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Congratulations on purchasing **PC-Navigo**, so far the only Route Planner AND navigation system for all the European inland waterways. Its huge database contains all the facts of waterways and all their bridges, locks, ports and so on. It makes lots of complex puzzling by the skipper unnecessary. It is not only a complete encyclopaedia on inland waterways, it also serves as a fast tool to trace the whole navigable area for a certain boat or the estimated time of arrival at the place of destination.

Integrated in the voyage planner software is a full blown Inland ECDIS Chart viewer (ENC-viewer) with which the electronic navigation charts (ENC), published by the waterway authority or by others, can be displayed. These charts and a GPS and/or AIS transponder allow the skipper to navigate, aided by **PC-Navigo**.

Comparing, measuring and calculating, which are as much part of inland navigation as of sea navigation, are all made very easy: one can compare dozens of alternatives within minutes, and thus plan a more economical, easier and more relaxed voyage. And because **PC-Navigo** takes a lot of the statistics (laid back mileage, navigation hours, covered distances and so on) out of the hands of the captain, it leaves him or her with more time for other - and perhaps more enjoyable - tasks.

The various presentations in **PC-Navigo**'s standard features make the use of this software worthwhile for every type of waterway user. Both the commercial skipper, transporting two thousand tons of oil from Rotterdam to Vienna, and the proud yacht owner touring from Calais or Dunkerque to Bordeaux, will get all the relevant details needed for their trip, presented in the way that serves them best. All relevant data, such as the precise sequence of the route, a VHF-channel or telephone number of a certain lock or the operating hours of a lift bridge, are neatly presented, so that the skipper knows exactly where he's going.

The data are assembled with utter care and precision. They are regularly checked and compared with all available source data, both public and private (waterway boards, commercial barge companies data, census bureaus, waterway guides and maps etcetera). Nevertheless a mistake is always possible, which is the reason why the makers cannot accept liability for damages or other consequences directly or indirectly caused by the use of **PC-Navigo**. The safety of navigation is, and remains, the sole responsibility of the skipper/navigator!

**System-requirements for PC-Navigo**

**PC-Navigo** is written for Windows 7 or higher. The program can be used on any modern Windows-7 or -8 or -10 computer. For the exact requirements please visit our website: [www.pcnavigo.com](http://www.pcnavigo.com)

**PC-Navigo and Windows**

The user of **PC-Navigo** is supposed to be familiar with the use of Windows. See also your Windows manual or instruction book. The indications in this **PC-Navigo** manual are only about the specific use of **PC-Navigo**. The given examples refer to **PC-Navigo**-Europe; the use of the regional versions is fully analogue.

**PC-Navigo and it's copy protection**

**PC-Navigo** comes with a hardware key (dongle). The software is "copy protected". A purchased license allows the use of ONE simultaneous copy. If the software must be used on another computer, it can be installed, but it will only work if the dongle is connected to that computer. Simultaneous use of **PC-Navigo** on more than one computer is not allowed.
Attention: the hardware key (dongle) represents the FULL VALUE of the software license! If the key is damaged or malfunctioning, it can of course be replaced, but if the dongle is LOST, the complete license is lost too. We therefore recommend to attach a key ring with a floating object to the dongle if the dongle is used in different computers - and particularly if it is used on board!

Getting started with PC-Navigo

The first time you start PC-Navigo, you will find that operating the software is very similar to any other Windows program. On top of the screen you'll find the menu bar containing the main menus of PC-Navigo: File, Edit, View, Algorithm, Options, Logbook and Help. Before you start with these menus it may be good to learn some things about the general structure of PC-Navigo.

PC-Navigo contains a huge database in which all WATERWAYS of continental Europe are defined, complete with detailed information like currents, maximum speed, authorised dimensions, waterlevels and distances. On top of that, a second database contains details on objects IN the waterways: bridges, locks, safety gates, quays, ports, villages, cities, tunnels, aquaducts and so on. All of these objects are completely known, with their sizes, operating hours, telephone numbers, VHF channels and so forth. A third database contains all chart cells in the Inland ECDIS format, in which all the navigation details (buoys, beacons, locks and bridge shapes etc.) are shown.

PC-Navigo can sort out, recalculate, compare and count these data in a superfast manner. The program only needs microseconds to compare the dimensions of a certain boat with all the dimensions of every lock, bridge or passage on a certain route. Thus PC-Navigo can establish the navigability of such a route within seconds, whereas a skipper might need long nights of hopeless puzzling to do the same work. Likewise, adding up seconds and minutes of all the sections that make up a route, allows PC-Navigo to establish your estimated time of arrival in seconds, taking into account currents, waiting at locks and lift bridges and closing time at night and on particular Sundays or public holidays. It can even find out if you will be able to pass a certain lock or bridge on a certain date! Using these data PC-Navigo can answer all sorts of questions quickly, not only "what is the fastest route from Rotterdam to Paris?" but also "What regions can a barge, now moored in Frankfurt, Germany, reach without being lifted out of the water?" and "If I leave Calais on the first of August and I want to navigate some six hours every day, what day and time will I get to Avignon?".

We wish you lots of fun with PC-Navigo. And if you get stuck somewhere - not your boat, that is, but your use of the computer - then simply put the cursor on the topic that you don't understand and press F1: the help screens will explain anything there is to know about that topic.

Copy control

PC-Navigo is protected against illegal copying and multiplication. The copy protection uses a hardware key or "dongle". The copy control ensures that the program is used by a license holder. Therefore each user only pays for his own license and not for the illegal use of others.

The copy control is designed to interfere as little as possible with the normal use of the program. The only requirement is the insertion of the dongle (AFTER the first installation of the DVD-ROM).

License rights
The user license of **PC-Navigo** is personal. It does not allow the owner any form of reproduction or multiplication of the program. The user may however sell or give away his software to others, but only if he stops using it him-/herself.

As all data of users are registered by **NoorderSoft**, all changes of property must be made known. If this is not done, the new user will not be entitled to the normal service and to updates of the software or the data.

Updates of the software and the data will only be made available to formal license holders. Updating older versions by users who are not known by **NoorderSoft** will not be allowed.

Each license entitles the holder to the use of one version of **PC-Navigo**. This means in practise, that the software can be installed on an unlimited number of computers, but it can only be used in the computer that has the dongle connected. If you wish to use **PC-Navigo** on more than one machine simultaneously, you'll need more than one license.

Companies that use **PC-Navigo** commercially will need a license per user. It is recommended to contact **NoorderSoft** to see if arrangements can be made for multiple licenses.

**Dongle loss and key damage**

The dongle represents the TOTAL value of the license! Each dongle has a unique ID number, registered by **NoorderSoft**. If a dongle has been damaged or if it is malfunctioning it has to be returned to **NoorderSoft**, in order to be replaced by a new one. But if a dongle is completely lost, no replacement is possible!

The dongle can be attached to a key ring or to a floating object, to prevent it from falling overboard and sinking.

**Installation of the dongle-version**

To install a dongle-protected version of **PC-Navigo** one only has to install the DVD-ROM on the computer. It contains a fully automatic installation software that will guide the user through the process. After installation of the CD-ROM the dongle must be inserted in one of the USB ports.

The dongle must be present while **PC-Navigo** is STARTED. As soon as the software runs, it can be removed (e.g. is another USB port user must be connected to the same port).

**Different types of dongles**

Two types of dongles are available: the common type is the blue USB dongle, a very small USB connector that fits in one of the USB ports (of which there are several on modern computers).

Besides the blue USB dongle there is also a GREEN (hybrid) dongle available. This dongle can work both WITH and WITHOUT dongle drivers. With NEW licenses, this new dongle is provided automatically.

**Error codes and repair**

A dongle may occasionally cause problems because of malfunctioning. If the LED (the little green light) at the end of the dongle is on, the dongle works correctly. If it flashes, the dongle driver is not installed correctly. In the folder where **PC-Navigo** is installed, you'll find a series of tools, one of which is INSTALL OR REPAIR DONGLE DRIVERS. Remove the dongle first, then start this tool and follow the instruction given on screen; at the end, you'll be asked to reconnect the dongle, and it will probably work again.
If the LED is NOT on, the dongle is faulty and you must contact the help desk to find out what’s wrong.

Error codes usually give you indications how to overcome the error; if not, or if you can’t work things out, you must contact NoorderSoft, preferably by e-mail to (info@noordersoft.com).

Copyright

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File

The FILE menu contains the principal sub menus PC-Navigo has to open, save, store and adapt the various files and results. Under FILE you will find:

New
Open
Save
Save as
Close route
Close all routes
Export
Preferences
AIS
GPS
ENC
Close

New

With the submenu NEW you may open a new route, without erasing all data of an established route, in order to start anew with a completely different route or boat. The route that you were previously working on remains active in the background. Each route is depicted on its own divider in the detail screen at the right of the survey map. Each of the routes can be closed with the menu Close route.
The first time you do not need to use NEW, as the program's memories will all be empty.

Open

A defined route that has been saved earlier can be opened with this submenu. <OPEN> simply reloads the stored file and also the settings of your specifications (date and time, e.g.) Clicking OPEN will show a dialogue window, in which you'll have to look up the required file. Double clicking it opens the file and allows you to work further with it.

A reopened route will revalidate ALL aspects of this route, including the original departure date and time, the navigation hours, place of departure, destination and so on. After opening the route you may adapt or amend these data by redefining them in the various menus, such as Boat data, Time Planning, Departure or Destination and so on.

Save

Once a route has been calculated you can store it in your computer's memory by clicking SAVE. A dialogue window will appear, allowing you to name your route. Once you have given your route a name and you want to SAVE the same route again after alterations, no dialogue window will appear, but the altered route will be saved directly under the same name, unless you click SAVE AS...

Save as...

SAVE AS allows you to save the route under another name while also keeping the former route stored in the computers' memory. In the dialogue window you enter a different name. Both the original file and the altered file will be saved, the first under the old name, the second under the newly given name.

Close route

With the submenu CLOSE ROUTE you may close one of the routes you are currently working on, without erasing all data of other established routes. The routes that you were previously working on remains active in the background. The divider of the route you close disappears from the detail screen at the right of the survey map.

Close all routes
With the submenu CLOSE ALL ROUTES you may close all of the routes you are currently working on. The divider of the route you close disappears from the detail screen at the right of the survey map.

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## Print functions

**PC-Navigo** has a limited number of printing functions for various subjects in the program. The Voyage Plan may be printed, and also most of the little help screens containing phone numbers, operating hours a.s.o.

All the print functions show a print preview, which can be printed with a click on the PRINT button.

ATTENTION. The Pictogrammes and the Survey Map can NOT be printed directly: they are composed from numerous items in PC-Navigo's data files. In order to be able to print the map, it will have to be exported to a readable format first. This can be done by means of the export button, at the top of the screen. The picture shown in the map is exported to "bitmap" format (.bmp), which can be read, edited and printed by most graphical programs (like Windows' PAINT, Photo Shop, Paint Shop Pro a.s.o.)

The Print functions in **PC-Navigo** are not very elaborate: if you wish to edit or modify your route files more thoroughly, we advise you to export them to either .html format or to .txt format. The result can than be edited, modified and printed in any browser or text processor.

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## Preferences

Many settings and configurations in **PC-Navigo** can be stored in the submenu PREFERENCES. Storing these settings allow you to get to the core of **PC-Navigo** quicker every time you use the program. The PREFERENCES menu can be found by clicking the cogwheel in the menu. The possible choices concern:

### 1. chart settings:
- the radius of the automatic search function that searches the chart for objects and places;
- chart settings of location names you can switch the visibility of city and village names on and off to avoid cluttering of the chart. Apart from this switch, the zoom factor of the chart itself also influences the visibility of the name labels: the labels will only become visible at a certain zoom;
- the presentation of stoppages and/or chart notes; if this option is switched on, icons will appear on the location of a stoppage or note, that can be clicked on to reveal their information;
- chart settings of the "format" of the latitude and longitude data: either in degrees, minutes and seconds or in dregrees, minutes and decimal minutes or in degrees and decimal parts of a degree;
- the setting of font sizes for chart texts that originate from **PC-Navigo**'s database;
- The settings of the font size of the scale monitor;
- The settings of the font colour of the scale monitor (a double click on the colour pad opens the palette from which one can choose).
2. Search process settings:
- One can choose to hold three settings of the search process in the memory: the place of departure and the date of departure and the destination; The colour of the route line can be modified. There is also a setting which allows you to continue with your latest route.

3. Object filter settings:
- Setting the details in the voyage plan, in the pictogrammes and in the area list: choose which type of object you want to see and which type you want to hide;

4. Some secondary view options:
- The presentation of distances and dimensions can be switched from "metric" to "imperial"; please mind the difference between (statute) miles and nautical miles!
- The fuel reset dialog boxes may have been switched off in the fuel management module (with the "don't ask again" checkbox); the dialog boxes can be switched back on here.

5. The dynamic voyage planning:
- The voyage planning process in PC-Navigo can be connected to the GPS readings. If a GPS is connected and working, it can check AND correct the voyage plan accuracy. Those who choose this option use the GPS to control the deviation from the original voyage plan.
- If the deviation between the GPS readings and the original plan gets bigger than a certain amount of time (set to 10 minutes as a default) the software will propose changes to the plan. It recalculates the final ETA and the route to follow: the deviation MAY result in advice to change the route;
- If the user does not want to confirm the proposals of the dynamic planning process every time, he or she can choose to carry out the corrections automatically.
- Even without planification of a voyage the details of the waterway can be provided by using the current GPS position and the heading to define in which waterway the ship is navigating; it shows the details on the right. MIND YOU: the choice which turn off to take remains the skipper's to define, as the GPS only can "know" where the vessel is heading until the first (main) junction!

6. The communication parameters:
- PC-Navigo can communicate with the STOOGES SERVER on which all current stoppages are uploaded by NoorderSoft. With this server, voyage plans can take these stoppages into account. The server has its URL or IP adres. In case of changes or disruptions, these addresses might have to be changed. If so, you'll find instructions on our web site or in a dialogue box on your screen.

7. The GPS-Monitor:
- The GPS-Monitor is the representation of the main values of the GPS-signal: Latitude and Longitude (Lat and Long), Speed-over-Ground (SOG) and Estimated Time of Arrival (ETA) can be switched or off;
- The visibility and the transparency of the monitor window itself can be set;
The font of the values and their colours can be set separately in order to ensure a good visibility, even if the computer screen is a bit further away from the navigator.

8. The AIS-settings

A number of values of the AIS (Automatic Identification System) transponder can be set manually (although an automatic setting of these values is usually preferable): com port, com port speed, databits, stop bits, parity and synchronisation. Also the choice for the "own" GPS inside the AIS - instead of the "loose" GPS - and the autostart of the AIS can be set here. The range of the AIS around the ship's position, the labels display, the size of symbols for the other vessels, the background colour and the transparency of the background can also be modified.

9. The GPS-settings

The parameters of the GPS can also be set manually (although it's preferred to do this automatically): com port, com port speed, databits, stop bits, parity and synchronisation. The autostart can be switch on or off, and the lines of the NMEA signal can be selected and defined.

10. The track settings

The GPS tracks (the line that is formed by all the GPS signals in the chart) can be shown and kept visible; it shows the exact course the vessel followed. To save such a track one can automatically define the file name as the name of the route, and also where the file has to be saved to. Line colour and line size can also be defined.

11. The ECDIS settings

The ECDIS viewer in PC-Navigo allows the modification of certain parameters: to show the SOUNDINGS (depth values, as often shown in maritime charts) or not, to switch the scale sensitivity on or off (called SCAMIN: this mechanism suppresses the showing of chart elements when the chart scale would lead to "clutter": buoys and beacons will only appear after a certain zoom), the scale at which the overview chart switches to the detailed ENC chart, and the three safety margins (shallow, safe and deep water, see also INTELLIGENT CHART.

Export

PC-Navigo allows the EXPORT of routes and voyages:

1. The data format of Google-Earth. With this export file one can present the voyage (INCLUDING the estimated times of passage at each way point) on the satellite images of Google Earth. Since this is a generally accessible exchange format, the voyage can be sent - attached to an email, for example - to others, providing them with a lot of detailed information on the supposed whereabouts of the boat at any given moment in time.

A voyage has to be planned first. If one clicks on <EXPORT> a file tree is opened, in which one can select the appropriate file to store the voyage data into. If the right folder is defined, a click on OK exports the voyage to the Google Earth (.kml) file format.

In Google Earth the route can be opened by simply selecting the complete content of the file
(consisting of a voyage line and a long series of waypoints) and opening it. The voyage appears as a white line with waypoints. A click on one of the waypoints shows the supposed moment that the boat will pass there.

Visitors, friend and others who may be interested in knowing the whereabouts of the boat have an easy access to this simplified voyage plan: if they want to know when they must be at a given place to find the boat there, they only need a look in Google Earth.

- 2. to PC-Navigo's MOBILE SERVER. Exporting a voyage to this dedicated NoorderSoft server makes the voyage plus all its details, boys and other specific information, accessible to an ANDROID device on which PC-Navigo Mobile is installed. PC-Navigo Mobile has been discontinued and is no longer available.

**Exit**

Clicking on <EXIT> closes down PC-Navigo and erases everything in the program that has not been saved or stored. It resets all the settings that have been altered for PC-Navigo. It stores some functions in memory for your next use of PC-Navigo.

**Edit**

The main menu <EDIT> contains all functions of the user’s choices in the various processes: the choice of boat, its dimensions, the date and time of departure, the amount of hours reserved for navigating, the choice of departure place and destination, places to visit and places to avoid. All of these data are necessary to make PC-Navigo do its job...

To understand the route calculation algorithm of PC-Navigo it is important to know which data are obligatory:
- the boat's data (dimensions, speed and type) are obligatory to allow the program to establish the navigability of each section of waterway;
- the place of departure and destination must be given to define the route;
- the date and time of departure and the daily navigation hours must be given to allow the computer to calculate daily progress and operating of locks and bridges.

As soon as PC-Navigo has enough data available to start calculations, it will do so: it will calculate the type of route you will have selected under the ALGORITHM menu or in the detail screen of the survey map. You may however keep adding data (like "via"-places or places to avoid): the program will simply redo its calculations until you're through.

Within this menu the following submenus are available:

- **Boat data**
- **Departure**
- **Destination**
- **Add via-places**
Add places to avoid
Time planning

Boat data

<BOAT DATA> opens a window with a few dividers, in which all boats you ever described are listed, with all relevant dimensions and data. You may select a boat from this list, or you may define one of the boats as your 'usual' (standard) boat, keeping it in the computer's memory until you choose another boat. With ADD and REMOVE you can edit the list of boats: removing one or more boats or adding a new boat. If you click the ADD button, a picture window is opened in which every possible type and category of boat is depicted. By clicking on the type that matches your boat best, you select this type of vessel with all its characteristics and store it in your fleet list, on the first divider, in which you can make as many amendments and alterations as you like. Once all your data are correct, you can close the window.

On the second divider, NAVIGATION, you can choose the category your boat belongs to (pleasure craft or commercial) and some specifics of your navigation habits: do you or do you not navigate on Sundays, which daily navigation scheme do you usually maintain, how many hours may you sail maximally in accordance with European crew requirements. The standard rules of the crew requirements are implemented in the software, so that a corresponding number of daily hours can be generated with each scheme. Changes in daily navigation schemes are passed on to your time planning automatically.

You must indicate whether or not the boat is suitable for navigation on open seas. If not the maritime connections will be disregarded in the route planning process. Mind that this can lead to the impossibility to establish a navigable route: if two places are NOT linked by inland waterways, no route will be found!

The choice to allow or prohibit navigation over the open seas can also give a "limited" permission for maritime stretches. This serves to indicate a certain "handicap" for sea navigation: the greater the value in the "handicap" field next to the <Limited> button, the more reluctant the program will be to allow maritime sections in the route. A "handicap" of 1 or 2 will mean a slight preference for inland routes, while a "handicap" of 8 or 9 will only result in a sea crossing when there is really no other way to reach the destination. The user can set the handicap after his/her own liking.

The third divider, FUEL, lets you insert the fuel consumption statistics and the content of the tanks. During the voyage, an estimate can be made of the fuel consumption and a warning can be issued if the calculated left over fuel gets critical.

In this FUEL divider the relation between SPEED, ROTATIONS PER MINUTE and CONSUMPTION can be specified in a table. This relation allows a calculation of the amount of fuel needed to travel the total route with a certain speed, and the effects of raising or lowering that speed.

The tank or tanks (one can add as many tanks as the vessel contains) are shown separately in the TANKMONITOR, and for every tank a warning can be given if that tank's content is getting critical.

The fourth divider, BOAT SHAPE, is meant to define the representation of the vessel in the screen. An indication of the bow and stern shape (over which distance is the boat getting narrower) is used to redefine the drawing of the vessel. The screen also contains fields for the definition of the GPS antenna position (the distance of which, calculated from the port side and stern of the boat, can be inserted). This is vital for larger vessels, because the vessel's position depends on it.

Finally, the distance rings in the chart can be switched on or off for each individual vessel separately. One can indicate how many rings one wants to see, and at what distance. These rings make the estimation of distances in electronic chart navigation a lot easier.
The fifth divider lets you choose a symbolic hull shape, meant for those cases where the zoom factor has become too large to be able to distinguish the hull shape on scale. For those cases one can choose an arrow form, including its color and the color of its contour, to make sure the best visibility is guaranteed in combination with the chosen chart screen.

After filling in all the fields you can close this screen. The following data will actually be used in the voyage planning: length, beam, air draught, draught, cruising speed, commercial or leisure craft, sunday navigation, suitability for maritime waters and the amount of daily navigation hours.

Once you have entered a specific boat's data, this boat is automatically stored in the BOAT'S LIST. A second time you want to select this same boat you can select it directly in the list by clicking the BOAT LIST button on the bottom left side of your screen.

### Departure

A window is shown in which you can type (part of) the name of a city, village, quay, port, or even bridge or lock, where you want to depart from. Don't worry about capital letters, accents and so on: **PC-Navigo** compares them all: (Ä=Ä=a=á=à=ä=â). If you don't know the correct spelling of a name, just type only part of it: typing *Frank* will result in Frankfurt am Main and Frankfurt am Oder, and if you type *bourg* one of the places in the list will be Strassbourg.

Your place of departure can also be determined at many other places in the program, by clicking the right mouse button and "marking" the particular place as your departure place (e.g. in **OPTIONS**, **BROWSE**, **FIND** etc).

In the detail screen at the right of the survey map you also have the opportunity to change your place of departure: by means of the "LOCATION" button under departure.

A button, the SELECT-PLACE-BUTTON (that has a blue pin point on it) lets you point out departure place, destination and possibly via-places in the chart. A click on this button and then on the chart location where you want to choose a departure point first results in a zoom to a closer view; a second click then defines the exact position where you want your departure point to be. You can then repeat this process - one click to zoom, a second one to define a position) to establish a destination (second action) and also one or more via-places (all following actions). The button next to the SELECT-PLACE-BUTTON lets you move or modify all the the places later on.

The place of your departure is needed for ALL calculations **PC-Navigo** makes, both for routes and for areas. Without a departure place **PC-Navigo** can only be used to browse through the data.

**ATTENTION:** If a place of departure, destination or "via" is situated in a stretch of waterway that is NOT navigable for a ship of the concerned dimensions, this will immediately lead to the impossibility to find a navigable connection. As an example: a barge leaving from one of the canals in Amsterdam will often NOT be able to sail those canals and therefore has "locked itself up" in a non navigable part of the network. You must therefore always mind the particular waterway in which you situate your departure, destination or any "via" place; the waterway in which a chosen point is situated is always indicated in the column behind the name. In the eaxmple of Amsterdam, a large ship is more likely to depart from the North Sea Canal or the Binnen-IJ instead of Prinsengracht!
Destination

In the same way as you selected and determined a place of departure, you can determine your destination, both by typing (part of) the name in the dialogue window and by "marking" any selected place in the program as your destination with the right mouse key.

A button, the SELECT-PLACE-BUTTON (that has a blue pin point on it) lets you point out departure place, destination and possibly via-places in the chart. A click on this button and then on the chart location where you want to choose a departure point first results in a zoom to a closer view; a second click then defines the exact position where you want your departure point to be. You can then repeat this process - one click to zoom, a second one to define a position) to establish a destination (second action) and also one or more via-places (all following actions). The button next to the SELECT-PLACE-BUTTON lets you move or modify all the the places later on.

A destination is only required for the calculation of routes; if you only want to calculate the navigable area of a certain boat, only the place of departure will do.

In the detail screen at the right of the survey map you also have the opportunity to change your destination: by means of the "LOCATION" button under destination.

ATTENTION: If a place of departure, destination or "via" is situated in a stretch of waterway that is NOT navigable for a ship of the concerned dimensions, this will immediately lead to the impossibility to find a navigable connection. As an example: a barge leaving from one of the canals in Amsterdam will often NOT be able to sail those canals and therefore has "locked itself up" in a non navigable part of the network. You must therefore always mind the particular waterway in which you situate your departure, destination or any "via" place; the waterway in which a chosen point is situated is always indicated in the column behind the name. In the example of Amsterdam, a large ship is more likely to depart from the North Sea Canal or the Binnen-IJ instead of Prinsengracht!

Add "via"-places

Exactly the same way as you selected and determined your place of departure and destination, you can determine places you want to visit on the way, so called "VIA"-PLACES. As applied to the other variables, you may also "mark" a place as a "via"-place anywhere in the program. In the detail screen at the right of the map you may add via-places by clicking on the plus sign and filling out (part of) the name you're looking for in the dialogue screen.

Mind you, more than one "via"-place always has to be given IN THE ORDER OF VISITING THEM! The route that is established will depart from your place of departure, then visit Via-place 1, then Via-place 2, then Via-place 3, and so on until only the destination is left.

You must pay attention to remove via-places after you have stopped working on a certain route. If you forget to do this, a next route will be calculated along all the via-places that are still in memory, resulting in completely irrelevant routes. Removing via-places can be done by putting the cursor on the place to be deleted and click on the minus sign. Once your via-places are removed you can reestablish via-places anew.
A button, the SELECT-PLACE-BUTTON (that has a blue pin point on it) lets you point out departure place, destination and possibly via-places in the chart. A click on this button and then on the chart location where you want to choose a departure point first results in a zoom to a closer view; a second click then defines the exact position where you want your departure point to be. You can then repeat this process - one click to zoom, a second one to define a position) to establish a destination (second action) and also one or more via-places (all following actions). The button next to the SELECT-PLACE-BUTTON lets you move or modify all the the places later on.

When no via-places are given, PC-Navigo will calculate the most direct route (either the fastest, the shortest, the optimum or the most tourist route, after your choices) between the place of departure and the destination.

When two or more via-places (or places to avoid) have been given, these places will automatically be displayed in an overview window of the via's and the places to avoid. This allows a quick modification in case of prolonged routes.

ATTENTION: If a place of departure, destination or "via" is situated in a stretch of waterway that is NOT navigable for a ship of the concerned dimensions, this will immediately lead to the impossibility to find a navigable connection. As an example: a barge leaving from one of the canals in Amsterdam will often NOT be able to sail those canals and therefore has "locked itself up" in a non navigable part of the network. You must therefore always mind the particular waterway in which you situate your departure, destination or any "via" place; the waterway in which a chosen point is situated is always indicated in the column behind the name. In the example of Amsterdam, a large ship is more likely to depart from the North Sea Canal or the Binnen-IJ instead of Prinsengracht!

**Interruptions or breaks**

Planned interruptions or breaks in a voyage can be predefined. The voyage is then interrupted at the given position, for the duration of a certain number of hours and/or days. Contrarily to the time correction function (where the moment of the continuation is defined) the planned interruption maintains its duration independent of the moment of arrival at the indicated spot.

Interruptions can be given for all pauses, of which the duration depends on activities that have to take place there, like visiting attractions or loading/unloading activities, shopping or bunkering or necessary repairs underway. Upon arrival the interruption clock starts ticking, until the indicated time has elapsed, after which the voyage is continued within the given navigation hours.

Interruptions can be entered by means of the || button at the right of the Via field: in the dialogue box days and/or hours can be specified.

**Add places to "Avoid"**

If there are any places you want to avoid on the way, you can type them in the dialogue window the same way as the other places, or "mark" them anywhere in the program with the right mouse key. You can also sum up the places you want to avoid in the detail screen at the right of the map, using the plus sign to add a new place.
The order in which you type in "avoid"-places is irrelevant. But just as with Via-places, you must remember to erase places you want to avoid: if you forget this, any future route will be calculated avoiding the indicated places, which is not what you would have wanted.

To erase the places to avoid, either use the submenu DELETE ALL PLACES TO AVOID or use the minus sign in the avoid places field of the detail screen at the right of the map.

Specifying places to avoid may be handy to express your personal preference for a certain area or waterway. E.g. if you navigate from Amsterdam to the Med, you may want to avoid the Rhine (due to the current or the license requirements). To do so, just define any place between the Dutch border and the first junction of the Rhine in Germany as Avoid-place: the program will now look for alternatives.

When two or more via-places (or places to avoid) have been given, these places will automatically be displayed in an overview window of the via's and the places to avoid. This allows a quick modification in case of prolonged routes.

Delete all "via"-places

After several route planning activities, it may be practical to cancel the whole list of places to visit in ONE click. This can be done with this submenu, DELETE ALL VIA-PLACES. This action removes the complete list of places, both in the list at the right of the map and in the memory of the computer.

Delete all places to avoid

After several route planning activities, it may be practical to cancel the whole list of places to avoid in ONE click. This can be done with this submenu, DELETE ALL PLACES TO AVOID. This action removes the complete list of places, both in the list at the right of the map and in the memory of the computer.

Time planning

To make the computer aware of your time planning, you must insert your departure date and time (OR your required arrival date and time) in a dialogue window. If your trip will presumably take more than one day, you may also insert your daily navigating hours, so that PC-Navigo knows at what time you will continue your journey in the morning and at what time you want to moor up for the night.

PC-Navigo contains the algorithms for the calculation of daily navigation hours corresponding with the restrictions on most of the european waterways. If a navigation scheme is specified in the boat's data screen, the corresponding daily hours will be filled in automatically.

ATTENTION: The data of a navigation scheme will overrule previously given hours!

New in PC-Navigo is the possibility to calculate backwards from the destination of the voyage: by defining at what time each point in the voyage will ultimately have to be passed in order to make it to
the destination in time, the required time of departure can be generated.

**ATTENTION:** Note, that a slight change in the time of departure or in the RTA does not always show a corresponding change in the ETA or in the time of departure. This is due to the fact that operating schemes of locks and bridges often cause delays, which spread the optimum duration of the voyage considerably. For example: a bridge that's not operated on Sundays will result in the same ETA for all those departure times which cause the boat to get "stuck" in front of that bridge.

Apart from daily navigation hours the user must also choose which type of operating services he or she wants to use: only "normal" operation, or also operation that has to be especially requested - usually after an early notification. Of the latter, the choice must also be made whether or not to use special operation for which extra payments are due.

**ATTENTION:** in some areas - e.g. in most canals in France - ALL passages have to be announced. If one choses only to use normal operation, PC-Navigo will always avoid these waterways - which may not be what the skipper wants. It is therefore recommended to chose ALL forms of operation as a default while planning a new voyage for the first time, to be sure that ALL voyage possibilities are presented.

The distinction between commercial boats and pleasure craft is also taken into consideration: a professional barge will be allowed to pass at all hours for commercial boats, while a yacht will be restricted to the hours pleasure craft is allowed passage.

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**ATTENTION:** Keep in mind that a slight change of navigation schedule may result in huge changes in your route: the differences that can be caused by sunday closings and by operating hours can make a route from Rotterdam to Marseille vary as much as twenty percent in arrival time! The schedule differences also cause 'hidden blockades": a pleasure craft with a mast, that can only sail through the city of Amsterdam at 02:00 a.m., will never be let through if the skipper indicates to sail between 09:00 and 19:00 hours. Keep these possibilities in mind while planning a route!

**View**

All types of data presentation and viewing are assembled in the menu <VIEW>. Some forms of viewing data require that a route is calculated first (like Pictogrammes and Voyage Plan), others can be used continuously, like BROWSE and SURVEY MAP.

The core of PC-Navigo is the survey map: all data generated by the route calculations can be shown in the map, either as chart object, or as a symbol in the detail screen at the right. Unlike in the older versions of PC-Navigo, which had a strict separation between chart presentation and data presentation, these two types of presentations are combined in PC-Navigo. It provides a total overview of all relevant data in one screen.

Apart from the survey map, you have the following sub-menus available:

- Pictogrammes
- Voyage Plan
- Level Graph
- Dimension graph
- Browse
- Authorised Dimensions / Hour Specification
- Warning monitor
- Operation on demand
ENC Viewer

The ENC-Viewer is the well known Inland-ECDIS Viewer of **PC-Navigo**, in which ENC (Electronic Navigation Charts) or Inland-ECDIS charts (vector charts) can be shown. If zoomed in to a sufficient scale, the viewer shows the Elektronic Navigation Charts with all the navigation details of the waterway. An extensive description of the ENC principle can be found in [PC-Navigo-ENC](#).

The ENC-Viewer presents the charts in symbols borrowed from the familiar maritime (sea) charts. The charts are structured in an identical way all over the world, and produced by the waterway authority (in principle, but other producers can make ENC too). ENC charts are the equivalent of certified maritime charts on the inland waterways.

Scale

The current scale in **PC-Navigo** can be shown in the small SCALE MONITOR, that will indicate the current scale at all times. The SCALE MONITOR can be dragged to any position on the screen.

Survey Map - controls

The SURVEY MAP - or OVERVIEW MAP - is the most important screen of **PC-Navigo**. It shows the total network of inland waterways. Once a route has been generated, it is shown in the map with contrasting colours; as long as no route has yet been laid out, the whole network is blue.

**ATTENTION!** The survey map in **PC-Navigo** is NO navigation chart! If you want to use **PC-Navigo** to navigate in waters you’re NOT acquainted with, you MUST use **PC-Navigo** with the appropriate electronic nautical charts and you must make sure these are available and visible (by zooming in sufficiently to make the ENC pop up), OR you must make sure you have enough detailed paper chart material available!

*If you’re navigating with **PC-Navigo** you may want to put the chart window FULL SCREEN; this can be done with a push on the **F-11** key. Changing back to the original chart window is also done with **F-11**.*

Both actions can also be performed with the FULL SCREEN BUTTON 📱.
An itinerary is automatically established as soon as all necessary data have been filled in: departure place, destination, boat's choice and date and time). The itinerary is shown in contrasting colours in the chart. Further details - the boat, the used 'criteria', the place of departure, places to avoid and via-places, the destination and the type of itinerary calculated, are shown in the detail screen at the right.

Once a route has been established, the survey map offers the fastest and most complete look of the route. Should any part of the route need adaptation or improvement, you can always add "via" places or avoid places to adapt it to your needs and recalculate the route.

Above the map area you will find a row of thirtytwo buttons:

The first five buttons from the left are for the opening, saving and storing of routes:

- The first button opens a New Route. In the detail screen on the right a new divider is added, on which the details of the route can be shown. Other routes remain accessible on their own respective dividers.
- The second button allows you to (re)open a previously stored route.
- The third button lets you close (close) a route. If the route is not saved yet it will first ask you to save the route.
- The fourth button lets you store (save) a route. A dialogue window is opened, in which you can give a name to the file in which the route is saved.
- The fifth button lets you save the map image as a "bitmap" file (.bmp): this is the graphical format that can be edited in most graphical software. The vectorised map, that is shown in PC-Navigo, would not be compatible with such graphical software and it would also require large amounts of space on your disks. The bitmap format is easily accessible and can be processed in most editing programs, like Windows' PAINT.
The next five buttons are the actual controls of the chart:

- The first button allows "zooming in" and/or "zooming out". A click on the button, followed by a rectangle, drawn with the left mouse button (where you push the button in the left top corner and holding it down you "drag" the mouse to the right bottom corner, where you release the mouse button) will enlarge the selected portion of the map till it covers the whole canvas. To zoom OUT, you do the same but you draw the rectangle from bottom-right to top-left (i.e. right in the OTHER direction as for the zoom-IN). You may also zoom in step-by-step by using the "+" button on your numerical keyboard (the numbers keyboard at the right).

- Aside the zoom-out button a small button to set a preset scale allows you to set the **PC-Navigo** charts to a preset scale between 1 : 5.000 and 1 : 15.000.000. It is possible to have a scale indication on-screen by using the [View] menu.

- A button with a "globe" in it is meant to zoom in or out in ONE step, right to the scale in which the complete planned voyage fits and is in view. The necessary zoom factor is automatically defined by the spread of the concerned voyage;

- the fourth button with the cross pointing in 4 directions (in earlier versions this button had a "grabbing hand") allows you to pan the map: clicking this button, then pushing the right mouse button somewhere on the map and, with the button kept down, dragging it in a certain direction and releasing it, the map will be panned over the same distance as your mouse drag.

- **Missing image: text32.png** The fifth button, with the letter T for Text, lets you switch most of the text labels of the ENC-charts on and off; this can serve to improve the visibility on the chart when too many labels "clutter" the image.

The next five buttons rule the 'interaction' between the user and the chart:

- The first button is the [information button]: a click on it opens a menu to specify the TYPE OF INFORMATION you want to seek: you can choose between MARINA SERVICES, PHOTOS, NOTES,
STOOGES, ENC-CONTENT, TIDE, SAFE BOATING and NTS NOTICES. When you have chosen, a click on any of the corresponding icons in the chart allows the mouse cursor to open the information behind it, either a database view of the marinas or a photo or a user note or the content of a stoppage, or the item at which you're pointing in the ENC chart. (ATTENTION: some of this information is optional and not included in the standard version of PC-Navigo; access to this info needs to be ordered and paid for before the info becomes accessible!)

- the second button, the "pointing finger" allows you to search the map interactively: a click on the map will result in a list of all places and objects that were found in a certain distance from the appointed position. In this list, you may want to define a place as your departure place or your destination. The RADIUS with which you want to carry out these searches can be defined under PREFERENCES. The marking of the found places as departure point, destination, "Via"-place or place to avoid can be done with a click on the RIGHT mouse button and a choice from the menu that appears. If no list appears, no places or objects have been found within the indicated radius: you may either enlarge the radius or shift your search location and click again.

- The third button with a red pin point in it is the PLACE-SELECT-BUTTON: a click on this button, followed by a click near where you want to define your departure place (or your destination, or a via-place) results first in a zoom closer to the chart, to allow you to define the EXACT position you want to pin-point with the SECOND click; the place defined in this way will automatically be set as your DEPARTURE. If you repeat the series of clicks a second time, the next place will be your DESTINATION, and if you repleat it again, all following places will be considered as VIA-places. Thus you can plan your voyage with a few clicks of the mouse.

- The fourth button, with the red flag, allows you to modify the defined places by clicking on the button, then on one of the flags in the chart - the one you want to move. Dragging the flag to the desired position changes the concerned point to the point where you let go of the mouse button.

- the fifth button, the arrow pointing at your route, defines the cursor position as the pointer to the details of a specific point in the route: if the map screen is in the "navigation" mode (see below), this button makes all the details of the route appear in the detail screen on the right: waterway name, class, level, authorized dimensions, distance laid back, distance ahead, name of the place or object, time of passing, available dimensions, VHF-channels, phone numbers and operating hours.

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The next button switches the computer screen to an appropriate brightness:

- this button controls the brightness of your screen. To avoid blinding in a wheel house when navigating at night or in the dusk the screen can be "dimmed" to colours that are less blinding in those circumstances. There are three values: daylight, dusk and darkness. They correspond with the regulations of the Central Rhine Commission. Using this possibility allows a skipper to consult his or her screen even in low visibility circumstances.
The next **three** buttons switch between "manual controls" and "GPS-controls" and between "north up" and "course up" mode:

- The blue arrow switches the controls to the mouse: in the "navigation mode" (see below) it is the position of the mouse on the map that indicates, of which particular place you will see the details depicted in the screen on the right.

- The satellite switches the controls to the GPS coordinates: if a NMEA-GPS is connected to the computer, the detail screen on the right will automatically follow the coordinates generated by the GPS, thus keeping the detail screen continuously at the real position of the boat.

- The rotation button automatically adapts the orientation of the chart to the course of the ship, in such a way that the course always points at the top of the screen (the so called "Course Up Orientation"). The heading of the GPS is used to turn and rotate the chart in function of the course.

The next two buttons switch the detail screen from "plan-mode" to navigation-mode:

- The button without the picture of the boat switches the screen to "plan-mode": in the detail screen all particular details, needed for the planning of a route, are visible: place of departure, destination, criteria, via-places, places to avoid, and the type of route. All of these may be modified in order to enter all the particular data that describe the route you plan to navigate.

- The button with the picture of the boat switches the screen to "navigation-mode": instead of the planning data of your route, the detail screen is filled with resulting data: waterway name, class, level, authorized dimensions, distance laid back, distance ahead, name of the place or object, time of passing, available dimensions, VHF-channels, phone numbers and operating hours.

The next two buttons::
This button allows for changing between chart catalogs. PC-Navigo comes equipped with two catalogs: Default and Northsea. The Northsea catalog only displays charts after the Northsea extension has been purchased through our website: www.pcnavigo.com.

The button with the four arrows pointing at the edges of the screen "doubles" the F-11 key: it sets the chart canvas to FULL SCREEN, so that the chart is as clear as it can be. A second click on this button (or on the F-11 key) changes the chart back to its canvas, so that the help screens at the side become visible again.

The next seven buttons are for creating waypoints. More on this subject in our article on waypoints.

The next two buttons are for retrieving external data. Blue Wave is for moorings (for merchant vessels) and actual operating times (merchant-and pleasurecraft. The yellow triangle is for retrieving NTS messages.

Just under the row of buttons, you will see the position of the cursor and bearing and distance of the mouse. If a GPS device has been connected to the computer and if this is working, the latitude and longitude of the real position of the boat is shown, as are the GPS time and the GPS speed and the navigation time and distance till the next object or place on the route.

Users who have a PC-Navigo version and the appropriate ENC cell at their disposal, will notice an abrupt change of the chart image at a certain zoom factor: the survey map turns into an electronic nautical chart (ENC). If one zooms in still further, more and more details become visible, until finally all that is relevant for the navigation is shown, when the zoom factor approaches the setting used in computer- and GPS-aided navigation. See also PC-Navigo-ENC.

**Information button**

The INFORMATION BUTTON in the button bar above PC-Navigo's charts plays an important role in the search for certain types of information. There are SO many data in PC-Navigo, that you would get lost without some form of selection. The INFORMATION BUTTON allows you to select the desired type of info up front.
The selection categories are:

- Marina services*
- Pictures
- Chart Notes
- Stoppages
- ENC
- Tide
- Safe boating
- NTS messages

MARINA SERVICES accesses the symbolic representation of services and facilities that are available in marinas. The database that contains these data is an OPTIONAL extra to PC-Navigo: the dongle must be modified in order to be able to open these data, in which private data of ANWB (a.o.) are incorporated. Except for marina data, some additional data on service providers and ship yards are available as well. If you FIRST click on the MARINA SERVICES in the sub menu list and THEN on one of the concerned red symbols, the underlying information becomes available.

Pictures of bridges and locks are shown as a symbolic "camera" if you have zoomed in far enough. If you FIRST click on PICTURES in the sub menu list and THEN on such a camera symbol, you'll open the image.

Your own CHART NOTES are symbolised with a blue info icon. If you FIRST click on CHART NOTES in the sub menu list and THEN on such a symbol, you'll open the note.

STOPPAGES are symbolised with a similar - red - icon with an exclamation mark in it. If you FIRST click on STOPPAGES in the sub menu list and THEN on such a symbol, you'll open the details of the stoppage.

Locations for which tidal data is available are shown by a blue icon. If you select "tide" using the sub menu list of the info button and then select on of these blue icons you will open up a new screen containing a tidal curve for that location. Tidal curves are only available for the current year, meaning the 2017 version only contains tidal curves for 2017. These curves are based on astronomical predictions, so the actual values may differ depending on factors like wind-direction and pressure areas.

The safe boating icon looks like 2 waves, each having either a light or a dark blue color. For more information about this, refer to the safe boating page.

This icon opens the NTS message of the current location. More on this on the NTS page.
The content of ENC-cells can also be opened with the INFORMATION BUTTON. If you FIRST click on ENC in the sub menu list and THEN on a position in an ENC-chart on which you’d like to investigate the underlying data, you’ll open a so called PICK REPORT, a textual description of the items in the chart. The pick report only contains CODED information and is not always very easy to read. See also the chapters on ENC.

Survey map - lay out

The SURVEY MAP - or OVERVIEW MAP - is the most important screen of PC-Navigo. It shows the total network of european inland waterways. Once a route has been generated, it is shown in the map with contrasting colours; as long as no route has yet been laid out, the whole network is blue.

ATTENTION! The survey map in PC-Navigo is NO navigation chart! If you want tu use PC-Navigo to navigate in waters you’re NOT acquainted with, you MUST use PC-Navigo with the appropriate electronic nautical charts (by zooming in sufficiently), OR you must make sure you have enough detailed paper chart material available!

If you're navigating with PC-Navigo you may want to put the chart window FULL SCREEN; this can be done with a push on the F-11 key. Changing back to the original chart window is also done with F-11.

Both actions can also be performed with the FULL SCREEN BUTTON 📱.
The survey map consists of two parts: on the left, the actual map is shown, with the result of a route calculation drawn in contrasting colours. Should any part of the route need adaptation or improvement, you can always add "via" places or avoid places to adapt it to your needs and recalculate the route. To the right of the actual map is a screen that contains details, either details needed to define the specifications of the planned route, or details describing the resulting route itself.

The plan process - that is the actual definition of a route plan - can easily be carried out in the detail screen on the right: in the "planning mode" this screen shows all relevant choices neatly grouped together: the selected boat, dimensions with which to reckon, (planned or calculated) date and time of departure, place of departure, destination, via-places and places to avoid, (calculated or planned) date and time of arrival, and the type of route calculated.
(fastest, shortest, optimum or tourist).

Modification you can make in this screen are:

- the choice of boat: a click on the "select" button allows you to define another boat than the one that is actually selected;
- the search criteria": by the activation of the check boxes in front of the signs with authorized (red) and/or available (blue) dimensions (length, beam, air draught and draught) the respective dimension is - or is not - regarded in the calculations of a navigable route;
- the place of departure, the destination (both with the "location" button) and the via-places and places to avoid (with the plus and minus signs next to the respective fields);
- the type of route to be calculated: the fastest (in time), the shortest (in distance), the optimum (in engine hours) or the most tourist route (following the smallest and most picturesque waterways).
- the planned (or calculated) date and time of departure and the calculated (or planned) time of arrival: if one of the two is filled in, the other is automatically recalculated.

Once a route has been planned and calculated, the detail screen on the right can be switched to the "navigation mode" by means of the button on the right of the row of buttons. In the "navigation mode" the detail screen on the right shows the characteristics of the route itself: waterway name, class, level, authorized dimensions, distance laid back, distance ahead, name of the place or object, time of passing, available dimensions, VHF-channels, phone numbers and operating hours. The exact location of which the details are shown can be established manually - by pointing with the mouse - or (if a GPS-device is connected) automatically by the GPS coordinates. You can switch between the manual and automatic positioning by means of the row of buttons above the map. If the GPS controls the position, the details shown in the right screen are always the details of the place where the boat is navigating.

Dialogue screens with phone numbers of the bridges and locks, dialogue screens of the operating hours and a dialogue screen allowing time corrections in the route plan can all be opened directly from the detail screen.
Departure = Up
- Harlingen
- New Willems Harbour Harli...
- Kimstergat and Vingegeat/B...
- Molenrak East
- Locks of Kornwerderzand
- Kornwerderzand North
- Moorings Outer Harbour
- Atsluitdijk Bridges
- Moorings Outer Harbour
- Lorentz Locks
- Quay Lorentz Locks
- Moorings Inner Harbour
- Kornwerderzand South
- IJsselmeer along the Frisia...
- Makkumerdiep
- Zool
- Stavoren Harbour
- IJsselmeer, Stavoren to No...
- IJsselmeer along the Holla...
- IJsselmeer, Lemmer to Enk...
- IJsselmeer, Den Oever-Ket...
- IJsselmeer, Trintel Harbour
- Ketel Lake/IJsselmeer, Le...
- Urk Harbours
- Harbours Urk
- Urk Canal
- Urk Marina
- Quay RWS/Salvage Boat
- Urk
- Stop Gate Urker Lock
- Urker Lock and Bridge
- Bridge lower wall Lock
- Cycle Bridge Lock
- Quay Urk
- Fuel station Urk
- Ir.A.De Wit Bridge
- New Zwolle Bridge Urk
- Nagele Canal
- Quay Tollebeek

From "behind"
the detail screen, the little button on top slides the Pictogramme screen into the picture (this may also be achieved with <VIEW>, <PICTOGRAMMES>). The pictogramme is a schematic representation of all objects and constructions in the itinerary, like bridges, locks, quays, harbours and other objects. Both with a GPS and with a manual pointer - by clicking at the right position - the specifics of that object can be made visible in the details screen at the right: dimensions of the passage, operating hours, communication channels and so on. The complete integration of the chart, the details screen and the pictogramme screen assures that you will always be able to see all relevant information on any particular point in your itinerary.

Users who have a **PC-Navigo** version and the appropriate ENC cell at their disposal, will notice an abrupt change of the chart image at a certain zoom factor: the survey map turns into an electronic nautical chart (ENC). If one zooms in still further, more and more details become visible, until finally all that is relevant for the navigation is shown, when the zoom factor approaches the setting used in computer- and GPS-aided navigation. See also **PC-Navigo-ENC**.

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**GPS**

**PC-Navigo** allows you to connect a Global Positioning System (GPS) device to the computer, which can display the boat's position, measured in latitude and longitude, in the survey map, and which can follow the progress of the boat during the trip. The GPS-device must be connected to one of the COM-ports of the computer and the various parameters (dataspeed, bitratio etcetera) must be properly adjusted. The device must also be able to capture satellite signals (which is sometimes NOT the case if it is used indoors!) The format of the produced latitude and longitude must be NMEA.

If the GPS system is properly connected and adjusted, the signal can be represented in the survey maps of **PC-Navigo**. The position of the boat in the European waterways is shown as a contrasting point. The progress of the boat along the route can be "guarded" by means of the extremely accurate atomic time which is sent along with the GPS-signal.

**Operation of the GPS-Module**

The GPS-submenu manages the GPS-module in **PC-Navigo**. The GPS-screen pops up, showing four tab pages: satellite, log, settings, and tracks. In the settings page you must FIRST bring about a first connection by means of the button <AUTO-CONNECT TO GPS>. The computer checks and investigates all the com ports, speed settings and data bits and selects the proper settings. These are saved for later use. If you're technically capable of setting these parameters yourself, you may use the <ADVANCED> button that will take you to the GPS section of the PREFERENCES screen.

There you have to choose the right COM-port and the databit, stopbit and parity settings (see also the manual of your GPS). If all settings are right, you should see "raw GPS data" pass by in the GPS settings tab page. You may then save your chosen settings and you can click the "AUTOSTART" function in order to start the GPS-receiver each time **PC-Navigo** is started.

Please note that most GPS devices take a couple of minutes to initiate: to use the <AUTO-CONNECT TO GPS> function, you should switch your GPS device on and make sure it's connected to the computer, then wait a couple of minutes for the device to initiate itself, and THEN click on the <AUTO-CONNECT TO GPS> button. Once a connection has been made, make sure you click on SAVE SETTINGS and on AUTOSTART to store the connection and to make sure the GPS starts itself the next time. If you usually use the program without a GPS, you'd better NOT switch on the <AUTOSTART> because this will trigger the checks and controls of the GPS at each program start, taking up a lot of time.

The page <LOG> allows you to record all positions in a log file, which can be saved under a chosen name, to review the specific route at a later stage. The START button begins the actual logging of the positions.
The page *<SATELLITES>* is the actual operation of the GPS signal. In the "star map" the satellites that are received by the GPS are shown: the more satellites, the more accurate the positioning. The signal strength of every satellite is represented too. Pushing the START button sends the GPS signal to **PC-Navigo**, where it is translated into a dot on the map. The STOP button erases the signal again.

The page *<NMEA>* offers two alternative reading functions, in case your GPS device does not emit the (default) RMC-sentence but one of the (older) other two sentences: GLL and GGA. You may look up the emitted sentence in your GPS manual or you can simply try out which choice has the best result.

The page *<Tracks>* regulates the "traffic" between the chart and past (or current) routes: it saves the navigation track of such a route for later viewing, e.g. to remind the navigator how a certain stretch was navigated an earlier time. A track is saved with the name of the voyage to which it belonged, or under any other name. The line size and line colour with which the track is depicted can be altered.

**Representation**

If all settings and functions have been chosen and if the computer detects the GPS signal, the boat's position is made visible in the Survey Map, and the boat's progress is automatically followed in the Pictogramme view: the pictogramme line and the detail screen "follow" the boat along it's route. The **GPS-Monitor** shows four data of the GPS in a clear, transparant screen that can be put anywhere on the computer screen. The font size and colour are sizeable to allow a clear reading even if the screen is a bit further away from the navigator.

If you want to look ahead at details of a bridge or lock, a bit before you're actually getting there, you may use the BINOCULARS. They allow you to set the representation of lock or bridge details to the lock or bridge at a given distance from your GPS-position. You have the following choices:
- to set ALL CONSTRUCTIONS to be shown, with or without a certain distance that you can fill in into the ANTICIPATION DISTANCE field; the details screen will show you all objects in the waterway, (bridges, locks, but also villages, quays, fuel stations, harbours etc.) either at your GPS position or at a set distance AHEAD of that position;
- to show ONLY operated constructions (locks and mobile bridges); in this setting only constructions that can be operated will appear in the details screen, regardless if they need operation for your ship or not;;
- to show ONLY locks and bridges that REQUIRE operation (i.e. of which the headroom of the closed bridge is insufficient); the details screens show the first of these locks and bridges that must be opened for you.

To cancel the effects of the BINOCULARS, you set the choice back to ALL CONSTRUCTIONS and the ANTICIPATION DISTANCE to zero.

The voyage plan process in **PC-Navigo** can be matched with the values of the GPS. The GPS position can control AND correct the voyage plan. If this option is used a regular check is carried out at the passing of each point in the route to see if that point is passed at the calculated time, or later, or earlier.
If the time of passage deviates more than a default time (set at 10 minutes by default, but one can change it under Preferences) the computer will propose to amend the voyage plan, taking the current position as a basis. The voyage is then recalculated to see if a change of route has become desirable; a new ETA at the destination is calculated too, of course.

If the repeated proposals of changes are not wanted, one can choose to have PC-Navigo carry out the changes without special confirmation: the software then simply recalculates at each point on the route.

GPS and the reliability of the position

**ATTENTION**! The latitude and longitude of the GPS and the maps originate from different sources and may not always be completely identical: the maps of the Netherlands, Belgium and France come from official local sources and will be accurate enough, those of Germany and the UK may still need some adjustment, and those of Poland and the Balcan countries will sometimes deviate substantially from reality. PC-Navigo-ENC does not only use its own overview maps, but also the official electronic nautical charts of the waterway authorities. They are another independent source of data, and therefore again differences are possible.

The quality of your GPS receiver has also an influence on the position of the boat in the map and charts: a normal GPS device reaches an accuracy varying from some meters to hundreds of meters; a so called differential GPS (DGPS) can reach an accuracy within the meter range.

Faults in the maps and in the signal can cause the representation of the boat to be ALONGSIDE a waterway instead of IN it. In waterways that are close together it may be impossible to establish in which waterway the boat navigates (e.g. in parallel waterways, on junctions and in double lock chambers). This deviation makes navigating on a GPS signal in poor view situations (at night or in fog) uncertain; and because the GPS signal will only show your own boat and NOT the other vessels, the use of radar is indispensible under those circumstances.

If you have a (reliable) GPS or DGPS and if you find a deviation between your map position and the map, we would appreciate being informed about this in order to improve the local map. If you can log the specific stretch of waterway, we would be happy to receive the log file in order to serve as comparison. You may send this attached to an e-mail message to info@noordersoft.com.

**AIS (Automatic Identification System)**

PC-Navigo permits you to connect an Automatic Identification System (AIS), also called TRANSPONDER, thus enabling you to see the positions of other transponder carrying vessels in your chart. The AIS transponder must be connected to one of the com ports, it must broadcast signals and all the parameters must be set correctly. The AIS transponder must provide data about the ship's name, position, course and speed according to the NMEA protocol.

If the link between the transponder and the computer is established, you'll see the other vessels in the
survey charts and navigation charts of **PC-Navigo**. It allows you to follow these ships with their name and call sign, their speed and course in your chart.

If both an AIS and a GPS receiver are used, one must switch off or disconnect one of the two signals, to avoid doubling the own ship signal, which will cause a "jumpy" chart image.

**Settings of the AIS module**

The submenu **<AIS>** starts and maintains the AIS communication in **PC-Navigo**. The AIS screen contains two options: the settings and the switching on and off of the AIS signals in the chart. The **<SETTINGS>** page has two tabs: LOG and SETTINGS. You will have to activate the first connection to your AIS transponder with the button **<AUTO-CONNECT TO AIS>** which sets the right parameters once. If you're technically capable of setting these parameters manually, you may do so with the **<ADVANCED>** button.

The tab **<ADVANCED>** lets you set the COM-port, BAUD rate, databits, stop bits and parity of your AIS signal. You can also opt to save your settings and to autostart the AIS connection at the next program start.

If you often use your computer WITHOUT a transponder, do not switch AUTOSTART on, as this will consume much time rechecking the settings at the next program start if it cannot find your transponder.

The tab **<LOG>** lets you record the AIS signals for later use; the **<START LOG>** command starts the recording. A reply can be adjusted to a higher speed, allowing you to play back a signal in much less time.

Under the menu **VIEW** you can also view a **LISTING** of all AIS-objects that your AIS receiver "sees": all AIS signals are show as a list of ships with all their specific AIS data.

**Representation**

If the connection to an AIS is set properly, names, call signes, positions, courses and speeds of AIS carrying vessels will be shown in your chart. They are shown as sharply pointed triangles, the sharp point indicating the course. If you put your cursor in the INFORMATION mode (by means of the round "i" symbol above the chart) and click on one of the AIS symbols, the details of the concerned ship will be shown in a label: Name, call sign, navigation status, AIS-type, vessel type, course, speed, rate of turn, ship's length and beam.
It is possible to display or not in preferences AIS targets vectors. The vectors are adjusted in proportion to the speed for a specified time, 5 minutes in PC-Navigo. This allows with a glance to
appreciate the respective speed of the two ships, the one with the longer vector is the fastest.

It has been found that the use of an AIS transponder in combination with the ENC charts puts rather heavy requirements on the system: NORMAL use of PC-Navigo without an AIS is possible on as little as 256 Mb RAM, without any requirements for the processor. WITH a transponder, the peaks appear to
require as much as 2 Gb RAM and a processor with a speed under 2.6 GHz may not be capable to cope with the large number of signals! A smaller RAM or a slower processor can result in stagnation of the chart panning or even in a system crash!

In case of problems it is wise to set the chart in NORTH UP position and to switch the depth soundings OFF and the scaling (SCAMIN) ON, and to limit the use of other programs that require processor capacity.

**AIS and the accuracy of positions**

**ATTENTION!** The longitude and latitude received from an AIS is a GPS signal; inaccuracies in the transponder's GPS can cause considerable errors in the position, sometimes up to many meters!

It must be discouraged to rely on an AIS signal for the overtaking or crossing of other craft, in particular when visibility is poor. Moreover, one must be aware that ONLY vessels equipped with a transponder are "seen". Navigation in poor visibility conditions will therefore always require radar.

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**Pictogrammes**

Apart from the detail screen on the right of the survey map, the clearest and most detailed way of looking into your route is offered by PICTOGRAMMES. Pictogrammes are schematised graphical views of the waterway objects. In older versions of **PC-Navigo** the pictogrammes were series of drawings in which 'traffic signs' contained the lock and bridge sizes and other data. In the newer versions the pictogrammes became a schematic drawing of a waterway segment with all the objects in it, situated at the proper side of the waterway, and with the 'traffic signs' and other important data in the margins. In this most recent version the pictogramme scheme is fully integrated into the chart and details screen: in one view you can see the position of objects in the waterway, the relevant dimensions, and so on, and you're only one click away from available data like telephone number, operating hours and VHF-channel.

The screen shows the schematic line of the itinerary, with (in the detail screen at the right) specifications of all bridges, locks, safety gates, tunnels, cities, villages, harbours, quays, fuel stations, turning basins and of course junctions. If a lock or bridge has a VHF channel this is shown too. Some general data on this stretch of waterway are also shown: the name, the class, and the local water level compared to the Ordnance Datums of WGS84, and the authorized dimensions and the speed limit.

The available dimensions of the channels: length, width, headroom and depth of the primary and secondary channel (if available) are all specified. The panel contains the buttons that give access to the operating hours and telephone numbers of the lock or bridge. If a bridge has to be operated to allow the boat to pass, the operating hours button will blink. When a route has been calculated, a time correction button is also placed in this panel. If there are Vessel Traffic Services channels for traffic control in the area, these are shown in the international style signs: compulsory reporting and control channels in a red and white panel, info channels in a blue panel.

If a GPS-device is linked to the computer and working, the pictogrammes will be shown in such a way, that it reflects the actual position of the boat, and move when the boat's position changes. This function can be switched off in the **FILE** and **GPS** menu's.

To adapt the types of object you wish to see in the pictogrammes scheme, you can click your right mouse button over the chart, and click on the OBJECT FILTER: in the dialogue screen you can indicate which of all the object you would like to see and which of them do not interest you. It allows you to amend all the information to your purposes.
Voyage Plan

Many situations require the availability of on-screen or printed lists of details of the waterways, or of a certain route. PC-Navigo produces such a list under VOYAGE PLAN. It contains the position in a route of every object, the names of the waterways and all the objects in it, the relevant data like dimensions, depth, lock hours and bridge hours, telephone numbers, VHF channels and so on. Selections of what to include or not, can be made by the user by means of the buttons at the top of the table: clicking each button switches the concerning column "on" or "off".

Likewise, the objects and places you want to have included in the table can be chosen: for this choice you must use the <Filter> option under <FILE> and <Preferences>, in the last tab sheet. If you only want to know which towns and villages you'll pass, you activate the checkboxes for towns and villages, and you leave all the others blank. But if you want to know exactly at what time you'll pass which lock, you insert the locks (and maybe mobile bridges) in your list choice.

Remember that some routes contain huge amounts of objects: plan a route from Paris to the Black Sea, and before printing anything you had better make a careful selection of what to include in your table, if not, you will find yourself with hundreds of pages, which is hardly helpful for a good view of the ins and outs of your route! You may also decide to plan portions of the route as separate routes, in order to limit the amount of paper.

The buttons at the top of the table control the following columns:

- Time of passage.
- Distance from the origin.
- Position in the direction of the route (left or right).
- Mile Marker or (on the continent) Kilometer sign (or if no such signs are available: distance from
origin of the concerned waterway).

Type of place or structure (e.g. city, village, quay, bridge, lock etc.).

Name of the place or structure.

Legend of footnotes and/or particularities.

Current locally (average at normal flows).

VHF-channel of bridge or lock or harbour.

Phone numbers of bridge or lock.

Available length, beam, height and depth.

Operation required (for bridge or lock). If the closed bridge offers enough headroom or if the lock is a stop lock that is normally open on both sides, no operation is required.

Normal water level locally.

The last buttons control the printing process and the exportation of Voyage Plan files:

Printer-settings. Opens a dialogue screen in which the printer settings can be modified: borders, margines, fonts and headers and footers can be altered.

Printer. This button opens a print preview screen, showing the (first of the) pages of the Voyage Plan. If the lay out is all right, a click on the "print" button starts the printer dialogue; if alterations are required, you can return with the "Close" button.

Exports the table to a .html or .txt file. The (digital) table can be exported to be read or modified in an internet browser (such as Internet Explorer or Firefox) or in a text processor (such as Word, Open Office or any other text processor). It allows further modification and/or the use of the table in an internet environment.
The Ebis button shows a pre-selected set of items, such as passagetime, distance and bridge heights.

The CLOSE button facilitates closing the screen when you're using a TOUCH SCREEN monitor.

**Level Graph**

Once a route has been established, **PC-Navigo** 'knows' the level variation between departure and destination. To show you on which parts of your route you are going upstream (with all the regulation consequences) and on which parts you're descending, you may consult the **<LEVEL GRAPH>**, indicating the level of every section compared to sea level (EOD or NAP or NN or NGM or OSDN). The LEVEL GRAPH shows you where you're locked UP and where you're locked DOWN, whether your mooring is at the upstream or downstream end of a lock, and where the water sheds in your route are situated.

Clicking on a certain point in the graph shows you the exact position on your route by presenting the name of the place or object at the bottom. You may run through the level graph by means of the left and right arrows or with the mouse.

**Dimension graph**

In the **<Dimension graph>** the relation between the vessel dimensions and the waterway structures is shown. The vessel dimensions (top to bottom: beam, air draught and draught, and length) are represented by a scaled blue line leaving some space between the widths of channels (the black lines) and the authorised beam in the waterway (the red restrictions).

In the middle scheme the same space is shown for air draught and draught (combined): the available headroom and depth at bridges is indicated by the black lines, the authorised height by the red borders. The space between the blue line and the black stripes indicated the amount of space above the wheel house/highest point and the bridges and the space between the lowest point/keel and the bottom.

**ATTENTION:** the available depth in rivers and some canals is often given as AUTHORISED depth, simply because the REAL depth figures are not known everywhere. These reals depths can be considerably larger than the indicated values!

The bottom scheme shows the relation between the vessel length and the available chamber length and authorised vessel length in a similar way.
Browse

The VIEW main menu offers you a possibility to BROWSE through all sorts of data on the waterways and their objects. You may "mark" places as departure, destination, "via"-place or "avoid"-place.

<BROWSE> allows you to enter directly - so without planning any route at all - into the data of PC-Navigo. A list of waterways is produced, in which you can select one by clicking it. In a so called PICTOGRAMME SLIDE SCREEN (that is a screen in which many details are represented by schematic icons) details of the selected waterway are made visible, while many more are 'hidden' behind special 'buttons' (such as operating hours, VHF-channels etcetera): one click is enough to get these data on screen.

Browsing gives access to the following data:
- VHF-channels;
- lock chamber length;
- lock chamber, bridge or passage width;
- available headroom;
- available draught;
- the same dimensions for a secondary channel if there is one;
- speed limit;
- maximum vessel length;
- maximum vessel beam;
- maximum air draught;
- maximum draught;
- suggestions and hints for navigation;
- phone numbers;
- operating hours;
- current;
- water level;
- VHF-sector channels;
- VHF-information channels.

Maximum dimensions

Once a route has been established its authorized dimensions (as allowed by the authorities) are often an important feature. Clicking on <MAXIMUM DIMENSIONS> provides you with a list of those sections of your route where the dimensions were the most critical, indicating length, beam, height and draught per section. Both the AUTHORIZED and the AVAILABLE dimensions are shown. So are the total amount of kilometres covered, and the total amount of navigation hours. But also the hours the engine has been running, the hours the engine has been on idle, the hours spent waiting for lockage, the number of locks in the route, and the number of times that locks and bridges had to be operated.

Please note that the dimensions are all belonging to objects IN the calculated route*. If you want to use this knowledge for analytical reasons, for example to establish if you can reach a certain
destination with boats of larger dimensions, you may use the menu "SHRINK TO FIT" under ALGORITHM. That function examines in little steps, which boats can only just pass a certain waterway, and it can establish the largest possible vessel with which you will be able to sail from A to B.

* If "via-places" have been appointed, you may not only survey the COMPLETE voyage, but also the various STRETCHES between the indicated places (departure, via place, via place........ via place, destination) separately: the overview shows either the complete voyage or one of the stretches. For analyses purposes this may come in handy.

**Hour Specification**

Once a route has been established its specifics are often important. Clicking on HOUR SPECIFICATION provides you with a list of those sections of your route where the dimensions were the most critical, indicating length, beam, height and draught per section. Both the AUTHORIZED and the AVAILABLE dimensions are shown. So are the total amount of kilometres covered, and the total amount of navigation hours. But also the hours the engine has been running, the hours the engine has been on idle, the hours spent waiting for lockage, the number of locks in the route, and the number of times that locks and bridges had to be operated.

Please note that the dimensions are all belonging to objects IN the calculated route*. If you want to use this knowledge for analytical reasons, for example to establish if you can reach a certain destination with boats of larger dimensions, you may use the menu "SHRINK TO FIT" under ALGORITHM. That function examines in little steps, which boats can only just pass a certain waterway, and it can establish the largest possible vessel with which you will be able to sail from A to B.

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**Operation on demand**

Once a voyage has been calculated and its route has been established, the necessity of a previous demand to operate certain locks and bridges can be established too; operation on demand is quite common on some of the waterways. Certain waterways in France, tunnels, winter opening of some structures and some large commercial vessel locks outside office hours in England require a previous notification anyway.!

If one or more locks and bridges require a notification beforehand, this is shown with the fourth of the five WARNING ICONS that will then blink in red:
The data that **PC-Navigo** collects contain the phone numbers of these locks and bridges; the menu <operation on demand> shows the complete list.

Attention! Sometimes a demand for operation can result in operation of a whole series of locks and bridges (e.g. in the same canal). Nevertheless ALL different phone numbers of locks and bridges are provided in the list. Check with the first lock or bridge in a row how far the arrangements of a granted service will stretch!

**ATTENTION:** in some areas - e.g. in most canals in France - **ALL passages have to be announced**. If one choses only to use normal operation, **PC-Navigo will always avoid these waterways** - which may not be what the skipper wants. It is therefore recommended to chose **ALL forms of operation as a default** while planning a new voyage for the first time, to be sure that **ALL voyage possibilities are presented**.

### Area Map

While your boat is moored at a certain place **PC-Navigo** can calculate which waterways are navigable from that place onwards. You get a map of the navigable AREA that has taken the specifications of that particular boat into account. The navigable stretches are indicated in contrasting colours in the survey map. From this map you have direct access to the **AREA LIST**.

### Area List

In the **AREA LIST** the details of your navigable AREA are neatly grouped together. Clicking on the header of each column sorts the list in the order of that column (e.g. if you click on distance, the various objects appear in order of their distance to your mooring point; if you click on waterway, the list is sorted in alphabetical order of the waterways). The object type you want to include in your list can be selected in **PREFERENCES**. Like the Voyage Plan, the **AREA LIST** may confuse you if the amount of selected details is too large!

Please note that the sorting of long area lists may take some time, in particular on slower computers: an enormous amount of data must be compared and rearranged.

### Summary of stoppages

On many waterways locks and bridges are temporarily closed in order to carry out maintenance works and inspections. The periods, during which these works take place, are usually published long before, and incorporated in the Notices to Skippers. International Notices to Skippers are checked daily by **NoorderSoft**, and all stoppages in the waterways network are kept in an obstruction file, which is uploaded on **NoorderSoft**’s internet server.

Users of **PC-Navigo** can **download** this obstruction file from the server at any time, allowing the computer to check for any interruptions of normal traffic on the route it has calculated. If any stoppages are found - valid for the day and time the lock or bridge will be passed according to the
route plan - **PC-Navigo** suggests to calculate, which alternative will be best: either to take a detour, avoiding the stoppages, or to "sit and wait" until the traffic resumes its normal course.

<table>
<thead>
<tr>
<th>Object / Waterway</th>
<th>From:</th>
<th>To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoogkerkster Bridge</td>
<td>18-03-2019 13:00</td>
<td>25-03-2019</td>
</tr>
<tr>
<td>Fixed Bridge Mensingeweer</td>
<td>29-10-2018 00:01</td>
<td>12-04-2019</td>
</tr>
<tr>
<td>Schaphalsterzijl Lock</td>
<td>11-03-2019 10:27</td>
<td>12-03-2019</td>
</tr>
<tr>
<td>Fraamtil (Bridge)</td>
<td>04-03-2019 00:00</td>
<td>21-04-2019</td>
</tr>
<tr>
<td>Fraamtil (Bridge)</td>
<td>03-06-2019 00:00</td>
<td>03-06-2019</td>
</tr>
<tr>
<td>Fraamtil (Bridge)</td>
<td>04-06-2019 00:00</td>
<td>04-06-2019</td>
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<tr>
<td>Fraamtil (Bridge)</td>
<td>05-06-2019 00:00</td>
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<td>06-06-2019 00:00</td>
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<td>Fraamtil (Bridge)</td>
<td>07-06-2019 00:00</td>
<td>07-06-2019</td>
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<td>10-06-2019 00:00</td>
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<td>12-06-2019 00:00</td>
<td>12-06-2019</td>
</tr>
<tr>
<td>Fraamtil (Bridge)</td>
<td>13-06-2019 00:00</td>
<td>13-06-2019</td>
</tr>
</tbody>
</table>

The stoppages can be **visually** listed by means of the **SUMMARY OF OBSTRUCTIONS**. This does not affect the planning process: when a stoppage is found in a calculated voyage, **PC-Navigo** will automatically offer the choice to either avoid the concerned stoppage or "wait it out" or disregard it (if one is planning for analytical purposes only). When a route is calculated, **PC-Navigo** checks this summary too, in order to establish if there are any stoppages to be expected at the time of passage. If so, it presents these in a shorter list, allowing the user to **RECALCULATE** the route. The faster of the two choices will be chosen: either to wait for the end of the stoppage, if that is faster than a detour, OR the detour if this gains time.

If you do NOT want to take closures and obstructions into account, you may delete the file with **DELETE TEMPORARY OBSTRUCTIONS**. This function erases the special obstruction file with the exception of those stoppages that last for longer than a full year.

**PC-Navigo** contains both the full stoppages and the interruption of bridge or lock operation; for bridges, the latter means that a ship that can pass the closed bridge will be allowed to plan along that particular obstacle, while a ship that is too high will not.

The **STOPPAGE SERVER** of **PC-Navigo** that is used to modify the list of stoppages on a daily basis, can be reached with the address obstruct.noordersoft.com but it is easier to use the menu **OPTIONS**.
Show stoppages in the chart

PC-Navigo's STOPPAGES SERVER contains all planned and published stoppages by the various waterway administrations. The stoppages that figure in the list can be made visible in the survey chart. You must select the period of which you want to see the stoppages, and after doing so you'll see the stoppages as red dots in the chart.

If you zoom in to the chart, you'll see the dots change into red icons with an exclamation mark ("!"). If you switch the cursor to INFORMATION MODE - STOPPAGES (by means of the blue "i" button) and click on such a stoppage, you'll see the exact location and the time schedule of the stoppage; in the dialogue window frame you can read if it concerns a FULL stoppage or a restriction of dimensions or an interruption of lock- or bridge operation.

GPS monitor

Many people use the GPS values as an "instrument panel" during navigation: the speed, but also the ETA, are frequently looked at. To ensure that these data are always clearly readable a special monitor screen has been made available, the so called <GPS-Monitor>. The fonts, colours and the transparency of this monitor can be set under <Preferences>. This makes an easy reading possible even if the screen is a bit further away from the navigator. The transparency of the monitor prevents the blocking of information on the chart behind it.

Especially during dynamic voyage planning the user will want to cast a glance at the GPS values occasionally in order to be well informed about the progress of the voyage:

- The voyage plan process in PC-Navigo can be matched with the values of the GPS. The GPS position can control AND correct the voyage plan. If this option is used a regular check is carried out at the passing of each point in the route to see if that point is passed at the calculated time, or later, or earlier.
- If the time of passage deviates more than a default time (set at 10 minutes by default, but one can change it under <Preferences>) the computer will propose to amend the voyage plan, taking the current position as a basis. The voyage is then recalculated to see if a change of route has become desirable; a new ETA at the destination is calculated too, of course.
- If the repeated proposals of changes are not wanted, one can choose to have PC-Navigo carry out the changes without special confirmation: the software then simply recalculates at each point on the route.
Fuel monitor

If the fuel consumption parameters of a boat are known, they can be given in a table of fuel consumption in the boat's data. The tank volume, the volume at the beginning of a voyage and the critical (minimal) volumes in the tanks can also be given. Thus PC-Navigo can survey the fuel consumption during the voyage.

The voyage plan (containing the most likely speed at each stretch) is then used to calculate the fuel consumption in relation to the volume at departure. The position of the GPS is thus used as a measure for the remaining fuel. One can also demand the fuel quantities at any given point in the voyage, finding out where and when the fuel is going to run short.

An alarm can warn the user about the necessity to get extra fuel; searching the nearest bunkerstation can then take care of the refuelling.

Algorithm

The main menu ALGORITHM is the core of PC-Navigo. It contains all calculation software and algorithms with which PC-Navigo executes its routines: the route calculation formulas and the area calculation formulas. Worthwhile for you as a user are the parameters that PC-Navigo considers while calculating. These are:

- average current speed and direction per waterway section;
- average delay at each lock;
- maximum speed if lower than the boat's cruising speed;
- allowed boat dimensions in every section of the waterways;
- available dimensions in every bridge, lock etc.;
- operating seasons, schedules and operating hours per bridge/lock;
- time of arrival in relation to the operating schedule;
- averages and variations of currents and circulation density;
- closures of waterways on Sundays and holidays and long closures;

Not considered are the following parameters:

- Sudden unexpected closures of bridges / locks;
- Extreme traffic density caused by jams in the waterways;
- Extreme high waters and the consequent currents and closures;
- 'Incidental' bad luck or good luck: just (or just not) passing a lock;
- Longer than average delays due to available draught;
- Current caused by tidal effects.

Of course all results are in fact statistical averages. Nevertheless practice shows that the estimated
time of arrival can be established fairly accurately, even in the case of very long routes.

**PC-Navigo** allows a "manual" start of all the types of route calculations it can execute, but this is not really necessary: as soon as all relevant parameters are available, **PC-Navigo** will automatically begin to calculate the type of route that is selected in the detail screen of the survey map.

The main menu `<ALGORITHM>` allows you to use the following submenus:

- **Fastest Route**
- **Shortest Route**
- **Optimum Route**
- **Tourist Route**
- **Nearest...**
- **Criteria**
- "Shrink-to-fit"

## Dynamic Voyage Planning

The calculated voyage plan uses a number of assumptions to calculate the time it takes to navigate from a certain departure place or GPS position to a certain destination, such as possible current speeds, possible delays and possible amounts of traffic. Of course these averages will not always be valid.

The GPS offers the possibility to compare every point of passage on the PLANNED route with the REAL time of passage of that point. If the two moments differ more than a given amount of time (set as a default at 10 minutes, but under `<Preferences>` one can change this setting) then one can choose to recalculate the rest of the voyage with the correct time of passage at the current position.

Because such deviations can occur repeatedly (e.g. when the delay of a lock lasts 30 minutes, a proposal to recalculate will be made three or more times!) one may want to ask the software to carry out the recalculations without prior consent. The computer then carries out the recalculation any time the deviation occurs.

**ATTENTION.** Dynamic voyage planning uses very exact distances and positions. But because neither all waterway distances nor the GPS positions are always 100 % accurate, a sudden deviation may occur that seems inexplicable. This will be the case when the original distances on the waterway (as provided by the authorities) differ from the actual distances or when the GPS position is not accurately calculated (which happens in built up areas sometimes). Dynamic voyage planning tends to get confused by these mismeasurements. It is recommended to switch it off in situations where too much interaction with the user is required to adapt: using the original parameters usually leads to more or less average (and thus correct) values a bit later.

## Fastest Route

If you want to get to your destination the fastest way, you ask **PC-Navigo** for the `<FASTEST ROUTE>`. Even when detours are necessary to gain time, the program will do so. In a few seconds **PC-Navigo** compares every piece of waterway and the time it will take you to navigate it, and then
compares all these millions of "split seconds" to one another, thus arriving at the very fastest possible route. These calculations do not take more time than one or two seconds. The result is the fastest way of getting to your destination under the specified circumstances.

Keep in mind that minor changes in your timing may cause major changes in the resulting route. Due to Sunday closures in some countries, to differences in operating hours and to the effects of operating schedules used by the various authorities, you may gain or loose hours or even days by the coincidence of just passing a certain bridge or lock or just being the first to get stuck there. Do experiment with your time of departure and navigation hours to find an optimum for the concerned route.

One of the effects of this rather exact way of calculating your sailing time is that you may look at possibilities to slow down at certain stretches, because you will have to wait for a lock or bridge to be operated anyway. Without loosing any time you can thus spare fair amounts of fuel, plus the environment and your own nerves.

**Shortest Route**

Looking for the SHORTEST ROUTE, PC-Navigo will simply add up all the stretches of waterway you have to pass, and then it selects the series with the smallest amount of kilometres. Remember that 'shortest' really means SHORTEST! A gain of 10 yards, causing a loss of 5 hours of navigation, will be chosen without any consideration. To avoid very unlogical routes, you may first calculate the fastest, then the shortest route. If the latter differs from the former, you insert one or two "via"-places from the shortest route, and with these places active, you recalculate the FASTEST route, now by these via-places. This often results in a reasonable alternative for the first fastest route.

Please note that it is imperative to look at the arrival date when calculating the shortest route: in case of long term closures the route can get stuck before a lock that will be out of order for a long period of time (which is common in some of the waterways used mainly for tourist purposes: they sometimes close for the whole winter period). The comparison with the fastest route is always recommended.

**Optimum Route**

A bit more complicated than the FASTEST and SHORTEST route is the calculation of the OPTIMUM ROUTE. In this option PC-Navigo calculates how a boat can sail from departure place to destination with the smallest amount of "engine-hours". Delays for locks and bridges are analysed to see if they can save detours without loosing too much time; longer delays are planned at times, when a stop is practical (e.g. the end of the day). Thus fuel saving, relaxed cruising and yet reasonably fast traveling are combined. Often the optimum route is the best alternative for the fastest route.

In particular boats with non-continuous navigating schedules can profit from the optimum route calculation: counting engine hours heavier than waiting hours an optimum is established in which long waits are combined with nightly mooring. An efficient route is thus combined with the perfect match of navigation hours and rest periods.

**Tourist Route**
If you do not navigate professionally, and especially if you want to avoid the busy, often dangerous, main commercial waterway arteries - the avoidance of which will serve both yourself and the professional boat people - it would be nice to avoid the busy rivers and canals as much as possible and still arrive within a reasonable amount of time. On the continent, **PC-Navigo** can compare the available alternatives and choose the calmer, more picturesque and relaxed waterways. Thus you may find yourself on the river Meuse, the Canal de l'Est and the Moselle on your way to Strasbourg, rather than on the Rhine, or you will travel from Amsterdam to Rotterdam over the Amstel and Gouwe river instead of the very busy and unpleasant Amsterdam-Rhine-Canal.

In the United Kingdom and Ireland, almost all waterways are recreational. There is no specific classification of waterways of different dimensions, other than "broad" and "narrow" canals, whose touristic potential will often be identical. The calculation of the tourist route on the continent makes use of the differences in class, enlarging a "handicap" for waterways with a higher class and lowring it for waterways of a lower class. The result is a strong preference for the picturesque rural canals. Applying the same method in the UK - where these class differences do not exist - will hardly ever result in different routes. Only around the bigger waterways like the tidal Thames, the Humber, the Manchester Ship Canal and the Severn Estuary this option might be useful.

**Nearest...**

A specific area algorithm option is the calculation of a nearest provider or city/village. By "marking" the actual spot where your boat is as departure place and clicking the `<NEAREST...>` followed by the type of object you want to look up (city, village, quay, port, marina, fuel station) the computer sorts out an area list, in which the features are sorted by the amount of time it takes your boat to get there:

- **All (the whole navigable area)**
- **City**
- **Village**
- **Commercial quay**
- **Port**
- **Container terminal**
- **Marina**
- **Yacht mooring**
- **Fuel station**
- **Gauge**

**City**

As CITY the program contains the bigger conurbations alongside the waterways.

**Village**

As VILLAGE the smaller places along the waterways are indicated.
Commercial Quay

Commercial quays are quays or wharves which the authorities have appointed as mooring places for commercial boats. Usually they are real quays; in the German rivers, however, some places that are really hardly more than anchor places are indicated as commercial quays (e.g. in the Mosel). In France only quays with enough draught for laden commercial barges are taken into consideration.

In the United Kingdom and Ireland the distinction of "commercial" and "leisure boat" facilities is often useless: wharves in many of the historic canals will be shared by many different categories of users and boats, some of them "commercial" (like hire boats) but not in the sense that they are used for commercial transport of goods. It is recommended to take both types of mooring facilities (commercial AND leisure) into account if one plans a voyage with a leisure boat.

Port

Under PORT the program contains appointed commercial ports. Often commercial ports are not strictly reserved for commercial boats and barges, but under all circumstances commercial boats and barges have priority in these harbours, and they must not be hindered blocked in any way.

Container terminal

Under CONTAINER TERMINAL all terminals for the transshipment of containers have been incorporated, if they are EXCLUSIVELY used for container loading and unloading. Often an prohibition to navigate is valid for other vessels than container vessels in and around these terminals.

Marina

Under Marina the program contains all pleasure ports and harbours that are mainly used for pleasure craft.

An additional source of information is available in some countries in the form of data on the SERVICES and FACILITIES in marinas. The database contains information such as the number of (visitors) berths, facilities on the pontoons, facilities and services provided in the marina and even the availability of repair shops and yard services. Those who have this additional info in their license (the info is optional and costs extra!) can get access to it by means of the INFORMATION BUTTON.

Yacht mooring
Under Yacht mooring the program contains all pleasure moorings and mooring places especially suitable for yachts; some (former) commercial quays and wharves have been included, because they are hardly ever used by commercial boats anymore.

In the United Kingdom and Ireland the distinction of "commercial" and "leisure boat" facilities is often useless: wharves in many of the historic canals will be shared by many different categories of users and boats, some of them "commercial" (like hire boats) but not in the sense that they are used for commercial transport of goods. It is recommended to take both types of mooring facilities (commercial AND leisure) into account if one plans a voyage with a leisure boat.

Fuel station

As FUEL STATION the program contains all commercial and non-commercial possibilities to take fuel, petrol, diesel oil etc. For commercial purposes fuelling points are spread all over the European waterways system. In areas where fuelling possibilities are limited it is usually possible to get fuel from fuel trucks. In France this way of refuelling is becoming very common.

ATTENTION: Over the past twenty years fuel stations - particularly the ones installed on floating pontoons and converted vessels - have been subject to many new rules and regulations with regard to their environmental safety. This positive development, combined with the ever increasing scale of commercial barges, has had a negative side effect: many of the stations have been closing up in the past 15 years. It has made the update frequency of the fuel station data in most countries insufficient. In case of urgent need of fuel, please consult the local waterway authorities or skippers with local knowledge. If you find out that a certain fuel station seems to have closed, please let us know, so that we can erase the station from our data.

Gauge

In many places local level indicators define the available draught and air draught. The nearest "Gauge" or level indicator is usually used to decide on the water level.

Please note that the indicated level gauges differ from the general Ordnance Datum quite often. Whereas PC-Navigo holds all headroom and draught dimensions in relation to a "normal level", which is in turn related to the European Ordnance Datum, the Level Gauge results are often independent, local scales. Calculation of water depths and headroom under bridges is possible if one recalculates back to the ordinary water level average at the spot.

Criteria

The parameters that are crucial for the calculation of navigable routes are the boats length, beam, height, draught and cruising speed. To allow research and analysis of navigable routes, the various parameters can be switched ON or OFF in PC-Navigo. If you click on <CRITERIA> a dialogue screen
is opened showing the MAXIMUM LENGTH, MAXIMUM BEAM, MAXIMUM HEIGHT, MAXIMUM DRAUGHT, AVAILABLE (CHAMBER)LENGTH, AVAILABLE WIDTH, AVAILABLE HEIGHT and AVAILABLE DEPTH. You can activate or de-activate them one by one, to analyse where, and to what extent, blockades occur in the required route.

In the United Kingdom, the concept of "maximum authorised" dimensions does not exist. The "recommended" dimensions of British Waterways have roughly the same meaning in the voyage planning process, though: if a vessel is larger than the recommended dimensions, it MAY be able to pass, but it is certain that it's wise to inform before departure.

**PC-navigo** can calculate independently why a certain itinerary is not navigable for a certain boat: if no connection between the departure place and the destination can be established, the software first investigates if such a connection does exist if it calculates on the basis of other daily navigation hours (to avoid problems with the operation hours of locks and bridges) and then it checks on the maximum dimensions of a vessel that can sail from departure place to destination. If the result of this analysis is, that only smaller boats can navigate the itinerary, this will be reported to the user.

If you do "switch off" any of the dimensions in the calculation criteria, do NOT forget to switch them back on after your work: leaving them switched off might get you stuck if you plan a certain itinerary in the assumption that it was checked for it's navigability, while in reality it wasn't!

"Shrink to fit"

Almost all waterways have limitations with regard to the maximum dimensions of boats. To establish, what the largest boat is that can JUST navigate a certain itinerary, a repetitive calculation is needed.

If a connection between two places cannot be established immediately, the computer takes three steps to analyse the situation:

- first a recheck is carried out, to establish if the desired connection can be found with continuous navigation hours (to avoid that the obstruction is not in the dimensions, but in the limited operation of a certain bridge or lock) or with the switching on of "passage on demand" or "passage at extra costs". If this appears to be the case, the bar with WARNING-ICONS is shown in which the SECOND icon will blink in red: if you click on it, a window opens that allows you to modify your navigation hours;

- If a modification of navigation hours doesn't solve the problem, it is checked if a connection can be found if MARITIME NAVIGATION is allowed; in that case, the bar with WARNING-ICONS will show with the THIRD icon blinking red (the one with the wave): a click on this icon will open a window that allows you to
modify the navigation options in the vessel data;

- If no connection is found even with those ampler navigation hours or the possibility of sea crossings, then the bar with WARNING ICONS will show with the FIRST icon blinking red. Then the computer will propose to establish step by step what the dimensions are of the largest boat(s) that can only just navigate this itinerary. We called this procedure "Shrink-to-fit". The found results can be compared with the given boat's dimensions, and if they are smaller than the user's boat he/she may decide how to proceed: if the problems will be in the boat's length of beam, it may be concluded that the itinerary can really not be navigated; if it concerns the draught or air draught of a boat, though, some ballast or the removing of higher parts may solve the problem.

The resulting routes will be presented by their dimensions in the "Shrink-to-fit" screen. Clicking the check box behind one or more of the routes will put the selected route(s) into the active files, so that you can work further with the results. After selecting the desired routes, you must close the "Shrink-to-fit" dialogue screen.

As the itinerative process of these step by step calculations may require much time, especially on older or slower computers, the user is asked to confirm his wish to continue these calculations.

If even these calucations do not result in an itinerary, it can be concluded that departure place and destination are situated in separate areas of the waterway infrastructure. This is the case if an itinerary is sought from Brittany or the western French waterways to the rest of Europe, for example.

Often, the search for maximized dimensions does result in more than one route: if a certain itinerary can be navigated by boats of 80 meters long and 8 meters wide, for example, it is possible that another itinerary to the same destination would allow boats with a beam of 9 meters, but only if they are 70 meters long. These relations between the various dimensions can cause a whole range of different "largest dimensions". A comparison with the dimensions of one's own vessel will often be necessary.

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**Options**

The main menu OPTIONS holds a number of routines defining the views and calculations of PC-Navigo on a very high level, to allow you to adjust the software even more to your preferences. The following items are available:

- Find
- Browse
- Language
If you search details in **PC-Navigo** there are always three entries: either through the WATERWAY list, or through the OBJECTS/PLACES list, or through the interactive map.

The databases in **PC-Navigo** are built in a triple "layer" system: the first layer contains the waterways, canals and rivers, with the data describing their lengths, currents, speed limits, authorized dimensions, levels etcetera. The second layer contains the places and objects IN these waterways: locks, bridges, cities etcetera, each with their dimensions, vhf-channels, phone numbers and so on. The third layer contains general data the computer needs to calculate routes: calendars, lists of national celebration days, statistical data on lock delays, etcetera.

The last - general - layer is not of much importance to you, but the difference between the first and the second must be kept in mind: before starting a search, ask yourself if the researched item is a waterway (stretch) or a point IN a waterway (point). You will find the Amstel river in the list of waterways, but the Amstel bridge in the list of objects.

Lists are provided in dialogue boxes at both options, allowing you to scroll through the list or to type (the first characters of) the wanted waterway or object or place. Detailed surveys can be made by putting the cursor on the desired item and double-clicking the left mouse key. Places can also be "marked" with the right mouse key, to turn them into place of departure, destination, "via"-places or "avoid"-places.

### Place/Object

**Waterway**

**In the map**

**GPS-position**

### Place/Object

If you're looking for a place by its name, you can type it into the record; a list is presented with all the possible names of places and objects in it. You don't have to type the full name, a part will do too: if you type "Beaucaire" you'll get a list with all places and objects that contain the concerned characters. Don't bother about accents, capitals or accentuated spelling, **PC-Navigo** checks them all. If you type "Sete" you'll get both the "Boalseterhimbridge" and the city of Sète.

Double-clicking on a place with the cursor selects the concerned place and opens details in a pictogramme screen. With the right mouse button a place may be marked as departure, destination, "via" or "avoid" place.

**ATTENTION:** In **PC-Navigo** you can set the names of waterways and objects in the LOCAL language (resulting in "Écluse de Suresnes" even if the program works in english) or in your preferred language (in which case "Suresnes Lock" will appear). This fact has consequences for the search commands: you must specify the searched name in either the local language or in your preferred language,
depending on which one of these two you have opted for!

**Waterway**

If you're looking for something in a certain waterway, you may choose from a list of waterways (by their official names). Clicking on one opens the pictogramme list of this waterway, thus allowing you to select and maybe "mark" a place as your departure, destination, "via"-place or "avoid"-place.

ATTENTION: In **PC-Navigo** you can set the names of waterways in the LOCAL language (resulting in "Canal du Rhône au Rhin" even if the program works in english) or in your preferred language (in which case "Rhône-Rhine Canal" will appear). This fact has consequences for the search commands: you must specify the searched name in either the local language or in your preferred language, depending on which one of these two you have opted for!

**In the map**

You can use the survey map of **PC-Navigo** interactively: by first clicking on the "finger"-button and then clicking on the place in the map where you want to select something, you get a list of places and objects in the vicinity. The radius can be set in the menu **FILE** under **PREFERENCES**. By selecting one and clicking on it, you can "mark" it as your destination, departure or as "via" or "avoid" places.

ATTENTION! The survey map in **PC-Navigo** is NO navigation chart! If you want to use **PC-Navigo** to navigate in waters you're NOT acquainted with, you MUST use an ENC chart of **PC-Navigo** by zooming in far enough to make the appropriate electronic nautical charts visible, OR you must make sure you have enough detailed paper chart material available!

If you're navigating with **PC-Navigo** you may want to put the chart window FULL SCREEN; this can be done with a push on the F-11 key. Changing back to the original chart window is also done with F-11.

Both actions can also be performed with the FULL SCREEN BUTTON.
The survey map consists of two parts: on the left, the actual map is shown, with the result of a route calculation drawn in contrasting colours. Should any part of the route need adaptation or improvement, you can always add "via" places or avoid places to adapt it to your needs and recalculate the route. To the right of the actual map is a screen that contains details, either details needed to define the specifications of the planned route, or details describing the resulting route itself.

The plan process - that is the actual definition of a route plan - can easily be carried out in the detail screen on the right: in the "planning mode" this screen shows all relevant choices neatly grouped together: the selected boat, dimensions with which to reckon, (planned or calculated) date and time of departure, place of departure, destination, via-places and places to avoid, (calculated or planned) date and time of arrival, and the type of route calculated (fastest, shortest, optimum or tourist).

Modification you can make in this screen are:

- the choice of boat: a click on the "select" button allows you to define another boat than the one that is actually selected;
- the search criteria: by the activation of the check boxes in front of the signs with authorized (red) and/or available (blue) dimensions (length, beam, air draught and draught) the respective dimension is - or is not - regarded in the calculations of a navigable route;
- the place of departure, the destination (both with the "location" button) and the via-places and places to avoid (with the plus and minus signs next to the respective fields);
- the type of route to be calculated: the fastest (in time), the shortest (in distance), the optimum (in engine hours) or the most tourist route (following the smallest and most picturesque waterways);
- the planned (or calculated) date and time of departure and the calculated (or planned) time of arrival: if one of the two is filled in, the other is automatically recalculated.

Once a route has been planned and calculated, the detail screen on the right can be switched to the "navigation mode" by means of the button on the right of the row of buttons. In the "navigation mode" the detail screen on the right shows the characteristics of the route itself: waterway name, class, level, authorized dimensions, distance laid back, distance ahead, name of the place or object, time of passing, available dimensions, VHF-channels, phone numbers and operating hours. The exact location of which the details are shown can be established manually - by pointing with the mouse - or (if a GPS-device is connected) automatically by the GPS coordinates. You can switch between the manual and automatic positioning by means of the row of buttons above the map. If the GPS controls the position, the details shown in the right screen are always the details of the place where the boat is navigating.

Dialogue screens with phone numbers of the bridges and locks, dialogue screens of the operating hours and a dialogue screen allowing time corrections in the route plan can all be opened directly from the detail screen.
the detail screen, the little button on top slides the Pictogramme screen into the picture (this may also be
achieved with <VIEW>, <PICTOGRAMMES>). The pictogramme is a schematic representation of all objects and constructions in the itinerary, like bridges, locks, quays, harbours and other objects. Both with a GPS and with a manual pointer - by clicking at the right position - the specifics of that object can be made visible in the details screen at the right: dimensions of the passage, operating hours, communication channels and so on. The complete integration of the chart, the details screen and the pictogramme screen assures that you will always be able to see all relevant information on any particular point in your itinerary.

When in the Raster Viewer mode, you can make the list of various chart layers visible by means of the VIEW menu, LAYER LEGEND. If the legend is switched ON, you will see the various layers of the chart, the ENC layer, the PHOTOS layer, the NOTES layer, the ANWB (marina services) layer, the ROUTE layer, the STOPS (stoppages) layer, the GPS layer and the AIS layer. The order of the layers can be dragged to change the drawing order of the chart image.

ATTENTION: changing the drawing order in the Raster Viewer may result in HIDING certain chart elements, as they're covered by other chart elements; this will, for example, be the case if the ENC are drawn the last (i.e. if the layer is at the BOTTOM of the list): it will then hide the photos and notes and the other features in the layers above!

Users who have a PC-Navigo version and the appropriate ENC cell at their disposal, will notice an abrupt change of the chart image at a certain zoom factor: the survey map turns into an electronic nautical chart (ENC). If one zooms in still further, more and more details become visible, until finally all that is relevant for the navigation is shown, when the zoom factor approaches the setting used in computer- and GPS-aided navigation. See also PC-Navigo-ENC.

### GPS based search

If a GPS is connected to the computer - and if this GPS provides a valid signal - you can search objects in the immediate vicinity of your position. A click scans the data for objects in a radius (that can be set and changed under <Preferences>) around your position. Thus it is easy to find certain targets (like mooring quays, bunker stations or towns/villages) near where you are.

If no GPS is connected or if a connected GPS does NOT provide a reliable signal, this function is not available. A dialogue box will then inform the user that the function cannot be accessed.

### Browse

With <OPTIONS>, <BROWSE> you can open the BROWSE possibility, as under VIEW and BROWSE with the WATERWAYS submenu. But here, you can also BROWSE through the MARINA SERVICES: you can check the ANWB database of services and facilities in most marinas. This database is a list of all leisure boat harbours and services. It provides detailed information on all sorts of services and facilities in the port, varying from the number of guest moorings to the capacity of a boat lift or the availability of 220 V or water. A click on the SHOW IN THE CHART menu shows where the port is situated.

Browsing through the WATERWAYS, places can also be "marked" with the right mouse key, to turn them into place of departure, destination, "via"-places or "avoid"-places.
<BROWSE> allows you to enter directly - so without planning any route at all - into the data of PC-Navigo. A list of waterways is produced, in which you can select one by clicking it. In a so called PICTOGRAMME SLIDE SCREEN (that is a screen in which many details are represented by schematic icons) details of the selected waterway are made visible, while many more are 'hidden' behind special 'buttons' (such as operating hours, VHF-channels etcetera): one click is enough to get these data on screen.

Browsing gives access to the following data:
- VHF-channels;
- lock chamber length;
- lock chamber, bridge or passage width;
- available headroom;
- available draught;
- the same dimensions for a secondary passage;
- speed limit;
- maximum vessel length;
- maximum vessel beam;
- maximum air draught;
- maximum draught;
- suggestions and hints for navigation;
- phone numbers;
- operating hours;
- current;
- water level;
- VHF-sector channels;
- VHF-information channels.

ATTENTION: In PC-Navigo you can set the names of waterways and objects in the LOCAL language (resulting in "Écluse de Suresnes" even if the program works in English) or in your preferred language (in which case "Suresnes Lock" will appear). This fact has consequences for the search commands: you must specify the searched name in either the local language or in your preferred language, depending on which one of these two you have opted for!

**Language**

In the dialogue window you can switch from one language to another at any moment, also while performing calculations. As a default the program is distributed in the language of the requested manual.

*Nederlands*  
*Deutsch*  
*Français*  
*English*

The language settings can be applied in two variations: the one changes ONLY the program tags and names (the menus, help screens, buttons and dialogue boxes), the other INCLUDES the waterway and
object names (and some of the place names like Vienna, Cologne and Brussels). If one chooses <Waterway names in the local language>, all names will appear in their original language (resulting in "Schleuse Koblenz" and "Rheinbrücke" and Écluse de Noyon" and "Most Kolejowi Warsawa" etc). If you choose <Waterway names translated> you'll see "Koblenz Lock" en "Rhine Bridge" en "Noyon Lock" en "Railway Bridge Warsaw".

Mind the consequences for a search by object name: if you set the program to translate waterway names too, you must enter the TRANSLATED name for a search command!

Nederlands

"Nederlands " translates all texts, buttons, labels, help screens and so on into Dutch, INCLUDING the translatable parts of the place and object names in the various countries. If you want the names to appear in the LOCAL language (which is often easier for a smooth recognition of names and an easier communication with lock and bridge keepers) you can select the names to appear in the local language.

Deutsch

"Deutsch " translates all texts, buttons, labels, help screens and so on into German, INCLUDING the translatable parts of the place and object names in the various countries. If you want the names to appear in the LOCAL language (which is often easier for a smooth recognition of names and an easier communication with lock and bridge keepers) you can select the names to appear in the local language.

Français

"Français" translates all texts, buttons, labels, help screens and so on into French, INCLUDING the translatable parts of the place and object names in the various countries. If you want the names to appear in the LOCAL language (which is often easier for a smooth recognition of names and an easier communication with lock and bridge keepers) you can select the names to appear in the local language.

English

"English" translates all texts, buttons, labels, help screens and so on into English, INCLUDING the translatable parts of the place and object names in the various countries. If you want the names to appear in the LOCAL language (which is often easier for a smooth recognition of names and an easier
communication with lock and bridge keepers) you can select the names to appear in the local language.

Circumstances

Some of the parameters that play a part in PC-Navigo's calculations are statistical averages. Actual circumstances that can vary quite a lot are the speed of currents, related to the flow of a river, and the traffic density, particularly in waterways that are canalised (due to jams at locks). In <CIRCUMSTANCES> you can enlarge or diminish the effect of the average statistical factors by moving the track bars up or down. The result will be a percentual difference in the effect of the current, respectively the locking time, on the total amount of time the journey takes.

Beware that increasing the statistical effects of a current may cause the resulting current to prevent a relatively slow boat from sailing upstream! By this effect an originally navigable route can become unnavigable for that particular boat.

Downloading stoppages

On many waterways locks and bridges are temporarily closed in order to carry out maintenance works and inspections. The periods, during which these works take place, are usually published long before, and incorporated in the Notices to Skippers. International Notices to Skippers are checked daily by NoorderSoft, and all stoppages in the waterways network are kept in an obstruction file, which is uploaded on NoorderSoft's internet server.

Users of PC-Navigo can download this obstruction file from the server at any time, allowing the computer to check for any interruptions of normal traffic on the route it has calculated. If the button "DOWNLOAD STOPPAGES" is clicked, the computer makes contact with NoorderSoft's internet server and automatically downloads the stoppages file. The file contains both the date it was downloaded and the date it was modified by NoorderSoft, allowing you to check whether your file is accurate and up to date. The list can be viewed with VIEW and SUMMARY OF OBSTRUCTIONS.

If any obstructions are found - valid for the day and time the lock or bridge will be passed according to the route plan - PC-Navigo suggests to calculate, which alternative will be best: either to take a detour, avoiding the stoppages, or to "sit and wait" until the traffic resumes it's normal course.

NB: in order to be able to access NoorderSoft's servers, an internet access must be available. It is advised to use a recent version of the obstruction file when planning longer routes - in particular routes through France. A file not older than 14 days will generally do.

PC-Navigo contains fully automatic DOWNLOAD STOPPAGES function. The address of the stoppages server can be modified with PREFERENCES, COMMUNICATION PARAMETERS. If for some reason it is impossible to automatically download the stoppages you will automatically be sent to our website, where you can manually download the stoppages.

If you do NOT want to take closures and stoppages into account, you may delete the file with DELETE TEMPORARY OBSTRUCTIONS. This function erases the special obstruction file with the exception of those stoppages that last for longer than a full year.

Since version 2010 the file contains both the full stoppages and the interruption of bridge or lock operation; for bridges, the latter means that a ship that can pass the closed bridge will be allowed to
plan along that particular obstacle, while a ship that is too high will not.

Delete temporary stoppages

In some cases it is unpractical to take all closures and stoppages in the waterways into account. If one is analyzing routes in general without knowing precisely when a voyage will be made, for example, or if there has not been an occasion to download the actual list from the internet.

With DELETE TEMPORARY STOPPAGES one can erase all those stoppages that are valid for a relatively short period of time (e.g. one day, one week or even one month). Only the long term interruptions (such as waterways that have remained closed for an extensive period now, or repairs lasting longer than a full year) are kept in the database.

The list of long lasting stoppages has been updated on the 1st of January 2017.

To restore the normal situation one can simply download the obstruction file again from the internet with the DOWNLOAD OBSTRUCTIONS menu.

Legends

Three series of symbols are used in PC-Navigo, some of which may require explanations:

- The symbols, signs and images used in ENC-navigation charts;
- The symbols, signs and images used in marina data, derived from the ANWB water almanac;
- The symbols, signs and images used in lock and bridge operating schemes.
- The symbols used to represent other vessels in the AIS receiver;

With a click on the desired series tab, the legends can be opened.

Chart notes

The user of PC-Navigo can also make notes directly into the chart. A double click on the desired spot or a left mouse click and a choice for the NEW CHART NOTE option opens a text field in which remarks, notes or reminders can be stored in relation to the indicated spot. Above the text field a note name can be added, that appears next to the note icon in the chart.

The tab page ADVANCED provides the exact latitude and longituide of the click and the note, the scale above which the note is to appear, the file name where the note is stored and the date the note was first added.
When opened these notes can be edited as well: a click on the EDIT button reopens the text field and allows amendments.

Except text the user can also copy and paste pictures (photo's, chart fragments, sketches) in the note. These may allow a clarification of the situation at the specific spot.

Regularly additional graphic material is offered through the NoorderSoft web site, such as pictures of bridges, locks and other objects. These additions may also be added to the software as a chart note. Likewise an exchange of other user’s comments and additional information will be made possible in the course of this year: please check our web site regularly for more information on these topics: www.noordersoft.com.

If the icon of a chart note appears, a click on it with the INFORMATION CURSOR in the "NOTES" mode is enough to open the information in the note. If a note name has been added, this name will also appear in the chart. It may be a good idea to give notes that indicate a danger a name that expresses the urgency of the note (e.g. "WATCH OUT!").

Info

<INFO> shows you information about copyrights and about the makers of the software. INFO also contains the specifications of the HELP DESK telephone lines, hours and numbers, and the current version number of your software. For more about PC-Navigo and NoorderSoft please visit our website: www.pcnavigo.com

At the bottom of the form you will find the serial and build number of this version of PC-Navigo. This number is important to establish the need to download a patch or update and to extend the coverage. The number consists of four parts: the first number is the version number (2020), this is followed by the coverage code, the sub version number and finally the "build" number (indicating the different production series).

Register via Internet

Licenses for PC-Navigo are provided on a personal basis. Of each license holder, a number of data are kept, with regard to his or her rights to certain uses of the program (e.g. the coverage, the options and the year version). License rights can be turned over to somebody else, but ONLY with permission of the original license holder. This is to prevent the abuse of stolen license keys (dongles).

In particular when a license has been purchased through a reseller, registration with NoorderSoft is important: only registered licenses will be taken into account for updates, options and the right to receive free data.

A click on REGISTER VIA INTERNET will open a form - provided there is an Internet connection available - in which the license holder can provide his/her data. A click on OK will post this form to NoorderSoft.
The chapter HELP contains the help screens, but also additional information about licensee registration, about the makers of PC-Navigo and about access to on line help desk services.

Interactive help for the use of PC-Navigo can be obtained by putting the mouse cursor at a subject, on which you want to be informed, and pushing the F1-button. Usually the right help screen will pop up straight away. If you want more help, or help on another topic, you may also click on the Index field on top of this screen.

In the helptexts and manuals you will find many so called "links", which can connect you to other places in the help text or manual where a related topic is explained. By clicking on such a link you're moved to those related topics and you can read more about their details and workings.

In the main menu HELP the following items are available:
- Contents
- Registration via Internet
- About
- On line help desk

Online Help Desk

The ON LINE HELP DESK is a tool that allows the programmers of NoorderSoft access to your computer. A click on this menu opens a window that provides an access code ID and a pass word. If you give those to the programmer of NoorderSoft, he will be able to view your computer screen via Internet.

The link with your computer is a "once only" affair: any next time the operator wants access to your computer again, he'll need your permission and a new password. The operator that looks at your screen with you is highly capable of judging what may be wrong in ONE glance only, and he'll even be able to make the necessary modifications and repairs for you. On some computers and operating systems your cooperation will be needed every once in a while, e.g. to give permission for certain actions that are savedguarded by your virus scanner or fire wall, or to connect or disconnect the dongle, or to insert a CD.

The repair of malfunctions and the correction of installation errors is mostly done MUCH faster on line, because the programmer knows his way in the software much better than most of the users.

When the connection is interrupted at the end of a session, you'll see the markers of the on line connection disappear and you'll also see the background image - which is usually suppressed to allow a faster connection - return on your screen.

Dongle modifications
The software is copy-controlled by means of a USB-dongle, a little "start key" that contains the data of your specific license. Modifications in that license (e.g. when you buy an update to a newer version) can be inserted into the dongle by means of a simple update code.

This update code can be entered manually, by means of the DONGLE INFO AND UPDATE tool in the PC-Navigo 2017 folder: the code must be entered in the indicated field and a click on UPDATE NOW will change the license accordingly. After a few seconds you'll see the new dongle data in the window above the code field.

If your computer has access to the Internet while you're executing an update or extension, the dongle change can occur automatically: your computer makes contact with our license server and installs the necessary codes without any interference. After the automatic update, your dongle is able to run the updated program and, if applicable, the added options.

**Date and time of arrival**

**PC-Navigo** calculates the route from departure to destination by means of a Dijkstra Algorithm: starting at the departure point, the whole network of waterways is scanned for navigability. Then all the "nodes" are defined and the links between them are calculated for time or distance it takes to pass them. This is how **PC-Navigo** arrives at the fastest, shortest, or optimum connection between the two places.

The calculation takes a large number of parameters into account simultaneously:

- dimensions of the boat in comparison with the dimensions of bridges, locks etc.;
- dimensions of the boat in comparison with the authorized dimensions of the waterway;
- speed of the boat in relation to speed of the current of the waterways;
- the seaworthiness of the boat;
- speed of the boat in relation to the maximum speed in the waterways;
- operating hours of bridges and locks, in relation to the time of arrival of the boat at the bridge or the lock;
- (average) delays at bridges and locks;
- daily navigation hours (exploitation hours);
- announced interruptions of traffic in the waterways;
- preferences of the user with regard to places that need to be visited (via-places);
- preferences of the user with regard to places that need to be avoided (places to avoid);
- calculated time of navigation over all waterways (for the fastest route);
- calculated distance over the waterways (for the shortest route);
- calculated amount of engine hours needed to cover all waterways (for the optimum route);
- calculated distance over class I waterways (for the tourist route);

The red lines may result in the impossibility to establish a navigable route between the departure point
and the destination. Although this will be seen as logical for the dimensions, it is less evident for the speed. Yet a boat that cannot develop enough speed to overcome a strong current going the other way, will not be able to navigate a certain waterway upstream.

Even less obvious is the importance of daily navigation hours for the possibility to establish a route. Yet, a sailing boat, that has to pass the railway bridges of Amsterdam, can do so ONLY at night (when traffic is low). If this boat plans a route to be navigated between 09:00 a.m. and 5:00 p.m., it will NEVER find a possibility to pass these bridges!

To keep the user from having to "guess" where the obstructions are, PC-Navigo adds two extra checks to its calculations:

1. it checks if a navigable itinerary can be found when the given navigation hours are expanded;
2. and if not, it finds the largest possible dimensions of a boat on this itinerary. In this exercise it will produce one or more itineraries, (each) with its/their respective maximum dimensions.

These checks are presented in the form of the bar with WARNING ICONS:

Once PC-Navigo has established a route, the exact time of arrival at each bridge and lock is calculated, so that a check can be done whether the arrival coincides with the operating hours or not. If not, the boat is made to wait until the next possibility to pass the bridge or lock.

Thus a step by step calculation is made until the boat reaches its destination. The time of arrival there can be established very accurately, and of course, so can the distance laid back since the departure. To final result is depicted in the survey chart, the pictogram screen and the voyage plan.

Voyages that will NOT be planned based on the presumable time of departure, but on the basis of a required time of arrival (e.g. voyages for which the unloading process is planned, or voyages that have the risk of getting "stuck" in an interruption of navigation) can be calculated "backwards" from the wanted arrival time: in time planning the arrival time can be inserted, and the necessary departure time will then be calculated.

**Time correction**

Sometimes a journey is interrupted, e.g. for loading or unloading on the way, or to have a break. The
TIME CORRECTION function in **PC-Navigo** allows for the planning of such breaks.

At the required place or time the moment at which the journey is resumed can be entered. **PC-Navigo** then recalculates the remainder of the journey.

The TIME CORRECTION can also be used to correct differences between the calculated journey and reality manually: if it is found that a certain place is reached later or earlier than planned, a correction can be given, so that the remainder of the route is recalculated. If a GPS is used in connection with **PC-Navigo**, this correction can also be made automatically by means of <Dynamic voyage planning> (see also <Preferences>): in dynamic voyage planning, an interaction between the voyage plan and the current GPS position is used to guard of passage of a certain point really takes place at the calculated time. If a deviation of more than a set value (default: 10 minutes) then the remainder of the voyage is recalculated in order to establish a new ETA and to find out if an amendment of the route is advisable.

A change of daily navigation hours is optional, when one changes the time of passage at a certain position.

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**Operating hours**

**PC-Navigo** calculates the route from departure place to destination in such a way, that its time of arrival at each bridge or lock can be compared with the operating hours of that bridge or lock. Upon arrival at each bridge or lock a check is executed to establish if operation is required: if a boat can pass the bridge unopened, or if the lock is only a flood lock which is normally open at both ends, no check on the operating hours is needed. For other cases, it is checked whether or not there is operation at the time of arrival.

For the operating hours a check is executed on the date (because of the operating seasons), on the day of the week (because of the differences in operation between weekdays, saturdays, sundays and holidays) and the time of day. Moreover, a check on the COUNTRY in which the bridge or lock is situated, covers for the differences in national holidays.

Apart from these checks, the category of boat is checked (to account for differences in operating hours between commercial craft and pleasure boats) and the preferences of the user are taken into consideration (does he/she only want to pass during "normal" operating hours, or also if operation is on demand or even at additional costs?)

All operating hours of all bridges and locks in Europe are regularly checked, and Notices to Skippers - in which changes are announced - are checked on a daily basis. Nevertheless differences may occur between the operating schedules in the databases of **PC-Navigo** and the real hours of operation. If you have a possibility to send us an e-mail whenever you find different operating schedules, we would truely appreciate this. You can mail us at info@noordersoft.com

Many locks and bridges in the United Kingdom have BW staff on duty during some hours of the day, but they can be passed at OTHER hours if the crew operates the lock or bridge themselves. Of course, these practices have little or no effect on the progress of the boat. In the operating schedules, the periods WITH staff are seperated from the periods WITHOUT staff, but the boats are let through at all times.

During the past years, many modifications of existing operating schemes have been published for the period between Christmas and New Year. These publications are often released on a very short term, sometimes only days or at best weeks before. It is therefore necessary to inform locally in case of a voyage that includes the dates between december 24th and january 2nd of each year. A dialogue box will appear - after you've downloaded the stoppages - to warn you for the risk.
No route could be found?

If a connection between two places cannot be established immediately, the computer takes three steps to analyse the situation:

- first a recheck is carried out, to establish if the desired connection can be found with continuous navigation hours (to avoid that the obstruction is not in the dimensions, but in the limited operation of a certain bridge or lock) or with the switching on of "passage on demand" or "passage at extra costs". If this appears to be the case, the bar with WARNING-ICONS is shown in which the SECOND icon will blink in red: if you click on it, a window opens that allows you to modify your navigation hours;

- If a modification of navigation hours doesn't solve the problem, it is checked if a connection can be found if MARITIME NAVIGATION is allowed; in that case, the bar with WARNING-ICONS will show with the THIRD icon blinking red (the one with the wave): a click on this icon will open a window that allows you to modify the navigation options in the vessel data;

- If no connection is found even with those ampler navigation hours or the possibility of sea crossings, then the bar with WARNING ICONS will show with the FIRST icon blinking red. Then the computer will propose to establish step by step what the dimensions are of the largest boat(s) that can only just navigate this itinerary. We called this procedure "Shrink-to-fit". The found results can be compared with the given boat's dimensions, and if they are smaller than the user's boat he/she may decide how to proceed: if the problems will be in the boat's length of beam, it may be concluded that the itinerary can really not be navigated; if it
concerns the draught or air draught of a boat, though, some ballast or the removing of higher parts may solve the problem.

Sometimes even these calculations result in the message "No route can be found from your departure place to your destination", which means, that **PC-Navigo** was NOT able to establish a navigable connection bewteen the two. This can have a few different causes:

- Normally a connection exists, but it is cut off because of a stoppage of which the duration is unknown;

  **The SOLUTION:** if there is a detour to avoid the stoppage, **PC-Navigo** would have found it. If it didn't, the stoppage will appear crucial for the connection between departure place and destination.

- Even the smallest boat wil NOT be able to navigate from the departure place to the destination if the waterways network is not connected by inland waterways and navigation by the sea is excluded. This is the case when the origine and the destination are in different parts of the waterway system: one in Germany and the other in Brittany, for example: the connecting waterways have long been abolished.

  **The SOLUTION:** Switch on the option for maritime navigation in the **<BOAT DATA>** or **<TIME PLANNING>** menu and see if the maritime stretch is feasible. The part of the route that leads over maritime waters can be influenced by means of extra "via" or "avoid" settings.

Even for those cases where an itinerary is found for boat's dimensions that are smaller than the dimensions of your vessel, you may wonder about the reason, if you're convinced that such an itinerary does exist. This might be caused by the following circumstances:

- the place of departure or the destination are situated in a waterway that is NOT navigable for the boat with which the route is planned. (For example: the destination is situated in "Amsterdam-Centrum" - which is on the Amsterdam Canals - while the boat is a giant barge of 110 by 11,45 meters);

  **The SOLUTION:** Check the exact location of departure, destination and possibly of Via-places and make sure they are situated in a waterway big enough for the type of boat you're sailing.

- Departure and destination are both on a waterway large enough for the boat, but there is NO uninterrupted connection of the same size between them (e.g. Rhine barges can navigate both the Rhine and the Rhône, but NOT the connecting canals)

  **The SOLUTION:** If a connection is navigable for boats SLIGHTLY smaller than the boat you're planning with, it's recommended to plan the route with a smaller boat and check the critical (maximum) dimensions, to see how critical the dimensions really are. If the differences are very small, it may be feasible to navigate the connection by means of particular measures (ballasting, breaking down a wheel house, a.s.o.).
If a route is calculated, a range of situations may occur that influence the choice of the route or the way it can be navigated. In those situations the toolbar containing the WARNING ICONS is shown, a tool which allows the user to see in ONE glance what's the problem:

- When it's obvious that no navigable connection between departure place and destination can be found, the FIRST warning icon will blink in red. With "Shrink to fit" the program can be told to calculate the dimensions that DO allow to reach the destination;

- If the daily navigation hours are less than full time, it is checked whether a lengthening of the navigation hours will result in a navigable connection; the problem may after all be due to the fact that lock or bridge operating hours may be completely before or after the indicated navigation hours of the ship. If the problem is indeed in the operating hours, the warning icon with the clock (the SECOND icon) will blink red. A click on that icon opens a window in which the operating hours can be extended;

- If still no route can be found, it may be necessary to allow for open sea navigation. In that case the THIRD warning icon (with the wave) will blink red. A click on it opens a window that allows a modification of the settings of the ship, in particular for open sea navigation;

- Even WITH a navigable route a result of the calculation, some warnings may be necessary: if the FOURTH icon blinks red, it is mandatory to announce certain lock or bridge passages up front. A click on this icon opens the
list of bridges and locks where this is the case and provides their phone numbers;

Another warning in a route concerns possible STOPPAGES, either on the route itself OR on a logical alternative; apart from the option to either make a way around the stoppage or to wait for the end of it, a click on the FIFTH icon for the stoppages lists the concerned stoppages and their duration.

As a result of a route calculation, either one or more icons may blink!

**Distance**

**PC-Navigo** calculates three of the four possible types of route by comparing the time it takes to navigate them: both the **fastest** and the **optimum** and the **tourist** route check the time it takes from one point in the waterways network to the other.

But as soon as the route is established, **PC-Navigo** can of course calculate the total distance of the route: the total amount of miles, nautical miles or kilometers is presented in the route screen, and so are the distance laid back and the distance still to cover at each position along the route.

Only the **SHORTEST** route really counts the miles. That is reason to warn: shortest, for the computer, really means shortest, so that a shortest route that takes the boat to the neighbourhood of Ghent, will send the boat through the long and winding city waters instead of via the circular canal around the city: the circular canal is some 300 meters longer than the city waters - although it takes half a day less to pass it!

Another typical effect of the shortest route is the way it deals with stoppages: even if a stoppage may hold traffic for over a year, shortest is still shortest, and the boat will be made to wait until the end of the stoppage. All of these things make it clear that it’s wise to use **SHORTEST ROUTE** with great care and awareness of the possible consequences.

Please mind that routes over sea are often faster than routes over the inland waterways. As not all boats will be equipped for regular voyages on open sea, it is wise to exclude maritime navigation if one wants to be certain to arrive at a destination: should bad weather occur, you may want to make sure that there is a safe detour available!
New in PC-Navigo 2020

- The Inland-ECDIS viewer in **PC-Navigo** has been adapted completely to comply with the new Central Rhine Commission's requirements to carry ENC-charts in the information mode; **PC-Navigo** is therefore a fullblown Inland-ECDIS system compatible with the new 2015 regulations;
- All ECDIS (=ENC-) charts in **PC-Navigo** have been updated according to the very last publications of the German, French, Belgian and Dutch waterway authorities;
- Charts of the waterways in West-Poland have been added, and these waterways have been fully reviewed;
- An EDIT function has been developed to modify or add or delete buoys and beacons in the charts. The user can keep his charts up to date now;
- A few added options to PREFERENCES allow the modification of line colours and track colours in the charts, to improve visibility (in particular for colorblind people);
- **PC-Navigo** has been updated to work on windows 10. Currently we support 7, 8.1 and 10.
- In the plan-data of **PC-Navigo** there are now 60.900 "points of interest"! Some substantial additions to the existing infrastructure have been added;
- The ECDIS (or ENC-) library now contains 870 pre-installed chart cells for West-Europe; the cell of East-Europe (available as a free download from our sites) contains 282 charts. More than two thirds of these cells have been recently updated or re-published;
- **PC-Navigo** online routeplanner was launched. This is a website, optimized for mobile, tablet and PC, which allows you to plan your routes quickly and easily. Ideal for use on the move. **PC-Navigo Online Routeplanner**
- Some labels and hints in the program have been improved or clarified;
- ALL operating hours and ALL planned stoppages for 2020 have been checked and corrected; if necessary, more modifications will be included in the patch files, which will be available on our website for free;
- New user interface with new buttons
- Blue Wave functionality has been added. More on this at our Blue Wave page.
- NTS messages can be loaded and displayed. More on this at our NTS page.
- Improvement of AIS interface

A fast start with PC-Navigo

**PC-Navigo** is a voyage planner for the inland waterways. It works more or less like a navigation system of a car: a place of departure and a destination are entered and the computer calculates how one gets from the one to the other. To get started quickly, you'll have to set the following steps:
1. First you insert the specifications (once) of one's own boat. This is done with the main menu <Edit> and the submenu <Boat data>. At the bottom left of the <Fleet list> screen you find an <Add> button. Clicking on it opens a screen with a whole series of standard vessels. If you click on the vessel that approaches your own, this vessel is added to the fleet list screen in which you may adjust the various data:

- your boat's name;
- a vessel ID number if applicable;
- length, beam, air draught and draught;
- cruising speed (average, on still open water);
- whether you're a commercial or plaisure craft;
- whether or not you navigate Sundays;
- (if commercial) what navigation hours you operate;
- (average) daily starting time and end time of voyages that last more than one day;
- whether or not your boat can sail the open seas (or whether or not you want this).

Apart from these data you can also enter some parameters that define your fuel consumption: a table of average consumption at certain speeds, an indication of counting in cubic meters or in liters, the total volume of your tanks, the starting amount of fuel and the critical (minimal) amount that must always remain in the tanks.

If all these data are entered you can click on <Use this boat>. If you usually navigate with the same boat, you can set this as your <Standard Boat>.

2. For a (first) voyage a time planning must be entered: in the main menu <Edit> you click on the sub menu <Time planning> and you give the date and time of departure and a daily starting time and ending time. Your preferences of which type of lock and bridge operation you want to use can be specified and you must indicated whether or not you want to navigate on open seas. A click on <Apply these hours> defines your time planning.

3. In the main menu <Edit> or with the relevant data fields of the right side planning screen you now enter a departure and a destination and (if you want) places you want to visit ("via"-places) or avoid ("avoid"-places). Immediately after the last entry PC-Navigo calculates a route: depending on the checked radio buttons on the bottom right it will be either a fastest or a shortest or an optimum or a tourist route.

The more than 250 additional functions of PC-Navigo will let you adapt the software and all its settings and results to your very personal tastes and preferences. All of these functions are described in this manual: via the index you can get acquainted with all possibilities of PC-Navigo.

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**PC-Navigo ENC**

PC-Navigo contains the ENC chart viewer as a default. ENC stands for Electronic Nautical Chart. With "an ENC" we indicate a chart cell, produced in a standardised format (according the so called Inland ECDIS standard). This standard format is often referred to by the number of the document of the IMO in which it is described: S-57.
ENC’s are usually produced by the various waterway authorities, although there are also some private companies - like NoorderSoft - that produce ENC charts. The European Union has published a directive that obliged the member states to publish ENC’s for all inland waterways of CME class IV and higher (these are waterways navigable for boats of 80 by 9,5 meter). It takes special viewers to show these ENC’s.

In **PC-Navigo** an extra module has been implemented, that can show ENC’s. Above a certain zoom factor (which can be set between 1:50.000 and 1:200.000) and if an ENC cell is available for the concerned area, the overview map screen of **PC-Navigo** is automatically replaced by the Electronic Nautical Chart screen of the ENC.

Inland ECDIS ENC’s show an extreme detail needed for navigation: depth areas, buoys, beacons, dangers, obstacles, and the correct topography of the surroundings of the navigable channel (coast lines, banks, training walls, moorings, lock chambers etcetera). The charts are produced with an accuracy of less than a half a meter error.

Because of this accuracy, the combination with a global positioning device results in an accurate position of the boat in the channel. One sees, as it were, one’s own boat navigating "in the chart". This makes the ENC a valuable aid to navigation, particularly in those waters where a complicated course winds in between obstacles and shallows.

The ENC’s that **PC-Navigo** ENC uses are now an integrated part of the software; they are pre-installed and ready-to-use when you receive your new software. The pre-installed charts are based on the formal, official ENC published by the various waterways authorities. They have been corrected, completed and actualised by NoorderSoft and they have been assembled into a coherent, full coverage of the concerned waterways.

It is of course possible to use ENC directly from waterways authorities. We recommend that you first make a back up of your entire CHART directory of **PC-Navigo**, because the "formal" ENC often lack coherence and completeness. If you find out this is the case, you can always restore the original CHART directory provided with **PC-Navigo**.
If you want to load ENC directly from other providers, a list of links is provided on NoorderSoft's web site, www.noordersoft.com. Downloads from the NoorderSoft servers is also possible, see the DOWNLOADS page.

NoorderSoft also produces its own ENC, in particular of those areas that are badly or not at all covered by the official ENC. A series of Belgium and France is available and so are an additional series of The Netherlands (filling in the gaps in the official coverage) and of Germany, containing the waterways that have not yet been published by the German waterways authority. All of these charts are now part of the standard PC-Navigo version.

**ENC Settings**

**PC-Navigo** allows the user to set certain parameters of the nautical chart according to personal preferences. Two of the representation parameters and three depth area values can be set:

- Soundings are often shown in ENC’s in wide waters (such as sea arms and river mouths). The availability of depth areas makes these soundings redundant for many chart users: a vessel navigating within a safe depth area will not be interested in the exact depth at many individual points. Therefore the soundings can be switched off by means of the submenu <ENC-SETTINGS> under <SWITCH OFF SOUNDINGS>;

- The scale-dependent representation of details rules the amount of details shown in each zoom factor; this prevents the cluttering of the chart image with irrelevant details of buoys and marks. It may nevertheless be practical to show ALL available details of a chart, e.g. to check if a certain feature is incorporated or not. The scale-dependent representation is ruled by the SCAMIN (scale minimal) value of each detail. One can show ALL available details by switching off the function that rules this SCAMIN function with the submenu <ENC-SETTINGS> under <SWITCH OFF SCAMIN>;

- **PC-Navigo-ENC** can modify many Inland ECDIS charts in such a way, that the draught of the boat is the main parameter for the definition of depth areas: four different depth areas can be shown: deep water (water that is SO much deeper than the draught of the boat that it isn't even worth worrying about it), safe depth (water that has at least a certain safe margin - to be set by the user - below the keel of the boat), tight depth (water that is only slightly deeper than the boat's draught requires, in which there's a serious risk of grounding and squat) and shallow water (water that is simply not deep enough for the boat). Involving the boat's draught in these definitions allows the computer to redraw these depth areas depending on the boat's draught: for a shallow vessel, most of the waterway will indicate "safe water", while for a deep draught vessel, much of the channel will be dark blue.... In the submenu <ENC-SETTINGS> one can modify the default values for shallow, safe and deep water.

- **PC-Navigo-ENC** switches between the overview charts and the ENC at preset scales (to be modified by the user) The range of the scales for these switches is 1:50.000 to 1:200.000. The larger the number, the longer the ENC stay visible while zooming out. Mind that this may ask (too) much of the computer's memory.

- The character font (size) that the ENC use can be set at different sizes: the default value is 10 pixels.
ENC's and S-57 files

Types of electronic nautical charts

Electronic charts for navigation are available in many different types and formats, varying from RASTER (bitmap) charts to complex VECTORISED charts, such as the IMO standardised marine nautical charts of the so called **ECDIS** (Electronic Chart Display and Information System), that are sometimes referred to by the code number of the IMO document that describes them, **S-57**. These ECDIS or S-57 charts are in fact enormous databases, in which each detail of a navigable channel is described separately and with great accuracy.

Raster charts can in fact only be shown: the computer screen simply replaces the paper chart and the navigator will still have to interpret and translate all the information which the chart provides. Vector charts, however, and in particular S-57 charts, contain so much more detail and background information, that they allow the computer to do much of the interpretation and translation for the navigator. They allow, for example, a continuous comparison between the draught of a vessel and the depth of the channel it's passing through; an alarm can be given when a grounding is likely to occur.

These (marine) ECDIS charts now have an "inland brother", called "Inland ECDIS", a standard adopted by the European Union and by the Central Rhine and Danube Commissions. Inland ECDIS and maritime ECDIS are fully compatible.

Cell size and file size

S-57 charts are divided in relatively small regions: the enormous amount of data in an S-57 cell limits the dimensions of the region which the cell describes to a few square miles at most. The file size of an Inland ECDIS cell is limited to 5Mb. As a consequence, it takes MANY cells to cover all European waterways: 150 cells for the Netherlands alone, some 200 for the main waterways in Germany, and even the less than 200 mile stretch of the Austrian Danube counts 70 cells!

It's not necessary to install all those cells simultaneously: only those who navigate throughout Europe will need such a large amount of data. Most skippers will only need a limited amount of Inland ECDIS charts in their immediate vicinity.

File type

S-57 cells have a file name of eight characters, followed by the extension .000. For example: "1X5IJ001.000". The first two characters are the producer code (1X = the code for **NoorderSoft**), the third character is the "usage" code (a large number indicates a usage with much detail such as in a berthing situation, a small number a usage with little detail, such as on wide open water), the remaining 5 characters indicate the waterway (in which a series of two characters and three digits is now common, indicating an abbreviation of the waterway name and the kilometer point where the chart begins, e.g. IJ001 would be the IJ river in Amsterdam, from its origin, and RH460 would be the Rhine from kilometer marker 460 to kilometer marker 470). All files end with the .000 extension, and are therefore often referred to as "zero-zero-zero-files" or "triple-zero-files".

Chart viewers that use "open" S-57 files can directly read and import these .000 files. So can **PC-Navigo-ENC**. Internally these files are converted into the own format of the viewer, to accelerate access to the data and to improve the refreshment rate of the screen. In this conversion, all "binary"
descriptions of e.g. buoys, beacons, depth areas etcetera, are translated into "visible" information (like the drawing of a buoy, complete with its top mark, its light frequency and its color).

Some S-57 viewers are NOT able to read "open" S-57, but only encrypted S-57. Those viewers need S-57 charts in a special pre-encoded form, so that only one specific viewer can use only one specific chart file format. This often limits the use of charts in those situations, where the authorities do not provide the charts for free.

Charts like ARC and DWK are no S-57 format charts, but in fact raster (bitmap) charts. They cannot be used in an S-57 viewer without special conversion.

**Update files**

In the S-57 standard an update mechanism has been implemented, which allows chart producing authorities to publish chart updates without having to replace the complete chart file. An update (number .001, .002 and so on) replaces only a limited amount of data in an existing chart cell. The principle is completely incorporated in **PC-Navigo-ENC**. Users are able to update their chart cells with these relatively fast and effective update cells. Placing the .001 and .002 and .003 cells in the same directory where the equivalent .000 cell is stored and re-installing this .000 cell is enough to update the data in the cell with all modifications that are available in the follow up cells, resulting in the modified chart image.

**ATTENTION:** When the update number of an update cell is higher than .001, all intermediate update files have to be present in the directory, otherwise the update process will NOT be executed!

**Import S-57 ENC's**

During the production of **PC-Navigo-ENC** most of the (freely available) ENC-charts are pre-installed and converted by **NoorderSoft** so that the software is ready-to-use. Those who only use these chart cells don't have to do anything until additional or replacing cells have to be installed.

The chart cells produced by the waterway authorities often have to be corrected, extended and refitted, since the coherence between authorities and the limitation to the larger waterways cause gaps and conflicts in the coverages. **NoorderSoft** corrects and matches all the official cells and then adds the cells of all the smaller scale waterways (such as the Amsterdam Canals, the leisure boat waterways and many of the lake areas) to achieve a 100 % coverage of the waterways network. As of version 2011, these additions are pre-installed free of charge in the software, so that all available ENC coverage - with the exception of the German rivers and most of the French waterways - is included in **PC-Navigo**.

For an additional installation and to replace existing cells by newer ones or by updated cells, the following instructions have to be followed:

S-57 cells have a file name of eight characters, followed by the extension .000. For example: "1X5IJ001.000". The first two characters are the producer code (1X = the code for **NoorderSoft**), the third character is the "usage" code (a large number indicates a usage with much detail such as in a berthing situation, a small number a usage with little detail, such as on wide open water), the remaining 5 characters indicate the waterway (in which a series of two characters and three digits is now common, indicating an abbreviation of the waterway name and the kilometer point where the chart begins, e.g. IJ001 would be the IJ river in Amsterdam, from its origin, and RH460 would be the Rhine from kilometer marker 460 to kilometer marker 470). All files end with the .000 extension, and are therefore often referred to as "zero-zero-zero-files" or "triple-zero-files".
In **PC-Navigo-ENC** the .000 files must be imported and converted to **PC-Navigo**'s private chart screen format. This conversion only needs to be done once; the files are stored after conversion, for later use. In order to read and convert ENC-cells, they have to be downloaded or copied onto the computer's hard disk first.

To import and convert one or more ENC cells into the **PC-Navigo** format, we recommend that you first make a back up of the complete CHARTS directory in the directory where **PC-Navigo** is installed; this allows you to restore your chart library in case of later problems. Then you click on `<FILE>` and `<ENC>` and `<IMPORT S-57(.000)>` and you click on the `<BROWSE/ADD>` button. This opens a dialogue screen that lets you indicate where you have put the .000 files. When you select the desired ENC and click on `<OPEN>` your computer will convert, translate and file the indicated charts fully automatically. A confirmation of the result of this process is given at the end.

The converted charts are not shown immediately, though: only when **PC-Navigo**'s chart screen is zoomed in to past a scale larger than approximately 1:25.000 the ENC chart image appears. Zooming in any further brings more and more detail (because S-57 charts adapt the amount of detail they show to the scale of the chart presentation, to avoid "clutter" (an enormous amount of detail that makes the chart unreadable). As soon as one zooms out past the limit again, the ENC screen is replaced by **PC-Navigo**'s overview chart, to avoid a slowing down of the computer when it has to read too many large ENC cells at the same time. More explanation of the elements of an ENC in `<ENC SETTINGS>` and in `<NAVIGATING WITH AN ENC>`.

### Update files

In the S-57 standard an update mechanism has been implemented, which allows chart producing authorities to publish chart updates without having to replace the complete chart file. An update (number .001, .002 and so on) replaces only a limited amount of data in an existing chart cell. The principle is completely incorporated in **PC-Navigo-ENC**. Users are able to update their chart cells with these relatively fast and effective update cells. Placing the .001 and .002 and .003 cells in the same directory where the equivalent .000 cell is stored and re-installing this .000 cell is enough to update the data in the cell with all modifications that are available in the follow up cells, resulting in the modified chart image.

**ATTENTION:** When the update number of an update cell is higher than .001, all intermediate update files have to be present in the directory, otherwise the update process will NOT be executed!

### ENC-Legend

ENC's in the S-57 format present the chart information in a predefined way: all matters concerning navigation and safety have their symbols. Most of these symbols are pretty self-evident: a can shape buoy in a certain colour will be depicted as a can shape in that same colour, and a top mark on a buoy will most likely have a form that is identical to the form of the real top mark. The same is true for beacons, traffic signs, land marks and many other features.

Yet many symbols are not as easy to interpret. For those a chart legend is incorporated in **PC-Navigo**, comparable to "Chart Zero" in maritime cartography, in which all signs and symbols are explained. To open this legend, you click on `<FILE>` and on `<ENC>` and then on `<Legend>`. You can then search the symbol that you want to be explained and you'll find the explanation in the table.

The ENC-legend is also available under **OPTIONS** and **LEGENDS**, where all legends have been brought together.
Navigating with an ENC

Only when **PC-Navigo**'s chart screen is zoomed in to past a scale larger than approximately 1:25,000 the ENC chart image appears. As soon as one zooms out past the limit again, the ENC screen is replaced by **PC-Navigo**'s overview chart, to avoid a slowing down of the computer when it has to read too many large ENC cells at the same time. Navigating with the assistance of an ENC makes it vital to be aware of what the charts show and when they show it.

The combination of **PC-Navigo-ENC** and a GPS system and the possibility to show the boat itself in the chart form a powerful aid to navigation: one sees the boat "sail through the chart" as it were, exactly in the right position. The course one should steer can be seen directly and in real time. This "computer-and-chart-aided navigation" does require a lot from both the computer and the chart and the navigator:

- the chart must be extremely accurate and extremely up to date;
- the computer and the GPS, but also the power supply and the operating system, must be very reliable;
- the navigator must be very familiar with the meaning of all chart elements and with the way in which chart, GPS and boat course interact.

**Accuracy of the chart**

ENC's are produced by the institutions that manage the waterways, often on the basis of extremely accurate topographic base charts (many authorities use a 1:1000 topographic chart). An accuracy of errors less than 50 centimeters is the objective. But of course, even cartography is done by people, and people inevitably make mistakes. One must therefore realise that a chart is no REAL TIME IMAGE of reality, but a momentary recording of it. Reconstructions of the channel, new buildings, and mistakes in the cartography process can cause differences between the chart image and the real world. Only if one has been able to verify the accuracy of a chart one can be sure that the chart image is correct. In unfamiliar areas it is not wise to be overconfident with regard to the chart information.

The update frequency of a chart is also important: new bridges, changed channels and siltation can require a modification of the course. Please make sure your chart is the newest version available.

**Computer, GPS, Power Supply and OS**

Even an accurate chart that is fully up to date will not be of any help, if the computer cannot show it. A computer crash or a power failure are enough to get the depending navigator in trouble. Even a problem with the Operating System can be a danger: if a restart of the computer takes too much time, the boat may already be in danger. Make sure you have adequate backup possibilities (either a second computer or paper charts, if you really depend on the chart information).

**The meaning of the chart features**

The presentation library of Inland ECDIS is subject to many prescribed protocols and priorities: in general, things that are important for the safety of navigation have priority over other elements. Checks of the integrity of data and image are built in to ensure that nothing is missing or covered behind less relevant information.
The visible chart does not always show ALL elements it contains. The risk of "clutter" (i.e. the filling up of the screen with thousands of details that block the view on other, more relevant information) was successfully suppressed by a standardised scalability of all chart elements: some buoys and beacons will not at all be relevant when one looks at a large chart area, but VERY relevant when one navigates in narrow channels. The zoom factor (from how "near" or "far away" does the user look at the chart) influences the amount of elements that appear. The user may switch off the function that suppresses the representation of some details by means of the submenu <ENC SETTINGS> under <SWITCH OFF SCAMIN>.

The presentation of all chart elements is similar to the IMO and IHO presentations, that are show on "chart zero"; they can be found in the chart legend of PC-Navigo-ENC. If you see an unfamiliar symbol in the chart, it's wise to look it up in this legend.

**Chart and/or radar**

Using only the chart-GPS combination as navigation aid in bad visibility is not good seamanship! Although one sees the position of one's own boat with regard to the surroundings (that is: IF the computer, the GPS, the power supply and the operating system keep working!) there are at least TWO things one does NOT see: other vessels and "dynamic" objects (lock doors, bridge decks, traffic lights a.s.o.). This makes OTHER aids to navigation (radar, AIS) indispensible in those circumstances.

The dynamics of navigating with the help of electronic nautical charts sometimes tempt skippers to take more risks than they would normally do. It is good to be aware of the limitations of this technology, and one should in fact interrupt the voyage in circumstances that are not safe.

**Full screen chart**

**PC-Navigo-ENC** combined with a Global Positioning System (GPS) can be a great help to the navigator. In the situation where the chart is used as the information base to establish course, heading and speed, the chart screen is much more important that all other screen elements - one will use buttons, edit fields and menus during the PLANNING stage of a voyage, not during the NAVIGATION. To ensure the best visibility of the chart, a FULL SCREEN option is created: a click on the F-11 key or on the FULL SCREEN BUTTON moves the chart image to a FULL SCREEN setting.

The setting of DISTANCE RINGS (which can be set and modified in <BOAT DATA> on the divider <BOAT SHAPE> can make the estimation of distances a lot easier.

A repeated click on the F-11 key or on the FULL SCREEN BUTTON moves the chart image back into it's original position and gives access again to the other elements of the **PC-Navigo** screens.

**Intelligent chart**
**PC-Navigo-ENC** can use the "intelligence" built in an Inland ECDIS chart. Except for its presentation facilities and the possibility to show one's own boat in the chart, the chart itself can be modified to various requirements:

### Draught dependent depth areas

**PC-Navigo-ENC** can modify many Inland ECDIS charts in such a way, that the draught of the boat is the main parameter for the definition of depth areas: four different depth areas can be shown: deep water (water that is SO much deeper than the draught of the boat that it isn't even worth worrying about it), safe depth (water that has at least a certain safe margin - to be set by the user - below the keel of the boat), tight depth (water that is only slightly deeper than the boat's draught requires, in which there's a serious risk of grounding and squat) and shallow water (water that is simply not deep enough for the boat).

Involving the boat's draught in these definitions allows the computer to redraw these depth areas depending on the boat's draught: for a shallow vessel, most of the waterway will indicate "safe water", while for a deep draught vessel, much of the channel will be dark blue....

### Soundings

In ENC so called SOUNDINGS are often shown, values of the local depth. As these values may clutter the chart image, they can be "switched off" with FILE and ENC and **SETTINGS**.

### Scale dependent representation of chart details

The scale dependent representation of some details is ruled by the zoom factor of the screen; this function prevents so called "clutter", the filling up of the image with irrelevant and oversized images of e.g. buoys and marks. It may nevertheless be practical to show ALL available details in the chart, such as in the case where one wonders if a feature is incorporated or not. The scale dependency in an ENC is governed by the SCAMIN parameter (meaning Scale Minimal). One can switch off the scale dependency by means of the submenu **<ENC-SETTINGS>** under **<SWITCH OFF SCAMIN>**;

### Day/Dusk/Night screens

Navigating in the dark sometimes causes problems when a computer screen can blind the navigator by its light. **PC-Navigo** always had a possibility to switch to low intensity screens. The ENC charts are fully compatible with this function: when one changes to DUSK or NIGHT screens, the colors and contrasts of the charts change too.

## ENC-Pickreport

The data stored in an ENC describe EVERY sign and symbol separately. Most of these data are represented graphically, as a symbol with certain colours and specifications. One can also access these data in a text format, by clicking on the info-button (the one with the i) above the chart and then by
clicking on the desired symbol or area in the chart.

This action opens a so called Pick Report (a "click report" actually) in which the data from the database are shown as text. Things like bridge names, dimensions, buoy colours, characters and so on, can be shown this way as textual data.

With the <MORE DETAILS> button the full list of objects and areas in the ENC is shown, so that one can scroll through all the data in the chart cell.

Edit ENC charts

All elements in an ENC chart are individual topics in the database. Each element is drawn individually by the computer. Therefore it is possible to modify certain elements without corrupting the chart as a whole. By request of many PC-Navigo users, a little chart editor has been introduced in PC-Navigo, to add, move or delete buoys and beacons in the charts. Thus a user can update the charts himself if necessary. A click on the main menu FILE and then on ENC and on CHART TOOLS opens a window with the file name of the concerned ENC cell and a button that allows to return to the original chart under all circumstances (thus deleting all modifications!).

Three buttons are available to ADD or MOVE or DELETE buoys and beacons. A click on the ADD button shows you the legend of the various types of buoys from which you can choose. The convention is that buoys on the right shore (seen in the direction of the river flow) are always red can buoys (type BOYCAN60 or BOYLAT24 or BOYLAT50 in the legend), and for the left shore green conical buoys (type BOYCON61 or BOYLAT13 or BOYLAT51 from the legend); if you look in the direction from open sea into land, use green conical buoys (type BOYCON61 or BOYLAT13 or BOYLAT51 from the legend) for your starboard side and red can buoys (type BOYCAN60 or BOYLAT24 or BOYLAT50 in the legend) for your port side. A simple click on the desired buoy type and then another click on the place where you want to put this buoy and you're done!

MOVE a buoy by clicking on the MOVE button and than dragging (with the mouse button kept down) it to its new position. DELETE a buoy with a click on the DELETE button and then a second click on the buoy you want to delete.

If you want to return to the original chart, you can simply click on REMOVE CHART to make your modified version disappear and the original version reappear.

Installation of PC-Navigo

BEFORE YOU INSTALL PC-NAVIGO:

The box in which you receive PC-Navigo contains: A CD-ROM, a so called USB-dongle (the copy protection key), this manual and possibly a registration card (if you have purchased via a dealer).

There is NO printed manual. If you want to read the digital manual before you install the program, you can find it on the CD-ROM using your Windows Explorer, under the directory "Docs". A double click on "help.chm" opens the manual in the usual Windows help format.

AFTER you've installed the program, the manual is also available in the directory where you've put PC-Navigo AND - as interactive help screens - behind your F-1 key. We recommend you to consult the
manual often, in particular if you're a new user: the program is rather sophisticated and as a beginner you may get lost in all the functionalities.

NB: The copy protection USB dongle represents the TOTAL value of your software! Please make sure you don't loose it.

**INSTALLATION MANUAL**

When you insert the CD-ROM in the drive, it will auto-start and open the installation menu. Attention: the auto-start process may take a few minutes because the CD player usually scans the complete CD-ROM.

(If auto-start does not function, you can kick-start the installation by going to "My Computer" and double clicking on your CD player, or by using your Windows Explorer and double click on the program "setup.exe").

1. **THE CHOICE OF YOUR PREFERRED LANGUAGE**

First you have to choose in which language you want to do the installation. Mind you: this choice ONLY influences the installation procedure; in **PC-Navigo** you can switch languages at any time.

2. **THE COPY RIGHT SCREEN**

As soon as you've chosen your preferred language, you will see a screen with information about your specific version and with copy right information.

3. **THE INFORMATION SCREEN**

If you click on the "next" button, you'll get a dialogue screen that warns you only to connect your USB-dongle AFTER you've installed the program.

4. **THE LICENSE AGREEMENT**

Another click on the "next" button" shows you the license agreement with the conditions of the usage of the license. If you agree, you can mark the "I agree" check box, which activates the disabled "next" button.

5. **THE INSTALLATION OPTIONS**

An option screen allows you to choose the elements of the desired installation: you can choose to re-install drivers and/or photos. We recommend to only install the drivers if this is the first time you use PC-Navigo on that PC and you have a blue dongle. If you decide to exclude one of these options, the installation will be carried out WITHOUT either the photos or the chart drivers. On computers with a limited disk space this may save a considerable amount of space.

Below you can change the folder or directory in which **PC-Navigo** will be installed. If you click on "browse" your computer will present the directory listing of your computer (ATTENTION: this may take a while!) and it will offer you a choice to install **PC-Navigo** in ANOTHER directory than C:\navigo20xx.

Once your preferred directory has been chosen, please click on the "install" button to start the actual installation.

6. **THE INSTALLATION**
A scroll bar indicates the progress of the installation process. This may take quite a while, particularly if you install pictures as well. If the installation is completed successfully, you'll be informed and you're invited to connect the "dongle" (the USB key that has been provided if you've purchased PC-Navigo for the first time, or the key that was provided to you for an earlier version). A few seconds after connecting the dongle, the little "led" light in the tip of the dongle will light continuously and a hint will tell you that "new hardware has been found". A click on "finish" rounds up the installation. PC-Navigo is now ready to be used.

After this installation procedure, you won't need the CD-ROM anymore to use PC-Navigo. You can store it for later reinstallation. The dongle however is needed for every use of PC-Navigo.

7. THE USE OF PC-NAVIGO

After a successful installation of PC-Navigo on the hard disk of your computer you can start it by means of the short-cut on your desk top. The dongle has to be connected during program start, but it may be removed when the program has fully opened and the planning screen (with the overview chart) is shown, e.g. if you need the USB port for another device. If you remove the dongle, PC-Navigo will continue to work until you quit the program.

PC-Navigo can also be started by means of the Windows START button (usually bottom left on your screen) and a click on "ALL PROGRAMS". In the program list you'll find PC-Navigo with nine other menu options, amongst which "PC-Navigo 20xx" allows you to start the program.

The other eight options are:

"Dongle Info and Update": this little program is used to find information about your USB-dongle and to update or modify it;
"Install or repair dongle drivers" is meant to (re)install or restore the drivers of the USB-dongle, e.g. after installation of a new operating system on your computer. If your dongle light blinks, you can repair the drivers for the dongle by clicking this little software tool;
"PC-Navigo manual" (and its German, French and Dutch equivalents) opens the comprehensive manual for the use of PC-Navigo;
"Chart notes editor" is a tool that allows you to edit chart notes, modify them and/or manage your chart note collection;
"PC-Navigo Set Communication Parameters" is a tool that allows you to modify the communication parameters of the servers that PC-Navigo can communicate with;
"PC-Navigo online help desk" (and the german, french and dutch equivalent) is a tool that can make your computer accessible for one of our developers, so that he can locate and repair bugs or faulty settings quickly and efficiently;
"Uninstall PC-Navigo" can be used to uninstall PC-Navigo from your computer and erase all registries, settings and modifications that were set during installation.

8. THE USE OF ON LINE HELP

In the newest version of PC-Navigo you have the possibility to give one of our developers access to your computer screen. This permits him to diagnose and repair possible problems, bugs and faults in the installation. While you can watch what he does on your own screen, you can witness the modifications and maybe learn to avoid the mistakes in the future. On line uploading of repair files, patches and updates is also possible.

Throughout the repair actions you can always interrupt the developers doings. The access given to our developer depends on a pass word that allows entry only ONCE; a next time, a new pass word will be needed. This assures your privacy and the safety of your data.

During the repairs a phone connection is NOT necessary: with a chat screen, our developer can ask
you for your help during his actions (e.g. to plug in the dongle or to insert the CD-ROM).

At the end of the session the developer - or you yourself - will disconnect the on line connection, and your computer will be fully and only yours again.

Waypoint Navigation

In PC-Navigo it is possible to use waypoint navigation. This is built as an addition to the normal routes in PC-Navigo. Waypointnavigation is meant for use on open water, where navigation on preselected lines is not feasible. When using these waypoints the range and bearing of the next waypoint is constantly visible. As soon as you approach a Waypoint the system will automatically select the next waypoint. A short discription of the different icons follows below:

This button adds a waypoint. If you click multiple times, multiple waypoints are added.

With a click on this button you delete the last waypoint.

With this button you can remove all the waypoints.

This button opens a dialog for saving your current waypoint-route.

With this button you can load a previously saved route.

If this button is selected you can freely move waypoints.

With this button you can manually select the next waypoint.

Grib Files

Grib files are small files in a standardized format containing weather data. These can be displayed as an extra layer on top of a chart.
This screenshot shows a list of grib files available free of charge from our server. When you select one of these the region related to the grib file becomes outlined. The grib file in this particular screenshot shows the current in the German Bight. After you have downloaded the grib file the button "Show on map" becomes available.
Grib files work with prediction. Using the arrows you can walk through the time of the prediction. If the info button is selected, the precise values of the mouse-location are shown.

Using the Tab "Download Locations" a number of websites are shown where you can download Grib Files. There are many more sources for grib files available online.

When you press the "open" button, you can open a file on your local PC. This way you can also open files with wind-data.

**Current Depth**

PC-Navigo enables you to download a list of recently measured depth figures. This requires an active internet connection. Downloading the latest depth figures can be done through view->list of current depth. When you press "get current depth" the latest
measurements will be downloaded. Some wifi networks or firewalls may block this download.

This screenshot shows what it looks like after the current depths have been downloaded. Depths in the Netherlands are relative to NAP.

**Tidal functions**

PC-Navigo has several tidal functions:

1. **Routeplanning**
   When planning a route on tidal water you will automatically be presented with a dialogue asking you whether you wish to make use of tidal data. If you select yes tidal data will automatically be applied to your route. Tidal data is only included for the current year, so it
can only be applied to routes with a start and end date in 2017.

2. Tidal Curves
Tidal Curves are a valuable addition to PC-Navigo. They allow you to see at what time high and low tide will take place and it gives an indication of the expected water level, very useful for determining time of departure or arrival.

![Tidal Curves Image]

**Safe Boating**

'Safe boating' aims to increase the safety on and around the water. There are many different types of craft, both professional and leisure craft, which requires constant awareness of safety-risks.

This necessitates continuous attention for safety risks. The cooperating partners of "safe boating" pool their knowledge, networks and communication power to inform and motivate the various waterway users to share the waterways and the waters safely with each other.
In PC-Navigo we have the nodes of safe boating as objects. Via the info button you can click on such a point, this opens a link to the website of safe boating. On this website the nodes are described with useful tips and tricks.

If you prefer not to see these icons you can switch them off under file-> preferences-> show safe boating

You can read more about safe boating on the website: https://www.varendoejesamen.nl/en

**History List**

Since the 2018 version you now have the opportunity to use locations from your history. This saves a lot of searching work for places that you often need. The locations you enter in "departure", "destination", "via", ... are automatically stored in the history. In this list you can also indicate these locations as favorites, to find them even more easily.

You can also choose to empty the list, but not the favorites. This is useful to keep certain places in the list and to make the list less chaotic again. To find places easier, you can also sort the list by alphabet, ascending or descending.

**AIS Interface**

You can change some settings of your AIS transponder from your PC, via the AIS interface. In this interface, multiple AIS devices are supported. To be able to use the interface, the cabling between AIS and PC needs to function correctly in both ways.

If connected correctly, you can retrieve the data from the AIS using the "Get AIS settings" button. You can then adjust them and save them in the transponder with "Send to AIS".

A number of settings are protected by a password: ENI, MMSI, Call sign etc should already be stored correctly in the transponder during installation.
Blue Wave

Blue Wave is a Dutch webservice which provides real-time data about bridge openings and available berths. This service is available for an expanding number of regions in the Netherlands. Within PC-Navigo it is possible to retrieve Blue Wave data when zoomed in sufficiently by pressing the Blue Wave icon.

After retrieving the data various icons are displayed:

By clicking the blue i button in the top bar and then selecting the bridge-icon (or the complete contour of the bridge when zoomed in far enough) it will show information about the bridge on that location. This screen will show you at which times an actual opening is planned.

By using that same blue i button and then selecting the berth icon (or the complete contour of the berth when zoomed in far enough) you will see actual data of that berth, like dimensions or occupancy rate.

NTS Messages
In December 2018 the EU published a new standard for displaying notices to skippers in digital form; the NTS standard. This standard is used by all governments to send notices to skippers as well as Water Levers and Ice related messages. The notices to skippers may be retrieved by pressing the yellow-black triangle in the top right.
You may select the country and or region and the type of message to be retrieved. The messages are built in such a way that they can be displayed in your own language. This reduces errors in interpretation and allows messages in foreign languages like Hungarian, Polish or Bulgarian to be read. When retrieving water-levels you may sometimes find predictions in the same message. Only the water levels for the major waterways are retrievable in the Netherlands.
**fairway**

<table>
<thead>
<tr>
<th>Sender of the message</th>
<th>BMVIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originator of the information</td>
<td>BMVIT</td>
</tr>
<tr>
<td>Country where message is valid</td>
<td>Austria</td>
</tr>
<tr>
<td>Original language</td>
<td>German</td>
</tr>
<tr>
<td>District/region within country</td>
<td>Wien</td>
</tr>
<tr>
<td>Date of issue</td>
<td>2018-06-14T15:56:44+02:00</td>
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<table>
<thead>
<tr>
<th>Subject</th>
<th>Announcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of validity</td>
<td>2018-06-14</td>
</tr>
<tr>
<td>Contents</td>
<td>Im Bereich der Furt Zahngrund (Strom-km 191, Schiffahrtsrinne in Richtung linkes Ufer verlegt. Austonnung und der ergänzenden Information ab</td>
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<tr>
<td>Notice source (authority)</td>
<td>BMVIT</td>
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<tr>
<td>Reason of notice</td>
<td>changes in the fairway</td>
</tr>
<tr>
<td>Communication channel info section</td>
<td>INF, AH: <a href="http://www.doris.bmvit.gv.at/fahrwasser">http://www.doris.bmvit.gv.at/fahrwasser</a>, Paket 2018-06-14</td>
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</table>

<table>
<thead>
<tr>
<th>Waterway or fairway section</th>
<th>Name of Geo object</th>
<th>Donau</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>ATXX</td>
<td></td>
</tr>
<tr>
<td>(Type of waterway)</td>
<td>River</td>
<td></td>
</tr>
<tr>
<td>Fairway begin and end coordinates</td>
<td>48 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>48 0</td>
<td></td>
</tr>
</tbody>
</table>