



AIS Aid to Navigation Transceiver (AtoN) – Type3 & Type1 User Guide

V4.0

June 2026

English

Document-ID: A20026_Manual_v_EN



1 Additions According to DIN EN IEC/IEEE 82079-1

1.1 Information Management Process

The creation, maintenance, and updating of this manual follow a defined information management process. This includes analysis of user needs, structured information gathering, quality assurance through reviews, and regular updates in case of product changes.

1.2 Target Audience Analysis

These instructions are intended exclusively for technically trained personnel authorised by the relevant maritime and shipping authorities.

The following knowledge is required:

- In-depth knowledge of AIS (Automatic Identification System) and how it works in a maritime environment.
- Experience with the installation of maritime electronics and antenna systems.
- Basic knowledge of electrical installation on board ships or on navigation marks (12/24V DC).
- Familiarity with local and international regulations for radio communication and aids to navigation.
- Confident use of PC software for configuring technical devices.

Persons without these qualifications are not permitted to install or configure the device.

1.3 Safety Information Clarification

Signal words such as WARNING indicate safety-related instructions. These are used in accordance with ISO 3864-2 to highlight potential hazards and ensure user safety.

1.4 Author Competence

This manual was created by qualified technical writers with expertise in AIS systems and technical documentation in accordance with DIN EN IEC/IEEE 82079-1.

1.5 Media and Layout Considerations

This manual was designed with readability and visual clarity in mind. Font sizes and contrast were selected to ensure legibility under various lighting conditions.

1.6 Structural Navigation

To improve navigation, consistent headings and internal references (e.g., 'see Chapter 10.3') are used throughout the document.

2 Safety instructions in accordance with the Product Safety Act

Please read these instructions carefully before operating the device.

2.1 Intended use

The easyAtoN device is intended exclusively for use as AIS Aids to Navigation (AtoN) in accordance with IEC standards. Any other use is considered improper and may cause hazards.

2.2 Installation and operation

- Installation may only be carried out by qualified personnel.
- Ensure that the power supply and cabling comply with the technical specifications.
- Avoid operating the device in a damaged condition or with unauthorised accessories.

2.3 Safety risks

- Incorrect installation or improper configuration can lead to failures in the position display or to incorrect representations in the electronic nautical chart.
- The device must not be opened or modified – risk of malfunction and loss of approval.
- The device is dust and water resistant (IP67). Permanent underwater installation is not permitted.

2.4 What to do in the event of a malfunction

- If you suspect a malfunction, take the device out of service immediately.
- Contact your dealer or the manufacturer immediately.
- Do not continue to operate the device if safety-related functions are impaired.

2.5 Product safety and recall

The manufacturer continuously monitors the safety of the devices. If risks become known after the devices have been placed on the market, users will be informed immediately. Necessary measures (e.g. updates, repairs, replacements) will be provided free of charge and in a timely manner.

3 Identification of the information for use

3.1 Purpose and Intended Use

The easyTRX3 AtoN Type 3 is designed as an **Aid to Navigation (AtoN) transceiver** for use in maritime environments, according to IEC 62320-2:2017.

It is intended for the transmission and reception of AIS data to mark navigational hazards, aquaculture facilities, or fixed marine structures.

Intended users are trained marine personnel, technicians authorised by maritime authorities, and other professionals with knowledge of AIS installation and operation.

The device must not be used:

- As a primary navigation device for vessels.
- In environments outside the specified operating temperature and environmental conditions.
- Without a valid MMSI assigned by the competent authority.
- Without adherence to local radio communication regulations.

3.2 Misuse

Any use of this product other than that described under "Purpose and Intended Use" is considered improper. The manufacturer accepts no liability for any damage resulting from such use.

Examples of misuse include:

- Connection to non-approved antennas or power sources.
- Operation without required licenses or authority permissions.
- Modification of hardware or software without written approval from the manufacturer.

3.3 Transport and Storage

- Always transport the device in its original packaging or equivalent protective packaging.
- Store in a dry, dust-free environment within the storage temperature range: -20 °C to +75 °C.
- Protect from mechanical shock and strong electromagnetic fields during transport and storage.

Commissioning

Follow the installation instructions in this manual step-by-step. Do not connect the device to the power supply until all cables and antennas are correctly installed.

Decommissioning

Disconnect the power supply and all connected antennas. Remove the device from its mounting location and store or dispose of according to local regulations.

Disposal

This device must not be disposed of with household waste. Dispose of the product at an authorised collection point for the recycling of electrical and electronic equipment in accordance with Directive 2012/19/EU (WEEE) and local environmental regulations.

3.4 Use

Commissioning

Follow the installation instructions in this manual step by step. Do not connect the unit to the mains power supply until all cables and antennas have been correctly installed.

Decommissioning

Disconnect the unit from the mains power supply and all connected antennas. Remove the unit from its mounting location and store or dispose of it in accordance with local regulations.

Disposal

This appliance must not be disposed of with household waste. Please dispose of the product at an authorised collection point for the recycling of electrical and electronic equipment in accordance with Directive 2012/19/EU (WEEE) and local environmental regulations.

4 ⚠ Warnings

• ⚠ WARNING - 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.

• ⚠ WARNING - Safety

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 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.

• ⚠ WARNING - RF Exposure

Danger: Exceeding permissible RF field strengths near the antenna.

Possible consequences: Health hazards due to RF exposure.

Prevention: Maintain a distance of ≥ 0.80 m from the VHF antenna during transmission; do not install the antenna near people; installation only by qualified personnel.

Target group: Installation/service personnel.

Reference: Installation section 12.1/12.3.

- **⚠ WARNING – Lightning strike**

Danger: Device destruction/fire due to lightning currents.

Possible consequences: Failure of the AtoN function, fire.

Prevention: Install approved lightning protection between the VHF antenna and the device; follow local standards.

Target group: Installation/service personnel.

- **⚠ WARNING - 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 AtoN aquaculture.

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 instructions included contain information on how to verify the correct programming.

5 References

Product category

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

Revision Level

Stand 1.0, Autor: Jürgen Zimmermann (CTO), Michael Knipp (Head of Marketing), 03/2020

Stand 1.1, Autor: Jürgen Zimmermann (CTO), Max Schuster (Head of Service), 02/2021

Stand 3.1, Autor: Jürgen Zimmermann (CTO), Michael Knipp (Head of Marketing), , 08/2025

Stand 4.0, Autor: Jürgen Zimmermann (CTO), Michael Knipp (Head of Marketing), 06/2026

Restrictions

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

6 Explanation of terminology / Index of Abbreviations

Terms such as AIS, GNSS, and MMSI are used throughout this manual. AIS refers to Automatic Identification System, GNSS to Global Navigation Satellite System, and MMSI to Maritime Mobile Service Identity.

Abbreviations

AIS	Automatic Identification System
CPA	Closest point of approach
LAN	Local area network
MMSI	Maritime Mobile Service Identity
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

7 Pictures/Sketches Overview

Figure 1 - scope of delivery.....	11
Figure 2 - AIS general overview.....	14
Figure 3 - AtoN supported messages	17
Figure 4 - easyAtoN - connectors and plugs	18
Figure 5 - easyAtoN drilling mask.....	19
Figure 6 - power and interface connectors.....	20
Figure 7 - AtoN type of marks.....	22
Figure 8 - Programming Software screen	24
Figure 9 - Device Settings.....	25
Figure 10 - Terminal Tab	32
Figure 11 - Command Tab.....	33
Figure 12 - Diagnostics Tab	34
Figure 13 - Telegram Monitor Tab.....	35
Figure 14 - technical data.....	37

8 Table of Symbols

Symbol	Meaning	Where to find
	Conformité Européenne	label on the box label on the unit
	Warning	Chapter 4 Chapter 13
	WEEE (Waste of Electrical & Electronical Equipment) separate collection of E-Waste	label on the box
	Electrical Power	Chapter 12

Table of Contents

1	Additions According to DIN EN IEC/IEEE 82079-1	2
1.1	Information Management Process	2
1.2	Target Audience Analysis	2
1.3	Safety Information Clarification	2
1.4	Author Competence	2
1.5	Media and Layout Considerations	2
1.6	Structural Navigation	2
2	Safety instructions in accordance with the Product Safety Act	3
2.1	Intended use	3
2.2	Installation and operation	3
2.3	Safety risks	3
2.4	What to do in the event of a malfunction	3
2.5	Product safety and recall	3
3	Identification of the information for use	4
3.1	Purpose and Intended Use	4
3.2	Misuse	4
3.3	Transport and Storage	4
3.4	Use	5
4	 Warnings	5
5	References	6
6	Explanation of terminology / Index of Abbreviations	6
7	Pictures/Sketches Overview	7
8	Table of Symbols	8
9	Scope of delivery	11
10	Additional Equipment	12
11	Controls, Connectors & Plugs	12
12	Introduction	12
12.1	General Information about AIS	12
12.2	AtoN general system overview	14
12.2.1	real AtoN	15
12.2.2	synthetic AtoN	15
12.2.3	virtual AtoN	16
12.3	Type 1 AIS AtoN	16
12.4	Type 3 AIS AtoN	16
12.5	GNSS Systems	16
12.6	AIS messages supported	17

12.7	Default Reporting intervals are:.....	17
12.8	Virtual AtoN.....	17
13	Installation	18
13.1	Mounting	18
13.2	VHF Antenna	19
13.3	easyAtoN connectors / Interfaces	20
13.4	Power and transceiver interface connector	20
13.5	Power connecting	21
14	Configuration / Programming	21
14.1	AtoN type of marks offshore.....	21
14.2	AtoN type of marks inland waterways	22
14.3	Installation Software.....	23
14.4	Programing & Configuration Tool	24
14.4.1	Message IDs	28
14.4.2	RATDMA	28
14.4.3	FATDMA.....	28
14.4.4	Timeslots/Channels/Length	29
14.4.5	UTC Start Times	29
14.4.5.1	UTC Start Hour.....	29
14.4.5.2	UTC Start Minute.....	29
14.4.6	Examples	29
14.4.6.1	RATDMA, 1 minute	29
14.4.6.2	RATDMA, 15 minutes.....	30
14.4.6.3	FATDMA, 1 minute	30
14.4.6.4	FATDMA, 15 minutes	31
15	Spec / Technical Data	36
16	Standards	37
16.1	AID – MMSI Configuration	38
16.2	ACF – General Config Command.....	39
16.3	ACG – Extended General AtoN Station Configuration Command	40
16.4	CBR – Configure Broadcast Rates for AIS AtoN Station Message Command	41
16.5	MEB – Message Payload Rebroadcast.....	42
17	Troubleshooting	44
18	Maintenance.....	44
18.1	Cleaning	44
18.2	Decommissioning and Disposal	44
18.2.1	Decommissioning	44
18.2.2	Disposal	45

19	Declaration of conformity	46
20	Contact and support information	47
21	Licensee agreement	47
22	Warranty	48
23	Drilling Mask.....	49
24	Index.....	50

9 Scope of delivery

The package contains:

- (1) easyAtoN unit
- (2) 10-pin cable NMEA0183 + Power
- (3) User manual guide



Figure 1 - scope of delivery

10 Additional Equipment

We recommend the usage of further equipment, which is 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

11 Controls, Connectors & Plugs

Ref.No.	Element/Connector	Function	Page
01	VHF Antenna Connector (N-Type)	Connects to external marine VHF antenna	15
02	Power Connector (Amphenol circular)	Supplies 12/24VDC power	15
03	USB Port	Programming and configuration	15
04	GPS Antenna	Connects to external GPS antenna	15

12 Introduction

12.1 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.

This product is an AIS Aid to Navigation (AtoN) transceiver.

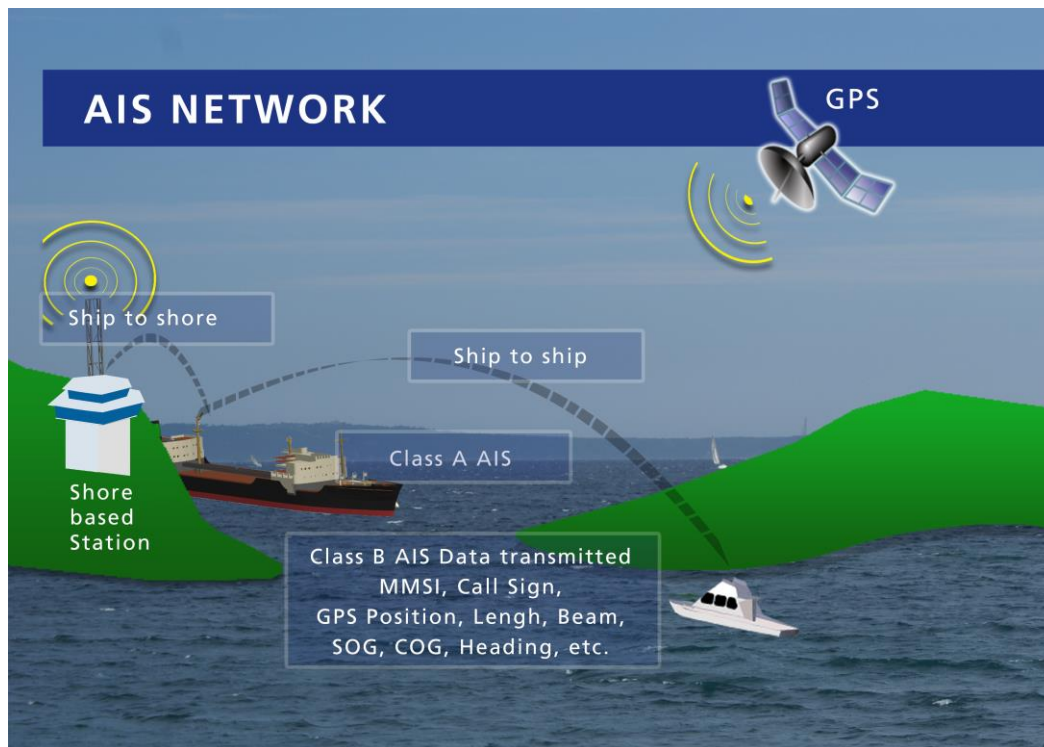


Figure 2 - AIS general overview

12.2 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).

Designed for use in enclosed settings such as equipment cabinets on physical Aids to Navigation structures, this AIS AtoN transceiver is a self-contained unit capable of operating in both Type 1 (transmit-only) and Type 3 (transmit and receive) modes.

An optional radar sensor or light sensor can be connected to extend the device's functionality. Thanks to its exceptionally low power draw, the unit is well suited for floating Aids to Navigation that rely on solar-charged power systems — with the lowest consumption achieved during Type 1 operation, where only position data is transmitted.

Further details on Type 1 and Type 3 operation are provided below.

12.2.1 real AtoN

Types of AtoN

Real AIS AtoN

A physical navigation aid on which an AIS transmitter “easyAtoN-Type3” is mounted and from which AIS messages are sent.



12.2.2 synthetic AtoN

Types of AtoN

Synthetic AIS AtoN

A physical navigation aid without an AIS transmitter, but for which AIS messages are sent from another (usually land-based) location.



12.2.3 virtual AtoN

Types of AtoN

Virtual AIS AtoN

A non-physical navigation aid for which AIS messages are sent from another location.

real view



AIS chart plotter view



12.3 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.

12.4 Type 3 AIS AtoN

An AIS AtoN Type 3 has 'transmission and reception capability' and can therefore use either the FATDMA (Fixed Access Time Division Multiple Access) or RATDMA (Random Access Time Division Multiple Access) access method. The RATDMA procedure enables the AIS AtoN to allocate slots internally for the transmission of AIS messages without reservation from an AIS base station. By default, the AIS reception capability also allows an AIS AtoN Type 3 to repeat certain AIS messages, including AIS SART (Search-And-Rescue Transponder) or AIS messages from other AIS AtoNs, in order to increase their range. One option is 'VDL configuration' for configuration by AIS coastal stations, as well as the 'chaining' of several AIS AtoN stations.

The chaining is not yet implemented in easyAtoN!

The easyAtoN is an AIS Aid to Navigation (AtoN) transceiver and suitable for usage as Type1 or Type3.

12.5 GNSS Systems

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

12.6 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

12.7 Default 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)

12.8 Virtual AtoN

The easyAtoN is able to incorporate virtual AtoN (i.e., transmitter location is different from the AtoN position). Up to 31 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).

13 Installation

Follow the installation instructions step by step. Do not connect the device to the power supply until all cables and antennas have been installed correctly.

WARNING

Danger from high-frequency electromagnetic radiation during operation, the VHF antenna connected to the device emits electromagnetic radiation. Exposure in the immediate vicinity may exceed the permissible RF levels and cause damage to health.

- Maintain a minimum distance of 20 cm from the antenna during operation.

WARNING

Damage to the device due to lightning strike A lightning strike to the VHF antenna can destroy the easyAtoN device and pose a fire hazard. ► Install suitable lightning protection between the VHF antenna and the easyAtoN device.

- Follow local regulations and standards for installing lightning protection.

13.1 Mounting

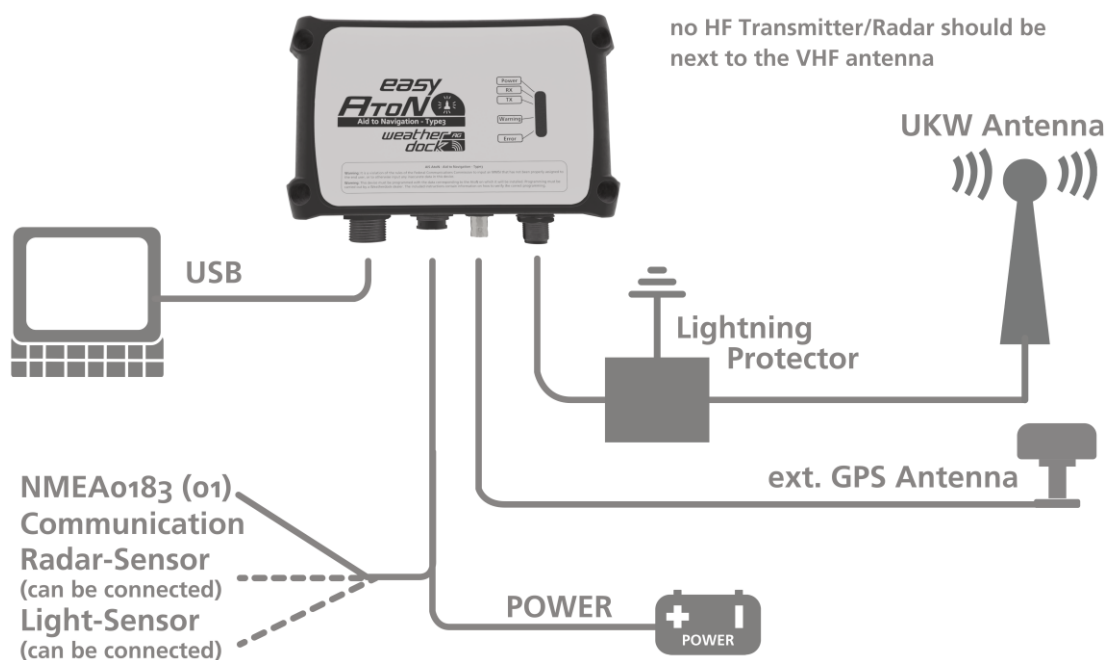
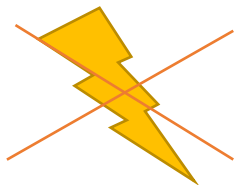


Figure 4 - easyAtoN - connectors and plugs

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!

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.

13.2 VHF Antenna

The VHF antenna should be mounted at a high position on the structure (e.g. a buoy). It should not be mounted parallel to or in front of metal parts, as this would reduce the radiated VHF signal power and reduce the range of the AtoN. Do not mount the antenna in the immediate vicinity of HF transmitters or radar equipment.

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.

13.3 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, 1 NMEA in, 1 NMEA out (RS422 or RS232)
- VHF antenna connector: N female
- GNSS antenna connector: BNC female
- Power supply: Amphenol circular connector

13.4 Power and transceiver interface connector

PIN ID	Signal name	Function and Notes	
1	12VDC / 24VDC	Power	Red
2	Ground '-'	Power	Black
3	NMEA0183 OUT 1P	Communication (Presentation Interface: PI-Port)	White
4	RACON_1	Radar-Sensor (can be connected)	Yellow
5	NMEA0183 OUT 1N	Communication (Presentation Interface: PI-Port)	Green
6	NMEA0183 IN 1P	Communication (Presentation Interface: PI-Port)	Pink
7	NMEA IN 1N	Communication (Presentation Interface: PI-Port)	Brown
8	Light_o	Light-Sensor (can be connected)	Brown/White
9	RACON_o	Radar-Sensor (can be connected)	Red/White
10	Light_1	Light-Sensor (can be connected)	Blue

Figure 5 - power and interface connectors

13.5 Power connecting

- Vessel board net
- Solar Panel (on request)

14 Configuration / Programming

Each AtoN must have its own valid MMSI number as required by law. The easyAtoN device can be easily configured using the programming software via a USB cable from a PC or laptop.

WARNING

Legal consequences of incorrect programming: Programming an MMSI that is not properly assigned to the end user or otherwise programming inaccurate data into the device is a violation of national authority regulations and may result in legal consequences.

- Programming must be performed by an authorised Weatherdock dealer.
- Ensure that all data entered complies with the specifications received from your competent authority.

14.1 AtoN type of marks offshore

- 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 Standard, 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 6 - AtoN type of marks

14.2 AtoN type of marks inland waterways

- 0 Standard, type not specified
- 1 Fairway near the right bank
- 2 Fairway near the left bank
- 3 Crossing on the right bank
- 4 Crossing on the left bank
- 5 Bridge pier
- 6 Overhead power line
- 7 Right side of the fairway
- 8 Left side of the fairway
- 9 Fairway split
- 10 Split channel, pass on the right
- 11 Split channel, pass on the left
- 12 Hazard and navigation obstacle on the right
- 13 Hazard and navigation obstacle on the left
- 14 Mooring on the right-hand side
- 15 Mooring on the left-hand side
- 16 No entry
- 17 No causing of wake
- 18 Limited clearance above water level
- 19 Warning buoy
- 20 Reserved for future use
- 21 Reserved for future use
- 22 Reserved for future use
- 23 Reserved for future use
- 24 Reserved for future use
- 25 Reserved for future use
- 26 Reserved for future use
- 27 Reserved for future use
- 28 Reserved for future use
- 29 Reserved for future use
- 30 Reserved for future use
- 31 Reserved for future use

14.3 Installation Software

easyAtoN Configuration tool should be downloaded from our webpage

https://www.easyais.com/wp-content/uploads/2025/02/SETUP_easyAtoN-Configuration_1-23.zip

This Weatherdock software-Tool is only available for PC using Windows operating system.

The steps to complete the installation are as follows:

- Download the .ZIP file
- Extract the ZIP file on your computer
- Open the new created folder and double click on SETUP easyAtoN Configuration.exe to start the installation process
- Follow on-screen instructions to complete the installation

Following successful installation, the application can be launched from the easyAtoN folder in the Windows start menu.

USB drivers for the transceiver are installed automatically during installation of easyAtoN.

14.4 Programing & Configuration Tool

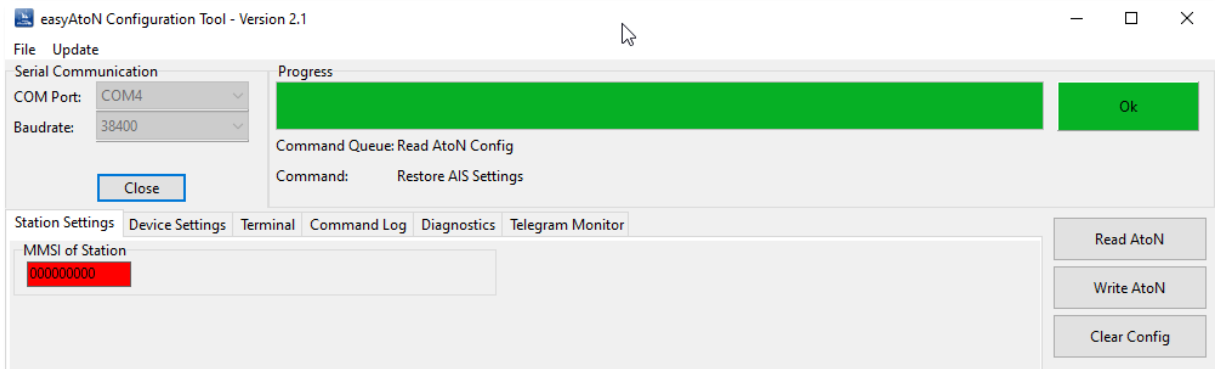
When the easyAtoN is connected to the computer via USB and the prog tool is opened, you will see this starting screen.

Figure 7 - Programming Software screen

You can see that default baud-rate of 38400 Baud is set automatically.

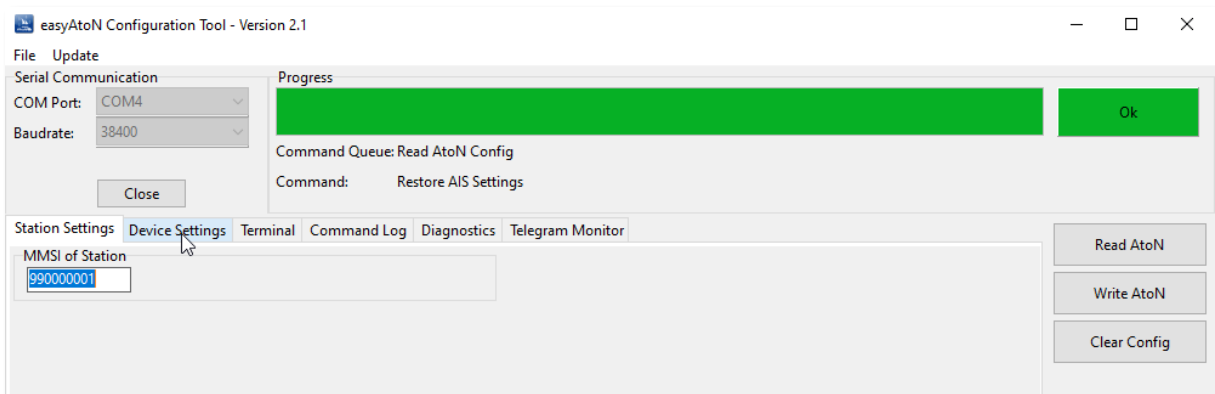
Please select the COM port and maybe switch the Baud rate if needed.

Click on "Open" to start the connection for programming and data exchange.



The connection is OK and established.

First, you must enter the MMSI which is given by your local authority.



Click on the Tab "Device Settings" to continue the process and you will see the next screen.

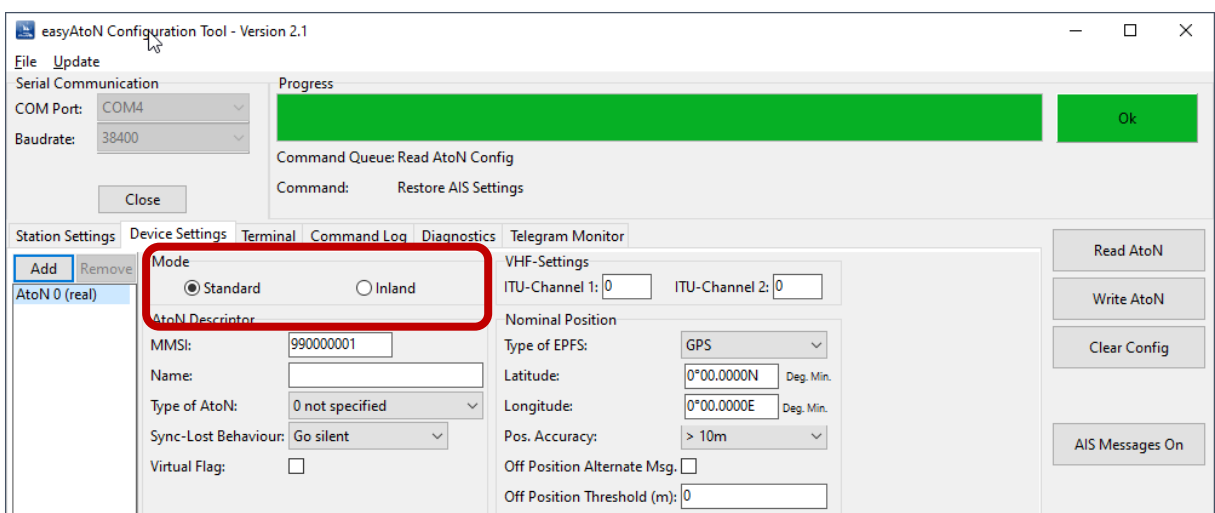
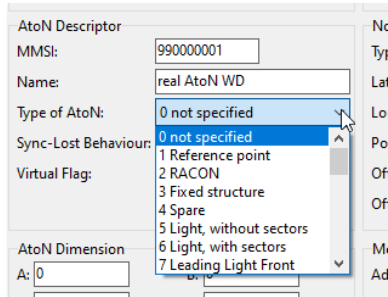


Figure 8 - Device Settings

The first item is set to "real AtoN" automatically with the entered MMSI. You can add the individual name of the AtoN.

You can choose between Standard or Inland settings. Standard settings are for offshore usage. Inland settings are for inland waterway usage.

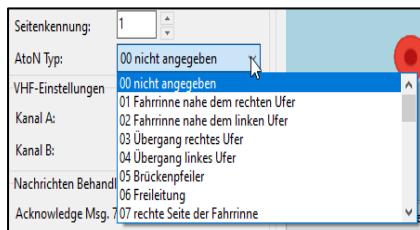
Standard (offshore) settings:



From the drop-down list you can select the right type of AtoN from the following:

- | | |
|---|---------------------------------------|
| 0 not specified | 17 Beacon, Isolated danger |
| 1 Reference point | 18 Beacon, Safe water |
| 2 RACON | 19 Beacon, Special mark |
| 3 Fixed structure | 20 Cardinal Mark N |
| 4 Spare | 21 Cardinal Mark E |
| 5 Light, without sectors | 22 Cardinal Mark S |
| 6 Light, with sectors | 23 Cardinal Mark W |
| 7 Leading Light Front | 24 Port hand Mark |
| 8 Leading Light Rear | 25 Starboard hand Mark |
| 9 Beacon, Cardinal N | 26 Preferred Channel Port hand |
| 10 Beacon, Cardinal E | 27 Preferred Channel Starboard hand |
| 11 Beacon, Cardinal S | 28 Isolated danger |
| 12 Beacon, Cardinal W | 29 Safe Water |
| 13 Beacon, Port hand | 30 Special Mark |
| 14 Beacon, Starboard hand | (<-- only this is used for sea farms) |
| 15 Beacon, Preferred Channel port hand | 31 Light Vessel/LANBY/Rigs |
| 16 Beacon, Preferred Channel starboard hand | |

Inland (waterway) settings:



If you are going for Inland waterway usage, you can select from the drop-down-list the following types of AtoN

- | | |
|--|--|
| 0 Standard, type not specified | 16 No entry |
| 1 Fairway near the right bank | 17 No causing of wake |
| 2 Fairway near the left bank | 18 Limited clearance above water level |
| 3 Crossing on the right bank | 19 Warning buoy |
| 4 Crossing on the left bank | 20 Reserved for future use |
| 5 Bridge pier | 21 Reserved for future use |
| 6 Overhead power line | 22 Reserved for future use |
| 7 Right side of the fairway | 23 Reserved for future use |
| 8 Left side of the fairway | 24 Reserved for future use |
| 9 Fairway split | 25 Reserved for future use |
| 10 Split channel, pass on the right | 26 Reserved for future use |
| 11 Split channel, pass on the left | 27 Reserved for future use |
| 12 Hazard and navigation obstacle on the right | 28 Reserved for future use |
| 13 Hazard and navigation obstacle on the left | 29 Reserved for future use |
| 14 Mooring on the right-hand side | 30 Reserved for future use |
| 15 Mooring on the left-hand side | 31 Reserved for future use |

Mode
☒ Standard ☐ Inland

AtoN Descriptor
MMSI:
Name:
Type of AtoN:
Sync-Lost Behaviour:
Virtual Flag:

For the case that the AtoN will loose connection, you can define the "Sync-Lost Behaviour" of the AtoN.

Select between "Go silent" or "Continue as before", depending on which fits most for your special setup.

VHF-Settings
ITU-Channel 1: ITU-Channel 2:
Nominal Position

Next step is to set on which channels the AtoN must transmit.

For regular AIS channels to have to use 2087 & 2088.

Nominal Position
Type of EPFS:
Latitude: Deg. Min.
Longitude: Deg. Min.
Pos. Accuracy:
Off Position Alternate Msg. ☐
Off Position Threshold (m):

Now it is time to set the nominal position of the AtoN item.

Nominal Position
Type of EPFS:
Latitude:
Longitude: Deg. Min.

If you want to use the internal built-in GNSS receiver for position evaluation, go with the setting "GPS".

If you want to use a surveyed GNSS position, go ahead with "Surveyed" and enter the data for Latitude and Longitude.

Longitude: Deg. Min.
Pos. Accuracy:
Off Position Alternate Msg. ☐
Off Position Threshold (m):

After the position settings, please select the position accuracy (<10m or >10m),

Select if an "Off Position Alternate Message" has to be send out.

Finally, the setup for transmission interval and transmission behaviour has to be designed.

Messages

Msg	Idx	Access	Ch 1-UTC	Ch 1-Slot	Ch 1-Intervall	Ch 2-UTC	Ch 2-Slot	Ch 2-Intervall	
21	0	RATDMA	__:_	-1		__:_	-1		
21	1	RATDMA	__:_	-1		__:_	-1		

By default, AIS message 21 is pre-set for transmission.

Make right settings for RATDMA and/or FATDMA and how to change transmission interval.

Important note

Be aware to make the right settings your local authority gave to you!

It is a violation of the rules of national authorities to use the application to program an MMSI that has not been properly assigned to the end user, or to otherwise program any inaccurate data into the device.

14.4.1 Message IDs

For each AtoN, including virtual AtoNs, you define two message IDs within the programming procedure.

First line (Msg. ID 0): Settings for regular transmission

Second line (Msg. ID 1): Settings how to perform when AtoN has loose its chain and drifts away (further known as "Off-Position"). This is only for real AtoNs because the pre-programmed virtual AtoN position cannot drift.

Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval
21	0	RATDMA	24:01	512	120	24:02	512	120
21	1	RATDMA	24:01	-1	60	24:02	-1	60

14.4.2 RATDMA

Random Access Time Devision Multiple Access

No fix slots, will be decided on its own and by reception of other AIS participants.

RATDMA slot interval is defined within seconds.

The channel interval can be set between 1-86.400 (1 day) seconds, where the value has to be set so, that the telegram is repeated after one day at the exact same second. This is the case if the number of seconds per day are divisible by the interval without rest.

For Example:

$$(24*60*60) / 120 = 720 \rightarrow \text{Ok}$$

$$(24*60*60) / 500 = 172.8 \rightarrow \text{Invalid}$$

14.4.3 FATDMA

Fixed Access Time Devision Multiple Access

Fix timeslot where to send.

This must be defined by your local authority!

FATDMA slot interval is defined within timeslots.

The channel interval can be set between 1-3.240.000 (1 day) slots, where the value has to be set so, that the telegram is repeated after one day at the exact same slot This is the case if the number of slots per day are divisible by the interval without rest.

For Example:

- Interval 1200 Slots: $(24*60*2250) / 1200 = 2700 \rightarrow \text{Ok}$
- Interval 1300 Slots: $(24*60*2250) / 1300 = 2492.31 \rightarrow \text{Invalid}$

14.4.4 Timeslots/Channels/Length

AIS consists of two AIS channels.

This is Channel A (Ch1) with 161.975MHz and Channel B (Ch2) with 162.025MHz.

Each channel has a number of **2250** slots within one minute

(Remember: this is used on **FATDMA**!)

So one slot length is 26 milliseconds (60s / 2250 slots).

e.g. 2 minutes are 4500 timeslots.

14.4.5 UTC Start Times

The channel interval defines the distance between two telegrams on one channel. But it does not define a specific time, when a telegram should be sent. This is done by the UTC Start time and the start slot.

If you see the sending events as a grid over the day, the UTC start time is used to shift the complete grid.

Note : Start time does not mean the first sending event of a telegram. It just defines one sending event in the sending grid of one day.

14.4.5.1 UTC Start Hour

The start hour defines the point of one sending event. Usually, the first sending event per day of a telegram is set here. If the value is set to 24, the hour should be ignored. This is the case, if the sending events are at the same seconds for each hour.

14.4.5.2 UTC Start Minute

The start hour defines the minute of one sending event. Usually, the first sending event per day of a telegram is set here. If the value is set to 60, the minute should be ignored. This is the case, if the sending events are at the same slots/seconds for each minute.

14.4.6 Examples

Following settings are just examples, please contact your local authority for the right settings!

14.4.6.1 RATDMA, 1 minute

Start UTC for channel A (hour:minute): 24:01

Start UTC for channel B (hour:minute): 24:02

Should be given to you by your local authority:

Start slot for channel A: 512

Start slot for channel B: 512

Slot Interval for channel A (seconds): **120**

Slot Interval for channel B (seconds): **120**

- ➔ 2 minutes x 60 seconds = **120** seconds
- ➔ As the messages will transmit alternating on each channel A/B you have a total time of 2 minutes on one channel.
 - 1 Minute: Transmission Channel A

- 2 Minute: Transmission Channel B
- 3 Minute: Transmission Channel A
- ...
- So total time difference between two Channel A messages: **120** seconds!

Result in Configuration-Tool:

Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval
21	0	RATDMA	24:01	512	120	24:02	512	120

14.4.6.2 RATDMA, 15 minutes

Start UTC for channel A (hour:minute): 24:00

Start UTC for channel B (hour:minute): 24:15

Should be given to you by your local authority:

Start slot for channel A: 512

Start slot for channel B: 512

If not available make "-1".

Slot Interval for channel A (seconds): **1800**

Slot Interval for channel B (seconds): **1800**

- ➔ 15 minutes x 60 seconds = **900** seconds
- ➔ As the messages will transmit alternating on each channel A/B you have a total time of 30 minutes on one channel.
 - 0 Minute: Transmission Channel A
 - 15 Minute: Transmission Channel B
 - 30 Minute: Transmission Channel A
 - ...
 - So total time difference between two Channel A messages: **1800** seconds!

Result in Configuration-Tool:

Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval
21	0	FATDMA	24:00	-1	1800	24:15	-1	1800

14.4.6.3 FATDMA, 1 minute

Start UTC for channel A (hour:minute): 24:01

Start UTC for channel B (hour:minute): 24:02

Fixed slot must be given to you by your local authority:

Start slot for channel A: 512

Start slot for channel B: 512

If not available make "-1".

Slot Interval for channel A (timeslots): **4500**

Slot Interval for channel B (timeslots): **4500**

- ➔ 1minute x 2250 slots = **2250** slots
- ➔ Difference to RATMA: slots instead of seconds
- ➔ Same as RATDMA: total time difference 2 minutes (2x2250 timeslots).

Result in Configuration-Tool:

Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval
21	0	FATDMA	24:01	512	4500	24:02	512	4500

14.4.6.4 FATDMA, 15 minutes

Start UTC for channel A (hour:minute): 24:00

Start UTC for channel B (hour:minute): 24:15

Fixed slot must be given to you by your local authority:

Start slot for channel A: 512

Start slot for channel B: 512

If not available make "-1".

Slot Interval for channel A (timeslots): **67500**

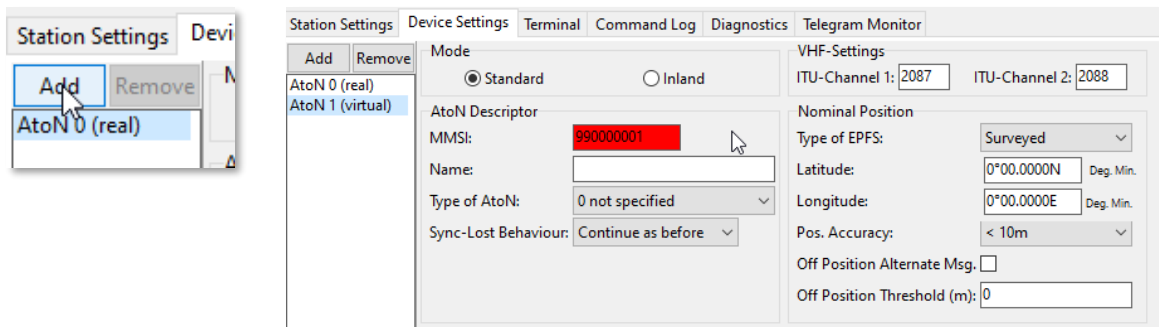
Slot Interval for channel B (timeslots): **67500**

- ➔ 15minutes x 2250 slots = **33750** slots
- ➔ Difference to RATMA: slots instead of seconds
- ➔ Same as RATDMA: total time difference 30 minutes (30 x 2250 timeslots).

Result in Configuration-Tool:

Msg	Idx	Access	Ch1-UTC	Ch1-Slot	Ch1-Interval	Ch2-UTC	Ch2-Slot	Ch2-Interval
21	0	FATDMA	24:00	512	67500	24:15	512	67500

If you want to setup one or more additional virtual/synthetic AtoN items, for continuing just click on "Add" and repeat the steps and do the settings.



The screenshot shows the 'Station Settings' window with the 'Add' button highlighted. Below it, a list shows 'AtoN 0 (real)' and 'AtoN 1 (virtual)'. The 'Device Settings' tab is active, showing 'Mode' set to 'Standard'. The 'AtoN Descriptor' section includes 'MMSI' (990000001), 'Name' (empty), 'Type of AtoN' (0 not specified), and 'Sync-Lost Behaviour' (Continue as before). The 'VHF-Settings' section shows 'ITU-Channel 1' (2087) and 'ITU-Channel 2' (2088). The 'Nominal Position' section includes 'Type of EPFS' (Surveyed), 'Latitude' (0°00.0000N), 'Longitude' (0°00.0000E), 'Pos. Accuracy' (< 10m), and checkboxes for 'Off Position Alternate Msg.' and 'Off Position Threshold (m): 0'.

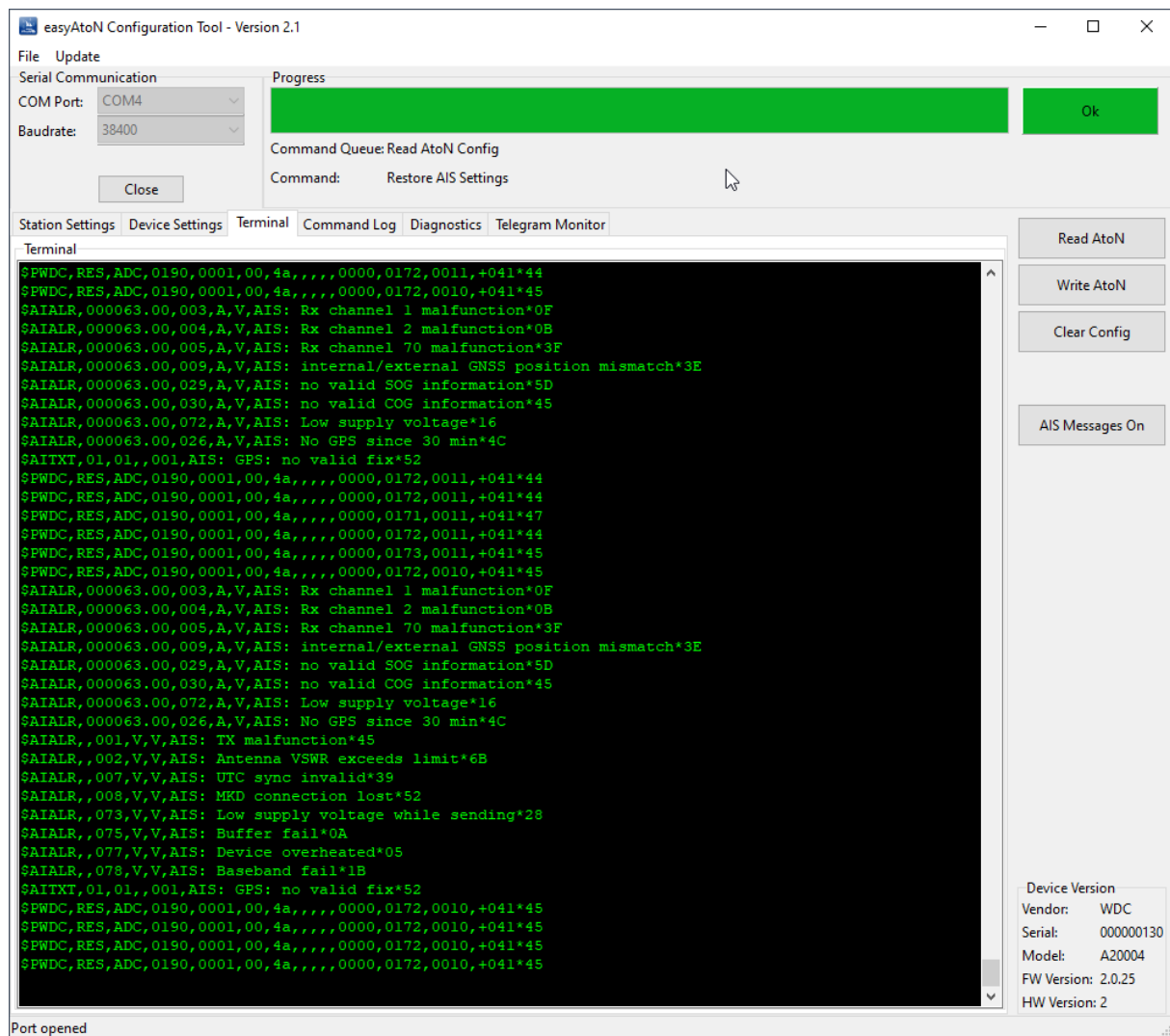


Figure 9 - Terminal Tab

The “Terminal” Tab simply displays the NMEA messages that are sent in and out via USB.

Double-clicking in the terminal pauses the output.

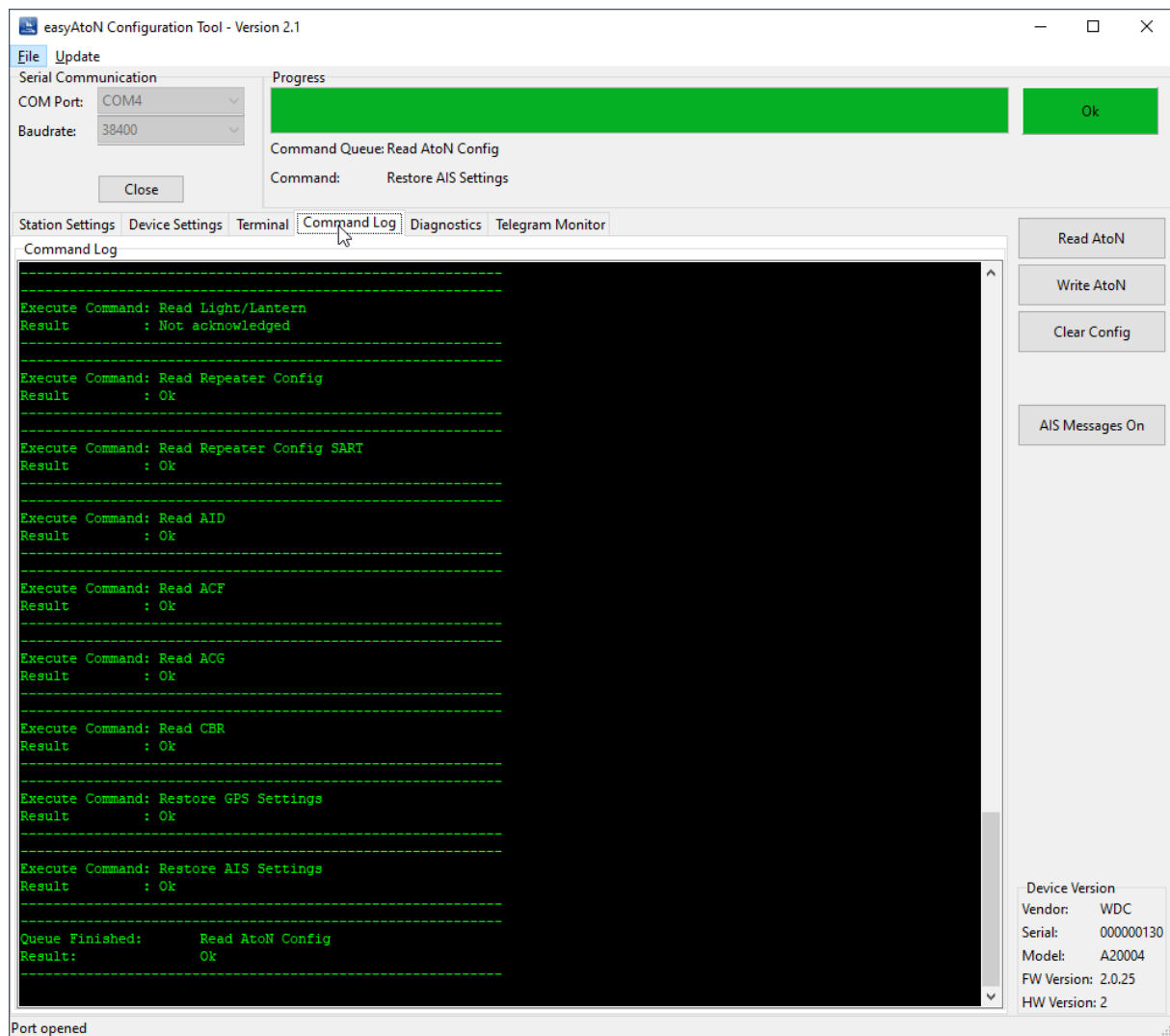


Figure 10 - Command Tab

The tab "Command Log" gives you an overview of all commands which are activated.

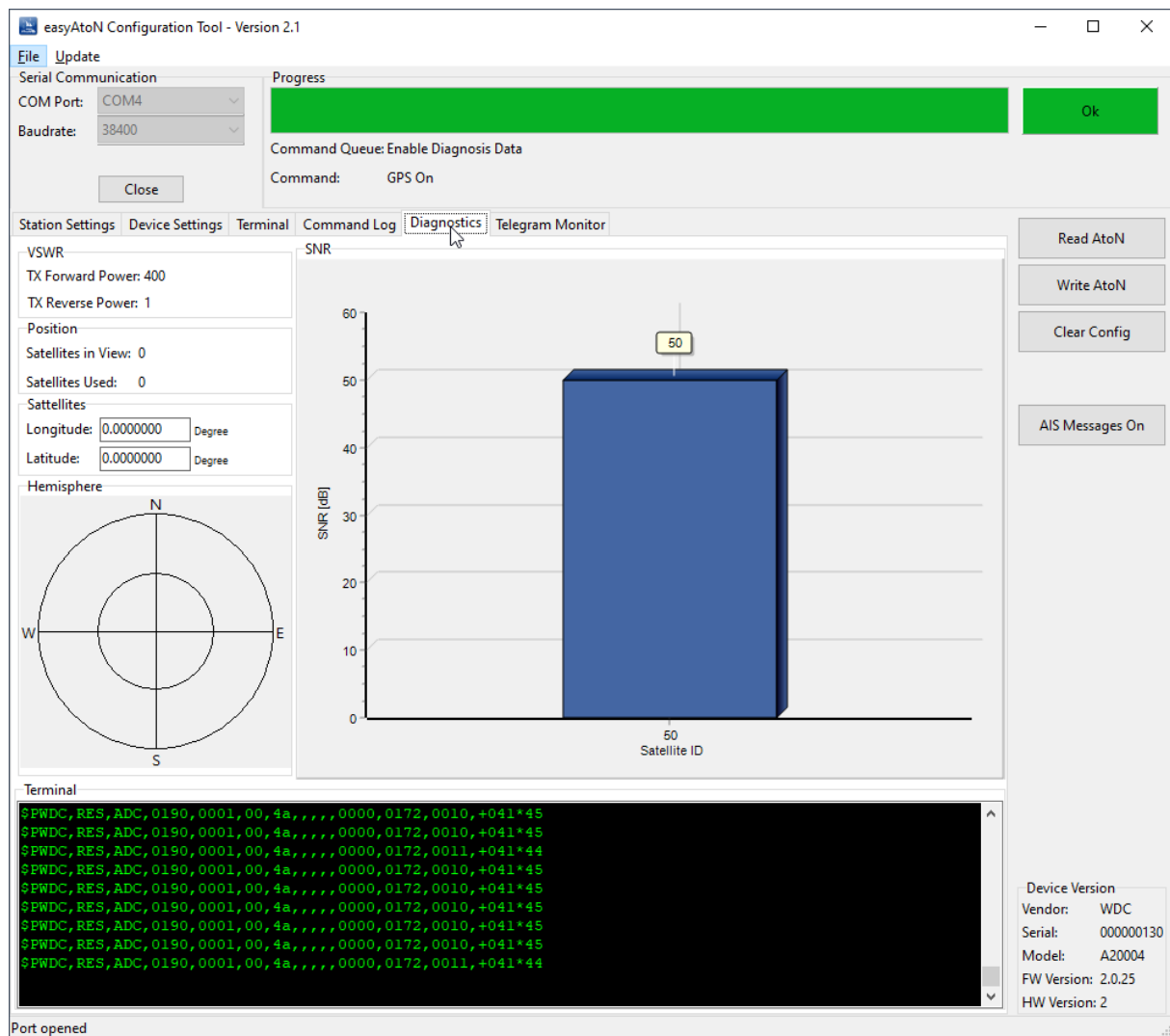


Figure 11 – Diagnostics Tab

The Tab “Diagnostics” gives you an overview of important figures like VSWR Forward & Reverse as well as SAT quality.

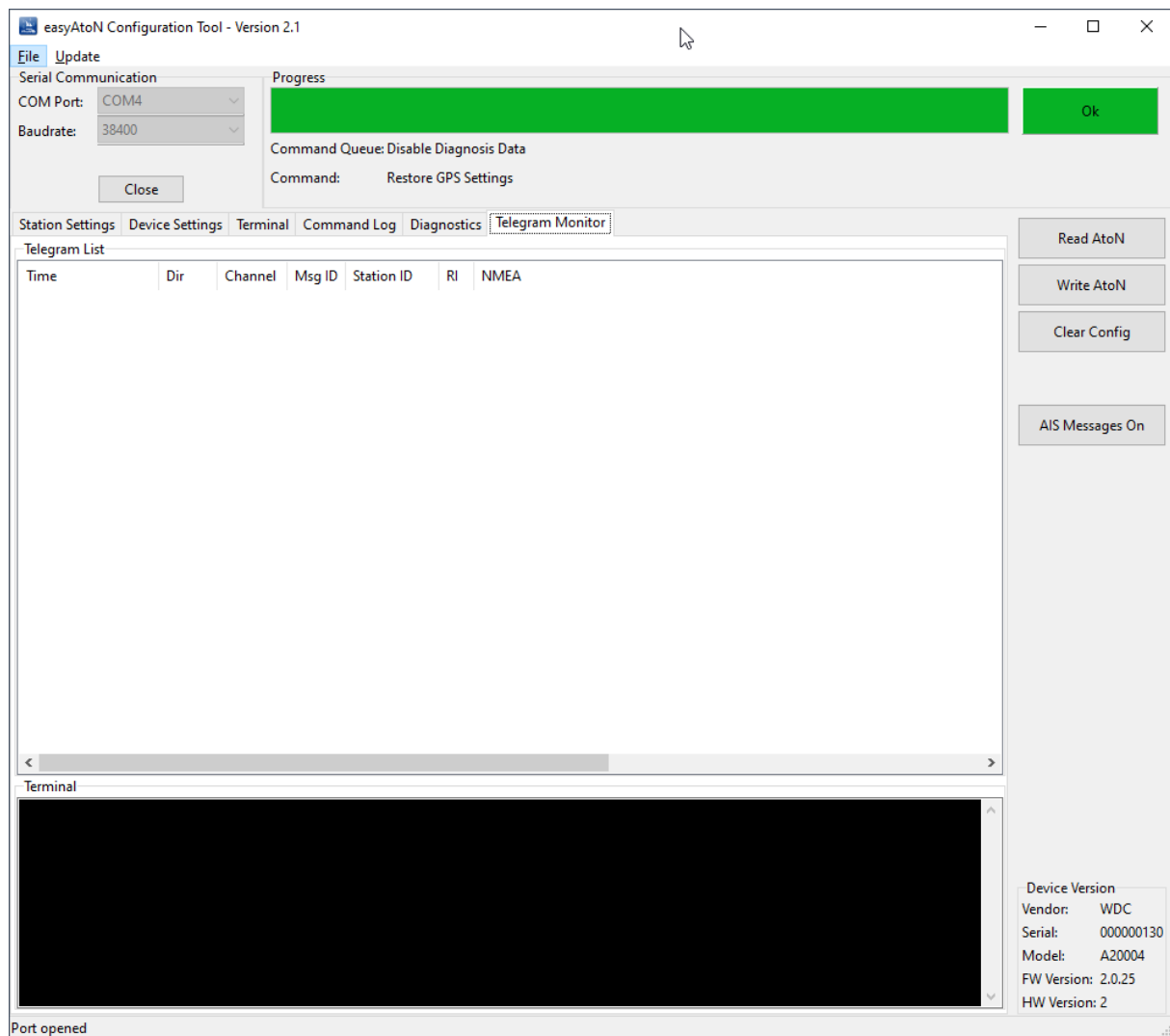
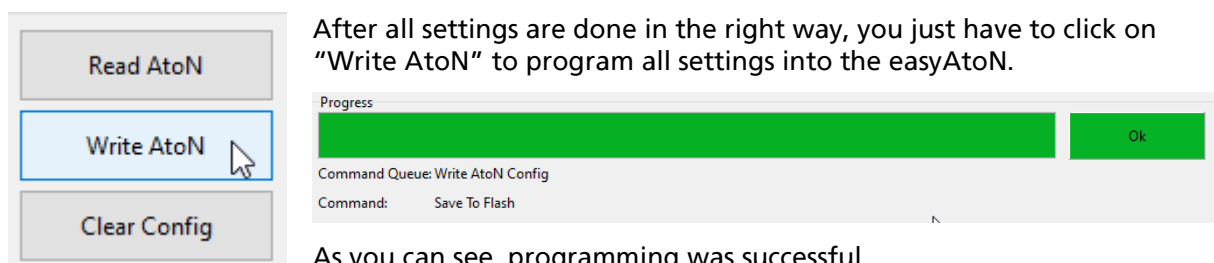


Figure 12 - Telegram Monitor Tab

In the Tab “Telegram Monitor”, the received (RX) or transmitted (TX) data is displayed for each line. Here you also can configure which telegrams have to be send-out from the unit.



As you can see, programming was successful.

15 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	1.5 Ah / 24h @ RATDMA 3 minute cycle
GNSS Specification	
GPS/GNSS Receiver (internal)	99 Channel GNSS Receiver
	GPS, Galileo, Beidou, GLONASS Up to 3 concurrent GNSS constellations
External Connections	
Interfaces	1x NMEA0183 IN
	1x NMEA0183 OUT
	4x Digital IN
Connections (standard version)	USB-C
	10 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 13 - technical data

16 Standards

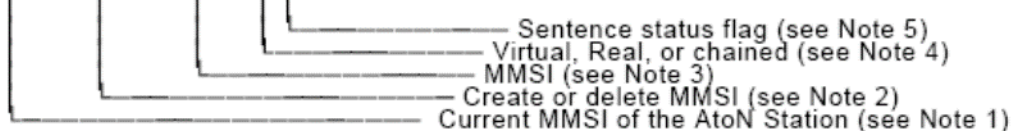
This product complies with all the necessary standards under the European RED directive. The following standards have been followed in pursuance of this:

- 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

16.1 AID – MMSI Configuration

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



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;

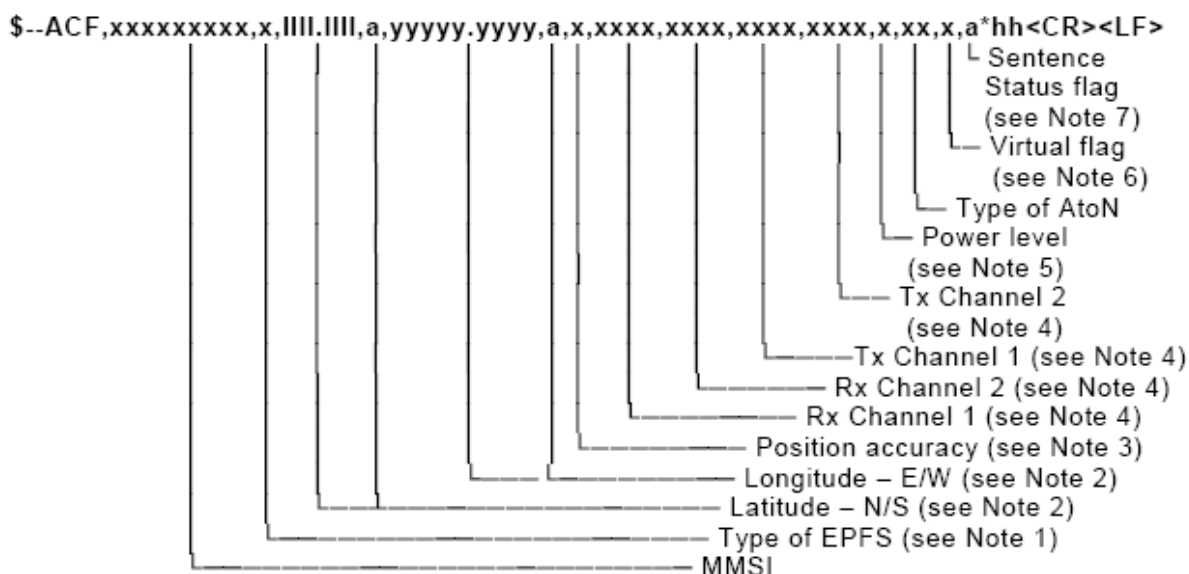
"C" = child AtoN in the chain.

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.

16.2 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).

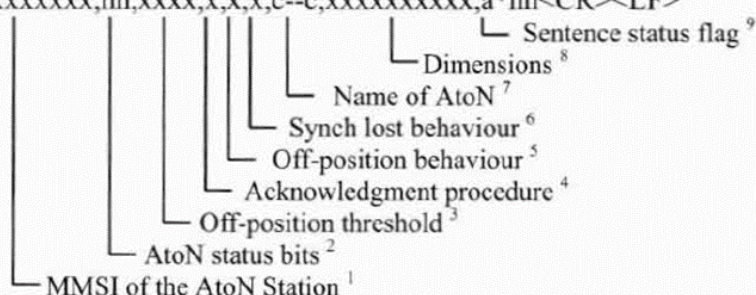
NOTE 7 This field is used to indicate a sentence that is a status report of current settings or a configuration command changing settings. This field should not be null.

"R" = sentence is a query response,

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

16.3 ACG – Extended General AtoN Station Configuration Command

\$--ACG,xxxxxxxx,hh,xxxx,x,x,x,c--c,xxxxxxxxxx,a*hh<CR><LF>



Notes:

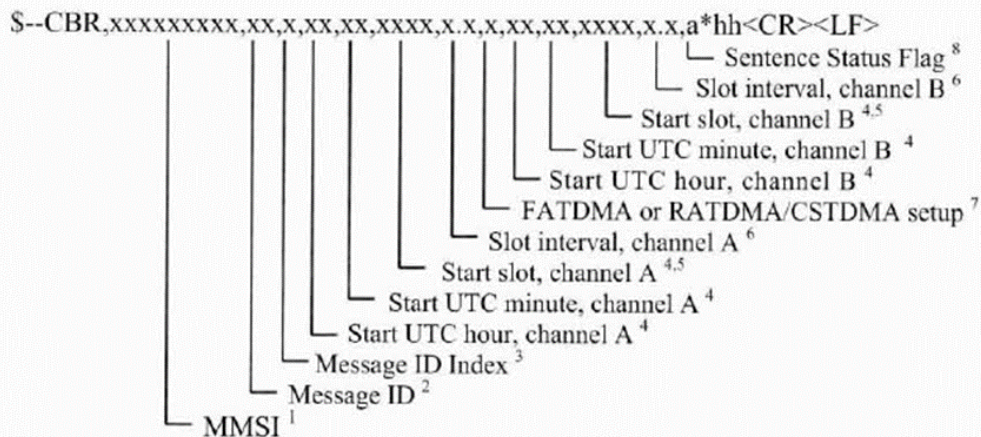
- 1) This sentence should be accepted only if the MMSI matches a previously input MMSI (See AID sentence).
- 2) AtoN Status Bits, Indication of the AtoN Status, default "00 hex": For a Virtual AtoN this field should be 00 hex . The three most significant bits represent the Page ID. (See IEC 62320-2, 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.

16.4 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.

16.5 MEB – Message Payload Rebroadcast

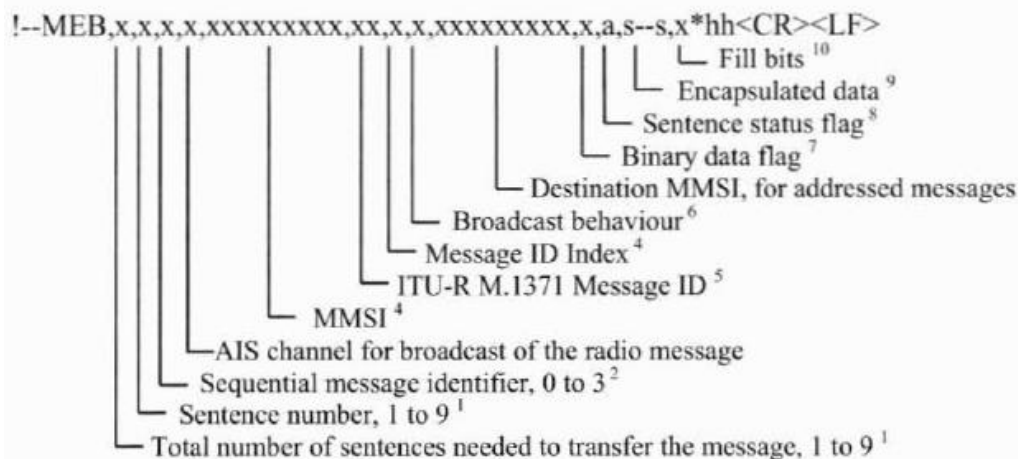
MEB – Message Input for Broadcast, Command

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.

17 Troubleshooting

Symptom	Possible Cause	Remedy
No AIS transmission	VHF Antenna not connected or damaged	Check and secure antenna connection
No GPS position	Poor GPS reception	Move GPS antenna to a location with unobstructed sky view
Programming not possible	Wrong COM port selected	Select correct COM port in configuration software

18 Maintenance

The device is maintenance-free under normal operating conditions. However, regular checks are recommended:

- Check all cable connections and antenna mounts every 6 months for corrosion or damage.
- Check the correct AIS message transmission at least once a year using monitoring software.
- Only update the configuration or firmware with official software versions from the manufacturer.

Repairs may only be carried out by authorised service personnel.

18.1 Cleaning

The housing can be cleaned with a soft, dry or slightly damp cloth if necessary. Do not use aggressive cleaning agents, solvents or abrasives, as these can damage the housing surface. Before cleaning, make sure that the device is disconnected from the power supply.

18.2 Decommissioning and Disposal

18.2.1 Decommissioning

Disconnect the power supply and all connected antennas. Remove the device from its mounting location.

Before storage or disposal, delete all configuration data (MMSI, position data, etc.) using the configuration software to prevent misuse of the data.

Store or dispose of the device in accordance with local regulations.

18.2.2 Disposal

This device must not be disposed of with household waste. Dispose of the product in accordance with Directive 2012/19/EU (WEEE) and local environmental regulations at an authorised collection point for the recycling of electrical and electronic equipment.

If possible, separate different materials (e.g. metal housing, plastic parts, electronic circuit boards) and dispose of them in the appropriate recycling stream.

19 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	• 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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20 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.

21 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.

22 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.

23 Drilling Mask

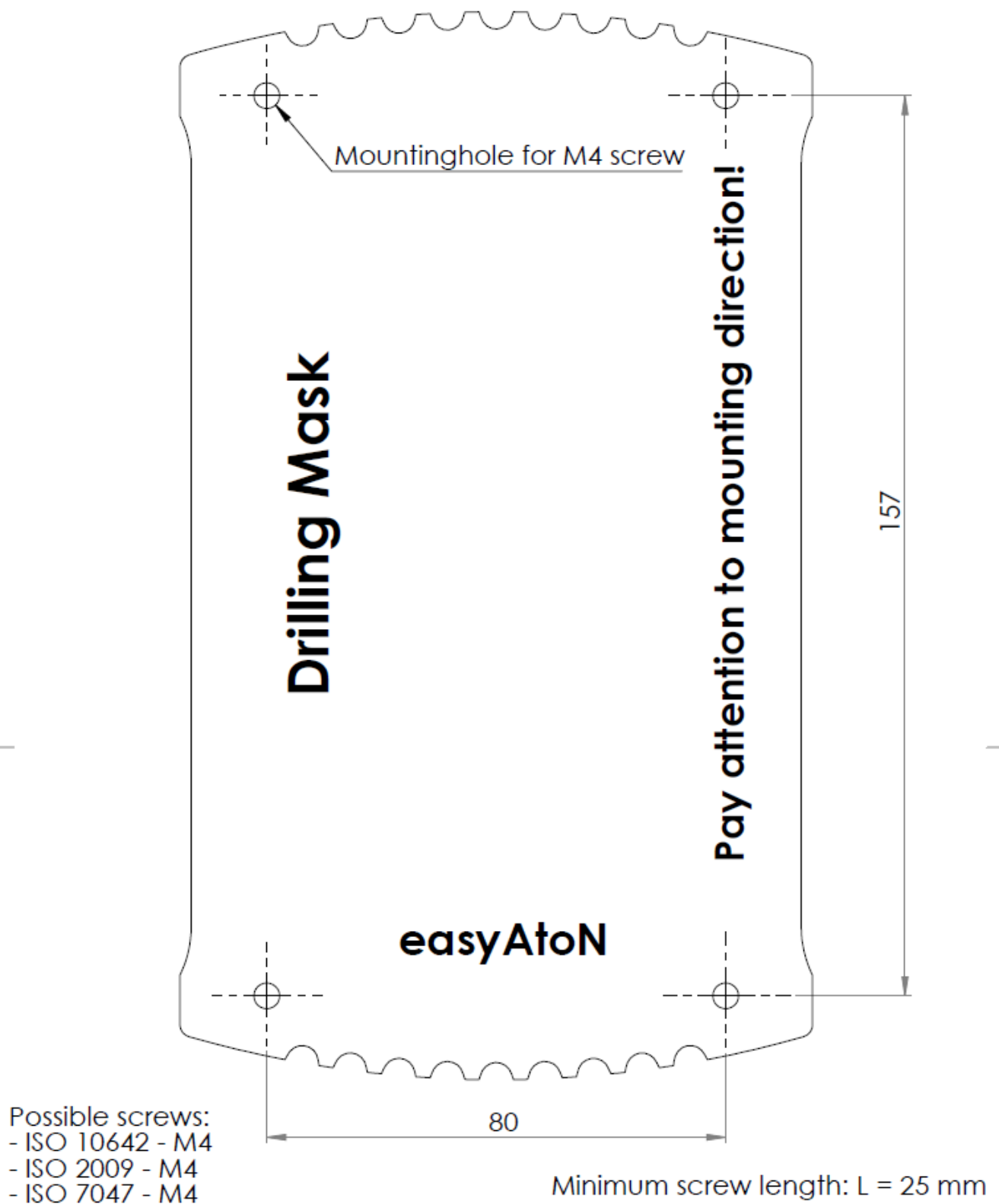


Figure 14 - easyAtoN drilling mask

24 Index

"Command Log"	33	Licensee agreement.....	47
"Diagnostics"	34	Maintenance	44
"Telegram Monitor"	35	MMSI.....	7
According to DIN EN IEC/IEEE 82079-1	2	NMEA.....	7
AIS	7	Operating temperature.....	36
AIS messages supported	17	Operating voltage range	36
AIS Specification	36	Power connecting	21
AtoN type of marks inland waterways	22	Power Specification	36
AtoN type of marks offshore	21	problem	47
Board voltage	36	Product category	6
Certifications	37	Product Safety Act	3
Cleaning	44	Product safety and recall	3
Configuration	21	Programming	21
Connectors & Plugs	12	RATDMA.....	28
CPA	7	References.....	6
Current consumption	36	Reporting intervals	17
Data type NMEA output	36	RX only	37
Declaration of conformity	46	Safety distance compass.....	36
Decommissioning	44	Scope of delivery	11
Dimensions	36	Sensitivity	37
Disposal	45	Software	23
Drilling Mask	49	SSID	7
External Connections	36	Standards	37
FAQ.....	47	Storage temperature.....	36
FATDMA.....	28	support	47
Frequencies	37	Technical Data	36
GNSS	7, 36	Terminal	32
GNSS Specification	36	Transmission Power	37
GPS/GNSS Receiver	36	Transport and Storage	4
HDOP.....	7	Troubleshooting	44
Index of Abbreviations	7	Type3 AIS AtoN	16
information for use	4	VHF	7
Input.....	36	VHF Antenna.....	19
Installation	18	VSWR	7
interface connector	20	Warnings	5
Interfaces	20, 36	Warranty	48
Introduction.....	12	Weight.....	36
LAN.....	7	WiFi.....	7

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