

User Manual

ATB1

AIS Class B Transceiver
SOTDMA

English



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1. GENERAL

1.1 Exposure to RF Electromagnetic Energy

This product complies with EN62311:2008 (EU) and RSS-102 (Canada).

This product has been evaluated for compliance with the FCC RF exposure limits given in CFR 47 part 1.307(b) at a distance greater than 25cms from the antenna.

1.2 Warnings

This product is designed to assist navigation and should not be used in the place of appropriate navigational judgement. AIS should be used as a complement to navigation and should not be used to replace installed equipment such as RADAR or ECDIS.



AIS devices can only monitor other AIS equipped vessels. It is the responsibility of the vessels crew and skipper to always be aware of surrounding vessels that may not be fitted with AIS equipment.



The ATB1 must always be used in conjunction with the supplied GPS antenna. Use of an alternative GPS antenna may impair the functionality of the system.



This product contains no user-serviceable parts. All maintenance work should be carried out by trained persons authorized by Ocean Signal.



Do not install in a flammable atmosphere (engine room, near to fuel tanks) or in a location subject to excessive solar heat (direct sunlight, beneath a windshield).



The ATB1 is a maritime radio transmitter and is subject to radio licensing laws. Contact the relevant authority in your country for local license requirements.



False information transmitted can result in risk to other vessels as well as your own. It is the user's responsibility to ensure that vessel sensors are configured and calibrated correctly and that all AIS information transmitted is accurate and up to date. It is a criminal offence in some countries to transmit falsified data.



USA Users only: It is a violation of the rules of the FCC 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 entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels. Instructions on how to accurately enter and confirm static data in the device can be found in Section 3 of this user manual.

1.3 ATB1 Overview

The Automatic Identification System (AIS) was designed as an aid to collision-avoidance in the marine industry and is a significant development in navigational safety. It is now widely used at sea to provide vessels with a live accurate picture of marine traffic in the surrounding area.

The fully compliant ATB1 is a Class B type AIS Transponder from Ocean Signal. Your vessel information such as position, speed, and course is ascertained automatically and continuously using an internal multi-GNSS receiver and transmitted to all other AIS equipped vessels to maximum of every two seconds.

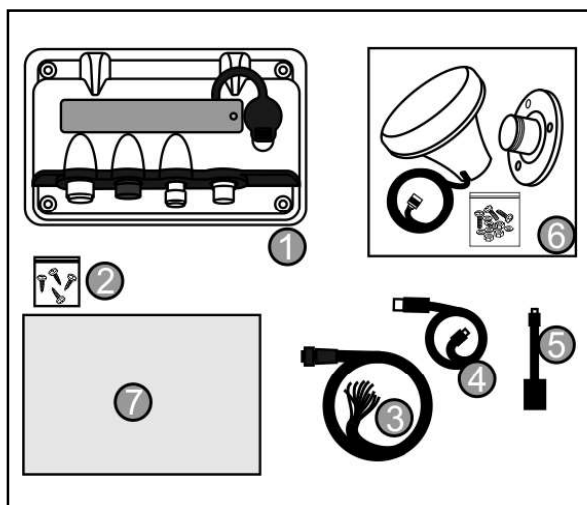
Other vessel information such as vessel name, call sign, type and dimensions as well as the MMSI are also transmitted. This information can be uploaded to the ATB1 easily by several methods described in Section 3 of this guide. Once this information has been uploaded, it remains stored in the unit's non-volatile memory even if powered down.

The ATB1 also receives and interprets AIS messages from other AIS equipped vessels within range, which can then be relayed effortlessly to other navigation devices such as chart plotters, laptops or mobiles using the ATB1's NMEA0183, NMEA2000, USB or Wi-Fi outputs.

A multi-colour LED indicator light on the ATB1 signals the on-going operational status of the unit. This additional safety feature provides you the confidence of knowing that the ATB1 has continuous AIS transmission and optimal performance.

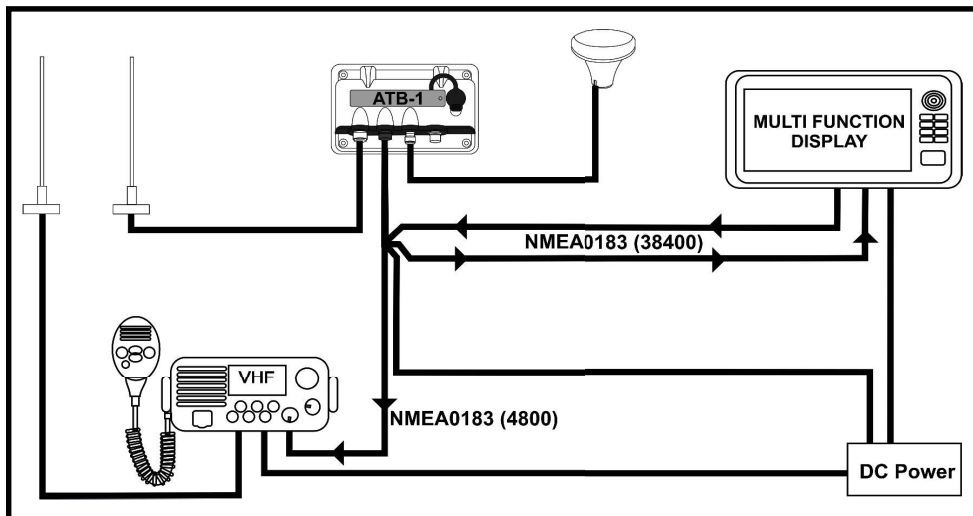
1.4 ATB1 Contents

1	ATB1
2	Screw Kit
3	Power/Data cable
4	USB to Micro USB Cable
5	USB On-The-Go cable
6	GPS Antenna (Inc. fixing kit)
7	User Manual



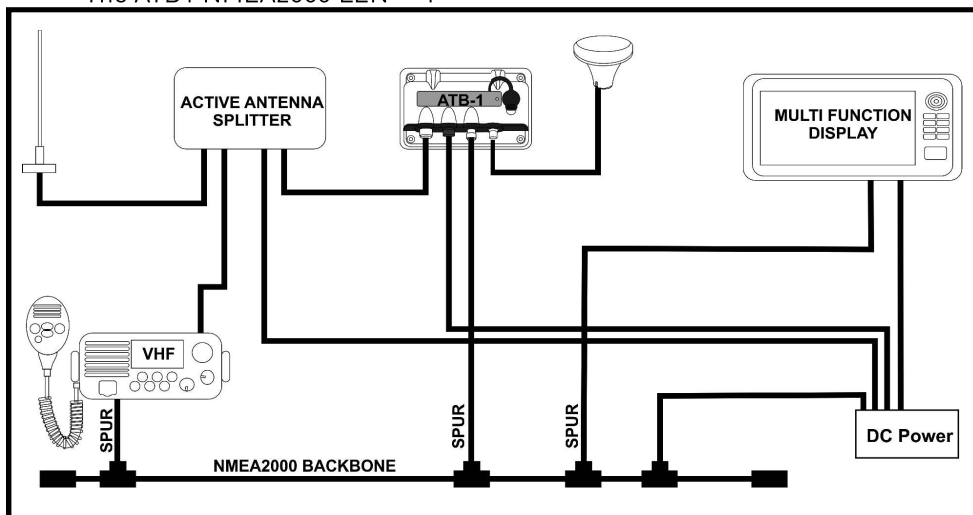
1.5 Example Systems

1.5.1 Example System Using NMEA0183



1.5.2 Example System Using NMEA2000

The ATB1 NMEA2000 LEN = 1

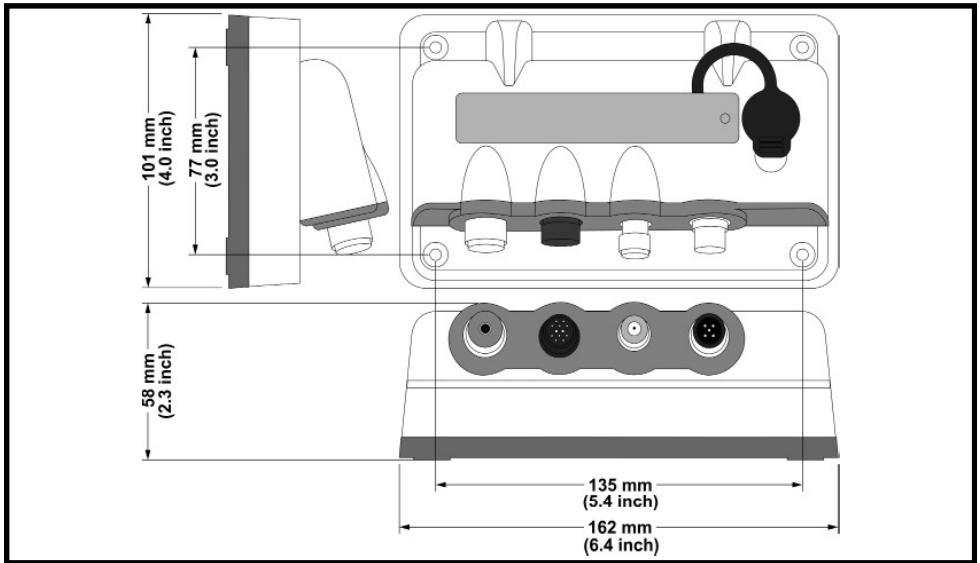


2. INSTALLATION

2.1 Mounting

2.1.1 Transceiver mounting

Determine the mounting location for the ATB1 ensuring that there are suitable access routes for all the required cables and attach securely to a flat surface using the four fixing screws provided. The unit should be easily accessible to allow for disconnection from the power source. The power/data cable plug is the disconnect device, unplugging this will isolate the ATB1 from both poles of the power source. It is also recommended that the unit can be accessed later to view the indicator LED and operate the Mode button.

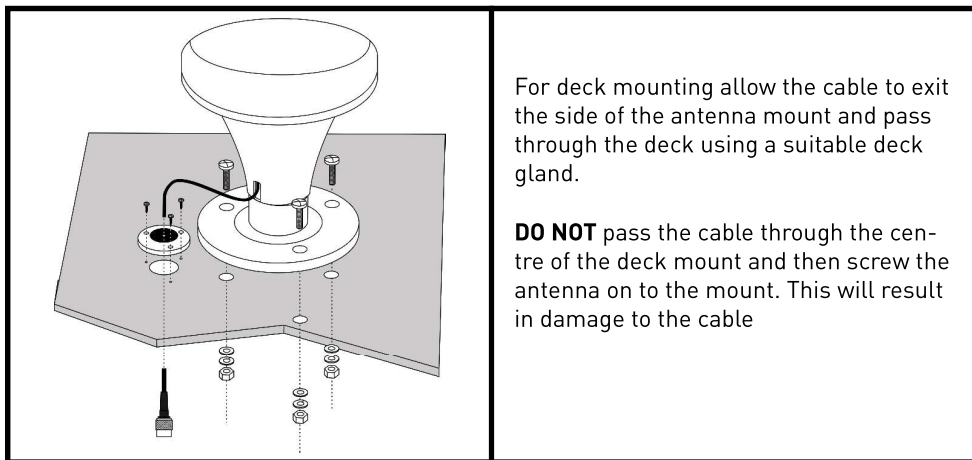


2.1.2 GPS (GNSS) Antenna Mounting

The GPS Antenna should be installed with a clear and unobstructed view of the sky, it should NOT be positioned or mounted on a mast that can cause the antenna to swing and potentially reduce the accuracy of the GPS position and it should NOT be positioned in the direct path of a radar transmitter.

The GPS antenna can be mounted either on a flat horizontal surface or on a suitable pole mount (not supplied).

- If you intend to surface mount the antenna, ensure you have access to the underside of the mounting surface.
- If you intend to pole-mount the antenna, the mount requires a 1 inch 14 TPI thread.



After fixing the GPS antenna to an appropriate location, route the 10m cable to your AIS transceiver unit, adding extension cable as necessary.

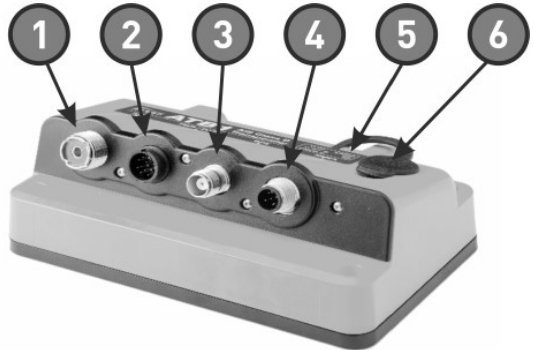


DO NOT cut the GPS Antenna cable. Neatly coil and tie any excess cable

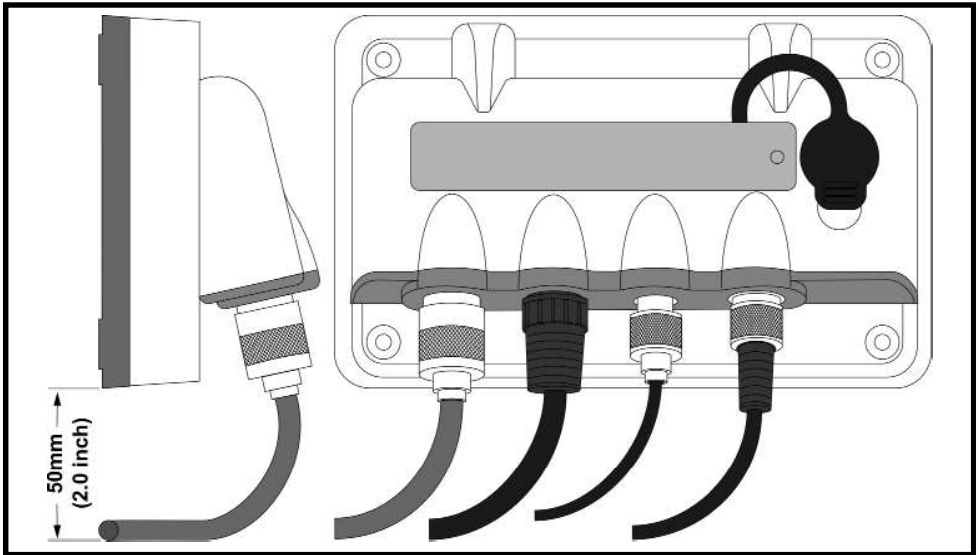
Connect the cable to the GPS connector on the ATB1.

2.2 Connections

Item	Connector
1	VHF (SO239)
2	Power/Data
3	GPS Antenna (TNC)
4	NMEA2000
5	LED Indicator Button
6	USB (Micro-B)



To avoid damage to the cables, ensure at least 50mm (2.0 inches) is available below the Transceiver to allow the cables to turn.



2.2.1 RF Connectors

The VHF antenna should be connected to the SO239 socket.

If the vessel is equipped with a single VHF antenna that is required to be shared between the ATB1 and a VHF Radio Transceiver it is necessary to use an active antenna splitter. Attempting to connect two transmitting devices to a single antenna without a splitter will cause severe damage to either or both devices. Install a third party splitter in accordance with the instructions provided with that unit connecting the ATB1 "ANT" connector to the AIS Input connector on the splitter.

An typical active splitter installation connection is shown in the NMEA2000 example on page 6 of this manual.



When a splitter is installed and the VHF Radio is transmitting, the ATB1 is unable to make use of the SOTDMA system and reporting rates may be longer than those specified for normal operation. For optimum operation a dedicated VHF antenna is recommended.

The GPS antenna should be connected to the TNC connector.

2.2.2 Power and data connectors

The power and data connections are on the 10-core flying lead supplied.

Connect the power cables to the vessel's supply via a suitable fast acting fuse.

If you need to extend the length of the power cable, ensure you observe the following:

- 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 (1.31 mm²). For cable runs longer than 15 meters, you may need to consider a thicker wire gauge (e.g. 14 AWG (2.08 mm²), or 12 AWG (3.31 mm²)).



Default NMEA Port Settings

Power	RED	DC Power	+ve	12 - 24V dc
	BLACK	DC Power	-ve	0V dc
Port 1 Fast NMEA	BROWN	38400	+ve	In
	BLUE	38400	-ve	In
	WHITE	38400	+ve	Out
	GREEN	38400	-ve	Out
Port 2 Slow NMEA	YELLOW	4800	+ve	In
	GREY	4800	-ve	In
	ORANGE	4800	+ve	Out
	PINK	4800	-ve	Out

The ATB1 includes 2 bidirectional NMEA 0183 ports.

The baud rate for each port can be configured via the set-up application. Both ports can be multiplexed or enable GPS data provided to one port to be combined with AIS data and output on the other port.

Typically port 1 is connected to an MFD and configured for 38,400 baud rate, the baud rate required for AIS data transfer. Port 2 is connected to a Heading sensor or other NMEA 0183 device and configured for 4,800 baud rate.

Details of the NMEA0183 sentences accepted and transmitted by each channel are to be found in Section 7.1. NMEA0183 Data Sentences Supported.

3. CONFIGURATION

The ATB1 needs to be correctly programmed with the following vessel data before use:

- Vessel Maritime Mobile Service Identity (MMSI) number
- Vessel name
- Vessel call sign
- Vessel dimensions and AIS GPS antenna location
- Vessel type

An MMSI number comprises 9 digits, and all 9 digits of a valid number must be entered to be accepted during setup. All other fields (i.e. vessel type, name etc.) are optional.

If your vessel already has an MMSI number (used for a VHF DSC radio) then the same MMSI number must be used to program the transceiver.

If a valid MMSI number is not entered, the ATB1 will enter Silent Mode and will not transmit although it will still operate as a receiver.



Important: In the United States of America, the MMSI and Static Data must be entered only by a qualified dealer or other appropriately qualified installer of marine communications equipment on board vessels. The user is NOT authorized to do this. 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.

Configuration can be completed via 3 platforms:

- Android App (downloadable from Play Store) using WiFi or USB stick
- iOS App (downloadable from App Store) using WiFi
- Web Configuration App (online at www.oceansignal.com/installers) using USB stick

All user guides can be downloaded direct from the Ocean Signal website www.oceansignal.com.

3.1 Using WiFi



An Internet connection is required

From the Google Play Store or the Apple App Store search for Ocean Signal.

Install the Ocean Signal App on your mobile device.

To set-up a WiFi connection with your mobile device (initial connection only):

Turn off the power to the ATB1.

Press and hold the LED button and turn on the power. Keep the button held for 6 seconds until the LED turns Red following Amber flashes. Release the button and the LED will remain, Amber blinking off every 2 seconds to indicate the ATB1 is in Wi-Fi connection mode.

Open the App on your mobile device and press Search to look for available devices (this may take a few moments). Once the search has completed, select the ATB1 to pair with your mobile device (for iOS only, this is automatic using Android).

Use the Android or iOS app to upload the vessel information to your paired ATB1.

3.2 Using a USB Device

Your vessel information can be transferred from your Android phone or computer/laptop to the ATB1 using a USB stick and the provided on the go cable.



Ensure the ATB1 is powered off before inserting the USB stick.

Once inserted, power on the unit. The ATB1 will upload the information from the USB stick automatically. This may take a few moments. Once the LED stops flashing and a steady Green or Green/Amber flashing* light can be seen, the information is stored.

Press and hold the LED button for 10 seconds, the LED will start to flash Red/Amber and on release will alternate Green and Amber to allow the USB stick to be safely removed without corruption. The LED will revert to normal operation once the USB stick is removed.

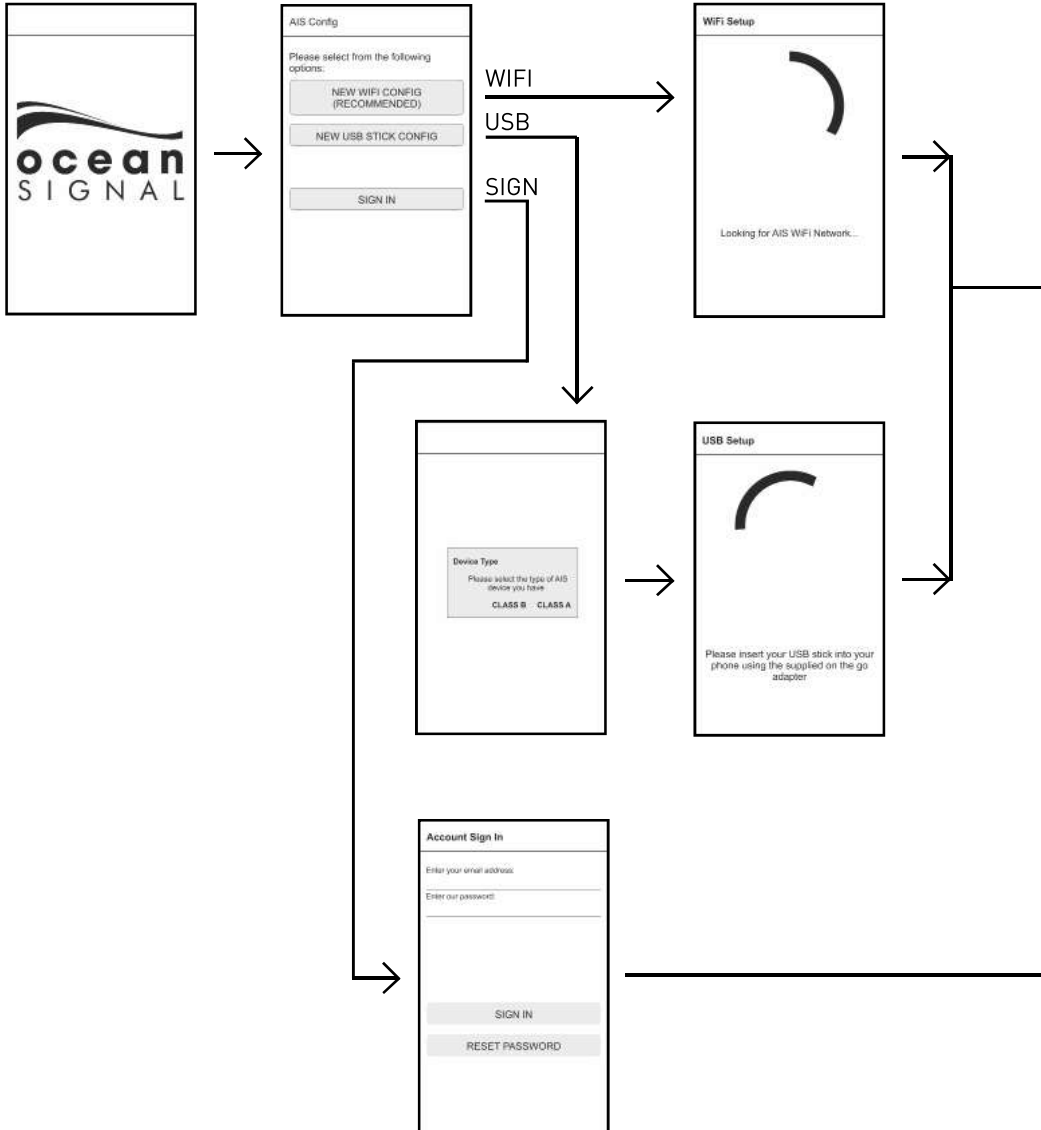
You can use the Android App (see above) or the web-based software to upload vessel information onto the USB Stick. The web-based software is available at www.oceansignal.com/installers.

* Dependant on whether LRM is turned on

3.3 Using the Set-up App (Android and iOS)

Open the Ocean Signal App on your mobile device.

NOTE: An Internet connection is required throughout a WiFi set-up procedure. Create a USB stick file if there is no Internet signal available.

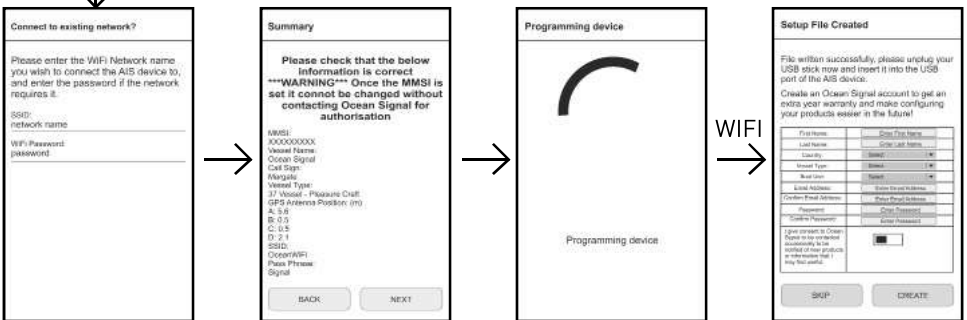
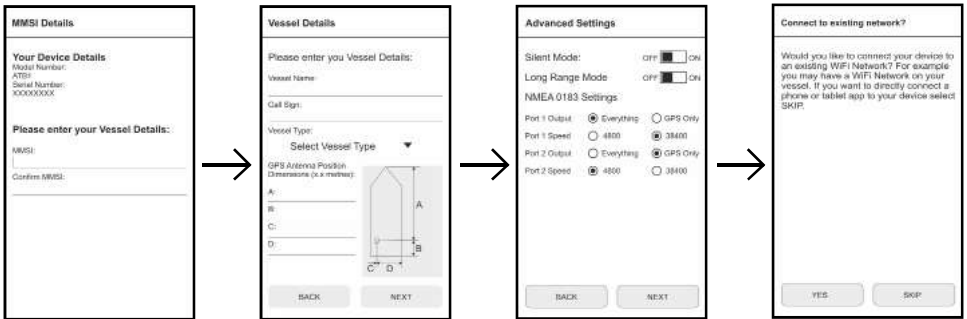


ATB1 USER MANUAL

Carefully enter as many of the details requested by the App as possible. The MMSI number is a mandatory field but all other fields are optional. The App can be used at any time to change information OTHER than the MMSI number.

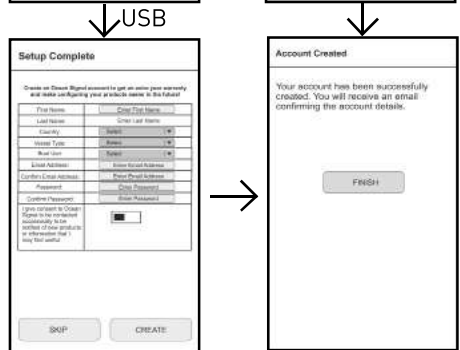
To change a programmed MMSI number it is necessary to contact Ocean Signal to unlock the ATB1.

Please note that the App may vary slightly from the images shown here depending on the device it is operating on

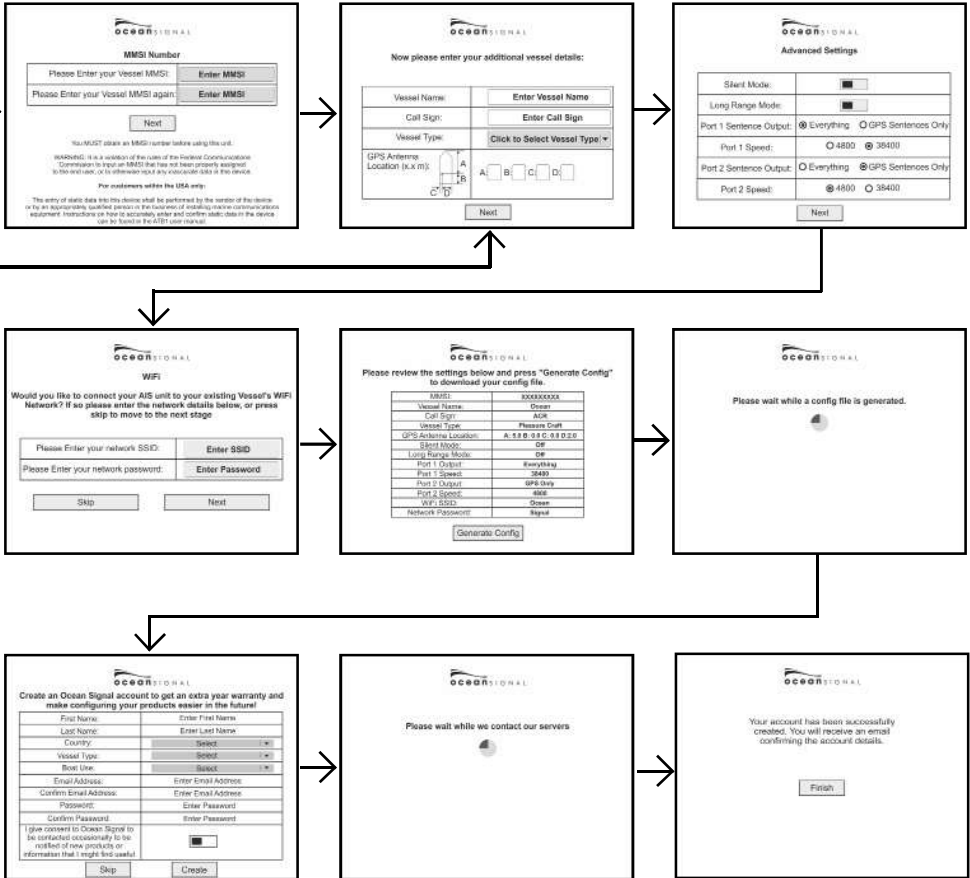


The creation of an account will increase the warranty period to 3 years. The details entered into the account will also allow Ocean Signal to contact you with any software updates or other important information regarding your AIS.

Ocean Signal will not pass on your details to any third parties for marketing purposes.



ATB1 USER MANUAL



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4. OPERATION

Once configured the ATB1 will start to operate automatically once the power supply is switched on. The LED will flash Red for a short period while a GPS fix is acquired, after which the LED will remain constant Green flickering slightly every time an AIS signal is received. Alternative operating modes can be selected by pressing the LED button. The operating mode is indicated by the LED as shown in the table in section 4.2.

4.1 Operating Modes

4.1.1 Silent Mode

The ATB1 can be prevented from transmitting the vessels position information allowing it to be used as an AIS receiver only.

To activate Silent Mode press and hold the LED button for 2 seconds until the LED starts flashing Amber/Green. At this point release the button and the LED will flash Red for 5 seconds indicating the unit is entering Silent Mode. Once in Silent Mode the LED will remain continuous Amber to indicate the ATB1 is operating in Silent Mode.

To deactivate Silent Mode and start transmitting press and hold the LED button for 2 seconds until the LED starts flashing Amber/Green. At this point release the button and the LED will flash Red for 5 seconds indicating the unit is exiting Silent Mode. Once in normal mode the LED remains continuous Green indicating the ATB1 is transmitting data.

4.1.2 Long Range Messaging (LRM) Mode

To ensure the best operation when in offshore waters and out of VHF range from land based AIS stations, the ATB1 can be used in Long Range Messaging Mode to make optimum use of the satellite based AIS receivers.

To activate LRM Mode press and hold the LED button for 5 seconds until the LED shows continuous Amber following 3 seconds of flashing Amber/Green. At this point release the button and the LED will flash Red for 5 seconds indicating the ATB1 is entering LRM mode. Once in LRM mode the LED will flash Green/Amber to indicate the ATB1 is operating in LRM mode.

To deactivate LRM mode and return to normal operation press and hold the LED button for 5 seconds until the LED shows continuous Amber following 3 seconds of flashing Amber/Green. At this point release the button and the LED will flash Red for 5 seconds indicating the ATB1 is exiting LRM mode. Once in normal mode the LED remains continuous Green indicating the ATB1 is transmitting in normal mode.

4.2 LED Indicator Sequences

LED Sequence	Reason	Description
Flashing Green	Start-up	Unit is starting and obtaining a GPS fix.
Steady Green	Operating	Unit is operating and is ready to receive/transmit. Brief interruptions occur as AIS targets are received
Steady Amber	Silent Mode	Brief interruptions occur as AIS targets are received
Green / Amber alternating	LRM Mode	Unit is operating in Long Range Message Mode. Brief interruptions occur as AIS targets are received
Steady Red	Error – Transmit stopped	Use the WiFi App to see details of the fault or check error messages on a connected Multi-Function Display.
Flashing Red	Error – Transmit continued	These errors may be temporary due to external influence. If the error indication continues for more than 60 minutes check error messages on a connected Multi-Function Display
Amber with off pulse every 2s	Wi-Fi Set-up mode	The unit is in Wi-Fi pairing mode and is visible to other devices
Green / Red blink every 1s	External data lost	External data (ie. Heading) that has previously been received by the ATB1 has been lost

4.3 Connecting with Wifi

To connect a mobile device or PC with AIS capable navigation software to the ATB1 via WiFi is dependent on the original set-up of the unit.

4.3.1 With the default WiFi settings

If no specific settings were entered for WiFi during the initial set-up using the Web based App the ATB1 will not be visible as a WiFi Access Point. To connect a WiFi device it will be necessary to power up the ATB1 while holding the LED button for 6 seconds as describes in section 3.1 on page 13. Following successful connection with a mobile App the ATB1 will be visible with the SSID: OS_AISxxxxxxx where xxxxxxxx is the serial number.

4.3.2 With Access Mode set-up

If a SSID and password has been entered and Access Mode selected via the Web based or Mobile App then the ATB1 will be visible to other devices with that SSID. Connect your device to the ATB1 using the previously entered password.

Once the device is connected open the third party software application and use the settings within that program to connect to IP address 192.168.4.1 port 24000.

When connected GPS information and AIS target information will be available within that application.

4.3.3 With Infrastructure Mode set-up

If the unit has been set-up originally in Infrastructure Mode with the SSID and password of an on-board network the ATB1 will connect automatically to that network on power up. The ATB1 will be allocated an IP address by the network router. Before you can connect another device running AIS capable navigation software it will be necessary to access the router configuration and determine this IP address. The ATB1 will show in the router as "Espressif". Once the IP address has been determined open the third party software application and use the settings within that program to connect to the appropriate IP address port 24000.

When connected GPS information and AIS target information will be available within that application.



When restarted it is possible that a router will allocate a different IP address. For consistent connections use the router configuration software to set a fixed IP address for the ATB1

5. GLOSSARY OF TERMS AND ABBREVIATIONS

AIS	Automatic Identification System	m	Metre
AWG	American Wire Gauge	MFD	Multi-Function Display
DSC	Digital Selective Calling	mm	Millimetres
ECDIS	Electronic Chart Display and Information System	MMSI	Maritime Mobile Service Identity
EU	European Union	PGN	Parameter Group Number
GNSS	Global Navigation Satellite System	RADAR	Radio Detection And Ranging
GPS	Global Positioning Satellite	RF	Radio Frequency
LED	Light Emitting Diode	USB	Universal Serial Bus
LEN	Load Equivalency Number	Vdc	Volts direct current
LRM	Long Range Messaging	VHF	Very High Frequency

6. DISPOSAL

Disposal of the ATB1 at the end of life should be done in accordance with local or national disposal of waste electronic equipment in force at the time.

In the EU the ATB1 should be disposed of in accordance with the Waste Electrical and Electronic Equipment Directive (2012/19/EU). Waste Electronic equipment is not allowed to be disposed of with normal household waste.

7. INTERFACE PROTOCOLS

7.1 NMEA0183 Data Sentences Supported

Port name	Data Speed Baud Rate	Transmit sentences	Receive sentences
Channel 1	Default 34800	ABM, ACA, ACK, ACS, ALR, BBM, EPV, HBT, NAK, SSD, TRL, TXT, VDM, VDO, VER, VSD, DTM*, GBS, GGA*, GLL, GNS, GSV*, GSA*, RMC*, VTG*, POSG	HDG, HDT, THS, ABM, ACA, AIQ, AIR, BBM, EPV, SPW, SSD, VSD, POSG
Channel 2	Default 4800 *GPS only	ABM, ACA, ACK, ACS, ALR, BBM, EPV, HBT, NAK, SSD, TRL, TXT, VDM, VDO, VER, VSD, DTM*, GBS, GGA*, GLL, GNS, GSV*, GSA*, RMC*, VTG*, POSG	HDG, HDT, THS, ABM, ACA, AIQ, AIR, BBM, EPV, SPW, SSD, VSD, POSG

* When set to GPS only via the App, only the marked sentences are transmitted. When a port is set to 4800 it will automatically set the output to GPS only. Valid NMEA0183 sentences received on one port re transmitted on the other.

7.2 NMEA2000 PGNs Supported

PGN	Title
59392	ISO Acknowledgement
60160	ISO Transport Protocol, Data Transfer
60416	ISO Transport Protocol, Connection Management
60928	ISO Address claim
126208	Request group function
126464	PGN List - Transmit PGN's group function
126992	System Time
126993	Heartbeat
126996	Product information
126998	Configuration Information
129025	Position rapid update
129026	COG SOG rapid update
129029	GNSS position data
129033	Local Time Offset

PGN	Title
129038	AIS Class A position report
129039	AIS Class B position report
129040	AIS Class B extended position report
129041	AIS Aids to Navigation (AtoN) report
129539	GNSS DOP's
129540	GNSS sat's in /view
129545	GNSS RAIM Output
129792	AIS DGNSS broadcast binary message
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
129800	AIS UTC/Date Inquiry
129801	AIS addressed safety related broadcast message
129802	AIS safety related broadcast message
129803	AIS interrogation
129804	AIS assignment mode command
129805	AIS data link management message
129807	AIS group assignment
129809	AIS Class B 'CS' static data report part A
129810	AIS Class B 'CS' static data report part B

7.3 WiFi Output

During normal operation all data being received on either NMEA183 port will be output via the WiFi signal and be available to any device connected. Multiple WiFi devices may be connected to display this data.

Note: If both NMEA0183 ports are set to 4800 or GPS only then GPS data only will be available on the WiFi output.

8. SPECIFICATIONS

AIS transmission

Transmit Power (EIRP)	5/1Watt
Frequency Range	156.025 – 162.025MHz
Modulation AIS	GMSK: BT 0.4

Receiver

Sensitivity	-107dBm for 20% packet error rate
Frequency Range AIS RX1 and RX2	156.025 – 162.025MHz
Frequency Range DSC	156.525MHz

WiFi

Sensitivity	20dBm (typical)
Frequency Range	2400.0 – 2483.5MHz

General

Dimensions	101 x 162 x 58mm 4.0" x 6.4" x 2.3"
Frequency Range DSC	156.525MHz
Temperature range	-15°C to +55°C 5°F to 131°F
Compass Safe Distance (ATB1 and GPS Antenna)	1m
Waterproof	IPx7 (1 metre for 30 minutes)
Equipment category (ATB1)	Protected
Equipment category (GPS Antenna)	Exposed
Supply Voltage Range	DC 10.8V - 31.2V
GPS Receiver	High Sensitivity
GPS Channels	99 acquisition/33 tracking
Serial Port Interfaces	NMEA0183 (2 Rx, 2 Tx), NMEA2000 (DeviceNet), USB ¹

Compliance

Standards	IEC62287-2, IEC60945
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¹ For maintenance/configuration

Essential ratings information can be found on a label attached to the back of the product

9. SPARES AND ACCESSORIES

Part Number	Description
763S-02845	GPS Antenna (with 10m cable)
763S-03088	ATB1 Power Data Cable
763S-03089	USB On the Go Adapter Cable
763S-03090	USB A to USB micro cable
763S-03095	USB Connector Protective Cover

10. APPROVALS

10.1 European Declaration of Conformity

Hereby, Ocean Signal Ltd. declares that the radio equipment type ATB1 is in compliance with Directive 2014/53/EU.

See www.oceansignal.com/approvals-documents for the full Declaration of Conformity.



10.2 Country of Intended Use (EU requirement)

The ATB1 can be operated in the maritime environment only in littoral countries of the European Union.

Austria	✓	Germany	✓	Poland	✓
Belgium	✓	Greece	✓	Portugal	✓
Bulgaria	✓	Hungary	✓	Romania	✓
Cyprus	✓	Ireland	✓	Slovakia	✓
Croatia	✓	Italy	✓	Slovenia	✓
Czechia	✓	Latvia	✓	Spain	✓
Denmark	✓	Lithuania	✓	Sweden	✓
Estonia	✓	Luxembourg	✓	United Kingdom	✓
Finland	✓	Malta	✓		
France	✓	Netherlands	✓		

11. WARRANTY

11.1 Limited Warranty

Your Ocean Signal ATB1 is warranted against manufacturing defects in materials and workmanship for a period of 2 years from the date of purchase and in accordance with the following conditions.

Ocean Signal will at its discretion, repair or replace faulty product free of charge excluding the cost of shipping. Proof of purchase shall be required for a warranty claim to be valid from the original purchaser. All claims shall be made in writing to Ocean Signal or an approved service dealer or distributor. Ocean Signal shall not be liable to the buyer under the above warranty:

- for any repairs or modifications carried out using parts not supplied or approved by Ocean Signal and for work carried out other than by Ocean Signal or approved service dealers,
- for any part, material or accessory that is not manufactured by Ocean Signal the consumer will be covered by the warranty offered to Ocean Signal by the manufacturer or supplier of such a component,
- for product which has not been fully paid for,
- for any product supplied by Ocean Signal to a customer under an alternative warranty or commercial agreement, for the cost of shipping product to and from the customer.

11.2 Extended Warranty

During the set-up and entering of your vessels data you will be asked to create an account allowing Ocean Signal to send you information and updates regarding this product.

On successful completion of this account the Limited Warranty period will be extended to a period of 3 years from the date of purchase.

Storage of data is fully GDPR compliant and you can request information regarding the data held or request its removal at any time. Email gdpr@oceansignal.com.

This warranty does not affect your statutory rights. This warranty is to be interpreted under English law.

For further assistance please contact our Technical Service Department.
Email: info@oceansignal.com

12. RECORD YOUR INFORMATION HERE

To ensure easy access to your AIS unit in the future it is recommended that you note the login information.

Boat Name:	
Call Sign:	
MMSI:	
WiFi Network SSID:	
WiFi Network Password hint:	
Email address:	
Password hint:	

NOTE: For dealers installing this product on behalf of a customer it is advisable to use the customer's details to create the account. This will allow the customer to access the unit from their own Mobile device later.

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