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„easyWatchBox" Manual

NMEA-Alerting Unit: A087

Revision 1.3

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WARNINGS AND PRECAUTIONS

IF YOU CHOOSE TO USE THE EASYWATCHBOX FOR MARKING A AQUACULTURE PLANT, IT IS THE SOLE RESPONSIBILITY OF THE OWNER/OPERATOR OF THE EASYWATCHBOX TO ENTER THE CORRECT POSITION OF THE ATON IN THE WGS84 COORDINATES. IF THE COORDINATES (LAT/LON) ARE WRONG; THE TRANSMISSIONS OF THE EASYWATCHBOXMAY CAUSE DANGEROUS SITUATIONS OR DAMAGES TO OTHER SHIPS. EVEN IF THE COORDINATES ARE ENTERED CORRECTLY, IT MIGHT BE POSSIBLE THAT A SHIP DAMAGES THE PLANT, BECAUSE NOT ALL SHIPS CARRY AIS STATIONS AND THEREFORE NOT ABLE TO RECEIVE THE AQUACULTURE-ATON.

This software uses components and source code developed by other companies or groups.

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Pos	Date	New version	Author	Description of change
1	02.Jan 13	1.0	Zimmermann	Base information
2	22.Jan 13	1.1	Zimmermann	Corrections
3	29.July 13	1.2	Zimmermann	Changes
	30. Sep. 15	1.3	Schuster	

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Congratulations!

Thanks to purchase a unit from the Weatherdock AG. This testifies your high technical competence, because you purchased the best available product on the market. Thank you.

PREREQUISITES

The easyWatchBox programming application is designed to operate with Microsoft Windows® 2000 (SP 3), XP (SP 2) and above. Recommended minimum system requirements are:

- Microsoft Windows® 2000 SP3 or Microsoft Windows® XP SP2
- Display resolution of at least 1024 x 768
- One USB port
- A pointing device (mouse or equivalent)

1. GENERAL INFORMATION TO AIS

1.1. What is AIS

AIS stands for **A**utomatic **I**dentification **S**ystem. AIS increases navigational safety and collision avoidance by transmitting vessel identification, helping to reduce the difficulty of identifying ships when not in sight (e.g. at night, in radar blind arcs or shadows or at distance) by broadcasting navigational intentions to other vessels by providing ID, position, course, speed and other ship data with all other nearby ships and land based stations.

According to IALA regulations, AIS is defined as follows:

AIS is a broadcast Transponder system, operating in the VHF maritime mobile band. It is capable of sending ship information such as identification, position, course, speed and more, to other ships and to shore. It can handle multiple reports at rapid update rates and to meet these high broadcast rates and ensure reliable and robust ship to ship operation.

The IMO defines the performance standards as follows:

Ship to ship working, ship to shore working, including long range application, automatic and continuous operation, provision of information messaging via PC and utilization of maritime VHF channels

The Modules:

GPS system, AIS Transponder, VHF Antenna, and the Data Power Cable and the appropriate application software.

AIS are required to function flawlessly in a variety of modes.

The relevant regulations requirements:

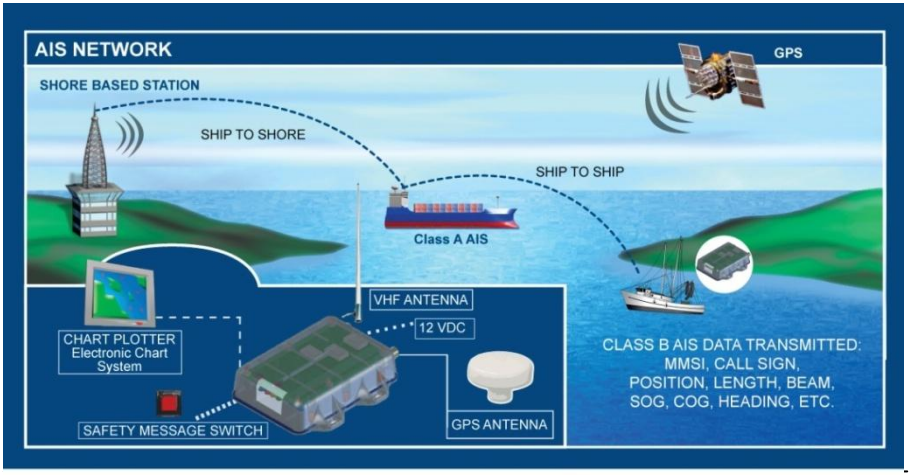
The system shall be capable of

- An "**autonomous and continuous**" mode for operation in all areas. This mode shall be capable of being switched to/from one of the following alternate modes by a competent authority;
- An "assigned" mode for operation in an area subject to a competent authority responsible for traffic monitoring such that the data transmission interval and/or time slots may be set remotely by that authority;
- A "polling or controlled" mode, where the data transfer occurs in response to interrogation from a ship or competent authority.

This illustration depicts a typical AIS System, where two or more AIS equipped vessels (and shore based systems) are automatically communicating with each other.

The following sketch shows a typical easyWatchBoxinstallation in a common environment. The easyWatchBoxis connected to an external power supply, and in connection with the VHFantenna the minimal requirements for Transponder operation are fulfilled.

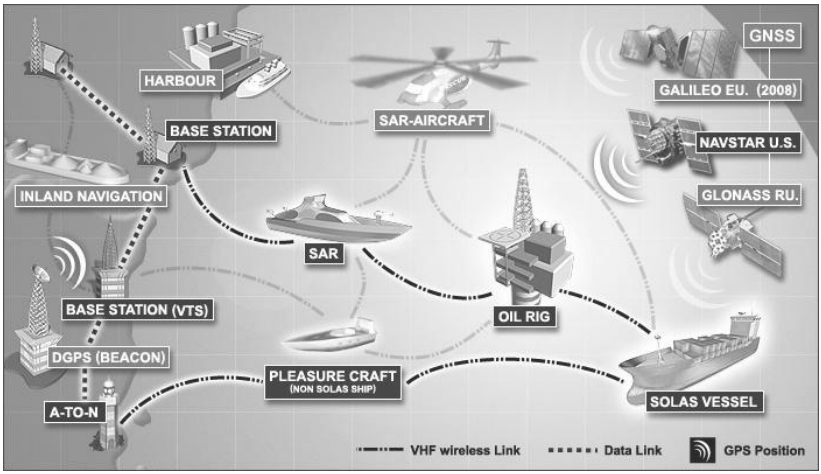
Due to "Time – Synchronization" they use the same organization of free and allocated windows (Slots) in the shared VHF Data Link to send and receive messages. Without the necessity of any operating interaction, both vessels know exactly who or what is cruising nearby and where the



individual object is heading.

1.2. What AIS classes do exist?

The scenario below shows a full AIS coverage area (including all applications and complete shore infrastructure).



There are two important classes of AIS units fitted to vessels, Class A and Class B. In addition AIS base stations may be employed by the Coastguard, port authorities and other authorized bodies. AIS units acting as Aids to Navigation (A to N) can also be fitted to fixed and floating navigation markers such as channel markers and buoys. An last but not least AIS-SART (Search-and-Rescue Transmitters) give position information of objects in emergency.

1.2.1. Class A

Class A units are a mandatory fit under the safety of life at sea (SOLAS) convention to vessels above 300 gross tons or which carry more than 11 passengers in International waters. Many other commercial vessels and some leisure craft also may be fitted Class A units.

The **Class A** operation consists of three different types of messages:

Dynamic information:

- MMSI number
- position of the ship (derived from GPS)
- time, when the position was measured in UTC
- course over ground (COG)
- speed over ground (SOG)
- heading (HOG)
- ship status
- rotational speed/turn rate

Static information:

- call sign and name of the vessel
- length and width of the vessel
- IMO-number of the vessel, if existent
- type of vehicle
- position of the GPS sensor onboard

Journey-related information:

- draught of the vessel
- type of cargo
- port of destination and estimated time of arrival (ETA)
- route plan, optional

The block of dynamic information is the most important block looking for threatening collisions. Therefore this block of information is transmitted in a compulsory way, depending on the vessels movement. The

following table shows the mandatory repetition rate of Class A transmissions linked to the ship's movement:

- anchored vessels 3 minutes
- vessels at 0 – 14 kn 10 seconds
- vessels at 0 – 14 kn, fast maneuver 3.3 seconds
- vessels at 14 – 23 kn 6 seconds
- vessels at 14 – 23 kn, fast maneuver 2 seconds
- vessels at > 23kn 2 seconds
- vessels at > 23 kn, fast maneuver 2 seconds

Static information as well as information belonging to the journey is dispersed every 6 minutes.

The reporting intervals correspond to both radio channels (161.975 MHz, 162.025 MHz) together.

1.2.2. Class B

Class B: EN62287, 2005: class B operation is described in the standard EN62287, published in 2005.This document is obligatory for class B. Pages 15 and 38 describe the operation:

Class B units are designed for fitting in vessels which do not fall into the mandatory Class A fit category.

Reporting intervals are:

Dynamic ship data:

Boats at < 2 kn: 3 minutes

Boats at > 2 kn: 30 seconds

Static ship data (similar to class A): 6 minutes

These intervals are the standard operation modes.

Competent authorities, like base stations, can have influence on the reporting intervals (as they do with class A as well). Interval timing can be reduced down to 5 seconds in exceptional cases. There is no automatism to change the 30 sec / 3 min dynamic intervals by the ship itself.

2. SCOPE OF DELIVERY

In the carton there is contained:

- The easyWatchBox
- This manual for the operation of the easyTRX2-SF21

3. MOUNTING AND INSTALLATION

3.1. Electric installation

The easyWatchBox has got a 1 m cable with 5 colored wires.

Please connect the power cable (red and black wire) to the power supply. 12 v and 24 V voltage supplies can be used with the easyWatchBox.

The grey wire is an output with a special function (see section 4.3).

The NMEA data input is the white and green wire:

- NMEA(+) white,
- NMEA(-) green.

Please connect the NMEA0183 data output of the AIS to the NMEA input of the easyWatchBox.

Your AIS can be:

- AIS Class B transponder (e.g. easyTRX2), or
- AIS receiver (e.g. easyAIS)

The AIS output must be set to 38400 baud data rate.

If you have a chart plotter connected to the AIS, you just connect the easyWatchBox in parallel. So the AIS output is connected to the input of the chart plotter AND to the input of the easyWatchBox!

Electrical Self-Check:

The easyWatchBox has got an internal self check, which gives you information, if the data input cables provide the right data.

For proper working the easyWatchBox needs GPS-NMEA data and AIS-NMEA data. Only when both data are available, the watch box can calculate the distance to other ships and possible collision scenarios.

a) The Bat-low LED should always show green light. If not, please double check the power supply. If it shows red light, the supply voltage is too low.

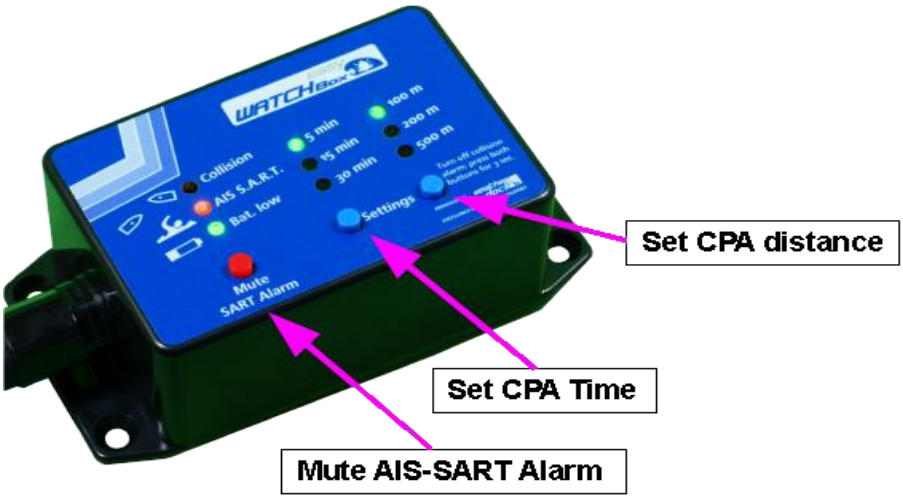
b) When no NMEA data is available (broken wire, or AIS-Class B is turned off) the green Settings-LEDs are turned off at all.

c) When GPS-NMEA and AIS-NMEA data are going into the easyWatchBox, the actual setting LEDs (one for time and one for distance) show green light.

d) When AIS signals are missing or lost for at least 30 sec (so only GPS data are available), the green settings LEDs are blinking. As soon as AIS signals are coming in, the LEDs stop blinking.

3.2. Mechanic installation

The easyWatchBox can be fixed with 4 screws. Please check that there must be a gap to the wall, where you mount the device, because then the buzzer alarm is loud enough.



4. FOR USE OF THE EASY-WATCH-BOX

The easyWatchBox is used as an alerting device, which analyses the NMEA data output of an AIS receiver or AIS transponder.

From this data it analyses alarm situations, like AIS-SART (Search and Rescue Transmitter) or it calculates collision scenarios.
Whenever an alarm situation is detected, the LEDs show, which kind of alarm has occurred and the internal buzzer gives a loud signal.

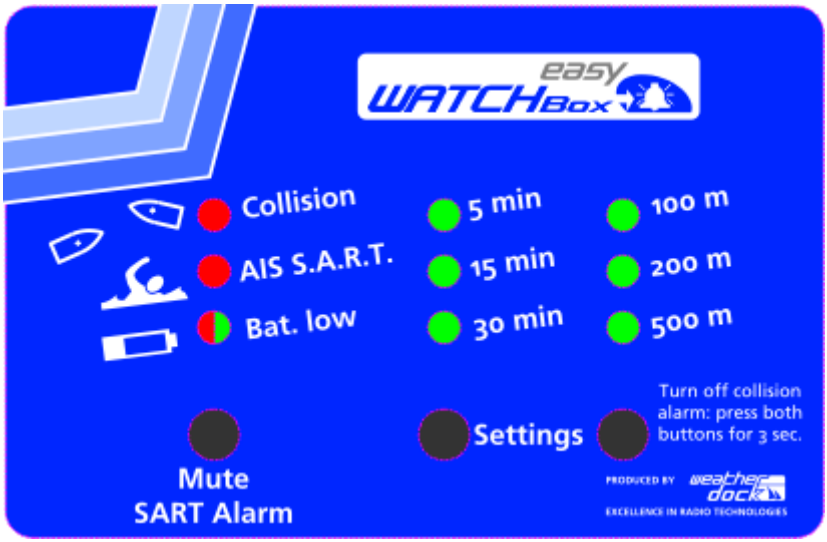
In addition the easyWatchBox examines the supply voltage of your battery.
If there is a danger of low battery, you get an alarm, too.

With the buttons you can either turn on and off the acoustic alarms or you can set-up the collision alarm parameters (alarm distance and time).

ATTENTION:
The collision alarm is only available, when the AIS has got also GPS data on the NMEA output. This is always true, when you use an AIS Class B.

The AIS-SART alarm works almost with all AIS systems in the market.

4.1. LED Indication



- Collision: It turns on, when there is a danger of collision with another vessel.
- AIS S.A.R.T.: It turns on, when an AIS-SART (active) signal was received.
- Bat.low: It turns from green to red, when the battery voltage falls below a dangerous limit
- Time LEDs (5, 15 and 30 min): This LED show the time limit, that you have selected.
- Distance LEDs (100, 200, 500 m): This LED show the radius limit, that you have selected.

4.2. Buttons

The buttons have following functions:

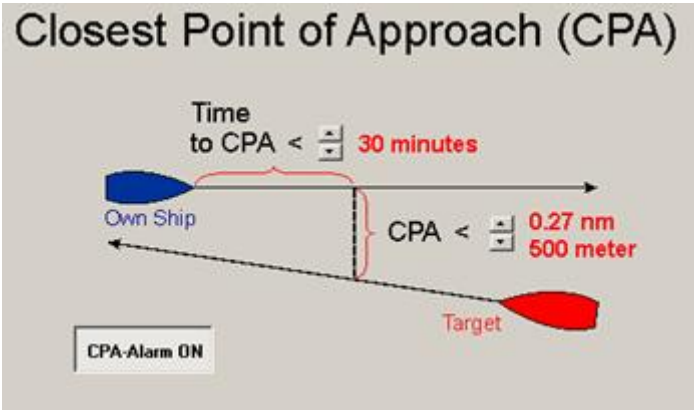
- Mute SART Alarm: When you press this button, the AIS-SART buzzer alarm is turned off. To turn it on again, please press this button for more than 3 seconds; you hear a short double tone.

- Settings: With the both "Setting" buttons you can change the Collision parameters. If you press both buttons together for more than 3 sec, the collision alert is turned off. The green LEDs are turned off.

(ATTENTION: After 30 minutes all disabled alarms are turned on automatically for your safety!!!)

4.3. What does collision mean

A "Collision" means more precise in technical terms: CPA "Closest Point of Approach". The easyWatchBox devices have a built-in feature, which calculates the CPA with every received AIS target.
You can now set a safety radius (around your ship). If a target ship enters your safety radius (in this example 500 m) within the stated time limit (here 30 minutes) the CPA alarm occurs.
You may change the radius and the time by the "Settings" buttons.



Possible safety radius: 100 m, 200 m and 500 m.
Possible time limits: 5 min, 15 min and 30 min.
Some recommendations:
If you are sailing in areas with very few vessels around, you should increase the radius and time.
A radius of 100 m and a time of 5 minutes is suitable in high traffic areas. Here you get a lot of collision alarms, so you can reduce the alarm to those, which are indeed critical.

CAUTION:
When the easyWatchBox gives a collision alarm, it might be a good idea to double check the situation on the chart plotter for identifying the dangerous vessel,
Only vessels, which do have a properly working AIS aboard, are able to trigger the CPA alert in the easyWatchBox!! Therefore you should always watch out for other vessels which are on collision course!!!

4.1. How to mute a CPA-alarm

When the easyWATCHBox detects a possible collision, the Collision LED turns on you hear beeps.
To turn this type of alarm of you have several possibilities but keep in mind that when turn off the alarm, there is still a ship approaching your position.
You can:

- change course and/or speed
- reduce the safety radius by reducing time or distance with the setting buttons
- Turn CPA-Alarm off for 30min by pressing both settings buttons for 3 seconds.

4.2. What does AIS SART alarm mean

An AIS-SART is a small AIS transmitter, which somebody can carry in a life boat or in a life vest. In case of emergency this transmitter can send the position into the AIS, so that all other ships around can see the AIS-SART as a symbol on their chart plotters.
The easyWatchBox gives an SOS acoustic buzzer alarm, when an AIS-SART signal was received.
So you get immediately the information that a person is over board.

If you have an AIS-SART (easyRESCUE) on your board, you can test is with the easyWatchBOX. Just press the test button of the easyRESCUE and wait 30 - 60 sec for a GPS fix. Then it will send a test signal to the AIS and the easyWatchBox will give a sound of two beeps. So you can test your whole alerting system.

4.3. Special Features

4.3.1. External "Horn"

There is another wire (grey colour), which can be connected to an external horn.
This can be useful, if the internal buzzer cannot be heard for some reason.
When the internal buzzer turns on, this wire has got the supply voltage 12 V or 24 V (up to 4 A can be drained).

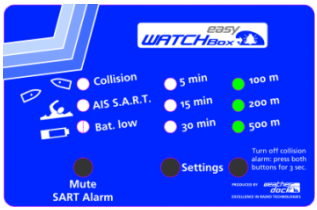
4.3.2. External "Switch"

You can also connect an external switch, a relays or a battery load (e.g. a refrigerator), which will be turned off, when a "low battery" alert occurs. This feature would save your battery.

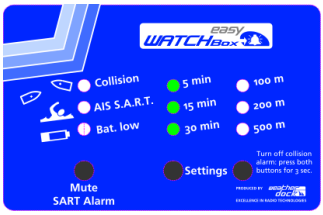
ATTENTION: To use this feature, you have to configure the external function:

- Turn off the easyWatchBox,
- Press the Mute button and keep it pressed,
- Turn on the easyWatchBox,
- Recognize the row of LEDs turning on!!!
- After the buzzer beep, release the Mute button.

When the right row of LED was turned on, the grey cable has got the "Battery-Low" functionality.



When the left row of LED was turned on, the grey cable has got the horn alarm functionality.



You can repeat this setting as often you want. It will always toggle between the functions "Horn" and "Switch".

4.4. Troubleshooting

Problem	Cause	Solution
No LED is on	No Power supply or low voltage	Double check that the supply voltage (12V ore 24V) is at the easyWatchBox
No green LED (for distance and time setting).	No valid GPS data are going into the easyWatchBox	Check if cables are connected in right order. Check if AIS-Class B is receiving GPS Check if AIS-Class B has GPS data output enabled.
Green Settings LEDs are blinking	No AIS data are available	Check if AIS-Class B is receiving AIS targets

5. SPEC / Technical Data

Parameter	Value
Power	DC (12 V / 24 V)
	Average power consumption 6 mA @ 12V DC
Electrical Interfaces	NMEA0183, 38400 baud
	External switch: Output of supply voltage (12V or 24 V). Max current: 4 Ampere.

6. CONTACT AND SUPPORT INFORMATION

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Contact your local dealer for WEATHERDOCK AIS support.

Please see also our WEATHERDOCK Website: www.easyAIS.com

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7. LICENSEE AGREEMENT

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Weatherdock retains the exclusive right to repair or replace the unit or software or offer a full refund of the purchase price at its sole discretion. Such remedy shall be your sole and exclusive remedy for any breach of warranty.

If you choose to use the easyWatchBox, it is the sole responsibility of the owner/operator of the EasyWatchBox to secure the easyWatchBox so that it will not cause damage or personal injury in the event of an accident. It is the sole responsibility of the operator of the boat to operate the boat in a safe manner, maintain full surveillance of all boating conditions at all times, and never become distracted by the EasyWatchBox to the exclusion of safe operating practices.

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