

General Overview

TimeZero Coastal Monitoring is the first true turnkey solution for Maritime Surveillance.

When selecting a technical solution, customers always face the same question: BUILD or BUY?



Do you need management of an infrastructure/business with limited human and financial resources?

Are you looking for a solution with the following specifications?

- Easy to Use
- Quick to implement
- Low cost to maintain

Do you want all this at the best financial value?

The answer to all these questions is

TimeZero Coastal Monitoring

Our Group

After 30 years of continuous growth, our group now consists of 80 employees located in 3 countries (Biarritz, France / Barcelona, Spain / Portland, USA).

We are the worldwide leader in marine navigation software with 95,000 boats equipped throughout 70 countries.

We recently decided to focus our 30 years of software development experience in the Maritime Surveillance market by launching the first true turnkey VTS solution (Vessel Traffic System).

Since 2009, our financial and technical partnership with the Japanese group « Furuno Electric Company » allows us to offer the first native compatibility with the world's best marine navigation radar.

This advanced compatibility gives us the opportunity to significantly reduce the infrastructure costs of our complete solution (e.g. no server infrastructure, no external tracker, and no radar extractor)

Solution Components

Our software is able to merge the following sensors into a single work station:

- Radar (Furuno DRS and Furuno FAR from 2kW to 60kW)
- Cameras (FLIR, AXIS or cameras using Pelco-D standard protocol)
- AIS receiver (NMEA)
- Weather Station (NMEA)



Main features and potential customers

TimeZero Coastal Monitoring offers the following features:

- Display real time maritime traffic in a limited geographic area:
 - o Radar : Detection (max: 12nm)
 - o AIS : Identification (max: 50nm)
 - o Camera : Visualization (max: 5nm)
- Sound and Visual Alarm management according to customizable factors:
 - o Enter/Exit Area
 - o Stop/Restart Area
 - o High/Low speed
- Record up to one month of data (Radar, Target, Video, Audio)
- Display Weather (Real Time and Forecasts)

All of these features allow our solution to answer multiple and different needs:

- Detection of illegal activities (illegal fishing, piracy, terrorism, etc.)
- Anti-collision system between vessels and/or platforms
- Search and Rescue
- Optimization of port infrastructure
- Protection of sensitive sites (Power Plants, Fish Farms, Wind Farms)

Given the extent of features provided by TimeZero Coastal Monitoring, our potential customers are the following:

- Ports, Pilots and marinas
- Oil Platforms
- Fish Farms
- Natural Reserves
- Wind Farms
- Nuclear power plants
- Bridges / Dams Constructions
- Military Sites
- Submarine Cable Areas
- Personal Security

Radars in TimeZero Coastal Monitoring

a. Furuno Radar Compatibility

TimeZero Coastal Monitoring is compatible with the 2 main Furuno Radar products:

- **NavNet UHF DRS**

- X band Radars
- Antenna maximum size is 6ft (also available with 4kW Dome)
- From 4kW to 25kW



Note: This radar can be directly connected to a PC running TZ Coastal Monitoring. This direct compatibility significantly reduces the hardware cost as no dedicated radar screen and/or processor is required (only requires a specific Power Supply from Furuno)

- **FAR 2xx7 Range**

- X Band Radar / Up to 8ft Antenna / Up to 25kW
- S Band Radar / Up to 12ft Antenna / Up to 60kW



Note: In order to interface with TZ Coastal Monitoring, this radar requires a complete radar system including dedicated processor, screen and keyboard.

A NEW RADAR RANGE IS CURRENTLY UNDER DEVELOPMENT:

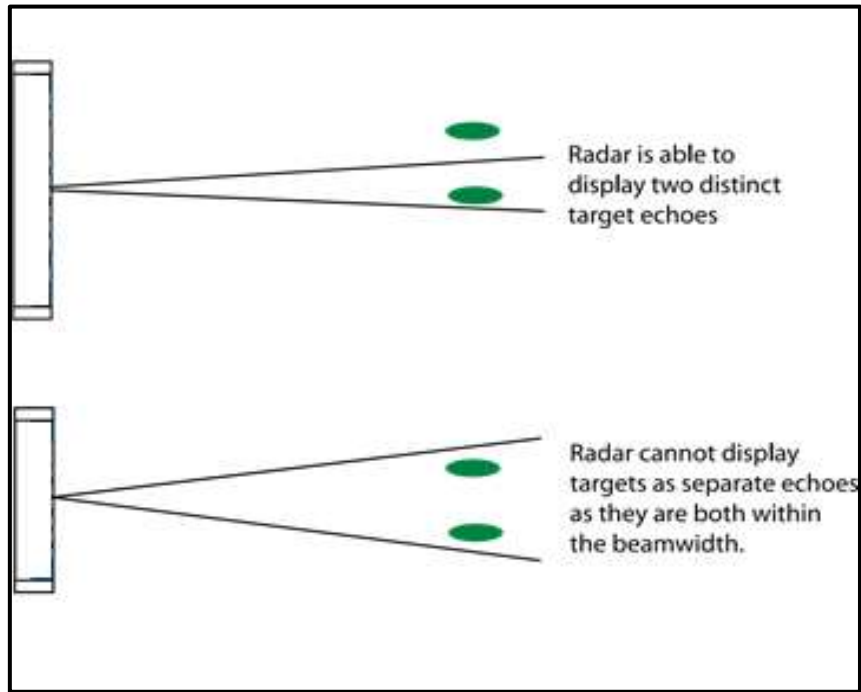
FAR3000

FAR3000 WILL USE SOLID STATE TECHNOLOGY (no magnetron)



b. Radar Specifications

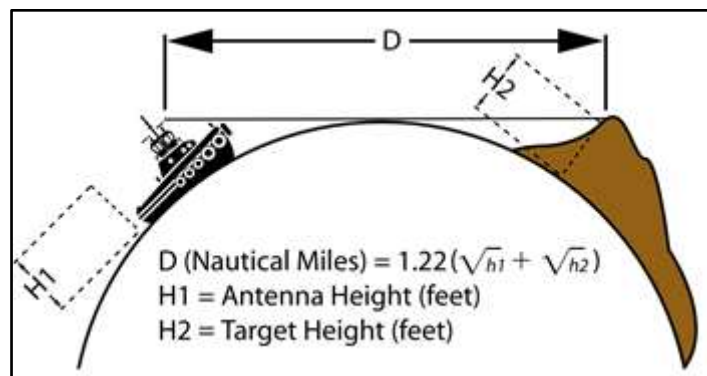
Radar resolution mainly comes from the antenna size. The bigger the antenna is, the higher the radar resolution will be and consequently the ARPA target acquisition will be more accurate.



Example of difference between a 6ft antenna (at the top) and a 24 inch Dome (at the bottom)

The two others factors which strongly affect the radar coverage are:

- **Its power:** the higher the power is, the farther the microwaves will reach.
- **The height of the antenna location :** the higher the antenna is located the farther the microwaves will reach



Ex: If the Radar is mounted on a 10 meters tower, the radar horizon is only 10NM for a small target (3 meters high). The curvature of the Earth prevents the radar to "see" farther.

COASTAL MONITORING

c. Typical Radar Detection Range

FURUNO DRS4D (Dome)	Detection Distance in NM
Detection of a small target (1m ²)	1 NM
Detection of a medium size target (10m ²)	2 NM

FURUNO DRS12A (6ft Antenna)	Detection Distance in NM
Detection of a small target (1m ²)	3 NM
Detection of a medium size target (10m ²)	5 NM

FURUNO DRS25A (6ft Antenna)	Detection Distance in NM
Detection of a small target (1m ²)	3 NM
Detection of a medium size target (10m ²)	6 NM

FURUNO FAR2127 (8ft Antenna)	Detection Distance in NM
Detection of a small target (1m ²)	5 NM
Detection of a medium size target (10m ²)	10 NM

FURUNO FAR2137S (12ft Antenna) S Band	Detection Distance in NM
Detection of a small target (1m ²)	6 NM
Detection of a medium size target (10m ²)	12 NM

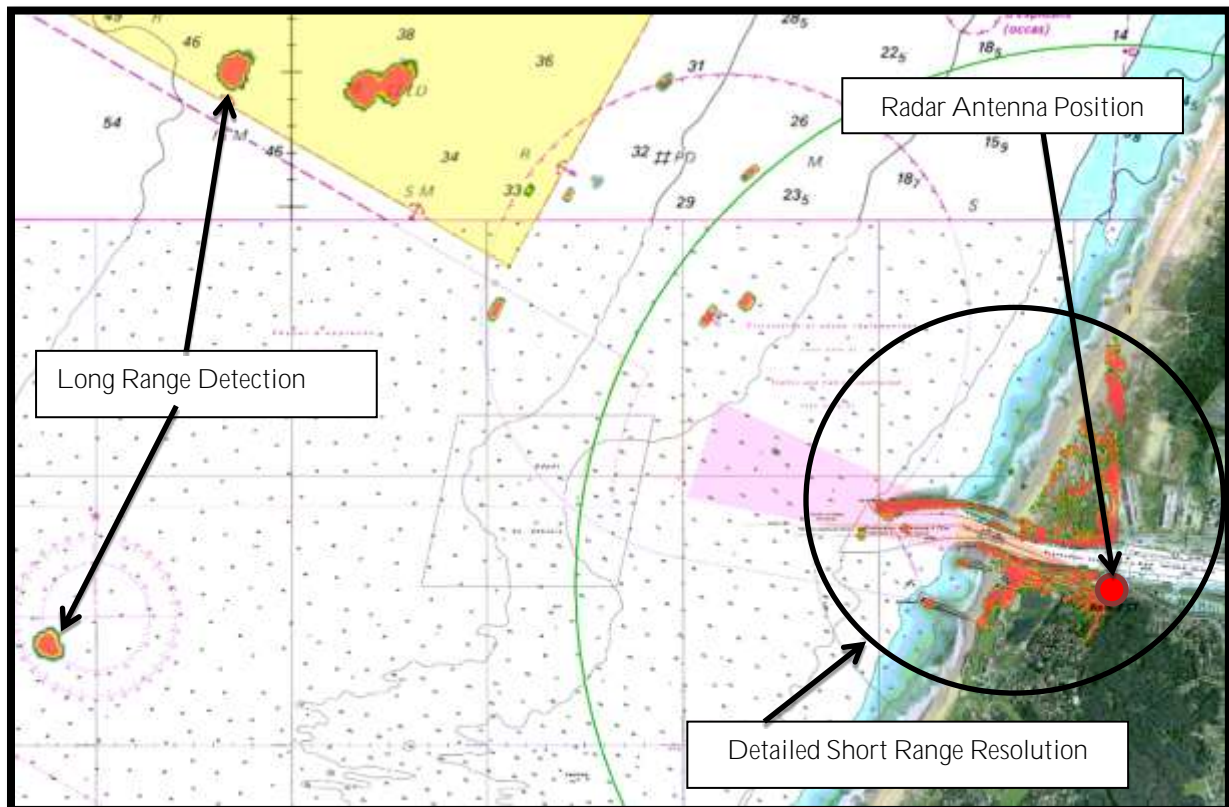
Note: The next « solid state » Furuno Radar (FAR3000) will offer slightly better performance than the FAR2137S.

- Target Types in m²:
- Aids to Navigation without radar reflector: < 1m²
- Small Open Boat (Fiber Glass, Wood) with 2 persons and outboard: 1m² to 5m²
- Flock of Birds: up to 3m²
- Small Sailing Boat and fishing vessels: 3m² to 10m²
- Aids to Navigation with radar reflector > 10m²
- Fishing Vessels, Patrol Vessels: 10m² to 100m²
- Coastal Trading Vessels (50 to 60m length): 300m² to 4000m²
- Container Ship (200m length): 10000m² to 50000m²



d. DRS Radars Dual Range feature

DRS radars offer a very powerful (and patented) DUAL RANGE feature. This very advanced feature enables the radar to scan and display two independent ranges (long/short) with every antenna rotation. This provides a crisp and detailed short range resolution while keeping long range detection with one single radar antenna.





e. DRS or FAR?

f. FURUNO DRS RANGE	
<u>PROS</u>	<u>CONS</u>
Best value for the money	Limited to 6ft Antennas
Ease of installation	X Band only
Dual Range Feature	
Low maintenance cost	
Low power consumption	



FURUNO FAR2XX7	
<u>PROS</u>	<u>CONS</u>
World class Commercial Radar	Higher Cost
Up to 12ft Antennas	Requires dedicated display, processor and keyboard
X Band and/or S Band	
Larger Coverage	
Available with High Speed Rotation Antennas	



AIS in TimeZero Coastal Monitoring

a. What is an AIS?

Automatic Identification System: These devices are mandatory on most professional ships (cargo, ferry, fishing vessels, etc.) enabling them to permanently send their position, speed, heading and MMSI number through VHF signals.

By using a simple AIS receiver, it is then possible to display all this information in TimeZero Coastal Monitoring.

Although extremely interesting/useful, this system only allows for receiving information from the ships that are transmitting their positions (professional boats exclusively) and does not replace the use of a radar which will detect ALL of the moving vessels.

b. Types of AIS

AIS class A:

This type of AIS is used on vessels under SOLAS convention (merchant navy cargos...). It enables transmitting information about their characteristics, their position, their draft, the type of goods and their destination. The transmitting power of AIS class A is 12.5W (by default) or 2W (when operating in a specific area). The range of AIS class A is around 50 nm.

AIS class B:

This type of AIS is used on vessels that are not under SOLAS convention (fishing vessels under 15 m, recreational boats...). AIS class B are more economical and their range is more limited (between 5 to 10NM) than AIS class A. The frequency of the messages sent is lower than with AIS class A. Their transmitting power is 2W (by default).

AIS Receivers:

AIS receivers can only receive the information from Class A or Class B transponders. These devices are generally the ones that are connected to TZ Coastal Monitoring.

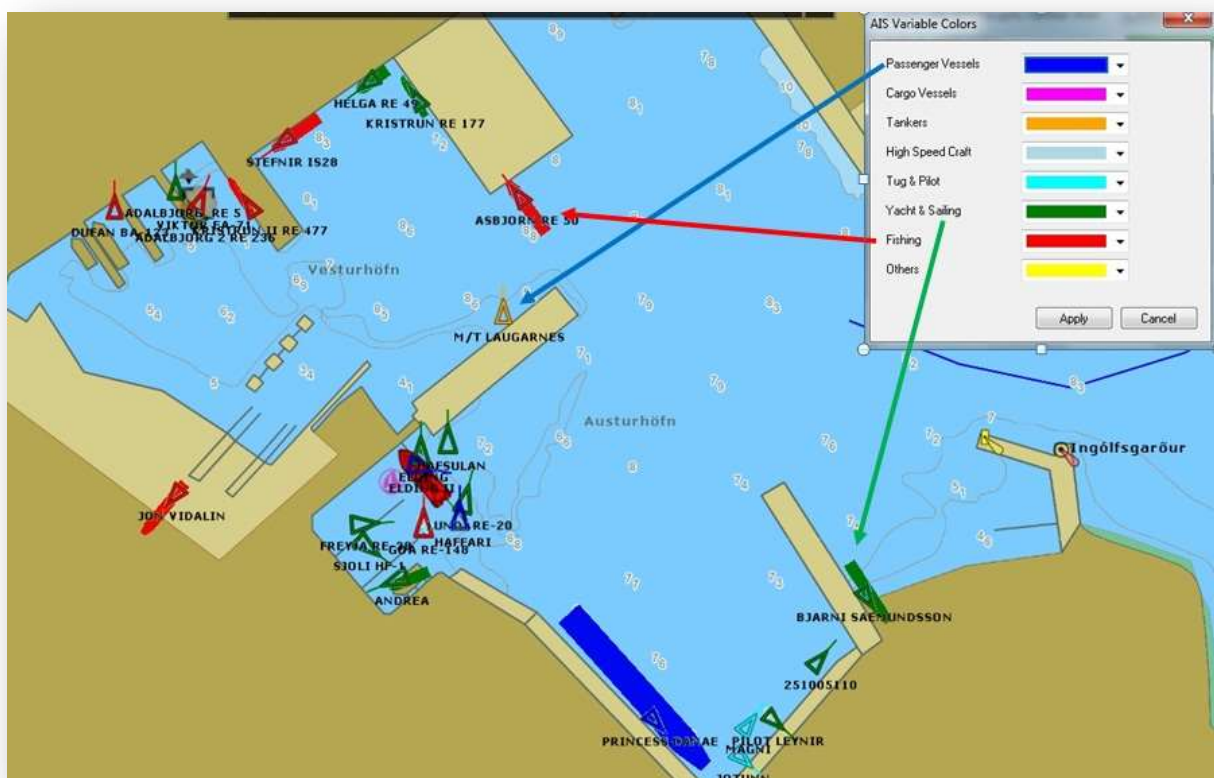
The model that we usually recommend is the Furuno FA30 (285€ excluding taxes) because it has an Ethernet output. However, TZ Coastal Monitoring is compatible with all AIS receivers that have an NMEA0813 output.

c. AIS features in TZ Coastal Monitoring

When connected to TZ Coastal Monitoring, the AIS system offers the possibility to display all the AIS targets on the chart and in real time. An AIS antenna positioned on a tower (10 meters) will enable to detect vessels up to 50 NM (with the correct antenna).

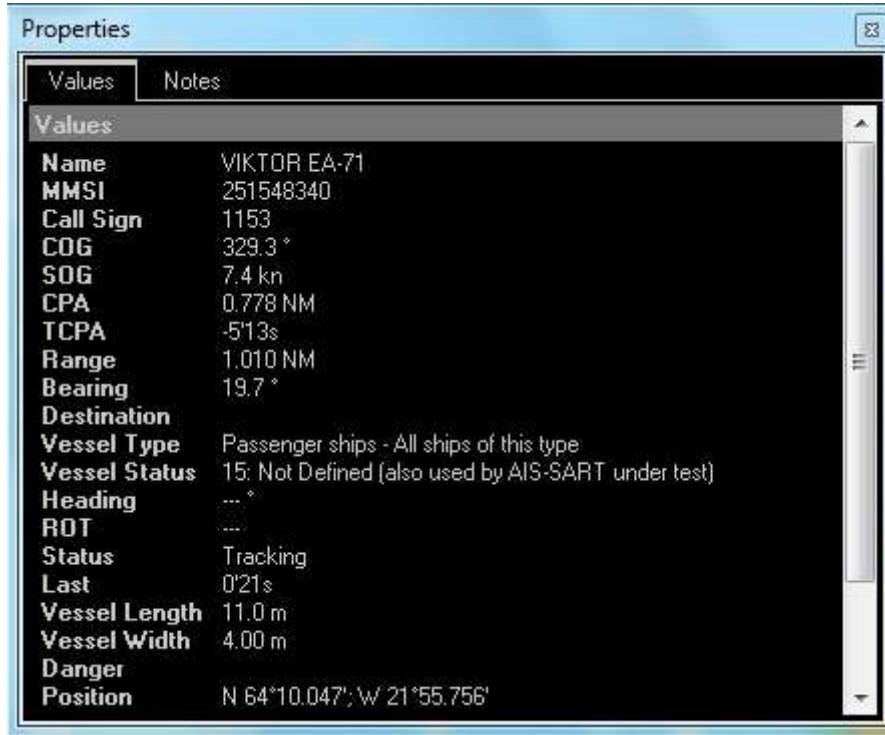
TZ Coastal Monitoring offers the ability to display AIS targets according to different parameters.

For example, it is possible to define a specific color for each type of vessel.



In order to keep track of a specific fleet, TZ Coastal Monitoring offers the ability to create an “AIS Directory” using the vessels’ MMSI’s.

It is then possible to display the vessels in the directory with a specific color. This also allows the user to manage all alarms associated with those targets (enter/leave an area for example).



Properties	
Values	Notes
Values	
Name	VIKTOR EA-71
MMSI	251548340
Call Sign	1153
COG	329.3 °
SOG	7.4 kn
CPA	0.778 NM
TCPA	-5'13s
Range	1.010 NM
Bearing	19.7 °
Destination	
Vessel Type	Passenger ships - All ships of this type
Vessel Status	15: Not Defined (also used by AIS-SART under test)
Heading	... °
ROT	...
Status	Tracking
Last	0'21s
Vessel Length	11.0 m
Vessel Width	4.00 m
Danger	
Position	N 64°10.047'; W 21°55.756'

Example of data received from an AIS Class A

Cameras in TimeZero Coastal Monitoring

a. Camera compatibilities

TZ Coastal Monitoring offers the ability to connect up to 12 cameras on the same work station. Integrating a camera enables you to receive additional data to what is received from the Radar and the AIS by enabling the visual identification of the target.

TZ Coastal Monitoring is compatible with different types of cameras:

- AXIS IP Cameras and video encoder
- FLIR M-Series, D-Series and PT-Series (requires an AXIS video encoder type M7001)
- Compatible with Pelco-D protocol via TCP (requires an AXIS video encoder type M7001)
- USB Cameras

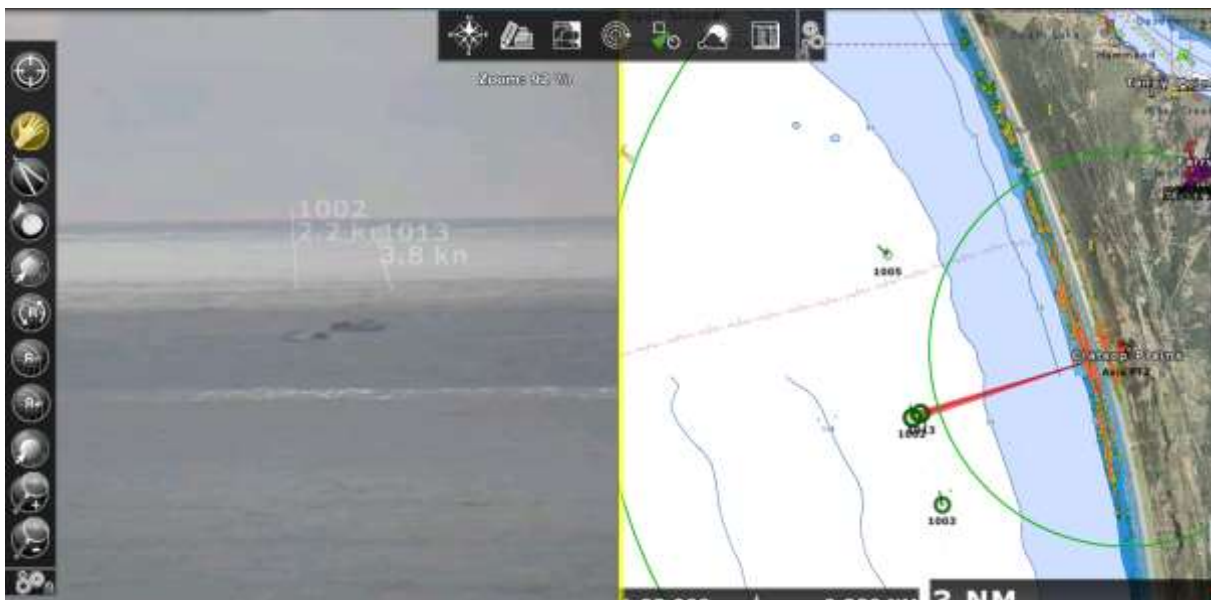


b. Types of Cameras

AXIS Q6044-C

AXIS Q6044-C is an exterior camera with a PTZ dome that is reliable in extreme environments. Its HDTV 720p resolution and its optic zoom x30 enables this PTZ dome camera to cover exceptional extended areas and the autofocus provides extremely detailed views.

It offers the ability (day vision only) to identify large vessels up to 12,000 meters away and small vessels up to 5,000 meters (costs approximatively 3,500 € ex-VAT).



Small Fishing Vessels at 6km

FLIR M-Series

The FLIR M-series combines a thermal image camera with a daylight camera. It offers excellent thermal images, with a high clarity, in total obscurity, fog or smoke.

	M-612L	M-625L	M-625XP	M-324L	M-324XP	M-618CS
Human detection (1.8 m × 0.5 m)	1,240 m	820 m	820 m	450 m	450 m	1,300 m
Small boat detection (2.3 m × 2.3 m)	3,200 m	2,200 m	2,200 m	1,300 m	1,300 m	3,900 m

The cost of the FLIR M-series varies from 10.000 € to 40.000€ ex-VAT

FLIR MV604CL

	MV604CL
Human detection (1.8 m × 0.5 m)	4.400 m
Small boat detection (2.3 m × 2.3 m)	12,700 m



MSRP of a FLIR MV604CL is approximately 160.000€ ex VAT

c. Camera features in TZ Coastal Monitoring

TZ Coastal Monitoring offers the ability to automatically track the targets that are within a user defined area and clarify their status.

For example, when an ARPA/AIS target enters or leaves a specific area, TZ Coastal Monitoring will automatically center the camera on the target and will keep track of its movements until it is manually acknowledged.





Augmented reality:

TZ Coastal Monitoring offers the ability to merge real time video inputs with inputs coming from other sensors (ex: AIS). Different information can then be overlaid in real time on the video image (Heading, Speed, MMSI, etc.).



VHF in TimeZero Coastal Monitoring

TimeZero Coastal Monitoring allows interfacing up to 4 audio channels that can be used to record up to 4 VHF.

In order to connect 4 VHF to TZ Coastal Monitoring an external sound card will be required.

(Below Example Approx. cost: 200€ ex-VAT)



TimeZero Coastal Monitoring will be able to record all the VHF communications (Record and Replay module required).

It will then be possible to go back in time in order to analyze all vessels movements and the related VHF communications.

Weather in TimeZero Coastal Monitoring

Weather forecasts:

TimeZero Coastal Monitoring offers a free and unlimited access to our weather server. Weather Forecasts can be received by email and/or Internet.

Please find below the different types of forecast we provide for free:

Data type	Coverage Info	Coverage	Resolution	DL per day	Source
Wind	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS
Pressure	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS
Waves	World (oceanic only)	78°N/78°S/0° - 360°	1,00° x 1,25°	every 6 hours	WW3 World
Currents	World (norths limited)	47,04°N/78,64°S/ 0° - 360°	0,08° x 0,08°	once a day	HYCOM
Geo. Height	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS
Air Temp	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS
Clouds	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS
Rain/Snow	World	90°N/90°S/0° - 360°	0,5° x 0,5° 1,00° x 1,00°	every 6 hours	GFS

Real Time Weather:

In addition to the weather forecasts, TimeZero Coastal Monitoring is able to receive data coming from a Weather Station in order to receive real time weather information (Wind Speed and Direction, Air temperature, Atmospheric Pressure)

Digital data will be then displayed on the Navdata bar on the right side of the screen.



Here is an example of ultra sound Furuno Weather Station: WS200 (1,255€ ex-VAT)





***RECORD in TimeZero Coastal Monitoring**

This is an optional module (9,900€ ex-VAT) which allows recording all the data coming from the different sensors connected to TimeZero Coastal Monitoring:

- Radar Image
- AIS Targets
- ARPA Targets
- Video
- Audio

It is then very easy to specify a date/time and instantaneously display all the targets at their specific location at a given date/time.

