

# ***AI3000 AIS Receiver***



## ***Installation and Quick Reference Guide***

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## Disclaimer

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***This product is designed to aid navigation and should be used to augment normal navigational procedures and practices. It is the users responsibility to use this product prudently.***

***Neither Euronav, nor their distributors or dealers accept responsibility or liability either to the product user or their estate for any accident, loss, injury or damage whatsoever arising out of the use or of liability to use this product.***

*Note; The AI3000 is a receive only unit and does not comply with the mandatory SOLAS carriage requirements for most commercial vessels to fit Class A AIS Transponders. The receive only unit is suitable for any vessel wanting to monitor (but not transmit own ship details) any vessels fitted with AIS transponders in the local vicinity.*

## Limited Warranty

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Euronav warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. Euronav will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour. The customer is, however, responsible for any transportation costs. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. A returns number must be given before any unit is sent back for repair.

## Contents of this Box

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This box contains:

- ☐ AI3000 AIS receiver unit with trunnion mounting bracket.
- ☐ Interface cable for connection to PC
- ☐ Interface cable for NMEA connection
- ☐ Power cable (12/ 24 volts)
- ☐ This guide.

## Quick Start

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This section describes the essential information you need to install the AI3000 receiver. You should read the remainder of this guide for full information on installing and operating the AI3000 unit.

To install your AIS3000 to work with your PC:

### 1. Power connection

Connect the power lead to a 12 or 24v DC supply via a suitable 1A fuse or breaker panel.

Lead connections:    Red is positive  
                              Black is negative

Plug the cable into the PWR socket at the back of the unit.

### 2. Antenna connection

Connect a standard Marine VHF aerial to the ANT input at the back of the unit. The aerial should have a clear view of the horizon, and be separated from any other transmitting aerials, if this can't be avoided, the aerial should be mounted above the transmitting aerial. The AI3000 will automatically receive any AIS transmission and this is visually indicated on the red lights (Channel 1 & 2) which will flash on receiving data.

### 3. Connection to the PC

Use the RS232 cable supplied (this has 9 pin D type connectors at each end) and connect the DATA connector on the back of the AI3000 to a spare serial port on the PC. If you do not have a serial port available, a USB port with a suitable USB to serial converter cable can be used.

Start your compatible navigation or monitoring software and set the BAUD rate for the serial port to 38400 (you may need to refer to your software manual).

The red indicator lights marked Channel 1 and 2 will flash when AIS target information is being received.

*Note; If you don't have any AIS software you can use the Hyperlink program supplied with Windows. This can be found by pressing the*

*Start button -> programs ->Accessories->Communications->HyperTerminal*

<i>Set the com port for :</i>	<i>Baud rate</i>	<i>38400</i>	
	<i>Data bits</i>	<i>8</i>	
	<i>Parity</i>	<i>None</i>	
	<i>Stop bits</i>	<i>1</i>	

Once set up you will see the VDM NMEA data strings. These are binary encoded, unlike most NMEA data.

## Brief Background to AIS

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AIS was designed to fulfil a need for vessels to know the position, details and navigational intentions of other vessels within VHF range for improved safety and collision avoidance. Most commercial vessels are required to fit AIS transponders by December 2004. The transponders use VHF frequencies to transmit details of their own vessel and receive details from other vessels or navigation aid within VHF range.

## Introduction

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AI3000 is a low cost, high performance AIS receive only unit, that enables the reception of information from vessels fitted with AIS transponders at a fraction of the cost of a conventional transponder.

The AI3000 installation is quick and simple, requiring only the connection to a VHF aerial (not supplied) and a computer (PC) or other device (e.g. plotter). Note these must have software that is compatible with AIS standard output to display this information.

Information received by the AI3000 is then transmitted via the serial data cable so that it can be displayed on compatible vessel navigation systems, vessel monitoring or other applications.

Information transmitted from vessels fitted with AIS Transponders includes:

### Static Information

- Name
- Type of vessel
- Call sign
- MMSI number
- IMO number
- Draft
- Size of vessel

### Dynamic Information

- Vessel position
- SOG
- COG
- Rate of turn
- Heading
- Status
- Destination
- ETA

*Note; Not all the above information is necessarily transmitted by every vessel.*

## Installing the AI3000 Receiver

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The AI3000 is supplied with a power cable and data cables for connection to a PC serial port or an NMEA device.

The AI3000 Receiver *is not supplied with a VHF antenna* as the type of antenna and cable requirements are different for various types of vessel. You need to provide a suitable VHF antenna before the receiver will operate fully. These can be obtained from a local marine chandler or electronics outlet. The antenna connector type is BNC, 50 ohms and cable recommended should be equal or better than RG214.

### General tips on antenna location

Installing the VHF antenna for AIS on a vessel is a compromise between the following items:

- Antenna separation
- Clear view of the horizon
- Antenna height

### Antenna separation

AIS transponders use frequencies on the high side of the marine mobile band (Channel 1 is 161.975 MHz, Channel 2 is 162.025MHz). The frequencies are close to the duplex channels used for marine communication.

The AIS VHF antenna should be separated as much as possible from the voice VHF installations used for main communication to avoid unnecessary interference. Best separation is achieved by installing the antennas over each other or on separate sides of the mast. The VHF antenna should be mounted at least 3 meters away from and out of the transmitting beam of high-power transmitters or other VHF antenna installations.

### Clear view of the horizon

The AIS VHF antenna should be mounted with a relative clear view of the horizon. Large obstructions might shade the AIS radio communication in certain directions.

### Antenna height

AIS uses VHF radio frequencies, whose propagation is close to line of sight, therefore, the higher the antenna location the longer the range.

## Mounting the AI3000 receiver

The AI3000 receiver comes with a trunnion mount to secure to a bulkhead or shelf. Select a location away from excessive heat sources, such as heating vents or equipment heat exhausts and avoid areas where there is a high flow of moisture or humid salt air (e.g. port holes/windows, and hatches that are open to the outside) and high levels of vibrations and shocks.



## Connections

### Power

Connect the power lead to a 12 or 24 volt DC supply. This should be connected to a breaker switch panel preferably with a fuse rated at 1 Amp. Pin connections are shown below.

Pin 1	RED	Positive 12 or 24 volts
Pin 2	BLACK	Negative

### Data connector

The data connector enables one of the two cables supplied to connect either to a PC serial port (or USB port by using a suitable USB – serial adaptor cable) or a NMEA device e.g. plotter or GPS.

- PC connection cable – terminated with two 9 Pin D type connectors
- NMEA cable – 9 Pin D type plug with flying leads

Data output is the AIS VDM string and any NMEA data supplied on the NMEA input (such as GPS).

## AIS3000 – Power and Data Interface

Power cable	Function	Cable Color
Pin		
1	Positive 12 or 24 volts DC	Red
2	Negative	Black

9 Pin D type data		
1	-(B) NMEA output	Brown
2	+ RS232 Output	Red
3	Reserved	Orange
4	+(A) NMEA Output	Yellow
5	- RS232 Ground Return	Green
6	Programming Input	Blue
7	Programming Output	Violet
8	+ (A) NMEA Input	Grey
9	- (B) NMEA Input	Black

### Connecting to a Computer or RS232 device

Use the RS232 cable (the one with connectors at both ends). Connect one end of the cable to the AIS receiver data connector and the other end to the PC serial port.

### Connecting to a NMEA plotter/radar

Use supplied NMEA cable (9 Pin D type at one end and flying leads at other)

NMEA output                      4 = Signal (+) Yellow                      1 = Signal (-) Brown

### Connecting a GPS to AIS3000 and AIS300 to PC

Use supplied cable (9 Pin D type at one end and flying leads at other)

NMEA GPS Input                      8 = Signal (+)                      9 = Signal (-)

NMEA output to PC                      4 = Signal (+) Yellow                      1 = Signal (-) Brown

*Note: You may need an RS422 to RS232 converter to connect up the output to your PC, or make up your own D type connector and cable using above pin outs to use the RS232 output.*

### GPS interface

The NMEA (GPS) input is fixed at 4800 BAUD and the data is simply reflected on to the output NMEA data string. Due to the NMEA bandwidth limitations, this data should be kept to a minimum.

### Programming input

Should only be used under instructions from Euronav Tech support.

## Correct operation

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Operation of the AI3000 unit is fully automatic and only requires power, VHF and data cable connection. Once you have supplied power to the AI3000 unit the green light marked ON should illuminate.



The channel 1 and 2 lights should flash momentarily when information from nearby transponders is received.

Data is then transmitted for visual or textual viewing on suitable electronic charting systems (such as seaPro) or other systems or devices.



## Fault finding

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### No power light is displayed

Check that the power lead is connected to a 12 or 24 volt DC supply and the polarity of the supply is correct (red = positive and black is negative).

### Channel 1 and Channel 2 lights do not flash

Make sure that a suitable VHF antenna is fitted and correctly connected.

Make sure that the antenna is correctly positioned – i.e. at a suitable location to visibly 'see' vessels.

Check that the aerial is not being swamped by other transmitting aerals.

*Note; Until the deadlines for mandatory fitment are reached, ships may not have fitted a Transponder, therefore if a ship is sailing past and no signal is received there may be no fault with the AI3000 receiver.*

### Channel 1 and Channel 2 lights flash but no data is received

If the red channel lights flash then data is being received from nearby vessels.

Make sure the correct data cable is connected to the PC or NMEA device.

Make sure that on the PC application or device that the correct port is assigned and the correct baud rate is setup. The correct baud rate is 38400.

Use the Windows Hyperlink program to confirm data is being received (see quick start guide).

## PRODUCT SUPPORT

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## Technical specifications

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AI3000 is a compact dual channel synthesised VHF receiver designed to receive and decode transmissions from vessels fitted with Class A AIS transceivers.

### Electrical

Power supply range : 9 - 30 Volts DC  
Power consumption : 400mW

### Output

Baud rate : 38400 Baud (38.4Kb)  
Format : ITU/ NMEA 0183  
Output message : VDM

### Receiver

Frequency : AIS 161.975 MHz  
AIS 162.025 MHz  
Channel spacing : 25KHz  
Sensitivity : -112dBm  
Demodulation : GMSK  
Data Rate : 9600  
Antenna impedance : 50 ohms

### Physical

Dimensions : Length: 140mm, Width: 120mm,  
Height: 50mm  
Weight : 600g  
Mounting : Trunnion bracket  
Connectors : Antenna BNC  
Output port: 9 pin D socket  
Power: 2 pole plug

CE approval to: EN61000-6-3:2001  
EN61000-6-1:2001  
EN60945 (EMC)