



AIS Aid to Navigation (AtoN) – Type3 User Guide

V3
English



1 References

- General Warning

All marine automatic identification system (AIS) units utilize a satellite-based system such as the global positioning satellite (GPS) network or the global navigation satellite system (GLONASS) network to determine position. The accuracy of these networks is variable and is affected by factors such as the antenna positioning, how many satellites are used to determine a position and how long satellite information has been received for. Therefore, it is desirable wherever possible to verify both your vessels AIS derived position data and other vessels AIS derived position data with visual or radar-based observations.

The easyAtoN software is intended for use as an installation and configuration tool. The application is not a navigation tool and should not be used as such.

- Safety Warnings

This equipment must be installed in accordance with the instructions provided in this manual. Failure to do so will seriously affect its performance and reliability. It is strongly recommended that a trained technician installs and configures this product.

This equipment is intended as an aid to navigation and is not a replacement for proper navigational judgement. Information provided by the equipment must not be relied upon as accurate. User decisions based upon information provided by the equipment are done so entirely at the users own risk.

The accuracy of a GNSS position fix is variable and affected by factors such as the antenna positioning, how many satellites are used to determine a position and for how long satellite information has been received.

Please keep away from the VHF antenna, which is connected to the easyAtoN, when the device is powered on and is transmitting. The recommended distance is 20 cm and more, to avoid higher RF exposure to the human body.

- Warnings and Precautions

If you use the easyAtoN for marking an aquaculture plant, it is the sole responsibility of the owner/operator of the easyAtoN to enter the correct position of the AtoN in the WGS84 coordinates. If the coordinates (LAT/LON) are wrong, the transmissions of the easyAtoN may 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 vessels carry AIS stations and therefore are not able to receive the aquaculture AtoN.

It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

This device must be programmed with the data corresponding to the AtoN on which it will be installed. Programming must be carried out by a Weatherdock dealer. The included instructions contain information on how to verify the correct programming.

- Product category

This product is categorized as 'exposed' in accordance to IEC 62320-2:2017.

- Revision Level

Stand 1.0, Author: MK, 03/2020

Stand 1.1, Author: MS, 02/2021

- Restrictions

There are no known restrictions for the usage of the easyTRX3 in EU countries.

2 Index of Abbreviations

Abbreviations

CPA	Closest point of approach
LAN	Local area network
NMEA	National Marine Electronics Association
SSID	Service set identifier device
VHF	Very High Frequency
VSWR	voltage standing wave ratio
WiFi	wireless fidelity -connect to a network by radio
GNSS	global navigation satellite system
MMSI	Maritime mobile service identity
HDOP	horizontal dilution of precision

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4 Scope of delivery

The package contains:

- (1) easyAtoN unit
- (2) 18-pin cable NMEA0183 + Power
- (3) USB Cable
- (4) Installation CD with configuration software
- (5) User manual guide

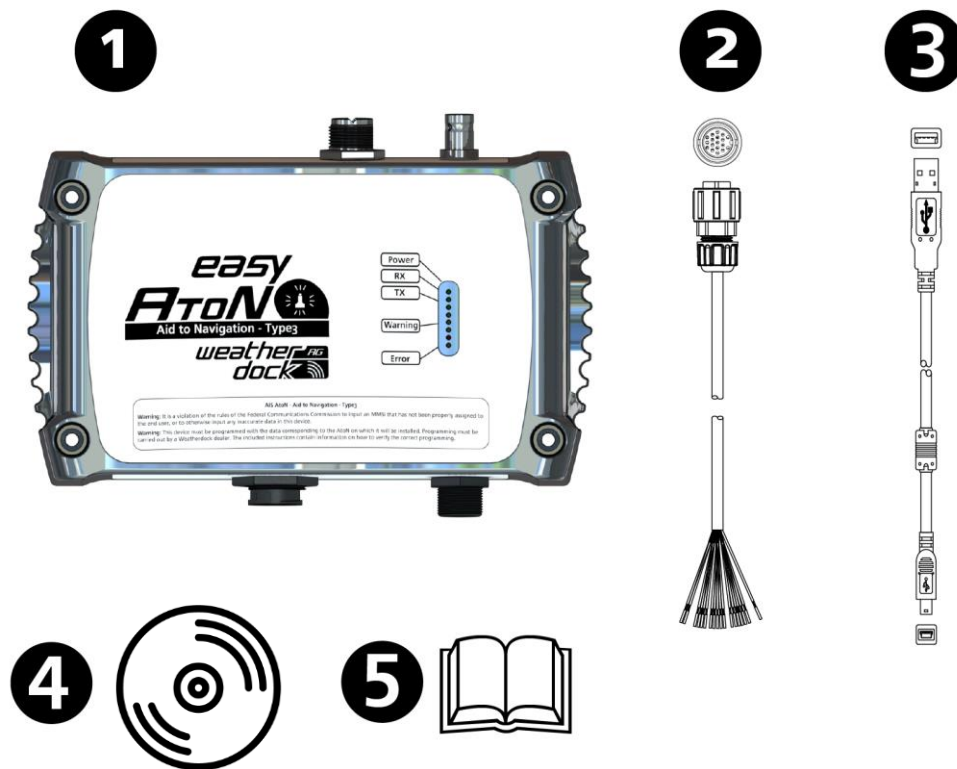


Figure 1 - scope of delivery

5 Additional Equipment

We recommend to use further equipment, not included in package:

- (1) Lightning protection, between your VHF antenna and the easyAtoN unit.
- (2) VHF antenna, best for frequency: 162MHz, N-male plug
 - Antenna pole, fix antenna as high as possible
 - Antenna holder

- (3) GPS antenna, necessary if installation is not outside, BNC-male plug
- (4) Tools for installation

6 Introduction

6.1 General Information about AIS

AIS stands for Automatic Identification System. 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 easyAtoN installation in a common environment. The easyAtoN is connected to an external power supply, and in connection with the VHF antenna 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.

- **Class A transceivers**
these transceivers are designed to be fitted to commercial vessels such as cargo ships and large passenger vessels. Class A transceivers transmit at a higher VHF signal power than Class B transceivers and therefore can be received by more distant vessels, they also transmit more frequently. Class A transceivers are mandatory on all vessels over 300 gross tons on international voyages and certain types of passenger vessels under the SOLAS mandate.
- **Class B transceivers**
Similar to Class A transceivers in many ways, but are normally lower cost due to the less stringent performance requirements. Class B transceivers transmit at a lower power and at a lower reporting rate than Class A transceivers.
- **AIS base stations**
AIS base stations are used by Vessel Traffic Systems to monitor and control the transmissions of AIS transceivers.
- **Aids to Navigation (AtoN) transceivers**
AtoN are transceivers mounted on buoys or other hazards to shipping which transmit details of their location to the surrounding vessels.
- **AIS receivers**
AIS receivers receive transmissions from Class A transceivers, Class B transceivers, AtoN and AIS base stations but do not transmit any information about the vessel on which they are installed.

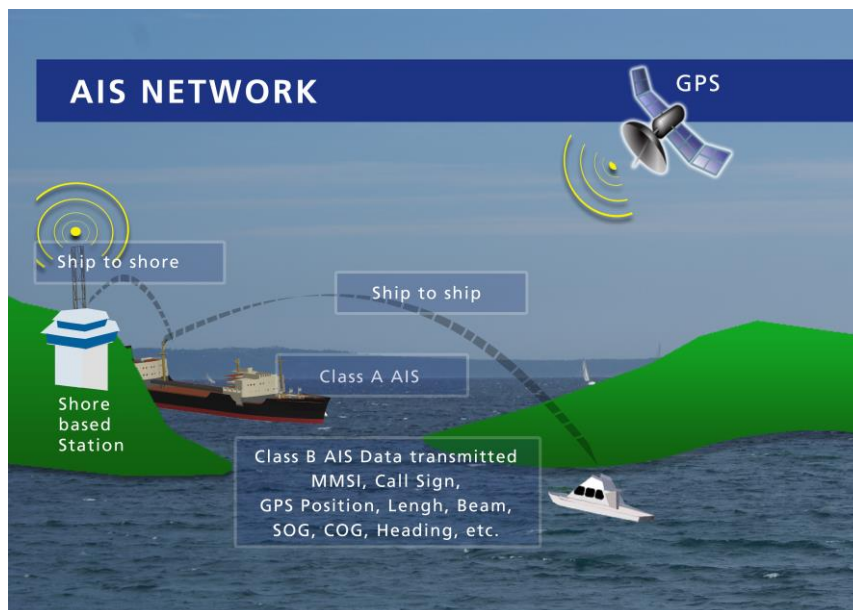


Figure 2 - AIS general overview

6.2 AtoN general system overview

AtoN (Aids- to-Navigation) are sending information presenting a buoy or sea-sign (e.g. beacons, cardinal mark, single danger mark, waterway marks, etc.). The AtoN-transmitters may be located at the buoy (real AtoN) or apart from the AtoN-position (synthetic or virtual AtoN).

6.3 Type 1 AIS AtoN

A Type 1 AIS AtoN is a transmit-only device using the FATDMA (Fixed Access Time Division Multiple Access) access scheme. This requires that the AIS AtoN is configured with fixed AIS time slots in which it will transmit AIS messages. Mobile AIS stations operating in the area where a Type 1 AIS AtoN is installed need to be aware of the time slots allocated to the AIS AtoN. The slots allocated to the AIS AtoN are 'reserved' by AIS Base Station transmissions covering the area in which the AIS AtoN is installed. This mode of operation therefore requires that an AIS base station is operating in the same area as the AIS AtoN and is configured to make the necessary slot reservations.

6.4 Type 3 AIS AtoN

A Type 3 AIS AtoN has transmit and receive capability and can therefore use either the FATDMA or RATDMA (Random Access Time Division Multiple Access) access schemes. The RATDMA scheme allows the AIS AtoN to internally allocate slots for transmission of AIS messages without reservation from an AIS Base Station. Optionally the AIS receive capability also allows a Type 3 AIS AtoN to be configured and queried for status via AIS messages sent from a shore station (known as VDL configuration). An extension of VDL configuration is 'Chaining' where configuration and query commands are passed along a 'chain' of AIS AtoN stations to a distant station beyond the range of direct communication with a shore station.

This option is not yet implemented in easyAtoN!

The easyAtoN is an AIS Aid to Navigation (AtoN) transceiver type3.

6.5 GNSS Systems

The easyAtoN unit includes an internal GNSS receiver to supply the GPS and GLONASS satellite navigation systems as standard.

6.6 AIS messages supported

Message number	Description	Transmitted / Received by AtoN Transceiver	Application
1-4	Position report (Class A and Base Station)	received	Internally processed for AIS-Slot-Reservation Table.
5	Class A static data		
6	Addressed Binary Message	transmitted and received	
7	Addressed Binary Message	transmitted and received	
8	Broadcast Binary Message	transmitted and received	The transceiver uses message 8 to broadcast binary data (relating to connected sensors and systems) to all other AIS stations in range.
12	Addressed safety related message		On request

13	Addressed safety related acknowledgement		On request
14	Safety related message		On request
18	Position report (Class B)	received	Internally processed for AIS-Slot-Reservation Table.
21	Aids to navigation report	transmitted	This is the primary message transmitted by the transceiver. It contains the position, identification and status of the transceiver.
25	Single slot binary message		On request
26	Multi slot binary message		On request

Figure 3 - AtoN supported messages

Reporting intervals are:

Msg. 21 (AtoN): 3 minutes (autonomous mode = default)

Msg. 6, 8, 21 (AtoN): 10 seconds up to 1 day (assigned mode = special configuration)

The easyAtoN is able to incorporate virtual AtoN (i.e., transmitter location is different from the AtoN position). Up to 32 virtual AtoN can be realized with one easyAtoN. Each of these virtual AtoN has got the same reporting rate of 3 minutes (autonomous) or can be changed to different intervals (assigned).

7 Installation

7.1 Mounting

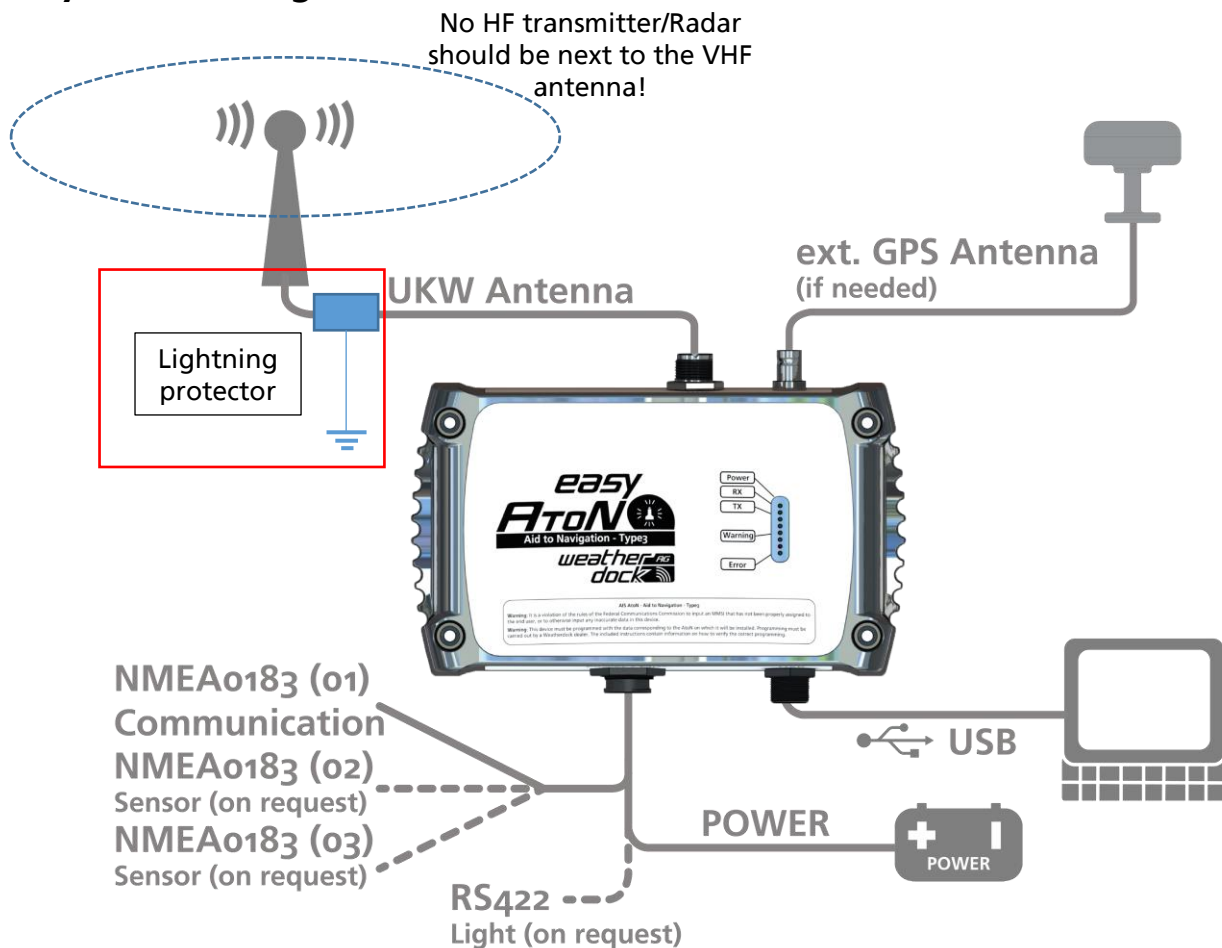


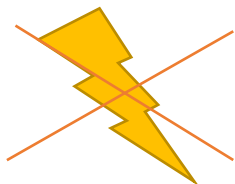
Figure 4 - easyAtoN - connectors and plugs

The VHF antenna should be mounted on a high position of the structure (e.g. buoy). It should not be mounted in parallel or in front of metal parts; these would lower the radiated VHF signal power and reduce the range of the AtoN.

Important note:

To prevent easyAtoN from damaging, use a **Lightning protector** between your VHF antenna and the easyAtoN unit!

Please follow your local rules and standards for installation of a lightning protection!



Also, the antenna should be free and no HF transmitter, no Radar should be next to the easyAtoN antenna!

7.2 Drilling Mask

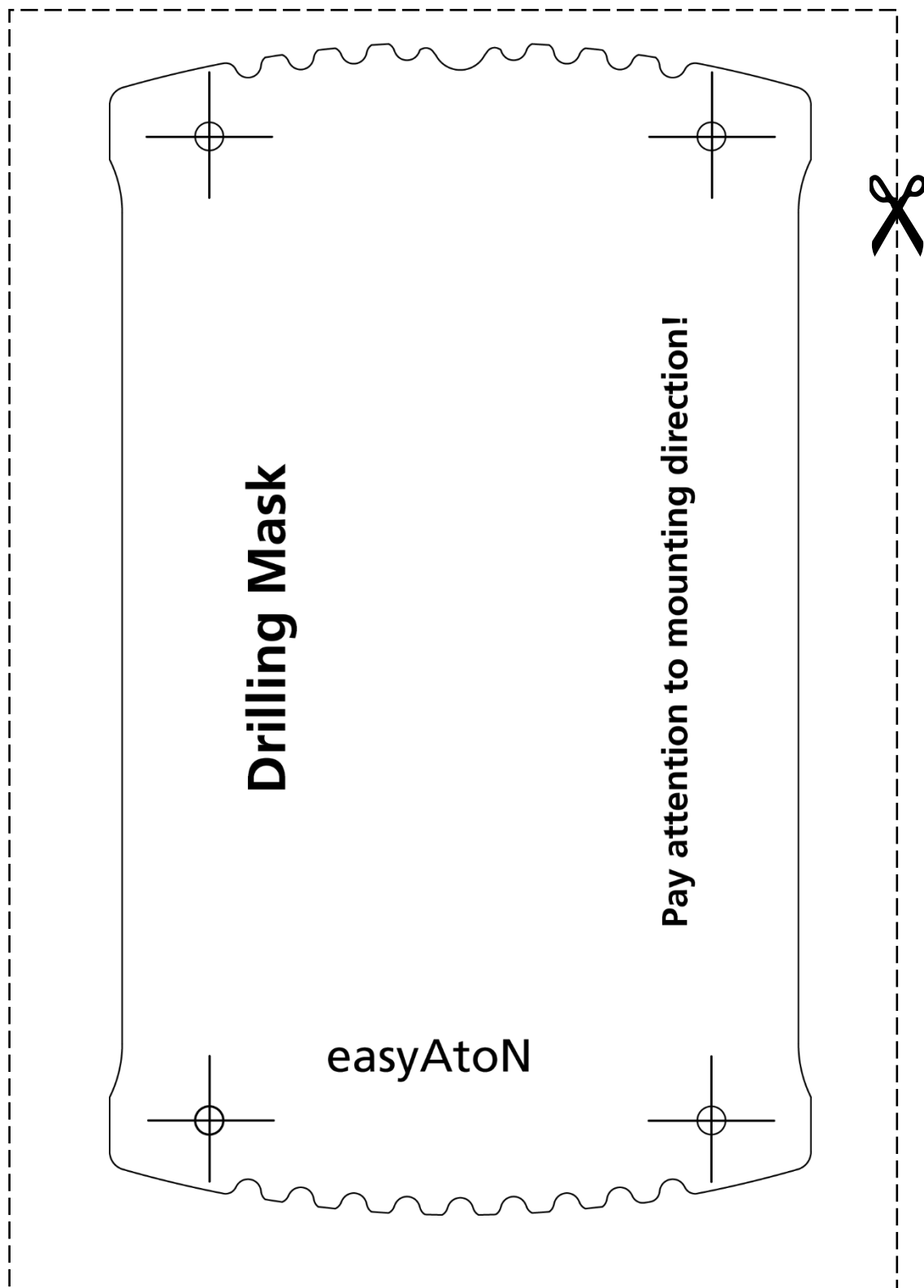


Figure 5 - easyAtoN drilling mask

When mounting the easyAtoN, pay attention to the mounting direction because of the internal GNSS antenna. In case of using an external GPS antenna connected to the easyAtoN, you are free in mounting.

Wall mounting:



Flat mounting:

Mounting the easyAtoN on top of a horizontal surface, as lying on a table, is also possible.

7.3 VHF Antenna

Any VHF marine band antenna covering the marine band (156.025 - 162.025 MHz), which is designed for VHF marine band voice communication and AIS transponder operation can be used. The coaxial cable of the antenna must have a connector type: N-male plug.

It is recommended to mount the antenna as high as possible with free visibility in horizontal plane to get high range.

7.4 easyAtoN connectors / Interfaces

- Input: 4x input lines logic levels (read light fault, lights on, Racon fault data)
- Output: 1 (open drain) transistor, 1,8A at up to 32VDC or relay drive
- Communication ports: 1 USB, 3 NMEA in, 3 NMEA out (RS422 or RS232)
- VHF antenna connector: N female
- Power supply: Amphenol circular connector

7.5 Power and transceiver interface connector

PIN ID	Signal name	Function and Notes
1	12VDC / 24VDC	Power
2	Ground '-'	Power
3	NMEA0183 Out 1,2,3 '-'	Common data ground, Communication (PI- and Sensor-Ports)
4	NMEA0183 Out1 '+'	Communication (Presentation Interface: PI-Port)
5	NMEA0183 Out2 '+'	Sensor on request

6	NMEA0183 Out3 '+'	Sensor on request
7	NMEA0183 In1 '-'	Communication (Presentation Interface: PI-Port)
8	NMEA0183 In2 '-'	Sensor on request
9	NMEA0183 In3 '-'	Sensor on request
10	NMEA0183 In1 '+'	Communication (Presentation Interface: PI-Port)
11	NMEA0183 In2 '+'	Sensor on request
12	NMEA0183 In3 '+'	Sensor on request
13		Switch for Light on request
14		
15		
16		
17		Switch for Light on request
18		

Figure 6 - power and interface connectors

7.6 Power connecting

- Vessel board net
- Solar Panel (on request)

8 Configuration / Programming

For every AtoN it is statutory to have an own valid MMSI number.

The configuration of the easyAtoN unit can be done very easy with the programming software (contained on CD-ROM) via USB cable from a PC or laptop.

8.1 AtoN type of mark

- This is the type of the AtoN. The AIS standard has got a predefined list of types. Only the type "30 Special Mark" is appropriate for the aquaculture plant.
 - 0 not specified
 - 1 Reference point
 - 2 RACON
 - 3 Fixed structure
 - 4 Spare
 - 5 Light, without sectors
 - 6 Light, with sectors
 - 7 Leading Light Front
 - 8 Leading Light Rear
 - 9 Beacon, Cardinal N
 - 10 Beacon, Cardinal E
 - 11 Beacon, Cardinal S
 - 12 Beacon, Cardinal W

- 13 Beacon, Port hand
- 14 Beacon, Starboard hand
- 15 Beacon, Preferred Channel port hand
- 16 Beacon, Preferred Channel starboard hand
- 17 Beacon, Isolated danger
- 18 Beacon, Safe water
- 19 Beacon, Special mark
- 20 Cardinal Mark N
- 21 Cardinal Mark E
- 22 Cardinal Mark S
- 23 Cardinal Mark W
- 24 Port hand Mark
- 25 Starboard hand Mark
- 26 Preferred Channel Port hand
- 27 Preferred Channel Starboard hand
- 28 Isolated danger
- 29 Safe Water
- 30 Special Mark (<-- only this is used for sea farms)
- 31 Light Vessel/LANBY/Rigs

Figure 7 - AtoN type of marks

8.2 Software

easyAtoN - Configuration - Version 1.3

COM Settings Open Close Load Config Save Config

Add Remove

AtoN 0 (real)
AtoN 1 (virtual)
AtoN 2 (virtual)
AtoN 3 (virtual)
AtoN 4 (virtual)
AtoN 5 (virtual)
AtoN 6 (virtual)
AtoN 7 (virtual)
AtoN 8 (virtual)
AtoN 9 (virtual)
AtoN 10 (virtual)
AtoN 11 (virtual)
AtoN 12 (virtual)
AtoN 13 (virtual)
AtoN 14 (virtual)
AtoN 15 (virtual)
AtoN 16 (virtual)
AtoN 17 (virtual)
AtoN 18 (virtual)
AtoN 19 (virtual)
AtoN 20 (virtual)
AtoN 21 (virtual)
AtoN 22 (virtual)
AtoN 23 (virtual)
AtoN 24 (virtual)
AtoN 25 (virtual)
AtoN 26 (virtual)
AtoN 27 (virtual)
AtoN 28 (virtual)
AtoN 29 (virtual)
AtoN 30 (virtual)
AtoN 31 (virtual)

Settings Terminal Log

AtoN Descriptor

MMSI: 999123456 ☐ Virtual

Name: W-07

Type of AtoN: 12 Beacon, Cardinal W

Sync-Lost Behaviour: ☐ enabled

VHF-Settings

ITU-Channel 1: 2087 ITU-Channel 2: 2088

Messages

Addressed MMSI: 211000000

Acknowledge Msg. 7: ☐ enabled

AtoN Dimension

A: 1 C: 1

B: 1 D: 1

Nominal Position

Type of EPFS: GPS

Latitude(dd°mm.mmmN): 49°12.7600N

Longitude(ddd°mm.mmmE): 11°06.8010E

Pos. Accuracy: > 10m

Off Position Alternate Msg. ☐ enabled

Off Position Threshold (m): 200

Read AtoN
Write AtoN
Clear Config
Firmware Update

6 (Addressed Binary Message)

Add Remove

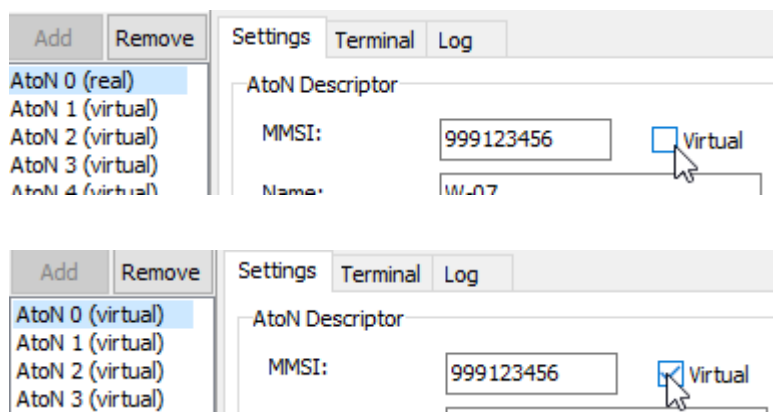
Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval	Dest. MMSI	Te
21	0	RATDMA		-1			-1			
21	1	RATDMA		-1			-1			

Figure 8 - programming software

8.3 'Real' AtoN configuration

By default, you need to configure the real AtoN at first. This is the physically existing transponder. On the table at the bottom of the form two schedules are implemented. The first with the Index (Idx) 0 is the "on-position" reporting and schedule index 1 is used, when the AtoN is "off-position", which means it is drifting and has moved outside the "Of Position Threshold". The off-position schedule can be turned off un-checking the "Off Position Alternate Msg." checkbox. You can optionally add "binary" messages (i.e., Msg. 6 (addressed) or Msg. 8 (broadcast) with a pre-defined text, which can be entered in the table.

- ➔ The first "Real"-AtoN can be also programmed also as an "virtual" AtoN since program version 1.3



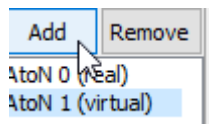
The figure shows two screenshots of the software interface. The top screenshot shows the 'AtoN 0 (real)' selected in the list on the left. The 'Settings' tab is active, and the 'AtoN Descriptor' section shows 'MMSI: 999123456' and 'Name: 111111'. The 'Virtual' checkbox is unchecked. The bottom screenshot shows 'AtoN 0 (virtual)' selected in the list. The 'Settings' tab is active, and the 'AtoN Descriptor' section shows 'MMSI: 999123456' and 'Name: 111111'. The 'Virtual' checkbox is checked.

8.4 'Synthetic' AtoN configuration

A synthetic AtoN is a real existing sea mark where no AIS AtoN unit can be mounted onto. To realize that the origin position information of this sea mark is transmitted into the AIS traffic data, the easyAtoN can be programmed with this position information to broadcast on behalf of the sea mark.

- 'Virtual' AtoN configuration

With "Add" you can configure new "Virtual AtoNs".



The figure shows a screenshot of the software interface. The 'Add' button is highlighted in the list of AtoNs on the left. The list shows 'AtoN 0 (real)' and 'AtoN 1 (virtual)'.

The parameter set is equal to the real AtoN. As the virtual AtoN have got normally another position than the real AtoN, the Type of EPFS is automatically changed from "GPS" to "Surveyed Position". Msg. 21 of this virtual AtoN will send the position entered manually in this form.

9 Spec / Technical Data

Description	Value
General	
Dimensions	195mm * 135mm * 60mm (L*W*H)
Weight	700 grams
Operating temperature	-15°C to 55°C
Storage temperature	-20°C to 75°C
Safety distance compass	min. 80 cm
Power Specification	
Board voltage	12V DC / 24V DC
Operating voltage range	9,6 to 31,2V DC
Input	2,9W at 12V DC
Current consumption	2A (Transmit), 240mA (Stand.) at 12V DC
GNSS Specification	
GPS/GNSS Receiver (internal)	72 Channel GNSS Receiver
	# GPS
	# GLONASS
External Connections	
Interfaces	3x NMEA0183 IN
	3x NMEA0183 OUT
Connections (standard version)	USB
	18 pin plug
	VHF antenna connection (N-type connector)
Data type NMEA output	VDM
AIS Specification	
Transmitter	1 Transmitter (AIS1/AIS2)
Receiver	2 Receiver (AIS1/AIS2)
	DSC (AIS Channel Management)
Frequencies	Marine Band: 156,025MHz - 162,025MHz

	AIS1: 161,975MHz
	AIS2: 162,025MHz
Transmission Power	5Watt (50Ohm)
Channel width/grid	25kHz
Modulation	GMSK (AIS, TX and RX)
Transmission rate	9600bit/s (AIS)
Sensitivity	-114dBm 25kHz (<20% PER)
Co-channel rejection	10dB
Adjacent channel rejection	70dB
Intermodulation	65dB
Blocking	84dB
Certifications	
AIS Standards	IEC 62320-2:2017, ITU-R M.1371-5
Environmental	IEC 60945:2002 + Corr.1:2018
GPS Performance	IEC 61108-1:2003
Product Safety	EN 60950-1:2006

Figure 9 - technical data

9.1 Standards

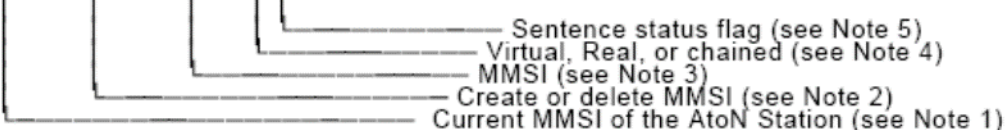
This product complies with all the necessary standards under the European RED directive. The following standards have been followed in pursuance of this:

- IEC 62320-2 Ed.1: Maritime navigation and radio communication equipment and systems - Automatic identification system (AIS) - Part 2: AIS AtoN Stations - Operational and performance requirements, methods of testing and required test results
- IEC60945: 2002-08 Maritime navigation and radio communication equipment and systems – General requirements – Methods of testing and required test results
- IEC61162-1: Maritime navigation and radio communication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners
- IEC61108-1: GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) – Part 1: Global positioning system (GPS) -Receiver equipment - Performance standards, methods of testing and required test results
- EN 301 843-1 v2.1: Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for marine radio equipment and services; Part 1: Common technical requirements

- EN 50383: 2002 Basic standard for calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio base stations and fixed terminal stations for wireless telecommunications system (110MHz – 40GHz)
- EN60950-1:2006 Information technology equipment – Safety – Part 1: General requirements

9.2 AID – MMSI Configuration

\$--AID,xxxxxxxx,x,xxxxxxxx,a,a*hh<CR><LF>



Sentence status flag (see Note 5)
Virtual, Real, or chained (see Note 4)
MMSI (see Note 3)
Create or delete MMSI (see Note 2)
Current MMSI of the AtoN Station (see Note 1)

NOTE 1 The MMSI of the station being addressed. The initial factory setting should be defined by the manufacturer, for example 000000000.

NOTE 2 The indicator to define if the MMSI is being created/changed (1) or deleted (0). If own station MMSI is deleted it should revert to the factory setting. If a Virtual AtoN is deleted, then all associated messages for that Virtual AtoN are also deleted.

NOTE 3 The current MMSI to be created/changed/or deleted.

NOTE 4 Real AtoN, chained, or Virtual AtoN – Real is own station, chained indicates an MMSI that this station is responsible for relaying messages to and from, a Virtual AtoN indicates an MMSI that this station is responsible for generating at least a Message 21.

"R" – Real AtoN;

"V" = Virtual/Synthetic AtoN;

"P" = parent AtoN in the chain;

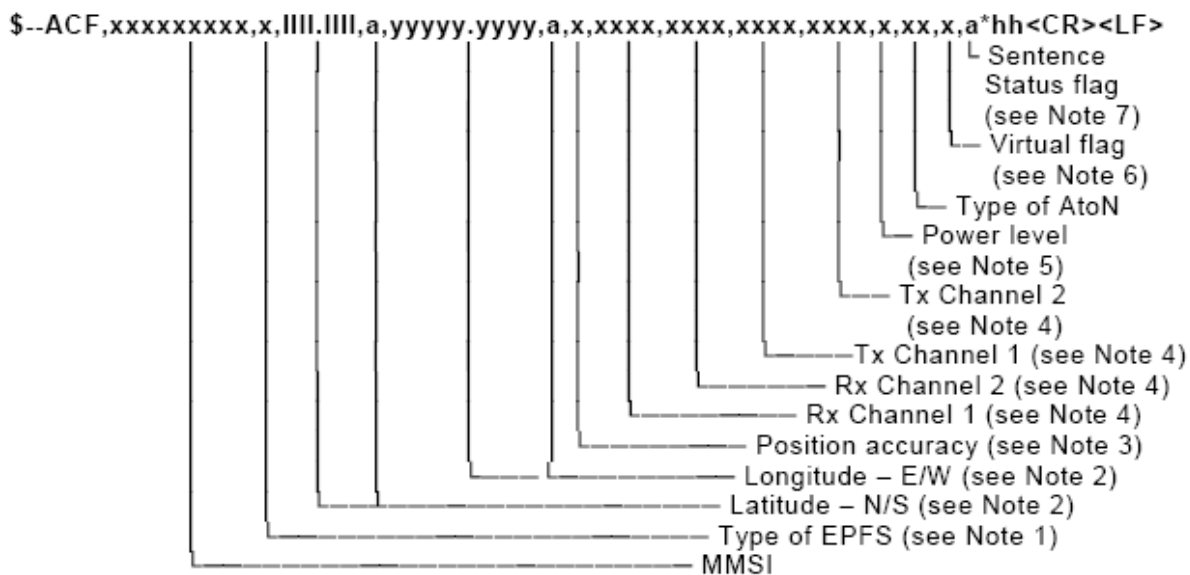
"C" = child AtoN in the chain.

NOTE 5 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R" = sentence is a query response;

"C" = sentence is a configuration command to change settings.

9.3 ACF – General Config Command



NOTE 1 Identifies the source of the position, see ITU-R M.1371 Message 21 parameter (type of electronic position fixing device).

NOTE 2 Nominal or charted position.

NOTE 3 0 = low > 10 m,

1 = high < 10 m; differential mode of DGNSS.

NOTE 4 VHF channel number, see ITU-R M.1084.

NOTE 5 0 = default manufacturer power level (nominally 12,5 W),

1 to 9 as defined by the manufacturer.

NOTE 6 Virtual AtoN flag

0 = Real AtoN at indicated position (default),

1 = Virtual AtoN,

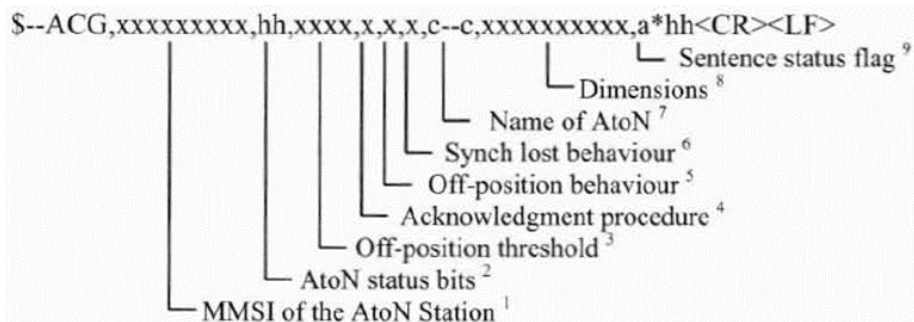
2 = Synthetic AtoN (flag remains 0 in message 21 but the repeat indicator must be > than 0).

NOTE 7 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R" = sentence is a query response,

"C" = sentence is a configuration command to change settings.

9.4 ACG – Extended General AtoN Station Configuration Command



Notes:

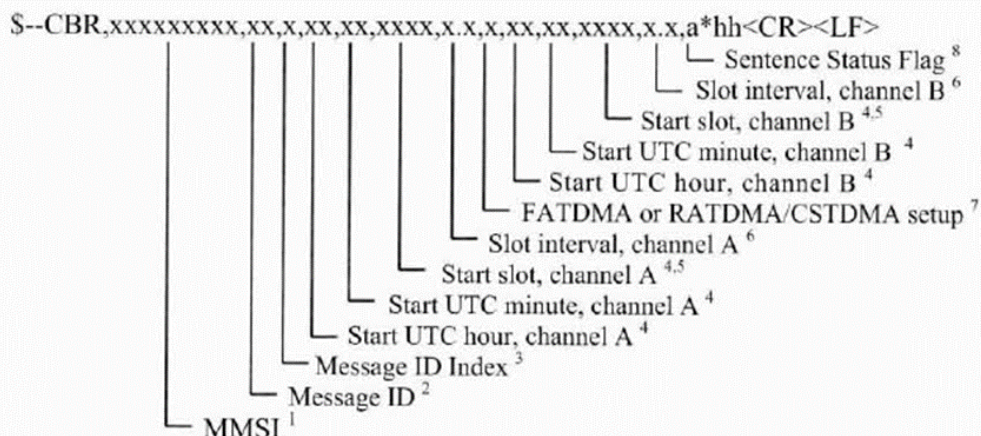
- 1) This sentence should be accepted only if the MMSI matches a previously input MMSI (See AID sentence).
- 2) AtoN Status Bits, Indication of the AtoN Status, default "00 hex": For a Virtual AtoN this field should be 00 hex . The three most significant bits represent the Page ID. (See IEC 62320-2, Annex C, Message 21 – AtoN status bits)
- 3) Off-position indicator is generated when this threshold is exceeded (distance in metres) – (See IEC 62320-2, Off-position monitoring)
- 4) Determines behaviour of AtoN for message acknowledgement (replying using Message 7 and 13).
 0 = will provide acknowledgement as defined by manufacturer (If an acknowledgement procedure is implemented, it is enabled.).
 1 = will not provide acknowledgement (If an acknowledgement procedure is implemented, it is disabled.).
- 5) Off-position behaviour:

0 = Maintain current transmission schedule (use message ID Index 0)

1 = Use transmission schedule configured by CBR using, affected MMSI, message ID 21, message ID index 1. When the transmission schedule for Index 1 has not been configured, the off-position maintains the message ID Index 0 schedule.

- 6) Synch lost behaviour (UTC source lost):
 0 = Silent (no transmissions)
 1 = Continue operation
- 7) Name of the AtoN: maximum 34 characters
- 8) Reference point of reported position; Should be given as dimension (aaabbbccdd) of the buoy (see ITU-R M.1371, Message 21)
- 9) This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.
 R = Sentence is a status report of current settings (use for a reply to a query).
 C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.

9.5 CBR – Configure Broadcast Rates for AIS AtoN Station Message Command



Notes:

- 1) This is a MMSI previously defined for the AIS AtoN station (See AID Sentence.).
- 2) Message ID is the number of the message being scheduled (See ITU-R M.1371). When Message ID is 0 this indicates that the slots being defined will be used for either chaining messages or MEB single transmissions (See IEC 62320-2).
- 3) Message ID Index is used to distinguish multiple occurrences of the same MMSI and Message ID combination. Valid range is 0 to 7.
- 4) Nominal start slot for each channel is determined by the combination of Start UTC hour, Start UTC minute, and Start slot.
- 5) Starting slot valid range is -1 to 2249.
 - A value of -1 clears the schedule and discontinues the broadcasts for the indicated channel(s).
 - A null field indicates no change to the current start slot setting when sent to the AtoN Station. In response to a query this field cannot be null.
 - A value of -1 indicates that the message is not scheduled for broadcast on the indicated channel.
- 6) Message transmission slot interval, valid range is -1 to 3 240 000 slots (24*60*2250 = 3 240 000 is once per day). A null field indicates no change to the current slot interval setting when sent to the AtoN Station. In response to a query this field cannot be null, -1 indicates that the slot interval is not set.
- 7) Used to select whether the CBR is configuring a FATDMA schedule or RATDMA/CSTDMA schedule (0 indicates FATDMA, 1 indicates RATDMA, and 2 indicates CSTDMA). For RATDMA/CSTDMA mode, scheduled transmissions are between the slot interval and the slot interval plus 150 slots.
- 8) This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.
 - R = Sentence is a status report of current settings (use for a reply to a query).
 - C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.

9.6 MEB – Message Payload Rebroadcast

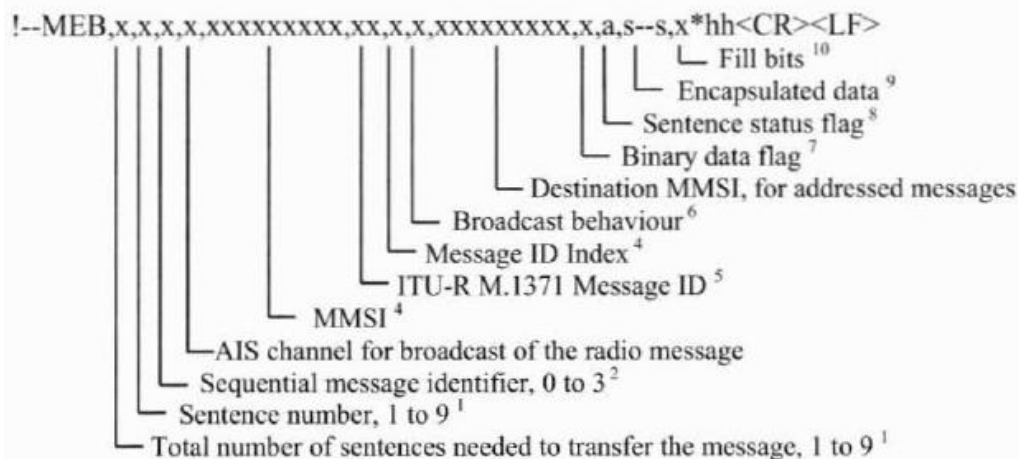
MEB – Message Input for Broadcast, Command

This sentence is used to input a message for storage or immediate broadcast. The sentence associates messages with real, virtual, and synthetic MMSI's (See AID sentence).

The stored message is associated by the MMSI, Message ID, and Message ID Index. The combination of MMSI, Message ID, and Message ID Index are used to reference the stored message and link the message to a transmission schedule as defined by a CBR sentence. The stored message's broadcast begins when both the message content and schedule (See CBR sentence) have been entered.

For immediate message broadcast, the binary data will be broadcast using the slots reserved by the CBR sentence with both Message ID and Message ID Index = 0, or will be broadcast using the next available slot. The channel for the immediate message broadcast is specified by the "AIS channel for broadcast of the radio message" (parameter field 4).

This sentence can be queried. When queried, the query response may contain one or more sentences and will continue until the transfer of all stored information is complete.



Notes:

- 1) The total number of sentences required to transfer the binary message data to the AIS unit. The first field specifies the total number of sentences used for a message, minimum value 1. The second field identifies the order of this sentence in the message, minimum value 1. All sentences contain the same number of fields. Successive sentences may use null fields for fields that have not changed, such as fields 4, 5, 6, 7, 8, 9, and 10.
- 2) This sequential message identifier serves two purposes. It meets the requirements as stated in Section 5.3.4 and it is the sequence number utilized by ITU-R M.1371 in message types 6 and 12. The range of this field is restricted by ITU-R M.1371 to 0 - 3. The sequential message identifier value may be reused after the AIS unit provides the "ABK" acknowledgement for this number. (See ABK Sentence).
- 3) The AIS channel that should be used for the broadcast:
 - 0 = no broadcast channel preference,
 - 1 = broadcast on AIS channel A,
 - 2 = broadcast on AIS channel B,
 - 3 = broadcast message on both AIS channels A and B.
 For an immediate message broadcast, this cannot be null. For a stored message it should be null.
- 4) For the message to be broadcast, this MMSI must match a previously entered a real, virtual, or synthetic MMSI (See AID and CBR Sentences).
- 5) ITU-R M.1371 messages supported by this sentence: 6, 8, 12, 14, 25, and 26. See IEC 62320-2 for the ITU-R M.1371 messages that are supported by an AIS AtoN Station.
- 6) 0 = For an AtoN device, the message is stored for autonomous continuous transmission as defined by a CBR sentence. The message is identified by the combination of MMSI, Message ID, and Message ID Index.
 1 = For an AtoN device, a single transmission (not stored in the "message table") using the next available slot following slot selection priority:
 - use CBR definition, id 0, index 0 – if available).
 - use RATDMA (if supported by AtoN unit)
 - - 9 = reserved for future use.
- 7) The "Binary data flag" field has a range from 0 to 1 with the following meaning:
 - 0 = unstructured binary data (no Application Identifier bits used)
 - 1 = binary data coded as defined by using the 16-bit Application Identifier (See ITU-R M.1371, messages 25 and 26)
- 8) This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.
 - R = Sentence is a status report of current settings (use for a reply to a query).
 - C = Sentence is a configuration command to change settings. A sentence without "C" is not a command.
- 9) This is the content of the "binary data" parameter for either ITU-R M.1371 MESSAGE 6, 8, 25, or 26, or the "Safety related Text" parameter for either message 12 or 14. The actual number of "6-bit" symbols in a sentence must be adjusted so that the total number of characters in a sentence does not exceed the "82-character" limit.
- 10) This field cannot be null.

10 Declaration of conformity



EC DECLARATION OF CONFORMITY

We: **Weatherdock AG**,
Emmericher Str. 17, D-90411 Nürnberg

declare under our sole responsibility that the products

Name and Type	easyTRX3 (AIS Class B SOTDMA transponder); easyAtoN (AIS Class Aids To Navigation transponder);
---------------	--

The above product is tested and complies with all applicable requirements of the following international instruments, regulations and testing standards for AIS Class B-transponders, detailed set forth in:

EU Council Directive	Directive 2014/53/EU RED
Testing standards	<ul style="list-style-type: none"> • ITU-R M. 1371-5 • IEC/EN 60945:2002 + Corr. 1:2008 • IEC/EN 62287-2 Ed.2.0:2017 • IEC 61108-1:2003 • IEC 60950-1:2006 • IEC 62368-1:2014 • IEC 62320-2 Ed.2 (2016) (easyAtoN only)
Name, Address of manufacturer	Weatherdock AG, Emmericher Str. 17, D-90411 Nürnberg
Assessment of radio (article 3.2)	By Notified Body 0700, Phoenix Testlab
Assessment of article 3.1a, 3.1b and 3.3	According marine electronic standards (see testing standards).
Statement of Conformity AIS AtoN	Nr. BSH/454.AIS-AtoN/Weatherdock easyAtoN/001

Usage:

The intended usage of the device is to participate the AIS (Automatic Identification System) on waterways. The device is able to receive and transmit AIS messages and it has got an own position source (GPS receiver). It transmits dynamic data (e.g. position, speed, course) and static data (e.g. ship's name, MMSI, call sign, ship dimension, ship type). The device receives AIS messages from other stations and presents these data to an interface, that can be connected to a "chart plotter" or "PC". This device is also available operating as AIS AtoN.

Assessment bodies:

Assessments made at, documents issued by:

- BSH, (Federal Maritime and Hydrographic Agency of Germany), Hamburg, Germany
- TÜV SÜD Product Service GmbH, Straubing, Germany
- Bureau Veritas CPS Germany GmbH, Nürnberg, Germany
- Type approval (article 3.2) by Phoenix Testlab in Blomberg, Germany
- Product Safety Consultant Inc., New Taipei City, Taiwan

Technical Construction File:

The technical construction file for this product is held by Weatherdock AG
On behalf of Weatherdock AG


Alfred Kotouczek-Zeise, CEO

June 9th, 2020


Jürgen Zimmermann, CTO

June 9th, 2020



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11 Contact and support information

Although WEATHERDOCK strives for accuracy in all its publications; this material may contain errors or omissions, and is subject to change without prior notice.

Frequently asked questions (FAQ):

You find them here: www.easyais.com/en/faqs/



Contact:

Contact your local dealer for WEATHERDOCK AIS support in most cases he can help quickly and straightforwardly.

Your dealer (stamp of dealer):

If he cannot help you, we are happy to provide help solving your problem:

Weatherdock AG
Emmericher Strasse 17
90411 Nürnberg
Tel: +49 911-37 66 38 30
support@weatherdock.de
www.easyAIS.de

Please do not send an apparently defective device to us without prior consultation. In most cases the problem can be solved via telephone or email.

12 Licensee agreement

By using the easyTRX3 you agree to be bound by the conditions of the following warranty. Please read this carefully.

Weatherdock AG grants you a limited license to use this device in normal operation. Titles, property rights as well as intellectual property rights contained in and of the software remaining Weatherdock AG.

13 Warranty

Weatherdock AG grants a warranty of 2 years from the date of purchase for defects in material or workmanship of this product. Within this period Weatherdock will at its sole option repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. The warranties and remedies contained herein are exclusive and instead of all other warranties express or implied or statutory, including any liability arising under any warranty of merchantability or fitness for a particular purpose, statutory or otherwise. In no event shall Weatherdock be liable for any incidental, special, indirect or consequential damages, whether resulting from the use, misuse or inability to use this product or from defects in the product. 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 breach of warranty.

Products purchased in online-auctions do not entitle you to deductions or to the use of Weatherdock's special offers. Furthermore we do not accept purchase confirmations from online auctions as evidence for warranty claims. An original receipt is compulsory for satisfaction of warranty claims. Weatherdock does not replace missing device or accessory parts in products which were purchased in online auctions. In a warranty case please contact your Weatherdock dealer. He will agree on the next steps with you. In the case of dispatch pack up the device properly and send it sufficiently stamped to the address stated by your dealer. For warranty repair always enclose a copy of your original sales receipt for evidence of ownership. The Weatherdock AG easyTRX3 does not contain parts which have to be repaired. If you have a problem with your device, please contact your easyTRX3 dealer. Any attempt to open, alter or modify the device will invalidate warranty and may damage the device irreparably.

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