

This installation guide serves as a complement to the product manual (Art.No. 1001001-2), included on the Nauticast Data Card (USB-Stick). It is designed to give immediate access to essential information when executing an installation and a functionality test. ***Installation of the Nauticast A2 AIS System should always be planned and executed by authorized personnel.***

Please visit our web-site for the latest information regarding the Nauticast A2. Our web-site also contains contact information of our world-wide service network.

Nauticast GmbH  
[www.nauticast.com](http://www.nauticast.com)

## RECOMMENDED PHYSICAL LOCATION

Transponder unit should be mounted in a protected area and compass safe distances kept in mind (see table on the right). VHF antenna must be mounted vertically with ideally 1.5m free space around it. GPS antenna must have an omnidirectional view of the sky for ideal reception.

Please consult the product manual for more detailed physical location aspects of the transponder unit and of the VHF and GPS antennas.

## SYSTEM MODE

**Important:** The Nauticast A2 can operate in two different system modes, **Class A mode** (default) and **Inland mode**.

Inland mode is currently only applicable to European river going vessels. Set correct mode in:

*Main Menu* → *Config* → *System Settings* → *System Mode*

**Instructions only relevant for Inland AIS operation will be in brown print.**

### Physical

Nauticast A2  
 Size W x H x D: 238x87x173 (mm)  
 Gimbal Mount  
 Size W x H x D: 252x95x65 (mm)

### Power

Input 12/24 VDC  
 Power Consumption: 20W (60W peak)  
 Required power on current: 4A

### GPS Receiver (AIS internal)

Receiver: 50 CH  
 Frequency: L1 (1575.42 MHz)  
 Update Rate: 2 Hz  
 Position accuracy (SA off)  
 Position <2.0 m DGPS (CEP, 50%)  
 Position <2.5 m GPS (CEP, 50%)  
 Antenna feeding: 5 VDC

### Electrical Interfaces

| RS 422 Port  | Default speed (bps) |
|--------------|---------------------|
| Pilot In/Out | 38400               |
| ECDIS In/Out | 38400               |
| LR In/Out    | 9600                |
| Sensor 1 In  | 4800                |
| Sensor 2 In  | 4800                |
| Sensor 3 In  | 4800                |

| RS 232 Port  | Default speed (bps) |
|--------------|---------------------|
| RS232 In/Out | 38400               |

Signal connector: 26 pin HD-SUB (M)  
 RS-232 connector: 9 pin D-SUB (M)  
 Power connector: 4 pin ConXall (M)  
 GPS 50 ohm antenna connector TNC female  
 VHF 50 ohm antenna connector BNC female

Chassis GND screw size: M6

### Cables (recommended)

|                   |                                  |
|-------------------|----------------------------------|
| VHF and GPS       | RG214/U                          |
| Sensors e.g. Gyro | RFE-HFI 2x2x0.75 mm <sup>2</sup> |

### VHF Transceiver

Frequency 156-163 MHz  
 Output power 1/12.5 W  
 Channel bandwidth 25 kHz  
 Bit Rate 9600 bps  
 Intervals between position reports 1-180 s  
 Modulation FM-GMSK/GFSK  
 Transmitter 1  
 Receivers 3  
 Transceiver Sensitivity <-107 dBm

### Environmental data

Protected environment (IEC 60945)  
 Operating temperature -15 °C to 55 °C

### Compass safe distance

60 cm to standard magnetic compass  
 45 cm to steering magnetic compass

### The Nauticast A2 AIS System is compliant with the following Standards

IMO Performance Standard for AIS (MSC 74(69) Annex 3)  
 ITU-R M. 1371-5  
 ITU-R M. 825-3  
 ITU-R M. 1084-5  
 IEC 61993-2 Edition 2  
 IEC 61162-1/2 Edition 4 (NMEA 0183, Version 4.0)  
 IEC 61108-1 Edition 2  
 IEC 60945 Edition 4  
 IEC 62288 Edition 2  
 IALA Guidelines on AIS  
 Inland Test Standard Ed. 2.0

Specifications subject to change without notice

### SYSTEM CONFIGURATION

*NOTE: Set correct System mode (CLASS A / Inland before proceeding)*

Set up the following parameters under: *Main Menu → Config → Ship Static*

| Class A Mode     | Inland Mode                       |
|------------------|-----------------------------------|
| MMSI             | MMSI                              |
| IMO              | IMO = 0                           |
| Call Sign        | Call Sign                         |
| Ship Name        | Ship Name                         |
| Height over Keel | Height over Keel                  |
| Ship Type        | ERI Code / Euro type              |
| Ship Dimension*  | SOG/COG/HDG quality               |
| -                | Euro number                       |
|                  | Ship and Convoy total Dimensions* |

#### \*SET SHIP DIMENSIONS

There are two methods for setting Ship Dimensions: configuration parameter "**Ship Size Mode**" in the view "**Config-> Interfaces -> Miscellaneous**" can be set to **Standard Mode** or **Simplified Mode** (default). This choice is only available in Class A system mode!

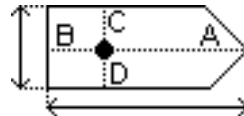
If external ECDIS will be used for full AIS configuration, Standard Mode is recommended unless the ECDIS integration has been verified with A2.

#### **Standard Mode (not available in Inland mode)**

In this mode data is entered exactly as is will be reported on VHF link.

Input:

- $A, B, C, D$  for internal antenna [m]
- $A, B, C, D$  for external antenna [m]

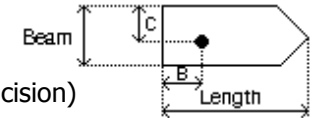


#### **Simplified Mode (default)**

In **Simplified mode** the transponder will automatically calculate and correctly round the A,B,C and D values reported on the VHF link from Length, Beam, C and B.

Input:

- *Ship length x.x* [m] (one decimal precision)
- *Ship beam x.x* [m] (one decimal precision)
- $C, B$  for internal antenna relative to ship x.x [m] (one decimal precision)
- $C, B$  for external antenna relative to ship x.x [m] (one decimal precision)



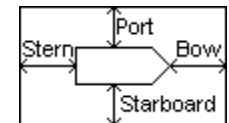
#### **Inland Mode Convoy Setting (Inland only):**

Set Length, Beam, C and B parameters as above.

Specify any extra convoy size in *Main Menu→Voyage→Convoy Settings*.

Extra convoy size on each side (value = 0 if convoy not used):

- *Bow x.x* [m] (one decimal precision)
- *Stern x.x* [m] (one decimal precision)
- *Port side x.x* [m] (one decimal precision)
- *Starboard x.x* [m] (one decimal precision)



A,B,C and D values reported on the VHF link will be calculated from Length, Beam, C,B and any extra convoy sizes.

This mode will make it easier for Inland AIS users to quickly change all relevant dimensions when changing convoy configuration, but may cause problems for external ECDIS integrations.

## SYSTEM FUNCTIONAL TEST

Please consult the product manual, included on the Nauticast Data Card (USB-Stick), if any problems are detected.

## SYSTEM POWER UP

The Nauticast A2 will start to operate when power is connected, the device does not have a power switch. The system is fully operational within 2 minutes.

## TRANSPONDER STATUS LEDs

Normal operation can be verified using the LEDs in front. Tx and Rx LEDs will flash during VHF Tx and Rx. Status LEDs on the transponder signal these operational states:

| SYSTEM STATUS                | STATUS LED   |
|------------------------------|--------------|
| Normal Operation             | Solid GREEN  |
| Unacknowledged active alarms | Flashing RED |
| Acknowledged active alarms   | Solid RED    |
| Power failure                | OFF          |

Note: LEDs will behave differently during a system boot. Allow two minutes from power-on before checking of LED status.

## ALARM LIST

Make sure no unexpected alarms are active. *Main Menu → Alarms*

Disable any active alarms not applicable for the installation in the Alarm Config View. *Main Menu → Config → Alarm*

## TIME AND DATE

Verify system time and date in the upper right corner. If incorrect, the transponder internal GPS does not have a position fix. This will also be indicated by an alarm "UTC Sync Invalid".

## GPS STATUS

Verify GPS antenna installation quality in the GPS Status View

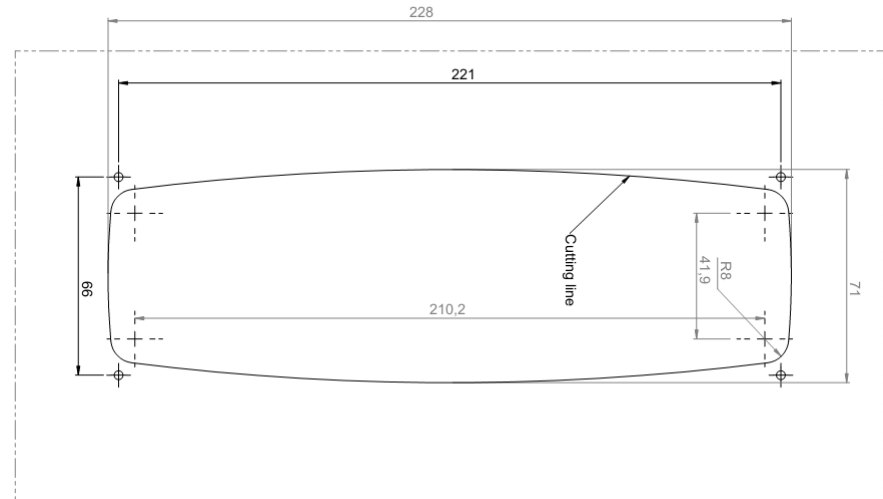
*Main Menu → Status → GPS Status*

## VHF Communication Test

Verify two way VHF communication with other vessels in the Comm. Test View. *Menu → Maintenance → Comm. Test.*

## Mounting

The Nauticast A2 can be panel or gimbal mounted (optional accessories 1001005 or 1001006). For flush mounting, remove any gimbal mount jacket. Use the cutout dimensions in the figure below. Do not exceed the cutout area, the screw holes may be too close to the cutout. A 1:1 scale cutout drawing is included on the Data Card. If printed, verify scale has not changed by measuring given dimensions.



## Nauticast A2 Signal Cable DSUB-OPEN, 1001003

26-pin High Density D-Sub, female. Out/Tx = Data from transponder.

| Pin | In/Out | Signal Name                   | Signal Type   | Colour         |
|-----|--------|-------------------------------|---------------|----------------|
| 1   | Out    | ECDIS - TxB (+)               | RS422         | White          |
| 2   | Out    | ECDIS - TxA (-)               | RS422         | Brown          |
| 3   | In     | Sensor1 - RxB (+)             | RS422         | Green          |
| 4   | In     | Sensor1 - RxA (-)             | RS422         | Yellow         |
| 5   | In     | Sensor2 - RxB (+)             | RS422         | Grey           |
| 6   | In     | Sensor2 - RxA (-)             | RS422         | Pink           |
| 7   | In     | Long Range - RxB (+)          | RS422         | Blue           |
| 8   | In     | Long Range - RxA (-)          | RS422         | Red            |
| 9   | -      | Long Range - GND              | RS422         | Black          |
| 10  | -      | ECDIS - GND                   | RS422         | Violet         |
| 11  | In     | ECDIS - RxB (+)               | RS422         | Grey / Pink    |
| 12  | In     | ECDIS - RxA (-)               | RS422         | Red / Blue     |
| 13  | -      | Sensor1 - GND                 | RS422         | White / Green  |
| 14  | -      | Sensor2 - GND                 | RS422         | Brown / Green  |
| 15  | In     | Sensor3 - RxB (+)             | RS422         | White / Yellow |
| 16  | In     | Sensor3 - RxA (-)             | RS422         | Yellow /       |
| 17  | Out    | Long Range - TxB (+)          | RS422         | White / Grey   |
| 18  | Out    | Long Range - TxA (-)          | RS422         | Grey / Brown   |
| 19  | -      | Alarm Relay - GND             | -             | White / Pink   |
| 20  | Out    | Alarm Relay - Out             | -             | Pink / Brown   |
| 21  | -      | GND                           | -             | White / Blue   |
| 22  | -      | TX test pin (do not connect!) | -             | -              |
| 23  | -      | Sensor3 - GND                 | RS422         | White / Red    |
| 24  | -      | Alarm Relay - VCC             | -             | Brown / Red    |
| 25  | In/Out | CAN (+)                       | Diff. CAN bus | White/Black    |
| 26  | In/Out | CAN (-)                       | Diff. CAN bus | Brown/Black    |

## A2 Power Cable, 1001001-1

4-pin male circular ConXall, female.  
5A Fuse.

| Pin | Signal Name       | Colour |
|-----|-------------------|--------|
| 1   | 12/24VDC positive | Red    |
| 2   | GND               | Black  |
| 3*  | External Switch   | Brown  |
| 4*  | External Switch   | Orange |

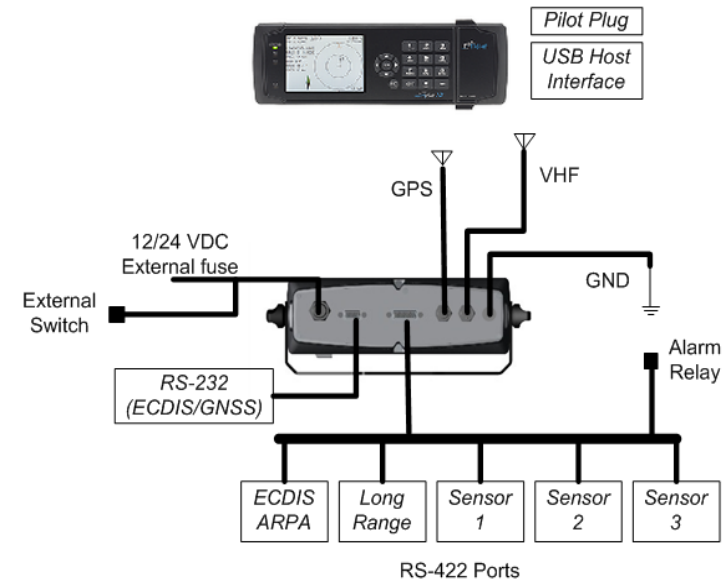
**\*See complete manual on Documentation CD/USB-Stick for details on external switch installation.**

## Transponder 232 pinout

Tx = from transponder.  
Default 38400 bps.

| Pin | Signal Name   |
|-----|---------------|
| 1   | Not Connected |
| 2   | AIS Data Tx   |
| 3   | AIS Data Rx   |
| 4   | Not Connected |
| 5   | GND           |
| 6   | Not Connected |
| 7   | Not Connected |
| 8   | Not Connected |
| 9   | Not Connected |

**Use a standard DE9F to DE9M Serial Cable.**



**System overview**