TZ NAVIGATOR

NOBELTEC TIMEZERO USER GUIDE

Table of Contents

Welcome

Thank you for purchasing TimeZero. This User's Guide is written for an audience assumed to have a mid-level, pre-existing knowledge of computer usage and the principles of marine navigation. Do not use this document and software to replace actual navigation training and experience, but as a valuable navigational aid.

WARNING: Nautical navigation is a serious undertaking and should only be engaged in by persons trained and experienced in such navigation

Registering TimeZero

It is highly recommended to register your software as this will help us provide better technical support. A registration is also required to access our online services (Weather, Chart Update Notification,...)

Your TimeZero software can be registered online using a web browser or directly within the software (if you have an Internet access on the computer where the software is running).

Register using the My TIMEZERO Website

If the computer you are running TimeZero on does not have an Internet connection, you can register your software from another computer at www.mytimezero.com.

- Go to www.mytimezero.com

- Click on the "My TIMEZERO" located on the top right:
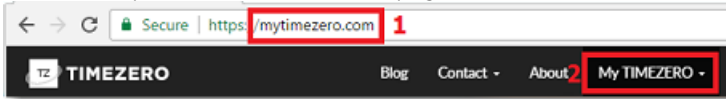
- Enter your "My TIMEZERO" credential. If you do not have a My TIMEZERO account yet, click on the "Create an account" button (you will just have to provide a valid email and your name or use a Facebook or Apple login):
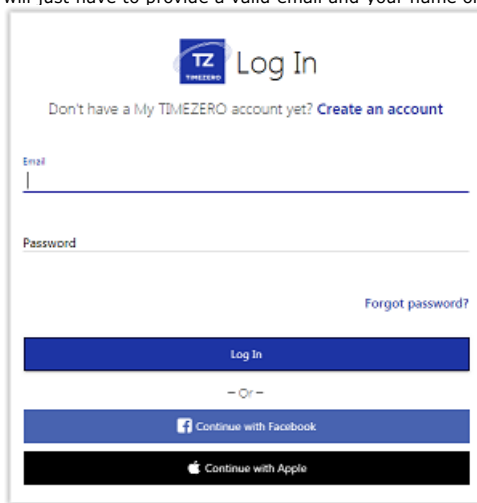
Note: After creating the My TIMEZERO account with an e-mail, your e-mail address needs to be verified. Make sure to check your e-mail Junk/Spam folder if you do not receive the account verification e-mail within 1 hour. After validating your account, repeat steps 1 to 3 and continue with the steps below.

- Once logged in, click on "My PC Software" and then, click on "Register my License":

- Enter your TIMEZERO Serial Number (your serial number starts with "TZ" and can be found under "About TimeZero"):
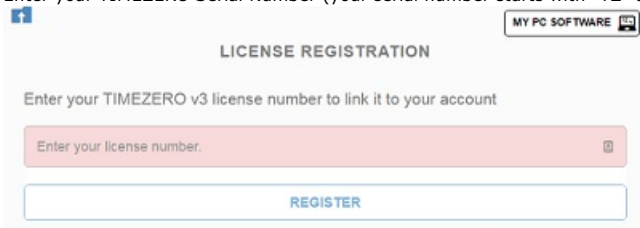
- If the serial number is valid, it will be linked to your account and you will be able to access your product information.

Register directly from the Software

When you launch TimeZero with an active Internet connection, the following screen will appear, allowing you to register your license directly from the software:
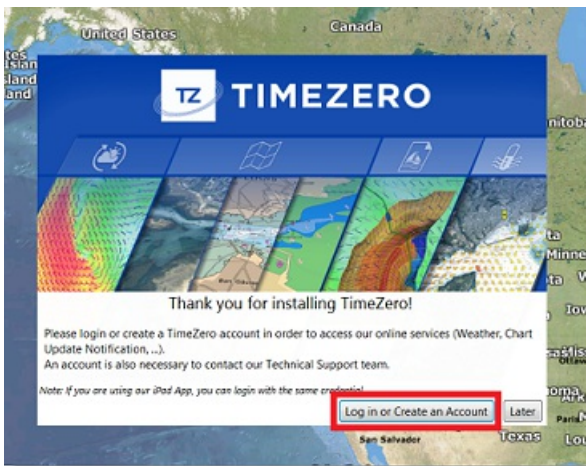
If your license has not been registered yet, the following screen will appear, allowing you to either create an account (click on the "Create an account" button) or enter your credential if you already have a My TIMEZERO account:
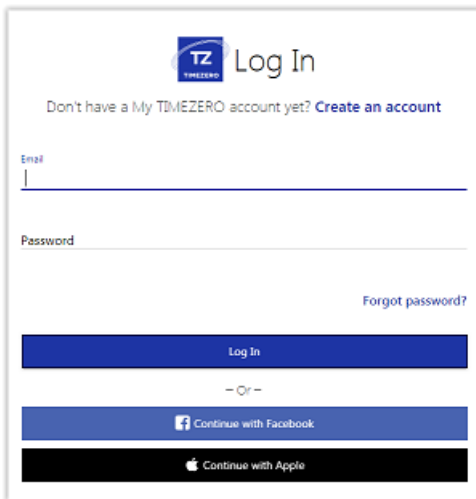
NOTE: After creating the My TIMEZERO account using an e-mail, your e-mail address needs to be verified. Make sure to check your Junk/Spam folder if you do not receive the account verification e-mail within 1 hour. After validating your account, repeat steps 1 to 3 and continue with the instructions below.

After entering your credential, your license will be automatically linked to your My TIMEZERO account.

Home Planning Vs. Navigation

TimeZero can be used in two modes. Upon starting the software, choose "Home Planning" or "Navigation" mode:

WEATHER INFORMATION WARNING: The weather information is subject to service interruptions and may contain errors or inaccuracies, and consequently should not be relied upon exclusively. The service is provided "as is". You are urged to check alternate weather information sources prior to making safety related decisions. You acknowledge and agree that you shall be solely responsible for use of the information and all decision taken in respect thereto. By using this service, you release and waive any claim against Nobeltec Inc. with regards to this service.

IF YOU DISAGREE, PRESS "QUIT"

IF YOU ARE CONNECTED TO A GPS (OR NAVNET) PRESS "NAVIGATION", OTHERWISE PRESS "HOME PLANNING"

Quit   Home Planning   Navigation

Home Planning

Choose the "Home Planning" mode when planning on shore (at home for example). In "Home Planning" mode, the vessel icon is not displayed on the chart, the alarms are disabled and routes cannot be activated. All other functions such as creating marks, planning routes, or updating and viewing weather files are available.

The Status Bar (Title Bar) appears in yellow with a "Home Planning" notification.

Navigation

Choose the "Navigation" mode when the computer is physically connected to sensors and instruments (GPS, AIS, NavNet...)

In this mode, the sensor and instrument data is displayed, alarms are enabled, and a route can be activated.

Note: The "Home Planning" and "Navigation" start-up mode are independent from the WorkSpaces (which can be used to plan a route while in the navigation mode). Make sure to review the WorkSpaces chapter for more information about this important concept of TimeZero.

Chart Compatibility

Mapmedia .mm3d charts

TimeZero is compatible with Mapmedia ".mm3d" charts. Mapmedia .mm3d charts are available in Raster Chart format or in Vector Chart format. Mapmedia Raster Charts are scanned from official hydrographic offices and select private sourced paper charts (called "MM3D Raster"). Mapmedia Vector Charts are manufactured from official hydrographic office vector charts (called "MM3D S-57") or from privately furnished vector charts from C-MAP (called "MM3D C-MAP") or Navionics (called "MM3D Navionics").

Note: All Mapmedia ".mm3d" charts are produced in the WGS84 coordinate reference. Make sure that your GPS is set to output its position in this format (which is the default format of most GPS units).

TimeZero in North America is furnished with the complete NOAA library of Raster charts, Vector charts, and 3D Bathymetry formatted in Mapmedia .mm3D files. Additionally, free USA High Resolution Satellite Photos are downloadable from the Mapmedia Catalog. Click here to download the free USA High Resolution Satellite Photo

Outside North America, Mapmedia offers a complete range of .mm3d nautical charts for purchase. Visit the Mapmedia Catalog to view the .mm3d chart coverage.

Installing Charts

MM3D Charts

Chart Installation from USB Drive

If you have received the charts on a USB Drive, insert it into the computer's USB port:

- If the content of the USB drive does not open automatically, use Windows Explorer to browse the USB drive content.

- Open the "Charts" folder. Chart files will be located under the corresponding provider sub-folder.

- Double click on a chart file to launch the installation process of that file in TimeZero.

- Repeat this process with all the chart files you wish to install.

Charts Installation from files downloaded online:

Every MM3D charts can be downloaded online from the Mapmedia Catalog. The chart data consists of multiple files that are downloaded individually. Chart data files are stored as .zip files.

Charts for the USA are free and can be downloaded and updated at any time without unlock code:

- Click here to download the latest revision of the NOAA Raster Charts

- Click here to download the latest revision of the NOAA Vector Charts

- Click here to download the free USA High Resolution Satellite Picture

Charts for outside the USA are licensed and require purchasing an unlock code.

If you download the charts from the computer running TimeZero, simply save the files in *"My Documents | My TimeZero | Downloaded Charts"*. The next time you open TimeZero, it will scan this folder and prompt you if you want to install the charts (TimeZero will automatically unzip the files then transfer them to the correct location).

Note: You can also manually unzip the chart files, and then double click on them to install the chart in TimeZero.

Using TimeZero

User Interface Overview
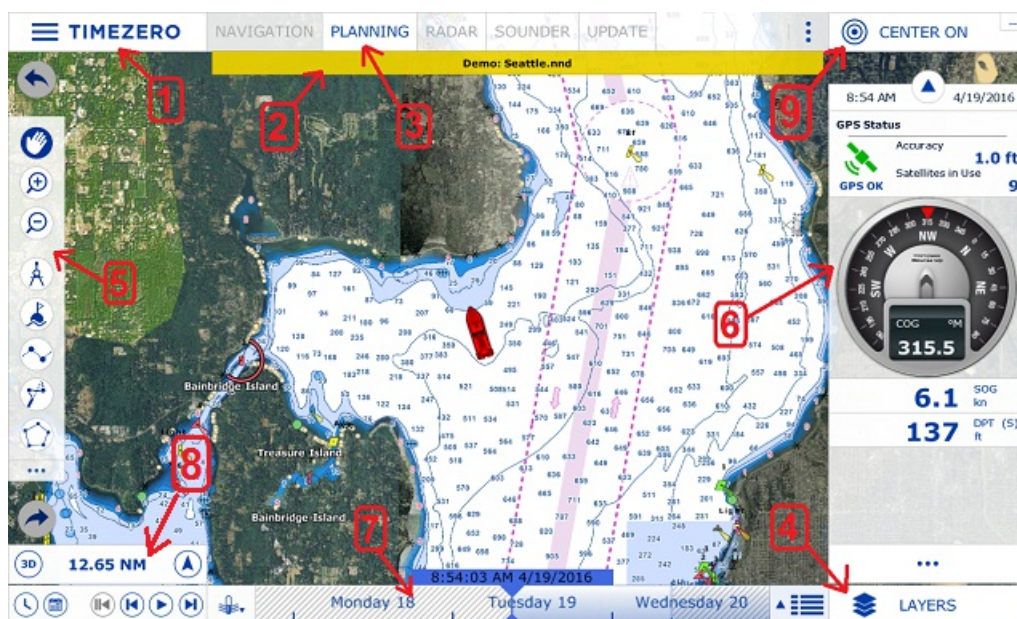
1. "TimeZero" button: Click on this button to access the Menus and Options of TimeZero and to exit the software. You will also find a built in User Guide located here.

2. Status Bar: This area displays the general status of the software

3. WorkSpaces: Click on any of the WorkSpaces to select the activity you want to display on your screen. Refer to the WorkSpaces Chapter for more information.

Note: Your WorkSpaces configuration might differ from the screenshot above according to your software configuration and optional Modules.

4. "Layers" button: The "Layers" button opens a panel that allows you to configure various information displayed on the charts.

5. Toolbar: The Toolbar displays all the tools that can be used with the selected window. Once a Tool is selected, a cursor action is required on the chart, such as creating a Mark.

6. NavData: The NavData displays the data received from external instruments such as the GPS, wind sensor, depth sounder etc… It also displays the cursor position and the range and bearing of the cursor from the vessel icon. Route information including Course to Steer, Range to Waypoint, ETA and other graphic data can also be displayed. To configure the NavData, right click on any of the items to select the value to display or to remove it. To add a new value, click on the "..." button located at the bottom of the NavData.

7. Timeline: The timeline (only available in the Planning WorkSpace) allows you to play Weather & Tides animations. Click on the Calendar icon to select a Data & Time to view the Tide and/or Weather Forecast. When you click on a route, the timeline also allows you to perform route simulation and see all the conditions evolving (tides, currents, weather) according to your route departure time and projected speed.

8. Chart Scale: The Chart Scale displays the horizontal range of the charts. It also includes a "3D" button that allows to toggle in between 2D and 3D presentation and an Orientation button (arrow) that allows you to toggle in between North Up and Head Up.

9. "Center On" button: Click on this button to center the chart on your GPS position. Note that this button can change its action according to the context. For example, when creating a route, this button transforms in "End Route". In the Update WorkSpace, this buttons allows you to open the Weather Update Wizard.

Tips: The WorkSpaces, NavData and Toolbar can be customized by clicking on the Configure Button:

Note: After customizing the user interface to your preferences, you can save all the settings to a file. Click on the TimeZero button and select "Save UI As...". To reset the user interface to your default settings, simply open TimeZero by double clicking on the User Configuration file. Note that you can make multiple User Configuration files for multiple users or various uses of the software.

Toolbar & Layers

Toolbar

The Active Tool (the tool currently selected) appears surrounded in blue. In the example below, the Panning Tool (hand icon) is selected:

Tooltip

When you left click on the chart or on a specific object, a Tooltip will appear. The Tooltip can combine information (such as range and bearing of the object) with buttons that will allow you to perform specific actions on that object:
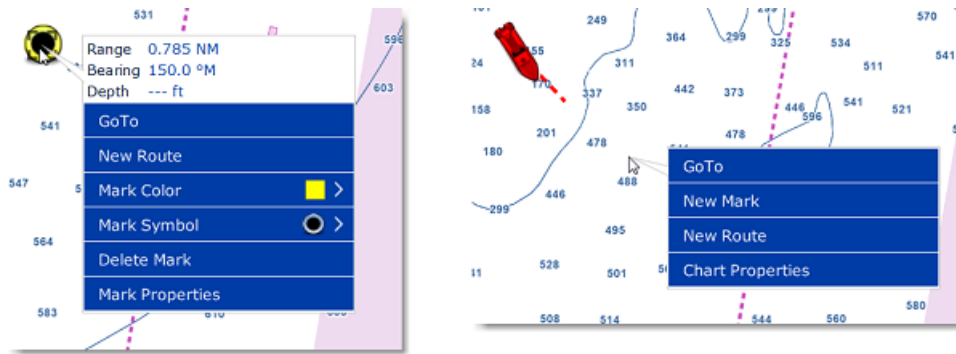
Note that the Tooltip will only provide the most common actions. For a complete list of actions, you can right click on the chart or on an object (this will bring the traditional windows contextual menu).

Layers

Click on the "Layers" button located on the bottom right of the screen to open a panel that allows you to configure what you see on your screen:
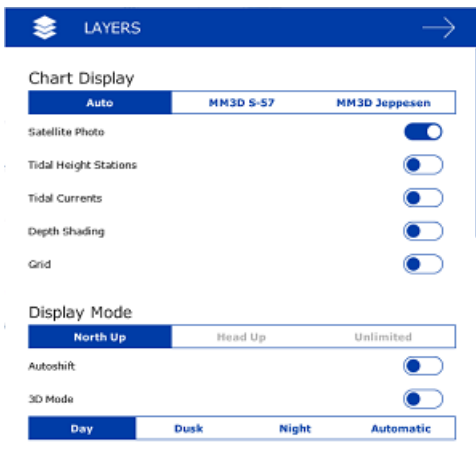
The layer panel also allows you to adjust some settings such as charts orientation (display mode), radar and sounder parameters (when you have the Radar or Sounder module).

You can scroll up and down on the layer panel using the mouse wheel or by clicking and holding (drag). To close the Layer Panel, click anywhere on the chart or click on the close button (arrow) located on the top right.

WorkSpaces

TimeZero is designed to perform multiple navigation tasks such as planning a voyage, navigating a route, downloading weather information . These activities require different tools and options. The WorkSpaces are our way of separating and differentiating different activities that occur on a navigation system, so the user interface is not cluttered with unnecessary functions and buttons that are not useful to the primary task. Also, since the WorkSpace configurations are independent, users can keep their navigation mode 100% intact while they plan the next phase of their journey and instantly snap back to their desired navigation view without needing to undo or re-configure the software.

- "Navigation" WorkSpace: This WorkSpace is selected by default when TimeZero is started in "Navigation" mode. This WorkSpace intentionally has limited functionality to simplify operation while underway. To access more advanced planning functions such as animation, route simulation or managing a list of objects, select the Planning WorkSpace.

- "Planning" WorkSpace: The Planning WorkSpace is selected by default when TimeZero is started in "Home Planning" mode. This WorkSpace allows you to plan and simulate routes, display weather forecast, display tidal height and current predictions and replay data that has been previously recorded. The Planning WorkSpace has a timeline at the bottom of the screen that allows you to change the date/time to perform various animations and simulations.

- "Dual Nav" WorkSpace: The Dual Navigation WorkSpace allows you to display two Plotter windows side by side. Each Plotter window can be managed independently. For example, one Plotter could be set up in 3D with Satellite Pictures while the second Plotter could display a more traditional 2D view. The Dual Navigation WorkSpace shares the same configuration settings as the Navigation WorkSpace.

- "Update" WorkSpace: The Update WorkSpace allows you to request and download Weather Forecasts. It also allows the user to update the ActiveCaptain database (when registered to the service). This WorkSpace has an "Update Area" tool in the Toolbar that defines the Weather Forecast area. The "Update" button located on upper right allows retrieval of the updated weather file.

- "Radar" WorkSpace: The Radar WorkSpace allows the user to display and control the Radar. This WorkSpace provides all the Radar tools and controls such as Gain, Sea Clutter and Rain Clutter. Note that this WorkSpace will only appear when the Radar Module has been unlocked and a Radar has been detected.

- "Dual Radar" WorkSpace: The Dual Radar WorkSpace display two radar pictures side by side. Note that Dual Radar display is only available with selected Furuno DRS radar.

- "Sounder" WorkSpace (requires Furuno Sounder module): The Sounder WorkSpace allows the user to display and control the Sounder. This WorkSpace provides all the Sounder controls. Note that this WorkSpace will only appear when the Sounder Module has been unlocked.

-

-

Additional Split Screen WorkSpaces are available when clicking on the "WorkSpace Configuration" button:

When the screen is split, the Toolbar and Layer selection applies to the active display which is surrounded by a yellow frame. For example, if your screen is split in two and if you want to change a property of the display located on the right, make sure to click on the right side (to make it the active display), then select the corresponding action from the Toolbar or Layer:
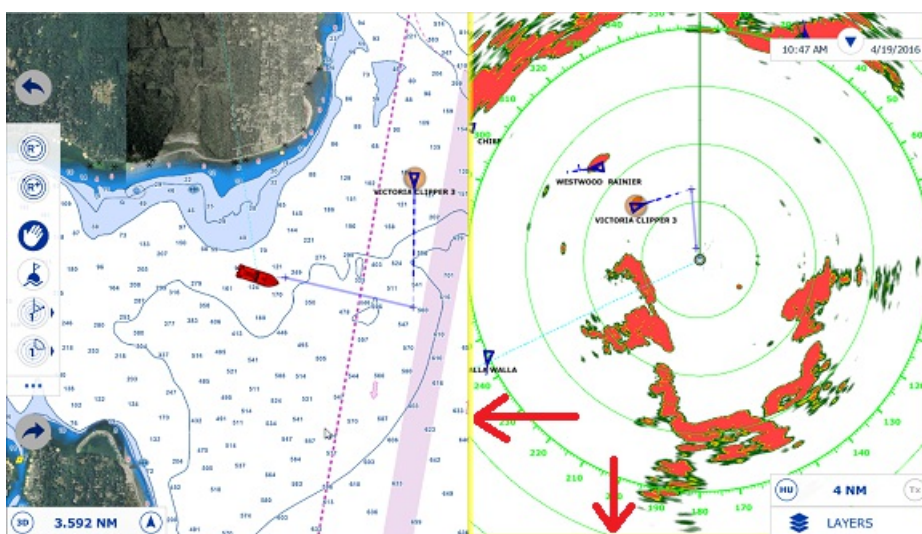
Setting Up Instruments

TimeZero can utilize information from many different instruments on your boat. A GPS will be the most common type of instrument used, but depth sounders, speed sensors, wind vanes, and AIS receivers can also supply information to TimeZero.

Instruments can be connected to the PC through an NMEA0183 interface (serial port), through the Network (if a Furuno NavNet MFD or Ethernet sensor is used) or through NMEA2000 (using the Actisense NGT-1 USB Gateway).

- Serial Port: In most cases, connecting an NMEA0183 instrument to a computer is straightforward, and is accomplished by simply connecting the serial cable supplied by the instrument manufacturer to the serial port on the PC. The serial port is a nine-pin male port on the back of the computer often identified by an IO or COM symbol.

- Serial to USB adapter: Newer computers – especially laptops – may not include a serial port. One can be added by using a serial-to-USB adapter, which can be obtained from any marine dealer. A serial-to-USB adapter will create a "virtual COM port" on your computer that can be viewed in the "COM and Ports" section of the Device Manager.

    IMPORTANT: Make sure to install the USB adapter drivers BEFORE connecting the USB cable of the adapter to the computer!

- Actisense NGT-1-USB: The Actisense NGT-1-USB is a USB to NMEA2000 adapter and allows TimeZero to receive data from a NMEA2000 bus and output navigation data to an auto-pilot.

    IMPORTANT: Make sure to install the USB adapter drivers BEFORE connecting the Actisense NGT-1-USB to the computer! Also note that TimeZero is NOT compatible with the Actisense NGT-1-ISO that uses a serial connection.

- Active USB GPS antenna is an easy way to provide the software with a vessel's position.

    IMPORTANT: Make sure to install the GPS USB drivers BEFORE connecting the USB cable of the GPS to the computer!

- Ethernet: If the boat is equipped with a NavNet series Furuno Chart Plotter or Sensor, your computer can be connected to the NavNet network using a standard Ethernet Cable. Assign a fixed IP address to the computer connected to the NavNet network such as 172.31.3.150 with a subnet mask of 255.255.0.0.

    Note that any NMEA0183 to Ethernet gateway or NMEA0183 to WIFI can also be used (by setting up a UDP or TCP connection).

Automatic Instrument Configuration

TimeZero can locate most instruments connected to the computer automatically. To use this feature, start TimeZero in "Navigation" mode to enable sensor and instrument connections. Next, launch the Automatic Configuration Wizard:

- Click on the "TimeZero" Button located on the top left of the screen

- Click on "Connection Wizard"

- Select the "Automatic Ports Configuration"; and then, click "Next"

- Follow the on-screen instructions

    Tips: For more information about connecting instruments, please refer to the Connection Wizard Chapter.

Note: The Connection Wizard option will not appear when the software is started in "Home Planning" mode

Scrolling & Zooming

TimeZero offers a new ultra-fast cartographic engine with unparalleled seamlessness and speed of zooming. TimeZero will always select the best charts as you scroll around and zoom in and out. Because scrolling and zooming are so important, TimeZero provides you with several ways of doing them using the mouse or keyboard.

Scrolling the Charts

Panning Tool:

The Panning Tool is the default tool of TimeZero. If it is not selected, click on the Panning tool (hand) located on the Toolbar and move the cursor over the chart to the center of the screen.

- Press and hold the left mouse button while moving the cursor to scroll or drag the chart around

- Double-click with the hand tool on a chart point to center automatically on that point

Note: The panning tool is automatically selected by default after every action. This feature can be disable from the General Options if you uncheck "Enable Auto Hand Tool Selection"

Using the Keyboard:

The Arrow Keys on the keyboard can also be used to scroll the chart. Holding down an Arrow Key moves the displayed chart area in the direction of the arrow.

Zooming the Charts

TimeZero allows you to seamlessly zoom in or out to the exact magnification level you like without steps or limitations.

Using the Mouse Scroll Wheel:

If the mouse has a wheel, roll the wheel up and down to zoom in and out. By default, the chart will be zoomed at the location of the cursor. This can be changed to the center of the screen by enabling "Center on screen when Zooming" from the General Options.

Note: Using the Scroll Wheel is the best practical method to change chart scale without having to change the active tool.

Using the Zoom +/- Buttons:

By default, the Zoom In and Zoom Out buttons are available in the Toolbar in every WorkSpace. Simply click on the corresponding button to Zoom In or Zoom Out by fixed increment.

Using the Zoom Tool:

The Zoom Tool is hidden by default. Click on the "Configure" button (at the very end of the Toolbar) to add it to the Toolbar configuration. The Zoom Tool is very powerful to zoom and pan the chart at the same time (especially if your mouse has no scrolling wheel). Select the tool by clicking on it, move the cursor over the chart, then left click to Zoom In or right click to Zoom Out.

Using the keyboard:

Use the Page Up / Page Down key or +/- keys to zoom in or out.

Note: When zooming with the Zoom +/- buttons or +/- keys, TimeZero uses predefined chart scale that can be adjusted from the Plotter Display Options menu (using the "Chart Scales Selection" button).

Scale & Range value

The Scale and Range of the chart are displayed on the bottom left of your screen. When the chart display is Overzoomed, the scale is written in red.

The range indicates the real distance from the left side to the right side of the chart screen. On the example below the distance represented on the screen is 26.59 Nautical Miles.
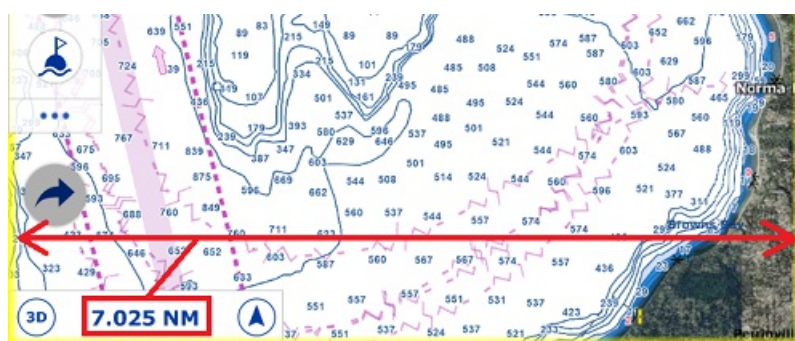
The range vary according the zoom level but also according to the latitude (due to the Mercator projection).

2D & 3D Chart Orientation

2D & 3D Mode

TimeZero operates in a fully rendered 3D environment. You can switch from the traditional 2D view to the impressive 3D perspective by choosing the 2D or 3D option in the Layer panel :
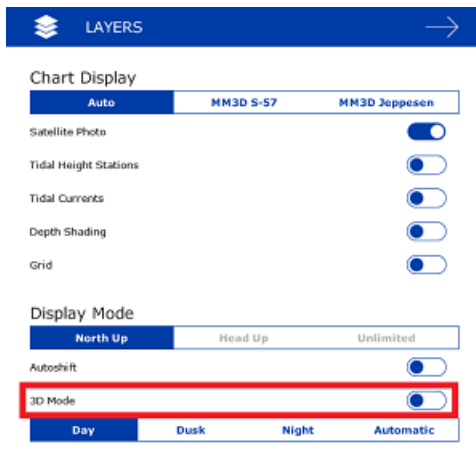
Note: You can also click on the "3D" button of the Chart scale located at the bottom left corner of the screen:

Chart Orientation

In 2D mode, the chart can be displayed in North Up or Head Up:

- **North Up**: This mode displays the North at the top of the screen.

- **Head Up**: This mode orients the bow of the vessel to the top of the screen. The chart rotates as the vessel's bow is always pointed toward the top of the screen. In Head up mode, pay close attention to the Compass icon (on the bottom left). It provides information about the direction of North.
  Head Up mode is only available if a Heading sensor is connected OR if your speed is over 1Kn (GPS COG will be used in that case)

Tips: Click on the Compass icon (arrow) of the Chart scale (located at the bottom left) to cycle in between the various mode

In 3D, the chart can be displayed in North up, Head Up or in "Unlimited":

- **North Up**: In this mode, the azimuth is fixed pointing toward the North. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.

- **Head Up**: In this mode, the azimuth is fixed pointing along the current Heading. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.

- **Unlimited**: In this mode, the azimuth and pitch can be freely adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.

Tips: A "3D Orientation" tool is available (hidden by default) and allows the user to adjust the azimuth and pitch by clicking and dragging the cursor over the charts. This is very useful if your mouse does not have a middle click button and if the keyboard is not easily accessible.

3D Bathymetry

When "3D" is selected from the "Layer" button or from the Chart Scale, TimeZero handles Altimetry (3D above Sea Level) and Bathymetry (3D below Sea Level) in two different ways:
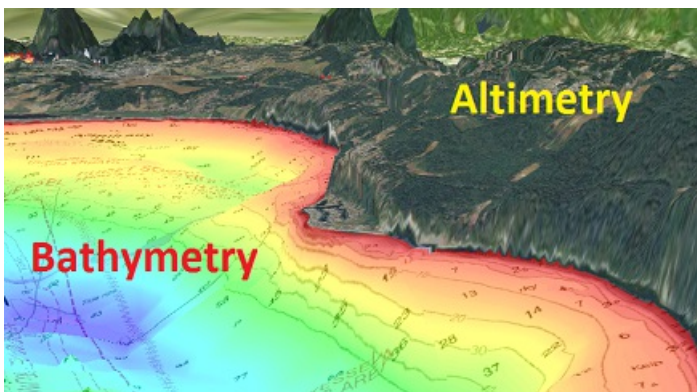
Altimetry (3D above water) is always activated and its exaggeration can be changed manually from the Plotter Display Options under the "3D Display" by adjusting the "3D Alti Exaggeration" slider.

Note: This setting is used to enhance the 3D image over land by over or under-exaggerating 3D data over land. Minor changes in elevation become visible in areas that might otherwise appear completely flat (or vice-versa). If you are in an area where the mountains appear too high, simply reduce the 3D Alti Exaggeration

Bathymetry (3D below water) is turned OFF by default. This means that, by default, the seafloor appears flat. This is to avoid parallax effect that can be disturbing to some users. If you want to enable the 3D underwater , simply select "3D Bathymetry" from the Plotter Display Options .

In the screenshot below, the Bathymetry is OFF (default setting). You can see that it is very easy to locate the boat and AIS icon relative to the chart:
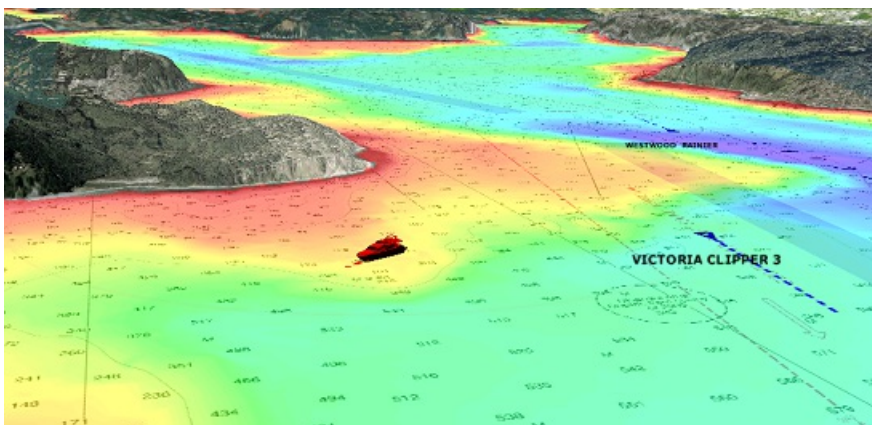
In the screenshot below, the Bathymetry is ON. This allows you to visualize in great detail the underwater structure around your vessel. However, it might be difficult to place objects that appear at the surface (target, marks, etc...) at their proper location relative to the bottom location:
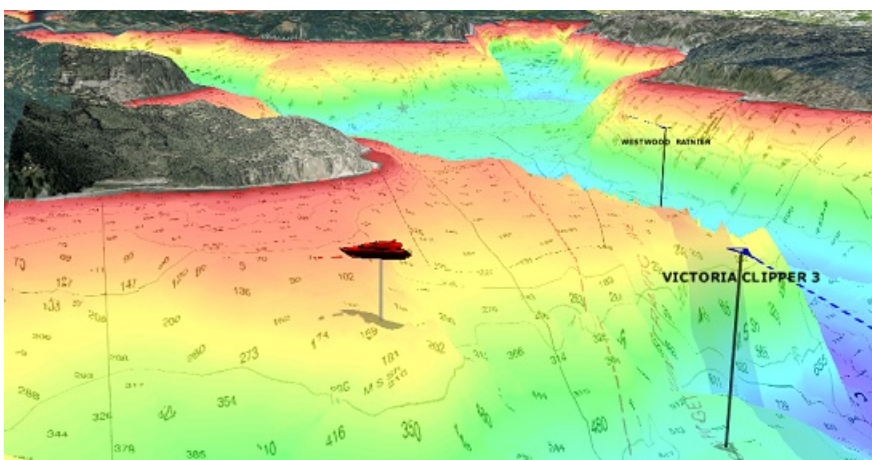
For that reason, the Bathymetry can be turned ON or OFF.

Note: The "3D Bathymetry" setting does not affect the Depth Shading

Selecting Charts & Overlays

TimeZero's powerful graphics engine adds new chart presentation options to the conventional method of electronic chart plotting. TimeZero can display vector o raster charts and merge them with satellite pictures and depth shading. With 3D data and our Satellite PhotoFusion rendering, satellite imagery blends with critical chart data in an easy, useful way that greatly enhances situational awareness.

Selecting Charts

Click on the Layer button to display and select the various options:

- **Auto**: Select this option if you want TimeZero to automatically pick the best MM3D chart source according to the area

Note: By default, TimeZero will try to use a Vector chart in Auto mode. However, if you have installed and prefer Raster charts, you can switch the "Chart Priority in Auto Mode" to "Raster" from the Plotter Display Options

- **MM3D S-57**: Select this option to display Vector Charts from Hydrographic Offices (NOAA) compiled in MM3D format

- **MM3D C-Map**: Select this option to display Mapmedia mm3d C-Map Vector charts

- **MM3D Navionics**: Select this option to display Mapmedia mm3d Navionics Vector charts

- **MM3D Raster**: Select this option to display Raster Charts from Hydrographic Offices (NOAA, SHOM, UKHO,...)

Note: If a chart type is missing from the selection, it means that you have not installed that type of chart yet.

Chart Property

Source, issue date, Unit (Raster Charts only) etc... can be displayed by right clicking on the chart and selecting "Chart Properties":
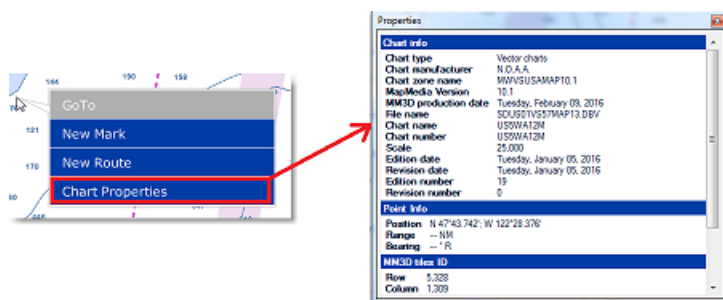
Note: The Raster Chart depth unit may change according to the location. A Raster Chart Unit legend can be displayed on the screen at all time by selecting "Display Raster Chart Unit Legend" from the Plotter Display Options. Vector chart always uses the depth unit define in the Units Options.

Satellite Photos

Satellite pictures can be fused with raster or any type of vector charts by a method called PhotoFusion. Land areas are completely opaque, so that these areas are displayed as high-resolution satellite photos on the chart. As the depth increases, the satellite photography becomes more transparent so that the shallows are displayed along with the chart information. As the deeper water begins, the satellite picture disappears, leaving the raster or vector chart. High-resolution satellite photography enables the user to easily identify the seabed classification as sand, rock, coral or other obstructions.

To enable the PhotoFusion overlay, select "Satellite Photo" from the Chart button.

Note: PhotoFusion automatically adjusts the transparency of the Satellite Photo, however, it is possible to manually offset the transparency (make it more or less transparent) using the "PhotoFusion Transparency Offset" setting available in the Plotter Display Menu.

Tips: When the "Chart Boundaries" option is selected from the Plotter Display menu, Green boundary outlines are displayed where the Satellite pictures are installed.

Depth Shading

A depth color scale can be applied to raster or any type of vector charts. This unique feature allows you to view water depths at-a-glance with vibrant colors. To enable the Depth Shading overlay, select "Depth Shading" from the Layers button.

By default, the color scale is set automatically (TimeZero scans for the deepest and shallowest point on the screen and automatically adjusts the upper and lower boundary). You can disable the Automatic mode by clicking on "Auto".

In Manual mode, you can adjust the lower and upper boundaries from the Plotter Display under Depth Shading.

Other Overlays

The Layer button allows the user to display various additional overlays:

- Select "Tidal Height Stations" to display the Tidal Gauges on the Charts (refer to Tides for more information).

- Select "Tidal Currents" to display Currents Arrows on the Charts (refer to Tidal Currents for more information).

- Select "Grid" to display a Lat/Lon grid on the Charts.

Note: When the Grid is set to TD or Loran, it will only appear at lower zoom level

Adjusting Vector Charts Display

Unlike Raster charts, Vector charts can provide control over the level of information displayed. Vector charts are made up of individual objects and data layers such as navigational aids, spot soundings and land features that can be displayed or hidden. These adjustments are made from the Vector Chart and the S-52 Display Options.

Vector Chart Options

"Chart Object Size" is a slider that allows the user to change the size of the Vector Charts Depth Sounding and Objects (Buoys, Wrecks, Obstructions, etc...)

"Chart Color Palette" allows the user to change the colors (or "theme") of the Charts.

"Chart Symbol" allows the user to change the buoys icons to either a "S52" or "International" representation.

The Shallow/Safety/Deep Contour parameters are used to color the various depth areas on the Vector Chart. The transition between colors is based upon the depth contour lines of the vector chart. If no contour line (corresponding to the exact value you selected) is available on the vector charts, the color transition will happen at the next (deeper) contour line available.

In addition to these screen rendering parameters, the Vector Chart Menu allows you to turn ON or OFF the display of specific objects (such as Buoys Name or Light Description).

S-52 Display Options

This menu allows fine tuning of the vector chart objects that are displayed on the screen. The S52 Vector Chart Display Mode provides quick access to five different levels of detail for vector charts:

• "Base" shows the minimum set of objects necessary for planning.

• "Standard" adds other objects (such as restricted areas or channels) that are necessary for safe navigation

• "Other" display all the objects available

• "Fishing" adds objects that are useful for fishing

• "Custom" uses the settings defined under the S-52 Custom menu (checked boxes)

Ship Icon

When TimeZero is started in Navigation mode and is receiving a valid position, a ship icon is displayed on the chart:

Note: If you cannot locate the ship icon on the chart, click on the "Center On" button located on the top right to center the chart on your ship's position.

The icon in red represents the boat and indicates its position and heading (or course over ground if heading data is not available). Note that it is possible to change the default red color to green or yellow from the Initial Setup Options.

If the position source is lost the ship icon is displayed in black and stays at the last known position value. A GPS Lost alarm is also triggered:

Note: The ship icon will turn black if no valid GPS data is received for more than 10 seconds. If you have intermittent GPS signal, it is recommended to try to relocate the GPS antenna position on your boat to improve reception. If you want to monitor the quality of GPS signal and number of satellites being used, it is recommended to use the "GPS Status" NavData.

Icon Size

The size of the icon can be selected from the Initial Setup Options ("Size of Static Icon").

When sufficiently zoomed in on the chart, the ship icon will be displayed in real size according to the scale of the chart and the "Boat Length" parameters setup in the Initial Setup Options.

When the Plotter is displayed in 3D, a three dimensional model of the vessel icon is displayed. The model can be customized from the Initial Setup Options ("Boat Icon").

Course & heading Vector

The Heading line and/or Course vector can be displayed. Right click on the Ship Icon and enable or disable the corresponding vector.
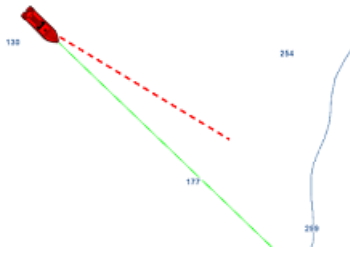
The COG vector (displayed in dashes with the same color as the boat icon) is calculated by the GPS. It indicates the direction of movement relative to a ground position. The length of the COG vector can be setup by distance or time. When it is set to "Time", the length varies according to the speed of the boat and can be configured to show the predicted position in a specified amount of time. This setting is available in the Ship & Tracks Options (under "COG/SOG Predictor").

The Heading Line (displayed as a green line by default) is sent by an Electronic Compass and shows the direction of the bow of the boat. The heading line color can be changed from the Ship & Tracks Options (under "Heading Line Color").

The Drift Vector (displayed as a blue dashed line) can be received from a sensor or computed by TimeZero when COG, SOG, STW and heading are received. This vector graphically represents the drift direction and speed. To be consistent, the drift vector shares the same parameters as the COG vector (when set to "time").

Range Circle

A range circle can be displayed around your vessel. Right click on the Ship Icon and enable "Range Circle":
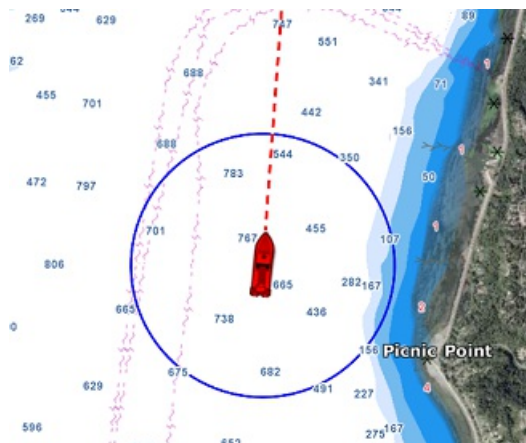
Range circle distance, color and thickness can be adjusted from the Ship & Tracks Options.

Centering On The Boat

Click on the "Center On" button on the top right corner of your screen to center the charts on own ship position:

Motion Mode

When your boat is on the screen and the chart is scrolled or zoomed, a red circle appears in the middle of the screen. This is the "Relative Motion Circle", a new and intuitive way to control the Relative/True motion.
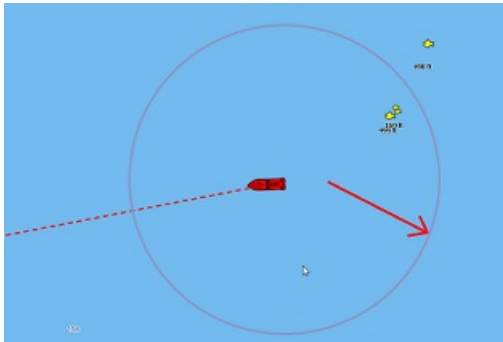
When the Ship icon is inside the Relative Motion Circle, the chart will scroll on the screen and the Ship icon will always stay at the same relative position inside the circle (Relative motion mode). When the Ship icon is outside the Relative Motion Circle, the screen will not scroll (True motion mode).

To shift the position of the relative motion mode, scroll the charts using the Panning Tool or the Keyboard arrows until the Ship icon is at the desired location on the screen, making sure to keep the Ship icon inside the Relative Motion Circle.

Note: When the chart orientation is set to "Head Up", the software automatically offsets the icon location on screen to the bottom, giving more chart view in front of your boat.

Auto Shift mode ("Look Ahead")

You can change the behavior of the "Center ON" button to Auto-Shift (or "Look Ahead") from the Layer button (under "Display Mode"):
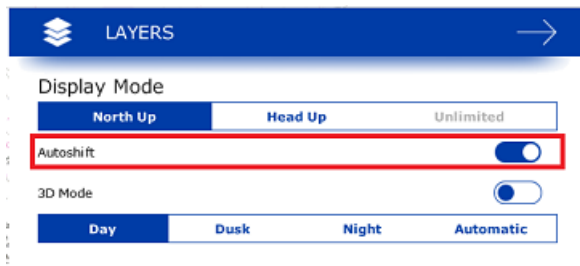
When this mode is selected, the position of the boat will automatically be moved inside the motion circle based on your speed and your course (COG). The "Autoshift Maximum Speed" can be adjusted from the Ship & Tracks Options. This adjusts the speed at which the boat will be the most off centered on screen.

Note: The Autoshift function makes the most sense when the chart orientation is set to "North Up". However, the Autoshift function will also work in "Head Up" mode, and will simply off center the boat on a vertical axis based upon its speed.

Note that if you manually pan the chart or use the arrow keys on your keyboard, the Auto Shift mode will automatically be turned OFF.

TIPS: You can adjust the size of the Motion Circle from the Ship & Tracks Options to increase or decrease the maximum Auto shift location on the screen. Make sure also to adjust the Auto shift Maximum speed according to your boat.

Trail & Tracks

TimeZero can keep track of your Own Ship position history using either Trail or Tracks. The trail is always and automatically recorded in the background (you have nothing to enable) and it can be either displayed or hidden on the chart. Tracks need to be manually recorded by using the track button (ON/OFF) or be recalled from a Trail portion. Tracks can then be managed from a list and exported/imported.

Trail and Track have each their advantages and their specific uses. Tracks are useful to permanently record specific passages , but can quickly clutter your screen if you are not diligent about choosing when to enable or disable the track recording. The trail on the other hand is 100% automatic and you can dynamically adjust its length (using the trail duration setting).

For recreational boaters, the best practice is to primarily use the trail, and then, if you want to permanently display on your chart a specific passage, simply create a track from a trail portion (using the right click on the trail and selecting "recall track").

Note: Trail and Tracks are both recorded at one second interval as soon as TimeZero receives a good GPS position

Trail

To display the trail on your chart, click on the boat icon and enable "Own Ship Trail":
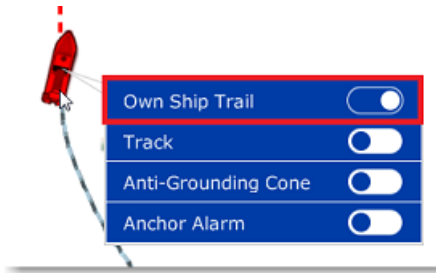
When enabled, the trail displays behind the boat icon all your contiguous position using animated white and black dots:

The trail duration can be adjusted from the Ship & Tracks Options

Note that the trail display is dynamic and changing its duration will immediately update its length on the chart. By default, TimeZero displays a trail duration of 1 day, but you can make it as short as 30 minutes or as long as 20 days.

Note: It is possible to replay a trail older than 20 days by using the Boat Replay feature of the Planning WorkSpace.

Tracks

Enabling / Disabling Track Recording

The "Track" button that allows you to enable or disable the track recording is not configured by default in the Toolbar. If you want to use the track recording in addition to the trail, you will have to add the "Track" button to your Toolbar configuration first. Just click on the "Configure Tools" button (at the lower end of the Toolbar) to add the Track button:
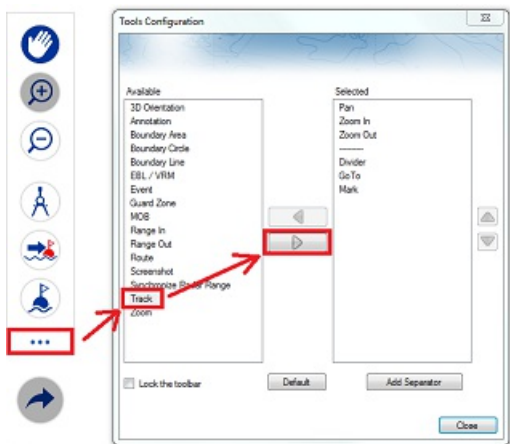
Once available on the toolbar, simply click on the Track button to enable track recording:

When the track is being recorded, the "Track" Button turns blue:

Click on the button again to toggle OFF the track recording.

Recalling a Track using the Trip List and the Trail

TimeZero has an innovative feature that allows you to recall any track portion from your trail (which is guaranteed to be always recorded). This is a much more practical way to create a track rather than trying to remember to press the track button ON and OFF at specific times. Although the live trail display is limited to 20 days, you can use the Planning WorkSpace and the trip list to recall any trail of any trips you have done in the past.

To recall a track:

- Select the "Planning" WorkSpace

- Click on the Calendar icon to open the Calendar and Trip list. Either select a date/time using the calendar or select a trip by clicking on its start date inside the list:
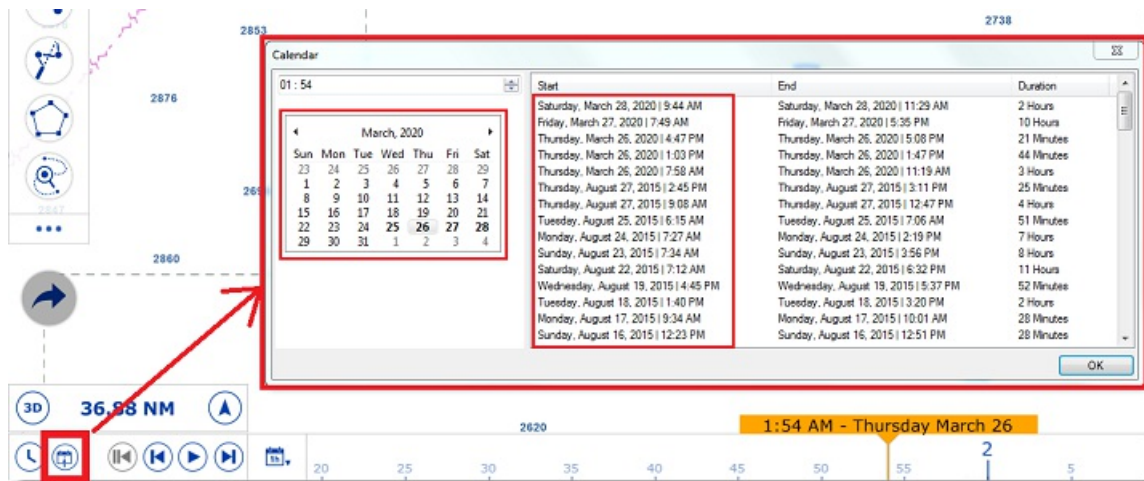
- After selecting a valid date, the chart will center automatically to the recorded location and a blue boat icon will be visible on the chart (this is the position TimeZero recorded for the selected date/time). Note that you can move the timeline at the bottom of the screen to refine the date/time until the blue boat icon is approximately at the position you wish to record the track from.

- To activate the Track Recall mode, either click on the "Track Recall" tool available in the Toolbar of the Planning WorkSpace, or right click on the blue boat icon and select "Recall Track":

Date	6:15:00 AM Tuesday, August 25, 2015
Position	36°58.3961' N / 27°02.6094' E
COG	109.9 °M
Heading	109.9 °M
Recall Track	
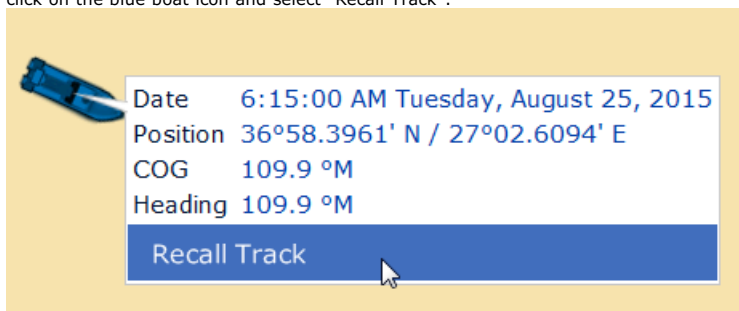
- Once the Recall Track mode is enabled, TimeZero will display track points around the blue boat icon and your cursor will change into cut tool:
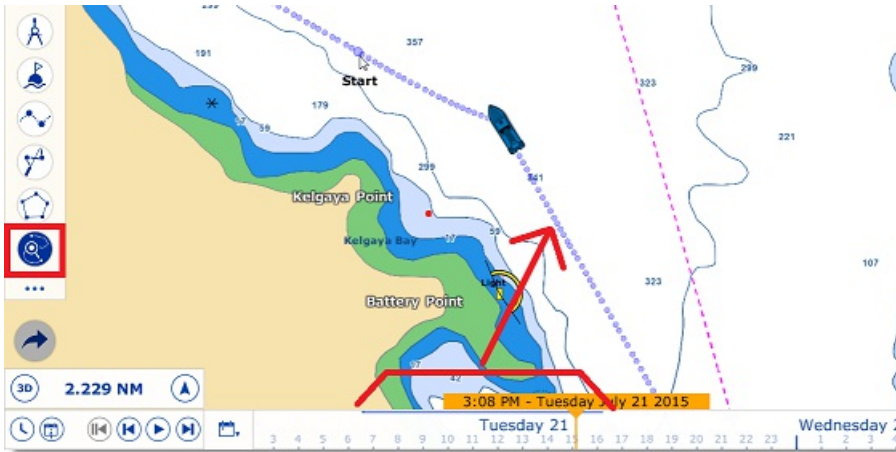
- Use the tool to "cut" the track portion you want to recall by clicking on a first point to set the beginning of the track and by clicking a second time to set the end. TimeZero will then create a track automatically:

Track Coloring

You can change the default track colors from the Ship & Tracks Options by adjusting the "Track Color" setting. After adjusting this setting, all the new tracks will use that color by default. Note that you can individually change the color of any track by right clicking on a track and selecting a new color.

Displaying the Track List

To display a list of all the tracks, select the "Lists" button from the "Planning" WorkSpace located on the bottom right to open the Lists:
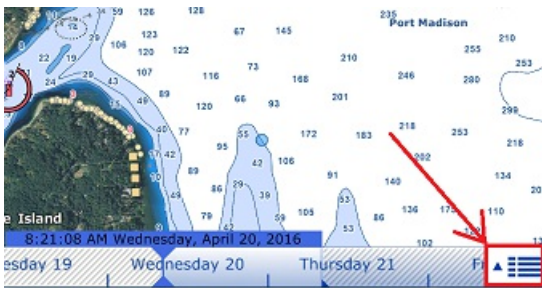
Select the Track list:
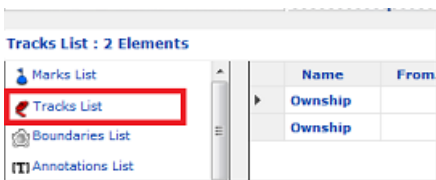
To select and center on a specific track on the Chart, click on the first column corresponding to the track you want to display:
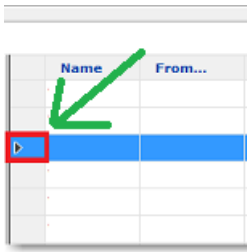
Please refer to the Marks and Objects List chapter for more information on the List.

Converting a Track into a Route

Right Click on a track (either on the Chart or from the Track list) and select "Follow Track". This will create a route that follows the track direction.

Note: If you right click on the track being recorded (the "active track"), select "Track Back" to convert the Track into a Route and automatically reverse it.

Importing and Exporting Track

Exporting Track

You can export all your tracks from the "Import/Export" button available under the TimeZero button. Please refer to the Import & Export Data chapter for more information.

If you want to export only one track or a specific selection of tracks, you can use the "Action" menu of the Track List:

- Open the "Track List" by using the "List" button located in the ribbon

- Select one or multiple tracks. To select multiple consecutive tracks, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual tracks, press and hold the CTRL key and click on the lines.

- Click on the "Action" button located on the upper right side of the list panel

- Select "Export Selected track(s)"

- Select the export format

- Give a name to the file that will hold your track(s) and save it:
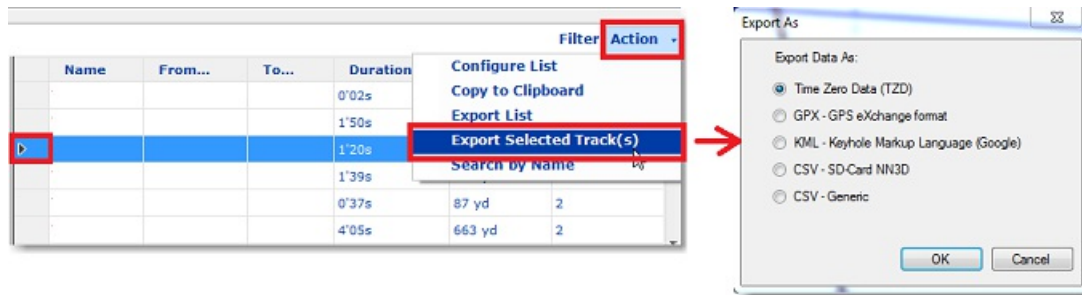
Note: If you want to export one or multiple track to exchange them with another TimeZero user, it is recommended to use the "TimeZero Exchange (TZX)" format.

Exporting Track Details

When you select "CSV - Generic" from the format window, all the detailed track information (including additional data) will be exported as a CSV file:
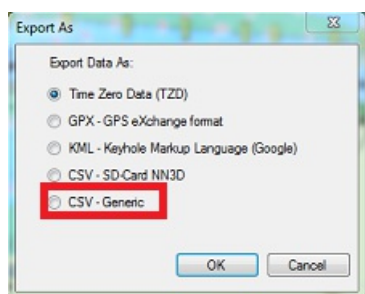
This selection allows the user to generate a CSV file containing a new line for every track point with all parameters included in the track. The first line starts with # followed by the track name. The second line is a header indicating the name of each parameters contained in the

column.

<u>Example:</u>

#Name1
Latitude,Longitude,Year,Month,Day,Hour,Minute,Second,Depth,Course over ground,Speed over ground,Heading,Speed through water,True wind direction,True wind angle,True wind speed,Apparent wind angle,Apparent wind speed,Set (Current direction),Drift (Current speed),Atmospheric pressure,Air temperature,SST

The resulting CSV file can be opened in Excel if needed for deeper analysis.

Note: If multiple tracks are selected, all the information (from multiple tracks) is combined in a single file. The #TrackName and header will allow to identify the beginning of all the tracks in the CSV file.

Importing Track

To import tracks, select the "Import/Export" button available under the button. Please refer to the <u>Import & Export Data</u> chapter for more information.

Note: When you import track from a file, they are added to your existing database.

Trips & Boat Replay

TimeZero includes a powerful logbook feature that always record your position and instruments data into a database. This data is automatically split into "trips" that can be easily selected and replayed from the Planning WorkSpace.

When you select the "Planning" WorkSpace, a timeline is displayed at the bottom of the screen. This timeline allows to simulate route planning, display weather or tides & currents, but it also allows you to go in the past and replay your trips.

When the timeline is in Hour, Day or Week Mode, time-spans containing recorded data will be indicated with a blue bar. As you shift the play-head over these time-spans, a blue boat icon will be displayed on the chart indicating your recorded position:
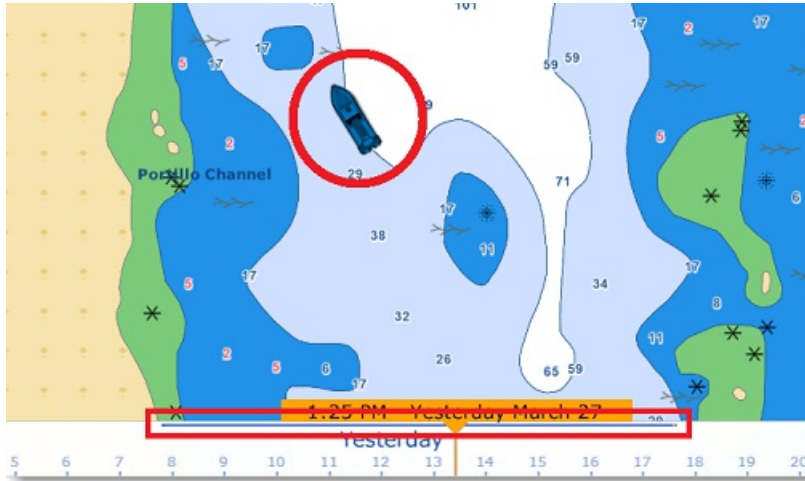
You can click on the blue boat icon to display all sensor data available at that time:

To display a list of your previous trips, simply click on the Calendar icon located at the bottom left corner of the Planning WorkSpace:
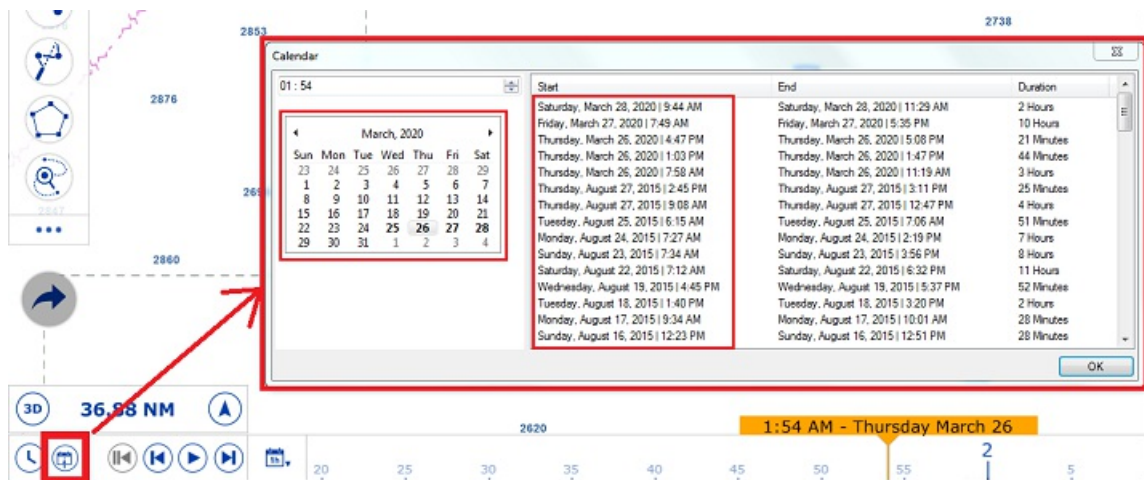
All window will appear allowing you to select a specific date (using a calendar) or view all your previous trips organized by date (most recent at the top). Note that by clicking on the start date of any trip, the timeline will adjust to this date and the chart will center on the blue boat icon making it very easy to find and replay your trips.

You can then use the Play/Pause button or manually drag the timeline to replay your trip. If you want to create a track from your past trips, read the following chapter.

Anti-Grounding Cone

The anti-grounding cone enables TimeZero to scan for dangerous objects and depth in front of your boat and warn you in case of possible collision or grounding. To activate the anti-grounding cone, either click on the boat or click on the Layer button and select "Anti-Grounding Cone".

This will display a cone in front of the vessel that has the same length as the COG/SOG predictor. If a dangerous objects enter the cone, an alarm will appear in the status bar (a sound can also be assigned from the Alarm Options by pressing "Define Alarm Sounds"):
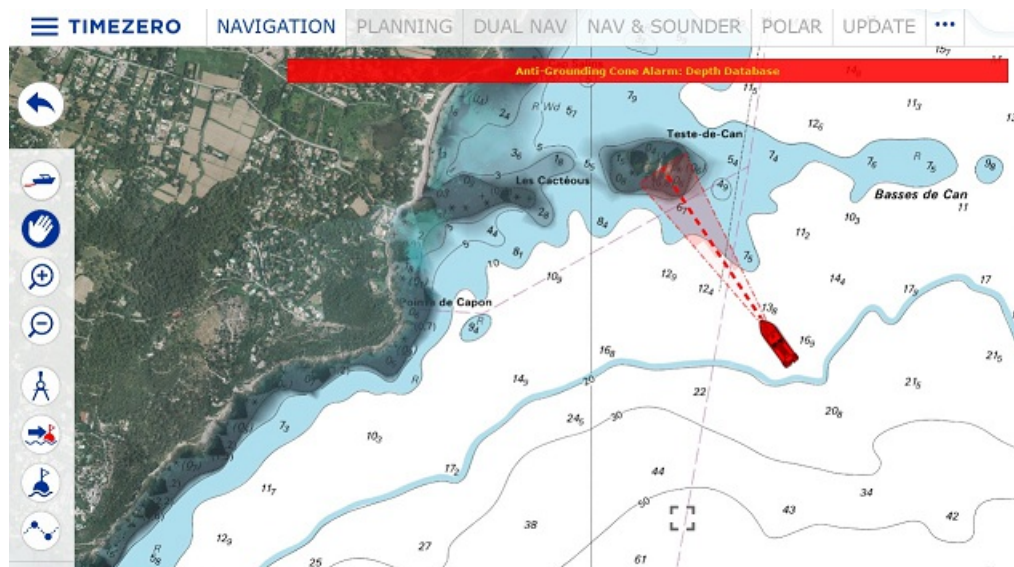
The shape of the cone can also be adjusted from the Alarm Options by pressing "Anti-Grounding Cone configuration". The angle of the cone and the maximum length/width can be adjusted. In the example below, the angle has been increased (making the cone cover a wider area quicker in front of the vessel), but maximum values have also been setup that modify the shape of the cone similar to a funnel:
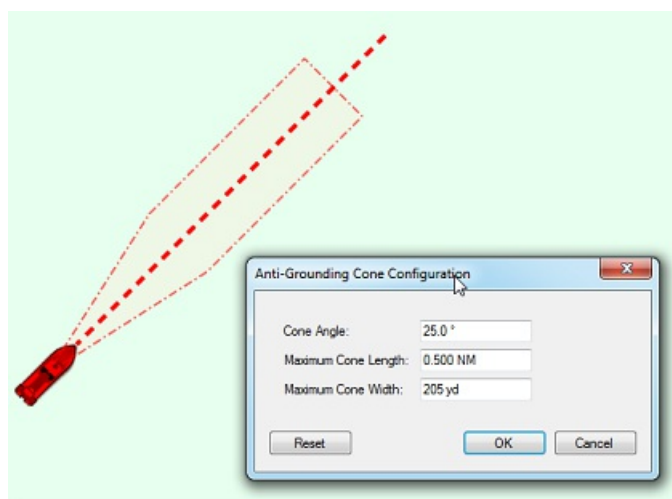
The type of dangerous objects and depth areas that TimeZero scans inside the cone is shared with the Route Safety. The list of objects can be adjusted from the Routes Options by clicking on "Route Safety Configuration".

Although the Anti-Grounding Cone is not limited to vector charts objects, a warning will be displayed if it is enabled in an area where no detailed vector chart is available.

Note: Vector charts don't have to be displayed on the screen, they just have to be loaded in the software. If you install both Raster and Vector charts and prefer to display Raster charts on screen, the Vector charts data will still be used by the anti-grounding cone.

Man Over Board

The "Man Over Board" button is hidden by default. To make it available in the Toolbar, click on the "Configure" button and add it to the WorkSpace configuration.

The MOB button can be configured to act in two ways from the Alarms Options (under "MOB Behavior"): "Event Only" or "Alarm and Activate Route".

When the MOB is set to "Event Only":

- An Event (mark with MOB icon) is dropped at the current vessel location

- The Navigation WorkSpace is automatically selected

- The chart is automatically zoomed and centered on the MOB location

When the MOB is set to "Alarm and Activate Route":

- An instant Waypoint is created at the current ship position and the Route is activated

- The Navigation WorkSpace is automatically selected

- The chart is automatically zoomed and centered on the MOB location

- The MOB alarm is activated in the status bar

Note: When a MOB is triggered in "Alarm and Activate Route", the Waypoint Switching parameters are disabled and the MOB Waypoint remains active until manually cancelled.

To return to Normal Mode:

Cancel the MOB by clicking on the Active Route leg and select "Cancel Navigation".

Anchor Watch Alarm

The Anchor Watch Alarm allows you to set and monitor your position relative to an anchor point. If your current position strays too far from that set point, a warning and alarm will be triggered.

TimeZero includes an advanced Anchor Watch Alarm that is automatically synchronized on the local network among other compatible TimeZero devices (TZ iBoat on iOS and other TimeZero on PC). The Anchor Watch Alarm can also be sent to the TimeZero Cloud (Internet connection required) so that you can monitor your boat remotely from any web browser.

Set the Anchor Watch Alarm

You can enable ("drop") the Anchor Alarm by clicking directly on the Own Ship icon and selecting "Anchor Watch Alarm".

When the alarm is enabled, an icon is dropped at the anchor point, and a red dashed circle corresponding to the anchor watch alarm radius (adjusted from the Alarms Options) is drawn on the chart:
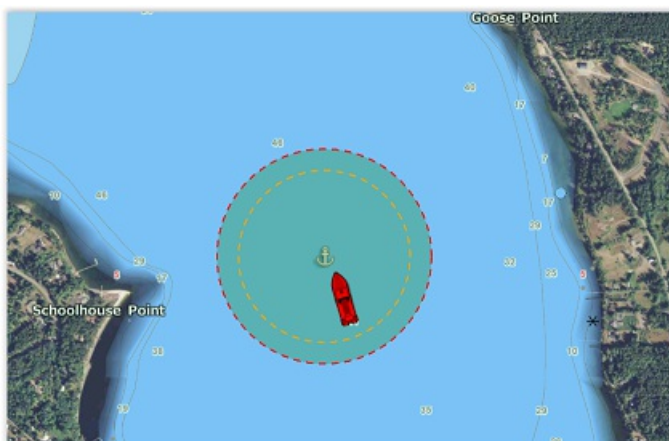
Note: By default the anchor point will be set at the bow of your vessel. You can adjust the Anchor Point position (relative to your vessel) from the Initial Setup Options under "CCRP". Note that for the anchor point to be properly placed, a heading sensor is recommended (so that TimeZero knows exactly which direction your vessel is facing).

When the anchor watch is enabled, the trail is automatically displayed and restricted to the time the anchor watch was dropped. This allows you to view the movements of your vessel since your started the anchor watch:

If you notice big swings in position that are due to GPS inaccuracies, it is possible to enable the Anchor Watch "Position Averaging" from the Alarms Options. When enabled, this will average your GPS position over the specified duration (from 5 seconds to 45 seconds). Note that if you enable position averaging, the averaged position will be displayed on the chart:

Enabling position averaging will delay the Anchor Watch warning, but it might avoid lots of false alarms.

Adjust the Anchor Watch Alarm Position and Radius

If you need to adjust the anchor watch position and/or radius after it has been dropped, simply click on the anchor icon to select it. You will then be able to drag the anchor point with your mouse and adjust the alarm radius by using the two handles that will appear when the anchor point is selected:
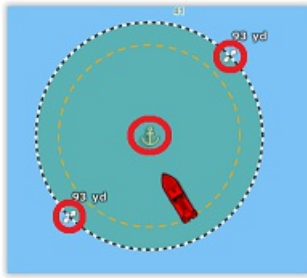
TIPS: when the anchor point or circle is selected, the alarm radius is displayed just above the two handles.

If you want to reset the anchor point to the bow of your vessel, you can right click on the anchor point or circle and choose "Reset Anchor Watch".

Anchor Watch Warning and Alarm

When the vessel is at a safe distance from the anchor point (when the distance from the anchor point to your GPS position is less than 80% of the alarm radius), the circle background is green. When the distance reach 80% (but stays under 100%), you are in the "warning" area: the circle background will turn orange, a yellow warning ("Anchor Watch Warning") will appear in the status bar and a short warning sound will play through your computer speakers. If your GPS position goes outside the alarm radius, the circle background will flash in red, a red alarm ("Anchor Watch Alarm") will appear in the status bar, and an alarm sound will play through your computer speakers:
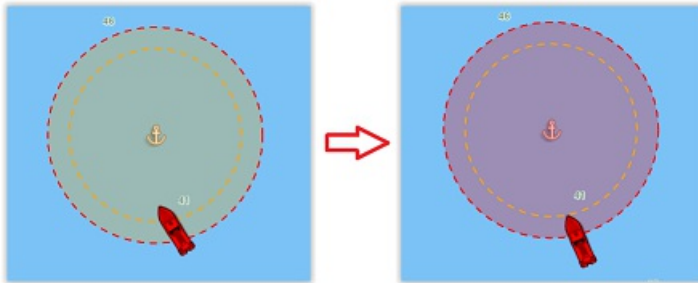
TIPS: It is possible to change or disable the warning and alarm sounds from the Alarms Options (click on "Define Alarm Sounds").

To stop the Anchor Watch Alarm, you can right click on the anchor point or its circle and select "Remove Anchor Watch". You can also uncheck "Anchor Watch Alarm" by clicking directly on the Own Ship icon.

Local Synchronization of the Anchor Watch Alarm

If multiple compatible TimeZero devices are connected on the same local network (TZ iBoat on iOS and other TimeZero on PC), the Anchor Watch will be automatically synchronized on all devices. Any modification done to the Anchor Watch after it has been set will also be synchronized on the local network. This allows you to drop the Anchor Watch from a phone running TZ iBoat and then adjust it from the PC. When the Anchor Watch is created, modified or removed through another device on the network, a notification will be displayed in the status bar.

Remote Monitoring of the Anchor Watch Alarm

If the PC is connected to the Internet, it is possible to monitor your Anchor Watch using a Web Browser from any location. Just make sure to register TimeZero with your My TIMEZERO account and enable "Report my position automatically to My TIMEZERO" from the My TIMEZERO Options.

To monitor remotely your Anchor Watch and boat position, you can use any web browser (including mobile phone web browser such as Safari or Chrome) and login to your TZ Cloud account at: https://cloud.mytimezero.com/

Your vessel position and the anchor watch alarm will be displayed:
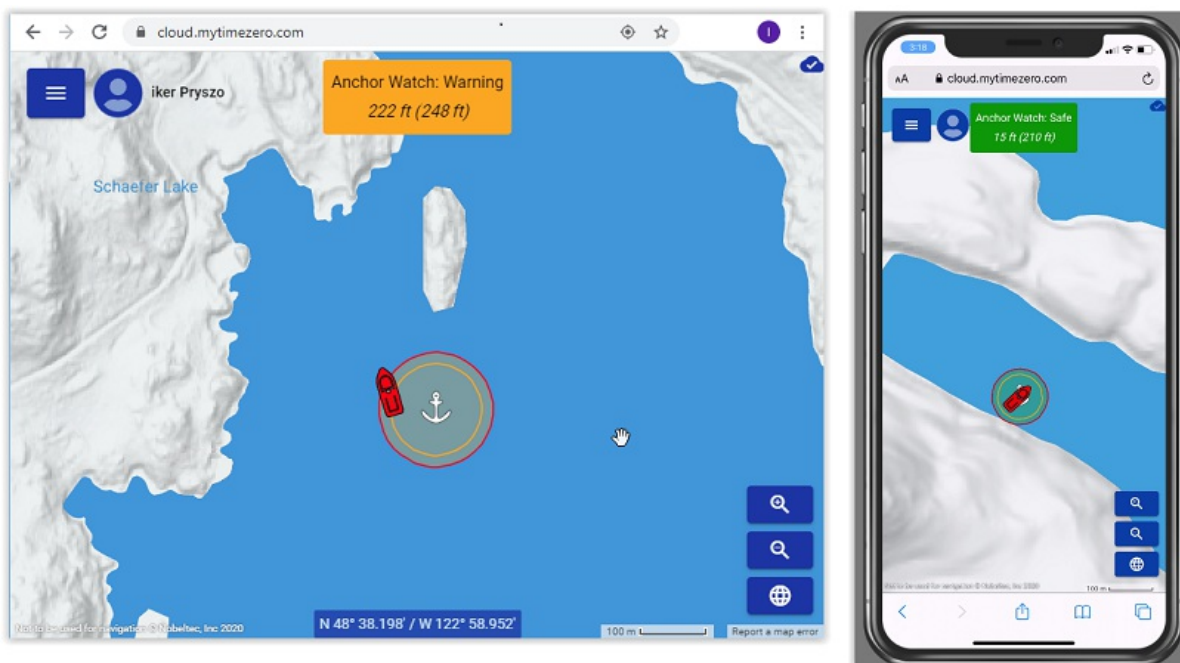
Note that you can click on your vessel to get real time information including speed, depth and wind if TimeZero is wired to the appropriate sensor and if "Include Wind and Depth to position report" is enabled from the My TIMEZERO Options (enabled by default):
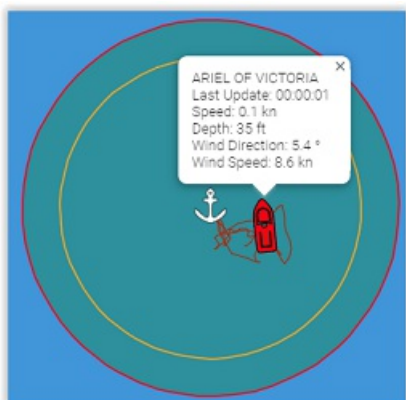
Note: When the Anchor Watch alarm is enabled, the position reporting interval set in the My TIMEZERO Options is ignored and the position/anchor watch report is fixed to 5 sec (to make sure to have an Anchor Watch monitoring close to real time). As soon as the Anchor Watch is disabled, the position reporting interval will revert to your selected setting.

Divider Tool

The Divider Tool can be used to display range and bearing in between two points or in between your own position and multiple points:

Bearing and distance between two points

To display the bearing and distance between two points, select the divider tool and move the cursor on the first location, click a first time to drop the first point on the chart, move the mouse over the second location and click a second time to drop the second point. A label with the range and bearing in between the two points will appear (near the second point):
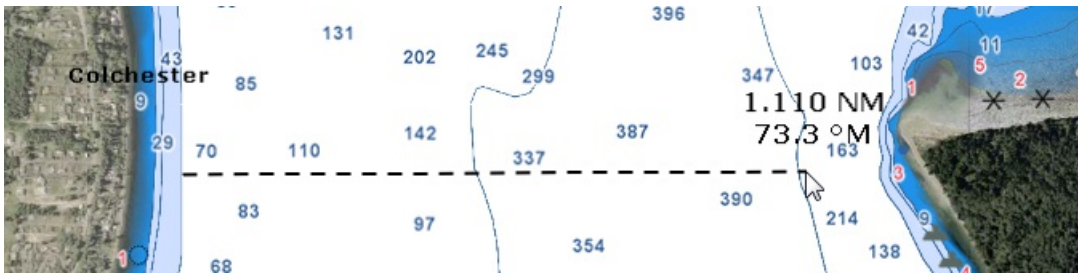
Note: After dropping the first point, it is possible to move the chart by clicking and dragging on the screen. You can also zoom in/out using the scroll wheel or keyboard shortcut. Please refer to the Scrolling & Zooming chapter.

Multiple Bearing and distance from own ship position

Select the divider tool and double click on the chart. This will create a divider line between the location where you double clicked and own ship position.

You can create multiple divider lines by repeating this action (select divider tool again and then double click on other locations):

Note: The divider lines from own ship will update as the boat is moving

Bearing and distance between two targets or a target and a point

The Divider tool can also be "attached" to targets (AIS or ARPA targets) by selecting (left click) the target with the tool. The range and bearing will automatically update on screen as the target move. You can click on a target and a fix point on the chart, or you can click in between two targets to get up to date real time bearing and distance information.

Note: If a target is lost or if you restart the software, the divider line(s) that were using a target as reference point will be erased.

Editing and Deleting Divider line

Divider lines can be moved by clicking and dragging the point to a new position

You can right click on a Divider line to delete it or delete all Divider lines.

Tips: If you double click on the Divider tool, it will erase all Divider lines on screen

Cursor NavData

The cursor NavData is displayed by default under the "Planning" NavData Panel on the right side of the screen. If the cursor NavData is not displayed, click on the "+" button on the top of the NavData panel to add it:

The Cursor NavData is very convenient to get quickly access to cursor position and range and bearing from own ship position.

If you right click on the NavData you will see an option to add and display additional information such as "Time to Cursor" (TTC). The Time to Cursor will give you a rough estimate about the time required to reach the cursor position with your current boat speed.

EBL & VRM

The "Furuno Radar Module" or "InSight Radar Module" needs to be unlocked and radar configured to access this feature

The EBL / VRM tool is available in the Tool Bar of the Radar WorkSpace. You can right click on the tool to get access to two EBL and two VRM:
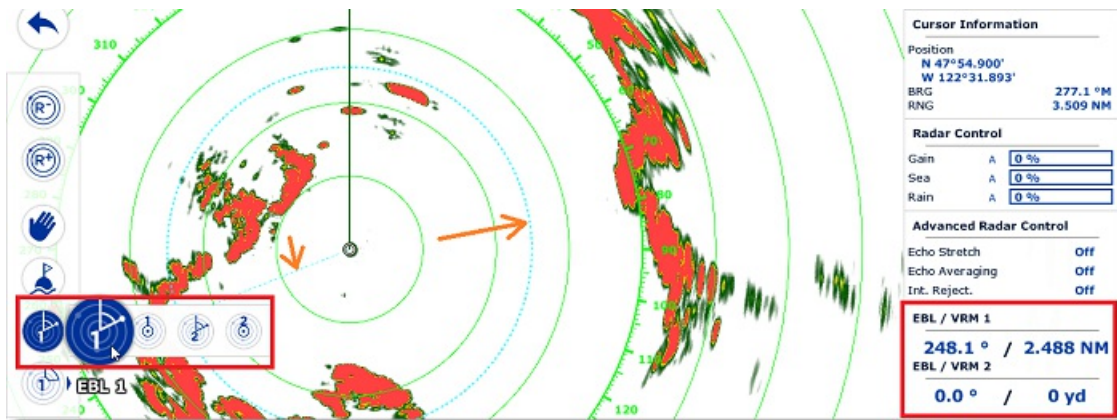
The EBL is used to display the relative bearing of a target on the radar display. After setting the EBL/VRM tool in EBL mode (either EBL1 or EBL2), a line is moved with the cursor, and the bearing is read from the EBL/VRM NavData. Note that one end is always anchored at the center of the radar.

The VRM is used to determine the distance to a particular target, such as the mouth of a river, a sea buoy marking a channel entrance or another vessel. The VRM is like a standard range ring, but can be adjusted manually by selecting the EBL/VRM tool in VRM mode (either VRM1 or VRM2). The range is read from the EBL/VRM NavData.

To adjust the EBL and VRM, you can click and drag them with your mouse, or put the cursor over the VRM or EBL value and use the scroll wheel. To delete an EBL or VRM, you can right click on it and select Delete. If you want to delete all EBL/VRM from the screen, just double click on the EBL/VRM tool.

Tips: The EBL/VRM color can be adjusted if you right click on the EBL or VRM.

Route Introduction

TimeZero allows for the creation of up to 200 routes of 500 waypoints each allowing you to plan multiple voyages.

Once you are ready to navigate, you can designate the route you want to follow and "activate" it. The active route is displayed in red and has special priority in the navigation system. When a route is activated, the first Waypoint becomes active (surrounded in yellow) and if a pilot is connected and configured in TimeZero, its information (bearing and XTE) will be sent and used to automatically steer the boat.

On the picture below, the route on the bottom is activated:
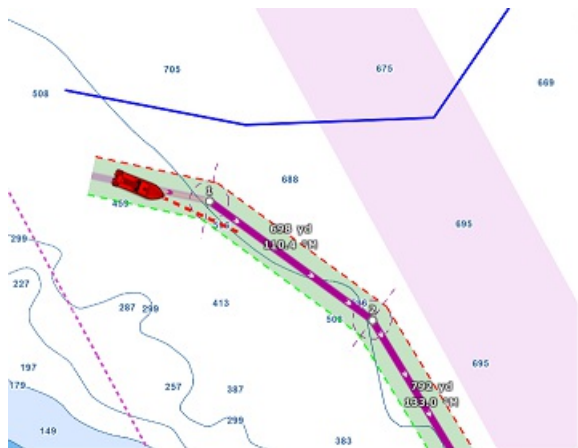
When enabled, the route safety is automatically analyzed by TimeZero. Safe legs have a green background while dangerous leg will have a red background. For more information, please refer to the Route Safety chapter.

Route Synchronization

Routes are automatically synchronized with all the compatible TimeZero Platforms (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3) that are connected on the same local network. You can display a list of all the detected TimeZero platforms from the Device List Options. Note that for the synchronization to work, TZ Navigator, TZ Professional and TZ iBoat all need to be logged with the same My TIMEZERO account (for security). But note that the synchronization with Furuno TZT2/TZT3 does not require to be logged when connected directly to the NavNet network (172.31.x.x).

The route activation will also be automatically synchronized on all the platforms at the same time. Note that it is recommended to use the same Waypoint Switching Mode settings to have a common visual reference on every devices, but if the settings are different, the first platform to arrive at a waypoint will indicate all the other one to switch as well.

If you do not want a platform to synchronize automatically on the local network, you can turn OFF the LAN Synchronization from the Device List Options.

Routes can also be synchronized using the cloud (when connected to the Internet). For more information, please refer to the TimeZero Cloud chapter.

Hiding All Routes

You can hide all routes (except the active and planning route) by deselecting "Display Routes" from the LAYER Button:
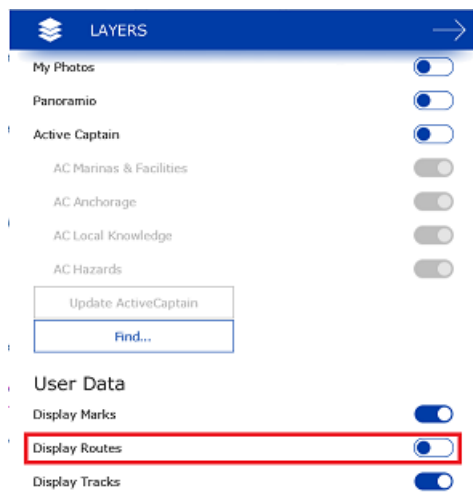
Note: It is not possible to hide the selected (planning) and active route. The selected and active route will always be displayed on the chart even if the route has been hidden. If you want to hide the planning route), right click anywhere and select "unselect all".

Hiding Individual Routes

You can hide individual routes from the Route list by selecting or not the visible checkbox:

	Visible	Name	From	To	Length	Comment
Marks List	☑	Alaska 01	Clam Bay	Gowlland Harbour	98.86 NM	Don't take Mudge against the ebb again
Routes List	☑	Alaska 02	Clevelan...	Ketchikan	57.37 NM	
Route Detail	☐	Seattle	Gig Harbor	Poulsbo	19.52 NM	
Catches List						

Routes List : 28 Elements

Note: It is not possible to hide the Selected (Planning) and Active Route. The Planning and Active Route will always be displayed on the chart even if the route has been hidden. If you want to hide the planning route), right click anywhere and select "unselect all".

Note that you can select multiple routes from the list (using the SHIFT or CTRL key) and then use the right click on the selection to change the visibility of multiple routes at the same time.

Creating A Route

When creating or editing a route, it is recommended to use the Planning WorkSpace. This WorkSpace allows you to access advanced features such as displaying a route detail list or making simulations and animations with tides, currents and weather.

To create a new Planning Route:

1. Tap on the chart

2. Select "New Route" from the Tooltip

3. Move the cursor to the next desired destination and click on the chart. Continue with this procedure to add additional waypoint

4. When all the desired waypoints are added, right click to create the last waypoint and choose "End Route" or press the Esc key on the Keyboard to end the route at the last created Waypoint. Alternatively, double click at the creation of the last waypoint.

While creating a route, the chart will move automatically to follow the route. To move the chart manually, click and drag the chart with your cursor. Waypoints are only created when you left click on the same position (without dragging the cursor). The arrow keys on the keyboard can also be used to scroll the chart while building a route.

Right click on the selected route and select "FlyOver" will follow the route on the chart.

By default, TimeZero is setup to display the range and bearing of each leg directly on the chart:
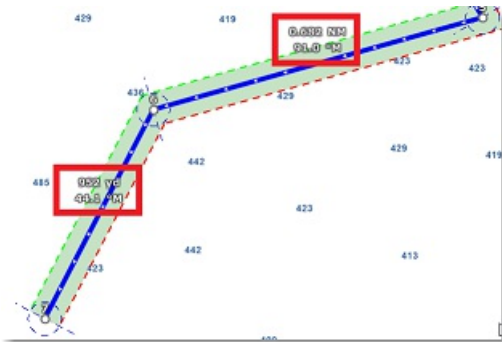
This can be turned off from the Routes Options by disabling "Display leg distance and bearing".

Great Circle Route:

TimeZero can display great circle or rhumb line routes. The great-circle route is the shortest path between two points on a sphere, like the Earth. A rhumb line route crosses all meridians of longitude at the same angle. Since the charts displayed by TimeZero are Mercator projections, rhumb line routes appear as straight lines and great-circle routes appear as curved lines.

When the "Great Circle Navigation" option is enabled, TimeZero divides the route into shorter rhumb line segments that follow the great circle path.

Route Safety

TimeZero includes a very innovative feature that allows you to check route safety while you are building it. This feature (enabled by default) can be adjusted from the Routes Options under "Check Route Safety".

When turned ON, the leg you are building will turn red or green after a brief moment letting you know if the leg is safe or not:
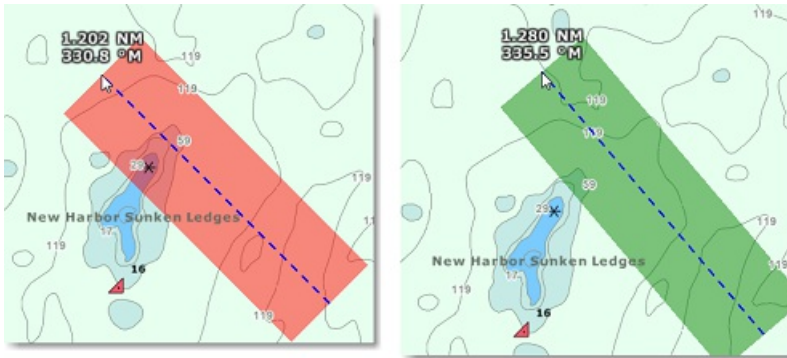
The width of the path checked along the route for dangerous objects and depth area corresponds to the "Default Route XTE Value" (default cross track error). This setting can be adjusted from the Routes Options. Note that by default, TimeZero can reduce automatically the width of the XTE to be able to fit the route in tight passage:

The minimum limit that TimeZero will use for automatically adjusting the XTE can be setup using the "minimum XTE value" from the Routes Options. If you do not want TimeZero to automatically adjust the route XTE (and always use a fix value), simply disable "Automatic XTE" from the Routes Options.

The type of dangerous objects and depth areas that TimeZero scans can be adjusted from the Routes Options by clicking on "Route Safety Configuration".

Although the Route Safety scan is not limited to vector charts objects, a warning will be displayed if it is enabled in an area where no detailed vector chart is available.

Note: Vector charts don't have to be displayed on the screen, they just have to be loaded in the software. If you install both Raster and Vector charts and prefer to display Raster charts on screen, the Vector charts data will still be used for the Route Safety scan.

You can also launch a Route Safety scan on any route that you have previously created or imported by simply clicking on the route (selecting the route as the planning route). Dangerous leg will be displayed in red on the chart and on the Route Detail list:
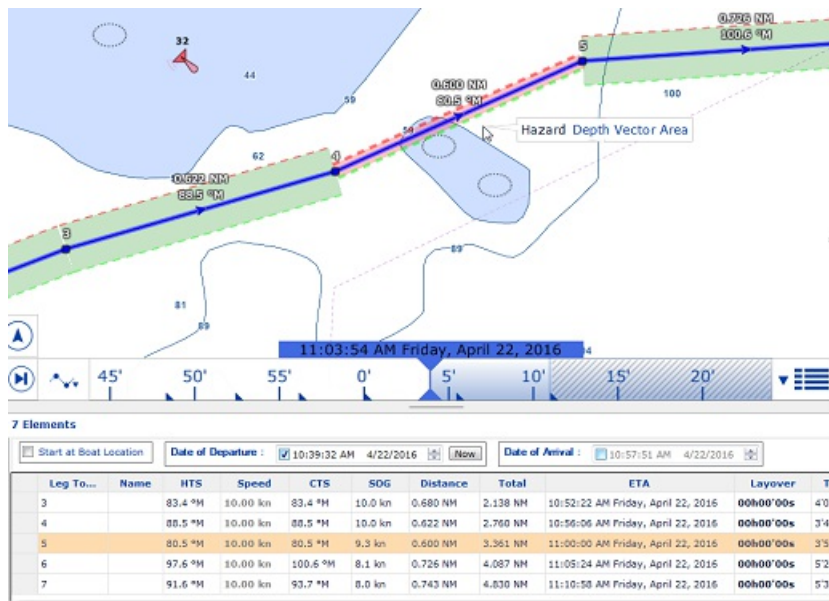
Note: Leg on the Route Detail list can also be displayed in red if a current is too strong.

IMPORTANT: Route Safety is only checked on leg that are 30NM or less. If you create a leg that is longer than 30NM, the route safety background will be gray indicating that no check has been performed. It is recommended to keep your route legs smaller than 30NM by inserting more waypoints.

Editing Routes

To move a Waypoint, place the cursor on top of it, then click and drag the Waypoint to the new location. Most of the advanced route editing operations can be performed by right clicking directly on any leg of a route and selecting the appropriate option from the drop-down menu. Note that if the Route Safety is enabled, it will be checked automatically as soon as the route is edited.

Note: TimeZero offers a very powerful unlimited Undo/Redo function. Every editing operation can be Undone or Redone multiple times by clicking the arrows in the status bar. The corresponding keyboard shortcuts (CTRL-Z, CTRL-Y) can also be used

Extend a Route

To add waypoints to the end of the route, click on any leg of the route and choose "Extend Route". TimeZero will automatically center the display on the last waypoint and enter into Route Building mode.

Insert a Waypoint

To insert a new waypoint in the middle of a route (to avoid an obstacle, for example), click on any leg of the route and choose "Insert Waypoint". Once the new waypoint has been inserted, you can drag it to the new desired position.

Reverse Route

To reverse the direction of a route, click on any leg of the route, and then, choose "Reverse Route".

Delete Route

To delete a Route, click on any leg of the route and choose "Delete Route".

Note: An Active Route cannot be deleted; it must be deactivated first by selecting "Cancel navigation"

Split Route

You can split the route at a specific waypoint or on a specific leg. When you right click on a waypoint and select "Split Route", the waypoint is duplicated and the route will stop at this waypoint and a new route starting at the same location will be created. When you right click on a route leg (segment) and select "Split Route", that leg will be removed and you will end up with two routes.

Join two Routes

To join two routes together, right click on the first route and select "Extend Route". With the route builder selected, put the cursor over any leg of the second route and then right click on it. Select "Link Route" from the contextual menu. This will join the two routes together:

"Fork" Route

A route can be "forked" from any waypoint. Simply right click on the waypoint you want to fork the new route from and choose "Fork Route". This will duplicate the route up to the location and allow you to go to a different direction from that point.

Rename Route

To rename a Route, right click on any leg of the route and choose "Rename Route".

Lock and Unlock Route

Right click anywhere on a leg or a Waypoint and choose "Lock Route". When a route is locked, you will not be able to move its waypoint and a confirmation window will appear if you try to erase it. Use the same process to unlock a Route.

Route Detail

The Route Detail displays the selected planning route in a tabular format together with information about the route as a whole. The Route Detail can also be used to calculate an ETA for each waypoint along the route and will help you select the best departure or arrival time possible. When planning a route, TimeZero computes automatically the Speed over Ground (SOG) according to the Speed through Water (that you can customize) and local currents.

Opening and Closing the Route Detail

Select the Planning WorkSpace, right click on a leg-line of the route you want to see and then select "Route Detail". Alternatively, you can also double-click on any leg-line of the route to open its Detail:

To close the Route Detail, use the button below that allows you to open or close the list view:
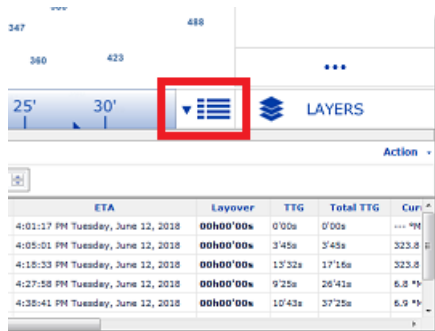
> **Note**: Line in the route detail can be displayed in red. This means that either a current is too strong on that leg or that the Route Safety detected a dangerous area or depth under the safety depth value.

Using the Route Detail

The top part of the Route Detail displays information about time of departure and ETA (Estimated Time of Arrival). The time of departure can be selected as the present time or another selected date. When a time of departure is selected, TimeZero will calculate the ETA according to the parameters available in the table (speed, current,...).

TimeZero also allows the user to set a date of arrival rather than a date of departure. This is useful when you need to arrive at a specific time (because of tidal currents for example). In this case, TimeZero will calculate the time of departure.

The information appearing in Bold in the table (such as "Name") can be edited by double clicking on the cell to be edited. After changing the value, press the ENTER key, or click outside the value to accept the new value, or press the ESC key to cancel the change.

Values that can be changed include: the waypoint name, the waypoint position, the speed (speed through water), the XTE (cross track error) and the layover time. The other values are computed by TimeZero, and cannot be changed directly:

- Leg To: Each line of the list gives you information about the leg that allows to reach a specific waypoint. The "Leg To" value is the number of that Waypoint.

- Name: Name of the waypoint.

- HTS: Heading to Steer. This is the heading that you should follow to reach the next waypoint. This value is adjusted to take the currents into account. This value can be different from the CTS if currents are strong in the area.

- Speed: Speed through water of the boat (or surface speed). This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu. If you want to revert to the default speed value, just erase the content of this cell.

- CTS: The "Course to Steer" is the direction (bearing) of the route leg as it would be on a paper chart.

- SOG: Speed over Ground being calculated based upon the surface speed and currents. The SOG will be different that the speed, because your boat can be "pushed" or "slow down" by the currents.

- Distance: is the distance of that leg

- Total: is the cumulative distance from the start of the route to that leg

- ETA: The Estimated Date of Arrival to that Waypoint taking account the currents (based on SOG).

- XTE: Cross Track Error of the leg. This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu. If you want to revert to the default XTE value, just erase the content of this cell.

- **Layover:** allows you to enter a pause in the route for a specific leg

- **TTG:** "Time to Go" is the time to navigate on that leg. The SOG and Distance are used to compute that value.

- **Total TTG:** is the cumulative time to go from the start of the route to that leg

- **Current D:** is the current direction of the station closest to the middle of that leg (default) or the station that was manually assigned to that leg

- **Current S:** is the current speed of the station closest to the middle of that leg (default) or the station that was manually assigned to that leg

- **Tidal Current Name:** is the name of the tide station closest to that waypoint

- **Tide Level:** is the tide height of the station closest to that waypoint.

- **Comment** *(hidden by default)*: Comment of the waypoint.

- **Current Angle** *(hidden by default)*: is the current angle (from the bow of the vessel) in which the current goes

- **Position** *(hidden by default)*: is the position of the waypoint

- **Tide Name** *(hidden by default)*: is the name of the tide station closest to that waypoint

The Route Detail "Action" menu provides quick access to main functions and parameters. It can be found on the right side title bar of the list. It includes the following options:

- **Activate Route:** To activate the planned route and start navigating. Note that this option is not available when TimeZero is started in Home Planning mode or when no position (GPS) is available.

- **Reverse Route:** To reverse the direction of the planning route

- **Set Speed of all legs:** To adjust or reset the intended speed of all the legs

- **Set XTE of all legs:** To adjust or reset the Cross Track Error of all the legs

- **Optimized Departure Time:** To compute the best departure time according to currents (see next paragraph for details)

- **Arrive at High Tide:** To compute the time you need to leave to arrive at your destination during high tide (see next paragraph for details)

- **Configure List:** To add or remove columns of the Route Detail table

- **Copy to clipboard:** To copy the list information as displayed on your screen. You can paste this information in a text editor or Excel for further editing

- **Export list in text file format:** To export the list information as displayed on your screen. Each field is separated by a Tab

- **Print:** To print the route detail voyage plan

Route Wizard & Simulation

Route Wizard

After creating a route, the Route Wizard will automatically appear (you can also right click on an existing route and select "Open Route Wizard"):
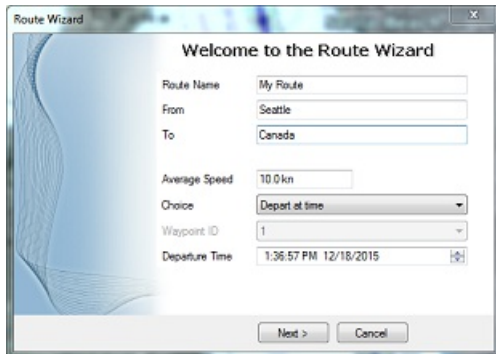
The Route Wizard allows you to enter the route information (name, origin and destination), but also helps you adjust speed and departure date according to tides and currents (when available).

Start by entering the average speed that will be used on all legs of the route for time computation. Then, select the mode you want to use:

- Depart at time: use this choice when you want to leave at a specific date and time. TimeZero will then compute your arrival time (ETA) using the selected departure date, the average speed on all legs and the currents (when available).

- Best departure time: use this option when you want TimeZero to select the best departure time according to currents along the route (taking into account your average speed on all legs). TimeZero will look for the best departure time around the time you selected (+/- 12H).

- Arrive at time: use this choice when you want to specify the arrival time. TimeZero will then compute your departure time using the selected arrival date, the average speed on all legs and the currents (when available).

- Arrive at high tide: use this choice when you want to arrive at high tide. TimeZero will look for the departure time around the time and date you selected (+/- 12H) that will allow you to arrive at high tide at your destination (taking into account speed and currents). A tide station needs to be near the last point of the route for this function to work.

- Arrive at a waypoint at given time: use this choice when you want to pass a specific waypoint at a specific date and time (transit time) taking into account the average speed along all legs and currents (when available).

The most powerful mode of the Route Wizard is certainly the "Best Departure Time" choice. This mode can save you a lot of time (and fuel!) when transiting in areas with a lot of currents. In the example below, the original date of departure was set to 5PM on December 19 (with an average speed of 7Kn). However, after computation, TimeZero let me know that by leaving at noon, I would be able to save more than 2 hours (more than 10% of the total trip duration):
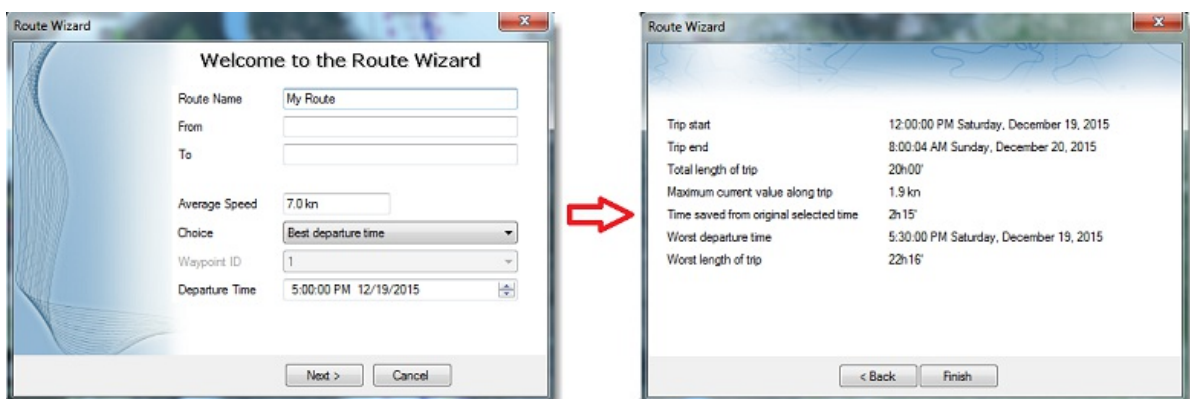
The Route Wizard result page also gives you interesting information (such as worst departure time and maximum current value along the trip).

When you close the Route Wizard, the speed and date of departure is automatically set for the current planning route.

Route Simulation

IMPORTANT: The Route Simulation features are only available in the Planning WorkSpace.

When a line of the Route Detail list is selected, or when you click on a waypoint, the Timeline at the bottom of the screen will switch in "Route" mode and set the Chart Time to match the ETA at the selected Waypoint. A "virtual boat" (blue ship icon) will also appear. This function is very useful when Weather Data or Tidal information is displayed because they will automatically adjust to the predicted time.

To select a specific row (or line) of the Route Detail, click inside the first grey column in front of the specific line:
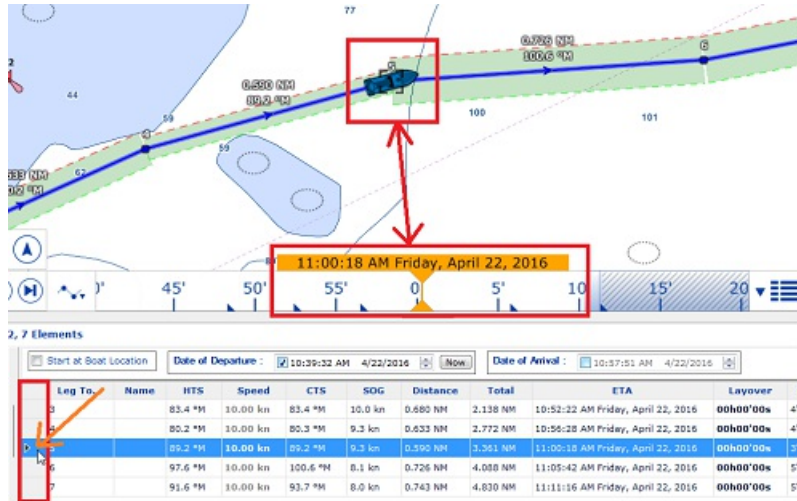
The chart will automatically center on that waypoint and the Timeline will automatically adjust the Chart Time to that ETA. The Tide Gauges, Current arrows and Weather (if displayed on the chart) will automatically refresh to display the conditions at that waypoint.

As soon as you adjust the Departure (or Arrival) date or change the speed (either the speed of all legs or the speed of each leg individually) from the Route Detail list, TimeZero will compute the simulation with the new parameters taking into account the currents (when available).

In areas where high resolution tidal currents are available (mostly Western Europe), TimeZero will automatically compute the effect of currents along the route.

In other areas where discrete current stations are available (North America), TimeZero uses the current which is closest to the middle of the leg (surrounded in red below). If you want to assign another current station for a specific leg, right click on the leg, select "Assign Tidal Current" then click on the new current stations.
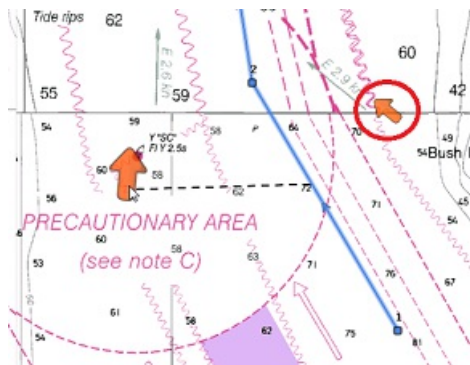
Note: The maximum search distance to assign automatically discrete current stations is 5NM

Discrete Currents that have been assigned manually to a leg will not display "Auto" in the Tidal Current name column:

73.7 °M	0.1 kn	Auto(Johns Island, 0.8 mile north of)
193.7 °M	0.3 kn	Cattle Point, 5 miles SSW of
33.6 °M	2.3 kn	Auto(Race Passage, British Columbia Current)

Advanced Route Optimization

The Route Wizard allows you to get a quick result by using the same average speed along all legs. However, it is possible to set independent speed on some legs from the Route Detail list. Simply enter individual speeds for some legs, and then, run the optimization from the "Action" menu. This will preserve all custom speeds that have been set on the legs:

When you manually enter a speed on a leg, the font is slightly bold indicating that you have fixed a "speed constraint" on that leg. When activating the route, all the speeds that have been manually set along the legs will be used instead of the speed given by the GPS (except for the Active Leg which is always using the real time GPS speed). If you prefer to use the real time GPS speed for all legs, simply select "Set Speed of All Legs" from the "Action" menu and then select "Reset Speed to Default". This will remove all the manual speed constraints and allow the dynamic GPS speed to be used instead.

Note: Running the Route Wizard will NOT replace the speed on the leg for which you have set a speed constraint. Select "Set Speed of All Legs" from the "Action" menu and "Reset Speed to Default" in order to remove all speed constraint to allow the Route Wizard to update the speed.

Activating A Route

Once a route is created and checked for obstacles and other hazards, the route can be activated for navigation. This section describes the process and tools TimeZero provides to do this.

Note: TimeZero needs to be started in "Navigation" mode with a valid GPS fix for the route activation to be available.

First, select the "Navigation" WorkSpace. lick on the desired route to navigate; then choose "Activate Route". A route can also be activated by clicking on a waypoint or even the middle of a leg and choosing "Activate Route from this Point". This automatically skips all previous waypoints from activation.

When a Route is activated:
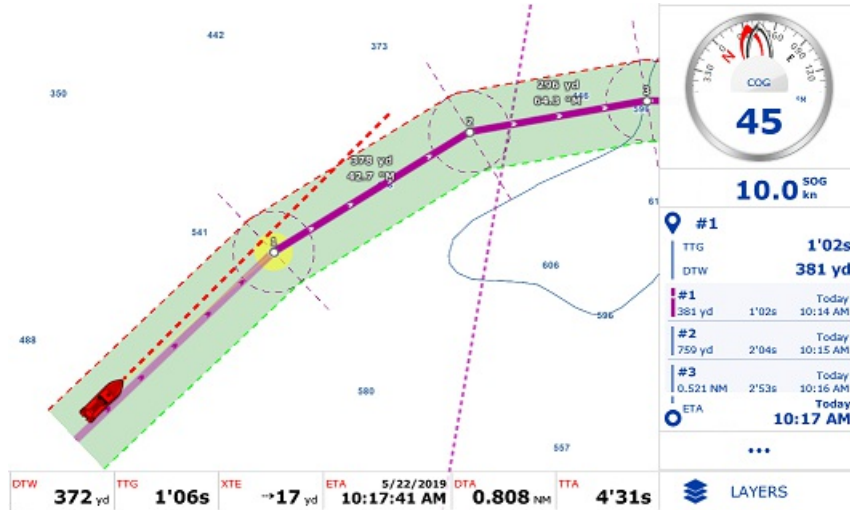
- The Active Route legs are displayed in red

- The Active Leg is drawn slightly more transparent

- The Active Waypoint is surrounded by a glowing yellow circle

- When "Display XTE Alarm lines" is enabled from the Routes Options, the Cross Track Limit Area appears delimited with two colored dashed lines: green on the starboard of the Ship icon, red on the port of the Ship icon. This value can be adjusted globally from the Routes Options ("Default Route XTE Value") or leg by leg from the Route Detail list.

- The Active Route information are displayed at the bottom of the screen of the "Navigation" WorkSpace and in the NavData

Note: It is possible to add other type of information related to the Active Route in the NavData. Just click on the "..." button located at the bottom of the panel and then select the Route Data you would like to display. You may repeat this operation multiple times to add multiple pieces of route data to the NavData sidebar. For more information, please refer to the NavData Chapter.

- The Active Waypoint Distance, Bearing and Cross Track Error information are transmitted to the Autopilot, if configured as an output

Speed used in the Active Route:

If you have never manually adjusted the speed of legs from the Route Detail list (setting "speed constraints"), the speed will be automatically set and updated to the GPS real time speed. HOWEVER, if you have customized the leg speed from the route detail when planning the route, this speed will be used instead of the GPS speed (note that this does not apply to the active leg that always rely on GPS speed). If you have previously customized leg speeds when planning the route and would prefer to use the real time GPS speed instead, select "Set Speed of all Leg" from the Route Detail Action menu and then "Reset Speed to Default" before activating the route. :

Also, by default, TimeZero will use SOG (GPS Speed) and will not take into account tidal currents along the active route (like it does with the planning route). This is the default behavior so that the active route ETA and TTG matches other devices that may not be able to take into account tidal currents. However, if you want, you can enable "Use Currents in Active Route" from the Routes Options. Just note that to get an accurate computation, you need to have Speed Through Water (STW) configured in TimeZero.

Restart or manually switch waypoint:

If the cross-track-error ("XTE") gets large enough to start causing alerts, select the "Restart" function (click on the route or on the boat), to realign the intended course and head directly to the active Waypoint without reverting to the original course. Restarting a route is a typical action if you had to take an action to avoid another vessel or an object and just want to head directly toward the active waypoint.

In some situation, instead of restarting the route you may want to directly switch to the next Waypoint. This action can be done by selecting "Skip Waypoint" (click on the active Waypoint).

Create an instant "Go To" waypoint:

With the "Go To" Tool:

- Select the "Go To" tool from the Toolbar

- Click on the intended destination within the chart or on an existing Waypoint

Using the Right Click Contextual Menu:

- Right Click on the chart on the intended destination

- Select "Go To"

This will create an Instant Active Waypoint for navigation.

Tips: If you want to create an Instant Active Waypoint using coordinates, double click on the "Go To" tool. This will display a window where you can enter the coordinate.

Note: Any Instant Active Waypoint created with the Go To tool will be erased when the Active Route is canceled. To save the destination drop a Mark using the Mark Tool onto the Active Instant Waypoint.

Waypoint Switching Mode

Upon arrival at a Waypoint, the switching notification is triggered and the next Waypoint is activated automatically. Waypoint arrival parameters are determined by the "Waypoint Switching Mode" selected in the Routes Options:

Circle:

In this mode, the next Waypoint is automatically switched when your boat icon enters the active Waypoint's arrival circle. The value of the arrival circle is set from the Routes Options ("Switching Circle Radius"):
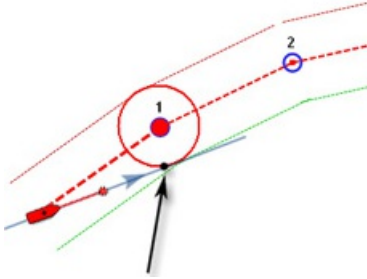
Cross Line (also known as "Perpendicular"):

In this mode, the next Waypoint is automatically switched when your boat crosses the line through the Waypoint that is perpendicular to the leg line.
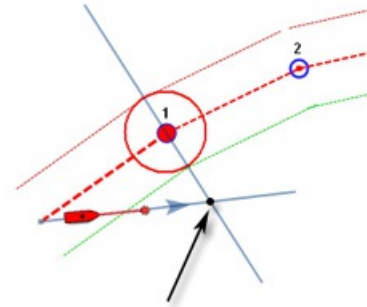
Circle and cross line:

This is the default selection. In this mode, the next Waypoint is automatically switched when the boat enters the active Waypoint's arrival circle or crosses the line through the Waypoint that is perpendicular to the leg line.

Note: Upon arrival at the last Waypoint, the route is automatically cancelled (de-activated).

TIPS: If you do not want TimeZero to automatically switch waypoint, or if you do not want TimeZero to automatically deactivate a "Go To", simply set the Waypoint Switching Mode to "Circle" and set the radius to 0. This will prevent TimeZero to ever reach any waypoint and switch or cancel the route automatically.

Cancelling The Active Route

To deactivate or stop the navigation, click on the route and select "Cancel Navigation".

When a Route is deactivated, it reverts to a Planning Route.

Note: An Active Route is automatically cancelled when reaching the last Waypoint of the route.

Laylines

The "Routing Module" needs to be unlocked to access this feature

Laylines can be displayed on the chart from the Layer button. The Laylines will only be displayed on the chart under the following conditions:

- Laylines display is enable on the chart

- True Wind Direction (TWD) is received in TimeZero (note that TimeZero can compute TWD from True Wind Angle and Heading)

- A Go To or Route is Active and displayed on screen

- The destination (the Active Waypoint) is in such a way that would put the Sail Boat in a "No Go Zone" if sailed directly to the destination.

In the example below, the Wind Direction is coming from the East (displayed using a TWD Gauge NavData). The Active Waypoint is straight into the wind, and it is not possible for the Sail Boat to reach the destination directly without tacking. In that case, the Laylines appear on the chart and show the two best tacking points (optimum course and distance):
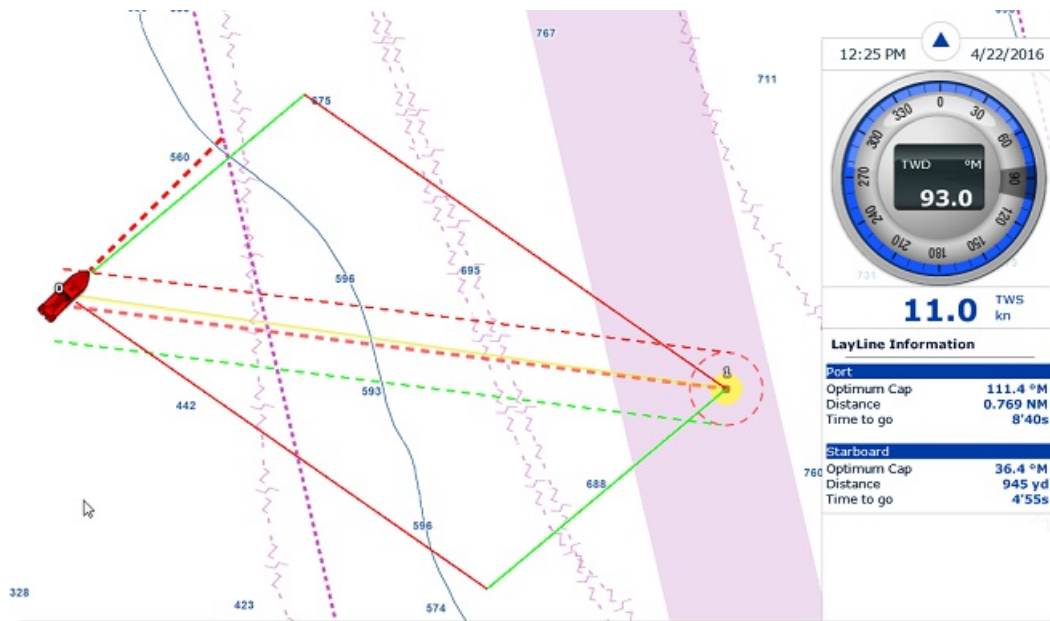
A Layline NavData can be configured in the NavData bar. This will display the port and starboard optimum course and distance as well as Time to Go (or "Time to Tack").

Note that the laylines computation takes into account the Polar file loaded in the software, true wind direction and tidal currents (if applicable).

Importing & Exporting Route

When you are logged in to your My TIMEZERO account and when "Synchronize my User Object to My TIMEZERO" is enabled, your routes will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

However, if you want to manually import or export one or multiple routes to a file (for example to exchange with another user or another system), you can follow the steps below:

Exporting

You can export all your Routes from the "Import/Export" button available under the TimeZero button. Please refer to the Import & Export Data chapter for more information.

If you want to export only one route or a specific selection of routes, you can use the "Action" menu of the Route List:

- Open the "Routes List" by using the "List" button

- Select one or multiple routes. To select multiple consecutive routes, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual routes, press and hold the CTRL key and click on the lines.

- Click on the "Action" button located on the upper right side of the list panel

- Select "Export Selected Route(s)"

- Select the export format

- Give a name to the file that will hold your route(s) and save it
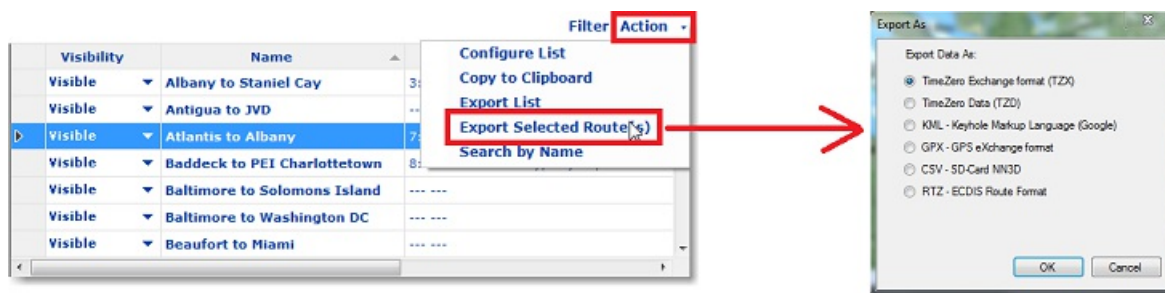
Notes:
- If you want to export one or multiple routes to exchange them with another TimeZero user, it is recommended to use the "TimeZero Data (TZX)" format.
- If you want to export a route in the RTZ format (to exchange the route with an ECDIS system), you must select only one route before choosing "Export Selected Route". This is because the RTZ file can only contain one route.

Importing

To import routes, select the "Import/Export" button available under the TimeZero button. Please refer to the Import & Export Data chapter for more information.

Note: When you import routes from a file, they are added to your existing database

Creating & Editing Marks

TimeZero allows for the creation of up to 30,000 Marks. Marks are used to plot specific locations such as fishing spots, harbors or preferred anchorages. All Marks are displayed on the chart and in the Marks List.

Creating Marks graphically

Click on the Mark tool located in the Toolbar and click on the Chart to drop a Mark.

You can also simply click on the Chart and select "New Mark" from the Tooltip:
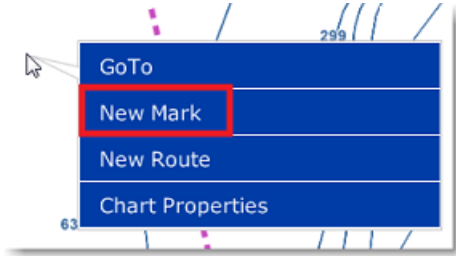
The default icon and color setup in the Marks & Boundaries options will be used.

Note: When using the Mark tool from the Toolbar, the software will automatically revert back to the Panning tool (Hand tool) after the Mark is dropped. To add several Marks without having to select the Mark Tool each time, deselect "Enable Auto Hand Tool Selection" from the "General" options. When you are finished creating Marks with the tool, the Panning Tool must then be manually selected.

Creating Marks Manually

To create a Mark by entering the Latitude/Longitude, double click on the Mark Tool located in the Toolbar. This will display a window to enter the Latitude/Longitude numerically.

Moving a Mark

To move a mark, you have to select it first by left clicking on it with your cursor. Once selected, you can drag it to the new desired location.

If you want to manually adjust the mark coordinates (using lat/lon numbers), double click on it (or right click and choose "Mark Properties") to display its Property window. Enter the new coordinates in the corresponding fields.

Changing Marks Icon and Color

Click on a mark and select the corresponding option from the Tooltip to either change the mark color or icon:
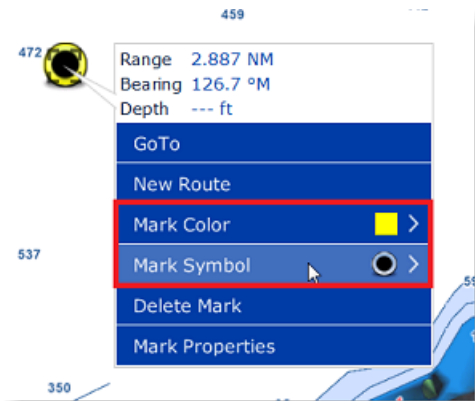
You can also double click on a mark (or right click and choose "Mark Properties") to display the Property window. Change the color and/or icon from the corresponding fields.

Tips: If you want to assign the same color or icon to multiple marks, use the "Select" tool to select multiple marks then right click on one of the selected mark.

Adjusting Marks Size

The Marks Size is a global setting (found under the Marks & Boundaries Options) that will affect all marks displayed on the screen.

Delete or Rename Mark

Right click on a mark and choose the corresponding option (Rename Mark or Delete Mark) from the drop down menu.

Lock and Unlock Mark

Right click on a Mark and choose "Lock Mark" to lock a Mark. When a Mark is locked, you will not be able to move it and a confirmation

window will appear if you try to erase it. Use the same process to unlock a Mark.\

Hiding Marks

All marks can be hidden by deselecting "Display Mark" from the "LAYER" Button (under the "User Data" category).

Creating & Editing Boundaries

Creating Boundaries graphically

TimeZero allows for the creation of up to 100 Boundaries (Areas, Lines and Circles) with up to 50 points per Area/Lines.

If the tools are not displayed, click on the "Configure Tools" button (at the lower end of the Toolbar) to add the tool you want to appear:
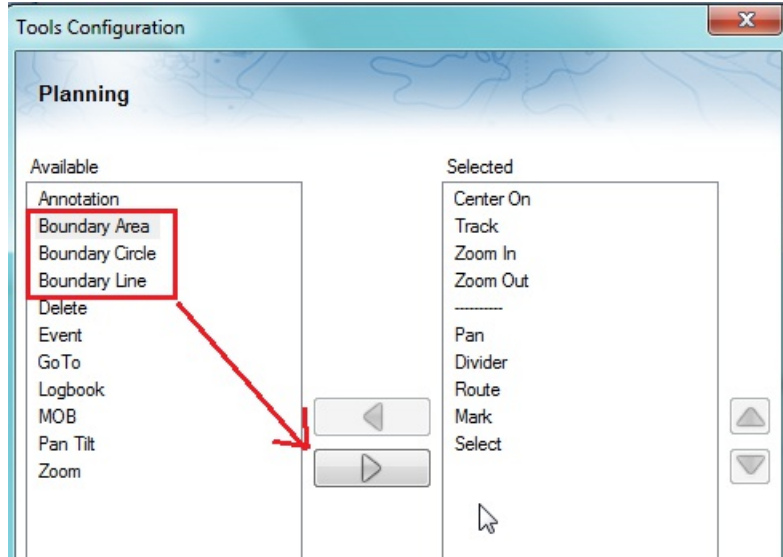
Click on the corresponding Boundary Tool (Area, Circle or Line) and click on the Chart to create the boundary. For areas and lines, double click on the last point to close the area or end the line.

You can also right click anywhere on the Chart and choose "Create" -> "Boundary".

The default color and transparency (for areas and circles) defined in the Marks & Boundaries options will be used.

Tips: You can right click on the Boundary Tools to select a color before creating the boundary on the chart.

Creating Boundaries (Areas and Lines) Manually

To create an area or a line manually by entering numbers (by Latitude/Longitude), double click on the corresponding Boundary Tool located in the Toolbar. This will display a window to enter the Latitude/Longitude numerically.

Delete or Rename Boundary

You can delete or rename a boundary by right clicking on the boundary edge and choosing the corresponding option from the drop down menu.

Note: Instead of clicking on the edge of a boundary, you can also select the boundary first (left click) and then right click on it. Just make sure that the boundary is displayed entirely on the screen. If the boundary is partially displayed (because the screen is zoomed in too much), you will not be able to select it. In this case, zoom out until the boundary is displayed entirely on the screen then click on it again to select it.

Moving a Boundary

To move a boundary, you have to select it first by left clicking on it with your cursor. Once selected, you can drag it to the new desired location. Just make sure that the boundary is displayed entirely on the screen. If the boundary is partially displayed (because the screen is zoomed in too much), you will not be able to select it. In this case, zoom out until the boundary is displayed entirely on the screen then click on it again to select it, then drag it.

If you want to manually adjust a boundary point coordinates (using lat/lon numbers), select the boundary first. The corners will appear and you will be able to right click on them to edit their positions. Enter the new coordinates in the corresponding fields.

Note: if the boundary is locked, the corner will not appear. You will have to unlock the boundary first.

To move a circle by entering new coordinates, double click to display its Property window.

Changing Boundaries Color and Contour

Double click on a boundary (or right click and choose "Boundary Properties") to display the Property window. Change the color and/or contour from the corresponding fields.

Tips: If you want to assign the same color to multiple boundaries, use the "Select" tool to select multiple boundaries then right click on one of the selected boundary.

Changing Boundary Area and Circle transparency

Double click on a circle or area (or right click and choose "Boundary Properties") to display the Property window. Change the transparency from the corresponding field.

Adjusting Boundary Contour Thickness

The Boundary Contour Thickness is a global setting (found under the Marks & Boundaries Options) that will affect all boundaries displayed on the screen.

Lock and Unlock Boundary

Right click on a boundary and choose "Lock Boundary" to lock a boundary. When a boundary is locked, you will not be able to move it or delete it (a dialog box will appear if you try to erase it). Use the same process to unlock a boundary.

Hiding Boundaries

All boundaries can be hidden by deselecting "Display boundaries" from the "Layer" Button (under the "User Data" category).

Catches

TimeZero allows for the creation of up to 1000 Catches. Catches are marks with specific properties allowing to capture information about a single caught fish:

- Fish Species

- Fish Length

- Fish Weight

- Name & Comment

- Depth

- Pressure

- Sea Surface Temperature

The icon is fixed and automatically selected according to the selected fish species. The color will vary automatically according to the average fish size caught by species (green for above average and red for under average among all the Catches you entered in TimeZero):
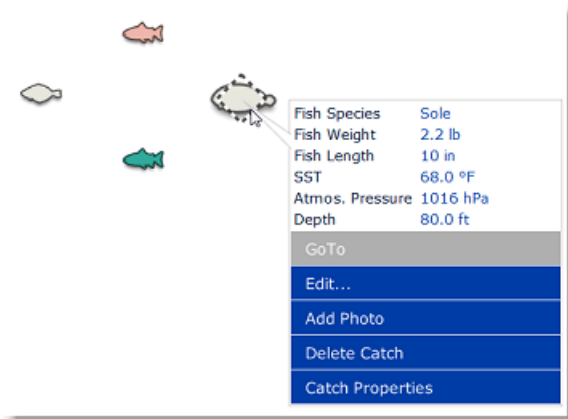
In addition to environment conditions, you can add a picture to your catch (usually a photo of the fish).

Creating a Catch

To create a Catch, right click on the chart, select "Create" and "Catch". A window will appear allowing you to enter information about your Catch:
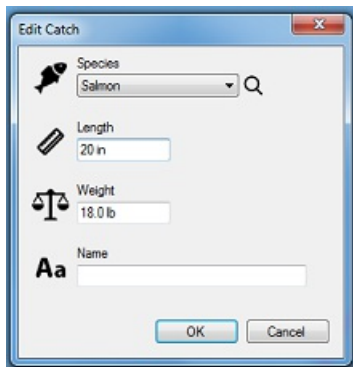
Adding a picture to a Catch

It is possible to add a picture to your catch. Simply click on the Catch and select "Add Photo".

The next time you click on the Catch, the picture will appear in the tooltip:

To display the picture in full screen, just click on it.

TIPS: To capture Catches from your phone, a free App (for iOS & Android phones) is available on the Apple App Store and Google Play Store. The name of the App is "TZ First Mate" (published by Furuno). This App was originally designed to be a "companion" of Furuno NavNet TZT2 and TZT3 Plotters, but it can also be used with TimeZero. TZ First Mate allows to quickly capture a Catch by snapping a picture using the phone camera. The position (and atmospheric pressure when available) will be automatically inserted using the phone sensors. The App will then synchronize and push the Catches to the TZ Cloud as soon as the Phone has an Internet connection and you will be able to see the objects on TimeZero via Cloud Synchronization. Note that if the computer and the phone are on the same network, the local synchronization will also work (without Internet access).

Editing a Catch

To edit a catch basic information, click on it and select "Edit...". If you want to edit all properties, select "Catch Properties".

Show/Hide Catch

All catches can be hidden by deselecting "Display Catch" from the "LAYER" Button (under the "User Data" category).

Photos

TimeZero allows for the creation of up to 1000 Photos. Photos are a great way to highlight specific point of interest on the chart. Photos can be manually added on the chart at a specific location, or they can be imported automatically using the position embedded in their metadata (usually when the photo has been taken with a phone). When you add or import a photo in TimeZero, it is automatically compressed and if you are logged in to your My TIMEZERO account (with "Synchronize my User Object to My TIMEZERO" is enabled), your Photos will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

Add a Photo Manually on the Chart

Instead of using a mark to record a nice beach or a mooring location, a photo can be used instead. Just right click on the chart and select "Add Photo". This opens a window allowing you to select a photo on your computer. Once the photo has been selected, a small pictogram will appear on the chart and the full picture will be available when you click on it:

TIPS: To create a Photo from your phone, a free App (for iOS & Android phones) is available on the Apple App Store and Google Play Store. The name of the App is "TZ First Mate" (published by Furuno). This App was originally designed to be a "companion" of Furuno NavNet TZT2 and TZT3 Plotters, but it can also be used with TimeZero. TZ First Mate allows to quickly create a Photo using the phone camera. The position will be automatically inserted using the phone GPS. The App will then synchronize and push the Photos to the TZ Cloud as soon as the Phone has an Internet connection and you will be able to see the objects on TimeZero via Cloud Synchronization. Note that if the computer and the phone are on the same network, the local synchronization will also work (without Internet access).

Import Photo

Photos stored on your computer can be imported and positioned automatically on the chart.

When importing photos from the Import Wizard, TimeZero will look for any GPS tag information that may be embedded in the EXIF metadata. If no GPS tag is found in the photo, TimeZero will look at the date/time tag (which is available with most digital cameras) and try to cross reference the date with trail information.

Please refer to the Import & Export Data chapter to learn how to import JPG photos.

Note: You can only import automatically photos that are in the JPEG format (*.jpeg or *.jpg extension)

Show/Hide Photos

All photos can be hidden by deselecting "Display Photo" from the "LAYER" Button (under the "User Data" category).

Selecting User Objects

Selecting Individual Object

To select a single object (mark, route, boundary, etc...), just click on it. Note that for Boundaries (Area or Circle), the entire object needs to be visible on the screen in order to be selected by clicking on it. If the entire boundary is not visible on screen, you can click on its edge to select it.

Once an object is selected, you can right click on it to change its properties, or drag it to move it on the chart.

Selecting Multiple Objects

You can press and hold the SHIFT key and drag the cursor to select multiple object (rectangle). You can also press and hold the CTRL key on your keyboard and click on multiple objects to manually select them.

Multiple objects can also be selected from the list (CTRL or SHIFT). Since the list can be sorted by various parameters, it can be easier to select multiple objects (for example by creation date, color, icon, etc...). For more information about list, please refer to the Objects List chapter.

Apply a modification on Multiple Objects

Once multiple objects are selected, you can right click on the selection to delete or change properties common to all the objects (color, icon etc...)

User Object Lists

Lists are really useful to sort, filter and find specific objects. When you select a line from a list, the corresponding object gets selected on the chart and centered on the screen. To display a list of Marks, Boundaries or Annotations, click on the "List" button of the Planning WorkSpace .
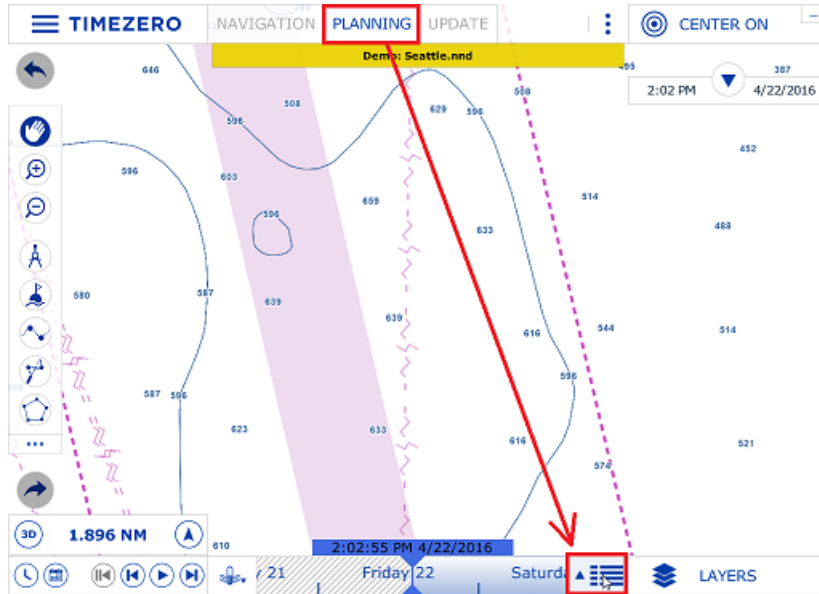
Once the list tab is open at the bottom of the screen, you can change list category from the left pane:
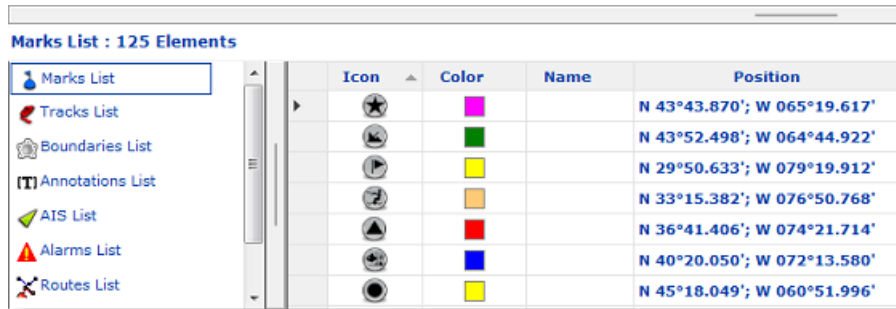
Note: The list for a corresponding object will only appear if you have created at least one object of that kind. So for example, if you have not yet created any mark, the mark list will not be available.

To select a specific row (or line), click inside the first grey column in front of the specific line:
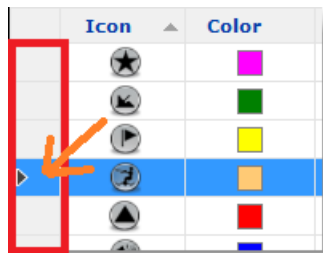
When a line is selected, the chart will be centered on the corresponding object.

The information displayed in the table (rows) can be customized by clicking on the "Action" button (available on the right side of the List header) and choosing "Configure List".

This information can be exported in a file (text format) or copied to the clipboard by clicking on the corresponding item under the "Action" menu. The fields in the text file are delimited using Tabs. We recommend using Windows Excel to open the file or paste the content of the clipboard (for proper formatting).

The "Filter" button (available on the right side of the List header) allows you to filter objects displayed in the list using various criteria. Once the list is filtered, select an object to center the chart on it (this is particularly useful to retrieve Marks created at a specific date).

Note: The filters do not affect what is displayed on the chart. The filters only affect what is displayed inside the list.

User Objects Synchronization

All User Objects (routes, boundaries, lines, catches, and photos) are automatically synchronized with all the compatible TimeZero Platforms that are connected on the same local network (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3). You can display a list of all the detected TimeZero platforms from the Device List Options:
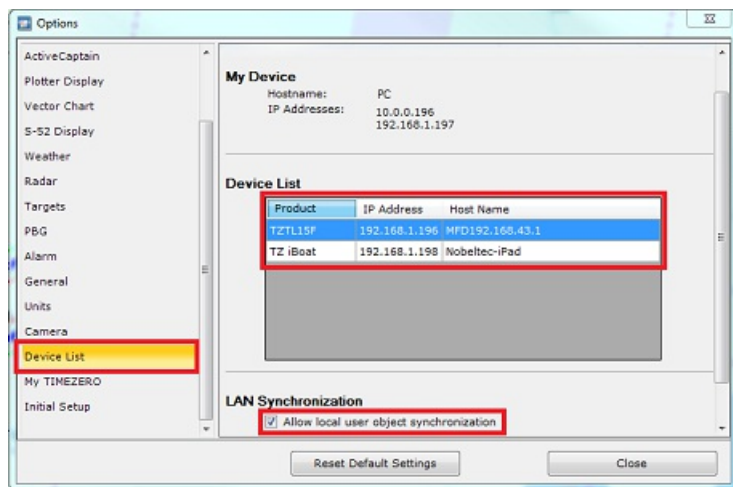
Although the LAN synchronization does NOT require an Internet connection to work (as it operates on the local network), TZ Navigator, TZ Professional and TZ iBoat all need to be logged with the same My TIMEZERO account in order for the synchronization to occur (for security).

Note: the synchronization with Furuno TZT2/TZT3 does not require to be logged in when connected directly to the NavNet network (172.31.x.x). Also note that the the synchronization with TZT2 only works with firmware v7 and above.

If you do not want a platform to synchronize automatically on the local network, you can turn OFF the LAN Synchronization from the Device List Options.

User Objects can also be synchronized using the cloud (when connected to the Internet). For more information, please refer to the TimeZero Cloud chapter.

Importing & Exporting Objects

When you are logged in to your My TIMEZERO account and when "Synchronize my User Object to My TIMEZERO" is enabled, your Marks and Boundaries will automatically be saved and synchronized on all your TimeZero devices (iPads and computers).

However, if you want to manually import or export one or multiple objects to a file (for example to exchange with another user), you can follow the steps below:

Exporting

You can export all your objects from the "Import/Export" button available under the button. Please refer to the Import & Export Data chapter for more information.

If you want to export only one or a specific selection of objects, you can use the "Action" menu of the corresponding object list. For example to export a single or subset of Marks:

- Open the "Marks List" by using the "List" button

- Select one or multiple marks. To select multiple consecutive marks, select the first line, press and hold the SHIFT key then select the last line (this will select the range). To select individual marks, press and hold the CTRL key and click on the lines.

- Click on the "Action" button located on the upper right side of the list panel

- Select "Export Selected Mark(s)"

- Select the export format

- Give a name to the file that will hold your mark(s) and save it

Note: If you want to export one or multiple marks to exchange them with another TimeZero user, it is recommended to use the "TimeZero Data (TZD)" format.

Importing

To import objects, select the "Import/Export" button available under the button. Please refer to the Import & Export Data chapter for more information.

Tides

TimeZero can predict the tide level for thousands of tide stations around the world. Tides can be displayed directly on the chart or in a graph.

Displaying Tides on the Chart

Click on the "Layer" button and select "Tidal Heights Stations":
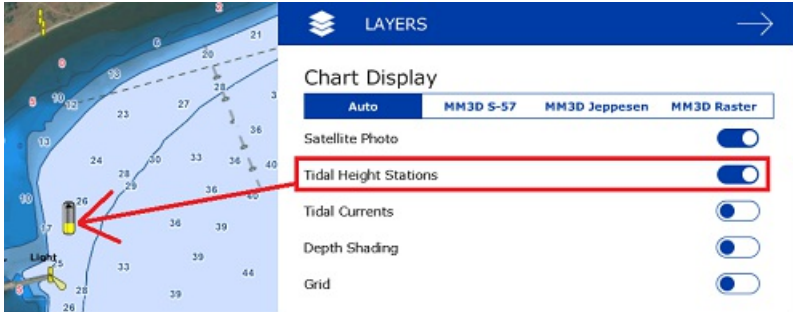
The tide icons displayed on the chart are dynamic and show you a preview of the water level:

Rising from low to high

Falling from high to low

At slack (low and high)

If you put your cursor over a tide icon or click on it, a tool tip indicating the Tide level will appear.

If you are in the Navigation WorkSpace, the tide level is displayed for the current time. If you are in the Planning WorkSpace, you can change the time using the timeline located at the bottom of the screen.

IMPORTANT: All tidal height prediction times in the Navigation WorkSpace are adjusted for the local time currently selected on your computer. Make sure that your computer is set at the correct time and that the local time zone is properly selected for your area. To change the computer's time zone or daylight savings time setting, use the "Date and Time" option in the Windows Control Panel.

Displaying the Tide Graph

To display a Tide Graph, right click on a Tide icon and select "Open Tide Graph" (or double click on the tide icon). You can also right click anywhere on the chart (in this case it will use the nearest Tide Station from cursor position). This opens a window displaying various tides related information (tide level, low/high tide time, moon phase, sunrise/sunset time):
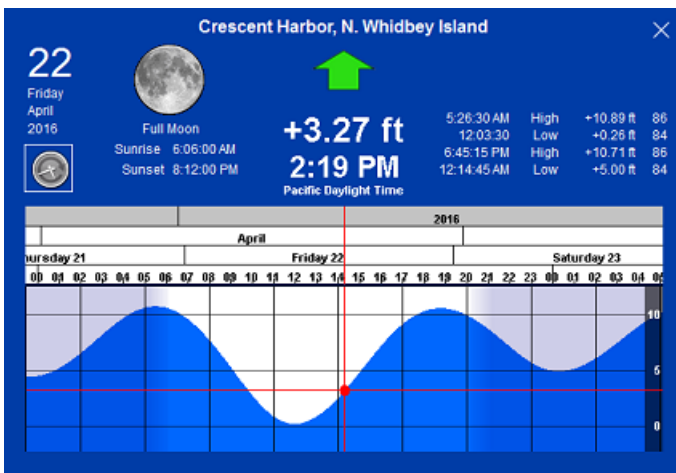
To change the time, you can drag the graph with your mouse, use the scroll wheel or use the right/left arrow of your keyboard.

Tips: To scroll the graph over a long time period, you can put your cursor over the day or month on the time bar and drag from this location. This will increase the scrolling speed.

To set the time of the graph back to the current time, click on the clock button:

Note: If you open the Tide Graph from the Planning WorkSpace, the time of the graph is initialized to the same time selected in the Virtual Time Control (Time Bar) of the Work Space.

1.   Selected date

2.   Moon and Sunrise/Sunset information

3.   Tide level and Time (with Time Zone indication)

4.   Time, Level and Coefficient for previous and next high/low

Tidal Currents

TimeZero can predict tidal currents for thousands of current stations around North America. In Western Europe, High Resolution Tidal Currents are available for an additional fee. Please refer to the Mapmedia Catalog for coverage.

Tidal current can be displayed directly on the chart or in a graph.

Displaying Tides on the Chart

Click on the "Layer" button and select "Tidal Currents":
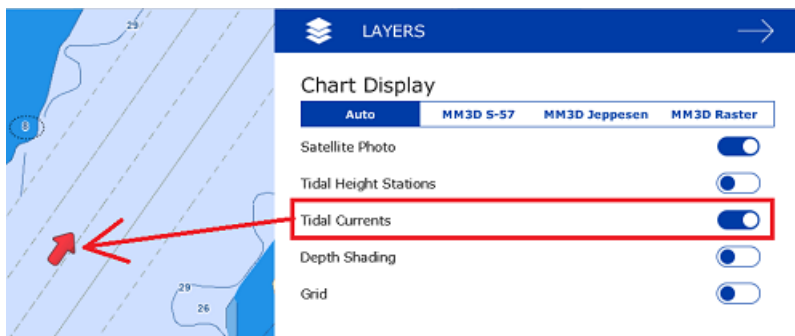
This will display arrows on the chart indicating the direction and overall speed of the current. Low current speeds are indicated in yellow. Orange or red colors indicate high speed currents.

IMPORTANT: Oceanic Currents (that are downloaded with Weather Forecast) are displayed in blue, while Tidal Currents (integrated in the software) are displayed in yellow-red. Please refer to Displaying Weather Data for more information.

If you put your cursor over a current icon or click on it, a tooltip indicating the Speed and Direction will appear.

IMPORTANT: All tidal current prediction times in the Navigation WorkSpace are adjusted for the local time currently selected on your computer. Make sure that your computer is set at the correct time and that the local time zone is properly selected for your area. To change the computer's time zone or daylight savings time setting, use the "Date and Time" option in the Windows Control Panel.

Displaying the Tidal Current Graph

To display a Tidal Current Graph, right click on a Tide icon and select "Open Current Graph" (or double click on the current icon):
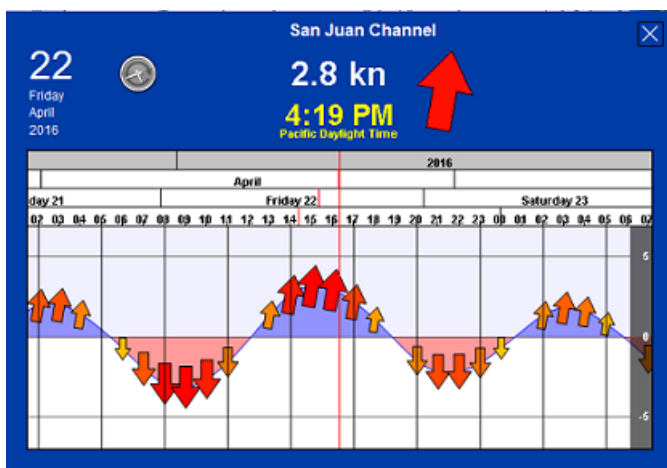
To change the time, you can drag the graph with your mouse, use the scroll wheel or use the right/left arrow of your keyboard.

Tips: To scroll the graph over a long time period, you can put your cursor over the day or month on the time bar and drag from this location. This will increase the scrolling speed.

To set the time of the graph back to the current time, click on the clock button:

Note: If you open the Current Graph from the Planning WorkSpace, the time of the graph is initialized to the same time selected in the timeline of the WorkSpace.

Tides & Current NavData

When you have a GPS position, a Tides & Current NavData can be added to the NavData panel by clicking on the "+" icon. This NavData displays and updates in real time the nearest Tides and Currents information from your own ship position:
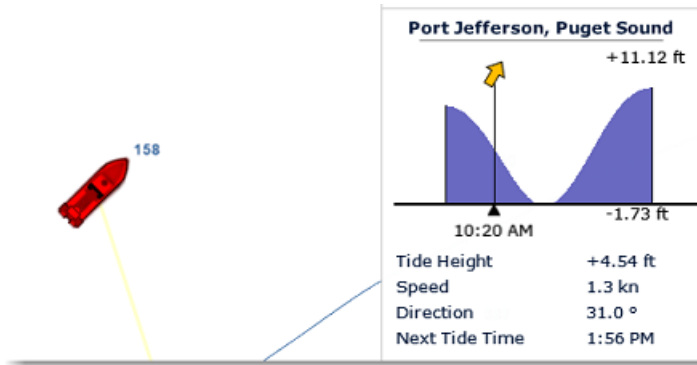
The maximum search distance for tide stations is 50NM and 4NM for Tidal Current Station. If there is no tide or current station within this distance, the NavData will display no information.

Note that it is possible to choose and fix the Tide Station being display in the NavData by selecting a Tide Station as a "Reference Station". Just right click on a Tide icon on the chart and select "Use as Reference Station". To release the reference station, you can right click on the NavData and select "Set Auto".

Note: It is not possible to fix a Tidal Current station. Currents are always automatically selected based on distance from own ship.

NavData Introduction

The NavData panel is displayed on the right side of the screen and can be opened/closed by clicking on the arrow at the top:
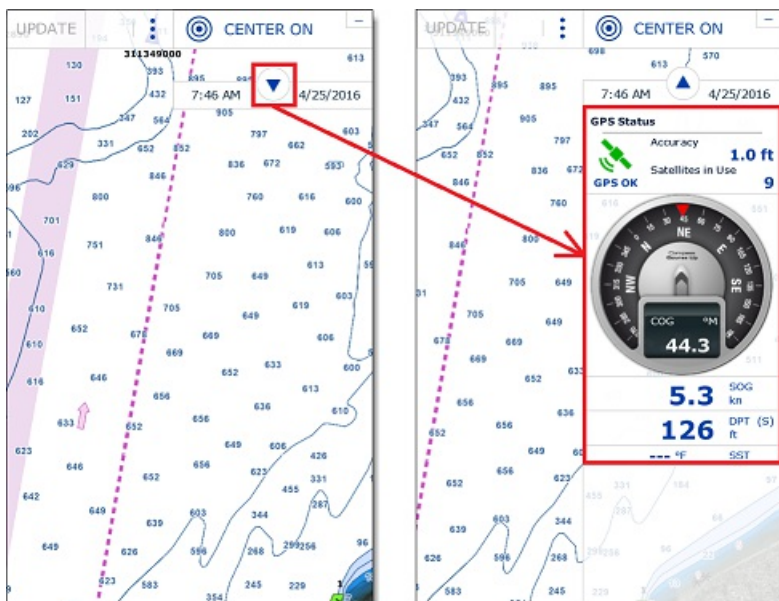
The content of each panel can be fully customized. To add a NavData, click on the "..." button located at the bottom of the panel:

To remove a specific NavData, right click on it and select "Remove".

To change the position of the NavData inside the panel, just click and drag to the new location.

You can edit most of the NavData (to change the information it displays) by right clicking on it.

Note that the configuration of the NavData panel is independent per WorkSpace. This means that you can customize NavData that are relevant to navigation in the "Navigation" WorkSpace (such as Course, Speed, GPS Status,...) and configure another set of NavData in the planning WorkSpace (Weather, Cursor Information,...).

Note: When you add too many NavData or when the list are displayed at bottom of the screen, the NavData may eventually "overflow" and not be visible anymore. If you see the overflow icon at the bottom of the NavData panel, it is recommended to delete some NavData to free up space:

Note that the overflow icon is just an indication (you cannot click on it to scroll the NavData).

The NavData panel overall size and transparency can be adjusted from the General Options.

NavData Types

Various types of NavData can be displayed in TimeZero:

Sensors NavData

Sensor NavData are used to display numerical values received from sensors connected to the computer. The font color is white for data that is received directly from a sensor and yellow when the data is being computed by TimeZero from a sensor:
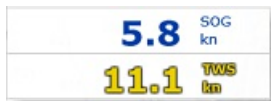
Note: In the example, above, Speed Over Ground (SOG) is displayed in white because it is directly received from the GPS. The True Wind Speed (TWS) is displayed in yellow because it is computed by TimeZero from Apparent Wind (received from the sensor) and Speed.

The following Sensor NavData are available:

- Date/Time

- Boat Position

- COG - Course Over Ground

- SOG - Speed Over Ground

- DPT - Depth

Note: The Depth can be configured to display the value below the keel or below sea level using the "Depth Display" from the Initial Setup Options

- SST - Sea Surface Temperature

- HDG - Heading (can be computed by TimeZero from SOG when the speed is over 1kn)

- STW - Speed Through Water (also known as Speed Over Water)

- Set - Current Direction (can be computed by TimeZero from COG, STW, Heading and SOG)

- Drift - Current Speed (can be computed by TimeZero from COG, STW, Heading and SOG)

- TWD - True Wind Direction. If True Wind Direction is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation")

- TWA - True Wind Angle. If True Wind Angle is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation")

- TWS - True Wind Speed. If True Wind Speed is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Speed and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation")

- AWA - Apparent Wind Angle

- AWS - Apparent Wind Speed

- VMG - Velocity Made Good. If VMG is not received, it can be computed by TimeZero from True Wind Direction and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation").

- Atmospheric Pressure

- Air Temperature

- Humidity

- HDOP

- Boat Position Lat/Lon: always displays the boat position in Lat/Lon even if another unit has been selected as coordinate system.

- % Polar: Only available with the Routing module

- Pitch

- Roll

To change the data displayed in a sensor NavData, just right click and select a new data from the contextual menu. The NavData will be

immediately updated and display the selected data.

It is possible to configure one NavData to cycle through multiple data. Just right click on the NavData, select "Add" and choose the data you want to add. The NavData will begin to cycle between the two data. You can repeat this operation and add more data to cycle through. To stop the cycle, uncheck all data from the "add" contextual menu.

Note: The cycle speed can be changed from the General Options by adjusting the "NavData Multi Data Dwell Time" setting.

Route NavData

Route NavData are used to display various numerical values linked to the Active Route computed by TimeZero. Note that by default an "Active Route NavData" giving you basic information about the active route is configured inside the "Navigation" NavData panel. If that does not give you enough information, Route NavData can be configured manually. Note that if a route or Go To is not activated, the Route NavData will display dashes ("--"). The font color of the Route NavData is red:

The following Route NavData are available:

- BTW - Bearing to Steer: indicates the course to steer to reach the active Waypoint from own ship position. This value does not take into account any current and is simply the course as it would be plotted on a chart. This value corresponds to the "CTS" column in the list.

- HTS - Heading to Steer (real time): indicates the course to steer to reach the active Waypoint from own ship position taking into account the real time variations caused by wind and/or currents. The HTS (real time) is computed by TimeZero from the CTS and the drift vector.

- HTS - Heading to Steer: indicates the course to steer to reach the active Waypoint from own ship position taking into account the Tidal Currents embedded in TimeZero.

Note: The HTS will display the same value as CTS if there is no Tidal Currents near the Active Leg.

- NEXT - Next Course: indicates the CTS to follow after the next Waypoint. This is useful to see if a major course change is needed after passing the Active Waypoint.

- TTG - Time To Go (using VMC): indicates the time that it will take to reach the Active Waypoint. TimeZero computes this value using the DTW and the VMC.

- DTW - Distance To Waypoint: indicates the distance remaining to reach the Active Waypoint from own ship position.

- XTE - Cross Track Error: indicates the distance the vessel is to one side of the straight line between the Active Waypoint and previous Waypoint (or position where the route was Activated if the Active Waypoint is the first of a route or a Go To).

- ETA - Estimated Time Arrival: indicates the arrival date and time taking into account the Tidal Currents along the route and the real time speed.

- TTA - Time To Arrival: indicates the time remaining to reach the end of the route taking into account the Tidal Currents along the route and the real time speed.

- DTA - Distance to Arrival: indicates the distance remaining to reach the end of the route.

- VMC - Velocity Made Good: indicates the speed made good towards the Active Waypoint. This is computed by TimeZero from the component of SOG that is in the direction of the Active Waypoint. In other words, the VMC is "the speed at which you approach the Active Waypoint".

To change the data displayed in a Route NavData, just right click and select a new data from the contextual menu. The NavData will be immediately updated and display the selected data.

It is possible to configure one NavData to cycle through multiple data. Just right click on the NavData, select "Add" and choose the data you want to add. The NavData will begin to cycle between the two data. You can repeat this operation and add more data to cycle through. To stop the cycle, uncheck all data from the "add" contextual menu.

Note: Note that in the "Navigation" WorkSpace, Route information will be automatically displayed at the bottom of the screen when a Route or GoTo is activated.

Active Route NavData

When a route is activated, the Active Route NavData displays Distance, Time To Go and Estimated Time of Arrival of each waypoint:

If the route contains many waypoints that do not fit inside the NavData, it is possible to scroll the content of the NavData to look at future waypoint information. Note that the last waypoint (the arrival) will always be visible at the bottom of the NavData.

Note that this NavData automatically expands and contracts to occupy the remaining space of the NavData container. If you undock the NavData, a right click on it will allow you to set the size it occupies (to display 5, 10 or 15 waypoints).

You can right click on this NavData to configure its content. You can also select to only display the waypoints that have been named. This can be useful when you want to display only a couple of important waypoints in the list. In this case, simply double click on the waypoint (on the chart) to enter a name.

Waypoint NavData

The Waypoint NavData displays information about the Active Waypoint. It combines in one screen a "highway" display (also known as "Helmsman" Display), and the XTE (cross track error) and BTW (Bearing to Waypoint) values.

Gauge NavData

Gauge NavData are used to display values received from sensors connected to the computer in a graphic "gauge" type display. The font color is white for data that is received directly from a sensor and yellow when the data is being computed by TimeZero from a sensor:

The following Gauge NavData are available:

- Date/Time

- Bearing To Cursor

- TWD - True Wind Direction. If True Wind Direction is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Angle with Heading/Speed through Water ("Surface" reference) or COG/SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation")

- TWS - True Wind Speed. If True Wind Speed is not sent by the wind sensor, it can be computed by TimeZero from Apparent Wind Speed and Speed through Water ("Surface" reference) or SOG ("Ground" Reference). "Surface" or "Ground" can be selected from the Initial Setup Options ("True Wind and VMG Calculation")

- Atmospheric Pressure

- Air Temperature

- COG - Course Over Ground

- SOG - Speed Over Ground

- DPT - Depth

Note: The Depth can be configured to display a value below the keel or below sea level using the "Depth Display" from the Initial Setup.

- SST - Sea Surface Temperature

- HDG - Heading (can be computed by TimeZero from SOG when the speed is over 1kn)

- STW - Speed Through Water (also known as Speed Over Water)

- TWA - True Wind Angle (can be computed by TimeZero from Apparent Wind and STW or Apparent Wind and SOG)

- AWA - Apparent Wind Angle

- AWS - Apparent Wind Speed

- VMG - Velocity Made Good

Most of the Graphic NavData scale can be adjusted from the Initial Setup Options under "Graphic Instruments Setup".

Cursor NavData

The Cursor NavData displays various information related to the cursor position on the screen:

If you right click on the Cursor NavData you can configure what information you want to display.

The following data can be displayed inside the Cursor NavData:

- Position: indicates the position of the cursor on the screen using the position unit selected from the Units Options.

- Position Lat/Lon (hidden by default): indicates the position of the cursor on the screen using the Lat/Lon unit.

- BRG: indicates the bearing from own ship

- RNG: indicates the range from own ship

- DPT: indicates the depth below cursor.

-

- Time to cursor (hidden by default): indicates the time it would take to reach the cursor position from own ship using the current speed.

Tide & Current NavData

This NavData displays and updates in real time the nearest Tides and Currents information from your own ship position:

Port Jefferson, Puget Sound

Tide Height	+8.86 ft
Speed	0.1 kn
Direction	217.0 °
Next Tide Time	4:57 PM
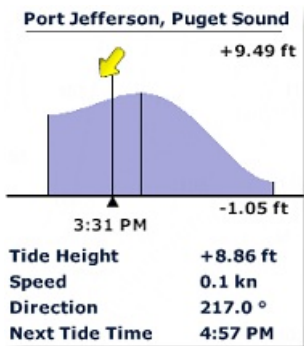
The maximum search distance for Tide Stations is 50NM and 4NM for Tidal Current Station. If there is no tide or current station within this distance, the NavData will display no information.

Note that it is possible to choose and fix the Tide Station being displayed in the NavData by selecting a Tide Station as a "Reference Station". Just right click on a Tide icon on the chart and select "Use as Reference Station". To release the reference station, you can right click on the NavData and select "Set Auto".

Note: It is not possible to fix a Tidal Current station. Currents are always automatically selected based on distance from own ship.

Tips: If you right click on the NavData you can select "Open Tide Graph" or "Open Current Graph", this will open the full Tide or Current Graph for that station.

Weather NavData

The Weather NavData displays the weather forecast under the cursor using numerical value:

Weather Information

Wind Dir.	246.2 °M
Wind Spd	2.7 kn
Air Temp.	48.4 °F
Cloud	56.3%
Rain-Snow	0.10 mm/h
Pressure	1,021 hPa
500 mb	+18,080 ft
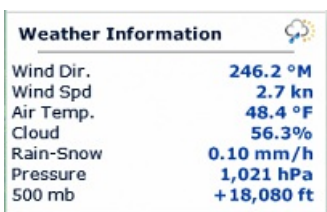
In the "Planning" WorkSpace, the time of the forecast is set by the timeline. In the "Navigation" Work Space, the time of the forecast is always set by computer current time.

You can right click on the NavData to add or remove specific weather data.

GPS Status NavData

The GPS Status NavData displays in large font "GPS OK" (in green), "Poor GPS" in yellow or "NO GPS" (flashing in red):

GPS Status

Accuracy 1.0 ft
Satellites in Use 7
GPS OK
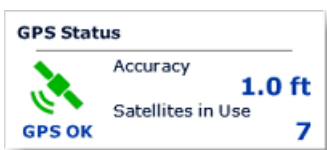
It also displays the GPS accuracy (based on HDOP) and the number of satellites that are used to compute the position fix.

Note: In order for the accuracy to be displayed in the NavData, the HDOP must be received in TimeZero (NMEA sentence GGA or GNS or GSA or PGN129029 or PGN129539). In order for Satellites in Use to be displayed, the NMEA0183 sentence GGA or GNS must be received. The GPS Poor quality indicator is a combination of HDOP and Satellites in Use (when HDOP > 4 or Satellite in use < 4).

Laylines NavData

The "Routing Module" needs to be unlocked to access this feature

The Laylines NavData displays the Port and Starboard layline optimum Course and Distance as well as Time To Go ("time to tack").

LayLine Information

Port	
Optimum Cap	281.8 °M
Distance	355 yd
Time to go	2'29s
Starboard	
Optimum Cap	340.8 °M
Distance	171 yd
Time to go	1'00s
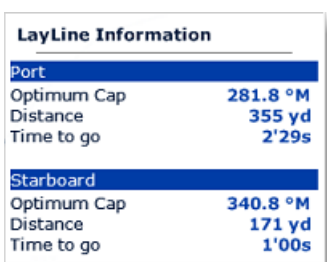
Please refer to the Laylines chapter for more information.

Trip Odometer NavData

The Trip Odometer NavData allows you to keep track of various trip statistics:

Trip Information	
Date Set	4/25/2016
Duration	1h43'
Avg. Speed	5.4 kn
Max. Speed	6.2 kn
Trip	9.345 NM
Odometer	9.345 NM

Note that all values (except Odometer) can be reset by right clicking and select "Reset". You can also enable or disable some information by right clicking on the NavData. Like in a car, the Odometer is never reset.

Tips: if you change computer or reset to factory default, the Odometer value will go back to 0. If you press and hold the CTRL key while right clicking on the NavData, a new item "Restore Odometer Value" will appear allowing you to enter any number.

Target Information NavData

The Target NavData displays detailed information about the selected target (AIS, ARPA or DSC). To select a target, just click on it. The target will become surrounded in yellow and the information will be displayed in the Target Information NavData:

Target Information	
Label	
	VICTORIA CLIPPER 3
Position	
	N 47°44.564'
	W 122°27.151'
COG/SOG	
	164.7 °M/22.9 kn
CPA/TCPA	
	1.038 NM/2'34s
Range/Bearing	
	1.492 NM/39.7 °M

Note that once a target is selected (surrounded in yellow), you can select other objects (such as Marks or Boundaries) without affecting the target selection. Only selecting another target will change the target selection.

If you click on the "i" icon (blue icon on the top right), it will open the full target property window.

AIS and ARPA List NavData

The AIS and ARPA lists display a list of AIS or ARPA targets:

AIS List		Sort by RNG
367337230		4.134 NM
--- °M	0.0 kn	0'08s
CPA 1.143 NM		TCPA-38'55s
ISLAND CHIEF		4.683 NM
9.1 °M	0.1 kn	0'09s
CPA 4.607 NM		TCPA 8'05s
367309280		5.320 NM
--- °M	0.0 kn	0'16s
CPA 1.168 NM		TCPA-50'55s
368409000		6.310 NM
344.4 °M	0.0 kn	0'13s
CPA 1.781 NM		TCPA-59'19s

The list can be sorted by Range, CPA, TCPA or SOG when you right click on the NavData. You can also select the type of data you want to see for each targets (COG/SOG and/or CPA/TCPA). Note that this NavData automatically expands and contracts to occupy the remaining space of the NavData container. If all targets cannot be displayed in the sapce available (more likely with AIS), it is possible to scroll the content of the NavData.

Note that you can click on any item of the list and TimeZero will autonatically center the chart on the correspoding target. Also, if you click on a target on the chart, it will highlight it inside the list and scroll if necessary:

If you undock the NavData, a right click on it will allow you to set the size it occupies (to display 5, 10, 15, or 20 targets).

Radar Control NavData

The Radar Control NavData gives quick access to the most used radar control: Gain, Sea (STC) & Rain (FTC):
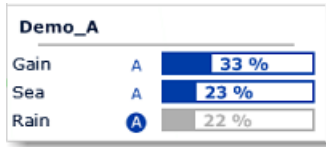
Tips: Click on the "A" to switch from Manual to Automatic mode for the selected parameter.

The Radar Control NavData can also display the "Tune" bar (read only). Simply right click on the NavData and add "Tune" to the NavData configuration.

Advanced Radar Control NavData

The Advanced Radar Control NavData gives quick access to the more advanced radar filters. Click on the filter value to cycle through the various mode:

You can customize the NavData by right clicking on it.

Undocking NavData

When you add a NavData (by clicking on the "..." icon of the NavData Panel), it appears initially inside the NavData panel. You can move the NavData outside of the panel ("undock the NavData") and placing it anywhere on the screen by clicking on it and dragging your mouse outside of the panel:

If the "Hide Undocked NavData" setting from the General Options is unchecked, the undock NavData will stay displayed on screen even if the NavData Panel is closed.

Undocked NavData can be made bigger or smaller by right clicking on them and choosing Decrease or Increase Size.

Tips: If you want to "lock" the undocked NavData to prevent them from being accidentally moved after placing them on the screen, you can check the "Lock Undocked NavData" setting from the General Options.

To dock a NavData back into the NavData panel, just drag it back inside the panel.

Weather Introduction

After registering TimeZero to your My TIMEZERO account, you will be able to download free weather forecast. You can receive the data from our server using a direct Internet connection, using an Iridium Go or by E-mail (with a file attachment). Weather data can then be displayed and animated from the Planning WorkSpace.

In addition to the free weather service, you can subscribe to a Premium Weather Service that will give you access to local models and weather data at a much higher resolution.

Note: TimeZero also has the capability to open standard GRIB file.

Requesting A Weather File

IMPORTANT: In order to be able to request a weather file, you have to register your copy of TimeZero.

You can update the weather data from the "Update" WorkSpace. This WorkSpace allows you to define an area, select the parameters you want, and retrieve the weather data. If you have a direct Internet connection or if you have an Iridium Go, the weather file is downloaded directly within TimeZero. If you are using a Satellite Phone or low-bandwidth connection, you can choose to request the file by E-mail instead and receive it as an attachment.

To request a weather file:

* Select the "Update" WorkSpace then pan and zoom the chart to display roughly the area where you want to receive a weather forecast.

* Select the "Update Area" Tool from the Toolbar.

* Click and drag the cursor on the chart to draw an area, or move the existing area

* Select the parameters you want from the menu on the right side of the screen

* Click on the "Download" / "Request by E-mail" button
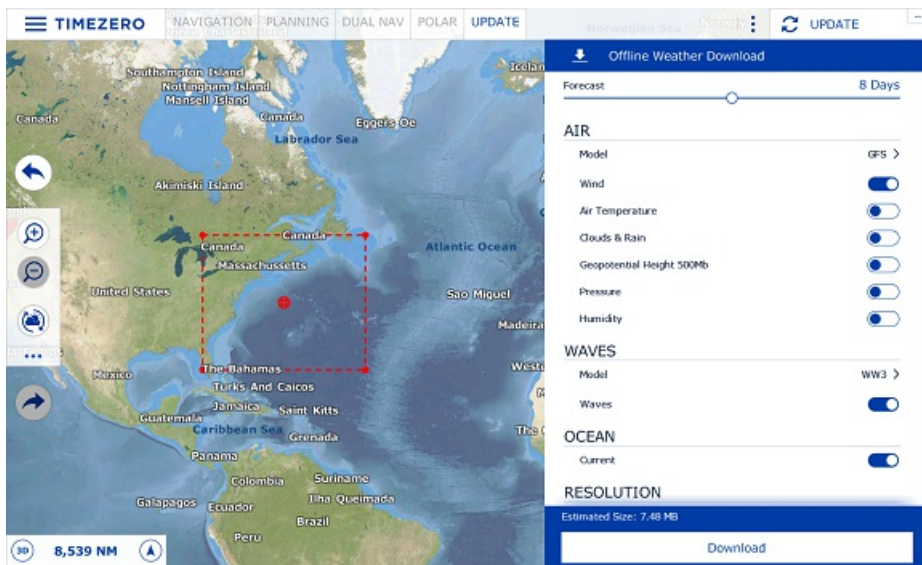
Note: The default weather download method set in TimeZero is "direct" (download via Internet). You can change the download method to E-mail or Iridium Go from the Weather Options.

When you choose to retrieve the Weather file by e-mail TimeZero will open the default e-mail client set on your computer to create a request. After sending this request, our server will reply with an e-mail containing an attached file (.tzw file) that can be opened in TimeZero.

Note that the e-mail containing the **weather file will be sent to the same e-mail address that was used to request the weather file**.

Tips: To change the default e-mail client of the computer, open Internet Explorer, select the TOOLS menu, INTERNET OPTIONS, PROGRAMS.

If you have an Iridium Go, TimeZero will automatically trigger the connection to the satellite and establish the communication. Please refer to the Iridium Go chapter for more information.

Displaying Weather Data

Displaying Graphically

When you download a Weather File from the Update WorkSpace, TimeZero automatically loads the data for you. You just have to select the "Planning" WorkSpace, click on the "LAYER" button and select "Display Weather". TimeZero offers a new and innovative weather presentation using particle animation. It is now very easy to visualize the "flow" of weather and oceanographic conditions such as wind, currents and waves:
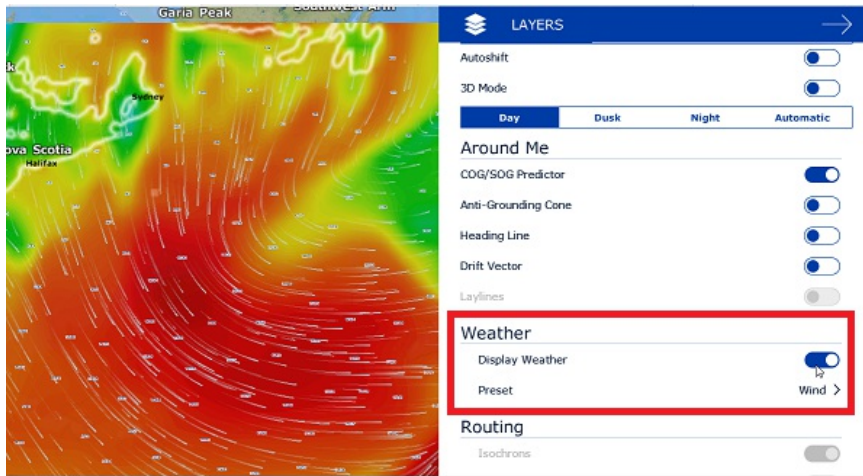
Note: When receiving the weather file by e-mail or from a third party provider, you first need to open the file in TimeZero. Please refer to the Opening a Weather File Chapter.

Once "Display Weather" is checked, you can choose from various display presets or select a custom display.

When "User Preset" is selected, you can select individual weather data you want to display on the chart:
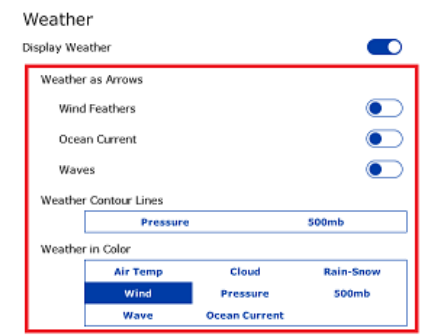
When the Wind is displayed using symbols (Weather Feather), the icon and color give you an estimation of the wind direction and wind speed. The size and number of feather indicates wind speed (add 5Kn for a small feather and 10Kn for a big feather):

∘	This icon and color a used if the wind is in between 0 and 2.5Kn
\	This icon and color are used if the wind is in between 2.5 and 7.5Kn (one small feather)
\	This icon and color are used if the wind is in between 7.5 and 12.5Kn (one big feather)
\	This icon and color are used if the wind is in between 12.5 and 17.5Kn (one big feather and a small feather)

When a weather data is displayed in color, a scale will be displayed on the lower left.

Displaying Numerical Value

The Weather information NavData can be used to display weather data using numerical values. It is displayed by default in the "Planning" NavData panel. This NavData displays weather condition under the cursor and is updated as you move the cursor over the weather data on the chart. If the "Weather Information" NavData is not displayed, click on the "+" icon on the top of the NavData panel and select "Weather Information":

You can customize the weather data displayed in the NavData by right clicking on it.

Meteogram

A "Meteogram" window can be displayed just above the timeline inside the Planning WorkSpace by clicking on the button below:

The Meteogram allows to see a graphical presentation of one or multiple meteorological variables with respect to time at a particular location. To select the location, click on the target button and then click on the chart at the location you want to see the weather parameters over time:
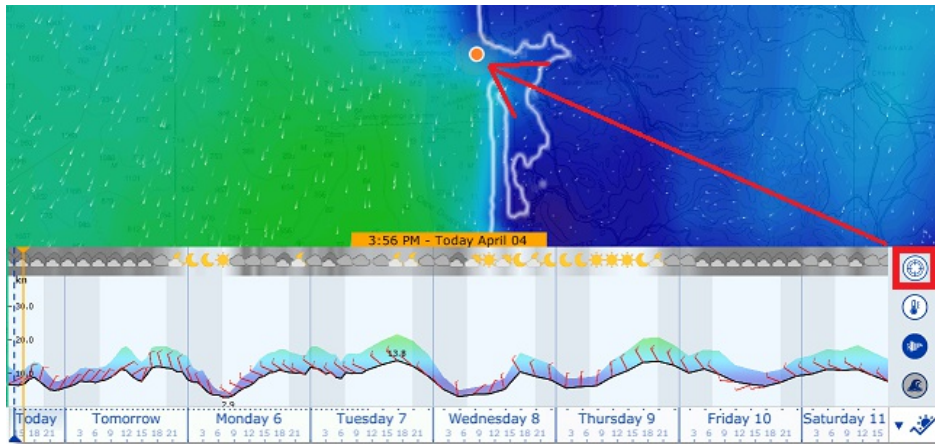
The Meteogram can be very useful to see the evolution of weather at a specific point (represented by the orange dot on the chart) and determining the best departure or arrival time. Note that you can drag the orange dot on the chart to change the Meteogram location and see the change applied in the window in real time.

The Meteogram can also be displayed along a route by clicking on a route. The route projected speed and ETA will be used to show the various conditions that you will encounter along the journey. As you move your cursor over the Meteogram, you will see the orange dot move along the route to indicate the location of the weather forecast:
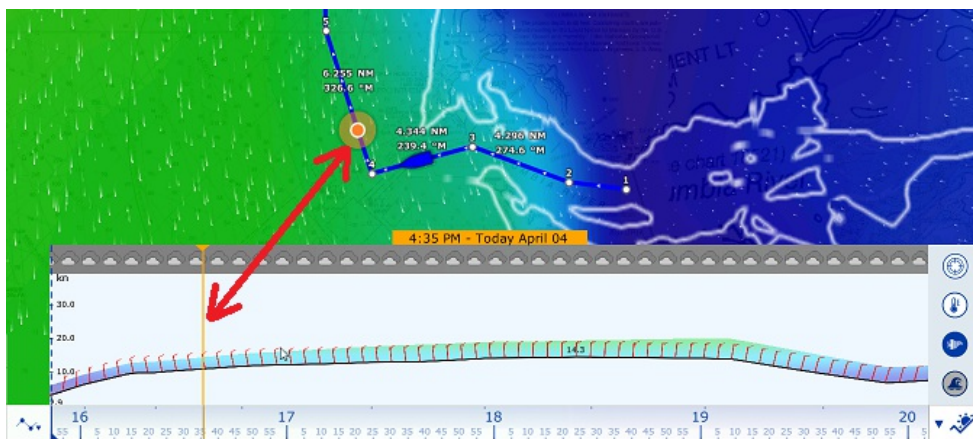
Weather Info (Source and Run date)

If you would like to know the weather validity (run date) or weather source, you can right click anywhere on the chart (when the weather is displayed) and select "Weather Information":
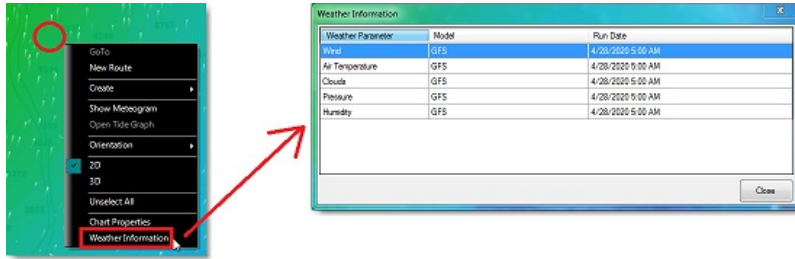
A window will appear listing all the weather parameters available at that location with their corresponding model and run date.

Weather Type and Coverage

The following Weather Data is available from the free Weather Service:

- Wind: This data contains wind speed and wind direction forecast and is available globally (90°N/90°S/0°- 360°). The wind direction is given by the angle of "where the wind is coming from".

- Air Temperature: This data contains the Air Temperature forecast and is available globally (90°N/90°S/0°- 360°).

- Pressure: This data contains atmospheric pressure forecast at sea level and is available globally (90°N/90°S/0°- 360°).

- Clouds & Rain: This data contains the Cloud Coverage and Rain forecast and is available globally (90°N/90°S/0°- 360°).

- Humidity: This data contains the humidity forecast and is available globally (90°N/90°S/0°- 360°).

- Wave: This data contains Wave Height and Wave Direction forecast and is available only on open oceans (excluding Great Lakes and Mediterranean) in between 78°N and 78°S (0°- 360°). The wave direction is given by the angle of "where the wave is going to".

- Current: This data contains Oceanic Currents Speed and Direction at the time it was requested (one observation). This data has limited availability (47.04°N/78, 64°S & 0°- 360°). The current direction is given by the angle of "where the current is going to".

-

Note: The Premium Weather Service offers much higher resolution data based on local model.

Animate Weather Forecast

The "Planning" WorkSpace allows you to play time-lapse movies of Weather Forecast thanks to the time line located at the bottom of the screen. When you display weather, the timeline automatically switches in "Weather Mode" matches the duration of the weather forecast:
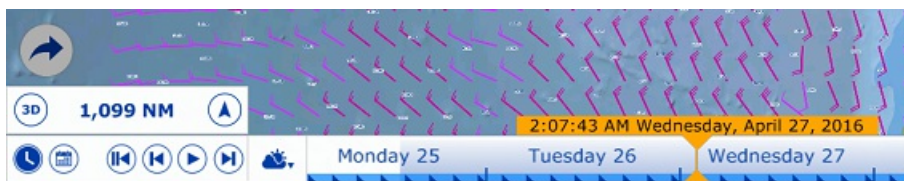
To make an animation:

- Display weather information on the chart (select "Display Weather" from the "Layer" button)

- Make sure that the Timeline mode is set to "Weather Mode":

- Click on the "Rewind" ("File Start") button:

- Click on the "Play/Pause" button to start/pause the movie:

- To reset the virtual time back to the current time, click on the "Actual Time" button:

- To step forward and backward using the file forecast interval, click on the "Step Back/Forward" buttons:

You can also scroll through time at various speeds by dragging your mouse in the timeline:
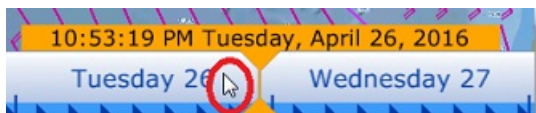
TIPS: You can adjust the replay speed from the General Options by adjusting the "Animation Replay Speed" setting.

Note: Whenever the Chart Time is different from the current computer local time, the Date/Time text is surrounded in yellow.

Opening A Weather GRIB File

TimeZero is compatible with GRIB file (GRIB 1 format only) downloaded from the weather service or third party service. To open a weather GRIB file in TimeZero:

- Click on the Button and select "Open Weather File"

- Browse and select the GRIB file then click on "Open"

Tips: When receiving a weather file by e-mail, you can directly open the attachment and load it in by double clicking on it.

If you open a GRIB file that was downloaded or generated from a third party source or software, TimeZero might not be able to display all layers of data (the GRIB format contains more than 200 type of parameters!). Below is the list of GRIB data layer that TimeZero can render:

- ugrd (33) Wind Direction & Speed

- vgrd (34) Wind Direction & Speed

- prmsl (2) Pressure

- tmp (11) Air Temperature

- tcdc (71) Cloud

- prate (59) Precip.

- swell (105) Waves

- htsgw (100) Waves

- wvhgt (102) Waves

- swper (108) Wave Period

- swdir (104) Wave Direction

- wvper (103) Wave Period

- wvdir (101) Wave Direction

- perpw (108) Wave Period

- dirpw (107) Wave Direction

- uogrd (49) Current Direction & Speed

- vogrd (50) Current Direction & Speed

- spc (48) Current Direction & Speed

- dirc (47) Current Direction

Premium Weather Service

In addition to the free weather forecasts (based on the GFS model), it is possible to subscribe to a premium weather service that provides access to a higher resolution global model (ICON Global) and four higher resolution local models. The Arpege model offers European coverage at a resolution of 10 kilometers and up to 4 days of forecast. The Arome model offers coverage of French coasts and bordering countries at a resolution of 1 kilometer and up to 2 days of forecast. The NAM CONUS offers coverage for North America at a resolution of 3 kilometers up to 2.5 days of forecast. The ICON Global model offers a worldwide resolution at a 6 kilometers resolution (more than twice the GFS model) up to 5 days of forecast. The premium weather service also offers access to 3 additional wave models.

When you subscribe to the premium weather, you can change the default GFS model when requesting a weather file from the "Update" WorkSpace:

You can select higher resolution models for "Air" (Wind, Pressure, ...) and for "Wave".

Below is a comparison in between the free weather service (using GFS Model) and Premium Weather Service:

Service	Weather (Free)	Premium Weather (Subscription)
Wind	25Km	1Km
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Wind Gust	25Km	1Km
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Pressure	50Km	50Km
	GFS (0.5 * 0.5)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Air Temperature	25Km	1Km
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Cloud	25Km	1Km
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Precipitation	25Km	1Km

	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Humidity	25Km	1Km
	GFS (0.25 * 0.25)	GFS (0.25 * 0.25) ICON Global (0.125 * 0.125) ICON Europe (0.062 * 0.062) Arome (0.01 * 0.01) Arpege (0.1 * 0.1) NAM CONUS (0.3 * 0.3)
Wave (Significant)	50Km	3Km
	WW3 (0.5 * 0.5)	WW3 (0.5 * 0.5) Copernicus Global (0.083 * 0.083) Arome (0.02 * 0.02) Arpege (0.1 * 0.1)
Surfacic Current	8Km	8Km
	(0.08 * 0.08)	(0.08 * 0.08)

Iridium Go

TimeZero can use an "Iridium Go" to download weather data at sea, where Wi-Fi or Cellular connection is not possible. The Iridium Go is a satellite communicator that creates a Wi-Fi HotSpot for your computer:

Although very slow (2Kbps), the Iridium Go offers an unlimited data plan for about $150 per month that can be a very good solution to download weather anywhere. To setup the Iridium Go in TimeZero, open the Weather Options and set the weather download method to "Iridium Go". You will then be able to enter your Iridium Go login and password and test the connection:
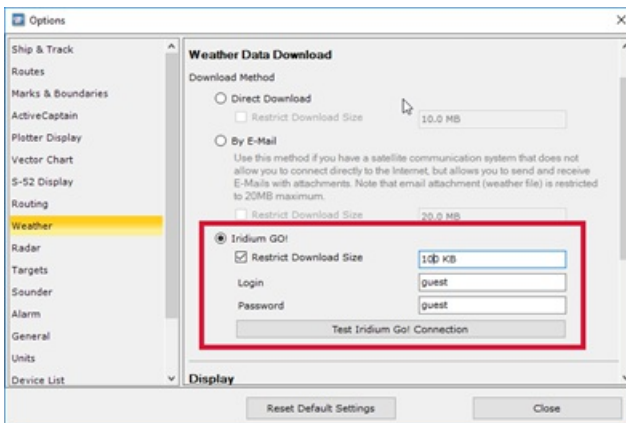
IMPORTANT: Make sure to connect your computer to the Wi-Fi HotSpot created by the Iridium Go before testing the connection or attempting to download weather data.

Once setup, the "Update" WorkSpace download button will change to display the current status of the Iridium Go (satellite connection status):

When pressing the "Download" button, TimeZero will automatically establish the Iridium Go satellite connection (dial up), data download, and finaly close the connection (to save power). In case of interruption during the download, the progress bar will turn orange. Do NOT press on "Cancel" to try to relaunch the process manually, TimeZero will automatically attempt to reconnect and resume the download at the point where it left off. Note that for data download to start, the satellite status needs to have at least 3 bars.

Note: The real world speed of the Iridium Go is about 10KB/minute. A weather download of 80KB will take a little less than 10 minutes in average. The default maximum size is set to 100kB (from the Weather Options), but you can increase it to up to 1MB (but it might take as long as 2 hours to retrieve 1MB).

Routing Introduction

The "Routing Module" needs to be unlocked to access this feature

Like all sailors know, the most direct route isn't always the best one. TimeZero Routing Module allows to calculate the optimal sailing route based on weather forecasts, currents, performance of your sailboat ("polars") and your own navigation style. The Routing algorithm uses the isochrons method to comute the best route. A specific isochron represents all the points that your sailboat can reach in a fixed amount of time, dependent upon the weather forecast (wind, current, wave) and the boat characteristics (as defined in the polars).

Excerpts from comments on "weather routing" by Brice Pryszo, founder of MaxSea International:

In 1984, when I designed the "isochrones" routing algorithm method, the only existing routing solutions required the use of powerful shore-based computers which basically tested millions of routes to choose the best one. This required power and time then not available on board sail boats. The MaxSea routing algorithm was designed to be executed on a personal computer.
The very first time that I tested the MaxSea weather routing algorithm was during the trans-Atlantic race "La Route de la Decouverte" with Philippe Jeantot onboard Credit Agricole. Philippe was late arriving at the Canary Islands due to equipment failure. The fleet leaders, 24 hours ahead, were sailing WSW in nice 10-15 Kt trade winds, south of a low pressure system (as any smart sailor would do). Meanwhile, the MaxSea weather routing algorithm sent Credit Agricole NW, straight into unsettled weather and unstable wind, up to the cold front of a deep low pressure system. The first hours were not welcoming but behind the cold front, a 20 Kt North wind pushed the large catamaran at twice the speed of the remaining fleet. Two days later, Credit Agricole was leading the race by several hundred miles. At that time no experienced navigator would have chosen such a solution!
Another astonishing example of the power of routing occurred when we tried to optimize an Atlantic passage West to East with regular high pressure mid Atlantic. As any good sailor knows, routing should begin by passing around the high pressure using a northerly course. Instead of following the quiet sailing to the east, the weather routing plunged the course to the south, straight into the low pressure center. Before reaching ineffective wind, the MaxSea routing jibbed the boat port into an increasing breeze perfect for reaching, making her route much faster than if she had taken the northern route with a downwind slog.
These two incidents had a major effect on sail boat racing results. Today, using routing is absolutely necessary to be competitive in ocean and long distance races. Routing has also proven to be great tool for cruisers because it greatly enhances safety and comfort. Routing can exploit user-defined characteristics and create what we call "cruising" or "safety" polar curves. Utilizing such polar curves the routing will do all it can to find a path which avoids strong wind. This is beneficial because strong wind is generally surrounded by medium wind in which the boat is faster allowing her to "escape".

Brice Pryszo

Creating A Routing

The "Routing Module" needs to be unlocked to access this feature

Before creating a routing, it is recommended to update the weather for the corresponding area. Please refer to Requesting a Weather File for more information. Make also sure to load the corresponding Polar file in TimeZero. Please refer to the Polar chapter for more information.

Select the "Planning" WorkSpace and display the weather data on the chart (to make sure that the weather file covers the area). Please refer to Displaying Weather Data for more information.

Select the "Launch Routing" tool available in the Toolbar:

- Move the cursor over the charts (at the departure location) and click once to set the starting point

- Move the cursor over the charts (a rubber line will appear) and click a second time to set the arrival point

Note: If you are connected to a GPS and receive a live position, you can double click with the "Launch Routing" tool on your destination. This will launch a routing in between your current location and the destination.

In some cases, when moving the cursor to set the departure and arrival points, you might see a text tooltip appearing warning you of specific conditions:
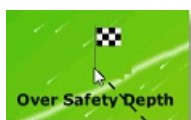
- "Outside Weather Coverage": the cursor position is outside the area covered by the weather forecast.

- "No Bathymetric Data": there is no detailed bathymetric data available under the cursor position. Note that it is normal to have this warning in open water, where detailed bathymetric data is not available. However, if you see this warning near the coastline, this is an indication that you should install 3D data (files ending with ".dbt").

- "Over Safety Depth": the cursor position is over land or above the minimal depth defined in the Routing Options.

- "Strong Winds" / "Big Waves": the weather maximum criteria (maximum wind, maximum wave) defined in the Routing Options are exceeded at the cursor position

As soon as the departure and arrival points are defined, TimeZero will open the Routing Wizard window:

First, select if you prefer to set a departure time or arrival time (by clicking on "Departure" or "Arrival"), then, select a date and time. Note that you can click on the clock icon to use the current time:
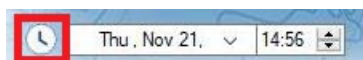
Tips: Make sure the selected date & time fall within the weather forecast range. If the weather forecast is not "long" enough for the trip (for example a 5 days trip with only a 3 days forecast), TimeZero will use the last forecast available for the reminder of the trip (fixed value).

Before launching the Routing, the Wizard allows you to adjust some parameters:

- Use Motor Under Sailing Speed: This parameter allows you to specify a minimum speed for which you will decide to start your engine. Note that the speed you achieve under power can be adjusted from the Routing Options.

- Polar Curves Percentage: This setting allows you to apply an overall factor on your polars. For example, if you want to see what

would be the route if you only achieve 90% efficiency, you can set the slider to -10%.

- **Minimal Depth**: Set the minimum depth allowed for the routing. You would usually use a value corresponding to the draft of your vessel plus a margin. When computing the optimum route, TimeZero will avoid areas that are shallower than this value.

- **Maximum True Wind Speed:** Set a maximum wind speed constraint. When computing the optimum route, TimeZero will avoid areas that have wind speed over this value.

- **Maximum Wave Height:** Set a maximum wave height constraint. When computing the optimum route, TimeZero will avoid areas that have wave height over this value.

Note: Other (more advanced) parameters can be setup from the Routing Options. For example, you can set a minimum wind speed or shift/alter the weather data.

After reviewing and/or adjusting the routing parameters, you can click on "Launch Routing". TimeZero will launch the routing computation and display a route summary window:
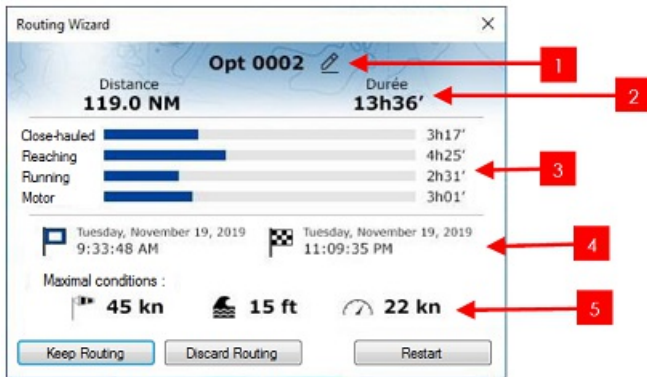
1: Click here to change the name of the route

2: Total Distance and total Duration of the route

3: Total time under specific sail or motor configuration

4: Departure and arrival date / time

5: Maximal conditions reached along the route

Note that when TimeZero computes the optimum route, you may see black, red or blue lines. Those lines represent areas where a constraint has been reached (preventing the optimum route to cross this path). Red highlights areas where a maximum wind constraint has been reached. Black highlights maximum wave height and blue highlights minimum wind constraint. In the example below, you can see that the resulting computation has avoided those areas:
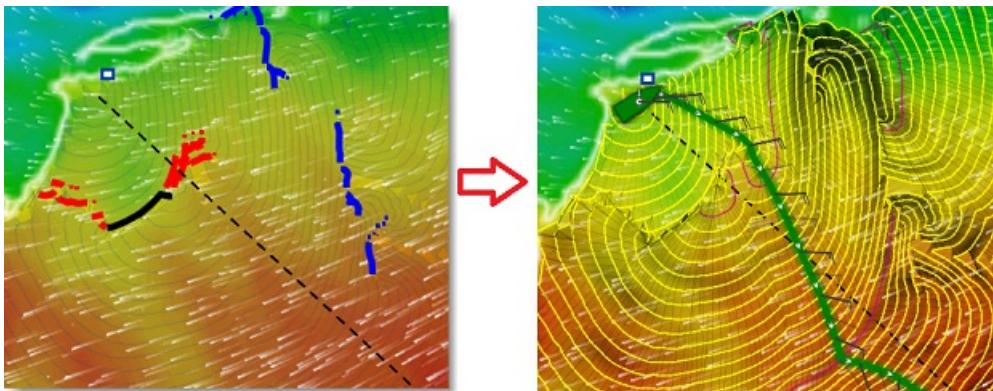
To close the Routing Wizard, you can choose to discard the routing, restart a new computation (for example if you want to change the date of departure), or keep the routing.

Tips: By default TimeZero will automatically erase previous routings to only keep the last one. If you prefer to keep all routings (if you want to compare multiple scenarios), you can uncheck "Only Keep the Last Routing" from the Routing Options.

After closing the Wizard (when "Keep Routing" has been selected), the optimized route (1) will be displayed in green, the "isochrons" (2) in yellow/purple lines, and the SailSets in various colors:
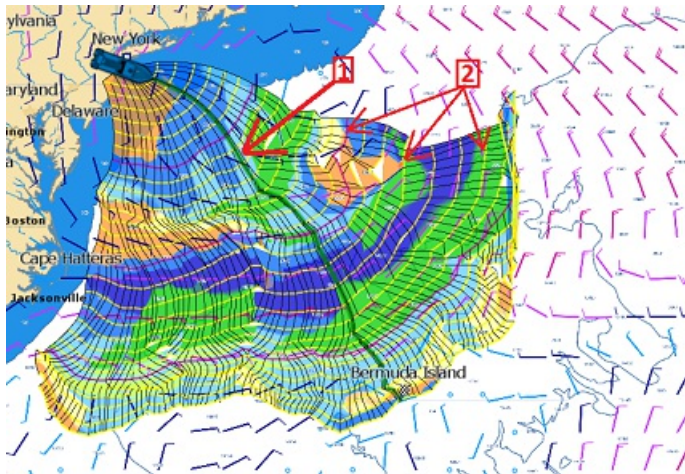
Note that the length of weather forecast should cover the entire time required for the trip. If this is not possible (for a very long cruise), TimeZero will use the latest forecast available as an estimation, and display the isochrons in semi-transparent color. In the following example, TimeZero is using the same fixed weather forecast (latest available) from the location pointed by the red arrow:
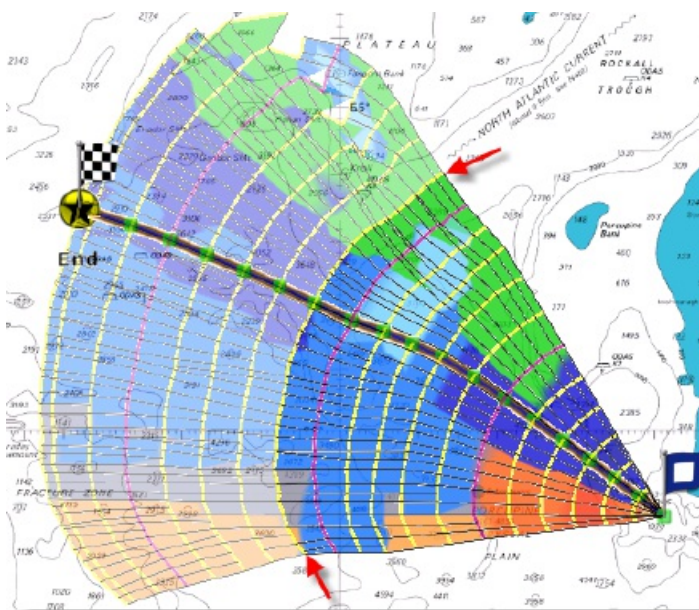
If you would like to focus on the optimum route generated by TimeZero, you can hide the isochrons and sailsets from the "Layers" menu (that can be opened by clicking on the "LAYERS" button located at the bottom right of your screen):
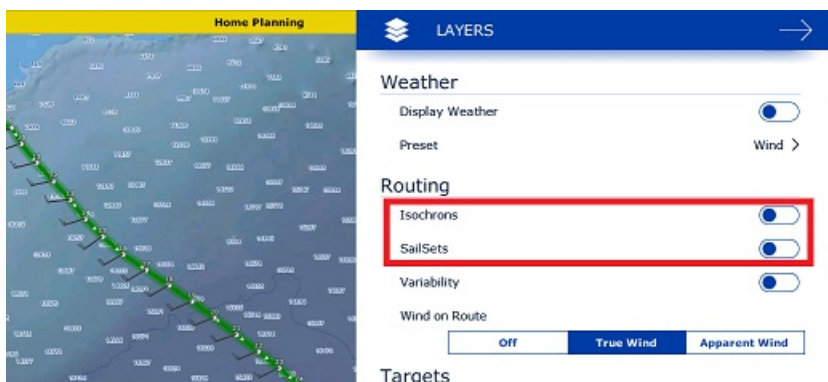
This will reveal the route (displayed in green by default) which will include a wind feather icon on each waypoint showing the wind direction and strength that is forecasted at the location for the date/time predicted by the routing algorithm. By default TimeZero display the True Wind direction and speed, but it is possible to switch it to the Apparent direction and speed from the Layers menu.

Note: Once the optimum route (routing) has been generated, it cannot be edited. You cannot move waypoints nor adjust the departure time or speed after it has been computed. If you would like to edit the routing like a route, you can right click on it and select "Convert to route".

How to interpret isochrons

Each isochron represents a group of points that the sailboat can reach in a fixed amount of time. For example, if the isochron interval is 3 hours, then the first isochron represents the point the boat can reach in 3 hours, the second isochron is the point the boat can reach in 6 hours, the third one is the point the boat can reach in 9 hours, and so on. The isochrons are drawn as yellow curves on the chart. Every 24 hours, a purple color is used for the isochron (to quickly visualize a day worth of sailing on the chart).

The shape of the isochrons indicates global tendencies. For example, if a group of isochrons is "compacted" in the North (red circle below), and other group is "expanded" in the South (green circle), this indicates that the South holds the better options for travel:
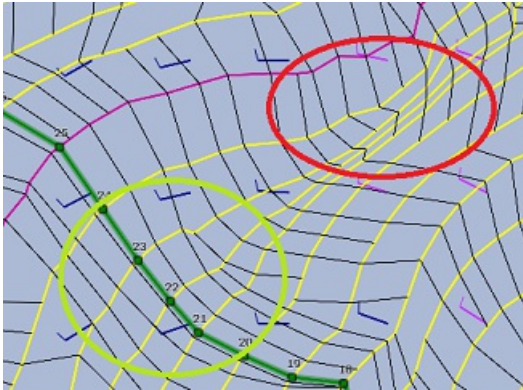
Isochrons that are farther apart means faster speed (because a longer distance can be achieved in the same amount of time).

TimeZero automatically analyzes these patterns, computes the best route possible and displays it in green on the chart.

How to Interpret SailSets

SailSets display the Sail configuration to be used in color on the chart. The color scale is defined in the SailSets table of the Polar WorkSpace.

Note that the default color scale pre loaded in TimeZero allows you to graphically visualize quickly on the chart the "type of navigation" that you can expect for various areas. Red colors are used for Close Hauled navigation or Downwind, green for Broad Reach and blue for Close and Beam Reach. The darker the color, the stronger the wind.

In the example below, the navigation will start Close-Hauled with medium wind speed (orange), then the wind speed will drop around waypoint #6 (pale orange), then the configuration will change to reaching with low wind around waypoint #10 (pale blue), then the wind speed will increase around waypoint #12 (darker blue):
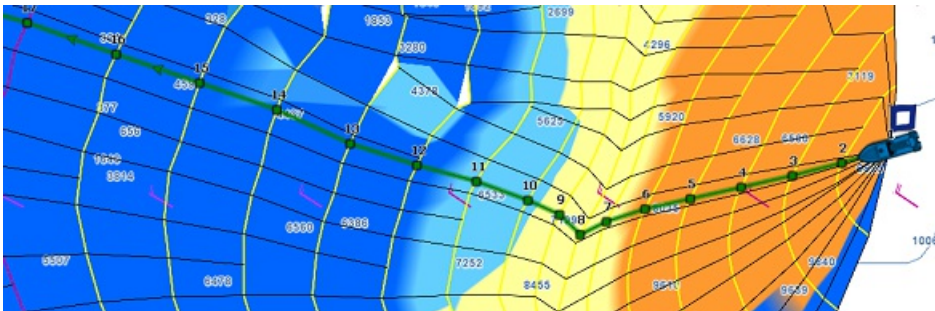
SailSets are great to identify alternate route that may offer easier navigation (if reaching your destination in the shortest time is not your primary goal). In the example below, the fastest route forces you to sail in an area with lots of Close Hauled at the beginning (orange color). You could define an alternate route (south) which would adopt a much easier navigation (in the blue area).
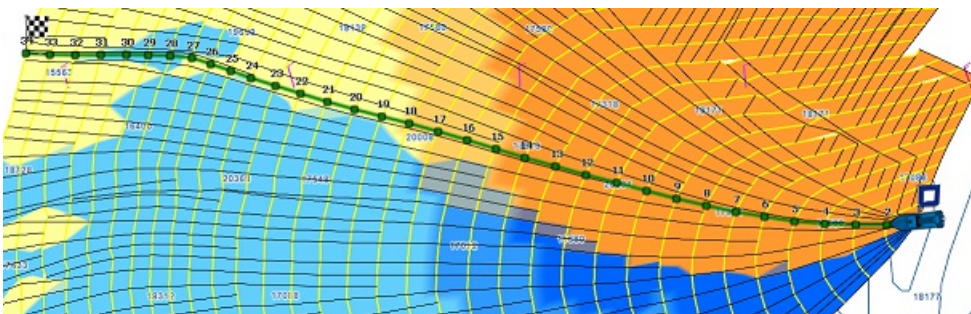
Avoid Land and Shallow Water

By default the Routing will avoid land (minimum depth is set to 0), but you can adjust the safety depth from the Routing Options using the "minimal depth" setting:

Please make sure to install the detailed 3D database files (files ending with ".dbt") that came with your charts. If no detailed 3D data is available, the routing will use the lower resolution worldwide 3D database that can lead to unexpected results.

Note: In some extreme circumstances, the routing module will not be able to find a "path". In these cases, you can try to split the routing in multiple steps by creating a route first. Please refer to the Manual Constraints chapter.

Minimum Speed ("motoring")

You may enable the "Use Motor Under Speed" setting from the Routing Options if you would like to indicate to the routing algorithm that you are willing to use your engine in areas where you speed (under wind power) would fall below a threshold. Note that you can setup the threshold and the speed that you will reach under engine power independently. For example, you may setup the threshold at 5Kn (meaning that if your speed goes under 5kn you will start your engine), and use a different value for your speed while "motoring" (for example 8kn).

If you enable this option, TimeZero will highlight the legs where you need to start your engine with a black outline:

Routing With Manual Constraints (Advanced)

The "Routing Module" needs to be unlocked to access this feature

Routing from several waypoints

It is possible to define a routing that go over specific locations. This can be useful in intricate passages where the routing cannot find a way due to land or shallow water. To perform a "multi-leg" routing, start by creating a route with the Route tool. The various waypoints of the route will define the various locations that must be reached by the routing. Once the route is created, select the departure date from the Time Bar, select the "Launch Routing" tool and click once on the route. This will automatically create a routing that goes over all the Waypoints:
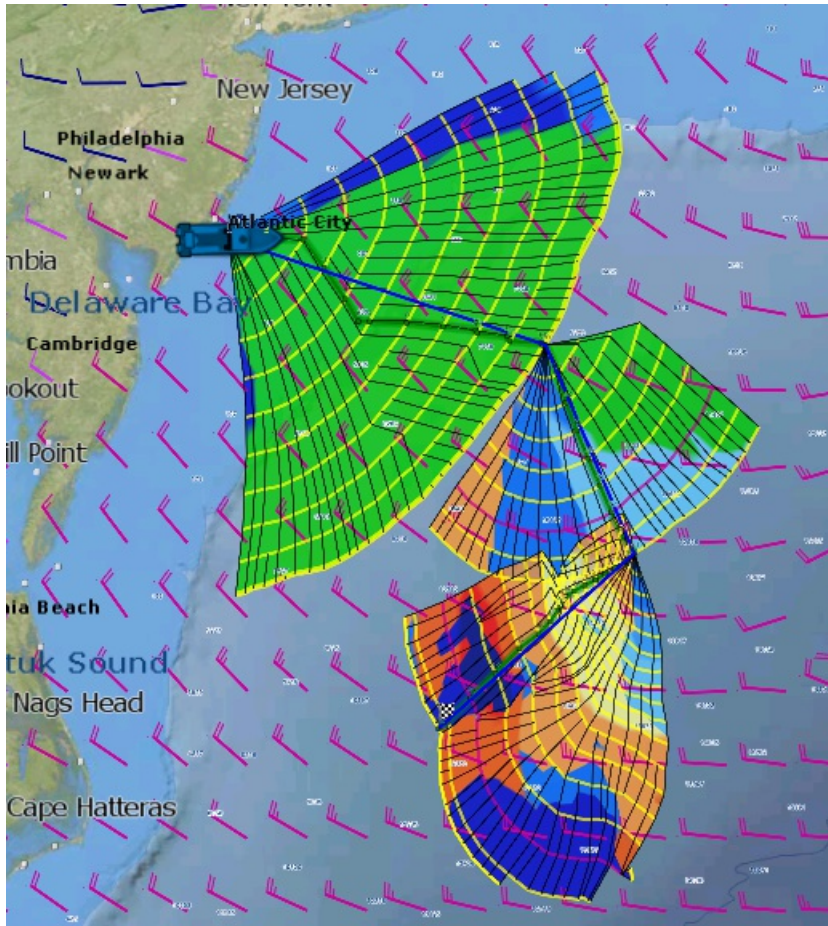
Routing with constraints

Instead of defining "hard constraints" (routing going over a specific location), you can perform a routing with "loose" constraints. This can be useful to avoid specific areas. The steps are very similar to creating a routing from several waypoints. But, before clicking on the Route with the Routing Tool, simply right click on the Waypoints and select "Leave Port" or "Leave Starboard". This will allow the Routing algorithm to "explore" more options while leaving specific waypoints to the Starboard or Port side. In the example below, a route consisting of 3 Waypoints was created. Then Waypoint #2 was set to "leave port":
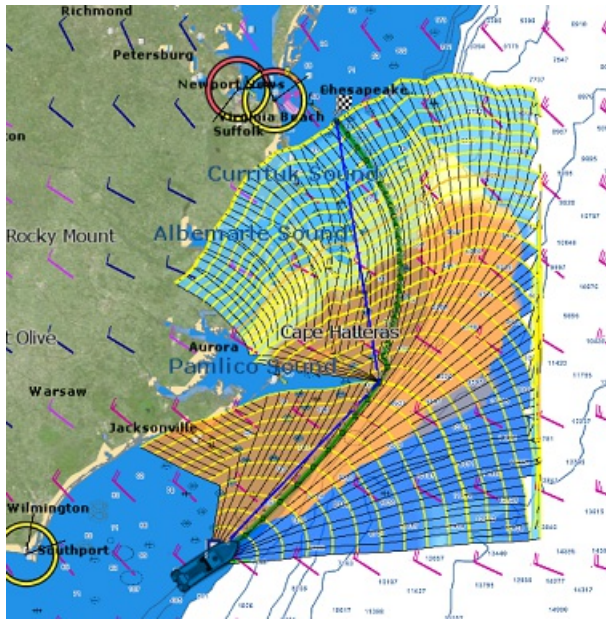
Routing Detail

The "Routing Module" needs to be unlocked to access this feature

The Routing Detail is very similar to the Route Detail. It displays information about the selected routing in a tabular format together with information about the routing as a whole (date of departure, weather file used for computation, etc...). Unlike the Route Detail, the Routing Detail cannot be modified. If you want to modify a parameter (date of departure for example), a new routing must be launched.

Opening and Closing the Routing Detail

Note: Although you can display the Routing Detail in the Navigation WorkSpace, it is highly recommended to work in the Planning WorkSpace (that provides the Time Bar).

Select the Planning WorkSpace, zoom in on the optimized route and double click on it (double click on one of the green leg).
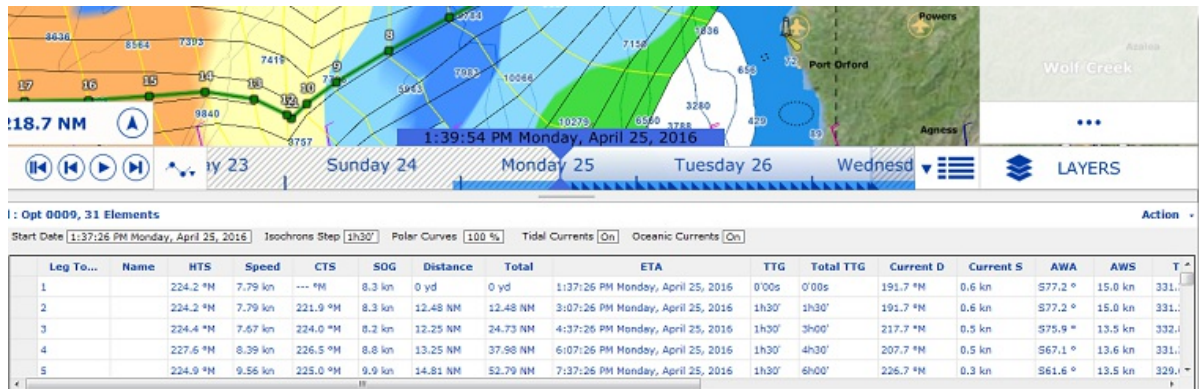
To close the Route Detail, Click the "X" button at the top right of the route detail list.

Using the Route Detail

The top part of the Routing Detail displays information about the routing itself:

- Start Date: The Routing date of departure

- Isochrons Steps: The step in between two isochrons displayed on the chart. In most cases (if there is no tack in between two isochrons), this will also be the step in between two legs.

- Polar Curves %: Indicates the polar percentage factor that was used for the computation of this routing.

- Tide Current, Oceanic Current, and Waves: Indicates if these parameters are taking into account for this routing (can be adjusted from the Routing Options).

The table display for each leg various useful information that can be displayed, hide or reorder from the "Action" menu:

- Leg To: Each line of the list gives you information about the leg that allows to reach a specific Waypoint. The "Leg To" value is the number of that Waypoint.

- ETA: The Estimated Date of Arrival to that Waypoint taking account the currents (based on SOG).

- Speed: speed through water of the boat (or surface speed). This value can be edited individually for each leg or can be set globally (for all legs) using the Action menu.

- HTS: Heading to Steer. This is the heading that you should follow to reach the next waypoint. This value is adjusted to take the currents into account. This value can be different from the CTS if currents are strong in the area.

- SailSet: is the SailSet used for this leg according to Wind Angle, Speed and the SailSet table defined in the Polar WorkSpace.

- SOG: Speed over Ground being calculated based upon the surface speed and currents. The SOG will be different that the speed, because your boat can be "pushed" or "slow down" by the currents.

- CTS: The "Course to Steer" is the direction (bearing) of the route leg as it would be on a paper chart.

- TWS: is the True wind Speed

- TWA: is the True Wind Angle

- TWD: is the True Wind Direction

- Waves H: is the Wave Height

- Distance: is the distance of that leg

- Total TTG: is the cumulative time to go from the start of the route to that leg

- AWA: is the Apparent Wind Angle

- AWS: is the Apparent Wind Speed

- Current D: is the current direction

- Current S: is the current speed

- Name: an optional name you can set on a specific waypoint

- Position: is the position of the waypoint

- Total: is the cumulative distance from the start of the route to that leg

- TTG: "Time to Go" is the time to navigate on that leg. The SOG and Distance are used to compute that value.

- Variability: is the variability on that leg

- Waves D: is the Wave Direction

- Waves P: is the Wave Period

Note: Current, AWA, AWS, TWD, TWS, Waves are values coming from the Weather File.

The Route Detail "Action" menu provides quick access to main functions and parameters. It can be found on the right side title bar of the list. It includes the following options:

- Convert to Route: To convert a routing (which has fixed constraint and cannot be edited) to a route that can be freely edited.

- Activate Route: To activate the planned route and start navigating. Note that this option is not available when TimeZero is started in Home Planning mode or when no position (GPS) is available.

- Configure List: To add or remove columns of the Route Detail table

- Copy to clipboard: To copy the list information as displayed on your screen. You can paste this information in a text editor or Excel for further editing

- Export list: To export the list information as displayed on your screen in a text file. Each field is separated by a Tab

- Print: To print the list as displayed on your screen.

- Search by name: To locate in the list a waypoint with a specific name.

Polar

The "Routing Module" needs to be unlocked to access this feature

Opening a Polar file

Boat speed used by the Routing algorithm and Laylines is entered into TimeZero from a polar curve diagram which relates boat speed to wind speed at a given wind angle. To open a polar file, click on the button and select "Open Polar File". Click on the "Browse" button in front of "Wind Polar File":
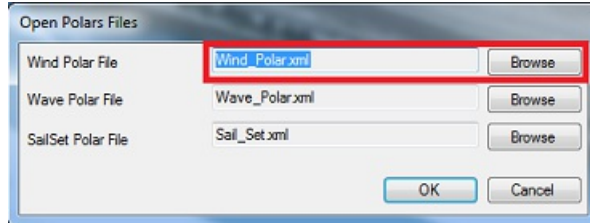
Select the polar file and click on "Open"

Note that various Wind Polar files for multiple sailing boats can be downloaded from www.mytimezero.com. Just sign in, click on "My TimeZero" then "My Wind Polar".

Note: You should not have to open any Wave_Polar file. The default Wave Polar file loaded in TimeZero should work for every user (as it applies an automatic relative offset to the Wind Polar).

The polar Graph

The polar file loaded in the software can be viewed and modified from the "Polar" WorkSpace:
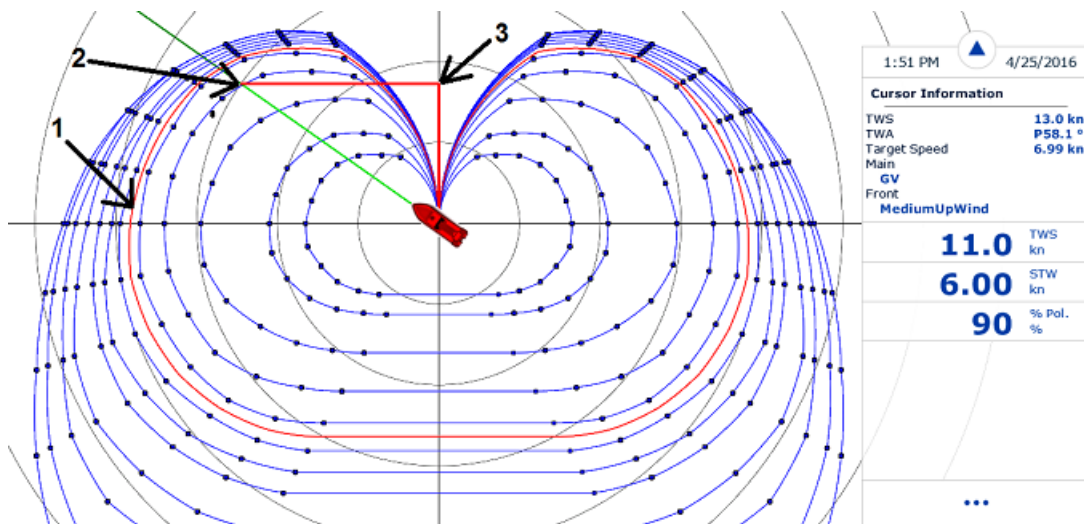
The various polar curves (in blue) represent the boat theoretical speeds according to True Wind Angle (TWA) and True Wind Speed (TWS). The theoretical boat speed value is given by the distance in between the point on the polar curve and the center of the graph (the farther away the greater the speed). There is one polar curve per True Wind Speed value. If TimeZero is connected to a sensor that output True Wind Speed, the polar curve corresponding to the real time wind speed ("Live Polar") will be highlighted in red (1).

Note: The graph can be either displayed in "Wind Up" (default) or "Head Up" from the "Layer" button . The traditional "Wind Up" display places the wind axis vertically on the graph.

If TimeZero is connected to a speed sensor (Speed Through Water), the real time boat speed will be displayed (2) with its projection on the wind axis (3) (aka: VMG).

In the Polar WorkSpace, the Cursor Information NavData gives various information related to the polar. In the example above, the cursor has been placed over the real time polar curve (displayed in red) in the boat direction (aligned with the heading line). We can learn that the Target Speed (theoretical boat speed) is 6.99Kn. The real time boat speed (STW) is only 6.00Kn. So, in this case, the boat is not reaching maximum performance (90% performance). This is either because the polar data over estimates the boat performances or because the sail configuration needs to be adjusted by the crew to meet the real boat performance.

Polar Performance analysis

TimeZero continuously records wind and boat speed data at a rate of one sample per second. These samples can be displayed in the Polar WorkSpace as individual dots which, when accumulated, form a cloud o points called the Performance Plots. Performance Plots are automatically sorted by wind speed. In live mode, the wind speed sensor connected to TimeZero is used to select the appropriate points. When live mode is turned OFF, you can select the wind speed to show by clicking on one of the polar curves directly on the graph or by selecting a column in the polar table. In the screenshot below, the selected wind speed is 12Kn as displayed on the lower left corner (3). The theoretical performance of the boat at this speed is indicated by the polar curve displayed in red (2). TimeZero displays all the points that have been logged at this selected wind speed showing your real performance on the graph:
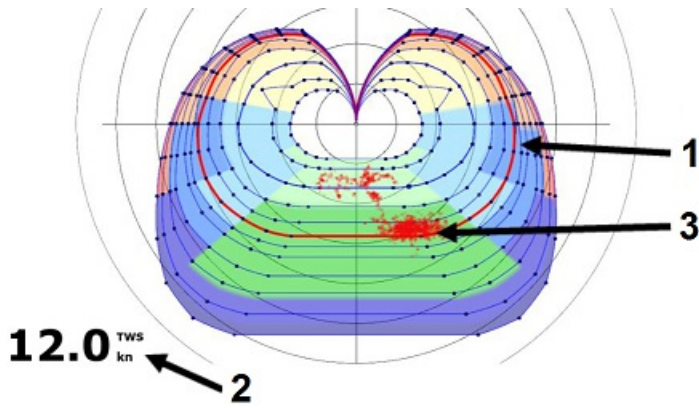
In the examples below, showing the point cloud for various wind speeds, it can be seen that the user mainly sailed in 12 kt of wind, since this is where the cloud is the most pronounced:
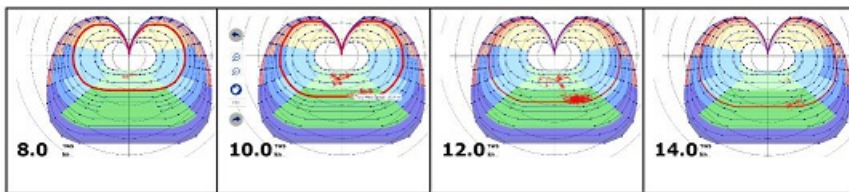
When "Live Polar" is selected, you can select how much history you want to display on the polar graph. When "Live Polar" is unchecked, you can select a previous trip, a duration and a starting date:
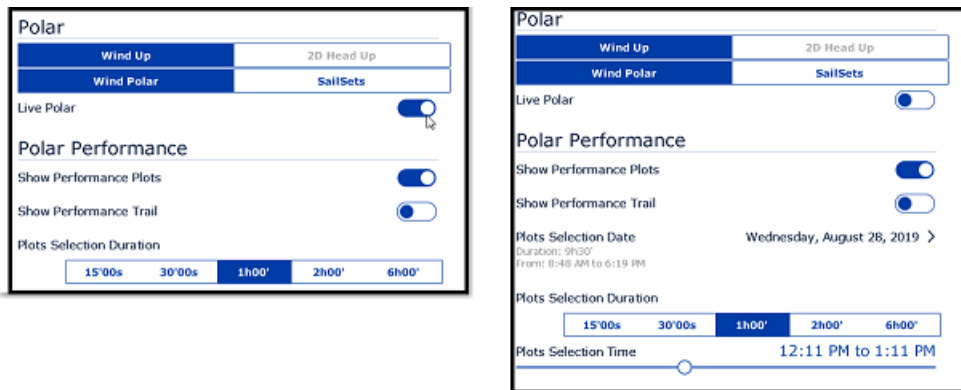
Modifying the Polar data

It is possible to adjust the polar data by using the table at the bottom of your screen. Just make sure to select "Wind Polar" on the left. Value can me modified (like in a spreadsheet) and column and row can be added or deleted. Just right click on the column or row header you wish to add or delete:

The rows represent the angle in between the wind and the boat (where is the wind coming from relative to the bow of the boat). The columns represent the Wind Speed. So, in the table above, if the True Wind Speed is 20Kn and if the True Wind Angle is 60 degree, the target speed (theoretical boat speed) is 7.5Kn. You can edit this value by selecting the cell and entering the new value.

As soon as you make a change in the table, the graph above will update. If you want to store permanently the modification, make sure to click on the "Save" button at the top of the table. This will write the modification to the polar file on your Hard Drive.

SailSets

The SailSets color can be displayed on the Polar graph from the "Layer" button:
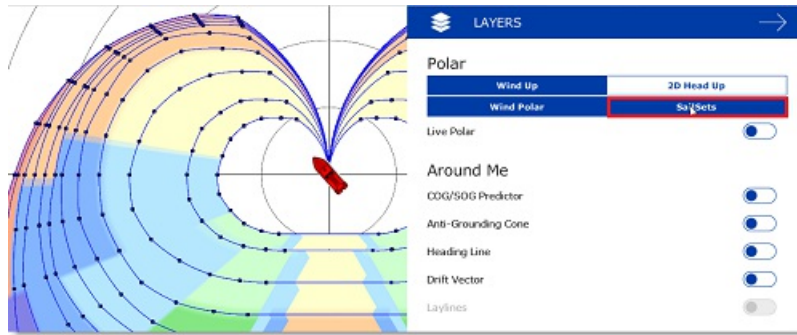
If you select "SailSets" in the list on the bottom left, the Sail Set color table will be displayed. Each cell can be assign new sail configuration using a drop down menu. If you want to change a sail configuration, click on the "SailSets Configuration" button at the top of the table.

Note: For the average user, the default SailSets configuration does not need to be changed. In this case, the color will simply highlight on the chart the type of navigation (Close Hauled, Reaching, etc...)

Advanced Routing

The "Routing Module" needs to be unlocked to access this feature

Polar Modification (Percentage)

It is possible to adjust the Polar Curves percentage from the "Routing" Options. You can increase or decrease the overall polar performance without having to load multiple polar files. By selecting "Save All Routings in Planning Space", you can launch multiple routings (same origin and destination) with different Polar percentages. This will show you multiple scenarios on screen illustrating what would happen if you underperform (lower percentage) or over perform the Polar speed during your cruise.

The example below shows two routings that have the same origin, arrival and start date. One routing was made without any polar modification (0) and the second one was made with a 10% reduction:

You can see that if you under perform by 10%, the two optimum routes are totally different.

TIPS: To launch the same routing (same start point, end point and date) right click on a black line and select "Launch Same Routing":

To help you adjust the polar in real time, you can display the real time "% Polar" computation in the NavData. TimeZero will compare the theoretical data from the Polar file with the real time speed and wind data from your sensors. The "% Polar" will tell you in real time if you over or under perform the polar data.

Routing Variability

The Variability (OFF by default) allows to identify important variation of wind direction and speed directly on the chart. Dark areas indicates passage that would require extra attention (weather transition, important pressure gradient,...)

The variability uses an inverse factor: it is equal to 100% if wind direction and speed are stable and decrease when the routing shows important variations.

To display the variability on the chart, select "Variability" located in the "Layer" button of the Planning WorkSpace:
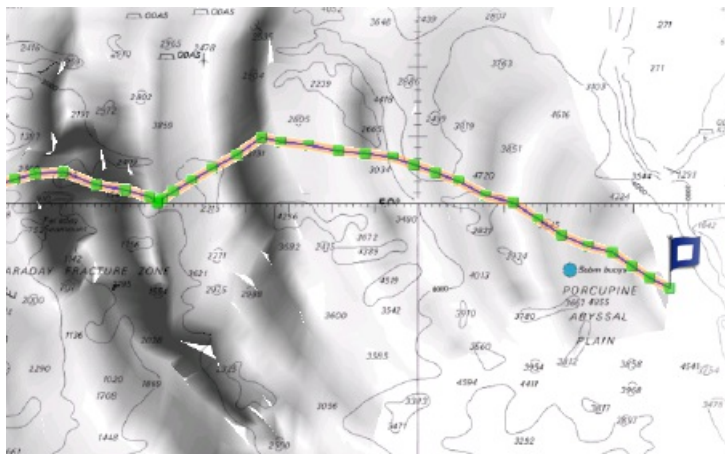
The variability can also be displayed leg by leg in the Routing Detail list.

Weather Modification

With experience, you may learn how to adjust the weather prediction based on real time observations from you or other competitors. It is possible to adjust the Weather File using multiple criteria.

You can adjust the overall wind speed (either by percentage or constant value), wind direction and the entire weather grid location. All these parameters can be adjusted from the "Weather" Options.

Alternate Routing

The alternate routing allows you to compute a new routing that will pass over a specific location. Sometimes, it can be better to adopt an alternative strategy (as explained above) or if the initial routing result is going over land or crossing any type of obstacle. All route plans drawn in black in between each isochrons are optimal routes (they allow to reach the corresponding location in the minimum amount of time). Simply right click on any Route Plan (black leg) and choose "Launch Alternative Routing".
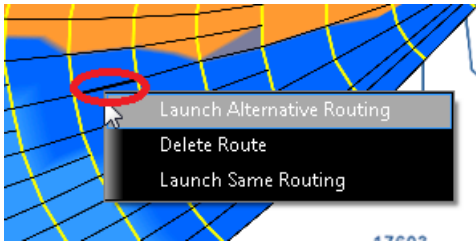
Note: It is sometimes easier to zoom in on the chart in order to be able to right click on a specific Route Plan

Target Overview

TimeZero can track multiple types of targets:

- ARPA targets transmitted by your Radar

Note: A Heading Sensor is required to display ARPA targets in TimeZero

- AIS targets transmitted by an AIS receiver (split into "AIS Class A" and "AIS Others")

- AIS targets received through the Internet from the Marine Traffic service ("Marine Traffic")

- DSC targets transmitted by a VHF with DSC functionality

Targets can be displayed on the chart or on the radar screen by selecting the "LAYER" button and selecting the corresponding target category:

Target alarm (CPA/TCPA and AIS Proximity alarms) can be set from the Alarms Options. When a predicted CPA of any target becomes smaller than the CPA alarm and when its predicted TCPA becomes smaller than the TCPA alarm limit, the target becomes dangerous and its icon flash in red. If CPA/TCPA alarm is checked, the status bar will turn red and an audio sound will play (if "Alarm and Notification Sound" is checked).

AISTarget

Regular AIS Symbols are small triangles colored by default in blue for AIS Class A and green for AIS Class B:

M/V VESSEL   M/V VESSEL

Note: AIS downloaded from the Internet through the Marine Traffic Web Site are colored in yellow. Please refer to the Marine Traffic chapter for more information:

When Heading and Course Over Ground (COG) is sent by the AIS receiver, TimeZero Navigator will use the heading information to align the AIS icon and will display a COG Vector in dashed line:

Note: The AIS target COG vector length use the same time parameter as your own ship setup in the Ship & Tracks Options

If the AIS target contains the vessel size information, TimeZero Navigator will represent the shape of the vessel on the chart (in real size) when the chart is on a small range.

When an AIS SART (Search and Rescue Transponder) is received by TimeZero Navigator , an alarm will be triggered automatically and the target icon will be displayed in red (cross circle).

AIS Target Icon

	AIS Icon with speed vector and Rate of Turn indicator. In this example, the AIS target is turning to port.
	AIS Lost Icon. An AIS gets lost if no information updating the target location is received after a period of time. The time that cause an AIS to get lost varies with the class of AIS (A or B), its speed and its status (moored, in navigation, etc...). A lost AIS icon will disappear from the screen after 30 seconds.
	AIS Icon with one (or multiple) important data missing preventing CPA and TCPA computation (missing COG and/or SOG of target or Own Ship)
	AIS Icon breaking (flashing) an alarm condition (either CPA/TCPA or proximity alarm)
	AIS Base Station Icon
	AIS Search and Rescue Aircraft
	AIS SART (Personal Man Over Board transponder)
	AIS AtON (physical or virtual Aid to Navigation)

AIS Color

The default color of AIS targets can be changed from the Targets Options. You can choose a different color for AIS Class A or AIS Class B. You can also set the color to "variable". In this case, the target type (Cargo, Fishing, Blue Force, etc...) will be used to color the symbol by

default:

You can also change the color of any AIS target individually by right clicking on an AIS target and selecting a color or by adding an entry in the AIS directory.

Note: When you manually change the color of a specific AIS target, will remember this setting and will continue to represent that AIS target with the custom color even if the target is lost or the software restarted. Any color that has been manually changed or defined in the AIS directory has priority over the default color.

AIS Directory

It is possible to give a Nickname and set a predefined color from the "Directory" under the Targets Options. Simply click on the "Add" button, enter the MMSI number of the target, select a Nickname and color. The list can be saved (exported) for backup or to be imported on another TimeZero Navigator .

AIS Filtering

AIS targets can be filtered (automatically hidden) by adjusting the "Hide AIS target farther than" parameter located in the Targets Options.

AIS SART

Personal Search And Rescue Transponders (SART) use AIS messages to broadcast their position and trigger an alarm automatically in TimeZero Navigator . AIS SART can be a device on a vessel, in a life raft or a personal Man Over Board (MOB) device. In an emergency situation an alarm will be triggered and a message will appear in TimeZero asking to either center your display on the SART location or create a Go To point. The position of the AIS SART on the chart will be marked with the following icon:

TimeZero Navigator can also receive AIS SART Test messages. In this case a simple notification will be displayed in the status bar and the icon will be displayed on your chart in green instead of red.

ARPA Target

This feature requires your computer to be connected to a Heading Sensor and Radar

Introduction

ARPA (automatic radar plotting aid) symbols are small circles colored by default in green: . The ARPA symbols are created and tracked by analyzing the radar picture. ARPA targets can be either computed by the Radar directly or by TimeZero when connected to an Ethernet Radar (when TimeZero receives the radar picture). In this case, TimeZero uses a powerful process to detect, filter and track up to 200 ARPA targets.

Note: When connected to a Furuno FAR2xx7 series radar or NavNet Network (with MFD), it is possible to choose if the ARPA targets are computed inside the radar (default) or by TimeZero by adjusting the setting "Enable Local TimeZero ARPA Processing" available in the Radar Options.

Acquiring ARPA targets

Note: It is only possible to acquire ARPA target from TimeZero when connected to a compatible Ethernet Radar (with corresponding Module unlocked). If your radar is connected to TimeZero via NMEA0183 (using TTM sentence), control from the PC is not possible.

ARPA targets can be manually acquired by:

- Double clicking on a radar echo

- Clicking and selecting "Acquire Target"

- Using the "Acquire Target" tool (hidden by default) and left clicking on a radar echo

Note that properly tuning and adjusting your radar for changing conditions (weather, sea state,...) is critical for proper ARPA target tracking. If there is too much noise on the radar picture, this can cause false targets detection. On the other hand, if the radar is not adjusted properly (not enough gain for example), you could miss some targets.

When TimeZero is processing the targets (only available with Ethernet Radar), ARPA targets can also be acquired automatically by analyzing Radar Echo inside one or multiple areas. Please refer to the Guard Zones chapter.

ARPA Target Icon

	Just after acquiring a target, TimeZero will process radar data for a few revolutions and display the target using a dashed circle.
	Once the target is fully acquired, TimeZero displays the target using a plain circle with a speed vector (over 1kn).
	Lost ARPA target. This happens if the target becomes out of radar range or if the target cannot be tracked by the radar anymore.
	ARPA Icon (flashing) breaking an alarm condition (either CPA/TCPA or proximity alarm)

Note: When TimeZero is processing the targets (only available with Ethernet Radar), the ARPA target icon size and transparency varies according to its tracking quality. If the radar has difficulties seeing the target, its icon will slowly decrease and its transparency increase until the radar can get a strong echo of the target.

ARPA Color

The default color of all ARPA targets can be changed from the Targets Options. You can also change the color of any ARPA target individually by right clicking on an ARPA target and selecting a color.

DSC Targets

DSC equipped marine radios provide vessel tracking for both DSC polling and distress calls. When you poll another boater who is also equipped with DSC VHF for their position, TimeZero will display their returned position. TimeZero can be connected to a VHF using NMEA0183 through the Connection Wizard.

When DSC is configured, DSC targets can be displayed from the "Layer" button:

DSC target icon

DSC target icon under distress
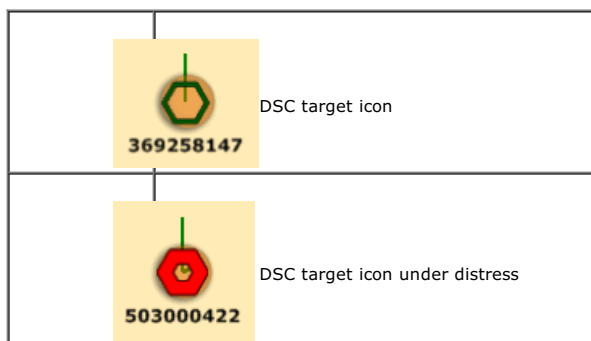
Note: DSC will not appear under the "Target" button until it has been configured in the Connection Wizard.

By default, DSC targets will display their MMSI number on screen. You can replace that number by a Nickname from the AIS/DSC Directory located in the Targets Options.

When a DSC distress call is received by TimeZero, an alarm will be triggered and the DSC target icon will be displayed in red.

Target Information

TimeZero can display target information in various ways:

Using the ARPA or AIS List:

From the Planning WorkSpace, click on the List button and select either the ARPA or AIS list.

The list can be sorted by double clicking on any column title. It is possible to "Freeze" the refresh of the list (to prevent the selected line to be moved by the sorting process) and filter the list using various parameters. The "Actions" button offers various options such as searching by MMSI, Name, or configuring the list:

Name	MMSI	Call Sign	CPA	TCPA	Range	Bearing	COG	SOG	Heading	Destination
VICTORIA CLIPPER 3	366902890	WAP4478	0.992 NM	-0'32s	1.011 NM	82.0 °M	174.1 °M	22.8 kn	172.0 °M	SEATTLE PIER
WESTWOOD RAINIER	311349000		1.062 NM	-8'32s	3.004 NM	29.4 °M	354.4 °M	17.0 kn	353.0 °M	
CADEAU	338115675	WBY9752	3.212 NM	-26'51s	3.998 NM	114.6 °M	--- °M	0.0 kn	--- °M	
	367337230		3.301 NM	-25'52s	4.019 NM	116.4 °M	344.0 °M	0.0 kn	--- °M	
ZEEHAEN	366955010	WDB8224	3.344 NM	-26'24s	4.081 NM	116.2 °M	--- °M	0.0 kn	--- °M	SHILSHOLE
WALLA WALLA	366710810	WYX2158	4.136 NM	-4'40s	4.158 NM	336.6 °M	247.4 °M	0.1 kn	278.0 °M	WSF TERMINAL
ISLAND CHIEF	366838990	WDA7043	2.340 NM	-45'30s	4.650 NM	29.7 °M	328.1 °M	0.1 kn	--- °M	LOCAL

To select and center a target on the screen, click on the first column corresponding to the target you want to display:

	Name	From...
▶		
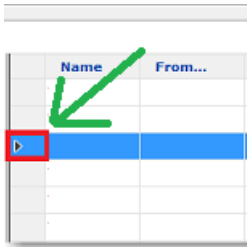
Using the Target Information NavData:

A "Target Information" NavData can be added to the NavData bar configuration. Simply click on the "..." icon to add the corresponding NavData to the NavData bar.

The target information that will be displayed in the NavData is the last selected target (surrounded with an orange circle on the chart):

Target Information ⓘ
Label
VICTORIA CLIPPER 3
Position
N 47°44.245'
W 122°27.155'
COG/SOG
166.8 °M/22.9 kn
CPA/TCPA
1.000 NM/2'16s
Range/Bearing
1.281 NM/49.1 °M

To display the full information of the target, click on the blue "i" icon located on the top right corner of the NavData

Tips: If you don't want to leave the NavData bar opened all the time but still want to see the target information, you can undock the Target NavData by dragging it outside of the NavData bar, then close the NavData bar and position the NavData in a corner. To "lock" the NavData and prevent to move it accidentally when dragging the charts, you can select "Lock Undocked NavData" from the General options.

Using the AIS and ARPA NavData list

An "AIS List" and "ARPA List" NavData can be added to the NavData bar configuration. Simply click on the "..." icon to add the corresponding NavData to the NavData bar.

These NavData can be sorted using various parameters by right clicking on them.

Target Track

Target Track

Target Tracking can be enabled on AIS and ARPA targets by right clicking on a target and selecting "Target Tracking". From that moment, TimeZero will start recording and displaying a line showing you the past position of the target.

Note: DSC Targets have their tracks automatically and always recorded. Select "DSC Tracks"from the "Layer" buttonto display them on screen.

The track line has the same color as the target (this can be changed by right clicking on the target or the track).

When the target disappears from the screen (when the target is lost), the track remains on the screen until manually deleted by the user (by right clicking on the Track line). In case of AIS target, tracking can be automatically enabled as soon as the target re-appears if "Remember AIS tracking status" is set checked from the Targets Options.

Target Graphic CPA

Graphic representation of the target Closest Point of Approach (Graphic CPA) is available on the selected target displayed on the screen. This information is continuously updated and warns you about potential collisions by locating on the chart the location where you will meet a specific target.
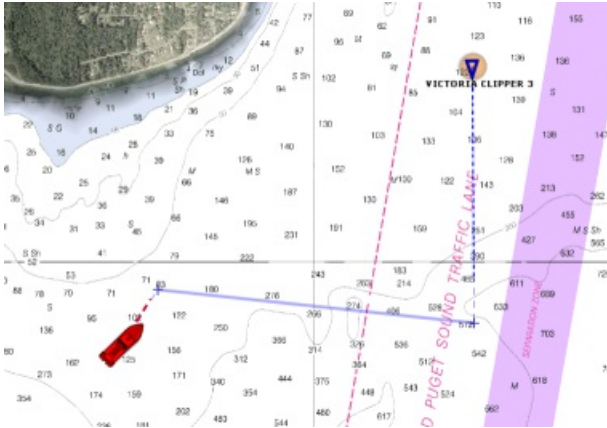
You can enable or disabled the graphic CPA for the selected target from the Targets Options.

Note: The graphic CPA will always be automatically displayed on targets that break alarm condition (dangerous target)

Radar Introduction

The "Furuno Radar Module" or "InSight Radar Module" needs to be unlocked and radar configured to access this feature

Radar is an acronym meaning RAdio Detecting And Ranging. It is a device which measures not only the time it takes for a pulsed signal to be reflected back from an object but also its bearing relative to your position. Radar mainly functions as an anti-collision aid. It also provides information about the whereabouts of neighboring vessels, coastal outlines, etc.

The Radar Scanner (or antenna) rotates 360 degrees on its vertical axis, using a special gear that allows the radar to know at any time in which direction it is pointing at with extreme accuracy. Radio pulses are emitted from the scanner in a certain direction. When the pulse strikes an object such as a ship or island some of the energy returns to the scanner ("radar echo"). The direction in which the scanner is pointing when the reflection is received is the direction of the target causing the reflection. Since radio waves travel at a near-constant speed, the time required for the reflected echo to return to the scanner is a measure of the range (distance) to the target.

TimeZero is compatible with three types of radar:

- **Nobeltec InSight Radar:** TimeZero is compatible with all MDS Ethernet InSight Radars (Koden radars with MDS5 or MDS6 control box). Since V2, TimeZero is also compatible with the Ethernet 2KW Dome Radar (MDS1R and MDS8R Koden radars).

Note: TimeZero is NOT compatible with the older serial based InSight radar or the IR2BB

- **Furuno NavNet DRS & DRS-NXT Series Radar:** TimeZero can be connected to a Furuno "DRS" (Digital Radar Sensor) through an Ethernet connection.

Note: DRS radar can be directly connected to TimeZero (without a NavNet MFD).

- **Selected Furuno FAR series Radar:** TimeZero is compatible with most of the Furuno FAR commercial series radars that have an Ethernet interface: FAR2xx7, FAR15x3 & 15x8, FAR 2xx8 and FAR3xxx.

To interpret the radar picture, an operator should be familiar with the radar video presentation caused by the wanted and unwanted effects. For instance, radar images (radar echo) produced by bridges, sand beaches, waves and even a boat's wake may all be represented differently than expected based on their visual appearance. For correct interpretation of the radar picture, it is highly recommended that you practice using the radar in good weather conditions.

The picture below shows an example of a typical radar picture compared against a sample real-world scenario. There are a number of things to learn from this image regarding how a radar works:
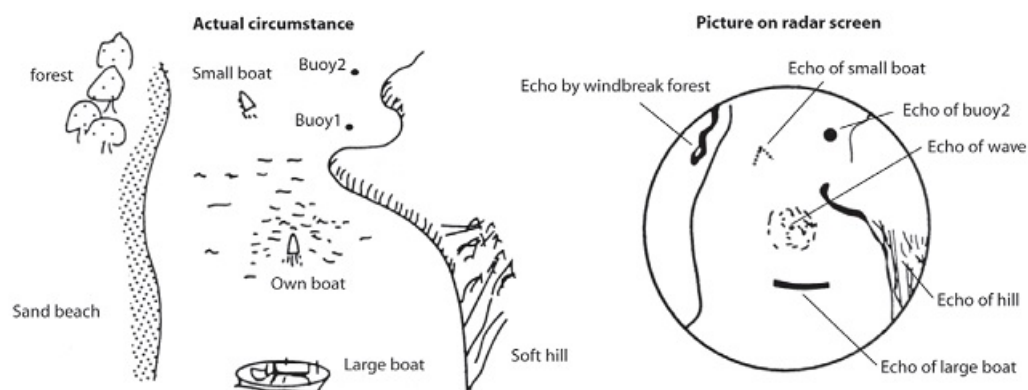
Here is a list of some important ones:

- Buoy #1 is being blocked by the cape or hill and is not visible in the radar display

- Due to its proximity and size, the large boat returns a strong radar return that is similar to its actual profile. On the other hand, the small boat is painted as a small dot, because its reflection area is smaller. Also notice that the smaller boat's wake returns a large reflection.

- The hill on the starboard side of the vessel, because of its dense forest and hilly nature, returns large echoes, while the sandy beach to the port returns a weak radar image. The exception to the port side return is the windbreak forest which returns strong echoes because of its profile differences.

- The waves around your boat are displayed on the radar by little "speckle" of noise (that can be suppressed by increasing the "Sea" control of the Radar)

Radar WorkSpace

The "Furuno Radar Module" or "InSight Radar Module" need to be unlocked and radar configured to access this feature

Radar Overview

The Radar WorkSpace displays a traditional dedicated radar display:
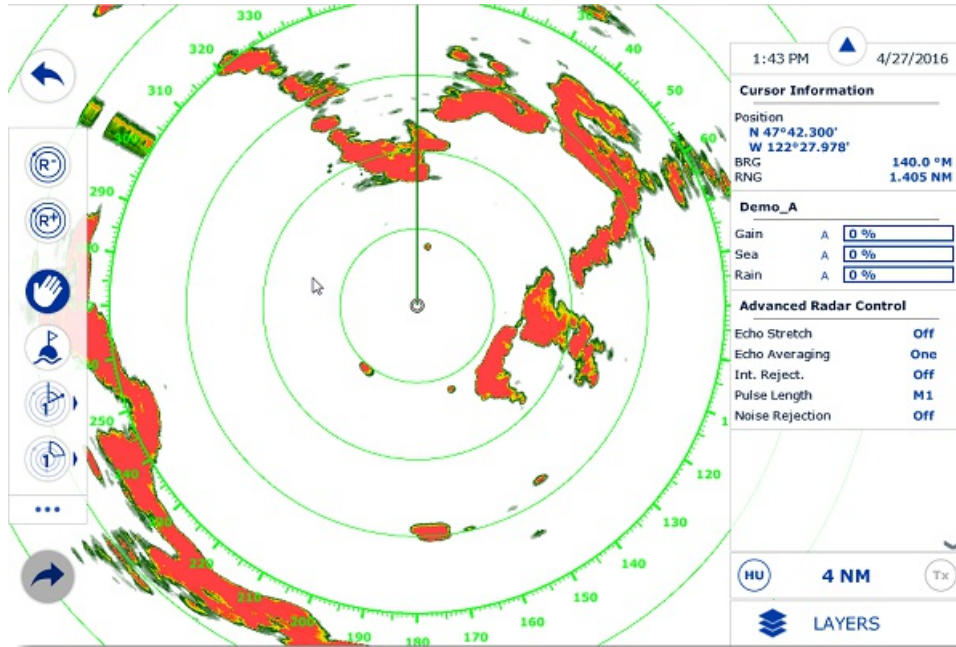
The Radar can be displayed full screen or split screen with another display (such as Plotter).

When using a DRS radar that is capable of dual range , the Radar WorkSpace will always display the first range of the DRS. In order to display the two Radar Ranges of the DRS, a Dual Radar WorkSpace must be selected.

Transmit /Standby

When the Radar is powered on and warmed up, you can view the radar image on screen by putting the Radar in Transmit mode. You can transmit the radar by:

- by clicking anywhere on the Radar Screen and selecting "Transmit"

- by clicking on the "Stand-By" text located at the center of the radar screen

- by clicking on the Radar Range Scale on the lower right of the screen (on the "StdBy" status)

To stop the Radar, you can:

- click anywhere on the Radar Screen and select "Standby"

- click on the "TX" located on the Radar Range Scale on the lower right of the screen.

Note that in Standby mode, the Radar is still ON but does not rotate and does not send magnetic pulses. Usually a Radar is never turned completely off in navigation because it takes a while to warm-up (1 to 2 minutes).

Radar Range

Press the radar "Range +" or "Range -" buttons located in the Toolbar to increase or lower the radar range respectively:

    Click this button to reduce the Range of the radar. A smaller range provides greater detail of the radar echoes close to your position (by using shorter pulse length), and should be used as you approach coastlines, harbors or if you want to monitor other vessels in your close proximity.

    Click this button to increase the Range of the radar. A bigger range provides greater distance of detection, but decreases the resolution (because a longer pulse length is used by the radar).

You can also use the scroll wheel of your mouse on the Radar WorkSpace to change the range (similar to zooming in or out on the chart).

When you change the radar range, the range rings are updated on the display. The range of the Radar is displayed on the lower right of the screen:
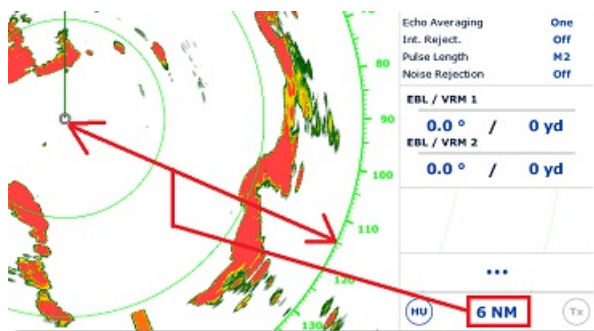
The interval rings can be shown or hidden from the "Layer" button by selecting or deselecting the "Radar Rings" option. You can setup the number of interval rings displayed on the radar from the Radar Options.

Note: When you set the radar to a specific range (3NM for example), the Radar will actually transmit and detects targets farther than this value. This is done to allow the user to offset the radar (shift the display) by panning the radar screen down.

Radar Orientation

- North Up: This mode displays the North at the top of the screen. In order to display the Radar in North Up mode on the Radar WorkSpace, a heading sensor is required.

- Head Up: This mode orients the bow of the vessel to the top of the screen. This is the default and traditional radar orientation display.

Bearing Scale

The Bearing Scale is displayed on the Range Ring and indicates bearing using graduations. The bearing scale can be setup in "True" or "Relative" from the Radar Options.

When set to "Relative", the bearing origin (0) is from the bow of the vessel. This means that in "Head Up" orientation mode, the bearing "0" is always at the top of the screen.

When set to "True" the bearing origin (0) is toward True North. This means that in "North Up" orientation mode, the bearing "0" is always at the top of the screen.

Note: When set to True, the bearing scale does not take into account the Magnetic Variation. It is always referenced to true North.

Range and Bearing to target

The range and bearing to a target can be measured inside TimeZero by using the Cursor NavData displayed by default in the NavData panel.

Variable Range Marker and Electronic Bearing line can also be used. Please refer to the EBL & VRM chapter for more information.

Radar Display

The Radar background and Radar echo color can be adjusted from the Radar Options.

The Radar display can be configured to not only show the radar picture but also other information such as AIS targets, Marks, Boundaries, Routes, etc...

To configure the Radar display, simply use the "Layer" button to enable or disable corresponding features.

Tips: If you want to temporarily and quickly remove all objects from the Radar display to only focus on the radar picture, you can press and hold the CTRL key and the Space Bar.

Radar Overlay

The "Furuno Radar Module" or "InSight Radar Module" needs to be unlocked and the radar configured to access this feature

The Radar Picture can be displayed over the charts if the computer is connected to a Heading sensor. The radar overlay helps you navigate the chart better and the chart brings context to what can often be a confusing display of radar blobs. To enable the radar overlay, select the "Navigation" WorkSpace, click on the "Radar" button located in the Ribbon and then select "Radar Overlay". This will display the radar echo over the charts:
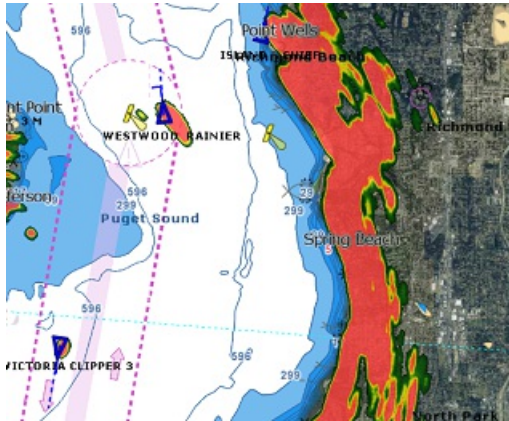
Note that the Radar can be adjusted from the "Navigation" WorkSpace by using the Radar NavData and/or "Layer" button.

Tips: If you want to only display the radar picture temporarily, press and hold the CTRL key and the spacebar. This will get rid of everything except for the radar picture and ARPA targets.

The Radar Overlay transparency can be adjusted from the Radar Options.

If you are using a Furuno DRS radar (capable of "Dual Range"), you can select which range is displayed on the chart. Please, refer to the DRS Dual Range chapter.

Radar Controls

The "Furuno Radar Module" or "InSight Radar Module" needs to be unlocked and the radar configured to access this feature

Most of the Radar Controls can be found under the "Layer" button or from one of the Radar NavData.

Radar Source

When having two radars on the network, the "Radar Host" selection from the Radar Options allows to select which Radar is being selected, displayed and controlled in TimeZero.

IMPORTANT: When changing Radar Source, it takes approximately 10 seconds before the selected radar becomes fully operational.

Transmit /Standby

When the Radar is powered ON and warmed up, you can view the radar image on screen by putting the Radar in Transmit mode. You can transmit the radar by:

- by clicking anywhere on the Radar Screen and selecting "Transmit"

- by clicking on the "Stand-By" text located at the center of the radar screen

- by clicking on the Radar Range Scale on the lower right of the screen (on the "StdBy" status)

To stop the Radar, you can:

- click anywhere on the Radar Screen and select "Standby"

- click on the "TX" located on the Radar Range Scale on the lower right of the screen.

Note that in Standby mode, the Radar is still ON but does not rotate and does not send magnetic pulses. Usually a Radar is never turned completely off in navigation because it takes a while to warm-up (1 to 2 minutes).

Note: If the Transmit button is greyed out, make sure that the radar is powered and that a correct Radar Hostname is selected from the Radar Options.

Gain / Sea (STC) / Rain (FTC)

The Gain, Sea and Rain controls can be adjusted from the Radar Ribbon button or directly from the Radar Control NavData (displayed by default in the Radar NavData Panel):
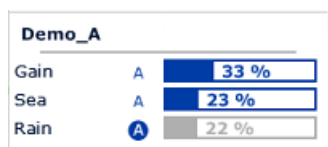
Gain: This control adjusts the receiver sensitivity. Increase the gain to increase sensitivity and display radar echoes on the screen. Reduce the gain if you see too much noise on the screen and if the picture gets overly cluttered with random "speckles". The Gain can also be setup in "Auto" mode on some radar models by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

Sea: Sea control, also called STC (Sensitivity Time Constant), suppresses reflections from waves near your own ship, especially at short range. In rough seas the reflected echoes from wave crests are very strong, producing a mass of echoes which cover the central part of the display. This is called sea clutter. Any echoes within the clutter will be partially or totally obscured. Increase this control to reduce the clutter and distinguish echoes. The proper setting should be such that the clutter is suppressed and echoes become distinguishable. If the control is set too high, both sea clutter and echoes will disappear from the display. When there is no sea clutter visible on the display, decrease the value. The Sea can also be setup in "Auto" mode on some radar model by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

Rain: The Rain control, also called FTC (Fast Time Constant), suppresses the reflected echoes from rain, hail and snow to clear the display. The echoes from legitimate contacts can become lost in the echoes from precipitation, called rain clutter. When rain clutter masks the display, increase this control to break up the clutter and distinguish echoes. Adjust the control so that the clutter just disappears; too much Rain action may shrink or erase the echoes from legitimate targets. If there is no precipitation, leave that setting to 0 (minimum). The Rain can also be setup in "Auto" mode on some radar models by selecting the corresponding option in the Radar Ribbon button or by clicking on the "A" in the Radar Control NavData.

How to adjust manually the Gain, Sea and Rain controls:

The Gain, Sea and Rain can be adjusted from the Radar Control NavData or from the Radar Ribbon button. If your Radar model is capable of "Auto" mode (from the Radar Ribbon), the auto features will work well for most situations. If you want to adjust the Radar manually try the following:

- Transmit the Radar to a medium range (around 3NM)

- Set the Sea and Rain control to the minimum (0)

Note: While initially adjusting the Gain/Sea/Rain, it is recommended to turn OFF all the radar filters (Echo Averaging, Echo Stretch etc...)

- Set the Gain control to maximum (the screen should show mostly Radar noise)

- Now decrease the gain control until the radar picture show a very small amount of noise (only a few noise spots on the screen) from 1.5NM to 3NM (it is alright to have noise near the center of the screen in between 0 and 1.5NM)

- Without disturbing the gain control select the appropriate working range (1.5NM for example)

- Increase the Sea control as desired until the noise that is present near the center on the screen disappears

- Only increase the Rain control if there is precipitation.

The InSight Radar models with MDS Control Box have Gain, Sea and Rain "presets" available in the Radar Options (under "Radar Initial Setup"). For most situations, the various presets should be left to their default settings. However, if you find that the regular Gain, Sea and Rain control are not "strong" enough (don't affect the radar picture enough), you can raise the Preset value. Presets are like a master control that raises or lowers the overall effect of the control it adjusts.

Automatic Clutter Elimination - ACE (FAR3xx0, FAR2xx8 & FAR15x7/x8 only)

This setting is available from the "Advanced Radar Control" NavData.

ACE is an automatic filter that reduces noise caused by sea and rain clutter. When ACE is activated, the Sea and Rain adjustments are disabled (because automatically adjusted by the ACE algorithm). When ACE is enabled, the operator can only adjust the gain.

Pulse Length

Pulse Length is the length of time of each transmission of radar waves by the transceiver. Typically a longer pulse length produces better long range target detection and a shorter pulse length is for better target range discrimination. The pulse lengths are pre-set for each range so you are not typically required to change this setting. However, if you are not satisfied with the current pulse length setting, it is possible to toggle between a shorter or longer pulse length from the "Radar" Ribbon button.

Note: The Pulse Length is not available on MDS1/8-R Radars

Echo Trail

This feature requires the computer to be connected to a Heading sensor.

This feature available from the "Layer" button continuously shows the movements of other ships in afterglow. It is useful for assessing overall target movement. Echo trails show the movements of radar echo overtime relative or true to your vessel. The trails disappear overtime (according to the "Trail Length" parameter). When set to "True" mode, only objects that are moving in reference to the water (such as another ship) will show a trail on the screen. Fixed objects on the water (such as buoys or a rock) will not show a trail even if your own ship is moving. When set to "relative" mode, any objects that move relative to your boat will leave a trail on the screen. So if your own ship is moving toward a stationary target (buoys for example), the target will leave a trail (smearing):

(a) True target trails (No smearing of stationary targets)

(b) Relative target trails Targets moving relative to own ship
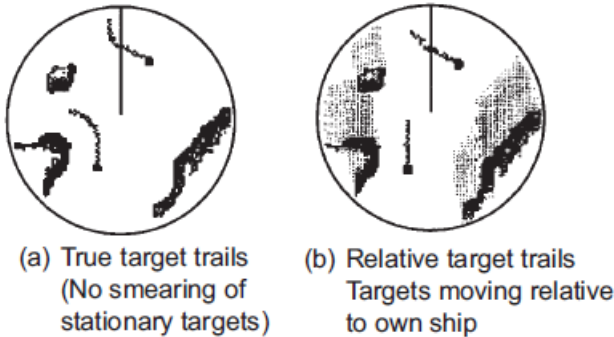
The following Trail options are available from the Radar Options:

- Trail Shade: "Single" displays the trail with one color intensity. "Multi" decreases (fades) the trail color intensity over time

- Trail Level: Adjusts the way the trail picture is merged with real time radar echo. The higher the number, the more emphasis there will be on the trail.

- Trail Length: Adjust the trail length.

To clear (reset) the trail, use the "Clear Trail" option of the "Layer" button.

It is possible to change the color of the trail from the Radar Options.

Note: If you want more precise information for a specific radar echo, you can click on it and acquire it as an ARPA target. The radar will precisely look at the echo and extract Course and Speed.

Interference Rejection

This setting is available from the "Advanced Radar Control" NavData.

If intermittent "Streaks" or "spiral lines" show up on your Radar display, it is most likely Radar interference received from another Radar. The Interference Rejection reduces or eliminates interference received from another ship's Radar. Turn it off when no Radar interference exists.

Echo Stretch

This setting is available from the "Advanced Radar Control" NavData.

This function 'stretches' small echoes to make them easier to see. It stretches not only small echoes but also returns from sea, rain clutter and Radar interference. For this reason, make sure clutter and interference are sufficiently suppressed before using echo stretch.

Echo Averaging

This setting is available from the "Advanced Radar Control" NavData. Echo averaging requires the computer to be connected to a Heading sensor.

The echo averaging uses multiple consecutive radar pictures to create an "average picture". This filter is very effective at removing noise (that has a tendency to have random position in between two pictures). Note that a side effect of the echo averaging is that it makes target that are moving quickly weaker on screen.

Noise Rejection

This setting is available from the "Advanced Radar Control" NavData.

This function removes the "white noise" (random "speckles") that can sometimes spread over the entire radar picture.

Target Analyzer (DRS-NXT only)

This setting is available from the "Advanced Radar Control" NavData.

DRS-NXT radar uses the new Furuno exclusive Target Analyzer function, where targets that are approaching your vessel automatically change color. Green targets are targets that stay stationary, or are moving away from you, while red targets are moving towards your vessel. Target Analyzer works independent of vessel speed, both your own vessels and target vessels, with minor limitations. Echoes dynamically change colors as targets approach, or get farther away from your vessel. Target Analyzer can increase safety, as well as improve situational awareness.

Bird Mode (DRS-NXT & DRSAX only)

This setting is available from the "Advanced Radar Control" NavData (hidden by default).

The DRS-NXT and DRSAX (DRS "X-Class") feature a new bird mode that helps you identify birds gathering around schools of fish at the sea surface. Bird mode adjusts the gain and sea settings automatically for optimal visibility.

RezBoost (DRS-NXT & DRSAX only)

This setting is available from the "Advanced Radar Control" NavData (hidden by default).

RezBoost allows to improve the azimuth resolution of the radar echoes. When set to "High" the horizontal beamwidth resolution is improved by a factor of 2. Note that using RezBoost can make target "smaller" on screen.

Guard Zones

The "Furuno Radar Module" or "InSight Radar Module" needs to be unlocked and radar configured to access this feature

Guard Zones can be setup in TimeZero from the Radar WorkSpace using the Guard Zone tool located in the Toolbar. Guard Zones are used to detect and warn you about radar echo that enters or exits a specific area. When a target (AIS or ARPA) or Radar Echo (picture) triggers the Guard Zone, a "Target Alarm" is raised and displayed in the Status Bar. When the ARPA targets are computed by TimeZero ("Enable Local TimeZero ARPA Processing" selected from the Radar Options), Guard Zone can also be used as Automatic ARPA Acquisition Area.

If you right click on the tool, you can select which Guard Zone to draw (either Guard Zone 1 or Guard Zone 2).

With the tool selected, click and drag on the screen to draw the Guard Zone. Note that the Guard Zone are always "fan" shaped and relative to the bow of your vessel (they move with vessel orientation). That way, a Guard Zone displayed at the top of the screen in Head Up mode will always stay in front of your vessel.

Once the Guard Zone has been drawn, you can right click on it to adjust its parameters:

• Hide: If you hide a Guard Zone, it is not active anymore and disappears from the screen. The only way to create a new Guard Zone with the tool

• Sleep: When you sleep a guard zone, it remains displayed on the screen but the alarm is inactive. Note that if "ARPA Auto Acquisition" is selected, the ARPA acquisition will still be operating (even when the Guard Zone is set to sleep)

• Work: After putting a guard zone to sleep, you can re-activate it by selecting "Work". This will activate the Alarm again.

• Guard Zone Alarm Level: this adjusts the sensitivity of the Alarm. If you want the alarm to only be triggered with strong echo, set it to "Low"

• Guard Zone Alarm In/Out: adjust if the guard zone is triggered when target enter or exit the zone.

Note: if a Guard Zone is working and displayed, you will get a notification if the Radar Range becomes smaller than the Guard Zone range. This is because the Radar will not be able to "see far enough" to monitor the Guard Zone area. To correct this problem, increase the Radar Range until the Guard Zone is covered by the radar range or sleep the Guard Zone to stop using it.

DRS Dual Range

The "Furuno Radar Module" needs to be unlocked and a Furuno **DRS** radar needs to be configured to access this feature.

Dual Radar WorkSpace

All Furuno DRSxD, DRSxA, DRSxAXClass antennas, have "True" Dual Range radar capability which provides "simultaneous" transmission of both short and long pulse. This allows complete independent control of range, gain, sea clutter and rain clutter for two separate ranges. The DRS-xNXT has also Dual Range capability, but the control of gain, sea clutter and rain clutter will be interlocked.

Note: The DRS4DL and FAR Series radars do **NOT** have Dual Range capability

When is connected to a Furuno DRS Radar capable of Dual Range, it is possible to configure a WorkSpace that displays two Radar pictures:
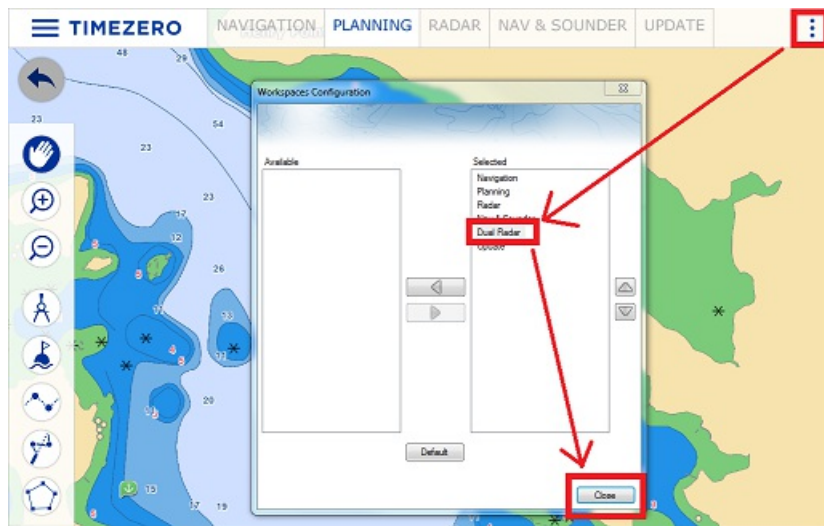
The Dual Radar Range WorkSpace allows you to visualize and control the two ranges of the DRS. The range displayed on the left side is referred to as "Range A". The range displayed on the right side is referred to as "Range B". To control a specific range, click on the corresponding side of the window to select "Range A" (left side) or "Range B" (right side). A yellow border will highlight the range that is currently selected and controlled from the "Layer" button and from the Radar NavData:
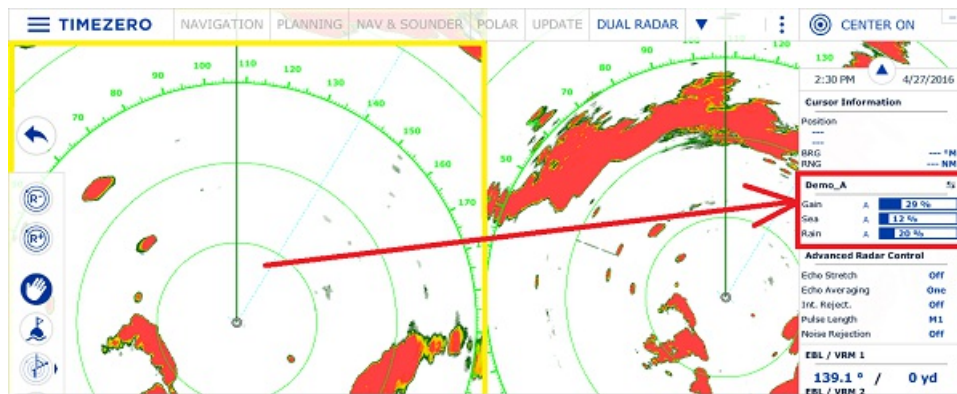
Range A of the DRS can be transmitted with or without Range B. When only Range A of the DRS is transmitting, this allows the antenna to turn at high speed (up to 48RPM at small range). If both Range A and Range B are transmitting (when the DRS operates in Dual Range), the DRS can only turn at 24RPM.

Note: For technical reasons, when Range B is set to transmit, it will also automatically transmit Range A. If you only want one range to be transmitting (to operate at high speed) make sure to transmit Range A. Note also that when you click on Standby from either range, it will automatically standby all range (to stop the antenna).

All single Radar WorkSpace are always using "Range A". When transmitting from a single Radar WorkSpace, you only transmit "Range A". Only the "Dual Radar" WorkSpace allows you to access directly "Range B".

Dual Radar Range on Chart Overlay

When using the Radar Overlay on the chart, you can either use "Range A" or "Range B" as a source of the Radar Overlay.

Use "Range A" if you want the DRS to run at high speed and/or if you want the Radar WorkSpace to display and share the same settings as the Radar Overlay. Use "Range B" if you want independent picture and control in between the single Radar WorkSpace (that always uses Range A) and the Radar Overlay. In this mode, the "Range B" can be adjusted from the Radar Overlay using the Radar Control in the NavData panel or from the "Dual Radar" WorkSpace (using the radar picture located on the right side).

Sounder Introduction

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.
Note: *No Module is necessary to display the digital depth from a NMEA0183 or NMEA2000 sounder. Please refer to the* [Sensor NavData](#) *chapter for more information.*

Echo sounders or "fish finder" determine the distance between its transducer and underwater objects such as fish or seabed and show the results on the screen. An ultrasonic wave transmitted through water travels at a nearly constant speed of 4800 feet (1500 meters) per second. When a sound wave strikes an underwater object such as fish or sea bottom, part of the sound is reflected back toward the source. The depth to the object can be determined by calculating the time difference between the transmission of a sound wave and the reception of the reflected sound. The sounder will then display this return ("ping") as one of up to 64 different colors depending on the strength of the returned signal. Sounder pings are represented over time, in a running display moving from right to left as the bottom appears beneath the transducer.
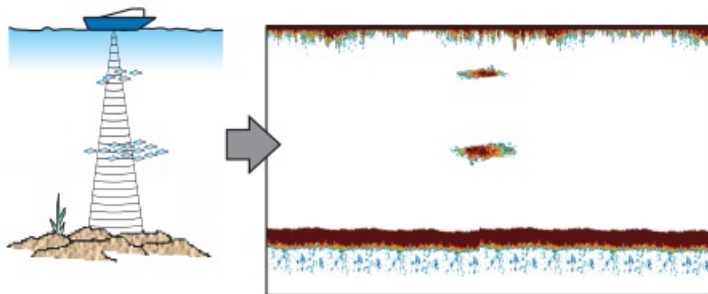
Most of the sounders on the market can operate at multiple frequencies (usually "Low" and "High"). The frequency of the sound waves created by the transducer impacts the type of reflected returns. Higher frequency sound waves, such as 200 kHz, do not penetrate the water deeply, but they return greater detail from the items they contact. For this reason, the Sounder in 200 kHz frequency is great for fish detection. However, transducers are rarely able to penetrate deeper than 600 feet in 200 kHz mode. Lower frequency sound waves behave in the opposite way. They offer much deeper depth penetration, but provide less detail from objects they contact.

TimeZero is compatible with the following Furuno Ethernet sounder:

- **DFF1**: Black Box 600W/1kW Dual-frequency 50/200 kHz

- **DFF3**: Black Box 1kW/3kW Dual frequencies between 28 and 200 kHz

- **BBDS1**: Black Box 600W/1kW Dual-frequency 50/200 kHz with bottom discrimination (*)

- **DFF1-UHD**: Black Box 1kW Broadband "CHIRP" Dual frequencies (50 kHz +/- 20 kHz, 200 kHz +/- 25 kHz) with bottom discrimination (*)

- **TZtouch2 & TZtouch3 Internal Sounder:** 600W/1kW Dual-frequency 50/200 kHz sounder integrated to the NavNet TZtouch2 & TZtouch3 MFD with bottom discrimination (*)

- **FCV-1150**: Standalone 1kW/3kW Dual-frequency 28/200 kHz

(*) The Bottom Discrimination is only available with selected transducer models. Make sure to contact your Furuno dealer for transducer compatibility.

Sounder WorkSpace

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

Sounder Overview

The Sounder WorkSpace displays a traditional dedicated sounder display:
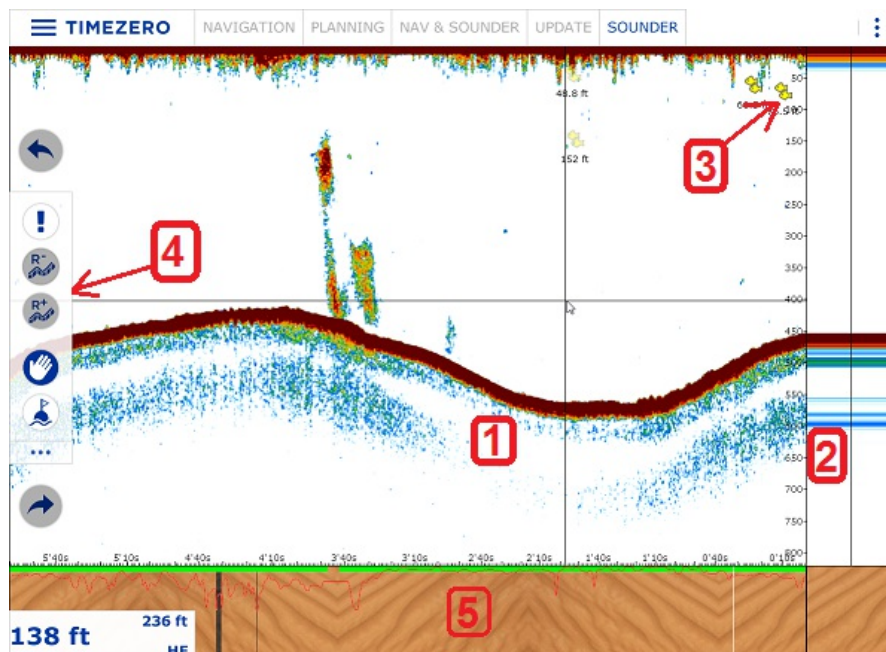
1: <u>Sounder Echogram:</u> The sounder picture moves from right to left. Echo on the far right represent "real time" return (what is picked up by the transducer under your boat).

2: <u>A-Scope Display:</u> The A-Scope displays the enlarged, newest sounder echo returns. These magnified returns are also drawn in proportional scale, where strongest returns are also the widest.

3: <u>ACCU-Fish Icon:</u> The ACCU-Fish feature of the Sounder can be utilized to display individual fish icon when fish echoes are detected. It helps beginners to identify the fish targets on the display for a more fun fishing experience. Note that this feature is not available with the FCV1150.

4: <u>Toolbar:</u> Contain the Range In and Range Out button.

5: <u>Bottom Discrimination Display:</u> Display the type of bottom when the Bottom Discrimination feature of the BBDS1 or DFF1-UHD is enabled.

Note that if you click anywhere on the echogram, a tooltip with most common action will appear:
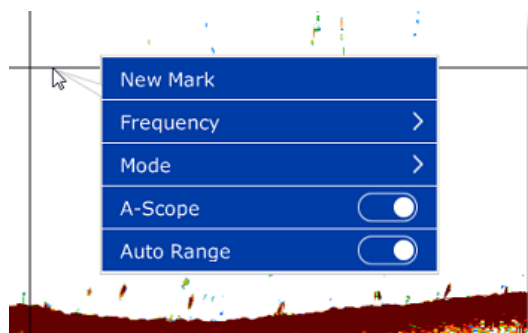
1: <u>Depth Indication:</u> Depth sent by the sounder

2: <u>Range:</u> Sounder Range Scale (maximum depth detection of the sounder). Can be adjusted by using the "Range +/-" buttons on the Toolbar.

3: <u>Frequency:</u> Operating frequency of the sounder. "HF" for High Frequency, "LF" for Low Frequency, "HF/LF" for Dual Frequency.

4: <u>Distance Indicator:</u> Distance of the echo under the cursor from own ship position.

5: <u>Horizontal Scale:</u> Time Scale of past echoes.

6: <u>Vertical Scale:</u> Depth Scale

Sounder History

TimeZero is able to record sounder history. To display sounder history, click and hold your mouse then drag the sounder picture to the right. You can also use the left/right key of your keyboard. The range of the sounder history will automatically scale to what is displayed on your screen.

Note: The sounder history length recorded by TimeZero varies according to depth. In shallow water, TimeZero can record approximately 1 hour. In deeper water, the sounder history can be up to 5 hours.

Note that, when displaying the sounder history, the sounder picture is not scrolling anymore. To go back to the real time sounder display (and have the picture scrolling again), drag the sounder picture all the way to the left or click on the "Center On" button. You can also click anywhere on the sounder history echo and select "Real Time".

Note: After 5 minutes, the Sounder will go back automatically to the real time view.

The sounder history can also be displayed by rolling the cursor over the **active** track:
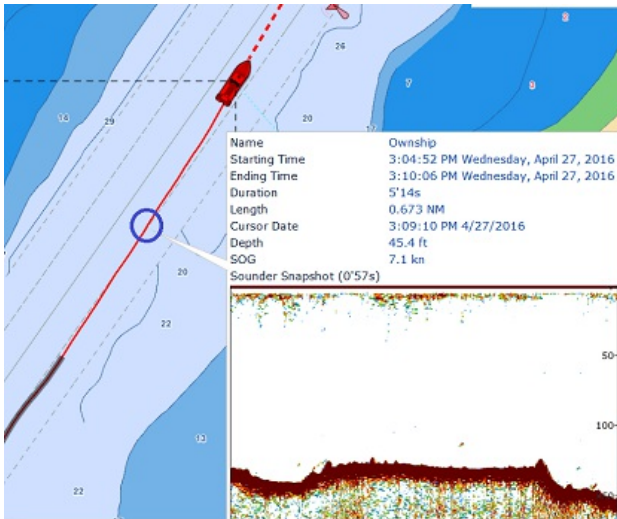
Note that the sounder history will only appear in the track tooltip for the track being actively recorded (the active track). If you stop tracking, it will lose the sounder reference.

Sounder Geolocation

TimeZero is able to associate each sounder ping with a specific Lat/Lon. This feature allows you to pinpoint exactly where a specific sounder ping was acquired by rolling the mouse over the Sounder Display. A "ghost" (or duplicate) image of the cursor will appear on the chart plotter if your screen is split in between the Sounder and Navigation, indicating where the sounder ping was taken. You can also double click anywhere on the sounder picture to drop a mark:
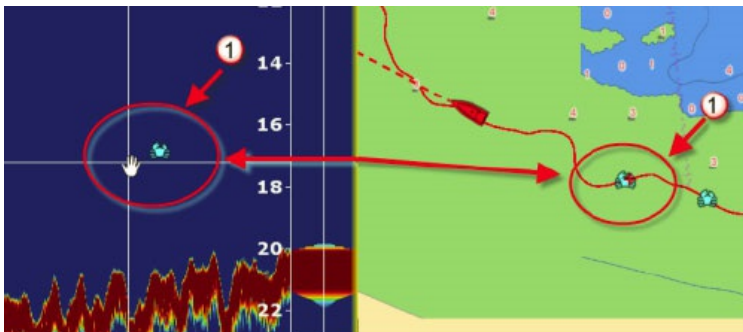
The mark will appear on the chart at that location and will contain the depth at which it was created.

A-Scope

The A-scope appears at the right of the screen when selected from the "Layer" button. The A-Scope displays the enlarged, newest sounder echo returns. These magnified returns are also drawn in proportional scale, where strongest returns are also the widest:
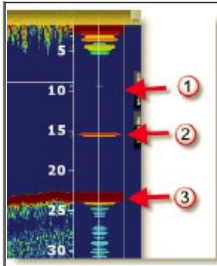
1: Weak reflection (Fish or noise)

2: Strong reflection (Fish)

3: Strong reflection (bottom)

Note: The "A-Scope Peak Hold" setting available in the Sounder Options allows to keep the peak of the A-Scope displayed for longer period of time.

Sounder Display Mode

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

The various sounder display modes can be selected from the "Layer" button:

Single Frequency

The single frequency mode shows either the low-frequency or high-frequency picture on all the screen.

A low frequency gives a wide detection area and can reach deeper. Use the low frequency for general search and to find bottom conditions.
A high frequency gives better resolution but cannot reach as far as low frequency. Use the high frequency to inspect a school of fish:
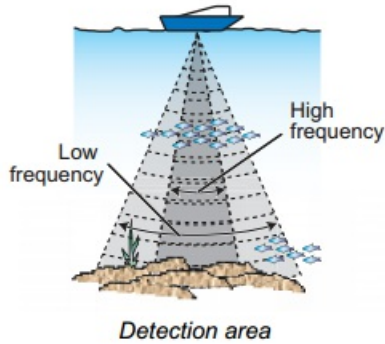
Tips: You can switch from Low to High frequency by clicking on the Sounder frequency indicator on the lower left of the screen:

Dual Frequency

The dual frequency mode splits the sounder screen in two and provides both low and high frequency pictures at the same time. Use the dual frequency display to compare the same picture with two different sounding frequencies.

You can reverse the High and Low frequency side by inverting the frequency selection or by clicking on the Sounder Frequency indicator on the lower left.

Bottom Zoom

With the Bottom Zoom selected, the Sounder Display is divided in half. The left side contains a Bottom Zoom display, while the right side continues to display the regular sounder data. Bottom Zoom causes the bottom, when it is found, to be drawn larger (1). Zoom reference lines are displayed on the right screen (2), allowing you to view the area of the echo that gets expanded:
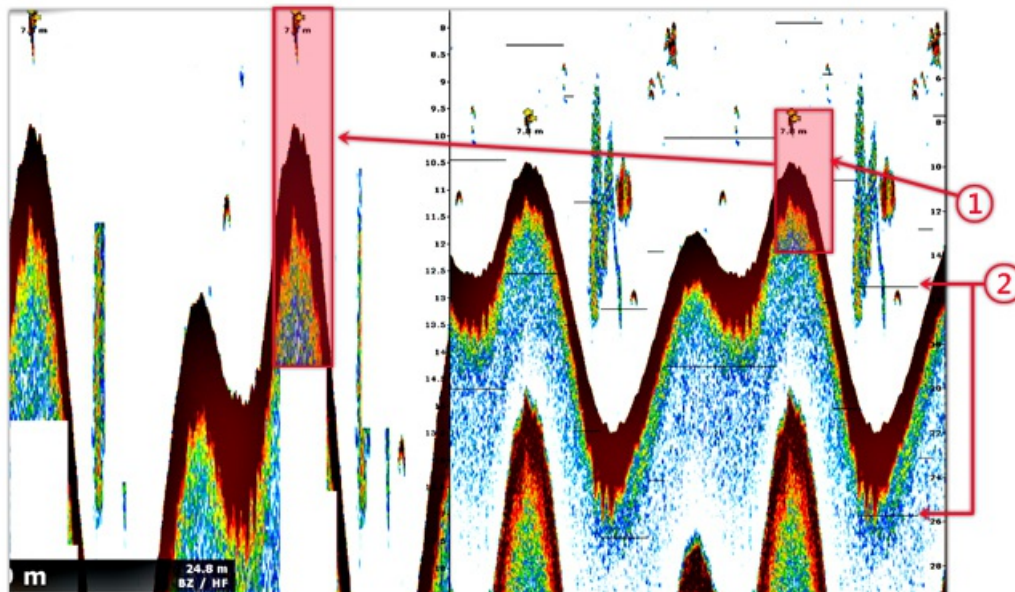
The zoom "window" size can be adjusted by using the "Zoom Range Span" setting available in the Sounder Options. The center of the "window" can be shifted around the bottom (depth) by using the "Bottom Range Shift Area" setting available in the Sounder Options.

The zoom can operate on the High or Low frequency picture.

This display mode is useful to focus on bottom fishing.

Bottom Lock

The Bottom Lock mode presents an interesting view of the sounder returns. The sea floor is flattened in this view, allowing easy comprehension of how far a fish or other return is above the sea floor:
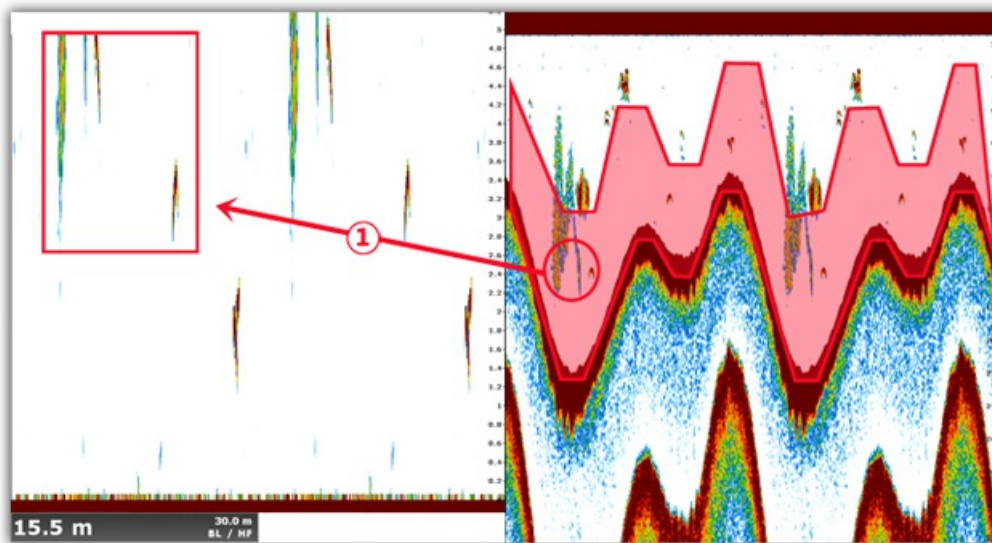
The zoom "window" size can be adjusted by using the "Bottom Lock Range Span" setting available in the Sounder Options.

Bottom Classification

This feature is only available with the BBDS1, DFF1-UHD and TZT2/3 Internal sounder when paired with selected transducers. Contact your Furuno dealer for more information about transducer compatibility.

Some Furuno Ethernet sounders have a bottom classification feature that determines the bottom structure and separates them into the following categories: mud, sand, gravel, and rock. This is achieved automatically by analyzing echo characteristics from the bottom components such as particle size and hardness.

To enable the bottom discrimination, select "Bottom Classification" under the "Layer" button. The sounder will start analyzing the bottom and return its structures with probability of detection. TimeZero can display this information in various ways.

Note: Enabling the Bottom Classification locks the sounder in Auto Range and Automatic Mode (you can no longer adjust the range or the gain manually). The sounder also goes into Dual Frequency (Low and High frequencies) to get more information about the bottom.

"Aquarium" Mode:

The "Aquarium" mode is automatically displayed at the bottom of the Sounder Echogram when the "Bottom Classification" is enabled from the "Sounder Display" button. A red line is also displayed indicating the probability of corresponding data (the higher the more confident the result is):
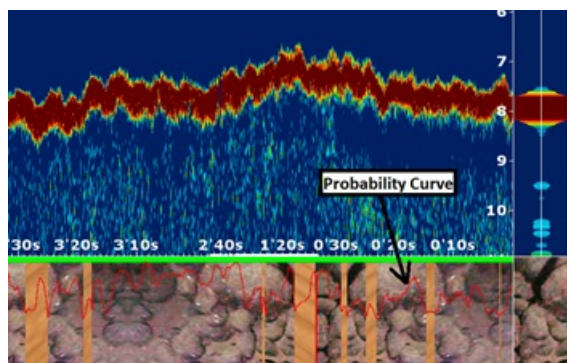
The various textures of the Aquarium mode are:

ACCU-Fish

The ACCU-Fish feature estimates the length of each fish and shows a fish symbol and depth value or fish length. This feature requires appropriate transducer and either the BBDS1 or DFF series sounder. ACCU-Fish helps beginners to identify the fish targets on the display for a more fun fishing experience.

When the ACCU-Fish function of the Sounder is enabled from the "Layer" button, fish icons will be displayed on the Sounder Echogram and on the chart. You can change the fish icons (dot, solid or striped) and label (depth or size of the fish) from the Sounder Options.

Fish size	Solid	Striped
Large fish symbol (more than 51 cm (20.08 inch))		
Small fish symbol (10 to 50 cm (3.9. to 19.69 inch))		

You can change the fish icons color from the "Sounder Display" button in the Ribbon.

Note that the ACCU-Fish icons are only temporary and disappear on the chart and sounder after two minutes. If you want to create a permanent mark, simply double click on the sounder echogram over the fish icon, or right click on the chart on a fish icon and select "Create Mark".

Note: Enabling the ACCU-Fish function force the sounder into Dual Frequency (Low and High frequencies).

Auto Range

When "Auto Range" is selected, the sounder range will automatically adjust according to the depth. Note that, if the sounder lose bottom, the range will automatically cycle through all the values until a good bottom (depth) is found again. In certain cases, (when the bottom disappear due to the boat moving at high speed), it is recommended to de-activate "Auto Range" to prevent the sounder from cycling through the various ranges.

Sounder Controls

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

Automatic Mode:

There are two types of automatic fish finder modes: "Auto Fishing" and "Auto Cruising". These settings can be adjusted from the "Layer" button. "Auto Fishing" optimizes the sounder to display schools of fish, and "Auto Cruising" optimize the sounder to detect the bottom. "Auto Cruising" uses a higher clutter removal setting than "Auto Fishing". Do not use "Auto Cruising" when your purpose is to find fish, because the clutter removal circuit can erase weak echoes. The automatic fish finder function automatically adjusts the gain, clutter, TVG and echo offset:

- The sensitivity of the receiver (Gain) is adjusted to show the bottom echo in reddish-brown

- The Clutter Adjustment is set to automatically reduce low-level noise like plankton.

- The TVG function is automatically adjusted.

- The echo offset balances the gain on high and low frequencies.

There is an independent "Auto-Range" control (available from \the "Layer" button) that adjusts the range of the sounder automatically to track the bottom. Note that, if the sounder loses bottom, the range will automatically cycle through all the values until a good bottom (depth) is found again. In certain cases, (when the bottom disappear due to the boat moving at high speed), it is recommended to de-activate "Auto Range" to prevent the sounder from cycling through the various ranges.

Manual Mode:

When you select "Manual", you can manually adjust the Low and High frequency Gain of the sounder.

Gain: The gain controls how echoes of different strengths are displayed on the screen. Set the gain to show a slight amount of noise on the screen. Increase the gain for greater depths and lower the gain for shallow waters:

Gain too high   Gain proper   Gain too low
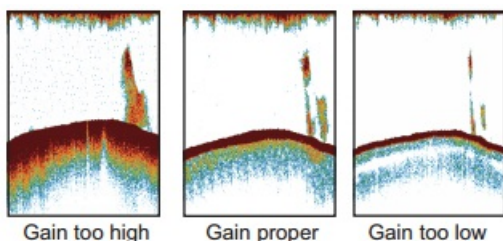
Range: When "Auto Range" is turned OFF from the "Layer" button, you can manually adjust the range by clicking on the "Range +" or "Range -" buttons located on the Toolbar. You can enable or disable specific ranges value from the Sounder by clicking on "Sounder Ranges Selection". This allows you to only cycle through and limit the depth ranges that are useful for your application. You can also use the wheel of your mouse to change the range to any value (not restricted by the Sounder Range Selection).

Range Shift: You can "offset" or shift the range from the Sounder Options by entering a value in the "Range Shift" setting or by dragging the sounder picture downward.

Clutter: If low intensity "spots" of noise appear over most of the screen like in the illustration shown below (caused by sediment in the water or noise) you can increase the "Clutter" slider available in the Sounder Options.
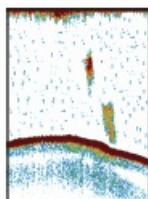
Picture Advanced: The "picture advance" setting available in the Sounder Options controls how quickly the vertical scan lines (pings) of the sounder move across the screen. A fast advance speed expands the size of a school of fish horizontally on the screen. A slow advance speed shortens the school of fish. Use a fast advance speed to see the hard bottom. Use a slow advance speed to see the smooth bottom.

Fast   Slow
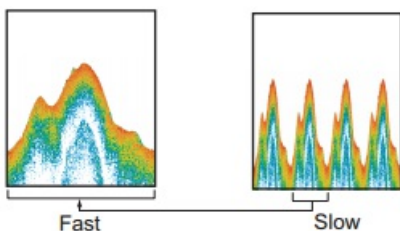
For most application, it is recommended to leave the picture advance to "1".

Interference Rejection: This setting available from the Sounder Options. Only use the Interference Rejection when noise appears on the screen due to other sounder around you or if you have interference from electrical equipment:
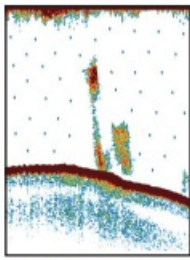
Interference from other sounder
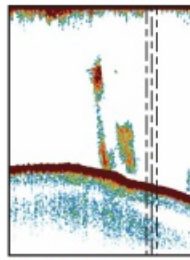
Interference from electrical equipment

TVG: The TVG settings (HF and LF) available in the Sounder Options can be used to balance the echo strength along the water column. A school of fish at a depth deeper than a school of equal strength in shallow water appears in weaker colors. This condition is caused by the attenuation of the ultrasonic wave. To display the schools of fish in the same colors, use the TVG. The TVG automatically increases the gain with depth so that echoes of the same strength and different depths are shown in the same colors. In the illustration shown below, for example, the TVG is set for 300 ft and the TVG level is adjusted. Unnecessary echoes at a distance less than 300 ft are deleted and echoes at depths greater than 300 ft are not adjusted

Unwanted echoes

0 ft

-300 ft
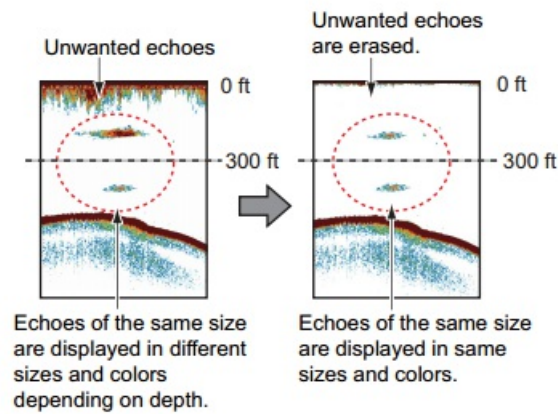
Echoes of the same size are displayed in different sizes and colors depending on depth.

Unwanted echoes are erased.

0 ft

-300 ft

Echoes of the same size are displayed in same sizes and colors.

TimeZero Cloud

User Objects Cloud Synchronization

When you are logged to your My TIMEZERO account, your user objects (routes, marks, catches, boundaries, lines, and photos) can be automatically saved and synchronized to the TZ Cloud. If you own any other TimeZero products (such as the TZ iBoat iPad App, a Furuno TZT2/TZT3 MFD, or another PC loaded with TimeZero), they can all be synchronized (even remotely) as long as they are connected to the Internet and logged to the same My TIMEZERO account.

Note: Please refer to the Registering TimeZero chapter for more information about the My TIMEZERO account.

Note that your data is kept secured and it is NOT shared with any other users, but if you would like to disable the automatic backup/synchronization, you can do so from the My TIMEZERO Options:
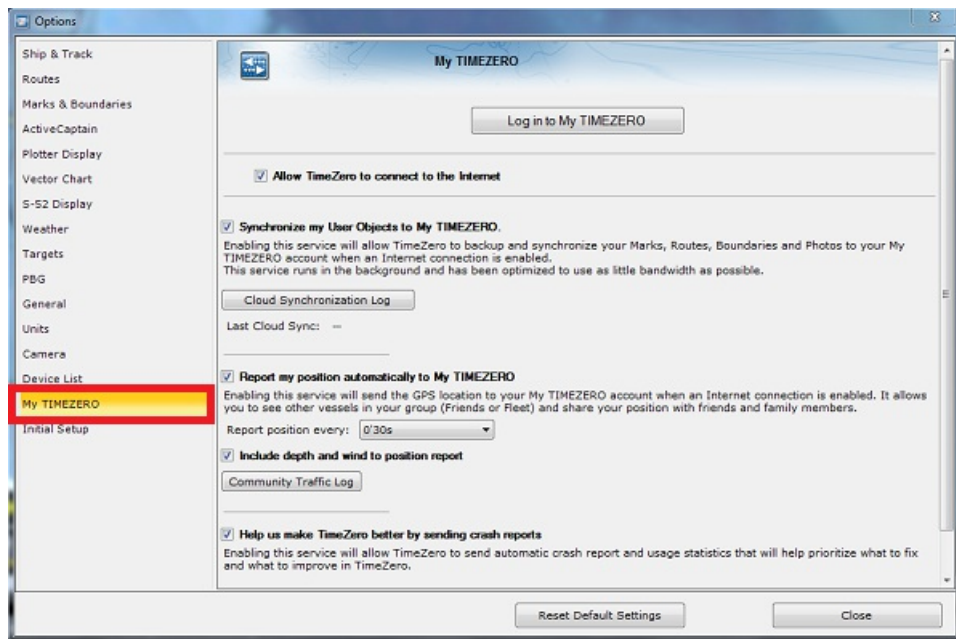
My Position

If you have an Internet connection on-board, you can enable the "Report my position automatically to My TIMEZERO" setting from the My TIMEZERO Options. Once this settings is enabled and once you have a connection to the Internet, your position will automatically be sent securely and privately to the TZ Cloud allowing a family member (that has your My TimeZero credential) to see your live position on any Web Browser:
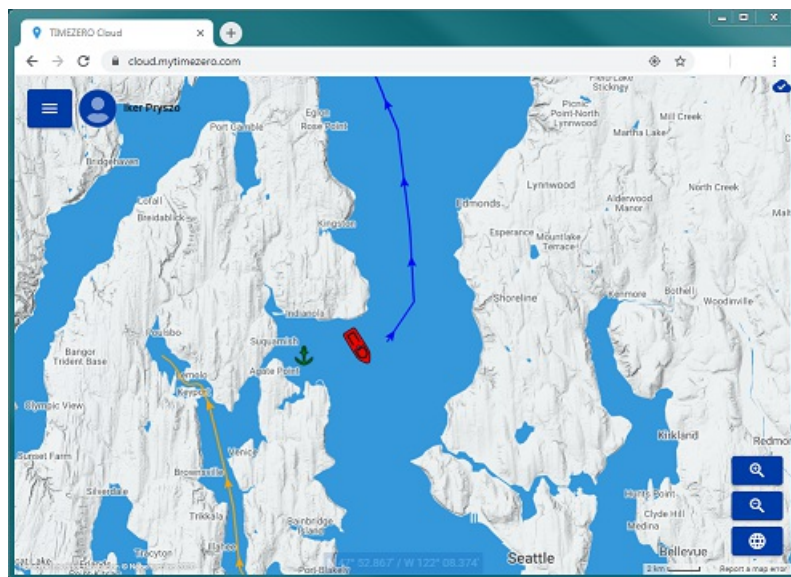
Fleet Tracking Service

The Fleet Tracking service is geared toward governmental agencies (Coast Guard, Search and Rescue…) and Fishing Fleets customers that want to monitor a list of vessels and be able to exchange objects (Route, Search and Rescue Pattern, Areas, or Picture) seamlessly and automatically.

Please refer to the Fleet Tracking chapter to learn all the features of this service.

ActiveCaptain

ActiveCaptain is what is called a "crowd sourced" Point of Interest (POI) data service whereby hundreds of thousands of users participate in building and consuming the data. The ActiveCaptain database is stored, maintained and synchronized inside TimeZero directly. An Internet connection is not necessary to access any of the marina, anchorage, local knowledge, or hazard markers data. However, an Internet connection is required to update the data. In addition, a Garmin account with an ActiveCaptain profile is necessary if you want to post a review or a comment.

Register to be an "ActiveCaptain":

To register and for more information about the ActiveCaptain POI database and its features, make sure to visit http://www.activecaptain.com. You will have to create a Garmin account and then create an ActiveCaptain profile. Once your account is created, enter your Garmin login/password information under the ActiveCaptain Options by clicking on "Log in to my ActiveCaptain Account" (Internet connection required):
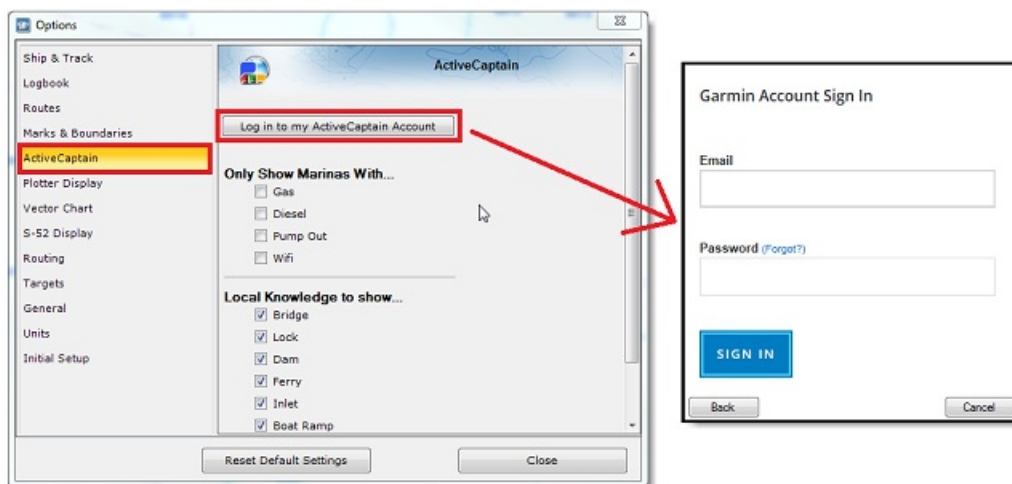
Note: Registration is mandatory to be able to post reviews or comments. However, registration is not mandatory to view or update ActiveCaptain data.

Displaying ActiveCaptain Markers on the chart

To display the ActiveCaptain markers on the chart, click on the "LAYERS" button and select the corresponding ActiveCaptain data layer ("AC Marina", "AC Anchorages", "AC Local Knowledge", "AC Hazards").

Tips: It is possible to setup advanced filters for some markers (Marinas and Local Knowledge) from the ActiveCaptain Options.

To display basic marker information, click on any marker. To access the full marker information, double click on any marker. This will open the Marker Property window that contains multiple tabs (sorted by category).

Updating ActiveCaptain data

To update the ActiveCaptain database, click on the "LAYERS" button and select "Update ActiveCaptain". This will open the ActiveCaptain Update Wizard.

Post a Review or Comment

When the PC is connected to the Internet , you can post a review directly from TimeZero. Just open the marker properties (double click on it), select the "Review" tab and click on "Rate it...".

You can also Vote on existing reviews or comments by clicking on the Thumb Up icon.

Marine Traffic

IMPORTANT: THE MARINE TRAFFIC FEATURE SHOULD NOT BE USED FOR NAVIGATION. THERE CAN BE A SIGNIFICANT DELAY (5 MINUTES TO ONE HOUR) IN BETWEEN THE ONLINE REPORTS AND REAL TARGETS POSITION. THE MARINE TRAFFIC SERVICE IS SUBJECT TO SERVICE INTERRUPTIONS AND IS PROVIDED 'AS IS'.

If the PC is connected to the Internet, TimeZero can display AIS target from the Marine Traffic Web Site. This service provides free near real-time information, about ship movements and ports, mainly across the coast-lines of Europe, Asia and North America. In order to display the target from the Marine Traffic service, you have to register and create an account on the Marine Traffic Web Site and get an Activation Key for TimeZero: http://www.marinetraffic.com/en/p/partners/timezero

To enter the activation key, open the Targets Options and click on "Marine Traffic API Key:
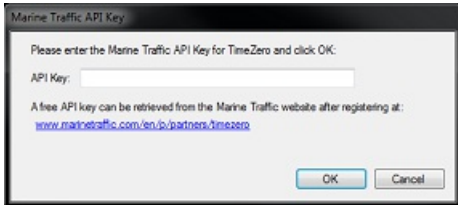
Once you have entered the activation key in TimeZero, select "Marine Traffic" from the "Layer" button.

Note: After enabling Marine Traffic, it might take a couple of minutes for the information to appear on the screen

AIS received through the Internet from Marine Traffic appears in orange ("real" AIS targets from an AIS receiver connected to TimeZero appear in blue for Class A and green for Class B):

Note that the Marine Traffic targets only appear when the chart is zoomed in at a range of 200NM and below (to avoid loading too much data from the server). Targets are refreshed automatically every one minute or as soon as the chart is scrolled to a new location. It is possible to adjust the maximum "age" of a target that will be displayed on the chart from the Targets Options using the "Do not display Marine Traffic AIS older than..." setting. This is useful if you don't want to display targets that have not been updated on the Marine Traffic website for a long time (out of a receiver range).

To access the target information, rollover the AIS icon with your cursor or click on it. The free Activation Key will allow you to display AIS Position, MMSI, COG, SOG and the time of the last received position (last update). TimeZero users are able to subscribe to an "advanced" service (for a monthly fee) directly on the Marine Traffic website to receive even more detailed information about the target (Name, Size, Destination, ETA, Picture,...):
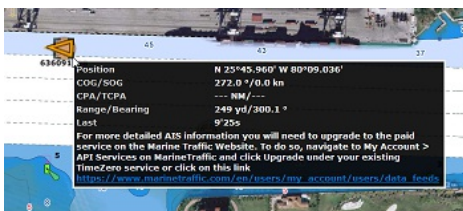
Basic Service (free)
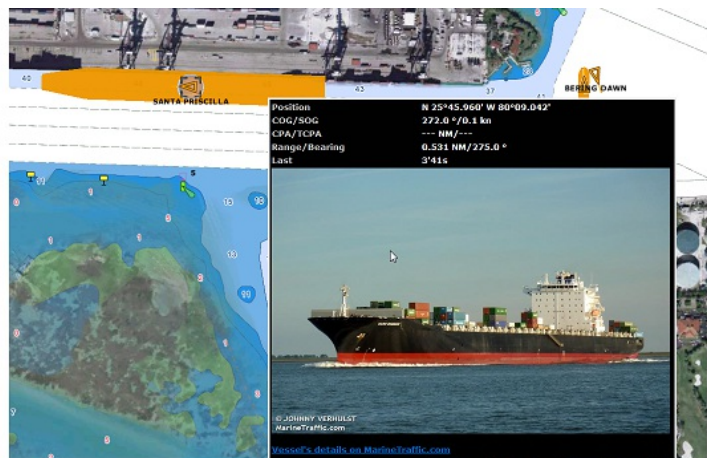
Advanced Service (monthly fee)

NMEA0183 Serial Connection

Instruments (GPS, Heading sensor, Sounder, AIS…) are usually connected to the computer using a serial connection. The data being transferred on that serial connection needs to be in NMEA0183 format for the instrument(s) and computer to understand each other. Be aware that physical serial connections may be achieved using two different protocols: RS-232 or RS-422.

RS-232 (regular PC "COM port")

The default standard for serial ports on computers is RS-232. It uses 3-wires consisting of a transmit signal "TD" (pin 3 of the DB9 connector from the computer perspective), a receive signal "RD" (pin 2 of the DB9 connector), and a signal ground "SG" (pin 5 of the DB9 connector). Some GPS (like the Furuno GP32) have a dedicated PC port (RS-232) that can be connected directly to the serial input of the PC.

Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Received Data	7	Request to Send
3	Transmitted Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	Signal Ground		
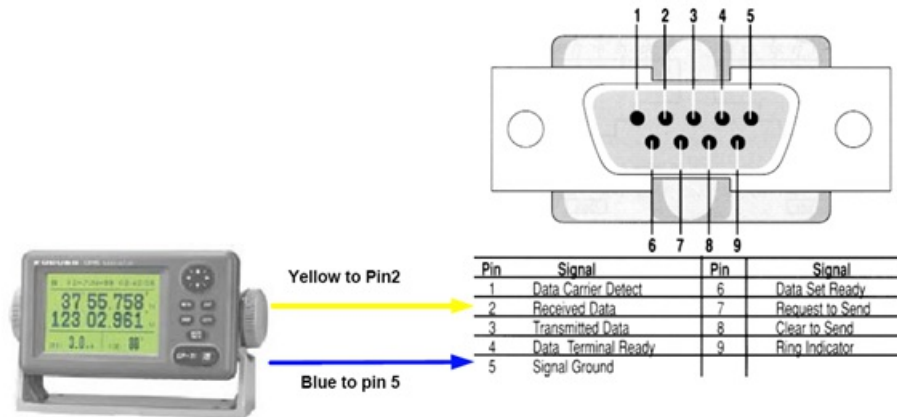
Note: In the above diagram, only 2 wires of the GPS are used: the transmit signal and ground (or "Signal Ground"). In this example the PC is just a "listener" and doesn't send any information back to the GPS.

RS-422 (or "NMEA port")

RS-422 uses a "balanced" (or differential) signal that does not use a common ground. RS-422 uses 4 wires: TD-A (Transmit Positive), TD-B (Transmit Negative), RD-A (Receive Positive) and RD-B (Receive Negative).

Note: "TD-A" / "TD-B" can also be noted "TD-H" / "TD-C" (Hot/Cold)

RS-422 has been selected as a preferred interface to transmit NMEA0183 data on a boat. RS-422 uses a differential signal instead of a single ended signal used by RS232. Where a single-ended system will start to become unreliable after a couple dozen feet, a differential system can be reliable for several hundreds of feet. In an electrically noisy environment like a boat, this can make a big difference. With RS-422 (differential signal), 4 wires are used (two to transmit and two to receive). Note that there is no common ground with RS-422 (no "signal ground"). The transmit and receive lines use their own "point of comparison".

All Furuno depth sounders (such as FCV1100) only output NMEA0183 using the RS-422 protocol. If you want to connect the FCV1100 to a serial COM port (RS232), you will have to use a RS-422 to RS-232 adapter.

Connect the white wire to the RD-A and the black wire to the RD-B of the converter. In this example we do not want to talk back to the sounder (so we will not use TD-A and TD-B of the converter).

If you want to talk and listen to the NMEA0183 device, you will have to wire both TD and RD lines:
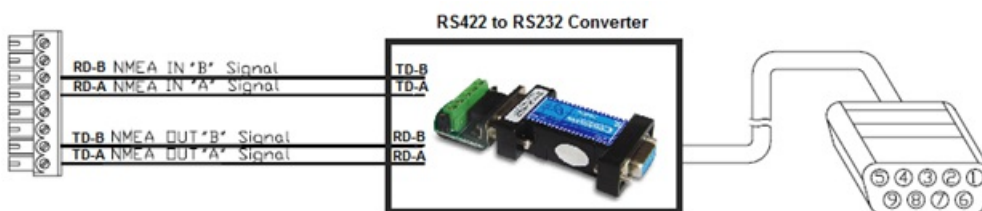
Using a Serial to USB Adapter

On most computers, the USB interface has replaced the old COM port (serial) interface. Most laptop manufacturers got rid of serial ports years ago. Some desktop computers still have a serial port, but these serial interfaces are less common and it is unlikely that modern computers will have a serial port. So, if you need to connect an instrument serially to your computer, you will have to purchase a Serial to USB Adapter.

Before connecting the Serial to USB Adapter, you will have to install the "driver" provided by the hardware manufacturer. Usually, the driver is provided on a CD, but it is always a good idea to download it from Internet (to make sure that you install the latest version). When connecting the Serial to USB Adapter to your computer, the driver will create a "virtual COM port" (also known as "VCO"). This means that for any software installed on the computer, the adapter will be seen and detected as a regular COM port (just like if the PC had a Serial COM port). Note that if the appropriate driver has not been correctly installed in Windows, the Serial to USB Adapter will not function properly and will not appear as a Virtual COM Port for the software.

To make sure the drivers are correctly loaded, open the "Device Manager" and look for a COM port under "Ports (COM & LPT)":
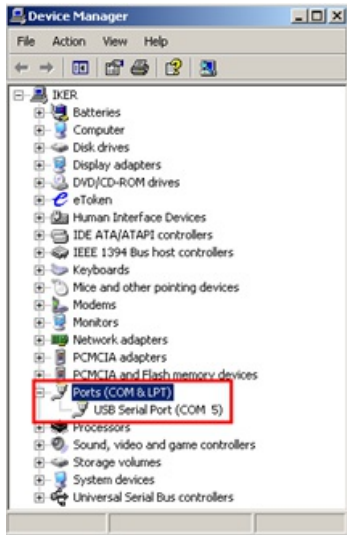
To open the Device Manager under Windows 7, search for "device Manager" from the Start menu. Under Windows 8, right click on the "Start" button (on the lower left of the Desktop) and select "Device Manager".

Introduction

The Connection Wizard is used to configure instruments such as GPS, AIS, Heading and Wind Sensor. The Wizard is designed to intuitively recognize your hardware devices and connect them to the software correctly. However, you must already have the devices wired and transmitting data.

Note: The Connection Wizard is not used to configure Radar or Sounder. It is only used to configure NMEA0183, NMEA2000 and NavNet NMEA sensors.

The Connection Wizard is also used to output data (NMEA0183) to a pilot or external display.

To open the Connection Wizard, make sure to start the software in "Navigation" mode, click on the "TimeZero" button and select "Connection Wizard":

Automatic Port Configuration

The Automatic Port Configuration option of the wizard will scan your system automatically for the various sensors:

- NMEA0183 sensors (GPS, AIS, Heading, Wind Sensor, etc...) connected through a Serial port or USB to Serial Adapter (at 4800 and 38400 baud rate).

- NMEA200 sensors (GPS, AIS, Heading, Wind Sensor, etc...) connected through the Actisense NGT1-USB.

- NavNet Data (FA30, MFDs, etc...) connected through an Ethernet cable

Before launching the detection, make sure to connect and power all the sensors.

IMPORTANT: When you perform an Automatic Detection, it erases the previous input configuration.

Note: It is not possible for TimeZero to automatically configure the outputs (to a pilot or external display for example). The Automatic Port Configuration only configures the inputs. You will have to manually configure the output by selecting "Data Output and Pilot".

After the detection, the wizard will display a page with the list of the ports that are receiving data on the left and the detail of the selected port on the right:
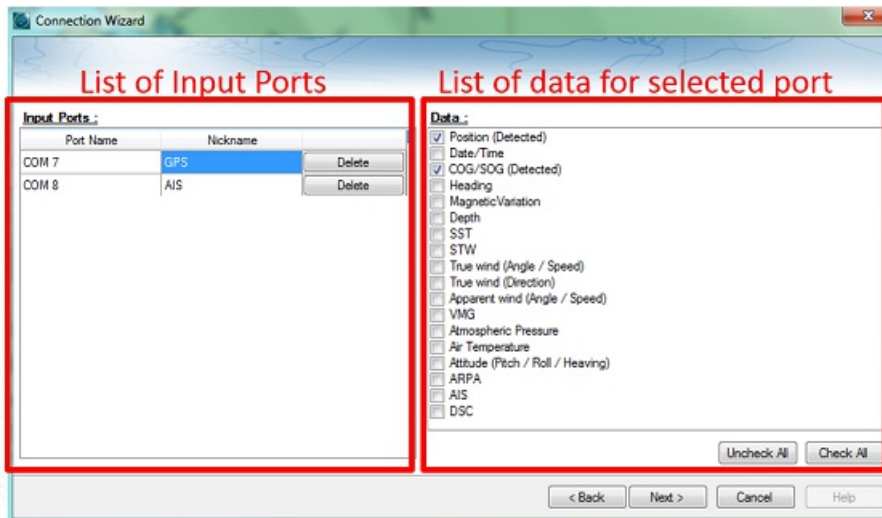
Every data type detected is automatically checked (on the right). Note that you can uncheck data type on specific port(s) if you don't want to use them. For example, it is not recommended to use position or heading from a port connected to an AIS sensor.

Note that you can enter an optional Nickname for each port configured (on the left) such as "GPS", "Heading" or "AIS".

If you do not want to use a specific port that was automatically discovered, you can press the "Delete" button available on the left panel.

Click on "Next". This will display the Data Source page.

Note: If you feel you are missing a port or data type, check the wiring and use the port monitor to check that data is correctly flowing.

Manual Port Configuration

Choose "Manual Port Configuration" when you know what to configure or to edit an existing port configuration.

Add/Configure Serial Port (NMEA0183):

Select this option to manually configure a new or modify an existing COM Port (Serial or USB to Serial Adapter). The first screen will allow you to select a COM port and a Baudrate (default 4800 bauds):

```
COM port :  COM 11      Baud Rate :  4 800 bauds      Advanced...
$GPVTG,115.0,T,115.0,M,0000.0,N,00000.0,K,A*13<cr><lf>
$GPGGA,001329.04,4816.52781,N,12414.36329,W,1,12,0.0,0.0,M,50.0,M,0,0*66<cr><lf>
$GPVTG,115.0,T,115.0,M,0000.0,N,00000.0,K,A*13<cr><lf>
$GPGGA,001349.87,4816.52781,N,12414.36329,W,1,12,0.0,0.0,M,50.0,M,0,0*6B<cr><lf>
$GPVTG,115.0,T,115.0,M,0000.0,N,00000.0,K,A*13<cr><lf>
$GPGGA,001349.89,4816.52781,N,12414.36329,W,1,12,0.0,0.0,M,50.0,M,0,0*65<cr><lf>
$GPVTG,115.0,T,115.0,M,0000.0,N,00000.0,K,A*13<cr><lf>
```

Note: The "Advanced" button is only reserved for Technical Support. Do not adjust any advanced settings yourself.

After selecting a COM port, you should see NMEA0183 sentences flowing in the window below. Valid NMEA sentences should:

- Start with "$" or "!"

- Followed by 5 characters:

    - The first 2 characters indicating the type of sensor sending the data (such as "GP" for GPS, "AI" for AIS, "EC" for Electronic Compass, "II" for multi-sensor, etc...)

    - The 3 remaining characters indicating the type of NMEA sentence (such as "GGA", "GLL" or "RMC" for position information; "VTG" for speed information; "DPT" or "DBT" for depth information, etc...)

- Followed by a series of data separated by ","

If you don't see any data, try another COM port or double check the wiring. If you see "garbage" data (random letters and characters), try another baudrate speed (such as 4800, 9600 or 38400) and make sure the wires are not inverted.

Tips: If the COM port does not appear in the list, make sure the USB to Serial adapter drivers are correctly installed from the Windows "Device Manager" control panel. If you feel that TimeZero is not listing an existing COM port, press and hold the CTRL key and click on the COM port selection. This will display a window where you can manually enter a COM port.

The next page of the Wizard will display a list of the ports previously configured on the left with the port you just added/modified:
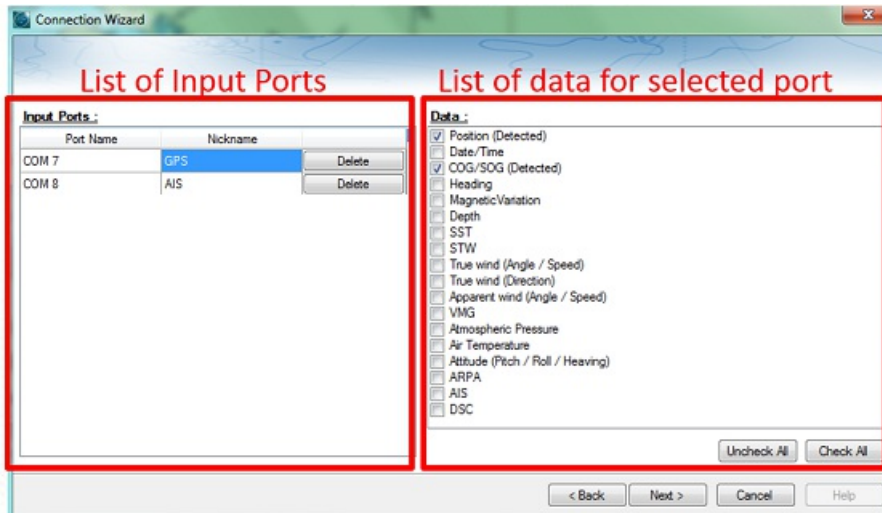
On the right, every data type detected is automatically checked. Note that you can uncheck data type on specific port(s) if you don't want to use them. For example, it is not recommended to use position or heading from a port connected to an AIS sensor.

Note: In some case, TimeZero cannot automatically detect (and thus check) specific data types. This can happen with AIS receivers that may not send target data while TimeZero is analyzing the data feed. If you are sure that the data should be present on that port (for example of you saw on the previous window NMEA "!AI" sentences corresponding to AIS), you can manually check a data type (AIS in that case).

Click on "Next". This will display the Data Source page.

Add/Configure NavNet Connection:

Select this option to configure or modify a NavNet connection when the computer is connected to the Furuno NavNet network through the Ethernet port.

- "NavNet NMEA" is used when the computer is connected to a Furuno NavNet MFD (Multi Function Display such as "NavNet 1", "NavNet Vx2", "NavNet 3D" or "NavNet TZtouch"), Furuno AIS (FA30, FA50) or Sounder (to get the depth, temperature and speed information from the transducer).

- "NavNet Fast Heading" is used when the NavNet network contains a DRS radar. In that case, a better faster heading is available from the DRS radar.

- "NavNet ARPA" is used when the NavNet network contains a DRS radar to get the ARPA data from the radar.

After checking the corresponding options, click on "Next" and follow the same steps as when configuring a Serial COM port.

Add/Configure UDP (or TCP) connection (NMEA0183):

Select this option to configure a network UDP (or TCP) connection. This can be used with Serial to Ethernet converters that can broadcast the serial information (NMEA0183) on the Network using "UDP" (or "TCP"). Select the IP address of your computer connected to the corresponding Ethernet card and enter the port number programmed inside the Serial to Ethernet converter:

Network adapter : 127.0.0.1 ▼ UDP port : 1100

!AIVDM,2,1,0,A,54T11MI1OHCT4U?62204U>0<h5=>062222222220I,0*4F<cr><lf>
!AIVDM,2,2,0,A,D0`:N5dl9<Q1APEC5888888888882,2*04<cr><lf>
!AIVDM,1,1,,A,14T11MI000awodtD:aBP2P3H050I,0*42<cr><lf>
!AIVDM,1,1,,A,14T11MI000awodtD:aBP2P3L050I,0*46<cr><lf>
!AIVDM,1,1,,A,14T11MI000awodtD:aBP2P3P050I,0*5A<cr><lf>

Confirm that NMEA0183 data is flowing and press on "Next". Follow the same steps as when configuring a Serial COM port.

Note: UDP or TCP connection can be useful to send data in between two TimeZero computers

Add/Configure NMEA2000 connection:

This option is used when the Actisense NGT1-USB is connected to the computer. The NGT1-USB gives TimeZero direct access (input and output) to the NMEA2000 data (PGN).

Before configuring the NMEA2000 connection in TimeZero, make sure that the NGT1-USB drivers have been installed (the Actisense NGT1-USB should appear as a Virtual COM Port in the Device Manager). Note that because only one gateway needs to be connected to the computer to provide all NMEA2000 data, there is no need to select a COM port in the Connection Wizard when configuring a NMEA2000 connection (TimeZero will automatically find the first NGT1-USB it detects). Simply press on "Next" to automatically detect the gateway and follow the same steps as when configuring a Serial COM port.

Note that all the NMEA2000 data is coming inside TimeZero through one port, and it is not possible to adjust the NMEA2000 devices priority directly from the Connection Wizard interface. However, TimeZero will look at the NMEA2000 device instance number to affect priority to specific devices. For example if you have multiple GPS, you can assign priority by changing their instances number (the lowest the instance number, the highest the priority). For more information about NMEA2000 device priority, please make sure to read the How to adjust priority on NMEA2000 chapter.

Note that, by default, the NGT1-USB operates at a baudrate of 115200bps. If you have a NMEA2000 backbone with lots of sensors, the default speed should be increased to 230400bps in order to not drop NMEA2000 information. The baudrate of the NGT1-USB can be changed using the Actisense NMEA reader:
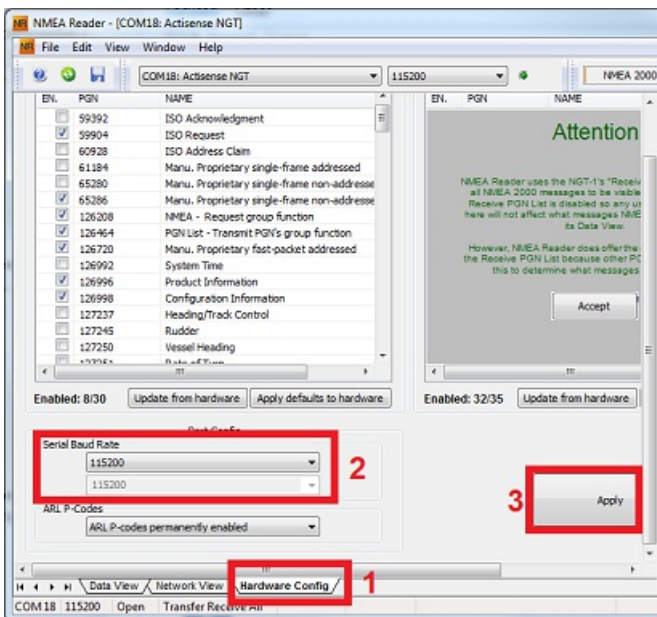
TimeZero will automatically detect the operating speed of the NGT1-USB when configuring the NMEA2000 connection in the Wizard.

To remove a connection:

If you want to remove a specific port from TimeZero:

- Open the Connection Wizard

- Select "Data Source" and press "Next"

- On the Input Ports configuration page, press the "Delete" button in front of the port you want to delete
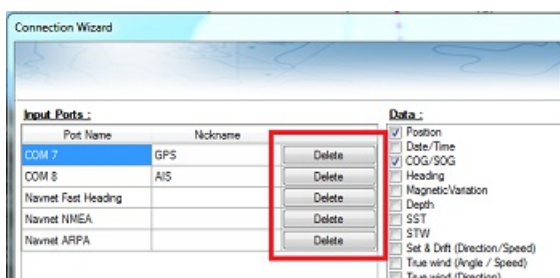
- Press "Next" and revue the "Master" setup (especially if you have deleted a Port that was previously used as a Master for a specific data type)

- Press "Next" and "Finish" to close the Connection Wizard

Autopilot And External Output (NMEA0183)

Choose "Data Output" when you want to output NMEA0183 data from TimeZero to an Autopilot or any External Display.

Each autopilot requires that certain, specific information be provided by TimeZero. Most autopilots follow the same basic principles of course to steer and cross track error. Autopilot tries to maintain a heading to a mark while maintaining a minimum Cross Track Error. TimeZero contains a number of specific settings that have been created because not all autopilots work the same way. Consult your autopilot manual to verify what information the device needs.

Output Configuration (NMEA0183)

TimeZero can output NMEA0183 data over a COM port (Serial or USB to Serial Adapter) or over an Ethernet network (using UDP or TCP). Select the appropriate option and click on Next:
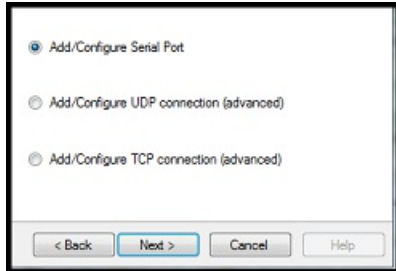
Note: UDP is useful when you want to broadcast NMEA data to one or multiple computers located on the same local network (same broadcast domain). Use TCP if you need to route NMEA0183 data through the Internet or if the device or computer you are sending the data only accepts TCP connection. Note that when TimeZero is set to output NMEA data using a TCP port that was not previously configured as an input, it will create and open a TCP port and listen to incoming connection from a remote client (TimeZero becomes a TCP server). Just configure the client to connect to the server (TimeZero in this case) using its IP address and to the port that is configured on the next page.
If you would like to receive and send data on the same port over TCP (for example to receive and send data to a NMEA Multiplexer), first, start by configuring the TCP port as an input in TimeZero. Then, when configuring an output TCP port, you will be able to select the input port you previously configured, allowing TimeZero to send and receive data on the same TCP port.

The top of the output configuration window will automatically adjust according to the output mode (COM, UDP or TCP). In the example below, the serial (COM) output has been selected, allowing you to select a COM port and a baudrate (in case of UDP or TCP, you have to select a network adapter and a TCP/UDP port):
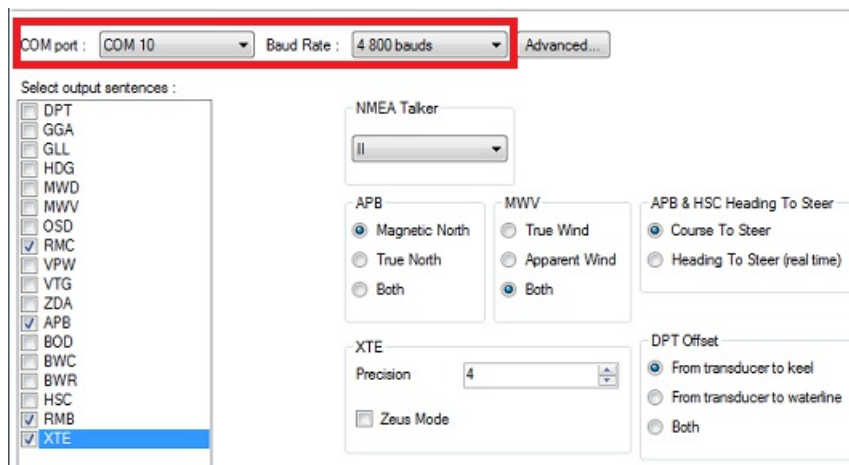
Note: If using a COM port and if the selected Port is already configured as an Input, you cannot select the Baudrate (it will be locked to the same baudrate as the input).

Note: The "Advanced" button is only reserved for Technical Support. Do not adjust any advanced settings yourself.

Once the port has been configured from the top of the page, select the NMEA0183 sentences you want to output from TimeZero to an External Device (including another TimeZero) or an Autopilot.

Most Autopilots only require "APB" and "XTE". If your pilot also needs position and speed information, add "RMC" to the list. It is recommended to read your Autopilot documentation to know what sentence you should select from the list.

IMPORTANT: Never send back position (RMC, GGA, GLL) to a device that already receives or outputs position. This can create a "data loop" and cause erratic behavior.

Note: When switching a Waypoint, TimeZero will always send an AAM (Waypoint Arrival Alarm) sentence to the Pilot. This allows the pilot to properly detect a switching Waypoint condition and notify you. If you want to trigger a notification inside TimeZero, make sure to check "Waypoint Switching Notification" and/or "End of Route Notification" from the Alarms Options.

Press "Next" to validate the settings then "Finish" to close the Wizard.

In order to confirm a good connection in between TimeZero and your Autopilot

- Activate a route in TimeZero (or create an Active Waypoint using the "Go To" tool)

- Add three Route NavData to the NavData panel in TimeZero: "CST", "DTW" and "XTE" (Please refer to the NavData chapter for more information)

- Make sure that the Autopilot and TimeZero are using the same North reference (either "True" or "Magnetic"). You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the Units Options

- Configure your pilot to show a "Steering Page" displaying at minimum the corresponding information:

  - Distance to Waypoint (usually labeled as "DTW" or "RNG" or "DIST")

  - Bearing to Waypoint (usually labeled "CST" or "BRG" or "Bearing")

  - Cross Track Error (usually labeled "XTE")

- Confirm that the information displayed in TimeZero and on the pilot matches

If no information appears on the Autopilot ("--" for example), or if the pilot is not steering properly, check the Autopilot Troubleshooting chapter.

Advanced Output Settings:
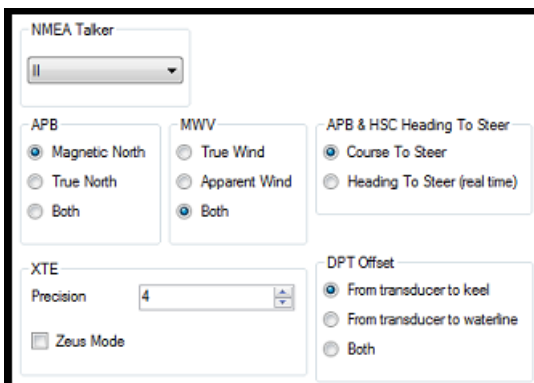
NMEA Talker:

This setting changes the NMEA talker used in the NMEA sentence generated by TimeZero. The default is set to "II" ("integrated instruments"). Some older pilots or external displays might not recognize the "II" talker. In this case, try to change it to "GP".

APB:

This setting defines the North Reference that will be used inside the APB sentence for the Bearing to Waypoint (or CTS). Usually, if the Autopilots is connected to a Magnetic Heading sensor, you will use "Magnetic North". If the Autopilot is connected to a True Heading Sensor (such as a Satellite Compass), you will use "True North". If set to "Both", the APB sentences will alternatively use Magnetic and True North. If you choose either Magnetic or True North, it is usually recommended to set TimeZero with the same reference. You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the Units Options

MWV:

This setting defines the Wind Reference that will be used inside the MWV sentence. If set to "Both" the MWV sentence will alternatively use Apparent Wind and True Wind (angle & speed).

APB & HSC Heading to Steer:

The APB NMEA0183 sentence contains two bearing references: Course to Steer and Heading to Steer. When "Course to Steer" is selected in TimeZero, the Heading to Steer field inside the APB and HSC NMEA sentences will use the same value as the Course To Steer field (copy). If "Heading to Steer (real time)" is selected, TimeZero will apply the drift vector to the Course to Steer value to compute the proper Heading to Steer that takes into account the real time currents and use that value in the Heading to Steer field of the APB and HSC sentences. Note that for the Heading to Steer (real time) value to be correct, you need a high precision heading source (such as a Satellite Compass). For most application, it is recommended to leave this setting to "Course to Steer".

XTE:

The "Precision" settings indicate the number of digits used for the Cross Track field used in the NMEA sentences. Only decrease the precision if you have an old Autopilot that has trouble adjusting to high precision XTE.

The "ZEUS" mode is only to be used with ZEUS Mercury Autopilot. This setting alters the "end of route" behavior of TimeZero. When the ZEUS mode is selected, all the XTE fields are set to a NULL value (,,) when reaching the end of a route. For any other Autopilots, leave that setting uncheck.

DPT (Depth) Offset:

Indicates the type of transducer offset used in the NMEA Depth output. Make sure that the "Transducer Draft" and "Keel Draft" settings are properly setup in TimeZero from the Initial Setup Options.

TTM Bearing and Course:

Used to output the TTM bearing relative to own ship heading (relative) or relative to North.

To delete an output port:

- Open the Connection Wizard

- Select "Data Source" and press "Next"

- Press "Next"

- On the Master selection page. press the "Delete" button in front of the output port you want to delete
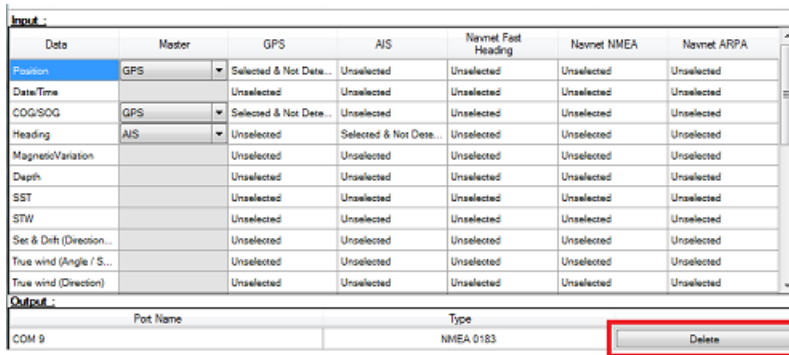
- Press "Next" and "Finish" to close the Connection Wizard

Autopilot Output (NMEA2000)

When an Actisense NGT1-USB is connected to your computer and already setup as an input (NMEA2000 input), the last page of the Connection Wizard allows you to enable or disable the "NMEA2000 Pilot Output" (checked by default):
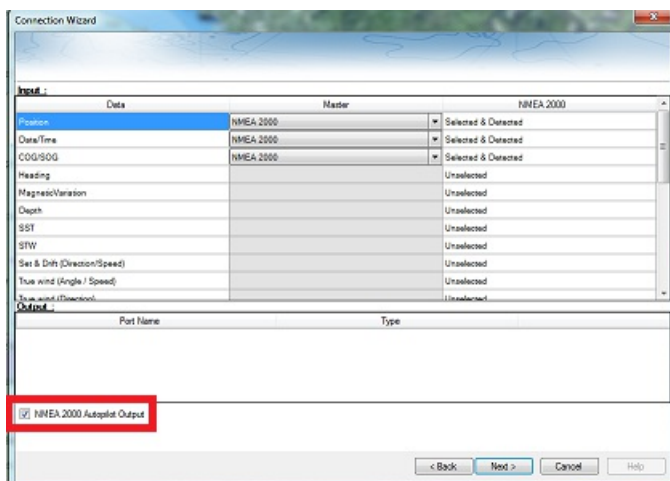
When "NMEA2000 Pilot Output" is checked, the following PGNs are automatically sent while a route is activated:

- PGN 129283 - Cross Track Error

- PGN 129284 - Navigation Data

- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

Port Monitor

The Port Monitor is used to troubleshoot and look at the data flowing into a specific port (if any). The port monitor can analyze:

- Any Serial COM Port available on your computer

- Any UDP Port already configured in TimeZero

- The NavNet NMEA ports
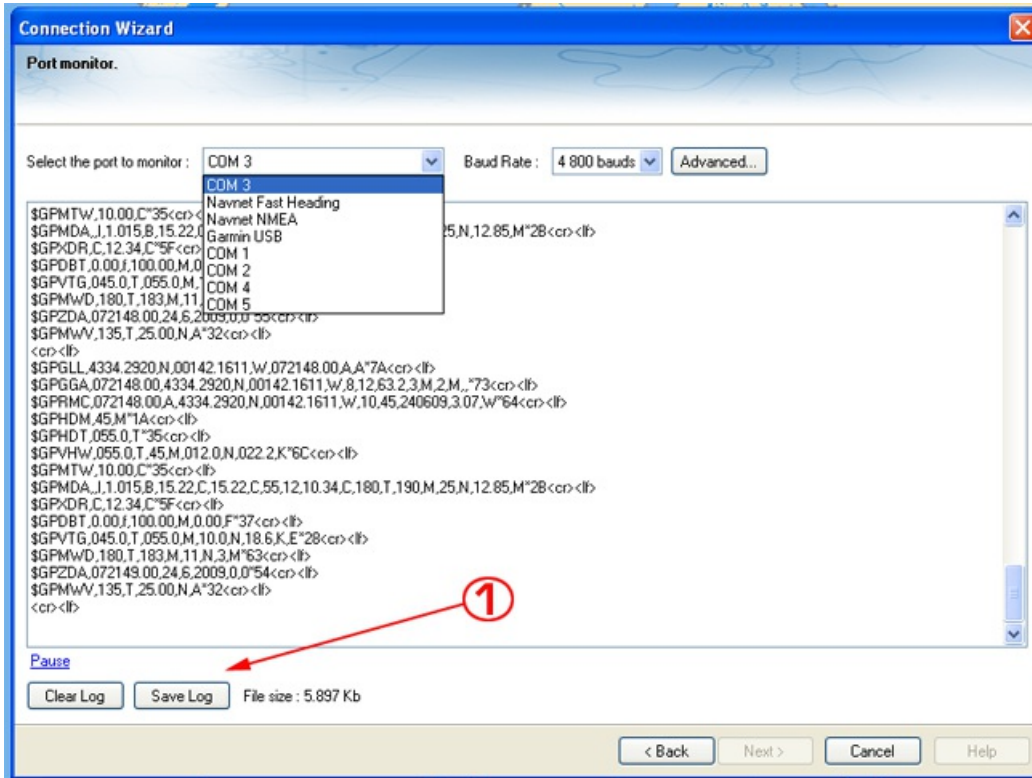
The "Save Log" button allows you to create a text file containing the log of the NMEA data. This is very useful to send this file to Tech Support for analysis, in case TimeZero does not seem to decode the sentence properly.

Data Source

The Data Source displays a "matrix" view of all the inputs and outputs and allows you to setup port priorities when more than one sensor provide the same data. All data types supported by TimeZero are listed in the first column (position, heading, etc...). Before this window is displayed, TimeZero analyzes all the inputs. For each data type and configured ports, the data source window display if it is "unselected" (unavailable), "Selected & Detected" (configured and correctly detected), or just "Selected" (configured by not detected).

If the same data type has been selected on more than one port, a drop down menu (in the "Master") column allows you to select which port to use as a primary sensor (which will be the port used for that specific data in TimeZero):

Input :

Data	Master	COM 11	COM 5	
Position	COM 11	Selected & Detected	Selected & Detected	
	COM 11			
	COM 5			
Date/Time		Unselected	Unselected	
COG/SOG	COM 11	Selected & Detected	Selected & Detected	
Heading		Unselected	Unselected	
MagneticVariation		Unselected	Unselected	
Depth		Unselected	Unselected	
SST		Unselected	Unselected	
STW		Unselected	Unselected	
Drift		Unselected	Unselected	
Current		Unselected	Unselected	
True wind (Angle / Speed)	COM 11	Selected & Detected	Unselected	
True wind (Direction)	COM 11	Selected & Detected	Unselected	

Output :

Data	COM 11	COM 5
MOB	Unselected	Unselected
Auto-pilot	Unselected	Unselected

If the Master Sensor becomes unavailable, TimeZero will automatically select another for you. If the Master Sensor becomes available again, TimeZero will revert back to it automatically without user interaction.

This allows you to design a system with total redundancy (as long as you have multiple GPS sources).

Clear All

This option will erase all the Input and Output configuration of TimeZero Navigator . Only use this option if you want to configure all the Inputs and Outputs of TimeZero Navigator from scratch.

Be careful as this cannot be undone.

Garmin GPS Gate Connection

Some Garmin GPS units do not output Position in neither NMEA0183 nor NMEA2000 data. Instead those Garmin units output in a Garmin proprietary format. TimeZero is not compatible with the Garmin proprietary data. In order for TimeZero to receive position information, a third-party software called GPS Gate Splitter (also known as Franson GPS Gate) must be installed on the computer.

GPS Gate can be setup to connect to the Garmin GPS and output standard NMEA0183 sentences using a virtual COM port. Follow the instructions below to install GPS Gate, configure it and setup TimeZero..

Install GPS Gate

Open a web browser and Google "GPS Gate Client" or "GPS Gate Splitter"

Note: You may want to try to access the following URL directly: http://gpsgate.com/products/gpsgate_client

Download and install GPS Gate Splitter Express (free edition)

At the end of the installation, you should have "Franson GPSGate" available in your Windows Start menu:
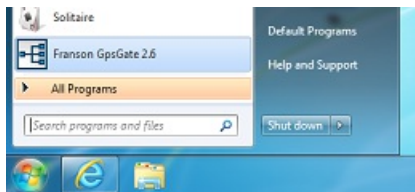
Configure GPS Gate

The first time you open GPS Gate, a wizard will appear. Select "Search for Garmin USB devices" and un-check any other selection:

Once it finds your GPS, click "Yes":

On the Select Output screen, select only "I want to share my GPS between several applications" and click next:

On the Summary page, click "Finish".

GpsGate is now configured and should look like the image below. Select the output tab to configure the output port. From this screen you can add or remove Virtual Com Ports:
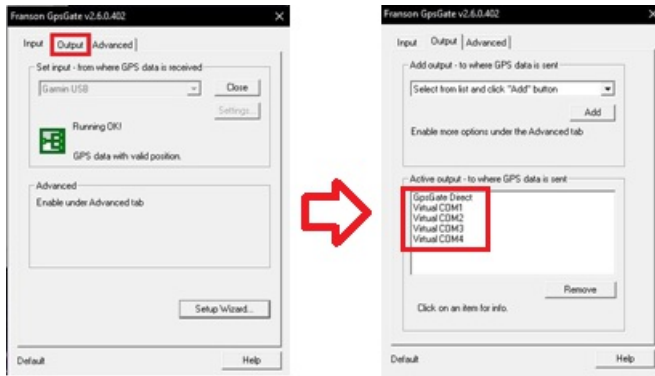
Configure TimeZero

Open TimeZero and open the Connection Wizard. Select "Manual Port configuration" and then "Add/Configure Serial Port":
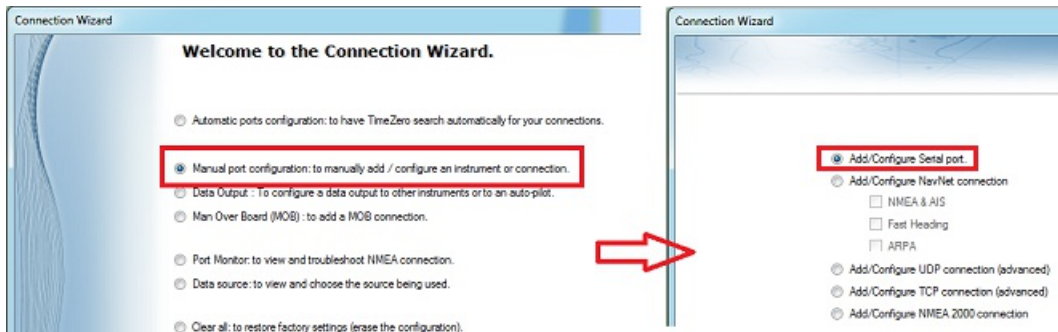
Hold the Ctrl key and Click on the COM port selection box and enter the COM port number that was configured in GpsGate and click "OK". Once you see NMEA data scrolling, click Next:
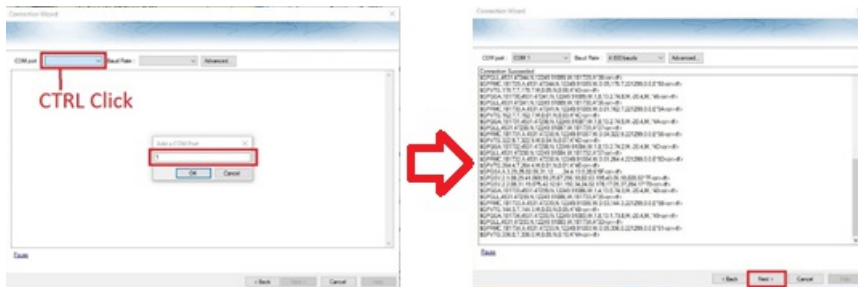
Make sure that "Detected" sentences are selected and then click Next and continue through the Connection Wizard as if it was with a regular NMEA0183 source.

NavNet MFD & DRS Connection

The "Furuno Radar Module" needs to be unlocked prior to configure NavNet3D, NavNet TZtouch or NavNet TZtouch2 in TimeZero.

IMPORTANT: this chapter assume that you have a compatible NavNet MFD (NavNet3D, TZtouch or TZtouch2) connected to the network. If the DRS radar is directly connected to the PC (no MFD on the network), please refer to the Direct DRS Connection Chapter.

TimeZero connects to a Furuno NavNet3D, TZtouch, or TZtouch2 "MFD" (Multi Function Display) and "DRS" (Digital Radar Sensor) through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the MFD and DRS. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the NavNet network (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the NavNet HUB or MFD from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:
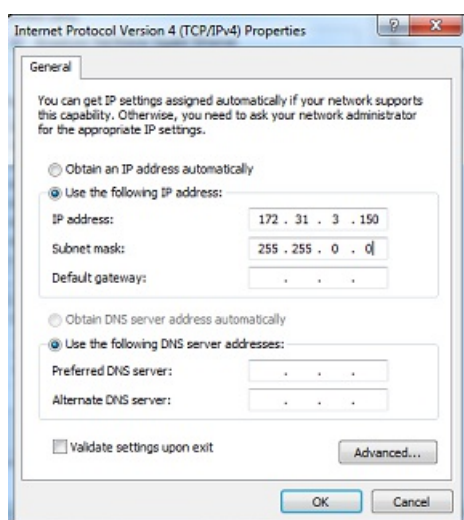
Once the computer's IP address has been assigned, launch TimeZero in Navigation Mode. Open the "Options" by clicking on the "TimeZero" logo (located at the top left corner) and select "NavNet". Make sure that the MFD and the Radar are detected. Do not proceed to the next step until all Furuno Ethernet sensors are properly listed.

Select the Connection Wizard and perform an "Automatic Detection". TimeZero will automatically detect the Navigation Data available on the NavNet network (GPS, Heading, AIS, Wind,...).

If the NavNet instrument is not automatically detected, you can manually add a NavNet Port:

- Select "Manual Port Configuration" from the Connection Wizard and click on "Next"

- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS", "Fast Heading" and "ARPA". Click on "Next"

- Make sure that the type of data you want to receive from the NavNet network are checked for the various NavNet ports

Note: Make sure that the MFD setup as a Master is turned on **before** starting TimeZero. TimeZero will not recognized the DRS if the NavNet MFD is turned OFF or not present on the network.

Important Note About DHCP Server And Router On A NavNet3D Network:

Using a Router (with a DHCP server) is **absolutely forbidden** on a NavNet3D Network. The NavNet3D MFD "Master" is already a DHCP server (and would conflict with any other third party DHCP server). You may setup the computer to acquire an automatic IP address, but in that case, the NavNet3D MFD set as a Master needs to be turned ON before the computer. If the computer is connected to the network or turned ON prior to the NavNet3D MFD set as Master, the computer will not acquire a valid IP address and the Ethernet connection must be repaired manually. That is why it is recommended to setup a fixed IP address (172.31.3.150 / 255.255.0.0).

Note: Some PC Network Interface (under Windows7) cannot acquire an IP address from the NavNet3D DHCP server (from the Master). In these rare cases, there is no other way but to fix the IP address of the PC or use the Windows "Alternate IP Configuration"

Direct DRS Connection

The "Furuno Radar Module" needs to be unlocked

IMPORTANT: Follow this chapter when the DRS radar is directly connected to the PC without MFD.

Selected DRS Antenna can be directly connected to TimeZero. Please refer to your local Furuno dealer.

Physical Connection

If you use the PSU012 or PSU013 (Power Supply Unit) to power the older DRS Series Radar Antenna (48v), make sure to insert the "J7" jumper inside the PSU (under its cover). If the jumper is not inserted, the PSU will not power ON (the LED will remain OFF) even when 12 or 24v is provided.
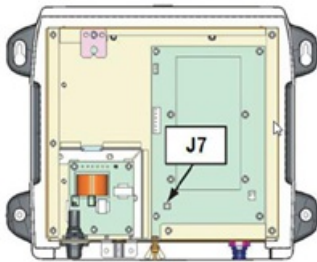
Some newer DRS (such as the DRS4D-NXT) do not need any Power Supply and can be connected directly to the main 12v or 24v battery (refer to the DRS installation guide for more information).

To connect the DRS Ethernet port to the computer, we highly recommend installing a HUB/Switch in order to be able to add additional Ethernet sensors easily (FA30, DFF1, etc…) and to be able to monitor and troubleshoot network traffic (by looking at the activity LED of the HUB):
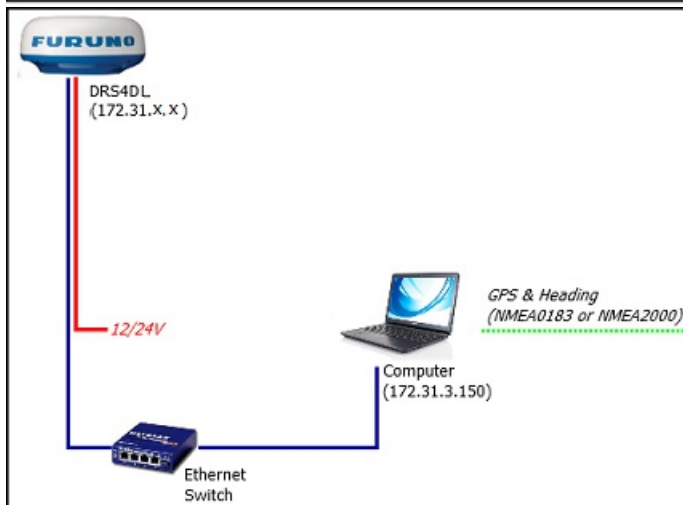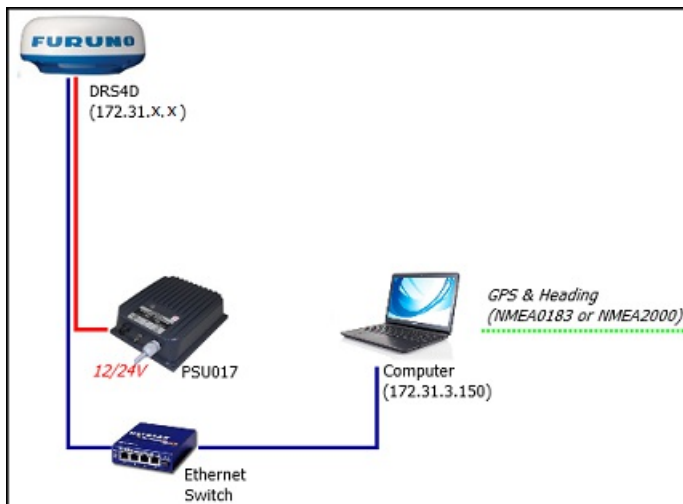
Connect GPS, Heading and optional additional instruments to the computer using one or multiple COM ports (through a USB to Serial adapter if needed) or through NMEA2000 via the Actisence NGT1 Gateway.

Important information regarding heading: If you want to overlay radar on the chart, acquire ARPA targets or use the North-Up Orientation of the Radar WorkSpace, you have to provide Heading to TimeZero. For reliable ARPA, the heading refresh rate must be 10Hz

or more (the heading sentences must be received 10 times per second or more). If TimeZero only receives heading once per second, ARPA reliability is not guaranteed.

Note: If you connect the Heading Sensor using NMEA2000 the refresh rate is always 10Hz.

Set the IP of the Computer

The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the DRS. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fixed IP address 172.31.3.150 with a subnet mask of 255.255.0.0:
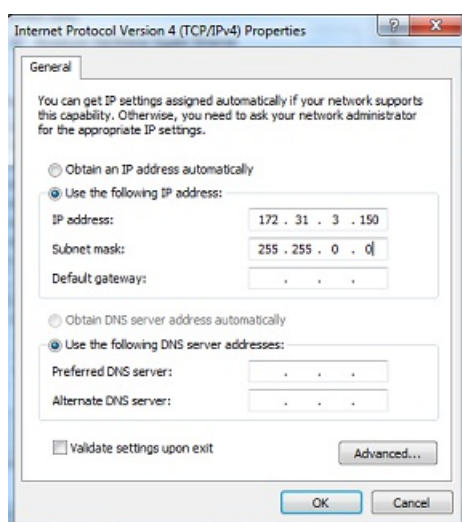
Once the computer's IP address has been assigned, launch TimeZero in Navigation Mode. Open the "Options" by clicking on the "TimeZero" logo (located at the top left corner) and select "NavNet". Make sure that the Radar is detected. Do not proceed to the next step until all Furuno Ethernet sensors are properly listed.

Note: Make sure the DRS is turned ON **before** starting TimeZero. TimeZero will not display the Radar features if the DRS is turned OFF or not present on the network.

Configuration

Open the Radar Options in TimeZero. Under "Radar Initial Setup", select the DRS Hostname and adjust the DRS initial settings just like you would from a NavNet3D or TZtouch MFD.

Note: There is no feedback when pushing the "Radar Optimization" button. This is normal!

FAR 2XX7 Connection

The "Furuno Radar Module" needs to be unlocked prior configuring a FAR2XX7 series Radar in TimeZero.

Configure the Radar

Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together, a unique "Radar Number" (and IP address) must be assigned to each radar processor. Note that for TimeZero to correctly detect the radar, at least one Radar Processor must be assigned to 172.31.3.6.

IMPORTANT: The FAR2xx7 IP address must be set up to 172.31.3.6. TimeZero will not be able to connect to the radar if the FAR2xx7 is set to another type of IP address. If the FAR is set with an IP address of 192.168.31.x (for ECDIS), make sure to revert DIP#4 to the OFF position on S1, then perform a factory reset. This will switch the FAR back to the Class B 172.31.x.x IP address:

S1	Monitor SXGA for FAR-2117, 2127 (Default)	Monitor UXGA for FAR2817, 2827 (MU-231CR S. No. 0269 or later*)	FAR-2117-BB FAR-2127-BB
1	OFF	ON	OFF
2	OFF	OFF	ON
3	OFF		
4	OFF = 172.31.x.x / ON = 192.168.31.x		

To assign the radar number, hold "HL OFF" and press the "MENU" key 5 times on the FAR 2XX7. The "Initialize" menu will appear. Select "Installation" (4), then Radar NO (4). Once the radar number is changed, the radar must be restarted to store the new setting. If applicable, follow the same procedure for each radar on the network, and then confirm that each radar number is unique. You cannot have two radars on the same network with the same name or number.

Note: Whenever a network change is made, it is recommended that all radars are powered down and restarted.

To confirm the network settings and communications between multiple radars, power up all of the radars in the network, then right click on the Radar Antenna box (top left corner). The antenna information for all of the available radars in a network will appear on the right in the menu panel. Be sure that all the radars on the network are listed in this panel. If not, check the cables and the network settings.

IMO Mode

When TimeZero is interconnected to the FAR2xx7 via the network, the radar should be set to IMO Mode B, C or W. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR 2XX7. The "Initialize" menu will appear. Select "Installation" (4), then "Type" (7). Set to "B", "C" or "W" ("W" is recommended).

SIO LAN Output

The FAR2xx7 SIO LAN Output has to be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the "Own Ship Position" box on the FAR and select OFF for the "SIO Data LAN Output" (3).

Configure the computer

TimeZero connects to a Furuno FAR 2xx7 radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x / 255.255.0.0). We recommended using 172.31.3.150 as a fix IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Once the IP address of the computer has been assigned, launch TimeZero in Navigation Mode.

Configure Instruments

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

Note that it is possible to connect NavNet sensors (such as a DFF1-UHD sounder) to the same network so that TimeZero can display Radar and Sounder Echo:

Note: The FAR "SIO LAN Output" can interfere with other NavNet sensors (such as Ethernet Sounders) that may be present on the network, and thus, it should be turned OFF.

ARPA Configuration

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the Radar Options by enabling or disabling "Enable Local TimeZero ARPA Processing". If you want TimeZero and the FAR to share the same ARPA data, make sure to disable this option (disabled by default) and configure the FAR radar and TimeZero with the instructions below.

2XX7 Configuration:
The ARPA target output must be setup through the LAN from one FAR2xx7. Hold "HL OFF" and press the "MENU" key 5 times. The "Initialize" menu appears. First, select "TT Preset" (6). Select "True" for "TTM Output" (2). Select "Back" to return to the "Initialize" menu and select "Other" (8). Set "INS" (5) to "LAN".

TimeZero Configuration:
In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard

- Select "Manual Port Configuration" and click on "Next"

- Select "Add/Configure UDP Connection" and click on "Next"

- Select the IP address that begins with 172.31.x.x from the "Network Adapter" drop down menu and type "10028" for the "UDP Port". Click on "Next"

- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right. Click "Next" then "Finish".

Note: You can only use the ARPA data from one FAR radar on the network.
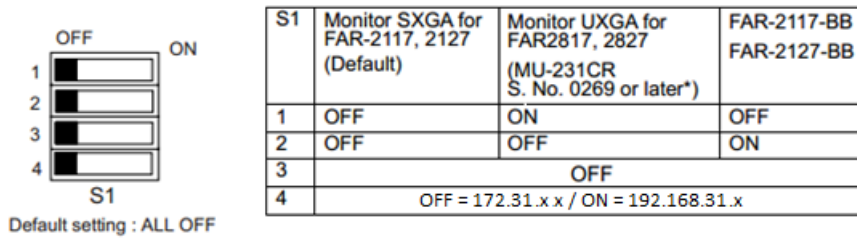
FAR15x3 & FAR15x8 Connection

The "Furuno Radar Module" needs to be unlocked prior configuring a FAR15XX series Radar in TimeZero.

Configure the Radar

Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together, a unique "Radar Number" (and IP address) must be assigned to each radar processor. Note that for TimeZero to correctly detect the radar, the IP address must match the NavNet IP address 172.31.x.x (172.31.3.17 by default).

The Radar number can be adjusted from the Radar Installation Menu. To access the Installation menu on a FAR15xx, press and hold the "HL OFF" button while pushing 5 times the "MENU" button. This should bring the "Radar Installation" menu on screen. Select "Installation" and adjust the "RADAR NO" (4).

Note: Whenever a network change is made, it is recommended that all radars are powered down and restarted.

IMO Mode

When TimeZero is interconnected to the FAR15xx via the network, the radar should be set to the "non-IMO" mode. From the same "Installation" menu, set "Type" (7) to "non-IMO".

SIO LAN Output

The FAR15xx SIO LAN Output has to be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the "[OS POSN]" box on the FAR and select OFF for the "SIO Data LAN Output" (3).

Configure the computer

TimeZero connects to a Furuno FAR15xx radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Radar Network (172.31.x.x / 255.255.0.0) in order to exchange information with the radar. We highly recommended using 172.31.3.150 as a fix IP address for the computer with a subnet mask of 255.255.0.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Once the IP address of the computer has been assigned, launch TimeZero in Navigation Mode.

Configure Instruments

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

Note that it is possible to connect NavNet sensors (such as a DFF1-UHD sounder) to the same network so that TimeZero can display Radar and Sounder Echo:

Note: The FAR "SIO LAN Output" can interfere with other NavNet sensors (such as Ethernet Sounders) that may be present on the network, and thus, it should be turned OFF.

ARPA Configuration

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the Radar Options by enabling or disabling "Enable Local TimeZero ARPA Processing". If you want TimeZero and the FAR to share the same ARPA data, make sure to disable this option (disabled by default) and configure the FAR radar and TimeZero with the instructions below.

FAR15xx Configuration:

The ARPA target output must be setup through the LAN from one Radar. Hold "HL OFF" and press the "OFF CENTER" key 5 times to display the "Factory" menu. Select "Back", select "Other" and set "INS" to "LAN". Select "Back" two times to display the "Radar Installation" menu. Select "TT PRESET", select "TT DATA OUTPUT" and set "Select Sentence" to "TTM" and "TTM Reference" to "True".

TimeZero Configuration:

In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard

- Select "Manual Port Configuration" and click on "Next"

- Select "Add/Configure UDP Connection" and click on "Next"

- Select the IP address that begins with 172.31.x.x from the "Network Adapter" drop down menu and type "10028" for the "UDP Port". Click on "Next"

- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right. Click "Next" then "Finish".

Note: You can only use the ARPA data from one FAR radar on the network.

FAR2xx8 Connection

The "Furuno Radar Module" needs to be unlocked

Configure the Radar

Set the FAR2xx8 IP Address

The PC communicates directly with the FAR2xx8 radar via its LAN1 port. The FAR2xx8 was designed to operate on either a CLASS C or CLASS B network.

CLASS C ("ECDIS") IP

By default, the FAR2xx8 operates on a Class C network 192.168.31.x / 255.255.255.0 ("ECDIS network"). For most application, it is recommended to leave the radar with its default IP address (LAN1: 192.168.31.21 / SCAN: 192.168.31.101) and configure the computer IP address accordingly:
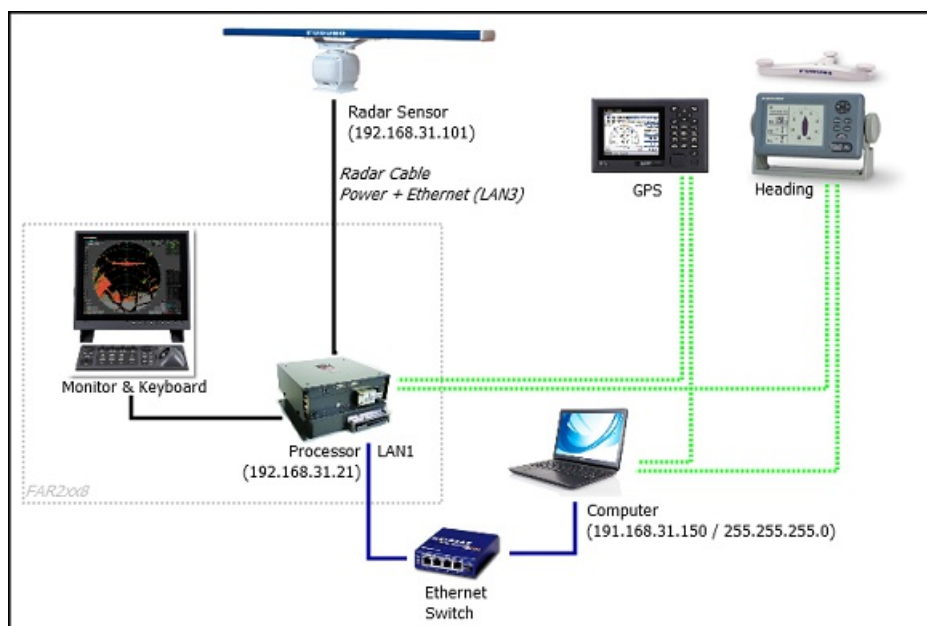
IMPORTANT: With this Class C IP address, you cannot mix and connect any NavNet Sounder (DFF1-UHD for example) with the FAR2xx8. This is because the NavNet sounders were designed to only operate on the "NavNet" network (172.31.x.x). Note that it is NOT possible to use a second Ethernet card on the computer to connect the sounder. This is because TimeZero can only use one Ethernet Card at a time for Furuno Sensor communication (Radar and Sounder). If you want to integrate TimeZero to a FAR2xx8 and a NavNet Sounder, you will have to change the IP address of the FAR2xx8 to a CLASS B network (see below).

CLASS B ("NavNet") IP

If you want to connect a FAR2xx8 radar and a network sounder, it is possible to switch the FAR2xx8 to the CLASS B network (172.31.x.x):
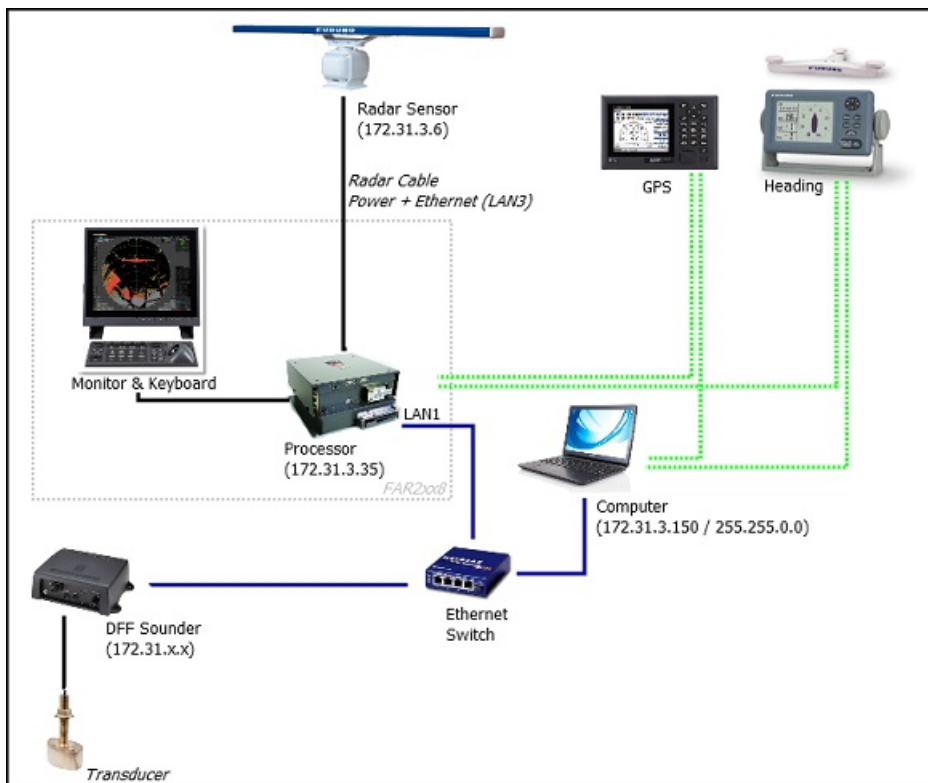
To change the CLASS and IP address of the FAR2xx8, hold "HL OFF" and press the "MENU" key 5 times. The Radar Installation menu will appear. Select "Next" (0), then "Network Settings" (2). Under "LAN 1.3 IP Address", set the Class to "B", then set the "LAN1 IP address" to "172.31.3.35" and "SCAN" to "172.31.3.6".

Once the radar IP is changed, the radar must be restarted to store the new setting.

IMPORTANT: Because TimeZero cannot output any Navigation data on the network (Position, COG/SOG, Heading, Picth & Roll, Heave) in presence of a FAR2xx8, only basic single beam sounder integration is supported. It is NOT possible to mix a DFF3D and FAR2xx8 on the same network. It is also NOT possible to mix FAR2xx8 and DRS radar on the same network. Also, please note that sounder heave compensation is not supported.

Note: If multiple radars are networked or inter-switched together, a unique Radar Number must be assigned to each radar processor and radar sensor. This can be done from the first page of the FAR2xx8 "Installation" menu.

IMO Mode

When TimeZero is interconnected to the FAR2xx8 via the network, the radar should be set to IMO Mode B or W. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR2XX8. The "Radar Installation" menu will appear. Select "Installation" (5), then "Type" (6). Set to "B" or "W" ("W" is recommended).

SIO LAN Output

The FAR2xx8 SIO LAN Output should be turned OFF (which is the default setting on the FAR). To make sure this setting is OFF, right click on the [POSN] box located a the top right of the FAR2xx8 screen:
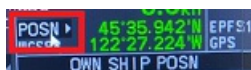
Select OFF for the "SIO Data LAN Output" (4).

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the FAR2xx8 and to the computer. When connecting instruments to TimeZero (via NMEA0183 or NMEA2000), it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.

Configure the computer

TimeZero connects to the FAR2xx8 radar through an Ethernet connection (100Base-T) via the LAN1 port of the radar processor. The computer needs to have an IP address that "matches" the Radar Network (192.168.31.x / 255.255.255.0 or 172.31.x.x / 255.255.0.0 according to the CLASS selected on the FAR2xx8). We highly recommended using the following IP for the computer:

- 192.168.31.150 with a subnet mask of 255.255.255.0 when the FAR2xx8 is set for CLASS C (Default "ECDIS" network)

- 172.31.3.150 with a subnet mask of 255.255.0.0 when the FAR2xx8 is set for CLASS B ("NavNet" Network)

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 192.168.31.150 with a subnet mask of 255.255.255.0 (or 172.31.3.150 with a subnet mask of 255.255.0.0 if CLASS B was selected):
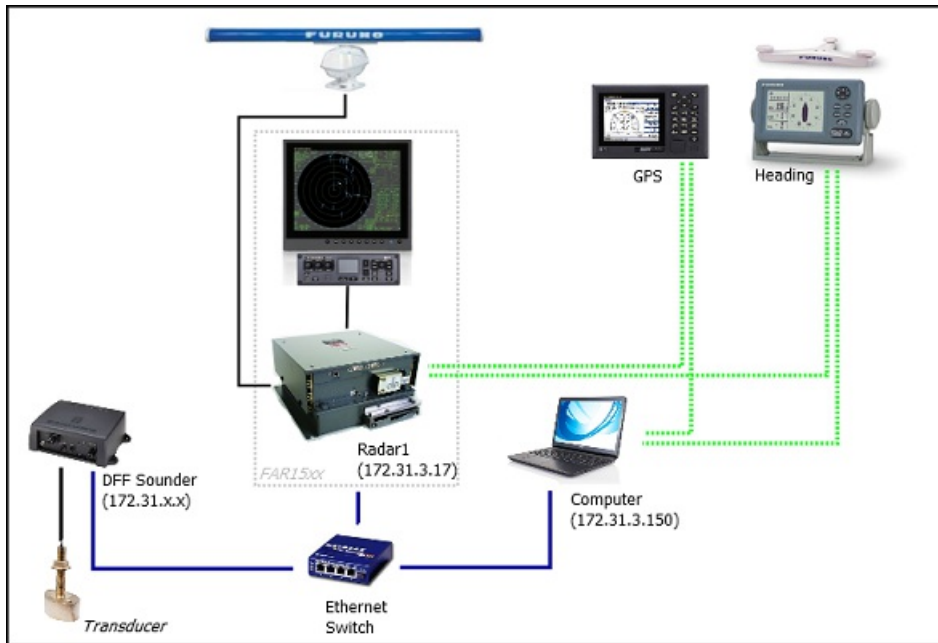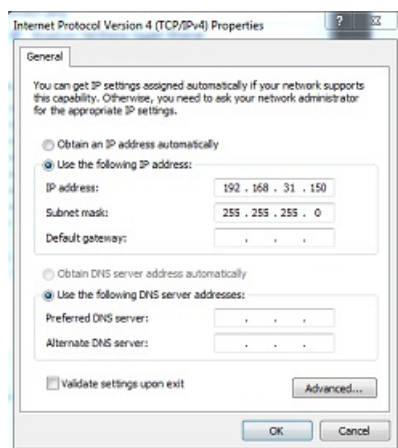

Once the computer's IP address has been assigned, it is recommended to Ping the IP address of the Radar Processor Unit (192.168.31.21 by default) and the Scanner unit (192.168.31.101 by default) to make sure the network is correctly set up. For more information on how to ping an Ethernet device, refer to the How To Ping chapter. Once connectivity has been confirmed, launch TimeZero.

ARPA Configuration

TimeZero can operate in two modes for ARPA processing. It can either use the ARPA data processed by the Radar (default), or use its own local ARPA processing. This setting is adjusted from the Radar Options by enabling or disabling "Enable Local TimeZero ARPA Processing". If you want TimeZero and the FAR to share the same ARPA data, make sure to disable this option (disabled by default) and configure the FAR radar and TimeZero with the instructions below.

2XX8 Configuration:
The ARPA target output must be setup through the LAN from one FAR2xx8. Hold "HL OFF" and press the "MENU" key 5 times. The Radar Installation menu will appear. Select "Next" (0), then "Other Settings" (3). Set "ECDIS" (4) to "LAN". Go back to the initial Radar Installation menu (first page), then select "TT Preset" (6), then "TT Data Output" (2). Set "Select Sentence" (2) to "TTM" and "TTM/TTD Reference" (3) to "TRUE".

TimeZero Configuration:
In order for the ARPA target to be received over the network, you need to configure it manually in the software:

- Open the Connection Wizard

- Select "Manual Port Configuration" and click on "Next"

- Select "Add/Configure UDP Connection" and click on "Next"

- Select the IP address that begins with 192.168.31.x from the "Network Adapter" drop down menu (or 172.31.x.x if the CLASS was changed) and type "10028" for the "UDP Port". Click on "Next"

- When TimeZero is done analyzing the port, select "UDP 10028" in the list on the left and make sure that "ARPA" is checked in the list on the right.

- Click "Next" then "Finish" to close the connection Wizard

Note: You can only use the ARPA data from one FAR radar on the network.

FAR 3xx0 Connection

The "Furuno Radar Module" needs to be unlocked

The FAR3xxx communicates directly with TimeZero via LAN1 of the processor unit.

IMPORTANT: You cannot mix and connect any NavNet sensors (DFF sounders or DRS radars) and FAR3xxx at the same time to TimeZero. NavNet sensors were designed to only operate on the "NavNet" network (172.31.x.x) which is incompatible with the FAR3xxx network (192.168.31.x). Note that it is NOT possible to use a second Ethernet card on the computer to connect NavNet sensors. This is because TimeZero can only use one Ethernet Card at a time for Furuno Sensor communication (Radar and Sounder).

Configure the Radar

Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together, a unique "Equipment ID" (and IP address) must be assigned to each processor and radar sensor. Note that for TimeZero to correctly detect the radar, at least one Radar Sensor Unit must be assigned to 192.168.31.101. Please refer to the Furuno Radar Installation Manual to properly setup Equipment ID (and IP address):

Processor Unit	
Equipment ID	CRA001
Equipment Name	No.1 Chart Radar
Equipment Type No.	FAR-3xx0
Subsystem	------
IP Address — Sensor Network	172 . 31 . 16 . 21
IP Address — Gateway Network	192 . 168 . 31 . 31
Serial No.	4395-2953

Radar Sensor Unit	
Equipment ID	RAS001
Equipment Name	No.1 Radar Sensor
Equipment Type No.	FAR-3xx0 SSD
Antenna Position	------
IP Address	192 . 168 . 31 . 101
Serial No.	

IMO Mode

When TimeZero is interconnected to the FAR3xxx via the network, the radar should be set to IMO Mode B. To set the IMO type, hold "HL OFF" and press the "MENU" key 5 times on the FAR3xxx. The "Radar Installation" (9) menu will appear. Select "Installation" (3), then "Type" (3). Set to "B".

Configure the computer
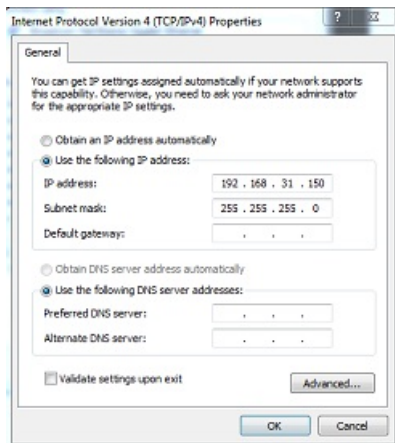
TimeZero connects to a Furuno FAR3xxx radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Radar Network (192.168.31.x / 255.255.255.0) in order to exchange information with the radar. We highly recommended using 192.168.31.150 as a fix IP address for the computer with a subnet mask of 255.255.255.0.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 192.168.31.150 with a subnet mask of 255.255.255.0:

Once the computer's IP address has been assigned, it is recommended to Ping the IP address of the Radar Sensor Unit (192.168.31.101) to make sure the network is correctly set up. For more information on how to ping an Ethernet device, refer to the How To Ping chapter. Once connectivity has been confirmed, launch TimeZero

Configure Instruments

Instruments (GPS, Heading, AIS, ...) need to be connected directly to the computer via NMEA0183 or NMEA2000. When connecting instruments to TimeZero, it is very important to make sure that the same GPS and Heading sources connected to the FAR radar are also used and connected to TimeZero. Connecting a different GPS and/or Heading source will result in radar overlay issue.
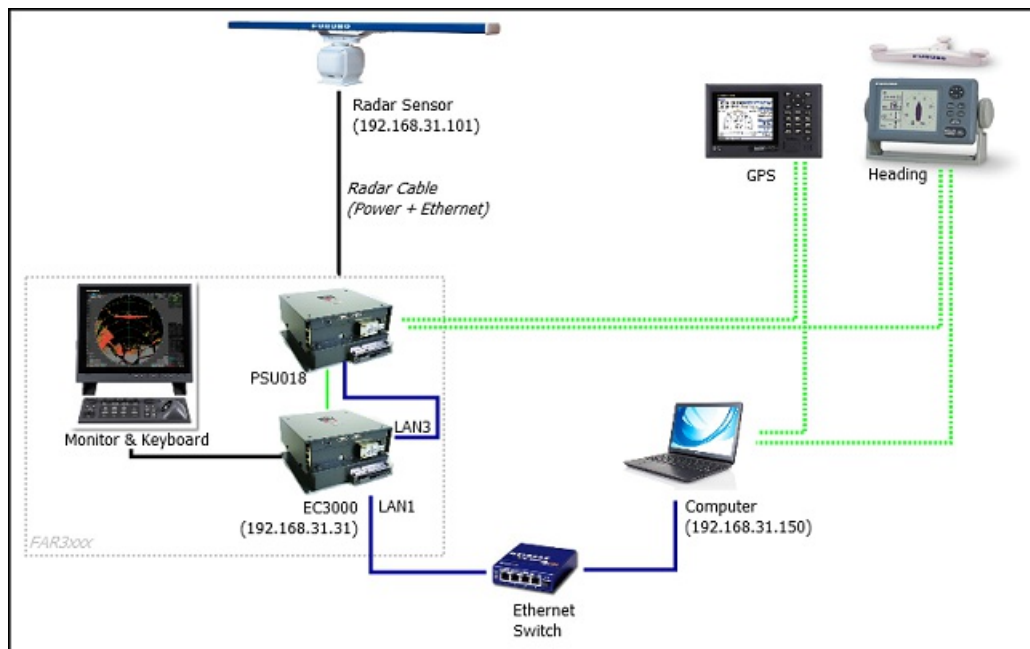
ARPA Configuration

At this time, TimeZero cannot "share" the same ARPA target with the FAR3xxx (unless a TTM serial output is configured). It is recommended to use TimeZero own local ARPA processing. This setting is adjusted from the TimeZero Radar Options by enabling "Enable Local TimeZero ARPA Processing".

DFF1 & BBDS1 Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

Computer Setup

The DFF1 or BBDS1 connect to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 class B network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Important: If you want to connect to the InSight Radar and to a Furuno Ethernet Sounder at the same time, please refer to the InSight Radar & Furuno Sounder chapter (a specific IP configuration needs to be adjusted on the PC) before continuing with the instructions below.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Sounder Setup

Make sure that the DFF1 or BBDS1 is set for the fix IP address mode. Remove the "MODE SW" rubber cap on the DFF1/BBDS1 side panel and make sure that DIP Switches are in the configuration "Down-Up-Up-Down":

Connect the DFF1/BBDS1 to the computer (directly or via a HUB/Switch).

Note: You can "Ping" the DFF1 or BBDS1 from the computer to make sure that the network connection in between the computer and the sounder is OK. The address of the DFF1 and BBDS1 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

TimeZero Settings

Open TimeZero in Navigation mode, select the Sounder Options and make sure that the "DFF1" or "BBDS1" is set as a Fish Finder Source.

Click on the "Transducer Setup" button. Select "TD-ID" if your transducer has this capability. If not, select "Model" to pick a model number or "Manual" to adjust the settings manually (frequency and power).

IMPORTANT: If you are setting up a BBDS1, "Manual" or "TD-ID" CANNOT be used. If you want the Bottom Discrimination to work properly, the transducer needs to be set to "Model" with a valid transducer model selected. If you have trouble with the Bottom Discrimination not appearing in TimeZero, please refer to the "Bottom Discrimination Troubleshooting" section below.

Note: Unless there is an MFD on the network and you want Heave compensation, there is no need to configure the Motion Sensor information.

Close TimeZero, restart the DFF1 or BBDS1 and restart TimeZero.

Select the Sounder Options again and make sure to adjust the "Transducer Draft" under "Sounder Initial Setup".

Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button

- Select "Manual Port Configuration" from the Connection Wizard

- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"

- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:

Note: In some instance, when the DFF1/BBDS1 is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

Advanced Troubleshooting

"Power OFF" Message

If TimeZero display "Power OFF" on the Sounder WorkSpace or you see no echo at all, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF1/BBDS1 from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF1/BBDS1 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

Bottom Discrimination not working (BBDS1 only)

If you use a BBDS1 and cannot see the Bottom Discrimination data (after enabling the feature from the "Layer" button), check the following points:

- The BBDS1 will ONLY send Bottom Discrimination data when the depth below transducer is over 5 Meters (17 Feet). If you are configuring the sounder at the dock with less than 5 meters of water, the bottom discrimination data will NOT appear. You will have to perform a sea trial. It is recommended to restart the BBDS1 (cycle the power) at least once in depth over 5 meters.

- Bottom Discrimination data will ONLY work with selected Transducers. Please contact your Furuno dealer for compatible transducer.

- Bottom Discrimination data will ONLY work if the Transducer Setup has been set up to "Model Number". If the transducer was previously set to "Manual" or "TD-ID" and switching it to "Model Number" does not seem to enable Bottom Discrimination, it is recommended to perform a Master Reset of the Sounder (see below).

How to perform a Master Reset of the sounder:

If TimeZero displays a white screen even after adjusting the Transducer Setup, it is recommended to perform a Master Reset of the DFF1/BBDS1 and try the configuration again. To perform a Master Reset of the sounder:

- Start TimeZero open the "Sounder" Options, select the DFF1 or BBDS1 under "Fish Finder Source" and click on "Set Hardware to factory" default. Close the Options but leave TimeZero open and connected to the Sounder
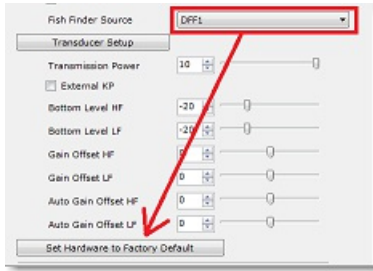
- Remove the DFF1/BBDS1 cover (leave the Sounder ON)

- Set the DIP 4 inside the DFF1/BBDS1 to ON (while the sounder is ON), then press on the red button (located on the top near the middle) and release it
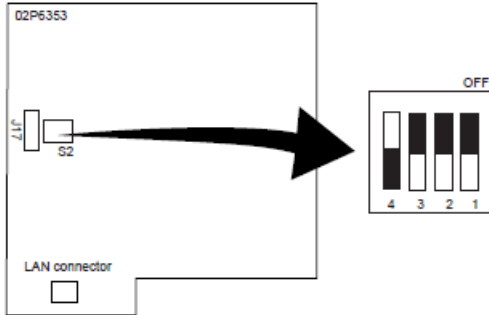
- Wait for approximately 20 seconds (until the LED flash ON and OFF on the Sounder board)

- Set the DIP switch 4 back to the OFF position

- Go back to TimeZero and configure the Sounder Transducer settings from the "Sounder" Options.

IMPORTANT: It is important to perform the Sounder Reset (turning the DIP switch ON then OFF) while the Sounder is powered ON and if possible with TimeZero open. There is no need to turn OFF the sounder during that procedure

DFF1-UHD Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

Computer Setup

The DFF1-UHD connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.
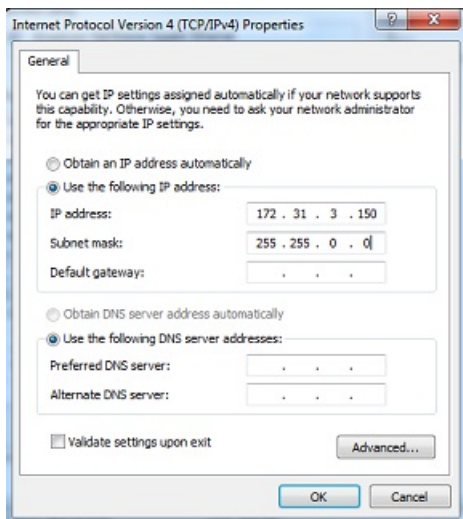
Important: If you want to connect to the InSight Radar and to a Furuno Ethernet Sounder at the same time, please refer to the InSight Radar & Furuno Sounder chapter (a specific IP configuration needs to be adjusted on the PC) before continuing with the instructions below.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

If the DFF1-UHD is directly connected to the computer, make sure that the DFF1-UHD is set for the fix IP address mode. Open the DFF1-UHD cover and make sure that the "S2" DIP Switches 1 and 2 are set to the OFF position (all DIP Switches should be in the OFF position):
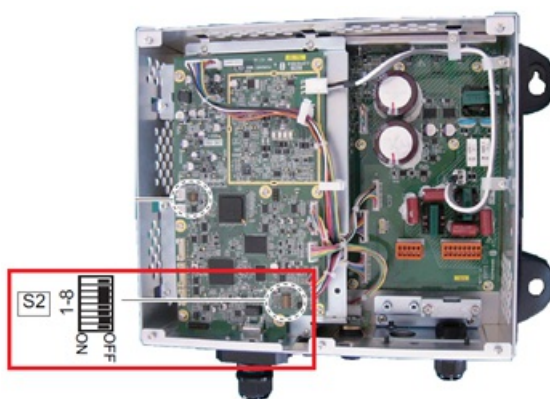
Connect the DFF1-UHD to the computer (directly or via a HUB/Switch).

Note: You can "Ping" the DFF1-UHD from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF1-UHD to ping is: 172.31.92.2. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

IMPORTANT TD-ID (XID) INFORMATION: In some instance the TD-ID (XID) wire (orange wire connected to PIN 3 of TB4 connector) can cause problem. It is recommended to disconnect the orange wire and proceed to a Master Reset of the Sounder (see at the end of this chapter). After performing the master reset, follow the instructions below to manually set the transduce settings.

TimeZero Settings

Open TimeZero in Navigation mode, select the Sounder Options and make sure that the "DFF1-UHD" is set as a Fish Finder Source.

Click on the "Transducer Setup" button. Select "Model" and select the corresponding transducer model:
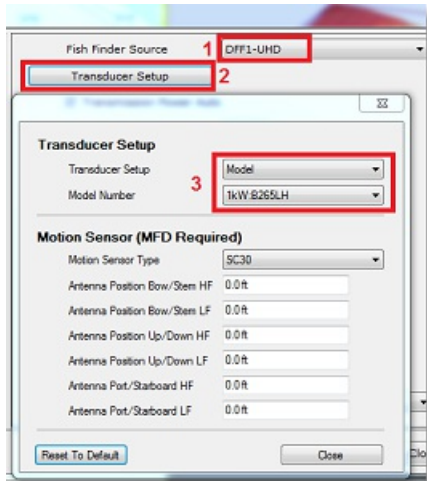
IMPORTANT TRANSDUCER INFORMATION: We recommend using the Airmar transducer B265 or CM265 with the DFF1-UHD. Other "Low High" CHIRP transducers such as the 175LH, 109LH or 509LH may be used, however the accuracy of both ACCU-FISH and Bottom Discrimination modes will not be guaranteed. In this case, put the transducer settings to "Model Number" and select "B265LH". Please refer to a Furuno dealer for more information on the DFF1-UHD sounder and compatible transducers.

Note: Unless there is an MFD on the network and you want Heave compensation, there is no need to configure the Motion Sensor information.
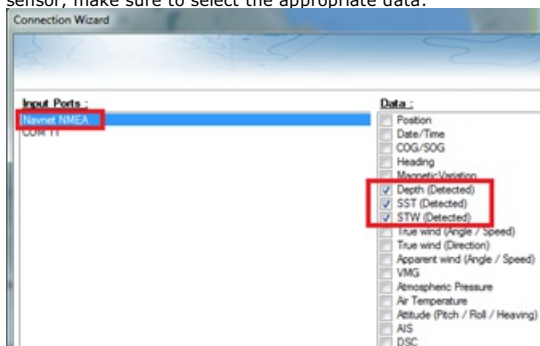
After doing any change to the Transducer Setup window, the DFF1-UHD **needs to be restarted** (to lock the settings in the DFF1-UHD memory). Exit TimeZero then unplug and plug back the DFF1-UHD power cable. Restart TimeZero.

Select the Sounder Options again and make sure to adjust the "Transducer Draft" under "Sounder Initial Setup". Make sure to also adjust the proper "Temperature Port". Most transducers have a built in temperature sensor and the information is sent through the transducer cable. In that case, select "Low Frequency" for "Temperature Port" selection. If you have an independent temperature sensor connected to the "MJ" port, select "MJ".

Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button

- Select "Manual Port Configuration" from the Connection Wizard

- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"

- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:

Note: In some instance, when the DFF1-UHD is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

Advanced Troubleshooting

"Power OFF" Message

If TimeZero display "Power OFF" on the Sounder WorkSpace or you see no echo at all, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF1-UHD from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF1-UHD to ping is: 172.31.92.2. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

"Blank" Screen (no echo even when gain is set to maximum):

If TimeZero displays a "blank" (empty) screen even after changing the Transducer Setup and restarting the DFF1-UHD, it is recommended to remove the orange wire (XID wire), perform a Master Reset of the DFF1-UHD and try the configuration again. To perform a Master Reset of the sounder:

- Disconnect the DFF1-UHD from the network and power it OFF (remove power)

- Remove the DFF1-UHD cover (leave the Sounder OFF)

- Set the "S2" DIP switch No. 4 to ON (while the sounder is OFF)
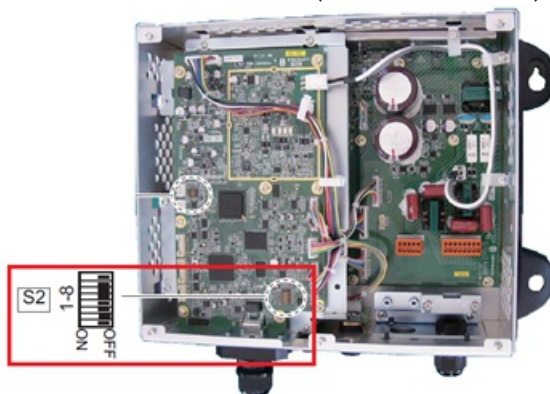
- Power ON (connect power) the Sounder and wait 1 minute or two minutes

- Power OFF the sounder, set DIP switch number 4 back to the OFF position

- Connect the DFF1-UHD back to the network

- Power ON the Sounder and confirm that the LED blink fast (twice per second) after 1 minute of boot up

- Start TimeZero and configure the Sounder Transducer settings from the "Sounder" Options

- Close the Options window and exit TimeZero

- Restart the DFF1-UHD (disconnect and reconnect power)

- After 1 minute, confirm that the DFF1-UHD led blink slowly (once every 2 seconds)

- Start TimeZero

Bottom Discrimination not working:

If you cannot see the Bottom Discrimination data (after enabling the feature from the "Layer" button), check the following points:

- The DFF1-UHD will ONLY send Bottom Discrimination data when the depth below transducer is over 5 Meters (17 Feet). If you are configuring the sounder at the dock with less than 5 meters of water, the bottom discrimination data will NOT appear. You will have to perform a sea trial. It is recommended to restart the DFF1-UHD (cycle the power) at least once in depth over 5 meters.

- Bottom Discrimination data will ONLY work with selected Transducers. For example, the bottom discrimination will NOT work with the B275LH-W. Please contact your Furuno dealer for compatible transducer.

- Bottom Discrimination data will ONLY work if the Transducer Setup has been set to "Model Number". "TD-ID" is NOT recommended. In some instance, it appears that the TD-ID configuration is not sending proper transducer information to the DFF1-UHD. In these cases, the TD-ID wire of the transducer needs to be disconnected to allow the transducer to be manually selected to the specific model. Remove the TD-ID orange wire which is connected to PIN3 of the TB4 connector. Once the orange wire has been removed, restart the DFF1-UHD and TimeZero, then set the Transducer Setup by Model Number and pick the corresponding Transducer Model.

DFF3 Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

Computer Setup

The DFF3 connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.
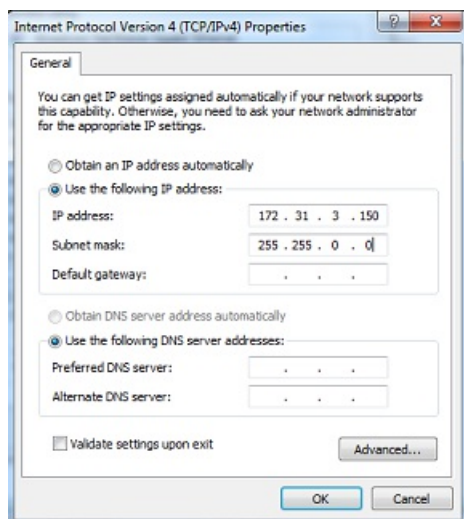
Important: If you want to connect to the InSight Radar and to a Furuno Ethernet Sounder at the same time, please refer to the InSight Radar & Furuno Sounder chapter (a specific IP configuration needs to be adjusted on the PC) before continuing with the instructions below.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Sounder Setup

Make sure that the DFF3 is set for the fix IP address mode. Open the DFF3 cover and make sure that "S2" DIP Switches 1 and 2 are set to the ON position (all other DIP Switches to OFF):
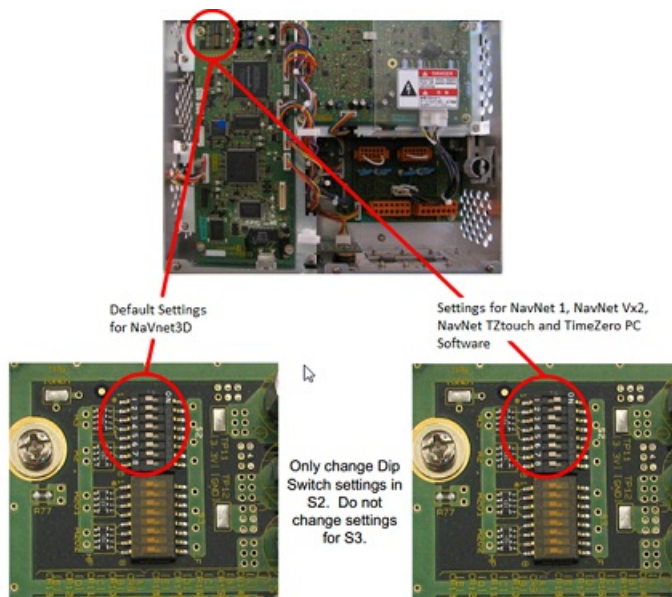
Connect the DFF3 to the computer (directly or via a HUB/Switch).

Note: You can "Ping" the DFF3 from the computer to make sure that the connection in between the computer and the sounder is OK. The address of the DFF3 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

TimeZero Settings

Open TimeZero in Navigation mode, select the Sounder Options and make sure that the "DFF3" is set as a Fish Finder Source.

Click on the "Transducer Setup" button. Select "TD-ID" if your transducer has this capability. If not, select "Model" to pick a model number or "Manual" to adjust the settings manually (frequency and power):
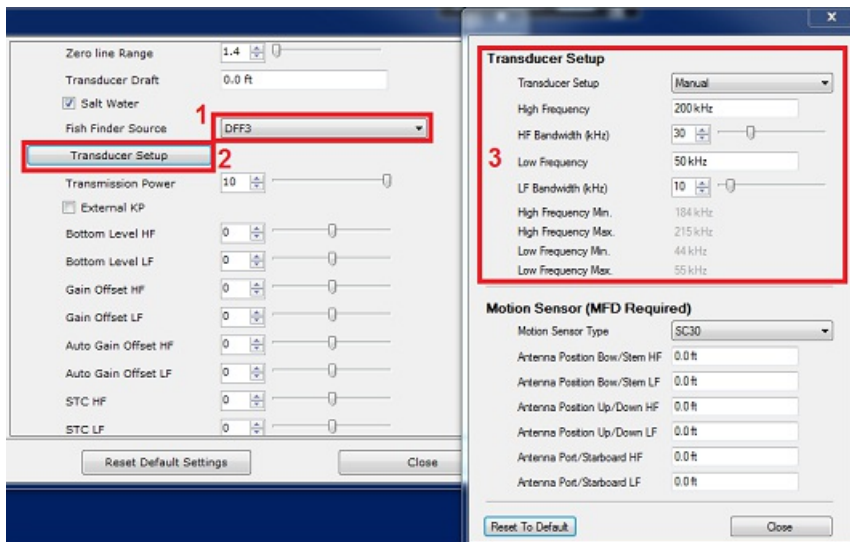
Note: Unless there is an MFD on the network and you want Heave compensation, there is no need to configure the Motion Sensor information.
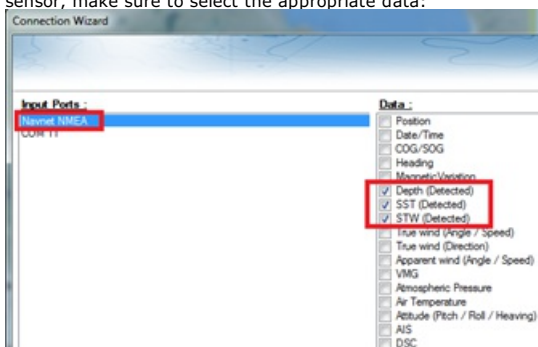
After doing any change to the Transducer Setup window, **the DFF3 needs to be restarted** (to lock the settings in the DFF3 memory). Exit TimeZero, and unplug and plug back the DFF3 power cable. Restart TimeZero.

Select the Sounder Options again and make sure to adjust the "Transducer Draft" under "Sounder Initial Setup". Make sure to also select the proper "Temperature Port". Select either "Low Frequency", "High Frequency" or "MJ Port" according to where the temperature sensor is connected.

Close the TimeZero Options and select the Sounder WorkSpace: you should see the sounder picture scrolling on the screen. Adjust the Sounder Range to get a good view of the bottom (it is recommended to set the mode to Auto Fishing).

Note that the depth, temperature and speed data is sent to TimeZero via the Ethernet connection on the NavNet NMEA port. Follow the instructions below to configure the NavNet port:

- Select "Connection Wizard" that can be found under the "TimeZero" button

- Select "Manual Port Configuration" from the Connection Wizard

- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"

- Make sure that at minimum "Depth" is checked for the "NavNet NMEA" port. If the transducer has a Speed and/or Temperature sensor, make sure to select the appropriate data:

Note: In some instance, when the DFF3 is connected to a transducer **without** speed sensor, it will still send a wrong "STW" value (that will always be set to 0). In that case, make sure to **uncheck** "STW" from the Connection Wizard.

- Click on "Next" and "Finish" to close the Connection Wizard

Advanced Troubleshooting

"Power OFF" Message

If TimeZero display "Power OFF" on the Sounder WorkSpace, it means that the sounder is not recognized on the network. Check the IP address of the computer (make sure the subnet mask is set to 255.255.0.0) and check the cable(s). You can "Ping" the DFF3 from the computer to make sure that the connection in between the computer and the sounder is OK. The address if the DFF3 to ping is: 172.31.92.1. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

How to perform a Master Reset of the sounder:

If TimeZero displays a blank" (empty) screen even after changing the Transducer Setup and restarting the DFF3, it is recommended to perform a Master Reset of the DFF3 and try the configuration again.

- Disconnect the DFF3 from the network and power it OFF (remove power)

- Remove the DFF3 cover (leave the Sounder OFF)

- Set the "S2" DIP switch 8 to ON (while the sounder is OFF)
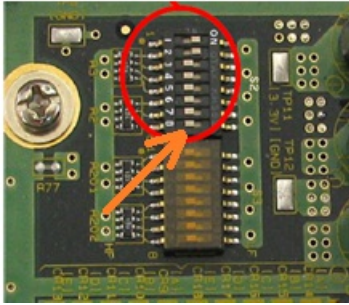
- Power ON (connect power) the Sounder and wait 1 or 2 minutes

- Power OFF the sounder, set DIP switch 8 back to the OFF position

- Connect the DFF3 back to the network

- Power ON the Sounder and confirm that the LED blink fast (every 0.5 sec) after 1 minute

- Start TimeZero and configure the Sounder Transducer settings from the "Sounder" Options

- Close the Options window and exit TimeZero

- Restart the DFF3 (disconnect and reconnect power)

- After 1 minute, confirm that the DFF3 led blink slowly (once every 2 seconds)

- Start TimeZero

FCV1150 Sounder

The "Furuno Sounder Module" needs to be unlocked prior to configure a Furuno Ethernet Sounder in TimeZero.

Computer Setup

The FCV1150 connects to the PC through an Ethernet connection (100Base-T). All the Furuno Ethernet sensors (including Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 network. You will have to setup your computer IP address to match that network. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.
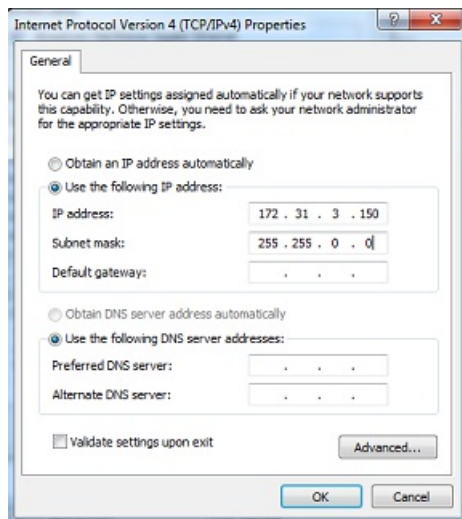
Important: If you want to connect to the InSight Radar and to a Furuno Ethernet Sounder at the same time, please refer to the InSight Radar & Furuno Sounder chapter (a specific IP configuration needs to be adjusted on the PC) before continuing with the instructions below.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:

Sounder Setup

IMPORTANT: In order to connect properly to TimeZero, the FCV1150 internal software must be v3.02 or above

Make sure that the FCV1150 is in "NavNet" mode (in order to enable the network connection of the FCV1150). To access the setup menu, power ON the FCV1150 while pressing the [MENU] key:
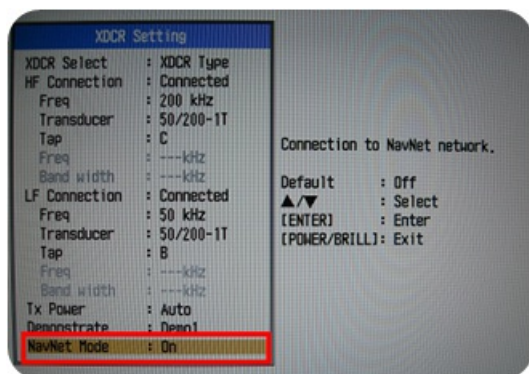
Once the NavNet mode has been enabled restart the FCV1150.

The FCV1150 can be used in "FCV1150" or "NavNet" control mode. This setting can be adjusted from the "NavNet" menu:
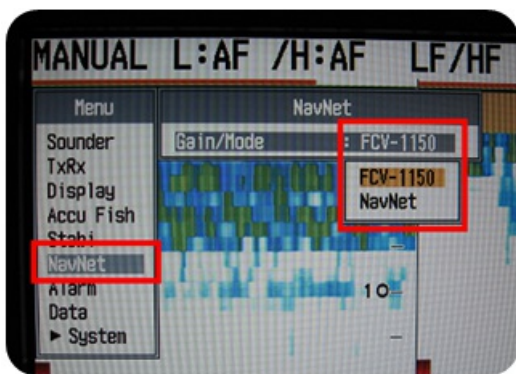
When the FCV1150 is setup in "NavNet" mode, the hardware knobs located on the FCV1150 will be disabled and TimeZero will have full control over the various settings (Gain, Mode, Range, etc...). When the Sounder is setup in "FCV1150" mode, TimeZero will only be able to control the Range and Shift of the FCV1150 (all the other controls such as gain and mode will have to be adjusted using the hardware knobs on the FCV1150 itself). Most users will want to setup the sounder in "FCV1150" mode in order to be able to use the knob of the sounder.

Configure all the initial Sounder settings directly from the FCV1150 (please refer to the FCV1150 installation guide).

TimeZero Setup

Launch TimeZero in Navigation Mode. Select the Connection Wizard and perform an "Automatic Detection". TimeZero will automatically detect the depth available on the network (sent by the Ethernet Sounder on the "NavNet NMEA" port).

If the sounder is not sending depth information while performing the Automatic Detection, you will have to manually add a NavNet Port:

- Select "Manual Port Configuration" from the Connection Wizard

- Select "Add/Configure NavNet Connection" and click on "NMEA & AIS"

- Make sure that "Depth" is checked for the "NavNet NMEA" port
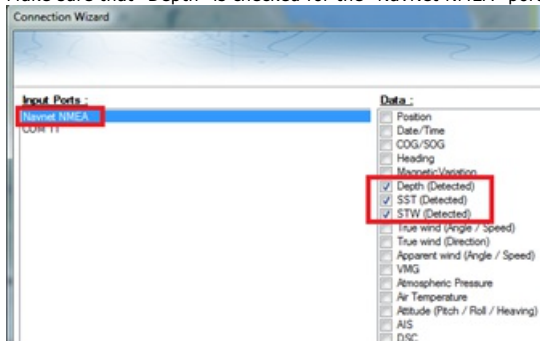
Note: If the transducer has a temperature and speed sensor, you will also receive Speed Through Water (STW) and Sea Surface Temperature (SST) through the network.

IMPORTANT: The resolution of the Sounder might be greatly degraded in TimeZero if you start the software while the FCV1150 Display Mode is set on "User 1" or "User 2" (knob on the front). It is recommended to set the FCV1150 to a regular display mode (such as Single or Dual Frequency display) when starting TimeZero.

InSight Radar Connection

The "InSight Radar Module" needs to be unlocked prior to configure an InSight 2 series Radar in TimeZero. Please note that TimeZero is **only** compatible with Ethernet Based Radar (it is not compatible with older Serial 2kW dome or with the IR2BB)

Introduction

TimeZero is compatible with all the MDS Ethernet InSight Radars (Koden radars with MDS5 or MDS6 control box). TimeZero is also compatible with the Ethernet 2kW Dome Radar (MDS1R and MDS8R Koden radars). The InSight Radar connects to the PC through the control box using an Ethernet connection (100Base-T). In order for TimeZero to display and control the radar, the PC and the Radar must be on the same IP network and subnet.

Direct Connection or connection via HUB/Switch:
The Koden InSight Radar operates on 192.168.0.x / 255.255.255.0 if there is no router on the network. In this case the Radar will automatically assign itself an IP address of 192.168.0.1 / 255.255.255.0 and you will have to manually set the computer with an IP address on that same subnet (usually 192.168.0.100/255.255.255.00).

Connection via a Router (DHCP Server):
If you have a router on the network (with DHCP capability), the Radar and the PC will automatically get their IP addresses from the router. You should not have to configure the IP addresses.

Note: The Radar Setup Wizard will show you the IP address of the Radar (default Nickname). This can be useful for troubleshooting (ping the radar). However, there is no guarantee that the radar IP address will never change in the future (because the Router can dynamically assign new IP address). If your router can "reserve" specific IP address for specific hardware (using the MAC address), it is recommended to reserve one for the Radar. That way the radar will always keep the same IP address (easier for future troubleshooting). Please refer to the documentation of your Router.

Once the Radar and Computer are on the same network, the Radar Installation Wizard is used to detect the radar on the network. Once the Radar is detected, TimeZero can be open.

Note: The Radar initial configuration (such as Heading Align, Transmit Trigger, etc.) can be made from the Radar Installation Wizard or from TimeZero.
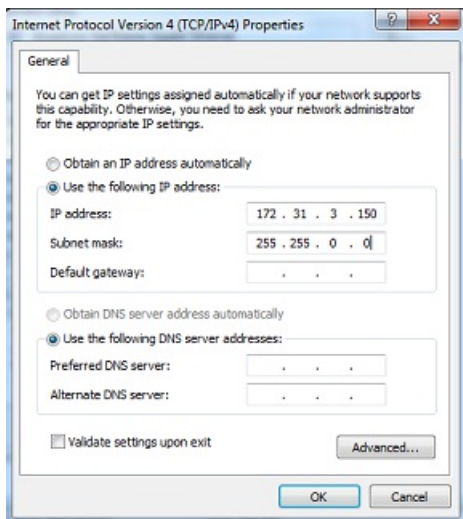
Important: If you want to connect to the InSight Radar and to a Furuno Ethernet Sounder at the same time, please refer to the InSight Radar & Furuno Sounder chapter (a specific IP configuration needs to be adjusted on the PC).

Set the IP address:

Connection without a Router:

If you connect the radar directly to the PC (using a crossover cable) or via a HUB or Switch, you have to manually assign an IP address to the PC.

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the radar (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the radar, you can temporary disconnect the Ethernet Cable connected to the radar from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 192.168.0.100 and subnet mask 255.255.255.0:

Connection with a Router:

The IP addresses of the computer and Radar should be automatically assigned by the router (DHCP Server). Just make sure that the Router is powered ON and connected to the Computer and Radar.

Note: For troubleshooting, we recommend to write down the IP and Subnet Mask of the Computer. This way, it will be possible to compare the IP address of the PC and Radar later to make sure they are on the same subnet. Follow the instruction below to discover the IP address of the PC: Click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Under Windows

8 or 10 you can press the combination shortcut "Windows Key" + X and select directly the Control Panel. Once the Network and Sharing Center window is opened, click on "Change Adapter Settings". Double click on the Network Adapter connected to the radar (usually "Local Area Connection"). Select "Details" on the "Local Area Connection Status" window. This will display the IPv4 Address and IPv4 Subnet Mask.

Detecting the radar

Make sure that TimeZero is closed, right click on the TimeZero shortcut and select "Open File Location" (this will open the "Professional Recreational" folder located in "TimeZero" under the Program Files). Double click on the "Radar Installation Wizard" shortcut to launch the Radar Setup Wizard.

Note: TimeZero needs to be closed while the Radar Installation Wizard is opened, but note that TimeZero needs to be activated and needs to have been open at least one time before launching the Wizard. The Radar Setup Wizard will create a "RADAR.INI" file that needs to be stored in "*C:\ProgramData\TimeZero_REC\PreferencesTimeZero*". This folder is created by TimeZero the first time it is opened.

Follow the on-screen instructions of the Wizard. The radar should be automatically detected and displayed as below:

Note: If the wizard does not seem to detect the radar (after waiting a long time), just Power OFF and ON the radar. Check Ethernet Cable and HUB/Switch for traffic activity. Try to turn OFF the firewall of the computer.

The next page of the wizard, will display the IP address of the Radar (default Nickname of the Radar). It is recommended to write down that IP address for troubleshooting. On the example below, the Radar is getting its IP address automatically from the Router and we can learn by reading the default Radar Nickname that its IP is currently 192.168.1.101:
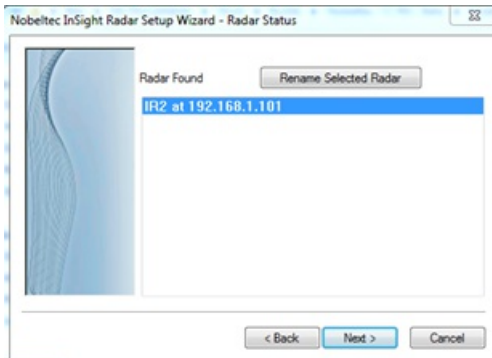
Note: If you notice that the IP address of the Radar does not match the same network as the computer, make sure to adjust the Computer IP address.

The next page will allow you to confirm that the radar is properly working. The radar will automatically start to transmit after warming up. You should see some messages exchanged in between the Radar and PC and a small radar picture in the "Radar Viewer":
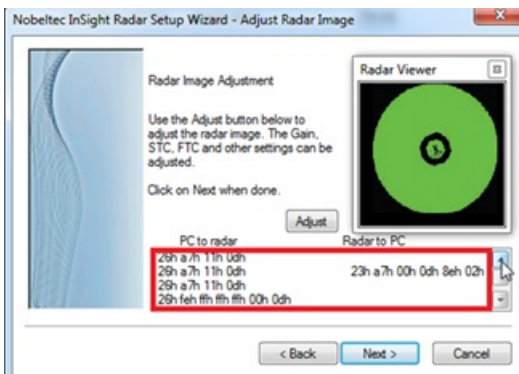
You can click the "Adjust" button to change the Range and some Parameters (Gain. Sea, etc.), however, you don't have to setup the initial radar settings from within the Wizard as you can perform the adjustment from within TimeZero (that offers a better view of the radar).

Note: If the Radar Installation Wizard detects the radar but do not display any picture (or is stuck on the message "Warming Up"), it might be caused by multiple network adapters or by having the PC on the wrong subnet or wrong IP. First, make sure to disable any other network adapter, double check the IP address of the PC (for IP and subnet) and try again. You can also try to look and change the subnet of the "Radar.ini" file

manually (see "Advanced Troubleshooting" below).

When you are done, click on "Next" then "Finish" to close the Radar Installation Wizard.

TimeZero Configuration

Open TimeZero in Navigation mode and select the "Radar" WorkSpace.

Note: If the radar WorkSpace is not available, make sure that the "InSight Radar Module" is activated

From the Radar Options, make sure that the Radar Host name is selected under "Radar Host":
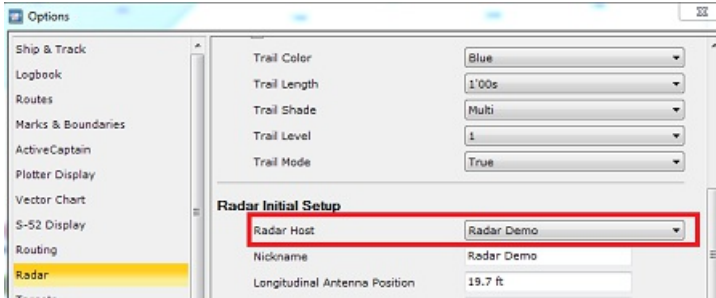
Close the Options, Transmit the Radar, then open the Radar Options again to adjust the various initial setup:
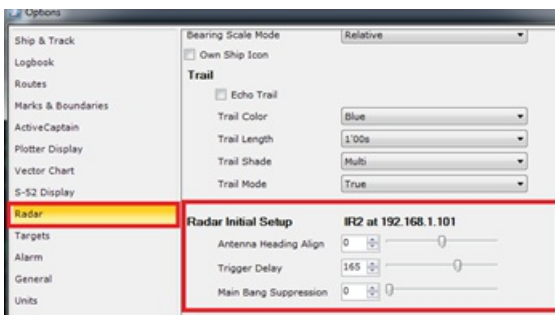
Make sure to review the Radar Options chapter to learn how to adjust the various settings.

IMPORTANT: The Radar Overlay (displaying the Radar Picture on top of the chart) is ONLY available when a GPS and Heading sensors are connected and configured.

Advanced Radar Troubleshooting

When the Radar Setup Wizard is closed, it creates a "RADAR.INI" file located in "*C:\ProgramData\TimeZero_REC\PreferencesTimeZero*" (hidden folder). This file stores the radar information and is used by TimeZero. You can open that file with a text editor such as Notepad for troubleshooting. Some interesting values are the Radar MAC Address and Subnet Mask:
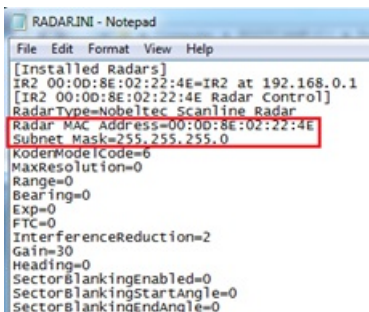
Make sure that the subnet mask match the one of the PC. In some cases (when having multiple network adapter for example), the radar installation wizard might detect the wrong adapter and write in the file the wrong subnet mask.

Note that the radar IP address is not saved in this file (the Nickname might contain the initial IP address of the radar, but this value is not updated if a DHCP server is used). It is possible to retrieve the Radar IP address by using the command "arp –a". This will display a corresponding list of MAC address and IP address:
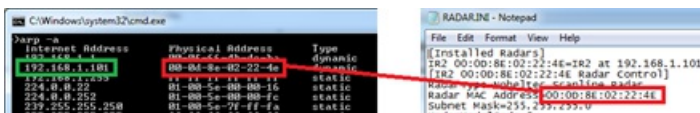
Note: Most router web interface also allows you to look for the Radar IP from the MAC address table

Once you know the IP address of the Radar, you can "Ping" the radar from the computer to make sure that the connection in between the computer and the radar is OK. For more information on how to ping an Ethernet device, refer to the How To Ping chapter.

Radar Initial Setup

Heading Align

It is not always possible to install a radar so that the front of the radar is exactly parallel with the boat's keel or center line. The Antenna Heading Align adjustment can compensate for this discrepancy. This process allows you to align the radar transceiver with the center line of the boat and only needs to be set once. Note that this is a different function than aligning your heading sensor. To adjust the Radar Antenna Alignment, it is best to display the Radar Work Space in "Head Up" mode and aim the bow of your vessel (during calm weather) at a buoy while underway. The buoy target should appear straight up on the Radar Screen.

Trigger delay

After successfully installing the radar, transmit trigger delay should be reviewed and adjusted in order to compensate for cable transmission delays. Longer cables generally require a higher trigger delay setting. Trigger delay should be initially set to reduce the size of the ring. Trigger Delay can also affect the radar image of a linear object such as a breakwater or riverfront. These can appear deformed due to excessive or inadequate trigger delay. Properly setting the delay requires to look at a straight object (refinement of the Transmit Trigger is best viewed using radar overlay on the Chart). On the water adjustment when the boat is parallel to a straight jetty is the ideal choice.

Inadequate Tx Trig   Good Tx Trig   Excessive Tx Trig
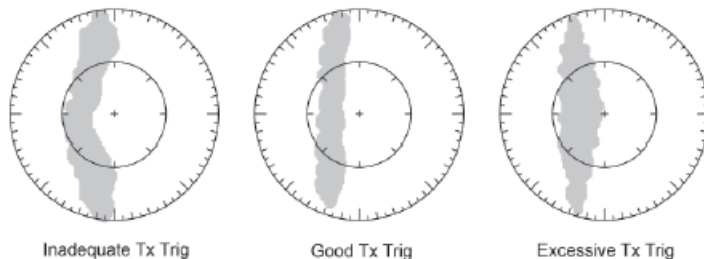
In most cases, Transmit Trigger settings remain between 125 and 160.

Auto Tune (InSight Radar with MDS box only)

InSight radars are always in "Auto Tune" mode. To optimize the image, it is necessary to set the auto tune preset. Once established, you should not need to adjust the auto tune preset unless the image quality deteriorates. Generally, you should adjust the auto tune preset on average once a year to make sure you have the highest quality image.

Follow these steps:

- Select the Radar Work Space and transmit the radar at 3NM. Make sure that you see a radar picture.

- Open the Radar Options and scroll to the "Initial Setup" Category

- Adjust the auto tune control down until you see the image start to deteriorate. Note the value of the setting.

- Adjust the auto tune control up past the point where the image looks good until it starts to deteriorate. Take note of the setting value.

- Set the controls at a point between the two extreme settings, where the quality of the image is at its best.

Radar Presets (InSight Radar with MDS box only)

The Presets settings are used to adjust the "range of operation" of specifics value. For example, if you are using the Radar in Manual Gain and find that you have to "push" the manual gain value very high to see good targets, you may want to increase the "Manual Gain Preset". This will internally increase the manual gain value range and you will be able to reduce the manual Gain value to reach the same level of gain. Note that you have an independent Manual and Automatic Preset for Gain and the Sea Clutter (STC). The various controls will be enabled or greyed out according to the Radar current value. So if you want to adjust the Manual Gain Preset, make sure that the Radar is in Manual Gain.

- *Auto Gain Preset:* To adjust the Auto Gain preset make sure that the Sea Clutter is set to 0 (manual Sea = 0). Set the Radar to Auto Gain (from the "Layer" button) and pick a range suitable for navigation (around 3NM). Adjust the Auto Gain Preset control down if the image looks too strong or up if the image looks too faint.

- *Manual Gain Preset:* To adjust the Manual Gain preset make sure that the Sea Clutter is set to 0 (manual Sea = 0). Set the Radar to Manual Gain at 50% (from the "Layer" button) and pick a range suitable for navigation (around 3NM). Adjust the Manual Gain Preset control down if the image looks too strong or up if the image looks too faint.

- *Auto Sea Preset:* The Auto Sea Preset is only used for range above 1NM (under 1NM TimeZero uses the Auto Harbor Sea preset instead). To adjust the Auto Sea preset, set the radar range to 12nm and select Auto Sea (from the "Layer" button) to turn on that function. Set the Auto Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Auto Sea preset value up until most of the weak echoes for an 8nm radius are eliminated. Adjust the radar range to 1.5nm and verify that strong echoes from nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Auto Sea preset.

- *Manual Sea Preset:* To adjust the Manual Sea preset, set the radar range to 12NM and set the Sea Clutter to Manual at 50% (from the "Layer" button). Set the Auto Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Manual Sea preset value up until most of the weak echoes for an 8nm radius are eliminated. Adjust the radar range to 1.5nm and verify that strong echoes from

nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Manual Sea preset.

- *Auto Harbor Sea Preset:* To adjust the Harbor Sea Clutter Preset, set the radar range to 1NM and select Auto Sea (from the "Layer" button) to turn on that function. Set the Harbor Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Auto Harbor Sea preset value up until most of the weak echoes are eliminated. Adjust the radar range to 1/8nm and verify that strong echoes from nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Auto Harbor Sea preset.

- *Auto Tune Preset:* InSight radars are always in "Auto Tune" mode. To optimize the image, it is necessary to set the auto tune preset. Once established, you should not need to adjust the auto tune preset unless the image quality deteriorates. Generally, you should adjust the auto tune preset on average once a year to make sure you have the highest quality image. Adjust the auto tune control down until you see the image start to deteriorate. Note the value of the setting. Adjust the auto tune control up past the point where the image looks good until it starts to deteriorate. Take note of the setting value. Set the controls at a point between the two extreme settings, where the quality of the image is at its best.

- *STC Curve:* The STC Curve function allows you to control all modes of the Sea Clutter profile of the radar. By default, the STC Curve profile is set to a value of 4. For most applications, there should be no need to change this setting. However, you may want to adjust this value to get a better application of Sea Clutter if the radar is mounted higher or lower than a typical installation. To adjust the STC Curve profile, set the radar range to 12nm, set Gain and Sea Clutter to manual settings (from the "Layer" button). When the STC curve profile is set to a lower number, the sea clutter is only applied in an area closer to the vessel. Setting the curve profile to a higher number causes STC to be applied to more of the image. Note that if the STC curve profile is not set correctly, adjusting the sea clutter (manual or automatic) may not have the desired impact. If you notice that increasing the sea clutter control has no impact on the image, your STC curve profile is too low. On the other hand if you notice that echoes disappear too quickly, your STC profile may be too high

InSight Radar & Furuno Sounder

Introduction:

All the Furuno Ethernet sensors (including the Ethernet sounders) only operate on the 172.31.x.x / 255.255.0.0 Class B network. The Nobeltec InSight Radar operates on a different network (usually 192.168.0.x / 255.255.255.0 if there is no router on the network).

In order for the computer to communicate with both the Furuno Ethernet Sounder and the Nobeltec InSight radar at the same time, the computer needs to be manually assigned two IP addresses:

- The IP address to communicate with the Furuno Sounder must be set to 172.31.3.150/255.255.0.0

- The IP address to communicate with the InSight Radar varies according to the network setup:

• If there is no router on the network (just HUB or Switch), the IP address must be manually set to 192.168.0.100 / 255.255.255.0

• If there is a router (DHCP Server) on the network, the IP address must be manually set to something compatible with the Router. To determine a compatible IP address, leave the computer IP in automatic mode and look at the IP address assigned automatically by the router (using the IPCONFIG command or by looking at the Status of the Ethernet Connection). Once you know the IP address given automatically by the router (for example 192.168.1.17), manually assigned the same IP address by just changing the last digit to a higher number (safer) such as 192.168.1.200

Note: If the router is used to access the Internet, make sure to enter the IP address of the router for the default gateway and DNS server. Usually the IP address of the router will end with "1" (192.168.1.1 in this example).

Dual IP address configuration:

Open the "Network Connections" control panel of your computer to adjust the IP address. Under Windows 8.1 and Windows 10 you can press the combination shortcut "Windows Key" + X and select directly the "Network Connections". Under Windows 7, click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Once the Network and Sharing Center window is opened, click on "Change Adapter Settings".

Double click on the Network Adapter connected to the sounder (usually "Local Area Connection").

Note: If you have multiple Area Connections (multiple Ethernet Cards) and if you don't know which one is connected to the sounder, you can temporary disconnect the Ethernet Cable connected to the sounder from the computer and look at which icon will display a red cross. This will indicate the LAN that has been disconnected from the computer, and thus the one that needs to be configured.

Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address (172.31.3.150) and subnet mask (255.255.0.0) corresponding to the Furuno network then click on "Advanced":
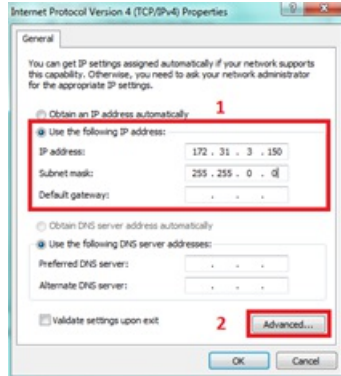
Click on "Add":
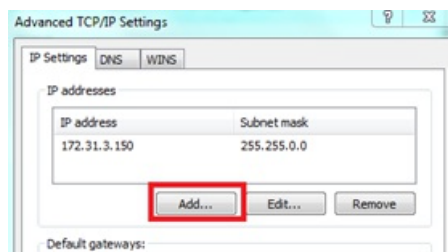
Enter the fix IP address of the InSight radar (192.168.0.100 or the one that has been identified if a Router is used) and subnet mask (255.255.255.0) then click on "Add":
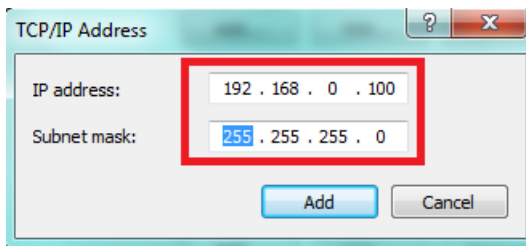
Note: If you use a router to access the Internet, enter the router IP address for the default gateway and DNS server

Your computer will now be assigned with two IP addresses and will be able to talk on both networks (the Furuno Network and the InSight Radar network):
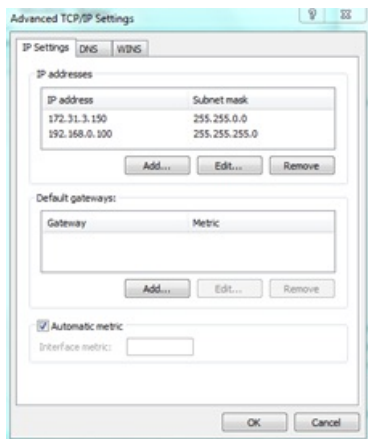
Click on "OK" to save the changes and close the various windows.

Continue the configuration of the InSight Radar and Furuno Sounder as usual (refer to corresponding chapter)

Important: If you need to configure two computers on the same network, simply increment the IP addresses of the second computer: 172.31.3.151/255.255.0.0 and 192.168.0.101/255.255.255.0

Import & Export Data

Backing-up and Restoring Data:

When you want to backup your data or when you want to "clone" your data on another computer, it is recommended to use the "Collection". A collection conveniently groups all objects (routes, marks, objects, tracks, ...) in one file.

To backup all your data, select "Backup Collection" from the menu.

To restore all your data, select "Open Collection" from the menu.

Note that the charts or settings are not backed up inside a collection. You will have to re-install the charts if you want to transfer your data to another PC. The settings are not saved into the collection, however, it is possible to save the user settings by using Save the User Interface from the menu.

IMPORTANT: When importing a collection, your current data will be overwritten with the data contained in the Collection. If you want to exchange data with another user (and merge the data) you have to use the TZX format from the "Import/Export" Wizard (see below).

Importing Data

Select "Import/Export" from the menu to import data from the following format:

Note: Imported data is merged with your existing data

Data:

- **TimeZero Exchange (TZX files):** this format is used to exchange all type of user objects (including tracks) in between TimeZero users. This format guaranties the full integrity of the data (it supports Routes, Marks, Tracks & Objects).

- **Legacy TimeZero User Data (TZD files):** this format is used to exchange data with older version of TimeZero software.

- **GPS Exchange (GPX files):** this "open source" format is often used by third party software or converter. It is primary used to exchanged Marks, but you can also import tracks and boundaries. Note that when importing GPX file from third party application, custom icon and color will be lost.

- **Google Map (KML & KMZ files):** this format is primary used to exchange data with Google Earth. Marks, Boundaries (lines / areas), and Tracks are supported.

- **Furuno NavNet 3D (CSV files):** this format is used to import Routes and Waypoints from Furuno NavNet3D Multi Function Display. Only Marks and Routes are supported.

- **Nobeltec ONF (TXT files):** this format is used to import marks, lines, boundaries, routes and tracks from the legacy software Nobeltec VNS & Nobeltec Admiral.

- **Rosepoint Navigation Object (NOB files):** this format is used to import all navigation objects from RosePoint Coastal Explorer.

-

-

-

Images

- **JPEG:** this format is used to import and geo-referenced photos (pictures are automatically placed on the charts). In order to be imported, the photo must either embed the lat/lon or a time/date that can be correlated by TimeZero with a GPS position.

Exporting Data:

Select "Import/Export" from the menu to export data in the following format:

Data

- **TimeZero Exchange (TZX files):** this format is used to exchange all type of user objects (including tracks) in between TimeZero users. This format guaranties the full integrity of the data (it supports Route, Marks, Tracks & Objects).

- **Legacy TimeZero User Data (TZD files):** this format is used to exchange data with older version of TimeZero software.

- **GPS Exchange (GPX files):** this "open source" format is often used by third party software or converter. It is primary used to exchanged Routes and Marks, but you can also export tracks.

- **Google Map (KML & KMZ files):** this format is primary used to exchange data with Google Earth. Marks, Boundaries (lines / areas), and Tracks are supported. Note that routes will be exported as lines.

- **Furuno NavNet 3D (CSV files):** this format is used to rxport Routes and Waypoints from Furuno NavNet3D Multi Function Display. Only Marks and Routes are supported.

If you want to only export a couple of Routes or Marks, use the "Actions" menu of the Route List or Mark List:

    1   Open the "Route List" or "Mark List" from the "Lists" button

1. Open the "Route List" or "Mark List" from the "Lists" button

2. Select one line on the list by clicking inside the first grey column in front of the specific line (or select multiple lines using the CTRL or SHIFT key)

3. Click on the "Action" menu and select "Export Selected Route/Marks" in either GPX or KML format

4. Select the location, give a name to the file and then validate

Save The User Interface (UI)

TimeZero can be highly customized to fit your needs. You can customize the ToolBar, configure the NavData, adjust Options, etc...

All these settings can be saved in a file by selecting "Save UI as" from the menu.

When you want to load all the TimeZero settings, make sure that TimeZero is closed, then double click on the file to open the software and load the corresponding settings.

Note that multiple files containing multiple setting profiles can be created (one per captain for example). Instead of opening the software using the TimeZero shortcut located on the desktop, open the file setting instead. This will ensure that your default settings are re-apply each time you start the software.

Note: The User Objects (Routes, Marks, etc..) and the Instruments Configuration (GPS, AIS, etc...) are not stored inside the setting files (they are global to the software and will stay the same when you open a file setting)

Note that there is also a way to just save a specific WorkSpace configuration. So that if you are a single user and just want to save one initial configuration, it might be easier to use this feature instead. Please refer to the Saving and Recalling WorkSpace configuration chapter for more information on how to save a WorkSpace configuration.

Note: Unlike the User Interface file (that requires TimeZero to be restarted), recalling a WorkSpace configuration can be done while the software is running.

Shortcuts

Shortcuts

The Shortcuts of TimeZero are:

- **Ctrl**: Maintain the Ctrl key down while selecting several objects together by clicking them one after one using the hand tool.

- **Shift**: Maintain the Shift key down to select the alternate tool (which varies with WorkSpace). The alternate tool is fixed to the:

    - Hand Tool for any Chart WorkSpace: hold the shift key while dragging to select multiple objects.

    - Acquire Target Tool for the Radar WorkSpace: hold the shift key and click to acquire a target.

- **Ctrl + F**: Find Places (if connected to Internet), Marina (from ActiveCaptain) and Tides Station.

- **Ctrl + Z**: Undo the last command or action

- **Ctrl + Y**: Redo the last command or action

- **Del**: Delete selected object

- **Page Up**: Zoom in

- **Page Down**: Zoom out

- **CTRL + Page Up**: Activate next step of the animation

- **CTRL + Page Down**: Activate previous step of the animation

- **F1**: Call up the Help Guide

- **F2**: Zoom in step by step

- **F3**: Zoom out step by step

- **F4**: Center on boat

- **F5**: Track on /off

- **F6**: Show / Hide NavData

- **F7**: Show/Hide Lists

- **F8**: Man Over Board (MOB)

- **F9**: Create an Event (same as ENTER key)

- **F10**: Radar Range Out

- **F11**: Radar Range In

- **SHIFT + F2**: Switch between Day, Dusk and Night display

- **SHIFT + F3**: Enable/Disable the "TrackBall" mode (to pan the chart by just moving the mouse)

- **SHIFT + F10**: Show / Hide Depth shading

- **SHIFT + F11**: Switch from 2D to 3D view

- **"g" + wheel (up/down):** Adjust the Radar Gain manually (slider)

- **"s" + wheel (up/down)**: Adjust the Radar Sea manually (slider)

- **"r" + wheel (up/down):** Adjust the Radar Rain manually (slider)

- **ALT + g:** Toggle Radar Auto Gain ON/OFF

- **ALT + s:** Toggle Radar Auto Sea ON/OFF

- **ALT + r:** Toggle Radar Auto Rain ON/OFF

Tools

Some tools may only be available in specific WorkSpaces or when specific Modules are unlocked:

- "Track": Click on this button to enable or disable Track Recording. Track recording is enabled when this button is surrounded in blue.

- "Zoom In/Out": Click on these buttons to zoom in or zoom on the chart. You can adjust the scale selection from the Plotter Display Options (by clicking on the button "Chart Scales Selection")

- "Zoom": This tool is very useful if you don't have a scroll wheel to zoom continuously on the chart. When this tool is selected, left click to zoom in and right click to zoom out.

- "Pan": This is the tool which is selected by default. It allows you to pan the chart with the mouse. If you have another tool selected, pressing the ESC key on your keyboard revert to the Pan tool.

- "Divider": This tool allows you to make bearing and range measurement in between two points. If you select this tool and double click on the chart, it will create a divider line in between own ship position and the point where you double clicked. You can double click on the tool itself to erase all dividers.

- "Go To": This tool allows to create a quick "Go To" point by creating an Active Route. You can double click on this tool to create a Go To using lat/lon.

- "Mark": This tool allows to create marks. You can double click on this tool to create a mark using lat/lon.

- "Route": This tool allows to create route.

- "3D Orientation": This tool is used to adjust the 3D view when the chart mode is set to "3D" . You can switch from 2D to 3D by clicking on the "3D" button located inside the chart scale at the bottom left of your screen.

- "Boundary Area": This tool is used to create areas. Select this tool, click on the chart to create boundary points and double click to close the area. You can double click on this tool to create an area by using lat/lon.

- "Boundary Circle": This tool is used to create circles.

- "Boundary Line": This tool is used to create lines. Click on the chart to create boundary points and double click to end the line. You can double click on this tool to create a line by using lat/lon.

- "Annotation": This tool is used to create annotation. You can double click on this tool to create an annotation by using lat/lon.

- "Recall Track": This tool (available in the Planning WorkSpace) is used to recall a Track portion from a Trail.

- "Event": This tool is used to drop a mark under the boat position.

- "MOB": This tool is used to drop a "Man Over Board" (MOB) mark under the boat position. When you activate the MOB, it drops a marks, selects the "Navigation" WorkSpace and zooms at a navigation scale automatically. If you would like for the MOB to also create an Active Route (to the MOB location) and raise an alarm, you can change the "MOB Behavior" from the Alarms Options.

-

- "Synchronize Radar Range" (requires the Radar Module): This button synchronizes the Radar range with the current chart range. Press this button to adjust the radar range to the closest matching chart scale. On the Navigation WorkSpace, you can also click on the Radar Scale (on the bottom right of the screen).

- "Range In/Out" (requires the Radar Module): These buttons are used to increase or decrease the radar range.

- "EBL VRM 1/2" (requires the Radar Module): Right click on this tool to select either "EBL" or "VRM" mode (two set each). Click on the chart or radar screen and drag the cursor to create the EBL or VRM. Double click on this tool to erase all EBL and VRM.

- "Guard Zone 1/2" (requires the Radar Module): Click on this tool to create a Guard Zone (relative to the boat) by clicking and dragging the cursor on the chart or radar screen. Once the guard zone has been created, right click to adjust its parameters. You can create up to two guard zones by right clicking on the tool. Double click on this tool to erase all guard zones.

- "Range In/Out" (requires the "Sounder Module"): These buttons are used to increase or decrease the sounder range. You can adjust the scale selection from the Options (by clicking on the button "Sounder Range Selections")

- "Update Area": This tool is only available in the "Update" WorkSpace and is used to define the weather update area. Once the area is define, select the "Update" button on the top right of the screen.

- "Launch Routing": This tool requires the "Routing" Module. It is used to create routing in between two points. If you double click on the chart and have a valid GPS position, it will create a routing in between own ship position and the point.

- "Screenshot": This tool takes a screenshot of the screen and stores it in the location define under the General Options ("Screenshot Recording Location").

Layer Overview

Most of the TimeZero display settings and controls can be found under the "Layer" panel that can be open by clicking on the "Layer" button located at the bottom right of your screen:
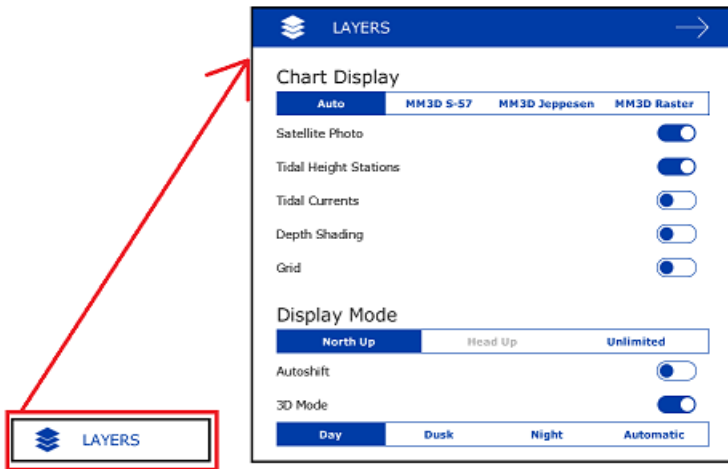
The Layer panel is contextual to each WorkSpace. For example, under the "Navigation" WorkSpace, you will find all the options to adjust the chart, the various overlay, the display mode, etc... If you open the Layer panel from the "Radar" WorkSpace (radar module required), you will find radar control settings such as Gain, Sea, Rain, etc...

Inside the Layer panel, items and options are grouped by category ("Chart Display", "Display Mode", "User Data", etc...). The following chapters details the function of each item sorted by category.

Chart Display

- **Chart**: Selects the type of chart used. Select "Auto" if you want TimeZero to pick automatically the best chart source according to the area.

- **Satellite Photo**: Displays the Satellite Pictures over the chart.

- **Tidal Height Stations**: Displays the Tidal Stations over the chart.

- **Tidal Currents**: Displays the Tidal Currents over the chart.

- **Depth Shading**: Displays and adjusts the intensity of the depth shading. Please refer to Depth Shading for more information.

- **Grid**: Displays a grid over the chart

Display Mode

- **Chart Orientation mode**

    - **North Up**: This mode displays the North at the top of the screen.

    - **Head Up**: This mode orients the bow of the vessel to the top of the screen. The chart rotates as the vessel's bow is always pointed toward the top of the screen. In Head up mode, pay close attention to the Compass icon (on the bottom left). It provides information about the direction of North. Head Up mode is only available if a Heading sensor is connected OR if your speed is over 1Kn (GPS COG will be used in that case).

    - **Unlimited (3D only):** In this mode, the azimuth and pitch can be freely adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.

- **Autoshift:** Enable the "Look Ahead" mode that offset the boat icon location on screen (opposite the side from where you are travelling). Refer to the Centering on the boat chapter for more information.

- **3D Mode**: Toggle in between 2D and 3D chart display mode.

- **Day/Dusk/Night/Automatic**: Adjusts the screen's brightness and vector chart color palette (for night or day). When set to Automatic, TimeZero will automatically switch modes according to your local sunset and sunrise time.

Around Me

- **COG/SOG Predictor**: Display the COG vector (displayed in red dashes). COG ("Course Over Ground") is calculated by the GPS. It indicates the direction of movement relative to a ground position. The length of the COG vector can be setup by distance or time. When it is set to "Time", the length varies according to the speed of the boat and can be configured to show the predicted position in a specified amount of time. This setting is available in the Ship & Tracks Options ("COG/SOG Predictor").

- **Anti-Grounding Cone:** The anti-grounding cone enables TimeZero to scan for dangerous objects and depth in front of your boat and warn you in case of possible collision or grounding. Please refer to the Anti-Grounding Cone chapter for more information.

- **Heading Line**: The Heading Line (displayed as a green line) is sent by an Electronic Compass and shows the direction of the bow of boat.

- **Drift Vector**: The Drift Vector (displayed as a blue dashed line) can be received from a sensor or computed by TimeZero when COG, SOG, STW and heading are received. This vector represents graphically the drift direction and speed.

- **Laylines (**Routing Module required): Displays the Laylines on the chart. Please refer to the Laylines chapter for more information.

Targets

- **AIS Class A**: Displays AIS Class A targets. Class A are usually commercial vessels.

- **AIS Other**: Displays AIS Class B targets, shore stations, AIS SAR and AIS SART. AIS Class B are usually recreational vessels. Please refer to AIS Target for more information.

- **Marine Traffic**: Displays AIS targets received through the Internet from the Marine Traffic website. This does not require TimeZero to be connected to a live AIS receiver. However, AIS targets received from the Internet can be subject to high latency and is not intended for navigation. Please refer to Marine Traffic for more information.

- **ARPA Targets**: Displays the ARPA target from the radar. Please refer to ARPA Target for more information. Heading information is required.

Point Of Interest

- **Active Captain:** Enable or disable all the ActiveCaptain markers (according to the selection below).

- **AC Marina/Anchorage/Local Knowledge/Hazards**: Displays the corresponding ActiveCaptain markers in the chart. Please refer to ActiveCaptain for more information.

- **Update ActiveCaptain:** Click on this button to update the ActiveCaptain database. Note that your ActiveCaptain account must be activated for this button to be enabled. Please refer to ActiveCaptain for more information.

- **Find**: Opens a window that allows to search for place. TimeZero can search in the Marina ActiveCaptain database, Tide database and in the online geoname database (when connected to the Internet).

User Data

- **Display Marks**: Displays Marks on the screen.

- **Display Routes**: Displays Routes on the screen.

- **Display Tracks**: Displays Tracks on the screen.

- **Display Boundaries**: Displays Boundaries on the screen.

- **Display Annotations**: Displays Annotations on the screen.

- **Display Photos**: Displays Photos on the screen.

- **Display Catches**: Displays Catches on the screen.

Weather

- **Display Weather**: Shows or Hides the Weather on the chart.

- **Weather as Arrows:** Display specific weather data (Wind, Ocean Currents and Waves) as arrow on the chart.

- **Weather Contour Lines:** Display specific weather data (Pressure and 500mb) as contour lines on the chart. It is only possible to display one weather component using contour line at a time.

- **Weather in Color:** Display specific weather data using a color scale on the chart. It is only possible to display one weather component in color at a time.

Routing

- **Isochrons** (when Routing Module is enabled): Show/Hide the Isochrons on the chart. Please refer to Creating a Routing for more information.

- **SailSets** (when Routing Module is enabled): Show/Hide the SailSets on the chart. Please refer to Creating a Routing for more information.

- **Variability** (when Routing Module is enabled): Show/Hide the Variability on the chart. Please refer to Creating a Routing for more information.

Radar

- **Echo Trail**: Enables the Radar Echo Trail. Please refer to Radar Controls for more information.

- **Clear Trail**: Clear and reset the Trail.

- **Gain/Sea/Rain**: Adjusts the Gain/Sea/Rain parameters of the radar. Please refer to Radar Controls for more information.

Radar

- **Echo Trail**: Enables the Radar Echo Trail. Please refer to Radar Controls for more information.

Sounder

- **HF / LF** : Selects the operating frequency of the sounder. If the sounder is in Dual Frequency mode (both HF and LF displayed on screen), clicking on this button will inverse the side of the operating frequency.

- **Sounder Mode:**

  - **Single Frequency**: Set the Sounder in Single Frequency mode. This will only display one sounder echogram on the screen. Select either HF or LF from the menu above.

> **Note**: If AccuFish or Bottom Discrimination is selected, the sounder will transmit HF and LF even if the mode appears to be set to Single Frequency only. This is because AccuFish and Bottom Discrimination need both frequencies in order to work. If you want the sounder to only operate in one frequency, make sure to disable AccuFish and Bottom Discrimination.

  - **Dual Frequency**: Set the Sounder in Dual Frequency mode. This will display two sounder echogram on the screen (one for the Low Frequency and the other for High Frequency). When operating in Dual Frequency, the range of both frequencies is synchronized. To inverse the side of the HF and LF, select the "HF" or "LF" button above.

  - **Bottom Zoom:** Set the Sounder in Bottom Zoom. Please refer to Sounder Display Mode for more information.

  - **Bottom Lock:** Set the Sounder in Bottom Lock. Please refer to Sounder Display Mode for more information.

- **Auto Range**: Enables the Sounder Auto-Range. When set, the sounder will attempt to track the bottom and adjust its range automatically.

- **AccuFish**: Enables the AccuFish feature of the sounder. This only applies to DFF1/BBDS1/DFF1-UHD sounders with compatible transducer.

- **Bottom Classification**: Enables the Bottom Classification of the Sounder. This only applies to the BBDS1 and DFF1-UHD. Please Refer to Bottom Discrimination for more information.

- **A-Scope**: Enables the A-Scope display of the Sounder.

- **Sounder Adjustment:**

  - **Auto-Fishing / Auto-Cruising**: Enables the Automatic Mode of the sounder. Please refer to Sounder Controls for more information.

  - **Manual**: Sets the sounder in manual mode, allowing you to manually adjust the gain for HF and LF frequency below.

- **Manual Gain HF/LF**: Adjusts the HF and LF gain when the sounder is set in manual mode.

Polar

Wind Up / Head Up: Adjust the Polar graph orientation. Please refer to the Polar chapter for more information.

Wind Polar / Sailset: Display the Polar Graph (Wind Polar) and the SailSet color scale. Please refer to the Polar chapter for more information.

Live Polar: Highlight in red the polar curve corresponding to the real time True Wind Direction (TimeZero needs to receive wind information).

Options Overview

All preferences and settings within TimeZero are set using the Options window found under the "TimeZero" button. The Options window is comprised of a categorized list of options to the left, and the main display area to the right which contains all of the controls that the user can customize. At the bottom of the Options window a "Reset Default Settings" button allows you to reset the settings of the current page to the factory default.

Note: The "Reset Default Settings" button only affects the selected page (or category)
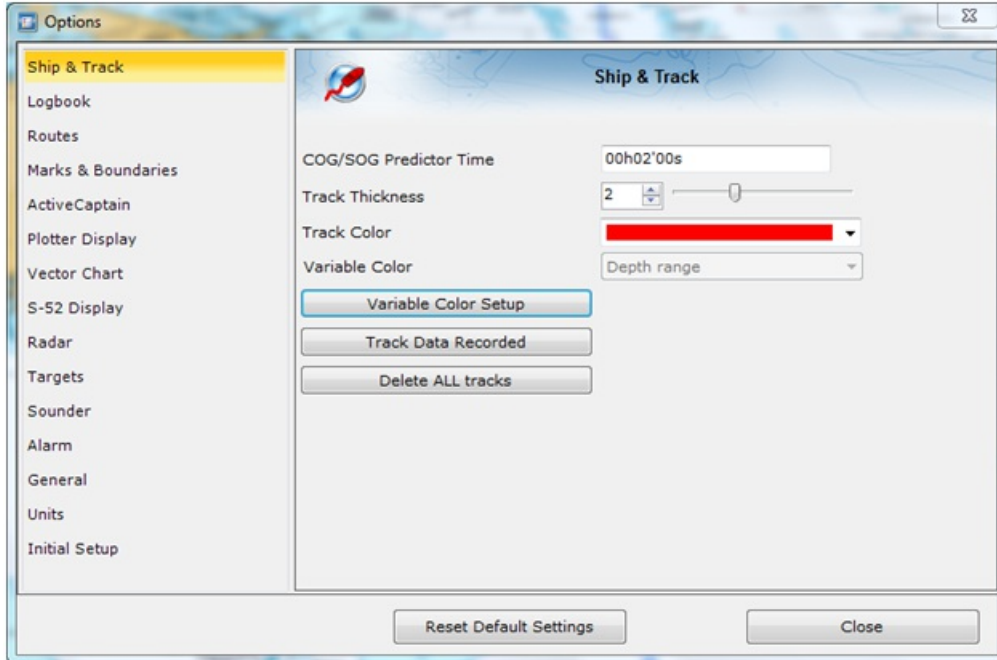
Note that some categories and features may not be available in your software (specific Modules may be required).

Ship & Tracks

The Ship & Track options are used to configure the vessel's COG & SOG predictor line and various track recording and display options.

- **Own Ship Trail Length:** Adjusts the length of the trail (in time) displayed on the chart. Make sure to review the Trail & Tracks chapter for more information.

- **Trail Thickness:** Adjusts the thickness of the trail.

- **Own Ship COG/SOG Predictor:** Selects if the Course Over Ground (COG) predictor varies in length according to speed or fixed by a distance value.

- **COG/SOG Predictor Length**: Adjusts the Course Over Ground (COG) predictor length when set for distance.

- **COG/SOG Predictor Time:** Increases the time value to make the Course Over Ground (COG) & Speed Over Ground (SOG) predictor line longer. Decreases the time value to make the predictor lines smaller.

Note: The COG/SOG Predictor Time setting also affects the ARPA and AIS target predictor. The SOG Predictor Time value is also used for the Drift vector (same setting).

- **COG/SOG Predictor Thickness:** Adjusts the thickness of the Course Over Ground (COG) predictor line.

- **Heading Line Color:** Adjusts the color of the Heading Line.

- **Heading Line Thickness:** Adjusts the thickness of the Heading Line.

- **Autoshift Maximum Speed**: When the Autoshift mode is selected (look ahead), this value is used to determine the off center position of the boat based on its speed. For example, if this value is set to 10Kn, the boat will be off centered to the edge of the motion circle at speed of 10kn and above.

- **Motion Circle:** Increases or decreases the size of the Relative Motion Circle (used for Relative and True Motion). Refer to the Centering on the boat chapter for more information on the Relative Motion Circle.

-

- **Range Circle Size:** Adjusts the range circle size (that can be displayed around the boat icon by enabling it by right clicking on the boat icon).

- **Range Circle Color**: Adjusts the range circle color

- **Range Circle Thickness**: Adjusts the range circle thickness

- **Track Thickness:** Increases or decreases the thickness of all the track lines that are set to use the "Default" thickness. Track thickness can be customize independently for each track by right clicking on the track and selecting a thickness size other than the "default" size.

- **Track Color:** Changes the default Track line color to one of 8 fixed set colors.

- **Delete ALL Tracks:** Push this button to delete all Tracks that you have created to date.

Routes

The Route options allow users to configure settings related to routes behavior and appearance.

- **Route Color:** changes the default Route color.

- **Route Thickness:** changes the thickness of all routes. This is a global setting that will affect all the routes displayed on the screen.

- **Display Route Wizard after creating a route**: check this option to have the software display the Route Wizard when a route is created. The Route Wizard can also be displayed by right clicking on a Route and select "Open Route Wizard".

- **Great Circle Navigation:** when this option is checked, the software will compute and display distance (with the divider tool) using the Great Circle distance (shortest distance between points on the surface of the Earth). The software will also chop long routes in smaller segments along the great circle path. These shorter resulting legs can be considered as straight ("rhumb line") segments that follow the shortest path on a Mercator projection using fixed bearing (on each segment).

- **Route Auto Zoom:** when this option is checked, the software will automatically adjust the zoom level when a new Waypoint is activated along a route. The software will either zoom in or zoom out in order to show the current position and the next Waypoint. *Note: The Route Auto Zoom will only work if the boat is displayed on the screen (the software will not attempt to adjust the zoom level if you are panning on another area)*

- **Route Animation:** when this option is checked, an animation is displayed on the active and planning route indicating its direction. If you find the animation distracting, you can turn OFF this option.

- **Display XTE Alarm Lines**: when this option is checked, a red and green dash line (respectively port and starboard) will appear on each side of the active leg (when a route is activated). These lines are a graphical representation of the Cross Track Alarm value.
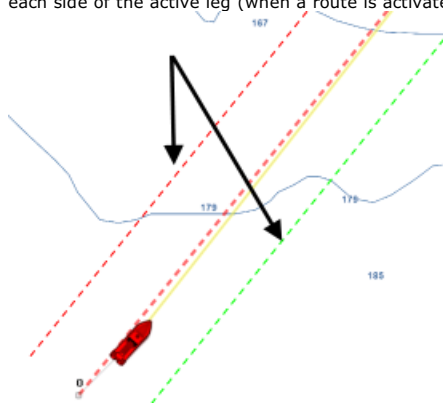
Note: In order to see the XTE Alarm Lines on the chart, you may have to zoom in at a closer range

- **Default Route XTE Value:** this setting sets the default value of the route cross track error (used for displaying the XTE Alarm lines). Note that if the "Automatic XTE" setting is turned ON, the value used on a route leg might be inferior according to the Route Safety check.

- **Check Route Safety:** this setting enables TimeZero to scan for dangerous objects and depth area along any route that has been created. Please refer to Route Safety for more information.

- **Automatic XTE:** When this setting is enable, TimeZero is allowed to reduce the XTE value of each leg to avoid obstacle (related to Route Safety). The minimum acceptable value is set by adjusting the Minimum XTE Value setting below

- **Minimum XTE Value:** When Automatic XTE is enabled, TimeZero can reduce the XTE value down to this minimum value. Set this setting to the absolute minimum XTE value you are comfortable with.

- **Prevent Creating Route when Leg is unsafe:** When this setting is enabled, you will not be able to drop a waypoint until the leg of the route your are building has been analyzed and considered safe (using the Route Safety parameters).

- **Route Safety Configuration:** Click this button to adjust the type of objects that will be check for the Route Safety and Anti-Grounding Cone. You can also enter your safety depth (for depth sounding and depth area) and safety height (for bridge clearance).

- **Waypoint Switching Mode:** this setting determines how the software switches to the next Waypoint automatically in a route

  - *Circle:* in this mode, the next Waypoint is automatically switched when your boat icon enters the active Waypoint's switching circle
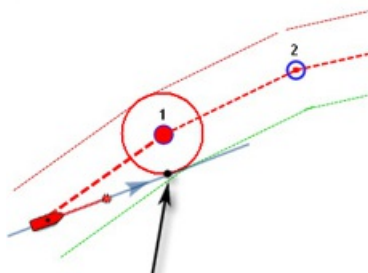
- *Cross Line (also known as "perpendicular")*: in this mode, the next Waypoint is automatically switched when your boat crosses the line through the Waypoint that is perpendicular to the active leg line
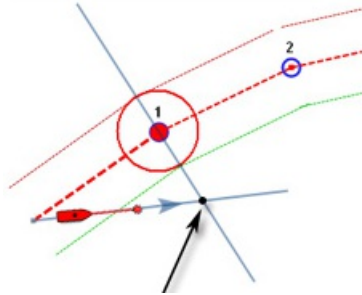
- *Circle and Cross line:* in this mode, the next Waypoint is automatically switched if it enters the switching circle or crosses the line.

- **Switching Circle Radius:** this option sets the radius of the switching circle and arrival alarm. This is a global setting that affects all Waypoints in a route.

- **Intelligent Waypoint Centering:** when this option is checked, the chart will automatically pan when a route is being built.

- **Display Leg Distance and Bearing:** when this option is checked, the distance and bearing (course to steer) will be displayed on the route leg:
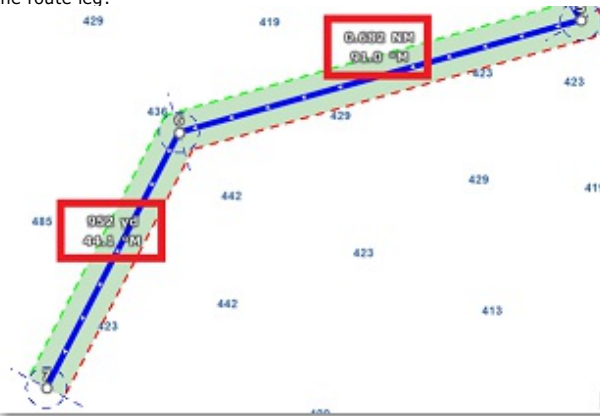
<u>Note</u>: the distance and bearing are not displayed on the active leg. This information can be displayed in the NavData using the "Route NavData"

- **Route Planning Default Speed:** Set the default speed that will be used when creating a route.

- **Use Currents in Active Route:** when this option is checked, TimeZero enables current computation on the Active Route. Note that you may want to leave this option disabled if you do not have an accurate speed through water sensor connected to the computer, or if you want the route computation (ETA, TTG,...) to match other devices on your vessel that are not able to take currents into account.

Note: This option may slow down the software on older computer.

Marks & Boundaries

The Marks & Boundaries options allow users to configure settings related to marks, events and boundaries (line, area and circle)

- **Display Objects Names:** this option displays object names next to the object. This is a global settings that affects all the marks, routes and boundaries displayed on the screen.

- **Mark Symbol:** changes the default Mark icon.

- **Mark Color**: changes the default Mark color.

- **Mark Size:** changes the size of all marks (ranges from 50-200). This is a global settings that affects all marks displayed on the screen.

- **Event Mark Symbol:** changes the default mark icon used when an event is triggered (when the "Event" tool or ENTER key is used).

- **Event Mark Color:** changes the default mark color used when an event is triggered.

- **Boundaries Color:** changes the default Boundary color.

- **Boundaries Transparency**: This option determines the default intensity of boundary transparency (ranges from 0-80).

- **Boundaries Contour:** changes the default Boundary contour style.

- **Boundaries Contour Thickness:** changes the contour thickness for all boundaries. This is a global setting that affects all boundaries displayed on the screen.

- **Annotation Color:** changes default Annotation color.

- **Annotation Size:** changes default Annotation size (ranges from 5-50).

- **Icon Set:** Allows the user to choose between a modern or classic icon set.

- **Delete All Routes Marks and Objects:** Pressing this button erases all existing routes and marks

ActiveCaptain

The ActiveCaptain options allow users to enter their ActiveCaptain credentials and set advanced marker filters

- **Only Show Marinas with:** this allows the user to show only Marinas that have information regarding specific features. Leave all the options un-check to show all marinas.

- **Local Knowledge to show:** this allows the user to show only specific "local knowledge" marker type. Leave all the options checked to show all "local knowledge" markers.

Plotter Display

The Plotter Display options allow users to configure settings related to the Navigation and Planning Work Spaces:

- **Day/Night Mode**: adjusts the screen's brightness and vector chart color palette (for night or day). When set to Automatic, TimeZero will automatically switch modes according to your local sunset and sunrise time.

- **Luminosity Variation:** allows to adjust precisely the screen's brightness. Note that this setting use independant values per mode (Night/Dusk/Day).

- **Red Filter in Night Mode**: enables a red hue when the night mode is selected. Note that the red filter only operates on the Chart, NavData, Toolbar and Ribbon. It does not apply to windows or contextual menu.

- **Inverse Chart Palette in Day Mode:** force the night chart color palette at all times.

- **Plotter Background Color:** in "Automatic" mode, the background color when no chart is displayed (when no chart is selected from the "Layer" button) will be dark grey in day mode and black in night mode or when "Inverse Chart Palette in Day mode" is enabled. Select "Manual" an press the "Background Color Selection" to select a custom color.

- **Chart Priority in Auto Mode:** If you have both MM3D Raster charts and MM3D Vector charts installed for the same area, this option allows you to select which type or charts (raster or vector) will be prioritize when the chart selection is set to "Auto". If you have multiple MM3D Vector charts for the same area, the following internal priority will be used: MM3D C-Map then MM3D Navionics then MM3D S-57.

- **Chart Boundaries:** selecting this option displays all chart areas boundaries:

  - The areas having detailed Nautical Charts (either Raster, C-Map, Navionics, S57 or Fishing charts according to the current selection) are surrounded in purple

  - The areas having detailed Satellite Pictures are surrounded in green

- **Cross Screen Cursor:** this options display lines and cursor position information on the screen to make the cursor location more visible.

- **Chart Scales Selection:** click on this button to select the chart scale that will be used when clicking on the Zoom In/Out buttons. By default, clicking on the Zoom In/Out button step by step will go through all the chart scales. If you want to "jump" directly from one scale to another or limit the Zoom In/Out, you can deselect the scales you want to skip.

- **Allow Vector Chart Overzoom:** this option prevents the "overzoom" chart tiles to appear even if no detail is available for a specific area at a high zoom level. Disable this option if you do not want TimeZero to overzoom the charts (and display an "Overzoom" indication on screen).

- **Display Raster Chart Unit Legend:** this option displays a raster chart depth unit legend in the lower left hand corner of the screen.

- **Grid Interval:** indicates the grid interval (ranges from very low to very high) that can be turned ON and OFF from the "Layer" button.

- **Transparencies**: The following objects' transparency can be adjusted:

  - *Tide Range for PhotoFusion:* Offset the depth at which the PhotoFusion will start. This setting is useful in area with important tides.

  - *PhotoFusion Transparency:* Manipulates the overall intensity of PhotoFusion transparency on water (ranges from 0-80)

  - *Tidal Currents Transparency*: Manipulates the intensity of tidal Currents transparency (ranges from 0-80)

  - *Depth Shading Transparency*: Manipulates the intensity of depth shading transparency (ranges from 0-80)

  - *Weather Color Transparency*: Manipulates the intensity of weather color transparency (ranges from 0-80)

- **3D Display:** While in 3D mode, the following options control the exaggeration of depth and altitude displayed:

  - *3D Alti Exaggeration*: Determines the exaggeration of land altitudes displayed while in 3D mode (all WorkSpace).

  - *Bathy Exaggeration*: Determines the exaggeration of the seabed in the "3D Cube" WorkSpace and in the Navigation and Planning WorkSpaces when "Display Bathymetry in 3D" is selected.

  - *Display Bathymetry in 3D:* Determines if the bathymetry is displayed or not in the Navigation and Planning WorkSpaces. When this setting is OFF (default), only perspective is used over the sea to avoid parrallax effect. If you wish to represent sea floor with actual 3D, make sure to check this option.

- **Depth Shading:** When the depth shading is turned on (from the "Layer" button), the range and hue of the depth color scale can be controlled using the following options:

  - *Depth Shading Mode:* When set to "Auto", TimeZero automates the range of water depths to be shaded according to the area displayed on the screen. TimeZero looks for the shallowest and deepest points and automatically adjusts the range accordingly. In this mode, the color scale range is continuously updated as you pan or zoom the charts. When set to "Manual", the color scale uses the Minimum and Maximum values defined below.

- *Minimum Value:* Fixes the minimum water depth value to be shaded when the "Manual" mode is selected.

- *Maximum Value:* Fixes the maximum water depth value to be shaded when the "Manual" mode is selected.

- *Depth Color Palette: Determines the color palette used for the depth shading in Auto and Manual mode.*

Vector Charts

The Vector Charts options allow users to configure common settings related to the Vector Chart display.

- **Chart Object Size:** Adjusts the size of the vector charts object icons (buoys, wrecks,...) and text displayed on the screen.

- **Chart Color Palette:** Determines the colors (or "theme") of the Charts.

- **Chart Symbols:** Determines the symbols (for buoys) to either the "S52" or "International" representation.

- **Shallow/Safety/Deep Contour:** These parameters are used to color the various depth area of the Vector Chart. The transition between colors is based upon the depth contour lines of the vector chart. Note that if there is no contour line available on the vector chart corresponding to the exact value you selected, the color transition will occur at the next deepest (safer) contour line available.

In addition to these screen rendering parameters, the Vector Chart Menu allows you to turn ON or OFF the display of specific object (such as Buoy Numbers or Light Description).

Note: More advanced settings (advanced vector chart layers) are available from the S-52 Display options.

S-52 Display

The Vector Chart engine in TimeZero follows the IHO "S-52" presentation guidelines. The "S-52 Vector Chart Display Mode" provides quick access to five different levels of detail for vector charts:

- "base": shows the minimum set of objects necessary for planning.

- "standard": adds other objects that enhance planning (adds important text, lights, ...)

- "Other": adds other layers of information necessary for safe navigation (contour lines, obstructions,...)

- "Fishing": removes some land information from the "Other" configuration

- "Custom": When this option is selected, all object layers appear and can be enable or disable individually

Routing

The "Routing Module" needs to be unlocked to access this feature

The Routing options allow users to configure settings that will change the Routing computation:

- **Only Keep The Last Routing**: by default, TimeZero only keep the latest routing. This means that when creating a new Routing, the previous one is discarded. If you want TimeZero to keep all routings on the screen (to test multiple scenarios for example), uncheck this option.

- **Routing Transparency:** adjust the isochrons and sailset transparency on the chart.

- **Isochron Interval:** adjust the time interval in between two isochrons. By default, TimeZero adjust automatically the isochron interval according to the routing distance. You can manually select a smaller isochron interval (to increase accuracy), but keep in mind that this will increase the computation time.

- **Use Motor Under Sailing Speed:** set the minimum speed that will be used underway. When predicted speed (from Wind Power) fall under this value, TimeZero will assume you will start your engine and use the speed below to predict the rest of the voyage (until the speed under wind power goes above this threshold again)

- **Motor Sailing Speed:** set the speed under engine power

- **Polar Curve Percentages:** Allow to adjust the overall polar speeds. This settings is especially useful to decrease the overall polar values when feeling that you cannot reach 100% efficiency.

- **Avoid Land and Shallow Waters:** when this option is enabled, TimeZero will try to avoid land and shallow water areas under whose depth fall under the setting below

- **Minimal Depth:** set the minimum depth

- **Waves:** Check this option of you want the routing computation to take into account wave height and direction.

- **High Resolution Tidal Currents:** Check this option of you want the routing computation to take into account the high resolution tidal current (the routing will not use discrete tidal current stations).

- **Oceanic Currents:** Check this option of you want the routing computation to take into account the oceanic current (from weather file).

- **Maximum Acceptable Wind Speed:** Enter the maximum wind value acceptable along the optimized route. Use this field if you want to avoid area with strong wind. Leave the default value (125!) if you don't want to put any restriction on the routing computation.

- **Minimum Acceptable Wind Speed:** Enter the minimum wind value acceptable along the optimized route. Use 0 if you don't want to put any restriction on the routing computation.

- **Maximum Acceptable Wave Height:** Same as above, but for wave height.

- **Routing Label Prefix:** Prefix used for the default name of every routing. Since routing will also appear in the route list, it is common to give a specific prefix for optimized (routing) routes.

- **Routing Auto Numbering:** Used with the prefix to assign a default name.

Weather

The Weather options allow users to configure how to retrieve weather data, how to display it on the chart and even apply offsets.

Weather Data Download:

- **Download Method:** Allow the user to select how to retrieve weather files. When direct download is selected (default), TimeZero will directly connect to the weather server to retrieve the file. When set to E-Mail, TimeZero will create an email that can be send to the server. After a couple of minutes, the server will reply back with an e-mail containing the weather file in attachment. When set to "Iridium Go!", weather data is retrieved throught your Iridium connection.

- **Restrict Download Size:** Allow the put a restriction on the maximum weather download.
-

Display:

- **Wind Particles Trail:** Allow to adjust how long the particles animation are.

- **Color Shading Palette**: Allow to select how continuous or discrete the color palette for weather will be. If you select fewer color, it will be easier to see "steps" in the weather data.
-

Wind and Wave Data Offsets:

- **Increase/Decrease Wind Speed (value and %)**: Allow to offset the overall wind speed. Useful if the weather forecasts have overestimated or underestimated wind speeds (based on your own observation).

- **Change Weather File in time:** Introduce a time offset to the weather forecast. For example, if you notice that a change in forecast appears sooner, you can adjust this offset globally, so that future forecast match with your observation.

- **Increase/Decrease Waves (%)**: Allow to offset the overall wave height (power). Useful if the weather forecasts have overestimated or underestimated waves (based on your own observation).

- **Increase/Decrease Currents (%)**: Allow to offset the overall oceanic currents speed (power). Useful if the weather forecasts have overestimated or underestimated currents (based on your own observation).

- **Change in Wind direction:** Allow to offset the overall wind direction.
-

Radar

The "Furuno Radar module" needs to be unlocked and radar configured to access this feature

The Radar options allow you to configure various advanced Radar Setup and displays preferences.

Note: If you are using a legacy Nobeltec InSight Ethernet Radar, you first need to run the Radar Connection Wizard available in the TimeZero Program Files (under "Koden/RadarSetupWizard"). Please refer to the InSight Radar Connection chapter for more information.

- **Day Background Color:** Determines the background color of the radar display that is used during the day.

- **Night Background Color:** Determines the background color of the radar display that is used during the night.

Note: The Day/Night setting can be found under the Plotter Display options.

- **Echo Color:** Determines the radar echo color:

  - **Multicolor 1**: Red for strong Echo / Yellow for medium Echo / Dark Green for weak Echo

  - **Multicolor 2**: Red for strong Echo / Green for medium Echo / Dark Blue for weak Echo

  - **Red**: Monochromatic Red with variable transparency according to echo level

  - **Green**: Monochromatic Green with variable transparency according to echo level

  - **Yellow**: Monochromatic Yellow with variable transparency according to echo level

- **Echo Transparency for Overlay:** Adjusts the overall intensity of echo transparency on the chart (this does not affect the Radar Work Space)

- **Radar Source for Overlay (Furuno DRS only):** When using a DRS with TimeZero, it is possible to use the Dual Range feature of the DRS for the chart overlay:

  - *Range A (Default):* Only the one range of the DRS (left side picture of the Dual Radar WorkSpace) will be used for the overlay. By limited the DRS to only one range, it allows the DRS to rotate at high speed (up to 48RPM).

  - *Range B:* The second range of the DRS (right side picture of the Dual Radar WorkSpace) will be used for the overlay. This allows to have individual Radar Range and settings in between the Radar Overlay and the Radar WorkSpace. This is because the regular Radar WorkSpace (not the Dual Radar) is only using the first range of the DRS (left side).

- **Allow COG to be used for Radar Overlay (Insight Radar only)**: In order to display the Radar Overlay on the chart, a heading sensor is usually required. However, in some cases, it is not practicable to install a heading sensor or its value is not reliable. For these specific cases, it is possible to use Course over Ground (COG) instead of Heading if heading information is not configured in TimeZero. When this box is checked and when no heading data is coming in TimeZero, the COG value will be used as a fake heading to align the radar on the chart. Note that this will also enable the radar post-processing (such as Echo Averaging or Echo Trail) that also usually require a heading sensor.
  PLEASE BE CAREFUL WHEN ENABLING THIS OPTION AND DO NOT RELY ONLY ON RADAR OVERLAY FOR NAVIGATION.

- **Sweep Fade:** The sweep fade displays a "traditional" radar animation. This feature automatically reduces the brilliance of weak signals (noise, sea clutter, rain clutter, etc.) and unnecessary echoes like radar interference.

- **EBL Reference:** When set to "True", the EBL (Electronic Bearing Line) is referenced to the True North. When set to relative, the EBL is referenced to the bow of your vessel.

- **Rings Interval:** You can manually adjust the number of Radar Range rings you want to display in the Radar Work Space. Leave the option set to "Automatic" if you want TimeZero to automatically adjust the number of rings according to the Radar Range and size of your screen (or window).

- **Auto Sea Mode (DRS Only):** This settings adjust the DRS auto Sea Mode. "Advanced" should be used for most application. Use "Coastal" when in an area with lots of return from a landmass.

- **Bearing Scale Mode:** When set to "True", the Bearing Scale (numbers displayed on the outer circle of the Radar Work Space) is referenced to the true North. When set to relative, the Bearing Scale is referenced to the bow of your vessel.

Note: When set to True, the bearing scale does not take into account the Magnetic Variation. It is always referenced to true North.

- **Own Ship Icon:** Check this option if you want to display a real sized ship icon in the Radar Work Space. Note that the ship icon will only appear at small range (according to your own ship beam and width).

- **Trail:** Echo trails show the movements of radar echoes relative or true to your vessel. The trails disappear over time (according to the "Trail Length" parameter). When set to "True" mode, only objects that are moving in reference to the water (such as another ship) will show a trail on the screen. Fixed objects on the water (such as buoys or a rock) will not show a trail even if your own ship is moving. When set to "relative" mode, any objects that move relative to your boat will leave a trail on the screen. So if your own ship is moving toward a stationary target (buoys for example), the target will leave a trail (smearing):

(a) True target trails
(No smearing of
stationary targets)

(b) Relative target trails
Targets moving relative
to own ship

- **Radar Initial Setup:** These settings are used to adjust the initial setup of the Radar. Note that this section will be limited if you are using a Furuno FAR radar (such as FAR2117) as these initial settings are performed from the Radar Processor directly. These settings are always linked to a specific Radar antenna. Make sure to select the correct Radar Hostname (from the drop down menu) before adjusting these settings.

  - *Radar Host:* Select the Radar detected on the network

  - *Nickname:* Enter the Radar Nickname that will be used in TimeZero

  - *Antenna Position:* Enter the Radar Antenna position

  - *Antenna Height (Furuno DRS Radar only):* Select the Radar Antenna height. This settings is used to automatically adjust the STC calibration.

  - *TX Channel (Furuno DRS-NXT Radar only):* Select the transmit frequency of the solid state transceiver.

  - *Target Analyzer (Furuno DRS-NXT Radar only):* This settings allow to display or hide echo caused by rain in Target Analyzer mode. Set to "Rain" when you want to see rain and "target" when you want to hide rain and focus on target only.

  - *Auto Acquire by Doppler (Furuno DRS-NXT Radar only):* When this setting is enabled, the DRS-NXT will automatically acquire ARPA target based upon Doppler information (it will attempt to acquire any target that are moving at a closing velocity of 2 or more knot).

  - *Antenna Heading Align:* It is not always possible to install a radar so that the front of the radar is exactly parallel with the boat's keel or center line. The Antenna Heading Align adjustment can compensate for this discrepancy. This process allows you to align the radar transceiver with the center line of the boat and only needs to be set once. Note that this is a different function than aligning your heading sensor. To adjust the Radar Antenna Alignment, it is best to display the Radar Work Space in "Head Up" mode and aim the bow of your vessel (during calm weather) at a buoy while underway. The buoy target should appear straight up on the Radar Screen.

  - *Trigger Delay (InSight Radar only):* The transmit trigger delay is a setting that, when configured incorrectly, can cause a donut-shaped ring to appear in the center of the radar image. Trigger delay should be initially set to reduce the size of the ring. Trigger Delay can also affect the radar image of a linear object such as a breakwater or riverfront. These can appear deformed due to excessive or inadequate trigger delay. Properly setting the delay requires to look at a straight object (refinement of the Transmit Trigger is best viewed using radar overlay on the Chart). On the water adjustment when the boat is parallel to a straight jetty is the ideal choice.

Inadequate Tx Trig   Good Tx Trig   Excessive Tx Trig
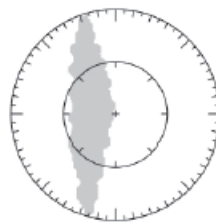
In most cases, Transmit Trigger settings remain between 125 and 165.

  - *Sector Blanking:* This feature is used to indicate a zone where the radar does not transmit a pulse. This is necessary if:

    - Two or more radars are mounted within each other's beam;

    - There is a significant structure near the radar that causes strong returns, overwhelming the circuitry of the radar;

    - You wish to prevent radiating a particular zone of the radar (for example, your radar is mounted low on the fly bridge).

  - *Antenna Rotation (Furuno DRS Radar only):* When set to "Auto" the DRS antenna rotation will increase automatically in specific conditions (at lower range). Select "24RPM" if you want the DRS radar to spin at a constant regular rate.

  - *Main Bang Suppression:* Increase this settings to reduce the "main bang" (circle that appears at the center of the radar screen).

- **Presets (InSight Radar MDS 5/6 only):** The Presets settings are used to adjust the "range of operation" of specifics value. For example, if you are using the Radar in Manual Gain and find that you have to "push" the manual gain value very high to see good targets, you may want to increase the "Manual Gain Preset". This will internally increase the manual gain value range and you will be able to backup the Manual Gain value to reach the same level of gain. Note that you have an independent Manual and Automatic Preset for Gain and the Sea Clutter (STC). The various controls will be enabled or greyed out according to the Radar current value. So if you want to adjust the Manual Gain Preset, make sure that the Radar is in Manual Gain.

  - *Auto Gain Preset:* To adjust the Auto Gain preset make sure that the Sea Clutter is set to 0 (manual Sea = 0). Set the Radar to Auto Gain (from the "Layer" button) and pick a range suitable for navigation (around 3NM). Adjust the Auto Gain Preset control down if the image looks too strong or up if the image looks too faint.

  - *Manual Gain Preset:* To adjust the Manual Gain preset make sure that the Sea Clutter is set to 0 (manual Sea = 0). Set the Radar to Manual Gain at 50% (from the "Layer" button) and pick a range suitable for navigation (around 3NM). Adjust the Manual Gain Preset control down if the image looks too strong or up if the image looks too faint.

  - *Auto Sea Preset:* The Auto Sea Preset is only used for range above 1NM (under 1NM TimeZero uses the Auto Harbor Sea preset instead). To adjust the Auto Sea preset, set the radar range to 12nm and select Auto Sea (from the "Layer" button) to turn on that function. Set the Auto Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Auto Sea preset value up until most of the weak echoes for an 8nm radius are eliminated. Adjust the radar range to 1.5nm and verify that strong echoes from nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Auto Sea preset.

  - *Manual Sea Preset:* To adjust the Manual Sea preset, set the radar range to 12NM and set the Sea Clutter to Manual at 50% (from the "Layer" button). Set the Auto Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Manual Sea preset value up until most of the weak echoes for an 8nm radius are eliminated. Adjust the radar range to 1.5nm and verify that strong echoes from nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Manual Sea preset.

  - *Auto Harbor Sea Preset:* To adjust the Harbor Sea Clutter Preset, set the radar range to 1NM and select Auto Sea (from the "Layer" button) to turn on that function. Set the Harbor Sea preset to 10. Set the STC Curve preset to 4. From the "Layer" button, manually adjust the gain until you get secondary echoes (noise) throughout the image. From the Options panel, adjust the Auto Harbor Sea preset value up until most of the weak echoes are eliminated. Adjust the radar range to 1/8nm and verify that strong echoes from nearby vessels or land are not eliminated. If land or vessel echoes are small or have been eliminated, decrease the Auto Harbor Sea preset.

  - *Auto Tune Preset:* Nobeltec radars are always in "Auto Tune" mode. To optimize the image, it is necessary to set the auto tune preset. Once established, you should not need to adjust the auto tune preset unless the image quality deteriorates. Generally, you should adjust the auto tune preset on average once a year to make sure you have the highest quality image. Adjust the auto tune control down until you see the image start to deteriorate. Note the value of the setting. Adjust the auto tune control up past the point where the image looks good until it starts to deteriorate. Take note of the setting value. Set the controls at a point between the two extreme settings, where the quality of the image is at its best.

  - *STC Curve:* The STC Curve function allows you to control all modes of the Sea Clutter profile of the radar. By default, the STC Curve profile is set to a value of 4. For most applications, there should be no need to change this setting. However, you may want to adjust this value to get a better application of Sea Clutter if the radar is mounted higher or lower than a typical installation. To adjust the STC Curve profile, set the radar range to 12nm, set Gain and Sea Clutter to manual settings (from the "Layer" button). When the STC curve profile is set to a lower number, the sea clutter is only applied in an area closer to the vessel. Setting the curve profile to a higher number causes STC to be applied to more of the image. Note that if the STC curve profile is not set correctly, adjusting the sea clutter (manual or automatic) may not have the desired impact. If you notice that increasing the sea clutter control has no impact on the image, your STC curve profile is too low. On the other hand if you notice that echoes disappear too quickly, your STC profile may be too high.

- **Radar Optimization (Furuno DRS only, not available for DRS-NXT):** Press that button while underway when commissioning the radar (note that it is not recommended to perform a Radar Optimization in the harbor because of the strong echo return). Pressing that button will calibrate the radar. You only need to press that button once after installing the radar. Note that there will be no feedback (no confirmation window) when you press that button.

- **Set Hardware to Factory Default (Furuno DRS only):** Click on this button to reset the DRS radar to its factory settings.

- **Enable Local TimeZero ARPA Processing (Furuno Radar only):** By default, the ARPA processing is performed inside the Furuno Radar Antenna. Check this option to use the internal TimeZero ARPA algorithm instead.

- **Advanced ARPA Settings:** These advanced ARPA settings affect how the internal ARPA algorithm detects and tracks the target.

  - *Maximum blob size in square meters*: A radar echo ("blob") that is bigger than the value of this setting will not be accepted as a valid ARPA target candidate ("Plot"). This setting is useful to reject landmass.

  - *Minimum blob size in pixel*: A radar echo ("blob") that has a smaller surface in pixel than the values specified will not be accepted as a valid ARPA target candidate ("Plot"). This settings is very useful to filter out noise or interferences that may create very small echoes on screen.

> **Note**: To adjust the Maximum and Minimum blob size, it is recommended to enable "Display Plots" at the bottom of the Advanced ARPA Settings window. This will display the "plots" using blue circles on top of the radar overlay. Once the plots are displayed on screen, it is easy to adjust the filter size until you don't see any blue circles around the echoes caused by noise, but still see blue circles around real targets.

  - *Minimum echo strength:* This setting adjust a pre-processing filter that removes weak echos from the picture used by the ARPA algorithm (blob detection algorithm). This setting is useful to remove noise (weak echo) but adjusting this value too high may create false "blob" (by breaking apart a strong large echo in multiple distinct smaller echoes).

> **Note**: To adjust the minimum echo strength, it is recommended to enable "Quantized Radar Display" at the bottom of the page. This will display the radar picture as seen by the ARPA algorithm. Adjust this filter until weak echoes caused by noise disappear.

  - *Target Max Speed:* This setting specifies the maximum speed of a target (50Kn by default). Decrease this value if you only want to track slower target (this will decrease the false detection rate).

- *Tracking Reactivity:* TimeZero uses an advanced Kalman filter to smooth past target positions and predict the next target location. This settings adjust the filter "responsiveness". The smaller the value, the longer the filter will take to react to sudden changes in target course. This means that targets turning fast or accelerating/stopping fast may be lost. But the advantages of a slower reactivity filter is that the COG/SOG of the target will be very stable (averaged) and its track will be very smooth. If the reactivity is increased, the filter will be quicker to react, but will cause the tracking to be "choppy" and COG and SOG to be less stable (varies quickly).

- *Target Min Acquire Scans:* A target that is being acquired (displayed with dash contour) will be considered as a valid target (displayed with solid contour) when the corresponding underlying plot is present during the specified amount of **consecutive** antenna turn. If the echo (plot) disappears for one (or multiple) antenna turn before reaching the Target Min Acquire scans value, the counter is restarted (the target must be validated again during x consecutive antenna turn).

- *Target Max Acquire Scans:* A target that is being acquired (displayed with dash contour) for too long (because the blob appears and disappears before reaching the minimum consecutive antenna turn) will automatically be dropped after reaching this value.

- *Target Min Lost Scans*: A target that is already acquired (displayed with solid contour) will be considered as "Lost" if the underlying echo ("plot") disappears during the specified amount of **consecutive** antenna turn.

- *Display Plots:* Displays the Radar Plots on screen. Plots are represented by blue circle and identify all the echoes whose shape could match a target. Pixel size and surface are also displayed next to the plots. This can help adjusting the ARPA filter.

- *Display Gate Distance:* Displays the search gate (circle) on the chart around each target. The search gate is used to link new observations to a specific target. If an observation (plot) is outside of the search gate, it will not be used.

- *Quantized Radar Display*: When this setting is enabled, the Radar Overlay will display the radar picture as seen by the ARPA processing algorithm. All echo will have the same value and will be "gated". This can be useful to temporary enable this mode when adjusting the "Minimum Echo Strength" parameter. Make sure to turn OFF this parameter when you are done.

- **Radar Status (Furuno DRS only):** This button open a window displaying the DRS antenna status.

Targets

The Targets options allow users to configure settings related to the Targets display.

- **Display Target Label:** Check this option to display target label on the chart below the target icons. TimeZero will always try to display the name first (either available inside the AIS information or inside the Buddy List). If a name is not available, TimeZero will display the MMSI number instead.

- **COG/SOG Predictor Time:** Increases the time value to make the Course Over Ground (COG) & Speed Over Ground (SOG) predictor line longer. Decreases the time value to make the predictor lines smaller.

Note: The COG/SOG Predictor Time setting also affects the Own Ship predictor (shared setting).

- **Hide AIS Targets Farther than:** Do not display on the chart the AIS targets located farther than this setting value. By default, this setting is set to a very long distance, allowing all AIS to be displayed on the chart. If you want to declutter the screen and hide AIS targets that are far away, decrease this setting value.

- **Default ARPA Color:** Select the default color used for ARPA target. Note that the target color can be individually changed when right clicking on the target.

- **Default AIS Class A Color:** Select the default color used for AIS Class A target. The color can be set to a fixed value or variable (according to AIS target Type). Note that the target color can also be individually changed when right clicking on the target (this takes priority over the default color).

- **Default AIS Class B Color:** Select the default color used for AIS Class B target. The color can be set to a fixed value or variable (according to AIS target Type). Note that the target color can be individually changed when right clicking on the target (this takes priority over the default color).

- **AIS Variable Color:** Press that button to automatically assign default color according to AIS target type. The default AIS color must be set to "variable" to activate this button. Note that if a color has been setup manually (by right clicking on the target or from the Directory), the manual setup will take priority over the variable color.

- **Target Size:** Adjust the overall target size displayed in TimeZero.

- **Display CPA/TCPA for selected target:** Display graphically on the chart the location of the closest point of approach for the selected target (surrounded in yellow). Please refer to Target Graphic CPA for more information.

- **Directory (AIS & DSC):** Press this button to show a window that allows you to pre configure AIS and DSC targets properties (nickname, color) from their MMSI number.

- **Marine Traffic API Key:** Press this button to enter your Marine Traffic API Key (allowing you to display AIS from the Marine Traffic Web Site using an Internet connection).

- **Marine Traffic Log:** Press this button to display a window with the Marine Traffic log information

- **Do not display Marine Traffic AIS Older than**: This settings do not display the AIS target data sent by the Marine Traffic service (over the Internet) that are older than the specific set time. Please refer to Marine Traffic for more information.
-
-

Sounder

The "Furuno Sounder Module" needs to be unlocked to access the sounder/fish finder features.

The Sounder options allow you to configure various advanced Sounder Setup and Displays preferences.

- **Fish Finder Source:** Select the Furuno Ethernet Sounder detected on the network

- **Day Background Color:** Determines the sounder screen background color in day mode.

- **Night Background Color:** Determines the sounder screen background color in night mode.

Note: The Day/Night setting can be found under the Plotter Display options.

- **Echo Color Levels:** Displays fish finder returns in 8, 16 or 64 colors.

- **A-Scope Peak Hold:** This option allows you to hold the echo return in the A-Scope for a couple of seconds.

- **A-Scope 3D Cone Threshold:** Adjust the A-Scope echo strength that will be displayed in the 3D WorkSpace when the "A-Scope" is displayed on the 3D Cone. This can be used to only show strong fish finder echoes in the 3D A-Scope.

- **Zoom Reference Lines:** Shows or hides the zoom marker that appears in the bottom zoom and marker zoom modes (not implemented yet)

- **High Resolution:** This option is only relevant when TimeZero is used in conjunction with a Furuno NavNet MFD. Turn on this feature to "smooth" sounder echoes if they take a "jagged" appearance on the MFD.

- **Picture Advance:** Adjusts the speed at which the sounder view scrolls across the page.

- **Range Shift:** Adjust the Sounder Range "offset". When the sea-floor depth exceeds a practical, maximum setting, expanding Range causes Sounder returns to become too small to view clearly. The Shift function narrows return to only a portion of Sounder data.

- **Bottom Range Shift Area:** Select the position where you want the bottom of the echo to be located on the screen (when the Sounder is set to Auto Range from the "Layer" button). For example, setting 75% would place the bottom echo at a position equivalent to 75% from the top of the display.

- **Zoom Range Span:** Set the size of the zoom window displayed on the left side when Bottom Zoom mode is selected.

- **Bottom Lock Range Span:** Set the size of the zoom window displayed on the left side when Bottom Lock mode is selected.

- **Sounder Range Selections**: Allows to select the various ranges that will be used when using the Sounder Range In/Out buttons.

- **ACCU-Fish:** Check this option to automatically mark any return that the sounder identifies as fish. Note that when ACCU_FISH is enabled, the sounder will work in dual frequency mode (as both frequencies are needed to detect fish automatically). Running your sounder in dual frequency lower the refresh speed.

  - *ACCU-Fish Info:* Fish information is displayed in either depth or size of detected fish.

  - *ACCU-Fish Symbols:* This option determines the fish symbol used to mark detected fish.

  - *ACCU-Fish Size Correction: Adjusts the size of fish information (percentage offset)*

- **Display ACCU-Fish Icon on Plotter:** Allows to display or hide the ACCU-fish icons on the charts. Note that disabling this setting will not disable the ACCU-Fish function inside the sounder (ACCU-Fish icon will still be displayed on the sounder screen). The ACCU-Fish function can be disabled in the Sounder from the "Sounder Display" button located in the Sounder WorkSpace.

- **Heaving Correction:** Check this option when a Furuno Satellite compass is connected (providing Pitch/Roll/Heave data) to compensate the sounder echo from heave. You can adjust the various parameters under "Transducer Setup".

- **Interference Rejection:** Interferences from other fish finders and electrical equipment can introduce artifacts (or noise) on the sounder screen:
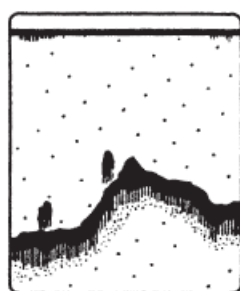
Interference from
other sounder
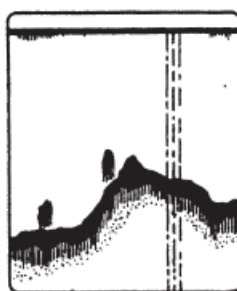
Interference from
electrical equipment

When this type of interference appears on the screen, use the lowest interference rejection setting possible that removes the noise

on the screen. Three or four levels are available

- **Clutter:** Increase this setting to remove low intensity "spots" of noise that can appear all over the screen when sediment in the water or noise are picked up by the sounder.

- **Color Erase:** Increase this setting to remove weak sounder return from the screen (remove the colors that are used to display weak echo)

- **White Marker:** Allows the user to change one color of the sounder color palette to white. This can be helpful in making certain returns stand out.

- **TVG HF/LF:** (Time Varying Gain) Increase this setting to reduce gain near the surface in either High or Low frequency while maintaining the gain for deeper water.

- **Transmit Rate Auto:** Automatically set the transmit rate according to ship's speed, and is inoperative when there is no speed data. The transmit rate auto is only working when one or multiple NavNet MFD are on the network. For most application, leave this setting to OFF (manual).

- **Transmit Rate Manual:** In normal use, leave this setting to the maximum value. If you are in shallow waters, set it to a lower value to prevent second reflection echoes that appear between the surface and the bottom echo.

- **Sounder Transmit:** Uncheck to put the Sounder in Standby.

Fish Alarm

Use these settings to configure a fish alarm that will trigger when an echo appears in between the configured ranges. "Fish Alarm" is used in regular mode. "Fish Alarm for Bottom Lock" is only used when the sounder is in "Bottom Lock" mode.

Use "Fish Alarm Level" to setup the sensitivity of the alarm. If the setting is set to "High" a stronger echo is required to trigger an alarm.

Sounder Initial Setup

- **Zero Line Rejection:** Check this option to "mask" the echoes near the top of the screen (that are caused by surface noise).

- **Zero Line Range:** Use this setting to increase or decrease the height of the Zero Line Rejection "mask".

- **Transducer Draft:** Use this option to calibrate the digital depth output of the sounder. This offset is directly stored and applied inside the Ethernet Sounder Black Box.

Note: The Transducer Offset set in the sounder using the above setting may be overwritten by the Keel Draft and Transducer Draft settings of the Initial Setup Options (when set to "Manual")

- **Salt Water:** Adjust the sound speed for fresh or salt water.

- **Fish Finder Source:** Select the Furuno Ethernet Sounder detected on the network

- **Transducer Setup:** When using an Airmar TD-ID transducer, the power and frequency will be automatically selected. When using another type of transducer, you will have to either select a model number or set the frequency and power manually.

- **Transmission Power:** Interference can appear on the screen when the fish finder on your ship and another ship have the same TX frequency. To prevent this interference, lower your TX power and ask the other ship to lower their TX power. The setting range is 0 to 10 (For DFF1-UHD, 0 to 2). 0 is off and 10 provides the highest TX power

- **External KP**: Turn on to sync with external keying pulse.

- **Bottom Level HF/LF**: Lower this setting to increase bottom detection sensitivity. If the sounder has difficulties displaying a good digital depth value, you may want to lower this setting. The default bottom level setting (0) determines that two strong echoes received in sequence are bottom echoes. If vertical lines appear from the bottom echo in the bottom lock display, lower the bottom level to erase the vertical lines. If you can not identify the fish near the bottom from the bottom echo, increase the bottom level.

- **Gain Offset HF/LF**: If the manual gain setting seems to "weak" or if there is a difference in between the low and high frequencies picture set as the same gain, use the gain offset to balance the gain for the two frequencies here.

- **Auto Gain Offset HF/LF**: If the Gain seems to weak or strong when the sounder is in Auto Mode, use this setting to adjust the picture

- **STC HF/LF (DFF3 only):** Delete unnecessary echoes (plankton, air bubbles, etc.) near the surface that hide the fish near the surface. The setting range is 0 to 10, and 0 is off. 10 deletes unnecessary echoes from the surface to approximately 16 ft. Make

sure you do not use more STC than necessary, because you can erase the small echoes near the surface.

- **Frequency Adjust HF/LF (DFF3 only):** You can adjust the TX frequency of both the low- and high-frequency transducers. Use this feature when your fish finder and another fish finder operate on the same frequency, causing interference. Change the frequency of your transducer by enough percentage points to remove the interference

- **TX Pulse HF/LF (DFF3 only):** The pulse length is automatically set according to range and shift. Use a short pulse for better resolution and a long pulse when detection range is important. To improve resolution on zoom displays, use "Short 1" or "Short 2". "Short 1" improves the detection resolution, but the detection range is shorter than with "standard". "Short 2" raises the detection resolution, however detection range is shorter. "Std" is the standard pulse length, and is suitable for general use. "Long" increases the detection range but lowers the resolution (about 1/2 compared to the "Std" pulse length).

- **RX Band HF/LF (DFF3 only):** The RX bandwidth is automatically set according to pulse length. To decrease noise, select "Narrow". For better resolution, select "Wide".

- **Temperature Port (DFF3 and DFF1-UHD only)**: Select the data source for water temperature.

- **Set Hardware to Factory Default:** Perform a Master Reset of the Sounder. After pressing this button the sounder will restart (wait a couple of minutes). Note that you will have to adjust the transducer setup after performing a Master Reset.

Alarms

The Alarm options allow you to configure all of the various alarms and warnings that can be trigger by the software. Alarms are displayed at the very top of the screen. An individual sound can be selected for each alarm by clicking on the "Define Alarm Sounds" button (at the end of the page). By default, all the Alarm sounds are turned off.

- **Route XTE Alarm** (Cross Track Error): An alarm is triggered when the vessel has strayed a designated distance ("XTE Alarm Value") from the active route. Note that you can display a graphical representation of the Cross Track Error limit on the chart by enabling the "Display XTE Alarm Lines" available in the Routes options.

- **Waypoint Switching Notification:** when this option is checked, a notification will appear in the status bar (on top of the screen) whenever the active Waypoint is automatically switched. A sound will also be triggered if a sound is selected under "Define Alarm Sounds" of the Alarms options.

- **End of Route Notification:** when this option is checked, a notification will appear in the status bar (on top of the screen) whenever the last Waypoint of a Route is reached. A sound will also be triggered if a sound is selected under "Define Alarm Sounds" of the Alarms options.

- **Own Ship Alarm Zone Warning:** User can create Boundary Area or Lines on the chart (using the "Boundary Area" tool or by right clicking on the chart and select "Create -> Boundary Area") and then set them as Alarm Zones by right clicking on them and selecting "Alarm". Once Boundary Alarms are created, this setting adjust the early warning notification. When the boat reach the distance set by this setting from any Alarm Zone, a notification will be displayed (to warn the user from the proximity). When the
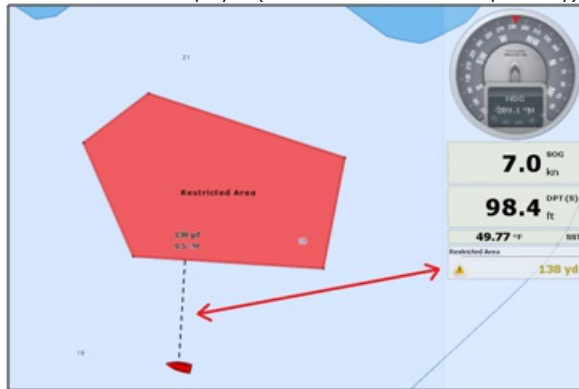
  boat enters any Alarm Zone, an alarm is triggered.

- **Depth Alarm**: An alarm is triggered when the vessel passes over water shallower than a designated depth value.

- **Sea Surface Temperature Alarm**: An alarm is triggered when a specific condition regarding Sea Surface Temperature value is met.

- **Speed Alarm:** An alarm is triggered when a specific condition regarding the speed value of your vessel is met.

- **CPA/TCPA Alarm/Display Value**: Defines the CPA and TCPA values for which a target is considered dangerous and displayed in red on the chart. These values are also used to trigger the CPA/TCPA Alarm, when enabled.

Note: Even if the CPA/TCPA Alarm is not enable (not checked), the targets that break the CPA and TCPA minimum values will be displayed in red on the chart (considered as "dangerous")

- **CPA/TCPA Alarm:** An alarm is triggered when a target becomes dangerous.

- **Proximity AIS Target Alarm:** An alarm is triggered when the vessel passes within a designated distance from an AIS target..

- **Ignore for target slower than...:** Use this setting to prevent targets that are not moving from triggering the proximity or CPA/TCPA alarm. This setting is very useful in harbor to prevent safe target (moored or docked boat) to raise unwanted alarms.

- **GuardZone Alarm Sensitivity:** Set the sensitivity of the Radar Guard Alarm Zone

- **GuardZone Alarm In/Out:** Sets if the Radar Guard Alarm Zone responds to echos entering or leaving the Guard Zone

- **Anchor Watch Alarm:** An alarm is triggered when the vessel strays a designated distance from where the user set anchor. Note that you can enable/disable the Anchor Alarm by right clicking directly on the Own Ship icon. If you enable "Position Averaging", this will average your GPS position over the specified duration (from 5 seconds to 45 seconds). Please refer to the Anchor Alarm for more information.

- **Anti-Grounding Cone Alarm:** Display and enable the Anti-Grounding Cone in front of the Boat.

- **Anti-Grounding Cone Configuration:** Press this button to adjust the shape of the cone. Note that the cone length is tied to the COG/SOG predictor length.

- **MOB Behavior**: This settings is used to adjust the MOB ("Man Over Board") behavior in TimeZero. When "Event Only" is selected, TimeZero will only select the Navigation screen (if another WorkSpace is selected), Zoom In on the chart and Drop an Event (with "Man Over Board" label). When "Alarm and Activate Route" is selected, TimeZero will perform the same actions as "Event Only", but in addition, it will also trigger an alarm and activate a route (to the "Man Over Board" event).

- **Lost Sensor Alarm:** Allows to enable or disable various alarms when loosing specific type of sensors (GPS,Depth, Wind,...)

- **Define Alarm Sounds:** This option allows the user to assign a sound to various alarms. 10 predefined sounds are installed with the software, but it is possible to replace the default sounds by overwriting the sound files located under "C:\Program Files\TimeZero\...\Sounds".

- **Sound Alarm Until Acknowledged:** When this setting is checked, the Alarm Sound will repeat over and over until the user acknowledge the alarm (by clicking on the status bar, checking "Acknowledge" from the Alarm List, or pressing a function key that has been set to Acknowledge all alarm)

General

The General options allow you to configure various TimeZero settings:

- **Function Gesture:** Selects the action you want TimeZero to perform when tapping with two fingers the touch screen. In order to work, this feature requires a touch screen with multi-touch capabilities.

- **Animation Replay Speed:** Sets the speed of animation when the "Play" button is pressed on the Virtual Time Control (Time Bar) of the Planning WorkSpace. If you find that the weather animation moves too quickly, lower this setting.

- **NavData Transparency:** This option manipulates the intensity of NavData transparency (ranges from 0-90)

- **NavData Multi Data Dwell Time:** When multiple numeric data are assigned to the same NavData panel, the "Multi Data Dwell Time" adjusts the time (from 2 to 10 seconds) that each piece of data will be displayed before switching to the next one. To add multiple data to the same NavData panel, right click on a numerical NavData (NavData displaying Number), select "Add" and click on the Data you want to add.

- **Hide Undocked NavData:** Check this option to hide undocked NavData when the NavData tab is closed

- **Lock Undocked NavData:** Check this option if you want to "freeze" the NavData that you have dragged outside of the NavData Bar. This prevent undocked NavData to be accidentally moved when dragging the chart. Make sure to undock and set up the NavData on the screen before enabling this option.

- **NavData Size:** Determines the size of the NavData bar on the right side of the screen (ranges from 50-150).

- **Toolbar Size:** Determines the size of the Toolbar on the left side of the screen (ranges from 25-100).

- **Auto Hide Interface:** This option automatically hides some interface components when the cursor stops moving after a designated period of time ("Auto Hide Delay"). This allows to maximize the chart display.

- **Center on Screen when Zooming with Hand:** Check this option if you want the plotter to zoom in on the center of the screen when using the mouse wheel (instead of zooming on the cursor location).

- **Enable Auto Hand Tool Selection:** Leave this option checked if you want TimeZero to automatically select the panning tool (Hand Tool) after creating a route or object. Un-check this option if you want to create multiple objects in a row.

- **Inertial Scrolling:** Allows TimeZero to continue to move the chart even after releasing the mouse. This option is specifically useful with Touch Screen.

- **Screenshot Recording Location:** Set the default screenshot recording location

- **Power Consumption Optimization:** This option adjusts software power consumption in order to aid either performance or battery conservation. If you want TimeZero to take full advantage of the video card computing power and achieve the fastest refresh time (regardless of power optimization), set this parameter to "performance".

Units

The Units options allow you to setup the units that you want to use for various data displayed on screen.

Simply select the corresponding unit you would like to use for each data:

Device List

This page displays information about your computer (its Hostname and IP address) as well as a list of network components consisting of other compatible TimeZero platforms (TZ Navigator, TZ Professional, TZ iBoat, Furuno TZT2/TZT3) and NavNet sensors that have been detected on the network.

Product Name	IP Address	HostName
DRS_RADOME	172.031.003.018	RADAR2
DFF1	172.031.092.001	SOUNDER
MCU001	172.031.254.001	CU000002
FA-30	172.031.024.002	AIS0
NavNet3D MFDBB	172.031.100.254	MF100254
NavNet3D MFD12	172.031.254.002	MF000001

Network Devices

Note that this list will only display other TimeZero platforms that are logged with the same My TIMEZERO account.

This page also allows you to setup the local synchronization of User Objects (Marks, Routes, Boundaries and Photos):

- **Allow local user object synchronization:** When this option is checked, your computer will synchronize your marks, routes, boundaries and photos with any other TimeZero platforms that are on the same local network and logged in with the same My TIMEZERO account. For example, it allows you to synchronize your user objects with an iPad!

-

- **Synchronization Log:** Press this button to open a window that will display all TimeZero platforms detected on the network, even if they are not logged with the same account (in that case, they will be displayed in red). This window also allows you to open the firewall if it failed during the installation of the software.

My TIMEZERO

This page allows you to login to your My TIMEZERO account (if you are already logged in, this page will display your account information) and adjust how TimeZero connects to the Internet.

- **Allow TimeZero to connect to the Internet:** If you turn OFF this option, TimeZero will no longer access the Internet for any service.

- **Synchronize my User Objects to My TIMEZERO**: When this option is checked, your user objects (routes, marks, boundaries, lines, and photos) will be automatically saved and synchronized to the cloud as soon as your computer is connected to the Internet. Please refer to the TimeZero Cloud chapter for more information.

- **Cloud Synchronization Log:** Opens a window indicating the last time your user object database was synchronized when you have an Internet connection.

- **Report my position automatically to My TimeZero**: When this options is checked, and when you have a valid Internet connection, your position will be reported to your TZ Cloud. This options is also used for remote Anchor Watch monitoring .

- **Community Traffic Log**: Opens a window indicating all the position upload.

- **Help us make TimeZero better by sending crash reports**: Allows TimeZero to send crash reports at startup when the computer is connected to the Internet.

Initial Setup

- **Boat Length:** Enter the vessel length

- **Boat Width:** Enter the vessel width

- **Boat MMSI**: Enter the vessel MMSI (identification). This field is automatically populated when connected to an AIS transmitter.

- **Boat Name:** Enter the vessel name. This field is automatically populated when connected to an AIS transmitter.

- **Boat Registration Number:** Enter the vessel registration number.

- **Boat Icon:** Users can choose the shape of the boat icon when the plotter is used in 3D (the shape of the 2D icon is fixed and cannot be changed)

- **Static Icon Size:** Users can choose the size of the 2D boat icon. Note that if you zoom to a very small range, the vessel icon size (in either 2D or 3D) will be displayed at its real scale (size) on the chart according to the "Boat Length" parameter.

- **Day Boat Icon Color**: Allows to select the color of the boat icon and COG vector during the day

- **Night Boat Icon Color**: Allows to select the color of the boat icon and COG vector during the night

- **Depth Display**: Users can choose to display the depth below the waterline or below keel. This requires the user to enter proper values for "Keel Draft" and "Transducer Draft"

- **Transducer Draft Source:** When set to "automatic", TimeZerowill try to use the offset sent by the instruments and revert to the offset set below if they are missing. When set to "hardware", will only use the offset received by the instruments (causing lack of data if the instruments are not sending the proper offset). When set to "manual", will only use the offset set below:

  - **Transducer Draft:** The value for "Transducer Draft" is always a positive value (enter the distance in between the water line and the position of the transducer).

  - **Keel Draft:** The value for "Keel Draft" is also a positive value (enter the distance in between the water line and the bottom of the Keel).

- **True Wind and VMG Calculation**: When set to "Surface", Heading and Speed through Water will be used to compute True Wind and VMG if they are not received. When set to "Ground", Course Over Ground (COG) and Speed Over Ground (SOG) will be used instead. Make sure to adjust this selection to "Ground" if you only receive Apparent Wind and don't have a Heading Sensor and Speed sensor.

-

- **CCRP**: The CCRP (Consistent Common Reference Point) settings allows you to define offsets for GPS and Transducers (the Radar offset is setup from the Radar Options). As set by IMO regulations, the CCRP is the location at the ship icon, to which all horizontal measurements, such as target range, bearing, relative course/speed, closest point of approach, or time to closest point of approach are referenced. Usually this is the Wheelhouse position on the boat. When entering all the settings (for CCRP, GPS, Transducer,...) remember that the longitudinal positions are always positive (from Bow to Stern) while the lateral position is negative for Port and positive for Starboard (0 is the middle of the vessel)

- **Furuno Satellite Compass Calibration:** Press this button to open a window that will allow you to calibrate the Furuno Satellite Compass SC30, SC33 and SCX20. You can view and setup the Heading, Pitch and Roll offset. Note that the calibration only works when the compass is connected via the Actisense NGT1-USB (NMEA2000) and when the NMEA2000 output has been configured on the last page of the connection wizard.

- **Graphic Instruments Setup**: Allows to enter the various Min/Max used for the Gage NavData.

- **COG and SOG Damping:** This setting can be useful when the GPS sends unreliable COG value (a COG that "jumps all over the place") to smooth the value in TimeZero. Increasing this value will raise the COG & SOG averaging time (but will decrease the response time).

- **Wind Speed/Direction Damping:** This setting smooth the wind data. Increasing this value will raise the Wind averaging time (but will decrease the response time).

- **Boat Speed Damping:** This setting smooth the speed data. Increasing this value will raise the speed averaging time (but will decrease the response time). Increasing this setting usually result in stable ETA time.

- **Offsets:** These settings allow to introduce various offset in the data received by TimeZero

- **Weather Server IP Address:** Do not change this setting unless specifically instructed by Tech Support.

- **Advanced Settings:** These settings should not be adjusted unless instructed by Technical Support.

NMEA Sentence

NMEA0183 Input

Below is the list of NMEA0183 sentences supported by TimeZero as input. There are sorted by the type of data they provide. In case multiple sentences provide the same data, there are listed by priority (higher priority first).

- Air Temperature: MDA, XDR ("C" parameter)

- AIS Target: VDM

- AIS Own Ship Information: VDO

- Apparent Wind Angle: MWV; VWR

- Apparent Wind Speed: MWV; VWR

- Atmospheric Pressure: MDA, XDR ("P" parameter)

- ARPA Target: TTM, TLL (containing an ID), WPL (containing an ID and having the "CD" talker)

- Course Over Ground: RMC; VTG; RMA; VDO

- Current Direction (Set): VDR

- Current Speed (Drift): VDR

- Depth Below Transducer: DPT; DBT

- Distance From Transducer To Keel: DPT

- Distance From Transducer To Water Line: DPT

- DSC Target: DSC & DSE

- Event: TLL (without ID)

- GPS Quality Indicator: GGA

- Heading: FEC_GPatt; HDG; HDT; HDM; VHW; OSD; VDO

- Heave: FEC_GPhve (Furuno Proprietary)

- Horizontal Dilution Of Precision (Accuracy): GGA; GSA; GNS

- Humidity (relative %): MDA; XDR ("H" parameter)

- Local Time Zone: ZDA

- Magnetic Deviation: HDG

- Magnetic variation: HDG; RMC; RMA

- Number Of Satellites in Use: GGA; GNS

- Position: RMC; GGA; GLL; RMA; GNS; VDO

- Rate Of Turn: ROT; VDO

- Pitch & Roll: FEC_GPatt (Furuno Proprietary)

- Sea Surface Temperature: MTW; MDA

- Speed Over Ground: RMC; VTG; RMA; VDO

- Speed Through Water: VHW

- Rudder Sensor Angle: RSA

- Ryokuseisha Buoy: RBY, BLV

- True Wind Angle: MWV

- True Wind Direction: MWD; MDA

- True Wind Speed: MWD; MWV; MDA

- UTC Date Time: ZDA; VDO

- UTC Of Position: RMC; GGA; GLL; GNS

- Velocity Made Good: VPW

NMEA0183 Output:

Below is the list of NMEA0183 sentences supported by TimeZero as output:

- AAM

- APB

- BOD

- BWC

- BWR

- DPT

- GGA

- GLL

- HDG

- HDT

- HSC

- MWD

- MWV

- OSD

- MPT (Proprietary Marport sentence)

- RBY_RBC (Ryokuseisha Buoy)

- RMC

- RMB

- RTE

- TTM

- VPW

- VSD

- VTG

- WPL

- XTE

- ZDA

NMEA2000 Input

Below is the list of NMEA2000 sentences supported by TimeZero as input. There are sorted by the type of data they provide. In case multiple sentences provide the same data, there are listed by priority (higher priority first).

Note: At this time, TimeZero cannot output NMEA2000 sentences. Only NMEA0183 output is supported.

- Air Temperature: PGN_130310; PGN_130311_PressureAndAirTemperature; PGN_130312_AirTemperature

- AIS Class A Position Report: PGN_ 129038

- AIS Class A Static and Voyage Related Data: PGN_ 129794

- AIS Class B Position Report: PGN_129039

- AIS Class B Extended Position Report: PGN_129040

- AIS Class B "CS" Static Data Report: PGN_129809 ; PGN_129810

- Apparent Wind Angle: PGN_130306_ApparentWindSpeedAndAngle

- Apparent Wind Speed: PGN_130306_ApparentWindSpeedAndAngle

- Atmospheric Pressure: PGN_130314; PGN_130311; PGN_130310; PGN_130311_PressureAndAirTemperature; PGN_130311_PressureAndSST

- Depth Below Transducer: PGN_128267

- Distance From Transducer To Keel: PGN_128267

- Distance From Transducer To Water Line: PGN_128267

- Drift Direction: PGN_129291_DriftAndMagneticSet; PGN_129291_DriftAndTrueSet

- Drift Speed: PGN_129291; PGN_129291_DriftAndMagneticSet; PGN_129291_DriftAndTrueSet

- GPS Quality Indicator: PGN_129029

- Heave: PGN_065280 (Furuno Proprietary)

- Horizontal Dilution Of Precision: PGN_129539; PGN_129029

- Magnetic Course Over Ground: PGN_129026_Sog_GeoCog; PGN_129026_Sog_MagCog

- Magnetic Deviation: PGN_127250

- Magnetic Heading: PGN_127250

- Magnetic Sensor Heading: PGN_127250

- Magnetic Variation: PGN_127250

- Number Of Satellites In Use: N/A

- Pitch & Roll: PGN_127257

- Position: PGN_129025; PGN_129029

- Sea Surface Temperature: PGN_130310; PGN_130311_PressureAndSST; PGN_130312_SST

- Speed Over Ground: PGN_129026; PGN_128259; PGN_129026_Sog_GeoCog; PGN_129026_Sog_MagCog

- Speed Through Water: PGN_128259

- Tracked Target Data : PGN_ 128520

- True Course Over Ground: PGN_129026_Sog_GeoCog; PGN_129026_Sog_MagCog

- True Heading: PGN_127250

- True Wind Angle: PGN_130306_TheoriticalWindSpeedAndAngle

- True Wind Magnetic Direction: PGN_130306_TheoriticalWindSpeedAndGeographicDirection;
PGN_130306_TheoriticalWindSpeedAndMagneticDirection

- True Wind Speed: PGN_130306_TheoriticalWindSpeedAndAngle; PGN_130306_TheoriticalWindSpeedAndGeographicDirection;
PGN_130306_TheoriticalWindSpeedAndMagneticDirection

- True Wind True Direction: PGN_130306_TheoriticalWindSpeedAndGeographicDirection;
PGN_130306_TheoriticalWindSpeedAndMagneticDirection

- UTC Date Time: PGN_126992

- UTC Of Position: PGN_129029

NMEA2000 Output

When "NMEA2000 Pilot Output" is checked from the last page of the Connection Wizard, the following PGNs are automatically sent while a route is activated:

- PGN 129283 - Cross Track Error

- PGN 129284 - Navigation Data

- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

Startup Mode

Some parameters can be added to the TimeZero shortcut path. To add a parameter, right click on the TimeZero shortcut (usually located on the Desktop) and select "Properties". Under the "Shortcut" tab, simply add a space after the quote and type the parameter at the very end of the target path (just after the "):
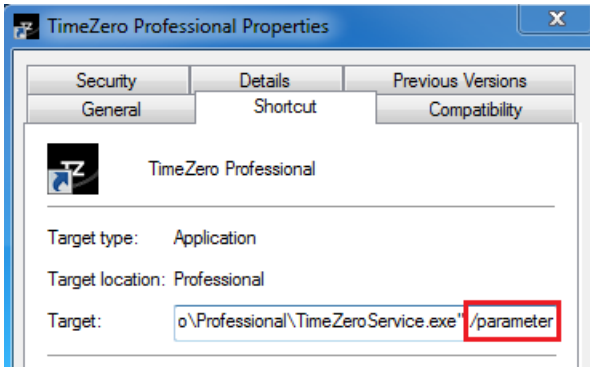
You can replace "/parameter" in the screenshot above by:

- /navigation = used to automatically start TimeZero in Navigation mode (bypass the agreement)

- /reset = used to reset all WorkSpaces that have a display configuration saved. If a Display Configuration was not saved (right click on WorkSpace tab), the WorkSpace will not be reset.

- /secondmonitor = used to shift the monitor used by TimeZero on the second screen.

- /windowtop:100 /windowleft:100 /windowwidth:800 /windowheight:600 = used to set the window size occupied by TimeZero. By default, TimeZero is always in full screen mode, but these parameters can be used to define in pixel the position an size of the space occupied by TimeZero on the screen. In this example, the top left corner of the window will be located at 100 pixel down (from the top of the screen) and 100 pixel right. The size of window will be 800 by 600.

Note: The window position parameter is a beta feature

2020-11-18 © **TIMEZERO - User Guide version 4.1**

Serial Connection

Open the Device Manager and make sure that the Virtual COM port(s) appear under the "Ports (COM & LPT)" category. If they don't appear (or if a warning appears next to it), disconnect the USB converter, make sure that the latest drivers are installed and reconnect the USB converter. If the driver is still not recognized please refer to the USB Drivers troubleshooting chapter.

Write down the Virtual COM port number (you will need that information for the next step)

Open the navigation software and use the "Port Monitor" on each of the virtual COM port. Look at the NMEA sentence (ex: "$GPGGA") to determine what type of sensor is connected (GPS, Sounder, etc…). If you see "garbage data" (random text characters), try a different Baud Rate speed (usually 4800 is used for GPS, Sounder, Heading and 38400 is used for AIS but you can occasionally have a device using something else such as 9600). Also try to invert the wire polarity if you continue to see garbage at all Baud Rate. If you don't see any data, check the wiring.

Use the Connection Wizard Auto Detection first to see if the software will detect the instruments automatically. Use the Manual Configuration (pointing at the Virtual COM port) if you have trouble.

Note: If you have multiple software on the PC accessing multiple COM ports at the same time, do NOT perform an Automatic Configuration in TimeZero Navigator . If you do an Automatic Detection, TimeZero Navigator will open and use all the active COM ports, preventing the other software to use them at the same time. In this case, configure manually the COM Port in TimeZero Navigator one by one (configure ONLY the one you want TimeZero Navigator to use).

If an AIS instrument is connected to the PC, make sure that the GPS/COG/SOG/Heading Master sources are not set to the AIS Port (too slow). Use the Port Priority of Data Source selection and select the real COM port connected to the GPS, Heading… Or uncheck "Position" and "Heading" coming from the AIS port.

USB Drivers

Sometimes, a USB to Serial adapter will not be able to find the proper drivers to use. This can happen if the adapter was plugged before installing the computer or if the wrong drivers were previously loaded. An adapter loaded without the drivers will look like that on the Device Manager:
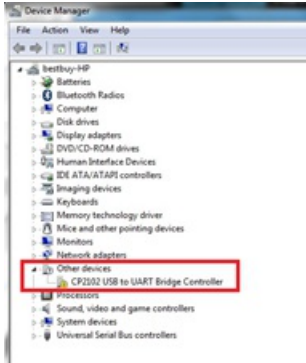
To solve the problem, double click on the adapter, select the "Driver" tab and then click on "Uninstall":
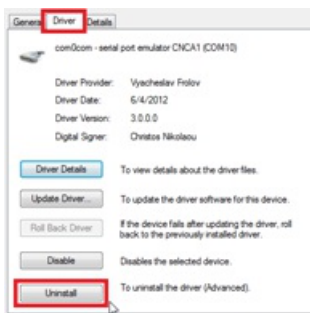
Once the device is uninstalled, unplug the adapter from the computer.

Make sure that the drivers are correctly installed. Remember that it is always better to download the latest version of the drivers on line. Be careful as not all drivers come with an installer. Sometimes, the driver is just a ZIP file that you have to unzip and put somewhere (on your desktop for example).

Plug the USB Adapter on your computer. If the drivers didn't come with an installer (just a ZIP file), select "Browse my computer for driver software" and select to the location of the unzipped folder:
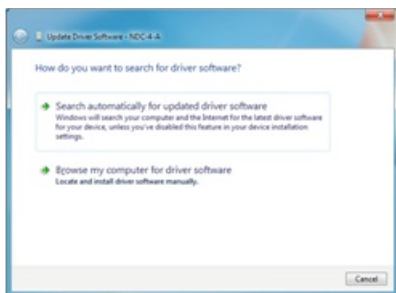
If the drivers came with an installer, just select "Search Automatically for driver software".

Autopilot Troubleshooting

Connection and Configuration (NMEA0183)

TimeZero can send NMEA0183 Navigation information to the autopilot via a COM port or via a USB to Serial adapter. The first step is to know where to send the pilot information (on which COM port).

Note: If the location of the pilot is not known, you can use the Port Monitor function of TZ to detect what port the heading is coming in on; usually this is the same port as the pilot (most pilots have a bi-directional communication with the PC to listen for pilot sentence from the PC and send Heading information to the PC).

Most Autopilots use the APB sentence to get course to steer, cross track error and Waypoint ID. TimeZero is set to output this sentence by default along with the XTE sentence. Other data to output is dependent on what the pilot will accept or need. For example, some pilots need to receive speed from the computer, in that case the VTG or RMC sentence will need to be turned ON. The user can find this information in the owner's manual for their autopilot.

Once you know which sentences to send to the pilot, open the Connection Wizard (under the TimeZero button) and select Data Output and Pilot. Click on "Serial Port" and select the COM port where the pilot is connected to and select the appropriate Baudrate (usually 4800). Select the sentences to output to the pilot. If you don't know which sentences to select, you can try APB, XTE and RMC.

Note that the APB sentence has two modes: "Magnetic North" and "True North". This setting defines the North Reference that will be used inside the APB sentence for the Bearing to Waypoint (or CTS) information. If the Autopilot is connected to a Magnetic Heading sensor, you should use "Magnetic North". If the Autopilot is connected to a True Heading Sensor (such as a Satellite Compass or Gyrocompass), you should use "True North". Note that most installations are using a Magnetic Compass, so the APB default setting ("Magnetic North") should be used.

Note: Also be sure that TimeZero and the autopilot are set to display the same North reference. You can adjust the North reference in TimeZero by adjusting the "Bearing Display" setting in the Units Options.

Once the settings have been adjusted in the Connection Wizard, click on "Next" and "Finish"

Connection and Configuration (NMEA2000)

TimeZero can also send Pilot information using NMEA2000. Unlike with NMEA0183, there is no sentence selection (called "PGN") as the NMEA2000 is much more standardized for pilot information. In TimeZero, you just need to make sure that "NMEA2000 Pilot Output" is checked from the last page of the Connection Wizard.

Note: This option will only be available when an Actisense NGT1-USB has been configured as a NMEA2000 input.

Checking this option will automatically output the following PGNs when a route is activated:

- PGN 129283 - Cross Track Error

- PGN 129284 - Navigation Data

- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

Test the Connection

On the NavData panel in TimeZero, configure to display CTS (Course to Steer), XTE (Cross Track Error), and DTW (distance to waypoint). Configure the pilot to display a "steering page" or a service page with the same information. Note that "CTS" may be referenced on the pilot as "Bearing", "BPW" (bearing position to waypoint) or "BRG". The "DTW" may be referenced on the pilot as "RNG", "Range" or "DIST".

Once you have configured the NavData panel in TimeZero and can also display that information on the pilot, simply activate a route/waypoint in TimeZero. Look at the pilot screen and make sure that the data matches what the software displays.

If the data does not match (course to steer for example), make sure that the Pilot and TimeZero are using the same North reference (Magnetic or True). If the course to steer is off by 1 or 2 degree, this might be due to the difference in the magnetic variation table built in the Pilot (or Heading Sensor) and the magnetic variation used by TimeZero. To avoid the pilot (or heading sensor) from making any variation calculations (going from True North to Magnetic North or the opposite), make sure that TimeZero is sending Magnetic bearing if the heading sensor used by the pilot is a magnetic sensor and True bearing if the heading sensor used by the pilot is a true heading sensor (Satellite Compass or Gyrocompass).

Note: With NMEA0183 connection, only the APB sentence allows you to select Magnetic or True bearing. If you use the RMB sentence, it will always send True Bearing (as per the NMEA0183 specification). For that reason, if you have a magnetic compass, it is better to use the APB sentence and make sure that it is set up in TimeZero for "Magnetic North".

If no information appears at all on the Autopilot ("--" for example), check the following if you use a NMEA0183 connection:

- Wiring: are the wires reversed? Or going into the improper input on the pilot?

- COM port number: is TZ outputting on the correct port?

- Some (older) pilots don't recognize the "II" NMEA Talker. Try to change the NMEA talker to "GP" (on the output setup page of the connection wizard)

- Check the Navigation source on your Autopilot. Some pilot have two or more inputs that can be switched. The "Navigation Source" port must match the input port of the pilot connected to the computer

- Check the input baud rate of the pilot. Most of the time it is set to the regular 4800bps, but it may be changed sometimes (38.4Kbps)

- Check if the pilot is using RS232 or RS422 and if the COM port used by TimeZero uses the same protocol

When you have confirmed that the data matches in TimeZero and on the pilot (at minimum XTE and CTS), you can perform a sea trial

Pilot not steering properly during a sea trial

If the data is correctly sent by TimeZero to the pilot (with matching values), but if the pilot is not steering properly (not following a straight line or not steering in the correct direction), check the following points:

Note: At this point, we are not troubleshooting TimeZero itself but the pilot. TimeZero's "responsibility" is only to send a good value to the pilot. If the pilot is not steering properly at this point, then something needs to be adjusted on the pilot itself (or the compass needs to be calibrated)

Check Pilot behavior in "Auto Mode"

Every pilot has an "Auto" mode which does not rely on any external Navigation information (unlike the "Nav" or "Navigation" mode which relies on XTE and/orcCTS sent by a "Navigator" such as TimeZero). Testing the pilot in "Auto" mode allows to validate its correct behavior in standalone mode. When engaging the "Auto" mode, the pilot simply takes a snapshot of the heading at the time the user presses the "Auto" button and it simply holds that course. If the pilot is unable to navigate a straight course in Auto mode, it will not be able to navigate a straight course in "Nav" mode either. In that case, adjust the pilot parameters until having a satisfactory "Auto" mode behavior.

Note: Some pilots allow to change course while in auto mode by turning the rotary knob. It is a good idea to change the course in Auto mode to see how the pilot react to change of course order.

Check the Heading Sensor

If the Pilot behaves correctly in "Auto" mode, but has problems following a route in "Nav" mode, then the problem is likely coming from the heading sensor. Understand that when TimeZero is sending an order to the pilot, via the Course to Steer sentence (ex: "go to 273 degree"), the pilot can only rely on its heading sensor to know where 273 degree is. If the heading sensor sends a wrong value, then TimeZero and the Pilot will not agree on where 273 degree is, resulting in an erratic behavior (pilot seems to follow an alternate course).

First, make sure that TimeZero and the Pilot are receiving the heading value from the same heading sensor. This will help when troubleshooting the heading sensor value. Then make sure that the heading value displayed on the pilot matches the value displayed in TimeZero (configure heading in the NavData panel to compare the value). If the values don't match, make sure that the pilot and TimeZero are using the same North Reference (Magnetic or True).

Once you checked that the heading is the same on the pilot and TimeZero, add a Course Over Ground ("COG") data box in TimeZero. On a calm day (low wind, no current, low wave), steer your boat on a straight line at 6-10Kn. In these conditions, the direction you are going (COG) should match the heading of the boat. In other words, the Heading and COG values displayed in TimeZero should be the same (+/- 1 degree). Repeat this process in various directions (heading North, heading South, heading East and heading West). If the heading and COG values don't match (offset more than 2-3 degrees), then the heading sensor needs to be calibrated if you want the "Nav" mode to steer in the correct direction.

Pilot not handling correctly the change of Waypoint

If the Pilot "overshoots" a Waypoint, make sure that you have setup a Waypoint Switching Radius large enough in TimeZero to allow the pilot to start the turn before it actually reaches the Waypoint. The Waypoint Switching Radius can be adjusted from the Routes Options.

Also, make sure that the counter rudder gain (parameter of the pilot) is set up properly for your boat. This parameter varies with the "inertia" of your boat. Some pilots (like the Furuno Pilots) learn this parameter dynamically and gets better after a couple of turns. This information will be found in the pilot manufacturer's documentation.

Summary

Here what to keep in mind when configuring a pilot with TimeZero:

- Make sure that the pilot is correctly connected to TimeZero (NMEA0183 or NMEA2000, Port COM, Baudrate, Wiring)

- Select the correct NMEA0183 output sentence (in most of the cases, APB, XTE and RMC will work) or check "NMEA2000 Pilot Output" from the last page of the Connection Wizard (when using NMEA2000)

- Make sure to match the bearing readout in TimeZero and on the Pilot (Magnetic or True) and make sure to send a bearing that has the same reference as the heading sensor (magnetic in most cases)

- Activate a route and make sure that XTE and CTS match on TimeZero and on the Pilot (display these two information on the pilot)

- Make sure that the heading sensor used by TimeZero is the same heading sensor used by the Pilot and make sure it is properly calibrated. Remember that a heading sensor that is offset by 3 or more degrees will cause the pilot to steer the boat by the same error!

How To Adjust Priority On NMEA2000

It is possible to have multiple devices providing the same information on a NMEA2000 bus. For example, you could connect on the same NMEA2000 backbone a GPS and a weather station. Some weather stations have an embedded GPS and they can provide wind but also GPS information resulting on two GPS information on the bus (one coming from the GPS and another one coming from the weather station). In TimeZero, when you configure a NMEA2000 connection, you cannot see individual sensors. So, to adjust priority (select the "Master" sensor) you have to adjust the sensor instance number. A device with a lower instance number has higher priority than a device with a higher instance number. So, if you want to make the GPS higher priority over the Weather Station, you need to set the GPS device instance to "0" and the weather station to "1".

TimeZero will be able to switch automatically from one device (with higher priority) to another device (with lower priority) in case of failure of the "Master".

Note that the instance number is actually a property of the sensor (it is stored inside the sensor and not in TimeZero) and to change it, you need to use the Actisense "NMEA Reader" tool (available for free on the Actisense Software). The "NMEA Reader" software is a very valuable tool that allows you to see the list of sensors connected on the NMEA2000 bus (and the data they output), but also allows you to change the device instance number.

Note: It is not possible to use the NMEA Reader and TimeZero at the same time. Make sure to exit TimeZero before opening the Actisense NMEA Reader.

Open the Actisense NMEA Reader and select the "network view" (tab selection is at the bottom left):
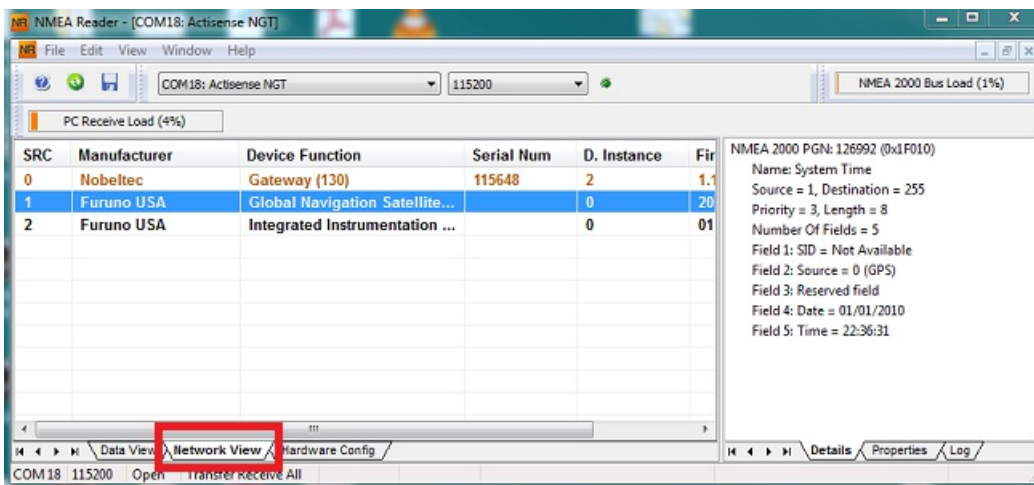
Select the product whose device instance you want to change and select the properties tab at the bottom right:
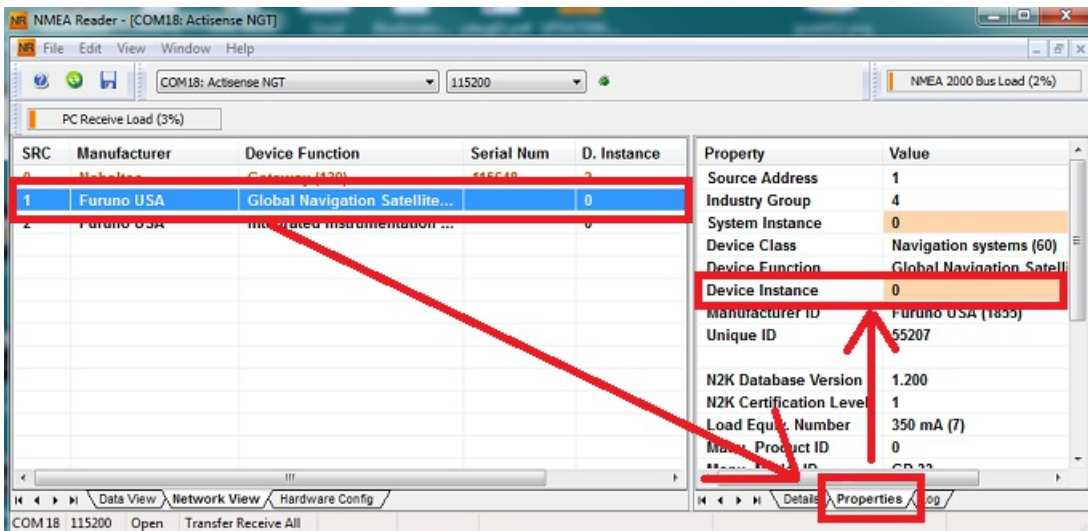
Click on the device Instance field, set the number you would like to use and press the ENTER key on your Keyboard.

IMPORTANT: With some devices, you may not see any change until restarting the device.

How To Ping

Ping a Network Device

To check the connection between the computer and any Ethernet device (Sounder, Radar, etc...), you can ping the device using its IP address.

Under Windows 7:

Click on the Windows Start button and search for "cmd". Select "cmd" under "Programs":
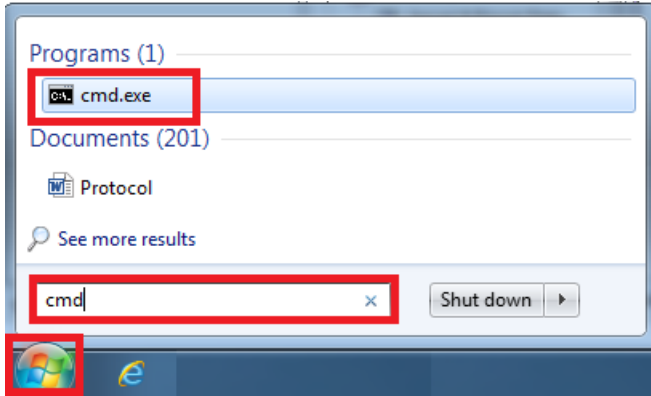
Under Windows 8:

Press and hold the Windows Key (or "Start" Key) and the "X" key. A pop up menu will appear. Select "Run", type "cmd" in the prompt and select "OK"

Once the Command prompt appear, type "ping 172.31.92.1" (replace "172.31.92.1 with the IP address of the device you would like to ping):
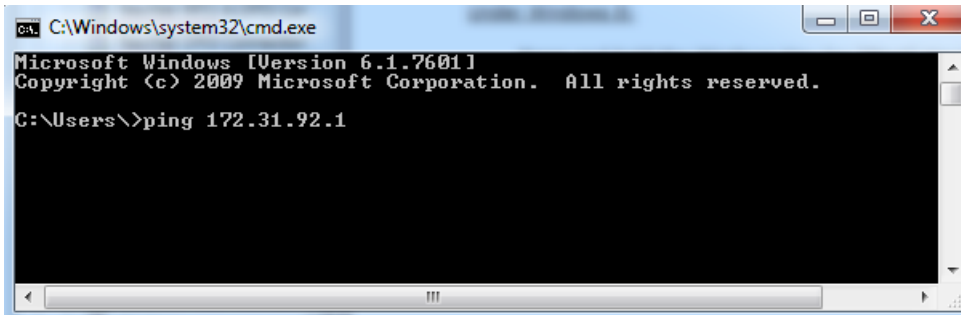
Note: Do not enter leading 0 in the command. For example do NOT type "ping 172.031.092.001"

If the result is Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), the communication with the Ethernet device is OK.

If the result is Packets: Sent = 4, Received = 0, Lost = 4 (100% loss) or if any error is returned, there is a problem with either the IP configuration of the computer or the cable. Ensure the IP address is correctly set-up and the correct cable is plugged into the network interface. If the computer is connected to a Hub, ensure that the "green light" is on and blinking on the corresponding Ethernet cable. If you still have problems, try alternate Ethernet cables.

Common IP addresses:

Furuno IP Addresses:

- AIS FA30 = 172.31.24.2

- AIS FA50 = 172.31.24.3

- Weather BBWX1/ BBWX2 = 172.31.200.2

- Sounder DFF1 (when the switch are "Down – Up – Up – Down") = 172.31.92.1

- Sounder DFF3 (when DIP switch 1 and 2 are set to ON) = 172.31.92.1

- Master NavNet3D MFD = 172.31.100.254

- NavNet TZtouch = 172.31.252.1

- Radar FAR2xx7 (set to radar 1) = 172.31.3.6

- Radar FAR2xx7 (set to radar 2) = 172.31.3.7

- DRS4DCM = 172.31.3.18

Koden IP Addresses:

- MDS5/6 or MDS1/8R with NO router on the network = 192.168.0.1

Factory Default

To reset TimeZero Navigator to Factory Default (Master Reset), exit TimeZero Navigator .

Open the Windows "Start" menu, locate " TimeZero" and click on "Clear Settings"
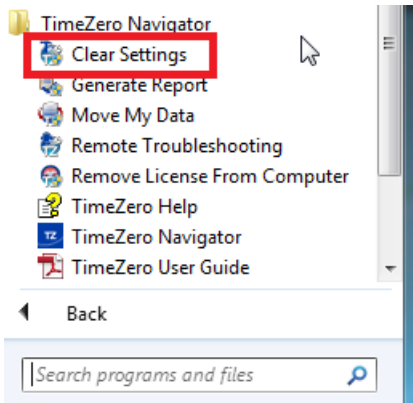
The following window will appear:
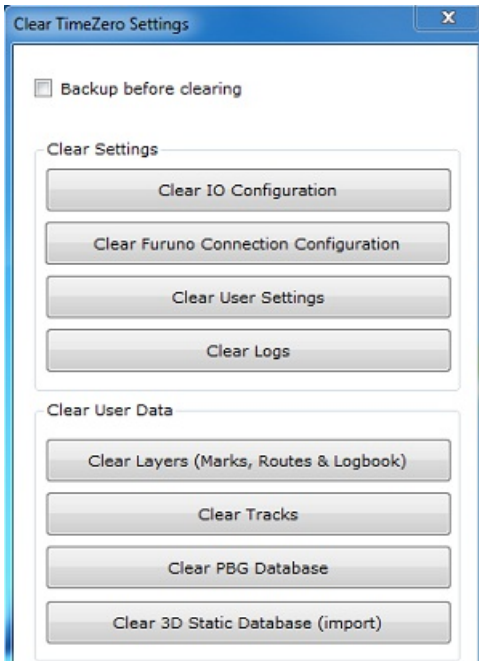
Clear IO Configuration: Erase the Input and Output configuration.

Clear Furuno Connection Configuration: Erase various Furuno Connection and Synchronization settings. These settings are restored automatically the next time you connect to a Furuno Sensor.

Clear User Settings: Set to default all the Options, NavData Configuration, Toolbar and WorkSpaces.

Clear Log: Erase all troubleshooting log files, message and user login information (My TimeZero)

Clear Layers: Erase all the objects (Marks, Boundaries, Annotation,...), Routes and Logbook

Clear Tracks: Erase all the tracks and their history (Recall Track)

If you check "Backup before clearing", the various settings files and database will be duplicated before being erased. Contact Tech Support to recover the files if necessary.

To perform a Factory Default or Master Reset, press on all the buttons.

How To Contact Nobeltec

If you have a question about TimeZero, please first review this User's Guide. If you cannot find the answer you are looking for, please contact us through our support portal available at http://support.mytimezero.com

TimeZero is supported by Nobeltec in North and South America and by MaxSea everywhere else:

MaxSea International
Technopole Izarbel
Allée Théodore Monod
64210 Bidart (FRANCE)

International Support Line:
+34 932 20 45 00
France Support Line:
0 899 700 264
Available from Monday to Thursday 9h00 - 12h00 and 14h00 - 17h30 / Friday 9h00 - 12h30 and 14h00 -17h00 (UTC)

Fax: +33 (0)559 43 81 01
Sales email: info@maxsea.fr
Web site: http://www.mytimezero.com

Nobeltec, Inc.
15242 NW Greenbrier Pkwy
Beaverton, OR 97006 USA

America Sales & Support (available 10 AM – 7 PM ET):
+1 503 579 1414

Fax: +1 503.579.1304
Sales email: sales@nobeltec.com
Web site: http://www.mytimezero.com

SOFTWARE LICENSE AGREEMENT

PLEASE READ THIS ENTIRE SOFTWARE APPLICATION LICENSE AGREEMENT ("AGREEMENT") CAREFULLY IN ITS ENTIRETY BEFORE INSTALLING, ACCESSING OR USING THIS SOFTWARE APPLICATION ("APPLICATION"). THIS AGREEMENT IS LEGALLY BINDING UPON YOU ("YOU") AND NOBELTEC, INC. ("NOBELTEC"). BY DOWNLOADING, INSTALLING, ACCESSING, OR USING THIS SOFTWARE APPLICATION, YOU ARE AGREEING TO EACH TERM OF THIS AGREEMENT INCLUDING THE RESTRICTIONS ON USE, LIMITED WARRANTY AND DISCLAIMER, AMONG OTHER THINGS. IF THE SOFTWARE APPLICATION IS TO BE USED ONBOARD A VESSEL AND YOU ARE NOT THE OWNER OF THE VESSEL AND/OR IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF ANOTHER PERSON OR LEGAL ENTITY, YOU REPRESENT THAT YOU HAVE THE AUTHORITY TO ENTER INTO THIS AGREEMENT ON THEIR BEHALF. THIS SOFTWARE APPLICATION IS FOR PRIVATE USE ONLY AND NOT FOR COMMERCIAL USE. WITHOUT PREJUDICE TO ANY OTHER LIMITATION OF LIABILITY SPECIFIED HEREINAFTER, NOBELTEC SHALL IN NO EVENT BE LIABLE FOR ANY LOSS OR DAMAGE ARISING FROM THE USE OF THE SOFTWARE APPLICATION FOR ANY BUSINESS ACTIVITY OF ANY NATURE WHATSOEVER. NOBELTEC RESERVES THE RIGHT TO CHANGE OR MODIFY ANY OF THE TERMS AND CONDITIONS OF THIS AGREEMENT AT ANY TIME WITHOUT NOTICE TO YOU. IF YOU DO NOT AGREE WITH THESE TERMS AND CONDITIONS, DO NOT PURCHASE, INSTALL OR USE THE APPLICATION. AS A PARTY TO THIS AGREEMENT, YOU AGREE TO THE FOLLOWING TERMS AND CONDITIONS:

1. APPLICATION.

As used in this Agreement, the term "Application" means, collectively:

(i)   the software application You are currently loading with which this Agreement is provided, including the object code form of the delivered digital images, the stock photographs, clip art, or other artistic works, and all data, protocols, links, articles, logos graphic or video messages and all information, text, application, music, sound, graphics or other materials made available through the Application, whether publicly posted or privately transmitted;

(ii)   the online web applications and services ("Services") related to the Application, accessible from the application or from the <www.mytimezero.com> web site using a My TIMEZERO account;

(iii)   related explanatory written materials and any other possible documentation related thereto;

(iv)   all upgrades, modified versions, updates, additions, and copies of the Application, if any, licensed to You by Nobeltec under this Agreement.

2. OWNERSHIP RIGHTS.

Nobeltec and/or its authorized third-party licensors shall retain all rights, title and interest in the copyrights, patents, trade secrets, trademarks, service marks, design rights, proprietary information rights and other intellectual property rights in the Application as may exist anywhere in the world. This license shall not be considered a "sale" of the Application. Nobeltec's Application is protected by copyright. To the fullest extent permitted by law, such protected works may not be copied, reproduced, translated, modified, adapted, reversed-engineered, decompiled, stored in a retrieval system, or retransmitted in whole or in part, in any form or by any means. You acknowledge that You do not acquire any ownership rights related to the Application and that You may not resell the Application or any part of it. This Agreement does not grant You any rights in connection with any trademarks or service marks of Nobeltec. All rights not expressly granted are reserved by Nobeltec and/or its authorized third-party licensors.

3. GRANT OF LICENSE.

Nobeltec hereby grants to You a non-transferable, personal, non-exclusive right, so long as You comply with the terms and conditions of this Agreement, to use the Application and any upgrades thereto only for Your benefit. TZ Navigator may be installed on a maximum of two (2) of Your own personal computers; provided, however it may only be used on one single computer at a time. TZ Professional and TZ Coastal Monitoring may be installed on a maximum of one (1) of Your own personal computers. You must individually purchase the Software for each individual computer on a network running the Software. The Software cannot be activated over Microsoft Remote Desktop Protocol (RDP). The Software is "in use" on a computer when it is loaded into temporary memory (i.e. RAM) of a computer. Nobeltec expressly reserves any and all rights that it may have in or to the Application which are not expressly licensed by Nobeltec to You under this Agreement. You acknowledge that Nobeltec has copyrights and other proprietary rights in and to the Application.

4. OTHER RESTRICTIONS.

You shall not (a) copy, duplicate, reproduce or publish the Application; (b) electronically transfer the Application to multiple computers over a network; (c) distribute copies of the Application to others by any means whatsoever; (d) modify, adapt, translate, reverse engineer, disassemble or decompile the Application in any way or create derivative works (i.e. works which include or are derived from any portion of the Application) based on the Application; (e) modify, adapt, translate, or create derivative works based on the printed, electronic or written materials; (f) assign, rent, exchange, lend, lease or sublease the Application; or (g) sell or transfer the Application. In no event shall You make any use of the Application for commercial purposes, it being understood that Your sole rights with respect to the Application shall be to use the Application for Your own benefit and not for the benefit of any third party, except as otherwise provided herein.

5. DURATION AND TERMINATION.

The license granted herein is effective unless rejected or until terminated. You may reject or terminate it at any time by removing the application and license from Your computer(s) and destroying the Application together with all copies, updates, upgrades and merged portions in any form, which are in Your possession or control. It will also terminate upon conditions set forth elsewhere in this Agreement or if You fail to comply with any term or condition of this Agreement. You agree upon termination, cancellation, suspension or expiration of this Agreement for any reason and by either party, to cease all use of the Application and to destroy the Application together with all copies, updates, upgrades, and merged portions in any form. You agree that any breach of this Agreement by You represents a material breach and entitles Nobeltec to immediately revoke the license under this Agreement and terminate the Agreement.

6. WARNING REGARDING NAVIGATIONAL USE.

The Application utilizes digital chart data and electronic information from the various marine electronic instrumentations on-board the vessel. You shall comply with and take into consideration the following Nobeltec warning.

Nautical navigation, including but not limited to navigation with 3-dimensional views of the ocean and land elevation topography, is an inherently dangerous undertaking and should only be engaged in by persons trained and experienced in nautical navigation. This application is intended for use only by persons trained in nautical navigation and only as a navigational aid, not as the sole method of navigation.

The navigation data are auxiliary means for navigation and can in no way replace the end user's navigating experience and diligence.

To the extent You have acquired a "one off" license to use the navigation data, You acknowledge that such data are changing rapidly, and that nautical navigation undertaken with the aid of such data increases the inherent danger of such navigation. The data may not contain all nautical navigation data existing worldwide and You should make no assumption otherwise. Unless otherwise clearly stated, the navigation data should only be used as an aid to navigation. The data is designed to facilitate the use of official government charts, not to replace them. Only official government charts and notices to mariners contain the current information needed for safe navigation.

The data is derived, in part, from material provided with the permission of various national hydrographic offices and other third parties (the "Licensors"). Nobeltec is an authorized user and licensee of selected data products under separate agreements with the Licensors. All rights are reserved by the respective Licensors and copyright restrictions apply. The information may not be modified or exploited by reverse engineering of its formats or its encryption or copied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or part. No Licensor has verified the data and no Licensor

accepts any liability for the accuracy of reproduction or for any modifications that may have been made to the information supplied. Furthermore, no Licensor warrants that the data meets any regulations as an appropriate product for navigation or that it contains the latest hydrographic information available.

Electronic charts are an aid to navigation designed to facilitate the use of official government charts, not replace them. New charts or notice to mariner corrections will render this product obsolete and inaccurate. Updates may be available from Nobeltec. Always remember that these electronic charts are inadequate as a primary means of navigation and should be used only as supplements to official government charts and traditional navigation methods, unless otherwise specified by national maritime authorities. Only official government charts and notices to mariners contain all information needed for the safety of navigation and, as always, the captain is responsible for their proper use.

7. WARNING REGARDING WEATHER INFORMATION.

The Nobeltec Weather Service is subject to service interruptions and may contain errors or inaccuracies, and, consequently, should not be relied upon exclusively. The service is provided "AS IS". You are urged to check alternate weather information sources prior to making safety related decisions. You acknowledge and agree that You shall be solely responsible for use of the information and all decisions taken in respect thereto. By using Nobeltec Weather Service, You release and waive any claim against Nobeltec Inc. and Signet S.A.S. with regards to Nobeltec Weather Service.

8. WARNING REGARDING MARINE ZONE AND PROTECTED AREA.

The Application may utilize digital chart data containing Marine Zone or Protected Area ("MLPA"). The purpose of the MLPA feature is to help interpret forbidden or protected areas. The zones and designated area boundaries are indicative only. Whilst every care has been taken to illustrate zone and designated area boundaries as accurately as possible, users must refer to the local authorities for precise zone and boundary descriptions. Whilst every care is taken to ensure the accuracy of this product, Nobeltec makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose. By using the MLPA feature, You release and waive any claim against Nobeltec Inc. and Signet S.A.S.

9. WARRANTY AND DISCLAIMER.

To the maximum extent permitted by applicable law, the Application is delivered "AS IS," and is not guaranteed to be free from errors or defects. Nobeltec does not warrant that the Application is error free, that it will perform without interruption or that it is compatible with products manufactured by any person or entity other than Nobeltec. The Application utilizes digital chart data and electronic information from the various marine electronic instrumentation on-board the vessel, which may contain errors. Nobeltec does not warrant the accuracy of such information, and You are advised that errors in such information may cause the Application to give inaccurate readings. You assume all risk as to their performance. To the maximum extent permitted by applicable law, Nobeltec makes no express or implied warranty, and disclaims any liability for the application, including but not limited to, any express or implied warranty of merchantability or fitness for a particular purpose. Some countries/states/jurisdictions do not allow limitations on the length of implied warranties, so the above exclusion may not apply to You. The limited warranties and other obligations and liabilities of Nobeltec, and Your remedies set forth in this Agreement, are exclusive and in substitution for any other rights, claims and remedies You would otherwise have against Nobeltec with respect to the application provided hereunder.

10. LIMITATION OF LIABILITY.

To the maximum extent permitted by applicable law, in no event will Nobeltec or its third party licensors be liable to You or to any third party for direct, special, incidental, indirect, consequential, punitive, exemplary or other damages of any nature whatsoever (including but not limited to loss of use, revenue, profit, data, property damage or injury) whether such liability is asserted on the basis of contract, warranty, contribution, strict liability, tort or other theory arising out of this Agreement or the use of or inability to use the application or any other legal theories, even if Nobeltec has been advised of the possibility of such damages. Because some countries/states/jurisdictions do not allow the exclusion of liability but may allow liability to be limited, Nobeltec's entire liability under any provision of this Agreement shall in such case be limited to the amount actually paid by You for the application license. If an arbitration panel or court of competent jurisdiction determines that relevant laws in force may imply warranties and liabilities which cannot be excluded or limited or which can only partly be excluded or limited, then the limit on Nobeltec's liability set forth in this Section shall apply to the fullest extent permitted by law. If Nobeltec cannot exclude or limit a warranty or liability implied by law, this Agreement shall be read and construed subject to such provisions of law.

11. INDEMNIFICATION.

You will indemnify and hold harmless Nobeltec and its third party licensors from and against all claims and liabilities (including claims by third parties), and costs and expenses (including attorneys' fees), incident thereto or incident to successfully establishing the right to indemnification, for injury to or death of any person or persons, including but not limited to Your employees, but not employees of Nobeltec, or for loss of or damage to any property, including any vessel or cargo, arising out of or in any way relating to (a) Your breach of any of the terms and conditions of this Agreement and (b) Your use of the Application provided hereunder, whether or not arising in tort or occasioned by the negligence of Nobeltec. Your indemnification obligations under this Section 11 will survive the termination of this Agreement.

12. EXPORT COMPLIANCE.

You shall be responsible for Your compliance with any applicable export control restrictions, laws and regulations as may be modified from time to time, imposed by the governments of the U.S. and, if applicable, other countries. You shall not attempt to, or knowingly export or re-export the Application covered under this Agreement to any country, or national thereof, prohibited from obtaining such Application, either directly or indirectly. You shall, at Your sole cost and expense, obtain and maintain in effect all permits, licenses and other consents necessary to conduct Your respective activities hereunder.

13. COLLECTION OF INFORMATION.

Nobeltec may collect information relating to how often You use the Application or the frequency with which certain features of the Application are used. This information, if collected, will be collected anonymously, in a way that does not personally identify You. Nobeltec may use this information to detect broad user trends and to otherwise enhance our applications.

Use of Location-based Services:
Nobeltec may provide certain features or services (e.g., Friends, Weather, Ocean-O, …) that rely upon GPS information (when available) (the "Services"). To provide the Services when available, Nobeltec must collect, use, transmit, process and maintain Your location data, including but not limited to the geographic location of Your device and information related to Your MyTIMEZERO account ("Account") and any devices registered thereunder, including but not limited to Your serial number, device ID, device name, and device type. You may withdraw consent to Nobeltec's collection, use, transmission, processing and maintenance of location and Account data at any time by not using the location-based features and turning off the services from the "My TIMEZERO" Options. Any location data provided by the Services is not intended to be relied upon in situations where precise location information is needed or where erroneous, inaccurate, time-delayed or incomplete location data may lead to death, personal injury, property or environmental damage. Nobeltec shall use reasonable skill and due care in providing the Services, but Nobeltec does not guaranty the availability, accuracy, completeness, reliability, or timeliness of location data or any other data displayed by the Services. The Services are not intended or suitable for use as an emergency locator system.

Data Backup / Synchronization:
The Services may create automatic backups of Your navigation data (route, marks, etc.), when the Application is launched and connected to the Internet. The Application will store your last backups on Your My TIMEZERO dedicated private cloud storage account; however, if a device has not backed up to My TIMEZERO for a period of one hundred and eighty (180) days, Nobeltec reserves the right to delete the backups associated with that device. Nobeltec shall use reasonable skill and due care in providing the Services, but, to the greatest extent permissible by applicable law, Nobeltec does not guarantee or warrant that any content You may store or access through the Services will not be subject to inadvertent damage, corruption, loss, or removal in accordance with the terms of this Agreement, and Nobeltec shall not be responsible should such damage, corruption, loss, or removal occur. It is Your responsibility to maintain appropriate alternate backup of Your information and data.

Nobeltec is committed to protecting your privacy and a copy of our latest Statement of Privacy is available on-line at:
https://mytimezero.com/privacy-statement

14. ASSIGNMENT.

Nobeltec may assign and transfer all its rights and obligations under the Agreement to any third party.

15. GOVERNING LAW AND MANDATORY ARBITRATION.

This Agreement will be governed by the laws of the State of Oregon, without giving effect to its conflicts of rules provisions. Any dispute relating to this Agreement that cannot be resolved by the parties must be resolved exclusively as provided in this Section. The parties will first endeavor to settle any dispute in an amicable manner before resorting to arbitration. Any unresolved dispute will be settled by arbitration administered by the "Arbitration Service of Portland, Inc." in accordance with its Commercial Arbitration Rules. Arbitration will be conducted in Portland, Oregon. One arbitrator will hear the dispute. The arbitrator must have a minimum of five years' experience as a state or federal judge, ten years as a lawyer or an accountant, or any alternate qualifications that the Parties agree upon. Nobeltec will advance to You Your portion of the arbitrator's fee and the administrative costs of the arbitration. However, if the arbitrator finds the claim to be frivolous, You will reimburse Nobeltec for your portion of the arbitrator's fee and administrative costs. Neither party may institute any court proceedings concerning any dispute. The dispute resolution procedure of this Section 15 is the sole remedy, unless otherwise provided elsewhere in this Agreement, for resolving disputes. Notwithstanding the foregoing, the parties may initiate court proceedings to enforce any arbitration award between the parties or for claims for equitable relief in the state and federal courts located in Portland, Oregon, and each party irrevocably consents to the jurisdiction of the state and federal courts located in Portland, Oregon and waives any objection that that venue is an inconvenient forum.

16. SERVICES.

Some Services that are purchased for a limited period (such as Premium Oceanography) are non-refundable. All services are considered to be provided on a strictly prepaid basis, and no prorated or partial refunds will be made.

17. ENTIRE AGREEMENT.

This Agreement contains the entire understanding of the parties hereto relating to the subject matter hereof. No waiver or modification of any of the terms hereof by You shall be valid unless agreed to by Nobeltec in writing and signed by Nobeltec and You. No waiver of any breach shall be deemed a waiver of any subsequent breach. If any provision of this Agreement is held to be invalid or unenforceable, the remaining provisions shall not be affected.

18. AMENDMENTS.

Nobeltec reserves the right to change or modify any of the terms and conditions of this Agreement at any time without notice to You. Any changes or modifications to the terms and conditions will be effective on the date the change or modification is made, and will be provided to You with the next Application update for Your acceptance prior to downloading, installing, accessing or using the updated Application.

19. GENERAL.

Failure or neglect by either party to enforce at any time any of the provisions of this Agreement shall not be construed or deemed to be a waiver of that party's rights under this Agreement

If You have any questions concerning this Agreement, including warranty service, You should contact: Nobeltec Inc., 15242 NW Greenbrier Pkwy, Beaverton, OR 97006 (USA).

You hereby acknowledge that You have read this Agreement, understand it, and agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between You and Nobeltec, which supersedes any proposal or prior agreement, oral or written and any other communications between You and Nobeltec relating to the subject matter of this Agreement.

Nobeltec Inc., A Signet S.A.S. Company

Privacy Policy

Nobeltec is committed to protecting your privacy and developing technology that gives you the most powerful and safe experience using its Websites and applications. This Statement of Privacy applies to the Nobeltec's websites and applications (1) owned and controlled by Nobeltec. This Privacy Policy governs data collection, processing and usage practices. It also describes your choices regarding use, access and correction of your personal information. If you do not agree with the data practices described in this Privacy Policy, you should not use Nobeltec's Websites and applications *(1)*. By using Nobeltec's Websites and applications1, you consent to the data practices described in this statement.

Personal Data Processed by Nobeltec

Personal data that is processed when you create a My TIMEZERO account:

When you create a My TIMEZERO account, we ask you to provide at minimum your email address and a name. You can also optionally provide additional information such as home or work address and telephone number.

PURPOSES AND LEGAL GROUNDS:

(a) Nobeltec processes your email address because you use your email address and your password to sign in to your account. The legal ground for processing your email address for this purpose is based on Nobeltec's legitimate interest in protecting the security of your account.

(b) Nobeltec also processes your email address for the purpose of sending you important information about your Nobeltec applications or account, such as important safety information or material changes to this Privacy Policy. The name you provide is associated with your account profile. The legal ground for processing your email address and name for these purposes is Nobeltec's legitimate interest in providing you important safety or other information about your Nobeltec applications, account or material changes to this Privacy Policy.

(c) If you provide your opt-in consent to receiving marketing information from Nobeltec, Nobeltec will also process your email address for the purpose of sending you marketing information about Nobeltec products. The legal ground for processing your email address for this purpose is your consent. You may withdraw your consent at any time by changing your preferences through the "email preferences" link at the bottom of our marketing emails or by contacting us at privacy@nobeltec.com. The type of marketing emails you receive from Nobeltec are based on the preferences you provide in your My TIMEZERO account (language) and the type of applications and charts linked to your My TIMEZERO account. The legal ground for processing this data for this purpose is Nobeltec's legitimate interest in reducing the number of marketing emails sent to each particular customer or subscriber by selecting which contact receives a particular marketing email rather than sending every marketing email to every customer and subscriber who has consented to receiving marketing emails.

(d) Nobeltec also processes your email address to associate it with your My TIMEZERO account when you interact with our customer support representatives. The legal ground for this processing is our legitimate interest in providing quality customer support.

(e) Nobeltec also processes your email address to notify customers when they have violated the terms of use. The legal ground for this processing is our legitimate interest in ensuring a quality experience for all customers and ensuring adherence to the terms of use.

Personal data that is processed when you sign in to your My TIMEZERO account with Social Media Credentials if you choose:

You may choose to sign in to your My TIMEZERO account using your Facebook sign-in credentials. If you choose to do this, the first time you do so you will be asked whether you agree that Facebook may provide certain information to Nobeltec, such as your username, email address, profile picture, age range, sex and other public info.

All this information is made available to Nobeltec by Facebook due to the way the sign-on configuration works. However, the only information Nobeltec retains and processes is your email address and your username. If you do not want your information to be shared with Nobeltec by Facebook, then you can simply sign in to My TIMEZERO using your My TIMEZERO account credentials instead of your Facebook account credentials.

Personal data that is processed when you communicate with Nobeltec:

When you interact with our support representatives via email, telephone or online, we collect personal data, such as your name, mailing address, phone number, email address and contact preferences; and information about the Nobeltec products you own, such as their serial numbers and date of purchase. We also may create report logs that are useful in diagnosing applications performance-related issues, and capture information relating to the support or service issue. To improve customer service, subject to applicable laws, we may also record and review conversations with support representatives, and analyze any feedback provided to us through voluntary customer surveys. Our support representatives may look at your My TIMEZERO account, if appropriate, to help troubleshoot and resolve your issue.

PURPOSE AND LEGAL GROUND:

We use this information to provide you with customer support and to monitor the quality and types of customer and product support we provide to our customers. The legal ground for processing this information for these purposes is Nobeltec's legitimate interests in providing quality support. The legal ground for looking at your My TIMEZERO account, if appropriate, is to help troubleshoot and resolve your issue.

Personal data that is processed when you purchase or update charts or applications:

(a) When you purchase our application or charts via a mobile app or our web store, we process authentication credentials, serial number and, for mobile app, device information to activate the product that you have purchased and allow access and download of the content. The legal ground for processing this information for this purpose is to be able to sell you our products.

(b) When you install our application on a PC, we process serial number and device information to activate the product that you have purchased and allow access of the application and its data. The legal ground for processing this information for this purpose is the performance of a contract.

(c) When you register your application either automatically or manually, we process your authentication credentials and device identifier(s) to register the application to your account. The legal ground for processing this information for this purpose is Nobeltec's legitimate interests in providing quality customer support.

Personal data that is processed when you synchronize your user objects to your My TIMEZERO account:

The user objects and location data you create in our applications are synchronized securely to your My TIMEZERO account. This data is not shared with any other users and is only available to the platforms that have been logged in using the same My TIMEZERO account. The legal ground for processing this information for this purpose is Nobeltec's legitimate interests in providing quality user experience across all your TIMEZERO platforms.

Personal data that is processed when you use our applications:

We collect data from users about their usage of our applications. The types of analytical information that are collected include the date and time the application accesses our servers, serial number, software version, the location of the device, language setting, features used, device state information, device model, hardware and operating system information. Nobeltec uses this data to improve the quality and functionality of the applications and to help identify and fix applications stability issues and other usability problems as quickly as possible.

The legal ground for processing this analytical information is our legitimate interest in understanding how our customers interact with our products so we can enhance the user experience and functionality of our products.

Transfers of Personal Data

Nobeltec is a global business and is owned by Signet S.A.S. To offer our products and services, we may need to transfer your personal data to other Signet companies in other countries. When you create a My TIMEZERO account, add personal data in your account profile, or upload data to your My TIMEZERO account, your personal data will be collected and stored on Microsoft Azure server.

Cookies and Similar Technologies

Website:

To help analyze how you and other visitors navigate Nobeltec's Websites, compile aggregate statistics about site usage and response rates, help diagnose any problems with Nobeltec's servers and administer Nobeltec Websites, we, with assistance from third-party analytics service providers, collect certain information when you visit our site. This information includes IP address, geographic location of the device, browser type, browser language, date and time of your request, time(s) of your visit(s), page views and page elements (e.g., links) that you click. We may use cookies, pixel tags, clear GIF's or other similar tools on our site to assist us in collecting and analyzing such information. We use this information to provide better, more relevant content on our site, to identify and fix problems, and to improve your overall experience on our site.

Google Analytics:

Google Analytics is used to track site statistics and user demographics, interests and behavior on Websites. We also use Google Search Console to help understand how our website visitors find our website and to improve our search engine optimization. Find out more information about how this analytics information may be used, how to control the use of your information, and how to opt out of having your data used by Google Analytics.

If you do not want information collected through the use of these technologies, there is a simple procedure in most browsers that allows you to automatically decline many of these technologies, or to be given the choice of declining or accepting them.

If you reside in the European Union or other jurisdiction that requires us to obtain your consent to use cookies on our sites; except that certain cookies are required to enable core site functionality and you cannot choose to disable those cookies.

Nobeltec encourages you to review the privacy statements of Websites you choose to link to from Nobeltec so that you can understand how those Websites collect, use and share your information. Nobeltec is not responsible for the privacy statements or other content on Websites outside of the Nobeltec and Nobeltec family of Websites.

Newsletter and Minisite:

For Newsletters and Minisite, Nobeltec uses HubSpot that employs a software technology called clear gifs (a.k.a. Pixel Tags). Clear gifs are tiny graphics with a unique identifier, similar in function to cookies. In contrast to cookies, which are stored on a user's computer hard drive, clear gifs are embedded invisibly in emails and are about the size of the period at the end of this sentence. We use clear gifs in our HTML-based emails to let us know which emails have been opened by recipients. You This allows us to gauge the effectiveness of certain communications and the effectiveness of our marketing campaigns. We tie the information gathered by clear gifs in emails to our customers' Personal Information. If you would like to opt-out of these emails, you can do so by clicking on the unsubscribe button in a marketing email or by contacting us at privacy@nobeltec.com.

Retention of Personal Data

How long we keep information we collect about you depends on the type of information. as described in further detail below. After such time, we will either delete or anonymize your information or, if this is not possible, then we will securely store your information and isolate it from any further use until deletion is possible.

We retain Personal Information that you provide to us where we have an ongoing legitimate business need to do so (for example, as long as is required in order to contact you about the Subscription Service or our other services, or as needed to comply with our legal obligations, resolve disputes and enforce our agreements).

When we have no ongoing legitimate business need to process your Personal Information, we securely delete the information or anonymize it or, if this is not possible, then we will securely store your Personal Information and isolate it from any further processing until deletion is possible. We will delete this information from the servers at an earlier date if you so request, see below under "Your Rights" for a description of your right of erasure.

If you have elected to receive marketing communications from us, we retain information about your marketing preferences for a reasonable period of time from the date you last expressed interest in our content, products, or services, such as when you last opened an email from us or as long as your My TIMEZERO account is considered to be active. We retain information derived from cookies and other tracking technologies for a reasonable period of time from the date such information was created.

Security

The security of your Personal Information is important to us, and we strive to implement and maintain reasonable, commercially acceptable security procedures and practices appropriate to the nature of the information we store, in order to protect it from unauthorized access, destruction, use, modification, or disclosure.

However, please be aware that no method of transmission over the internet, or method of electronic storage is 100% secure and we are unable to guarantee the absolute security of the Personal Information we have collected from you.

Compliance with Laws

We will disclose your Personal Information where required to do so by law or subpoena or if we believe that such action is necessary to comply with the law and the reasonable requests of law enforcement or to protect the security or integrity of our Service.

Children's Privacy

Only persons age 18 or older have permission to access our Service. Our Service does not address anyone under the age of 13 ("Children").

We do not knowingly collect personally identifiable information from children under 13. If you are a parent or guardian and you learn that your Children have provided us with Personal Information, please contact us. If we become aware that we have collected Personal Information from a child under age 13 without verification of parental consent, we take steps to remove that information from our servers.

Data Controller and Data Protection Officer

If you reside in a country in the European Economic Area or in Switzerland, then your personal data collected by Nobeltec is controlled by MaxSea Naval, which is located at Gran Via de les Corts Catalanes, 669 Bis, 2º 2ª, 08009 Barcelona, Spain. Nobeltec's EU Data Protection Officer is located at the same address and can also be reached by email at privacy@nobeltec.com.

If you reside outside of the European Economic Area and Switzerland, then the personal data collected by Nobeltec is controlled by Nobeltec, Inc., 15242 NW Greenbrier Pkwy, Beaverton, OR 97006, which you can also contact by email at privacy@nobeltec.com.

Your Rights

If you reside in the European Union, you have the right under the General Data Protection Regulation to request from Nobeltec access to and rectification or erasure of your personal data, data portability, restriction of processing of your personal data, the right to object to processing of your personal data, and the right to lodge a complaint with a supervisory authority. If you reside outside of the European Union, you may have similar rights under your local laws.

To request access to or rectification, portability or erasure of your personal data, or to delete your TIMEZERO account, please contact us at privacy@nobeltec.com.

If you live in the European Union and you wish to exercise your right to restriction of processing or your right to object to processing, contact Nobeltec's EU Data Protection Officer at 15242 NW Greenbrier Pkwy, Beaverton, OR 97006, United States or by email at privacy@nobeltec.com. If you do not live in the European Union but you believe you have a right to restriction of processing or a right to object to processing under your local laws, please contact Nobeltec, Inc. at privacy@nobeltec.com.

Customers cannot opt out of receiving transactional emails related to their My TIMEZERO account with us or our Service.

We Never Sell Personal Information

We will never sell your Personal Information to any third party.

Privacy Policy Updates

We may update this Privacy Policy from time to time as we add new products, as we improve our current offerings and as technologies and laws change. You can access the latest version of this privacy policy online at https://mytimezero.com/privacy-statement/. Any changes will become effective upon our posting of the revised Privacy Policy.

We will provide notice to you if these changes are material and, where required by applicable law, we will obtain your consent. This notice will be provided by email or by posting notice of the changes on the Nobeltec's Websites.

(1) Nobeltec's Websites and applications are:

- *mytimezero.com*
- *login.mytimezero.com*
- *store.mytimezero.com*
- *share.mytimezero.com*
- *weather.mytimezero.com*
- *extranet.mytimezero.com*
- *coastalmonitoring.com*
- *vesseltraffic.com*
- *safevts.com*
- *vtsais.com*

- *TZ iBoat – Marine Navigation*

- *MaxSea Marine navigation*

- *Nobeltec Marine navigation*

Chart License Agreement

TERMS OF USE: This product contains embedded navigational charts provided by Mapmedia, C-MAP and/or Navionics. By using these charts, you agree to be bound by the terms of the Mapmedia, C-MAP and/or Navionics End-User License Agreement.

Link to C-MAP EULA

Link to Navionics EULA

MAPMEDIA, C-MAP AND NAVIONICS CHART WARNING: Mapmedia®, C-MAP® and Navionics® charts make use of a combination of governmental, private and proprietary sources and are not official governmental charts and may not contain the latest update of the information contained therein. Like virtually all data sources, the sources on which Mapmedia®, C-MAP® and Navionics® charts are based may contain inaccuracies. Therefore, Mapmedia®, C-MAP® and Navionics® charts may be used for general directional information but should not be relied upon for personal safety or for any purpose requiring precise measurement of direction, distance, location or topography.

Use of this navigation aid is at User's risk: it is the User's responsibility to use this product prudently.

WARNING: No national Hydrographic Office has verified the information in this product and no national Hydrographic Office accepts any liability for the accuracy of reproduction or any modifications made thereafter. No warranty is given that this product complies with national or international regulations regarding the use of appropriate products for navigation.

Bundesamt für Seeschifffahrt und Hydrographic (BSH) has not verified the information included in this product and does not, therefore, assume any liability for its correctness, or the correctness of data updates made at a later date. Bundesamt für Seeschifffahrt und Hydrographic (BSH) does not guarantee that this product meets national or international requirements concerning the suitability of such products for navigation.

The Commonwealth of Australia accepts no liability for the accuracy of copying of information contained in this product and does not warrant that this product meets any regulations as an appropriate product for navigation.

Aucun service hydrographique officiel (SHOM) n'a vérifié les informations contenues dans ce document et ne peut être tenu responsable de la fidélité de leur reproduction ou de toute modification ultérieure. La possession de ce produit dérivé n'exonère pas de l'obligation d'utiliser les documents nautiques appropriés prévus par les règlements nationaux ou internationaux.

L'inclusion de données provenant du SHC dans le produit ne doit pas être interprétée comme une acceptation par le SHC du présent produit. Le présent produit ne satisfait pas aux exigences du Règlement sur les cartes marines et les publications nautiques (1995), sous la Loi de 2001 sur la marine marchande du Canada. Les cartes marines et publications émises par ou sous l'autorité du SHC doivent être utilisées afin de se conformer aux exigences de cette règlementation.

The Australian Hydrographic Service does not check the information in this product and the Commonwealth accepts no liability for the accuracy of copying of its material or for any modifications that may have been made to the information which it has
supplied. Furthermore, the Commonwealth does not warrant that this product meets any regulations as an appropriate product for navigation or that it contains the latest hydrographie information available.

No national Hydrographic Office (FMA) has verified the information in this product and no national Hydrographic Office accepts any liability for the accuracy of reproduction or any modifications made thereafter. No warranty is given that this product complies with national or international regulations regarding the use of appropriate products for navigation.

No National Hydrographic Office (DGA) has verified the information in this product and none accepts liability for the accuracy of reproduction or any modifications made thereafter. No National Hydrographic Office warrants that this product satisfies national or international regulations regarding the use of the appropriate product for navigation.

The Hellenic Navy Hydrographic Service has not verified the information in this product and does not accept any Iiability for the accuracy of reproduction or any modifications made thereafter. The Hellenic Navy Hydrographic Service does not warrant that this product satisfies national or international regulations regarding the use of the appropriate products for navigation.

Acknowledgements and Copyright Licenses:
Manufactured using data supplied by Bundesamt für Seeschifffahrt und Hydrographie
(BSH, Federal Maritime and Hydrographic Agency of Germany) [Licence no. 11123/2012-21]
Contains material © Commonwealth of Australia Copyright restrictions apply
Ce produit intègre des données © Shom reproduites avec l'autorisation n° 134/2019 & n° 64/2020
Le présent produit a été créé par Société MapMedia à partir de données du Service hydrographique du Canada(« SHC »), conformément aux normes et aux directives minimales établies par le SHC, aux termes de !'Entente de revendeur de produits numériques à valeur ajoutée du SHC n° 2020-0203-1260-M
This product has been derived in part from material obtained from the UK Hydrographic Office with the permission of the UK Hydrographic Office, Her Majesty's Stationery Office [and the following authorities: Servicio de Hidrografia Naval of Argentina; Vlaamse Hydrografic; Hvratski Hidrografski lnstitute ; lnstituto Hidrogrâfico de la Marina ; Hydrographic Department of the lcelandic Coast Guard ; Malta Maritime Authority; Netherlands Hydrographic Office; National Hydrographie Office, Sultanate of Oman; lnstituto Hidrogrâfico of Portugal]."
Certain hydrographic information in this product is © Commonwealth of Australia; and is used under licence with the permission of The Australian Hydrographic Service. All rights reserved.
National Oceanic and Atmospheric Administration (NOAA)
GEOCUBA Estudios Marinos
This product is based on data that are published by Kort & Matrikelstyrelsen Denmark, Licence number G.05-2009.
The chart information in this product is reproduced with the permission of the Hellenic Navy Hydrographic Service (Licence No 171.7/18/02)
IFREMER CONVENTION N° 11/2 212 108/R
This product is produced from products and with the agreement of lmray Laurie Norie & Wilson Ltd UK." "official copyright notices and corrections published on the original Imray chart
© Swedish Maritime Administration Licence No. 13-01172.
© British Crown Copyright, [2005]. All rights reserved.
© Copyright Servicio de Hidrografia Naval (SHN), [2008]. All rights reserved.
© Vlaamse Hydrografic, [2007]. All rights reserved.
© Copyright Hvratski Hidrografski Institute, {2007}. All rights reserved.
© Copyright lnstituto Hidrogrâfico de la Marina, [2008]. All rights reserved.
© Copyright lceland Coast Guard Hydrographic Department, [2005]. All rights reserved.
© Copyright Malta Maritime Authority (MMA), [2008]. All rights reserved.
© Copyright Netherlands Hydrographic Office, [2005]. All rights reserved.
© Copyright National Hydrographic Office, Sultanate of Oman, [2006]. All rights reserved.
© Copyright lnstituto Hidrogrâfico of Portugal, [2006]. All rights reserved.
© Copyright Lewis Offshore Limited.
© Finnish Maritime Administration licence No. 600/721/2008.

Index

Glossary

CCRP

CCRP is the location at the ship icon, to which all horizontal measurements, such as target range, bearing, relative course/speed, closest point of approach, or time to closest point of approach are referenced

CPA

Closest Point of Approach

DSC

Digital Selective Calling

EBL

Electronic Bearing Line

Electronic Bearing Line

Line that originates from the center of the boat and remain constant as the boat moves. Use the EBL to measure the bearing from the boat's position to a target

ETA

Estimated Time of Arrival

FTC

Fast Time Constant

HDOP

horizontal dilution of precision

Mercator

The Mercator projection is a cylindrical map projection that became the standard for nautical chart because of its ability to represent lines of constant course, known as rhumb lines, as straight segments which conserve the angles with the meridians

MMSI

A Maritime Mobile Service Identity (MMSI) is a series of nine digits which are sent in digital form over a radio frequency channel in order to uniquely identify a ship.

Overzoomed

Because TimeZero will let you adjust the viewing scale of the charts to anything, there will be times that the chart image you see has been magnified to the point of implying more detail than is really there. This is pretty obvious with raster charts as they start to look blocky, but vector charts tend to stay nice looking at extreme magnifications. To warn you of this overscale situation, the Chart Scale and Range box will appear in red.

Raster

A raster chart is a direct copy (or scan) of an existing paper chart and thus look identical to the paper charts it was produced from. All information contained within the chart is printed directly on it, so you cannot click on objects (such as buoys) like on a vector charts. When zooming in and out of a raster chart everything on the chart grows larger or smaller. When rotating a raster chart every thing on the chart rotates.

S-52

S-52 was developed in conjunction with the IMO Performance Standards for Electronic Chart Display and Information System (ECDIS). It provides specifications and guidance regarding the display of Electronic Navigational Charts (ENC)

STC

Sensitivity time control

TCPA

Time to Closest Point of Approach

Vector

Vector charts are computer generated from a series of points and lines (stored in a database) that make up the features of the chart on the screen. Various details on the chart can be turned on and off and objects can be clicked on to display more details. When zooming in and out of a vector chart the text and objects keep the same size and orientation.

VRM

Variable Range Marker

Work Spaces

The Work Spaces allow to separate different activities that occur on a navigation system, so the user interface is not cluttered with unnecessary functions and buttons that are not useful to the primary task that is performed.

XTE

XTE (or Cross Track Error) is the distance of a line drawn from the vessel perpendicularly to an active route leg. This determines to what extent the vessel is straying from the course of a route.