

NAVIOM

AIS



Installation Instructions

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Chapter 1: Important information

Product installation and operation

Ensure safe effective use of the product.

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.



Warning: Potential ignition source

This product is NOT approved for use in hazardous/flammable atmospheres. Do NOT install in a hazardous/flammable atmosphere (such as in an engine room or near fuel tanks).

Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized dealers. Unauthorized repair may affect your warranty.

RF safety notice

RF radiation statement

AIS **transceivers** generate and radiate radio frequency (RF) electromagnetic energy (EME).

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio / TV technician for help.



Warning: FCC Warning (Part 15.21)

Changes or modifications to this equipment could violate compliance with FCC rules and void the user's authority to operate the equipment.

Industry Canada

This device complies with Industry Canada License-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian ICES-003.

Industry Canada (Français)

Cet appareil est conforme aux normes d'exemption de licence RSS d'Industry Canada. Son fonctionnement est soumis aux deux conditions suivantes:

1. cet appareil ne doit pas causer d'interférence, et
2. cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Declaration of conformity

Naviom Electronics® declares that this product is compliant with the essential requirements of Radio Equipment Directive 2014/53/EU.

AIS disclaimer

All information presented by the Naviom AIS is advisory only, as there is a risk of incomplete and erroneous information. By placing this product into service you acknowledge this and assume complete responsibility for any associated risks, and accordingly release Naviom Electronics® from any and all claims arising from the use of the AIS service.

Disclaimer

Naviom Electronics® does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Naviom Electronics®.

Naviom Electronics® is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

Product disposal

Dispose of this product in accordance with the WEEE Directive.



The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment.

Technical accuracy

Technical accuracy disclaimer

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Naviom Electronics® cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Naviom Electronics® cannot accept liability for any differences between the product and this document.

Chapter 2: Document and product information

21 Applicable products

This document is applicable to the following products:

Name	Description
NAVIOM AIS	The NAVIOM AIS is a Class B AIS transceiver, used to display real-time information on local vessels, land based stations or aids to navigation that are equipped with either Class A or Class B AIS transceivers.

22 Parts supplied

	Description	Quantity
1	NAVIOM AIS	1
2	Universal M12 8-pin connector	1
3	Screwdriver for connector	1
4	Cap for M12 connector	1
5	2A waterproof fuse	1
6	Stainless fixing screws 4x12mm	2



Warning: Potential ignition source

This product is NOT approved for use in hazardous/flammable atmospheres. Do NOT install in a hazardous/flammable atmosphere (such as in an engine room or near fuel tanks).

3.1 Selecting a location

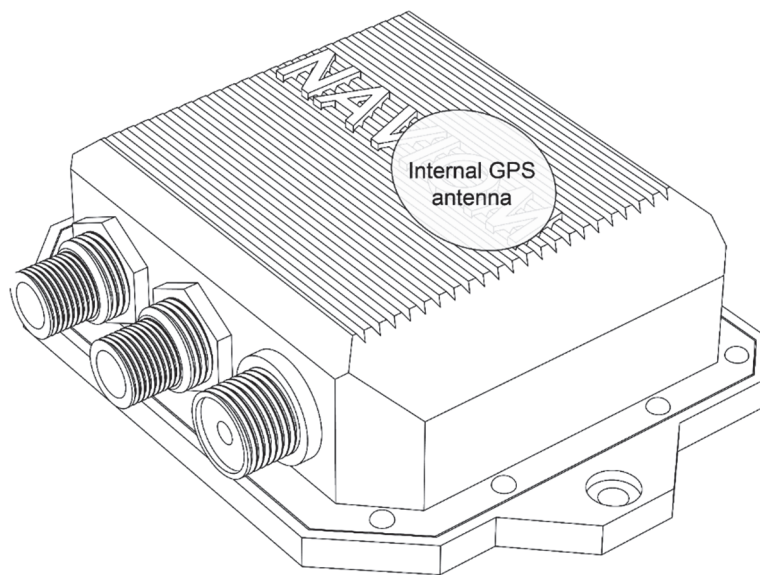
General location requirements

When selecting a location for your NAVIOM AIS it is important to consider a number of factors.

- **GPS Signal Access** - Open and clear of metal obstructions that could block line-of-sight to the sky. Can be placed placement behind plastic and wooden structures that do not impede the spread of the radio signal.
- **Wi-Fi signal access** - Place NAVIOM AIS not further than 10m (30 feet) from your Wi-Fi router or the place where you will connect to the device via Wi-Fi. There should be no large metal structures between the device and the Wi-Fi router, that shield the radio signal.
- **Water ingress** —Although the NAVIOM AIS is waterproof, it is good practice to locate it in a protected area away from prolonged and direct exposure to rain and salt spray.
- **Ventilation** — To ensure adequate airflow:
 - Ensure that NAVIOM AIS is mounted in a compartment of suitable size.
 - Ensure that ventilation holes are not obstructed. Allow adequate separation of all equipment.
- **Electrical interference** — Select a location that is far enough away from devices that may cause interference, such as motors, generators and radio transmitters / receivers.
- **Power supply** — Select a location that is as close as possible to the vessel's DC power source. This will help to keep cable runs to a minimum.
- **Diagnostics** — The NAVIOM AIS must be mounted in a location where diagnostics LED are easily visible.
- **Mounting surface** — Ensure the NAVIOM AIS is adequately supported on a secure surface. Do not mount units or cut holes in places which may damage the structure of the vessel.
- **Cabling** — Ensure the NAVIOM AIS is mounted in a location which allows proper routing, support and connection of cables:
 - Minimum bend radius of 100 mm (3.94 in) unless otherwise stated.
 - Use cable clips to prevent stress on connectors.
 - If your installation requires multiple ferrites to be added to a cable then additional cable clips should be used to ensure the extra weight of the cable is supported.

GPS antenna location requirements

The NAVIOM AIS includes a built-in GPS receiver and a built-in GPS antenna. GPS antenna is installed under the NAVIOM AIS lid indicated on the picture.



Important: The device should be placed either vertically or horizontally with a lid NAVIOM up (as shown on the picture). It is not allowed to mount the device with the lid NAVIOM down, in this case the GPS antenna will not be able to receive the signal from the GPS satellites.

Ensure that the selected mounting location is:

- Open and clear all metal obstructions that could block line-of-sight to the sky. Can be placed only behind plastic and wooden structures, that do not impede the transmission of the radio signal.
- As low as possible, to keep the antenna as stable as possible. The more stable the antenna, the more effectively it will track satellites and provide stable data.
- As far as possible (at least 1 m (3 ft)) from other antennae and electronic equipment.

Do NOT mount the antenna:

- In any area where it could be stepped on or tripped over.
- Up a mast. This will cause the antenna to swing and give significant errors in position data.
- In the direct path of a Radar beam.

EMC installation guidelines

Naviom Electronics® equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations, to minimize electromagnetic interference between equipment and minimize the effect such interference could have on the performance of your system

Correct installation is required to ensure that EMC performance is not compromised.

Note: In areas of extreme EMC interference, some slight interference may be noticed. Where this occurs the NAVIOM AIS and the source of the interference should be separated by a greater distance.

For optimum EMC performance we recommend that wherever possible:

- Naviom Electronics® equipment and cables connected to it are:
 - At least 1 m (3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (7 ft).
 - More than 2 m (7 ft) from the path of a Radar beam. A Radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The NAVIOM AIS is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.

- Naviom Electronics® specified cables are used.

Note: Where constraints on the installation prevent any of the above recommendations, always ensure the maximum possible separation between different items of electrical equipment, to provide the best conditions for EMC performance throughout the installation

Suppression ferrites

- Use data cables with pre-fitted or supplied with suppression ferrites. These are important for correct EMC performance. If ferrites are supplied separately to the cables (i.e. not pre-fitted), you must fit the supplied ferrites, using the supplied instructions.
- If a ferrite has to be removed for any purpose (e.g. installation or maintenance), it must be replaced in the original position before the product is used.
- Where an installation requires multiple ferrites to be added to a cable, additional cable clips should be used to prevent stress on the connectors due to the extra weight of the ferrites.

RF interference

Certain third-party external electrical equipment can cause Radio Frequency (RF) interference with GPS, AIS or VHF devices if the external equipment is not adequately insulated and emits excessive levels of electromagnetic interference (EMI).

Some common examples of such external equipment include LED spot or strip lights, and terrestrial TV tuners.

To minimize interference from such equipment:

- Keep it as far away from GPS, AIS or VHF devices as possible.
- Ensure that any power cables for external equipment are not entangled with the power or data cables for GPS, AIS or VHF devices.
- Consider fitting one or more high frequency suppression ferrites to the EMI-emitting device. The ferrite(s) should be rated to be effective in the range 100 MHz to 2.5 GHz, and should be fitted to the power cable and any other cables exiting the EMI-emitting device, as close as possible to the position where the cable exits the device.

Compass safe distance

To prevent potential interference with the vessel's magnetic compasses, ensure an adequate distance is maintained from the NAVIOM AIS.

When choosing a suitable location for the NAVIOM AIS you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3 ft) in all directions.

However for some smaller vessels it may not be possible to locate the NAVIOM AIS this far away from a compass. In this situation, when choosing the installation location, ensure that the compass is not affected by the NAVIOM AIS when it is in a powered state.

32 Mounting the NAVIOM AIS

Important:

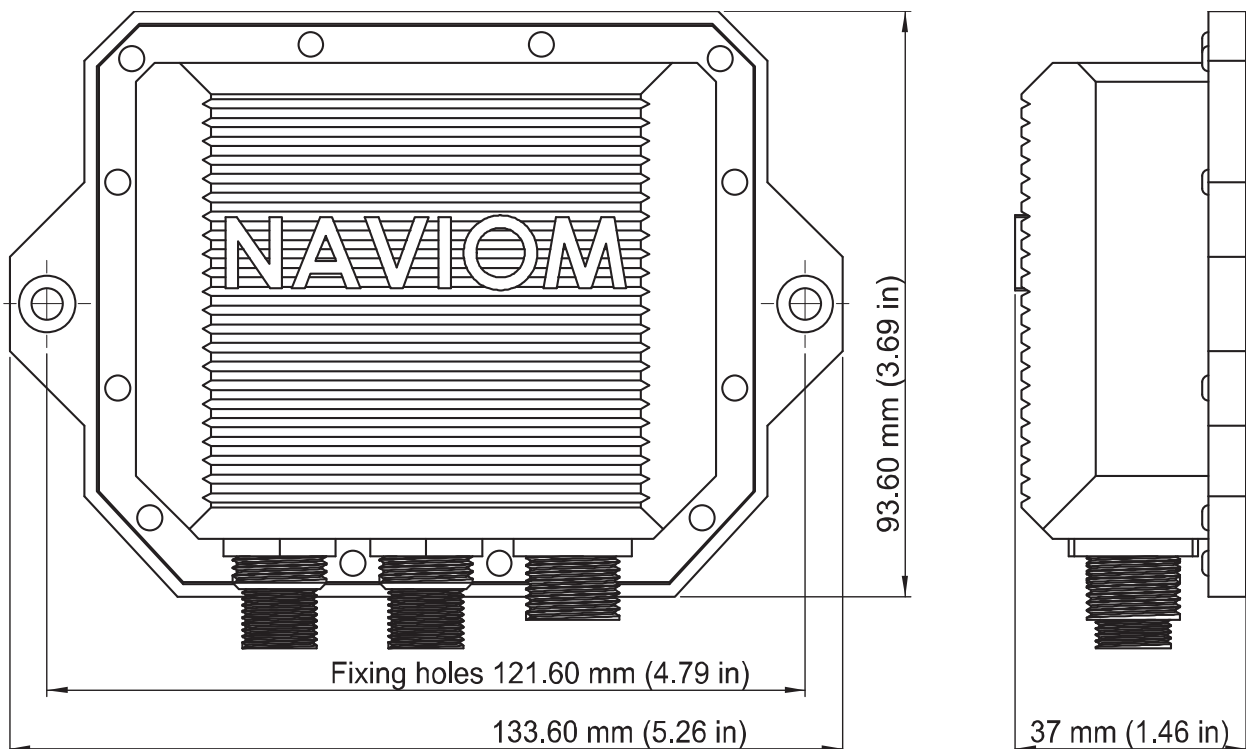
Use only a hand screwdriver to screw in the mounting screws. An electric tool may tighten the screw too much and damage the case or its tightness. The fixing screws must not be too tight. After installation, do not push on the device case or pull on the cables. Cables must have free play.

During operation it is not allowed to distort the case of device. When choosing a mounting space, consider the temperature deformations of materials and the displacement of the hull elements during its movement.

Before mounting the NAVIOM AIS ensure that you have:

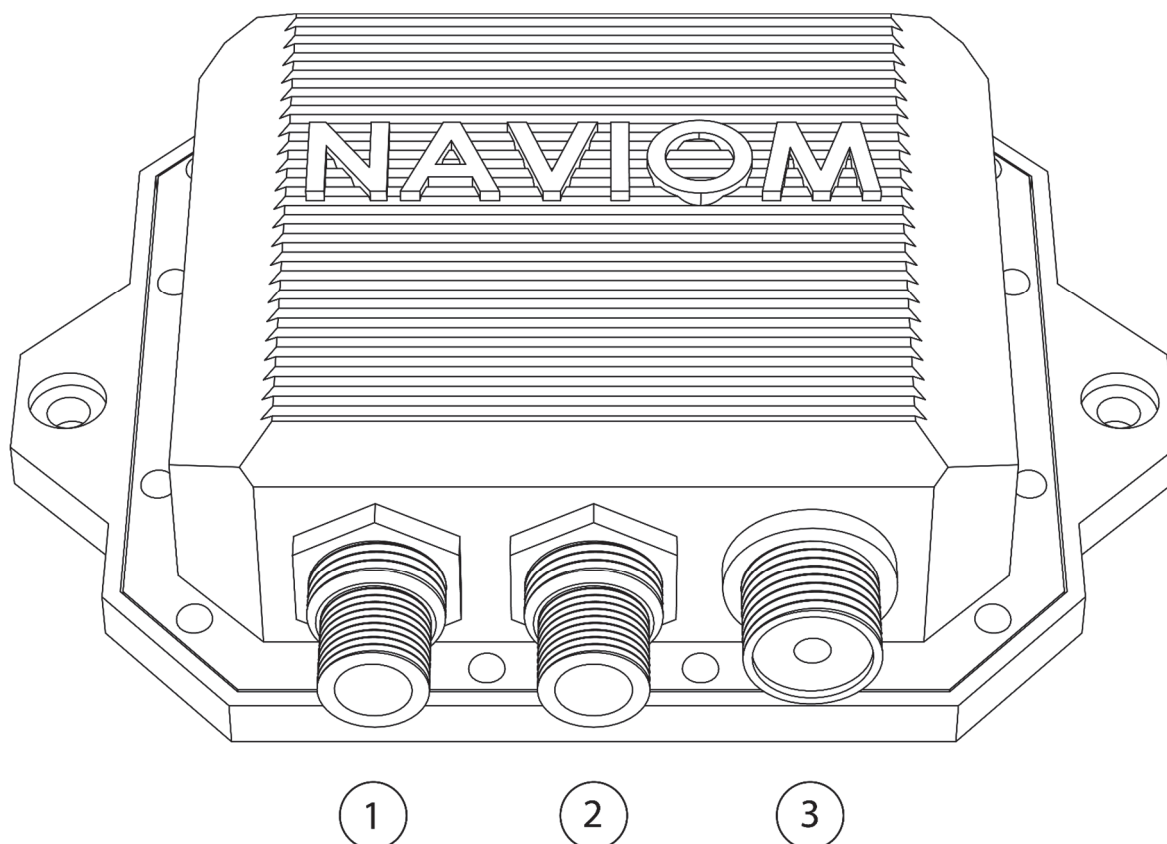
- selected a suitable location (a clear, flat surface is required).
 - Identified the relevant cable connections and the route that the cable will take.
1. Using the NAVIOM AIS as a guide, mark the location of the mounting holes on the mounting surface.
 2. Drill holes for the mounting fixings using a 3.5 - 4 mm drill bit.
 3. Connect the necessary cables. The power cable must be disconnected during installation!
 4. Screw all the fixings approximately half way into the holes in the mounting surface.
 5. Fully tighten the screws. Don't tighten too much it can damage the case tightness and damage the device.

NAVIOM AIS dimensions



Chapter 4: Connections

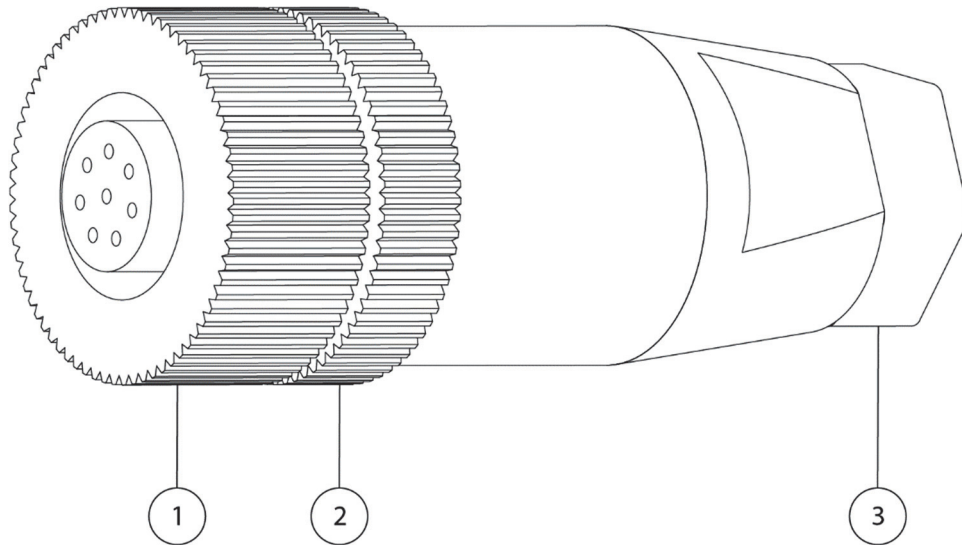
4.1 Connections overview



	Connection	Connects to:	Suitable connector:
1	Power and data connection	12/24 V dc power supply NMEA 0183 devices NMEA 2000 backbone	Universal M12 8-pin connector (supplied)
2	NMEA 2000 connection	12 V dc power supply NMEA 2000 backbone	NMEA2000 Micro-C M12 5-pin connector
3	To Antenna connection	VHF antenna	PL-259 connector

Note: Despite the fact that NAVIOM AIS is equipped with moisture-proof connectors, to increase the service life of the device, we recommend that when connecting the connectors to the device, wear a heat-shrink tube, containing adhesive. To seal the connection, the tube must be uniformly heated to a temperature of 130 - 160 degrees Celsius or 270 - 320 degrees Fahrenheit. Be careful not to overheat the connector or the body of the device when heating the tube. Under the influence of high temperature, the plastic case of the device may melt, change color, deform, and lose tightness.

42 Universal power/data connector



1. Ring fixing connector on the device
2. Connector parsing ring
3. Cable gland

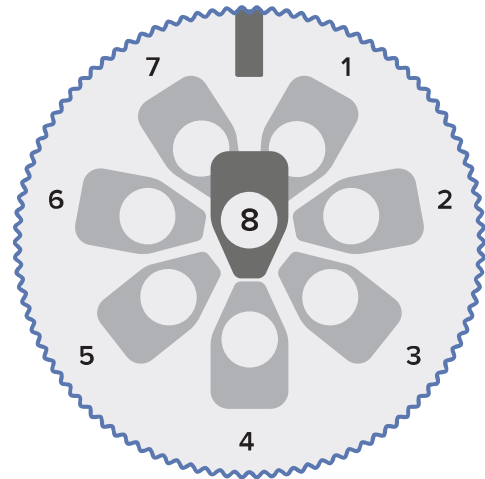
Connecting cable to the connector

1. Unscrew ring 3 and ring 2. Carefully remove the sealing elements located behind ring 3. Remember the orientation and sequence of the sealing elements.
2. Check the cable. It must be disconnected from the data lines and -be off power line. Connecting the connector to a live cable is dangerous to your health. A short circuit may cause a fire or damage the equipment of your boat.
3. Thread the cable through ring 3, the sealing elements, and the connector case. Pay attention to the correct installation of the sealing elements and ring 3 (they must be put on the cable in the reverse order).
4. Strip the cable and using the screwdriver that comes with the connector, connect the cable to the connector terminals according to the diagram below. For additional protection of the cable and connector against corrosion, we recommend to treat the cable and connector terminals with anti-corrosion for electrical connections.
5. Gently push the cable through the connector case and tighten the ring 2. Make sure that the cable does not come out of the connector terminals.
6. Screw on the ring 3. The sealing elements behind the ring 3 should tighten the cable tightly to prevent moisture from entering the connector housing. Do not overtighten ring 3 and ring 2, but make sure they are tightened securely.

Important: Damage of the connector, cable, or improper installation of the sealing elements can lead to communication interruptions, short circuits, or equipment malfunctions over time. In the case of absence of experience in installing electrical equipment, we recommend to contact a qualified professional.

Power/data connector pinout

1. NMEA2000 bus « CAN-H »
2. NMEA2000 bus « CAN-L »
3. Power supply negative « - »
4. Power supply positive « + »
5. Not used
6. NMEA0183 « OUT + » (A)
7. NMEA0183 « OUT - » (B)
8. Not used



Connector (inner part)

Important: When working with the Power/data connector, make sure to disconnect cables from the data lines and especially from the power line. This can harm your health and damage your property.

Note: The NMEA2000 bus terminals on the universal power/data connector are wired for test purposes. Although they are fully functional, we recommend to use the dedicated NMEA2000 Micro-C M12 5-pin connector in conjunction with the NMEA2000 DeviceNet cables. Cable lengths up to NMEA2000 backbone must not exceed 6m (20 feet).

4.3 General cabling guidance

Routing cables

Cables must be routed correctly, to maximize performance and prolong cable life.

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter of 200 mm (8 in) / minimum bend radius of 100 mm (4 in).
- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through.
- Do NOT run cables near to engines or fluorescent lights.

Always route data cables as far away as possible from:

- Other equipment and cables.
- High current carrying ac and dc power lines.
- Antennas.

Strain relief

Ensure adequate strain relief is provided. Protect connectors from strain and ensure they will not pull out under extreme sea conditions.

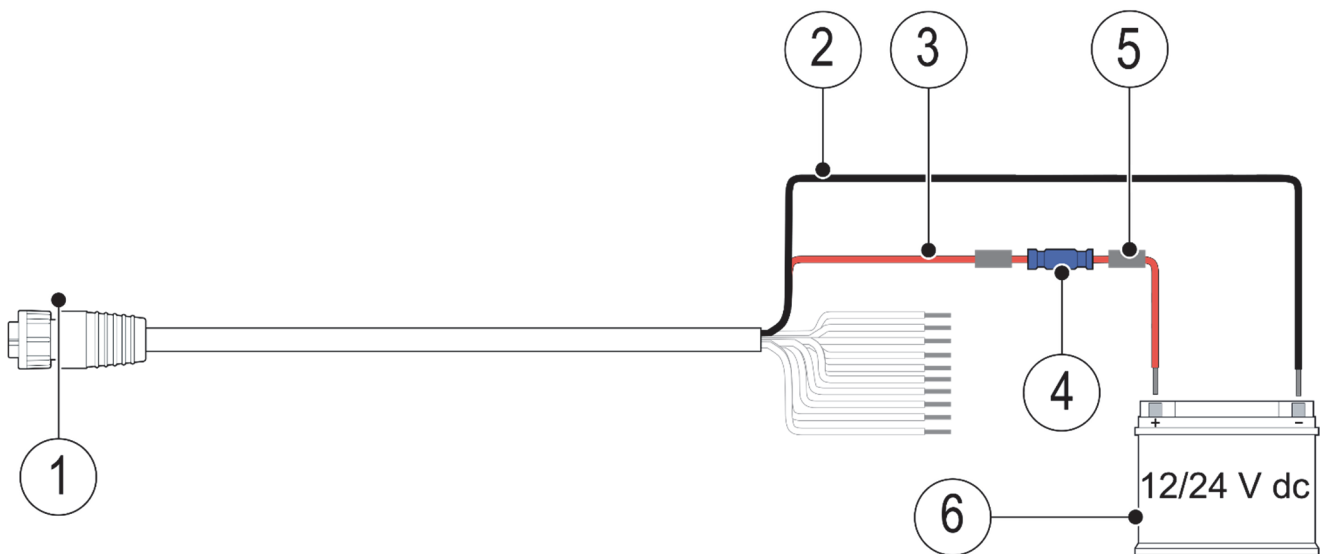
Cable shielding

Ensure that all data cables are properly shielded that the cable shielding is intact (e.g. hasn't been scraped off by being squeezed through a tight area).

4.4 Power connection

Connection to the power supply is possible both through the universal power/data connector and directly via the NMEA2000 bus. The NMEA2000 bus specification provides power for devices connected to the bus. If only the NMEA2000 bus is used and the NMEA0183 bus is not used, then the universal power/data connector can be not used.

Important: Use only one power line connection. If you connect to the NMEA2000 bus via the NMEA2000 Micro-C M12 5-pin connector, do not connect the power line through the universal power/data connector.



1. Power/data M12 8-pin connector (supplied)
2. Power supply – (Negative) Black wire (not supplied)
3. Power supply + (Positive) Red wire (not supplied)
4. Inline waterproof fuse 2A (supplied)
5. Suitable waterproof connection (not supplied)
6. Power source (12/24 V dc) (not supplied)

Important: When connecting to a 24V dc power line, make sure that the line voltage does not exceed the maximum allowable for the 28V device. The voltage in the power line may rise during the battery charging process. If the voltage can exceed 28V, then it is necessary to use a step-down voltage converter to reduce the supply voltage of the device to 12V, the output power of the converter must be more than 15 watts.

Power cable

Ensure you observe the following advice:

- The power cable for each unit in your system should be run as a separate, single length of 2-wire cable from the unit to the vessel's battery or distribution panel.
- For power cable extensions, it is recommended that a **minimum** wire gauge of 16 AWG (1.3 mm²). For cable runs longer than 15 meters, you may need to consider a thicker wire gauge (e.g. 14 AWG (2.1 mm²), or 12 AWG (3.3 mm²)).

Important: Be aware that some products in your system (such as sonar modules) can create voltage peaks at certain times, which may impact the voltage available to other products during the peaks.

An important requirement for all lengths of power cable (including any extension) is to ensure that there is a continuous **minimum** voltage of 10.8 V at the product's power connector, with a fully flat battery at 11 V.

More information

It is recommended that best practice is observed in all vessel electrical installations, as detailed in the following standards:

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

4.5 NMEA 2000 connection

NMEA 2000 offers significant improvements over NMEA 0183, most notably in speed and connectivity. Up to 50 units can simultaneously transmit and receive on a single physical bus at any one time, with each node being physically addressable. The standard was specifically intended to allow for a whole network of marine electronics from any manufacturer to communicate on a common bus via standardized message types and formats.

The NAVIOM AIS can transmit data to devices connected on NMEA2000 CAN bus networks. The NAVIOM AIS is connected to NMEA2000 bus by the DeviceNet cable (not supplied) or by universal power/data connector.

Note:

1. The NAVIOM AIS must be connected to a correctly terminated NMEA2000 backbone. You cannot connect your NAVIOM AIS directly to a MFD by NMEA2000 bus.
2. Refer to the instructions supplied with your MFD for details on creating a NMEA2000 backbone.

4.6 NMEA 0183 connection

The NAVIOM AIS can transmit data to devices connected via NMEA 0183. The NAVIOM AIS is connected to NMEA 0183 by universal power/data connector .

Note: Whilst it is possible to output both AIS and GNSS data, it is NOT recommended that you output GNSS data to external devices as this can cause data conflicts and / or performance issues. The ability to output GNSS data is intended for diagnostics purposes only.

Important:

To avoid potential data conflicts or loops multiple network protocols should not be connected to the same device i.e.:

- Do NOT connect the NAVIOM AIS to a MFD using NMEA 0183 and NMEA 2000 connections at the same time.
- Do NOT connect the NAVIOM AIS to a VHF Radio using NMEA 0183 and NMEA 2000 connections at the same time.
- If you are connecting to an AIS capable VHF Radio, you must disable the VHF Radio's AIS function first. Refer to your Radio's documentation for details on disabling the AIS function.

The NAVIOM AIS includes one one-directional NMEA 0183 port. The baud rate for port can be changed by configuration interface.

To connect NAVIOM AIS to the device via NMEA0183, connect as follows: the “OUT -” NAVIOM AIS terminal must be connected to the “IN -” or “B” terminal of the device to which you are connecting, respectively, the “OUT +” terminal of NAVIOM AIS must be connected to the “IN +” or “A” terminal of the device.

4.7 VHF antenna connection

Connect a VHF antenna (not supplied) to your NAVIOM AIS using the VHF antenna connection.

Use a marine-only VHF antenna and 50 Ohm cable, otherwise the NAVIOM AIS may fail.

Try to place the VHF antenna as high as possible; this affects the distance at which the signal from other ships will be received, and the distance at which you will be seen. Use a high-quality RF cable with a low attenuation the cable to the antenna should be as short as possible to reduce signal attenuation.

Place the NAVIOM AIS VHF antenna from the VHF Radio antenna at different heights and distances of at least 3m (10 feet) or use the VHF splitter to connect NAVIOM AIS and VHF Radio to the same antenna. Equipment may fail if two antennas are placed close to each other.

Avoid placing the NAVIOM AIS VHF antenna near the path of a Radar beam.

VHF antenna requirements

The VHF antenna should meet the following requirements:

Frequency band	156.025 MHz to 162.025 MHz
VSWR (Voltage Standing Wave Ratio)	should not exceed 2:1
Impedance	50 Ohm
Connector	PL-259

4.8 Wi-Fi connection

To connect the device to the existing Wi-Fi network refer to the instructions in the Configuration section.

To connect to the device do the following:

1. Connect the device to the power supply.
2. Wait for the network sign on the device (one long, after 5 second one short blink)
3. In the list of Wi-Fi networks on your computer or smartphone choose the network (SSID) "NAVIOM".

Important: Initially, a password to connect to the device's Wi-Fi network is not required, and therefore, after turning on the device, we strongly recommend that you configure the device's Wi-Fi network to prevent unauthorized access to the device.

4. Open the webpage <http://NaviomAIS.local> or <http://192.168.4.1/> from the computer or smartphone that has been connected to NAVIOM network. You can also open "Naviom AIS" device in the network environment of your computer.
5. On the device webpage enter the default password NAVIOM
6. You will get an access to the device password change page and change of Wi-Fi network, and after you will have an access to the main page of device.

Note: When making changes to the configuration, the device may reboot and your smartphone or computer may switch to another Wi-Fi network. After making configuration changes, make sure that you are connected to the Wi-Fi network configured in NAVIOM AIS

Chapter 5: Set up

5.1 Before configuration

Before using this product make sure to configure it correctly using smartphone or laptop with Wi-Fi access. . Incorrect configuration can cause erroneous data and prevent your product from transmitting.

The NAVIOM AIS can be configured before or after installation using a personal computer, smartphone or laptop.

The manner in which configuration is carried out depends on the legal requirements of your geographical location.

Important: Before configuration you need to connect to the device by Wi-Fi, as it is described in «0

5.2 Login to device

If Wi-Fi has not been configured, follow the instructions in the section «4.8 Wi-Fi connection».

The device supports various discovery protocols in the local network: Bonjour (for Apple devices), NetBIOS, SSDP (UPNP), mDNS.

Note: Before connecting to your NAVIOM AIS, make sure that the device you are connecting from is located in the Wi-Fi network configured on the NAVIOM AIS. And NAVIOM AIS is connected to the power supply.

In order to open the device management page, open the network environment (Windows) or Finder (MacOS) and open the device with the name “Naviom AIS”.

In addition, you can open the device page in your Internet browser using the address <http://NaviomAIS.local>

To search for a device in the network on mobile devices, use either the Naviom AIS mobile application (for Android smartphones) or Bonjour applications (for iPad and iPhone).

You can also assign a fixed DHCP IP address for NAVIOM AIS in the settings of your Wi-Fi router and open the device page by entering in the address bar of your Internet browser <http://x.x.x.x/> where x.x.x.x is the IP address assigned by NAVIOM AIS.

When you log in, you will be taken to the NAVIOM AIS main page.

5.3 Configuration page

For device configuration open the section «Device configuration» and make the necessary configurations by sections:

- Naviom AIS configuration
- Naviom AIS mobile application
- Naviom AIS NMEA0183
- Naviom AIS Wi-Fi configuration
- Naviom AIS change device password

Important: When changing the settings of any sections, click the "Save" button. Changes to the device configuration will be made only within this section. Do not make changes to multiple sections at once.

5.4 Naviom AIS configuration

In the “Naviom AIS configuration” section, you need to enter information on your vessel that will be transmitted via AIS radio channels to other vessels. To transmit the information entered in this section, the “AIS data transmission” field in the “Radio mode” item must be selected.

Vessel name

This point defines the name of the vessel in accordance with its registration data. Please note that the maximum allowable length defined by the AIS protocol specification is 20 characters. Only the following characters may be used: “A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [] ^ _ ! " # \$ % & ` () * + , - . / 0 1 2 3 4 5 6 7 8 9 ; < = > ? (space)”. All alphabetic characters are not case-sensitive (uppercase or lowercase) and are transmitted only as uppercase letters. If your ship’s name contains characters that are not listed above or your ship’s name is longer than 20 characters, you should indicate it in this field so that other ships can identify you by comparing your name indicated on the device with the name on hull of your ship. Also, the name indicated in this field can be used when trying to establish a radio connection with you and you should be prepared to hear this name on the radio.

MMSI number

A MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel/station. If your vessel already has a MMSI number (used for a VHF DSC radio) then the same MMSI number must be used.



Warning: MMSI number

You can change MMSI number not more than one time per month. The MMSI change limitation is regulated by AIS specification. Be careful when entering data, check it before saving.

To change the MMSI device must synchronize the time via GPS.

Important: In the United States of America, 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. The MMSI and Static Data must be entered only by an appropriately qualified installer of marine communications equipment on board vessels. Ensure you check the regulations for your location to ensure you are allowed to configure MMSI data on your unit.

In some areas, a radio operator license is required before a MMSI number will be issued. You can request a MMSI number from same agency that issues radio or Ship Radio licenses in your area.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

For further details, refer to the relevant Telecommunications Regulatory Body for your area.

Call sign

Maximum lengths of a call sign is 7 characters. The field is optional and may not be used.

Vessel length (meters)

The total length of the vessel, is entered in meters. To convert feet to meters, use the formula length (in feet) * 0.305 = length (in meters). The value must be rounded up to an integer up. For example, a vessel of 43 feet in length corresponds to 13.115 meters, in this case it is recommended to enter the number 14 in the Vessel length field.

Vessel width (meters)

The beam of the vessel is entered in meters. To convert feet to meters, use the formula beam (in feet) * 0.305 = beam (in meters). The value must be rounded up to an integer up.

Vessel type

Your vessel type, the most common values are: Sailing Vessel and Pleasure Craft (for motor yachts).

Radio mode

After you fill out all the data about your vessel, you can turn on the transmission of data on the air. In addition to the static data you entered for the vessel name, MMSI, call sign, vessel length, vessel beam and vessel type, dynamic information about your location, speed and course will also be transmitted. This information will be visible to ships and coast stations at a distance of typically up to 20 nautical miles, in rare cases up to 100 nautical miles. Also, when you turn on the transmission, you can find information about your vessel on the Internet resources involved in the collection of information on marine traffic through coastal stations AIS.

The information transmitted by your vessel through AIS channels will allow other vessels to make early decisions on maneuvering in the event of a danger of collision with you. The primary goal of the AIS system is to increase shipping safety. Do not disable the transmission of data about your vessel for no reason.

If for some reason you do not want your vessel to be visible through AIS, you can choose Silent mode and disable the transmission of information on AIS radio channels any time, you will still receive data from other vessels. To resume transmission, select AIS data transmission mode.

Enable data transmission only when the antenna is connected. Engaging a gear without an antenna connected may damage the equipment. See section “4.7 VHF antenna connection”.

5.5 Naviom AIS mobile application

The settings in this section apply to the Naviom AIS mobile application. If you are not using a mobile application, then these settings do not need to be changed. If you decide to use the mobile application, we recommend that you use the default settings at the beginning and only after some time make changes to the configuration.

Important: The device does not require the Naviom AIS mobile application. Additional functionality provided by Naviom Electronics through a mobile application is not part of this product. The functionality of the Naviom AIS mobile application and the conditions for its use can be changed any time.

Note: Attention. To activate notifications you need to mark checkbox.

Ships in the app at a distance less than

This section limits the ships displayed in the mobile application to the distance specified here. For example, if you specify a value of 7 nautical miles, the ship at a distance of 8 nautical miles will not be displayed in the application.

Alarm when a vessel is closer than

When this item is activated, a notification will be displayed in the mobile application if a vessel appears at a distance of up to the specified value. This item may be useful for long-distance transitions. In the case of heavy maritime traffic or while in marina, these notifications may be excessively frequent.

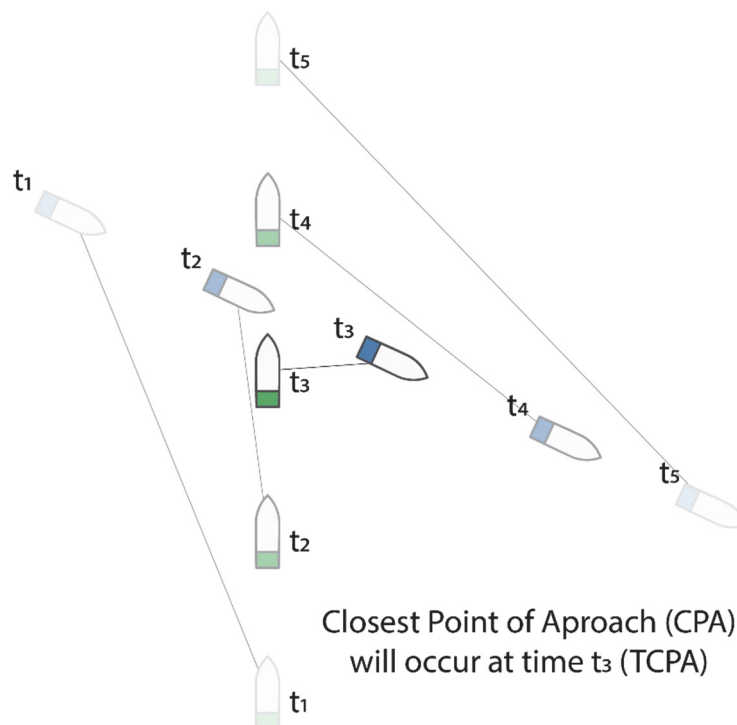
Notify if onboard voltage drops to

This section is for informing when the supply voltage drops below a predetermined level. This is to prevent the ship from turning off electrical equipment and to prevent overcharging of batteries.

It should be remembered that the minimum allowable discharge voltage of the Lead – acid battery is 10.8V at a nominal battery voltage of 12V. When the Lead – acid battery is below 10.8V, processes occur that significantly reduce the battery's life. And when reaching the minimum acceptable level of charge, you must either start the process of charging the batteries, or turn off the consumers of electricity.

Closest Point of Approach (CPA) alarm

Closest Point of Approach (CPA) is the point at which the distance between your vessel and a potentially hazardous vessel is minimal. Moreover, this point in most cases does not coincide with the point of intersection of the courses of the two vessels.



The time to Closest Point of Approach (CPA) and the distance between the vessels at this point are calculated by NAVIOM AIS based on the location, course and speed of the two vessels. When maneuvering ships, this information is updated.

Important: Please note that the time and distance to the Closest Point of Approach (CPA) are calculated in relation to the GNSS installation points on two vessels, but the real time and distance to CPA can be significantly different in case of large vessels

Notifications about a dangerous approach are sent to the mobile application if the current time of approach and distance satisfy the conditions described in this section.

You can set the conditions under which a notification will be sent:

- The time during which the vessel reaches the Closest Point of Approach (CPA). Because a potentially dangerous rapprochement can occur, for example, in a few hours, and it will be early to inform about it, because during this time, ships can change their course or speed and, as a consequence, the Closest Point of Approach (CPA) will change.
- The distance at which the ships end up at Closest Point of Approach (CPA). The distance between the vessels at this point can be several tens of miles and there will be no need to inform about this approach. Therefore, in this section it is necessary to specify a dangerous distance between the vessels in your opinion. Despite the fact that NAVIOM AIS also adds the dimensions of a dangerous vessel to this parameter. Please note that NAVIOM AIS may not have information about the dimensions of a dangerous vessel and do not take them into account in the calculations.
- The minimum ship speed at which notifications are transmitted. If the speed of your vessel or a potentially dangerous vessel is less than this parameter, then notifications will not be transmitted. If this parameter is set to zero, then it will not be taken into account and notifications will be transmitted regardless of the speed of the vessels. But it should be noted that when you are in the parking lot or when you enter the parking lot, you may experience Closest Point of Approach (CPA) satisfying the conditions above, but not requiring information about a dangerous proximity. This condition is intended to exclude such notifications.

5.6 Naviom AIS NMEA0183

In this section, you can choose the data transmission speed of the NMEA0183 bus. On devices combined with NMEA0183, the bus speed should be the same.

5.7 Naviom AIS Wi-Fi configuration

To configure the device's connection via Wi-Fi, you need to select the connection type:

- Device connects to existing Wi-Fi network
- Device works as an independent Wi-Fi access point

And enter the Wi-Fi network name and password. The name (SSID) of the Wi-Fi network should not exceed 20 characters, the password should be at least 8 characters and no more than 30.

A device's Wi-Fi connection is used to make configuration changes, view information received from other ships, and operate a mobile application. Be careful when making changes to this item, do not forget the name and password of the Wi-Fi network configured on the device.

5.8 Naviom AIS change device password

The password is used to access the device settings, to make changes to the "Friendly ships" address book. The default password is NAVIOM.

5.9 Naviom AIS firmware upgrade

To update the Naviom AIS firmware, you need to download the latest version from www.naviom.com and press the "File select" button to select the downloaded firmware file, and then click the "Upgrade" button. If the software upgrade is successful, a corresponding message will appear and the device will reboot under the upgrade firmware version.

Upgrade device software regularly.

Appendix A Troubleshooting

Problem	Action required
No power	<ul style="list-style-type: none"> • Check the power supply is properly connected. • Check the power supply voltage is correct (12 V dc or 24 V dc). • Check relevant fuses have not blown or circuit breaker has not tripped.
AIS hardware not detected by MFD (No AIS symbol shown on Homescreen)	<ul style="list-style-type: none"> • Check NMEA 2000 or NMEA 0183 connection and ensure proper connection. • When connected using NMEA 0183 ensure the port used to connect your transceiver to your MFD is set to 38,400 baud rate. • Ensure the MFD is either; connected directly to the same CAN bus network as your AIS transceiver as the MFD that is connected to the same CAN bus as your transceiver.
No AIS targets/data shown on MFD (AIS symbol shown on Homescreen)	<ul style="list-style-type: none"> • Check MMSI number and static data has been correctly configured. • Check the VHF antenna is properly connected and is not short circuiting to the vessel structure. • When connected using NMEA 0183 ensure the port used to connect your transceiver to your MFD is set to 38,400 baud rate. • AIS Layer not enabled on MFD. • MFD set to display Dangerous or Buddy targets only and none are in range of your vessel. • No AIS equipped vessels in range.
Erratic or conflicting data	<ul style="list-style-type: none"> • More than 1 AIS unit is connected and operating. • NMEA 0183 and NMEA 2000 connected at the same time.

Appendix B Technical specification

Power specification

Supply voltage	12 V dc / 24 V dc
Operating voltage range	10.8 V dc to 30 V dc
Power consumption	1 W (0.08A with 12V power supply) 14 W in peak (during transmission within 0.027 seconds).
Fuse rating	2 A
LEN (Load Equivalency Number)	1

Dimensions and weight

Dimensions without connectors	5.4 in. x 3.8 in. x 1.6 in. 135 mm x 95 mm x 39 mm
Dimensions with connectors	5.4 in. x 5.2 in. x 1.6 in. 135 mm x 130 mm x 39 mm
Weight	7 oz. / 200 gram

Environmental specification

Operating temperature range	-15°C to +55°C (+5°F to +131°F)
Storage temperature range	-20°C to +75°C (-4°F to 167°F)
Humidity	93% at 40°C
Waterproofing	IPx6

AIS specification

Transmitter	One
Receiver	Two
Operating frequency range	The frequencies are set by the base station in the range of 156.025 - 162.025 MHz for AIS in the assigned mode. The frequencies of 161.975 MHz and 162.025 MHz when working in autonomous mode. For DSC - 156.525 MHz (channel No. 70).
Channel spacing	25 kHz
Carrier frequency error	3 ppm (± 486 Hz @ 162MHz)
Bit rate	9600 bps (for AIS mode) 1200 bps (for DSC mode)
Modulation	GMSK/FM (for AIS mode) PH (for DSC mode)
Modulation index	0.5
Access to the data link	«SOTDMA» (Self organized time division multiple access)
Transmit output power	5W $\pm 1,5$ dB High setting / 1W $\pm 1,5$ dB Low setting
Emission class	25K0F2D (for AIS mode) 25K0G2B (for DSC mode)
Slotted modulation mask	$\Delta f_c < \pm 10$ kHz: 0 dBc ± 10 kHz $< \Delta f_c < \pm 25$ kHz: below the straight line between -25 dBc at ± 10 kHz and -70

	dBc at ± 25 kHz $\pm 25 \text{ kHz} < \Delta f_c < \pm 62.5 \text{ kHz}$: -70 dBc
Sensitivity	-110 dBm @ 20% PER
ITU-R Recommendation	ITU-R M.1371-5

GNSS receiver specification

Channels	72
Cold start acquisition	26s nominal
Position source	GPS
Frequency range	1573.4 - 1577.4 MHz 1597.5 - 1609.3 MHz
Emission class	1M02G7D, 2M05G7D

External connections

VHF antenna connector type	SO-239 50 Ω coaxial
NMEA 2000 connector type	5 way DeviceNet male
Power and NMEA 0183	4 way bare ended wires
NMEA 0183 port	NMEA 0183 HS (IEC 61162–1) compliant, one-directional, RS422 levels, 2 wire interface (differential signalling), configurable baud rate
Wi-Fi specification	IEEE 802.11 bgn, up to 150 Mbps
Wi-Fi frequency range	2400.0 - 2483.5 MHz
Wi-Fi maximum transmitter power	100mW
Wi-Fi emission class	22M0G1W, 22M0D1W, 40M0D1W, 40M0G1W

Appendix C NMEA 0183 supported sentences

The NAVIOM AIS supports the following NMEA 0183 sentences

Sentence	Description	Transmit	Receive
ABK	ABM/BBM acknowledgement	•	
ACA	AIS channel management assignment	•	
ACS	AIS channel management information source	•	
TXT	Text	•	
VDM	AIS VHF data-link message	•	
VDO	AIS VHF data-link own-vessel report	•	

Appendix D NMEA 2000 supported PGNs

The NAVIOM AIS supports the following PGNs.

PGN	Description	Transmit	Receive
59392	ISO Acknowledgement	•	•
59904	ISO Request	•	•
60928	ISO Address Claim	•	•
65240	ISO Commanded Address	•	•
126208	Request group function	•	•
126992	System time	•	
126993	Heartbeat	•	
126996	Product information	•	•
127250	Vessel heading		•
129025	Position, rapid update	•	
129026	COG & SOG, rapid update	•	
129029	GNSS position data	•	
129038	AIS Class A position report	•	
129039	AIS Class B position report	•	
129040	AIS Class B extended position report	•	
129041	AIS ATon report	•	
129793	AIS UTC and date report	•	
129794	AIS class A static and voyage related data	•	
129795	AIS addressed binary message	•	
129796	AIS Acknowledge	•	
129797	AIS binary broadcast message	•	
129798	AIS SAR aircraft position report	•	
129801	AIS addressed SRM	•	
129802	AIS safety broadcast binary message	•	
129809	AIS class B CS static data report part A	•	
129810	AIS class B CS static data report part B	•	

Appendix E AIS overview

Your NAVIOM AIS uses digital radio signals to exchange 'real-time' information between vessels, shore based stations, or aids to navigation (AToNs) on dedicated VHF frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data.

Although AIS augments your Radar app by operating in Radar blind spots and detecting smaller AIS-fitted vessels, it does not replace your Radar, as it relies on receiving transmitted AIS information and therefore cannot detect objects such as landmasses, navigational beacons or vessels not equipped with AIS.

Note:

NEVER assume that AIS is displaying information from all vessels in the area, because:

- Not all vessels are fitted with AIS
- Although it is mandatory for larger commercial vessels to carry AIS, it is not mandatory to use it. AIS should be used only to augment Radar information, not substitute it.

AIS limitation

Never assume that your AIS is detecting all vessels in the area. Always exercise due prudence and do not use AIS as a substitute for sound navigational judgement.

Classes of AIS

Class A transceivers

Class A AIS transceivers transmit and receive AIS signals. AIS transceivers are currently mandatory on all commercial vessels exceeding 300 tons that travel internationally (SOLAS vessels).

The following information can be transmitted by a Class A AIS system:

- Static data (Includes information such as MMSI number, vessel name, vessel type, call sign, IMO number, length, beam and GNSS antenna location).
- Voyage related data (Includes information such as draft, cargo, destination, ETA and other relevant information).
- Dynamic data (Includes information such as time (UTC), ship's position, COG, SOG, heading, rate of turn and navigational status).
- Dynamic reports (Ship's speed and status).
- Messages (Alarms and safety messages).

Remember that not all vessels will transmit all of the information.

Class B transceivers

Class B AIS transceivers transmit and receive AIS signals, but use a reduced set of data compared to Class A (see *Data Summary*). A Class B AIS transceiver can be fitted on any vessel not fitted with a Class A transceiver, but is not mandatory aboard any vessel.

Data Summary

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
Ship's name	Yes	Yes	Yes
Type	Yes	Yes	Yes
Call sign	Yes	Yes	Yes
IMO number	Yes	No	Yes
Length and beam	Yes	Yes	Yes

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
Antenna location	Yes	Yes	Yes
Draft	Yes	No	Yes
Cargo Information	Yes	Yes	Yes
Destination	Yes	No	Yes
ETA	Yes	No	Yes
Time	Yes	Yes	Yes
Ship's position	Yes	Yes	Yes
COG	Yes	Yes	Yes

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
SOG	Yes	Yes	Yes
Gyro heading	Yes	Yes*	Yes
Rate of turn	Yes	No	Yes
Navigational status	Yes	No	Yes
Safety message	Yes	No	Yes

*Class B transceivers do not transmit a Gyro heading unless the transceiver is receiving an NMEA HDT sentence from an external source.

Data reporting intervals

AIS information is classed as either static or dynamic. Static information is broadcast, when data has been amended, or upon request, or by default, every 6 minutes.

The reporting rates for dynamic information depend on speed and course change, and are given in the following tables.

Note: The reporting rates shown here are for reference and may not be the rate at which information is actually received by your AIS transceiver. This is dependent on a number of factors, including but not limited to antenna height, gain and signal interference.

Class A systems

Ships Dynamic Conditions	Reporting rate	
	Not changing course	Changing course
At anchor or moored, moving less than 3 knots	3 Minutes	3 Minutes
At anchor or moored, moving greater than 3 knots	10 Seconds	10 Seconds
0-14 knots	10 Seconds	3 1/3 Seconds
14-23 knots	6 Seconds	2 Seconds
Faster than 23 knots	2 Seconds	2 Seconds

Class B systems

Ships Dynamic Conditions	Reporting rate (nominal)
SOTMDA – 0 to 2 knots	3 Minutes
SOTMDA – 2 to 14 knots	30 Seconds
SOTMDA – 14 to 23 knots	15 Seconds
SOTMDA – Greater than 23 knots	5 Seconds
CSTMDA – 0 to 2 knots	3 Minutes
CSTMDA – Greater than 2 knots	30 Seconds

Other AIS sources

Source	Reporting rate
Search and Rescue (SAR) aircraft	10 Seconds
Aids to navigation (AToN)	3 Minutes
AIS base station	10 Seconds or 3.33 Seconds, depending on operating parameters