

NOMAD CLASS B AIS TRANSPONDER

Installation and instruction Manual



1. Introduction and Notices

Congratulations on the purchase of your NOMAD Class B AIS Transponder. This product is designed to be portable, with quick and simple installation that can be carried out by any practical person. With its wireless interface, NOMAD will work with any of the AIS apps on the market today, that support wireless NMEA data via UDP or TCP.

 When reading this manual please pay attention to warnings marked with the warning triangle shown on the left. These are important messages for safety, installation and usage of the product.

1.1 Safety Warnings

 This equipment must be installed in accordance with the instructions provided in this manual. DO NOT install the equipment in a flammable atmosphere such as in an engine room or near to fuel tanks.

 The Digital Yacht CLASS B TRANSPONDER is an aid to navigation and must not be relied upon to provide accurate navigation information. AIS is not a replacement for vigilant human lookouts and other navigation aids such as Radar. The performance of the CLASS B TRANSPONDER may be seriously impaired if not installed as instructed in the user manual, or due to other factors such as weather and or nearby transmitting devices. Compatibility with other systems is reliant on third party systems recognising the standard outputs from the CLASS B TRANSPONDER. Digital Yacht reserves the right to update and change these specifications at any time and without notice.

1.2 Position source

All marine Automatic Identification System (AIS) transponders utilise a satellite based location system such as the Global Positioning Satellite (GPS) network. The accuracy of a GPS position fix 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.

1.3 Compass safe distance

The compass safe distance of this unit is 0.5m or greater for 0.3° deviation. We suggest you always mount the unit 1m away from any compass and check for any localised interference

1.4 RF emissions notice

Caution: The AIS transponder generates and radiates radio frequency electromagnetic energy. This equipment must be installed and operated according to the instructions contained in this manual. Failure to do so can result in personal injury and / or AIS transponder malfunction. Caution: Never operate the AIS transponder unless it is connected to a VHF antenna.

To maximise performance and minimise human exposure to radio frequency electromagnetic energy you must make sure that the antenna is mounted at least 1.5 metres away from the AIS transponder and is connected to the AIS transponder before power is applied. The system has a Maximum Permissible Exposure (MPE) radius of



1.5m. This has been determined assuming the maximum power of the AIS transponder and using antennas with a maximum gain of 3dBi. The antenna should be mounted 3.5m above the deck in order to meet RF exposure requirements. Higher gain antennas will require a greater MPE radius. Do not operate the unit when anyone is within the MPE radius of the antenna (unless they are shielded from the antenna field by a grounded metallic barrier). The antenna should not be co-located or operated in conjunction with any other transmitting antenna. The required antenna impedance is 50 Ohms.

1.5 Warranty

The CLASS B TRANSPONDER is supplied with a standard 2 year return to base warranty as defined in the accompanying warranty information. Any attempt to tamper with or damage this product will invalidate the warranty. Physical damage and damage caused by salt water ingress are not covered under this warranty.

1.6 Disposal of this product and packaging

Please dispose of the AIS transponder in accordance with the European WEEE Directive or with the applicable local regulations for disposal of electrical equipment. Every effort has been made to ensure the packaging for this product is recyclable. Please dispose of the packaging in an environmentally friendly manner.

1.7 Accuracy of this manual

The AIS transponder may be upgraded from time to time and future versions of the AIS transponder may therefore not correspond exactly with this manual. Information contained in this manual is liable to change without notice. The manufacturer of this product disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

1.8 Declaration of conformity

Digital Yacht declare that this product is in compliance with the essential requirements and other provisions of the R&TTE directive 1995/5/EC.

The product carries the CE mark, notified body number and alert symbol as required by the R&TTE directive.

The CLASS B TRANSPONDER is intended for sale in the following member states: United Kingdom, France, Spain, Sweden, Austria, Netherlands, Portugal, Denmark, Norway, Belgium, Italy, Finland, Ireland, Luxembourg, Germany and Czech Rep.

1.9 FCC notice

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.



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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

 **WARNING:** This device must be programmed with data pertaining to the vessel, on which the device is or will be installed, by a qualified dealer or installer. Instructions for verifying correct programming can be found in the manual.

 **WARNING:** 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 following information about this transponder is required to complete license applications:

- FCC ID **07D-ZDIGAIT2000**
- FCC Type Accepted Parts 15 and 80
- Output Power: 2 watts
- Modulation: GMSK
- Frequency Range: 156.025 MHz to 162.025 MHz

In addition, the Nomad unit: CONTAINS FCC ID **U30-G2M5477**

1.10 Industry Canada notice

This device complies with Industry Canada licence-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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le Fonctionnement.

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



2. Before you start

You will need the following items and tools to complete the installation:

- NOMAD Class B AIS Transponder.
- VHF/AIS antenna and cable – supplied
- A USB power source i.e 12v to USB power adaptor, USB power pack, etc.
- 2x Velcro Strips (supplied) or 4x M4 screws (not supplied) or other fixings appropriate to the mounting location.

To configure the unit you will need:

- An MMSI number for your vessel
- A PC running Microsoft Windows XP®/Vista®/7/8/10 or Mac OSX with a free USB port.
- proAIS2 Class B+ AIS Transponder configuration software – Windows and Mac versions of the software are available for download from our “Online CD” at <https://support.digitalyacht.net>

OR

- An Android Phone/Tablet and a copy of our free AISConfig App which is available from the Google Play Store...
<https://play.google.com/store/apps/details?id=com.digitalyacht.aisconfig&hl=en>

Note: You can obtain an MMSI (Maritime Mobile Service Identity) from the same authority that issues ship radio licences in your area. An MMSI may have already been provided with your existing VHF radio licence. The MMSI number used for the AIS Transponder should be the **same** as that programmed into your VHF DSC radio.

 If you do not have an MMSI number the AIS Transponder will still operate in receive only mode. **Do not enter an invalid MMSI number.**

3. Installation

Before starting installation select a suitable location for the AIS Class B Transponder. The unit is water resistant; however it should not be permanently installed outside on-deck and we only recommend permanent mounting below deck in a dry location. The NOMAD unit can be temporarily mounted outside, in which case choose a sheltered location where it will not be subjected to constant exposure to water. Basically, if you would be happy to leave your smart phone or tablet in the same location, then it will be fine for NOMAD. When locating the unit you should consider:

- Routing of the USB cable to a suitable power source
- Mounting of VHF antenna and routing the cable to the unit
- If the internal GPS antenna will get good signals (see Step 2)
- If you need Wi-Fi reception around the whole boat
- Maintaining the compass safe distance of 0.5m
- Visibility of the LED indicators

Installation Step 1 – VHF/AIS Antenna or Splitter

- Install the VHF/AIS antenna (supplied) as high up as possible. The suction cup base sticks well to smooth GRP surfaces. For maximum performance, the antenna should be mounted on a horizontal surface so that it is pointing vertically in to the air.
- The AIS antenna supplied with the NOMAD comes with 4m of cable and a BNC type connector. It is possible to use NOMAD with another model of AIS/VHF antenna or even connect it to a Class B Splitter for more permanent installation.



Installation Step 2 – Locating and Fixing the unit

- The NOMAD has a high sensitivity GPS receiver with an internal antenna which is designed to be used below deck in GRP Fibreglass hulled boats. The GPS antenna is located in the top left corner of the unit below the “GPS Inside” circle.
- The NOMAD unit must be mounted on a vertical bulkhead so that the GPS antenna is pointing towards the sky. Care should be taken to ensure that only GRP fibreglass is between the GPS antenna and the sky, with no metallic or electrical objects above the antenna.
- Location of the NOMAD is critical for good GPS reception and it is strongly recommended that before permanently fixing the NOMAD in the chosen location, that the GPS reception is checked.
- The supplied proAIS2 software for PC/Mac is ideal for this purpose. With the unit connected via the USB cable to a PC/Mac running the proAIS2 software, view the “GNSS Status” page and ensure there is good GPS reception with the NOMAD in this location.



Unit Dimensions



- Once you are confident that the NOMAD is in the best location for good GPS reception, secure the AIS Transponder to a flat vertical surface in the selected location, either using the two strips of Velcro supplied or using four M4 wood screws (not supplied) or other fixings suited to the material the unit is being fixed to.

Installation Step 3 - Power

- Power is supplied to the unit, via its integral USB cable. Simply plug the USB cable in to a suitable USB socket of a computer, USB charger or USB Power Pack. The Nomad unit will take approximately 0.4A to 0.6A of current at the 5V USB voltage. Some older computers may complain about the amount of current, disabling the USB port until the Nomad is removed, in which case you may need to connect the Nomad to a powered USB Hub.
- Most modern USB 2.0 or the latest USB 3.0 ports should work quite happily with Nomad, providing power to the unit and also creating a virtual COM port for data transmission.



- It is also possible to power the Nomad unit from one of the many USB power packs that are now available online. These units vary in power capacity (measured in mA/Hours) and below is a table showing the approximate amount of continuous Nomad use you could expect from these packs;

USB Power Pack Capacity	Continuous Use Time (approx.)
3350mA/H	5.5 Hours
5000mA/H	8 Hours
15000mA/H	24 Hours
22000mA/H	36 Hours

Installation Step 4 – USB Interface

- As well as taking power from the USB interface, Nomad appears as a Virtual COM Port on the computer it is connected to and can transmit and receive data through the USB cable at 38400baud.
- If you need to extend the USB cable, please use a USB extension cable that is no more than 4m in length. The maximum length of USB cable without the use of a powered extender cable or Hub is 5m.
- Please do not plug in the USB cable of the NOMAD to your PC until after you have installed the proAIS2 software, which also installs the USB drivers for the NOMAD. Installing proAIS2 is covered in section 4 - Configuration.
- After the NOMAD is configured, the USB connection can be used to provide data to navigation program running on a PC or Mac. Please note that only one navigation program at a time can receive data from the NOMAD.

Installation Step 5 – Power Up

- Plug the NOMAD USB cable in to the computer or power pack
- Verify that on the top end cap of the NOMAD, that the green LED illuminates for a short period and then all four LED indicators flash once, followed by illumination of the amber and red LED's.
- Verify that the Data and WiFi LEDs on the bottom end cap are flashing.
- Scan for wireless networks and confirm that there is a new network called "DY-Nomad-xxxx" where **xxxx** is a four digit code unique to your NOMAD unit.
- Installation is now complete. The NOMAD needs to be configured using the proAIS2 software – see next section.



Top End Cap



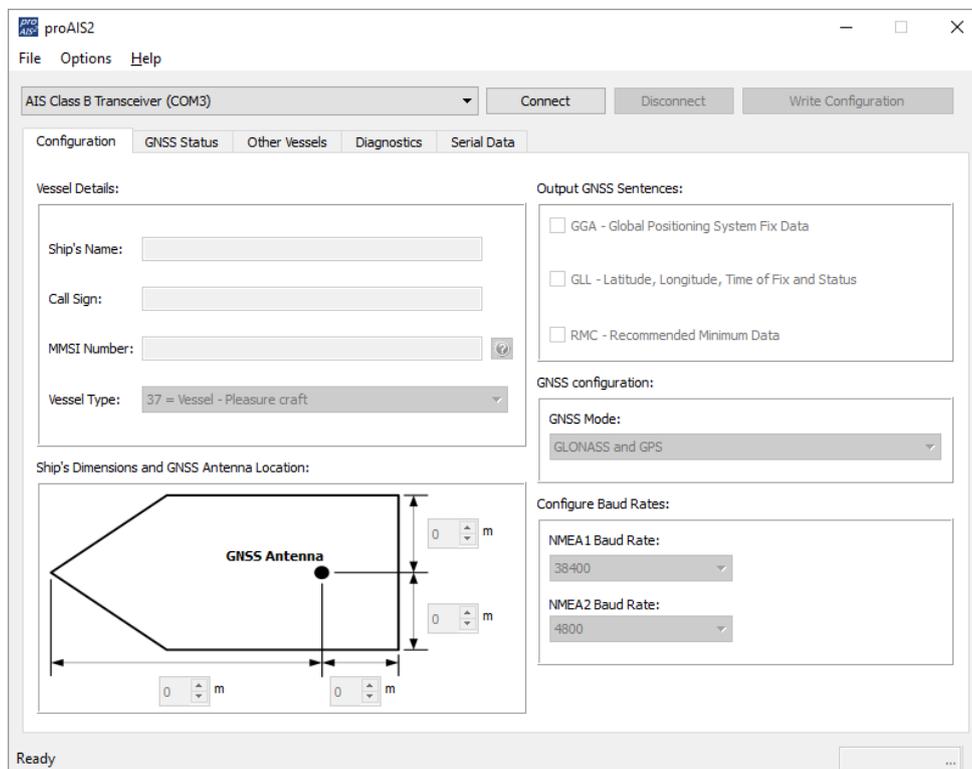
Bottom End Cap



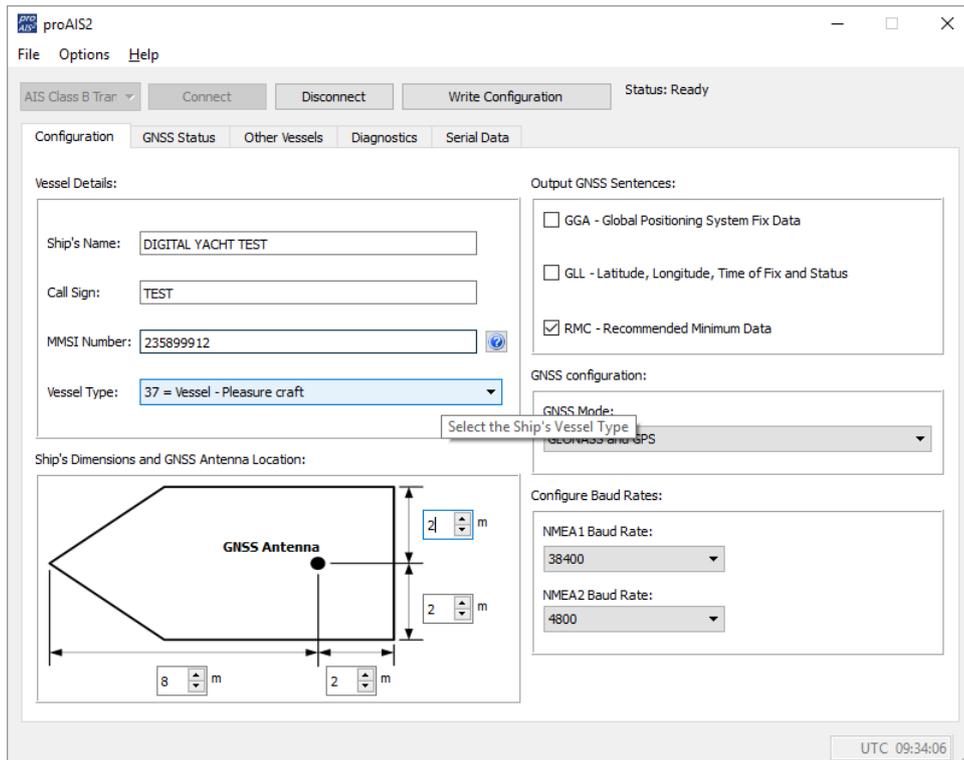
4. Configuration

The NOMAD transponder must be correctly configured for your vessel before operation. All configuration information must be entered carefully as this information will be transmitted to other AIS equipped vessels and shore stations.

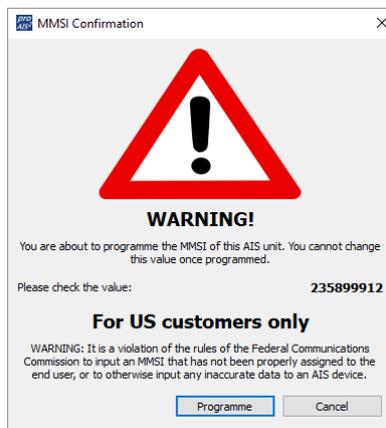
- The AIS transponder can be configured by connecting to a PC or Mac running the 'proAIS2' configuration tool or wirelessly using an Android device running the free AIS Config App which is available from the Google Play Store... <https://play.google.com/store/apps/details?id=com.digitalyacht.aisconfig&hl=en>
- Visit our "Online CD" at <https://support.digitalyacht.net> and look for the proAIS2 software for Windows or Mac. Download the one applicable to your computer and either unzip and run the Setup.exe for Windows or install the proAIS2.dmg for Mac. During installation the USB drivers will be automatically installed.
- Plug in the NOMAD USB cable in to your computer and then launch proAIS2. Select the COM port that the NOMAD has been allocated by Windows or OSX. Click the 'Connect' button The computer will now query the NOMAD and display any "Static" boat data stored in the unit. All new units will have no data stored and so you will just have a series of blank boxes in which you will need to enter your boat's data (see below).



1. Enter Vessel Name, Call Sign and MMSI
2. Enter vessel dimensions and location of GPS antenna to the nearest metre.
3. Select the most appropriate vessel type.



4. Click "Write Configuration" to save the data to the NOMAD
5. Read the warning message carefully and proceed only if the MMSI number is correct.
6. If you are configuring a new unit with a new MMSI number then a warning message will be displayed



7. Read the warning message carefully and proceed only if the MMSI number is correct.
8. Should you make a mistake or need to change anything in the future, all configurations and settings, except the MMSI, can be changed by running proAIS2 and following this procedure again
9. Configuration of the AIS Class B+ Transponder is now complete



5. Operation

Once installed and configured, correct operation of the AIS transponder should be verified as follows:

1. Check that at least one of the LED's on the front of the unit is illuminated. If the red 'Error' LED is illuminated please refer to the troubleshooting section in the NOMAD User Manual.
2. Check that the unit has a good GPS lock. If the GPS is locked the Latitude and Longitude will be displayed on the "GPS Status" tab in proAIS2 along with a number of green bars in the signal strength graph.
3. If the unit does not have GPS fix within a few minutes check that the NOMAD's internal GPS antenna is pointing upwards and only has fibreglass above it. Use the proAIS2 GNSS status page to check the signal strengths.
4. Check that the Green 'Power' LED on the front of the unit illuminates. This will not happen until the unit has GPS fix and has transmitted its first position report. Please allow up to 5 minutes for this to occur. **If the Green LED is illuminated you have successfully installed and configured the unit.** The proAIS2 application can be closed and the PC disconnected from the unit.
5. If you are in an area with other AIS equipped vessels you can check the "Other vessels" tab in ProAIS2 to view position reports received from other ships.

NOMAD is designed to be used with compatible navigation software running on a Laptop (PC, MAC or LINUX) connected via its USB cable or Wi-Fi interface. There are also many Apple iOS and Android apps to allow mobile phones and tablets to wirelessly receive and display the AIS data from NOMAD.

To configure navigation software to read AIS+GPS data from NOMAD, via USB, find the relevant setup menu in the software you are using and select the same "Virtual COM Port" that the proAIS2 software used to talk to NOMAD and make sure the data rate/speed is set to 38400 baud (default for AIS) – note that you cannot use the navigation software and proAIS2 software at the same time.

To configure navigation software or an iOS/Android App to read AIS+GPS data from NOMAD, via Wi-Fi, first scan for wireless networks and connect to the NOMAD network (SSID). Once a wireless network connection is established, run the software/app and find the relevant setup menu for configuring a network (TCP or UDP) data connection.

All NOMAD units are pre-programmed with the following IP address and Port number, which are the values you will need to enter in the software/apps setup menu;

NOMAD IP address = 192.168.1.1

NOMAD Port number = 2000

Normally if you select a TCP connection (single device) then you will have to enter both the IP address and Port, while if you select a UDP connection (multiple devices) you usually will only have to enter the Port number.

Ensure that the NOMAD DATA LED is flashing (indicates AIS or GPS data is being received) and then you should start to see AIS and GPS data appear in the software/app.

For more information on compatible software and apps, please visit our blog <http://digityacht.net> and search for "iOS Apps", "Android Apps", etc.



6. Troubleshooting

If the green LED is not illuminated after around 5 minutes then please check the following:

1. Is the MMSI number programmed?

Check the "Diagnostics" tab in proAIS2. If there is a red cross next to the "AIS Transceiver MMSI Valid" item then you have not correctly configured the MMSI.

2. Does the unit have a GPS position fix?

Check the "Diagnostics" tab in proAIS2. If there is a red cross next to the "GPS position fix" item then the unit does not have GPS fix. Check your GPS antenna and connections.

3. Is the unit reporting any alarms?

Check the "Active alarms" area in the "Diagnostics" tab of ProAIS2 & refer to the troubleshooting guide at the back of the ProAIS2 user guide.

4. Is there a good USB power connection?

Is the computer or USB power pack providing enough power to the NOMAD. If you run ProAIS2 and go to the Diagnostics page, you should be able to see a supply voltage of approximately 19v. If this is lower than 19v then the USB port is not providing enough voltage/current and you should try another USB port or power pack.

For more troubleshooting information on the NOMAD transponder please consult Tech Note 00036-2012 in the Support section of www.digitalyachtamerica.com

For more general information about AIS please Google "Introduction to AIS White Paper" and/or "Non-Idiots Guide to AIS" to find two useful AIS articles that we have published.