



TIMEZERO USER GUIDE

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Getting Started

Registering TimeZero

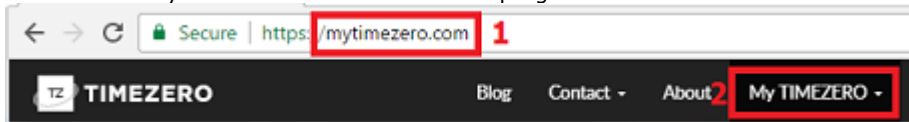
It is highly recommended to register your software as this will help us provide better technical support. A registration is also required to access our online services (Weather, Chart Update Notification, Own Ship Cloud Monitoring, Anchor Watch Cloud Monitoring...)

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:

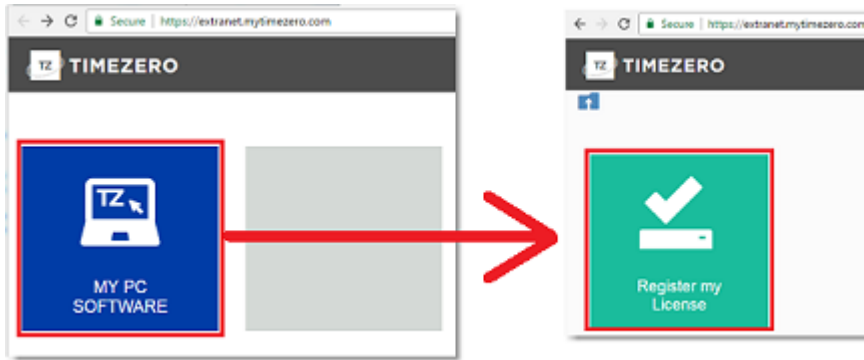


- Enter your "My TIMEZERO" credential. If you do not have a My TIMEZERO account yet, click on the "Create an account" button (you will just have to provide a valid email and your name or use a Facebook or Apple login):

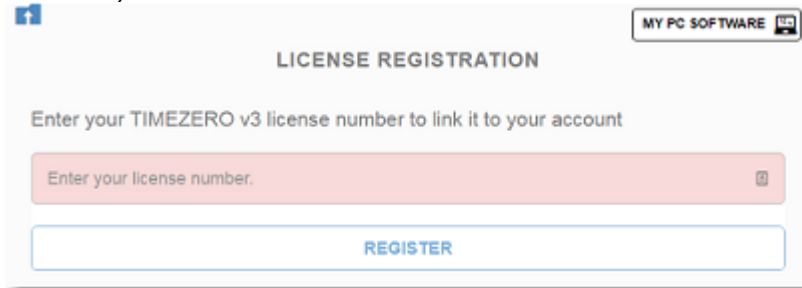
 A screenshot of the 'Log In' page on the My TIMEZERO website. The page features the TZ TIMEZERO logo and the text 'Log In'. Below the logo, it says 'Don't have a My TIMEZERO account yet? Create an account'. There are two input fields: 'Email' and 'Password'. A 'Forgot password?' link is located below the password field. At the bottom, there are three buttons: a blue 'Log In' button, a grey '- Or -' separator, a blue 'Continue with Facebook' button, and a black 'Continue with Apple' button.

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":



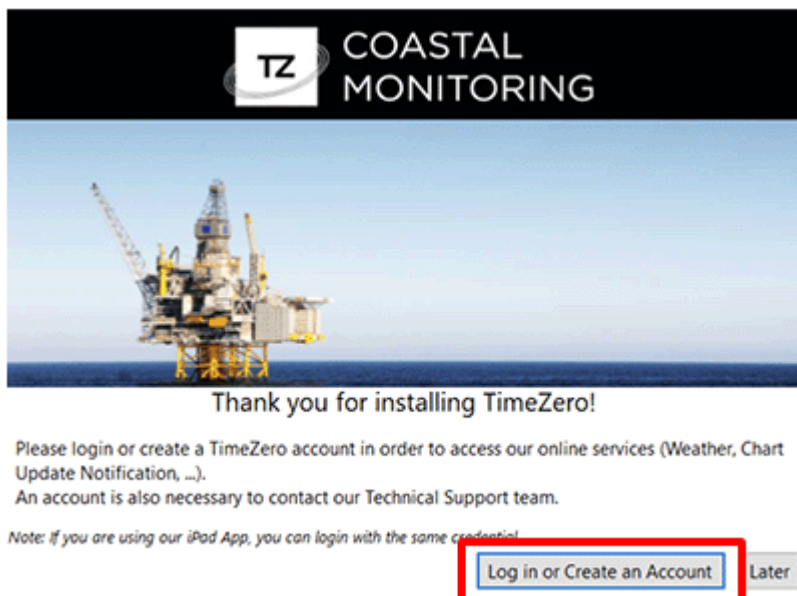
- Enter your TIMEZERO Serial Number (your serial number starts with "TZ" and can be found under "About TimeZero"):



- If the serial number is valid, it will be linked to your account and you will be able to access your product information.

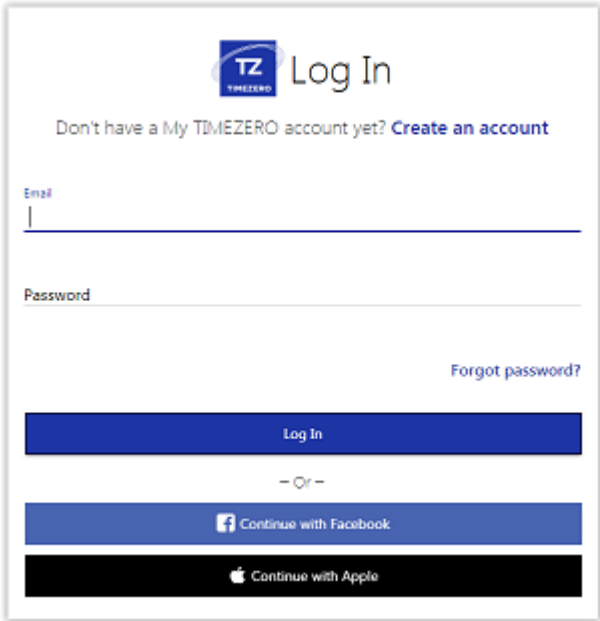
Register directly from the Software

When you launch TimeZero with an active Internet connection, the following screen will appear, allowing you to register your license directly from the software:



Note: If you missed the startup screen to login, you can manually click on the "Login" button from the [My TIMEZERO Options](#)

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.

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").

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.

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

Note: High Resolution Satellite picture can be produced on demand for a small area of 10NM by 10NM maximum (to cover a harbor for example).

S57 Charts ("ENC")

TimeZero is compatible with the S57 charts format. In the USA, these charts can be directly downloaded from the NOAA Website.

S63 Charts ("Encrypted ENC")

TimeZero is compatible with official S63 charts. These charts can be purchased from official ENC distributors (UKHO, Primar, Chartworld, ...). In order to purchase official S63 charts, a "User Permit" must be provided to the S63 chart distributor. The "User Permit" is available in TimeZero as soon as the "ENC Encrypted Module" is unlocked under the "Manage ENC" (under the "Manage S-63 Permits" tab).

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](#)

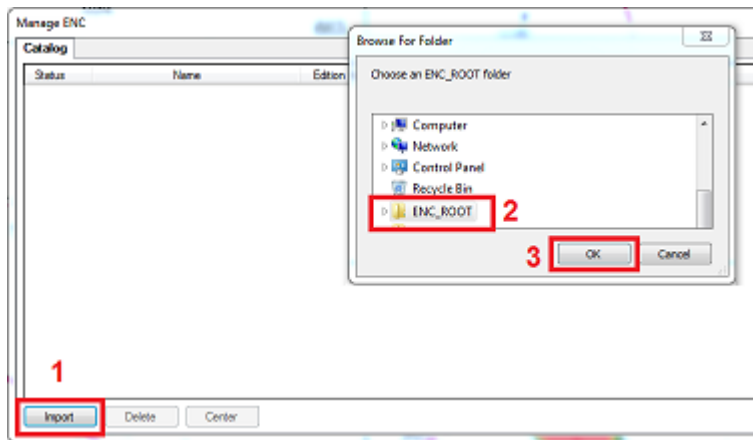
Charts for outside the USA are licensed and require purchasing an unlock code.

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.

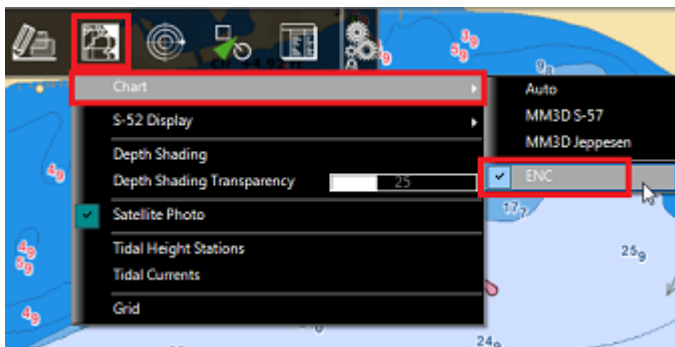
S57 Charts ("ENC")

S57 charts are always distributed inside an "ENC_ROOT" folder. If you downloaded the charts online, make sure to unzip the "ENC_ROOT" folder somewhere on your computer (on the desktop for example). Open TimeZero, select "Manage ENC" located under the TimeZero button and click on "Import". Select the "ENC_ROOT" folder containing the S57 charts you wish to import and click on "OK":



TimeZero will convert the chart cells and import them on your computer. Once the charts are successfully imported, you can erase the "ENC_ROOT" folder from your computer.

To display the charts in TimeZero, make sure to select "ENC" under the "Chart" selection of the "Chart" button located in the ribbon:



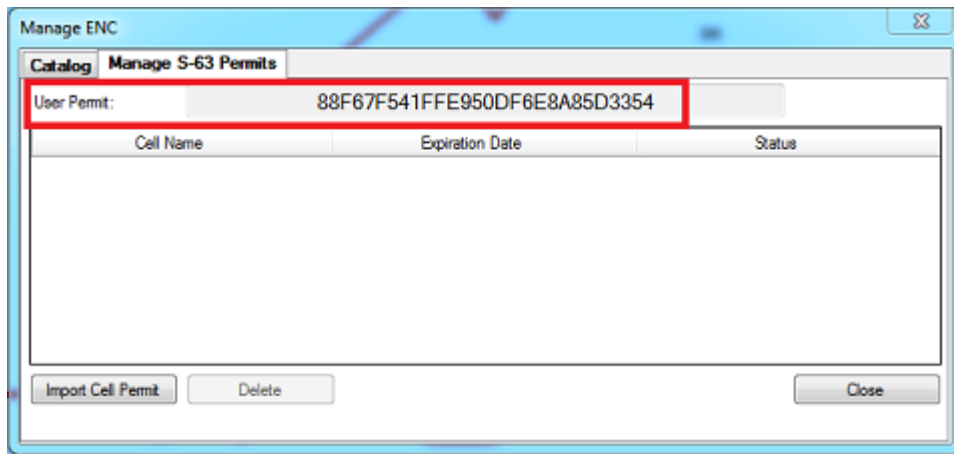
To update the charts, simply repeat the procedure above and re-import an updated "ENC_ROOT" folder.

NOAA S57 Vector charts for the USA can be downloaded freely from: <http://www.charts.noaa.gov/ENCs/ENCs.shtml>

S63 Charts ("ENC Encrypted")

S63 charts are similar to S57 charts but are encrypted and require a permit and other additional files in order to be imported and viewed in TimeZero. S63 charts can be purchased from official hydrographic chart distributors such as ChartWorld (DirectENC S63), UKHO (Admiralty AVCS) and Primar (ENC).

In order to purchase charts from one of these agencies, you need to provide them with your "User Permit". The "User Permit" is uniquely generated from your TimeZero Serial Number and can be found in TimeZero (if the software was activated using the Internet) or in your confirmation e-mail after purchasing the "ENC Encrypted Module". To view if your User Permit was automatically entered in TimeZero, select "Manage ENC" under the TimeZero button and select the "Manage S-63 Permits" tab:



Note: if you do not see the "Manage S-63 Permits" tab, make sure that the "ENC Encrypted Module" has been properly unlocked.

If TimeZero was activated with an Internet connection, the User Permit should be displayed (a long string of characters) like in the screenshot above.

If the User Permit is not available, you will have to enter it manually by contacting our technical support or referring to the confirmation e-mail containing your unlock code.

Once you have your User Permit, communicate it to the chart distributor when purchasing your S63 charts.

Note: The User Permit allows the Chart Distributor to identify you as a customer and issue a chart license (chart permit) that will work for you.

After purchasing the S63 charts, the chart distributor will give you a "PERMIT.TXT" (containing your chart license) and a DVD or link to access the Chart data.

Install Chart License:

Start by importing the charts permit (also named "cell permit") by clicking on the "Import Cell Permit" in TimeZero. Browse and select the file "PERMIT.TXT" that was provided by the chart distributor (usually sent by e-mail in a ZIP file). After opening the file, you will see the list of all the charts (cells) for which you have a valid license and their expiration date.

Install Chart Data:

The chart data will be provided by the chart distributor either on DVD(s) or as a download link. The data usually consist of a "Base" data set (all the charts) and an "Update" data set (incremental chart update since a specific date). Always start by importing the "Base" data set.

IMPORTANT: If you download the S63 chart data set, make sure to unzip the file and keep the entire content and folder structure intact. Below is an example of valid data set. You should have an "ENC_ROOT" folder with at minimum a "SERIAL.ENC" file:

ENC_ROOT	1/14/2016 7:09 AM	File folder	
INFO	1/14/2016 7:09 AM	File folder	
IHO.CRT	1/13/2016 10:24 AM	Security Certificate	1 KB
SERIAL.ENC	1/13/2016 10:24 AM	Wireshark capture...	1 KB

Once you have located the "ENC_ROOT" folder, select the "Catalog" tab in TimeZero, click on "Import" and select the "ENC_ROOT" folder containing the chart data. TimeZero will only import charts that have a corresponding valid permit.

Repeat this process with the "Update" data set if available.



The chart distributor might send you chart updates at a regular interval. Sometimes, the chart distributor will send you an updated Permit.txt file (when new charts are issued for example). In this case, make sure to import the updated Permit file first before importing the Updated data set.

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 provides access to the "Undo/Redo" functions and displays the general status of the software; yellow when the software is displaying a notification, and red when an alarm is active. The minimize button (minus sign) can be found on the far right of the Status Bar.
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. **Ribbons:** The Ribbons display a series of buttons according to the selected window and Workspace. Left click on any button to open a menu offering various options
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. The first button of the Toolbar centers the chart display over the reference position.
6. **NavData:** The NavData displays the data received from external instruments. 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 "Plus" sign (+) located on the top of the NavData.

Tips: The Ribbons and Toolbar can be customized by clicking on the Configure Button:

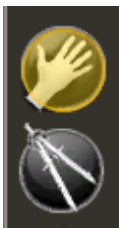


Note: After customizing the user interface to your preferences, you can save all the settings to a file. Click on the TimeZero button and select "Save UI As...". To reset the user interface to your default settings, simply open TimeZero by double clicking on the User Configuration file. Note that you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

Toolbar & Ribbons

Toolbar

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



When you want to change tool, left click on it to select it.

When you see a tool icon with a little down arrow in its lower right corner, it means that you can right click on the tool to view additional options:

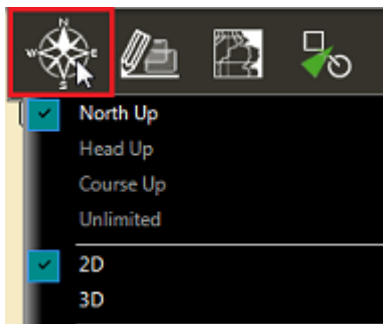


In this case, right clicking on the "Selection" tool allows you choose in between the regular selection method (square) or the free selection method:

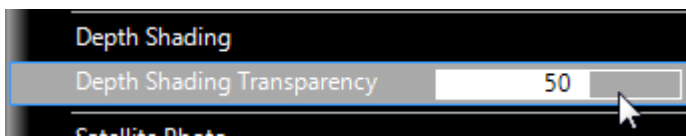


Ribbons

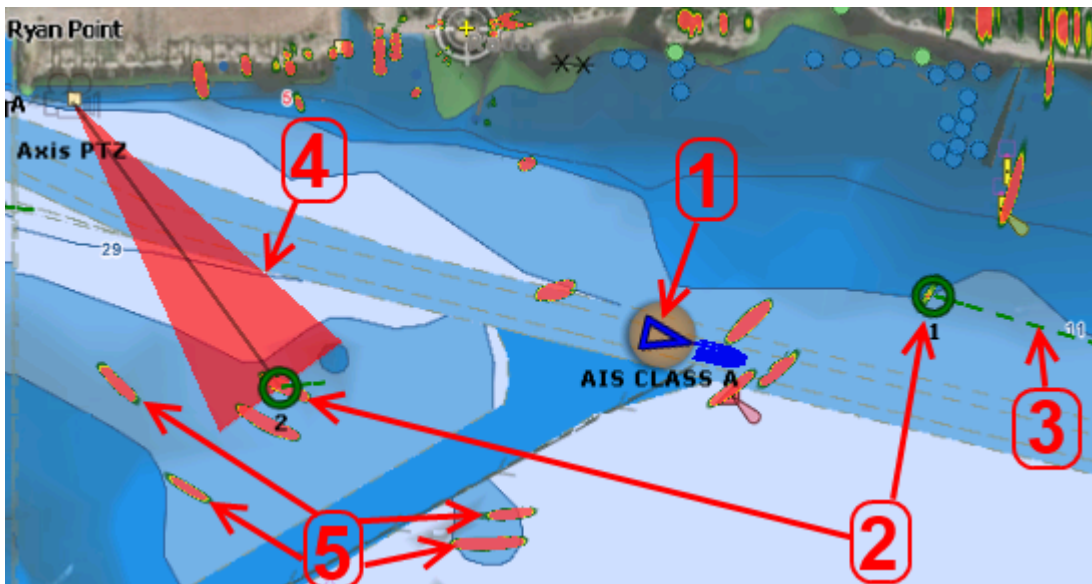
To open a menu in a Ribbon, left click on the corresponding button. Use your mouse to click on an item you want to enable or disable:



Some menus have drop down items with sliders. Click on the slider directly or use the mouse wheel (with the cursor over the slider) to adjust the value.



Target Overview



1. AIS Target: Blue or Green triangles represent vessels that have an AIS transmitter.
2. ARPA Target: Green circles represent ARPA targets. TimeZero creates automatically or manually ARPA targets from analyzing radar information.
3. Direction and Speed vector: Dashed lines in front of AIS or ARPA targets represent the direction and speed of the target. The faster, the longer the vector is.
4. Camera Field of View ("FOV"): When a Pan, Tilt and Zoom ("PTZ") camera is configured in TimeZero, a cone will be displayed on the screen indicating where the camera is looking at.
5. Radar Echoes: Raw radar echo information can be displayed on screen to make sure that the radar is operating and adjusted correctly. An echo on the chart indicates the presence of an object at this location (ship, buoy, rock, etc...). Usually, an ARPA target is created from a radar echo (manually or automatically) to analyze if the object is moving or not (indicating a possible ship).

WorkSpaces

TimeZero is designed to perform multiple tasks . These activities require different tools and options. The WorkSpaces are our way of separating and differentiating different activities that occur , so the user interface is not cluttered with unnecessary functions and buttons that are not useful to the primary task.

- "Monitoring" WorkSpace: This WorkSpace is selected by default when TimeZero is started. It is used to monitor the real time situation.
- "Analyze" WorkSpace: This WorkSpace allows you to display weather forecast, display tidal height and current predictions and replay data that has been previously recorded. The Analyze WorkSpace has a timeline at the bottom of the screen that allows you to change the date/time to perform various animations and simulations.




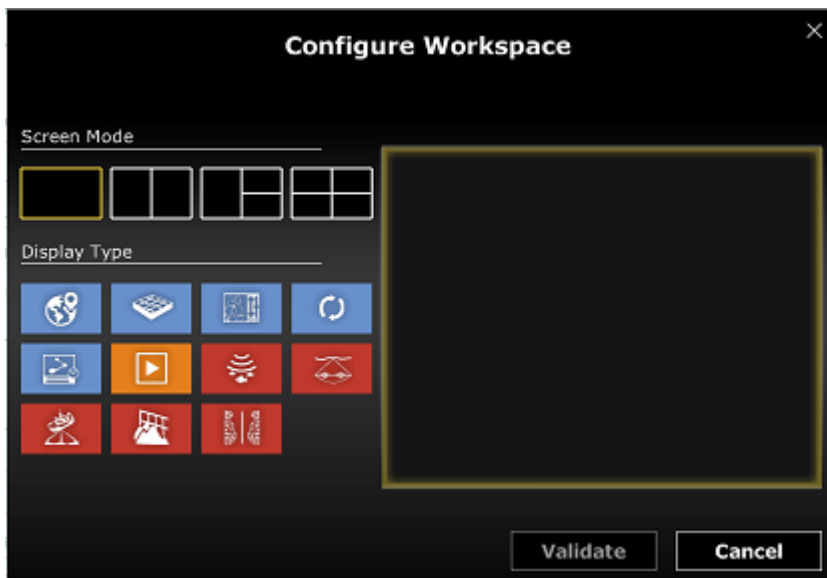
- "Update" WorkSpace: The Update WorkSpace allows you to request and download Weather Forecasts. This WorkSpace has an "Update Area" tool in the Toolbar that defines the Weather Forecast area and a panel on the right side that allows you to select the weather parameters and launch the download.
- "Camera" WorkSpace: The Camera WorkSpace allows you to display a full screen video stream.

Tips: A video stream can also be displayed in a small window using the "Camera" NavData

- "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.

Creating a Custom WorkSpace

New WorkSpaces and Split Screen configurations can be created by clicking on the "+" icon . This opens the WorkSpace configuration window below:



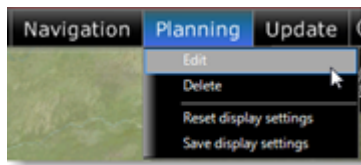
Start by selecting the Screen Mode (full screen or split screen) and then the type of display you want to include in your WorkSpace configuration. Note that for full screen configuration, the default name of the WorkSpace will adopt the type of display selected (but you can rename it if you want). For split screen configuration, the default name will be set to "Custom" but it is highly suggested to rename it to something more meaningful to you.

If you have the Record & Replay module, you can choose if you want to add a Timeline at the bottom of the WorkSpace:



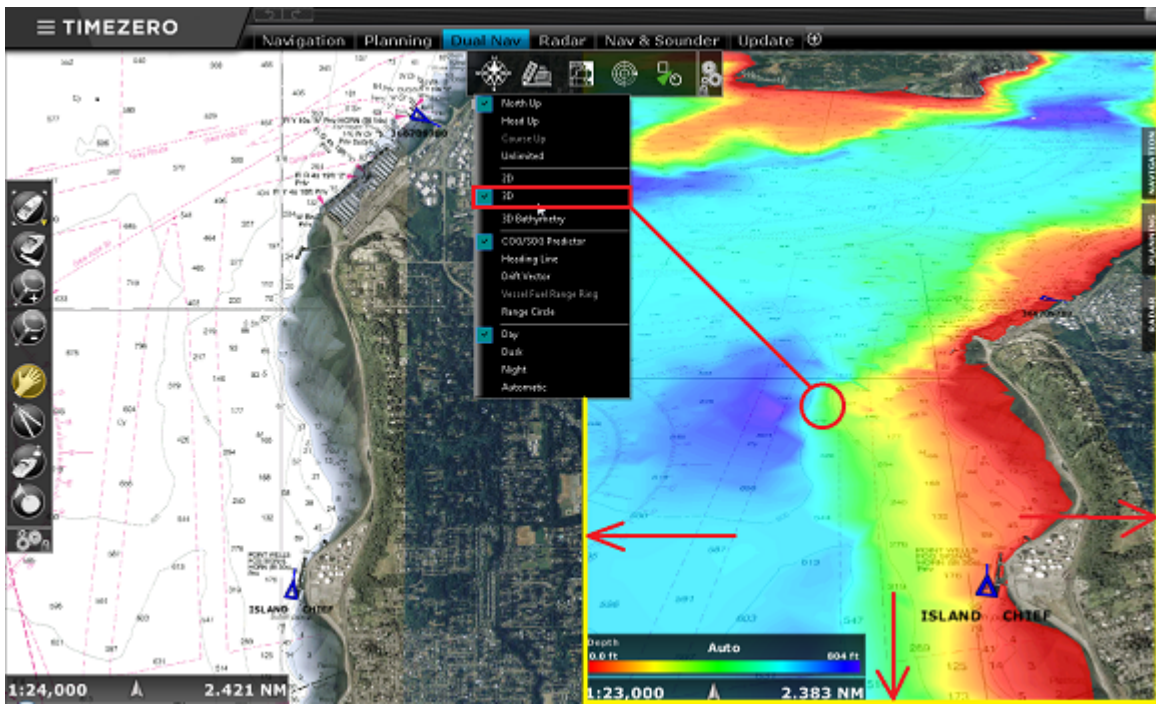
This Timeline can be used to replay previously recorded data. For more information on how to record and replay data, please refer to the [Record & Replay](#) chapter.

Once a WorkSpace has been created, it will be displayed just below the status bar. You can re-order the WorkSpace position by clicking and dragging on a WorkSpace tab. To delete or edit an existing WorkSpace, simply right click on it:



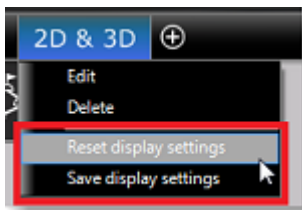
Note: You can only "Edit", "Reset/Save Display Setting" on the current WorkSpace (the WorkSpace that is currently selected)

When the screen is split, the Toolbar and Ribbon 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 Ribbon :



Saving and Recalling WorkSpace configuration

A WorkSpace configuration can be saved and then recalled at a later time:



The following parameters are saved:

- Toolbar configuration
- Ribbon configuration
- Undocked NavData (NavData that have been "pulled off" from the NavData bar)
- State of the display (Zoom Level, chart selection, ...)

For example, you could adjust the Monitoring WorkSpace to be centered on the harbor entrance, zoomed in on the chart without any additional layers (no depth shading, no contour lines...) with only the tools you need for Monitoring (Pan, Move Camera here,...). Once you are satisfied with your WorkSpace configuration, right click on the WorkSpace tab ("Monitoring" in that case) and select "Save display settings".

If for whatever reason you (or another user) start cluttering your Monitoring WorkSpace with useless layers, tools or set a zoom level not appropriate for navigation monitoring, you can always right click on the "Monitoring" WorkSpace and select "Reset display settings". This will revert the WorkSpace to its previously saved state.

WorkSpace configuration can also be recalled using [Quick Access NavData](#) or [Shortcuts](#).

Fixed & Dynamic Position

TimeZero Coastal Monitoring can operate in two positioning modes: fixed (manual fixed position are setup during installation) or dynamic (a GPS and Heading sensor are used to continually update the position and orientation).

Fixed Position

This is the default mode of the software. In that mode, fixed positions are used for all the sensors and for the default reference position. This means that all the sensors are mounted on land or on a fixed platform and that their position and orientation never change.



Installations that would use the fixed position mode are:

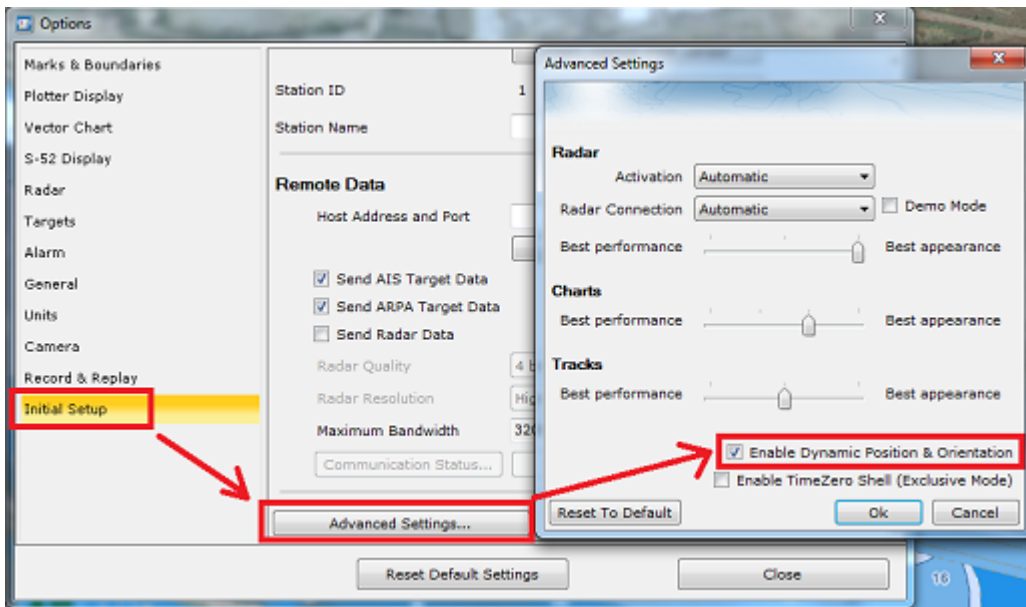
- Fixed Oil Platform (with legs)
- Dam
- Power Plant
- Refinery

Dynamic Position

In that mode, all the sensors and default reference position are relative to a live GPS and Heading sensor. This means that when the GPS moves, all sensors move in the same direction relative to the GPS position. Heading is also used to automatically adjust the orientation of the sensors (Radar and Camera). Installations that would use the dynamic position mode are:

- Oil Platform loosely anchored on the seabed (drifting)
- Fish Farm Barge
- Mobile Platform such as car or trailer

In order to change the software from fix position to dynamic position, select "Options" under the button located on the upper left corner of the screen. Select "Initial Setup", click on the "Advanced Settings" button and select "Enable Dynamic Position & Orientation":



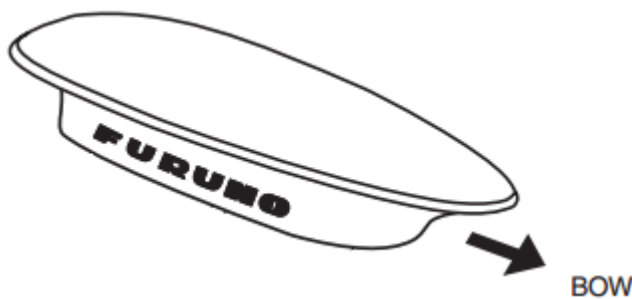
IMPORTANT: You have to restart the software to validate this change.

Once the software is in dynamic position and orientation mode, the sensors are referenced using offsets (longitudinal and lateral offset):

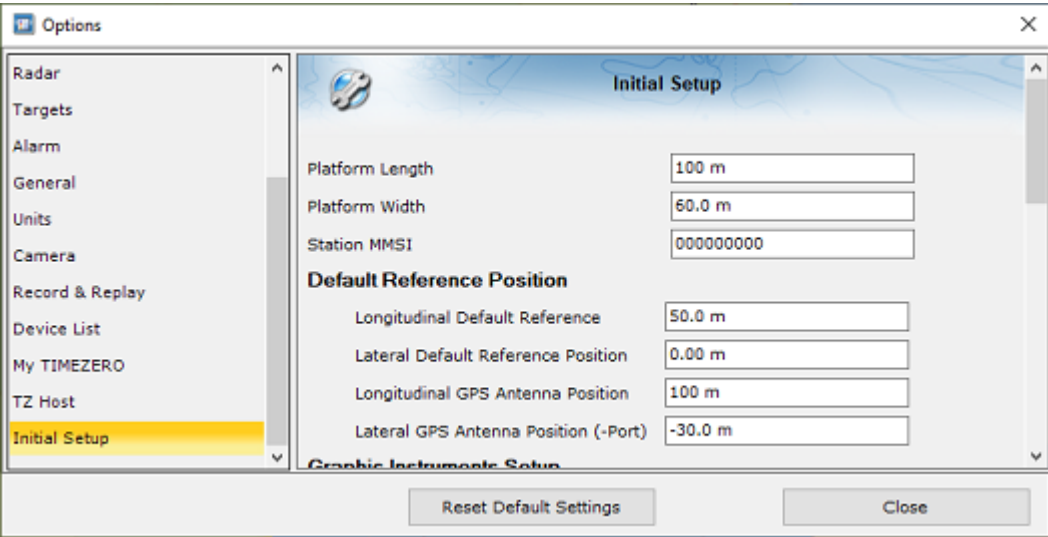
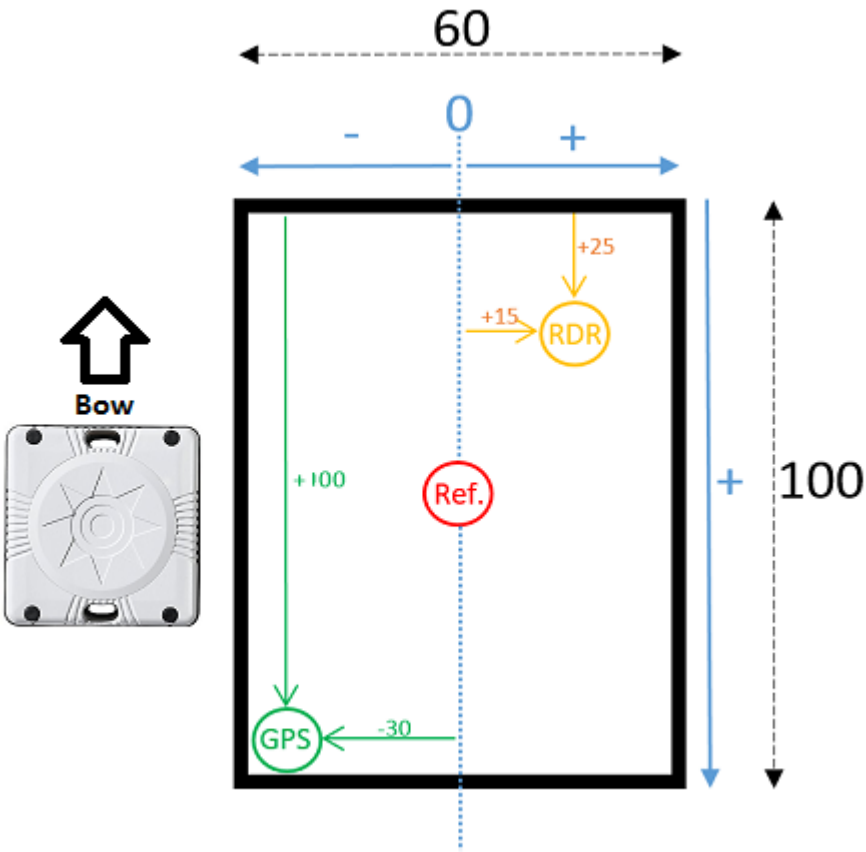
Radar Host	Radar Demo
Nickname	Radar Demo
Longitudinal Antenna Position	0.0 ft
Lateral Antenna Position (-Port)	25.0 ft

Longitudinal Default Reference Position	100 ft
Lateral Default Reference Position	0.0 ft
Longitudinal GPS Antenna Position	0.0 ft
Lateral GPS Antenna Position (-Port)	-25.0 ft

All the sensors and the default reference position are referenced from top to bottom (origin at the top) and from side to side (origin at the middle). Keep in mind that what defines the "top" of the platform is where the Heading sensor is pointing at. You should align the radar and camera "front" in the same direction that the heading sensor (usually a marker on the Heading Sensor and radar indicates the "bow" direction or the front of the sensor). The easiest is to align all sensors with the top of the platform:



In the example below, the black square represents a platform measuring 60 meters wide and 100 meters long. The size of the platform needs to be entered first in TimeZero from the [Initial Setup](#) Options. Then enter the relative position of the Default Reference position. In the example below, if the default reference position is located at the center of the platform, it would be 50 meters from the top (top to bottom always positive) and in the middle (0). If the GPS is located on the bottom left corner, its relative position would be 100 meters from the top and minus 30 meters from the middle:



In the example above, if the radar is located in the middle of the upper right corner, its coordinate would be 25 meters from the top and 15 meters from the middle:

Radar Initial Setup

Radar Host	Radar
Nickname	DRS
Longitudinal Antenna Position	25.0 m
Lateral Antenna Position (-Port)	15.0 m

Note that the radar needs to be aligned in the same direction as the platform (same direction as the heading sensor). If there is a small variation, the "Antenna Heading Align" setting of the radar can be used to match the radar echo with the chart (use the "Radar Overlay" under the "Radar" button located in the ribbon of the Monitoring WorkSpace).

The same logic applies to the camera. Use the "Horizontal Offset" setting (available in the Camera configuration page) to align the camera with the chart.

Note: When the software is set to Dynamic Position and Orientation, a GPS and Heading sensor **must** be connected and configured from the Connection Wizard.

Setting up Instruments

TimeZero can be connected to real time instruments such as AIS receiver, DSC Radio or Weather Station (Wind, Temperature, and Pressure). If the software is using dynamic positioning (instead of manual fix position), GPS and Heading sensors must be connected.

Instruments can be connected to the PC through an NMEA0183 interface (serial port), through the Network or through NMEA2000 (using the Actisense NGT-1 USB Gateway).

Note: GPS and Heading instruments are not required by TimeZero. A fix position (lat/lon) and orientation can be entered from the [Initial Setup](#) and [Radar](#) Options. If GPS and Heading instruments are connected and configured, it is possible to use the position and orientation from the sensor by pressing the "Insert Position from Sensor" button available in the same pages or switch the software operation mode to dynamic position and orientation (refer to [Fixed & Dynamic Position](#) for more information).

- **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 IOIO symbol.



- **Serial to USB adapter:** Newer computers 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.

- **Ethernet:** Sensors (such as Furuno Radar, Furuno Ethernet AIS Receiver, Serial to Ethernet adapter etc...) can be connected to the computer using a local area connection (100Base-T, Fiber Optic) or via high speed Line of Sight WIFI (30Mbps). Regular NMEA0183 (such as AIS or ARPA data) can also be transmitted over

Ethernet (from a serial to Ethernet adapter) using UDP or TCP.



Tips: For more information about installing Radar and Camera please refer to the Installation chapter.

Automatic Instrument Configuration

TimeZero can locate most instruments (such as AIS or Wind Sensor) connected to the computer automatically. To use this feature, start TimeZero . 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.

Default Reference Position

A default [Reference Position](#) needs to be setup from the [Initial Setup](#) Options. This is the position that will be used by default to center the chart on the screen. This position can be entered manually (by entering a lat/lon) or automatically (if a GPS sensor is connected and configured in the Connection Wizard) by pressing the "Insert Position from Sensor" or by switching the mode to Dynamic Position.

Tips: You can copy the coordinate of any point on the chart by right clicking on the chart while pressing the CTRL key down. Select "Copy Position". Then open the [Initial Setup](#) Options, click inside the position box of the "Default Reference Position" and press CTRL-V to paste the position.

Note: The Default Reference Position and Radar Position can be set to two different locations. The Radar Position and Orientation is adjusted from the [Radar](#) Options.

Working With Charts

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 disabled 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:

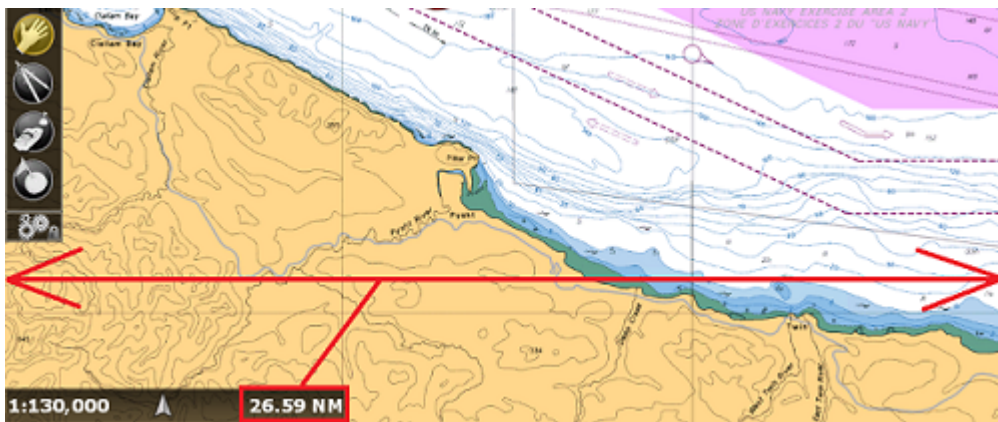
Use the Page Up / Page Down key or +/- keys to zoom in or out.

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.



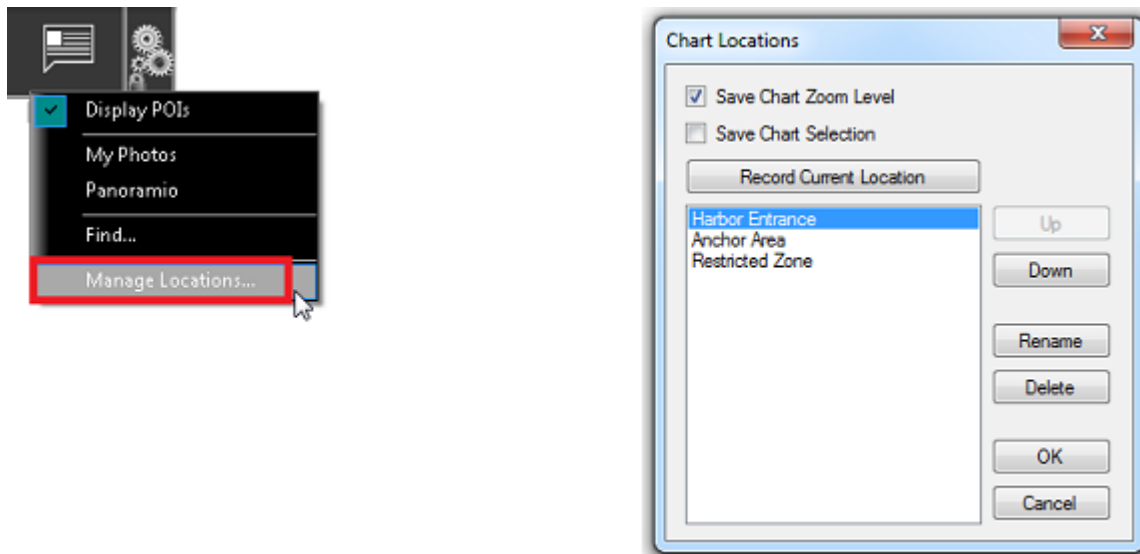
The chart scale is expressed as a ratio (1:130,000 in the example above), so the unit of measure does not matter. On a chart whose scale is 1:130,000, one inch the screen represents 130,000 inches in the real world.

The chart scale and range vary according to the zoom level but also according to the latitude (due to the Mercator projection).

Chart Location

Chart locations can be saved and recalled in TimeZero. This can be useful to quickly set your chart screen to a specific location (for example a Harbor Entrance, Anchorage Area or any other locations that are important and that you want to monitor). To save a chart location, pan and zoom to the correct location to adjust the chart screen as desired, click on the "POI" button located in the Ribbons and select "Manage Location...":

Note: If the "POI" button is not displayed in the Ribbons at the top of the screen, click on the "Configure Ribbons" button (on the right side of the Ribbons) to add it to the configuration



If you want the Zoom Level (Chart range) to be saved with the location, select "Save Chart Zoom Level". If you want to save the type of chart currently selected (Raster, C-Map, etc...) make sure to select "Save Chart Selection". This can be useful if a specific chart is better for a specific location.

Click on "Record Current Location" to name and save the location currently displayed on screen. Once the location is added to the list, you can reorder it using the "Up" and "Down" button. Make sure to click "OK" to close the Chart Locations window and save the location.

After one or multiple locations have been saved, you can quickly recall a location from the "POI" button in the Ribbons by selecting "Recall Locations". This will open a sub-menu with all your saved location.

Location can also be recalled using [Quick Access NavData](#) or [Shortcuts](#) (using the location number).

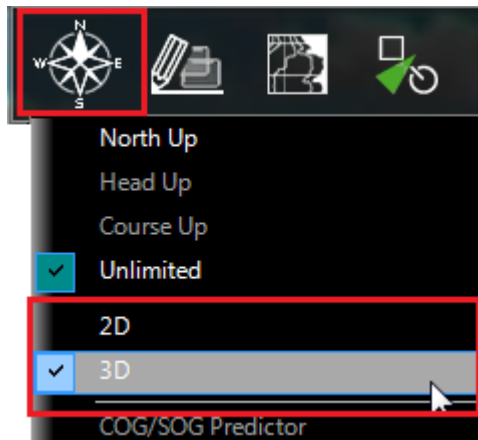
If you want to delete, rename or change the order of any location, just select "Manage Location..." from the "POI" button.

Note: A maximum of 12 locations can be saved.

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 Mode's drop-down menu:



Note: If you have the "PBG Module" and want to analyze seafloor bathymetry (for fishing for example), we recommend using the "3D Cube" WorkSpace that provides greater details and a better bathymetric view of the seafloor.

Chart Orientation

In 2D mode, the chart can be displayed in North Up, Course Up

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

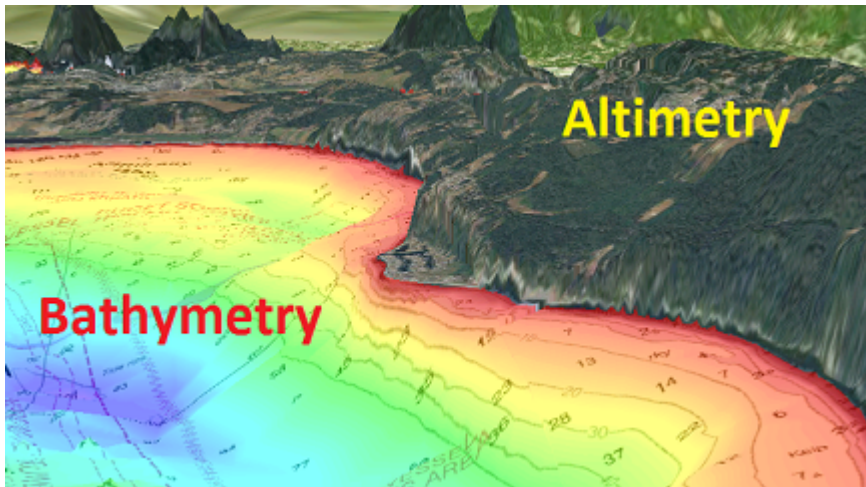
- **North Up:** In this mode, the azimuth is fixed pointing toward the North. The pitch or inclination is adjusted by holding the middle click button and moving the mouse. If the mouse does not have a middle button, press and hold the Alt (Option) key of the keyboard while moving the cursor.
- **Unlimited:**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

IMPORTANT: Bathymetry display is only available with MM3D Charts. If you select "ENC" as a chart source (S57 or S63 charts), the bathymetry is not available.

When "3D" is selected from the "Mode" button in the Ribbon, TimeZero handles Altimetry (3D above Sea Level) and Bathymetry (3D below Sea Level) in two different ways:

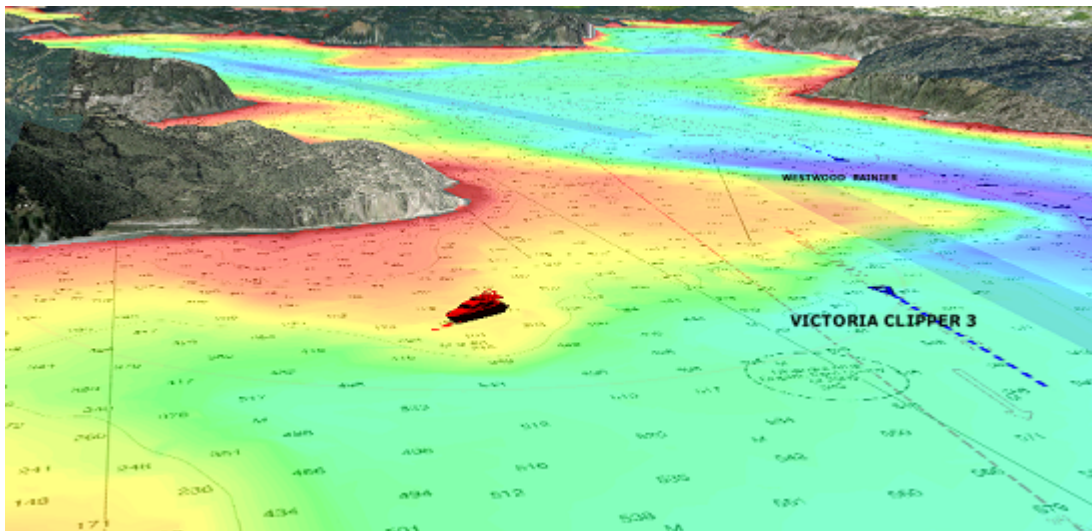


Altimetry (3D above water) is always activated and its exaggeration can be changed manually from the [Plotter Display](#) Options under the "3D Display" by adjusting the "3D Alti Exaggeration" slider.

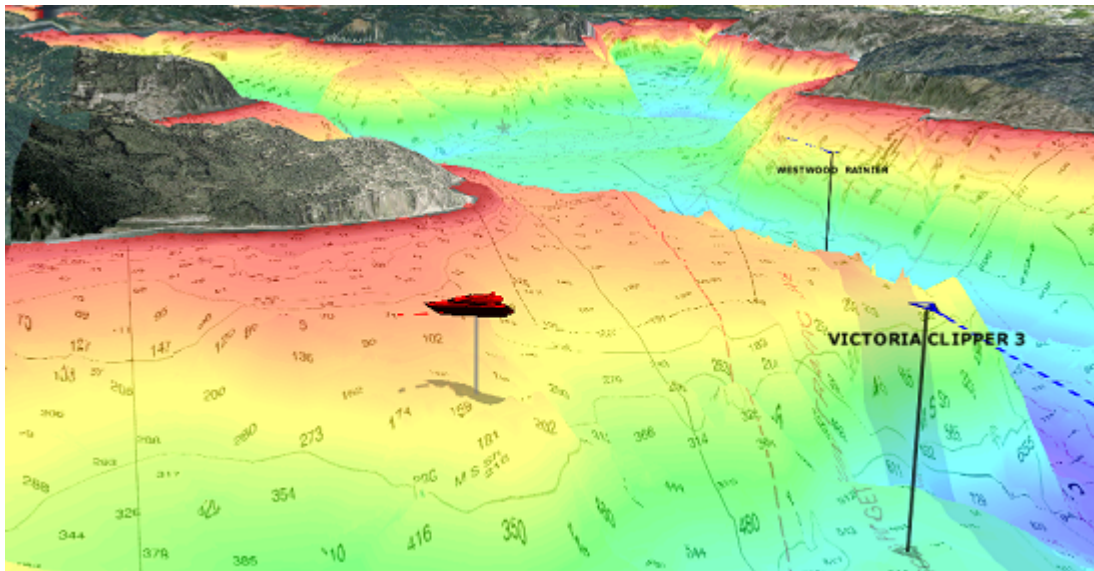
Note: This setting is used to enhance the 3D image over land by over or under-exaggerating 3D data over land. Minor changes in elevation become visible in areas that might otherwise appear completely flat (or vice-versa). If you are in an area where the mountains appear too high, simply reduce the 3D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

Bathymetry (3D below water) is turned OFF by default in the Monitoring and Analyze WorkSpaces. 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 in the Monitoring and Analyze WorkSpaces, simply select "3D Bathymetry" from the "Mode" button in the Ribbons.

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:



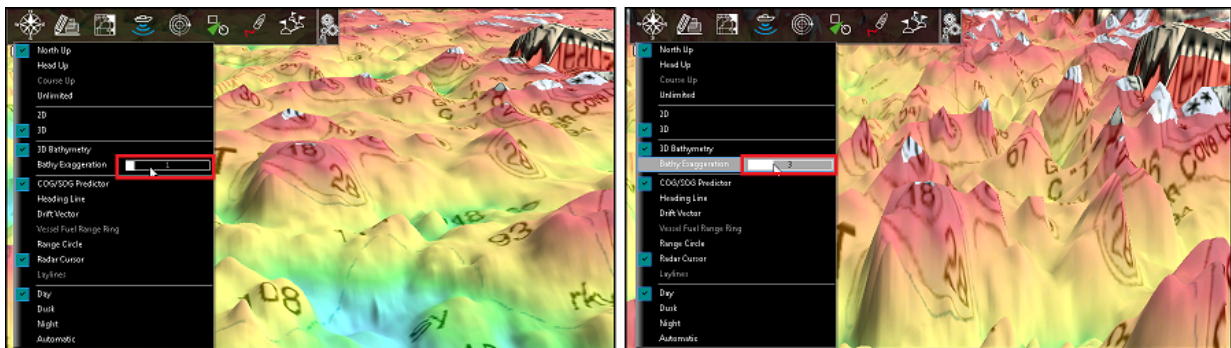
In the screenshot below, the Bathymetry is ON. This allows you to visualize in great detail the underwater structure around your vessel. However, it might be difficult to place objects that appear at the surface (target, marks, etc...) at their proper location relative to the bottom location:



For that reason, the Bathymetry can be turned ON or OFF.

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

When the 3D Bathymetry is turned ON, the 3D exaggeration under water is automatic, but an exaggeration factor can be applied in the Monitoring and Analyze WorkSpaces:

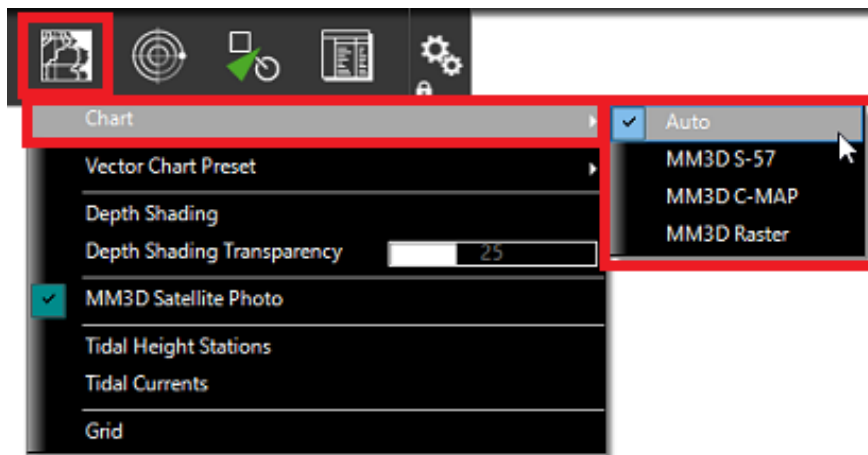


Selecting Charts & Overlays

TimeZero's powerful graphics engine adds new chart presentation options to the conventional method of electronic chart plotting. TimeZero can display vector or 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 Chart button in the Ribbon 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 Raster:** Select this option to display Raster Charts from Hydrographic Offices (NOAA, SHOM, UKHO,...)
- **ENC:** Select this option to display S57 (ENC) or S63 (Encrypted ENC) charts that have been imported

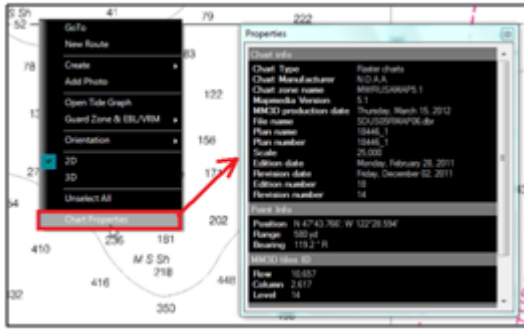
When a Vector Chart is selected (either "MM3D S-57", "MM3D C-Map" or "ENC"), the "S-52 Display" allows you to choose from Various Preset display configurations (Base, Standard, Fishing, Others). When set to "Custom", use the "S-52 Display" Options to customize the configuration.

Refer to the chapter [Adjusting Vector Charts Display](#) for more information.

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.

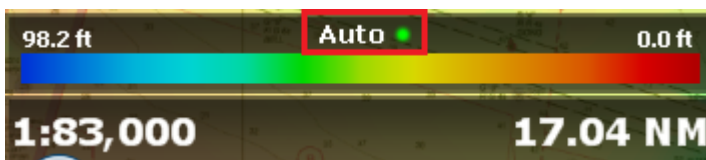
Note: PhotoFusion automatically adjusts the transparency of the Satellite Photo, however, it is possible to manually offset the transparency (make it more or less transparent) using the "PhotoFusion Transparency Offset" setting available in the Plotter Display Menu.

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

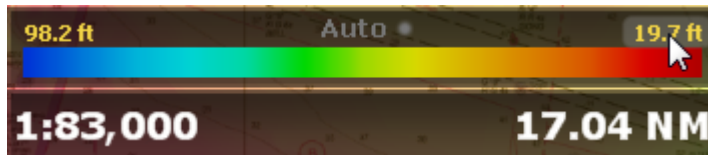
Depth Shading

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 Chart button. The transparency levels can be adjusted from the same location so that the chart data is visible beneath the color shading.

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 by moving the cursor over one of the depth values and using the mouse wheel to change it. You can also double click on one of the depth values to open the Menu where you can input the numerical value using a keyboard.



Tips: If you put the cursor over the color scale and use the mouse wheel (in manual mode), it will change both the upper and lower boundary at the same time (span).

Other Overlays

The Chart button in the Ribbons 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.

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](#) Options.

Vector Chart Presets

All vector chart options can be saved into presets. By default, TimeZero is initialized with a "Custom" preset in addition to the presets below:

- "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
- "All" display all the objects available
- "Fishing" adds objects that are useful for fishing
- "Custom" default preset used by TimeZero

Note that the "Base", "Standard", "All", and "Fishing" presets cannot be modified, and all vector chart options (except for Safety Depths) will be hidden when one of those presets is selected. The default "Custom" preset can be modified and the user can create new presets by selecting "<Add New>" from the preset selection list.

Vector chart presets can be recalled from the Chart button under "Vector Chart Preset". Note that different chart presets can be selected independently by WorkSpace.

Appearance

The appearance section of the Vector Chart options allows you to change how the charts are rendered on the screen. Various vector chart color theme can be selected. It is also possible to change the style of light and buoy icons as well as adjusting the overall object size (Depth Sounding Buoys, Wrecks, Obstructions, etc...).

Safety Depths

The Shallow, Safety and Deep water 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.

Note that these parameters are global to all vector chart presets. Changing these values will immediately apply to all presets.

Layers

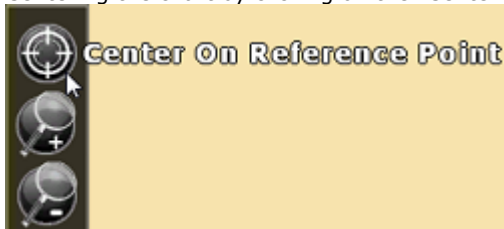
The layers section allows you to turn ON or OFF the display of specific objects on the chart and in some case control how they are displayed.

Bearing And Distance

Reference Position

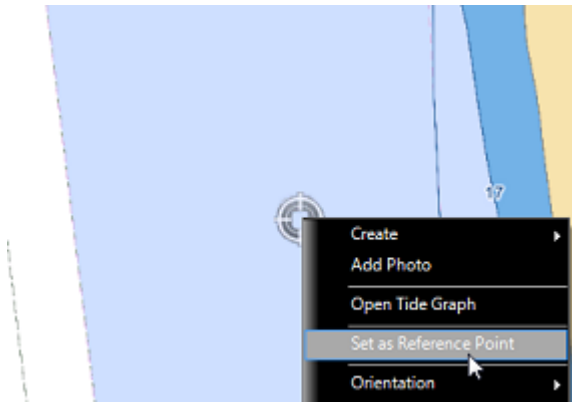
The Reference Position is used as a common reference point in TimeZero for:

- Centering the chart by clicking on the "Center on reference point" button in the Toolbar:



- Range and Bearing from Cursor (in NavData)
- Range and Bearing from Targets (Target NavData, Target List,...)
- Target CPA and TCPA
- Divider when double clicking on the chart

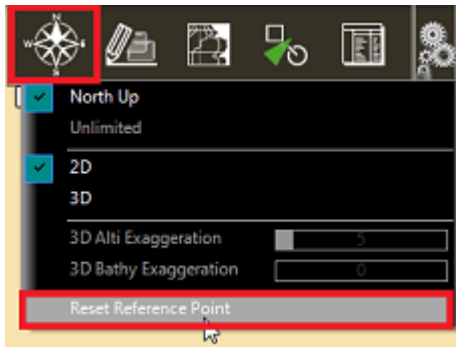
The reference position can be moved to any location on the chart by right clicking and selecting "Set as Reference Point":



An icon will appear on the chart indicating the location of the Reference Point:

The reference position can also be attached to targets by right clicking on them. When attached to a target, the reference position moves with it automatically. This is very useful to compute CPA and TCPA from a specific target of interest.

The reference position can be reset to the default location by clicking "Reset Reference Point" under the "Mode" Ribbon button:



The location of the default reference position is setup from the [Initial Setup](#) Options.

Note: When the software is set to **Dynamic Positioning**, the default reference position will move relative to the GPS position (offset set from the [Initial Setup](#) Options). When you right click on the chart to change the location of the Reference Position, it become fixed on the chart even if the GPS moves. Please refer to [Fixed & Dynamic Position](#) for more information.

Divider Tool

The Divider Tool can be used to display range and bearing in between two points or in between the reference point 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):

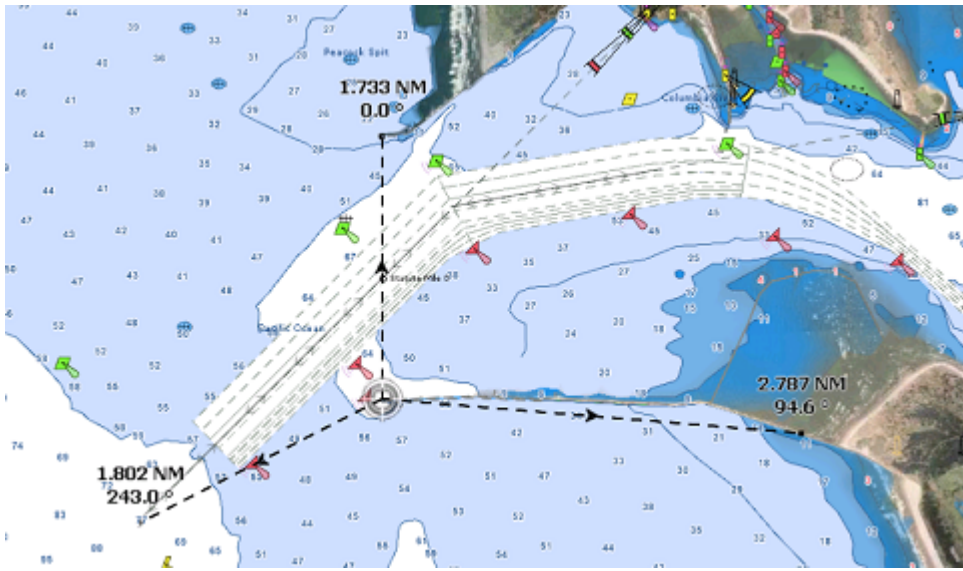


Note: After dropping the first point, it is possible to move the chart by clicking and dragging on the screen. You can also zoom in/out using the scroll wheel or keyboard shortcut. Please refer to the [Scrolling & Zooming](#) chapter.

Multiple Bearing and distance from the reference point

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

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 the reference point will update if the reference point is attached to a target.

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.

Editing and Deleting Divider line

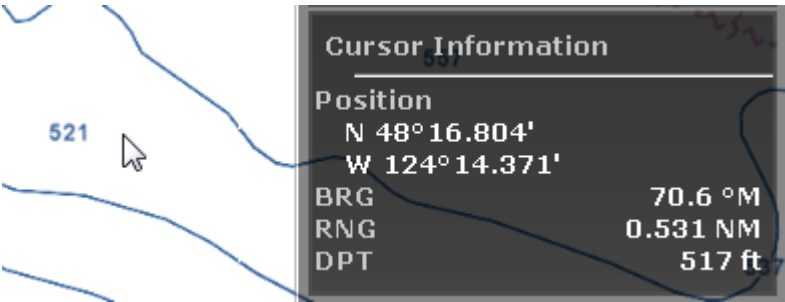
Divider lines can be moved by clicking and dragging the point to a new position

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 "Target" 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 the reference point.

Objects

Creating & Editing Marks

TimeZero allows for the creation of up to 30,000 Marks. Marks are used to plot specific locations. All Marks are displayed on the chart and in the Marks List.

Note: The 30,000 marks limitation only applies to the default "TimeZero" layer (which is automatically synchronized with all your TimeZero devices). You can create more than 30,000 marks if you create new layer(s). For more information about how to organize large quantity of user objects into layers, please refer to the [Layer Introduction](#) chapter.

Creating Marks graphically

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

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

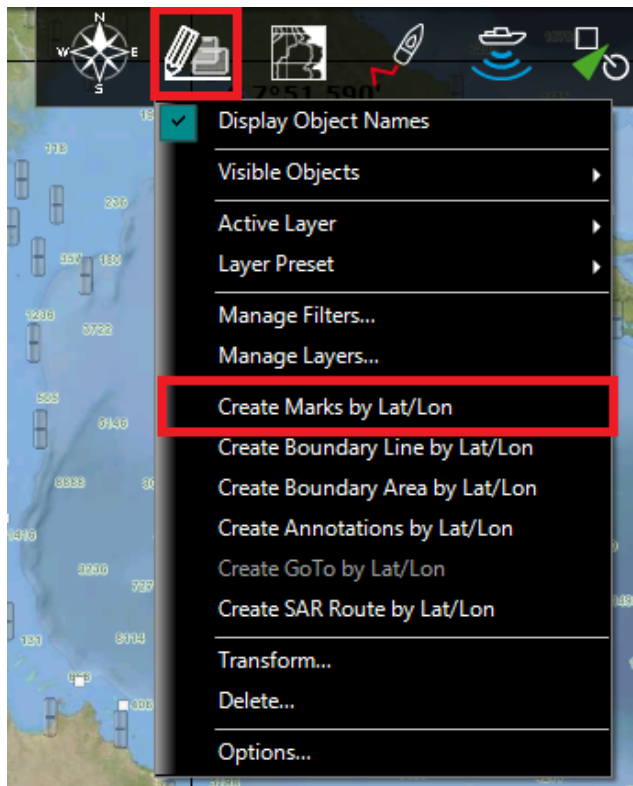
The default icon and color setup in the [Marks & Boundaries](#) options will be used.

Tips: You can right click on the "Mark" tool to select a color and icon before dropping a mark with the Mark tool.

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. You may also click on the "Marks" Ribbon button and select "Create Mark by Lat/Long":



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

You can right click on the mark to adjust directly some of its properties such as icon and color.

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 marks.

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

You can hide marks that belong to specific layers by selecting "Visible Layers" from the "Layers" Ribbon Button. You can automatically hide all the marks when switching in 3D mode by deselecting "Display Marks in 3D" from the "Plotter Display" Options. This can be used to reduce clutter when switching in 3D mode.

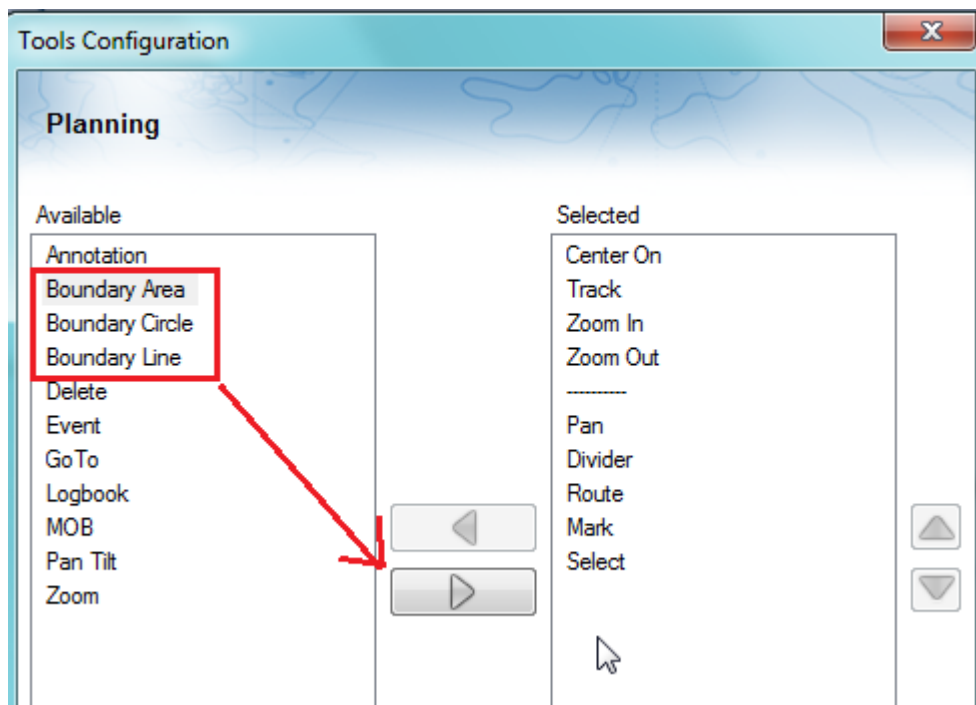
Creating & Editing Boundaries

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.

Note: The 100 boundaries limitation only applies to the default "TimeZero" layer (which is automatically synchronized with all your TimeZero devices). You can create more boundaries if you create new layer(s). For more information about how to organize large quantity of user objects into layers, please refer to the [Layer Introduction](#) chapter.

Boundary Areas and Circles can be used to create Automatic ARPA Target Acquisition or Exclusion, Zone Monitoring or Radar Mask. Boundaries can be created with your cursor y using their corresponding tool. 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.

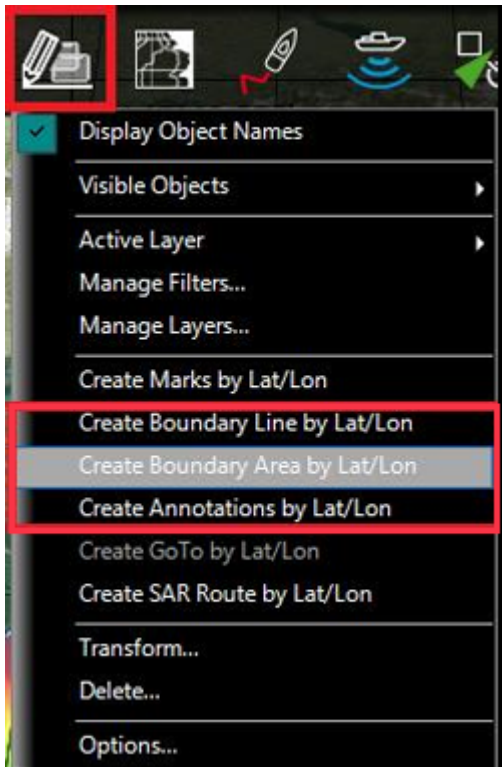
You can also right click anywhere on the Chart and choose "Create" -> "Boundary".

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. You may also click on the "Marks" Ribbon button and select the corresponding option:



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 boundaries.

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.

Note: If you want to protect a boundary to prevent users to make any modification, you can assign the boundary to a specific layer, lock the layer itself, then lock the user interface. Please refer to [Creating & Editing Layers](#) and [Lock the User Interface](#) chapters

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).

Note: Photos can only be created on the default "TimeZero" layer. It is not possible to create or move photos to another layer. This restriction is implemented so that photos are always and automatically synchronized with all your TimeZero devices (all objects put on the TimeZero layer are synchronized). Layers can only be used with Tracks, Marks, Boundaries and Annotations.

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.

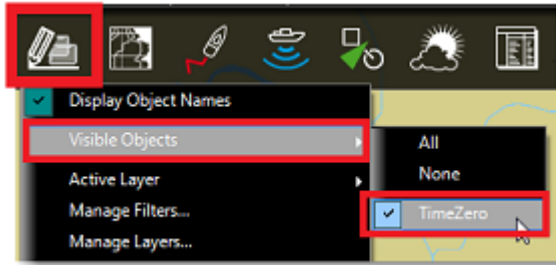
When importing photos from the Import Wizard, TimeZero will look for any GPS tag information that may be embedded in the EXIF metadata. If no GPS tag is found in the photo, TimeZero will look at the date/time tag (which is available with most digital cameras) and try to cross reference the date with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

Photos are located on the default TimeZero layer than can be enabled or disabled from the "User Objects" button:



Filters can also be used to show/hide group of objects with various condition. For more information, review the [Filters](#) chapter.

Selecting User Objects

Selecting Individual Object

To select a single object (mark, 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

The Selection tool can be used to select multiple objects at once. If you right click on the tool, you can set it in "Rectangle" mode or "Free" mode:



The rectangle mode allows to draw a rectangle on the screen (click and drag) and select all the objects inside that rectangle when the mouse is released. The free mode allows you to freely draw a selection area on the screen (click and drag) and is a very powerful tool to exclude or include specific objects to the selection.

Note: It is not possible to use the Selection tool when too many objects are displayed on the screen (over 100). To minimize the number of object, zoom in and try the selection tool again.

You can also 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.

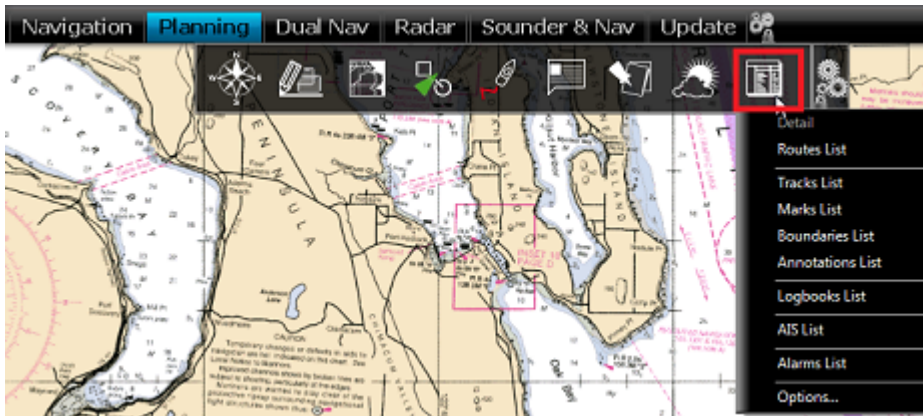
Multiple objects can also be selected from the list (CTRL or SHIFT). Since the list can be sorted by various parameters, it can be easier to select multiple objects (for example by creation date, color, icon, etc...). For more information about list, please refer to the [Objects List](#) chapter.

Apply a modification on Multiple Objects

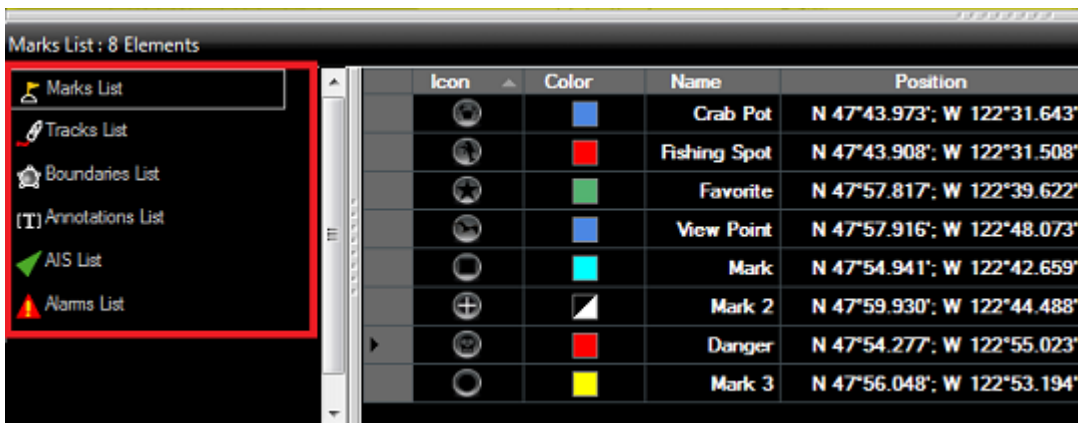
Once multiple objects are selected, you can right click on the selection to delete or change properties common to all the objects (color, icon, layers, etc...)

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 in the ribbon.

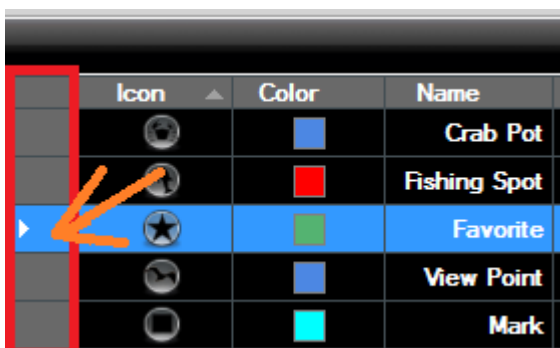


Once the list tab is open at the bottom of the screen, you can change list category from the left pane:



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".

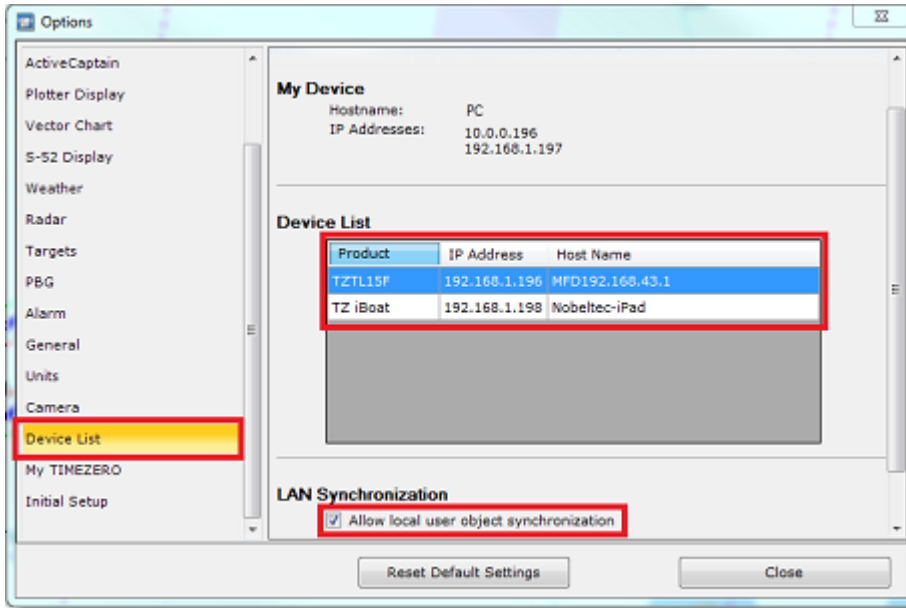
This information can be exported in a file (text format) or copied to the clipboard by clicking on the corresponding item under the "Action" menu. The fields in the text file are delimited using Tabs. We recommend using Windows Excel to open the file or paste the content of the clipboard (for proper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

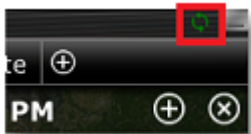
User Objects Synchronization

All User Objects (boundaries, lines, annotations, and photos) stored on the TimeZero layer are automatically synchronized with all the compatible TimeZero Platforms that are connected on the same local network (TZ Coastal Monitoring, 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), all the TimeZero platforms need to be logged with the same My TIMEZERO account in order for the synchronization to occur (for security).

When TimeZero synchronizes its database with another device on the local network, a small green status icon will appear at the top right corner of the screen (next to the minimize button):



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.

Note that by default, only the marks and objects that are stored on the default "TimeZero" layer are synchronized. If you create another layer ([Creating & Editing Layers](#)), and store user objects on that custom layer, they will not be synchronized. This is because the TimeZero layer enforces a limit on the number of user objects that can be synchronized with smaller platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). Custom layers (created by the user) do not enforce any limitation. Also, smaller platforms do not have the ability to handle multiple layers. For all these reasons, only the user objects that are put on the "TimeZero" layer are synchronized. However, if you do not care about smaller platform and would like to only synchronize user objects among other TimeZero, you can enable the option "Synchronize All Layers" from the [Device List](#) Options. When this option is checked, all layers and all user objects will be synchronized, but only with other TZ Professional (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TZ Professional .

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 or only objects belonging to specific layers 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 located in the ribbon
- 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.

Object Management

Introduction

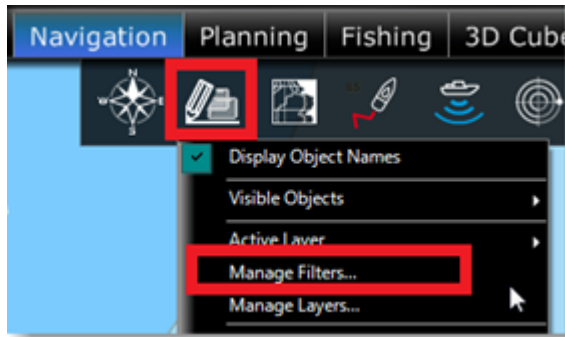
TimeZero includes various features that allow the user to manage large quantity of data (Tracks and User Objects). You can manage your data using "Filters", "Layers" or a combination of both. Filter and Layer both allow you to show or hide a specific set of User Objects on your screen so that you can focus your attention on the relevant data. For new users, we recommend looking at using "Filters" before diving into "Layers" management (which is an older feature based on legacy products).

TimeZero also includes various features that allow the user to create and log data easily. For example the Events allow you to preset marks with specific icon and color and drop them at your current location with one click (or one keystroke). You could use a crab icon to mark your pot location and the color of the mark to indicate the pot quantity (full pot = green / empty pot = red).

Finally, TimeZero allows the user to manipulate data using the Transform Objects window. This feature is especially useful when importing data from legacy or third-party software and/or when you want to re-organize your data.

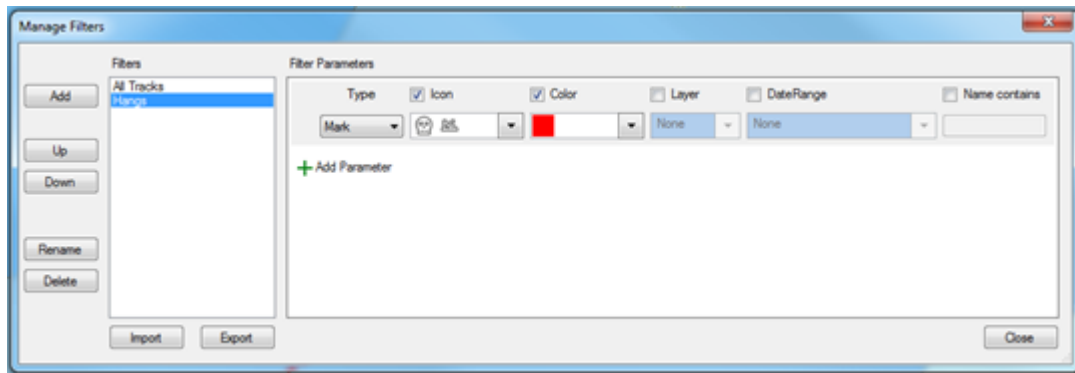
Filters

TimeZero allows the user to create filters based on simple parameters (type of object, color, icon...) so that only the relevant information is displayed on the screen. Filters can be created by selecting "Manage Filters..." under the "User Objects" button:



Creating Filters

To create a new filter, click on the "Add" button. After giving a name to the filter, you can add parameters that will define the objects you will see when the filter is applied:

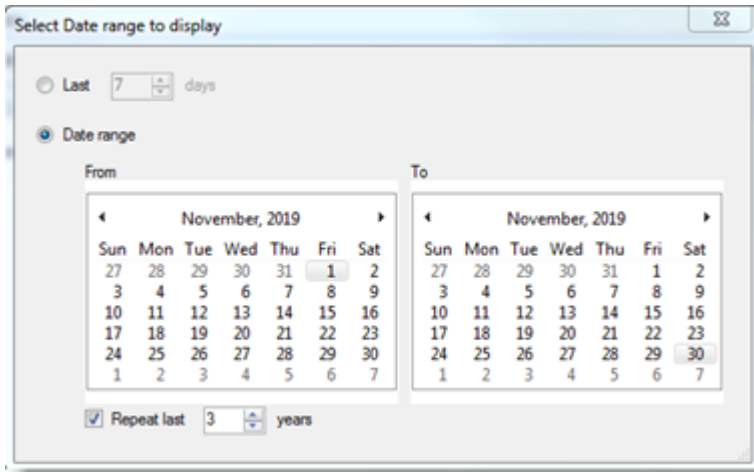


Up to 20 filters with multiple parameters can be created. Filters criteria include:

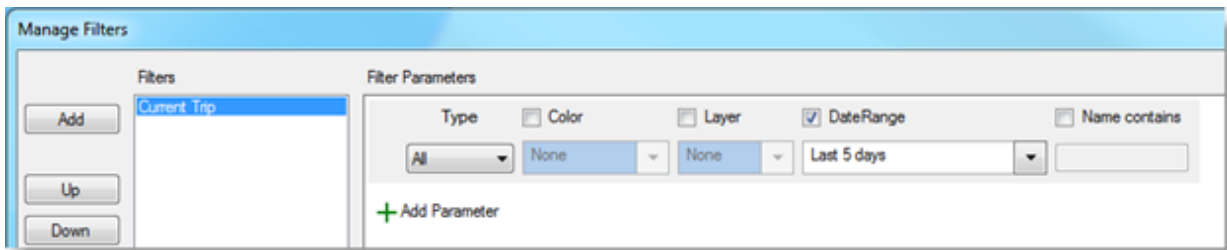
- Type of Object (Marks, Annotations, Route, Areas, Circle, Lines, Own Ship Tracks, AIS tracks, ARPA tracks, Catches and Photos)
- Icon (for marks) and pattern (for boundaries)
- Fish Size and Weight (for Catches)
- Color
- Layer
- Creation Date
- Name of Object

Note that the date criteria is very flexible and allows to select objects that have been created/modified during the

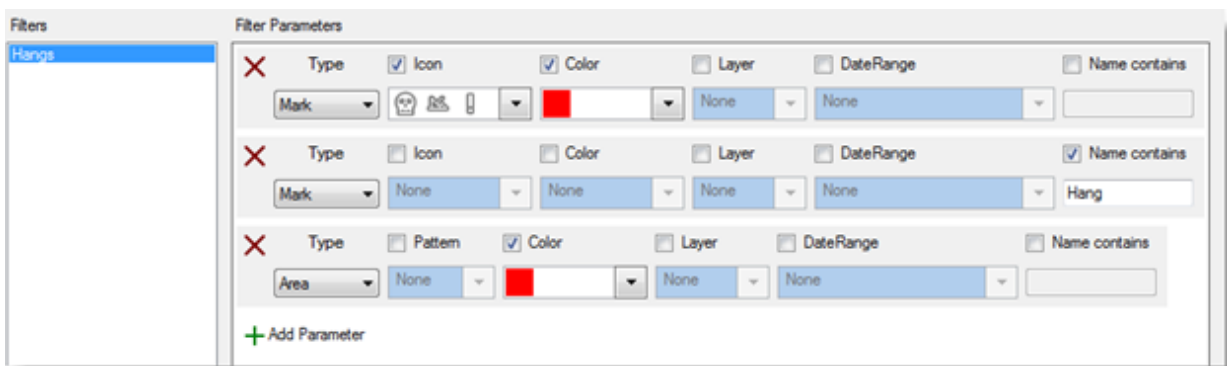
last XX days (last week for example), or created/modified in between two specific dates, or created/modified in between two specific dates over multiple years (to select multiple fishing seasons):



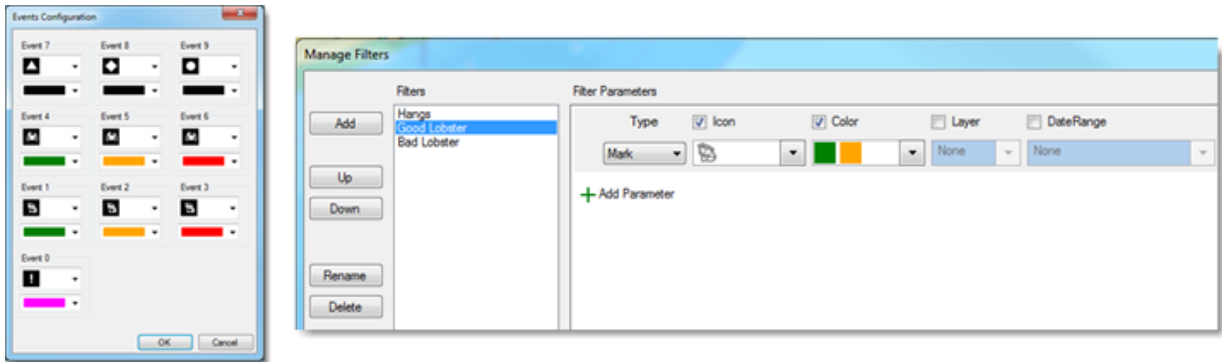
A filter can be configured to be as simple as displaying all objects that have been created/modified during the last 5 days (for example to only show the objects that have been created during the current fishing trip):



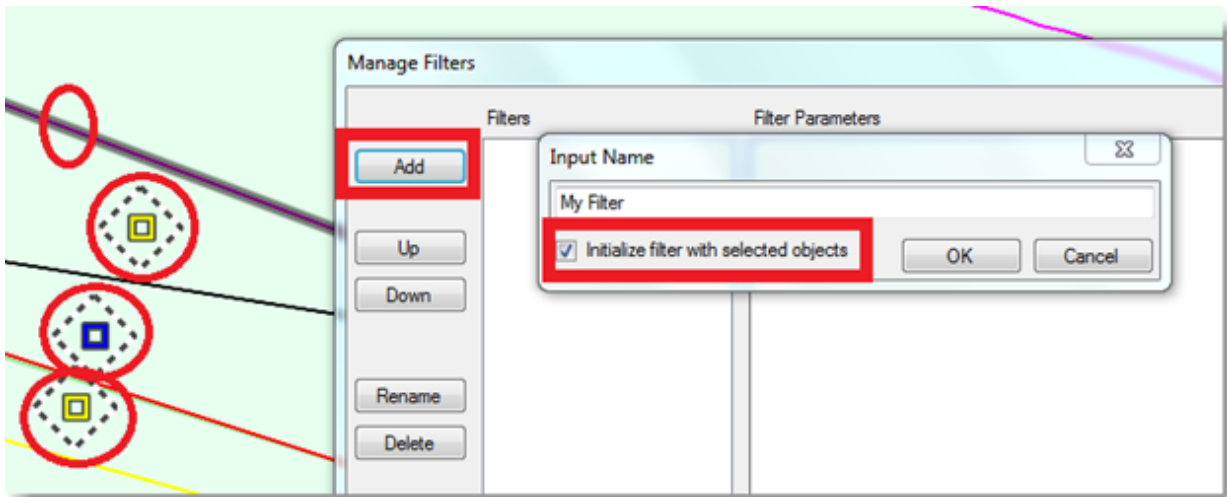
But filters can be configured to be very advanced by combining multiple parameters and multiple types of objects. For example, the filter below will display marks that are red with specific icons (3 icons), plus any marks whose name contain "Hang", plus any areas that are red:



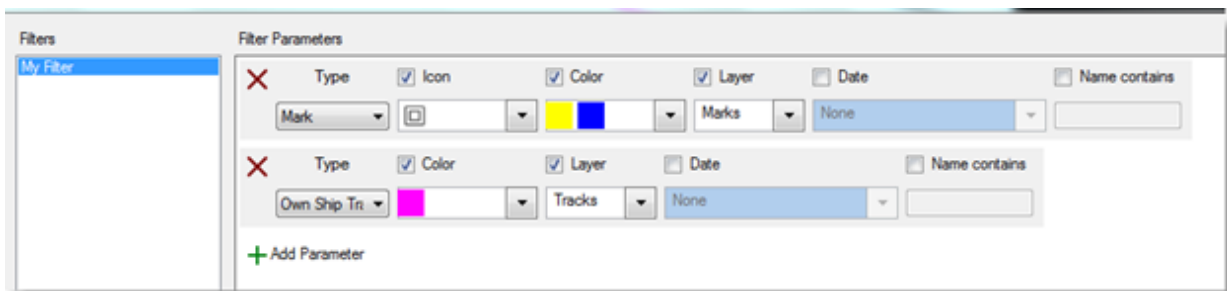
Filters are especially useful when paired with the use of Events, especially the Event NavData that allows to quickly drop preset marks under the boat. In the example below, the event NavData has been configured with lobster and crab icons that use a color code to indicate the relative catch amount (green for a trap that is full, orange for an average trap and red for nearly empty). Then, corresponding filters have been configured allowing the user to highlight productive areas with one click:



Note that filters can be created directly from existing user object selection. For example, you can OPTION-Click (or Shift Drag) on multiple objects and then create a new filter with the option "Initialize filter with selected objects":

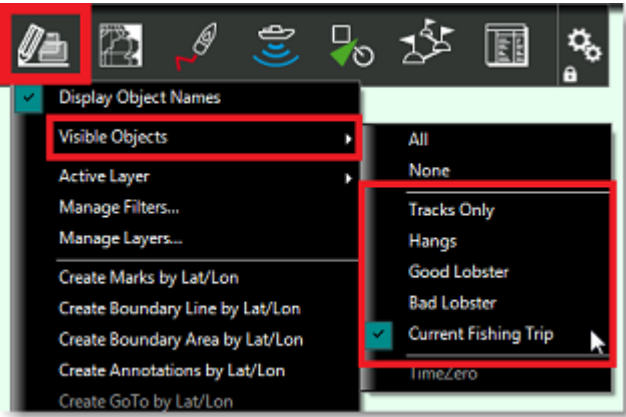


This will automatically create a filter with the selected objects in parameters:



Applying a Filter

Filters can be selected from the "User Objects" button under "Visible Objects":



Note: It is not possible to select multiple filters at the same time. Only one filter can be selected at a time.

But a more convenient way to select your filters is to use the dedicated Filter NavData. To add a new NavData, click on the "+" located at the top of the NavData container (it must be opened first). Then, find the "User Object Filters" in the list and click OK to add it to your configuration:



By default, this NavData will display the first 4 filters, but right clicking on the NavData allows to limit the number of filters to 2 or expand it to 8 filters. The active filter selection (if any) will be displayed in yellow/orange in the list:



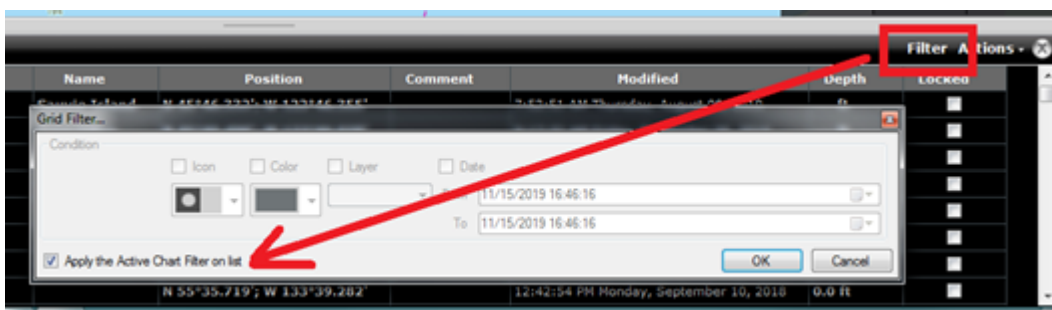
Note that you can re-order the list from the "Manage Filter" window (by clicking on the blue "i" icon), but you can also hide specific filters by right clicking on the NavData (and use "Toggle Filter Visibility"):



TIPS: Independent filters can be selected on each display and each WorkSpace. For example, if you split your screen in two (two plotters), the left side can be configured with one specific filter independent of the right screen.

Using Filter in Lists

The lists (Marks List, Tracks List, Boundaries Lists) can be setup to use the active filter (so that the chart and the list are synchronized and display the same objects):



Layers

TimeZero allows you to create "layers" that can be used to categorize your data. By default, TimeZero creates a "TimeZero" layer that stores all your User Objects. This layer is automatically synchronized with all compatible TimeZero Platforms (TZ Navigator, TZ Professional, TZ iBoat, and Furuno TZT2/TZT3). Because the default "TimeZero" layer is synchronized, there is a limitation about the number of User Objects it can hold:

- Marks = 30,000 maximum
- Boundary (Areas and Lines) = 100 with up to 50 vertices per object
- Circle = 100 maximum
- Annotation = 100 maximum

Note: There is no limit about Tracks as they are not synchronized among devices.

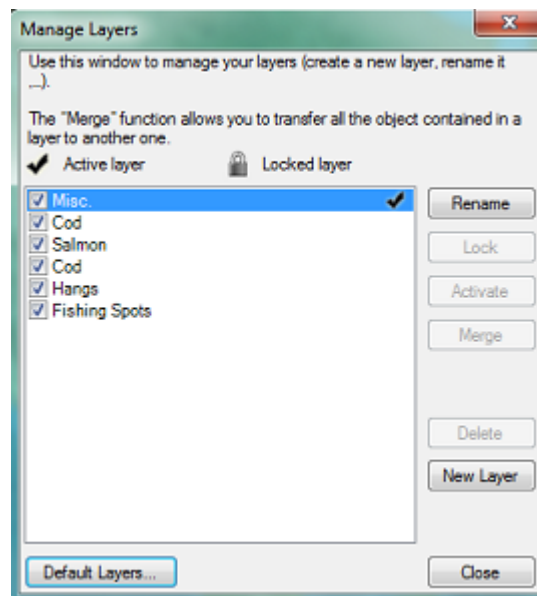
If you need to store more user objects and/or if you want to organize your data, you can create additional "custom" layers. For example, you could create a layer to group all the monitoring areas and another to group the ARPA acquisition or exclusion areas. You can create as many layers as you want and give them custom names.

Custom layers you create are not subject to any limitation, but they cannot be synchronized with small platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3).

Note: if you do not care about smaller platforms and would like to only synchronize user objects among other TimeZero, you can enable the option "Synchronize All Layers" from the [Device List](#) Options. When this option is checked, all layers and all user objects will be synchronized, but only with other TimeZero (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TimeZero.

Managing Layers

Select "Manage Layers..." from the "User Objects" ribbon button. This opens a window that allows you to perform various actions on Layers:



- **Rename:** Click on this button to rename the layer selected in the list

- **Lock/Unlock:** Click on this button to lock or unlock the layer selected in the list. Locking a layer prevents accidental change to any objects assigned to that layer

Note: To prevent a user to unlock a layer, it is possible to [Lock the User Interface](#) and protect it with a password. When the User Interface is locked, various advanced options of the software cannot be changed and it is not possible to unlock a layer.

- **Activate:** Click on this button to set the layer selected in the list as the Active Layer. The "Active Layer" is the default layer on which the objects will be assigned to when they are created
- **Merge:** Click on this button to transfer all the objects assigned to the layer selected in the list over a new layer (a pop up window will appear allowing you to select the target layer)
- **Delete:** Click on this button to delete all the objects assigned to the layer selected in the list

Note: You cannot delete the default "TimeZero" layer. The "TimeZero" layer is used for the synchronization of User Objects.

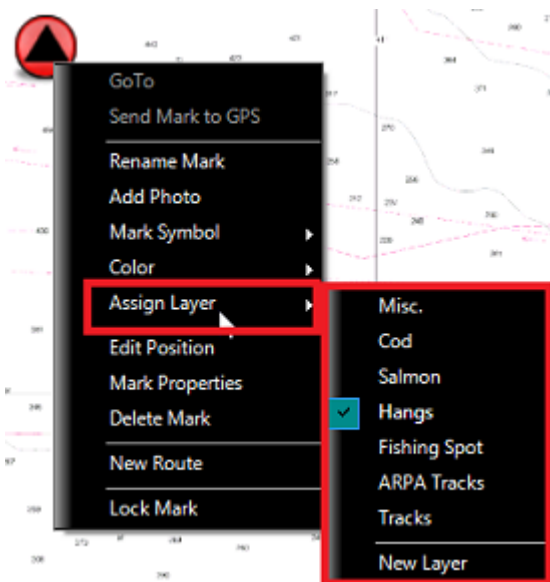
- **New Layer:** Click on this button to create a new layer

Using Layers

When you select a tool to create an object (Mark, Route, Annotation, Boundary,...) the "Active Layer" name will be displayed on the top of the screen:

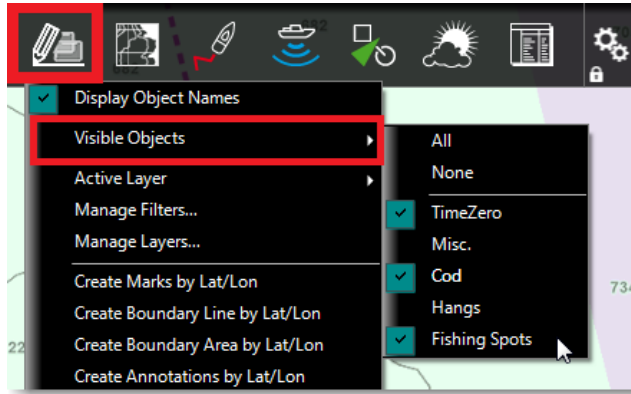


The "Active Layer" is the default layer assigned to any object created. Note that you can change the layer of a mark or object at any time after creating it by right clicking on the Mark and selecting "Assign Layer". This will display a contextual menu with the list of all the layers available:



Note: You can only assign one layer per object.

Once your objects are categorized with layers, you can configure your screen to only show objects that belongs to specific layer by adjusting the "Visible Objects" from the "User Object" button:



The "Visible Object" selection is independent per WorkSpace. You could have one WorkSpace display a set of layers and have another WorkSpace display another set of layers or no layer at all.

Note: By default, all layers are set to invisible on the Radar WorkSpace.

If you manage large quantity of objects and layers, it is also possible to use "Preset" of layer (by enabling the Advanced Mode of the Layer Management window). Layer Presets can be used to bundle a specific group of layers together and hide the one you are not using (the layers that are not part of the currently selected Layer Preset).

TIPS: You can lock specific layer(s) to prevent editing the objects it contains and also lock the user interface to prevent user from unlocking those layers (refer to [Lock the User Interface](#) for more information).

Enabling/Disabling Layers

If you have lots of layers and decide not to use some of them temporarily, you can disable them by deselecting the check box in front of the corresponding layer(s). When you disable a layer, the objects it contains will no longer be displayed on the chart and you will not be able to activate it or use it as a default layer.

Note: You cannot disable the default "TimeZero" layer. The "TimeZero" layer is used for the synchronization of User Objects.

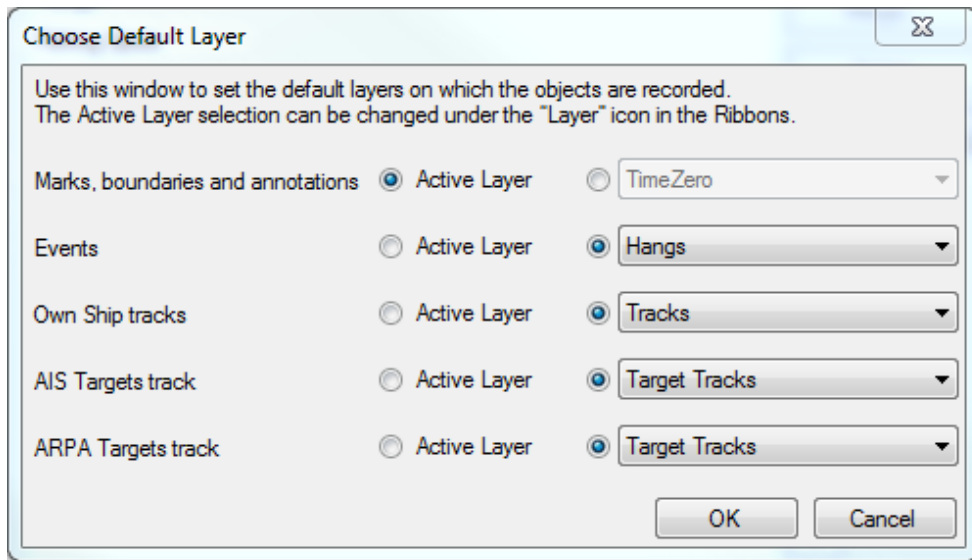
Locking Layers

If you want to prevent accidental changes to specific objects (for example boundary areas), group them on a layer(s) and lock that layer(s) by selecting the layer(s) in the list and pressing the "Lock" button.

If the User Interface has been locked from the main menu, the user will not be able to unlock Locked Layers. In order to unlock layers, the User Interface needs to be unlocked. Refer to [Lock the User Interface](#) for more information.

Default Layers

By default, all the Marks, Boundaries, Annotations and Tracks you create are assigned to the Active Layer. The "Default Layers" window allows you to force specific type of objects to be assigned to different default layers when they are created:



For example, you may want to create a dedicated layer for all the ARPA tracks and select it as a default layer (instead of the Active Layer). When you enable the Track Recording on an ARPA target, that track will automatically be assigned to the "Target Tracks" layer (regardless of the Active Layer selection).

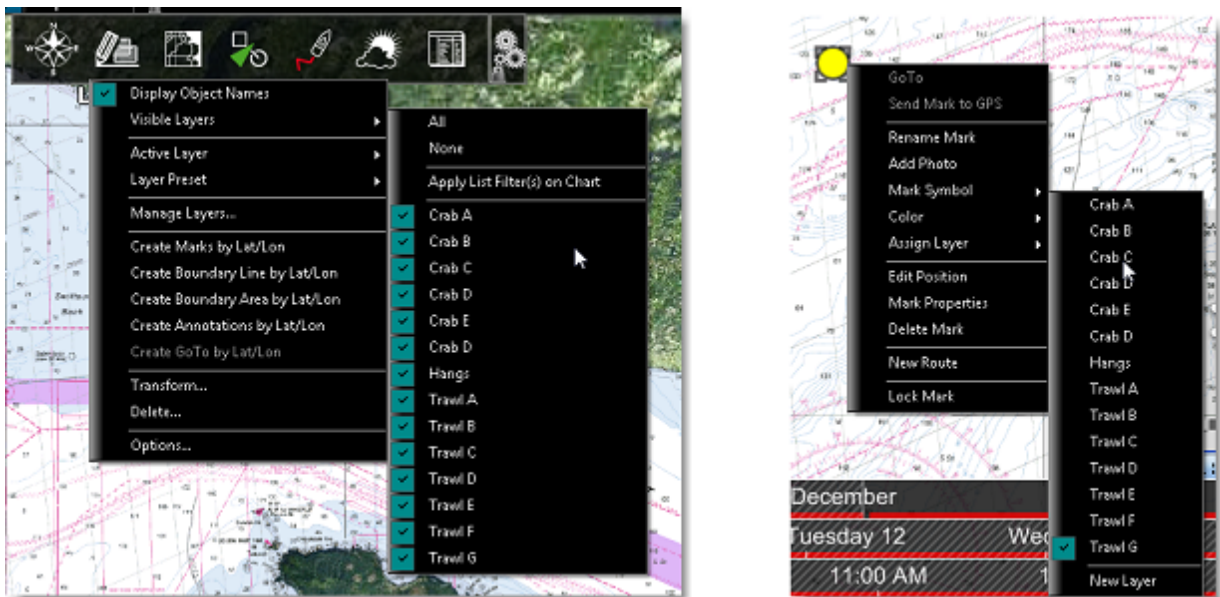
Advanced Layer Management

For advanced users that need to manage a large quantity of layers, TimeZero provides an advanced layer management system allowing a user to create "presets" of layers. Layer Presets can be used to bundle a specific group of layers together and hide the one you are not using (the layers that are not part of the currently selected Layer Preset). This allows you to only work and see a subset of layers at a specific time. Changing preset, will automatically unload and load a new set of layers.

This feature can be useful if you perform multiple types of fishing that do not necessarily require you to use the same layers. For example, you could have 10 layers that you only find useful when laying down pots (for crab), and 15 other layers that are only useful when trawling. In this case, instead of having 25 layers always available in the software, you could create a preset "crab" and another "trawling" that would only activate the relevant layers in the software. Note that you may have a layer that you use to store hangs (rocks, wrecks,...) that can be shared and enabled for both "crab" and "trawling" preset.

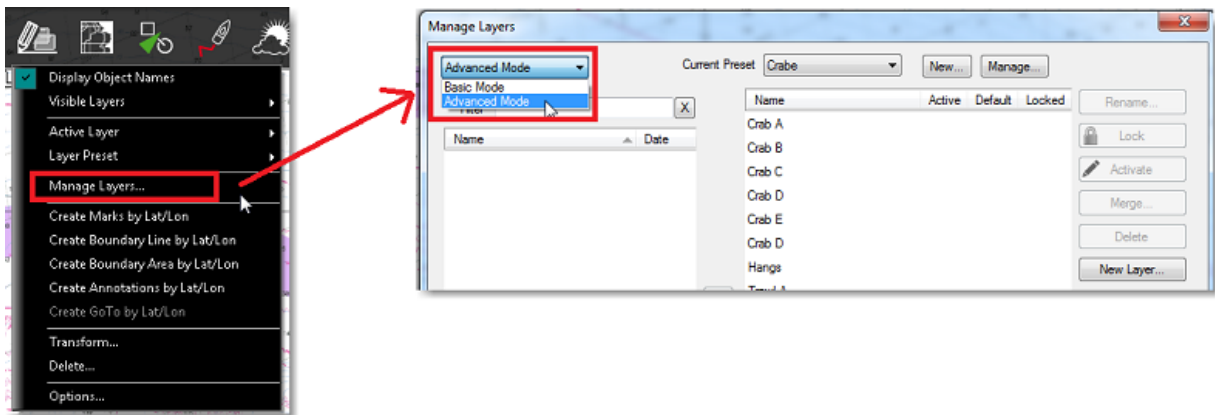
Note: Creating presets of layers is only useful when you have more than 10 or 20 layers. If you only work with 10 or less layers overall, it is easier to just turn them ON or OFF individually from the "Visible Layer" option under the "Layer" button in the ribbon.

In the example below, this user has too many layers in his software, making layer selection cumbersome:

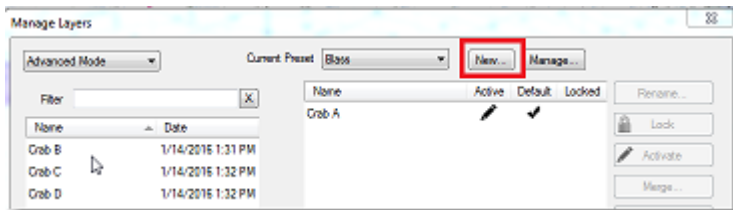


The user realizes that when trawling, he never uses any of his "Crab" layers. To solve this problem, a "Crab" and "Trawl" layer preset can be created from the Manage Layer Window.

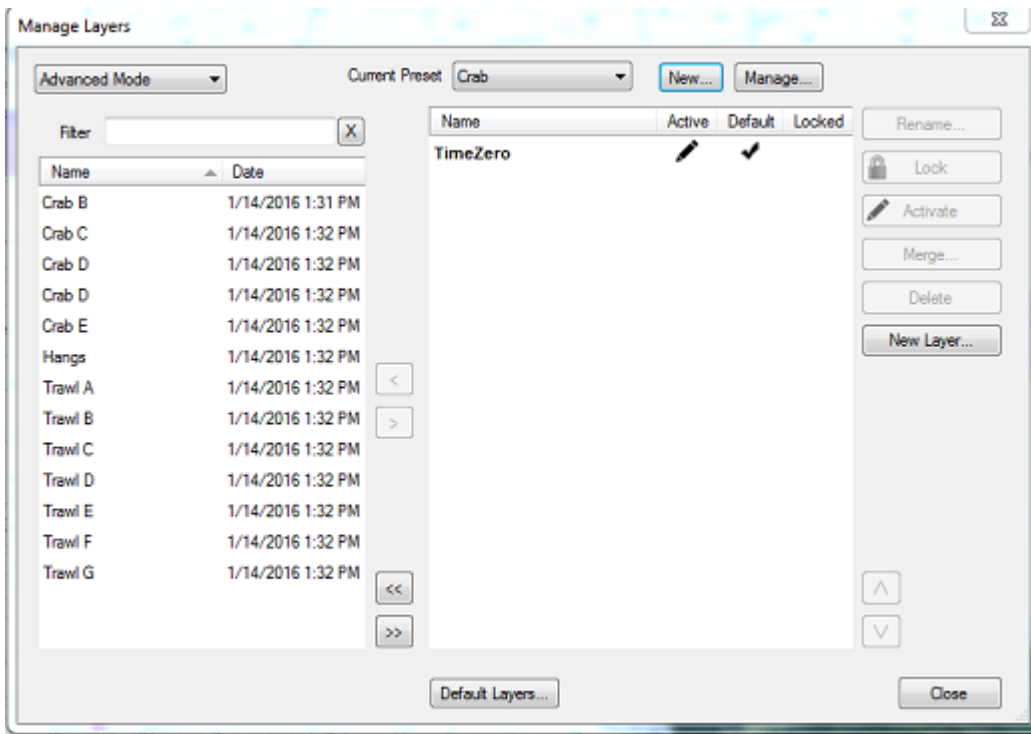
Simply select "Manage Layer..." located under the "User Object" button in the Ribbons and then select "Advanced Mode":



Click on "New" in front of Current Preset:

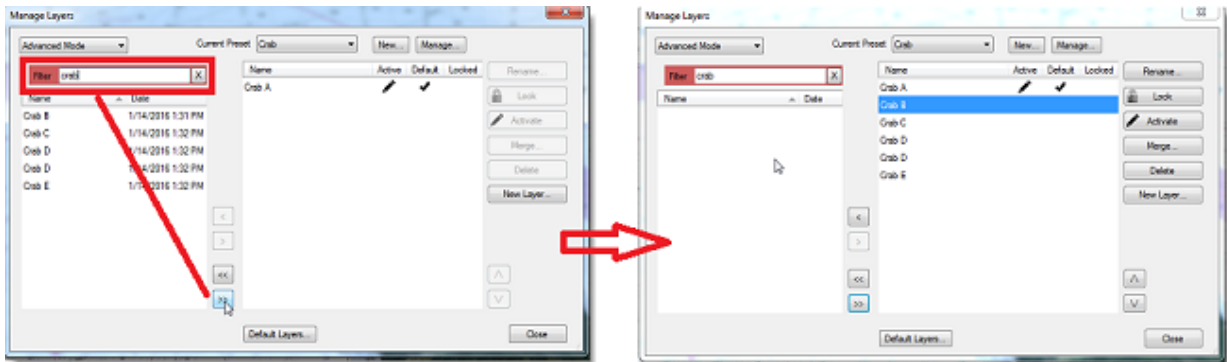


Enter a name for your preset ("Crab" for example) and press OK. TimeZero will create a preset just containing the default "TimeZero" layer:



To include a layer in the current preset, move them from the list located on the left (list of layers that are disabled for the current preset) to the right (list of layers that are enabled for the current preset).

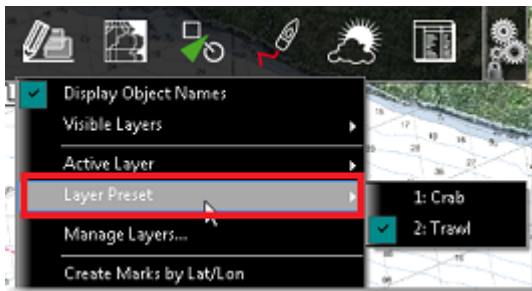
Note that if you have lots of layer, you can sort or filter the list on the left to find the layer you want to move to the right. In the example below, "Crab" is entered as a filter and thus, only the layers with containing "Crab" in their name are displayed. It is then possible to move all of them to the right by using the ">>" button:



Repeat the same process to create a "Trawl" preset.

Note that it is possible for the same layer to be in multiple presets. For example, it is possible to add the "Hangs" layer in both "Crab" and "Trawl" preset.

Once the Presets are created, it is possible to switch from one preset to another by selecting "Layer Preset" under the "User Object" button in the Ribbons:



Selecting a preset will unload from the software all layers and load only the layers that are selected in the preset.

If you want to rename or delete your presets, open the "Manage Layer" window and select "Manage..." in front of current preset. Note that deleting a preset will not delete the layers it contains.

Note: You cannot remove the default "TimeZero" layer from a Preset. The "TimeZero" layer is used for the synchronization of User Objects and it always need to be present in the software.

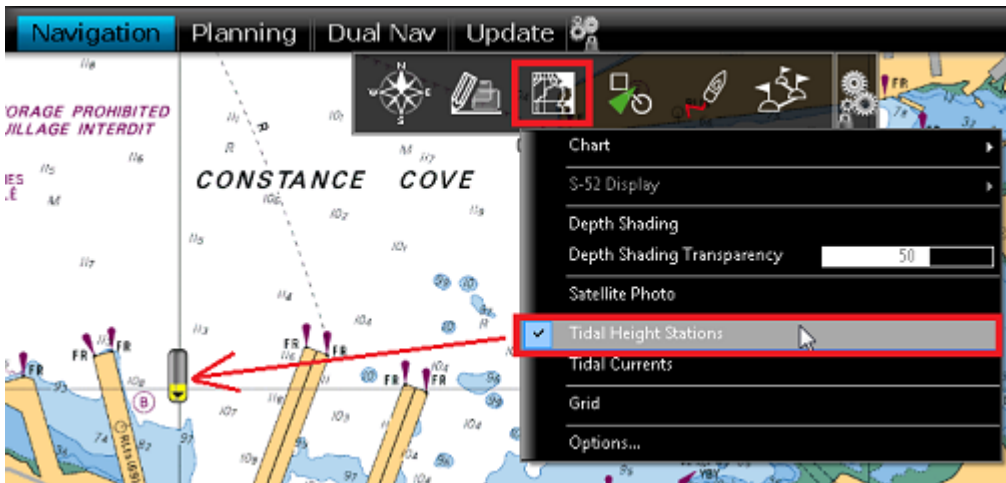
Tidal Height & Tidal Currents

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 "Chart" button located in the Ribbon and select "Tidal Heights Stations":



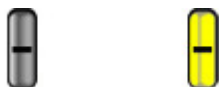
The tide icons displayed on the chart are dynamic and show you a preview of the water level:



Rising from low to high



Falling from high to low



At slack (low and high)

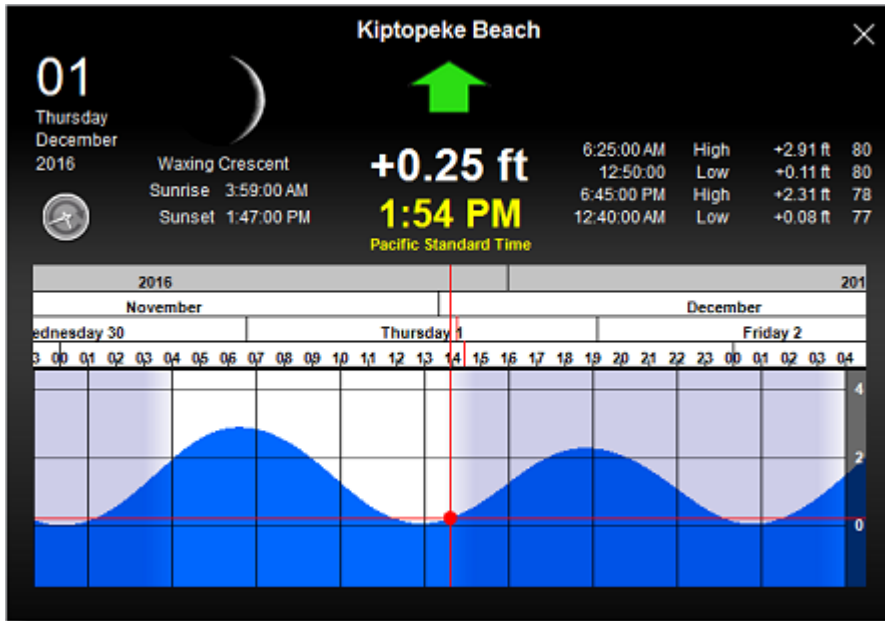
If you put your cursor over a tide icon or click on it, a tool tip indicating the Tide level will appear.

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

IMPORTANT: All tidal height prediction times in the Monitoring 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 Analyze WorkSpace, the time of the graph is initialized to the same time selected in the Virtual Time Control (Time Bar) of the WorkSpace.



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

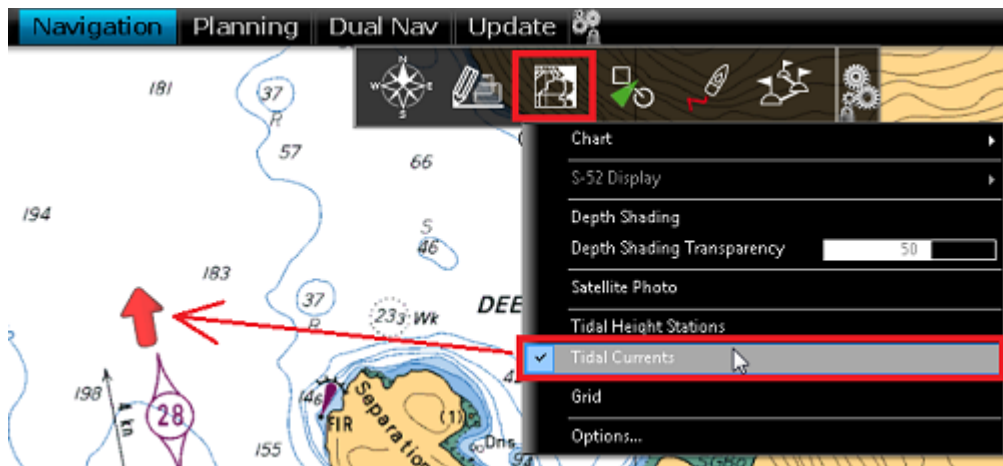
Tidal Currents

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 "Chart" button located in the Ribbon 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.

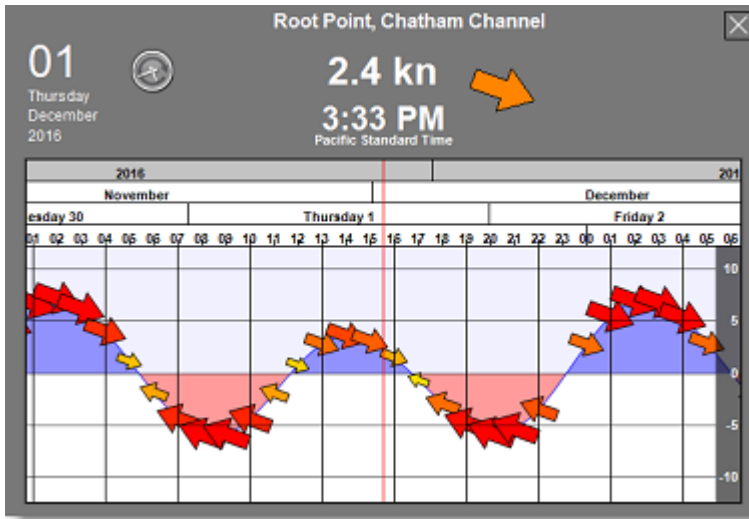
IMPORTANT: Oceanic Currents (that are downloaded with Weather Forecast) are displayed in blue, while Tidal Currents (integrated in the software) are displayed in yellow-red. Oceanic Currents (blue arrow) can be turned ON or OFF from the Weather button located in the Ribbon. Please refer to [Displaying 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 Monitoring 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.



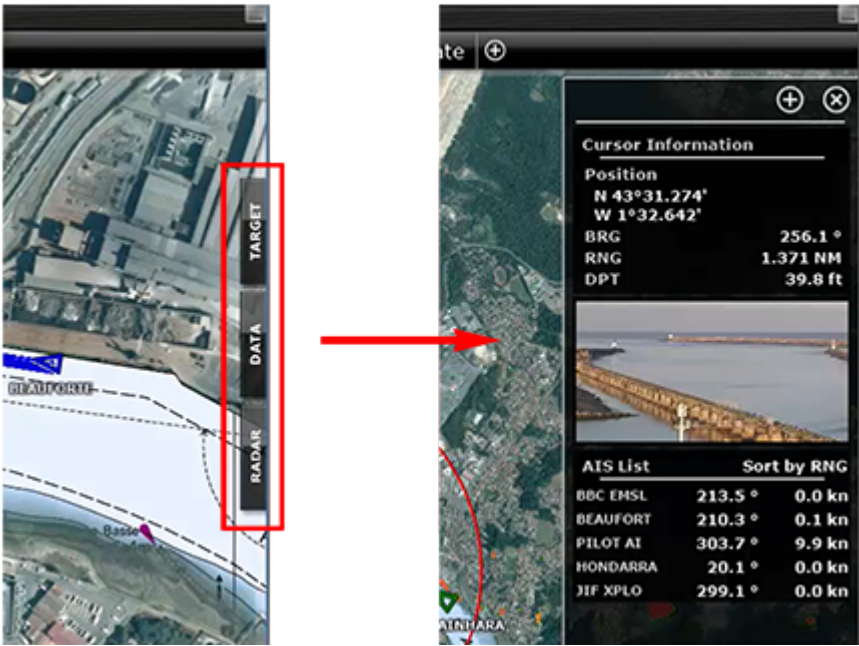
To set the time of the graph back to the current time, click on the clock button:

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

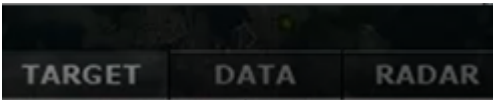
NavData

Introduction

The NavData panel is displayed on the right side of the screen. When the panel is closed, tabs allowing you to open the panel appear:



When the NavData panel is open, you can switch from various configurations by clicking on the tabs name located at the bottom of the panel:



TimeZero offers 3 panels by default.

Note: The tabs name and configuration cannot be changed but can vary according to your modules.

The content of each panel can be fully customized. To add a NavData, click on the "+" located at the top of the panel:



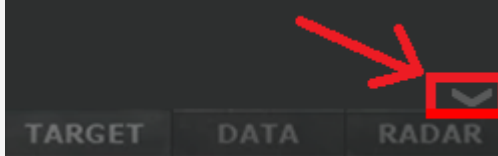
To close the entire NavData Panel, click on the "X" located next to the "+".

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 a NavData.

Note: When you add too many NavData or when the list is 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.

Note: The NavData Panel configuration is global to all the WorkSpaces in the software. However, the panel can be displayed or hidden independently per Workspace.

NavData Types

Various types of NavData can be displayed in TimeZero:

Sensors NavData

The Sensor NavData is 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:



The following Sensor NavData are available:

- Date/Time
- Platform Position (when software is set to [Dynamic Positioning](#))
- COG - Course Over Ground (when software is set to [Dynamic Positioning](#))
- SOG - Speed Over Ground (when software is set to [Dynamic Positioning](#))
- TWD - True Wind Direction.
- TWS - True Wind Speed.
- Atmospheric Pressure
- Air Temperature
- Humidity
- Visibility

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.

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:



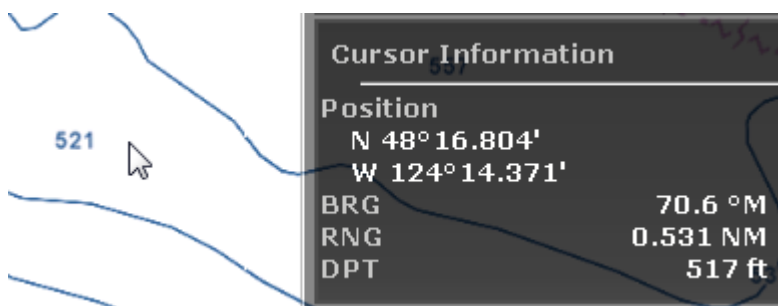
The following Gauge NavData are available:

- Date/Time
- Bearing To Cursor
- TWD - True Wind Direction.
- TWS - True Wind Speed.
- Atmospheric Pressure
- Air Temperature

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:



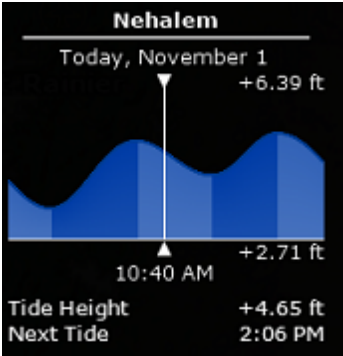
If you right click on the Cursor NavData you can configure what information you want to display.

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 the reference position.
- RNG: indicates the range from the reference position.
- DPT: indicates the depth below cursor.

Tide NavData

This NavData displays and updates in real time the nearest Tides information from the reference position:

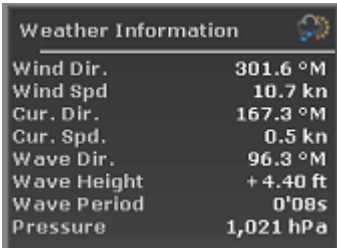


The maximum search distance for Tide Stations is 50NM. If there is no tide station within this distance, the NavData will display no information.

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".

Weather NavData

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

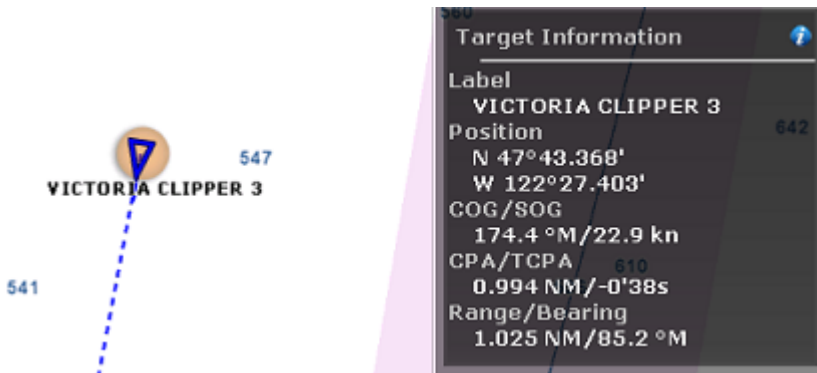


In the "Analyze" WorkSpace, the time of the forecast is set by the timeline. In the "Monitoring" WorkSpace, the time of the forecast is always set by computer current time.

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

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:



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.

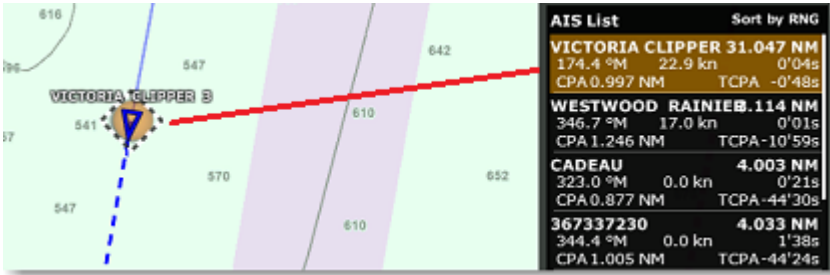
AIS and ARPA List NavData

The AIS and ARPA NavData lists display a list of AIS or ARPA targets with basic information (to fit in the NavData):

AIS List		Sort by RNG
VICTORIA CLIPPER	31.042 NM	
174.5 °M	23.0 kn	0'01s
CPA 0.997 NM	TCPA -0'43s	
WESTWOOD RAINIER	8.088 NM	
349.2 °M	17.0 kn	0'02s
CPA 1.158 NM	TCPA -10'39s	
CADEAU	4.003 NM	
323.0 °M	0.0 kn	0'16s
CPA 1.190 NM	TCPA -43'28s	
367337230	4.033 NM	
344.4 °M	0.0 kn	1'33s
CPA 1.304 NM	TCPA -43'18s	
ZEEHAEN	4.067 NM	
85.4 °M	0.0 kn	0'44s
CPA 1.321 NM	TCPA -43'58s	
WALLA WALLA	4.154 NM	
247.7 °M	0.0 kn	0'10s
CPA 3.579 NM	TCPA 23'46s	

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 target (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 space available (more likely with the AIS list), it is possible to scroll the content of the AIS or ARPA NavData.

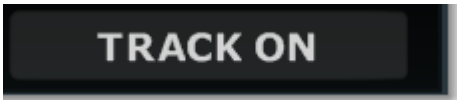
You can click on any item of the list and TimeZero will automatically center the chart on the corresponding target. Also, if you click on a target on the chart, it will highlight it inside the list and scroll if necessary:



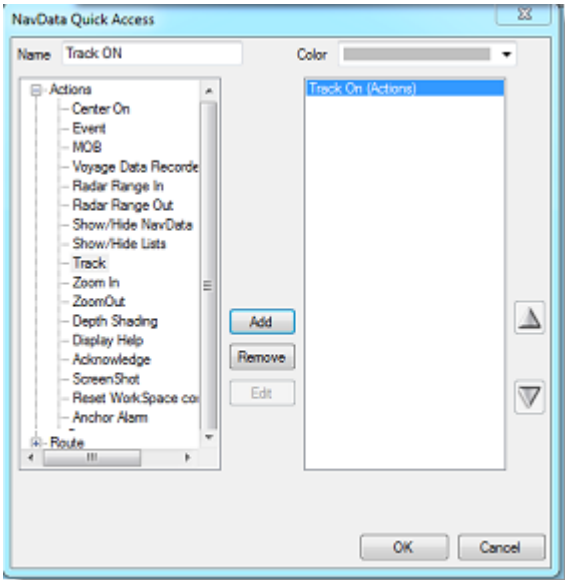
If you undock the NavData, a right click on it will allow you to set the size it occupies (to display 5, 10, 15, or 20 targets).

Quick Access NavData

The Quick Access NavData allows you to assign almost any function of TimeZero to a button that can be quickly activated:



When you add a Quick Access NavData, it will be empty by default. Simply click on it to open the configuration window:



This window allows you to enter the name that will be displayed on the button, the color and the Action(s) you want to perform. You can perform virtually any action available in TimeZero. Note that you can combine (add) multiple action to the same button similar to macros! For example, you could configure a button to select 2D mode, turn OFF the Depth Shading and set the orientation mode to Head Up.

Radar Control NavData

The Radar Control NavData gives quick access to the most used radar control: Gain, Sea (STC) & Rain (FTC) :

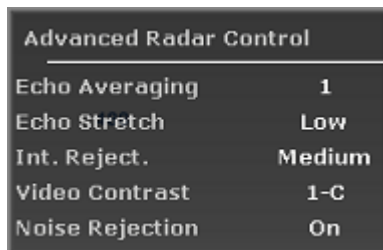


Tips: Click on the "A" to switch from Manual to Automatic mode for the selected parameter.

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

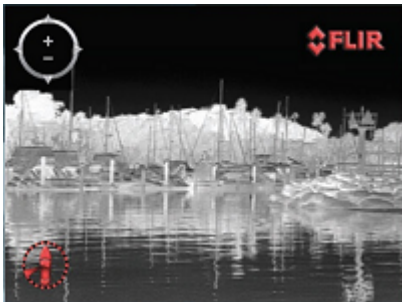
The Advanced Radar Control NavData gives quick access to the more advanced radar filters. Click on the filter value to cycle through the various mode:



You can customize the NavData by right clicking on it.

Camera NavData

This NavData displays a video feed. If the camera has Pan, Tilt, and Zoom (PTZ) capabilities, a virtual joystick will appear when you roll your cursor over the NavData:



You can change the video source of the NavData by right clicking on it.

If the camera has additional features (such as the Flir M-Series), the right click contextual menu also gives access additional commands (Scan, Home, Scene, IR/Visible switch, etc...).

For more information, please refer to the [Camera NavData](#) Chapter.

User Object Filters NavData

This NavData displays your user object filters using big buttons that are easy to toggle ON and OFF. For more information on how to create User Object filters, please refer to the [Filters](#) chapter.

SeaLevel IO NavData

This NavData allows you to control and monitor relays and input status from the SeaLevel Network IO 110E and 120E.



You can right click on this NavData to select which Input and Output you want to monitor/control (up to 4 inputs and 4 outputs). You can click on the "i" icon located on the top right to configure the SeaLevel hardware and rename the inputs and outputs. For more information, please refer to the [SeaLevel Network IO](#) Chapter.

Radio Direction Finder NavData

This NavData allows you to monitor the input of the RhoTheta Radio Direction Finder. It displays the information of the last bearing that was received together with channel number, frequency, and signal level:



For more information, please refer to the [Radio Direction Finder](#) Chapter.

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.

When a NavData is undocked, it become part of the configuration of the WorkSpace. This means that you can undock independent NavData in each WorkSpace.

Weather

Introduction

After [registering](#) TimeZero to your My TIMEZERO account, you will be able to download free weather forecast and basic oceanography data. 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 Analyze WorkSpace.

In addition to free weather forecast and basic oceanography data, you can subscribe to a Premium Ocean-O service that will provide higher resolution oceanographic data.

Note: TimeZero also has the capability to [open standard GRIB file](#).

Requesting a Weather File

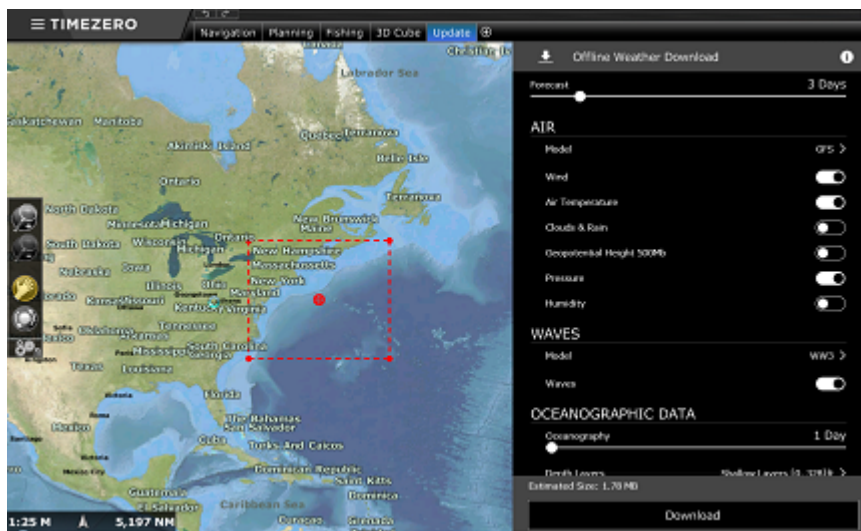
IMPORTANT: In order to be able to request a weather file, you have to [register](#) your copy of TimeZero.

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.

By default, TimeZero will use the "High Speed Internet" download method (that takes advantage of parallel downloads). But if you are using a satellite or a low bandwidth connection, it is recommended to change the download method to "Satellite or Low Bandwidth Internet" from the [Weather Options](#). If you use an [Iridium Go](#) make sure to refer to the [Iridium Go](#) chapter.

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 (.twz 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.

Setup an Automatic Weather Download Schedule:

Once an initial request has been performed (after setting up a weather download area and selecting parameters from the Update WorkSpace), it is possible to automate the weather download by enabling a schedule from the [Weather](#) Options. TimeZero will then automatically, and up to four times per day, initiate a download in the background:

Automatic Download

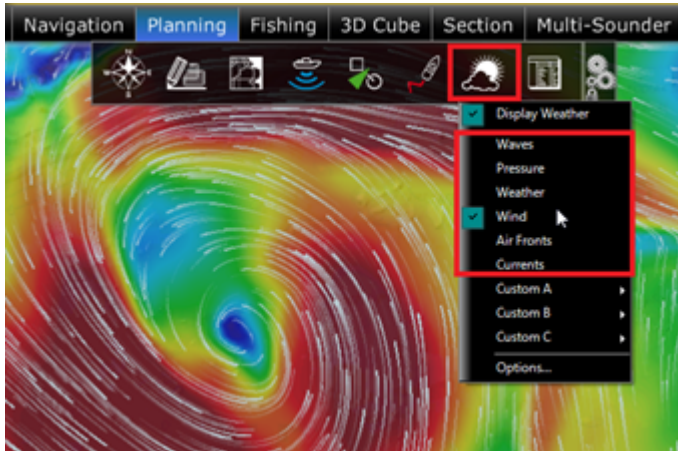
Check this option to automatically launch weather download up to 4 times a day; When checked, Weather data downloading will occur at the following hours of the day (GMT hours) :

First Time	<input checked="" type="checkbox"/> Second	<input checked="" type="checkbox"/> Third	<input checked="" type="checkbox"/> Fourth
<input type="text" value="00:30"/>	<input type="text" value="06:30"/>	<input type="text" value="12:30"/>	<input type="text" value="18:30"/>

Displaying Weather Data

Displaying Graphically

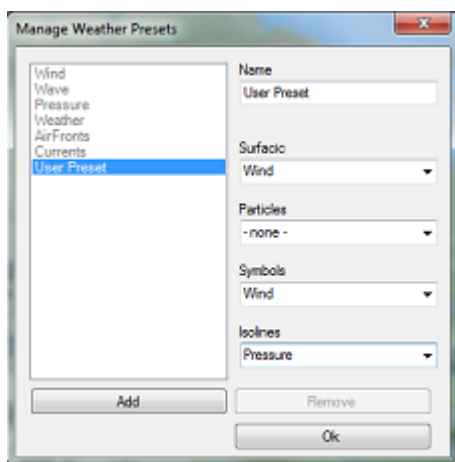
When you download a Weather File from the Update WorkSpace, TimeZero automatically loads the data for you. You just have to select the "Analyze" WorkSpace, click on the "Weather" button in the Ribbons and select "Display Weather". TimeZero offers a new and innovative weather presentation using particle 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.

To create a custom display, select "Manage Weather Presets". A window will appear allowing you to create or modify existing user presets:



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 are 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

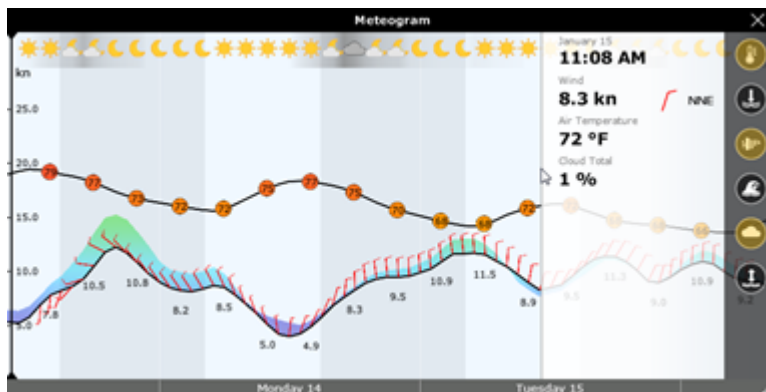
The Weather information NavData can be used to display weather data using numerical values. It is displayed by default in the "Data" NavData panel. This NavData displays weather condition under the cursor and is updated as you move the cursor over the weather data on the chart. If the "Weather Information"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

Weather Information	
Wind Dir.	301.6 °M
Wind Spd	10.7 kn
Cur. Dir.	167.3 °M
Cur. Spd.	0.5 kn
Wave Dir.	96.3 °M
Wave Height	+ 4.40 ft
Wave Period	0'08s
Pressure	1,021 hPa

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

Meteogram

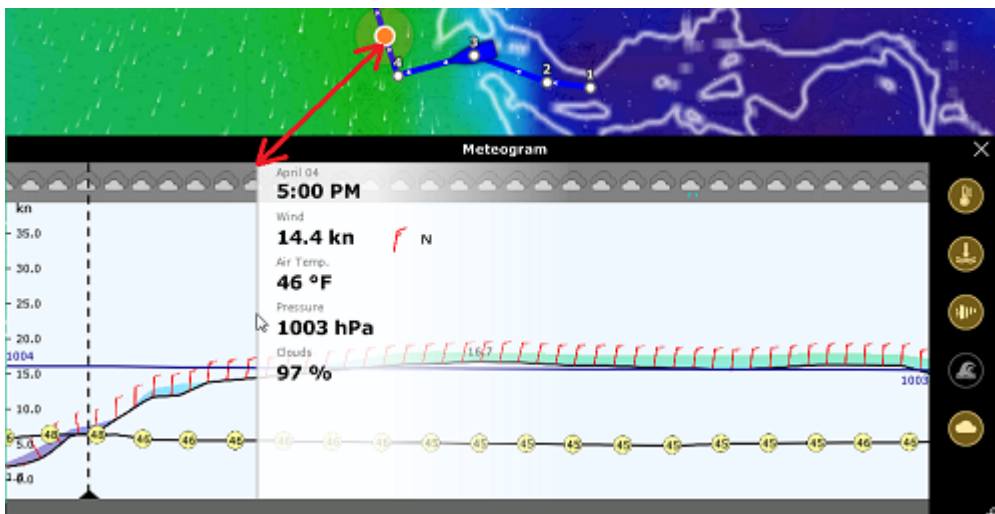
A "Meteogram" window can be opened by right clicking anywhere on the chart and selecting "Show Meteogram". The Meteogram allows to see a graphical presentation of one or multiple meteorological variables with respect to time at a particular location. If you click and hold the cursor inside the Meteogram window, numerical values will be displayed at the cursor position:



TIPS: You can change the scale of the Meteogram with the scroll wheel.

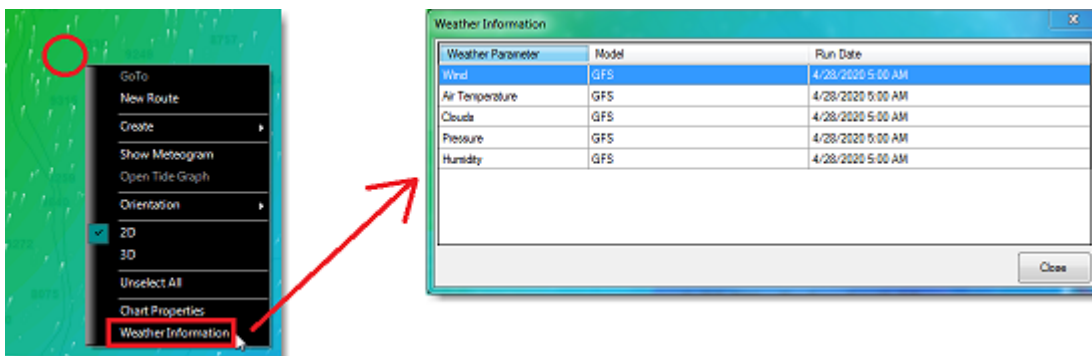
The Meteogram can be very useful to see the evolution of weather at a specific point (represented by the orange dot on the chart) and determining the best departure or arrival time. Note that you can drag the orange dot on the chart to change the Meteogram location and see the change applied in the window in real time.

The Meteogram can also be displayed along a route by right 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:

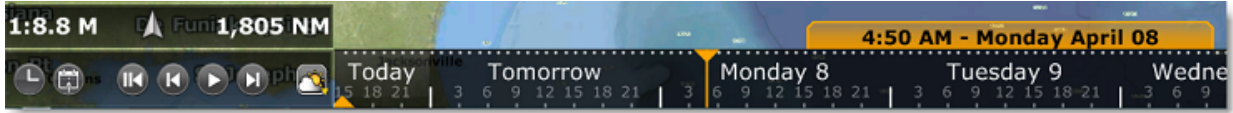
- Wind: This data contains wind speed and wind direction forecast and is available globally (90°N/90°S/0°-360°). The wind direction is given by the angle of "where the wind is coming from".
- Air Temperature: This data contains the Air Temperature forecast and is available globally (90°N/90°S/0°-360°).
- 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 that the Premium Ocean-O Service offers multi-layer currents (current data available at multiple depth) as well as up to 10 days forecast.
- Sea Surface Temperature: This data contains the Sea Surface Temperature at the time it was requested (one observation). This data is available in between 65°N and 60°S (0°- 360°).
Note that the Premium Ocean-O Service offers higher resolution Sea Surface Temperature (8 times more accurate). The Premium Ocean-O Service also offers multi-layer sea water temperature (temperature data available at multiple depth) as well as up to 10 days forecast.
- Sea Surface Height: This data contains the Altimetry at the time it was requested (one observation). This data is the ocean height anomaly from average sea level. This data is available in between 60°N and 60°S (0°- 360°)
- Chlorophyll: This data contains the Chlorophyll concentration at the time it was requested (one observation). This data is available in between 52°N and 50°S (0°- 360°)

Note: The Premium Ocean-O Service offers additional high resolution and multi-layer data (Thermocline, Salinity, Oxygen, Ph, Sea Ice etc...)

Animate Weather Forecast




The "Analyze" 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 "Weather" button located in the Ribbon)
- 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 TIMEZERO 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:

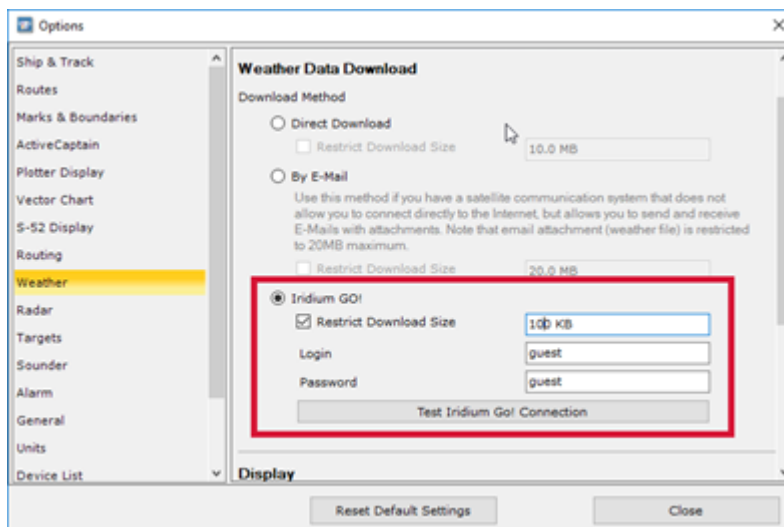
- ugrd (33) Wind Direction & Speed
- vgrd (34) Wind Direction & Speed
- prmsl (2) Pressure
- tmp (11) Air Temperature
- tcdc (71) Cloud
- prate (59) Precip.
- swell (105) Waves
- htsgw (100) Waves
- wvhgt (102) Waves
- swper (108) Wave Period
- swdir (104) Wave Direction
- wvper (103) Wave Period
- wvdir (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

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:

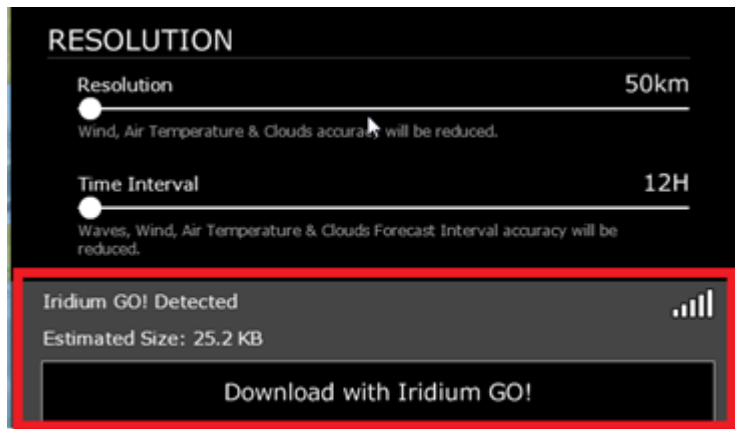


Although very slow (2Kbps), the Iridium Go offers an unlimited data plan for about \$150 per month that can be a very good solution to download weather anywhere. To setup the Iridium Go in TimeZero, open the [Weather](#) Options and set the weather download method to "Iridium Go". You will then be able 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 finally 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).

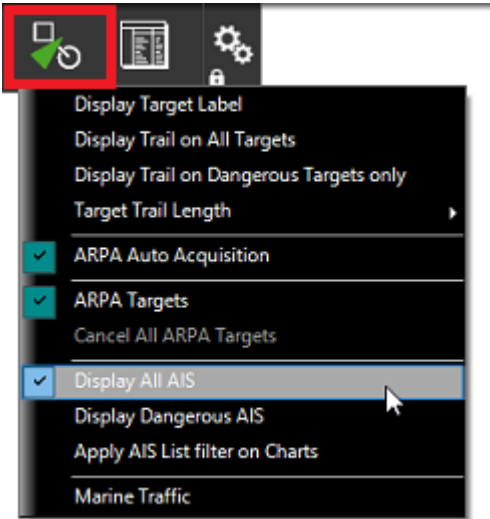
Targets

Target Overview

TimeZero can track multiple types of targets:

- ARPA targets (Radar Targets)
- AIS targets transmitted by an AIS receiver
- AIS targets received through the Internet from the [Marine Traffic](#) service ("Marine Traffic")
- DSC targets transmitted by a VHF with DSC functionality
- [Fleet targets](#) received through the Internet (using the My TIMEZERO Fleet Service) or via a Text file (POSREPORT Format) or via the TZ Host (Remote Architecture).

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



AIS Target

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



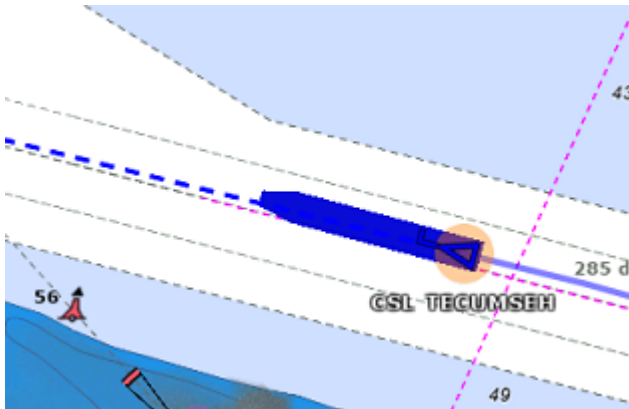
Note: AIS downloaded from the Internet through the Marine Traffic Web Site are colored in yellow. Please refer to the [Marine Traffic](#) chapter for more information:



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



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



AIS Target Icon

	<p>AIS icon with Rate of Turn indicator. In this example, the AIS target is turning to port</p>
	<p>AIS Lost icon. An AIS gets lost if no information updating the target location is received after a period of time. The time that causes an AIS to get lost varies with the class of AIS (A or B), its speed, and its navigation status (moored, in navigation, etc...). A lost AIS icon will disappear from the screen after 30 seconds</p>

	AIS Icon with one (or multiple) important data missing preventing CPA and TCPA computation (missing COG and/or SOG)
	Dangerous AIS icon breaking an alarm condition (either CPA/TCPA or proximity alarm) or when the AIS classification has been set to Hostile
	AIS Base Station icon
	AIS Search and Rescue Aircraft icon
	AIS SART (Personal Man Over Board transponder) icon
	AIS AtoN (physical or virtual Aid to Navigation) icon
	AIS Weather (AtoN with environmental sensors) icon

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 select the default color of the AIS icon:



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

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

AIS Label

The target label can be set to display the name of the target (name of the vessel or MMSI number), the speed of the target, or a combination of both. You can select which data you want to use as target label from the [Targets](#) Options (by adjusting "Target Label"). Note that by default, TimeZero will only display a label on the selected AIS target, but if you prefer, you can display a label on all targets by selecting "Display Target Label" from the "Targets" button located on the Ribbons:



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AIS Favorite

It is possible to give a Nickname, set the [Target Classification](#) and set a fixed color to one or multiple AIS from the "AIS Favorite" list located under the [Targets](#) Options. Simply open the list by clicking on the "AIS Favorite" button, click on the "Add" button, enter the MMSI number of the target, select a Nickname, Classification and color. The list can be saved (exported) for backup or to be imported on another TimeZero Coastal Monitoring.

TIPS: You can also right click on an AIS icon directly on the chart and select "Favorite" to add it to the list (without having to enter its MMSI manually).

AIS Filtering

AIS targets can be filtered (automatically hidden) on the chart from the "Targets" button located on the Ribbons. You can choose to:

- "Display all AIS": All AIS targets are displayed on the chart without any filtering
- "Display Dangerous AIS": Only the AIS targets that are considered dangerous are displayed on the chart. AIS are considered dangerous when they fall below both CPA and TCPA values (defined in the [Alarms](#) Options), or if they are inside a radar guard zone or if their classification is set to "Hostile".
- "Apply AIS List filter on Chart": When selected, this option allows to match any filter that may be applied to the AIS list onto the chart. For example, if you select this option and decide to filter the AIS list to only display targets that are set as your favorite, only those AIS would be displayed on the chart (to match the list filter). Please refer to the [Target List & Information](#) chapter for more information on how to enable the AIS List filter.

AIS SART

Personal Search And Rescue Transponders (SART) use AIS messages to broadcast their position and trigger an alarm automatically in TimeZero Coastal Monitoring . AIS SART can be a device on a vessel, in a life raft or a personal Man Over Board (MOB) device. The position of the AIS SART on the chart will be marked with the following icon:



TimeZero Coastal Monitoring 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.

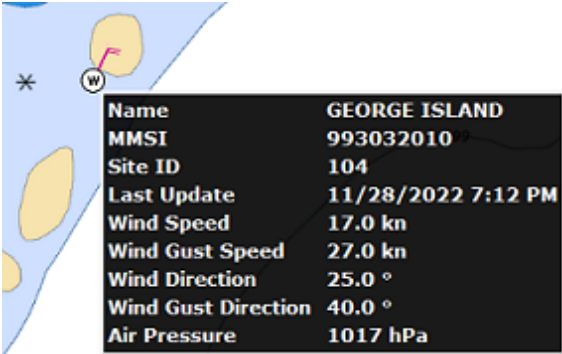
AIS Weather

When TimeZero detects an AIS Base Station or AIS AtoN which sends environmental data, a special weather icon is used instead of the regular Base Station or AtoN AIS icon. If the environmental data includes Wind Speed and Wind Direction, TimeZero will add a wind feather directly over the weather icon:

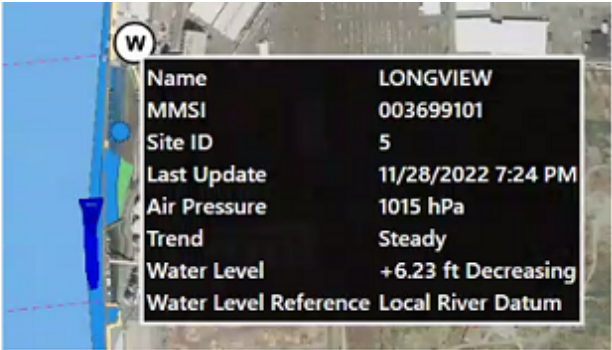


Note: TimeZero is compatible with the AIS Message 8 (ASM) "IMO Meteorological and Hydrographic data" DAC1 FI31, "USCG/USACE Environmental Message" DAC 367 FI 33, and "IMO Environmental Message" DAC1 FI26.

When clicking on an AIS Weather icon, a tooltip will appear with all the environmental data which is broadcasted by the station:




Name	GEORGE ISLAND
MMSI	993032010
Site ID	104
Last Update	11/28/2022 7:12 PM
Wind Speed	17.0 kn
Wind Gust Speed	27.0 kn
Wind Direction	25.0 °
Wind Gust Direction	40.0 °
Air Pressure	1017 hPa



Name	LONGVIEW
MMSI	003699101
Site ID	5
Last Update	11/28/2022 7:24 PM
Air Pressure	1015 hPa
Trend	Steady
Water Level	+6.23 ft Decreasing
Water Level Reference	Local River Datum

ARPA Target

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 FAR or DRS radar via the network, it is possible to choose if the ARPA targets are computed inside the radar antenna (default) or by TimeZero by adjusting the setting "ARPA Processing" available in the [Radar Options](#).

Acquiring ARPA targets





ARPA targets can be manually acquired by:

- Double clicking on a radar echo
- Right 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.

ARPA targets can also be acquired automatically by analyzing Radar Echo inside one or multiple areas. Please refer to the [ARPA Auto Acquisition](#) 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) or ARPA with Hostile classification.

Note: 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.

ARPA Auto Acquisition

TimeZero has a powerful ARPA auto-acquisition algorithm that allows you to specify boundary area(s) (or circle) where ARPA should be acquired automatically. Exclusion areas can also be specified inside an acquisition area to prevent buoy or rock to be automatically acquired.

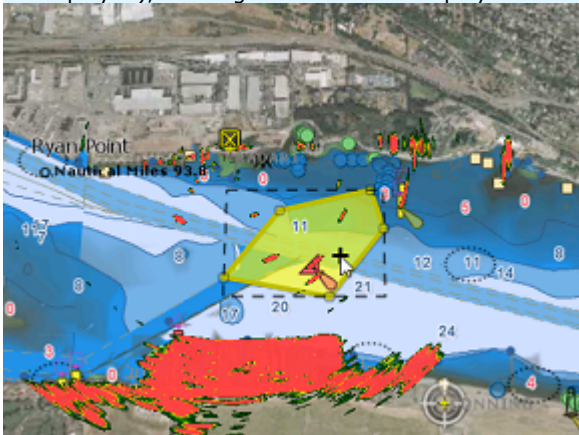
IMPORTANT: Before creating ARPA Acquisition and Exclusion area(s), it is recommended to create Radar Mask area(s) to remove echo from landmass. This will increase the software performance and present a much clearer picture to the operator. Please note that it is not recommended to use Radar Mask to remove echo from Buoys (use ARPA Exclusion Area instead). Radar Echo on buoys is very valuable to confirm that the radar is tuned and working properly. Please refer to the [Radar Mask](#) chapter for more information.

It is highly recommended to create one or two dedicated layer (named "Acquisition" and "Exclusion" for example) on which you can attach all the boundaries that will be use for automatic ARPA acquisition/exclusion. You can create as many areas as you want with as many points as you want. Please refer to the [Layer Introduction](#) chapter to learn how to create layers and attach objects to them.

To define an ARPA Auto acquisition area:

- Create a boundary area or circle on the chart using the Boundary Tool or by right click and select "Create Boundary"
- Click on the chart to insert boundary points around the area you want TimeZero to look for target
- Double click (or right click) to finish and close the area
- Right click on the area and select "ARPA Auto Acquisition"

Tips: You can only select and right click on a boundary if it is displayed entirely on the screen. You may have to zoom out a little in order to see the boundary on your screen. Just left click to select it (selection rectangle should be displayed), then right click on it to display its contextual menu.

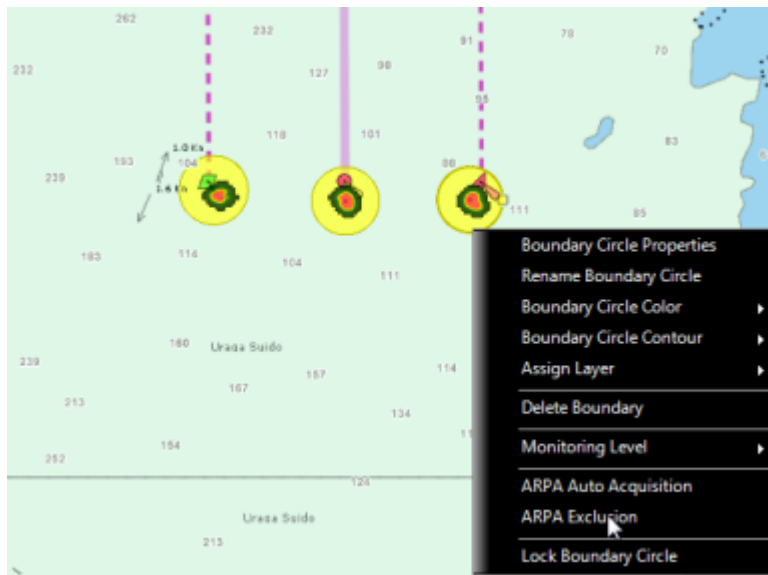


- Repeat this process if you need to create other Auto-Acquisition area

To define an exclusion area:

- follow the same exact step as above, but select "ARPA Exclusion" to define the area or circle where you don't want TimeZero to look for target

Below is an example of 3 boundary circles that are used to exclude 3 buoys inside a larger acquisition area (not shown on screen):



Activating/Deactivating ARPA auto acquisition:

To globally activate or deactivate the ARPA auto acquisition, click on the Target Ribbon button and select "ARPA auto acquisition". Note that it will take a few seconds before you see ARPA targets acquired on screen.

Note: The ARPA Acquisition or Exclusion areas are working event if they are not displayed on the chart (even if their layer is turned OFF)

Auto Acquisition Mode:

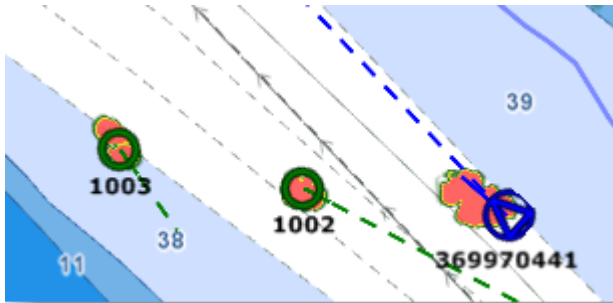
TimeZero provides two Automatic Acquisition modes. The mode of operation can be selected from the [Radar Options](#) under the "Advanced ARPA Settings" by selecting or not "Restrict ARPA to acquisition area".

- Default Mode ("Restrict ARPA to acquisition area" = OFF): ARPA targets that are acquired inside an Acquisition Area can still be tracked when they go outside the area (as long as they are not inside an ARPA exclusion area). In this mode, the acquisition areas are used to initiate tracking, but a target can leave the acquisition area and still be tracked.
- Restricted Mode ("Restrict ARPA to acquisition area" = ON): ARPA targets can only exist inside an acquisition area(s). If a target goes outside an acquisition area, the tracking will be immediately stopped and the target will be lost.

The mode you select varies according to your application. If you want to track targets in a very specific area surrounded by lots of obstacle (land, piers, etc...) such as a river, it might be better to setup one or multiple acquisition area and restrict the tracking and existence of ARPA targets to those areas. If you want to track target in an open area (for example around an Oil Platform), it might be easier to only use the acquisition area to setup the track initiation, but allow TimeZero to track the target outside the area.

Target Association

When Radar and AIS are connected to TimeZero, the same vessel can be picked up by both the Radar (as an ARPA target) and by the AIS Receiver (as an AIS target). To avoid displaying two targets on the chart, the AIS and ARPA targets are "fuse" into a single target with a specific icon (triangle inside a circle):





It is possible to fuse ARPA into AIS or AIS into ARPA. According to this selection, the position and the ToolTip of the target displayed on screen will reflect the one of the type selected. Target Association parameters are setup from the [Targets](#) Options.

Note: When TimeZero Remote is connected to multiple stations combining ARPA targets from multiple radars (Client/Server architecture), it is also possible to fuse two ARPA targets coming from two independent stations that have an overlapping radar coverage.

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 "Target" button located in the ribbon:

	DSC target icon
	DSC target under distress icon

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 DSC Favorite list located in the [Targets](#) Options.

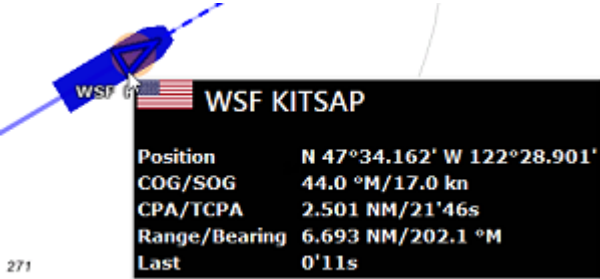
When a DSC distress call is received by TimeZero, an alarm will be triggered and the DSC target icon will be displayed in red.

Target Information

TimeZero can display target information in various ways:

Using the Target Tooltip:

Simply over or click on any target to display a tooltip:

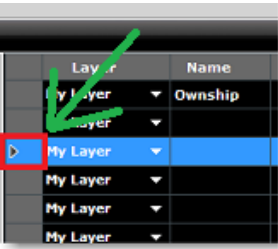


Using the ARPA or AIS List:

Select ARPA or AIS List from the "List" ribbon button to display the list of targets at the bottom of the screen.

Sorting the list:

The list can be sorted by clicking on any column title. For example, you can click on the "Range" column title to put the closest AIS targets at the top of the list (click again on the title if the sorting is reversed). To select and center a target on the screen, click on the first column corresponding to the target you want to display:

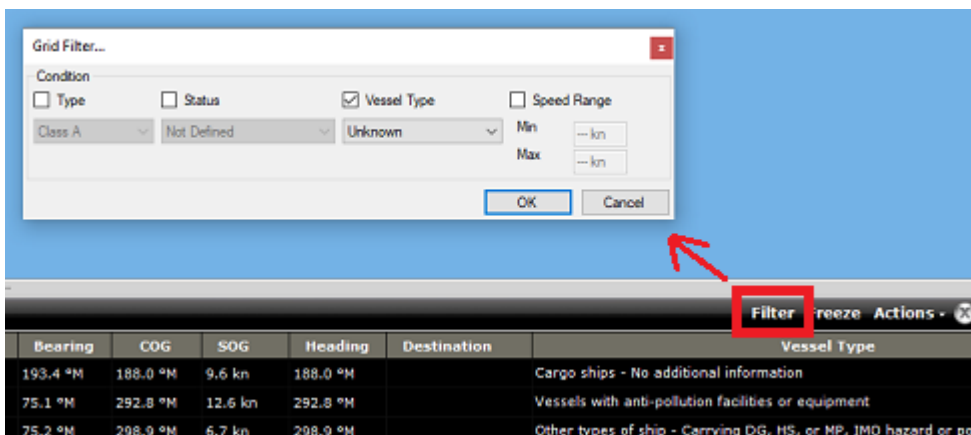


Note that the selected target might be bouncing up and down according to the sorting that you have selected. It is possible to "Freeze" the list (to prevent the selected line to be moved by the sorting process) by clicking on the "Freeze" button located in the list header:



Filtering the List:

The AIS list can be filtered by clicking on the "Filter" button located on the AIS list header:



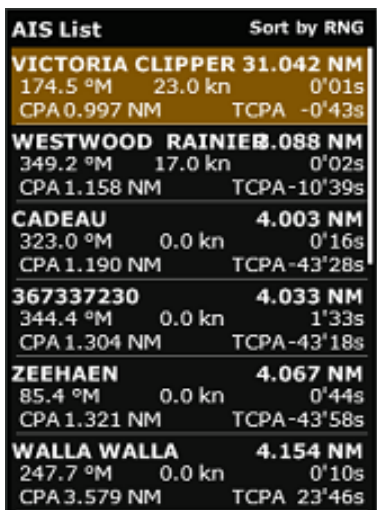
After pressing this button a window will appear allowing you to specify the filter you want to use. Pressing the "OK" button will validate the filter and a green checkmark indicating that a filter has been applied will be visible next to the filter button. To remove the filter and display all AIS targets again in the list, click a second time on the Filter button.

Note that by default, the filter only operates on the list, but if you select "Apply AIS List filter on Chart" from the Target ribbons, the filter will also be applied on the AIS targets displayed on the chart. For example, you may want to only display the AIS targets that you have set as favorite in the list and on the chart. Simply make sure to enable "Apply AIS List filter on Chart" and then set a filter by Vessel Type and select "Favorite".

Using the AIS and ARPA NavData list

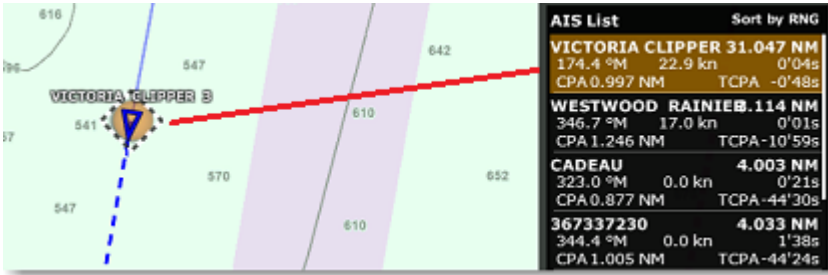
If you do not want to display the full AIS or ARPA list (to save space at the bottom of the screen), you can use the AIS or ARPA NavData list.

An AIS and ARPA list NavData are set up by default under the "Target" NavData bar.



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 target (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 space available (more likely with the AIS list), it is possible to scroll the content of the AIS or ARPA NavData.

You can click on any item of the list and TimeZero will automatically center the chart on the corresponding target. Also, if you click on a target on the chart, it will highlight it inside the list and scroll if necessary:

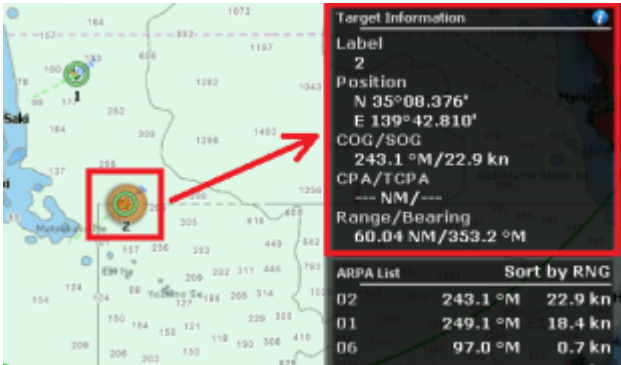


Using the Target Information NavData:

If you do not want to use any list, and just want to keep an eye on a single target, you can use the Target Information NavData that will display basic info about the selected target.

The "Target Information" NavData is set up by default under the "Target" NavData bar. If the NavData does not appear, simply click on the "+" icon to add the corresponding NavData to the NavData bar.

The target information always displays the information of the last selected target (surrounded with an orange circle on the chart):



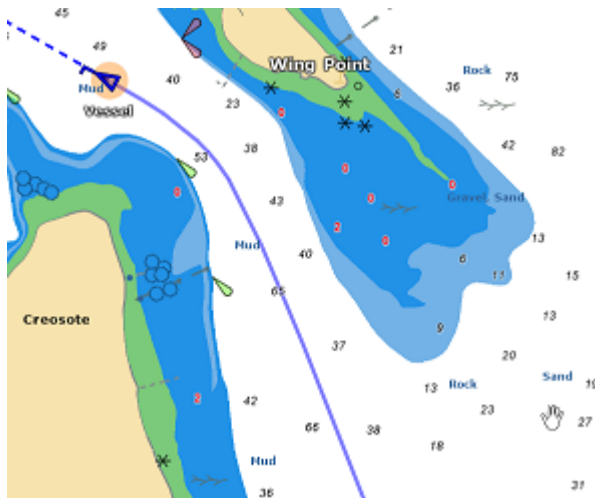
To display the full information of the target, click on the blue "i" icon located on the top right corner of the NavData.

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.

Target Trail

Target Trail

TimeZero automatically keeps track of all the AIS and ARPA target history (for up to 12H). In order to display the target position history (called a "trail"), simply click on a target to select it, and its trail will be automatically displayed:



Note: The trail color always matches the target color.

The trail offers a very convenient and quick way of displaying the target overall movements without having to manually enable track recording and without cluttering the display with hundreds of tracks. You can adjust the trail length from the [Targets](#) Options or from the Target button located in the ribbons with the "Target Trail Length" setting (set to 6 minutes by default).

Note that it is possible to display the trails on all targets by selecting the corresponding option from the Target Ribbon button. It is also possible to automatically display the trail on "dangerous" targets (targets that break the CPA alarm or that are manually classified as Hostile).

If you have the Record & Replay Module, you can display a trail on a replay target (thus extending the 12H limitation) by simply clicking on a replay target. Note that the trail representation on a replay target is slightly different:



Target Track

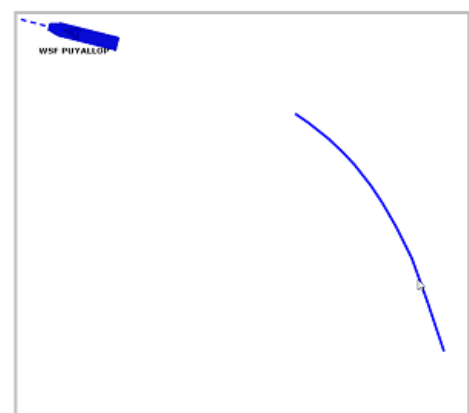
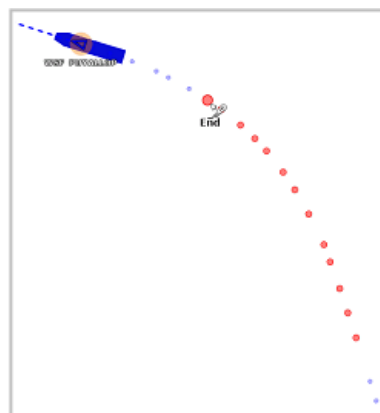
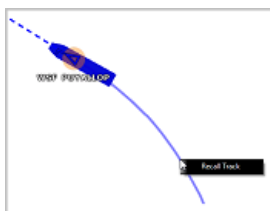
If you prefer to record permanently a track, Target Tracking can be enabled on AIS and ARPA targets by right clicking on a target and selecting "Target Tracking". From that moment, TimeZero will stop displaying the trail and start recording a track. Just like trail, the track line has the same color as the target (this can be changed by right clicking on the target or the track at a later time).

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](#).

Tracking can be automatically enabled or disabled by [Rules](#). However, setting an automated rule that enables target tracking may create a huge number of tracks after a while. To limit the number of tracks being created, it is recommended that for each rule that enables target tracking, another rule should be created to disable tracking (for example, enable tracking when target enters an area, and disable when target exit the same area).

Target Track Recall

It is possible to create a target track after the fact from a target trail. This is useful if you do not want to enable Target Tracking systematically (to avoid creating lots of tracks), but decide at a later time to create a track from a trail. Simply right click on the target trail and select "Recall Track". All the trail points will be displayed and the cursor will change allowing you to set a starting position by clicking a first time, and then set an ending location by clicking a second time:





After setting the end point, the track will be recalled and saved permanently in the track database (until manually deleted).

Note: The track might be displayed initially behind the trail. You can right click anywhere and choose "unselect all" to de-select the target and hide the trail from the screen. This should reveal the track behind it.

Target CPA & TCPA

CPA & TCPA values

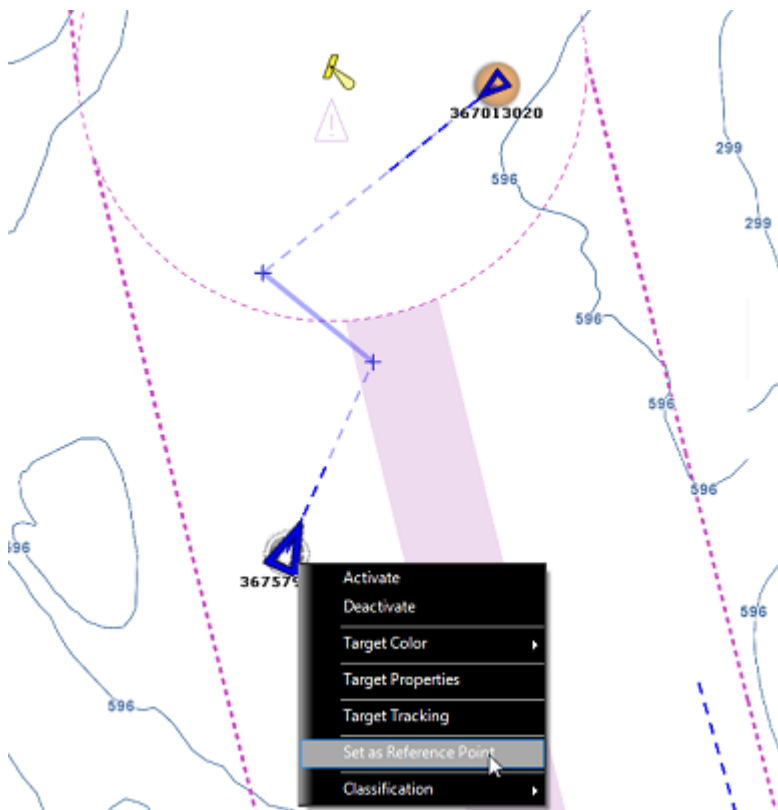
TimeZero always compute and update on any target type the Closest Point of Approach (CPA) and the Time to Closest Point of Approach (TCPA). You can display those values from the target tooltip or the target list, but you can also set thresholds that will categorize a target as dangerous and change the way the icon will be displayed on the chart. Those thresholds can be adjusted from the [Alarms](#) Options under "CPA Alarm/Display Value" and "TCPA Alarm/Display" value. Note that both thresholds need to be met for the target to be considered dangerous.

One or multiple monitoring zone rules can be configured from the [Alarms](#) Options with a CPA/TCPA condition to trigger various actions (notification, camera tracking...).

Graphic CPA

Graphic representation of the target Closest Point of Approach (Graphic CPA) can be displayed on the screen when the "Display CPA/TCPA vector" is enabled from the [Targets](#) Options. This information is continuously updated and warns you about potential collisions by locating on the chart the location of the closest point of approach.

The closest point of approach is computed from the reference position. Note that you can move the reference position to any point on the chart or attach the reference position to a specific target (refer to the [Reference Position](#) chapter for more information). Attaching the reference position to a target is very useful when you want to make sure that a specific target is not on a course collision with any other targets:

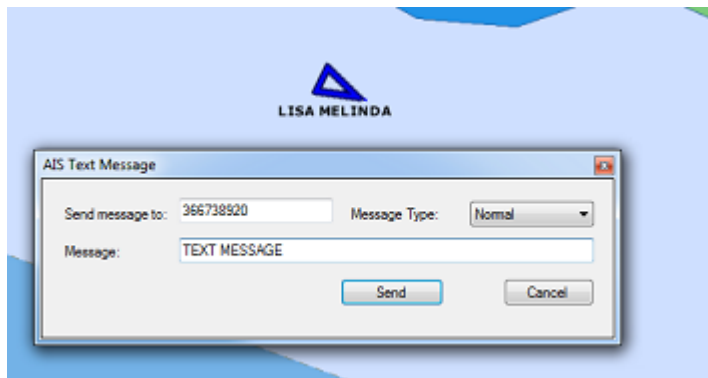


AIS Text Message

Sending AIS Text Message

When TimeZero Coastal Monitoring is connected to an AIS Class A **bidirectionally**, it is possible to send an addressed text message to another vessel that has an AIS receiver (Class A).

To send a message manually, right click on an AIS target and select "Send Text Message". Select the Message Type (Normal or Safety), type the message and click on "send":



AIS Text Messages can also be sent by clicking on the Target button located in the Ribbons, and by selecting "Send AIS text Message...". By default, the destination of the message will be filled with the MMSI of the selected target, but you can change and edit the MMSI number if you want.

AIS Text Message can also be sent automatically using an automated action of the Zone Monitoring Rules. Please refer to the [Rules](#) chapter for more information.

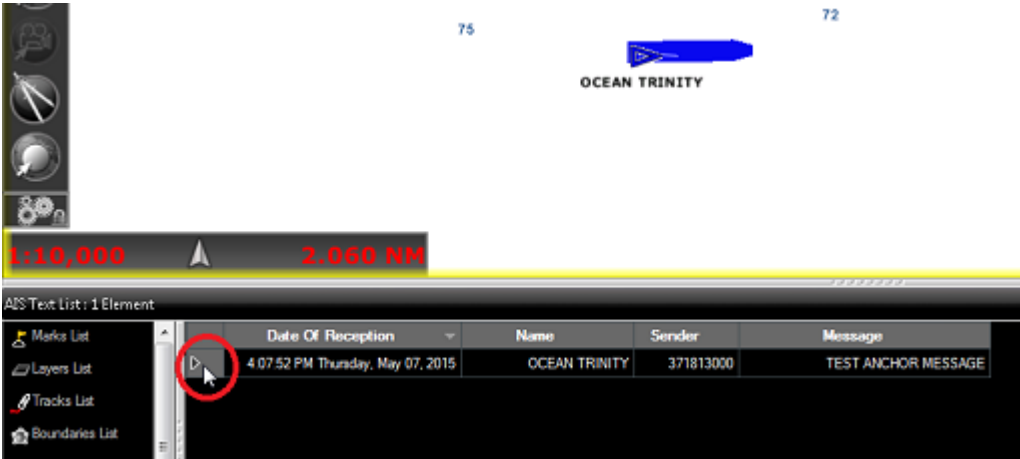
IMPORTANT: If you use a Furuno FA170 connected to the computer via Ethernet (NavNet network), the configuration is automatic. However, with any other AIS that are connected through a serial COM port (NMEA0183), a bidirectional serial communication must be used in between the computer and the AIS transmitter. Use the [Data Output](#) of the Connection Wizard and select the "ABM" sentence on the port connected to the AIS transmitter. The option to send an AIS Text message will not appear if the "ABM" sentence is not configured as an output in the Connection Wizard.

If the AIS transmitter sends an acknowledgment (through the NMEA "ABK" sentence), TimeZero Coastal Monitoring will display the notification "AIS Text Message Sent" in the status bar (no need to configure the "ABK" sentence as an input)

Note: Instead of using a serial cable, it is also possible to use the Furuno FA150 with the LAN adapter card (LAN Kit) and send/receive AIS text message (and AIS targets) through the network. The LAN adapter card needs to be set in "PC" mode and the UDP port 10000 needs to be configured as an "AIS" for input type and "ABK" for output.

Receiving AIS Text Message

When the AIS receives a text message, it is automatically displayed in TimeZero Coastal Monitoring. A notification will appear in the Status Bar ("AIS Text Message received from: xxxx" (where xxxx is the MMSI of the target that sent the message), and the message will be added to the "AIS Text " list. You can click on the AIS List (left side of the list) to retrieve on the chart the target that sent the message:

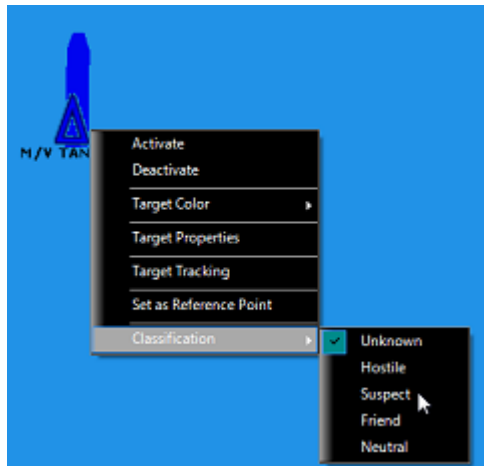


Message can be erased individually by right clicking on the message from the AIS Text List or globally from the AIS Text List "Actions" menu. Up to 100 messages can be stored in the AIS Text List.

TimeZero Coastal Monitoring will display "Normal" or "Safety" messages that are addressed or broadcasted.

Target Classification

Classification is used to "flag" ARPA or AIS targets. To change the classification manually, right click on a target and assign a classification:



The target presentation varies according to their classification:

- When the classification is set to "Hostile" the target is displayed in red and its icon is flashing
- When the classification is set to "Suspect" the target is displayed with a red background
- When the classification is set to "Friend" the target is displayed with a green background
- When the classification is set to "Neutral" or "Unknown" the target is displayed normally

Note: The various classification categories can be renamed from the [Targets](#) Options by clicking on the button "Classification Name". Note that the target representation will stay the same on the chart even if you change their name. For example, if you rename "Hostile" into "Dangerous", the target will still be displayed in red (and flashing) when selecting the "Dangerous" classification.

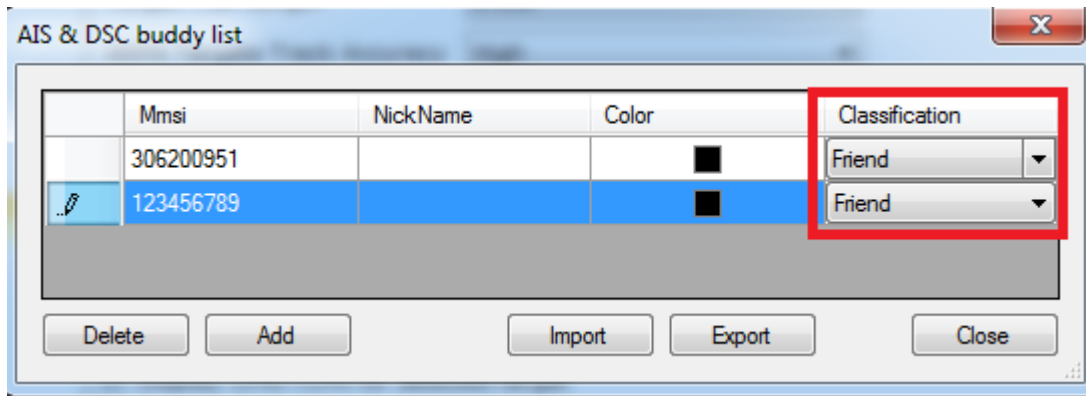
Rules can be set to automatically change target classification (under the "Actions" tab). For example, a rule could be setup to change all the targets that enter in an area to "Suspect". The operator can then identify the targets (using MMSI or a Camera) and manually change their classification to "Neutral" if the target does not cause any threat.

Classification can also be used to filter rule conditions. Simply click on "Enable Classification" under the "Filter" tab and click on "Parameters" to select which classification category to include or exclude. For example, this can be used to prevent a rule to be triggered if the target classification is set to "Friend" (uncheck "Friend" from the list).

AIS and ARPA list can also be sorted by classification. When sorting by classification, the following order will be used: "Unknown" then "Hostile" then "Suspect" then "Friend" then "Neutral".

AIS Favorite

If you have a list of safe known MMSI number for AIS, you can enter that list in the "AIS Favorite". Select the [Targets](#) Options and click on the "AIS Favorite" button. A window allowing you to add MMSI will be displayed. After adding the MMSI to the list, a specific nickname, color and classification can be chosen for each AIS target:



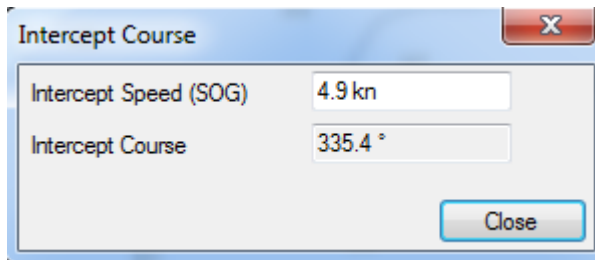
The list can be exported or imported by clicking on the corresponding buttons.

TIPS: You can also right click on any AIS target displayed on the chart and check "Favorite". This will add the AIS to the AIS Favorite list without having to enter manually its MMSI number.

Target Intercept

TimeZero can compute the intercept course for a specific target given a fixed speed.

First, set the reference position to the correct location. This represents the point of departure of the vessel that intends to intercept a target. Next, right click on a target that you want to intercept and select "Intercept...". The following window will appear:

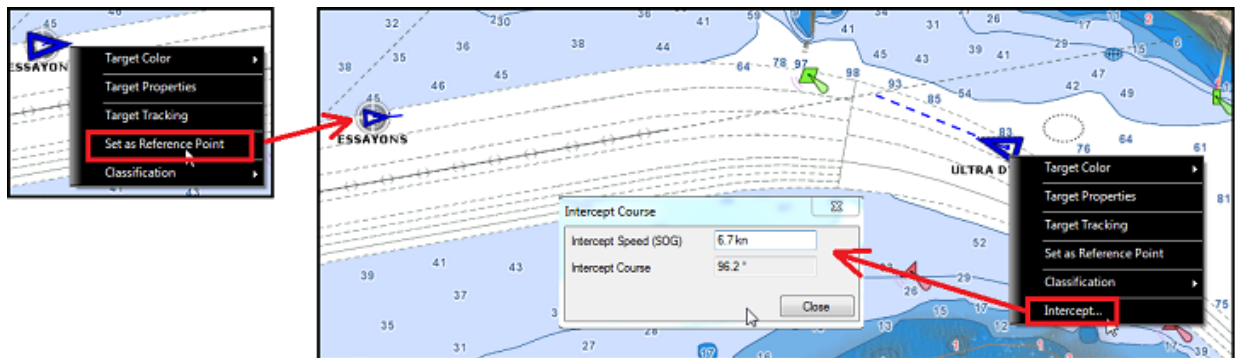


Enter the intercept speed and press the ENTER key. The intercept Course will appear.

Note that it is possible to compute the intercept speed between two targets. This is useful if you want to give direction for a specific vessel to intercept another:

- Right Click on the target that will perform the Intercept and set it as a reference point
- Right click on the target you want to intercept and select "Intercept..."
- The intercept window appears with the speed of the target that will perform the intercept already filled

In the example below, we will ask the AIS target "Essayons" to intercept another target ("Ultra Dynamic"):



If the target "Essayons" maintains its current speed (6.7Kn), it needs to follow the course 96.2 to intercept "Ultra Dynamic".

Fleet Tracking

In addition to AIS and ARPA targets, TimeZero can display Fleet Targets which are "private" targets that are generated from other compatible TimeZero platforms. It is possible to send/receive TimeZero Fleet targets using two methods which both have their advantages and limitations:

Fleet Targets send & receive via TZ Cloud

Transmission of the fleet target data is done via an Internet connection using TimeZero's own servers ("TZ Cloud") and is compatible with TZ Professional, Furuno NavNet TZT2/TZT3 and TZ Coastal Monitoring. It requires each vessel to use either TZ Professional or a Furuno NavNet TZT2/TZT3, and it requires the operating center (that would display the fleet target data) to either use TZ Coastal Monitoring Single/Dual Radar or TZ Coastal Monitoring Remote. Vessel's position and optionally wind/depth data can be transmitted at up to 5 seconds interval (default is 30 seconds). The TZ Cloud Fleet Tracking solution also allows to send text messages, user objects (routes, marks, areas...) and Radio Direction Finder bearings (MOB detection) among the fleet participants (RDF not available on NavNet TZ2/TZT3). The TZ Cloud Fleet Tracking solution has been optimized for slow and intermittent Internet connection. It supports "store & forward" for up to 7 days / 10,000 positions per vessel. This means that if a vessel loses its Internet connection (even for a couple of days), its past positions will be uploaded to the TZ Cloud as soon as an Internet connection is recovered (allowing all other participants to display a full trail without any "holes").

The Fleet Target via TZ Cloud is the perfect solution for customers that just need to upload basic data (position, wind, depth), or need to exchange user objects (route or boundary areas), or customers that do not want to setup their own infrastructure (no server setup needed, just a basic Internet connection). Typical customers would be a Search & Rescue operation that needs to send SAR routes from a command center to one or multiple vessels, or a Fishing Fleet that would need to keep track of its vessels and send boundary areas (prohibited areas).

Note that the Fleet Target solution via TZ Cloud requires an annual subscription (price varies according to the amount of vessel in the fleet). Fleet targets can be viewed and interacted with by any participant in the fleet.

Fleet Targets send & receive via TZ Host

Transmission of the fleet data is done via the self-managed TZ Host ([Remote Architecture](#)) and is only compatible with TZ Professional and TZ Coastal Monitoring. It requires each vessel to use TZ Professional with the TZ Host output module (not compatible with NavNet TZT2/TZT3), and it requires the operating center (that would display the fleet target data) to use TZ Coastal Monitoring Remote. This solution allows to send not only the vessel position (including wind and depth) but also the vessel AIS and ARPA targets together with Radar echo and Camera picture (including remote control ability for Radar and Camera). The trade-off is that a permanent connection must be established in between TZ Professional / TZ Coastal Monitoring Remote and the TZ Host (no "store & forward" capability due to the amount of data). Note that this connection does not need to be an Internet connection. The TZ Host can operate on a private LAN or private WAN. Another limitation is that sending user objects or text message is not supported via the TZ Host solution.

The Fleet Target via TZ Host is the perfect solution for customers that want to monitor (and control) radar or camera remotely. Typical customers would be one or multiple autonomous / semi-autonomous vessels (loaded with TZ Professional and the TZ Host output module) which require monitoring from the office (using TZ Coastal Monitoring Remote), or a customer with a land-based TZ Coastal Monitoring solution that needs some vessels to be part of the surveillance operation (mixing land-based station with mobile assets).

Fleet Target via TZ Host is self-managed and does not require a subscription.

Note: It is not possible to combine both solution (Fleet Tracking via TZ Host and Fleet Tracking via TZ Cloud).

Setup of Fleet Tracking via TZ Cloud

It is possible to subscribe to the My TIMEZERO Fleet Tracking service through your dealer. When this service is activated, you can configure multiple vessels under a "fleet" account (your private group of vessels). Each vessel will be able to report their own position and receive the position of all other vessels in the fleet using an Internet connection. The secure communication with the TimeZero server was optimized to take as little bandwidth as possible (so that the service can be used with Satellite connection). In addition to be able to send and receive

position, members inside the fleet can also exchange User Objects (Marks, Routes, Boundaries, and Photos) very easily.

Setup Vessels with TZ Professional:

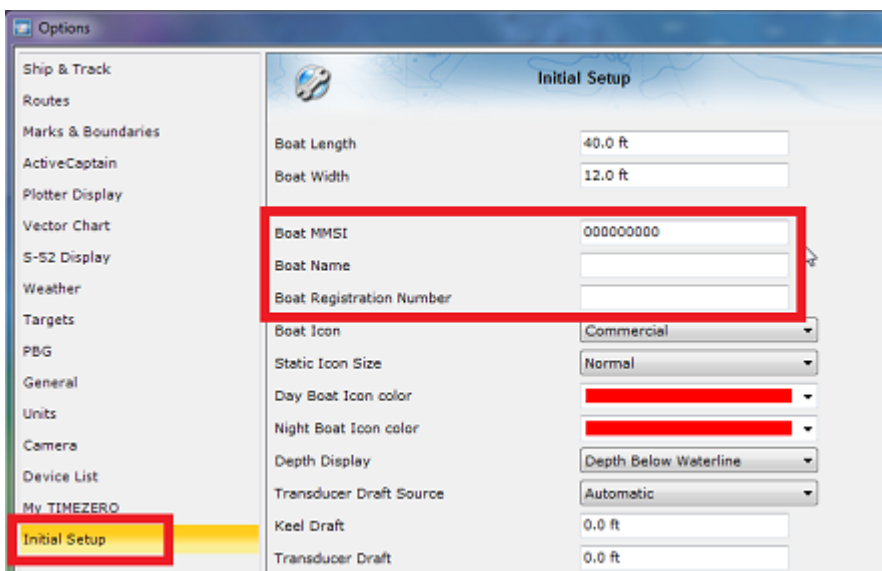
Each vessel must have an Internet connection and be setup and logged in with a different My TIMEZERO account. Once setup, contact your dealer to activate the service with the list of vessels (the list of My TIMEZERO accounts) to include in your fleet. Then, enable the "Report my position automatically to My TIMEZERO" from the [My TIMEZERO Options](#). Enabling this option will allow TimeZero to send your position, but also retrieve the positions of all other vessels in the fleet. The reporting frequency can be adjusted (as often as every 5 seconds to once every hour). You can choose to only send your Position (+ COG/SOG) or also include Depth and Wind data (speed/direction).

Note: The size of one message is less than 450 bytes for position (+ COG/SOG) and about 500 bytes (0.5KB) when it includes the additional Depth and Wind data. With the default option (set to report every 30 seconds), the upload bandwidth will be approximately 1.5MB/day and the download bandwidth will be the same number multiplied by the number of vessels in the fleet (so about 7.5 MB/day for 5 vessels). The bandwidth can be dramatically reduced by setting slower reporting interval (down to 12KB/day!).

When the position report is enabled, a status icon will appear in the top right corner (next to the minimize button) to indicate when TimeZero has a proper connection to the Fleet Tracking server. Green means that the connection is working and red signify that TimeZero is not connected (usually when the Internet connection is lost):



Note that it is highly recommended to setup the "Boat MMSI", "Boat Name", and optionally "Boat Registration Number" from the [Initial Setup Options](#):



The boat MMSI is especially important if the same My TIMEZERO account is used on multiple vessels. In that case, make sure to use different MMSI numbers so that the position reporting does not "jump" in between two vessels that are logged with the same account. You should also setup the boat name because it will be displayed on all the other TimeZero that are in the same fleet as you. The boat registration number and boat size are optional and for information only (they would be displayed in the vessel properties).

TIPS: If you are connected to an AIS transmitter (Class A or B), the boat MMSI and boat name will be automatically setup from the AIS feed through the VDO sentence.

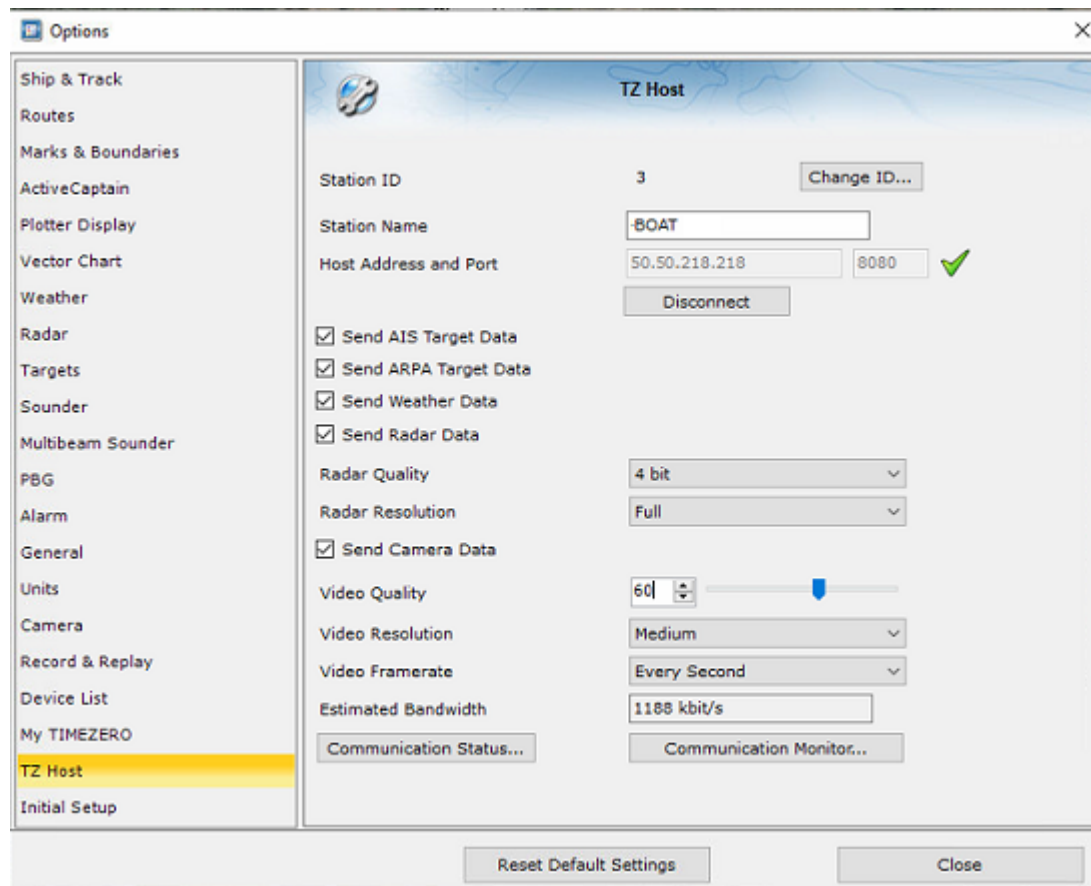
Setup the Supervision Center with TZ Coastal Monitoring:

The supervision center must have an Internet connection and be setup and logged in with a different My TIMEZERO account. Once setup, contact your dealer to activate the service with the list of My TIMEZERO accounts to include in your fleet. Then, enable the "Get Fleet Targets from TZ Cloud" from the [My TIMEZERO Options](#). Enabling this option will allow TimeZero to retrieve the positions of all other vessels in the fleet.

Setup of Fleet Tracking via TZ Host

Setup Vessels with TZ Professional:

Each vessel you want to track and get data from (AIS, ARPA, Radar, Camera) must be loaded with TZ Professional V5 (or superior) and have the TZ Host Output module unlocked. You will need to setup a TZ Host and a way for each vessel to communicate with the TZ Host (internet connection or private LAN/WAN). For more information about the network setup, please refer to the [TZ Host Architecture Network Setup](#). Once the network and the TZ Host have been setup, choose a unique Station Name and Station ID (used to identify the vessel on the TZ Host network), enter the IP address of the computer running the TZ Host, select which type of data you would like to send (and their quality) and click on "Connect":



TIPS: You can also enter additional vessel information (like Vessel Name, Size, MMSI, and Registration Number) from the [Initial Setup](#) Options

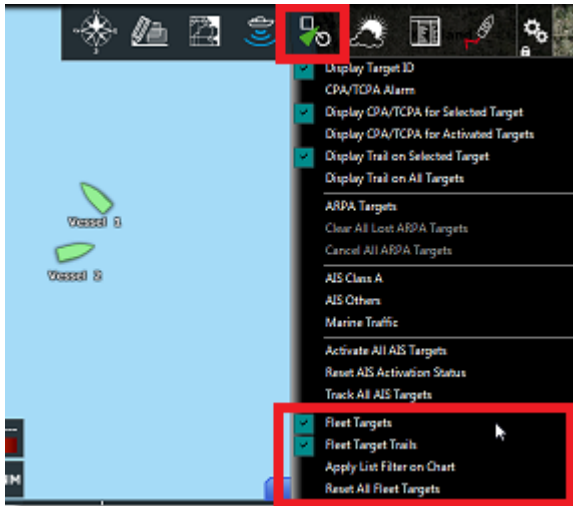
Setup the Supervision Center with TZ Coastal Monitoring:

In order to monitor the vessel(s), you will need to use TZ Coastal Monitoring Remote which will connect to the TZ Host to get all the data (vessel position, AIS, ARPA, radar and camera).

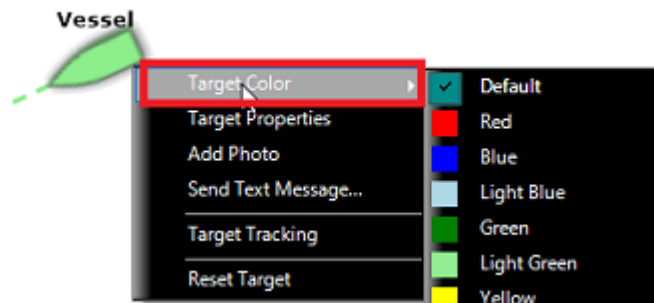
Note that with the TZ Host solution, the fleet targets will only be visible on TZ Coastal Monitoring Remote.

Show and Hide Fleet Targets

To display the fleet targets on your screen, select "Fleet Targets" from the "Targets" button located in the Ribbon:



By default, all Fleet targets are displayed in green, but you can change the default color from the [Targets](#) Options (by changing the "Fleet Color" setting). Note that you can also individually customize the color of each target by right clicking on the target and selecting "Target Color":



Changing the color of specific target can be useful to highlight specific vessel in your fleet.

By default, the text label displayed below the target icon will be the vessel name (as received by the Fleet Tracking server). But if you prefer, you can set a custom Nickname (either from the list or from the target properties) that will be used instead.

Note: If you customize the color and the nickname on specific target(s), TimeZero will remember these settings, even after restarting. You can revert to the default color by selecting "Default" (under target color) and revert to the name transmitted by the vessel by erasing the nickname.

Because the Fleet reception is not always real-time (especially with the TZ Cloud solution when the sender and/or receiver lose their Internet connection or when they setup a longer position update interval to save bandwidth), Fleet targets have a much longer timeout than AIS or ARPA targets. A Fleet target will no longer be displayed on the screen (and inside the Fleet list) if its last update is older than the "Fleet Timeout" setting available in the [Targets](#) Options (12 hours by default). Note that, if you would like to remove a fleet target before waiting for

this timeout, you can right click on a fleet target and select "Reset Target". This will get rid of the fleet target until a new position report is received again.

If you want to reset and erase all Fleet Targets at once, select "Reset all Fleet Target" from the "Targets" button located in the ribbon.

Fleet Target Trails

Fleet Target Trail

The Fleet Target trails are always and automatically recorded in TimeZero. The Fleet target trails behavior is slightly different than AIS or ARPA target trail. If you have selected to display the trail on all targets (from the Target Ribbon button), then the fleet target trail length will match the AIS or ARPA trail length (which is setup using the "Target Trail Length" setting from the [Targets Options](#)). However, when selecting (clicking on) a Fleet target, a longer trail is loaded and displayed on the chart. This longer trail (that is only displayed on the selected target matches the "Fleet Timeout" setting of the [Targets Options](#).

Note: The trail is automatically cut (split) if there is a gap of more than 50Km or if a position report was not received for more than 2 hours.

Fleet Target Track

Target Tracking can be enabled on Fleet targets by right clicking on a target and selecting "Target Tracking". From that moment, TimeZero will stop displaying the trail and start recording a track. Just like trail, the track line has the same color as the target (this can be changed by right clicking on the target or the track at a later time).

Target Track Recall

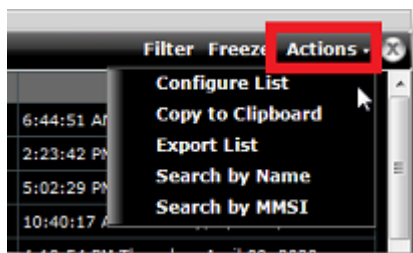
It is possible to create a target track after the fact from a target trail. This is useful if you do not want to enable Target Tracking systematically (to avoid creating lots of tracks), but decide at a later time to create a track from a trail. Simply right click on the target or on the trail itself and select "Recall Track". All the trail points will be displayed and the cursor will change allowing you to click once to set a start position and click a second time to set the end point.

Fleet Target List

To display a list of all the vessels in your fleet, select "Fleet Target List" from the "Lists" button located on the ribbon. If the list window is already open at the bottom of your screen, you can also select "Fleet List" from the list category:

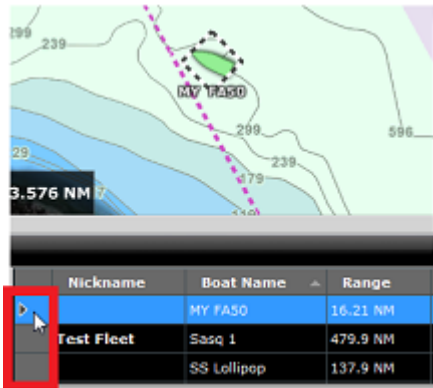


Note that you can customize the columns that are displayed in the list by clicking on the "Actions" menu and selecting "Configure List":



TIPS: This list can be sorted by double clicking on any column header. So for example, you can sort by "Last" date (to see the most up to date fleet target at the top), by speed or by color (if you have assigned specific color to specific targets).

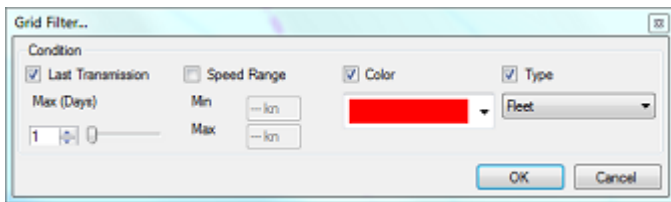
The action menu can also be used to search a specific Fleet Target by Name or by MMSI. Once you have located a target in the list, TimeZero can center on it if you just click on the row header:



TIPS: If you have sorted the list by a parameter that is often updated and can vary a lot (speed for example), individual items in the list might jump around and be difficult to select. To temporary stop the list from refreshing, you can click on the "Freeze" button.

Fleet Target Filter

It is possible to filter items in the list by clicking on the "Filter" button displayed at the top right corner of the list. When you click on this button, a window opens allowing you to select your filter parameters:



By default, the filter only operates on the list, but you can apply the same filter on the chart if you select "Apply List Filter on Chart" from the "Targets" button located in the ribbon.

Send and Receive User Objects and Text Message (TZ Cloud only)

Send User Objects:

It is possible to send and receive user objects (marks, boundaries, routes, and photos) in between any member of the fleet. To send a user object, simply right click on a user object and select "Send To". You will have the option to select a specific vessel inside the fleet or send the user object to the entire fleet at once.

Note: Sending a Route or a Boundary area containing about 20 points will only take 2kB. Sending user objects with the Fleet service is much more efficient and practical than sending user object by e-mail (using TZX file format).

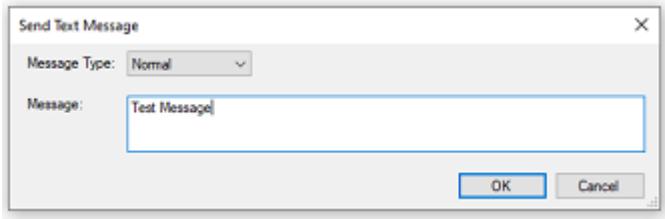
Note that if you lock the object or set it as an "Own Ship Alarm" area (in case of boundaries) before you send the object, these settings will be transferred as well with the user object.

If you modify the same user object (for example change its color, or add a waypoint to a route,...) and send it again, it will NOT create a duplicate on the receiver (it will update the same User Object as well).

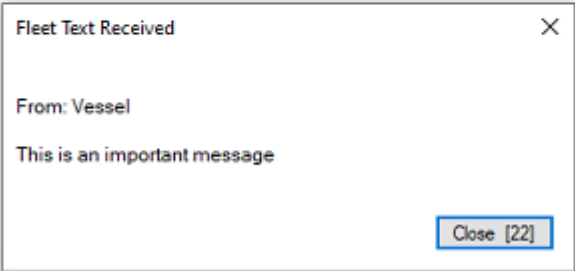
TIPS: Its is possible to send the Planning Route directly to a Fleet Target by right clicking on it and selecting "Send Planning Route".

Send Text Message:

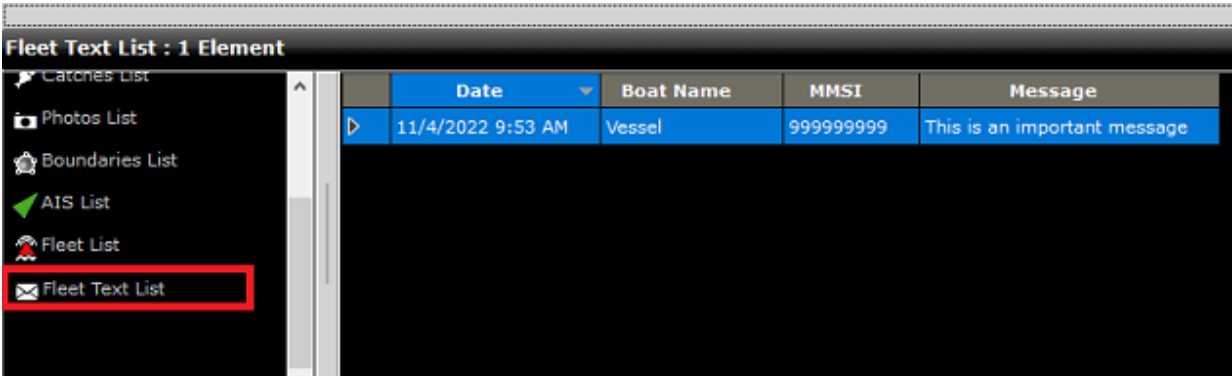
To send a message to a specific vessel, simply click on the fleet target you would like to send a message to and select "Send Text Message...". A window will appear allowing you to type a text message (maximum 150 characters):



Note that you can set the message type to "Normal" or "Important". When a message is sent with the "Normal" priority, the receiver will get a notification (yellow) with the message displayed in the status bar. When a message is sent with the "Important" priority, the receiver will get an alarm (red) with the message displayed in the status bar, and a window will automatically pop-up displaying the message to draw attention:



All the text messages you receive are kept and can be read at any time from the "Fleet Text List":



Notification and Acknowledgment:

Just after sending a user object or a text message, a mail icon will appear at the top of the target(s) you sent the object/message to. The icon will be yellow to indicate that the object/message was properly sent to the server, but not yet delivered to the vessel. Once the object/message is actually delivered to the vessel, the icon will turn green and a notification will be displayed in the status bar (and logged in the Alarm list):



When you see the delivery notification, you are guaranteed that the user object or message was delivered to the vessel. This acknowledgment is especially important in case the Internet connection is not reliable on the vessel you want to send the object or message to.

Note: If an Internet connection is not available on the vessel you want to send the user object to, the information will be kept and stored on the Fleet Tracking server until a valid Internet connection can be established with the vessel.

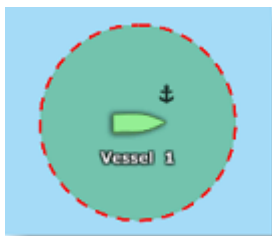
Receive & Control Radar & Camera (TZ Host Only)

All Fleet target data that is sent to the TZ Host can be viewed and controlled from TZ Coastal Monitoring Remote. The target will appear on the chart and the camera and radar data can be viewed/controlled from the Camera and Radar WorkSpace respectively. If the camera installed on the vessel has Pan/Tilt/Zoom ability, you will be able to control the camera directly from TZ Coastal Monitoring Remote. Target Watch Alarm and Zone Monitoring Rule can be set on TZ Coastal Monitoring Remote to trigger specific behavior.

Target Watch & Zone Monitoring

Target Watch

It is possible to set a Target Watch Rule on any Fleet Target. First you need to configure the Target Watch Rule from the [Alarms](#) Options. Once you configure the rule behavior, right click on any target and select "Target Watch Alarm" to drop a monitoring circle around the current target position:



The Target Watch Rule is specifically useful when you need to monitor a temporary location defined by the current target position (such as an Anchorage or a Mooring location). For more information about how to setup the Target Watch rule behavior, please refer to the [Target Watch](#) chapter.

Zone Monitoring

It is also possible to have Fleet Targets trigger Zone Monitoring rule(s). Rules can be attached to boundary area(s) you draw on the chart which is useful when you want to monitor a permanent fixed location such as a harbor entrance or a prohibited/restricted area. However, if you want to monitor an area relative to the Fleet target (an area that "moves" with the Fleet target), you can define a Guard Zone by right clicking on the Fleet target and select "Set Guard Zone". You can then define a rule for that guard zone and setup a behavior that allows you to monitor what is around the Fleet target. This can be useful for an autonomous vessel to trigger an alarm whenever another target (AIS or ARPA) is approaching the Fleet target or to automatically control the camera which is on the Fleet target from TZ Coastal Monitoring.

For more information about how to setup rules linked to areas or guard zones, please refer to the [Zone Monitoring](#) chapter.

Fleet Target Record and Replay

If you have the Record & Replay module, the Analyze WorkSpace allows to replay target position history by using the timeline:



Fleet Targets that are replayed are displayed in blue and are slightly more transparent than "real time" targets. Note that you can also display a trail on replayed Fleet Targets (the trail for replayed targets is fixed to one day).

Note: Even if a target has been reset, although it will not be displayed anymore in the "Monitoring" WorkSpace or when the date is set to "Now" in the Analyze WorkSpace, it will be possible to see the old target data by going in the past.

Legacy Fleet Target Format (PosReport file)

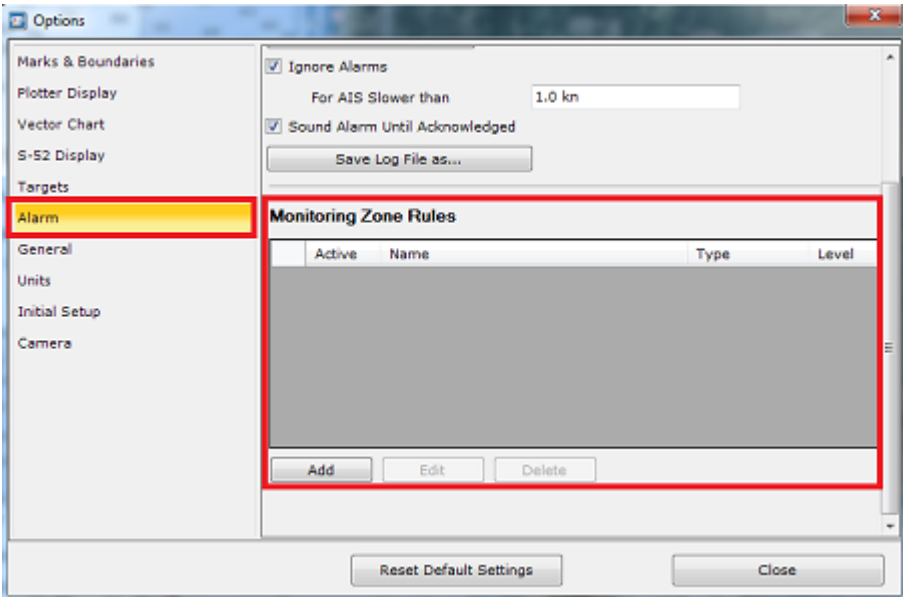
TimeZero can also display and update fleet targets by using the [POSREPORT format](#). The [POSREPORT format](#) consists of one or multiple text files located in a specific folder (selected from the [Targets](#) Options under "Vessel Tracking Data Location"). The text files contain information about other vessels (ID, Position, Date,...). The text files can be created manually, or sent by email and then saved in the Vessel Tracking Data folder, or created automatically by third party software compatible with the [POSREPORT format](#). As soon as a new text file is saved in the folder, TimeZero detects it, and displays the updated targets on screen. After TimeZero processed the file (to extract all targets information), TimeZero automatically deletes the file from the folder.

IMPORTANT: Only basic features are available when you use the POSREPORT format. For example, there is no automated way to report your position or send/receive user objects (with acknowledgment) like it is possible with the TZ Cloud Fleet service. The POSREPORT format was designed to offer basic Fleet Tracking capabilities with third party software that can generate a text file.

Rules & Monitoring

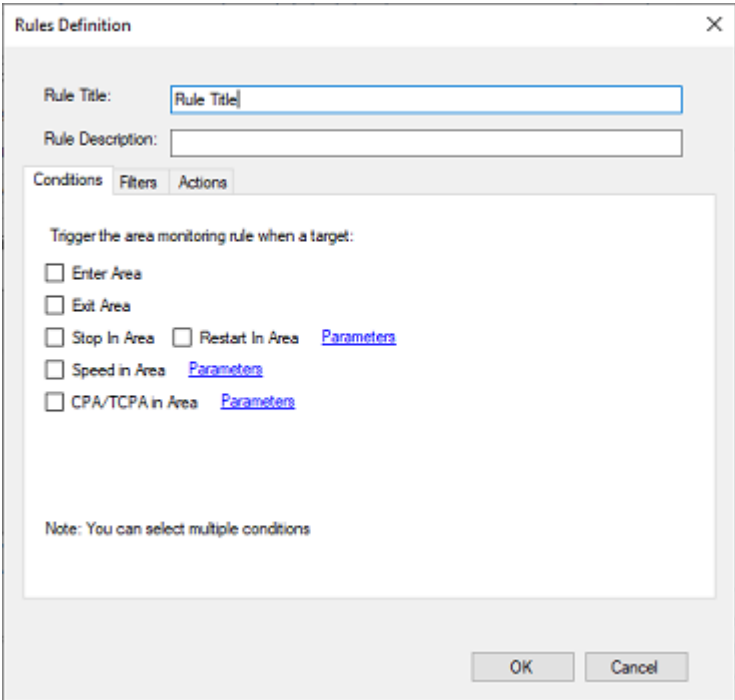
Create Rules

Boundary Areas, Boundary Circles, and Fleet Guard Zone can be set to trigger rules. Rules are defined in the [Alarms](#) Options:



Rules are used to trigger action(s) when a target (AIS, ARPA, or Fleet) exhibits a specific behavior while inside a zone (area, circle, or guard zone).

To add a rule, click on the "Add" button. The Rule configuration window appears:



The configuration window contains three tabs to define the "Conditions" that trigger the rule, the "Filters" you may want to apply (to limit the rule to specific type of targets or to a specific schedule), and the "Actions" tab to define the action that are performed when the rule is triggered.

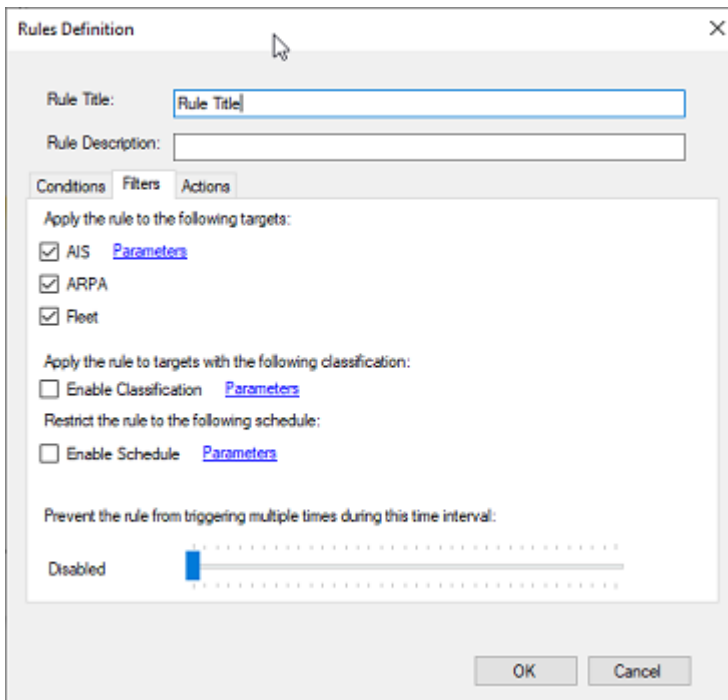
Conditions

First, use the "Conditions" tab to select the type of event that will trigger the rule (note that you can select multiple events):

- **Enter Area:** The target enters the area. This also includes ARPA targets that "appear" into the area when they are acquired (this can be the case when the same area is set to trigger the rule and also set to be an Automatic Acquisition Area).
- **Exit Area:** The target exits the area. Note that ARPA target that get lost inside an area do not trigger the exit event.
- **Restart:** The target must stop inside the area first (fall below the speed threshold defined under the "parameters" button) then restart by crossing the restart speed threshold or the distance from the stop position (in case the target is drifting slowly). Note that the stop and restart speed values are using independent settings.
- **Stop:** The target stops in the area (falls below the speed threshold defined under the "parameters" button).
- **Speed:** Target that goes over or under a specific speed value or target that falls in or out a specific range of speed values. The behavior can be adjusted when clicking on the "parameters" button.
- **CPA/TCPA:** Target that are inside the area and met the CPA/TCPA threshold defined under the "parameters" button. The CPA/TCPA rule is useful to watch if any target is on a collision course with the reference position. The user defines two parameters: a distance named "CPA" (Closest Point of Approach) and a time named "TCPA" (time to closest point of approach).

Filters

Then, the "Filters" tab allows you to define specific filter(s) that will restrict the rule from being triggered:



Start by selecting the type of target that can trigger the rule (AIS, ARPA or Fleet). For AIS targets, you can click on "Parameters" to restrict the rule to a specific Vessel Type or Navigation status (as transmitted by the AIS).

You can also restrict the rule to specific classification (refer to [Target Classification](#) for more information). This is very useful for excluding targets that have a specific classification (uncheck the classification for which you don't want the rule to be triggered).

TIPS: The AIS [Favorite](#) allows you to predetermine the classification of known vessel using their MMSI. For example, if you have a list of vessels that are allowed to cross a specific area without triggering a rule, simply assign the classification to "Friend" in the AIS directory and exclude the "Friend" classification from the rule.

Rules can be set to follow a schedule. This means that you could restrict a rule to be triggered by a target only during specific day and/or time. This can be useful if you want to design rules to be only operating at night or during the week end. If you want to enable the schedule, select "Enable Schedule" and click on the "parameters" button:

Day	All Day	From	To
<input type="checkbox"/> Monday	<input type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM
<input type="checkbox"/> Tuesday	<input checked="" type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM
<input checked="" type="checkbox"/> Wednesday	<input type="checkbox"/> All Day	From 5:00 AM	To 10:00 AM
<input type="checkbox"/> Thursday	<input checked="" type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM
<input type="checkbox"/> Friday	<input checked="" type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM
<input checked="" type="checkbox"/> Saturday	<input checked="" type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM
<input checked="" type="checkbox"/> Sunday	<input checked="" type="checkbox"/> All Day	From 7:00 AM	To 7:00 PM

OK Cancel

Select the day(s) you want the rule to be enabled. For the selected day, select "All Day" if you want the rule to operate from 12:00AM to 11:59PM that day or select a time range (unselect "All Day").

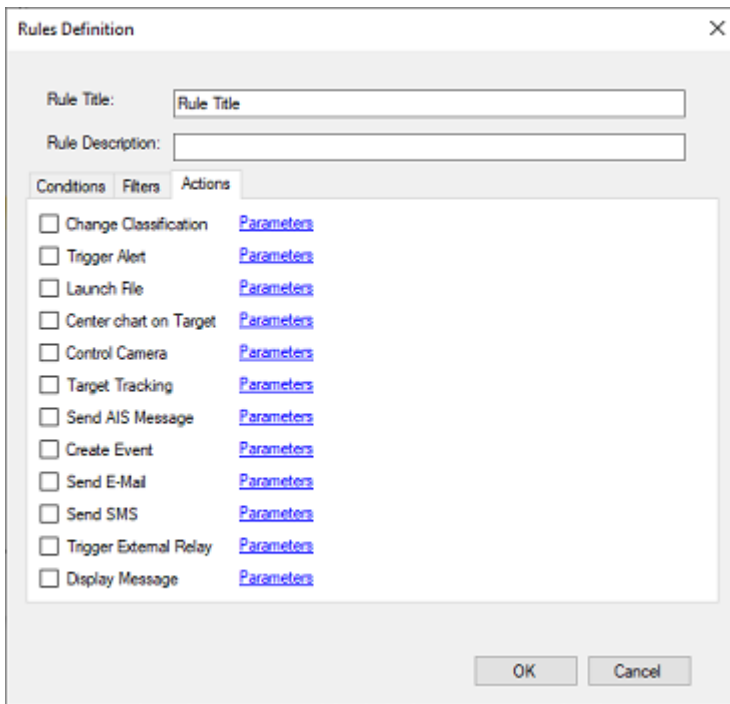
Note: If you set a day to operate on a time range where the starting time is set after the ending time, the rule will be active until the following day. Ex: if you set a rule to operate only on Sunday from 5PM to 7AM, it will operate on Sunday from 5PM to 11:59PM and Monday from 12:00AM until 7AM continuously (even if Monday is not selected).

Finally you can set an interval during which the rule cannot be re-triggered. This can be useful with ARPA targets to avoid multiple false alarms.

Note: In any case, the **same** target cannot trigger the **same** rule twice within 10 seconds. This is to avoid a target located at the limit of a boundary or near a speed value to trigger consecutively the same rule twice in a short period of time.

Actions

Click on the "Actions" tab to select the various action(s) that will be performed when the rule is triggered:



- Change Classification:** Automatically assign a classification to the target that break the rule condition. Refer to [Target Classification](#) for more information.
- Trigger Alert:** Display a message in the Status Bar corresponding to the Rule Name. Click on the "parameters" button if you want to play a sound, set the priority of the notification ("High" notification will be displayed in red, "Medium" will be displayed in yellow and "Low" will be displayed in green) or adjust the Time Out. By default, the Time Out is set to 30 seconds. This means that the notification will be displayed on the status bar (and optionally play a sound) for 30 seconds unless the user clicks on the Status Bar or acknowledge the alarm from the Alarm list before the Time Out is reached. If you set the Time Out to "none", the notification will play until the user acknowledges it manually (from the Alarm List or by clicking on the status bar).
- Launch File:** Open a file (.exe, .cmd or .bat) and pass the following argument in parameter (in order):

 - Type of Target ("ARPA" or "AIS")
 - Target ID: (MMSI for an AIS and ID number for ARPA)
 - Lat/Lon
 - UTC Date
 - UTC Time
 - Rule Name
 - Target Name (AIS only)

User can select if the program or script is ran normally (pop up window in front of TimeZero), minimized (does not appear) or maximized (pops up a full window in front of TimeZero)

Example of argument output (with an AIS): `Ais 206124607 35-12.9448-N,139-46.7543-E 2012-06-22 00:38:18 "Rule Name" "M/V Vessel"`

- Center Chart on Target:** Center the chart on the target that breaks the rule condition. If you select "Zoom" (under parameters), the scale of the chart will automatically be adjusted to display the target and the reference point on the screen and if you select "Keep Target on Screen" TimeZero will pan the chart automatically to follow the target.
- Control Camera:** Move the camera onto the target that breaks the rule condition. The camera can be set to "Lock" on the target (follow the target), or just "Move" on the target (move one time without tracking the target with the camera). It is possible to select which camera to control: the closest camera (from the point where the target broke the rule), the active camera, one or multiple specific camera (selected by name). When you select to control the closest or one specific camera, it is also possible to "Activate" this camera (simply check "Activate Camera"). Activating a camera is very useful when you have a Camera display (NavData or Camera WorkSpace) that is set to display the "Active" Camera. In this case, not only

will the relevant camera track the target, but the video source will also change automatically to display that camera and draw the attention of the operator. If the selected camera is already busy tracking another target, you can choose the behavior of the rule (do nothing, overwrite, use classification as a means of priority, or select another camera).

- **Target Tracking:** Turns the target track that breaks the rule condition to ON or OFF (click on the "Parameters" button). Notice that enabling this action could potentially result in a large number of tracks being generated on the chart. If you enable this action, it is highly recommended that you create a dedicated layer (from the [Manage Layer](#) window) and set that layer as the [default layer](#). This will allow you to show/hide all the tracks easily and purge that layer (delete it) as needed.
- **Send AIS Message:** Send a Text message to the AIS target (Class A only) that broke the rule condition. Note that the "ABM" sentence must be selected as an output (on the port where the AIS transmitter is connected) for this action to work properly. Click on "Parameter" to type the message to send.
- **Create Event:** Create an Event in the time line and in the Event list when you have the Record and Replay module. This can be useful to mark and retrieve specific occurrence of events and display the full situation at that time thanks to the recorded data. By default, the event will be named after the rule title, but this can be changed by clicking on the "parameters" button.
- **Send E-Mail:** Automatically send an email to the specify e-mail address. It is possible to customize the message and even insert "smart-tags" that would replace dynamically its content according to the target information:

The screenshot shows a dialog box titled "Email Parameters" with the following content:

To:

Subject: (34 characters remaining)

Message: (417 characters remaining)

Click on a tag to add to the body of the email. Tags may also be used in the subject.

Date	The date when a rule was triggered.
Hour	The hour and minute when the rule was triggered.
Rule Name	The name of the rule.
Target Type	The type of target which triggered the rule (AIS, ARPA...).
Target ID	The ID of the target.
Target Lat/Lon	The position of the target in Lat/Lon.
Target Name	The name of the target.

Buttons: Test, OK, Cancel

- **Send SMS:** Automatically send a SMS to the specify phone number (international format). It is possible to customize the message and even insert "smart-tags" that would replace dynamically its content according to the target information.

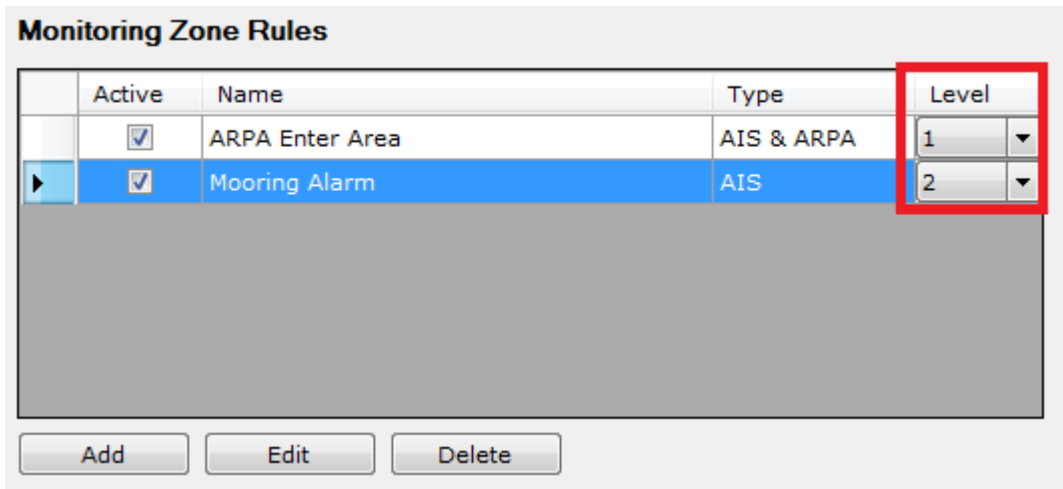
IMPORTANT: Both E-Mail and SMS requires TimeZero to be logged in to a My TimeZero account.

- **Trigger External Relay:** Trigger an external relay using a [SeaLevel Network IO](#) (110E/120E). The network relay can be toggled, turned ON or OFF, or be set to a temporary state (ex: Turn ON for 15 seconds, and then turn OFF).
- **Display Message:** Display a message in a dedicated window to the operator. The message can be formatted using HTML tags and can contain "smart-tag" that would replace dynamically its content according to the target information. This is useful when you want to display detailed instructions or workflow procedure to an operator when a rule is triggered.

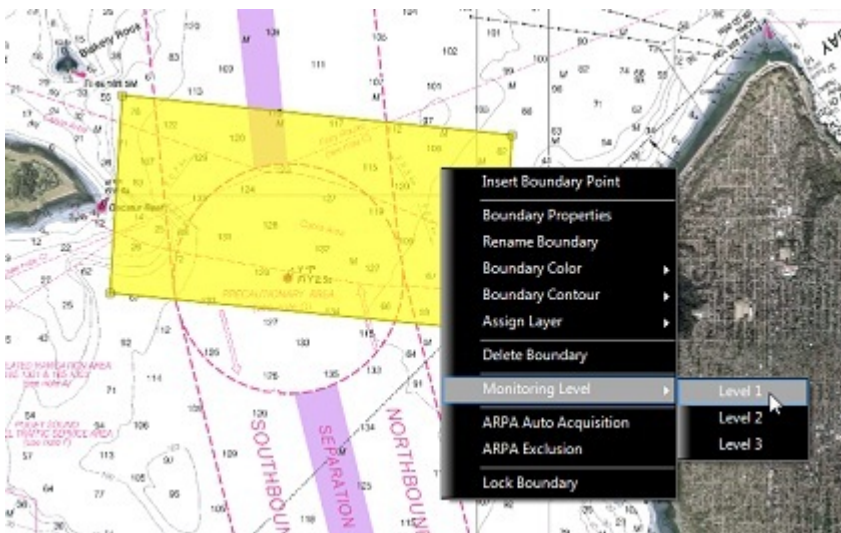
Once all the parameters are defined, click on OK to close the window and add the rule to the rule list.

Link Rules to Areas

After creating a rule, you need to select its level (1 to 10) from the Rules list:



The "Level" is an indirection that is used to link rules to a specific boundary area, boundary circle, or fleet guard zone. To attach a boundary to a rule, right click on an areas, circle or fleet guard zone and select a monitoring level:



Note that multiple monitoring levels can be assigned to the same area. When an area is set with a monitoring level(s), it will trigger the corresponding rule(s).

IMPORTANT: Areas that are set up to trigger rules are active even if they are not displayed on the chart (even when their layer is turned OFF).

Target Watch

The Target Watch rule is useful to monitor specific moored targets and to make sure they are not drifting. Note that this could also be achieved using the Zone Monitoring Rule by manually drawing a small circle around a specific target, but this would be slow and cumbersome. TimeZero provides a better and quicker way to achieve the same result using the dedicated Target Watch feature.

Start by enabling the "Target Watch Alarm" and selecting the threshold (distance) at which you want to trigger the Target Watch rule from the [Alarms](#) Options. Click on "Define Target Watch Rule" to specify the actions to take when an Anchor Watch Rule is triggered (trigger notification, center chart on target, etc...):



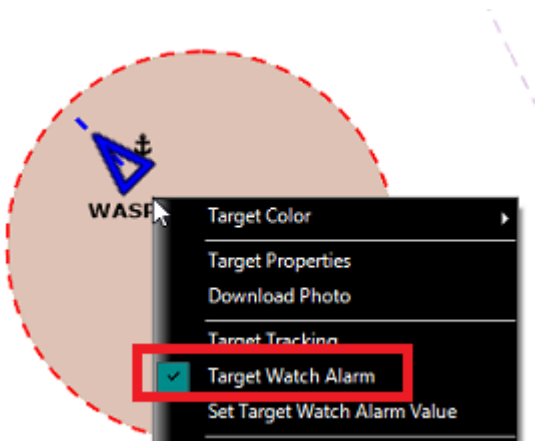
To enable an Anchor Watch on a specific target, right click on the target and select "Target Watch Alarm". A small anchor icon will be displayed on the upper right corner of the target icon with a circle around the target initialized with the Default Alarm Radius defined in the Options:



TIPS: If you click on the edge of the circle or the target, you will be able to adjust the radius of the circle

You can repeat this process on multiple targets. As soon the target drift over a greater distance than the circle, the Target Watch Rule will be triggered. The color of the circle will also change as the target approaches its boundary.

To disengage the Target Watch Alarm, right click on the target and uncheck "Anchor Alarm":



Note: The Target Watch Alarm can also be set on AtoN target to monitor if a buoy is drifting.

AtON Light Monitoring

TimeZero is compatible with the AIS ASM message 6 (DAC 235 / FI 10 Message) which allows TimeZero to monitor the light internal and external voltage. You can define a rule that would be executed whenever the voltage fall below a specific threshold:

AtON Light Monitoring

Trigger Alarm when internal Voltage falls below

Trigger Alarm when external Voltage falls below

Rules Definition

Rule Title:

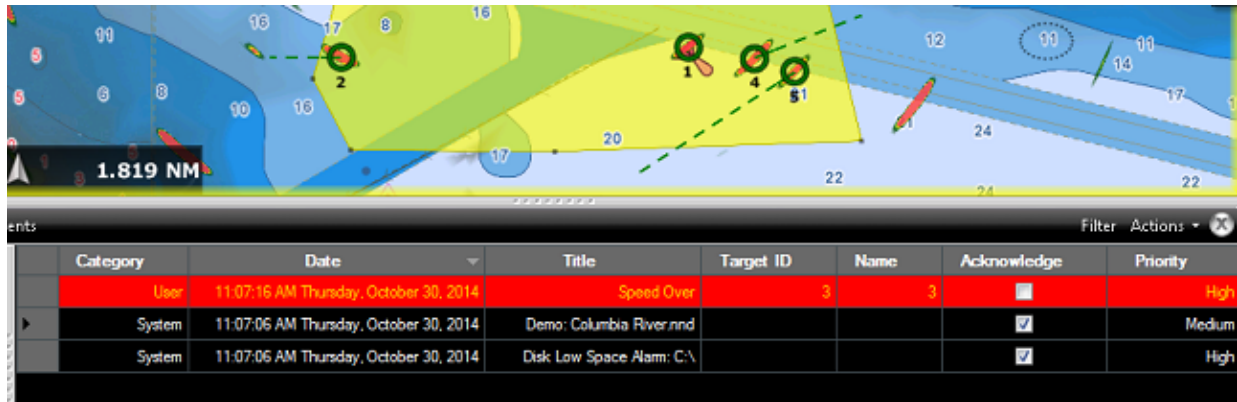
Rule Description:

Filters Actions

- Change Classification [Parameters](#)
- Trigger Alert [Parameters](#)
- Launch File [Parameters](#)
- Center chat on Target [Parameters](#)
- Control Camera [Parameters](#)
- Target Tracking [Parameters](#)
- Send AIS Message [Parameters](#)
- Create Event [Parameters](#)
- Send E-Mail [Parameters](#)
- Send SMS [Parameters](#)
- Trigger External Relay [Parameters](#)
- Display Message [Parameters](#)

Alarm List

An Alarm List can be displayed at the bottom of the screen by selecting "Alarm" from the "List" button on the Ribbon:



The Alarm List displays a list of all the alarms and notifications that were triggered in TimeZero. The following information is available:

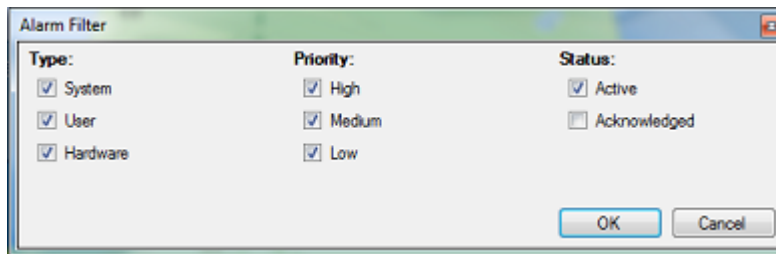
- **Category:** The alarms and notifications are classified in 3 categories: User, System and Hardware.
 - *User:* Any alarm that can be configured by the user. This includes all the Zone Monitoring Alert that may be triggered as the action of a rule.
 - *System:* Any notification or alarm that are raised by the software (such as "Demo Mode", "Chart Installation",...)
 - *Hardware:* Any alarm that are raised by an external instrument (such as "Radar Lost", ...)
- **Date:** The date and time when the alarm or notification occurred
- **Title:** A short description of the alarm or notification
- **Target ID:** In case of Zone Monitoring notifications, the Target ID (MMSI for AIS, ID for ARPA) will be populated
- **Name:** In case of Zone Monitoring notifications, the Target name (if any) will be populated
- **Acknowledge:** A checkbox that allows you to see the status of an alarm or notification and also acknowledge the alarm status

Tips: Acknowledging an alarm or notification can also be done by clicking on the status bar. This will acknowledge all currently active alarm or notification.

- **Classification** (hidden by default): In case of Zone Monitoring notifications, the Target classification will be populated
- **Priority** (hidden by default): The importance of the alarm or notification (High/Medium/Low). These are predefined for System and Hardware alarms/notifications, but can be customized with the Zone Monitoring rule.

By default, the alarm and notification are sorted by date, but this can be changed by clicking on the column title. When you select an Alarm that was triggered by a Target (Zone Monitoring Rule), it will pan and zoom the chart to the location where the target triggered the alarm.

The alarm list can be filtered by clicking on the "Filter" button (located at the top right of the list panel):



This is very useful to only display alarms and notifications with specific condition(s). Simply uncheck the condition(s) that you would not like to see. For example, if you only care about the alarms that have not been acknowledged (active alarms), you can select all conditions except "Acknowledged".

The "Actions" button next to the "Filter" button allows you to configure the column displayed (and their order), copy the current list displayed on the clipboard or export it in a text file, and acknowledge all the alarms and notifications (similar as clicking in the Status Bar). You can also clear the Alarm List from the "Actions" button.

Radar

Radar Introduction

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 two types of Furuno radar:

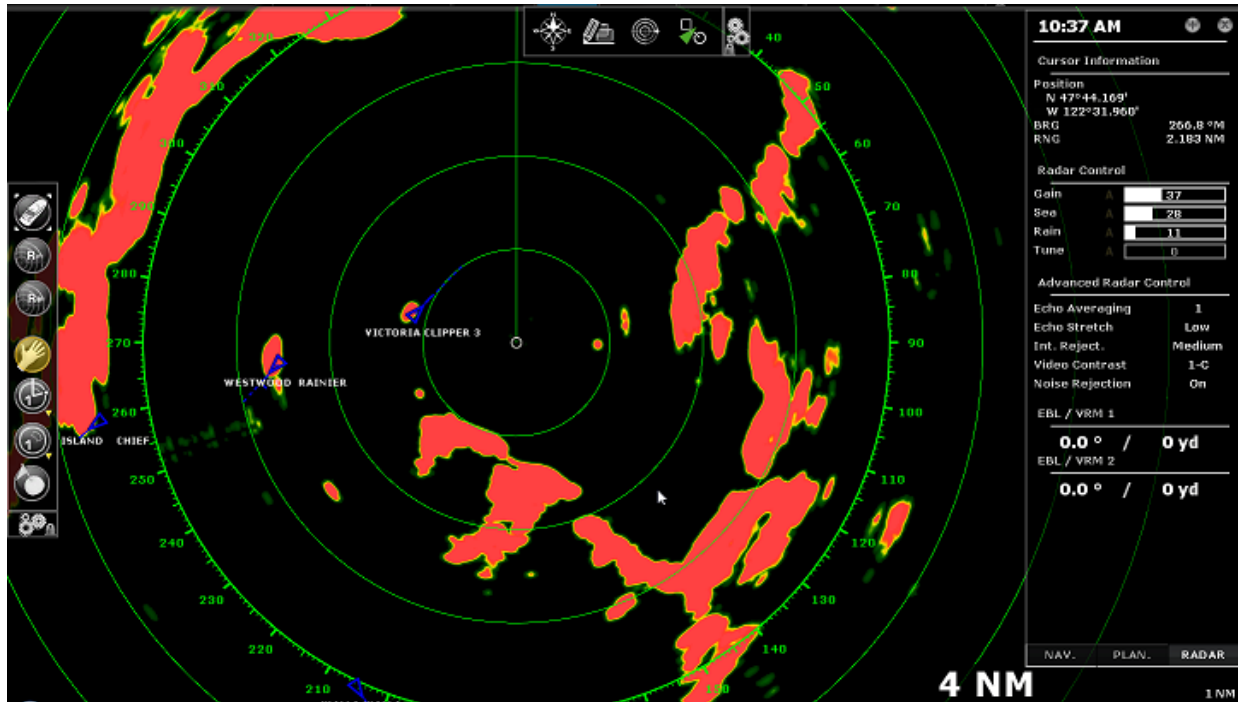
- **Furuno NavNet DRS Series Radar:** TimeZero can be connected to a Furuno "DRS" (Digital Radar Sensor) through an Ethernet connection.
- **Furuno FAR Series Radar:** TimeZero is compatible with most of the Furuno FAR commercial series radars that have an Ethernet interface: FAR2xx7, FAR15x3/15x8, FAR 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.

Radar Workspace

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 (excluding TZ Coastal Monitoring Dual Radar products), 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:

- selecting the "Transmit" options from the "Radar" Ribbon button
- 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:

- uncheck "Transmit" from the "Radar" Ribbon
- 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.

Note: It is possible to Transmit and Standby automatically the radar (to save power) using the Radar "WatchMan" feature. This can be adjusted from the [Radar Options](#).

Radar Range

Press the radar "Range +" or "Range -" buttons located in the Toolbar to increase or lower the radar range respectively:



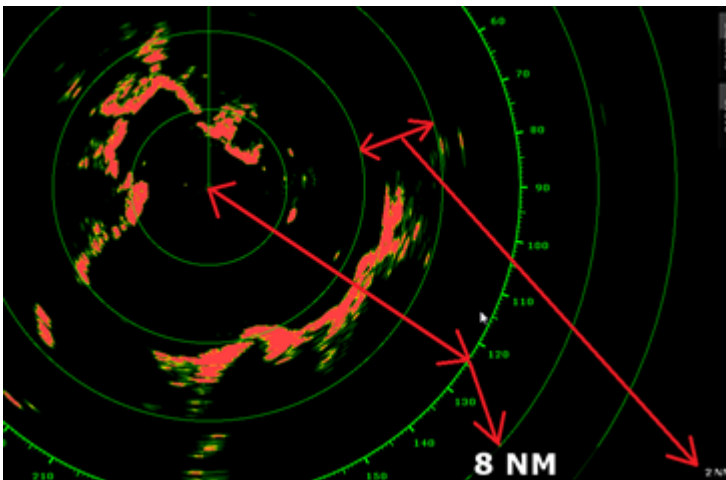
Click this button to reduce the Range of the radar. A smaller range provides greater detail of the radar echoes close to your position (by using shorter pulse length).



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 the "Change Radar Range with Scroll Wheel" is checked from the [Radar Options](#).

When you change the radar range, the range rings are updated on the display. The range of the Radar and the range of Ring interval are displayed on the lower right of the screen:



The range ring and interval rings can be shown or hidden from the "Radar" Ribbon 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.
- Head Up: This mode orients the front of the radar 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.



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.

Radar Display

The Radar background and Radar echo color can be adjusted from the [Radar](#) Options.

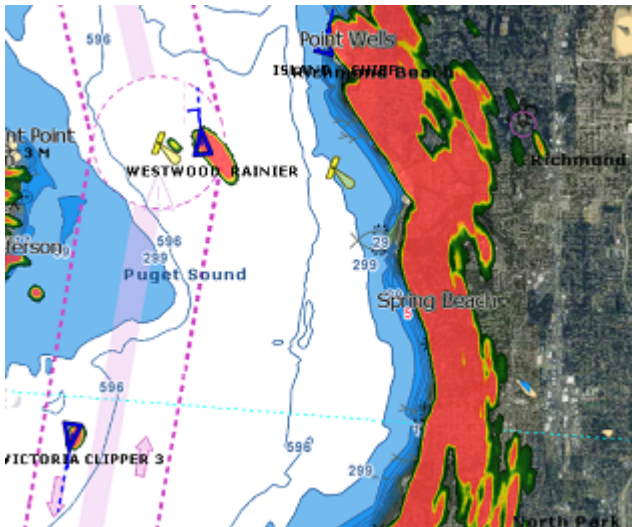
The Radar display can be configured to not only show the radar picture but also other information such as AIS targets, Marks, Boundaries, etc...

To configure the Radar display, simply use the corresponding Ribbon buttons (Targets, Marks, etc) 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

To enable the radar overlay, select the "Monitoring" 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 "Monitoring" WorkSpace by using the Radar NavData Panel and/or the Radar Ribbon 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.

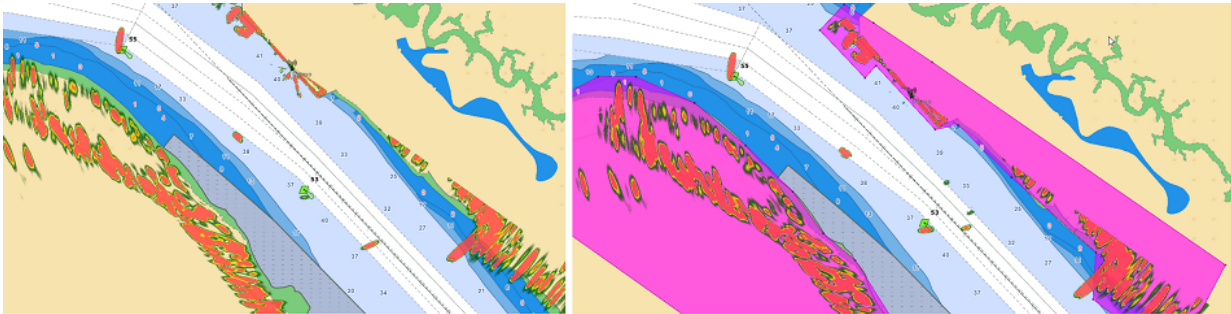
Radar Mask

Creating a Radar Mask has lots of advantages and is highly recommended for any installation that operates on or near the coast where radar returns from land can clutter the screen. A Radar Mask will clean the radar picture and only present the relevant radar information to the operator. In addition, applying a Radar Mask will increase performance (TimeZero will not spend time analyzing masked area for ARPA targets) and greatly reduce the size of the radar picture for the Record & Replay module or if the Radar picture is sent remotely to another computer loaded with TimeZero Remote.

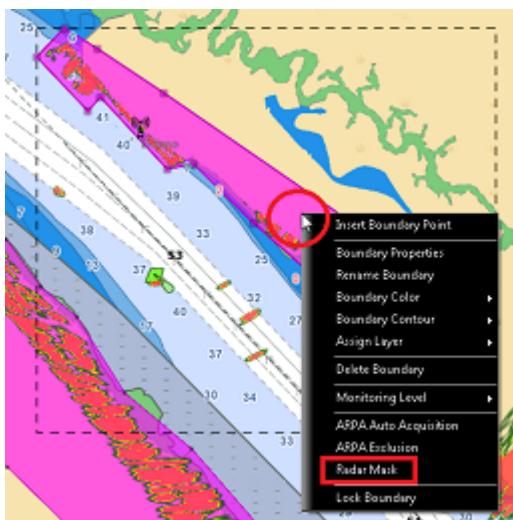
Radar Masks are created on the chart using the Boundary Area Tool located on the Toolbar. You can create as many areas as you want with as many points as you want. It is highly recommended to create a dedicated layer (named "Radar Mask" for example) on which you can attach all the boundaries that will be use as a mask. Please refer to the [Layer Introduction](#) chapter to learn how to create layers and attach objects to them.

Note: Only Boundary Area can be used for Radar Mask. It is not possible to use Boundary Circle.

To create a mask, select the "Boundary Area" tool available in the Toolbar and click on the chart to insert boundary points around the area you want to mask:

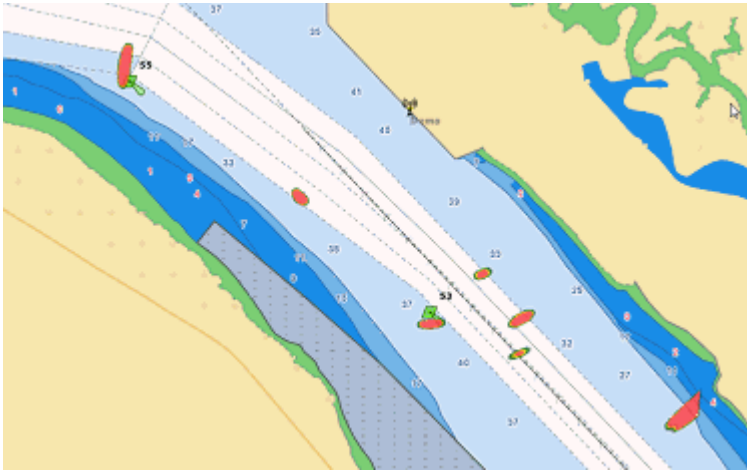


Once the boundary is created, simply right click on it and select "Radar Mask":



Tips: You can only select and right click on a boundary area if it is displayed entirely on the screen. You may have to zoom out a little in order to see the boundary on your screen. Just left click to select it, then right click on it to display its contextual menu.

Repeat this process if you need to create additional masks area. Once the boundaries have been created and set as "Radar Mask", you can hide the layer attached to them to hide the boundary from the chart. Even if the boundaries are not visible , the mask will continue to operate on the radar picture:



Tips: It is NOT recommended to use the Radar Mask to remove radar echo on buoys. Radar Echo on buoys is very valuable to confirm that the radar is tuned and working properly. To avoid TimeZero creating ARPA target on buoys, ARPA exclusion area (or circle) should be created instead. For more information, refer to the [ARPA Auto Acquisition](#) chapter.

Radar Controls

Most of the Radar Controls can be found under the "Radar" Ribbon 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:

- selecting the "Transmit" options from the "Radar" Ribbon button
- 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:

- uncheck "Transmit" from the "Radar" Ribbon
- 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.

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):



TIPS: If you have a scroll wheel, you can rollover the bar graph or setup shortcut that temporary allow you to use the wheel to adjust Gain/Sea/Rain

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.

Automatic Clutter Elimination - ACE (FAR3xx0, FAR2xx8 & FAR15x7/x8 only)

This setting is available from the "Radar" Ribbon button or 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 available from the "Radar Ribbon" "button continuously shows the movements of other ships in afterglow. It is useful for assessing overall target movement.



The following Trail options are available from the "Radar" Ribbon button or 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 "Radar" Ribbon 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 right 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 "Radar" Ribbon button or 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 "Radar" Ribbon button or 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 "Radar" Ribbon button or from the "Advanced Radar Control" NavData.

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 "Radar" Ribbon button or 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 "Radar" Ribbon button or 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 "Radar" Ribbon button or 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 "Radar" Ribbon button or 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.

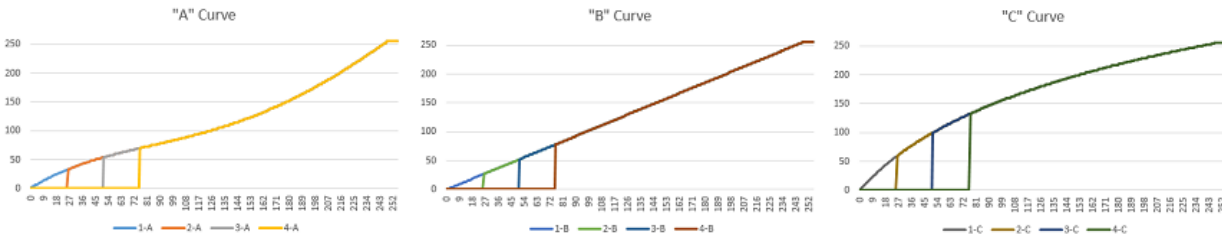
Video Contrast

This setting is available from the "Radar" Ribbon button or from the "Advanced Radar Control" NavData (hidden by default).

This advanced functions slightly alters the way the radar echoes are drawn on the screen. The settings from 1 to 4 adjusts a "gate" (1 = no gate, 4 = maximum gate).

The setting from A to C adjusts the dynamic curve. When set to "A", the mid-level in the curve is low, so this setting is suitable for reducing rain clutter. When set to "C" the mid-level in the curve is high, so this setting is suitable for detecting distant targets.

The graphics below plots the video intensity received by the radar on the X coordinate and the resulting echo intensity as seen on screen on the Y coordinate:

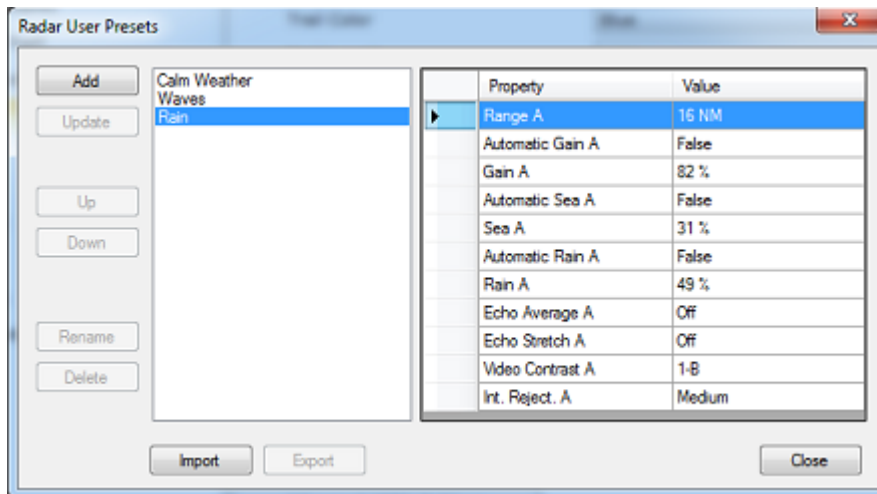


Radar User Preset

Radar User Presets can be created to save and recall all the radar parameters (Radar Range, Gain, Sea, Rain, Interference Rejection, Echo Averaging, Echo Stretch and Video Contrast). This is useful to adjust the radar to specific conditions without having to change all the parameters one by one. For example, you could create various presets according to weather.

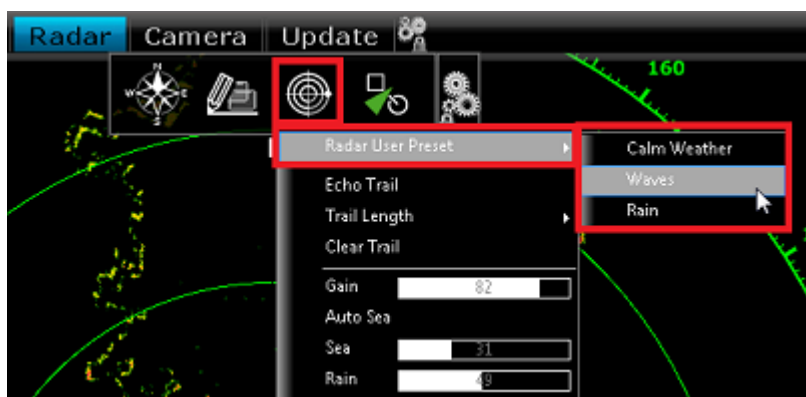
To store a Radar Preset:

- Adjust the Radar to match a specific condition or type of use
- Open the [Radar](#) Options and click on the "Radar User Presets" button
- Click on "Add" and enter a name for the preset. At this time, TimeZero will capture all the settings and stores them with the preset name:



- Repeat this process for creating other presets

To recall a Preset, click on the "Radar" button in the Ribbon and select "Radar User Preset":



Radar Presets can also be recalled using Custom Shortcuts that can be setup from the [General](#) Options by clicking on "Customize Functions Keys..."

DRS Dual Range

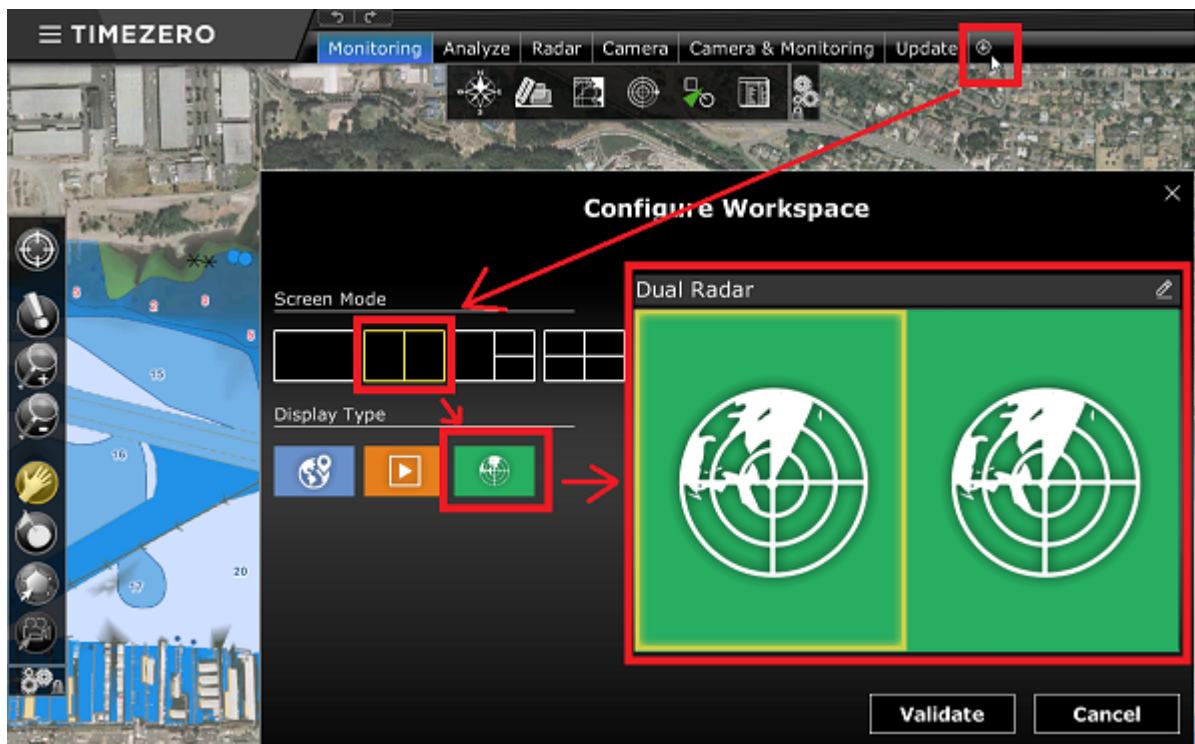
Note that the DRS Dual Range feature is not available with TZ Coastal Monitoring Dual Radar Product.

Dual Radar WorkSpace

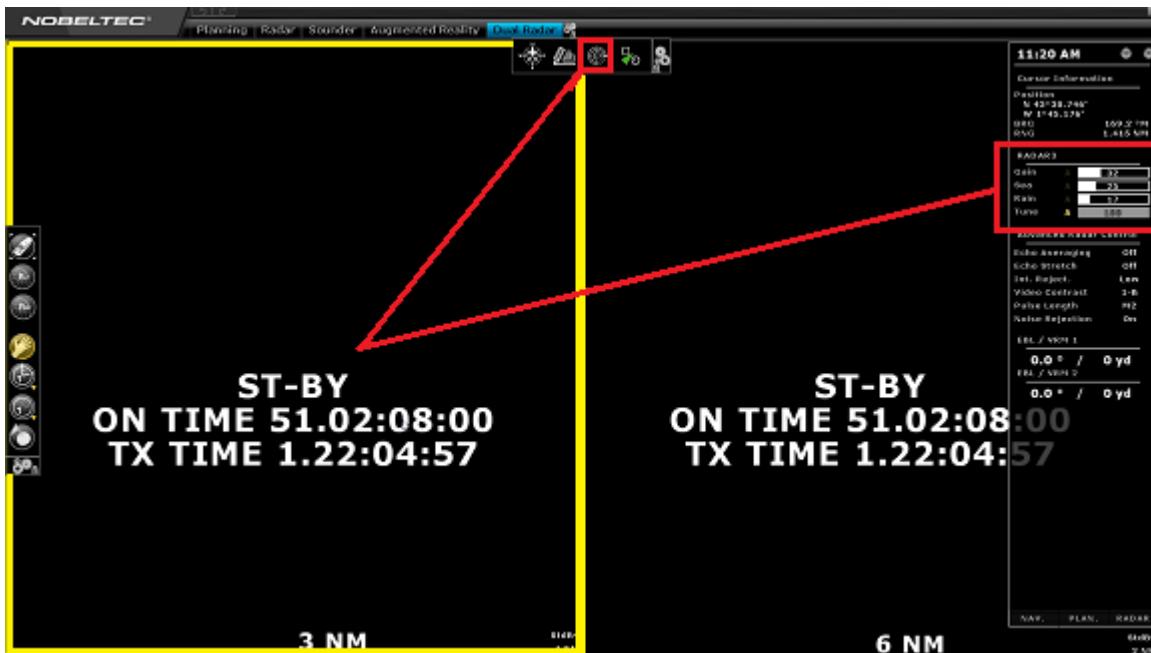
All Furuno DRSxD, DRSxA, DRSxAXClass antennas, have "True" Dual Range radar capability which provides "simultaneous" transmission of both short and long pulse. This allows complete independent control of range, gain, sea clutter and rain clutter for two separate ranges. The DRS-xNXT has also Dual Range 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 TimeZero Coastal Monitoring Single Radar 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 "Radar" button located in the Ribbon and from the Radar NavData:



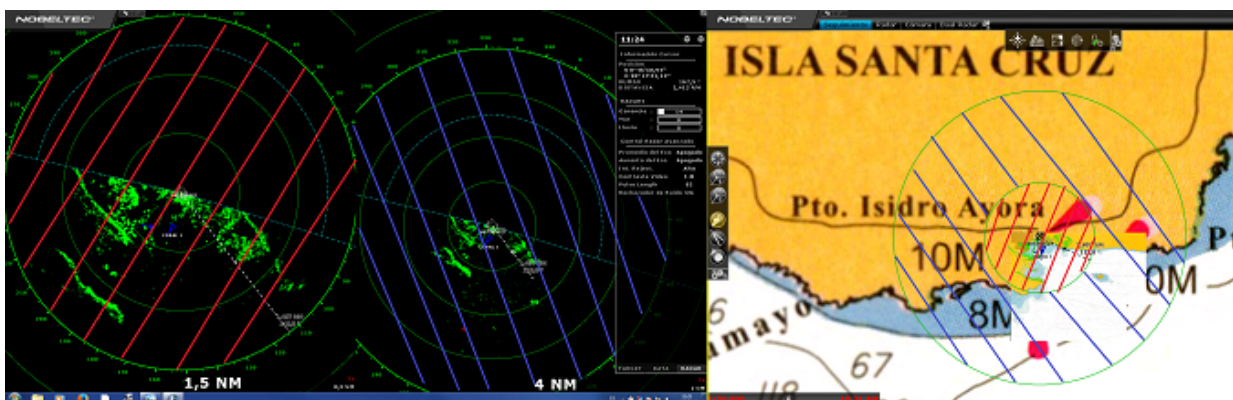
Range A of the DRS can be transmitted with or without Range B. When only Range A of the DRS is transmitting, this allows the antenna to turn at high speed (up to 48RPM at small range). If both Range A and Range B are transmitting (when the DRS operates in Dual Range), the DRS can only turn at 24RPM.

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 "Fusion", "Range A" or "Range B" as a source of the Radar Overlay. For most application, "Fusion" should be used. In this mode, TimeZero Single Radar uses the smallest range (providing the best details thanks to its short pulse length) then "fills the gaps" with the longest range. In the picture below, the small range is used on the picture of the left (Range 1 = 1.5NM). The picture on the right is set with a longer range (Range 2 = 4NM). The overlay is using Range 1 (red stripes) for close targets while range 2 (blue stripes) is used for long detection.



This results in accurate nearby target detection while keeping the advantage of long range detection.

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).

Dual Radar Range control (Fusion)

When using the "Fusion" for the radar overlay on the chart (default), you can select which radar range to control from the Radar Control NavData by clicking on the switch arrow button:



An indication of the range being controlled ("_A" or "_B") will be added to the Radar Nickname.

You can also right click on the DRS Radar icon on the chart and select which range you would like to control:



Click on the Radar Nickname to switch in between range A or range B of the DRS. All the Radar Parameters (Gain, Sea, Rain, etc..) will reflect the settings of the range currently selected.

Dual Radar

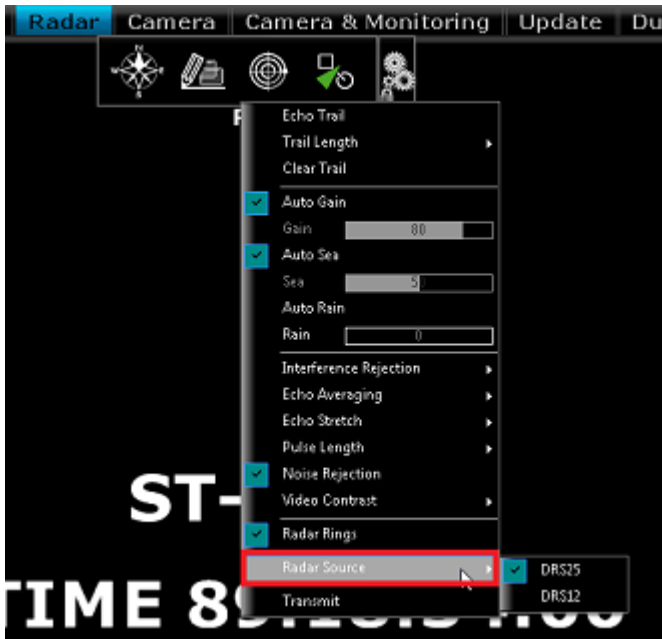
This chapter only applies to TZ Coastal Monitoring Dual Radar when the two radars are connected **locally** to the computer. If you are using TZ Coastal Monitoring Remote (radars that are remotely connected using the Client/Server architecture), please refer to the [Remote Radars](#) chapter.

TimeZero Dual Radars product allows you to connect two Furuno Radars (two DRS or two FAR) directly to the computer. The two Radars connected to the software can be displayed and controlled independently and merged on the chart for seamless integration.

Note: The two Radars and the PC need to be on the same local area network (same broadcast domain). Please note that each radar requires a bandwidth of 15Mbps to transmit the radar video and control. Please refer to the [Dual Radar Setup](#) for setup instructions.

Radar WorkSpace

When selecting the "Radar" WorkSpace, the radar that you want to display can be selected from the "Radar" button located in the Ribbons under "Radar Source":



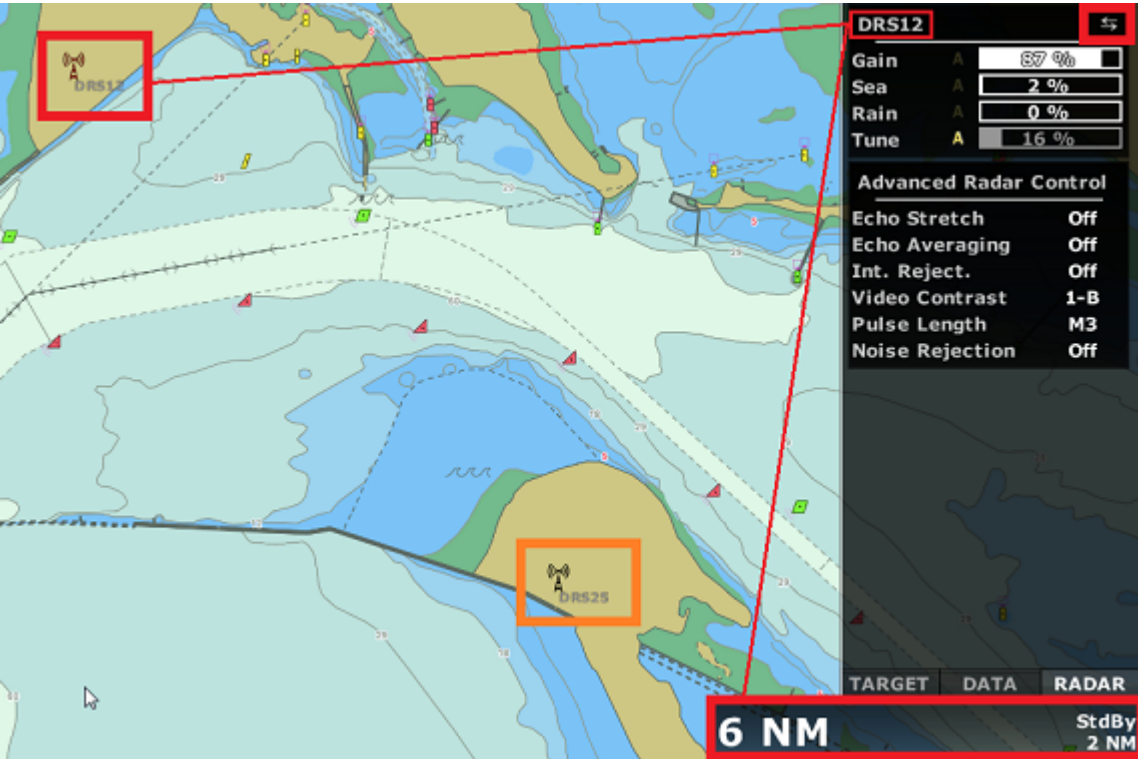
Note: When using a WorkSpace with multiple Radar windows, the Radar Source selection applies to the window which is selected (surrounded by a yellow border).

Each "Radar" WorkSpace will remember its own Radar Source selection.

Radar Overlay

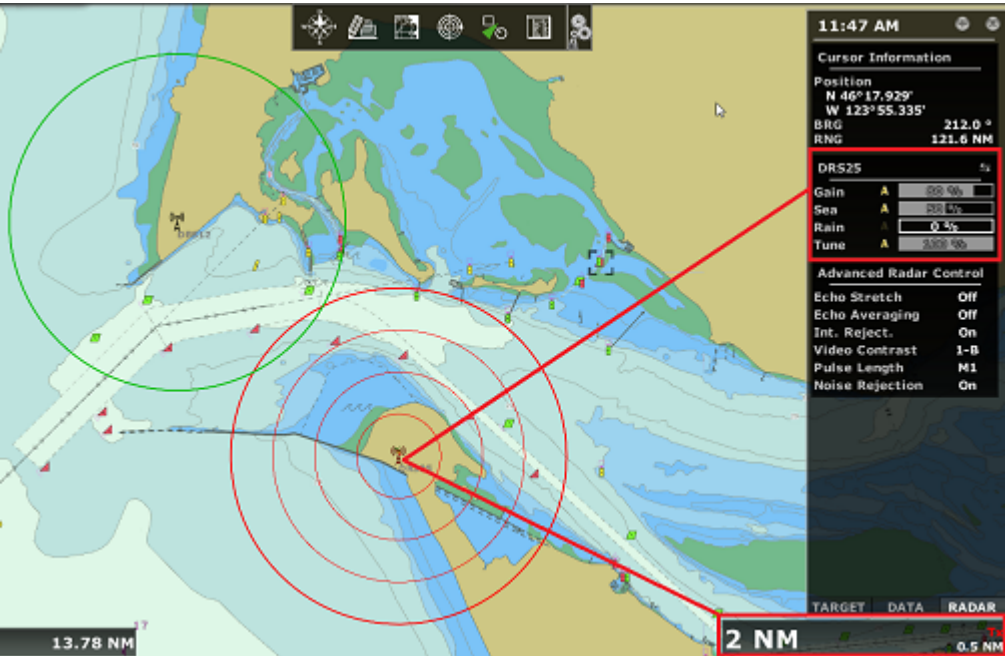
The Radar Overlay on the chart can be turned ON from the Radar button located in the Ribbons. This will automatically transmit both Radars and display them on the screen. The Radar echo are automatically merged.

From the "Monitoring" WorkSpace, you can adjust the Active Radar using the Radar NavData. The Active Radar Nickname is indicated inside the Radar NavData (title) or by putting the cursor over the Radar Range indication (in the lower right of the screen). It is possible to switch the Active Radar selection by clicking on the Radar NavData switch icon or by clicking on the Radar icon that are marked on the chart:



When switching the Active Radar, the range scale and the Radar NavData will automatically switch values to reflect the Active Radar parameters.

Note that the Active Radar rings and icon are displayed in red on the chart:



Note: To change the Range of the Active Radar from the chart, you can add the "Range In" and "Range Out" tools in the Toolbar.

There are two Radar Overlay display modes that can be selected from the Radar Options under "Radar Fusion":

- **Exclusive (default):** This setting should be the best choice for most applications. In areas where both radars overlap, only one radar will be displayed (one radar has priority over the other). The radar that gains priority in the overlapping area is the radar with the smallest range (usually the radar with the best echo resolution). This setting also takes into account the blank sector and properly fills the gap when needed.
- **Merge:** Both radar pictures are merged (displayed on top of each other) in overlapping areas. This setting should be used when the radars are not overlapping. For example, on an oil platform (where two radars are used to cover 360 degrees around the platform), the "Merge" mode would be a better choice.

Remote Radars

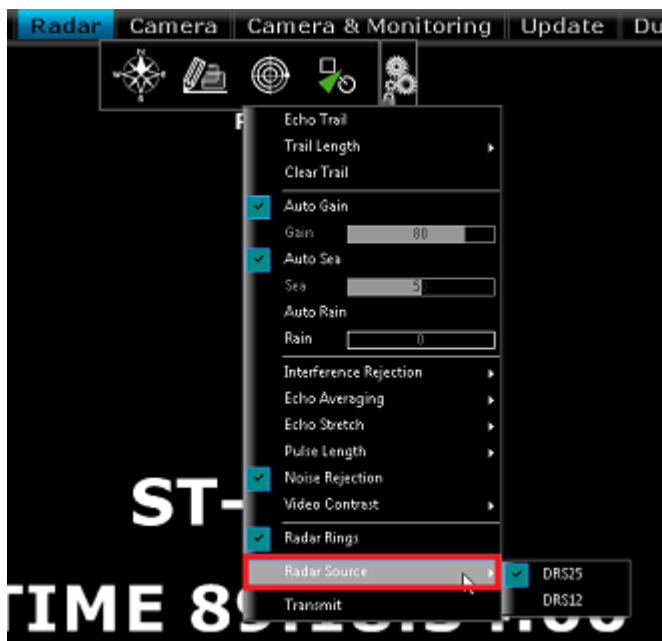
This chapter only applies TZ Coastal Monitoring Remote with radar(s) that are remotely connected using the Client/Server architecture. Please refer to the [TimeZero Remote Introduction](#) chapter for more information.

When you want to view and control a radar from a remote location or when you want to network more than two radars (up to 10), "TimeZero Remote" connected to one or multiple stations (each loaded with their own version of TimeZero) can be used.

Note that some radar controls or radar display options (Radar Trail, Echo Stretch and Video Contrast) are not available when using "TimeZero Remote" (client/server).

Radar WorkSpace

You can control and view the various radars connected to the network from a "Radar" WorkSpace. When selecting the "Radar" WorkSpace, the radar that you want to display can be selected from the "Radar" button located in the Ribbons under "Radar Source":



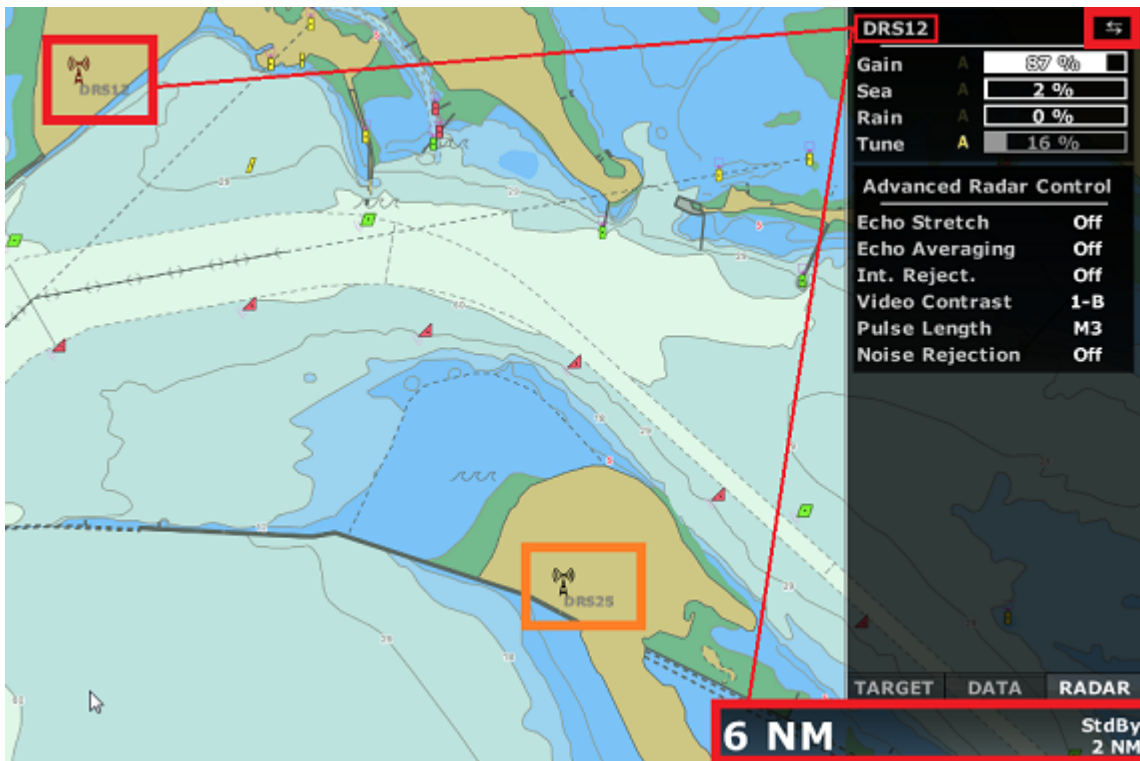
Note: When using a WorkSpace with multiple Radar windows, the Radar Source selection applies to the window which is selected (surrounded by a yellow border).

Each "Radar" WorkSpace will remember its own Radar Source selection.

Radar Overlay

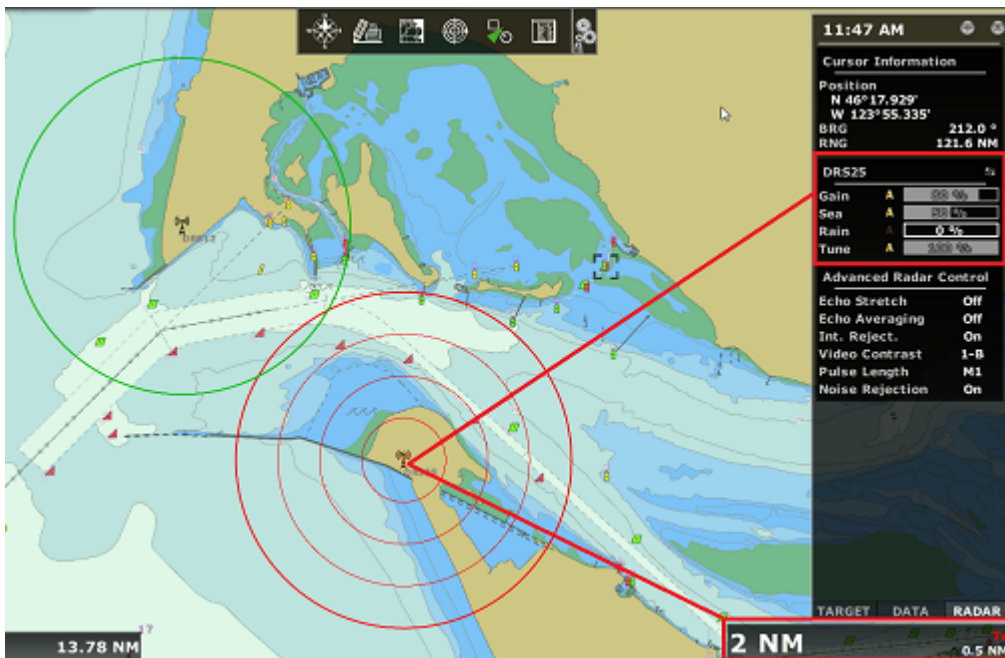
The Radar Overlay on the chart can be turned ON from the Radar button located in the Ribbons. This will automatically transmit all Radars and display them on the screen. All Radar echo from all the stations are automatically merged on screen.

From the "Monitoring" WorkSpace, you can adjust the Active Radar using the Radar NavData. The Station and Active Radar Nickname are indicated inside the Radar NavData (title) or by putting the cursor over the Radar Range indication (in the lower right of the screen). It is possible to switch the Active Radar selection by clicking on the Radar NavData switch icon or by clicking on the Radar icon that are marked on the chart:



When switching the Active Radar, the range scale and the Radar NavData will automatically switch values to reflect the Active Radar parameters.

Note that the Active Radar rings and icon are displayed in red on the chart:



Note: To change the Range of the Active Radar from the chart, you can add the "Range In" and "Range Out" tools in the Toolbar.

Camera

Camera Introduction

Up to 12 cameras can be configured in TimeZero. TimeZero is compatible with AXIS IP Cameras (fixed or PTZ), AXIS IP converters (single or quad converters), FLIR Cameras (M-Series and PT-Series), Pelco-D cameras, fixed H264 Cameras, and ONVIF Cameras.

IMPORTANT NOTE: Please contact us for Pelco-D cameras and ONVIF cameras support. We cannot guarantee that any Pelco-D cameras and ONVIF cameras would work out of the box with TimeZero (especially PTZ cameras). The camera manufacturer may not have implemented all commands that TimeZero needs to control the camera. The only cameras that we can fully support are FLIR and AXIS cameras.

A Pan, Tilt and Zoom camera ("PTZ Camera") can be controlled directly from TimeZero using the AXIS protocol, Pelco-D protocol, FLIR CGI Nexus protocol, and ONVIF Protocol. PTZ cameras that are able to pan 360 degrees and send feedback to TimeZero can be displayed on the chart (field of view) and used for tracking. A camera that is selected to be "Use for Tracking" from the Camera settings page can:

- Display a cone on the chart representing the field of view (FOV) of the camera
- Be [controlled directly from the chart](#) using the right click menu to move or lock the camera to a position, object or target
- Be controlled using a standard USB Joystick connected to the computer (USB joystick needs to be activated from the [Camera Options](#) and [Calibrated](#))

Note: In order for a camera to be displayed on the chart (and used for tracking), it needs to be able to pan 360 degrees and send feedback to TimeZero. Tracking cannot be set on a PTZ "fish-eye" camera such as the AXIS 212PTZ that only relies on digital zooming.

If a camera has PTZ functionality but is not configured for tracking, it will only be possible to control it from the NavData or from the Camera WorkSpace (the field of view, joystick control and right click control from the chart are not available).

The following chapters will describe how to display and control a camera. Please refer to the [Camera Installation](#) Chapter for setup instructions.

Note: If you would like to bring an external display in TimeZero using an HDMI to Ethernet encoder or a USB Video Encoder (DirectShow compatible), do not configure it as a camera source. Rather, configure the external display as a [Video Input](#).

Camera WorkSpace

The Camera WorkSpace is used to display the video feed from a compatible camera. This WorkSpace contains a "Camera", "Camera Control" and "Augmented Reality" buttons located on the Ribbon and can be configured as a full screen or quarter screen.

The "Camera" button allows you to select the video source displayed in the WorkSpace. If the video source is set to "Display Active Camera", the camera source will follow the Active Camera selection. This is very useful when managing multiple cameras. As you change the Active Camera selection (manually or using a [rule](#)), the Camera WorkSpace automatically switches its video source to match the Active Camera selection.

The "Camera Control" button allows you to control specific features of the camera (Home Position, Color Palette, etc...) and to unlock the camera if it has been locked on a target or object. Note that the features available under this button vary with the type of Camera. In the case of a Pelco-D Camera, specific actions and triggers can be configured from the Camera Pelco-D Configuration and can be displayed under this button.

Note: You can also right click on the video screen to change video source and directly access features of the camera.

The "Augmented Reality" button allows you to enable and configure the various Augmented Reality features. Note that in order to be available, the camera setting "Enable Augmented Reality" must be enabled from the Camera option page.

If the camera has Pan/Tilt/Zoom function, it is possible to move the camera by:

- using the virtual joystick available on the lower right corner of the camera WorkSpace
- left clicking on any point on the screen to center the camera on that point
- clicking and dragging the mouse to move the camera (see below)
- using the arrow keys on the keyboard

The camera Zoom can be adjusted by:

- clicking on the "-" / "+" buttons available in the virtual joystick
- using the mouse scroll wheel
- using the "Page Up" and "Page Down" buttons on the keyboard

Note: When displaying a Pelco-D camera, the focus can be changed by pressing and holding the Control key and using the Scroll wheel of the mouse.

Joystick Mode

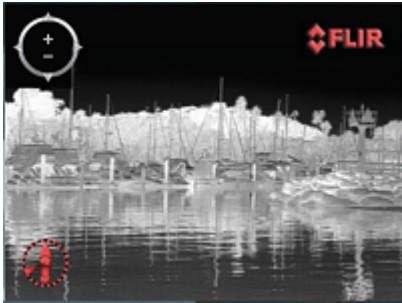
Clicking and holding the left mouse button on the camera screen will display a red arrow originating from the center of the screen to your cursor. You can move the cursor around the screen to change the direction of the arrow and its length. The farther from the center of the screen your cursor is, the quicker the camera will move in that direction:



Camera NavData

The camera image can be displayed in the NavData. This is useful when you don't want to dedicate a full or half screen to camera display. Multiple Cameras can be added to the NavData panel allowing you to keep an eye on multiple cameras at the same time.

To add a camera to the NavData configuration, click on the "+" button (at the top) and select "Camera":



By default, the NavData will use the first video source configured in the software. If you have configured multiple cameras, right click on the NavData to change the video source.

If the selected camera has Pan Tilt Zoom capabilities, a virtual joystick will appear when you roll the cursor over the NavData. This allows you to adjust the camera position and zoom level.

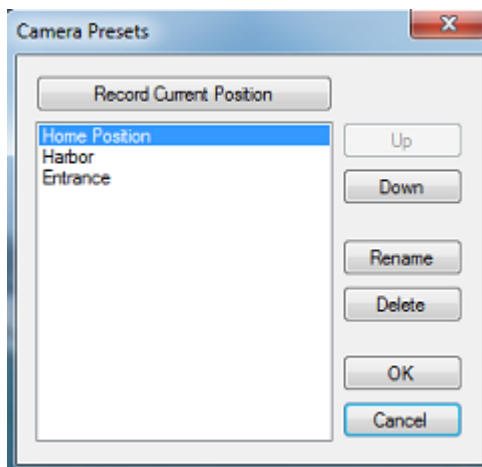
If the camera offers additional controls (such as the FLIR M-Series), right click on the NavData to access them (Scan, Home, Scene, IR/Visible switch, etc...).

When [undocking](#) the camera (dragging the camera image out of the NavData bar), you can resize the camera by right clicking on it and select "Increase" or "decrease".

Camera Presets

Camera Presets can be created to save and recall camera position (Pan/Tilt and Zoom). To store a Camera Preset:

- Select the Camera WorkSpace
- Select the camera you want to adjust from the "Camera" button located in the Ribbon
- Adjust the Camera to the specific position and zoom level you want to save using the mouse or virtual joystick
- Select "Manage Presets..." from the "Camera Control" button located in the Ribbon
- Click on "Add" and enter a name for the preset. At this time, TimeZero will capture all the settings and stores them with the preset name:



Note: Camera presets are stored individually per camera (so you can have different presets when you have multiple cameras).

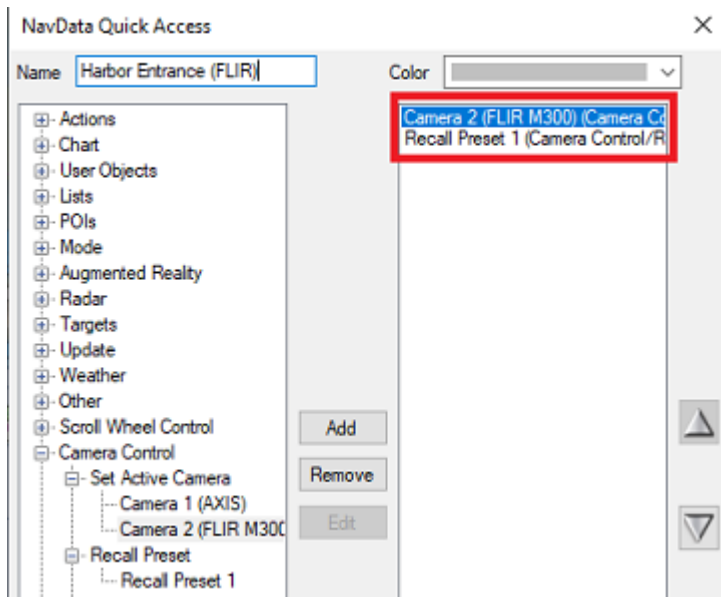
To recall a Preset, click on the "Camera Control" button in the Ribbon and select "Presets":



Camera Presets can also be recalled using Custom Shortcuts that can be setup from the [General](#) Options by clicking on "Customize Functions Keys..." or using a [Quick Access NavData](#).

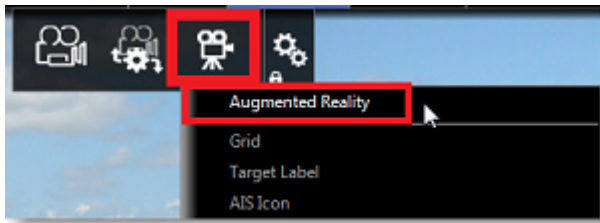
Note that when you recall a preset number using a Shortcut or a Quick Access NavData, the preset number will be applied to the Active Camera if you have multiple cameras configured. If you want a shortcut or a Quick

Access NavData to recall a specific preset of a specific camera, first set the desired camera as the active, and then recall the preset (chain two actions):



Augmented Reality

Various Augmented Reality features can be enabled from the "Augmented Reality" button located in the ribbon (when the camera has been setup for Augmented Reality):



Note: Augmented Reality is available with a fixed or PTZ camera. Please refer to the [setup instructions](#) below.

Augmented Reality Layers

Grid

A thin blue grid can be displayed over the video:



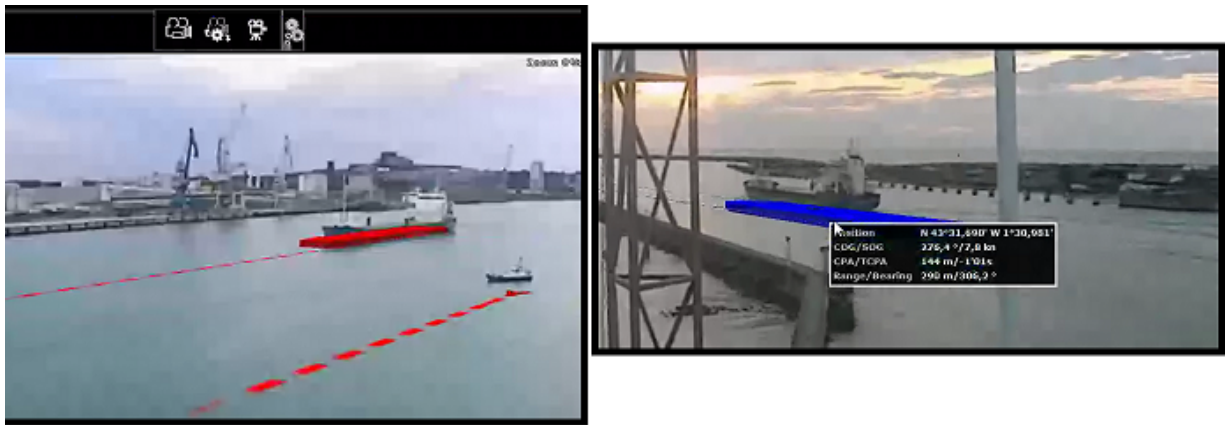
Target Label

A target label can be enabled to display information of ARPA or AIS targets directly into the camera feed. It displays the relative direction of the target, its ID (in case of ARPA) or Name (in case of AIS) and its speed:



AIS Icon

For AIS targets, TimeZero can display the icon and "shape" (if the AIS target transmits its size) directly over the video:

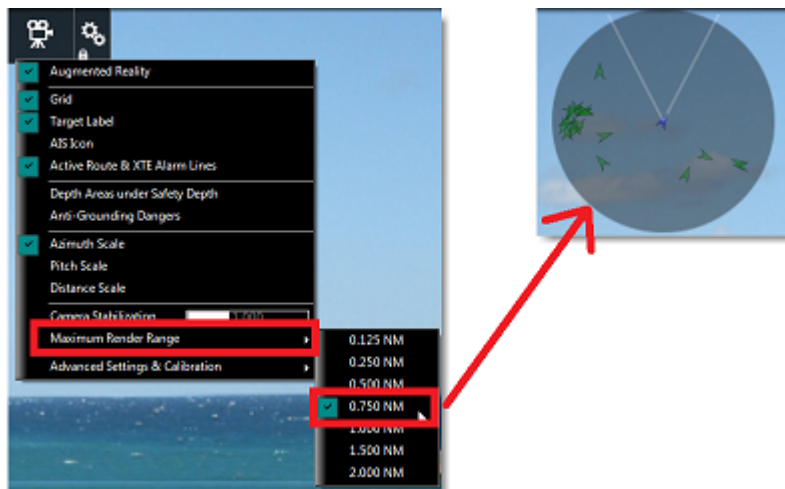


Azimuth, Pitch and Distance Scale

Various scales can be enabled or disabled at the bottom (azimuth) and right side (Pitch or Distance) of your screen. Note that it is not possible to display at the same time the Pitch and Distance scale.

Render Range

Objects that are displayed in the Camera WorkSpace are filtered by range. You can set how far TimeZero should render objects by adjusting the setting "Maximum Render Range". Note that this range is also used by the field of view preview panel located on the upper left corner of the screen:



Augmented Reality Setup

Camera Configuration

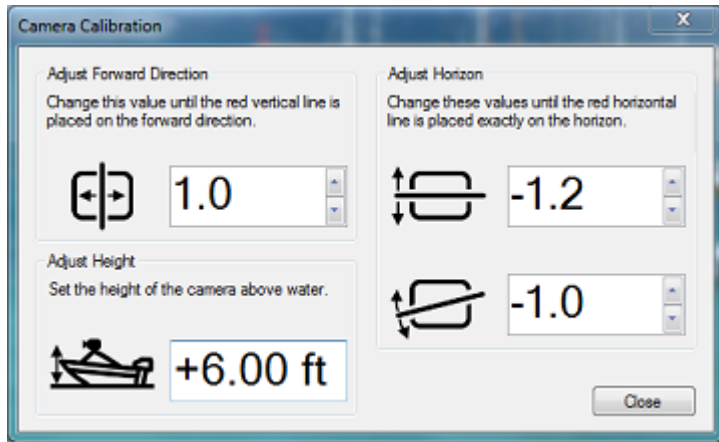
Make sure to select "Enable Augmented Reality" when configuring the camera. With a generic H264 camera or an Axis camera, it is very important to enter the horizontal Field of View of the camera into the "FOV" field of the camera setting. When configuring a PTZ Camera, you have to enter the maximum FOV (when zoomed all the way out) and minimum FOV (when zoomed all the way in). This information can be found in the camera documentation.

Note: There is no need to enter a FOV for FLIR Camera as it is configured automatically.

Initial Adjustments (calibration)

Good calibration is very important to display properly and accurately the various augmented reality layers. To calibrate the camera, select the Camera WorkSpace, click on the "Augmented Reality" button, then select "Advanced Settings and Calibration", and then "Calibrate Camera...".

When calibrating the camera, a heading and horizon reference lines are displayed and the following window appears:



Note: If you are calibrating a PTZ camera, the camera automatically moves into the forward direction when the window is open. Do NOT manually Pan/Tilt the camera when performing the calibration.

First, setup the height of the camera (its height above water) and then use the Horizon and Rotation offset controls to calibrate the camera. To adjust the horizontal and rotational offset, the best is to have the horizon visible on screen. Then, use the two controls so that the horizon reference line matches the horizon as seen through the camera.

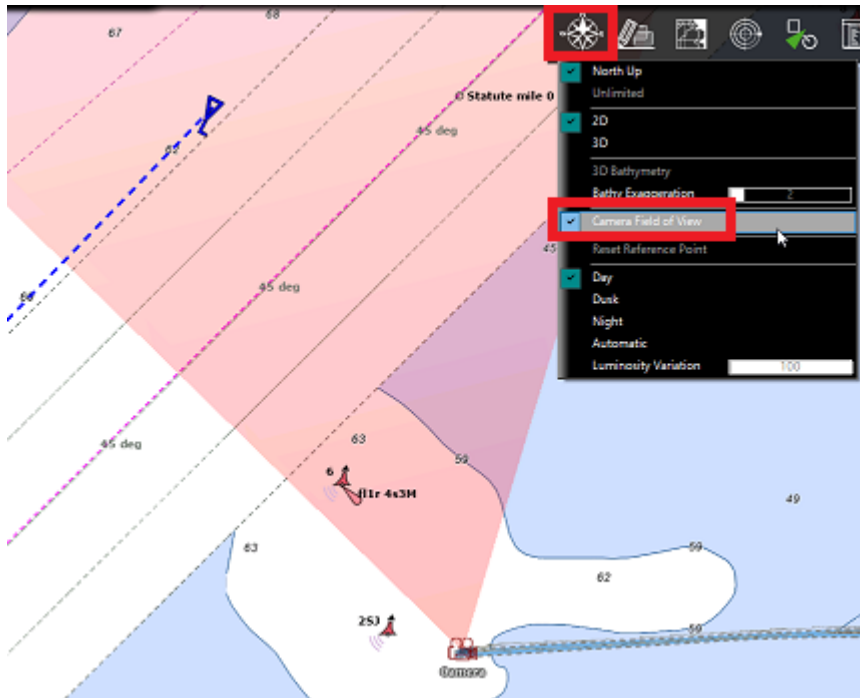
Note: It is not recommended for Coastal Monitoring (fixed) installation to adjust the Forward Direction using this window (only use it to adjust the Horizon and Rotation). It is better to align the camera with a fix object or target that is visible on both the screen and chart. Please refer to [Align the Camera](#) for more information.

Sensor Delay

Some cameras may take longer than other processing data (encoding and transferring the video over the network). Also, according to your computer CPU, decoding the camera video feed might also add some lag to the overall process. In order to better "synchronize" the sensor data (heading / pitch / roll) with the video feed, it is possible to introduce a lag to the Heading and Pitch/Roll data by adjusting "Heading Delay" and "Pitch & Roll Delay" available under "Advanced Settings and Calibration".

Controlling & Tracking from the Chart

A camera that has been configured to be used for tracking in the Camera Options can be controlled from the chart and used for tracking (if it is a PTZ Camera). A cone representing the field of view of the camera is displayed when "Camera Field of View" is selected from the "Mode" button located in the ribbon:



Note: The FOV color can be changed from the [Camera Options](#)

To control the camera, just right click on the chart, an object or a target and select "Move Camera Here". When using the "Move Camera" command, the camera will move in that direction one time, but TimeZero will not update the camera position as the target moves. If you want TimeZero to continue tracking the object or target, right click and select "Lock Camera":



When a camera is locked, the cone (FOV) appears with a brighter color and a black line is displayed in between the camera location and the object to track. To unlock a camera you can:

- Move the camera manually (by initiating a new "Move Camera Here" right click or using the Joystick)
- Use the "Camera Control" button and select "Unlock Camera" (make sure that the tracking camera is active)
- Right click on the camera and select "Unlock"

Important: The tracking is automatically disengaged as soon as you manually take control of the camera.

The camera can also be moved using the "Move Camera Here" tool (hidden by default):



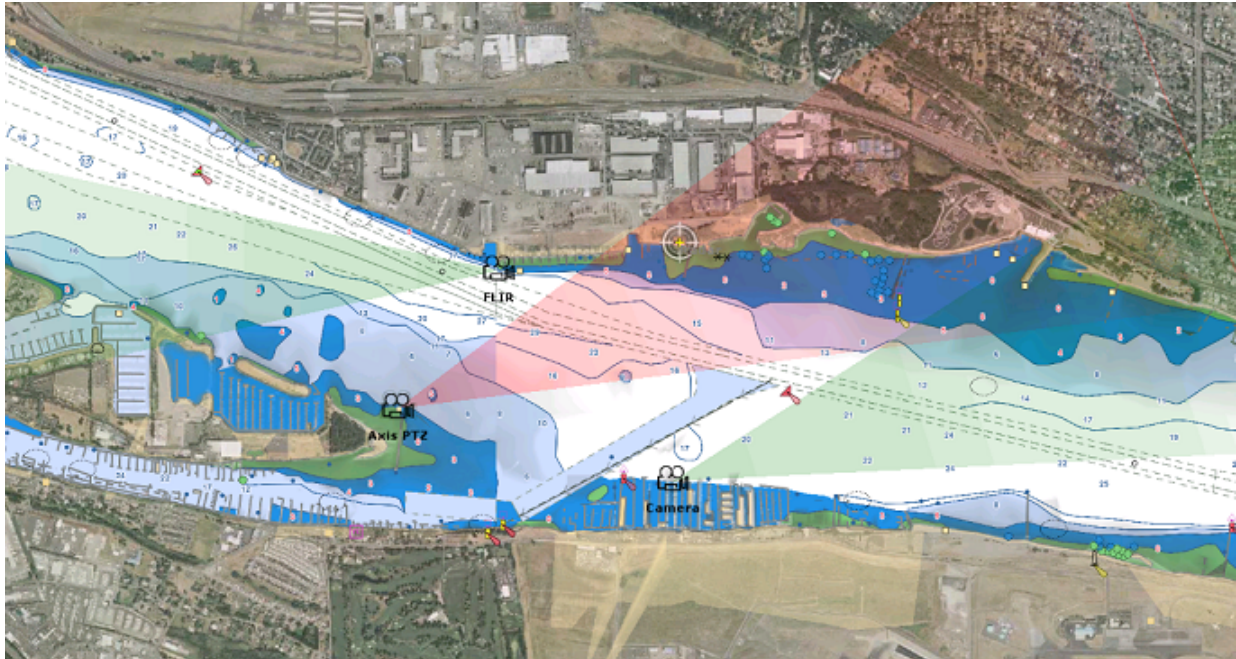
When clicking on the chart, this tool will initiate a "Move Here" command. However, if you click on a target, this tool will initiate a "Lock Camera" command automatically.

Controlling Multiple Camera

When multiple Tracking Cameras are configured, they will all appear on the chart.

Active Camera

Note that at any time, only one camera is "Active". The Active Camera cone is displayed in red and the other cameras cone are displayed in green (this can be changed from the [Camera Options](#)):



To activate a specific camera, you can simply click on its icon from the chart or change the active camera selection from the "Camera Control" button in the ribbon.

The active camera is the camera that will be controlled when using a USB Joystick. The concept of Active Camera is also very useful to change the video source of the Camera WorkSpace and NavData automatically. Select "Active Camera" as a video source in the Camera WorkSpace or Camera NavData. Whenever you click on a camera icon, this will activate that camera and automatically switch the video source to reflect the selected camera.

TIPS: You can also set shortcuts or [Quick Access NavData](#) to select the Active Camera.

[Rules](#) can also control and activate specific cameras. This allows automatic camera tracking and automatic video source selection to draw the attention of the operator when a target enters an area.

Chart Control Mode

By default, when right clicking on the chart to move or lock a camera, TimeZero automatically selects and activates the closest camera. For most application this behavior should work. However, in specific cases, the closest camera might not be the best one. Other mode can be selected from the [Camera Options](#):

- **Closest Camera (Default):** when this option is selected, TimeZero simply sends the move/lock command to the closest camera.
- **Active Camera:** when this option is selected, TimeZero sends the move/lock command to the current active camera. It is the responsibility of the operator to activate manually the correct camera before initiating the move or lock function.

- **List Closest 2 Cameras:** when this option is selected, TimeZero will look for the two closest cameras and list them in a sub-menu. This allows the operator to select the best camera to use and initiate the move/lock command in one click.
- **List All Cameras:** when this option is selected, TimeZero will list all cameras in a sub-menu. This allows the operator to select the best camera to use and initiate the move/lock command in one click.
- **Closest 2 Cameras:** when this option is selected, TimeZero will send the move/lock command to the two closest cameras, controlling two cameras at the same time.

Record & Replay

Introduction

The "Record & Replay" module needs to be configured to access this feature.

The user can set TimeZero to record Targets (AIS and ARPA), Radar Echo, Camera(s) and up to 4 Audio channels (from microphone or VHF). The data can then be replayed from any WorkSpace that has been configured with a time line. Various [Record & Replay](#) Options allow the user to select which data to record, and in the case of Radar and Camera, the frame rate and quality can be adjusted to save space. For Audio recording, any microphone or line input that are recognized by Windows can be used. However, if you plan to record more than two channels, we recommend using a dedicated external audio interface (refer to [Audio Interface](#) for more information).

TimeZero can store and playback up to 30 days of data that can be replayed immediately. When the recording limit is reached inside TimeZero, the data is either automatically deleted or archived. If an archive location has been selected (second Hard Drive, NAS, ...), the amount of data that can be stored is only limited by the size of the hard drive itself. Data that has been archived cannot be replayed directly by the software that is currently recording real time data, but can be replayed from another computer loaded with another copy of TimeZero. Please refer to the [Archiving](#) chapter for more information.

IMPORTANT: A solid state hard drive is required to support recording and replaying data in TimeZero

Enabling Recording

By default, TimeZero is set to record Targets and Events. Radar, Video and Audio recording can be enabled from the [Record & Replay](#) Options. Please note that Video and Radar recording can take lots of space! To save space, it is possible to decrease the recording frequency and the quality of the Radar and Video.

Recording automatically starts when the software is opened.

Recording Space (average):

- Events Recording: events recording is approximately 1MB per day (when TimeZero generates lots of events).
- Target Recording: approximately 200MB per day (200 AIS targets and 30 ARPA targets at all times).
- Radar Recording at maximum frequency (every radar turn) in high quality: approximately 1GB per day for a properly tuned radar picture. Decreasing the resolution to "normal" or "low" would reduce the size by a factor of 3 or 9 respectively. Decreasing the recording frequency would divide the size of the recording by the same amount. Lowering the Radar Quality (from 8 to 2 bits) would save 30% space. If space is an issue, we recommend lowering first the quality (4 bits for example), then the recording frequency and then the resolution. A good compromise in between quality and size would be recording in High Resolution at 4 bits every 2 antenna turn. This would result in 500MB per day. Note that noise and echo from landmass can greatly increase the size of the recording. Please refer to the [Radar Mask](#) chapter to learn how to "clean" the Radar picture and remove unwanted echo on landmass.
- Video Recording continuously at one frame per second and 50% quality: approximately 3GB per day per camera. It is possible to reduce the size by decreasing the recording frequency (recording a picture every minute will divide the space by 60!) or decreasing the quality (going from 50% to 30% quality will save 30% space). It is also possible to dramatically reduce the size by only enabling video recording when the camera is tracking a target (not recording when the camera is idling). This mode can be enabled from the [Record & Replay](#) Options.
- Audio Recording: 300MB per day per channel for [continuous recording](#). However, user can adjust an "Audio Recording Threshold" allowing to not record silence (the threshold should be adjusted just above the background noise). In that case, with a 10% utilization, the audio recording drops dramatically.

A 500GB Solid State Hard Drive should be enough space to hold the operating system, software, charts and one month of active recording. If the remaining disk space falls below 20GB, a first alarm will be triggered in

TimeZero ("Disk Low Space Alarm"). It is recommended to adjust the archiving process by decreasing the amount of day recorded if you see this alarm. If nothing is done and if the hard drive falls below 5GB, a "Disk Full Alarm" will be triggered and the recording of data will stop to avoid overfilling the disk.

Events

Events "bookmark" important moments so that they can be easily retrieved from the Event List or Time Line when playing back the data. Events are created by TimeZero when:

- The software starts or exits (automatic)
- The user creates a manual event
- A rule is set to record an event

Creating Manual Events

"Manual Event Log" can be manually created by the user to mark and retrieve specific moment from the event list. To manually record events, customers can click on the "TimeLine Event" button located in the Toolbar:



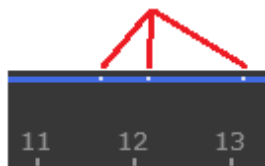
As soon as a manual event is created, a window will appear allowing the customer to give a title, description and a priority to the event. After validating the prompt the event will be created.

Create Events from Rules

Rules can be setup to create events automatically (from the [Alarms](#) Option). Simply select "Create Event" from the "Actions" tab of the Rule definition. You can click on "Parameters" to either use the Rule Name or a custom text as the event name.

Find Events

Events will be listed in the Event List and displayed on the Time Line with small white dots:



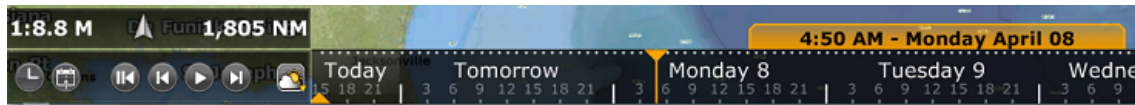
Please refer to the [Replay Data](#) chapter for more information.

TIPS: If a rule is set to move and activate a camera when a target enters an area, it can be a good idea to set that rule to also trigger an event. That way, it will be very easy to locate at which time a target entered an area, and when to look at the camera replay.

Replay Data


The "Record & Replay" module needs to be unlocked to access this feature.

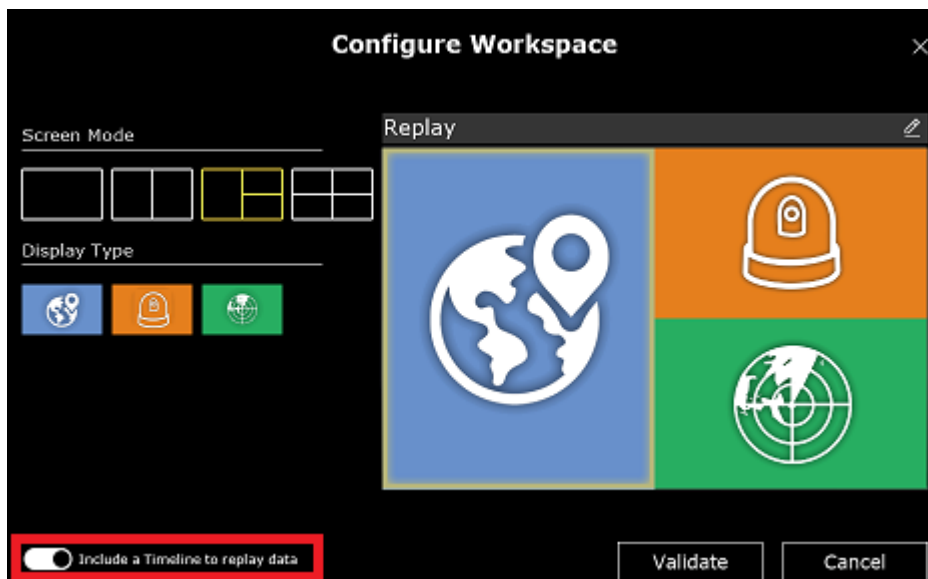
The Analyze WorkSpace contains a Time Line or "Virtual Time Control" at the bottom of the screen. It is used to [Animate Weather Forecast](#) when shifting the time in the future, but it can also be used to replay data that has been previously recorded with the "Record & Replay" module (up to 30 days) when shifting the time in the past.



Create a WorkSpace with a Time Line

By default, TimeZero configures the Analyze WorkSpace with a Time Line so that it can be used to replay data out of the box. However, you can create and name your own WorkSpace (with a Time Line) that may contain one or multiple displays (such as a split screen in between chart, camera, and radar).

To create a new WorkSpace, click on the "+" icon  located at the top right of the screen. This opens the WorkSpace configuration window. Select your screen configuration (full screen or split-screen), the type of display you would like to replay, and turn ON "Include a Timeline to replay data". Make sure to only select displays that can be replayed (for example, the video input or update displays cannot be configured in a WorkSpace with a Time Line):



Use the Time Line to replay data

Time Line Operation Mode:

The Time Line has two modes of operation:

- In "Live" mode, the WorkSpace displays real time data. The date and time marker are displayed in blue (updated continuously with the current date/time) and the "Actual Time" button is displayed in yellow:



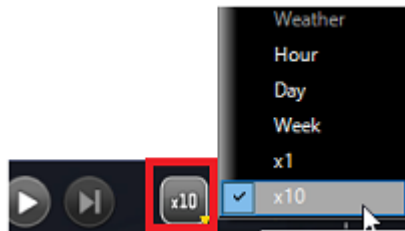
- In "Virtual" mode, when the time is shifted **in the past**, the WorkSpace displays recorded data. The date and time marker are displayed in yellow:



Note: Before replaying data, make sure that the appropriate information is displayed on screen. For example, if you want to replay radar echo on the chart, you will have to enable "Radar Overlay" from the "Radar" button in the ribbons.

Time Line Scale:

The Time Line offers various time scale that can be selected to replay data at various speed. Simply left click on the button below to select your time scale:





After selecting the scale, you can scroll through time by dragging your mouse over the Time Line:



TIPS: You can also use the mouse wheel to change the time: put your cursor over the time line and use the scroll wheel.

Time Line Control:

The Time Line includes various controls to replay recorded data:

- If you want to replay a specific amount of time from the current play head position, click on the "Replay Last" button: . You can change the amount of time (default 1 min.) by right clicking on the "Replay Last" button (1, 2, 5, 10, or 15 minutes). Note that when clicking on this button, the TimeLine scale will change to either X1 (when replay last is setup for 1 minute) or X10 (for all other values).
- To reset the virtual time to current time, click on the "Now" button: . This will set the Time Line to real time and live data will be displayed.

- To step forward and backward through the various Events, click on the "Step Back/Forward" buttons:

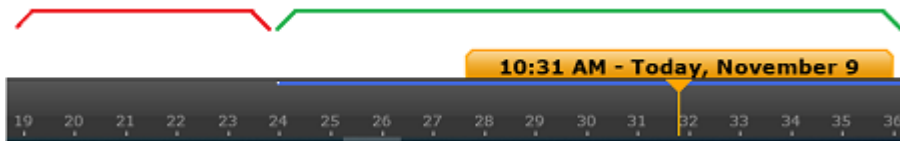


- To set the play head to a specific date, click on the "Calendar" button:



Time Line Recording indication:

A blue line on the Time Line indicates the presence of recorded data:

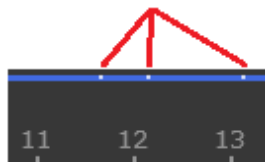


Retrieve Specific Events

Using Events

Events are used to "bookmark" important moments so that they can be easily retrieved from the Event List or from the Time Line. Some events are automatically created by TimeZero and are categorized as "System Event" (for example whenever the software is started or stopped or whenever an alarm is triggered). Events can also be created by Rules and are categorized as "Rule Events" (for example, each time an AIS enter a forbidden area). Events can also be created manually by the user by pressing the "Manual Event Log" button that can be configured in the toolbar. Those events are categorized as "User Events" and can be useful to record all kind of external events (for example whenever a VHF distress call is received). Finally "Audio Events" can be created whenever TimeZero detects activity in the audio channel(s). Note that "Audio Events" are dynamic: you can enable, disable them, or even choose the threshold (audio activity duration) at which they will be listed in the Event list from the Record & Replay Options.

Events are displayed on the Time Line with small white dots:



User can "jump" from event to event by using the "Step Forward" and "Step Backward" button available in the Time Line.

Event List

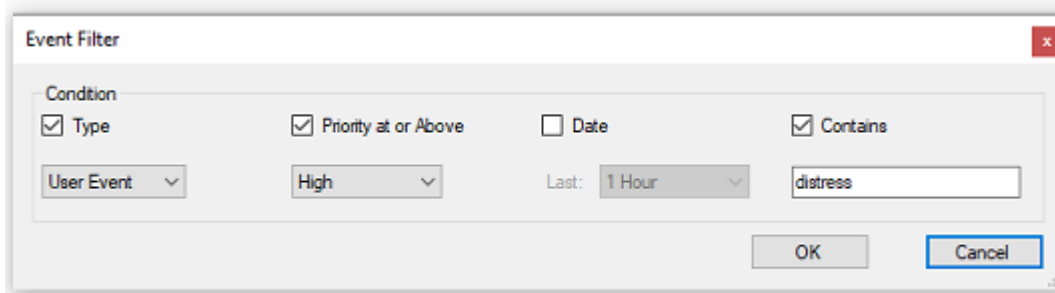
The Event List can be open from the "Lists" button in the Ribbon:

Event Type	Date	Title	Description	Position	Source ID	Source Name	Priority
User Event	1:44:42 PM Wednesday, November 9, 2022	VHF Call	Distress call receive via VHF	N 45°54.065'; W 123°58.206'			High
Rule Event	1:44:12 PM Wednesday, November 9, 2022	AIS in dangerous area	This is a description	N 45°53.411'; W 124°10.396'	367060690	FAITH II	High
System Event	10:23:56 AM Wednesday, November 9, 2022	Software Started		...			Medium
System Event	2:39:38 PM Tuesday, November 8, 2022	Software Stopped		...			Medium

By default, Events are sorted by date with the newest events at the top of the list, but you can sort using any column (by clicking on the column header). The rows displayed in the list can be customized by clicking on the "Action" button (available on the right side of the List header) and choosing "Configure List".

Note: The Event List can be exported in a file (text format) or copied to the clipboard by selecting "Export List" or "Copy to clipboard" 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 the events that are displayed in the list using various criterias:

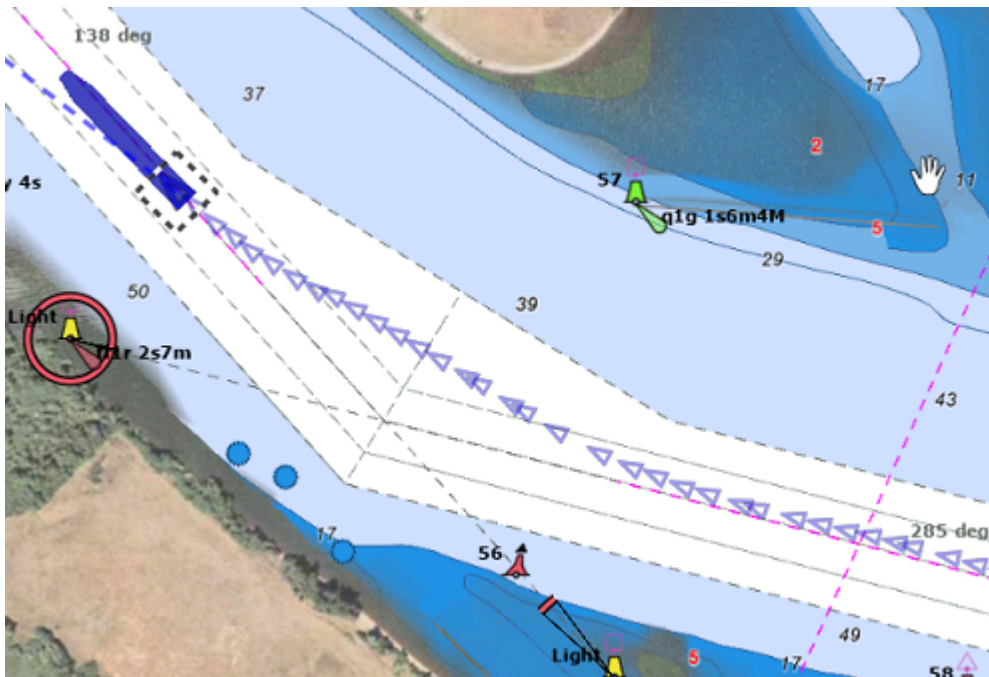


When the list is filtered, a green check-mark will be displayed in front of the Filter button. Simply click again on the same button to remove the filter.

Once you have found the event you are looking for, you can click on it from the list and TimeZero will automatically adjust the date of the Time Line to match that event.

Using Trail and Track

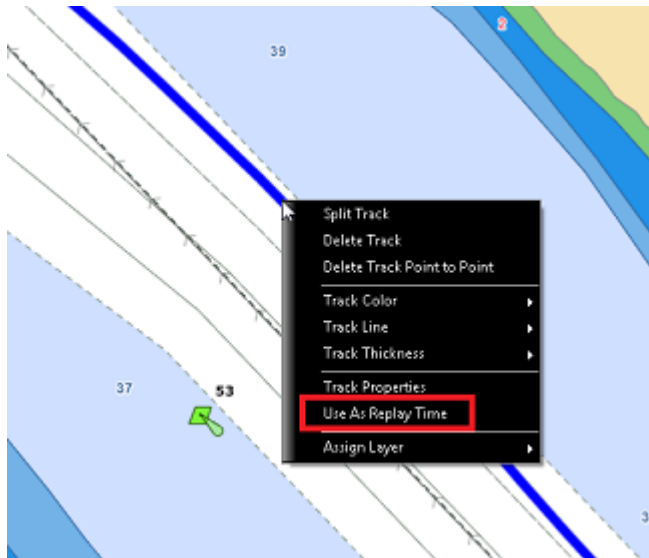
When the play back is paused in the past, it is possible to click on any recorded target to show its trail. This will automatically display on the chart all the past positions recorded in the database:



If you click on one of the trail icons, TimeZero will automatically adjust the time line to that date.

Note: The trail length is using the same settings as real time target trail from the [Targets Options](#)

Note that if you have a track displayed on the chart (that might have been recorded manually or automatically), it is possible to set the time line to the date at which this specific track was created (time embedded in the track under the cursor):



This is very useful to find and see the target that created the track originally for post analysis.

Archiving

The "Record & Replay" module needs to be configured to access this feature.

TimeZero can store and playback up to 30 days of data in its memory (this time limit is set to 7 days by default). Recorded data is stored by default on the local hard drive inside the Windows "ProgramData" folder. You can adjust the time limit (in between 3 and 30 days) and choose if the old data is deleted or archived from the [Record & Replay](#) Options under "Archive".

Note: For most application, you don't need to select the maximum number of days (30 days). In order to save space on the local hard drive and free up resources in TimeZero, it is recommended to only select the number of days you need for instant and immediate replay within TimeZero. Just select the number of days you need for instant and immediate data access knowing the fact that you can always setup a backup location for older data.

If you select to archive the old data, TimeZero will prompt you to select an archive folder (located usually on a secondary Hard Drive, secondary Partition or on a Network Storage). TimeZero will automatically transfer the oldest data continuously (data that would be older than the setting). For example, if you set the limit to 7 days (default), TimeZero will automatically transfer any data older than 7 days from the local hard drive to the backup location.

When a backup location has been selected, the amount of data that can be stored is only limited by the size of the hard drive. If the archive drive becomes full, the oldest data on the archive location will start to get purged weekly (to make more space for newer archived data).

If something happens to the archive location, an alarm will be raised explaining the problem ("Disk Full", "Disk Lost"). Archiving will resume automatically after fixing the problem.

Note: If you have set the limit to 30 days, but if your local hard drive has not enough space to store all the data, a first alarm will be triggered in TimeZero ("Disk Low Space Alarm") if the remaining disk space falls below 20GB. It is recommended to adjust the archiving duration by decreasing the amount of day recorded if you see this alarm or make some room on the drive. If nothing is done, and if the hard drive falls below 5GB, a "Disk Full Alarm" will be triggered and the recording of data will stop to avoid overfilling the disk.

Extracting Recorded Data

The "Record & Replay" module needs to be configured to access this feature.

Using the Accident Backup

TimeZero offers a quick way to backup and extract a short amount of recorded data to the Hard Drive of the computer or to an external media (USB Jump Drive, external Hard Drive, etc...) by using the "Accident" tool:



Note: If the "Accident" tool is not displayed in the Toolbar, click on the "Configure Tools" button (at the lower end of the Toolbar) to add the "Accident" tool to the configuration

This tool is useful when you want to backup and secure recent events after an accident or incident just happened.

As soon as the "Accident" tool is pressed, a window allowing to select the length of backup (always from current time) appears on screen:



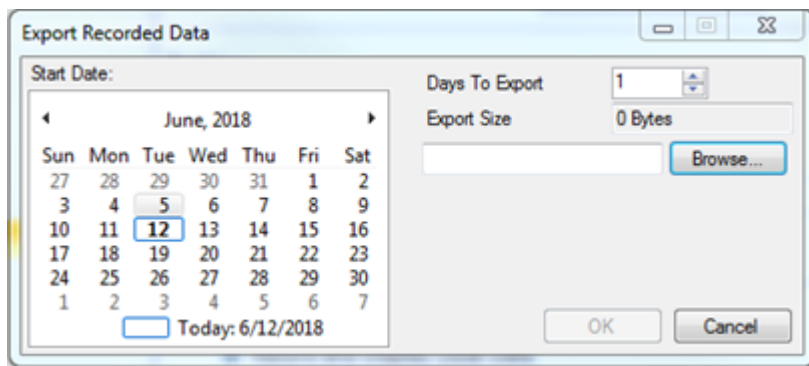
Select the backup duration then click on "Browse" to select a destination (USB Drive, Network Hard Drive, Folder,...).

Click on "OK" to start the copy of the data to the backup location.

Note: This will NOT erase the data currently recorded on the computer. The Accident tool allows to duplicate the data to a backup location. The next time you press the "Accident" tool, the duration and destination will be already fill with previous settings allowing you to just press "OK". We recommend using a 8GB USB Jump Drive.

Using the Record & Replay Options

Data that has been recorded in TimeZero (but not yet Archived) can be extracted from the [Record & Replay](#) Options by pressing the "Export Recorded Data..." button and selecting a starting date and a duration:



Choose the starting date using the calendar and the number of day(s) you wish to export.

TIPS: The days with available recorded data will appear in bold.

Once your time span has been defined, click on "Browse" to select a destination (for example a USB Drive) and click on "OK". TimeZero will create a folder named "TZ Backup yyyy-mm-dd" containing the recorded data for that starting date and duration.

Note: Data that has already been archived will not appear in the software and the procedure above cannot be used. Please refer to the next paragraph to extract recorded data from the archived location

Using Windows Explorer (for Archived Data)

Data that has been archived is not available anymore inside TimeZero (it is unloaded to free memory) and as such, the "Accident" tool or the "Record & Replay" Options cannot be used to export archived data. Instead, you just need to use Windows Explorer to browse to the archive location. The data is organized in various weekly sub-folders. Simply copy the folder corresponding to the week you want to extract. If you want to replay a range of days occurring in between two weeks, simply copy the two week folders.

Replaying Data that has been extracted on another computer

If you want to replay archived data, you need to use another copy of TimeZero on a second computer. Note that it is not necessary for the secondary computer to be connected to the instruments. Simply double click on one of the Archive file located in the week folder you extracted. This will open TimeZero in "Replay Mode" and replay all the data that was included in the same week folder. The only setting that we recommend to adjust on the second computer is the Initial Reference position (set it to a location close to where the data was recorded).

Select "Display Archived Data" from the [Record & Replay](#) Options under "External Playback". Disregard the warning (that explains that this computer cannot record any live data) and browse to the location of the extracted data.

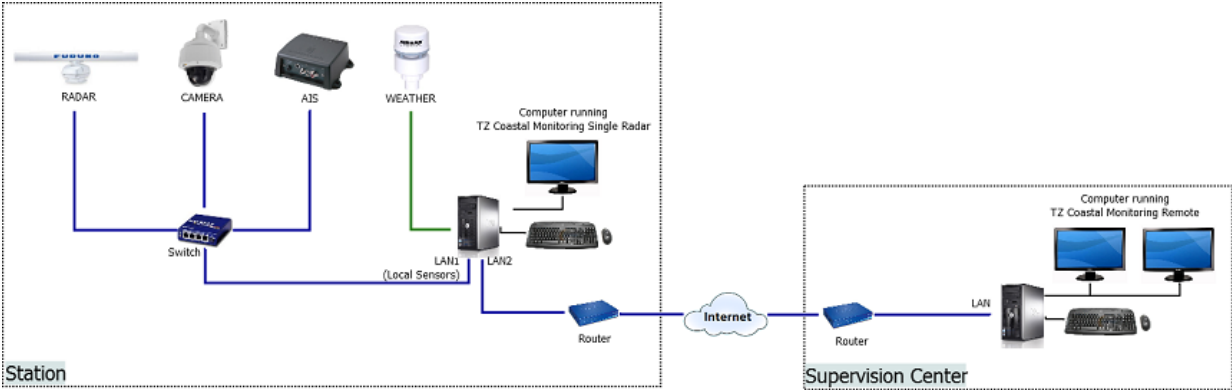
Select the "Analyze" WorkSpace, set the Time Bar to a Replay Speed mode and click on the "Calendar" button. Days containing recorded data will appear in bold. Click on OK and replay the data using the Time Bar control.

Note: Just like replaying real time data, the various layer of information (AIS, ARPA, Radar Overlay) should be turned ON from the Ribbon buttons.

Remote Control

TimeZero Remote Introduction

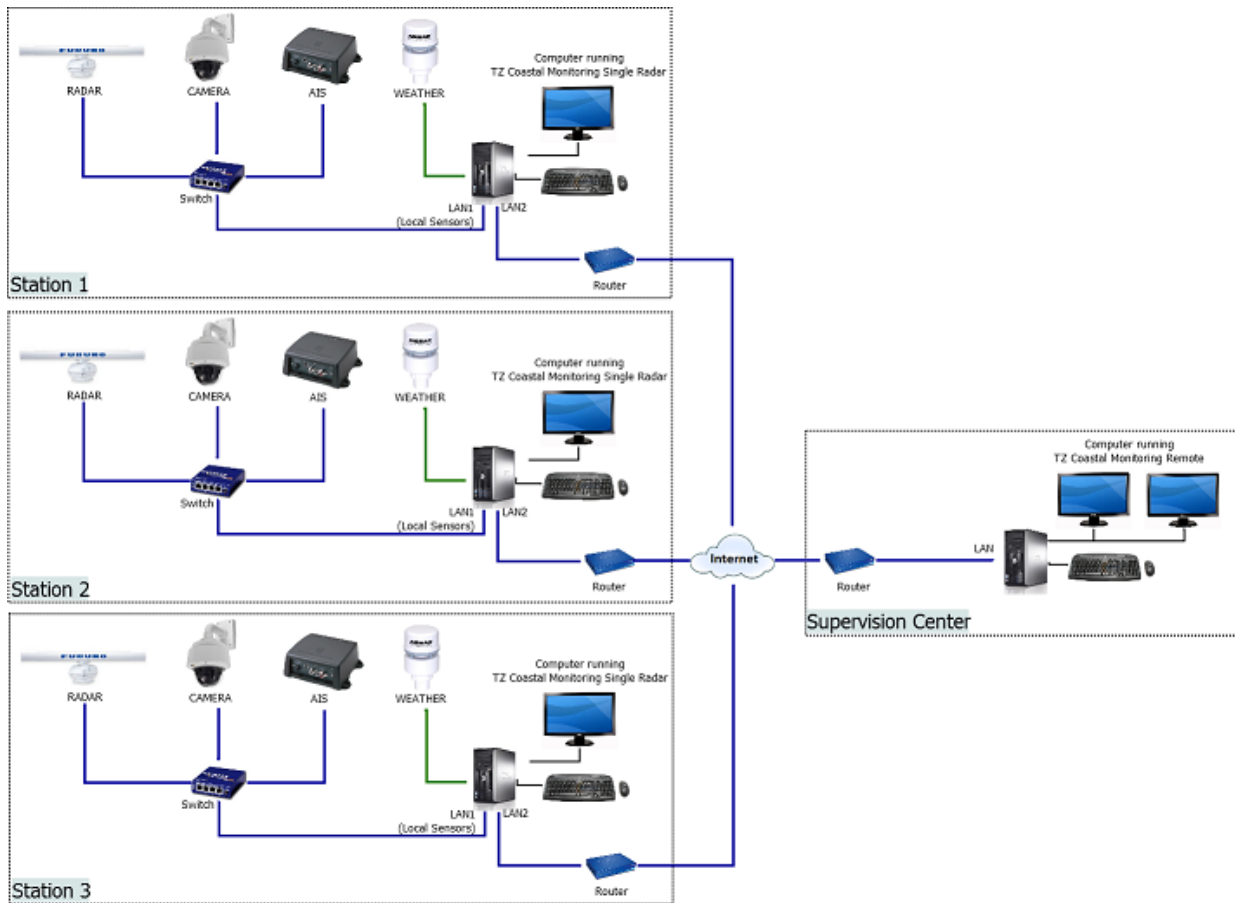
TimeZero Coastal Monitoring (Single or Dual Radar) and TZ Professional (with TZ Host Output module) can act as a "server" and send their data (Radar, AIS, Camera, Weather Station) to a remote computer loaded with TimeZero Coastal Monitoring Remote. The remote computer does not need to be on the same local network as the sensors and an Internet connection can be used to transfer all the data from the "Station" to the "Supervision Center":



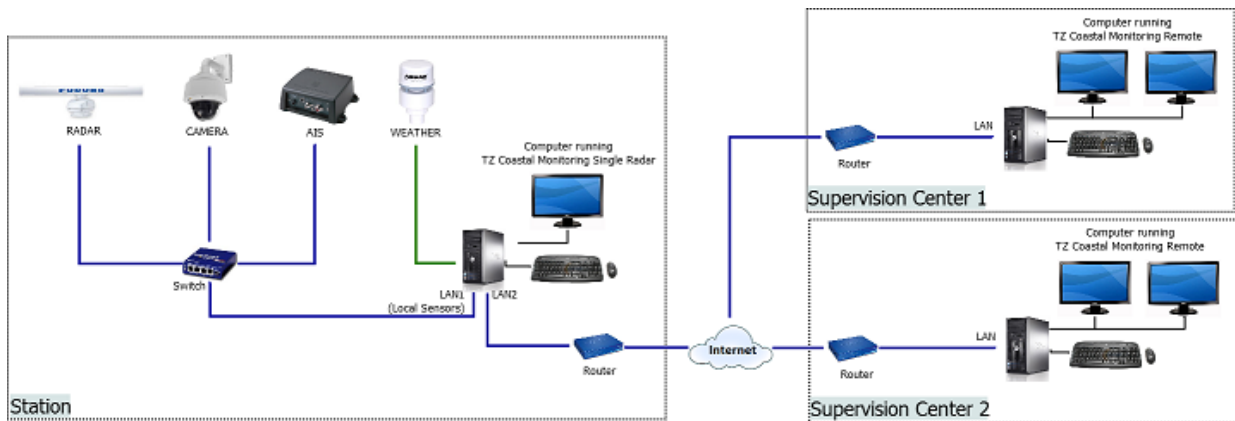
The computer which is directly connected to the sensors (on the "station" in the above diagram) compresses all the data (Radar, Camera, Target and Weather data) before sending it over to the remote computer. The amount of compression (linked to quality) can be adjusted to accommodate various type of connection (DSL, 4G cellular,...). Note that the Remote Computer will also be able to control remotely the Radar(s) and Camera(s).

Note: TimeZero Coastal Monitoring Remote cannot be connected directly to local sensors. It can only get its data through another computer.

Another advantage of using Coastal Monitoring Remote is that multiple Stations can be combined allowing large area (with up to 10 radars and 12 cameras) to be monitored from one computer. Below is an example with 3 stations (3 radars):



It is also possible to connect multiple Remote computers (up to 10) with individual "Rules" and Alarms to the same "group" of sensors (for example, if the data needs to be monitored from multiple locations). Below is an example with two Coastal Monitoring Remote:



Finally, it is possible to mix land-based stations (equipped with TZ Coastal Monitoring Single or Dual Radar) and patrol vessels (equipped with TZ Professional and the TZ Host output module).

Network Setup

The Remote Architecture requires the following components:

- TZ Coastal Monitoring (Single or Dual Radar) or TZ Professional (with TZ Host output module) loaded on a computer connected locally to sensors (Radar, AIS, Camera, Weather Station). This computer will act as a "server" and may or may not be used by a local operator.
- TZ Coastal Monitoring Remote loaded on a computer. This computer will act as the "client" and display all the data coming from all the servers connected to the network. This computer will also be able to control the Radar and Camera of the local station.
- One TimeZero Host loaded on a computer. The "TZ Host" is a small software that can be loaded on any computer on the network (usually on the Supervision Center). It acts as a "virtual HUB" and its role is to gather and distribute all the data to all the computers. The TimeZero Host is similar to a Web Server where all stations push their data and where all remote centers retrieve the data from.

TZ Host

To optimized data transfer, all the information is sent and retrieved to/from a central location called the "TZ Host". The TZ Host is a small software that is launched automatically at startup and that is dedicated to retrieve all the information from the servers and distribute it to all the clients. Each server pushes the data to the TZ Host. When new data has been uploaded, the TZ Host sends a notification to all the clients to ask them to initiate a download. This means that the clients only download data when there is new information available.

Note: The "TZ Host" is not licensed (no serial number, no activation). The TZ Host is provided as a Standalone installer available online.

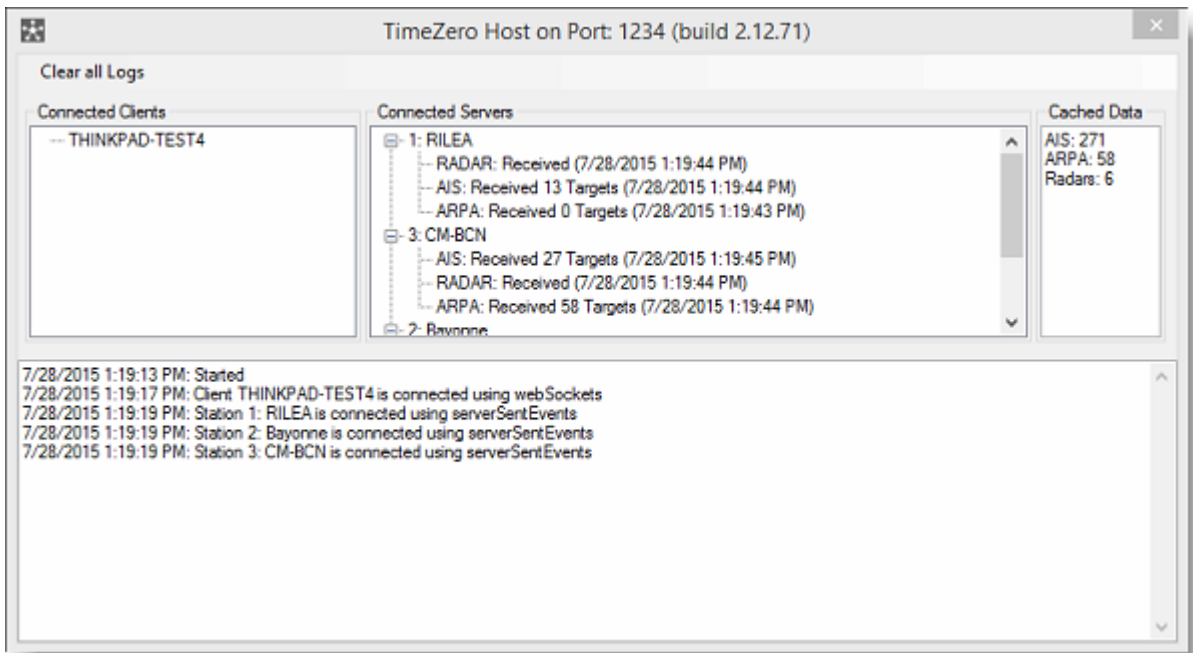
The TZ Host can be installed on any computer and can run in parallel of TZ Coastal Monitoring (it can run on the same computer). When selecting the TZ Host location, keep in mind:

- Install the TZ Host where the Internet connection is the fastest and the most reliable.

Note: If the TZ Host receives data from 6 servers at 320Kbps each, it needs a 2Mbps network download speed. If there are multiple clients connected to the TZ Host, each of them will use 2Mbps of upload speed (this does not apply when the client and the TZ Host are running on the same computer).

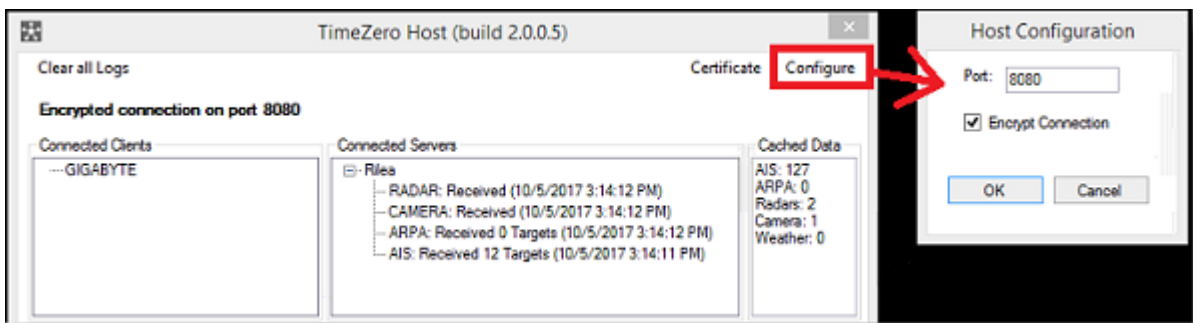
- If an Internet connection is used to transfer data to and from the TZ Host, install the TZ Host on a computer that can be accessed from the "outside" (this computer should be accessed by the "public" Internet). A NAT rule needs to be created on the router in order to redirect traffic coming from the public Internet on port 8080 (default port number) to the IP address of the computer running the TZ Host.

When installed on a computer, the TZ Host automatically runs at startup in the background. A small icon is displayed in the Windows Tray Bar and when the user right clicks on it and selects "Open", a basic user interface is displayed with the list of all the server(s) that are currently connected to the TZ Host. The total amount of Radar, AIS, ARPA and Camera that are "cached" into the TimeZero Host is also displayed:



Note: The clients will also appear in the list of "Connected Clients" but only if they issue a command (like changing a parameter of the radar or controlling a camera).

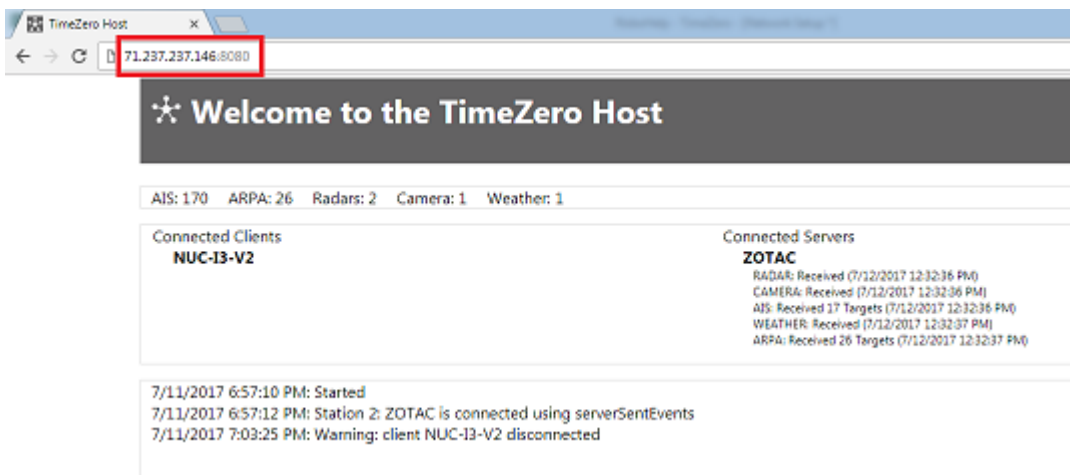
All data sent and retrieved to and from TZ Coastal Monitoring and the TZ Host is performed over a single TCP port (8080 by default) using SSL (encrypted connection). When installing the TZ Host on the computer, it will automatically install a self signed certificate and add a rule to the Windows Firewall to allow traffic on that port. It is possible to change the default TCP port used by the TZ Host by clicking on the "Configure" button:



IMPORTANT: It is highly recommended to leave "Encrypted Connection" selected. If you have to uncheck this option (because the Self Signed Certificate cannot be installed on the computer for example), you have first to disconnect all servers and clients from the TZ Host (so that nothing is connected to the TZ Host) and then, you can uncheck this option from the TZ Host. Note that, you will also have to enable "Unencrypted TZ Host Connection" from all TZ Coastal Monitoring (station and remote) available from the "Initial Setup" Options under the "Advanced Settings" buttons.

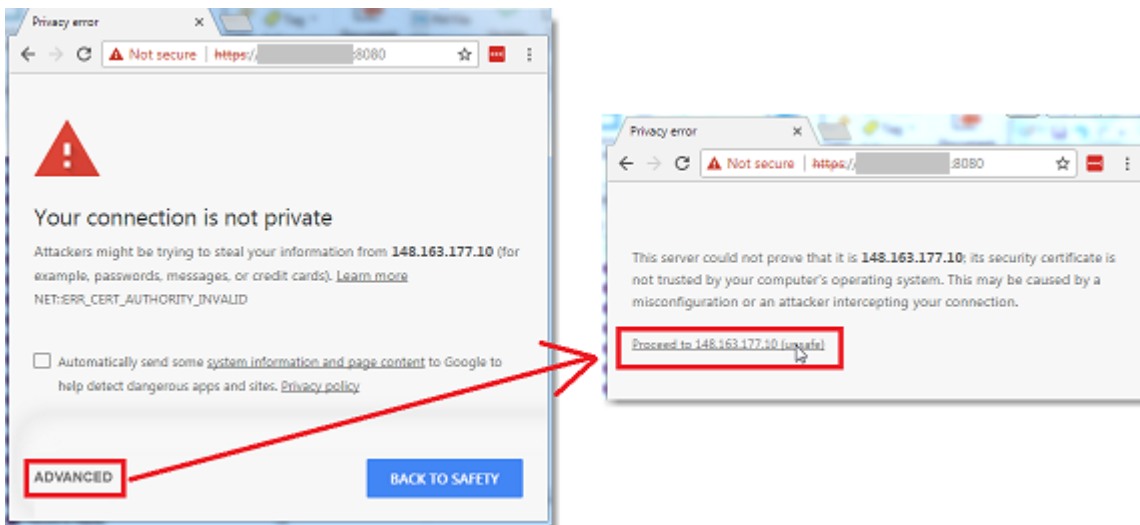
To test that the TZ Host is properly installed and can be accessed by other computers, you can type in any browser "https://" followed by the IP address of the computer, followed by ":8080". You should see a web page with the TZ Host status.

Ex: <https://71.237.237.146:8080>



Note: Since the connection is encrypted, make sure to type https (secured HTTP)

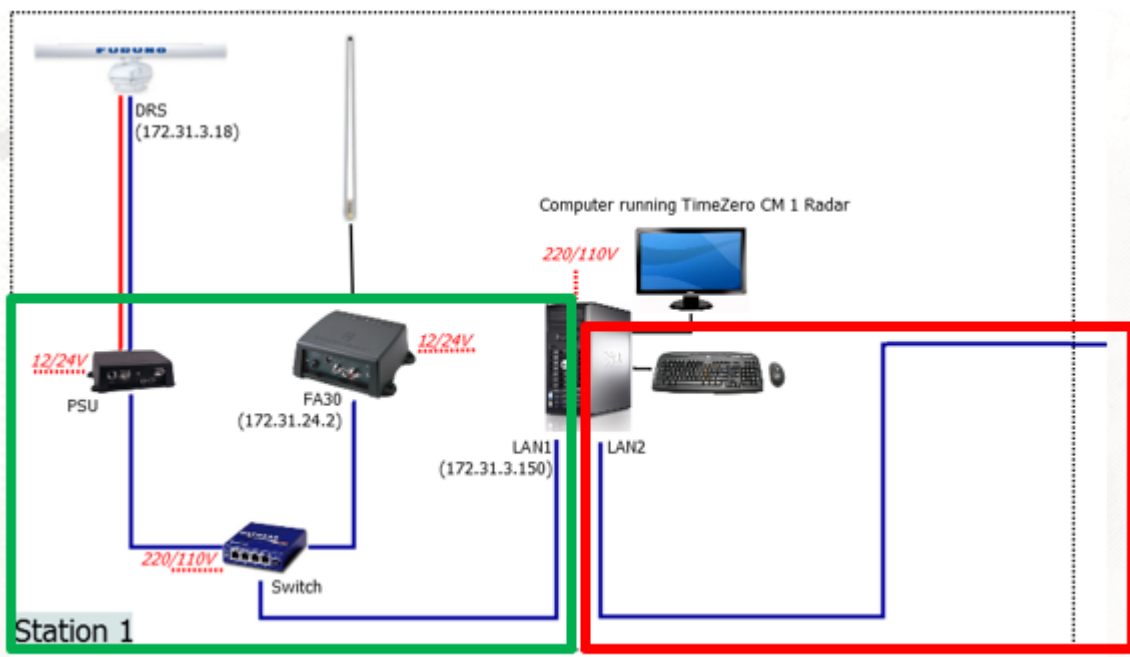
IMPORTANT: It is normal to get a warning when connecting to the TZ Host in secure mode (encrypted). This is because the default certificate installed with the TZ Host is self signed. The web browser is doing its job by alerting you that the certificate cannot be trusted (because the self signed certificate was not specifically issued for your computer by a valid authority). Simply click on "Advanced" and "Proceed Anyway" to disregard the browser warning and access the TZ Host web page:



Note: It is possible to replace the default Self Signed Certificate installed by the TZ Host with a real certificate (issued by a trusted authority for your domain name). Please refer to [Install a Trusted Certificate](#) Chapter.

Station Configuration

The computer loaded with TZ Coastal Monitoring Single Radar or Dual Radar (or TZ Professional with TZ Host output module) must have two Ethernet cards. One Ethernet card is used to connect to the "Sensor Network" (Radar, Camera, AIS...), and the second Ethernet card is used to connect to the "Global Network" in order to send the data to the TimeZero Host. In the example below, the sensors are connected to LAN1 using a fix IP address (172.31.x.x). LAN2 is being used to connect to a global network that links all the computers to the TZ Host. Usually, this global network is the Internet (but a private LAN or WAN can also be used):



This architecture isolates the "Sensor Network" (in green above) where Camera, Radar and AIS are connected, from the "Global Network" (in red above) used to send the data to the TZ Host. The computer on the station acts as a "bridge" and forward the data from the "Sensor Network" (on the left) to the "Global Network" (on the right) after compressing it.

Note: The cameras can be installed on either the "Sensor Network" or "Global Network". In some cases, you may want the cameras to be accessed directly by third party software and it might make more sense to install them on the "Global Network".

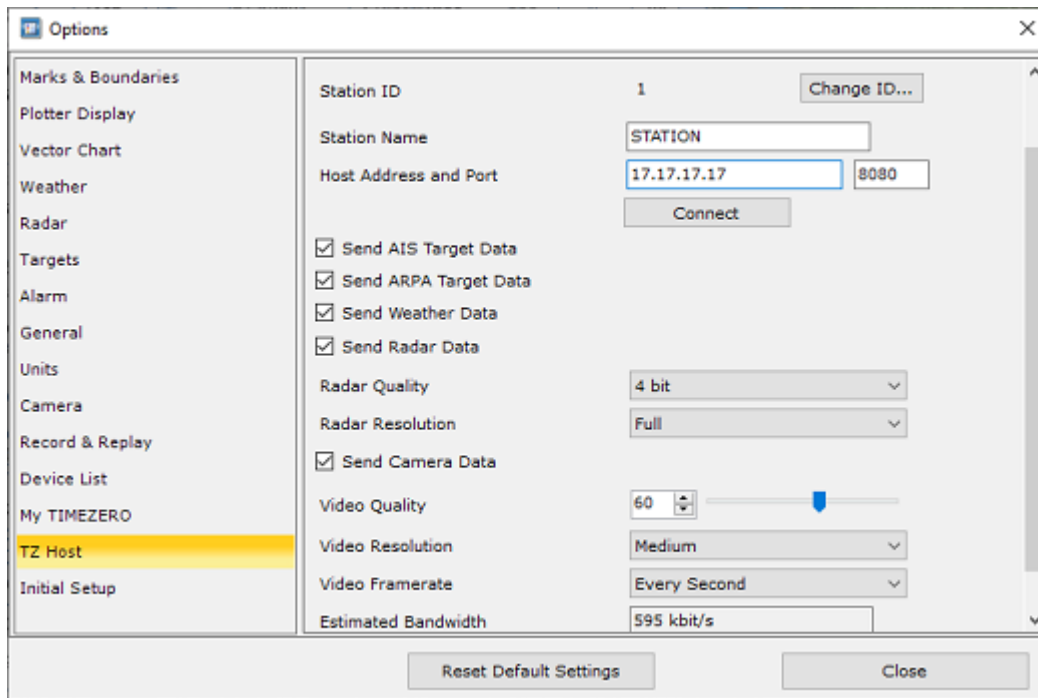
Once TZ Coastal Monitoring has been properly configured to connect to the Radar, Camera, AIS and Weather Station (follow the corresponding installation chapters for instructions), select the [TZ Host](#) Options to enable sending data to the TZ Host.

Note: If the computer located on the station is used without a local operator (as a Black Box), and if no monitor is connected to the computer, it is recommended to connect a "dummy plug" to the computer monitor output. Some computers may not boot up properly or initialize the graphic card properly without a monitor (or dummy monitor) plugged.

The first step is to assign a unique Station ID and Station name to every stations. In case you are sending data from multiple stations, **MAKE SURE** to select a different Station ID for each TZ Coastal Monitoring. Once the Station ID and Station Name have been setup, enter the IP address (or domain name) of the computer where the TimeZero Host is installed.

Note: If the TimeZero Host is installed on the same computer, use "127.0.0.1" for the IP address.

Then, select the type of data you want to send, and when applicable, the quality and resolution (for Radar and Camera) and then press on the "Connect" button:



All selected data will be available to the various TZ Coastal Monitoring Remote that will be connected to the same TZ Host.

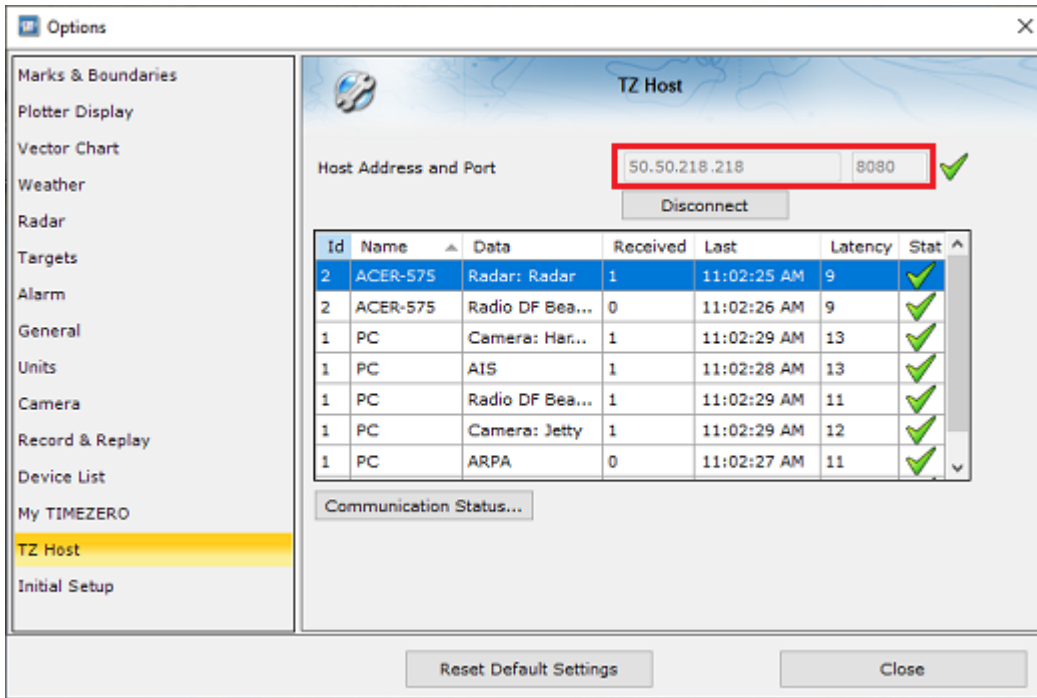
Control Center Configuration

The computer loaded with TZ Coastal Monitoring Remote (the client) only needs one Ethernet card to access the TZ Host.

Select the [TZ Host](#) Options and enter the IP address (or domain name) of the computer where the TZ Host is installed.

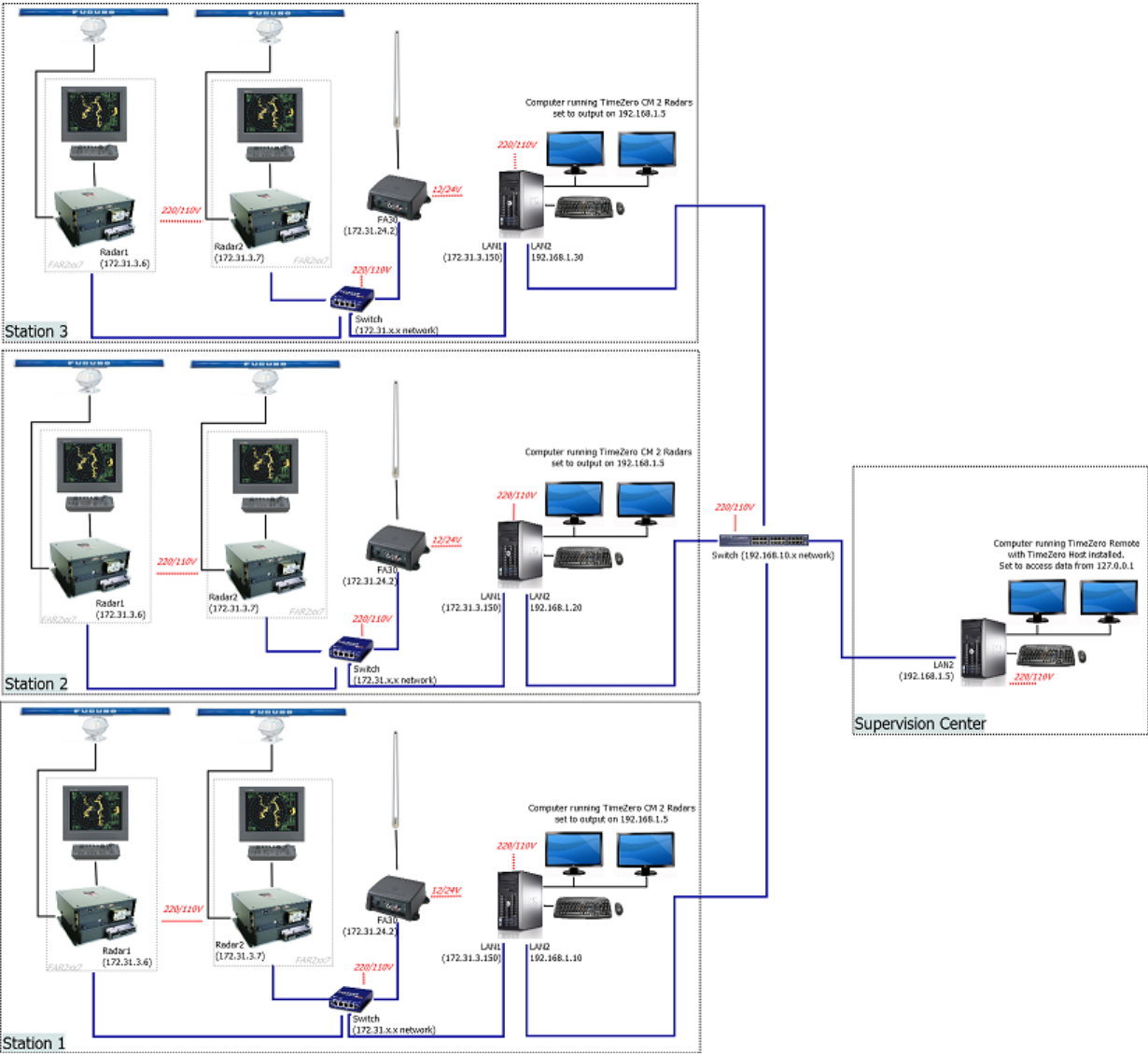
Note: If the TimeZero Host is installed on the same computer, use "127.0.0.1" for the IP address.

Once you click the "Connect" button, all data (Radar, Camera, AIS, ARPA and Weather) coming from all stations connected to this particular TimeZero Host will be discovered and configured automatically:



Local Network Setup Example

When all the computers are located on the same local network, you just need to know the IP address of the computer where the TimeZero Host is installed. In the example below, the TZ Host is installed on the computer located in the supervision center (same computer where TZ Coastal Monitoring Remote is installed). All computers are on the same local network with IP address 192.168.1.x:

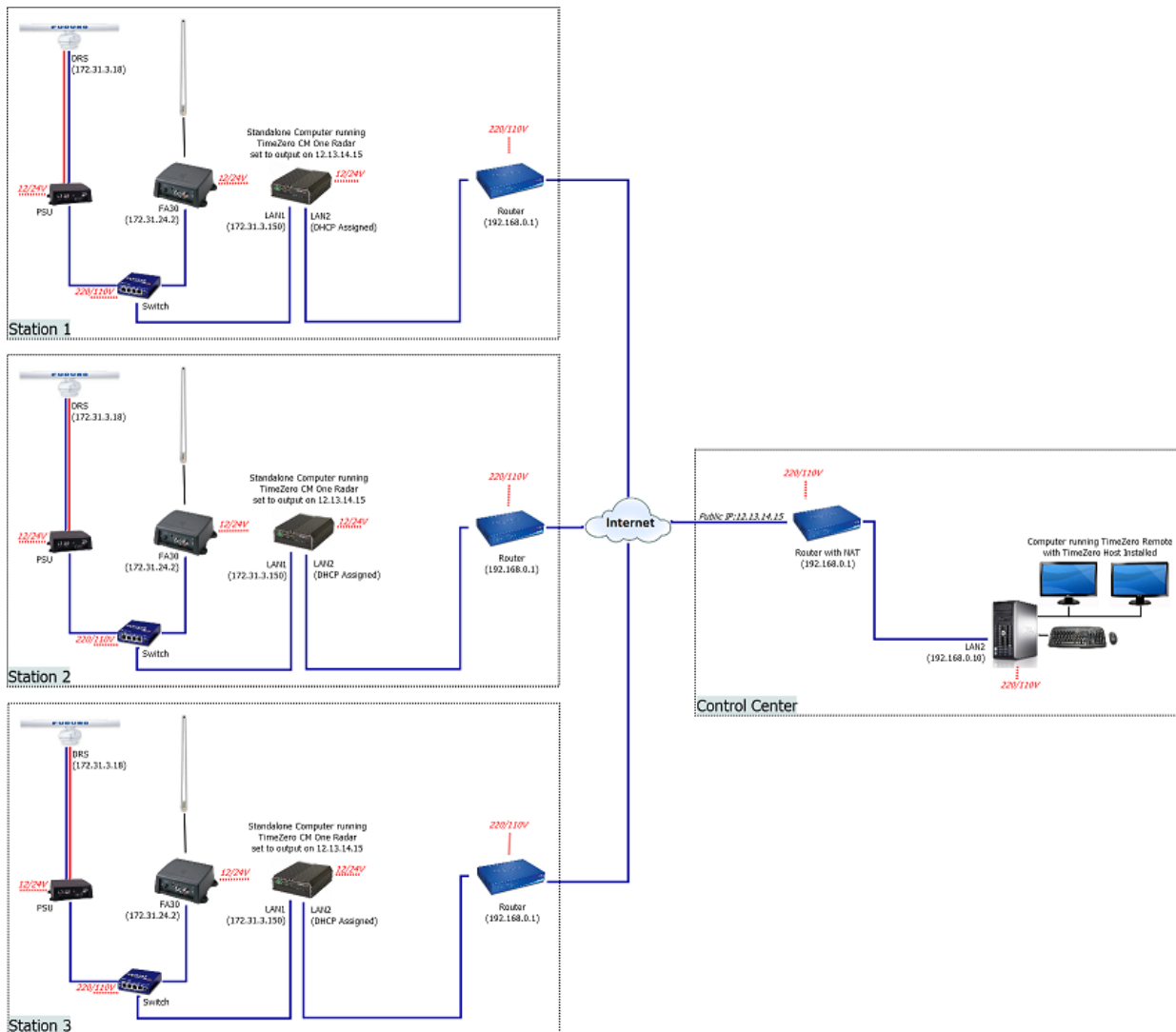


In the example above, the computer with the TZ Host installed has an IP address of 192.168.1.5. This is this IP address that must be used on all the computers.

Note: On the supervision center where the TZ Host is installed, it is possible to enter either 127.0.0.1 (loop back IP address) or 192.168.1.5 for the IP address

Internet Network Example Setup

In the example below, Internet is used to connect all the Stations and the Control Center together. The TZ Host is installed on the Control Center, where the Internet connection is the fastest and most reliable. The Router of the Control Center must be setup to redirect all incoming traffic on port 8080 (from the Stations) to the local IP address of the computer loaded with the TZ Host.



The first step is to choose and fix a local IP address for the computer located in the Control Center (192.168.0.10 in the example above). It is important to fix the IP address of the computer running the TZ Host in order to create a NAT rule in the router to that specific IP address.

Create a "NAT" rule (or "Port Forwarding" rule) in the Router that will redirect any WAN traffic on port 8080 to 192.168.0.10:

Port Forwarding List (Max Limit : 32)						
Service Name	Port Range	Local IP	Local Port	Protocol	Add / Delete	
TZ Host	8080	192.168.0.10	8080	TCP	+	
FTP Server	20,21	192.168.0.20	21	TCP	-	
HTTP Server	80	192.168.0.20	80	TCP	-	

Finally, configure all stations with the public IP address of the router (12.13.14.15 in the diagram above). Note that the public IP address of the router located on the Control Center needs to be fixed (it should not change overtime). If the Internet provider of the Control Center cannot provide a fix public IP address, services like DynDns can be used. In that case, instead of entering the public IP address in all the stations, a domain name would be used (like "example.dyndns.org")

Note that the IP addresses of the computers located in the Stations can be set to automatic (DHCP). The only IP address that needs to be fixed on the global network is the one hosting the TZ Host.

System Configuration

This chapter summarizes the configuration that needs to be done on the local station (with TZ Coastal Monitoring Single or Dual Radar) and on the control center (with TZ Coastal Monitoring Remote).

Local Station

The sensors (Radar, AIS, Camera,) need to be connected and fully configured on TZ Coastal Monitoring Single or Dual Radar. Here is an overview of the steps (please refer to the appropriate Installation Chapter for more detailed):

- Configure the Ethernet Card connected to the local sensors (Radar, Camera,...) with the appropriate IP (usually 172.31.3.150 /255.255.0.0)
- Configure the second Ethernet Card so that the computer can access the TZ Host (usually configure an Internet connection)
- Open TZ Coastal Monitoring Single or Dual Radar and set the "Default Reference Position", "Station ID" and "Station Name" from the [TZ Host](#) Options. Usually, the coordinate of the Station is used for the Reference Position. Make sure that the "Station ID" is unique
- If an AIS is connected to the computer, use the [Connection Wizard](#) to configure the Port
- If Camera(s) is (are) connected to the computer, configure them from the [Camera](#) Options
- From the [Radar](#) Options, setup the Radar Position and Orientation (you can use the Radar Overlay to align the Radar echo on the chart)
- Setup [Radar Mask](#) to remove radar echo generated by land and other fixed objects
- Setup [ARPA Auto Acquisition](#) so that the Station can generate ARPA targets. TZ Coastal Monitoring Remote does not have the ability to generate ARPA targets from the Radar Echo, and this task is deferred to the local station (because the local station has access to the raw high resolution radar picture).

- Make sure that the TZ Host is up and running, enter the public IP address of the computer running the TZ Host and press the "Connect" button from the [TZ Host Options](#):

Option	Value
Station ID	1
Station Name	STATION
Host Address and Port	17.17.17.17 8080
Send AIS Target Data	<input checked="" type="checkbox"/>
Send ARPA Target Data	<input checked="" type="checkbox"/>
Send Weather Data	<input checked="" type="checkbox"/>
Send Radar Data	<input checked="" type="checkbox"/>
Send Camera Data	<input checked="" type="checkbox"/>
Radar Quality	4 bit
Radar Resolution	Full
Video Quality	60
Video Resolution	Medium
Video Framerate	Every Second
Estimated Bandwidth	595 kbit/s

- If the Local Station is used by an operator, rules should be configured on TZ Coastal Monitoring Single or Dual Radar. Note that rules are independent per computer, and the notifications/alarms they may trigger are not shared on the network (rules should be set manually on all computers). This allows to have independent rules and independent behaviors on multiple computers (for example, the local operator might not need the same rules as the remote operator). If the computer located on the local station does not have any operator, there is no need to configure "Rules".

Control Center

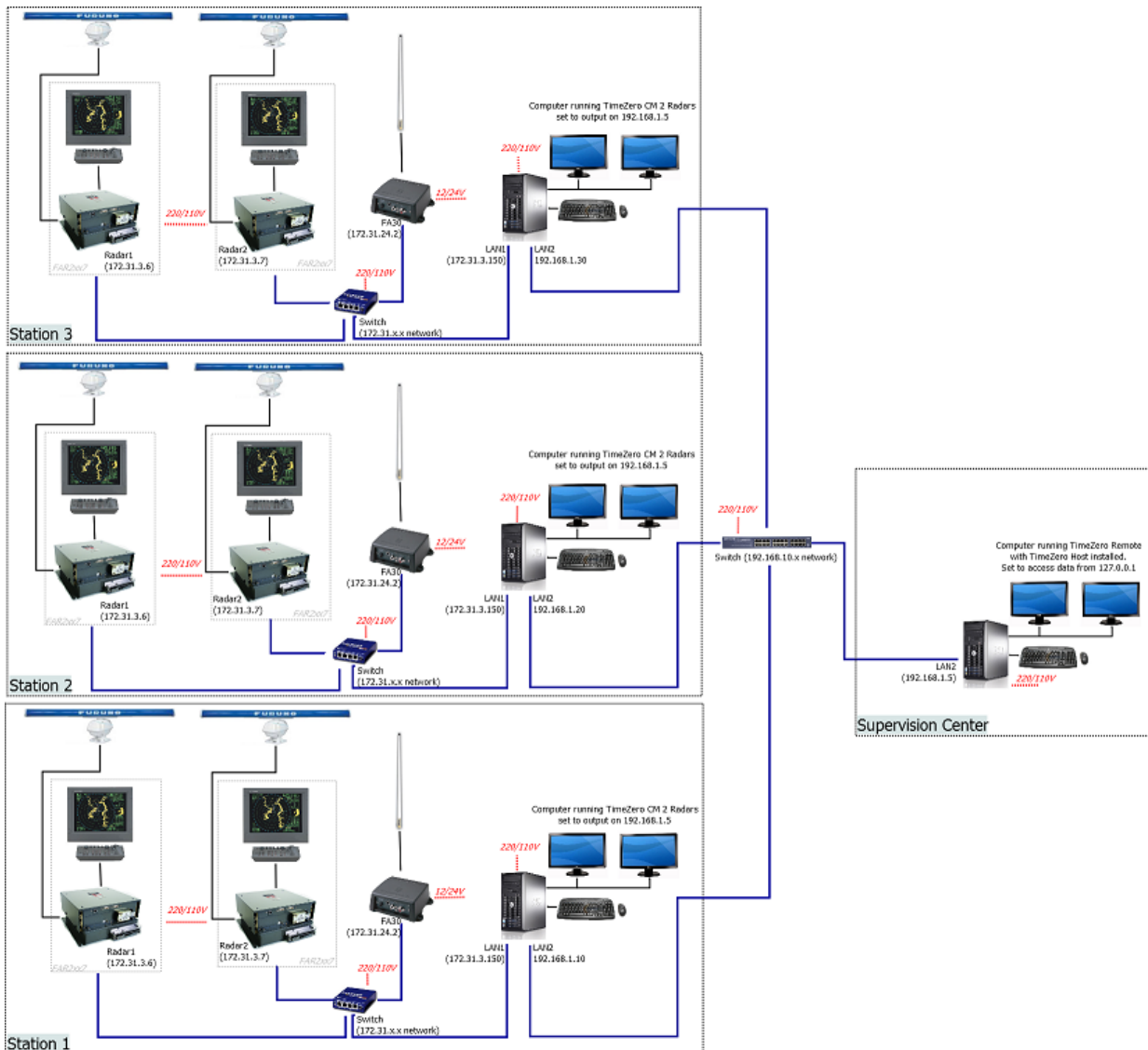
There is not much configuration needed on the Control Center (TZ Coastal Monitoring Remote) beside the Rules (that are independent per computer) and setting the Initial Reference Position. When connecting to the TZ Host, all sensor configuration (Radar Position, Orientation, Target Data, Cameras,...) will be done automatically as soon as TZ Coastal Monitoring Remote is connected to the TZ Host via the [TZ Host Options](#).

Remote Configuration Example

Display and control up to 10 radars from the same screen

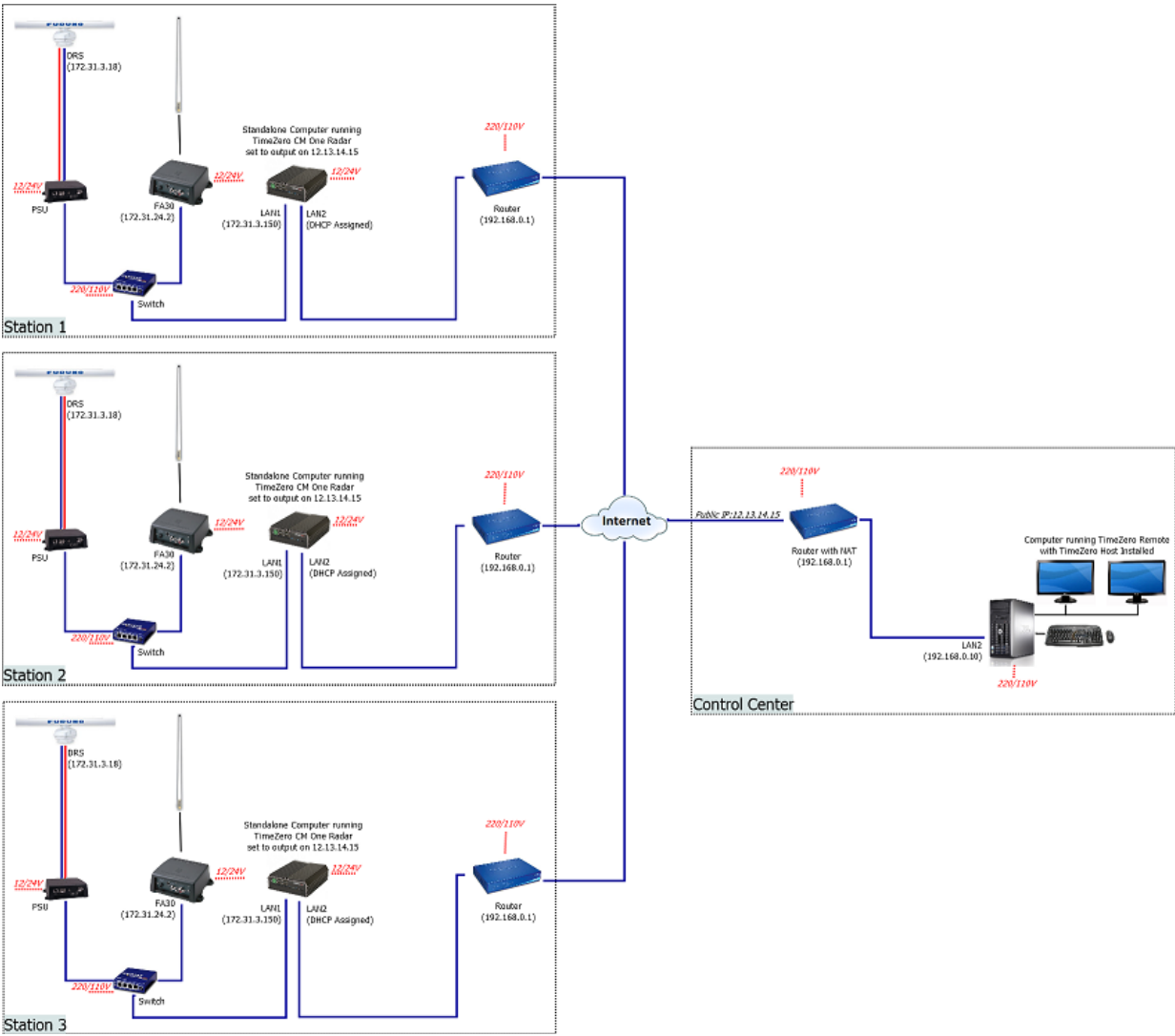
It is possible to combine up to 10 TZ Coastal Monitoring **Single Radar** or 5 TZ Coastal Monitoring **Dual Radar** (10 radars total) and send all that information to a computer loaded with TZ Coastal Monitoring Remote. This allows an operator to monitor up to 10 radars from one computer.

In the example below, a Supervision Center (loaded with TZ Coastal Monitoring Remote) connects to 3 oil platforms, each equipped with two FAR radars connected locally to a computer loaded with TZ Coastal Monitoring Dual Radar:



The computers located on the stations (the oil platform in this example) are used by a local operator. Each computer merges the picture from the two radars, creates the ARPA targets (either manually or automatically), processes the AIS target, presents all the information to the local operator, but also acts as a server and sends all the data to the Supervision Center (loaded with TZ Coastal Monitoring Remote).

In the example below only one radar is connected to each computer (loaded with TZ Coastal Monitoring Single Radar). In this example, there is no local operator. The computers located on the stations are just being used as servers:

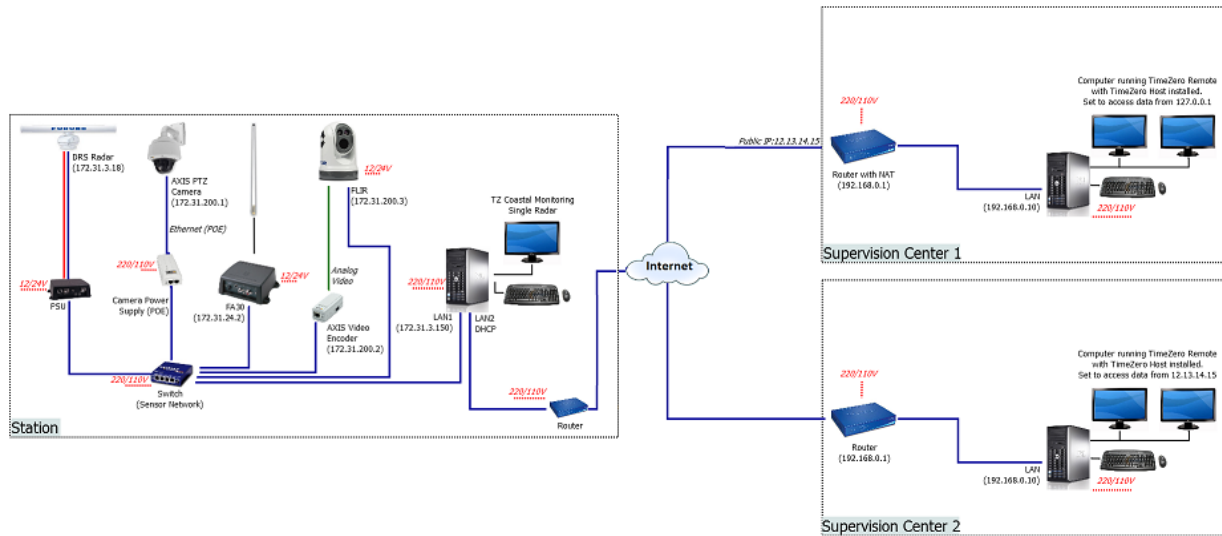


Note that even if there is no operator on the 3 stations, a full version of TZ Coastal Monitoring Single Radar needs to be loaded on each computer located on the 3 stations. Also, if the Dual Range feature of the Furuno DRS radar is enabled, the setup above will account for 6 radars pictures total (two radar pictures are used to transmit the dual range of one single DRS radar).

Note: It is possible to connect up to 10 DRS radars if the Dual Range feature of the DRS is disabled.

Up to 6 Supervision Centers

The example below illustrates a station loaded with TZ Coastal Monitoring Single Radar supervised by two remote Control Centers:

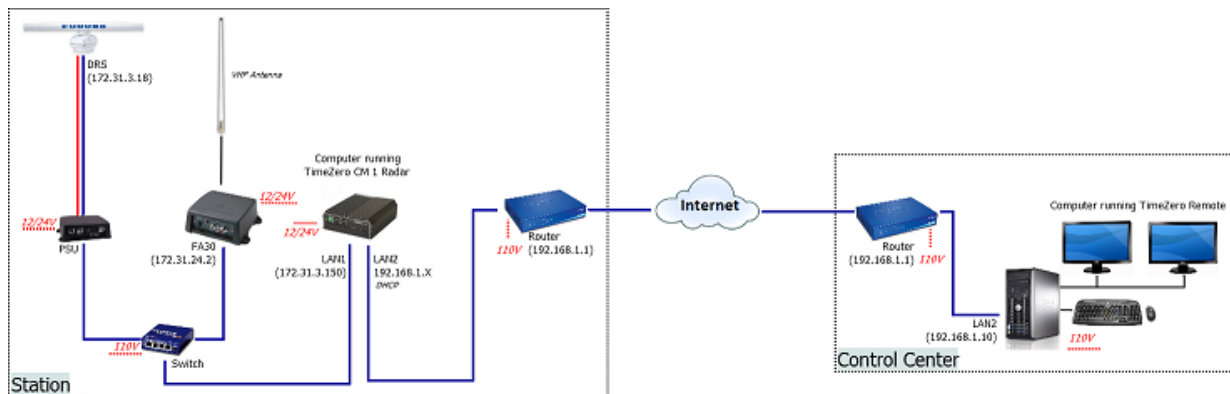


Up to 6 TZ Coastal Monitoring Remote (Supervision Center) can be connected to the same group of station.

Low Bandwidth Remote Access

The Server/Client architecture allows to transmit Radar, Targets and Camera using a low bandwidth network connection (minimum recommended is 320Kbps). This is very useful when the sensors are located in a remote location with limited network infrastructure.

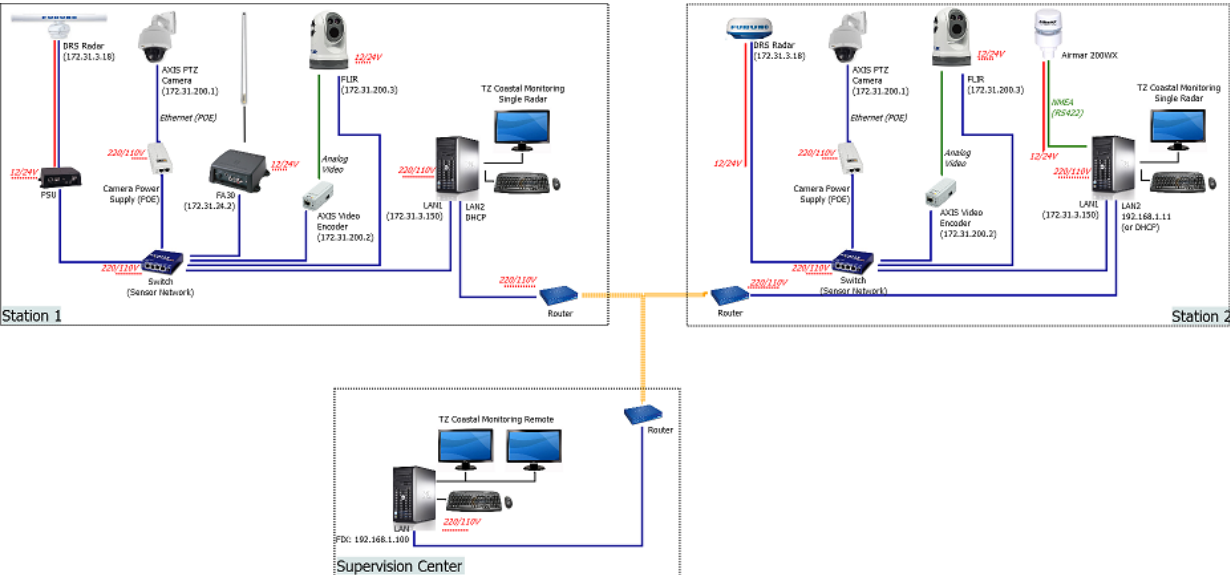
In the example below, a radar and an AIS receiver are connected to a computer running TZ Coastal Monitoring Single Radar acting as a server. This computer compresses and sends the data over a low bandwidth connection to the Control Center where TZ Coastal Monitoring Remote is installed.



Remote Cameras

The Server/Client architecture also allows to transmit Camera (video and control commands) over the internet. This dramatically reduces bandwidth and network configuration, especially when the Internet is used to relay data from the Station to the Control Center (no need to configure the router of the station and open multiple ports for video feed and control). Note that video sent through the Server/Client architecture uses a slower refresh rate (Video Framerate) to save bandwidth. By default, the camera is refreshed one time per second when sending video through the Server/Client architecture. This default settings allows to maintain a good resolution (more useful than refresh rate to identify targets) while keeping the bandwidth as low as possible.

In the example below, two stations with one radar and two cameras each are sending their data to one Supervision Center:



Online Services

TimeZero Cloud

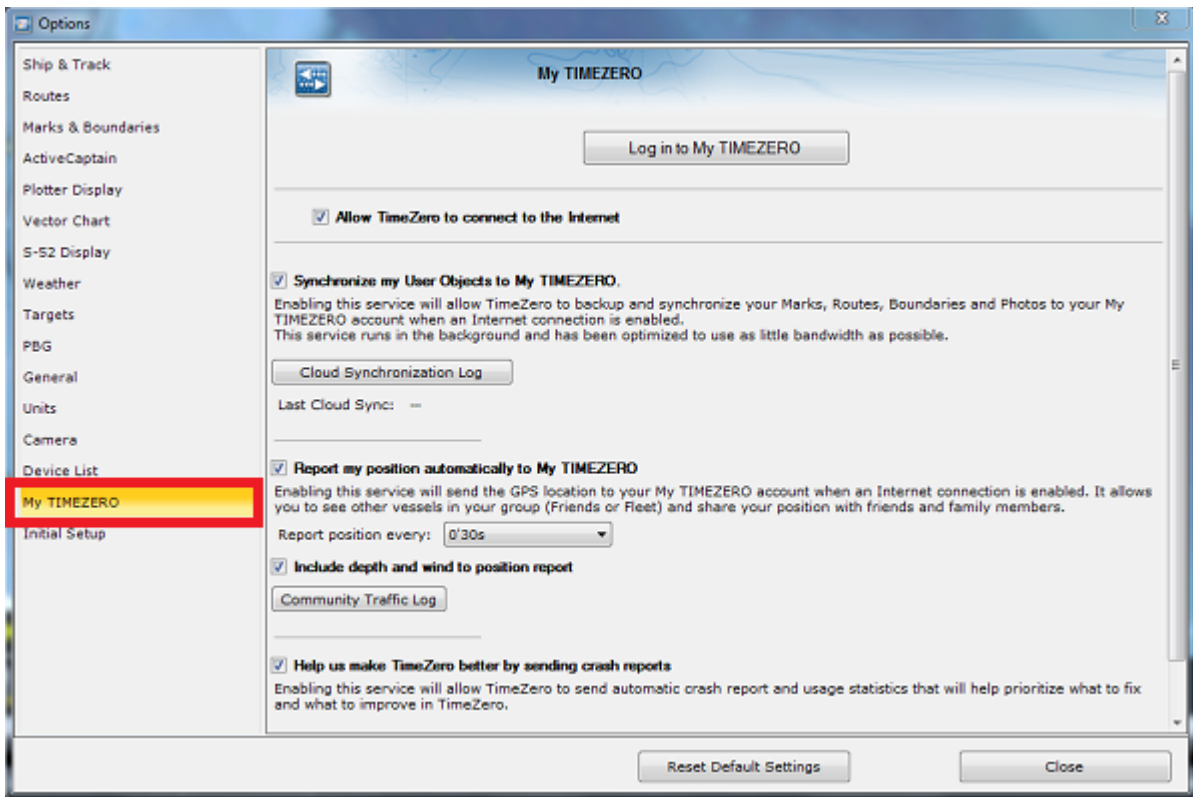
You can access your personal TZ Cloud from any web browser (Edge, Safari, Chrome) by tapping the URL: cloud.mytimezero.com. Simply log in with the same My TimeZero account credential you use in TimeZero.

User Objects Cloud Synchronization

When you are logged to your My TIMEZERO account, your user objects (marks,, boundaries, lines, annotations, 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](#):



When the cloud synchronization is enabled, you will see a small green status icon (cloud) appearing at the top right corner of the screen (next to the minimize button) each time TimeZero is exchanging data with the TZ Cloud:





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.

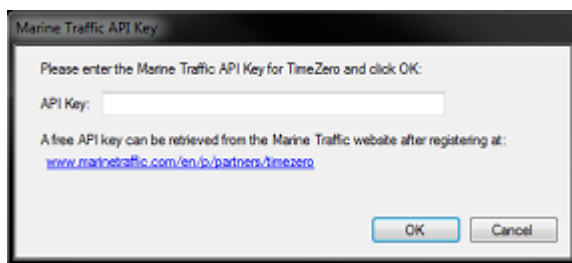
Please refer to the [Fleet Tracking](#) chapter to learn all the features of this service.

Marine Traffic

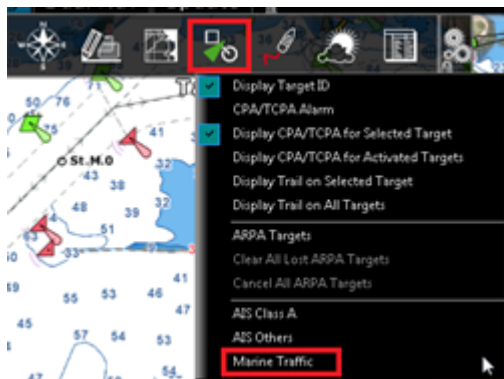
IMPORTANT: THE MARINE TRAFFIC FEATURE SHOULD NOT BE USED FOR NAVIGATION. THERE CAN BE A SIGNIFICANT DELAY (5 MINUTES TO ONE HOUR) IN BETWEEN THE ONLINE REPORTS AND REAL TARGETS POSITION. THE MARINE TRAFFIC SERVICE IS SUBJECT TO SERVICE INTERRUPTIONS AND IS PROVIDED 'AS IS'. THE RULES CANNOT BE TRIGGERED BY AIS TARGET RECEIVED FROM THE INTERNET (ONLY AIS RECEIVED BY AN AIS RECEIVER).

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 "Targets" button in the Ribbon.



Note: After enabling Marine Traffic, it might take a couple of minutes for the information to appear on the screen

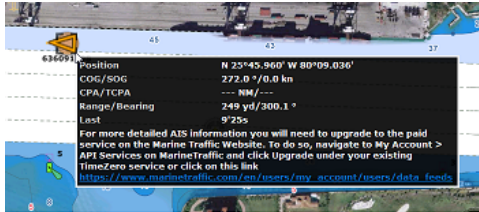
AIS received through the Internet from Marine Traffic appears in orange ("real" AIS targets from an AIS receiver connected to TimeZero appear in blue for Class A and green for Class B):



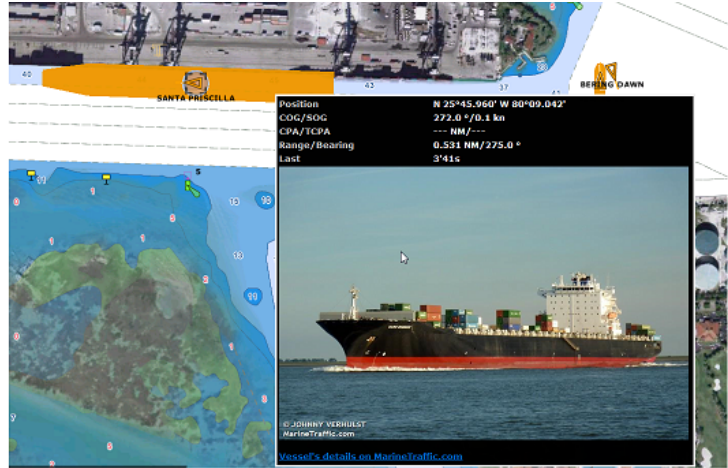
Note that the Marine Traffic targets only appear when the chart is zoomed in at a range of 200NM and below (to avoid loading too much data from the server). Targets are refreshed automatically every one minute or as soon as the chart is scrolled to a new location. It is possible to adjust the maximum "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)

SeaLevel Network IO

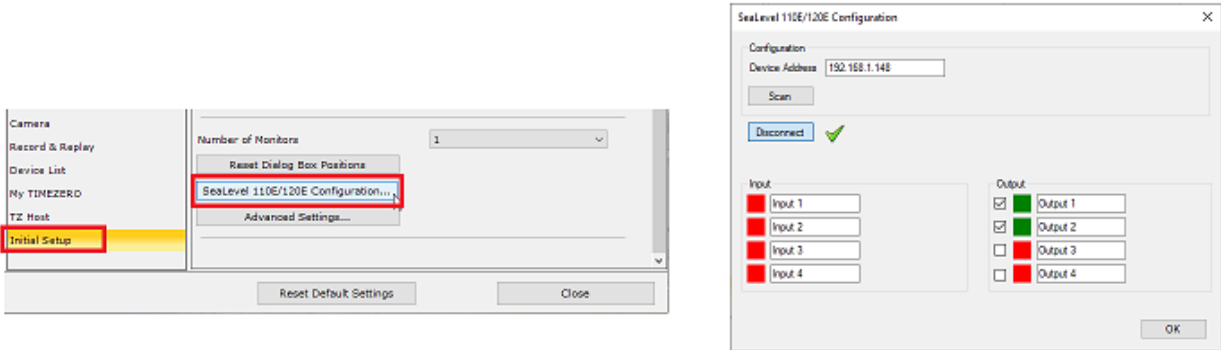
TimeZero can be connected to a SeaLevel 110 or SeaLevel 120 Ethernet (4 Inputs / 4 Relay Outputs Digital Interface Adapter). This allows TimeZero to control external devices and/or allows TimeZero to react to external inputs:



Configuration

The first step is to assign an IP address to the SeaLevel Network IO by following SeaLevel's instructions. Make sure to fix an IP address that is on the same subnet as the computer. After setting the IP address, it is recommended to ping the SeaLevel IP address to make sure the network is properly setup and that there is a good connection in between the computer and the SeaLevel Network IO.

To configure the SeaLevel Network IO in TimeZero, open the Initial Setup Options and click on the "SeaLevel 110E/120E Configuration" button:



You can either manually enter the IP address of the SeaLevel Network IO, or press the "Scan" button. Then, press on the "Connect" button to connect TimeZero to the SeaLevel Network IO. Once the connection has been established, you will be able to monitor the relay and digital input status (red or green squares), but also test the relay output from the configuration window by using the check-boxes. You can also setup nicknames to both the inputs and outputs (nicknames will be displayed in the NavData).

Output

NavData

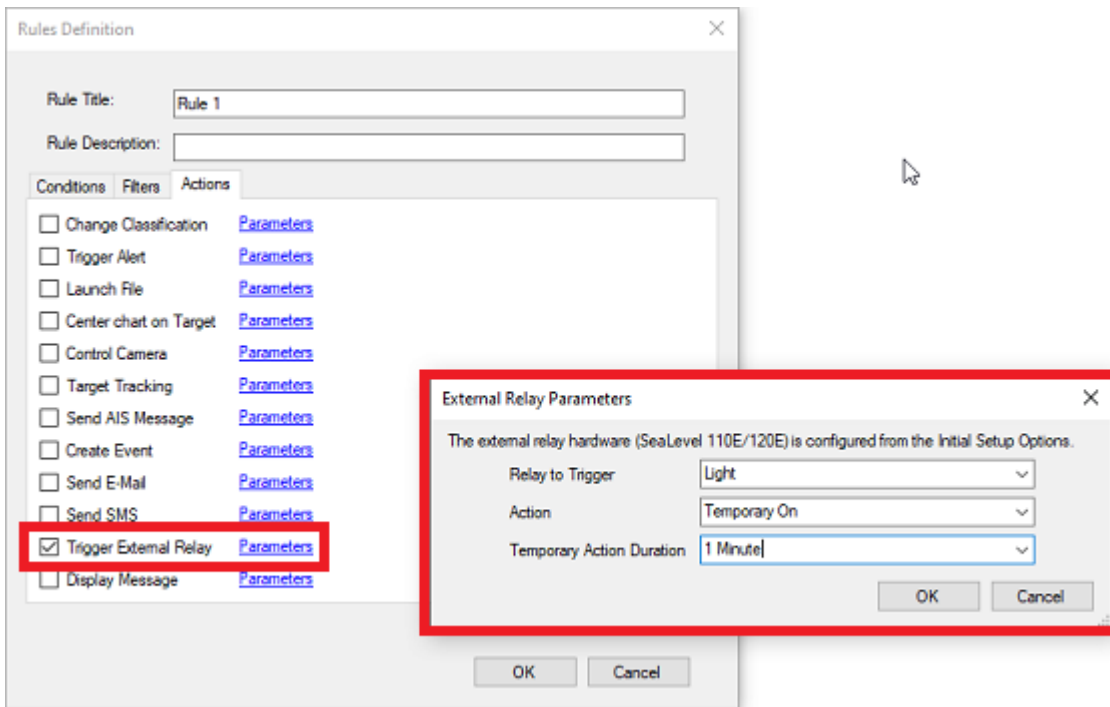
It is possible to control the output (turn the relays ON or OFF) directly from the SeaLevel IO NavData:



You can right click on this NavData to select which Output(s) you want to display and control.

Rules

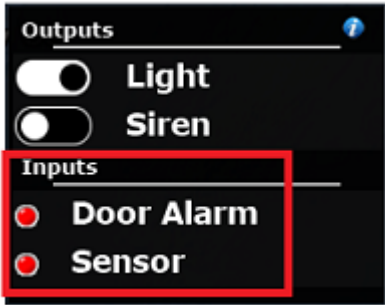
It is possible to control a relay as an action of a rule. The relay can be turned ON/OFF, toggled, or even set to be turned ON/OFF for a specific amount of time (after which the relay will revert back to its original state):



Input

NavData

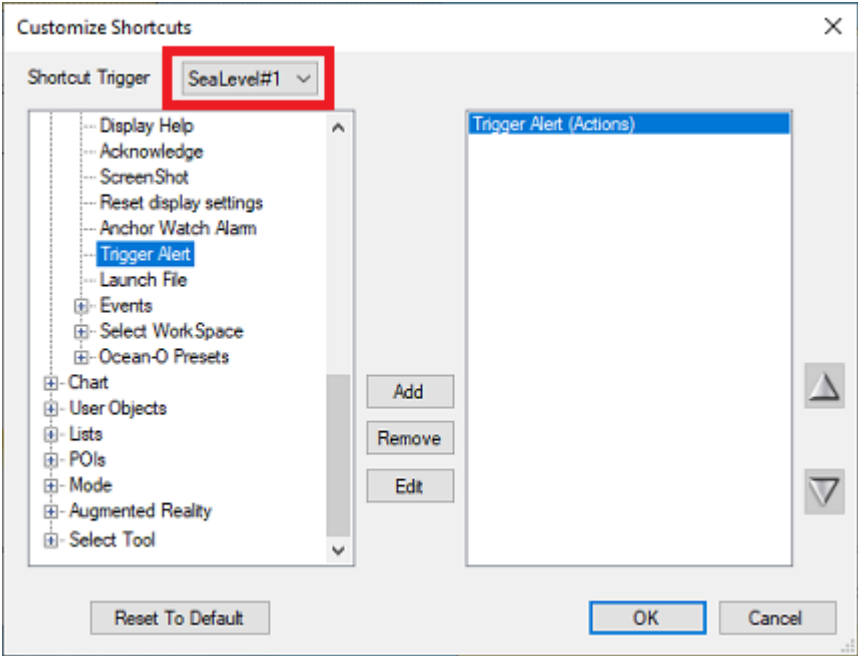
It is possible to monitor the input status directly from the SeaLevel IO NavData:



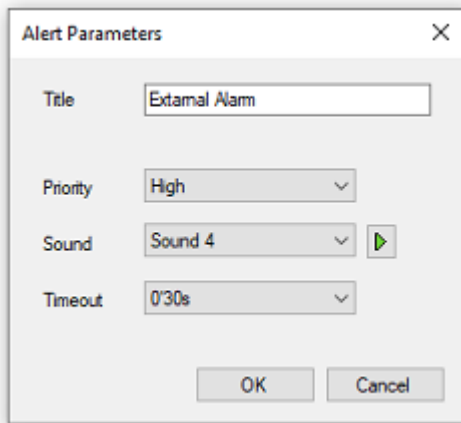
You can right click on this NavData to select which Input(s) you want to display.

Shortcuts

Each SeaLevel input can be configured to trigger one or multiple actions in TimeZero using the powerful shortcuts framework. This can be setup from the [General](#) Options by clicking on "Customize Functions Keys...". First, select the corresponding SeaLevel Input as the trigger (instead of a function key), and then, add one or multiple actions you would like this input to trigger:



If you would like a SeaLevel input to trigger an Alarm in TimeZero, simply select the "Trigger Alert" action. You will be able to setup a text (the title of the alarm), a priority (High for Red, Medium for Yellow, and Low for green), a sound, and a Timeout:



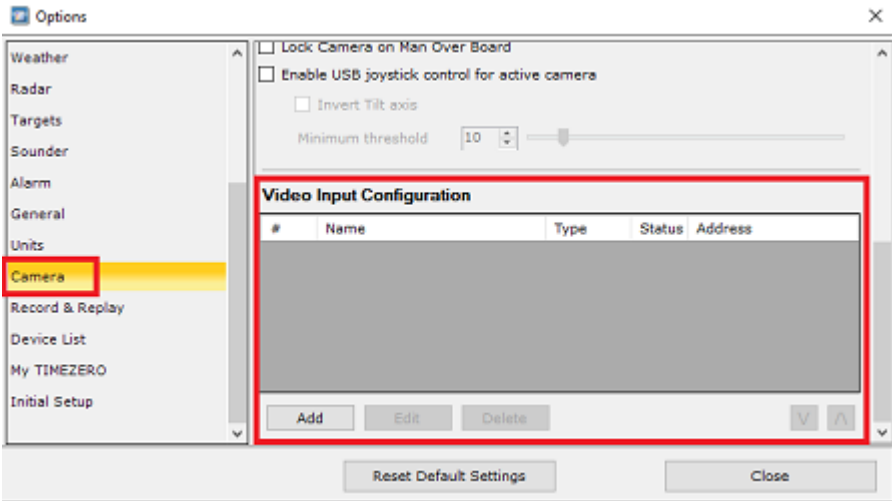
The image shows a dialog box titled "Alert Parameters" with a close button (X) in the top right corner. It contains four configuration fields: "Title" with a text input field containing "Extamal Alarm"; "Priority" with a dropdown menu set to "High"; "Sound" with a dropdown menu set to "Sound 4" and a play button icon to its right; and "Timeout" with a dropdown menu set to "0'30s". At the bottom of the dialog are two buttons: "OK" and "Cancel".

You can configure many actions and combine them (by simply adding multiple in the list) opening many integration possibilities.

Video Input

The Video Input can be used to bring external display inside TimeZero as a full or quarter screen display. You can use an H264 to DVI (or VGA) encoder or a USB converter (compatible with DirectShow).

To configure a Video Input simply open the [Camera](#) Options and scroll down to the Video Input section:

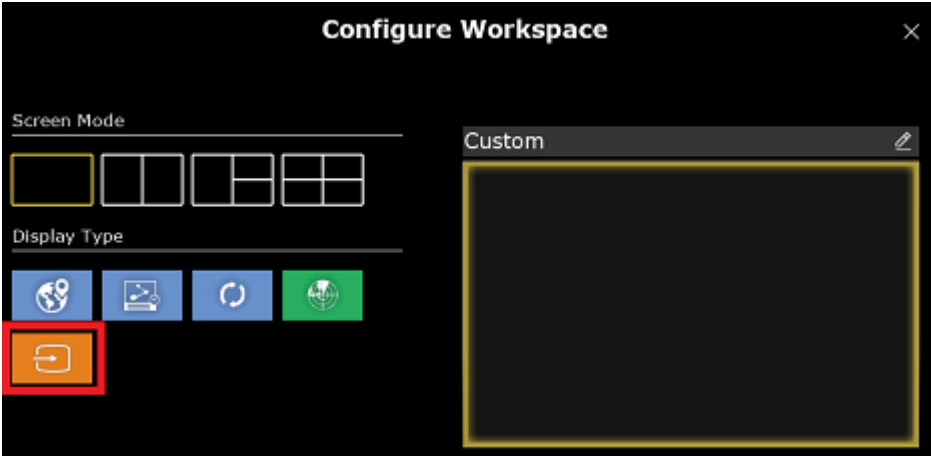


Click on "Add". If you are using a network video encoder, click on "H264 Network Encoder", make sure it has been set with a fix IP address, and that it can convert the video input into a H264 video stream. You will need to enter the RTSP path in TimeZero. Here is an example of RTSP path without login/password: "rtsp://192.168.1.210:554/Streaming/Channels/101". Here is an example with login/password "rtsp://admin:12345@192.168.1.210:554/Streaming/Channels/101".

Note: You may find the RTSP path in the network encoder documentation or online if you search for your network encoder model number followed by "RTSP Path" or "TSP URL".

If you are using a USB Video encoder click on "Direct Show Device". TimeZero will list all the Direct Show Compatible video encoder for you to choose.

Once at least one video input has been configured, you will be able to create a Workspace with a full screen or quarter screen display:



Radio Direction Finder

TimeZero is compatible with the Radio Direction Finder Rhotheta RT-800, RT-300, and RT-500M:



A radio direction finder (RDF) will be able to detect the bearing of any VHF signal and send it to TimeZero so that it can be displayed on the chart. In addition, if the signal originates from a PLB or Cospas-Sarsat beacon (MOB device), an alarm will be triggered in TimeZero.

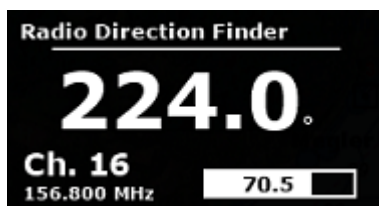
Configuration

The first step is to connect the Radio Direction Finder to TimeZero. This can be achieved through a Serial COM port or via a UDP or TCP port. Once you have connected the RDF to TimeZero, open the Connection Wizard and manually add an input port (select serial, UDP or TCP according to your physical connection). If the RDF is transmitting a signal while TimeZero is analyzing the port, the "Rhotheta RDF" checkbox will be automatically checked (check it manually otherwise).

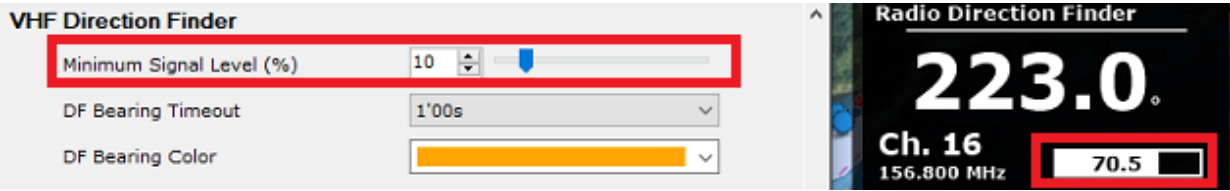
Note: TimeZero is compatible with the \$PRHO,xx,DFSTD and \$PRHO,xx,DFVTS sentences.

TimeZero only reads the relative bearing from the RDF, so make sure to apply the proper offset if needed on the RDF itself (if the antenna heading is not aligned with true North) so that the bearing is properly geo-referenced on the chart.

Once the Connection Wizard has been configured, you can add the Radio Direction Finder to the NavData. It should be displaying the real time data sent by the RDF hardware (Bearing, Channel Number, Frequency and Signal Level in %):



By default the DF bearings are displayed in orange on the chart, however, this color can be adjusted from the [Initial Setup](#) Options under the VHF Direction Finder section ("DF Bearing Color setting"). Note that, in order for a bearing to be displayed on the chart, it must be above the Minimum Signal Threshold which can be adjusted from the same options (set to 10% by default):



A DF bearing timeout can also be adjusted. It sets the time after which a bearing will disappear from the chart if no matching bearing is sent by the RDF to TimeZero.

DF Bearing

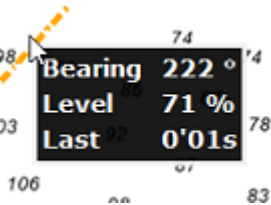
When "VHF DF Bearing" is selected from the Mode button located in the Ribbon, the DF bearing(s) will be displayed on the chart:



All DF Bearing lines are originating from the default initial reference position which can be adjusted from the [Initial Setup](#) Options. An existing DF bearing line is updated if a new bearing is received within 30 degrees of a previous bearing last value. If not, a new bearing line is created on the chart. This allows TimeZero to display multiple DF bearings that originate from multiple VHF or Beacon (if they are at least 30 degrees apart). If the bearing Min/Max values are available (only sent with the \$PRHO,xx,DFSTD sentence), a cone is displayed on the active bearing. The cone is slightly transparent and "flashes" (fade out over 1 sec) to indicate a new reception.

Note: The cone (Min/Max bearing values) is only available on the computer which is directly connected to the RDF. The cone is not available on TZ Coastal Monitoring Remote (only the main bearing is sent via the TZ Host).

If you click on a DF Bearing line, a tooltip will appear with the Bearing value, the Signal Level and the time the bearing line was last updated:

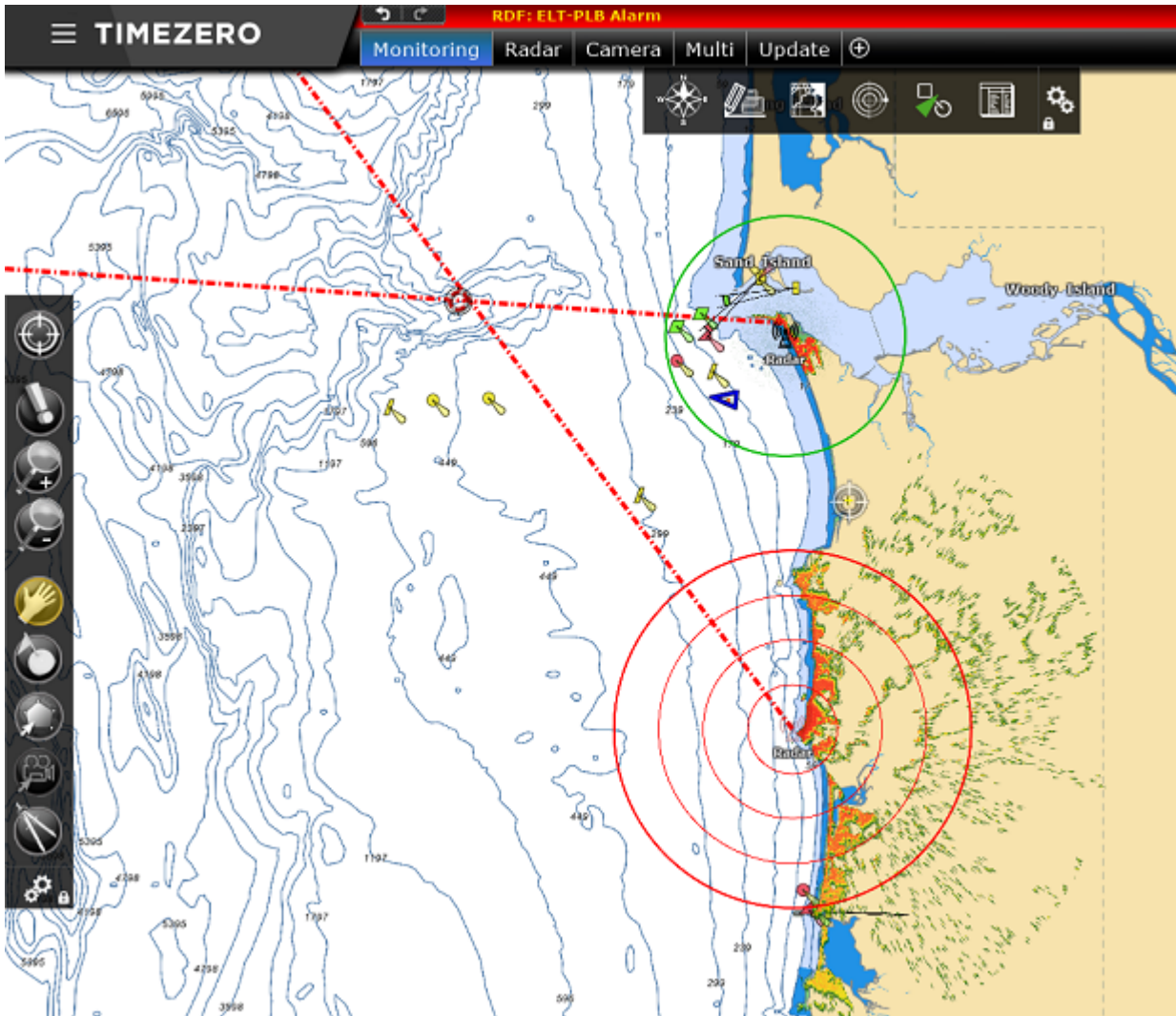


When a PLB or Cospas-Sarsat signal is received, the DF bearing will be displayed in red, and an alarm will be raised in TimeZero:



Triangulating multiple DF Bearings

If you are using the [Remote Architecture](#) to combine multiple stations (multiple Coastal Monitoring Single or Dual Radar computers) into a supervision center (TZ Coastal Monitoring Remote), it is possible to connect multiple RDF (one per station) and combine them onto the TZ Coastal Monitoring Remote computer. In addition, if the DF Bearings being received are coming from a PLB or Cospas-Sarsat signal (alarm bearings), TimeZero will automatically put a MOB mark at the intersection:



The MOB mark position will be automatically updated as the bearing intersection moves around. When the bearing(s) timeout (disappear from the chart), the marks will stay on the chart until manually deleted.

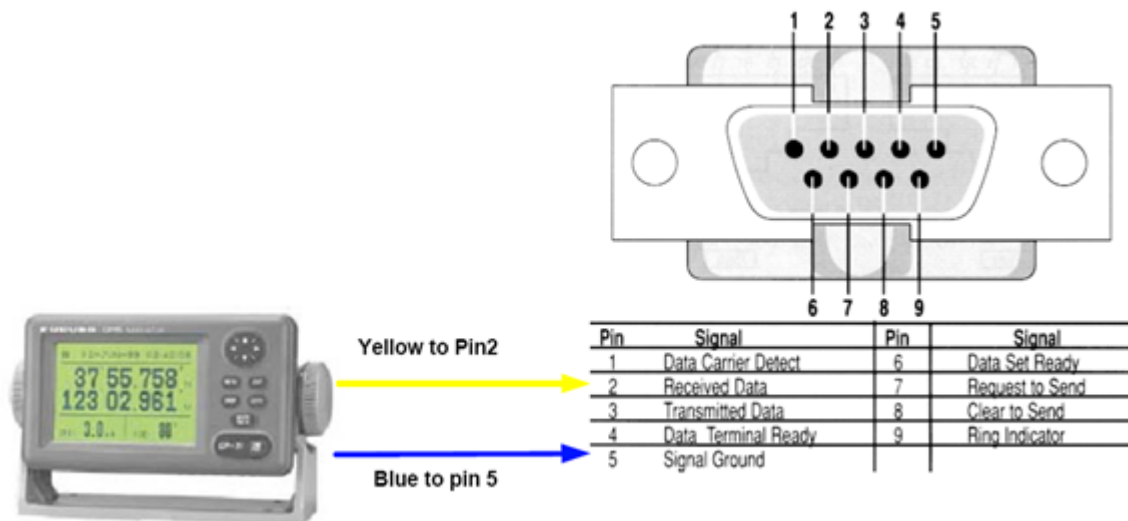
Installation

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.



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).

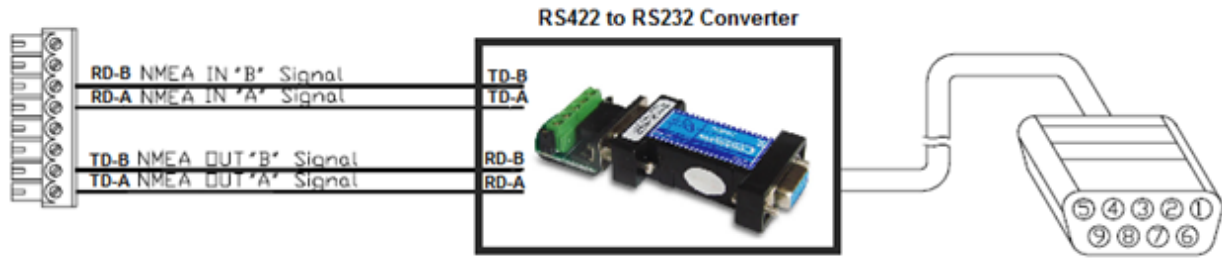
Note: "TD-A" / "TD-B" can also be noted "TD-H" / "TD-C" (Hot/Cold)

RS-422 has been selected as a preferred interface to transmit NMEA0183 data. 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, 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:

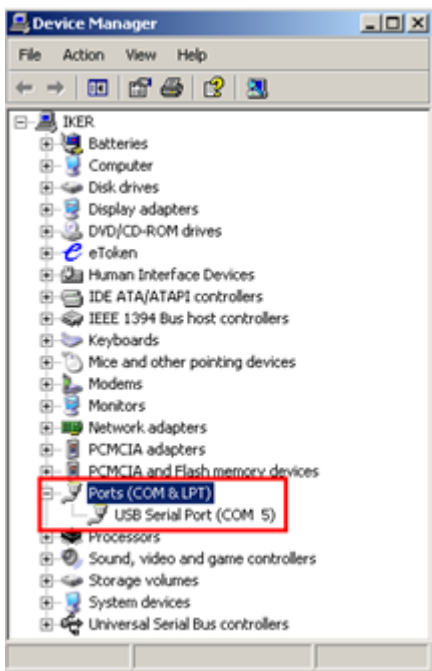


Using a Serial to USB Adapter

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)":



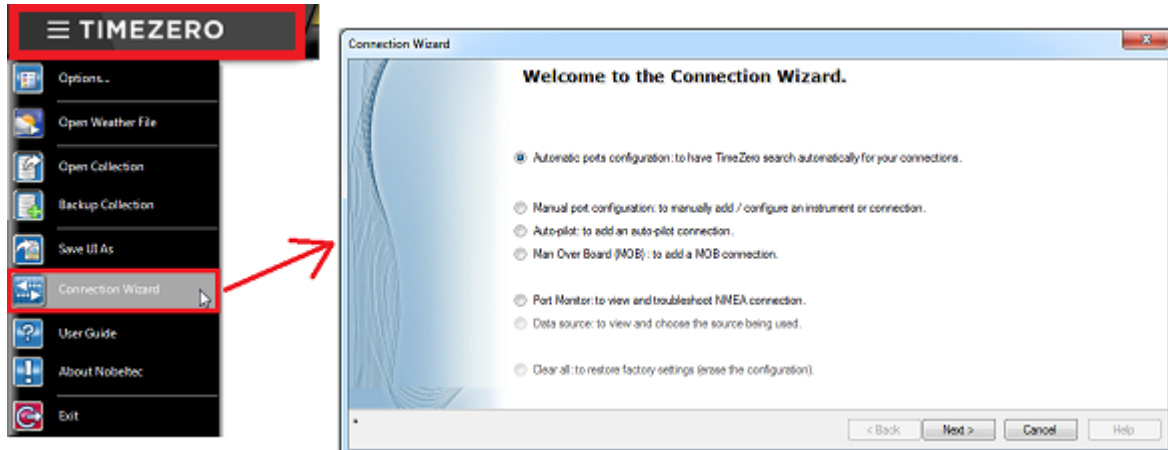
To open the Device Manager under Windows 7, search for "device Manager" from the Start menu. Under Windows 8, right click on the "Start" button (on the lower left of the Desktop) and select "Device Manager".

Connection Wizard 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.

The Connection Wizard is also used to output data (NMEA0183).

To open the Connection Wizard 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:

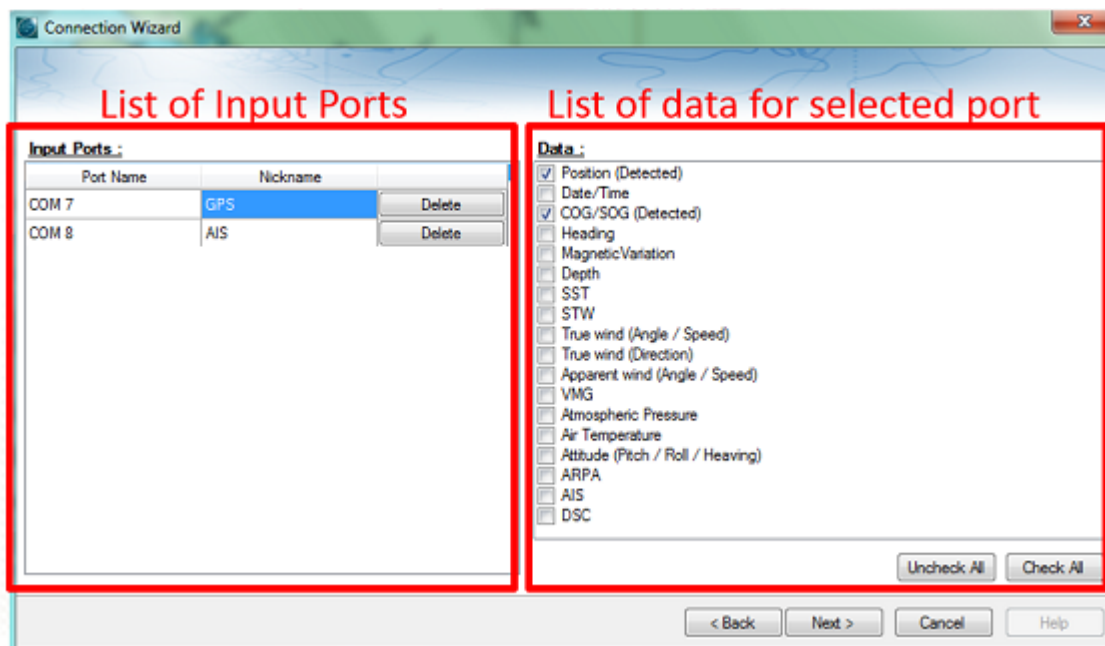
- NMEA0183 sensors (GPS, AIS, Heading, Wind Sensor, etc...) connected through a Serial port or USB to Serial Adapter (at 4800 and 38400 baud rate).
- NMEA200 sensors (GPS, AIS, Heading, Wind Sensor, etc...) connected through the Actisense NGT1-USB.
- NavNet Data (FA30, etc...) connected through an Ethernet 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. 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 : Baud Rate :

```
$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,M,50.0,M,0.0,0*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,M,50.0,M,0.0,0*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,M,50.0,M,0.0,0*65<cr><lf>
$SDDBT,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.

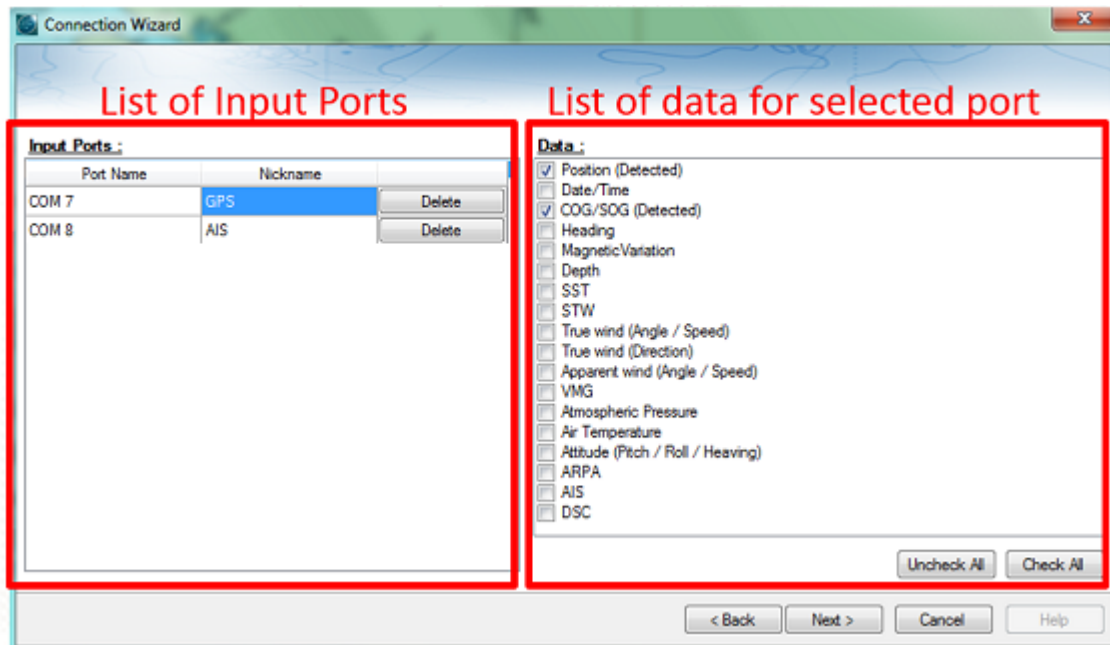
After selecting a COM port, you should see NMEA0183 sentences flowing in the window below. Valid NMEA sentences should:

- 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 baud rate 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:

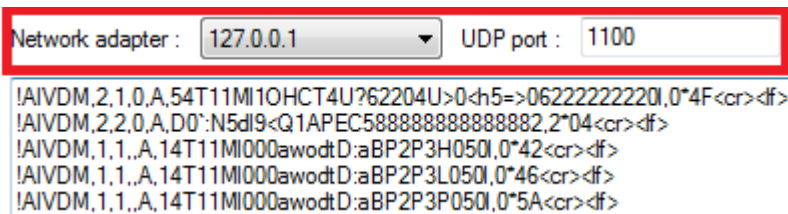
Select this option to configure or modify a NavNet connection when the computer is connected to the Furuno NavNet network through the Ethernet port.

- "NMEA" is used when the computer is connected to a Furuno AIS (FA30, FA50).
- "Fast Heading" is not used for Coastal Monitoring application. Make sure to not check this box.
- "ARPA" is not used for Coastal Monitoring application (ARPA is being computed within TimeZero). Make sure to not check this box.

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:



Confirm that NMEA0183 data is flowing and press on "Next". Follow the [same steps as when configuring a Serial COM port](#).

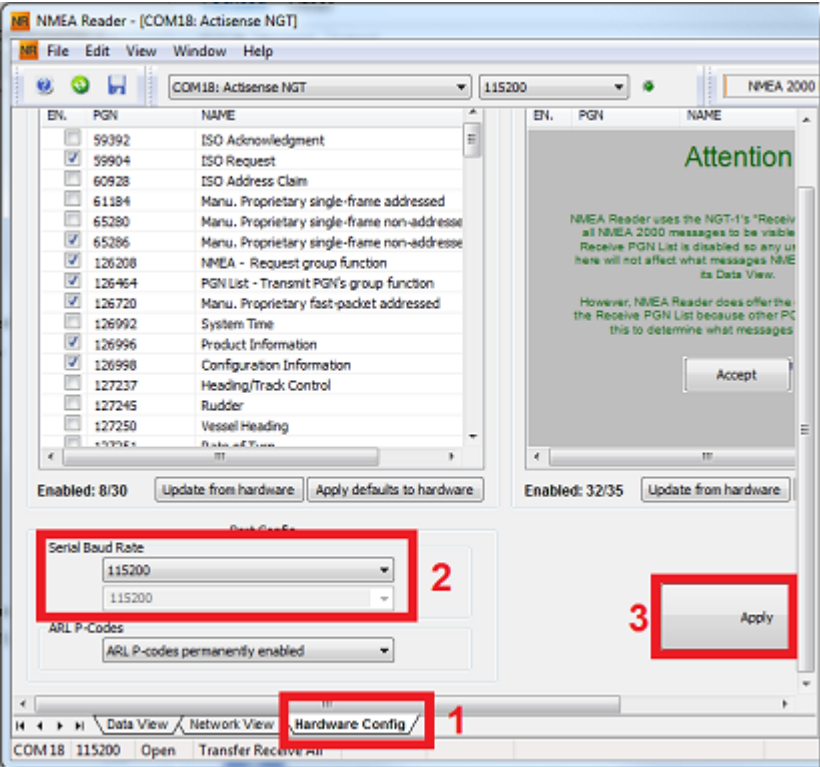
Note: UDP or TCP connection can be useful to send data in between two TimeZero computers

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](#).

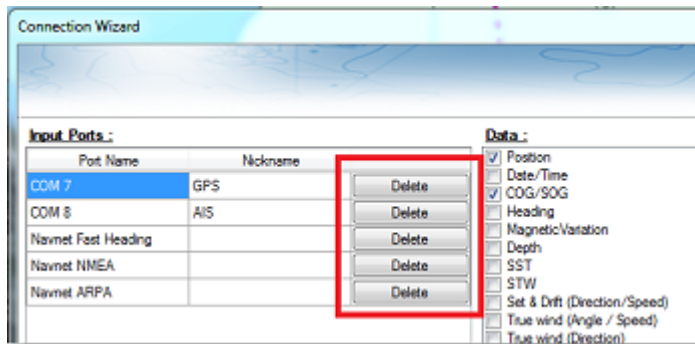
IMPORTANT: Note that TimeZero requires the NGT1-USB firmware to be v2.690 (or above) and also require the NGT1-USB to operate at a baud-rate speed of 115200bps (which should be the default operating speed of the NGT1-USB). If you need to upgrade the firmware of your NGT1-USB, you can download the latest version from the [Actisense website](#). If the baudrate speed of the NGT1-USB is not set to 115200bps, you can adjust it using the Actisense NMEA Reader tool that can be downloaded from the [Actisense website](#):



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



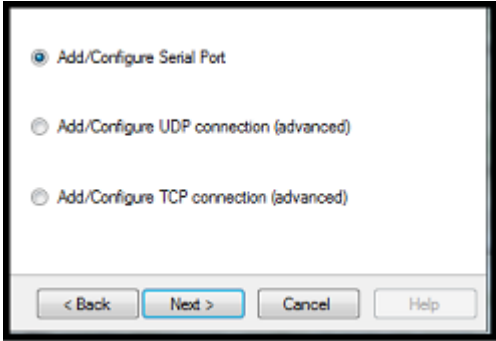
- Press "Next" and review the "Master" setup (especially if you have deleted a Port that was previously used as a Master for a specific data type)
- Press "Next" and "Finish" to close the Connection Wizard

Autopilot And External Output (NMEA0183)

Choose "Data Output" when you want to output NMEA0183 data. This can be useful to send ARPA targets (using the MXS_TLLX) to another distant computer.

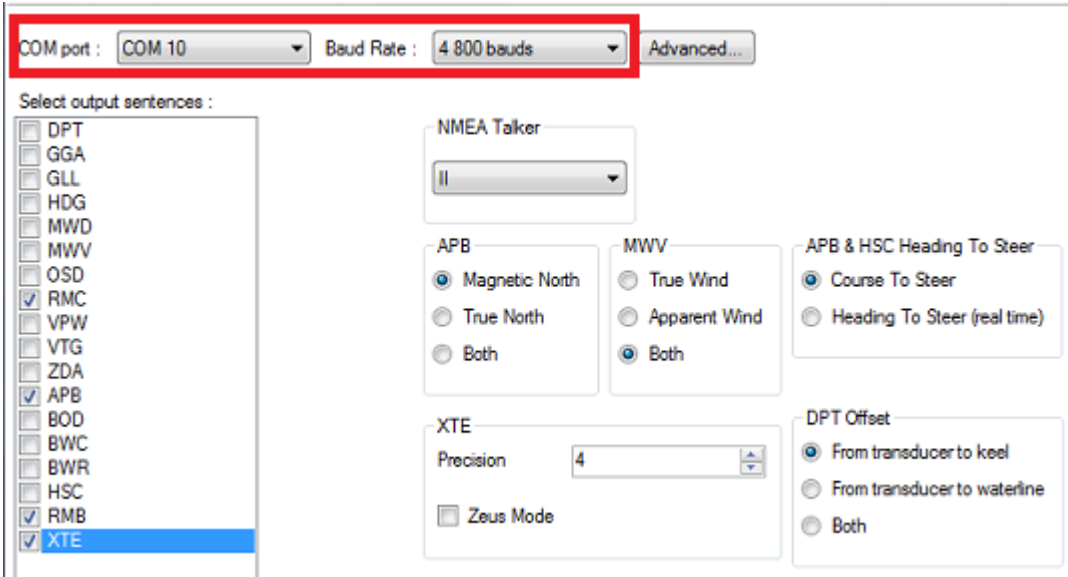
Output Configuration (NMEA0183)

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):



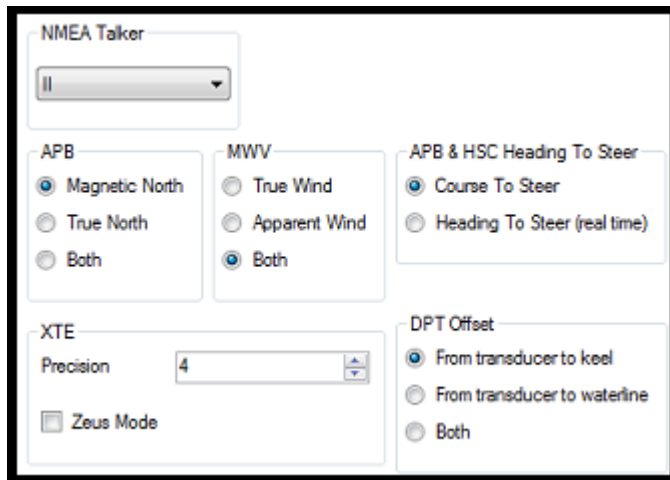
Note: If using a COM port and if the selected Port is already configured as an Input, you cannot select the Baudrate (it will be locked to the same baudrate as the input).

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).

Press "Next" to validate the settings then "Finish" to close the Wizard.

Advanced Output Settings:



NMEA Taker:

This setting changes the NMEA talker used in the NMEA sentence generated by TimeZero. The default is set to "II" ("integrated instruments"). Some external displays might not recognize the "II" talker. In this case, try to change it to "GP".

APB:

Not used for Coastal Monitoring application.

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:

Not used for Coastal Monitoring application.

XTE:

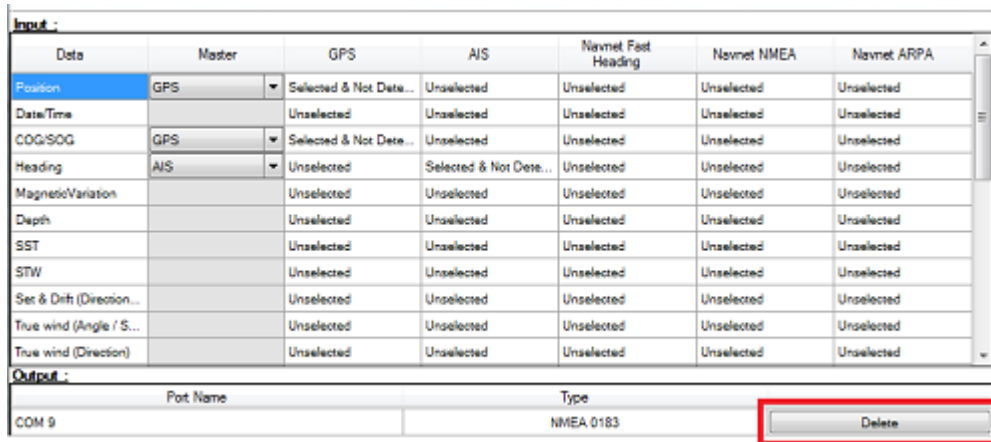
Not used for Coastal Monitoring application.

DPT (Depth) Offset:

Not used for Coastal Monitoring application.

To delete an output port:

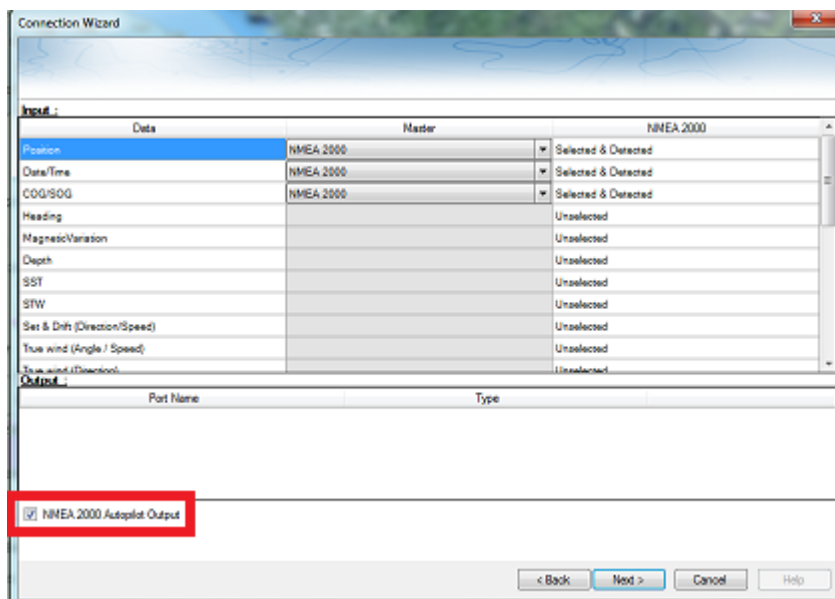
- Open the Connection Wizard
- Select "Data Source" and press "Next"
- Press "Next"
- On the Master selection page. press the "Delete" button in front of the output port you want to delete



- 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:

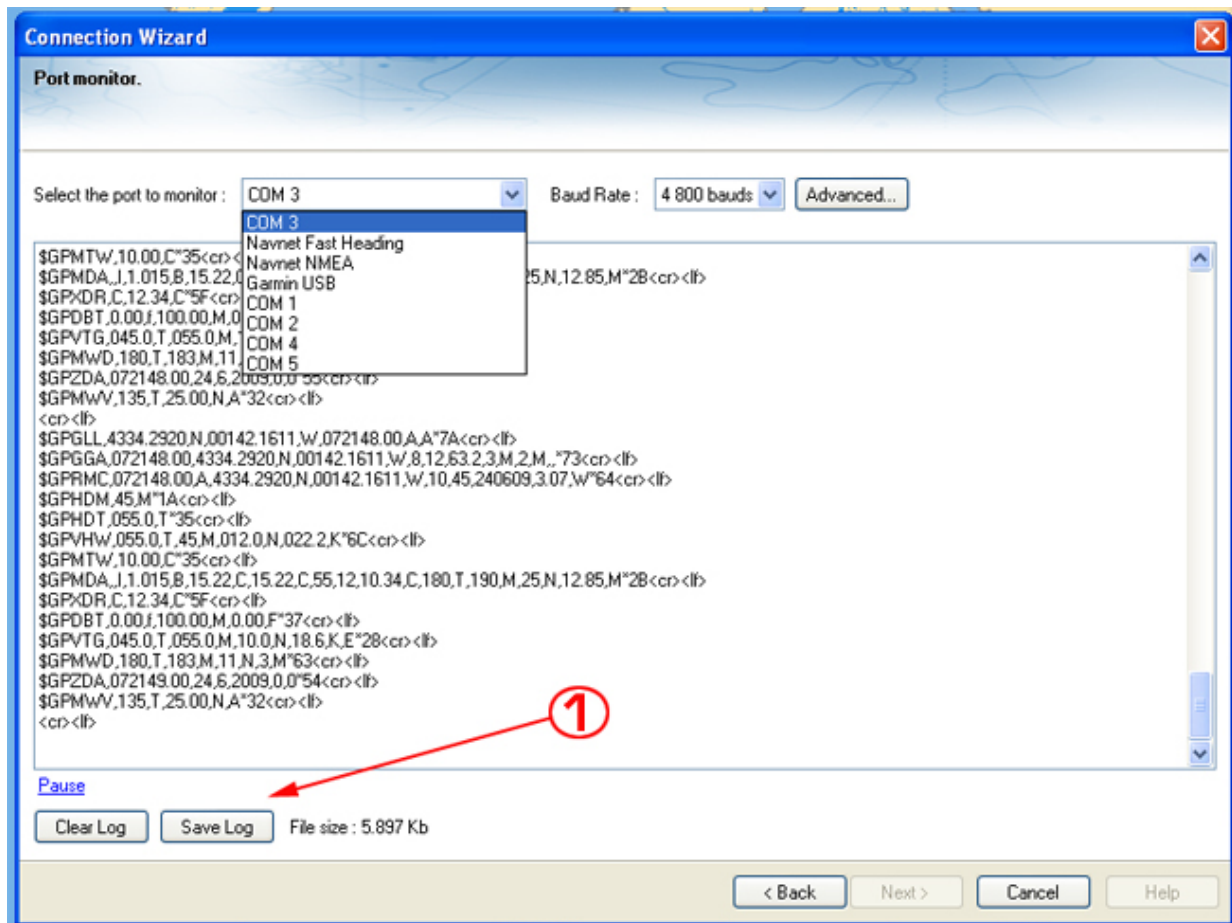


- PGN 129283 - Cross Track Error
- PGN 129284 - Navigation Data
- PGN 129285 - Navigation Route/WPT Information (used to transmit the name of the destination waypoint)

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
Date/Time	COM 11	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 Coastal Monitoring . Only use this option if you want to configure all the Inputs and Outputs of TimeZero Coastal Monitoring from scratch.

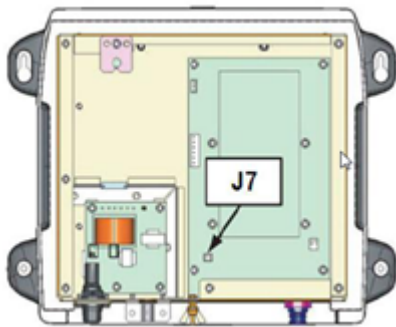
Be careful as this cannot be undone.

Direct DRS Connection

Power Supply Unit Connection (optional on some models)

Some newer DRS (such as the DRS-NXT) do not need any Power Supply Unit and can be connected directly to DC 24V and in some case DC 12v. Other models may come with a power supply unit (PSU-xxx). Please refer to the Furuno DRS installation guide for more information about power connection.

If the DRS model you use requires the PSU012 or PSU013 (Power Supply Unit) to power the 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:



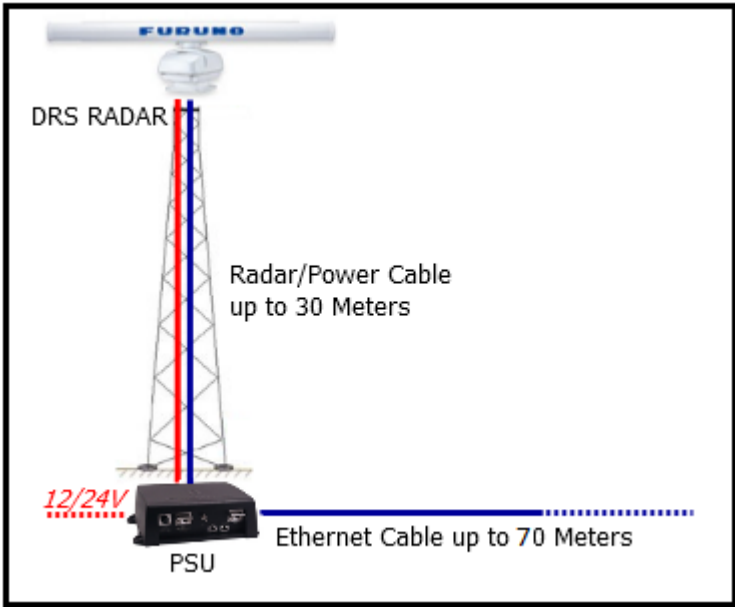
Note: If the PSU017 is used (for DRS dome antenna), there is no need to open the cover or insert any jumper.

Network Connection

The DRS radar and the computer needs to be connected on the same **local network** using the Furuno IP address (172.31.x.x / 255.255.0.0). It is NOT possible to have a router in between the DRS radar and the computer (the DRS and Computer need to be on the same broadcast domain).

Ethernet Network

If the DRS and computer are located close to each other, they can be networked using regular Cat5e or Cat6 Ethernet cable:



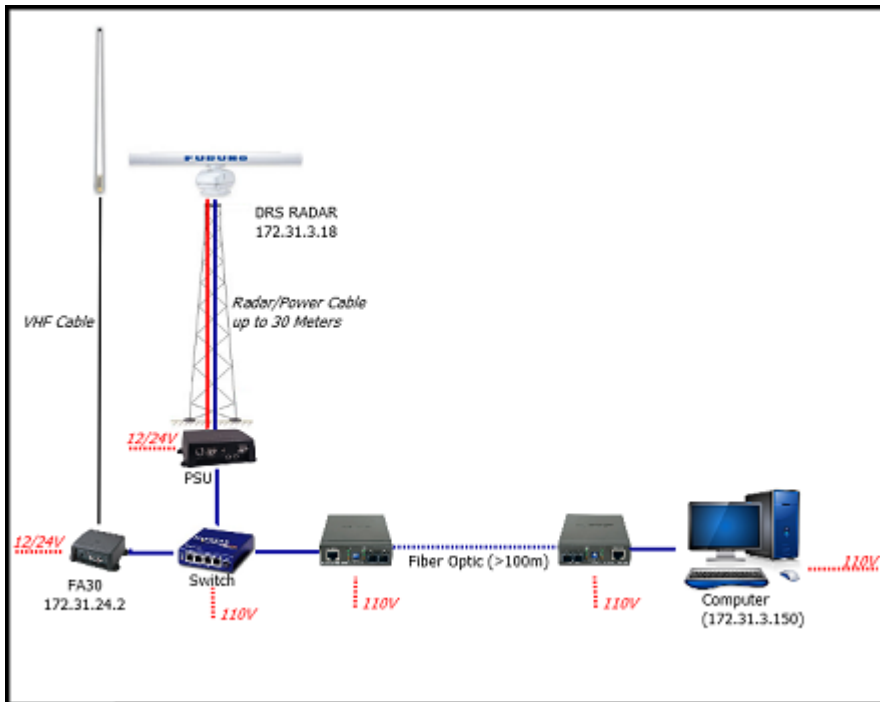
Note that the maximum length for a network cable segment is 100 meters per TIA/EIA 568-5-A. If longer runs are required, the use of active hardware such as a repeater or switch is necessary. Usually, fiber optic media is recommended for longer run than 100 meters.

Fiber Optic

A regular Ethernet network can be easily extended using fiber optic media converters if one run needs to be longer than 100 meters (usually in between the radar tower and the computer):

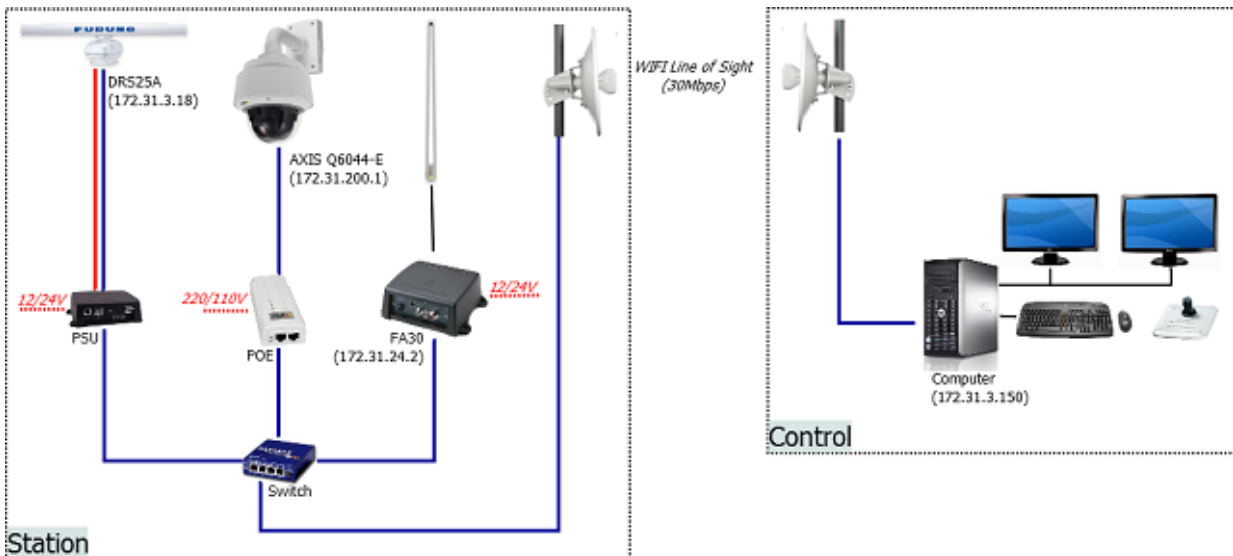


The below diagram shows a configuration with a DRS and AIS receiver connected to a switch at the base of the tower. A pair of fiber to Ethernet converters are used to extend the run using fiber optic cable:



Wireless Line of Sight bridge

In cases where Ethernet cable or Fiber Optic are not practicable, it is possible to use a dedicated Wireless Line of Sight bridge consisting of two antennas. Please note that the wireless link must support 30Mbps at minimum in order to carry the radar signal. The pair of antennas must be configured as a transparent bridge (they must act like an Ethernet cable without any routing or filtering):



Solutions like the Motorola PtP250 and Ubiquity NanoBridge can create wireless link up to 3KM (at 30Mbps).

IMPORTANT: The signal path in between the two antennas must be absolutely clear from any obstacle (trees, buildings, etc...)

Set the IP of the Computer

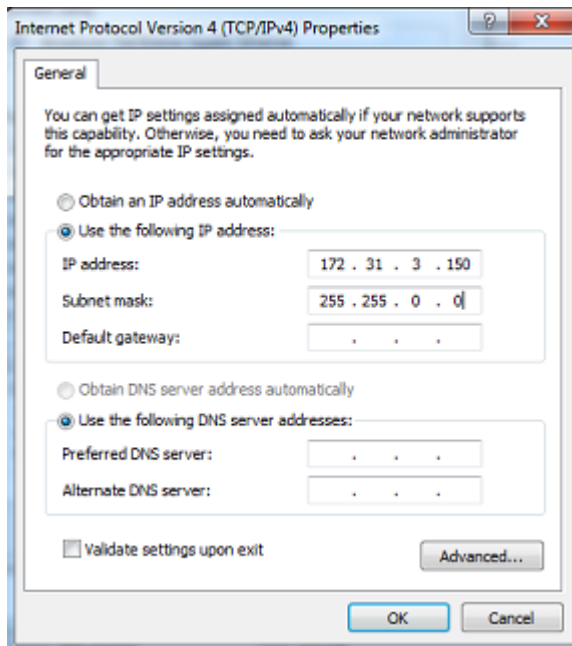
The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the DRS. We highly recommended using 172.31.3.150 as a fixed IP address for the computer with a subnet mask of 255.255.0.0.

Click on the Windows "Start" menu and search for "Network". Under the "Control Panel" category, click on "Network and Sharing Center". Under Windows 8 you can right click on the Start button and select 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").

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 temporarily 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, it is recommended to Ping the IP address of the DRS (172.31.3.18) 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.

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.

DRS Initial Setup

Perform the DRS Initial Settings from the [Radar](#) Options in TimeZero. Under "Radar Initial Setup", select the DRS Hostname you want to configure and adjust the following settings:

- enter the antenna position (Lat/Lon) and orientation. You can use the Radar Overlay on the chart to help setting the orientation of the radar
- enter the antenna height



- optional: setup the blank sector to avoid sending electromagnetic energy in area that don't need to be covered by the radar (toward land for example)

If you have two radars connected to TimeZero, please refer to [Dual Radar Setup](#).

FAR 2XX7 Connection

Connection

The FAR2xx7 Series Radar from Furuno consists of a:

- Gearbox and Antenna mounted on a Tower
- Analog Radar Cable
- Processor Box (with Ethernet output)
- Dedicated Keyboard and Service Monitor



When connecting a FAR series radar to TimeZero for Coastal Monitoring application, there is no need to connect GPS, Heading or AIS sensor to the FAR processor box.

Note: The FAR does not need any sensor connection because the ARPA targets are generated inside TimeZero. The FAR monitor and keyboard are only used to adjust the initial settings of the Radar and for service. The operator will exclusively work from the computer (the radar service monitor and keyboard are not used during normal operation).

The FAR radar and the computer need to be connected on the same **local network** using the Furuno IP address (172.31.x.x / 255.255.0.0). It is NOT possible to have a router in between the radar and the computer (the FAR and Computer need to be on the same broadcast domain).

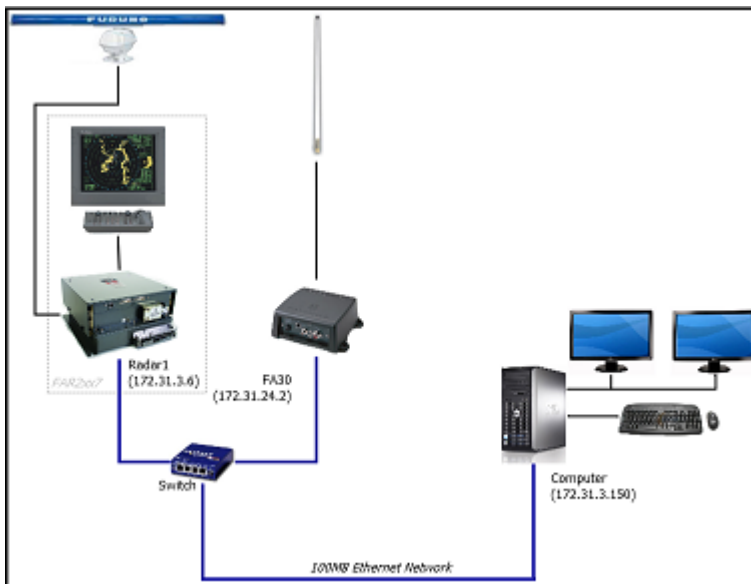
IMPORTANT: The FAR IP address must be set up to 172.31.3.x. TimeZero will not be able to connect properly to the radar if the FAR is set to another type of IP address. If the FAR is set with an IP address of 192.168.x.x (for ECDIS), make sure to revert DIP#4 to the OFF position on S1, then perform a factory reset. This will switch the FAR back to 172.31.x.x:



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		

Ethernet Network

If the FAR and computer are located close to each other, they can be directly networked using regular Cat5e or Cat6 Ethernet cable:



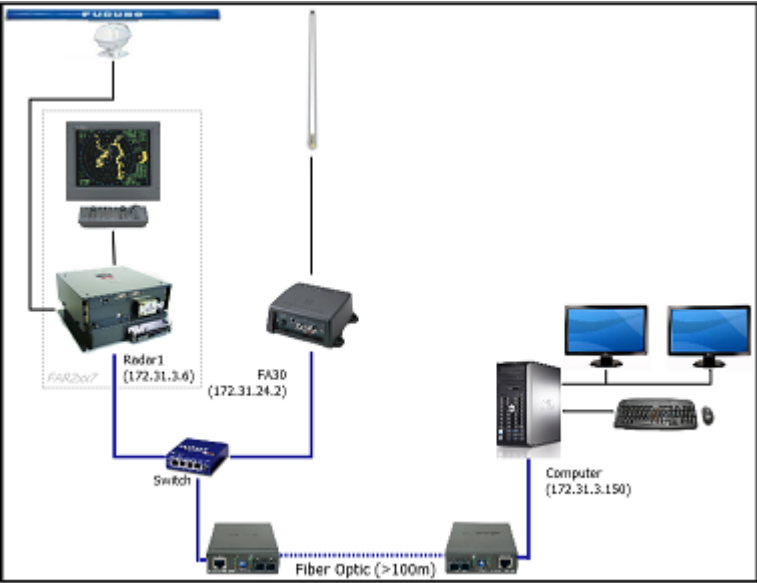
Note that the maximum length for a network cable segment is 100 meters per TIA/EIA 568-5-A. If longer runs are required, the use of active hardware such as a repeater or switch is necessary. Usually, fiber optic media is recommended for longer run than 100 meters.

Fiber Optic

A regular Ethernet network can be easily extended using fiber optic media converters if one run needs to be longer than 100 meters (usually in between the radar tower and the computer):

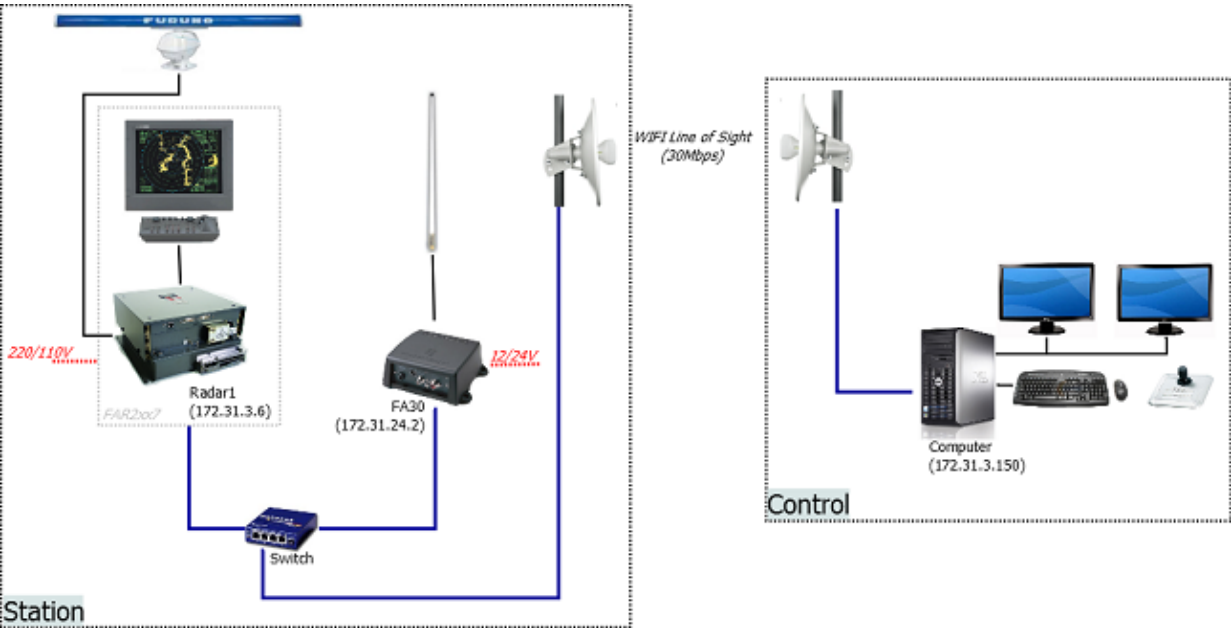


The below diagram shows a configuration where a pair of fiber to Ethernet converters are used to extend the run using fiber optic cable:



Wireless Line of Sight bridge

In cases where Ethernet cable or Fiber Optic are not practicable, it is possible to use a dedicated Wireless Line of Sight bridge consisting of two antennas. Please note that the wireless link must support 30Mbps at minimum in order to carry the radar signal. The pair of antennas must be configured as a transparent bridge (they must act like an Ethernet cable without any routing or filtering):



Solutions like the Motorola PtP250 and Ubiquity NanoBridge can create wireless link up to 4KM (at 30Mbps).

IMPORTANT: The signal path in between the two antennas must be absolutely clear from any obstacle (trees, buildings, etc...)

Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together, a unique number must be assigned to each processor. Note that for TimeZero to correctly detect the radar, at least one FAR2xx7 must be assigned to "RADAR1" (IP address = 172.31.3.6).

Tips: If the FAR radar was previously configured for another application, or if you have to change DIP#4 to OFF to set the IP to 172.31.3.x, it is recommended to perform a Master Reset:

- Make sure no menu is displayed
- Press and hold HL OFF + 2 then 3 then 4 and release
- Click on Factory Default 5 times

Once the FAR is set to factory default, open the installation menu:

- Make sure no menu is displayed on screen
- Press and hold HL OFF menu 5 times then release
- Select "Installation"
 - set the "RADAR No": set to "1" for the first . Selecting the radar number will automatically adjust the Radar IP address (172.31.3.6).
 - The radar will restart if you have to change its number.
- If you have a second Radar, repeat this process on the second Radar by selecting "2" for "RADAR No" (172.31.3.7)

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.

FAR2xx7 Initial Settings

Click on Menu and select "Echo". Press on "Tune Initialize". Wait for the initialization to be done (notification on the lower right corner).

Open the installation menu:

- Make sure no menu is displayed
- Press and hold HL OFF menu 5 times then release
- Select "ECHO ADJ"
 - Set "Cable ATT Adjust" as recommended. Bigger number = more Gain
 - Set "Timing Adj" as recommended. If possible, the best to use an AIS target to adjust the Echo.
 - Set "Default Ant Height" according to antenna tower
- Press "Back" and select "Scanner"
 - Adjust the "Blind Sector 1" as needed (please refer to [Dual Radar Setup](#) to setup blind sector and "merge" mode with two radars)
- Close the menu

If you don't connect any sensor to the FAR (GPS, Heading, AIS), follow the instructions below to silence the alarm:

- Right Click on "OS POSN" (top right) and select "Dead Reckoning".
- Enter the Dead Reckoning Lat/Lon (optional)
- Right click on "SPD" and select "Manual"
 - Set to 0
- Right click on "HDG" and set to "AD10"
- Long Left click on the AIS box (bottom right) to disable AIS

Optional: setup the blank sector to avoid sending electromagnetic energy in area that don't need to be covered by the radar (toward land for example). Please refer to [Dual Radar Setup](#) in case of sector blanking on an oil platform.

Configure the computer

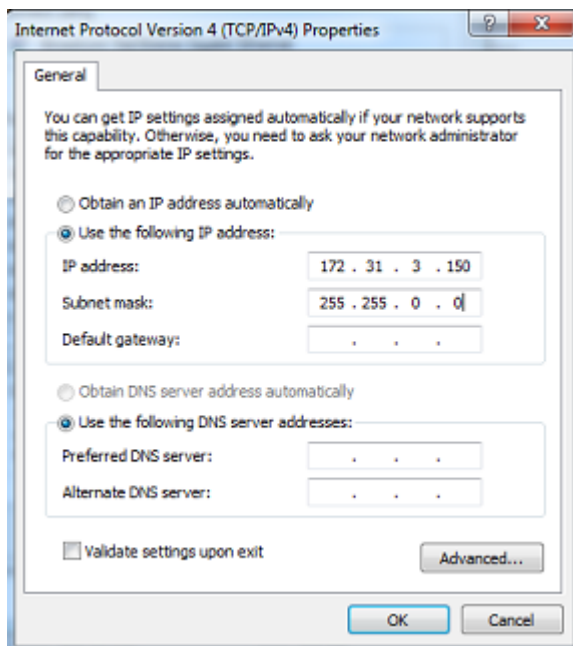
TimeZero connects to a Furuno FAR 2XX7 radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Furuno Network (172.31.x.x/255.255.0.0) in order to exchange information with the radar. We highly recommended using 172.31.3.150 as a fix IP address for 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 temporarily 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 computer's IP address has been assigned, it is recommended to Ping the IP address of the FAR (172.31.3.6) 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.

TimeZero Initial Setup

Perform the FAR Initial Settings from the [Radar](#) Options in TimeZero. Under "Radar Initial Setup", select the FAR Hostname you want to configure and adjust the following settings:

- enter the antenna position (Lat/Lon) and orientation. You can use the Radar Overlay on the chart to help setting the orientation of the radar
- optional: setup the blank sector to avoid sending electromagnetic energy in area that don't need to be covered by the radar (toward land for example)

If you have two radars connected to TimeZero, please refer to the [Dual Radar Setup](#) chapter.

FAR15x3 & FAR15x8 Connection

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" (menu item 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" (menu item 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" (menu item 3).

Configure the computer

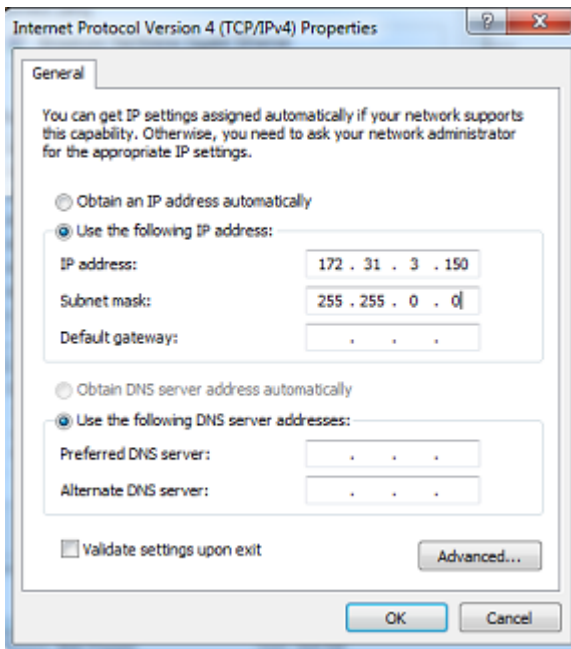
TimeZero connects to a Furuno FAR15xx radar through an Ethernet connection (100Base-T). The computer needs to have an IP address that "matches" the Radar Network (172.31.x.x / 255.255.0.0) in order to exchange information with the radar. We highly recommended using 172.31.3.150 as a fix IP address for 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 temporarily 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.

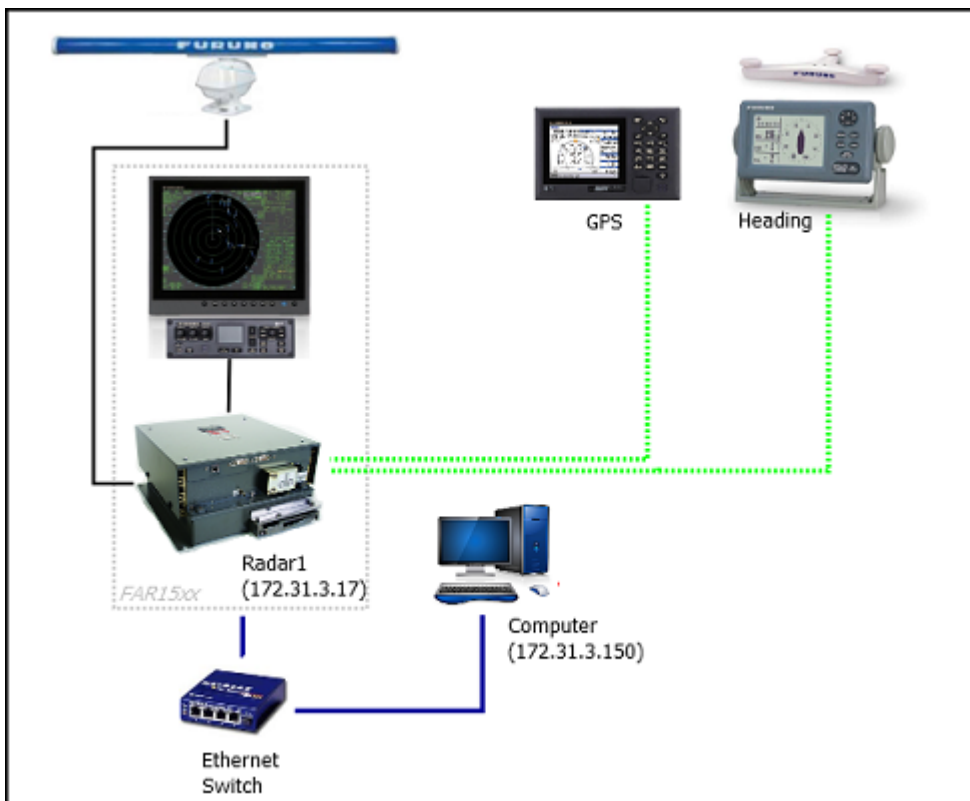
Select "Properties" on the "Local Area Connection Status" window. Double click on "Internet Protocol Version 4 (TCP/IPv4)". Use the fix IP address 172.31.3.150 with a subnet mask of 255.255.0.0:



Once the IP address of the computer has been assigned, launch TimeZero.

Configure Instruments

A GPS and Heading sensors need to be connected directly to the radar for the Anti Clutter Elimination (ACE Mode) to work properly, even in fixed application:



FAR2xx8 Connection

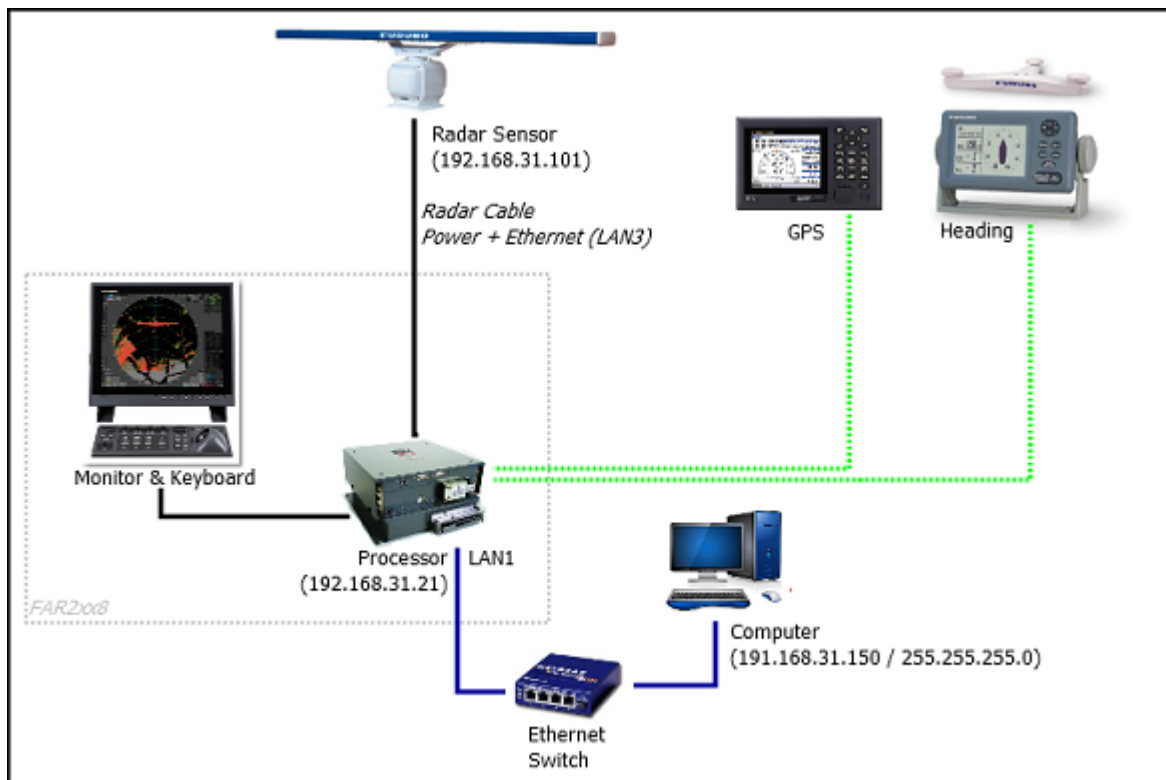
Configure the Radar

Set the FAR2xx8 IP Address

The PC communicates directly with the FAR2xx8 radar via its LAN1 port.

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. Note that a GPS and Heading sensors need to be connected directly to the radar for the Anti Clutter Elimination (ACE Mode) to work properly, even in fixed application:



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 at 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). We highly recommended using the following IP for the computer:

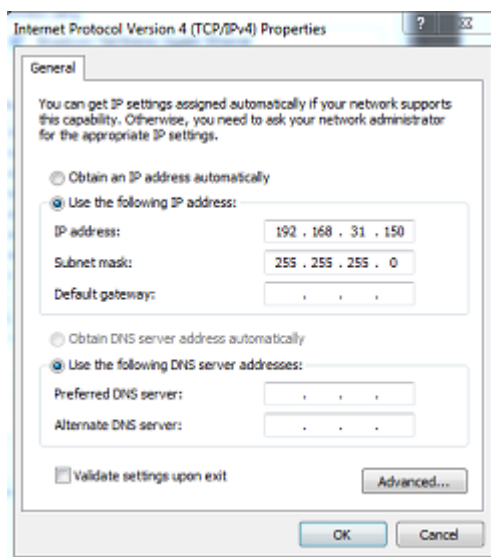
- 192.168.31.150 with a subnet mask of 255.255.255.0

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 temporarily 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:



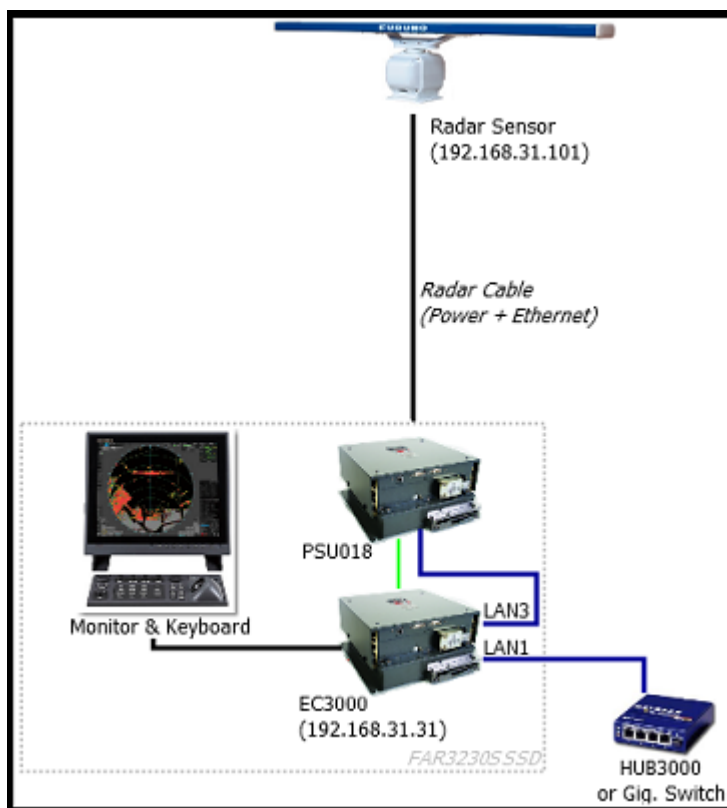
Once the computer's IP address has been assigned, it is recommended to Ping the IP address of the Radar Processor Unit (192.168.31.21 by default) and the Scanner unit (192.168.31.101 by default) to make sure the network is correctly set up. For more information on how to ping an Ethernet device, refer to the [How To Ping](#) chapter. Once connectivity has been confirmed, launch TimeZero.

FAR 3xx0 Connection

Connection

The FAR3xx0 Series Radar from Furuno consists of a:

- Radar Sensor (Gearbox and Antenna) mounted on a Tower
- Radar Cable (Power & Ethernet)
- EC3000 Processor Box (with LAN1 / LAN2 / LAN3 Ethernet Output)
- Dedicated Keyboard and Service Monitor

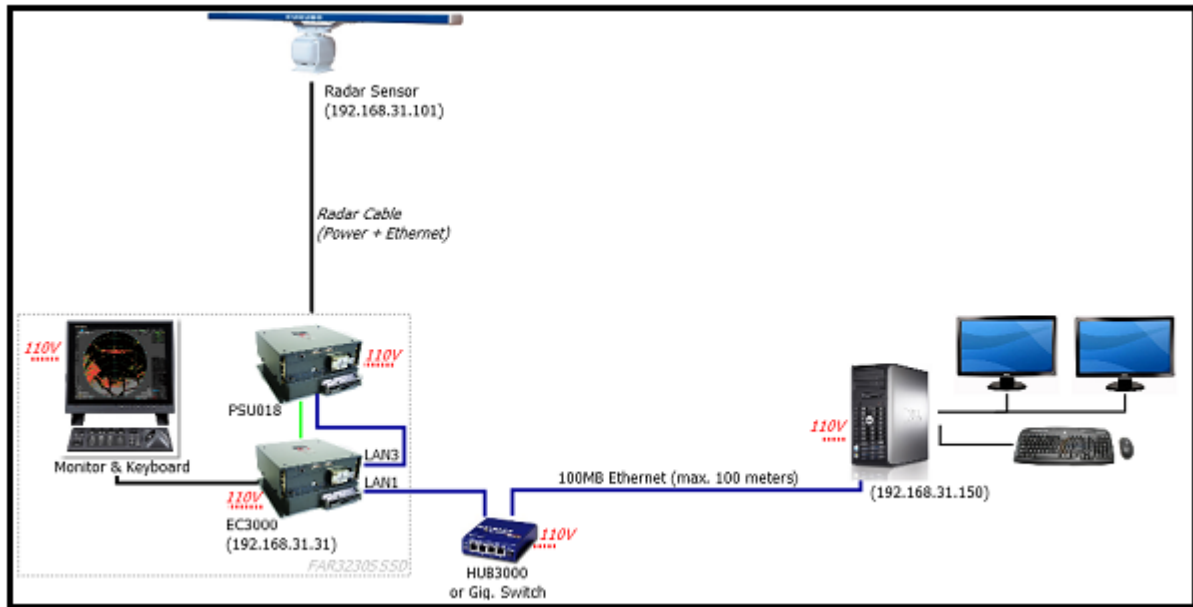


When connecting a FAR3K series radar to TimeZero for Coastal Monitoring application, it is not mandatory to connect GPS, Heading or AIS sensor to the FAR processor box because the ARPA targets will be generated inside the software and the AIS are monitored inside the software. HOWEVER, if you want the FAR3K ACE feature to work, you will have to connect position and heading (even fixed) to the Radar.

The FAR radar and the computer need to be connected on the same **local network** using the IP network 192.168.31.x / 255.255.255.0. The computer **MUST** be connected to the LAN1 output of the EC3000 (LAN3 is reserved for the Radar Sensor connection and LAN2 is reserved for Furuno Sensor Adapter which are usually not used in Coastal Monitoring application). It is **NOT** possible to have a router in between the EC3000 and the computer (the EC3000 and Computer need to be on the same broadcast domain).

Ethernet Network

If the FAR3K and computer are located close to each other, they can be directly networked using a regular Cat6 Ethernet cable:



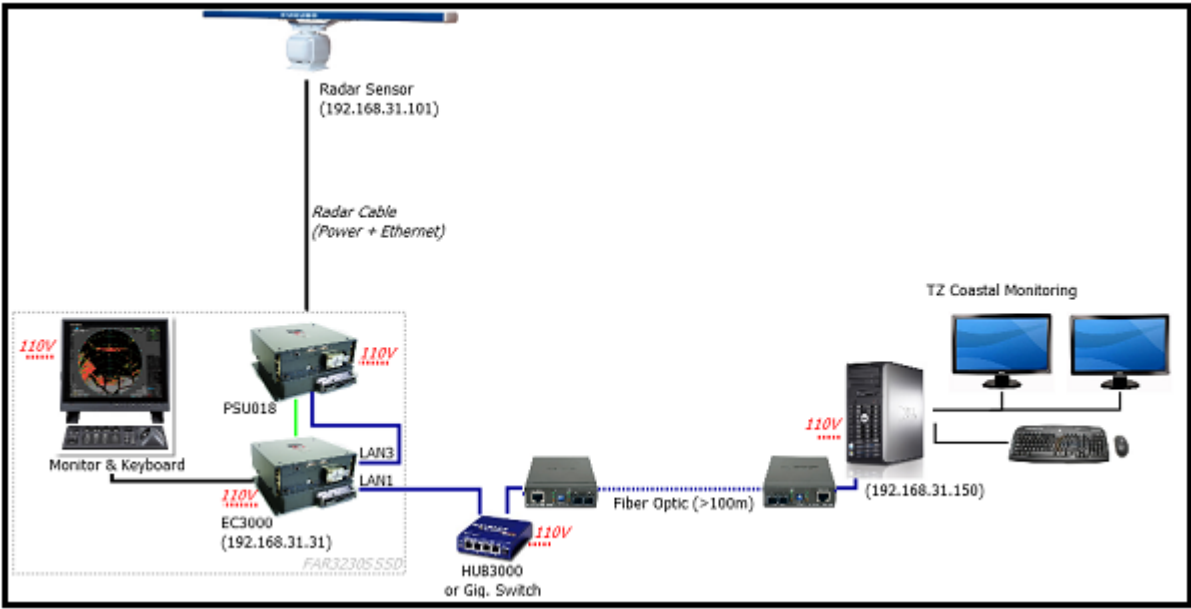
Note that the maximum length for a network cable segment is 100 meters per TIA/EIA 568-5-A. If longer runs are required, the use of active hardware such as a repeater or switch is necessary. Usually, fiber optic media is recommended for longer run than 100 meters.

Fiber Optic

A regular Ethernet network can be easily extended using fiber optic media converters if one run needs to be longer than 100 meters (usually in between the radar tower and the computer):



The below diagram shows a configuration where a pair of fiber to Ethernet converters are used to extend the run using fiber optic cable:



Check and Assign Radar Hostname(s)

When multiple radars are networked or inter-switched together via LAN1, a unique "Equipment ID" (and IP address) must be assigned to each processor and radar sensor antenna. Note that for TimeZero to correctly detect the radar, at least one Radar Sensor Unit must be assigned to 192.168.31.101.

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
	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.		

IMPORTANT: When changing the Equipment ID for the EC3000 (Processor Unit), it is important to also have the Radar Sensor unit connected to LAN3 of the EC3000. Changing the Processor Unit ID will also change the Radar Sensor Unit ID (so that they match). If you change the Processor Unit ID without the Radar sensor connected, you may introduce a mismatch in between the Radar Sensor ID and the Processor ID.

Please refer to the Furuno Radar Installation Manual to properly setup the IP addresses.

FAR3xx0 Initial Settings

The Radar Initial setup is performed from the Radar Keyboard and service monitor or a web browser on 192.168.31.31. Please refer to the Furuno Radar Installation Manual to properly setup the FAR radar.

Configure the computer

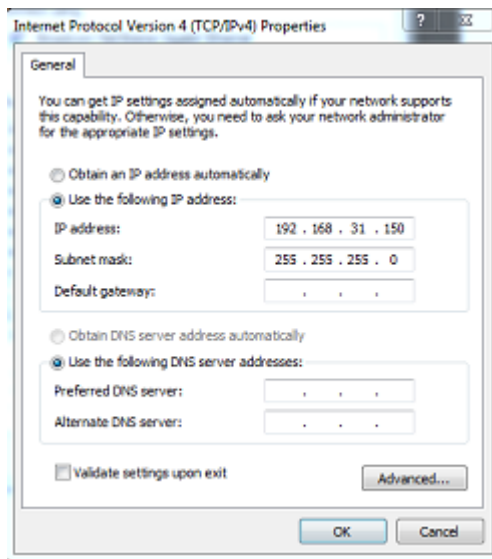
TimeZero connects to a Furuno FAR 3XX0 radar through an Ethernet connection (100Base-T) on LAN1 of the EC3000. The computer needs to have an IP address that "matches" the Radar Network (192.168.31.x / 255.255.255.0). We highly recommended using 192.168.31.150 as a fix IP address for the computer with 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 temporarily 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.

TimeZero Initial Setup

Select the [Radar](#) Options. Under "Radar Initial Setup", select the FAR Host Name you want to configure and adjust the following settings:

- enter the antenna position (Lat/Lon)
- enter the antenna orientation. You can use the Radar Overlay on the chart to help setting the orientation of the radar

If you have two radars connected to TimeZero, please refer to the [Dual Radar Setup](#) chapter.

Dual Radar Setup

This chapter only applies to TimeZero with "Dual Radar Module" when the two radars are connected **locally** to the computer

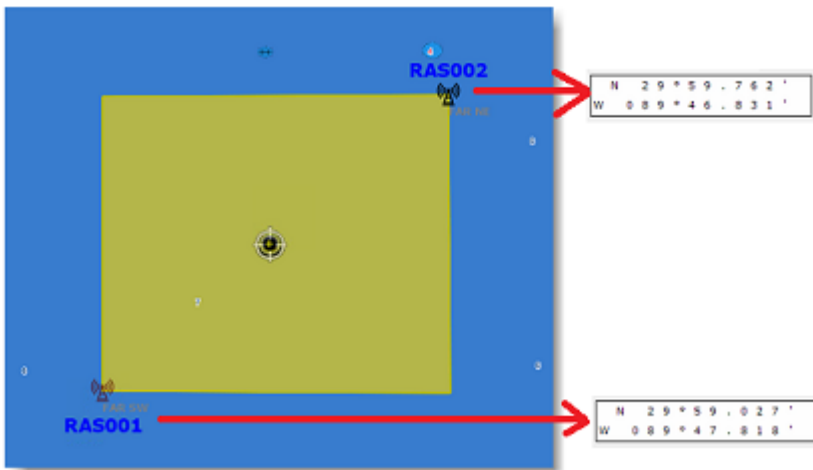
TimeZero Dual Radar product allows you to connect two Furuno Radars (two DRS or two FAR) directly to the computer. The two Radars connected to the software can be displayed and controlled independently and merged on the chart for seamless integration.

Note: The two Radars and the PC need to be on the same local area network (same broadcast domain). Please note that each radar requires a bandwidth of 15Mbps. Also, the two radars need to be of the same product range and have the same capabilities. For example, it is not possible to mix a DRS radar with a FAR radar. It is also not possible to mix a DRS-NXT radar with a DRS radar because they do not have the same capability (the DRS-NXT radar as a "Target Analyzer" mode that does not exist on a regular DRS).

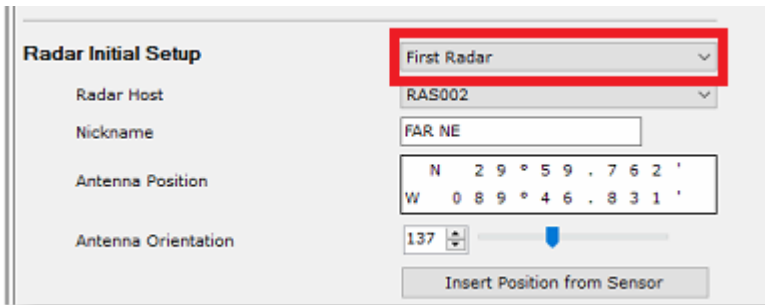
Configuration

IMPORTANT: Please refer to [NavNet DRS Connection](#), [FAR 2xx7 Connection](#) or [FAR 3xx0 Connection](#) to setup the network configuration of the computer and the radars before proceeding with this chapter.

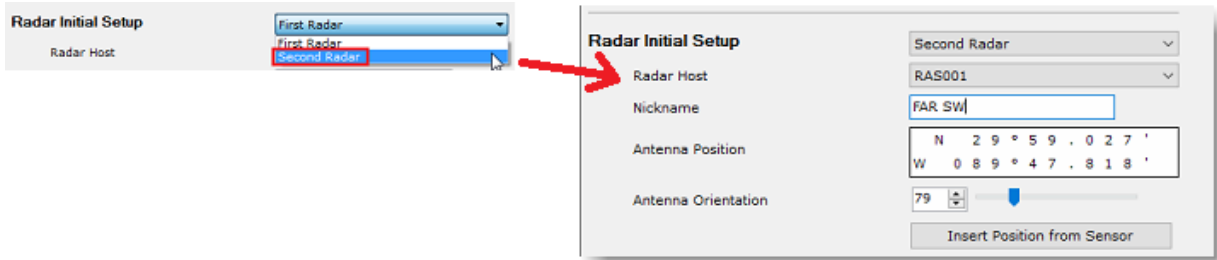
Before adjusting the two radars in TimeZero, you should know which radar is installed where (identified by their IP or Host Name). For example, in the case of FAR3000, the Host Name of the Radar will be "RAS001" when the IP address of the antenna is set to 192.168.31.101 (default) and "RAS002" when it is set to 192.168.31.102. In case of an oil platform, you should know which antenna is installed at which corner, and write down its corresponding position:



Select "First Radar Configuration" in front of the "Radar Initial Setup". TimeZero will automatically pick one radar host (in the example below "RAS002"). Enter the corresponding nickname for that radar (that will appear in the user interface), then enter the radar position and orientation:



Once the first radar has been configured, select "Second Radar Configuration". TimeZero will automatically pick the second Radar Host available on the network. Repeat the configuration steps by entering the position and orientation of that second radar:

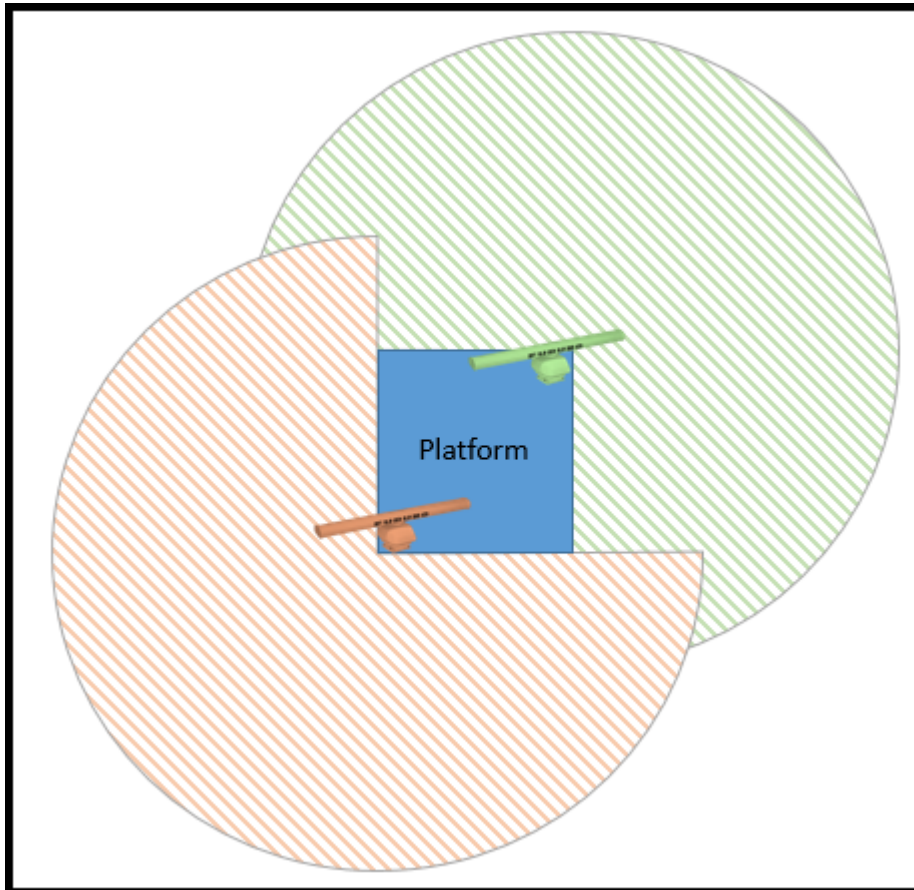


Note that you can re-adjust the initial settings of the two radars at anytime (for example if you need to change the orientation at a later time). Just make sure to select which radar you want to adjust: "First Radar Configuration" or "Second Radar Configuration".

With DRS radars, all the initial settings (such as blanking sectors) can be setup directly inside TimeZero. HOWEVER, in case of FAR2xx7 or FAR3xx0 radar, you have to adjust the initial settings from the Radar processor display (not inside TimeZero).

Oil Platform Merged Mode

Two Radars can be connected to TimeZero to provide a 360 degrees coverage around an oil platform:

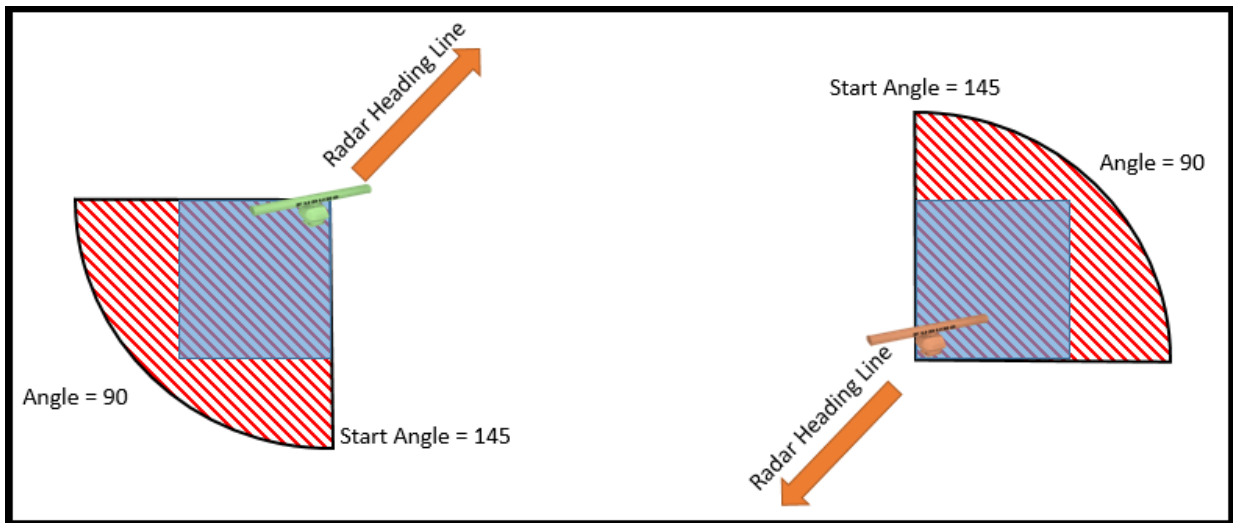


IMPORTANT: The Radar Merging always happens inside TimeZero. Do NOT use the "Merge Mode" of the FAR radar. Leave the FAR radar in "normal" mode. Only the blind sectors need to be setup on the FAR2xx7 / FAR3xx0 directly.

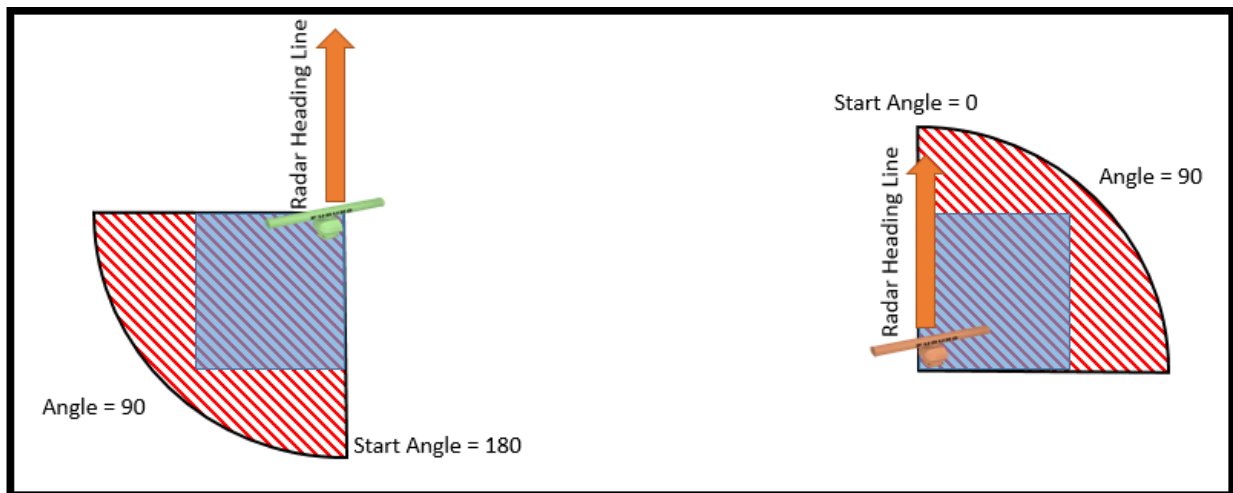
How to adjust blind sectors:

Blind Sectors are always adjusted relative to the antenna heading (the direction where the radar antenna has been installed). The start angle must be provided, and then, the blind sector angle (how wide the blind sector needs to be).

Below is an example, where the antennas are faced outward aligned with the diagonal of the platform. In this case, the blind sector settings would be the same on both radars:



Below is an example, where the two antennas are pointing in the same direction (to the top of the platform). In this case, the blind sector settings would be different on both radars:



Once the blind sectors have been adjusted on both radars, proceed to the Radar Orientation adjustment inside TimeZero (from the [Radar Options](#)). The easiest is to use the Radar Overlay and/or AIS target to align each radar echo on the chart.

IMPORTANT: Even if you connect a GPS and Heading to the FAR2xx7 radar, you will have to manually adjust the Radar Orientation in TimeZero unless you use the dynamic positioning (refer to [Fixed & Dynamic Position](#)). The FAR2xx7 & FAR3xx0 radar only sends a "Head Up" picture to TimeZero in fixed positioning mode.

AXIS IP Camera & Converter

Introduction

TimeZero is compatible with any AXIS IP Cameras and any AXIS IP Converters. If the Camera has Pan/Tilt/Zoom (PTZ) abilities, TimeZero can control the camera from the Camera WorkSpace, the Camera NavData virtual joystick, and from the chart (if the camera is set to be used for tracking).

Installation Overview

In order to view (and control) an AXIS IP camera or converter from TimeZero, it is necessary to:

- Assign a fixed IP Address to the camera or converter using the AXIS IP Utility Program
- Setup the camera or converter with credentials (it is recommended to use the default "pass" password for the "root" account)
- Adjust some settings such as maximum frame-rate and resolution (according to how many cameras you have on the network and the CPU of computer)
- Add and configure the Camera in TimeZero from the [Camera](#) Options

Note: Video feed decoding (H264) can take lots of CPU and requires a powerful computer if you connect multiple HD cameras. In some situation, you might have to reduce the frame-rate (FPS) and/or resolution of the camera for "smooth" operation in TimeZero.

Setting the IP of the computer

You can select any IP address you want for the AXIS IP Camera or Converter as long as the computer is on the same network. In the following example, we will configure the Cameras and computer addresses to use the IP network 172.31.x.x / 255.255.0.0 (same Network as Furuno sensors):

- Open the "Control Panel" from the Windows "Start" menu (under Windows 8 or Windows 10, right click on the "Start" button, then select "Settings" and "Network & internet")
- Select "Change Adapters"
- Right click on the Local Area Connection corresponding to the Ethernet card where the network is connected and choose "Properties"
- Select "Internet Protocol version 4 (TCP/IP v4)" then click on "Properties"
- Select "Use the following IP address" then enter the appropriate IP address and Subnet Mask for the computer

In this example, we will use the NavNet IP network, so we will set the IP address of the computer to 172.31.3.150 with a subnet mask of 255.255.0.0

Setting the IP of the camera(s)

In this example, we will set up 3 IP cameras:

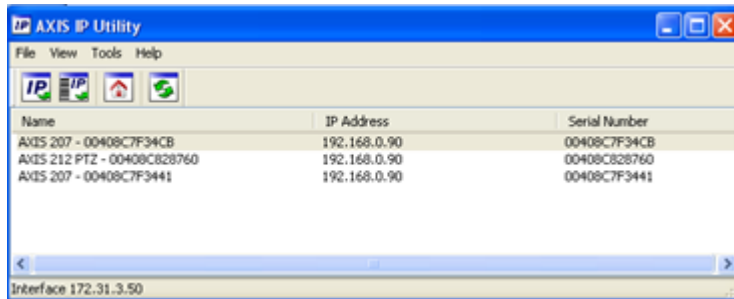
- One Pan/Tilt/Zoom IP camera (AXIS 212PTZ)
- One fixed (non PTZ) IP Camera (AXIS 207)
- One fixed (non PTZ) IP Camera (AXIS 207)

Download the AXIS IP Utility from AXIS website:

<https://www.axis.com/en-us/support/downloads/axis-ip-utility>

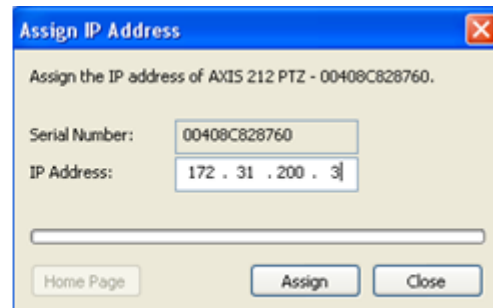
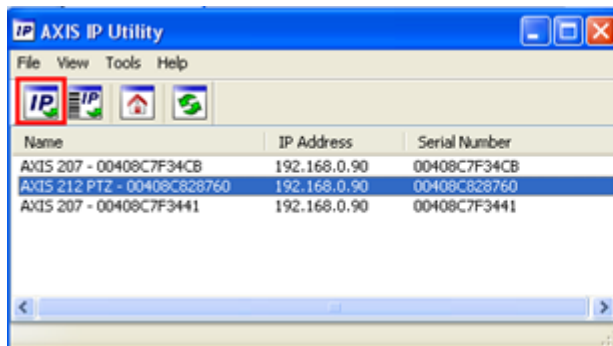
Right click on the "AXIS IPUtility" software and choose "Run as Administrator". If the Windows Firewall appears when opening the tool, make sure to click on "Unblock" to allow the software to detect and configure correctly the IP Camera(s).

The AXIS IP utility will detect all the IP cameras connected on the network:



Note: If you use the same camera models in multiple locations, be sure to write down the Camera serial number (which can be found on the back of the camera) with the intended location to help assign the correct camera.

To change the IP address of the Camera, select the camera in the list and click on the button "assign new IP address to selected device". Enter the correct IP address and click on "Assign":



Wait 30 seconds. If you don't get a confirmation message within 30 seconds, you will need to restart (power OFF and ON) the camera while leaving the tool running. After restarting the camera, wait for 3 minutes. You may have another Windows Firewall warning during the process. Simply accept it.

Note: If you do not get a confirmation message after 3 minutes, close the AXIS IP Utility tool and repeat the entire process.

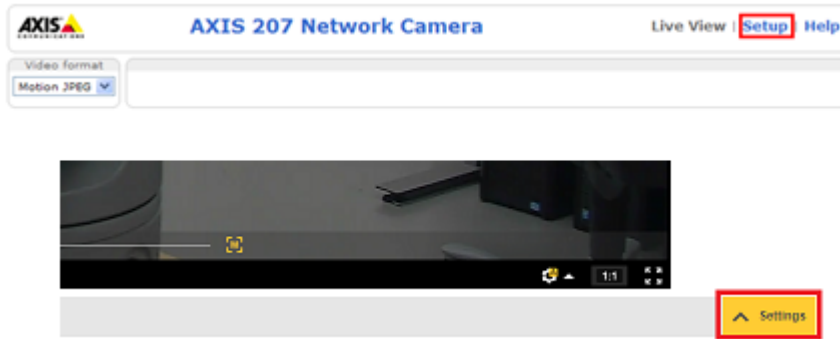
If applicable, repeat the process with other cameras (to assign the IP of the other cameras).

Configuring the camera

The cameras need to be initially configured using a Web browser. When you connect to the camera the first time, it will ask you to create the Root account. It is recommended to set the password of the IP camera to "pass" and click "OK".

Note: If the camera is also used by a Furuno NavNet MFD, the Root account password MUST be setup to "pass"

Once the page of the camera appears, open the settings page. Click on the "Setup" button located on the top right corner (on older AXIS Cameras) or click on the "Setting" button located on the bottom right corner (for newer AXIS IP Cameras):



RECOMMENDATION: To achieve better performance and optimize network bandwidth, it is recommended to limit the camera resolution to a maximum of 720p and the camera frame rate (fps) to 15 fps. On older AXIS IP Cameras, select "Video ->Video Stream" and adjust the "Resolution" and "Maximum Frame Rate" settings found under the "Image" tab. On newer AXIS IP Camera, those settings can be found directly under the "Stream" tab.

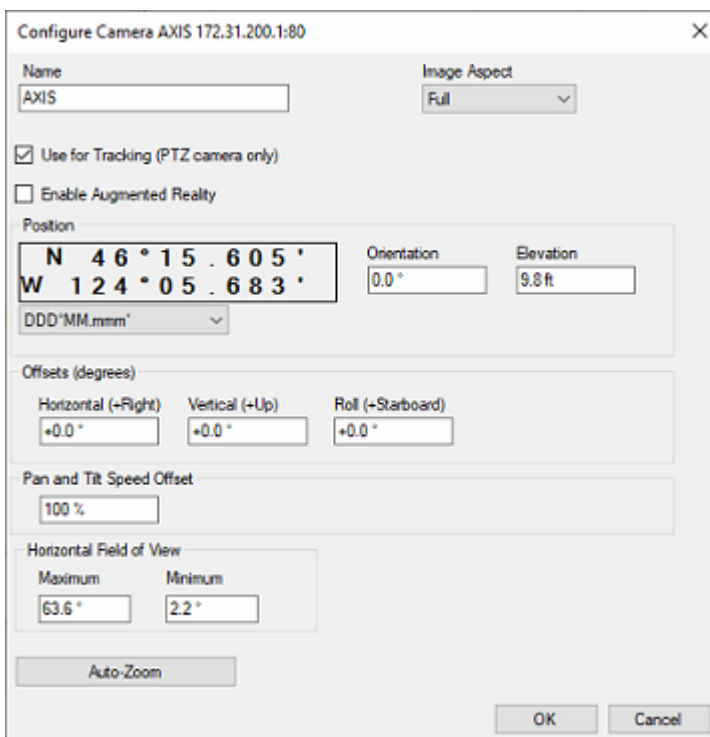
Note: If you have a PTZ camera with the "Control Queue" option (under "PTZ Configuration-> Control Queue"), make sure to leave the Control Queue setting OFF as it is not supported by TimeZero (or NavNet MFD).

Configuring TimeZero

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select AXIS. TimeZero will scan for any AXIS IP cameras that are connected on the local network.

Note: If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address.

After selecting the camera from the list (or after manually entering its IP address), TimeZero will ask you to enter the camera's credential (login/password). After validating the login and password, TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (fixed vs. PTZ) and features you want to enable (Tracking and/or Augmented Reality):



Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

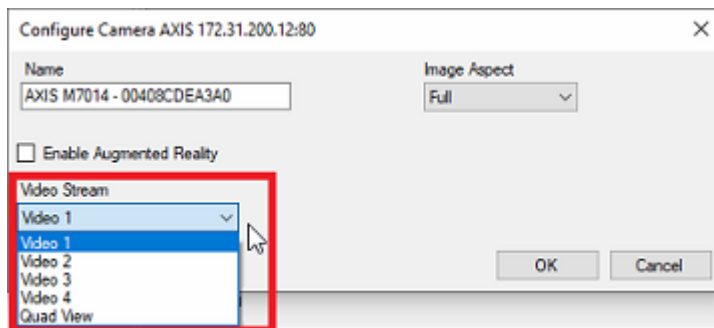
If you enable "Use for Tracking" (only available with AXIS PTZ Cameras) or "Augmented Reality", you will need to enter the camera position.

Enter the position of the camera using Lat/Lon (note that you can select the format just below). For the horizontal offset (orientation of the camera from North), please refer to the chapter [Align the Camera](#) which provide an easier way to enter the horizontal offset.

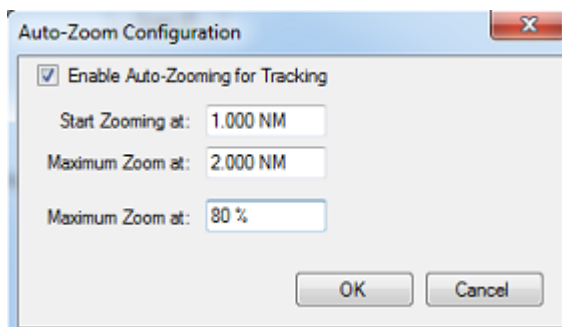
For the Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

You will also have to enter the horizontal Field of View of the camera. If the camera has Zoom capability, you will have to enter two values: the Maximum FOV (when the camera is zoomed out) and the minimum FOV (when the camera is zoomed in). Note that TimeZero will attempt to extract those values from the camera. However, some AXIS cameras do not support this feature and you should double check those values using the camera specification.

If you are using an AXIS IP Converter with multiple inputs, you can select a specific input or a view that will mix the 4 inputs as one camera. If you want to add another channel from the same converter, repeat the process by adding another converter with the same credential and IP address but with another channel selected (each channel is seen as an independent camera in TimeZero).

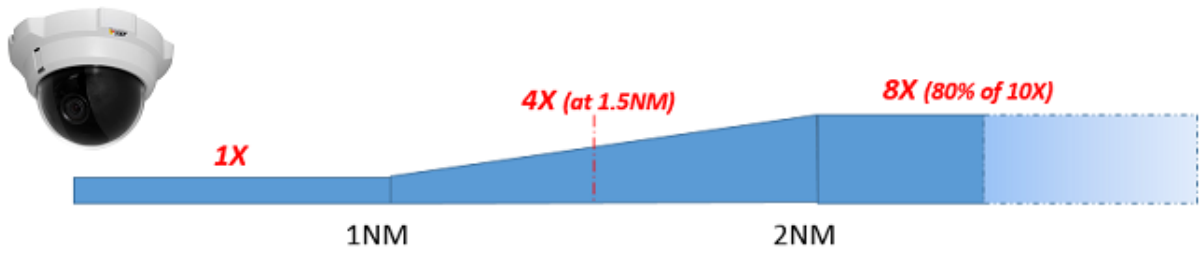


If the camera is PTZ and if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1NM and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



Note: Limiting the maximum zoom (in %) is useful if you don't want the camera to zoom at its full value (because it becomes "too blurry").

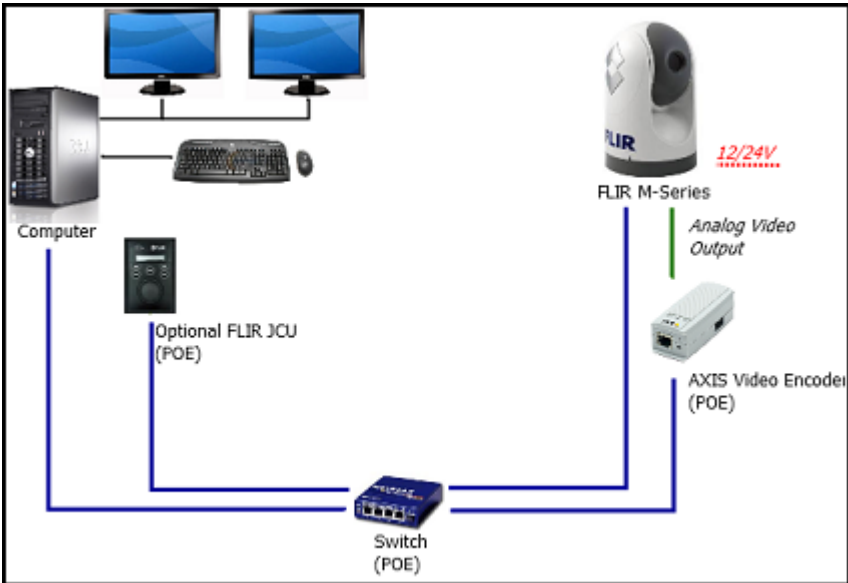
The diagram below illustrates the zoom value according to distance with a 10X zoom camera that has been restricted to 8X (80% of maximum zoom value):



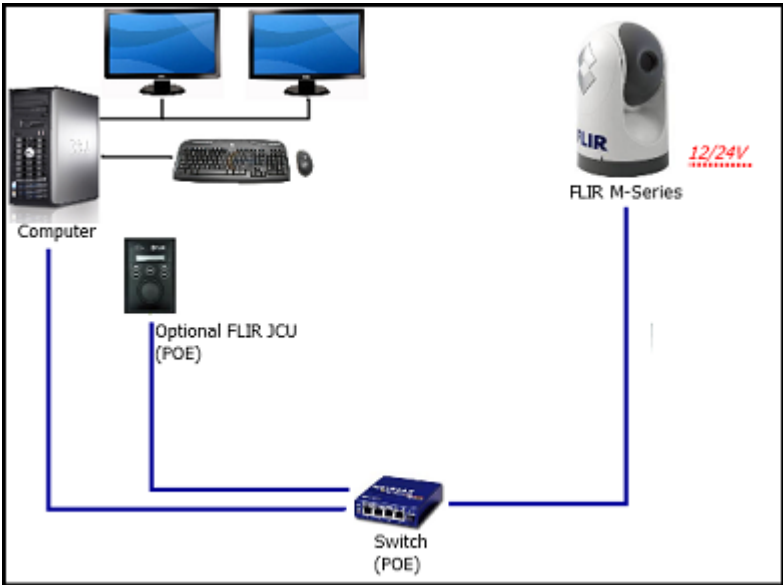
Click on "OK" to validate the settings and add the camera to the configuration.

FLIR Configuration

TimeZero is compatible with all FLIR M-Series and PT-Series cameras. Note that the legacy FLIR M-Series camera requires an AXIS video encoder if you want to view the video inside TimeZero. Below is an example showing a typical legacy FLIR M-Series connection diagram with an AXIS IP Video encoder to bring video inside TimeZero:



However, newer FLIR cameras have an internal IP video encoder and you don't have to use any external AXIS IP Encoder (a single Ethernet cable will provide Control and Video). The below example illustrates a typical connection diagram with a M200 (also applicable to M300/400/500):



The FLIR Joystick ("JCU") uses one Ethernet cable for data and power. To provide power to the JCU, you can use a regular switch with a "Power over Ethernet" (POE) injector or use a POE switch that can provide power directly from its POE connectors.

Camera Configuration

You have to assign a fixed IP address to the Camera, the JCU Controller (Optional) and the computer. In this example, we will use a traditional Class C network configuration (192.168.1.X / 255.255.255.0), but you could also use the Furuno network configuration (172.31.x.x / 255.255.0.0) if you want to integrate TimeZero, NavNet Sensors and the FLIR Camera onto the same network.

Note: When manually assigning the IP addresses, make sure to not use the same IP address twice!

Example:

- Computer = 192.168.0.50 / 255.255.255.0
- FLIR Camera = 192.168.0.100 / 255.255.255.0
- JCU (FLIR Joystick) = 192.168.0.101 / 255.255.255.0
- Optional AXIS Converter (for older M-Series) = 192.168.0.102 / 255.255.255.0

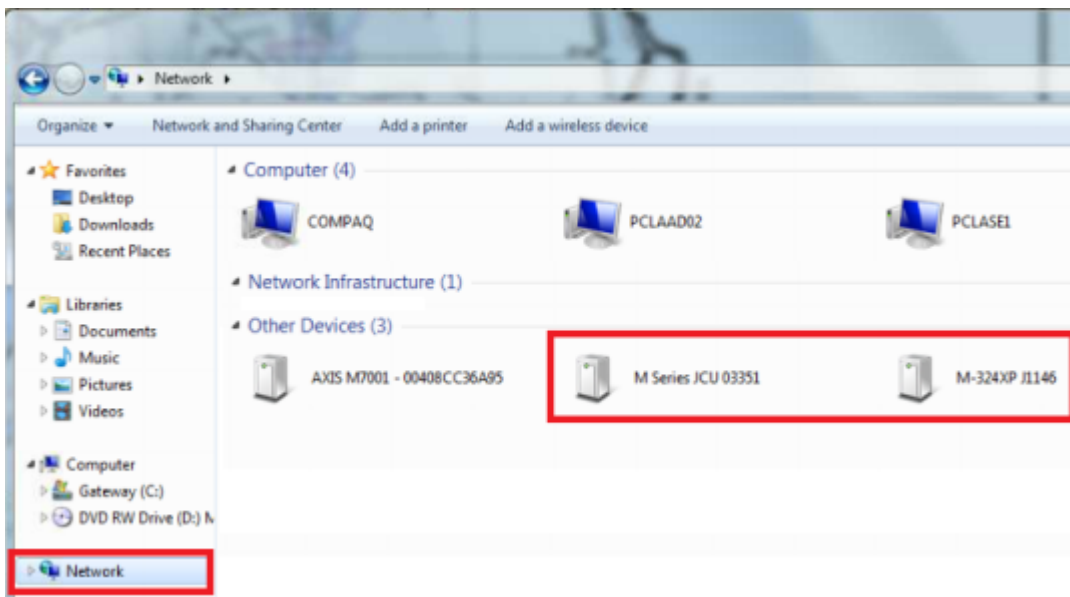
The FLIR Camera and the JCU controller are UPnP-enabled devices. You can see the list of UPnP-enabled device from your computer by opening "Network" in Windows. Note that the devices (Camera, JCU, and AXIS Converter) will only appear on your PC if they are on the same network domain.

When the computer is directly connected to the FLIR Camera or JCU via an Ethernet cable or via a Hub/Switch (without router or DHCP server on the network), the Camera and JCU automatically assign themselves an IP address of 169.254.x.x / 255.255.0.0. In order to access the configuration page of the Camera and JCU, you need to setup your PC on that network (ex: 169.254.1.2 / 255.255.0.0)

Note: If your computer is set to "obtain an address IP automatically", it should automatically set an IP address of 169.254.x.x after two minutes. However, it is sometimes easier to manually fix the IP address 169.254.1.2 / 255.255.0.0.

Note: If the JCU and the Camera, where previously assigned another IP address, you can display the JCU IP address by pressing the COLOR button while pushing the puck. You can then assign an IP address to your PC accordingly, and thus be able to access the Camera and JCU configuration page.

Once the computer is on the same network as the FLIR Camera and JCU, with UPnP enabled, you should see the Camera and JCU icon under "Network":



Note: If the devices don't appear, check to make sure that your computer is setup to display UPnP notifications:

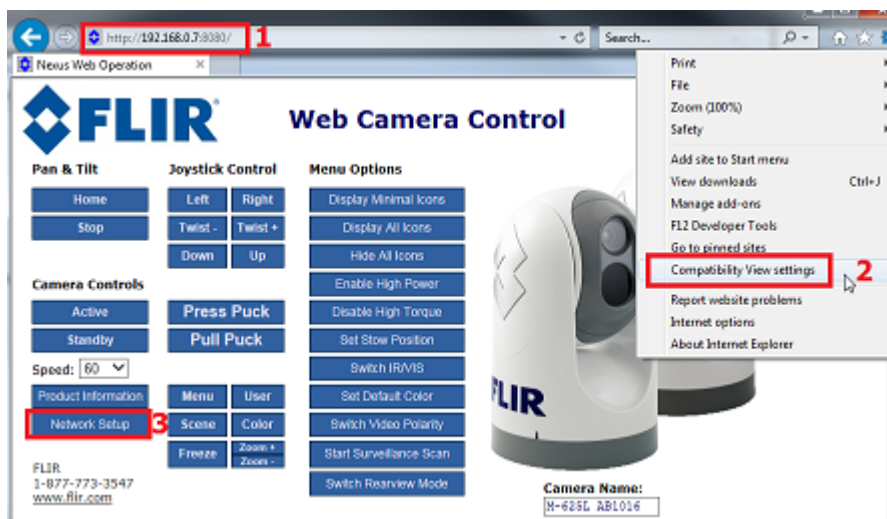
- Start the Control Panel and go to Add/Remove programs
- On the left-hand side, select the Add/Remove Windows components
- From the Windows Component Wizard, scroll down to Networking Services, then highlight and select the "Details" button
- Check the box to enable the UPnP User Interface and select OK
- Select Next when returning to the Windows Component Wizard
- Select Finish

Double click on the Camera icon to open its configuration web page.

FLIR M-Series (Legacy):

IMPORTANT: If you are configuring a first generation M-Series, make sure to use Internet Explorer in compatibility mode. Other browser (such as Chrome) might not allow you to edit properties.

To configure a fixed IP address for the FLIR M-Series first generation, click on "Network Setup":



Select the Static option rather than Dynamic. The screen will refresh, and the IP, Mask, and Gateway fields will change from grey to white, indicating that they can accept user entries:



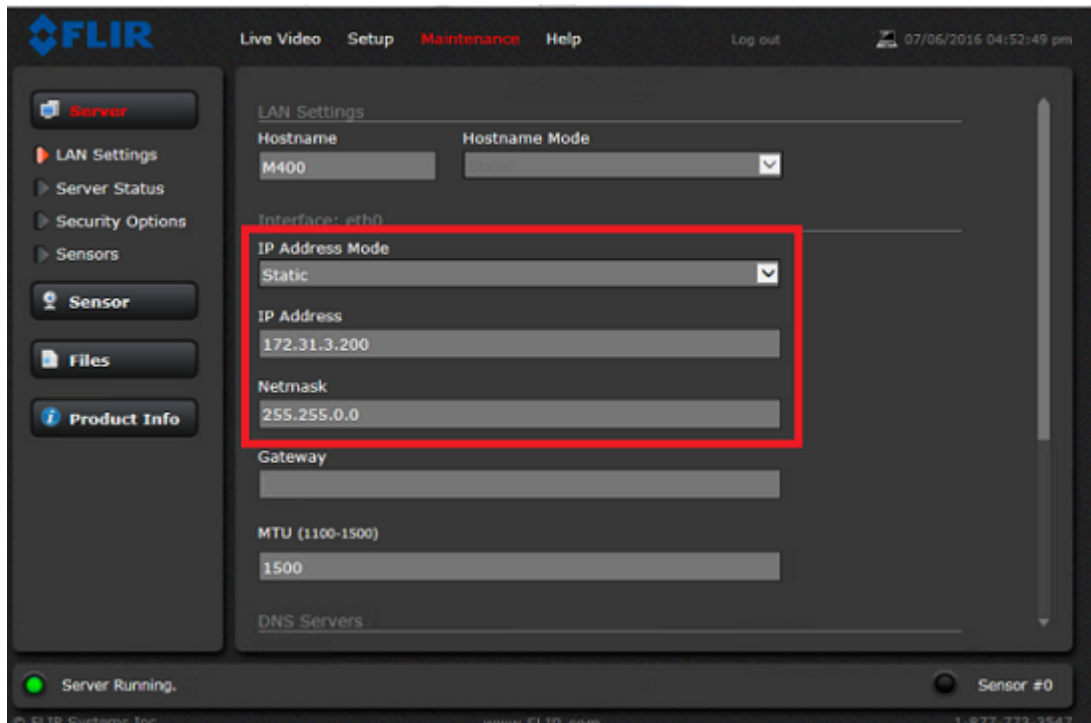
Once you have entered the appropriate IP address and subnet mask (192.168.0.100 / 255.255.255.0 in this example), click on the "Save" link. The camera should reboot and adopt the new IP address.

Note: You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

Wait one minute then restart the Camera (cycle the power).

FLIR M200, M400 and M500:

To configure a fixed IP address, select "Maintenance" at the top of the screen, then "Server" (on the left) and click on "LAN Settings". Set the IP Address Mode to "Static" and enter the proper IP address and subnet mask:

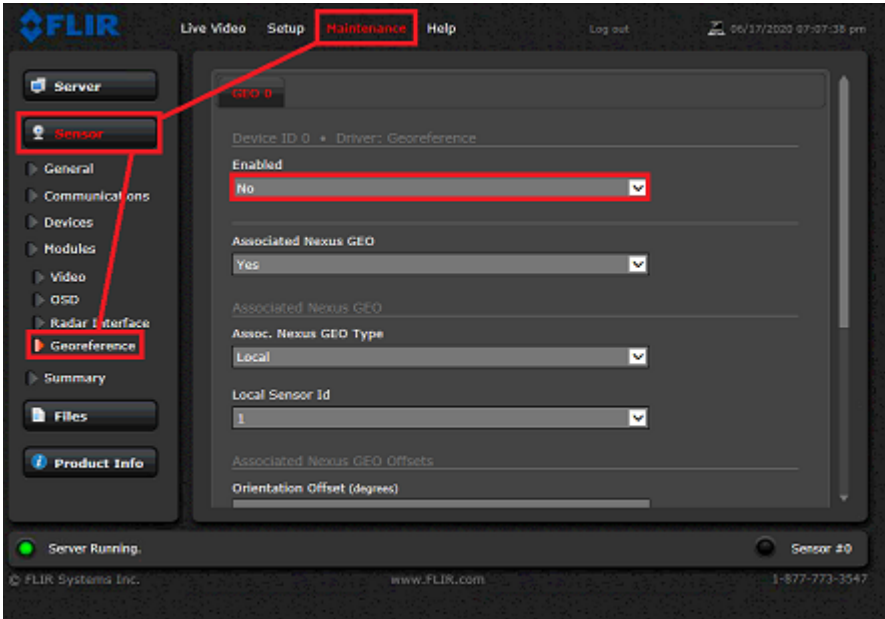


Once the parameters have been setup, scroll down and select "Save" and then "Restart Network".

Note: You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

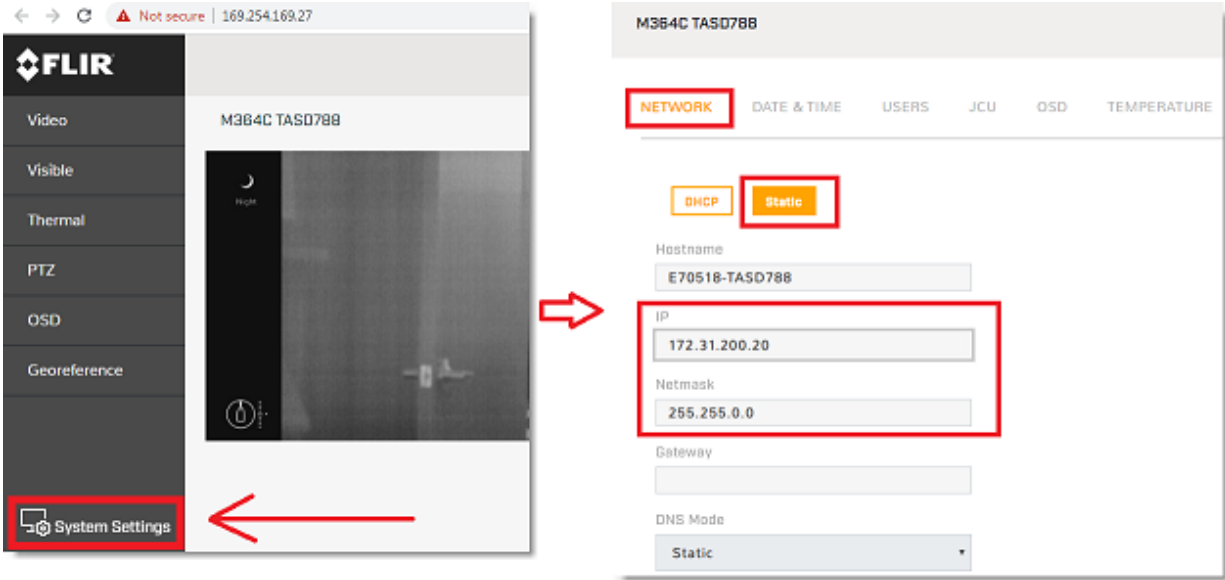
Wait one minute then restart the Camera (cycle the power).

Note that with M200, M400 and M500 the "Georeferencing" should be disabled if you have connected a GPS and Heading sensors to the camera:



FLIR M300:

To configure a fixed IP address, click on "System Settings" and then "Network". Set the IP Address Mode to "Static" and enter the proper IP address and subnet mask:



Once the parameters have been setup, scroll down and select "Save" and then "Restart Network".

Note: You will not be able to access anymore the Camera configuration page after changing its IP address (until you change the IP address of your computer later in this process)

Wait one minute then restart the Camera (cycle the power).

JCU (FLIR Joystick) Configuration

Go back to "My Network Places" and double click on the JCU to open its web page and set the IP address in the same way.

IMPORTANT: If you are configuring an older JCU, make sure to use Internet Explorer in compatibility mode. Other browser (such as Chrome) might not allow you to edit properties.



M-Series JCU Web Interface

Firmware Update

Please specify a .bin file:

Browse...

Upload

Network Addressing

Dynamic

Static

IP: 169.254.19.72 ?

Mask: 255.255.0.0 ?

Save

Enter the appropriate IP address and subnet mask (192.168.0.101 / 255.255.255.0 in this example), click on the "Save" link.

After changing the IP address of the Camera and JCU, you need to setup the final IP address of the PC on the new domain (192.168.0.50 / 255.255.255.0 in this example).

Once the IP addresses have been fixed on the same domain for all devices (PC, Camera & JCU), you should be able to see their icons in "My Network Place" (XP) or "Network" (Vista/Window 7).

AXIS Converter Configuration (legacy M-Series):

If you use an AXIS converter (with a legacy FLIR M-Series), use the "AXIS IP Utility" to fix the IP address of the converter. Note that the AXIS IP Utility is able to discover any AXIS device even if the computer is not on the same network domain. Leave the IP address of the PC to its final IP configuration (192.168.0.50 / 255.255.255.0 in this example) and open the AXIS IP Utility. Change the IP and the settings of the AXIS converter according to the documentation (please refer to the [AXIS IP Camera & Converter](#) chapter for more information).

TimeZero Configuration:

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select FLIR. TimeZero will scan for any FLIR cameras that are connected on the local network.

Note: If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address.

After selecting the camera from the list (or after manually entering its IP address), TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (Single vs. Dual Head) and features you want to enable (Tracking and/or Augmented Reality):

Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

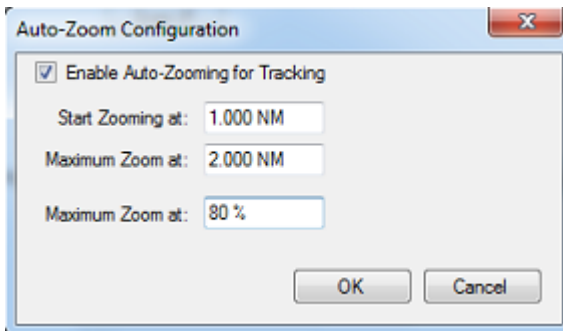
If you enable "Use for Tracking" or "Augmented Reality", you will need to enter the camera position.

Enter the position of the camera using Lat/Lon (note that you can select the format just below). For the horizontal offset (orientation of the camera from North), please refer to the chapter [Align the Camera](#) which provide an easier way to enter the horizontal offset.

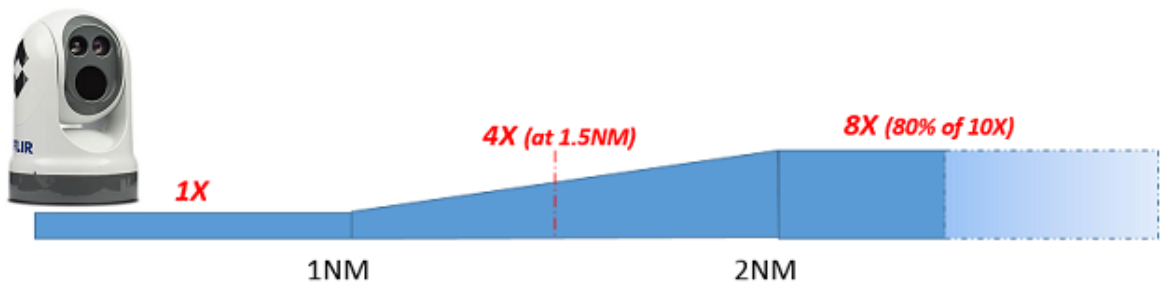
For the Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

Note: If you use an AXIS video encoder with an old FLIR M-Series (legacy model which does not support Video over IP), you will need to enter manually the RTSP path of the AXIS IP Encoder connected to the analog video output of the FLIR Camera. Example: `rtsp://root:pass@172.31.200.12:554/axis-media/media.amp`. Make sure to use the IP address of the AXIS IP Encoder in the RTSP path.

if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1 and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



The diagram below illustrates the zoom value according to distance with a 10X camera that has been restricted to 8X (80% of maximum zoom value):



If you have a Dual-Head FLIR Camera (VIS and IR Lens), you will be able to adjust independently the Visual and IR Auto-Zoom.

ONVIF Camera

Introduction

TimeZero can control a camera that supports the ONVIF Profile S protocol. ONVIF is a popular control protocol used in the CCTV industry. In order for TimeZero to successfully control the camera, specific ONVIF capabilities must be supported. Please refer to the [ONVIF Protocol Requirement](#) chapter to make sure the camera is compatible.

Setting the IP of the computer

You can select any IP address you want for the ONVIF Camera as long as the computer is on the same network. In the following example, we will configure the camera and computer addresses to use the IP network 172.31.x.x / 255.255.0.0 (same Network as Furuno sensors):

- Open the "Control Panel" from the Windows "Start" menu (under Windows 8 or Windows 10, right click on the "Start" button, then select "Settings" and "Network & internet")
- Select "Change Adapters"
- Right click on the Local Area Connection corresponding to the Ethernet card where the network is connected and choose "Properties"
- Select "Internet Protocol version 4 (TCP/IP v4)" then click on "Properties"
- Select "Use the following IP address" then enter the appropriate IP address and Subnet Mask for the computer

In this example, we will use the NavNet IP network, so we will set the IP address of the computer to 172.31.3.150 with a subnet mask of 255.255.0.0

Setting the IP of the camera(s)

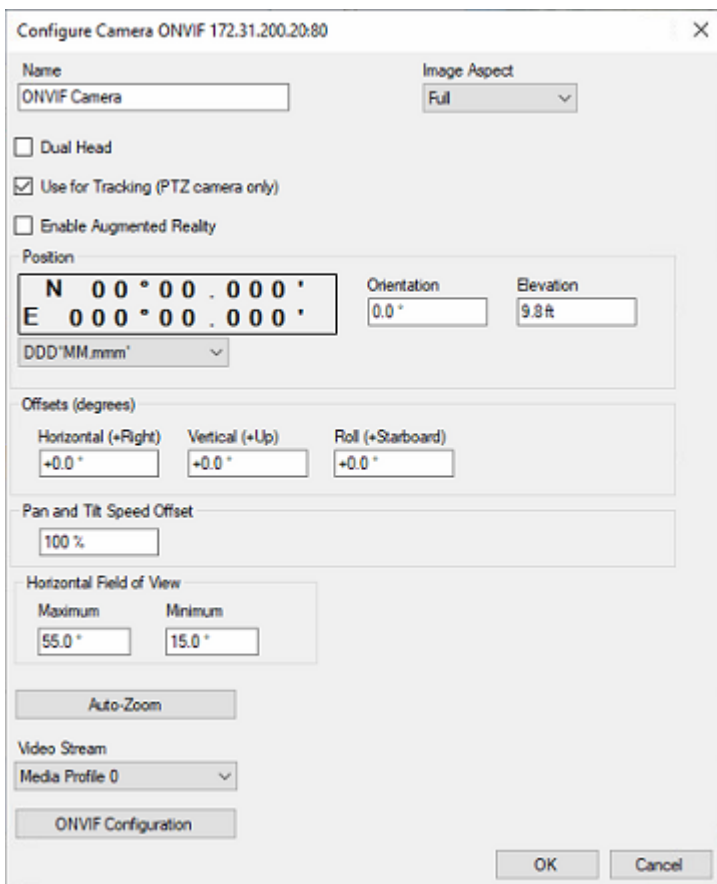
Please follow the manufacturer's instructions to fix the IP address of the ONVIF Camera. In this example, we will use an IP address of 172.31.200.1 for the camera. Make sure that "HTTP" is enable on the camera (TimeZero is not compatible with ONVIF over HTTPS).

Configuring TimeZero

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select ONVIF. TimeZero will scan for any ONVIF IP cameras that are connected on the local network.

Note: If the camera is not automatically detected (which can happen if the computer is connected to multiple networks), click on the button "My camera is not in the list" in order to manually enter its IP address (172.31.200.1 in this example) and the ONVIF port number (usually 80).

After selecting the camera from the list (or after manually entering its IP address), TimeZero will ask you to enter the camera's credential (login/password) if applicable. After validating the login and password, TimeZero will display the configuration window. The parameters you can edit will vary according to the camera capabilities (fixed vs. PTZ) and features you want to enable (Tracking and/or Augmented Reality):



Enter a user friendly name for the camera, then select the Image Aspect:

- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

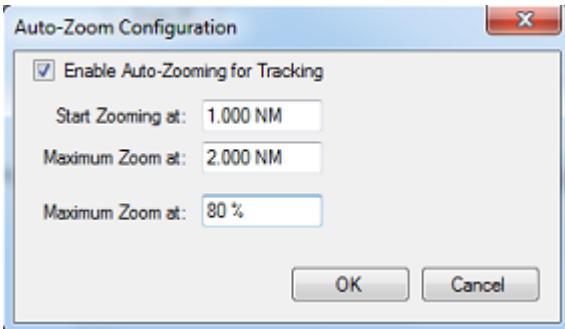
If you enable "Use for Tracking" (only available with PTZ Cameras) or "Augmented Reality", you will need to enter the camera position.

Enter the position of the camera using Lat/Lon (note that you can select the format just below). For the horizontal offset (orientation of the camera from North), please refer to the chapter [Align the Camera](#) which provide an easier way to enter the horizontal offset.

For the Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

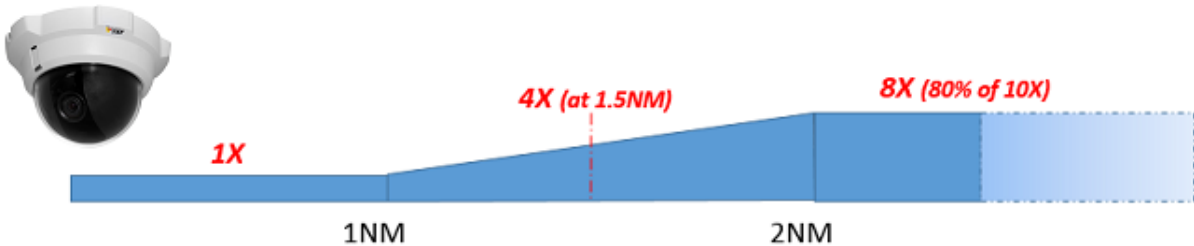
You will also have to enter the horizontal Field of View of the camera. If the camera has Zoom capability, you will have to enter two values: the Maximum FOV (when the camera is zoomed out) and the minimum FOV (when the camera is zoomed in). Check the manufacturer's specification for the maximum and minimum FOV values.

If the camera is PTZ and if you enabled the Tracking feature, you can configure the "Auto-Zoom" if you want the camera to adjust its zoom automatically when tracking an object. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1NM and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



Note: Limiting the maximum zoom (in %) is useful if you don't want the camera to zoom at its full value (because it becomes "too blurry").

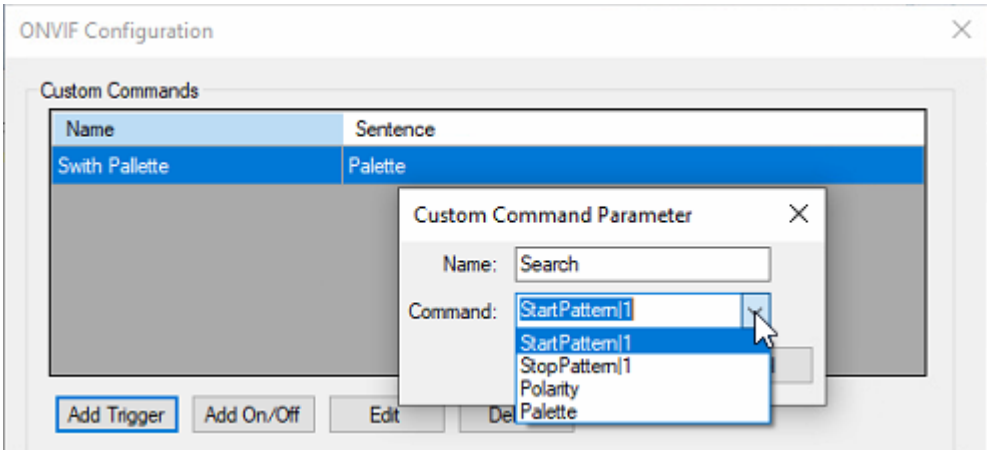
The diagram below illustrates the zoom value according to distance with a 10X zoom camera that has been restricted to 8X (80% of maximum zoom value):



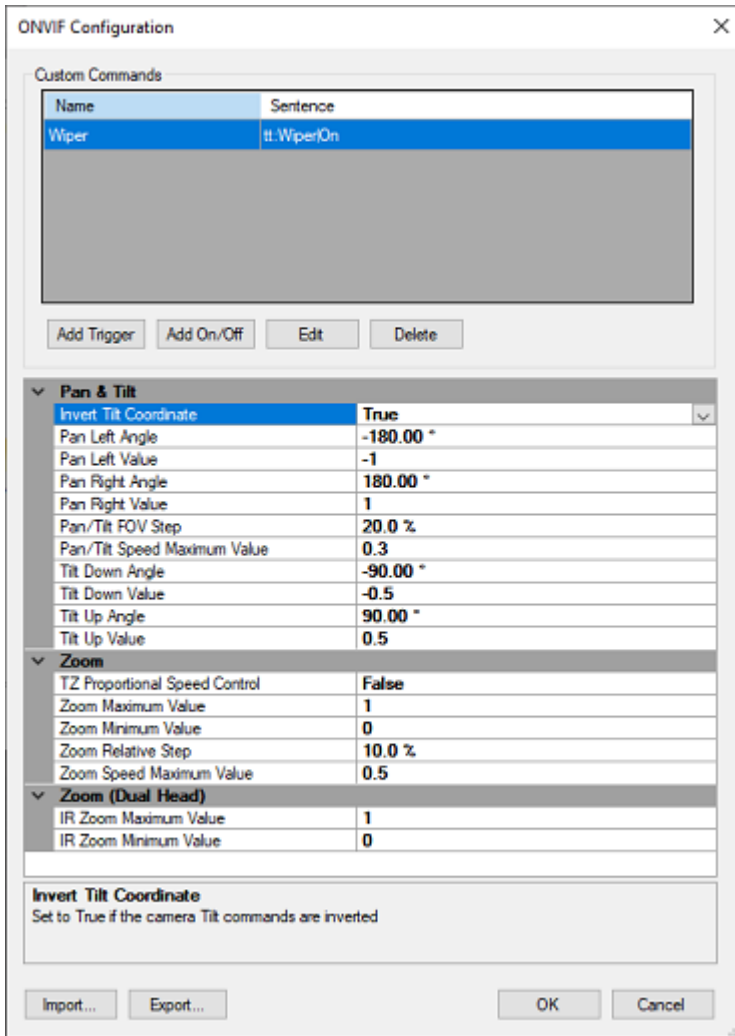
TimeZero will automatically detect the streaming profile that are advertised by ONVIF. You can select the streaming profile you would like to use from the drop-down menu.

ONVIF Advanced Configuration

Click on the "ONVIF Configuration" button to adjust the ONVIF protocol settings. The top part of the window allows you to configure custom actions that can be performed by the camera. Any action(s) configured on this page become available under the "Camera Control" button in the ribbon (when the corresponding camera is active) or when right clicking on the video of the camera. "Trigger" and "On/Off" actions can be configured. A trigger will only send one command and will not remember its state. Triggers are usually used for "one shot" actions that do not require any status to be displayed in TimeZero. "On/Off" requires two ONVIF actions and it is displayed as checkbox (one for the "ON" state and another one for the "OFF" state). TimeZero remember the ON/OFF state (checkbox) and this can be used to control Auxiliary sensor (Wiper, Spotlight...).



The bottom part of the window allows to configure advanced ONVIF parameters and can be usefull if the camera does not behave properly with the default ONVIF configuration:



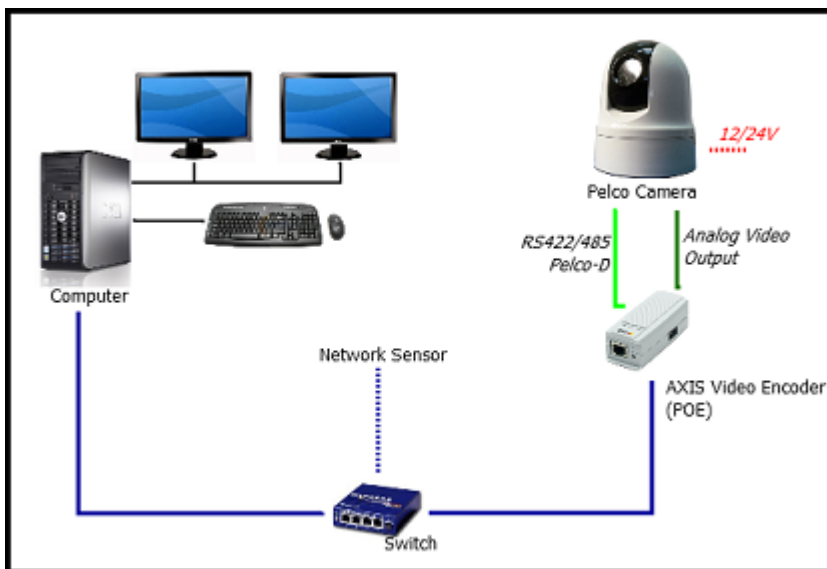
Please refer to the [ONVIF Protocol Requirement](#) chapter for an explanation of these parameters and guidelines on how to test the camera in TimeZero.

Pelco-D Camera

Introduction

TimeZero can control a camera that supports the Pelco-D protocol (two-way communication). Pelco-D is a popular control protocol used in the CCTV industry. In order for TimeZero to successfully control the camera, specific Pelco-D sentences must be supported. Please refer to the [Pelco-D Protocol Requirement](#) chapter to make sure the camera is compatible.

Note that the Pelco-D protocol does not "transport" video: it is only used by TimeZero to send commands to the camera (PTZ Commands) and used by the Camera to report its status (provide feedback on its Pan/Tilt/Zoom position). The video has to be encoded in H264 (RTSP) to be displayed in TimeZero. If the Pelco-D camera does not have an internal IP video encoder, you can use an external AXIS IP video encoder that would connect to the analog video output of the camera. Also note that the Pelco-D sentences are only sent and received by TimeZero over TCP (network). If the camera only provides a serial port (either RS485 or RS422) and does not provide a network port, you can use the AXIS IP encoder as a Serial to Ethernet adapter:

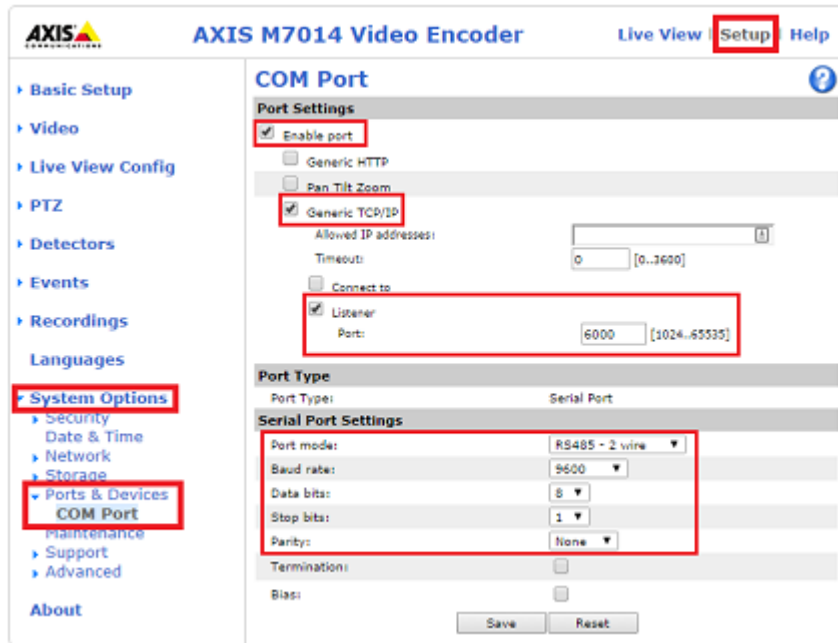


AXIS Port Configuration

Pelco-D sentences are sent and received over a single TCP port. If the camera does not support Pelco-D over TCP, you can use the included AXIS Encoder Serial Port to perform the conversion.

Note: If the camera has an Ethernet output, you can skip this part. Just make sure to configure and write down the IP address of the Camera and its TCP control port.

Configure the AXIS IP Encoder as described in the [AXIS IP Camera & Converter](#) chapter. Once the IP address and initial settings have been setup, you can proceed to the port configuration. Open a web browser, type the IP address of the encoder and select "Setup", "System Options", and then "COM Port" (under "Ports & Devices"). Enable the port for "Generic TCP/IP". Select the "listener" mode and enter a port number:



Configure the serial port settings as per the camera serial output specification. Please note that if RS422 is used, 4 wires are required to send and receive commands (usually, RS485 only needs two wires for bidirectional communication).

Camera Configuration

Open TimeZero, select the [Camera](#) Options, click on the "Add" button and select "PELCO". Enter the IP address of the camera and the TCP control port number (where TimeZero will connect to send and receive the Pelco-D sentences).

Note: If the Pelco-D camera has two independent optics or lens (such as independent Visible and IR lens), please refer to the [Pelco Dual Head](#) chapter.

Enter a user friendly name for the camera, then select the Image Aspect:

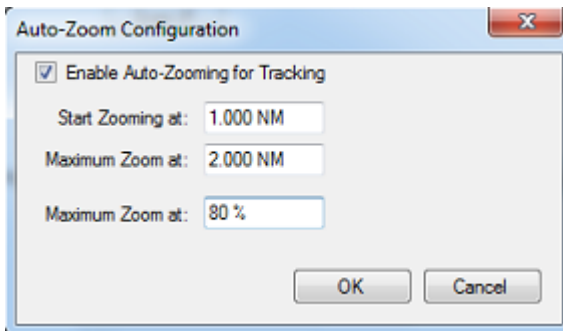
- "Full" will zoom the picture to fill the screen without changing the aspect ratio of the camera
- "Fit" will display the entire picture while keeping the aspect ratio of the camera and add a black border to fill the screen if needed

If you enable "Use for Tracking" or "Augmented Reality", you will need to enter the camera position. Enter the position of the camera using Lat/Lon (note that you can select the format just below). For the horizontal offset (orientation of the camera from North), please refer to the chapter [Align the Camera](#) which provide an easier way to enter the horizontal offset.

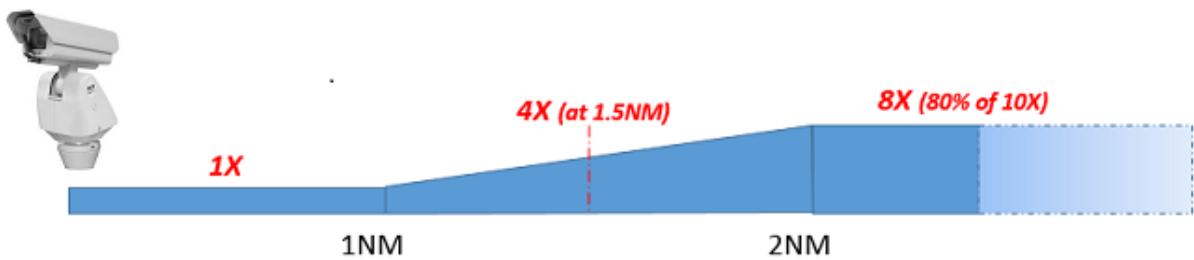
For the Vertical and Roll offset (mainly used for Augmented Reality), it is easier to adjust those settings from the Camera WorkSpace directly. Please refer to the "Augmented Reality Setup" paragraph of the [Augmented Reality](#) chapter for more information.

You will also have to enter the horizontal Field of Views of the camera. You will have to enter two values: the Maximum FOV (when the camera is zoomed out) and the minimum FOV (when the camera is zoomed in). Those values can be found from the camera manufacturer.

Click on "Auto-Zoom" if the camera supports continuous zoom. In the example below, the camera will start to zoom when the point or object to track reaches 1NM. The adjusted maximum zoom (80% of camera zoom maximum capacity) will be reached at 2NM. In between 1NM and 2NM, the zoom will be adjusted linearly (in between 1X and adjusted maximum zoom):



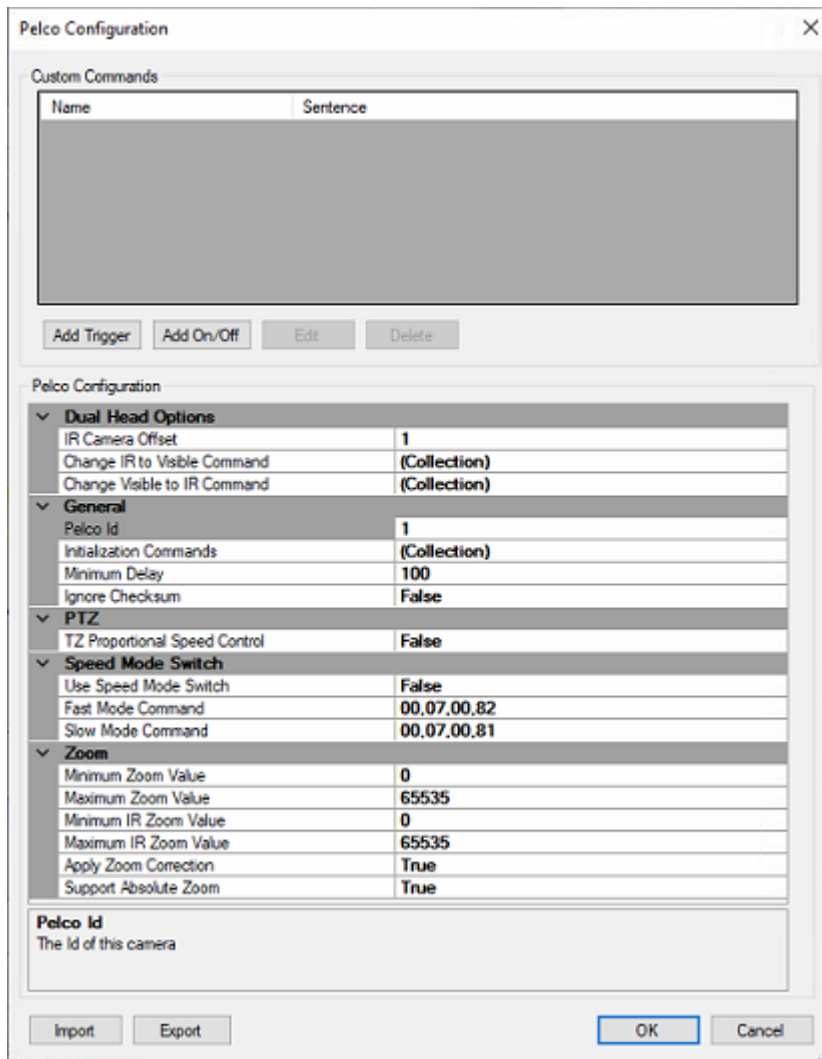
The diagram below illustrates the zoom value according to distance with a 10X camera that has been restricted to 8X (80% of maximum zoom value):



Finally, you will need to enter the RTSP path of the camera Video Encoder. If you are using an external AXIS IP encoder, enter the AXIS RTSP Path. Example: `rtsp://root:pass@172.31.200.12:554/axis-media/media.amp`.

Pelco Advanced Configuration

Click on the "Pelco Configuration" button to adjust the Pelco protocol settings:



The top part of the window allows you to configure custom actions that can be performed by the camera. Any action(s) configured on this page become available under the "Camera Control" button in the ribbon (when the corresponding camera is active) or when right clicking on the video of the camera. "Trigger" (command) and "On/Off" (checkbox) actions can be configured. A trigger will only send one command and will not remember its state. Triggers are usually used for "one shot" actions that do not require any status to be displayed in TimeZero. "On/Off" requires two Pelco sentences (one for the "ON" state and another one for the "OFF" state). TimeZero remember the ON/OFF state (checkbox) and this can be used to control Auxiliary sensor (or relay).

The bottom part of the window allows to configure advanced Pelco parameters:

Dual Head Options:

Not used for single lens Pelco Camera (only used for [Dual Head Pelco Camera](#))

General:

- **Pelco ID:** For most cameras, the Pelco ID should be set to 1. However, if you have a camera that "listens" to a different Pelco ID, you can enter this value here.
- **Initialization Commands:** You can define multiple Pelco commands that will be sent to the camera when starting TimeZero. This is useful if you want the camera to start in a specific state when opening the software.

- **Minimum Delay:** The minimum delay in milliseconds used by TimeZero to send two consecutive Pelco-D commands. The official Pelco protocol recommends a 300ms delay, but most camera can support a delay of 100ms or less. Increase this delay if the camera exhibits abnormal behavior. Keep in mind that increasing this delay will also increase the camera latency (for tracking). If possible, it is recommended to keep the delay as small as possible.
- **Ignore Checksum:** By default, TimeZero enforces the Pelco-D checksum. However, some cameras may compute the checksum incorrectly causing all position feedback send by the camera to be ignored by TimeZero. You can set this option to "True" for TimeZero to disregard the checksum.

PTZ:

- **TZ Proportional Speed Control:** When this setting is enabled, TimeZero automatically reduces the pan and tilt speed when the camera is zoomed in. If the camera already includes this behavior (proportional speed according to zoom), leave this setting to false.

Speed Mode Switch:

- **Use Speed Mode Switch:** On some cameras, a preset or command can be sent to reduce the Pan motor speed (slow and high gear). If your camera supports this feature, it is recommended to enable this option and enter the two sentences to send to the camera for high gear and low gear in the next two settings.
- **Fast/Slow Mode Command:** Enter the two Pelco-D commands that are used to switch the motor Pan speed to high and low speed.

Zoom:

- **Minimum/Maximum Zoom Value:** The Pelco values that are sent by the camera at minimum and maximum zoom level.
- **Minimum/Maximum IR Zoom Value:** Not used for single lens Pelco Camera (only used for [Dual Head Pelco Camera](#)).
- **Apply Zoom Correction:** Usually, the field of view is (approximately) linear according to the zoom value. On some cameras, a square operation needs to be added to have a correct relationship between zoom value and Field of View. Change this setting if the camera is not correctly centering on the screen when left clicking to a point on a picture.
- **Support Absolute Zoom:** Set it to True if the camera support absolute Zoom command (set Zoom Position).

Tips: You can display the "Camera Info" under the "Camera Control" button located in the Camera WorkSpace. This will display the raw Pelco values sent by the camera to TimeZero. This can be useful to learn the raw zoom minimum/maximum Pelco values.

Once you have configured all the Pelco settings, it is recommended to "Export" the configuration. You can then load the same configuration when configuring the same camera in the future.

Pelco Dual Head

Pelco Dual Head is used when configuring a Pelco-D camera that has two individual lenses with independent zoom (one for Visible and one for Thermal) mounted on the same Pan/Tilt assembly. The configuration is the same as a regular [Pelco-D Camera](#) (mono lens) with the following exceptions:

- There is a second RTSP path configuration for the IR camera. Usually an AXIS server encoder (Quad) will be used to convert the second video feed if the camera does not have an internet video encoder.
- There is a second Auto-Zoom configuration for the IR camera.
- There are independent field of view settings for the IR camera.

The screenshot shows the 'Configure Camera PELCO-D' dialog box. The 'Name' field is 'PELCO-D Dual Head' and 'Image Aspect' is 'Full'. There are checkboxes for 'Use for Tracking (PTZ camera only)' (checked), 'Enable Augmented Reality' (unchecked), and 'Use TCP' (unchecked). The 'Position' section includes 'Orientation' (0.0°) and 'Elevation' (9.8ft). The 'Offsets (degrees)' section has 'Horizontal (+Right)' (+0.0°), 'Vertical (+Up)' (+0.0°), and 'Roll (+Starboard)' (+0.0°). The 'Pan and Tilt Speed Offset' is set to 100%. The 'Horizontal Field of View' section has 'Maximum' (55.0°) and 'Minimum' (15.0°). The 'Infrared Horizontal Field of View' section (highlighted in red) also has 'Maximum' (55.0°) and 'Minimum' (15.0°) settings, with an 'Infrared Auto-Zoom' button below it. The 'H264 RTSP Video Stream' is 'rtsp://root:pass@172.31.200.12:554/axis-media/media.amp?camera=1'. The 'Infrared H264 RTSP Video Stream' (highlighted in red) is 'rtsp://root:pass@172.31.200.12:554/axis-media/media.amp?camera=2'. There are 'OK' and 'Cancel' buttons at the bottom right.

When selecting "Pelco Configuration", additional settings under "Dual Head Options" can be configured.

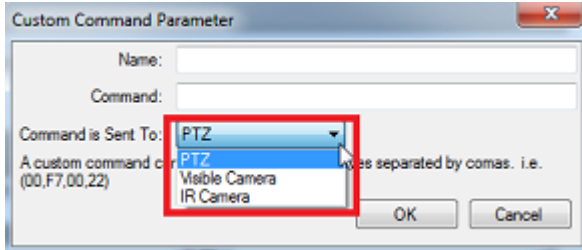
- **Second Camera Offset:** The Pelco ID value defined in the "General" category is used to control the Pan/Tilt Assembly and the visible lens. The "Second Camera Offset" parameter allows you to specify the Pelco ID that will be used to control the IR lens.

Example: If you set the Pelco ID of the Dual Head Camera to be "1" under "General" (default value), and "1" under "Second Camera Offset", TimeZero will send Pan/Tilt command using the Pelco ID number 1, send the Zoom command of the Visible camera using the Pelco ID number 1 and send the Zoom command of the IR camera using the Pelco ID number 2 (1+1).

- **Change IR to Visible Command:** Some camera don't rely on the Pelco ID to make the difference in between the Visible and IR lens. Instead they rely on TimeZero sending a sentence that will activate the Visible or IR lens. All Zoom/Focus commands send after activating a specific lens will be redirected to it. This setting is used to activate the Visible camera.
- **Change Visible to IR Command:** This setting is used to activate the IR camera.

Note: Camera that use a sentence to activate the Visible or IR lens usually use the same Pelco ID. In this case, the "Second Camera Offset" is usually set to "0".

When configuring Trigger or Action to send custom commands to the camera, you can select which component of the camera the command will be sent to:

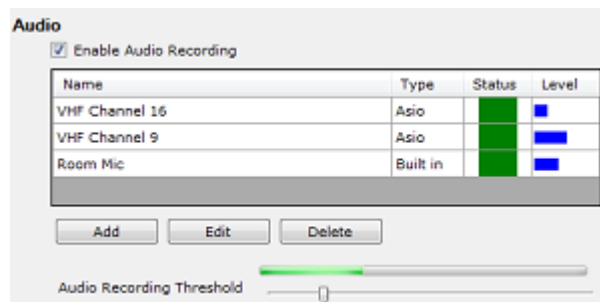


Audio Interface

The "Record & Replay" module needs to be configured to access this feature.

TimeZero can record audio with the "Record & Replay" module when the "Enable Audio Recording" is selected from the [Record & Replay](#) Options. Usually, audio recording is used to record room conversation via microphone or VHF output. TimeZero can use the regular computer audio input, a USB Microphone, or an external multi-channel audio interface.

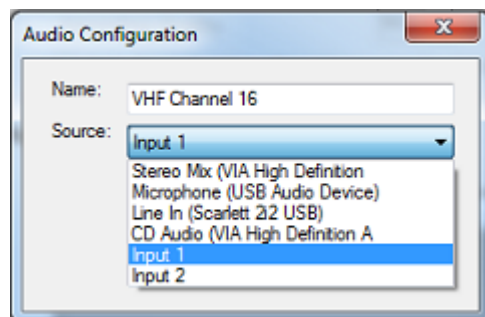
TimeZero can record one audio channel by using the computer integrated Line Input or Microphone. To enable audio recording, select "Enable Audio Recording" from the [Record & Replay](#) Options:



Multi-Channel Recording

If you want to record more than two channels (up to 4 audio channels), it is highly recommended to use an external multi-channel audio interface with "ASIO" drivers. Make sure to check with the manufacturer that the audio interface includes ASIO support before purchasing the audio interface.

Before connecting the audio interface to the computer via USB, make sure to install the **latest ASIO drivers** (check the manufacturer website). Once the drivers are installed, connect the interface to the computer and start TimeZero. If the interface is properly recognized, its audio inputs should be available in the list of audio devices:



Please refer to the manufacturer user guide to map channel number with physical connector on the interface.

Connecting a VHF

Using "Line" output of the VHF:

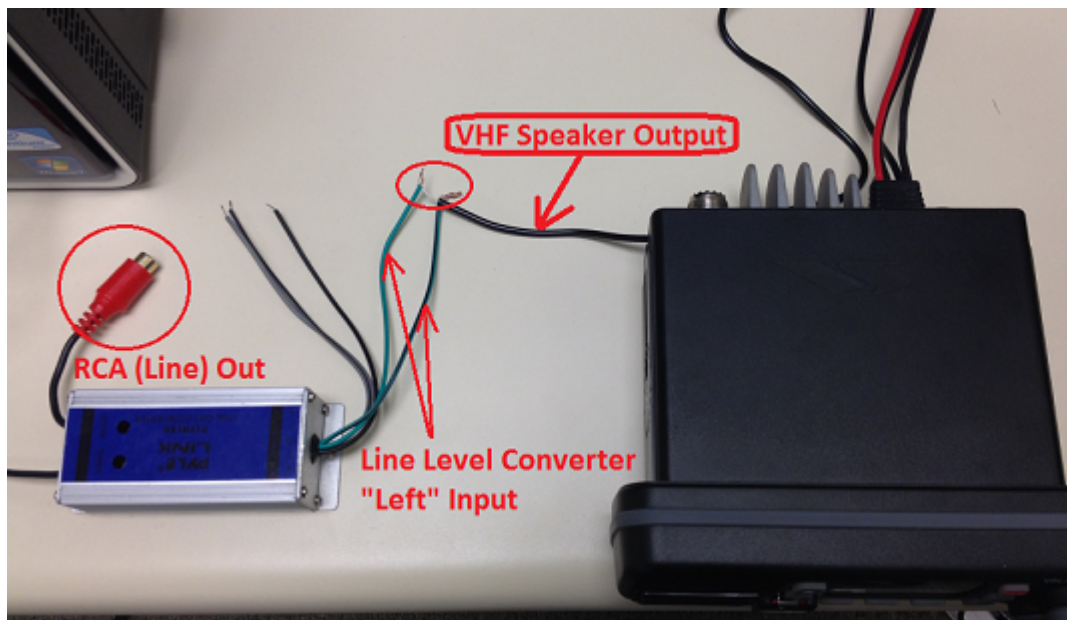
If the VHF has a line output (usually RCA connector), simply purchase an RCA to Jack cable and connect it to the computer or audio interface. Make sure to use a mono cable (one ring on the jack connector):



Note: Usually the computer "Line In" uses a 1/8" jack and the external audio interface "Line In" uses 1/4" jack, so make sure to purchase the cable or adapter with correct jack size.

Using "Speaker" or "Hailer" output of the VHF:

If the VHF has only a speaker/hailer output, you CANNOT connect the high power speaker output directly to the computer or to the audio interface! The speaker output is too strong and will overdrive (or destroy!) the computer or audio interface. In that case, a "Speaker Level to Line Converter" (adjustable) must be used in between the VHF speaker output and the computer or audio interface line input:



Note: Make sure that the converter is rated for the output power of the VHF. Most VHF have a 30W or less speaker output, allowing you to use commonly found Speaker to Line converter used in car audio.

Note that most of the line converters offer stereo output to two RCA connectors allowing to connect two VHF (one on the left side and one on the right side).

Once the level is converted to line level (RCA), you can then use an RCA to 1/4" Jack to connect the converter to the Audio Interface:



Or RCA to 1/8" jack if you connect the VHF to the Line Input of the computer:



IMPORTANT: Make sure to ONLY use mono 1/4" or mono 1/8" jack.

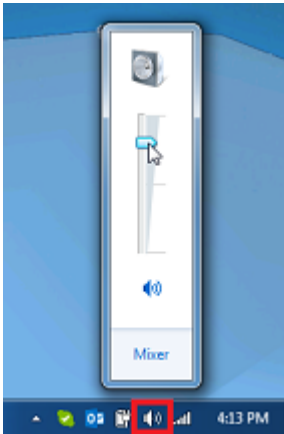
Once the VHF is connected to the computer or audio interface, it is recommended to check and adjust the Audio level. If you use an external USB audio interface, use the LED that are usually available on the interface to adjust the gain of the audio interface and/or the level converter. TimeZero also provides level meter from the list of audio channel that are configured.

Once the gain of every channel has been adjusted, it is highly recommended to adjust the threshold slider just above the background noise. Leave all the audio source connected, but make sure that there are not outputting audio (just background noise). Adjust the slider just above the global meter displayed just above the slider.

Note: The threshold is global to all the audio input.

Audio Playback in TimeZero

To test the playback in TimeZero, make sure that regular speakers are connected to the main audio output of the computer. Adjust the audio output of the computer and make sure you can hear the Windows "chime" when adjusting the volume output (confirming that the speakers are working properly):



IMPORTANT: The audio is always playback from the regular computer output. The audio is not played through the external audio interface unless you change the default playback device from the "Sound" Windows Control Panel.

Open TimeZero and make sure that the Audio recording is enabled from the [Record & Replay](#) Options. Select the "Analyze" WorkSpace and click on the "Now" button on the bottom left of the screen. Make sure that the VHF or Audio source is outputting audio during one or two minutes. Click on the "Replay last minute" in TimeZero and confirm that you can hear audio from the computer speakers.

TimeZero Hardware Compatibility

HARDWARE	TZ Professional	TZ Navigator	TZ Coastal Monitoring
NavNet NMEA Data (Vx2 / NN3D / TZT / TZT2/TZT3)	✓	✓	N/A
NavNet TZT2 (2nd Gen.) Routes & Waypoints synchronization (Furuno Firmware V7 and above)	✓	✓	✓
NavNet TZT3 (3rd Gen.) Routes & Waypoints synchronization	✓	✓	N/A
DRS2D / DRS4D / DRS4A / DRS6A / DRS12A / DRS25A	✓	✓	✓
DRS4DL	✓	✓	✓
DRS4D-NXT	✓	✓	✓
DRS6A-NXT	✓	✓	✓
DRS6-XCLASS	✓	✓	✓
DRS12/25A-XCLASS	✓	✓	✓
DRS2D-NXT	✓	✓	✓
DRS12/25A-NXT	✓	✓	✓
FAR15x3/15x8 (★)	✓	✓	✓
FAR2xx7	✓	✓	✓
FAR3xxx	✓	✓	✓
FAR2xx8	✓	✓	✓
FAR228NXTBB	✓	✓	✓
Overlay DRS4W	✓	✓	✓
NavNet Black Box Sounder (DFF1, DFF1-UHD, DFF3, BBDS1)	✓	✓	N/A
Internal TZT2 Sounder	✓	✓	N/A
FCV1900	✓	✓	N/A

FCV1150 (★★)	✓	✓	N/A
Internal TZT3 Sounder (including DI-FFAMP)	✓	✓	N/A
Multibeam Sounder DFF3D	✓	N/A	N/A
Simrad ES70 and ES80 (\$PSIMDHB sentence)	✓	N/A	N/A
Koden CVS-FX series (\$PKODS sentence)	✓	N/A	N/A
JRC JFC-130 series (\$PJRCS sentence)	✓	N/A	N/A
Hondex HDX-121, HE-1500Di, and HE-7300Di (\$PHDX)	✓	N/A	N/A
Seascan (\$PSAP sentence)	✓	N/A	N/A
Camera FLIR M Series	✓	N/A	✓
Camera FLIR M 200	✓	N/A	✓
Camera FLIR M 300	✓	N/A	N/A
Camera FLIR M 300C	✓	N/A	✓
Camera FLIR M 400	✓	N/A	✓
Camera FLIR M 500	✓	N/A	✓
AXIS Camera & Converter (Single LENS only)	✓	N/A	✓
Generic Fixed Camera	✓	N/A	✓
Multibeam WASSP (★★★)	✓	N/A	N/A
FCV25 (module required)	✓	N/A	N/A
SC30/SC33	✓	✓	N/A
SC50/SC70	✓	✓	N/A
SC130	✓	✓	N/A
SCX20/SCX21	✓	✓	N/A

CI-68, CI-88	✓	✓	N/A
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- ★ The FAR 15x3 Target Analyzer is not supported by TIMEZERO
- ★★ Custom mode of FCV1150 is not supported by TIMEZERO
- ★★★ Bathymetry and Backscatter data only with G1/G2. Full Sounder/Side-Scan/Section/Water Column views with G3

Reference

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 (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. 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 - MERGING DATA: 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).

IMPORTANT - SYNCHRONIZATION: Note that if you are using the [local synchronization](#) or the [TZ Cloud synchronization](#) (to backup data), you should not use collections. Importing an old collection (an old "state" of the user object database) will be overwritten as soon as you connect to the TZ Cloud or to another TimeZero device that may have a newer "state" of the same user objects database. In other words, after importing an old collection, you may see your user objects revert to the previous state automatically when connected to the Internet.

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 Marks, layers, 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 exchange Routes and Marks, but you can also import tracks. 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 Marks, layers, 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 exchange 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.
- **Furuno NavNet 3D (CSV files):** this format is used to export Routes and Waypoints to Furuno NavNet3D Multi Function Display. Only Marks and Routes are supported.

If you want to only export a couple of Marks, use the "Actions" menu of the Mark List:

1. Open the "Mark List" from the "Lists" button in the Ribbon
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 Marks"
4. Select the export format
5. 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 Ribbons and ToolBar of each WorkSpaces, 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.

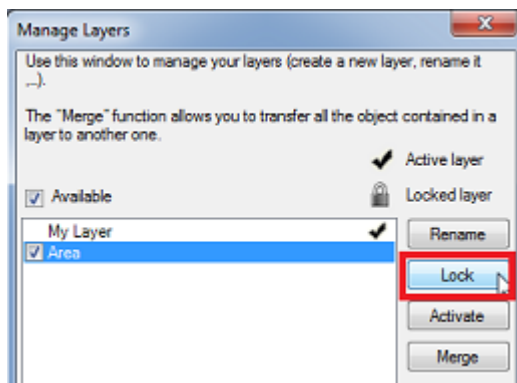
Lock the User Interface

To prevent users to modify the software configuration, rules and installation setup, it is possible to lock the user interface.

Select "Lock User Interface" from the menu. A window prompting for a password will appear. After validating the password, the following feature will NOT be available anymore to the user:

- The Options (including installation setup) will not appear anymore under the menu
- The Connection Wizard will not appear anymore under the menu
- It will not be possible to recall a backup (Open a collection)
- It will not be possible to change the configuration of the Toolbar, Ribbon, WorkSpace and NavData
- It will not be possible to adjust the ARPA Auto Acquisition global setting
- The layers that were previously locked from the "Manage Layers" window cannot be unlocked (see below)

To prevent users to modify layers containing Boundary Areas that are used for ARPA Acquisition, Radar Mask or Zone Monitoring, simply lock the layer(s) containing the boundary from the "Manage Layer" window under the "Mark" ribbon button:



Note that you cannot lock the Active layer. Make sure to activate another layer before locking it.

Note: It is NOT possible to lock all the layers in TimeZero Coastal Monitoring. At minimum one layer must be unlocked and set as the Active layer. This will be the layer used in case the user wants to create new objects. It is recommended to create one or multiple layers dedicated to ARPA and Zone Monitoring and lock those layers. Create and activate a "user" layer that will be used as the default Active layer.

Once the layer(s) you want to protect are locked, finish by locking the User Interface (after configuring all the Options, instruments, Toolbar, NavData and Rules). The protection is independent per Windows User Account. So if the computer has two user accounts ("Admin" and "User" account), and if you only lock the user interface on the "User" account, you will be able to access all the setup and Options by logging on the computer as the "Admin".

To unlock, select "Unlock User Interface" from the menu and enter your password

Tips: If you lose the password, click on "Hint" and send the generated code to Tech Support. We will be able to retrieve your password from to the Hint code.

Shortcuts

Default Shortcuts

The default 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 Marks, Routes 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 reference position
- **F6:** Show / Hide NavData
- **F7:** Show/Hide Lists
- **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)

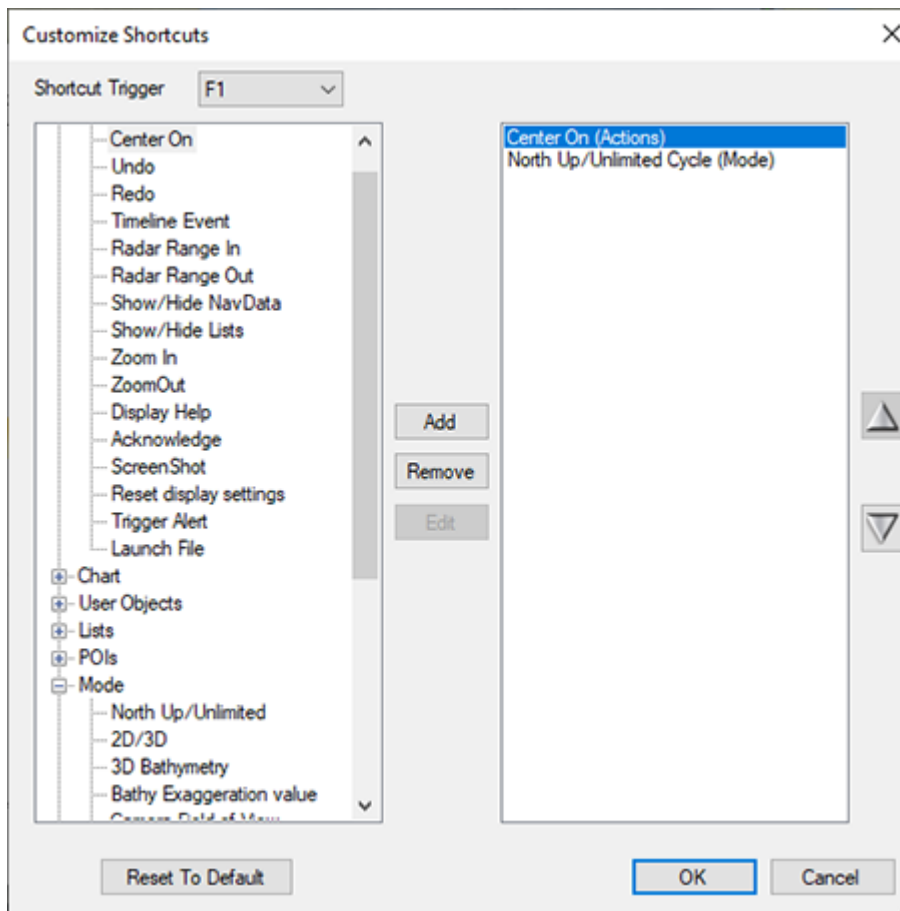
- **"r" + wheel (up/down):** Adjust the Radar Rain manually (slider)
- **ALT + g:** Toggle Radar Auto Gain ON/OFF
- **ALT + s:** Toggle Radar Auto Sea ON/OFF
- **ALT + r:** Toggle Radar Auto Rain ON/OFF

Custom Shortcuts & Macro

Shortcuts can be customized by the user from the [General](#) Options by clicking on the "Customize Function Key" button. Keys that can be setup by the user are F1 to F12 and the combination Shift + F1 to Shift + F12.

Note: If you have a USB Joystick connected, up to 12 buttons can also be used to trigger shortcut.

Multiple actions ("Macro") can be triggered by one shortcut. Simply configure multiple actions for the same function key. For example, in the example below, pressing the F1 key would Center the chart on the Reference Position and set the chart mode to North Up.











The actions are triggered in the order they are listed in the window.











Note that Custom Function can also be assigned to Quick Access NavData. Please refer to the [QuickAccess NavData](#) chapter for more information.

Toolbar

Tools

Some tools may only be available in specific WorkSpaces or when specific Modules are unlocked:

-  "Center on Reference Position": Click on this button to center on the reference position.
-  "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 the reference position and the point where you double clicked. You can double click on the tool itself to erase all dividers. If you have the PBG module, you can double click on a Divider Line to open the Profile Window. For more information, please refer to the [Divider Tool](#) Chapter.
-  "Mark": This tool allows to create marks. You can right click on this tool to select the mark icon and color. You can double click on this tool to create a mark using lat/lon.
-  "3D Orientation": This tool is used to adjust the 3D view when the chart mode is set to "3D" from the [Mode Ribbon](#).
-  "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.
-  "Manual Event Log": This tool is used to create an event on the Time Line when the "Record & Replay" module is activated.
-  "Accident": This tool is used to create a quick backup of recorded data. This tool is hidden by default and can be added to the Toolbar configuration when the "Record & Replay" Plus Pack is activated.
-  "Selection": This tool is used to select multiple objects. If you right click you can select the "Free Selection" tool that allows to draw a free selection on the screen. When multiple objects are selected, you can delete them, change icon and color.
-  "Delete": This tool is used to delete objects. You can either click on an object or draw an area around multiple objects.
-  "Synchronize Radar Range": Press this button to adjust the radar range to the closest matching chart scale.
-  "Range In/Out": These buttons are used to increase or decrease the radar range.
-  "Acquire Target": This tool allows to acquire a Radar ARPA target. Select this tool, then left click over a radar echo to acquire a target.



- "Update Area": This tool is only available in the "Update" WorkSpace and is used to define the weather update area. Once the area is defined, select "Download".



- Camera "Joystick" mode: this tool allows to control the camera (in the Camera WorkSpace). Please refer to the [Camera](#) chapter for more information.



- "Move Camera Here": This tool allows to control the camera from the chart or radar screen. Select this tool and click on the location where you want to camera to point at. By default, this tool will control the closest camera from the location clicked. This can be changed (to the active camera) from the [Camera](#) Options.



- "Screenshot": This tool takes a screenshot of the screen and stores it in the location define under the [General](#) Options ("Screenshot Recording Location").

Ribbons

Mode



This button gives access to various chart orientation in 2D or 3D, exaggeration in 3D mode and various objects (camera Field of View, etc...)

- **North Up:** This mode displays the North at the top of the screen.
- **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.
- **2D:** Selects 2D mode.
- **3D:** Selects 3D mode.
- **3D Bathymetry:** Enable the 3D bathymetry view under water. This option is only available when the 3D mode is selected.
- **Bathy Exaggeration:** Allows to increase or decrease the automatic bathymetry exaggeration factor in the Monitoring and Analyze Workspace only. Please refer to the [2D & 3D Chart Orientation](#) chapter for more information
- **Camera Field of View:** Display or Hide the Camera field of view (cone) on the chart. Please refer to [Controlling & Tracking from the Chart](#) for more information.
- **Reset Reference Point:** Sets the reference point back to its default position (defined in the [Initial Setup Options](#)). Please refer to [Reference Position](#) for more information.
- **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.
- **Luminosity Variation:** Adjusts the brightness intensity of the Day/Dusk/Night mode.

User Objects



This button allows to show or hide marks and objects on the chart using the layers. It also gives you the option to create objects using coordinate:

- **Display Object Names:** Turns ON or OFF the object label on the screen.
- **Visible Objects:** Selects which objects will be displayed on the screen according to the Filter or Layer selection. Please refer to the [Object Management Introduction](#) chapter for more information.
- **Active Layer:** Selects the layer that is used by default when creating object. Please refer to the [Layer Introduction](#) chapter for more information.
- **Manage Filters:** Opens a window that allows you to manage filters. Please refer to the [Filters](#) chapter for more information.
- **Manage Layer:** Opens a window that allows you to manage the layers.
- **Create Marks/Boundary/Annotation:** Creates objects using coordinate manually entered by the user.

Chart



This button allows you to select the chart used on the screen, adjust some of its property (vector chart only) and show/hide various layers of information on top of the chart:

- **Chart:** Selects the type of chart used. Select "Auto" if you want TimeZero to pick automatically the best chart source according to the area.
- **Vector Chart Preset** Provides quick access to five default presets (offering different levels of detail for vector charts) as well as any custom preset the customer may have created. Please refer to the [Adjusting Vector Charts Display](#) chapter for more information.
- **Depth Shading:** Displays and adjusts the intensity of the depth shading. Please refer to [Depth Shading](#) for more information.
- **MM3D Satellite Picture:** 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.
- **Grid:** Displays a grid over the chart

Target



This button allows to show/hides targets on screen as well as adjusting parameter related to targets:

- **Display Target Label:** Shows or hides the target labels (ID or Speed) on the screen. You can select if you want to display the target ID or the target Speed (or both) from the [Targets](#) Options. When set to ID (default) and for AIS targets, the label displayed on the screen is the name of the ship or the MMSI in case the name is not available.
- **Display Trail on All Target:** Displays a trail on all targets.
- **Display Trail on Dangerous Target:** Only display a trail on targets that are categorized as dangerous (targets that break the CPA/TCPA Values or that are manually classified as Hostile).
- **Target Trail Length:** Adjust the trail length.
- **ARPA Auto Acquisition:** Enables or disables the ARPA Automatic Acquisition overall. Make sure to check that option after creating boundary areas that are set to "ARPA Auto Acquisition". Please refer to [ARPA Auto Acquisition](#) for more information. When connected to a remote radar (using TimeZero Remote), this will send the command to the remote computer connected to the radar locally.
- **ARPA Targets:** Displays the ARPA target from the radar. Please refer to [ARPA Target](#) for more information.
- **Cancel all ARPA targets:** Erases all the ARPA targets that are currently tracked by the radar.
- **Display All AIS:** Displays all AIS targets.
- **Display Dangerous AIS:** Only display the AIS targets that are categorized as dangerous (targets that break the CPA/TCPA Values or that are manually classified as Hostile).
- **Apply AIS List Filter on Chart:** Causes the AIS list filter to also be applied on the chart when enabled.
- **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. Please refer to [Marine Traffic](#) for more information.
- **Track All AIS Target:** Enables the Track recording on all AIS targets. This feature should be used with caution as it can create lots of tracks.
- **DSC:** Displays DSC targets. Please refer to [DSC Targets](#) for more information. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **DSC Tracks:** Displays DSC target tracks. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **Clear all DSC:** Erase all the DSC targets and their tracks. This option only appears when DSC has been configured as an input in the Connection Wizard.
- **Fleet Targets:** Displays Fleet targets. This option only appears when Fleet Tracking has been configured. Please refer to [Fleet Tracking](#) for more information.
- **Apply List Filter on Chart:** Causes the Fleet Target list filter (that can be accessed at the top right of the list to also be applied on the chart.

- **Reset all Fleet Targets:** Reset all the fleet targets. This will cause all fleet targets to disappear from the screen until a new position is received.
- **Send AIS Text Message...:** Open a window that allows to send a Text Message to a specific class A AIS target. Note that the "ABM" sentence must be selected as an output (on the port where the AIS transmitter is connected) for this option to appear.

Lists



This buttons allows you to open the various lists at the bottom of the screen. Once the lists are opened, you can switch list by using this button again or by directly selecting the corresponding list on the left pane:

Marks List : 8 Elements

Icon	Color	Name	Position
	Blue	Crab Pot	N 47°43.973'; W 122°31.643'
	Red	Fishing Spot	N 47°43.908'; W 122°31.508'
	Green	Favorite	N 47°57.817'; W 122°39.622'
	Blue	View Point	N 47°57.916'; W 122°48.073'
	Cyan	Mark	N 47°54.941'; W 122°42.659'
	White	Mark 2	N 47°59.930'; W 122°44.488'
	Red	Danger	N 47°54.277'; W 122°55.023'
	Yellow	Mark 3	N 47°56.048'; W 122°53.194'

Note: The lists are "dynamic" and will only be displayed if you have at least created on corresponding object.

Radar



This button gives access to various radar adjustments and radar related features:

- **Radar Overlay** (Chart Only): Enables the Radar Overlay on the chart.
- **Radar Preset:** Display the list of Radar User Presets that have been configured (if any). Please refer to [Radar User Preset](#) for more information.
- **Echo Trail:** Enables the Radar Echo Trail. Please refer to [Radar Controls](#) for more information.
- **Trail Length:** Adjusts the trail length. 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.
- **Interference Rejection:** Adjusts the Interference Rejection. Please refer to [Radar Controls](#) for more information.
- **Echo Averaging:** Adjusts the Echo Averaging. Please refer to [Radar Controls](#) for more information.
- **Echo Stretch:** Adjusts the Echo Stretch. Please refer to [Radar Controls](#) for more information.
- **Pulse Length:** Adjusts the Pulse Length. Please refer to [Radar Controls](#) for more information.
- **Noise Rejection:** Adjusts the Noise Rejection. Please refer to [Radar Controls](#) for more information.
- **Video Contrast:** Adjusts the Video Contrast. Please refer to [Radar Controls](#) for more information.
- **Radar Rings:** Displays the Radar Ring on the Radar (only visible when "Radar Overlay" is turned ON).
- **Radar Source:** Selects the Radar Source in case multiple radars are available. Only available in TimeZero "Dual Radar" and "Remote" products
- **Transmit:** Sets the Radar in Transmit or Standby mode.

POIs



This button allows you to display various POI ("Point of Interest") on the chart and find places:

- **Display POIs:** Shows or Hides all the POIs that are selected at once.
- **Find:** Opens a window that allows to search for place. TimeZero Coastal Monitoring can search in Tide database.
- **Manage Locations...:** Allows to capture and manage chart location.
- **Locations:** Used to recall a chart location (only available when one or multiple chart locations have been saved)

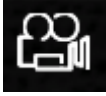
Weather



This button allows to display weather on the chart by selecting various presets:

- **Display Weather:** Shows or Hides the selected Weather Presets.
- **[Weather Preset List]:** Click on one of these buttons to activate the corresponding weather preset. To define a preset, just select "Manage Weather Presets". Please refer to [Displaying Weather Data](#) for more information.

Camera



This button (only available in the Camera WorkSpace) allows to select the Camera Source:

- **<List of Camera Name>**: Select the Camera to be displayed on the screen.
- **Display Active Camera**: Set the WorkSpace to display the Active camera. When the Active camera selection changes, this automatically updates the Camera WorkSpace.

Camera Control



This button allows to access features of the camera (according to the type of camera) and allows to unlock the camera (stop the tracking):

- **Unlock Camera:** Stop the camera tracking
- **<Camera Features>:** According to the type of Camera (FLIR for example), various features can be selected from this menu ("Home", "Scene", etc...)
- **Set Active Camera:** When multiple tracking cameras are configured, this allows you to select the Active Camera. Please refer to [Controlling Multiple Camera](#) for more information. Note that this Options (selecting the Active Camera) is not available in the Camera WorkSpace.
- **Reconnect Camera:** Attempt to reconnect to the camera when the connection is lost.
- **Camera Info:** Display camera information (for troubleshooting) such as Pan/Tilt and Zoom raw value.
- **Presets:** Display the list of current camera presets (when presets have been defined using the "Manage Presets" option below). Please refer to [Camera Presets](#) for more information.
- **Manage Presets...:** Allows user to capture camera presets and manage existing preset (order, name, etc...)

Augmented Reality



This button allows to display various layer of information on top of the camera video feed in the Camera WorkSpace:

- **Augmented Reality:** Enables or disables all the Augmented Reality features. Please refer to the [Augmented Reality](#) chapter for more information.
- **Grid:** displays a blue grid on top of the camera feed.

Note: The grid can be used to confirm that the camera is properly adjusted.

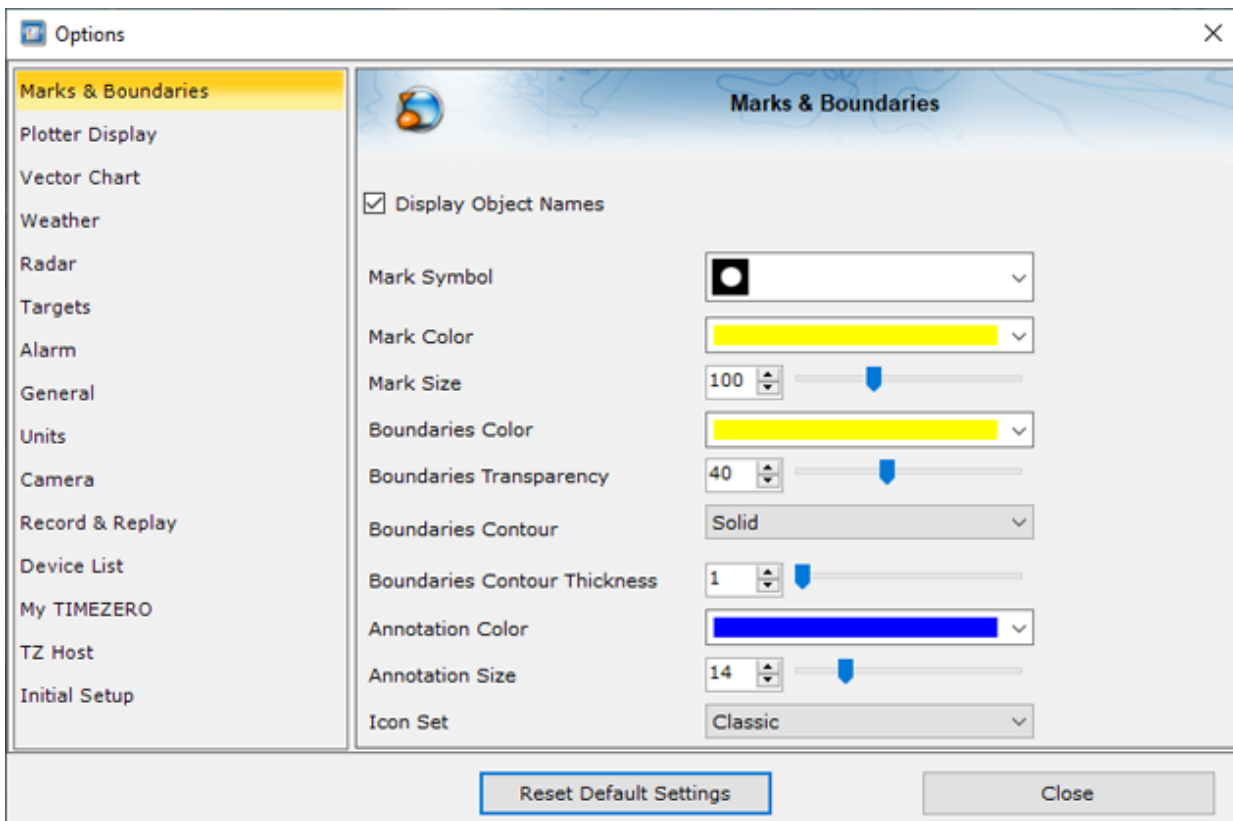
- **Target Label:** displays a label containing the target ID and its Speed over the target
- **AIS Icon:** displays the AIS icons in real size over the video. It is possible to click on these icons to get AIS information directly from the Camera WorkSpace
- **Azimuth Scale:** displays the horizontal orientation of the camera (angle from North) at the bottom of the screen.
- **Distance Scale:** displays a distance scale (only available under the horizon line).
- **Pitch Scale:** displays the vertical orientation of the camera.
- **Camera stabilization:** adjusts the camera stabilization factor (requires Pitch & Roll data).
- **Maximum Render Range:** sets the distance at which objects will be displayed in the Camera WorkSpace.

Options Overview

Introduction

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).

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 setting 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 setting that affects all marks displayed on the screen.
- **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.

Plotter Display

The Plotter Display options allow users to configure settings related to the Monitoring and Analyze 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 [Chart Ribbon](#)) 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 S-57.
Note: "ENC" chart (when installed) are not part of the "Auto" mode. They must be selected manually.
- **Chart Boundaries:** selecting this option displays all chart areas boundaries:
 - The areas having detailed Nautical Charts (either Raster, C-Map, 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 "Chart" button located in the Ribbon .
- **Display Sensors on Chart:** show or hide the various sensor location on the chart (Camera, Radar,...)
- **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 Monitoring and Analyze WorkSpaces when "Display Bathymetry in 3D" is selected.
 - *Display Bathymetry in 3D*: Determines if the bathymetry is displayed or not in the Monitoring and Analyze 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 "Chart" button located in the Ribbon), 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.

- **Preset:** Allows the user to manage vector chart presets that captures all the settings of this page. Various presets (with independent vector chart settings) can be created and recalled from any plotter. Just note that the Safety Depths will be shared across all the presets for safety reason.

Appearance

- **Color Theme:** Determines the color palette (or "theme") used to render the Vector Charts.
- **Style:** Selects the symbol representation (for buoys) to either use the simplified style (common on ECDIS) or the paper chart style.
- **Land Features:** Selects to turn ON or OFF the land features of the Vector charts.
- **Chart Object Size:** Adjusts the size of the vector charts object icons (buoys, wrecks,...) and text displayed on the screen.

Safety Depths

- **Shallow/Safety/Deep Water:** 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.

Layers

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).

Radar

The Radar options allow you to configure various advanced Radar Setup and displays preferences.

- **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 (for TimeZero Single Radar ONLY):** When using a DRS with TimeZero Single Radar, it is possible to use the Dual Range feature of the DRS on the chart overlay:
 - *Fusion (Default):* Both radar ranges of the DRS will be used and fused on the Chart Overlay. It is recommended to adjust the two ranges (one short and one long) from the "Dual Radar" WorkSpace. Usually, the Radar on the left side is used for the small range (0.5NM for example) and the second range on the right is used for long range detection (3 to 6NM).
 - *Range A:* Only the Range A of the DRS (left side picture of the Dual Radar WorkSpace) will be used for the overlay. By limited the DRS to only displaying Range A, it allows the DRS to rotate at high speed (up to 48RPM).
 - *Range B:* Only the Range B 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 Range A of the DRS (left side).
- **Radar Fusion (for TimeZero Dual Radar ONLY):** This setting adjusts how the two radar pictures are merged on the chart:
 - *Exclusive (default):* This setting should be the best choice for most application. In area where both radars overlap, only one radar will be displayed (one radar has priority over the other). The radar that gain priority in the overlapping area is the radar with the smallest range (usually the radar with the highest echo resolution). This setting also takes into account the blank sector and properly fill the gap when needed.
 - *Merge:* Both radar pictures are merged (displayed on top of each other) in overlapping area. This setting should only be used when the radars are not overlapping.
- **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.

- **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 setting adjusts 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.
- **Trail:** Echo trails show the movements of radar echoes over time . The trails disappear over time (according to the "Trail Length" parameter).
- **Watchman:** The Watchman allows you to Transmit and Standby the radar automatically by setting intervals. This can be used in situation where power needs to be saved. When the Watchman is enabled and when the user presses the Transmit button, the radar will transmit during the "Automatic Transmit Duration" then standby for the "Automatic Standby Duration". If you want the radar to start transmitting automatically (and start the watchman sequence) as soon as the software is started, it is possible to add a shortcut parameter to the TimeZero shortcut icon. Please refer to [Startup Mode](#).
- **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 FAR2xx8) 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 Orientation:* Adjust this setting until the radar overlay align perfectly with the charts.
 - *Insert Position from Sensor:* This button uses the current GPS and Heading sensor values and inserts them automatically for the Antenna Position and the Antenna Orientation. Note that a Position and Heading must be configured in the Connection Wizard. If the GPS and Heading sensor are moved to another location, this button needs to be pushed again to update the values (they are not updated automatically).
 - *Antenna Height (Furuno DRS Radar only):* Select the Radar Antenna height. This setting 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 setting allows 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:* For most Coastal monitoring application, this setting should not be used (use the "Radar Antenna Orientation" setting above instead)
 - *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.

- *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 setting to reduce the "main bang" (circle that appears at the center of the radar screen).
- **DRS Broadcast Mode (Furuno DRS only):** When sending the Radar picture to a remote site, this setting allows you to select if only Range A of the DRS is sent or both Ranges (fusion). When set to "Fusion" this account as two radar pictures (a maximum of 6 radar pictures can be sent overall to any remote site).
- **Radar Optimization (Furuno DRS only, not available for DRS-NXT):** . 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.
- **Radar User Presets:** Click on this button to open the Radar Preset window that allows to store radar configuration. Please refer to [Radar User Preset](#) for more information.
- **Advanced ARPA Settings:** These advanced ARPA settings affect how the internal TimeZero 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. Note that for fix radar installation, we recommend to create one or multiple [Radar Mask](#) to remove echo from land.
 - *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 setting 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 adjusts 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.

- *Restrict ARPA to Acquisition Area:* When this setting is set to OFF (default) ARPA targets that are acquired inside an Acquisition Area can still be tracked when they go outside the area (as long as they are NOT entering an ARPA exclusion area). When this setting is set to ON, ARPA targets can only exist inside acquisition area(s). If a target leave the acquisition area, it will be immediately lost.
- *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 setting adjusts 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). Lowering the reactivity of the filter will also reduce false detection rate.

- *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 during installation of the system.
- *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 opens a window displaying the DRS antenna status.

Targets

The Targets options allow users to configure settings related to the Targets display.

- **COG/SOG Predictor Time:** Increase the time value to make the Course Over Ground (COG) & Speed Over Ground (SOG) predictor line longer. Decrease the time value to make the predictor lines smaller.
- **Target Trail Length:** This option adjusts the length of target trails. The target trails can be enabled or disabled on specific targets from the Target Ribbon button. This setting is also used by the Record and Replay module when right clicking on a replay target to display its trail.
- **Target Label:** By default TimeZero displays the target ID when "Display Target Label" is checked, but this can be changed to display the target speed or a combination of both. When ID is selected (default), TimeZero will always try to display the name first (either available inside the AIS information or inside the AIS Favorite List). If a name is not available, TimeZero will display the MMSI number instead.
- **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.
- **Default DSC Color:** Select the default color used for DSC target.
- **Target Size:** Adjust the overall target size displayed in TimeZero.
- **Display CPA/TCPA Vector:** 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.
- **Display Target Label:** Check this option to display a target label on the chart below or above the target icons (according to target orientation).
- **Remember Target Tracking Status:** When this setting is enabled, TimeZero will remember the tracking status (Track ON or OFF) of targets (Fleet and AIS) based upon their MMSI. For example, if you enable the track recording on a specific AIS target, TimeZero will remember and continue to track this target in the future even if the AIS disappears (out of range) and reappears, or if the software is restarted.
- **Reset Target Tracking Status:** When this button is pressed, TimeZero turns OFF the tracking for all targets (Track OFF on all targets) and forget their recording status. Note that this will not erase any tracks that have been recorded up to this point.
- **Favorite (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. This window is also useful to preset the classification of known AIS vessels to "Friends" or "Neutral" to exclude them from triggering specific rules (that have been set to ignore "Friend" or "Neutral" classification).
- **AIS/ARPA Association:** Press this button to display the AIS/ARPA association window. When set to "None", ARPA and AIS will always remain two distinct objects. If you set to "AIS" or "ARPA", the targets that match the criteria will be "fused" into a unique object (AIS or ARPA according to the setting). All of the criteria need to match for the fusion to occur. It is also possible to merge multiple ARPA targets that are coming from different stations (picked up by different overlapping radar). This setting is used when

TimeZero receives ARPA target generated by other TimeZero using the TLLX sentence or when connecting to multiple stations (using the Client/Server architecture).

- **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 setting does 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.

Fleet:

- **Fleet Timeout:** This timeout is used by TimeZero to decide to display or not a fleet target on the chart (and in the list). If a fleet target was not updated since the timeout duration, it will no longer be displayed in TimeZero. This duration is also used on Fleet Target to display an extended trail when a Fleet target is selected. Please refer to [Fleet Tracking](#) for more information.

Note: Fleet Targets can also have a shorter trail displayed on all targets (not restricted to the selected fleet target). This setting is shared with the AIS & ARPA trail and can be adjusted at the top of this page using "Target Trail Length".

- **Fleet Color:** Adjusts the color of the fleet target icon.
- **PosReport Data Location:** If you are not using the TimeZero Fleet Tracking service, you can also update fleet targets using a [proprietary file exchange format](#). This setting sets the folder monitored by TimeZero to get fleet target information using the PosReport format.
- **Classification Name:** Press this button to rename the various classification. Note that the target representation will stay the same on the chart even if you change their name. So for example, if you rename "Hostile" into "XXXX", the target will still be displayed in red (and flashing) when selecting the "XXXX" classification.

Alarms

The Alarm options allow you to configure all of the various alarms and warnings that can be triggered 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.

- **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.
- **Target Watch Alarm:** Check this box when you want the Target Watch rule to trigger when a target drifts away more than the specified value. The anchor position to monitor for a specific target is enabled by right-clicking on a target and selecting "Target Watch Alarm"
 - **Default Alarm Radius:** Set the default radius that is used when the Target Watch is set on a target.
 - **Define Target Watch Rule:** Opens a window that allows to define action(s) when a target breaks its Target Watch Alarm threshold.
- **AtON Light Monitoring:** Check this box when you want the AtON Light Monitoring rule to trigger when specific voltage thresholds (defined below) are met. This allows TimeZero to monitor Light Buoys that report their position using AtON message 21 and that report their light voltage status via AIS ASM message 6 ([DAC 235 / FI 10 Message](#)).
 - **Trigger Alarm when internal voltage falls below:** Threshold to monitor the Analogue (internal) field of the Aids to Navigation monitoring data ASM
 - **Trigger Alarm when external voltage falls below:** Threshold to monitor the Analogue (external - from hardware analogue input No 1) field of the Aids to Navigation monitoring data ASM
 - **AtON Light Monitoring Rule:** Opens a window that allows to define action(s) when one of the thresholds (internal or external) is triggered.
-
- **Monitoring Zone Rules:** Rules can be added, edited or removed from that window. For more information about rules, refer to the [Rules](#) chapter.

General

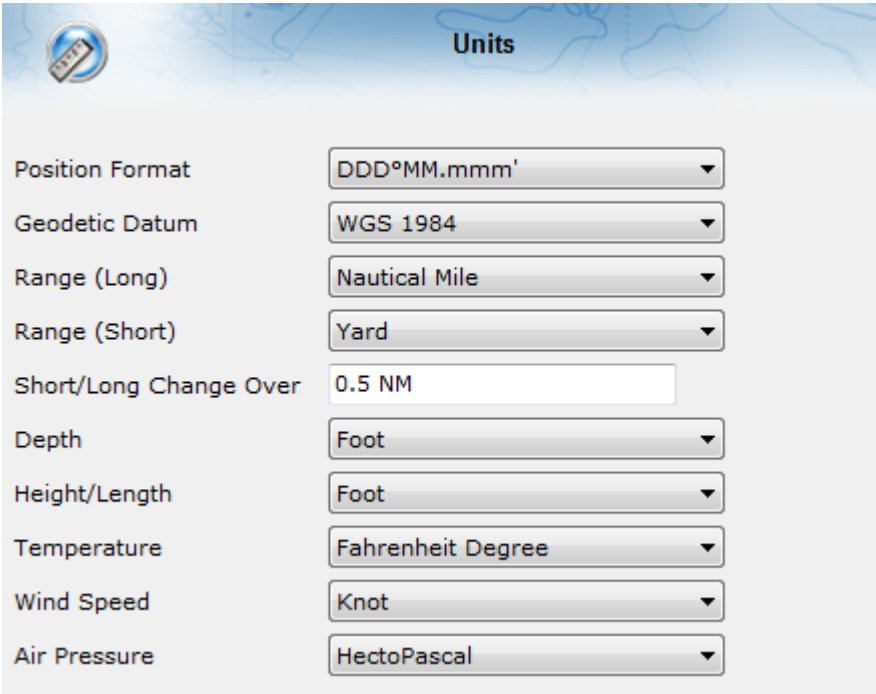
The General options allow you to configure various TimeZero settings:

- **Animation Replay Speed:** Sets the speed of animation when the "Play" button is pressed on the Virtual Time Control (Time Bar) of the Analyze 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).
- **Ribbons Size:** Determines the size of the Ribbons at the top of the screen.
- **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.
- **Display Tooltip Over Object:** Determines how quickly the Tooltip appears when hovering over an object. If you don't like the Tooltips to appear when the mouse is over an object, set this option to OFF. You can always display the Tooltip by left clicking on any objects.
- **Center on Screen when Zooming with Scroll Wheel:** 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.
- **Customize Function Keys:** The user can create shortcut keys to control various system settings. Please refer to [Shortcuts](#) for more information.
- **Screenshot Recording Location:** Set the default screenshot recording location
- **Power Consumption Optimization:** 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:



Parameter	Value
Position Format	DDD°MM.mmm'
Geodetic Datum	WGS 1984
Range (Long)	Nautical Mile
Range (Short)	Yard
Short/Long Change Over	0.5 NM
Depth	Foot
Height/Length	Foot
Temperature	Fahrenheit Degree
Wind Speed	Knot
Air Pressure	HectoPascal

Camera

The Camera options allows you to configure camera(s) and video input (to bring external screen) in TimeZero. Up to 12 cameras can be configured, allowing the user to switch source from the Camera WorkSpace or Camera Navdata. TimeZero Coastal Monitoring is compatible with AXIS network camera and converter, ONVIF Camera, PELCO-D Camera and FLIR camera (M-Series and PT-Series). For video input, TimeZero is compatible with DirectShow device (USB) or H264 feed.

- **Camera Configuration List:** This window allows to Add, Edit and Remove camera. The status column indicates if the camera is working properly (green) or not (red). In case of problem (red status), you can rollover the mouse to get more information. In case of IP camera or converter, the IP address will be available under the Address column.
- **Active Camera Cone Color:** Selects the color of the Cone that will be representing the Field of View (FOV) of the Active Camera on the chart and radar screen.
- **Inactive Camera Cone Color:** Selects the color of the Cone that will be representing the Field of View (FOV) of all the inactive cameras on the chart and radar screen.
- **Camera to Move/Lock:** Selects the behavior that will be used when the user right click on the chart to move/lock a camera when multiple PTZ cameras are available:
 - **Closest Camera:** When customer right click to move/lock a camera, TimeZero looks for the closest camera, activates it, and then sends the move/lock command to that camera.
 - **Active Camera:** When customer right click to move/lock a camera, TimeZero sends the move/lock command to the active camera.
 - **List Closest 2 Cameras:** When customer right click to move/lock a camera, TimeZero will list the two closest cameras in a sub-menu. This allows the customer to manually choose the relevant camera to send the command to. This can be useful when the closest camera option is not always selecting the best camera.
 - **List All Cameras:** When customer right click to move/lock a camera, TimeZero will list all cameras in a sub-menu. This allows the customer to manually choose the relevant camera to send the command to. This can be useful when the closest camera option is not always selecting the best camera.
 - **Closest 2 Cameras:** When customer right click to move/lock a camera, TimeZero looks for the two closest cameras, and then sends the move/lock command to these two cameras
- **Enable USB joystick control for active camera:** Select this option when a USB joystick is connected to the computer
 - **Invert Tilt axis:** Select this option if the movement of the camera seems inverted when pushing or pulling the Joystick.
 - **Minimum Threshold:** This slider adjusts the Joystick "dead band". The higher the setting the greater the Joystick has to move (initially) before sending a command to the Active Camera.

IMPORTANT: Make sure to calibrate the USB joystick in Windows. Please refer to the [Calibrate Joystick](#) Chapter

- **Video Input Configuration List:** This window allows to Add, Edit and Remove Video Input. The status column indicates if the external video encoder is working properly (green) or not (red). In case of problem (red status), you can rollover the mouse to get more information. In case of a network encoder (H264), the IP address will be available under the Address column.

Record & Replay

The "Record & Replay" Module needs to be configured to access this feature.

The Record and Replay Options allows you to enable or disable the data that is recorded and adjust compression options (note that Targets and Events are always recorded).

- **Enable Radar Recording:** Enable or Disable the Radar recording. User can set the radar recording frequency, Quality and Resolution:
 - **Radar Recording Frequency:** Adjust how often the radar picture gets recorded. You can decrease the recording frequency to save space. The Radar picture gets compressed and takes in average 1MB/minute at maximum recording speed (every antenna turn). Note that this number can increase or decrease according to how much radar echoes are present on the radar screen.
 - **Radar Quality:** Adjust the number of "level" used to store radar echo information. For example, if you set the quality to 4 bits, the echo level will be converted from 128 possible levels to 16 levels. Since the Radar Recording is only use for visualization (not for target processing), you can safely reduce the quality.
 - **Radar Resolution:** Adjust the resolution of the radar picture from 1024*1024 down to 256*256. Only reduce the Radar resolution when you need to save lots of space. Decreasing the resolution will noticeably decrease the radar echo "readability".
- **Enable Camera Recording:** Enable or Disable the Video recording. User can select the camera and recording frequency:
 - **Camera Recorded:** Select which camera gets recorded. You can select a specific camera name from the drop down menu or use the "Active Camera". When set to "Active Camera", the recorded camera will be the one that is set as active at that time. Usually this is the best choice as Rules can be setup to activate specific cameras and thus will always record the camera of interest.
 - **Recording Framerate:** Adjust how often the camera picture gets recorded. You can decrease the recording frequency to save space. The video gets compressed and takes in average 5MB/minute at 10 frame per second. Note that this number can increase or decrease according to how much "motion" is present in the video (a scene that stays still will take much less space than a scene with lots of movements). If you want to decrease the space taken for video recording, decrease the framerate (1FPS will take 10 time less space than 10FPS!).
*The recording resolution is kept the same as the source except if the video horizontal resolution is over 1200 pixels. In that case, the recording resolution is divided by two (ex: a camera with a resolution of 736*576 will get recorded at the same resolution, but a camera with a resolution of 1280*720 will get recorded at 640*360).*
 - **Recording Quality:** Adjust the quality of the video compression. TimeZero uses the advanced "WebP" compression format.
- **Enable Audio Recording:** Enable or Disable the Audio recording. Any microphone or line input recognized by Windows can be used to record one or multiple channels. However, when recording multiple channels, it is highly recommended to use one ASIO compatible multi-track audio interface.
 - **Audio Channel List:** Click on the "Add" button to configure a new Audio Channel. A window allowing you to select an audio channel (recognized by Windows) and give it a name will appear. Once added, it will appear in the list. Its status and real time audio level will appear in the list. You can click on settings to adjust a recording threshold. A slider allows you to not record any audio when the level is below the threshold.

The audio recording sample rate is fixed (22,050Hz / 8 Bit / Mono).

- **Display in the Event List, Audio Conversations longer than :** None or 5 /10 / 15 / 30 /60 seconds.

- **Archive/Delete Data Older Than:** Set the number of day you want TimeZero to keep recorded data on the local hard-drive. This defines how much day you can replay from the recording computer (live). Once this limit is reach you can either select to delete the old data (clean up) or archive to a secondary location (backup). Usually, you don't always select the maximum amount of days (30 days) in order to save space on the local hard drive and free up resources in TimeZero. Just select the number of days you need for instant and immediate data access knowing the fact that you can always setup a backup location for older data.
- **Delete Old Local Data:** Select this option if you don't want to keep data older than the limit set above.
- **Archive Old Local Data:** Select this option if you want to choose a backup location where old data will be transferred automatically (every day at midnight). This backup data can then be replayed from another computer (see [Archiving](#) for more information).
- **Export Recorded Data...:** Select this option when you want to export a chunk of data by date and duration. Note that this option only allows you to extract data that has not been yet archived.

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 MFD8B	172.031.100.254	MF100254
NavNet3D MFD12	172.031.254.002	MF000001

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.
- Synchronize all layers:** by default, only the marks and objects that are stored on the default "TimeZero" layer are synchronized. If you create another layer (refer to the [Layer Introduction](#) chapter), and store user objects on that custom layer, they will not be synchronized. This is because the TimeZero layer enforces a limit on the number of user objects that can be synchronized with smaller platforms (TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). Custom layers (created by the user) do not enforce any limitation. Also, smaller platforms do not have the ability to handle multiple layers. For all these reasons, only the user objects that are put on the "TimeZero" layer are synchronized. However, if you do not care about smaller platform and would like to only synchronize user objects among other TimeZero, you can enable this option. When this option is checked, all layers and all user objects will be synchronized, but only with other TimeZero (you will lose the synchronization with TZ Navigator, TZ iBoat and Furuno TZT2/TZT3). This option must be checked on all the TimeZero.
- 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.

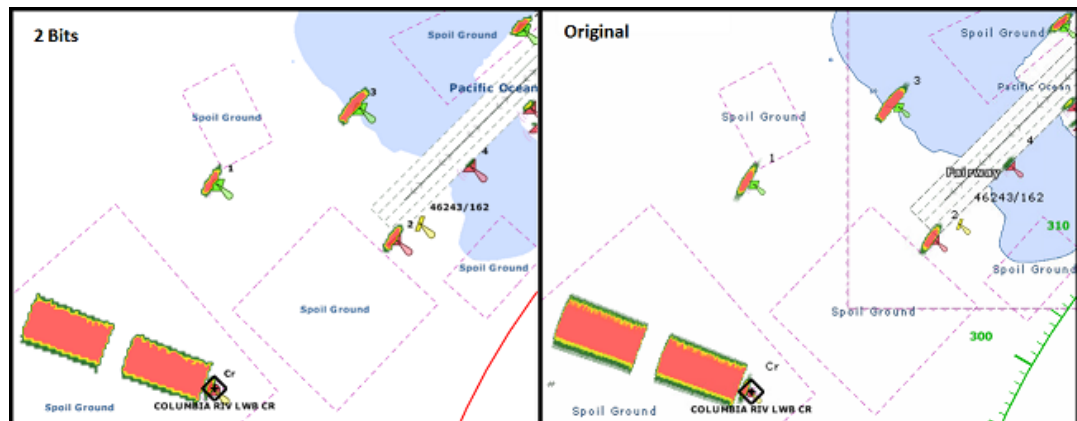
My TIMEZERO

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.

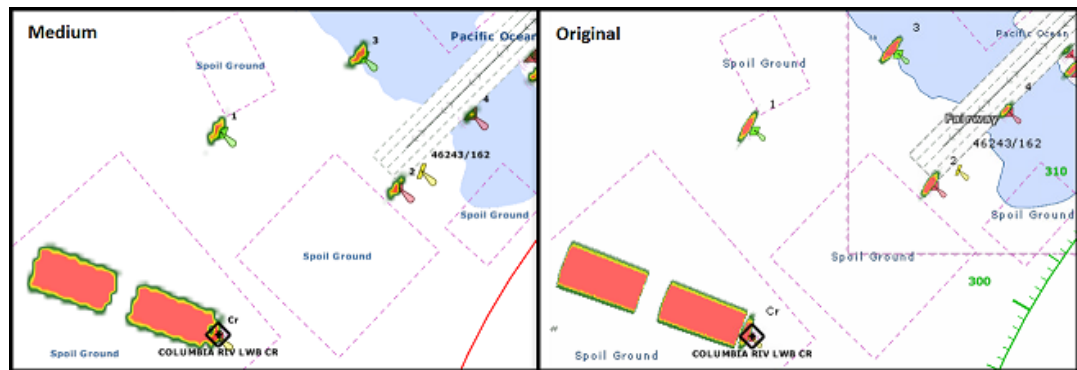
- **Allow TimeZero to connect to the Internet:** If you turn OFF this option, TimeZero will no longer access the Internet for any service.
- **Synchronize my User Objects to My TIMEZERO:** When this option is checked, your user objects (marks, boundaries, lines, annotations, and photos) will be automatically 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.
- **Get Fleet Targets from TZ Cloud:** When this option is checked, and when you have a valid Internet connection, you will be able to receive Fleet targets via the TZ Cloud. Please refer to the [Fleet Tracking](#) chapter for more information.
- **Position Report 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.

TZ Host

- **Station ID:** Used to set a unique ID and Name to the computer sending its data to the TZ Host. When outputting data from multiple stations to a central station loaded with TimeZero Remote, each station MUST have a unique ID (an error will be displayed if this is not the case). Note that changing the ID or Name will require a restart of the software.
- **Host Address and Port:** Enter the IP address or domain name of the computer where the TimeZero Host is running. The port is 8080 by default (but it can be changed on the TimeZero Host). When connected, TimeZero will display the status of the connection either "Encrypted" or "Unencrypted" (if HTTPS was disabled manually on the Stations and on the TZ Host). When the connection is Encrypted, it will be either "Self Signed" or "Trusted". Self Signed means that the default Self Signed certificate (installed by default with the TimeZero Host) is used. While this guarantees the encryption of the data, it does not guarantee authentication (anybody could "spoof" the IP address and use the default certificate). When the Status is "Encrypted (trusted)", it means that a trusted certificate is used for the domain name, providing encryption and authentication.
- **Send AIS Target Data:** Enable AIS output
- **Send ARPA Target Data:** Enable ARPA output
- **Send Weather Data:** Enable Real Time Weather Data output (Wind Direction, Wind Speed, Pressure, Air Temperature, Humidity and Visibility). Real Time weather must be configured on the Station using either NMEA0183 or NMEA2000 (via Connection Wizard).
- **Send Radar Data:** Enable Radar Echo output
- **Radar Quality (8bit / 4bit / 2bit / Quantized):** This setting adjusts the number of color "levels" that will be used when sending radar picture over the network. For example, when selecting "2 Bit", 4 colors will be used to represent all the intensities of the radar echo. When set to "Quantized", only one bit is used (one color) and the echo is gated like the Quantized Display of the ARPA processing (when set to "Quantized", the picture as seen by the ARPA algorithm is sent).



- **Radar Resolution (High/Medium/Low):** This setting adjusts the resolution that will be used when sending radar picture over the network (from 1024*1024 down to 256*256):



TIPS: To save bandwidth, it is recommended to decrease the Radar Quality first, then the Radar Resolution. A radar quality of 2 Bit with high resolution will offer better overall definition than a radar quality of 4 bit with medium resolution. Decreasing the quality from 8Bits to 4 Bits will not be noticeable for the operator eye and is recommended.

- **Send Camera Data:** Enable Camera output.
- **Video Quality:** This slider adjusts the amount of compression.
- **Video Resolution (Full/Medium/Low):** This setting adjusts the resolution that will be used when sending the camera picture over the network. When set to "Full" the native resolution of the camera will be used. When set to "Medium" the resolution will be divided by 2 and when set to "Low" divided by 4.
- **Video Framerate:** Adjusts the video refresh rate. By default, the camera picture will be sent every second. It is possible to increase the refresh rate or decrease it.
- **Estimated Bandwidth:** Provides an average of the bandwidth usage with the settings currently selected. This estimate supposes that the Radar picture is properly tuned and that a [Radar Mask](#) has been applied on land (to remove land echo).

Note: An improperly tuned radar picture (with noise all over the screen), will increase dramatically the bandwidth used to transmit the radar picture (up to 10 times!).

- **Communication Status...:** Open a window with all the connection and transmission logs
- **Communication Monitor...:** Open a window with real time upload time statistics per type of data.

Initial Setup

- **Default Reference Position:** Enter the default reference position that you want to use (usually the harbor entrance). All the range and bearings in the software will use that default reference position.
- **Insert Position from Sensor:** This button uses the current GPS sensor value and inserts it automatically for the Default Reference Position. Note that a Position must be configured in the Connection Wizard. If the GPS sensor is moved to another location, this button needs to be pushed again to update the value (the position is not updated automatically).
- **Station MMSI:** If applicable, enter the MMSI of the Station. This is usually only required when connected to an AIS transponder (to send Text Message).
- **Graphic Instruments Setup:** Allows to enter the various Min/Max used for the Gauge NavData.
- **Wind Speed/Direction Damping:** This setting smooths the wind data. Increasing this value will raise the Wind averaging time (but will decrease the response time).
- **Wind Speed / Direction Offset:** Allows to offset the Wind Direction by adding or subtracting an angle value and by increasing or decreasing the speed by a percentage.
- **VHF Direction Finder**
 - **Minimal Signal Level (%):** Adjust the threshold that is required for the DF Bearings to be displayed on the chart.
 - **DF Bearing Timeout:** Adjust the duration after which the DF Bearings will disappear from the chart if not continuously updated.
 - **DF Bearing Color:** Set the DF Bearing color on the chart (note that the alarm bearings will always be displayed in red).
- **Number of Monitors:** Enables the user to use two or three monitors with TimeZero. This option will only be available when (at least) two monitors in extended mode are detected. When enable, TimeZero will put the second and third display to the right side of the primary monitor. If there is no monitor available to the right of the primary monitor (or not enough when selecting 3 monitors), TimeZero will use the monitor to the left side of the primary monitor. It is usually recommended to make the primary monitor of Windows the left most monitor.
- **Reset Dialog Box Position:** Press this button to reset all dialog boxes (windows) position to their default location. This can be useful if a dialog box (such as the property window) has been dragged on a monitor that has been disconnected.
- **SeaLevel 110E/120E configuration:** Press this button to configure the IP address of the SeaLevel Network IO. Please refer to the [SeaLevel Network IO](#) for more information.
- **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
- DSC Target: DSC & DSE
- Event: TLL (without ID)
- GPS Quality Indicator: GGA
- Heading: FEC_GPatt; HDG; HDT; HDM; VHW; OSD; VDO
- 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
- Speed Over Ground: RMC; VTG; RMA; VDO
- True Wind Angle: MWV
- True Wind Direction: MWD; MDA
- True Wind Speed: MWD; MWV; MDA
- UTC Of Position: RMC; GGA; GLL; GNS
- Visibility: XDR ("V" parameter)

NMEA0183 Output:

Below is the list of NMEA0183 sentences supported by TimeZero as output:

- ABM
- GGA
- GLL
- HDG
- HDT
- MWD
- MWV
- OSD
- PCG (proprietary Sentence)
- RMC
- TLLX
- VSD
- VTG
- ZDA

NMEA2000 Input

Below is the list of NMEA2000 sentences supported by TimeZero as input. They are sorted by the type of data they provide. In case multiple sentences provide the same data, they are listed by priority (higher priority first).

- 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
- Fuel Level: PGN_127505 (only tanks level that are of type "fuel")
- Fuel Flow Economy: PGN_127497
- 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_TheoreticalWindSpeedAndAngle
- True Wind Magnetic Direction: PGN_130306_TheoreticalWindSpeedAndGeographicDirection;
PGN_130306_TheoreticalWindSpeedAndMagneticDirection
- True Wind Speed: PGN_130306_TheoreticalWindSpeedAndAngle;
PGN_130306_TheoreticalWindSpeedAndGeographicDirection;
PGN_130306_TheoreticalWindSpeedAndMagneticDirection
- True Wind True Direction: PGN_130306_TheoreticalWindSpeedAndGeographicDirection;
PGN_130306_TheoreticalWindSpeedAndMagneticDirection
- UTC Date Time: PGN_126992
- UTC Of Position: PGN_129029

Proprietary Sentence & File Format

Proprietary sentences provide a means for manufacturers to use the sentence structure definitions of NMEA 0183 standard to transfer data which does not fall within the scope of approved sentences. Below are the proprietary sentences recognized and used by TimeZero.

"PMXS,TLLX" Target NMEA Sentence

```

      0      1      2      3      4 5      6 7 8      9      0
$PMXS,TLLX,xxx,1111.11,a,YYYYY.YY,a,x.x,x.x,xx,a,ddmmyy,hmmss.ss*hh
| |      |      |      |      |      | |      | |      |      |
| |      |      |      |      |      | |      | |      |      |
| |      |      |      |      |      | |      | |      +-----+-- UTC of data
| |      |      |      |      |      | |      | |      | +-- Target status (*1)
| |      |      |      |      |      | |      | |      +-- Station ID (*2)
| |      |      |      |      |      | |      | |      +-- Target course over ground, degrees True
| |      |      |      |      |      | |      | |      +-- Target speed over ground, knots
| |      |      |      |      |      | |      | |      +-----+-- Target longitude, E/W
| |      |      |      |      |      | |      | |      +-----+-- Target latitude, N/S
| |      |      |      |      |      | |      | |      +-- Target number: 0 to 999
| +-- MaxSea International manufacturer code
+-- Proprietary sentence ID

```

Note: TimeZero can only generate and output a maximum of 200 ARPA targets at a rate of 10 targets per second.

POSREPORT file format

TimeZero can scan a folder (defined in the [Targets](#) Options under "Vessel Tracking Data Location") for new or updated text file(s) containing position report information. Once TimeZero detects a new file in that folder, it analyzes it and displays the location of the target(s) on screen.

TimeZero supports two formats: the traditional "POSREPORT" format and the "simplified" format.

POSREPORT Format

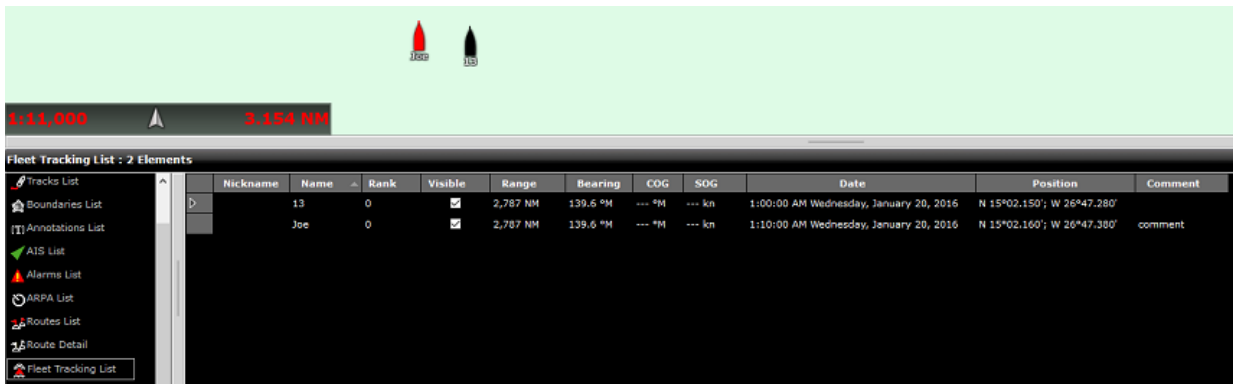
The POSREPORT text file always starts with "POSREPORT", then one line per target with the fields separated by ";".

Fields Definition:

- Rank (int)
- Name or ID (string)
- Latitude (string, degrees.minutes(2 fixed digits)decimal)
ex: N 44°54.074' = 44.54074N
- Longitude (string, degrees.minutes(2 fixed digits)decimal)
ex: W 034°42.018' = 34.42018W
- Date (UTC, format MM/DD/YY hh:mm(:ss optional))
- Comment (string)

Example:

POSREPORT
 0;13;15.0215N;26.4728W;01/20/16 09:00:00;
 0;Joe;15.0216N;26.4738W;01/20/16 09:10;comment



Simplified POSREPORT Format

The text file contains one line per target with each line starting with "//TM/POS". Then, the following parameters (key value/pair) are used (the order is not important).

- //OP/xxxxxx is used for the target name or ID (string)
- //LT/xx.xxxx is used for the latitude of the target (string: degree.decimal N = + / S = -)
- //LG/xx.xxxx is used for the longitude of the target (string: degree.decimal E = + / W = -)
- //DA/xxxxxx is used for the date of the position (string: YYYYMMDD)
- //TI/xxxxxx is used for the time of the position (string: HHMMSS)

Example:

//TM/POS//OP/My Name//LT/-16.4056//LG/-73.2195//DA/20120526//TI/141530

Note: TimeZero deletes the file after reading it.

Pelco-D Protocol Requirements

In order for a Pelco-D camera to be compatible with TimeZero, it needs to follow the below requirements:

- The camera must support continuous 360-degree rotation (continuous Pan)
- The camera must support speed commands ("Relative" PTZ commands) and position commands ("Absolute" PTZ commands)
- The camera must be able to provide position feedback (Pan Position, Tilt Position, Zoom Position), either continuously (more than 5 times per second) or upon request (whenever TimeZero issue a request position command). By default TimeZero will request position feedback 10 times per second (every 100ms), but this can be changed from the Pelco-D configuration.
- The camera must use the standard Pelco-D coordinate system for Pan and Tilt (see below)

Pelco-D Sentence Protocol

Pelco-D consists of 7 hexadecimal bytes:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Synch Byte	Address	Command 1	Command 2	Data 1	Data 2	Checksum

- Byte 1 - the synchronization byte, fixed to FF
- Byte 2 - logical address of the camera being controlled (Default Address is 01, but this can be changed from the "Pelco Configuration" settings)
- Byte - Command 1 and 2
- Byte 5 (Data 1) - pan speed, range from 00 (stop) to 3F (high speed)
- Byte 6 (Data 2) - tilt speed, range from 00 (stop) to 3F (maximum speed)
- Byte 7 (Checksum) - sum of bytes (excluding the synchronization byte), then modulo 100 (Decimal code: 256)

In order for TimeZero to successfully control a Pelco-D camera, the following Pelco-D sentences must be supported by the camera. It is important to understand that TimeZero needs to be able to send command, but also receive status (position feedback) from the camera:

"Relative" PTZ Commands (Speed Control):

Pan Left	xFF	Address (x01 by default)	x00	x04	Speed (x01-x3F)	x00	Check
Pan Right	xFF	Address (x01 by default)	x00	x02	Speed (x01-x3F)	x00	Check
Tilt Up	xFF	Address (x01 by default)	x00	x08	x00	Speed (x01-x3F)	Check
Tilt Down	xFF	Address (x01 by default)	x00	x10	x00	Speed (x01-x3F)	Check
Zoom In	xFF	Address (x01 by default)	x00	x20	x00	x00	Check
Zoom Out	xFF	Address (x01 by default)	x00	x40	x00	x00	Check
Stop	xFF	Address (x01 by default)	x00	x00	x00	x00	Check

"Absolute" PTZ Commands (Position Control):

Set Pan Position	xFF	Address (x01 by default)	x00	x4B	MSB of Pan Position	LSB of Pan Position
Set Tilt Position	xFF	Address (x01 by default)	x00	x4D	MSB of Tilt Position	LSB of Tilt Position
Set Zoom Position	xFF	Address (x01 by default)	x00	x4F	MSB of Zoom Position	LSB of Zoom Position

"Request Position" Commands:

Query Pan Position	xFF	Address (x01 by default)	x00	x51	x00	x01	Checksum
Query Tilt Position	xFF	Address (x01 by default)	x00	x53	x00	x01	Checksum
Query Zoom Position	xFF	Address (x01 by default)	x00	x55	x00	x01	Checksum

Response (from Camera to TimeZero):

Response Pan Position	xFF	Address (x01 by default)	x00	x59	x00	x01	Checksum
Response Tilt Position	xFF	Address (x01 by default)	x00	x5B	x00	x01	Checksum
Response Zoom Position	xFF	Address (x01 by default)	x00	x5D	x00	x01	Checksum

Focus Commands:

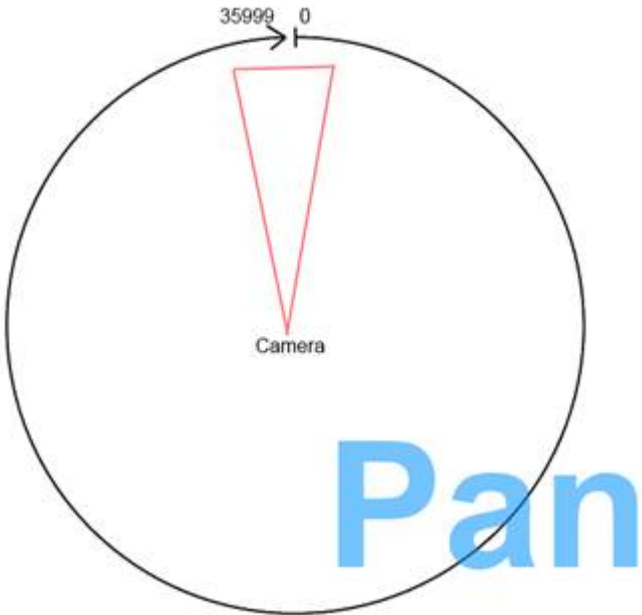
Focus Far	xFF	Address (x01 by default)	x00	x80	x00	x00	Checksum
Focus Near	xFF	Address (x01 by default)	x01	x00	x00	x00	Checksum

Coordinate System and Angle Resolution

The Pelco-D camera must adopt the standard Pelco-D coordinate system below with an angle resolution of 0.01 degree.

Pan:

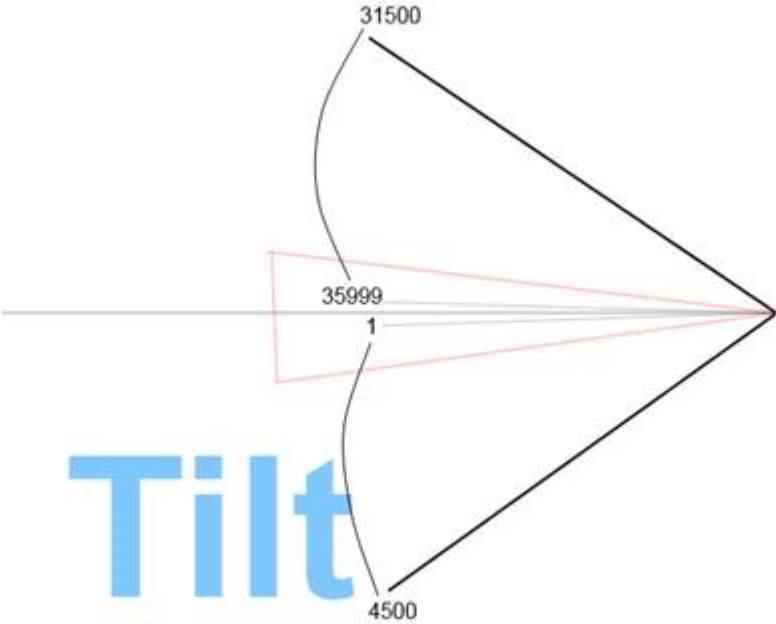
The camera must be able to pan continuously around the full 360 degrees. The Pan value (used to set and query position) must start at 0 and go up to 35999:



For example, to pan the camera 90 degrees, the Pelco-D value 9000 should be used.

Tilt:

The Tilt value (used to set and query position) must follow the coordinate system below:



The 0 value is used for the horizontal original angle. Sending positive value (with an angle resolution of 0.01 deg) should tilt the camera down. For example, if TimeZero sends the Pelco-D 4500 value, the camera should tilt down to 45 degrees. To tilt up, values should start at 35999 and go "down" to the (maximum tilt up angle * 100) - 36000. For example, to tilt up 45 degrees, the Pelco-D value 31500 should be used. Note that maximum tilt up angle and the maximum tilt down angle used in this example (respectively 31500 and 4500) are arbitrary. It is



OK for the camera to support different tilt up/down angle.

ONVIF Protocol Requirements

Summary of Requirements:

In order for an ONVIF camera to be compatible with TimeZero, it needs to follow the below requirements:

- The camera must support the mandatory features of the ONVIF Profile S protocol (see [ONVIF Profile S specification](#)) over HTTP (HTTPS not supported)
- The camera must support video streaming in H264 (TimeZero is not compatible with MJPEG, MPEG4, or H265)

In addition, for a PTZ Camera:

- The camera must support continuous Move and Stop PTZ operations (pan/tilt/zoom command by speed with stop command)
- The camera must support absolute positioning (used by TimeZero when controlling the camera from the chart to move or lock on targets)
- The camera must support relative positioning (used by TimeZero when using the virtual joystick button)
- The camera must be able to provide position feedback (Pan Position, Tilt Position, Zoom Position)
- Optional: The camera can support Auxiliary Commands
- For Dual Head Cameras that have a daylight lens (Visible) and a nighttime lens (IR), the video stream linked to the Visible and IR lens must implement a PTZ Configuration with independent "token". These tokens should be link to two independent PTZ nodes that would allow TimeZero to control independently the visible and IR zoom lens and get their proper zoom position (to be able to compute the Field of View for both the visible and IR lens).

ONVIF Camera Validation in TimeZero:

Although the ONVIF Profile S specification is very detailed, some manufacturers may not follow the specification closely causing unexpected behavior in TimeZero. The steps below will help you making sure that the camera is properly setup in TimeZero and conforms to the ONVIF specification.

Pan & Tilt Coordinate Space

The default ONVIF Pan and Tilt coordinate space is normalized to the range -1/+1. For Pan position, "0" is the front of the camera, "+1" is +180 degrees (right side), and "-1" is -180 degrees (left side). For Tilt position, "0" is the horizon, "+1" tilt up the camera to its maximum angle, and "-1" tilt down the camera to its minimum angle. A camera that does not use the normalized coordinate space should automatically provide its custom coordinate space to TimeZero (during the initial detection), but sometimes, this fails. That is why it is recommended to manually pan and tilt the camera to its maximum PTZ positions and write down the raw ONVIF values that get returned by the camera. Follow the instructions below:

- Select the Camera Workspace in TimeZero
- Click on the "Camera Control" button located in the Ribbon, enable "Camera Info" and look for the Raw Pan, Tilt, and Zoom values:

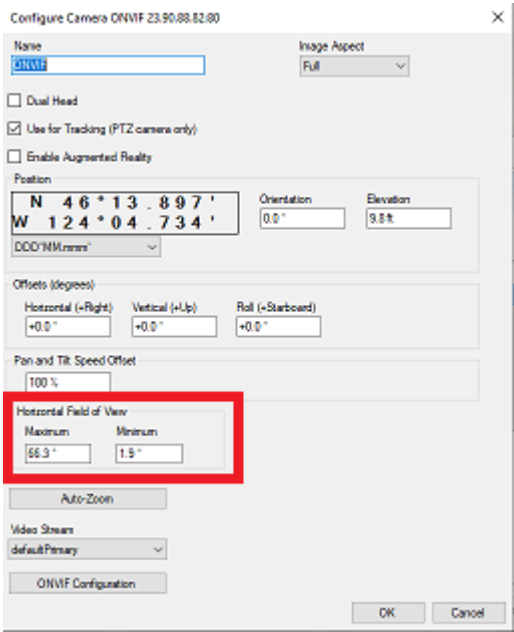


- Manually Pan the camera around 360 degrees and make sure the raw pan position value goes from -1 to +1, performing a full rotation (with 0 being the front of the camera)
- Manually Tilt the camera all the way up and make sure that the raw Tilt position is +1. If the sign is reversed, or if the maximum tilt value is different (0.5 for example), make sure to write down this information. Also write down the maximum physical angle in degrees by observing the camera or by looking at its datasheet (for example 90 degrees).
- Repeat the same procedure by Tilting down the camera to its minimum value.
- Open the Camera Options, double click on the camera in the list, and click on the "ONVIF Configuration" button. Make sure the values below match what you have written down:

Pan & Tilt	
Pan Left Angle	-180.00 °
Pan Left Value	-1
Pan Right Angle	180.00 °
Pan Right Value	1
Pan/Tilt FOV Step	20.0 %
Pan/Tilt Speed Maximum Value	0.3
Tilt Down Angle	-90.00 °
Tilt Down Value	-0.5
Tilt Up Angle	90.00 °
Tilt Up Value	0.5
Zoom	
TZ Proportional Speed Control	False
Zoom Maximum Value	1
Zoom Minimum Value	0
Zoom Relative Step	10.0 %
Zoom Speed Maximum Value	0.5
Zoom (Dual Head)	
IR Zoom Maximum Value	1
IR Zoom Minimum Value	0

Field of View and Zoom Coordinate Space

TimeZero needs to know the maximum (wide) and minimum (tele) horizontal field of view of the camera. This information can be found in the camera datasheet and should be setup in the Camera Options under Horizontal Field of View:



The default ONVIF zoom coordinate space is normalized from 0 (wide) to +1 (tele). It is recommended to zoom the camera to its minimum and maximum and write down the raw ONVIF values using the same procedure as for the Pan & Tilt Coordinate space. Then, make sure that the minimum and maximum values match what you have written down:

Zoom	
TZ Proportional Speed Control	False
Zoom Maximum Value	1
Zoom Minimum Value	0
Zoom Holding Step	10.0%
Zoom Speed Maximum Value	0.5
Zoom (Dual Head)	
IR Zoom Maximum Value	1
IR Zoom Minimum Value	0

Relative PTZ Step Interval

When using the virtual joystick buttons (quick press on the up/down/right/left arrows located at the bottom right corner of the camera screen), TimeZero will move the camera in the corresponding direction using a relative command. The relative step angle sent to the camera is set by default to half the current field of view of the camera (50%). You can change this default value by adjusting the "Pan/Tilt FOV Step" setting.

IMPORTANT: If you notice that the camera Tilt commands are reversed when pressing the up/down arrow, set the "Invert Tilt Axis" to True.

PTZ Continuous Move Speed

When using a physical joystick with TimeZero, or when clicking and dragging on the camera display with the cursor, TimeZero will control the camera using speed commands. If you feel that the control speed is too fast, you can reduce the "Pan/Tilt Maximum Value".

Proportional Speed Control

When the camera is zoomed in, you want the Pan/Tilt speed to be slower than when the camera is zoomed out. Most cameras should adapt the Pan/Tilt speed according to the zoom factor. If you feel that the camera does not implement this feature (and if the pan/tilt zoom is too fast when the camera is zoomed in), you may enable the "TZ Proportional Speed Control" setting in TimeZero. When this setting is enabled, the more you are zoomed in, the slower the Pan/Tilt speed will be.

Dual Head Configuration

When TimeZero detects multiple video stream, a "Dual Head" checkbox will appear in the main camera configuration window. In order for TimeZero to independently control the Visible and Infra-Red lens (zoom), the camera must implement two ONVIF PTZ nodes that must be linked to the Video Stream via a "token". When TimeZero detects two PTZ Nodes, new settings for the IR Field of View will be available in the main configuration window:

Configure Camera ONVIF 172.31.200.20:80

Name: ONVIF Image Aspect: Full

Dual Head

Use for Tracking (PTZ cameras only)

Enable Augmented Reality

Position

N 46° 15' 734" W 124° 05' 636"

Orientation: 0.0° Elevation: 9.8 ft

Offsets (degrees)

Horizontal (+Right): +0.0° Vertical (+Up): +0.0° Roll (+Starboard): +0.0°

Pan and Tilt Speed Offset: 100%

Horizontal Field of View

Maximum: 55.0° Minimum: 2.0°

Infrared Horizontal Field of View

Maximum: 35.0° Minimum: 15.0°

Auto-Zoom Infrared Auto-Zoom

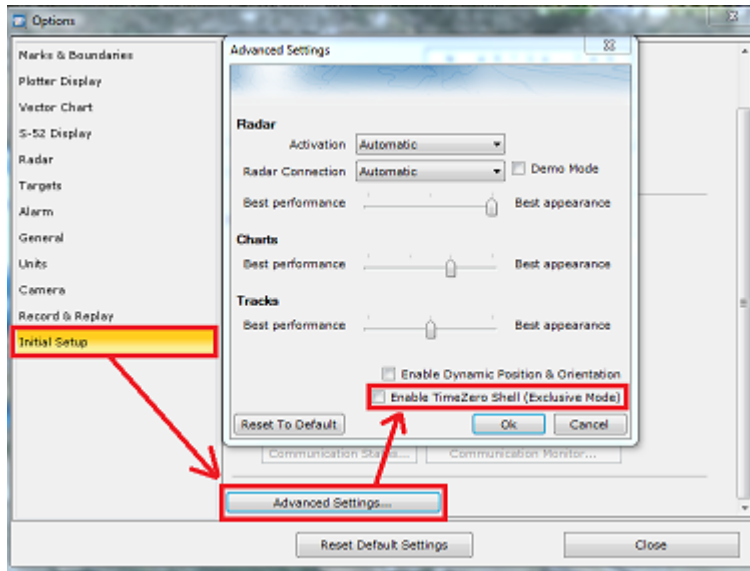
Video Stream: Media Profile 2 Infrared Video Stream: Media Profile 1

ONVIF Configuration OK Cancel

Shell (Exclusive Mode)

When you want to commit a computer to the sole use of TimeZero, it is possible to enable a "Shell". When this feature is enabled, it automatically launches TimeZero as soon as the user logs in on the computer. This prevents the user to access the computer Windows Explorer (files and folder).

To enable the TimeZero Shell for the current user, open TimeZero, select the "Initial Setup" Options, click on "Advanced Settings" and select "Enable TimeZero Shell (exclusive mode)":



After enabling the Shell, the next time the computer is restarted, TimeZero will start automatically and the access to the computer will be prevented. If the user exit TimeZero, it will automatically power off the computer. To restore access to the computer, the TimeZero Shell must be disabled by deselecting the same option.

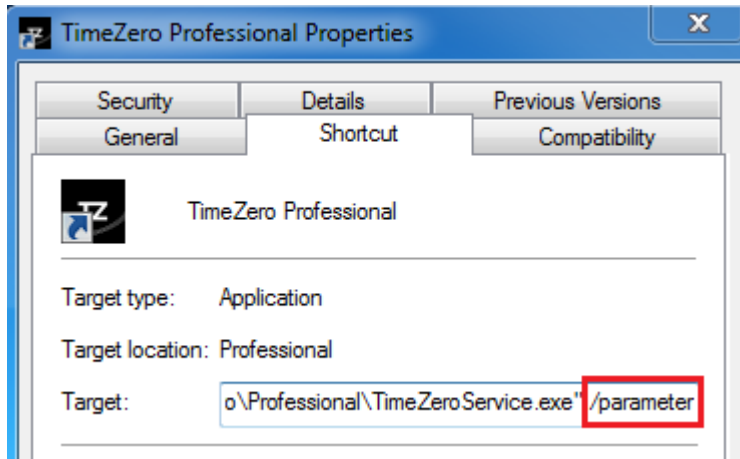
Tips: it is possible to prevent the user to disable the TimeZero Shell by locking the user interface in TimeZero (with a password). Please refer to [Lock the User Interface](#) for more information.

Note that the TimeZero Shell activation is independent per Windows User Account. For example, if the computer has two user accounts (an "Admin" and a "User" account), and if you only select the TimeZero Shell option on the "User" account, you will be able to use the computer normally by logging on the computer as the "Admin".

Also, when the Shell is enabled, it will automatically recall any WorkSpace configuration that have been created. This means that any WorkSpace for which the configuration has been saved will start in the same state every time you start the computer. Note that if a WorkSpace configuration has not been saved, TimeZero will not reset that WorkSpace. Please refer to the [Saving and Recalling WorkSpace configuration](#) chapter for more information on how to save a WorkSpace configuration.

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 "):



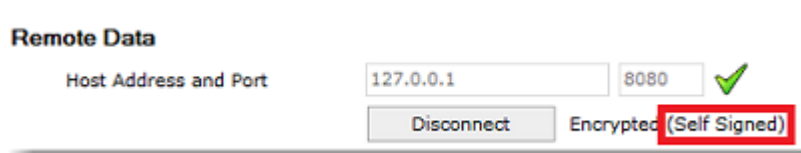
You can replace "/parameter" in the screenshot above by:

- /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.
- /simulation = used to enable the simulation mode of TimeZero.
- /transmitradar = used to automatically transmit the radar at startup (when TimeZero is opened)
- /secondmonitor = used to shift the monitor used by TimeZero on the second screen. Note that if multiple screens are used by TimeZero, this startup parameters will try to shift all screens to the right of the primary monitor. If unsuccessful, TimeZero will shift to the left.
- /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 and 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 pixels 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

Install a Trusted Certificate

When the TimeZero Host program is installed, an SSL security certificate is also installed on the computer. Having this certificate installed will allow encrypted communication in between the TimeZero Host and TimeZero. Because this certificate was generated by Nobeltec (self-signed) and not a known and trusted certificate authority (such as IdenTrust or Comodo), accessing the TimeZero Host with a web browser will result in a security warning and "Self Signed" will be displayed in TimeZero:

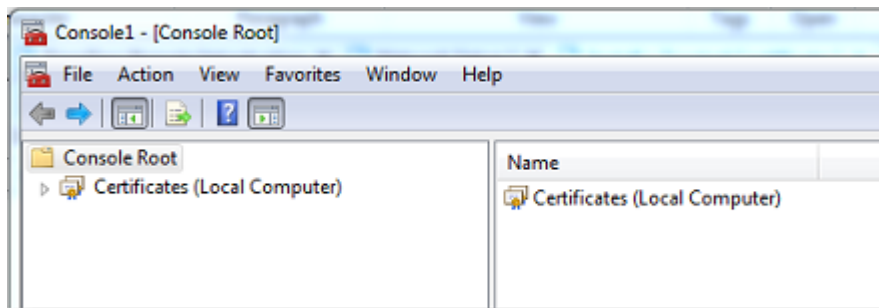


The only way to get a trusted certificate from a certificate authority is to have the TimeZero Host installed on a computer that can be accessed using a valid public domain name. This is because a trusted certificate is always issued (and linked) to a valid domain name (such as www.example.com). So, the first step is to buy and register your own domain name. Once your domain name has been registered and can be accessed publicly, you can purchase a certificate for that domain name.

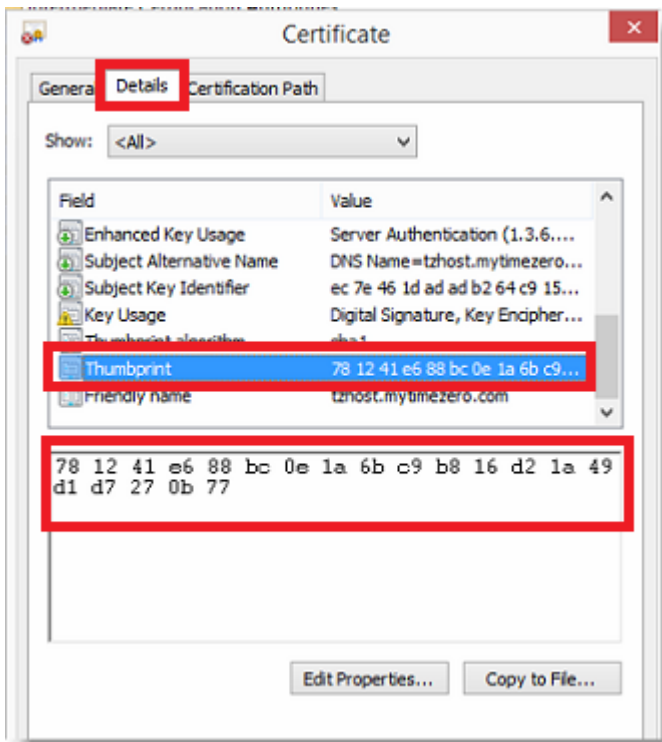
After installing the new certificate on the computer, you will have to setup the TimeZero Host to use this new certificate. The first step is to get the Hash or Thumb Print of the new certificate:

- Open a Command Prompt window.
- Type mmc and press the ENTER key.
- On the File menu, click Add/Remove Snap In.
- Select Certificates and Click Add.
- In the Certificates snap-in dialog box, select Computer account and click Next, then Finish.
- Click OK to close the window

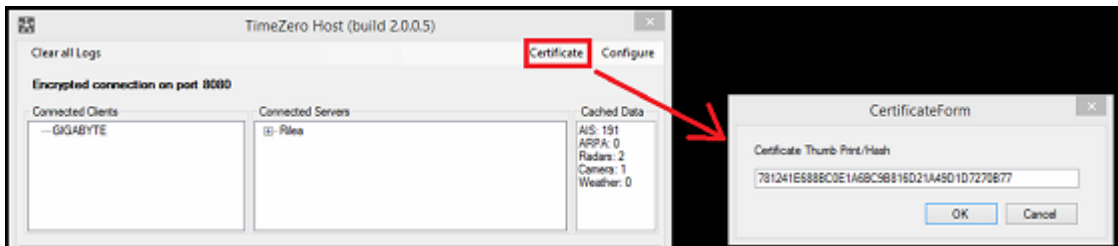
You should see the window below:



Double click on "Certificates (Local Computer)" on the right to open the list of all certificates installed on your computer. Locate your certificate (you can also use the "Find Certificates..." from the Action menu). Once located, double click on the certificate to open its properties, select "Details" and "Thumbprint":



Write down the Thumb Print somewhere, then open the TimeZero Host, click on the "Certificate" button and enter the Hash or Thumb Print of the new certificate:



Click on "OK".

To verify that the new certificate is working, you can use a web browser and type the url: <https://mydomain.com:8080> (replace *mydomain.com* by the domain for which you purchased the certificate). You should see the TimeZero Host status page without any warning.

Troubleshooting

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.

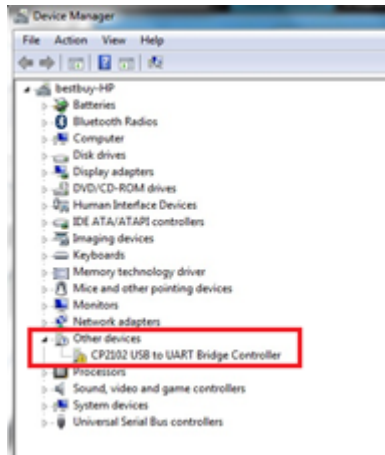
Use the Connection Wizard Auto Detection first to see if the software will detect the instruments automatically. Use the Manual Configuration (pointing at the Virtual COM port) if you have trouble.

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 Coastal Monitoring . If you do an Automatic Detection, TimeZero Coastal Monitoring 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 Coastal Monitoring one by one (configure ONLY the one you want TimeZero Coastal Monitoring to use).

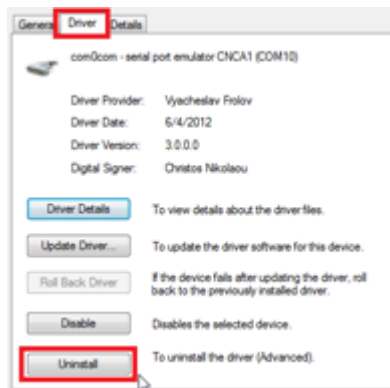
If an AIS instrument is connected to the PC, make sure that the GPS/COG/SOG/Heading Master sources are not set to the AIS Port (too slow). Use the Port Priority of Data Source selection and select the real COM port connected to the GPS, Heading... Or uncheck "Position" and "Heading" coming from the AIS 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".

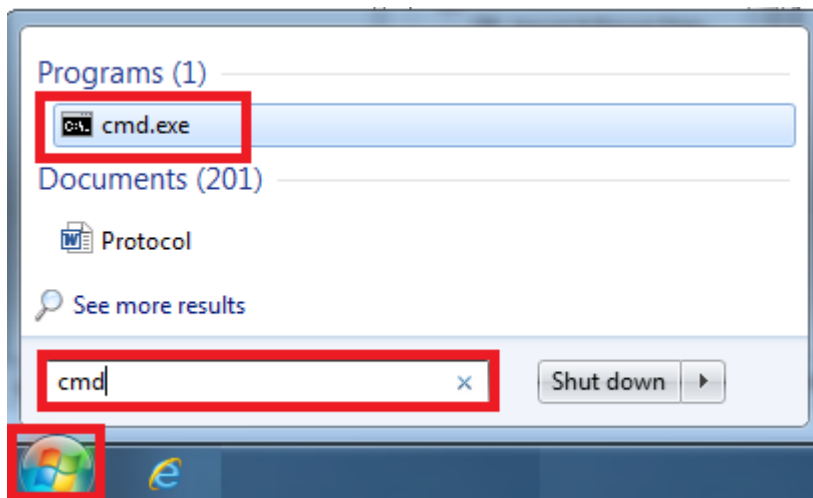
How To Ping

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.

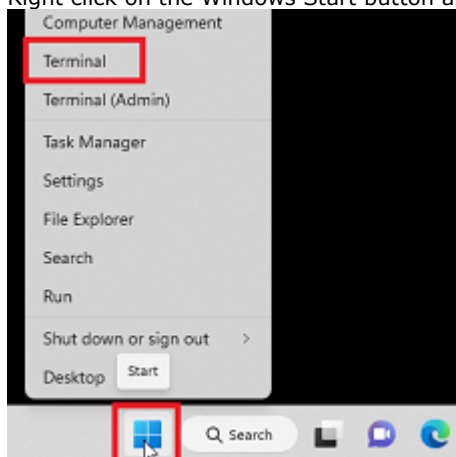
Under Windows 7 or Windows 10:

Click on the Windows Start button and search for "cmd". Select "cmd" or "command prompt" under "Programs" or "App":



Under Windows 11:

Right click on the Windows Start button and select "Terminal":



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):

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\>ping 172.31.92.1

```

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 Static IP Addresses:

- AIS FA30 = 172.31.24.2
- AIS FA50 = 172.31.24.3
- Radar Processor FAR2xx7 (set to radar 1 with S1 switch #4 set to the OFF for Class B network) = 172.31.3.6
- Radar Processor FAR2xx7 (set to radar 2 with S1 switch #4 set to the OFF for Class B network) = 172.31.3.7
- Radar Antenna FAR2xx8 (default Class C network) = 192.168.31.101
- Radar Antenna FAR3xxx (default Class C network) = 192.168.31.101

Furuno Auto IP Addresses:

Furuno DRS radars adopt an "Auto-IP" mechanism that automatically assigns an IP address to the device in a specific range. Unfortunately, it is not possible to predict the exact IP address of those devices without analyzing the network with a tool such as Wireshark. Below is the range of IP address those devices are using:

- DRS with firmware v1.16 and above = 172.31.253.x
- DRS-NXT = 172.31.3.x

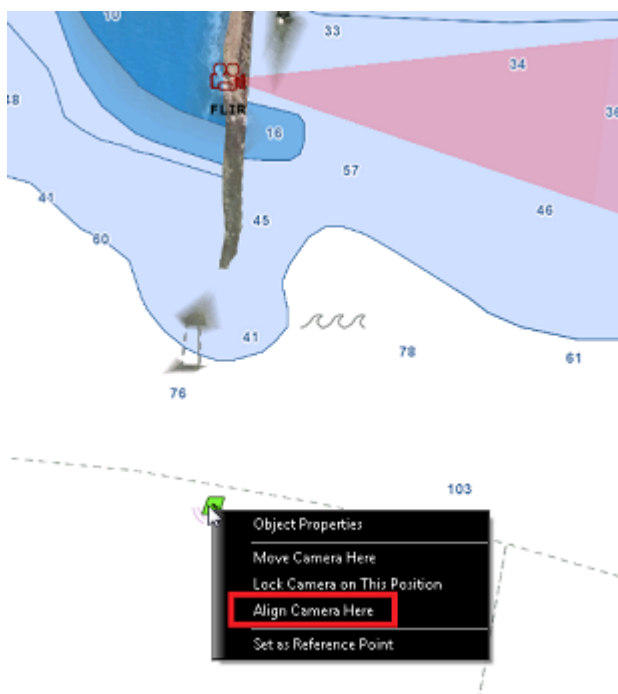
Align the Camera

In order for TimeZero to display the correct location of the camera Field of View (FOV) on the chart, the orientation of the camera needs to be properly setup



Follow these instructions to align the camera in TimeZero:

- Identify a fix object that can you look at with the camera and that is also visible on the chart. Usually, a buoy, jetty or fix AIS target (moored) can be used
- Manually Pan the camera from the Camera WorkSpace until the object is exactly at the center of the screen (the object should be in the middle of the video)
- Locate the same object on the chart, press and hold the CTRL key on the keyboard then right click and select "Align Camera Here":



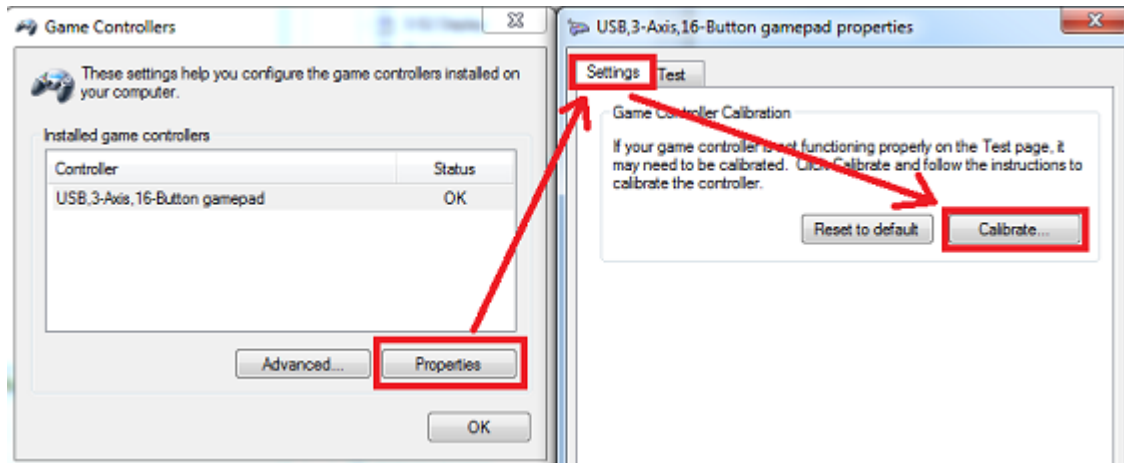
The Field of View of the camera (red Cone) will "snap" to that object and insert the proper value in the Orientation setting of the camera.

Repeat these steps with other cameras when applicable by switching the active camera.

Calibrate Joystick

Before using a USB joystick to control a PTZ Camera, it is highly recommended to calibrate it. Joystick that are not properly calibrated can move and zoom the camera on its own resulting into abnormal movements and tracking that is not working.

To calibrate the Joystick, open the "Start" menu of Windows and search for "Joystick". Under settings or control panel, select "Setup USB Game Controller". The Game Controllers control panel opens. Select the Joystick that appear in the list and click on "Properties". Select the "Settings" tab and click on "Calibrate"

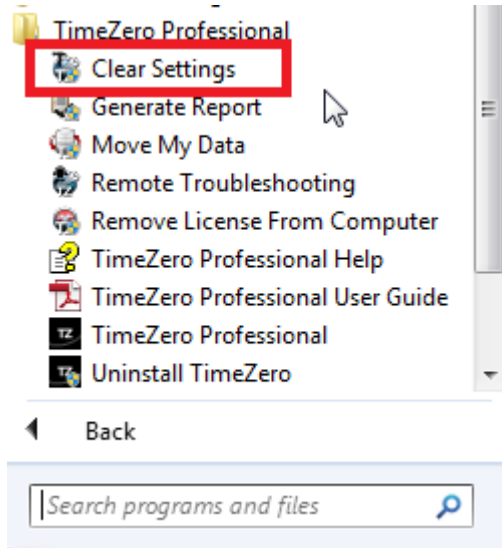


Follow the on-screen assistant to calibrate the Joystick.

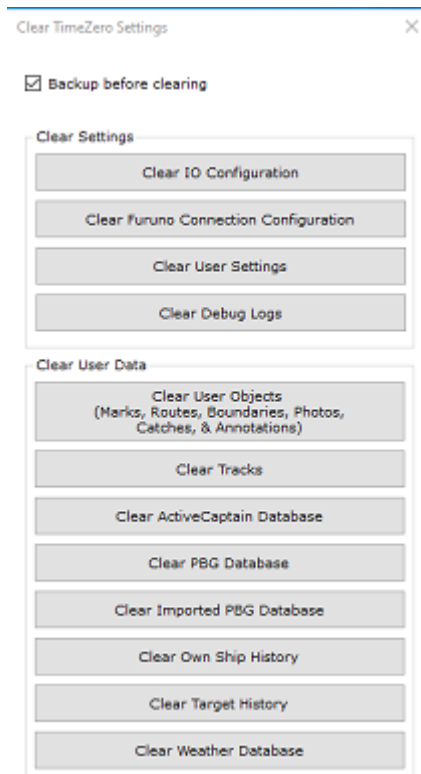
Factory Default

To reset TimeZero Coastal Monitoring to Factory Default (Master Reset), exit TimeZero Coastal Monitoring .

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. This also erase the location of sensor (radar, camera, etc...)



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, Ribbon and WorkSpaces.

Clear Debug Log: Erase all troubleshooting log files, message and user login information (My TimeZero)

Clear User Objects: Erase all the user created objects (Marks, Boundaries, Photos, ...)

Clear Tracks: Erase all the tracks

Clear Own Ship History: Erase the database that keeps the history of your boat position (track recall and boat replay will no longer be available)

Clear Target History: Erase the database that stores Fleet and Buoys data (Fishing Buoys)

Clear Weather Database: Erase the weather database

If you check "Backup before clearing", the various settings and databases will be moved instead of 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 Us

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> or by sending an e-mail to supportcm@mytimezero.com

TimeZero is supported by Nobeltec in North and South America and by MaxSea everywhere else:

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France Support Line:

0 899 700 264

Available from Monday to Thursday 9h00 - 12h00 and 14h00 - 17h30 / Friday 9h00 - 12h30 and 14h00 -17h00 (UTC)

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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.

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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., 16100 NW Cornell Rd., Suite 200, 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.

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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. TimeZero offers 4 download methods:
 - High Speed Internet: select this method when you are using a high speed Internet connection (at home or when using a 3G/LTE connection). TimeZero will directly connect to the weather server to retrieve the weather data and use up to 16 downloads in parallel.
 - Satellite or Low Bandwidth Internet: parallel downloads can cause issues with high latency and slow Internet connection. Use this method especially when using a Satellite connection to connect to the Internet. With this method, TimeZero will download the data from the weather server using a single "stream" (file) that is optimized for slow Internet. Note that the server will initially take some times to create and compress the file. TimeZero will also take some times at the end of the download to decompress the file and process the data before it can be used. You may notice that the estimated file size may be larger than the actual downloaded file size. This is normal and due to the compression algorithm that the server uses. Note that the maximum file size that can be downloaded with this method is 50Mb.
 - By E-Mail: use this method when the computer cannot be connected directly to the Internet but can still send and receive e-mails. 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. Note that the maximum file size that can be retrieved with this method is 20Mb.
 - Iridium GO!: Use this method when you connect your computer to the Iridium Go Wi-Fi network to connect to the Internet. Note that the maximum file size that can be downloaded with this method is 1Mb. Please refer to the [Iridium Go](#) for more information.
- **Automatic Download:** Allow the user to set a schedule at which the weather will be automatically downloaded.

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.