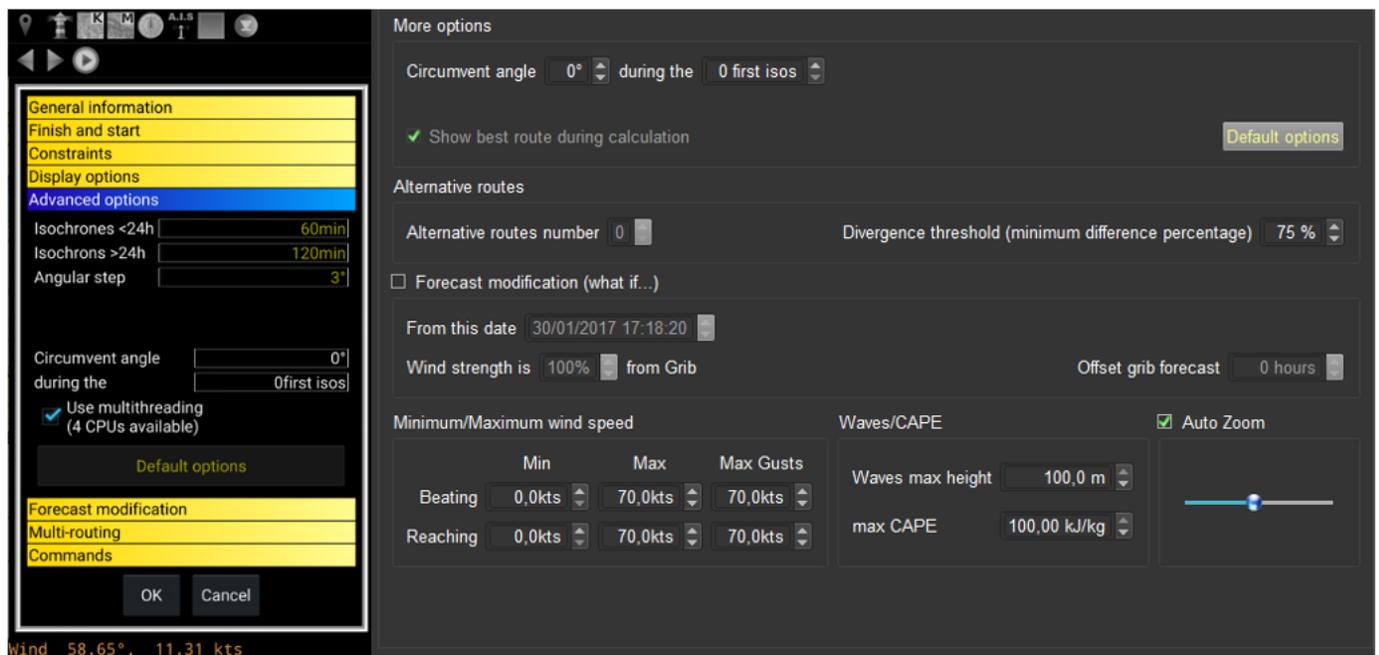


If you uncheck "Automatic Parameters", you can modify manually various options.

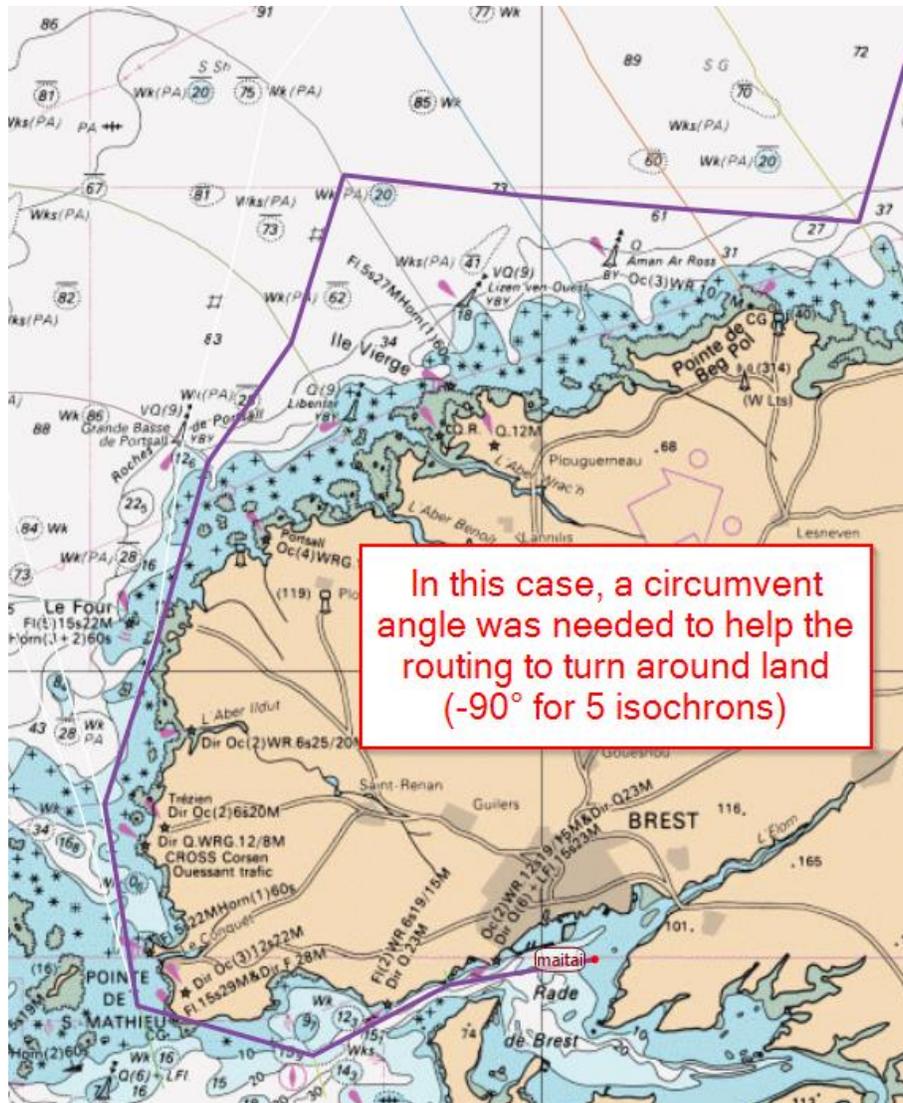


- Isochrons parameters: you can define duration, time step and angle step. Duration can be different for the first and last 24h, where normally there are more obstacles to deal with.

- Crossed sea polar efficiency: By default, this parameter takes the value entered in the boat parameters. You can override it.
- VBVMG between isochrons: qtVlm uses a formula based on VMGs to calculate route from one isopoint to another. If you uncheck this option qtVlm will use another, simpler formula. This is intended to be used with some Virtual Sailing simulators.
- Use multithreading: Uses all CPUs for calculations. Some machines do not support that well (XP for instance), and need to have this option deactivated.
- Do not route outside screen: **qtVlm detects only visible coasts**, so if you allow it to route outside the current view it might not detect crossing coasts. In some rare cases it might be useful to deactivate this parameter.
- Avoid coasts, avoid barriers: These options can be deactivated, resulting in a much faster calculation. Note that since version 5.3.12, **it is also possible to specify a minimum distance to coastlines**.



- Circumvent angle: this option can be useful when the destination is completely obscured by an obstacle and the boat is too close from it for the routing to find a solution. In that case you can help it by specifying a deviation angle for the few first isochrons.



- Orthodromic routing: heading to destination is calculated with orthodromic formula, loxodromic otherwise.
- Forecast modifications: grib's data can be altered to follow some "what-if" conditions, like changes wind speed or shifting grib time.
- Maximum and minimum winds: You can ask routing module to avoid areas with too strong or too weak winds.
- Maximum waves height: You can ask routing module to avoid areas with waves height over a value.
- Maximum CAPE: You can also ask routing module to avoid areas based on a maximum CAPE value.

- Maximum Gusts: You can specify a maximum value for gusts, assuming of course the grid contains such data.
- Auto zoom: This option asks routing module to automatically zoom on routing area. Since qtVlm do not see coasts outside view, it is sometimes necessary to adjust the zoom level with the slider or even uncheck this option and manage the zoom manually before launching the calculation.

Other parameters that have impact on routing module

Vacation (crank) length

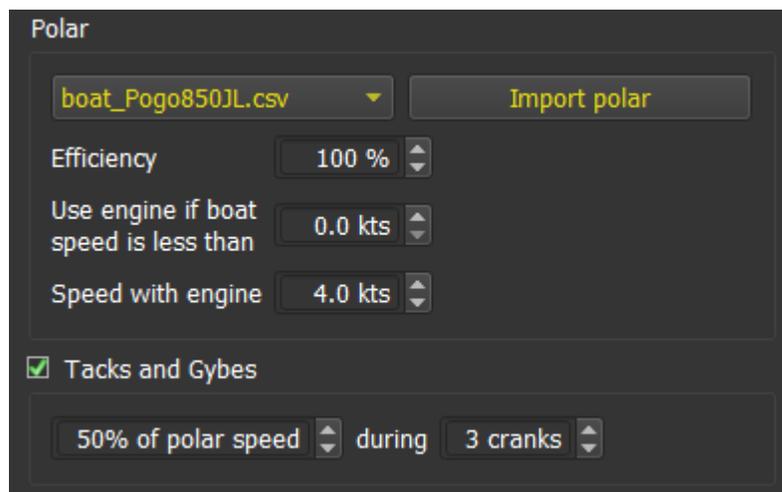
This value can be modified via the menu "qtVlm->Configuration->Advanced". It represents the internal step qtVlm is using for routes, routings and many other functions. For normal utilization, 5 minutes is the recommended value.

Grib interpolation formula

This setting can be modified via the menu "qtVlm->Configuration->Advanced". Spatial only and SOL interpolation mode are intended to be used for some simulation games and should not be used in real boat mode.

Polar, engine, tacks and gybes parameters

In boat configuration, where you can specify which polar you are using, you can also define an efficiency coefficient for the polar that will be applied systematically by routing, route, and some other modules.



You can also indicate under which sailing (with sails) speed you decide to turn the engine on, and at which speed you sail with engine. Routing and Route will take that into consideration and will generate routes mixing sails and engine.

Routes and Weather Routings modules will use Tacks and Gybes parameters to adjust speed during a number of vacations (one vacation is 5mn by default). Note that during this number of vacations tacking or gybbing will not be allowed, even if the speed is not reduced (100%).

Routes Module

Introduction

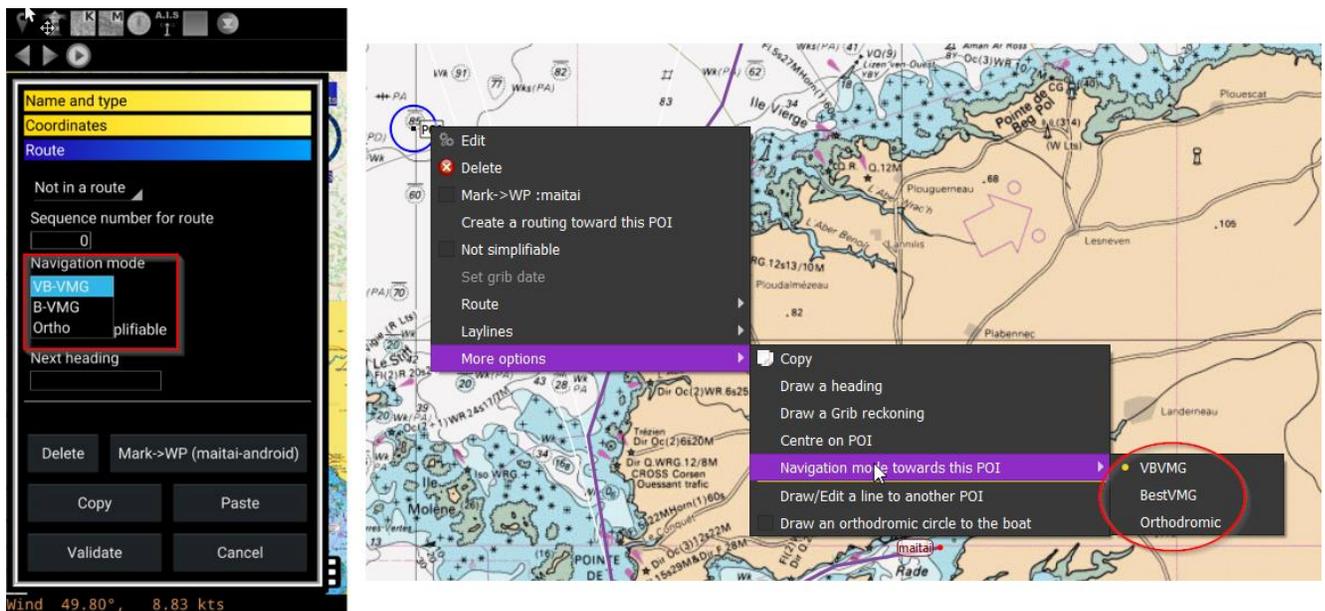
Routes are lines connecting points, called POIs in qtVlm (Points of Interest). They can be created by hand, or may come from a routing converted into a route, or be imported from other system in various format.

Routes use grib data to calculate a way between POIs, taking boat's polar into consideration as well as navigation mode defined at POI level. Calculation step (crank or vacation) is defined in "qtVlm->Configuration->Advanced", with a default value of 5 minutes.

By default, POIs in a route are reached in their alphabetical order. That can be changed to use a sequence number instead.

Three navigation modes exist to navigate toward a POI:

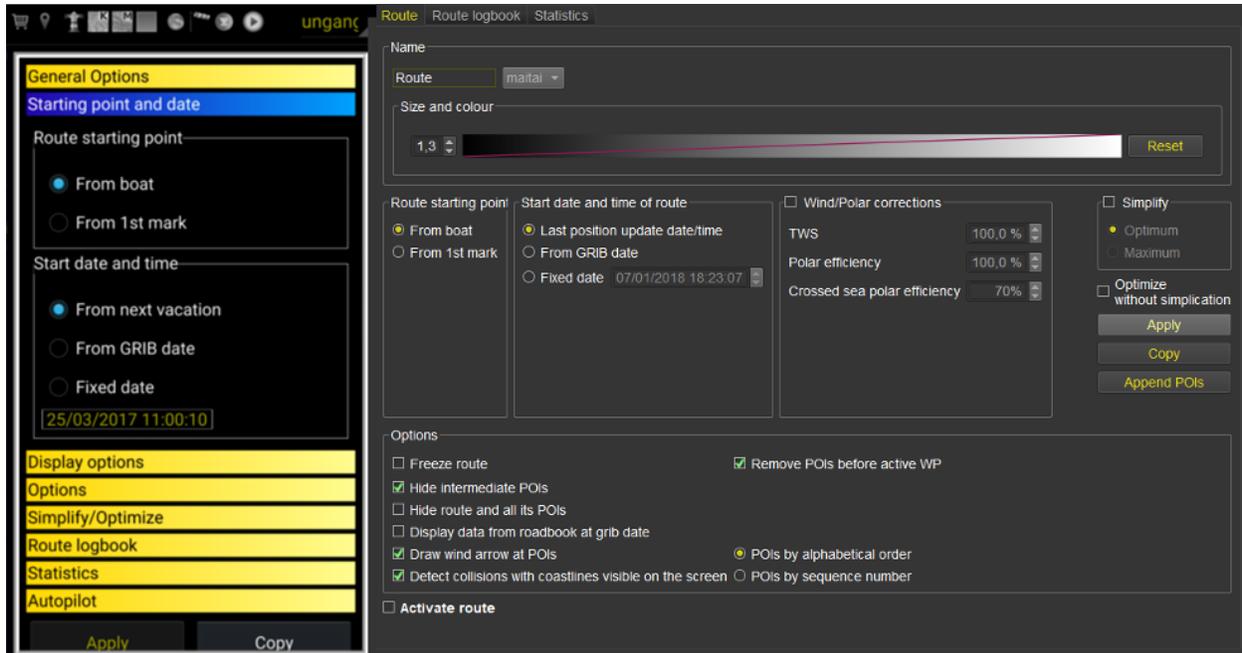
- **VBVMG mode:** This mode consists in navigating in orthodromic mode toward the POI, unless the polar indicates that not inside its VMG winds limits. If the polar indicates that the TWA is not within the VMG wind limits, the route will automatically start to tack or gybe to reach the WP.
- **VMG mode:** This mode uses the best VMG to WP (VMC) to navigate toward POI.
- **ORTHO mode:** This mode uses orthodromic route to reach the POI, even if it implies to be too much upwind or downwind.



These navigation modes are selectable from POI contextual menu, or through POI editor.

Creating or editing a route

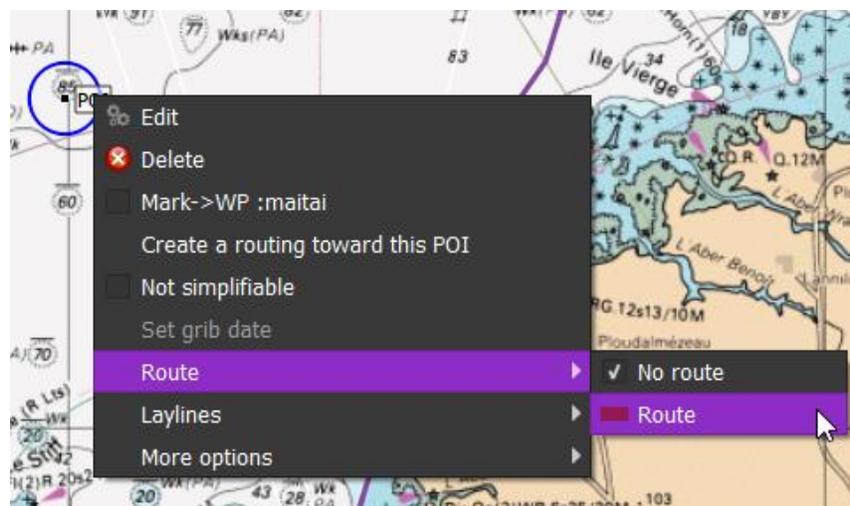
Creating a route is done via the menu "Routes->Create a route", or if the route already exists edition is done via the menu "Routes->Edit a route", or via its contextual menu.



Several options are available, including most important starting point and starting date. You can also choose to show or not intermediate POIs, or to detect collision with land and barriers. You can alter grib data from grib, and play with polar efficiency individually for this route.

A route can be defined as a pathway. In this case, it will appear with dashed lines and it can be used for multi-points weather routings.

If the route has been created manually, then you need to assign manually some POIs to it. This is made through the edition of POI, or via their contextual menu.



Converting a routing into a route

At the end of a routing calculation, it is possible to convert it into a route (see Weather Routing Module documentation).



Some POIs will appear in red. These POI are non-simplifiable points, generated by routing, and that cannot be removed or moved because they are useful to avoid coasts or barriers.

It is always needed to manage these points by hand (move or remove or add new), mainly because coasts lines used by qtVlm are not precise enough.

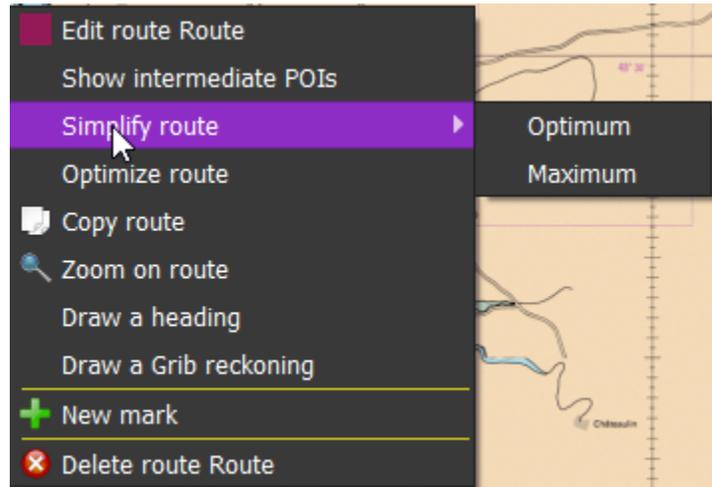
Coasts or barriers collisions

If the relevant option is checked, route will detect if it crosses a coast line or a barrier. If this is the case, that particular part of the route will turn red.



Simplification/Optimization

A route can be simplified and/or optimized. Simplification has two modes: optimum and maximum. Optimum mode will keep more points and will get better ETA, while maximum mode will keep only the strictly necessary points and remove all others. These functions can be called either from the route editor or from the route contextual menu.



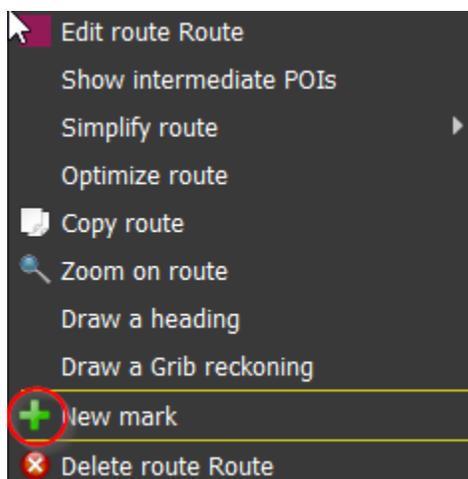
These processes do not try to avoid coasts or barriers, so it is often necessary to flag some POIs as non-simplifiable to make sure the simplified/optimized route is not crossing a coast line or a barrier. Routing Module places this points automatically when converting to route.

If an area is selected on the map, only the part of the route inside that area will be simplified/optimized.

Add/remove POIs to route

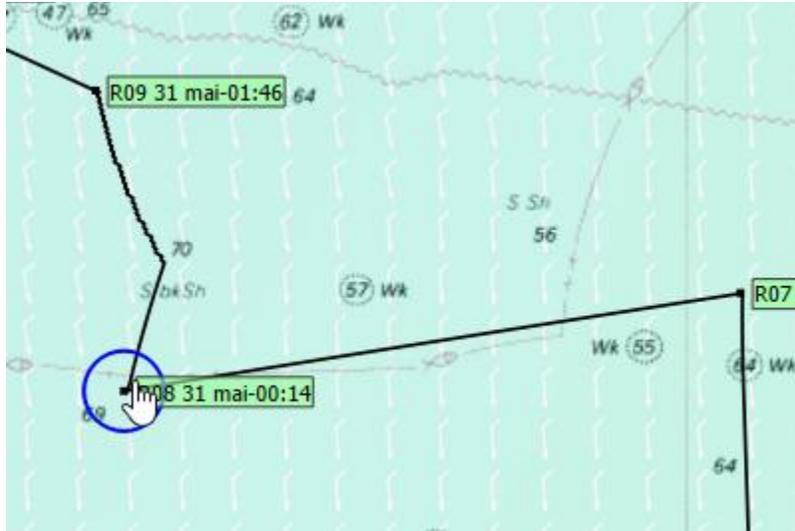
You can add or remove POIs from a route through its editor, or via its contextual menu.

A POI can also be added where you want by right-clicking the route and selecting New mark. A POI will be inserted on the route at the mouse (or finger) position.



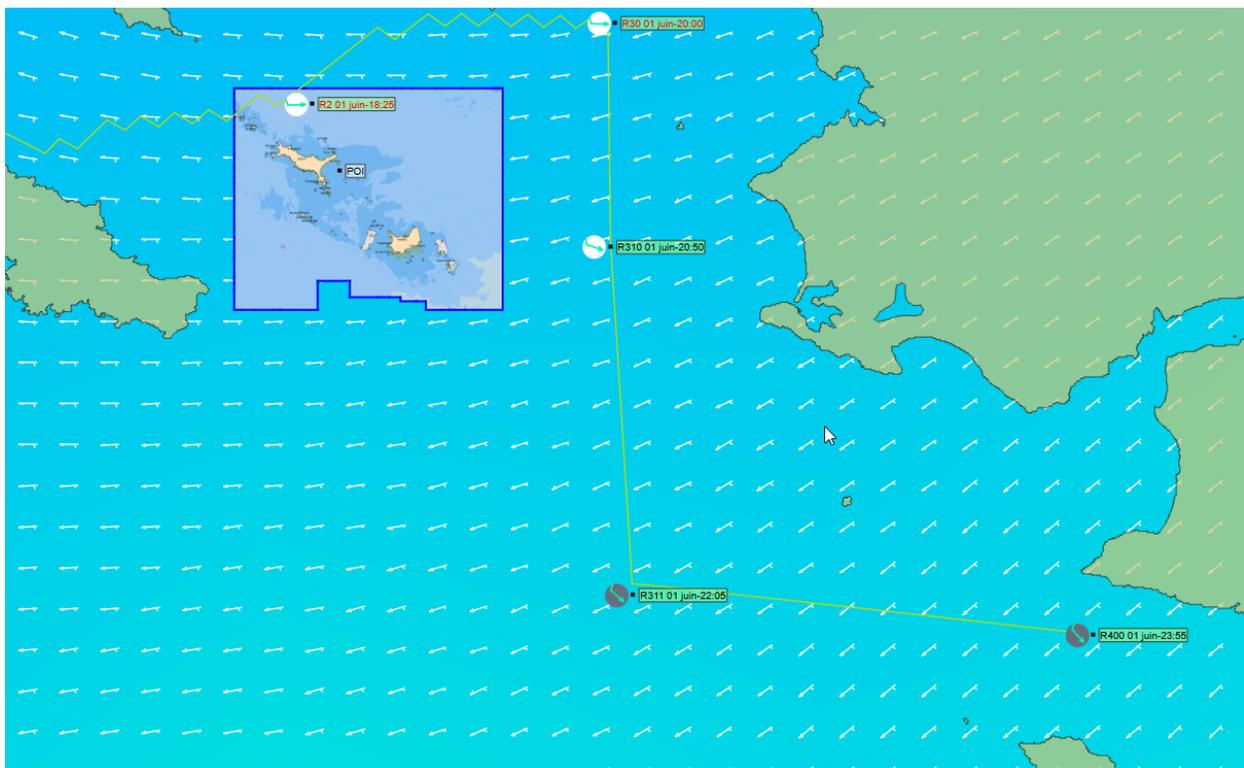
Moving POIs belonging to a route

POIs belonging to a route are moved the same way as normal POIs. When a blue circle appears on the POI after clicking on it, the POI becomes moveable and can be moved with mouse or finger.



Displaying Wind Arrows on POIs

It is also possible to display icons next to POIs, representing the wind at the time of passage. The icons also show if it will be during day or night.



Boat position extrapolation



A big dot appears on the route when the grib date is moved forward. This corresponds to the position of the boat at that date. It can also be seen when animating grib.

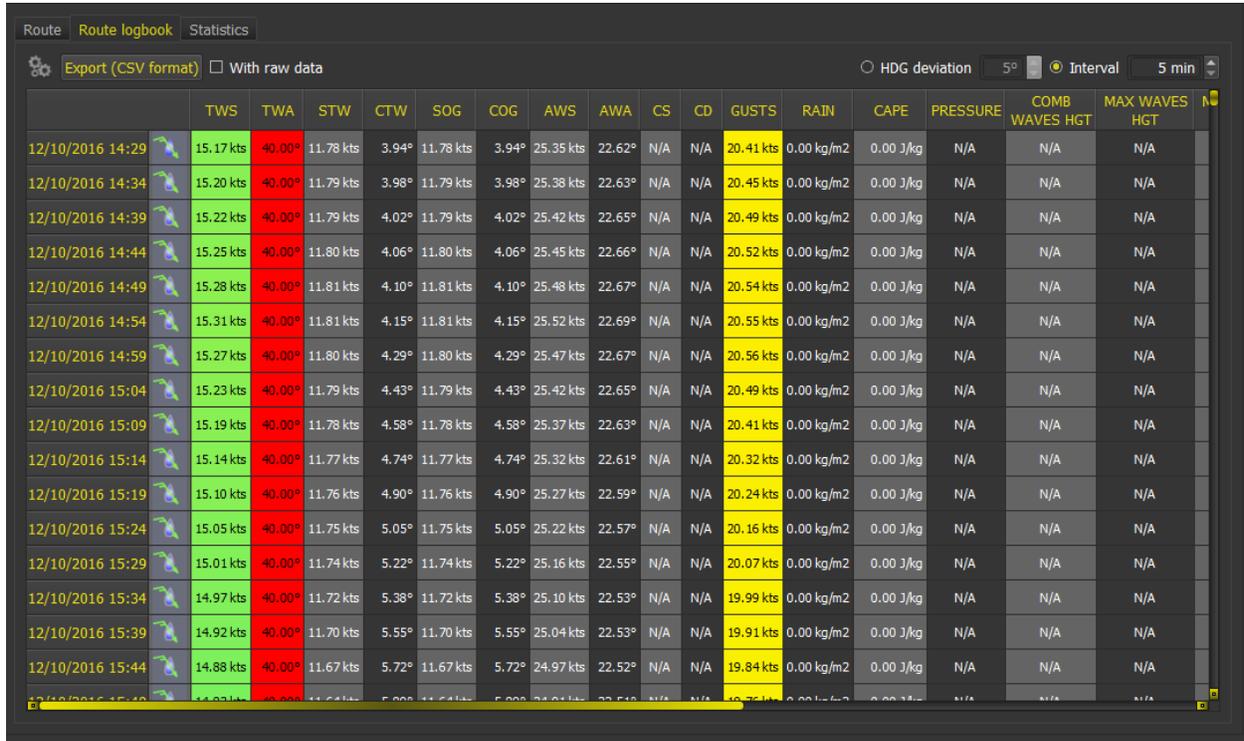
This also allows to compare boat's position on several routes.

The route's tooltip displays all weather information available at passage time

The yellow information is the wind data corrected with the difference between actual measured wind from instruments and grib wind at current boat position.

Route logbook

The route's logbook is available in the editor screen. It contains many information, that can be exported in CSV format. The  button can be used to configure which columns are displayed or hidden.



The screenshot shows the 'Route logbook' tab in a software interface. At the top, there are tabs for 'Route', 'Route logbook', and 'Statistics'. Below the tabs, there are controls for 'Export (CSV format)' (checked), 'With raw data' (unchecked), 'HDG deviation' (5°), and 'Interval' (5 min). The main area is a table with columns: TWS, TWA, STW, CTW, SOG, COG, AWS, AWA, CS, CD, GUSTS, RAIN, CAPE, PRESSURE, COMB WAVES HGT, and MAX WAVES HGT. The table contains 17 rows of data, each representing a time interval from 12/10/2016 14:29 to 15:44. The data includes wind speeds (TWS, TWA), speeds over ground (SOG), course over ground (COG), apparent wind speed (AWS), apparent wind angle (AWA), gusts, rain, CAPE, and wave heights.

Warning: Winds information at route level includes wind generated by Currents, if this data is available in grib. As a consequence, wind data in route's log might differ from pure wind grib data.

It is also possible to export this in a CSV file, to be treated in a spreadsheet calculator.

The last tab "Statistics" contains the following statistical data about the route:

Great circle distance	900.01 NM	Distance travelled	1,239.42 NM
BS (min/avg/max)	3.99 / 11.67 / 16.18 kts	TWS (min/avg/max)	3.66 / 16.20 / 33.40 kts
TWD (avg)	242°	CAPE (avg/max)	41.36 / 306.84 J/kg
Currents (min/avg/max)		Waves (max)	
Navigation time	4 days 10h 25min	Engine	
Night	1 days 23h 10min (44.3%)	Rain	3 days 2h 50min (70.3%)
Tacks/Gybes	60 / 1	Beating	3 days 8h 30min (75.6%)
Downwind	0 days 15h 00min (14.1%)	Reaching	0 days 10h 55min (10.3%)

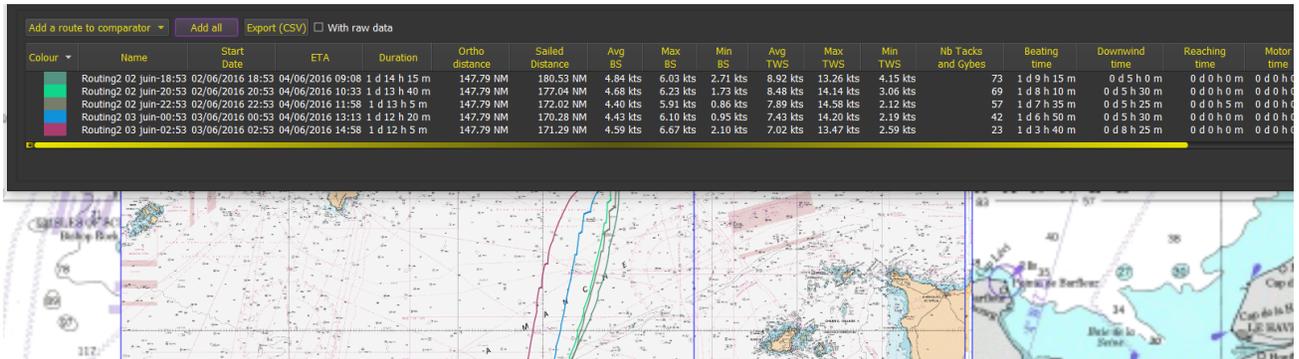
Activating a route

Routes can be activated, in which case the first POI will become the active WP. Once the POI is reached (i.e. the boat is within a configurable distance from the POI), the point is removed from the route and the next POI is activated.

The screenshot shows a software interface for configuring a route. At the top, there are three tabs: 'Route' (selected), 'Route logbook', and 'Statistics'. Below the tabs, the 'Name' section contains a text input field with 'Route' and a dropdown menu showing 'maitai'. The 'Size and colour' section has a numeric spinner set to '1.3' and a color selection bar. The 'Route starting point' section has two radio buttons: 'From boat' (selected) and 'From 1st mark'. The 'Start date and time of route' section has three radio buttons: 'Last position update date/time' (selected), 'From GRIB date', and 'Fixed date' with a date-time input field showing '25/03/2017 10:51:07'. The 'Options' section contains several checkboxes: 'Freeze route', 'Hide intermediate POIs' (checked), 'Hide route and all its POIs', 'Display data from roadbook at grib date', 'Detect collisions with coastlines visible on the screen' (checked), 'Remove POIs before active WP' (checked), 'POIs by alphabetical order' (selected), and 'POIs by sequence number'. The 'Activate route' checkbox at the bottom is circled in red.

Routes comparator

Via menu "Routes->Routes comparator", you can compare routes based on many criteria.



The screenshot shows the 'Routes comparator' interface. At the top, there are buttons for 'Add a route to comparator', 'Add all', 'Export (CSV)', and a checkbox for 'With raw data'. Below this is a table with the following columns: Colour, Name, Start Date, ETA, Duration, Ortho distance, Sailed Distance, Avg BS, Max BS, Min BS, Avg TWS, Max TWS, Min TWS, Nb Tacks and Gybes, Beating time, Downwind time, Reaching time, and Motor time. The table contains four rows of route data. Below the table is a map showing the geographical context of the routes, with various markers and labels.

Colour	Name	Start Date	ETA	Duration	Ortho distance	Sailed Distance	Avg BS	Max BS	Min BS	Avg TWS	Max TWS	Min TWS	Nb Tacks and Gybes	Beating time	Downwind time	Reaching time	Motor time
	Routing2 02 juin-18:53	02/06/2016 18:53	04/06/2016 09:08	1 d 14 h 15 m	147.79 NM	180.53 NM	4.84 kts	6.03 kts	2.71 kts	8.92 kts	13.26 kts	4.15 kts	73	1 d 9 h 15 m	0 d 5 h 0 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2 02 juin-20:53	02/06/2016 20:53	04/06/2016 10:53	1 d 13 h 40 m	147.79 NM	177.04 NM	4.68 kts	6.23 kts	1.73 kts	8.48 kts	14.14 kts	3.06 kts	69	1 d 8 h 10 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2 02 juin-22:53	02/06/2016 22:53	04/06/2016 11:58	1 d 13 h 5 m	147.79 NM	172.02 NM	4.40 kts	5.91 kts	0.86 kts	7.89 kts	14.58 kts	2.12 kts	57	1 d 7 h 35 m	0 d 5 h 25 m	0 d 0 h 5 m	0 d 0 h 0 m
	Routing2 03 juin-00:53	03/06/2016 00:53	04/06/2016 13:13	1 d 12 h 20 m	147.79 NM	170.28 NM	4.43 kts	6.10 kts	0.95 kts	7.43 kts	14.20 kts	2.19 kts	42	1 d 6 h 50 m	0 d 5 h 30 m	0 d 0 h 0 m	0 d 0 h 0 m
	Routing2 03 juin-02:53	03/06/2016 02:53	04/06/2016 14:58	1 d 12 h 5 m	147.79 NM	171.29 NM	4.59 kts	6.67 kts	2.10 kts	7.02 kts	13.47 kts	2.59 kts	23	1 d 3 h 40 m	0 d 8 h 25 m	0 d 0 h 0 m	0 d 0 h 0 m

Exporting and importing routes

Routes can be imported and exported in a variety of format, kml and gpx being the most common ones.

Imported routes are automatically frozen to keep their original data concerning ETA. You can uncheck this option later in the route's editor.

Pathways module

A pathway is a list of POIs that represents for instance marks to be reached in order.

Name

Pathway maitai

Size and colour

1,3 Reset

Pathway start date and time

Last position update time

Fixed date 06/01/2018 18:59:20

Pathway starting point

From boat

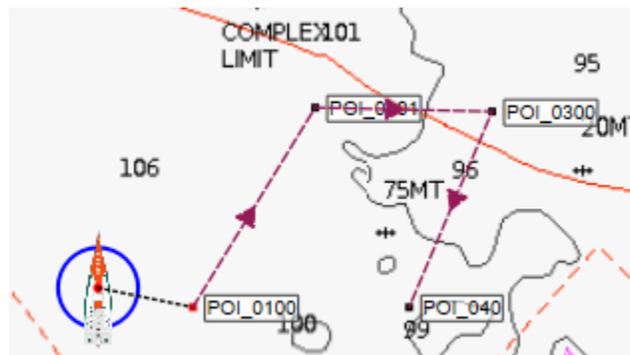
From 1st mark

Options

Close pathway POIs by alphabetical order

Hide intermediate POIs POIs by sequence number

Hide pathway and all its POIs Append POIs



A pathway can be used to generate a routing, in which case the routing will reach each point in order. A pathway can also be **activated**, meaning that qtVlm will declare the first POI as the active WP, and that when the boat will enter be inside the arrival circle as defined in this POI, will automatically switch to the next POI.

POIs and Barriers

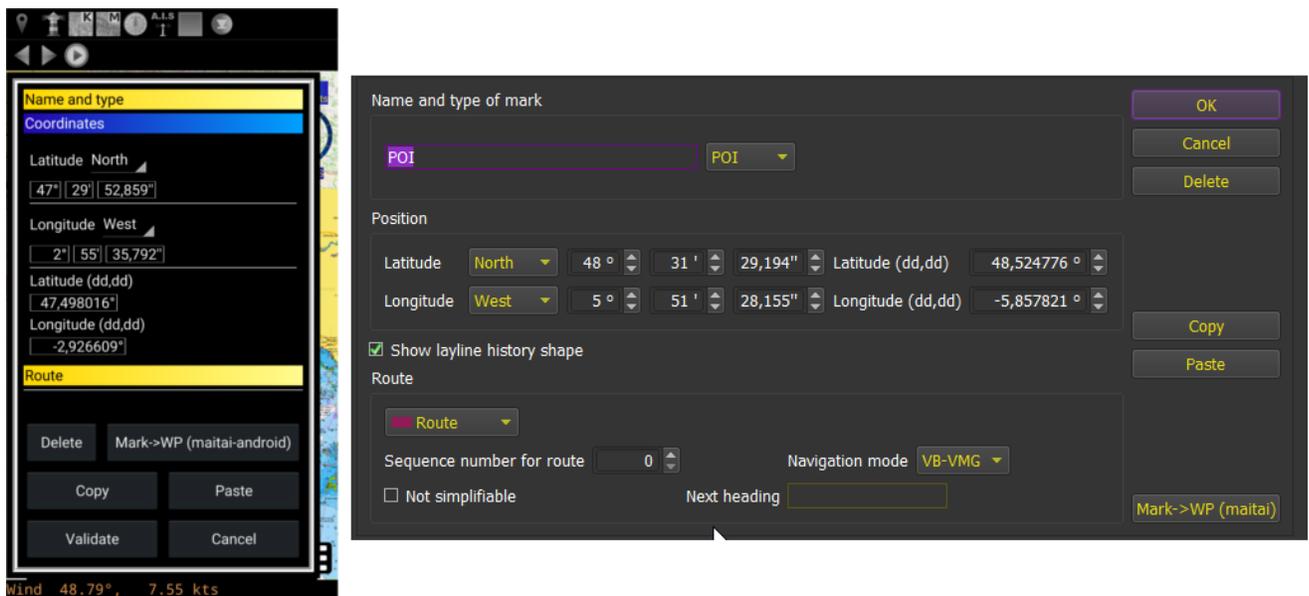
POIs (Points of Interests)

Introduction

POIs are points (Points of Interest) placed on the map. They can belong to a route or a pathway, be used as starting or arrival points for a routing, be declared as active WP, etc.

POI creation and edition

POI editor is called via its contextual menu.



Coordinates can be input in both formats.

There are 3 types of POIs: classical, Mark or Beacon. The only difference being their color on the map.

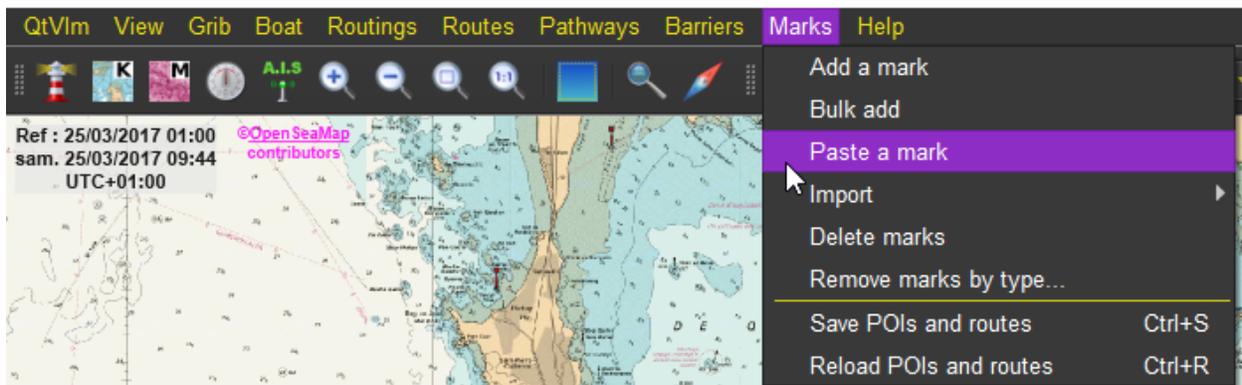
It is possible to copy/paste a POI.

Creating a POI can also be done via right-click menu somewhere on the map (or with the pinpoint  for mobile versions).

Moving a POI can be done with mouse or finger. On PC versions, if you press SHIFT before releasing the POI, it will come back to its initial position.

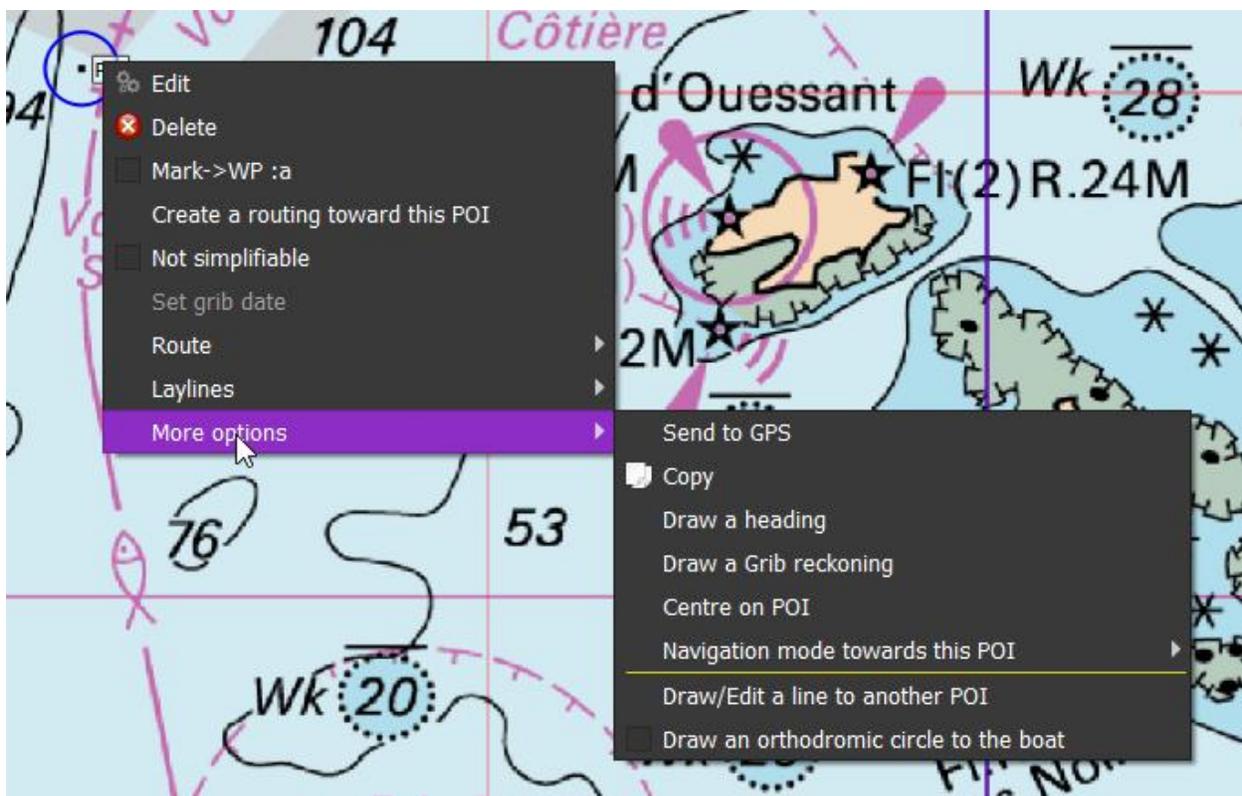
Mark menu

Mark menu proposes various action concerning POIs



POIs can be imported from other sources, like Geodata or from a gpx file.

POI contextual menu



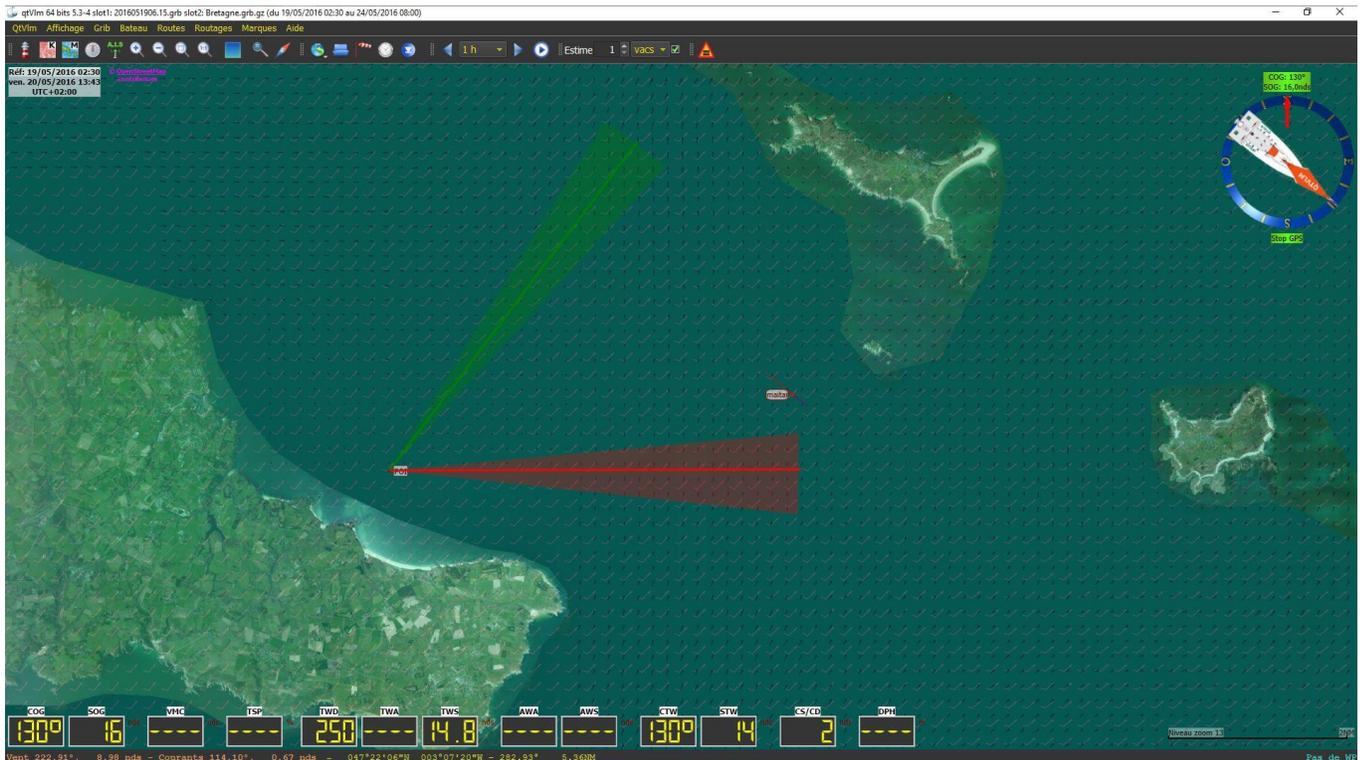
Most actions related to POIs are available in its contextual menu. For action "draw a heading" or "draw a grib reckoning" see chapter concerning qtVlm environment, for Route sub-menu see chapter concerning Routes module.

An orthodromic circle that passes to the boat can be drawn. A line between two POIs can also be drawn, for instance to materialize a starting/ending line.

The "send to GPS" function sends the POI's position via the output NMEA channel (see NMEA configuration). NMEA messages "WPL" and "BWC" will be send during 10 seconds at interval of 300ms.

Laylines

You can display two types of laylines from a POI: laylines calculated from grib's data, or/and laylines calculated with NMEA data. In both cases, Currents data are taken into consideration if available. Grib laylines appears with dashed lines.



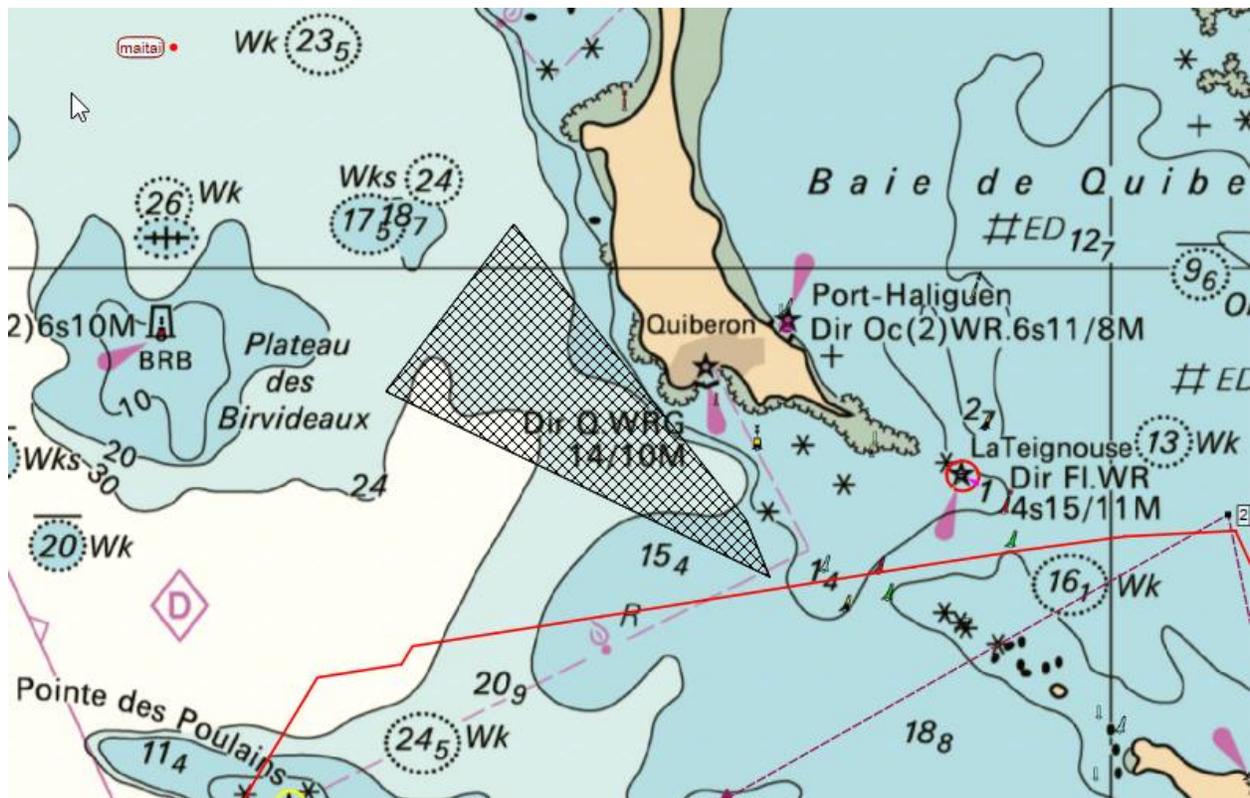
Historical variations of NMEA laylines are shown as well. This can be deactivated in the POI editor.

Barriers

Barriers management is done via the menu "Barriers".



Barriers are positioned with mouse or finger. Once placed you can move points, add/remove points, close the barrier, etc.



Barriers are used by Weather Routing Module and Routes Module. They can be used to force a passage, to defined a No Sailing Zone, etc.

They can be locked on the screen, to avoid moving them by mistake while moving the map.

Tutorial Videos

Several video tutorials have been realized, many thanks to ChrisCata. It's in French only (sorry) and you can find them here: [Video qtVlm \(in French\)](#)