



USER MANUAL T200B

CLASS B AIS TRANSPONDER

SKU: 001-1017

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1 T200B CLASS 'B' AIS TRANSPONDER



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2 DOCUMENT

2.1 About This Manual

This manual provides installation, operating instructions and fault-finding procedures for the equipment to which it relates.

After installation, this manual should remain with the vessel to which it relates.

This manual may also be made available in electronic Portable Document Format (PDF). In PDF format, the following categories are all enabled as active hyperlink references: (1) The titles of each section; (2) document cross-references; (3) the table of contents.

This document may therefore be navigated quickly and effectively by using a mouse or other pointing device to activate each of these hyperlinks. This is a printer friendly document, designed to be printed 2-sided as a booklet with A5 pages on A4 stock paper.

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3 NOTICE

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4 GENERAL NOTICES

Please read the General Notices:



SAFETY: Make sure the power supply is switched off before you make any electrical connections to the unit.



INSTALLATION: This equipment must be installed in accordance with the instructions provided in this manual. Failure to do so could result in poor performance, personal injury and/or damage to your vessel and/or connected equipment.



CABLES: The supplied cables should only be cut, shortened or lengthened by an appropriate supplier.



COMPASS: The compass safe distance of this unit is 0.5 m or greater for 0.3° deviation.

In accordance with a policy of continual development and product improvement, hardware and software may be upgraded from time to time, and future versions of equipment may therefore not correspond exactly with this manual.

When necessary, upgrades to the product will be accompanied by updates or addenda to this manual. Information contained in this manual is liable to change without notice.

COMAR SYSTEMS LTD. disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

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.

5 INTRODUCTION

The T200B is a compact and rugged AIS Transponder designed for the demands of the small commercial boat, fishing boat and leisure markets. It meets the Class 'B' standard that allows vessels that are not required to fit Class 'A' units to voluntarily fit an AIS Transponder. When connected to an external VHF antenna and a GPS antenna (not supplied), the T200B will transmit its own vessel position and data and also receive information from other AIS vessels, shore stations and navigational aids within VHF range.

The unit is initially programmed by the user with the supplied software. The vessel's MMSI number, name, call sign, dimensions and type of vessel are entered at this stage. Once programmed, the unit will automatically receive and transmit AIS data. The T200B is compatible with a range of computer-based navigation programs and chart plotters that are capable of accepting AIS data sentences over a NMEA 0183 or NMEA 2000 connection.

This manual describes the installation and operation of the T200B.

It is recommended that your Transponder is installed by a professional installer

Before operating the unit you should familiarise yourself with this user manual

5.1 Parts List

On delivery, carefully inspect the contents of the packing case. Note any damage or any missing items. Ensure that the correct parts are included for your application.

Item:	Description:	No. included:	COMAR SKU Number:
1	T200B AIS Transponder with mounting bracket	1	001-1017
2	T200B Installation CD	1	004-7043
3	T200B Manual	1	003-1017
4	Data cable: 9-pin D-sub male connector to bare tails, 2 m	1	002-1002-1
5	USB cable: USB 2.0 Type A to Type B connectors	1	002-1006

6 BACKGROUND TO AIS

The marine Automatic Identification System (AIS) is a location and vessel information reporting system. It allows vessels equipped with AIS to automatically and dynamically share and regularly update their position, speed, course and other information such as vessel identity with similarly equipped craft. Position is derived from a Global Navigation Satellite System (GNSS¹) network and communication between vessels is by Very High Frequency (VHF) digital transmissions.

A sophisticated and automatic method of time sharing the radio channel is used to ensure that even where a large number of vessels are in one location, blocking of individual transmissions is minimised, any degradation of the expected position reporting interval is indicated to the user, and even if the unit suffers extreme channel overload conditions it will always recover to normal operation.

6.1 AIS Classes

There are two classes of AIS unit fitted to vessels, Class 'A' and Class 'B'. In addition AIS base stations may be employed by the coastguard, port authorities and other authorised bodies. AIS units acting as aids to navigation (AtoNs) can also be fitted to fixed and floating navigation markers such as channel markers and buoys.

Class 'A' units are a mandatory fit under the safety of life at sea (SOLAS) convention to vessels above 300 gross registered tons or which carry more than 11 passengers in International waters. Many other commercial vessels and some leisure craft also fit Class 'A' units.

Class 'B' units are currently not a mandatory fit, but authorities in several parts of the world are considering this. Class 'B' units are designed for fitting in vessels which do not fall into the mandatory Class 'A' fit category. The T200B is a Class 'B' unit.

6.2 Information Transmitted and Received

An AIS Class 'B' unit will transmit:

- MMSI
- Call Sign and Name
- Length and Beam
- Ship Type
- Time
- Course Over Ground (COG)
- Speed Over Ground (SOG)
- Heading

¹ GPS is the American GNSS network. There are others, notably GLONASS (*Globalnaya Navigazionnaya Sputnikovaya Sistema*) which is the Russian system and BDS (*BeiDoü*) which is the Chinese system

In operation, an AIS unit uses one of two VHF channels within the international marine band allocation (channel 87B, 161.975 MHz, or channel 88B, 162.025 MHz) to regularly transmit information such as the vessel position, Maritime Mobile Service Identity (MMSI), Name, Speed, Course, *etc.*

In operation, an AIS unit also receives similar information from other AIS equipped vessels within VHF range and outputs that information for use by an external display medium (AIS enabled chart plotter, computer using AIS enabled chart plotter software *etc.*)

7 INSTALLATION

7.1 Installation Warnings



WARNING: Do not connect the T200B unit to a mains (line) AC electrical supply. An electric shock or fire hazard could result.



CAUTION: Do not connect the T200B unit to a dc supply exceeding 15.6V or reverse the supply polarity. This may damage the unit.



CAUTION: The T200B unit is designed for operation in the temperature range -25°C to +55°C. Do not install (or use) the T200B unit in environments which exceed this range.



CAUTION: The T200B unit should be installed in a location where it is protected from water and spray.

7.2 Mounting

The T200B can be mounted to a suitable bulkhead or shelf.

Select a location away from excessive heat sources

Avoid high levels of vibration and shock

7.3 Power Connection

Connect a 12 V dc supply (9.6 - 15.6 V) capable of supplying 2 A peak to the dc power cable.

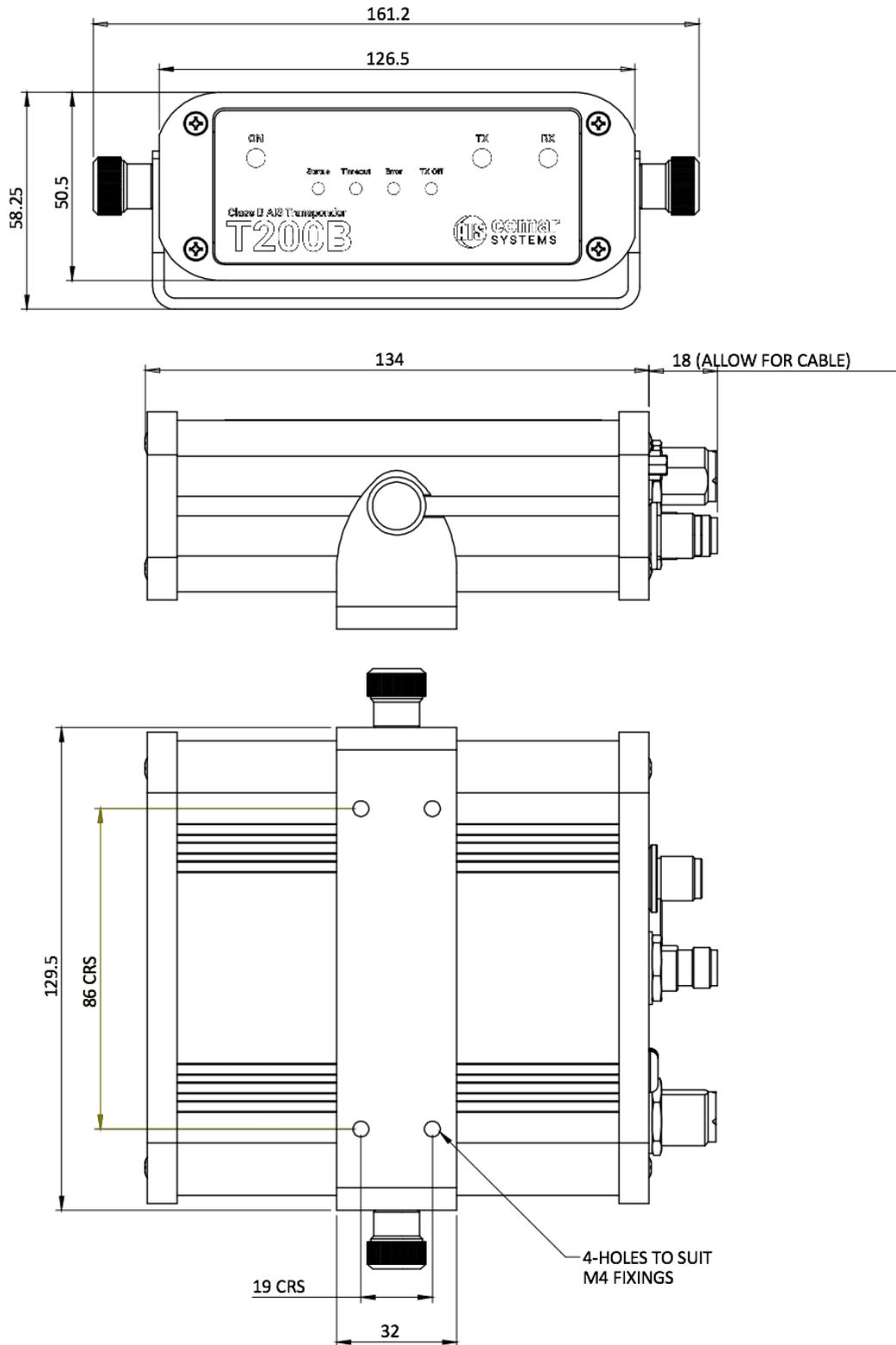
Positive (+) = **RED**

Negative (-) = **BLUE**

NOTE: The case of the unit is not isolated from the negative terminal of the supply; therefore it is not recommended that the unit is attached to metal parts of the vessel.

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8 DIMENSIONS



8.1 GPS Antenna

The GPS antenna used for a Class 'B' AIS device must be a dedicated antenna, i.e. not shared with any other GPS receiver.

Any NMEA GPS positional sentences transmitted as data from other equipment and connected to the NMEA ports of the T200B will not be used for AIS transmission.

The GPS antenna to be used must be of the active type, i.e. it should incorporate a low noise amplifier (LNA) and be suitable for marine shipboard applications (index of protection, ruggedness, means of mounting etc.) A GPS antenna should be selected so that there is a minimum total gain of 25 dB available at the antenna connector on the rear of the T200B.

Installation of the GPS antenna is critical for the performance of the built in GPS receiver which is used for timing of the transmitted time slots and for the supply of navigational information should the main navigational GPS fail.

We strongly recommend that:

The GPS antenna is mounted in an elevated position and free of shadow effect from the ship's superstructure.

The GPS antenna has a free view through 360 degrees with a vertical angle of 5 to 90 degrees above the horizon.

As the received GPS signal is very sensitive to noise and interference generated by other onboard transmitters, ensure that the GPS antenna is placed as far away as possible from RADAR, Inmarsat® and Iridium® transmitters and ensure the GPS antenna is free from direct view of the RADAR and the Inmarsat beam.

It is important that the MF/HF and other VHF transmitter antennas are kept as far away as possible from the GNSS antenna. It is good practice never to install a GPS antenna within a radius of 5 metres from these antennas.

8.2 VHF Antenna

The T200B will require either a dedicated antenna or separate antenna splitter if one antenna is to be shared with a VHF radiotelephone. The VHF antenna should meet the following requirements:

It must be suitable for marine shipboard applications (index of protection, ruggedness, means of mounting, etc.)

It should be omni-directional and vertically polarised with unity gain (0 dB) with a bandwidth sufficient to maintain VSWR <1.5 over the frequency range 156 -163 MHz. As a minimum the 3 dB bandwidth must cover the two AIS channels and the DSC Channel.

It should be mounted with at least a two metre vertical separation distance from any other VHF antenna used for speech or DCS communication.

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9 PROGRAMMING THE TRANSPONDER

The ProAIS-2 application (supplied) allows you to configure and monitor the performance of your T200B. ProAIS-2 is compatible with both Microsoft® Windows® and Intel based Apple® Macintosh® OS X operating systems. The system requirements are as follows:

- Microsoft® Windows® XP, Windows Vista, Windows 7, Windows 10 (32 and 64 bit)
- Apple® Macintosh® OS X 10.5 / 10.6 (Intel™ based systems only)

9.1 Installing the ProAIS-2 application

The application is installed from the CD provided with your T200B transponder. Insert the CD into your computer and navigate to the Windows or OS X folder.

Windows: Double click the setup.exe item to start the installation and follow the on-screen instructions.

OS X: Double click the ProAIS-2.dmg item to start the installation and follow the on-screen instructions.

9.2 Connecting to your T200B

Before launching the ProAIS-2 application, first connect your T200B to your computer using the USB cable. After it is connected, you can launch ProAIS-2 from the Windows Start menu or the OS X Applications folder.

Select the serial port corresponding to your T200B from the drop down menu at the top left of the ProAIS-2 window, and click the Connect button.

ProAIS-2 is now communicating with your T200B and will display any pre-configured vessel data in the Configuration page.

9.3 The ProAIS-2 Application - Functions

The ProAIS-2 application has a number of pages with specific functions. These functions control the setup of your T200B.

The Configuration page shows the current vessel information and T200B configuration. Vessel information and configuration can also be edited and saved to the T200B.

The GPS Status page shows the status and signal strength information for the AIS internal GPS receiver.

The Other Vessels page shows a list of AIS targets currently being received by the T200B.

The Diagnostics page shows a range of information relating to operation of the T200B which may be useful during installation.

The Serial Data page shows real time data from the T200B in NMEA 0183 format and provides functions to record this data.

9.4 Configuring your T200B

Please follow these steps to configure your T200B AIS Transponder correctly:

1. Select the *Configuration* page to configure the AIS vessel data that will be transmitted by your T200B.
2. Enter your vessel's name (20 characters maximum), call sign (optional, 7 characters maximum) and MMSI number. An MMSI number is required for the T200B to operate. The MMSI number configured in your T200B should be the same as that configured in any other radio equipment on board. If you do not have an MMSI number contact the relevant authority in your country for more information.



CAUTION: Once programmed, the MMSI number cannot be changed by the end user. If the MMSI number needs to be changed in any way, the unit must be returned to COMAR SYSTEMS or one of our authorised dealers

3. Select the vessel type most appropriate to your vessel from the drop down list.
4. Enter the dimensions of your vessel and the location of the GPS antenna in the *Ship's Dimensions and GPS Antenna Location* box. The dimensions should be entered in metres and rounded up to the nearest whole metre (1 foot is approximately 0.3 metres²).
5. Save the configuration to your T200B by clicking the *Write Configuration* button at the top right of the configuration page. Please read the warning message and check the MMSI number is correct before clicking the programme button.
6. Your T200B is now fully configured and ready for use.

9.4.1 Important information for US Customers:



CAUTION: There are specific laws in the United States of America (US) regarding the configuration of AIS Class 'B' transponders. If you are a US resident and intend to use your T200B in US waters, you should make sure that your retailer has configured your product prior to supplying it to you. If your T200B has not been pre-configured please contact your dealer for details of how to have it configured.



WARNING: It is a violation of the rules of the Federal Communications Commission (FCC) to input an MMSI number that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

9.5 Optional User Configuration

The *Configuration* page includes additional options for NMEA port Baud rates and GPS data output.

² 1 imperial foot = 0.3048 metres

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9.5.1 NMEA Baud Rate Configuration

Typically the NMEA Output Port 1 is used for connecting to a chart plotter or other display and is configured to operate at 38,400 Baud. This rate is required for AIS data transfer.

Your T200B provides a multiplex function between the NMEA Input Ports and the NMEA Output Ports. Any data provided to the NMEA Input Ports will be multiplexed to the NMEA Output Ports along with the AIS data. Typically the NMEA Input Port 2 is configured to operate at 4800 Baud for connection to a Heading Sensor or other NMEA 0183 device.

The *Configure Baud Rates* box allows the Baud rates for the NMEA 0183 Ports to be adjusted independently if required. After making changes to the Baud rate settings click the *Write configuration* button to save these settings to your AIS transponder.

9.5.2 GPS Data Output

Your T200B incorporates an internal GPS receiver and can be configured to output GPS position fix information via the NMEA 0183 port. Check the GPS data sentences required in the *Output GPS Sentences* box. After making changes to the GPS output settings click the *Write configuration* button to save these settings to your T200B.

9.5.3 GPS Status Page

The GPS status page shows the current GPS signal strength along with current GPS position fix information. Satellite signals shown in green are actively being used to calculate a position. If a position fix is not available then no position information will be displayed and the signal strength bars will be shown in blue.

9.5.4 Other Vessels Page

The *other vessels* page provides a list of all AIS vessels from which AIS position reports are being received. For each vessel the MMSI, Name, Call sign, AIS Class, Speed, Course, Latitude, Longitude, Range and Bearing are shown along with the age (in seconds) of the position report. It is possible to sort the displayed information by clicking on the column headings.

9.6 Optional Engineer Configuration



This information is provided for installation and diagnostic purposes only and should not be relied upon for navigation.

9.6.1 Diagnostics Page

The *diagnostics* page provides a range of information about your T200B operation and status. This information may be useful during installation or when attempting to diagnose a potential issue with the operation of your T200B. If your T200B is operating normally all items in the checklist at the top left of the page will show a green tick / check mark.

9.6.2 Serial Data Page

The *serial data* page shows all data output from your T200B in NMEA 0183 format. It is also possible to send NMEA 0183 commands to the T200B if required for technical support or custom configuration. A facility to record the data to a file is provided by clicking the *Log to File* button.

9.6.3 Menu Bar

The application menu bar includes the following functions and features:

File Menu:

Open log file - opens a previously recorded log file for review in ProAIS-2.

Save log file - start recording data received from the connected T200B to file.

Exit - exits the ProAIS-2 application.

Options Menu:

Alert on AIS transmission - a brief sound is output from your computer on each successive AIS transmission.

Help Menu:

About - shows ProAIS-2 application version and copyright information.

9.7 Disconnect the USB cable and Restart

After configuring the transponder using the ProAIS2 software, it is important to remember to:

Exit the ProAIS2 software

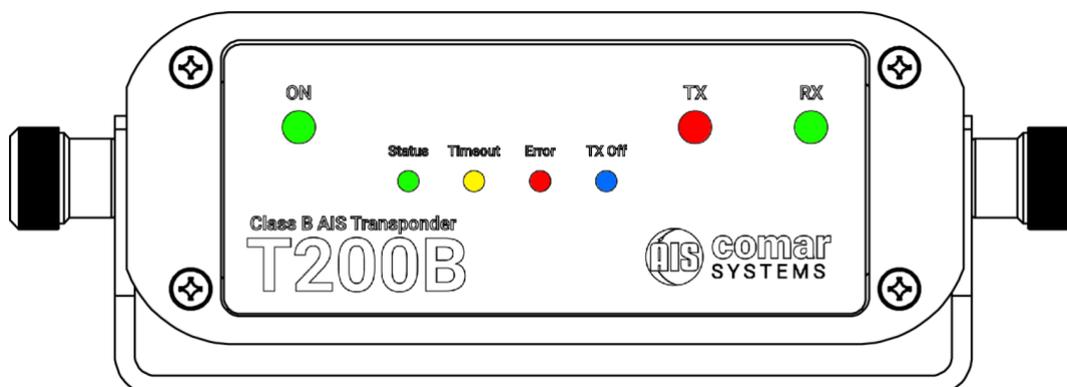
Disconnect the USB cable from the unit

Disconnect the main 12 V dc power supply

The unit is now ready for switching ON by reconnecting the main 12 V dc power supply and commencing active service.

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10 FRONT PANEL DISPLAY



11 OPERATION

11.1 Switching On

When the 12 V dc supply is switched ON then the green *ON* LED will light and the other six LEDs visible on the front panel of the unit will illuminate twice for a period of one second on each illumination. The *Status*, *Error*, *TX Off* and *TX* LEDs will then go out.

The green *RX* LED will flash when it is receiving data from other AIS units.

When the internal GPS is locked the yellow LED will go out and the green *Status* LED will light; note that this process may take up to 30 minutes depending on the switch-on state of the GPS receiver.

The red *TX* LED will flash momentarily every time the unit transmits.

11.2 Warning and Fault States

If the unit has not been able to transmit a position report during the last expected two reporting intervals (*i.e.* the nominal reporting interval cannot be maintained for operational reasons such as a Message 23 quiet period, high channel load conditions, *etc.*) the yellow LED will illuminate. This is a warning condition only and indicates that your vessels position is not currently being reported to other vessels. Reception of other vessels AIS information by the T200B is not affected. When the unit is able to commence reporting the yellow LED will go out.

If a fault occurs then the red *Error* LED will illuminate. This may illuminate briefly if the power supply is interrupted or if the VHF antenna characteristics are briefly affected.

If the red *Error* LED illuminates continuously then the unit should be assumed to be faulty and should either be switched off (power removed) or if this is not practical, any other vessel position information derived from the unit should not be used and it should also be assumed that the unit is not transmitting valid position information for your vessel. The unit should be examined by an authorised service agent at the earliest opportunity.

11.3 Data Port Messages

The data ports will output the following:

- (At power-up) boot-loader and main application splash text screens including version numbers, and memory status
- Details of relevant AIS transmissions received
- Details of AIS transmissions sent
- Details of channel management messages received
- Alarm messages generated by the Built-In Integrity Testing (BIIT) function

The data ports will accept the following inputs:

Programming information (USB)

Alarm acknowledgements (NMEA)

11.4 AIS Transmit OFF

The *Transmit OFF* facility is provided in the event that you do not wish to disclose your position to other users or to conserve power when it is not necessary to transmit your position.

The transmitter can be turned OFF by connecting a simple switch between the Blue core on pin 6 and the Green core on pin 5. Closing this switch will cause the Blue-TX off LED and the Yellow Timeout LED to light, the Green Status LED will extinguish. Opening the switch will resume transmissions. Reception of AIS data during this operation will not be affected.

11.5 Data Rates

The default Baud rate of the data link is 38.4 kBaud with 8 data bits, one stop bit and no parity. No handshaking is used.

11.6 Built in Test

The T200B is equipped with Built-In Integrity Testing (BIIT). BIIT tests run continuously or at appropriate intervals simultaneously with the standard functions of the equipment. The BIIT detects any failure or malfunction that will significantly reduce integrity or stop operation of the T200B unit. The tests include:

- AIS TX malfunction (synthesiser not locked and TX time-out not exceeded)
- Antenna VSWR exceeds limit
- Rx channel 1 malfunction (synthesiser not locked)
- Rx channel 2 malfunction (synthesiser not locked)
- Internal GNSS (GPS) not in use
- No valid SOG information

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- No valid COG information
- Background noise > -77dBm
- GPS failure
- VSWR exceeding the maximum allowed level
- The input voltage is out of the specified range

11.7 LED Indicators

ON This is a green LED which indicates, when lit, that power has been connected correctly to the transponder.

Status This is a green LED which indicates, when lit, that the transponder hardware has been configured, the operating software is present, the CPU has booted up, the application software is running and everything is correct.

RX This is a green LED which indicates when flashing that the T200B is receiving data from other AIS transponders and is outputting this data as a VDM NMEA sentence on the output data ports. If the Green LED is on continuously the unit has not been programmed with its personalised data, it will still send received data to the output port but will not transmit.

TX This is a red LED which flashes momentarily when the T200B transmits its own AIS data.

Timeout This is a yellow LED which indicates when lit that the transmitter is prevented from transmitting. Reasons for this include the following:

The transponder's internal GPS receiver is not operating or is not yet ready

The transponder was unable to transmit an AIS message due to the channel being already occupied, e.g. by transmissions from other AIS transponders, or the TX Off function is in operation

Error This is a red LED which indicates when lit, one of the following status conditions is possible:

Transmitter lockout timer (1 second maximum) has operated

GPS is unable to gain lock after 30 minutes

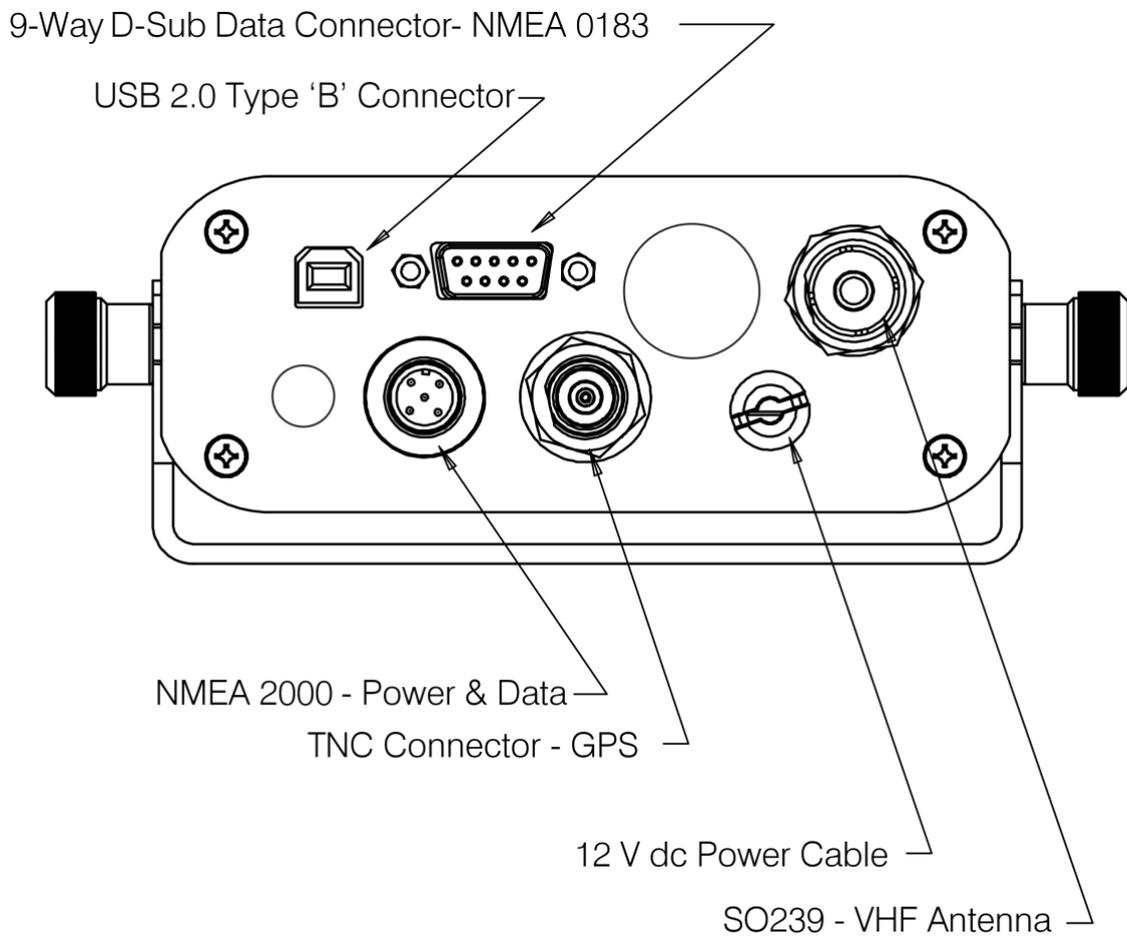
VHF antenna VSWR is out of range

Power Supply is out of range

Background noise level is above the threshold level (-77dBm)

TX Off This is a blue LED which indicates that the remote TX Off switch has been operated to manually stop the T200B transmitting data.

12 REAR CONNECTIONS



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13 DATA CONNECTION

If an external display unit is to be used to show other AIS units within range (such as a chart plotter, computer serial terminal or other display device) then connect the correct tails of the data interface cable to the display device. Note that the software in the display device must be configured for AIS operation.

13.1 Connection to a computer

The T200B may be connected to a computer using the USB cable supplied.

13.2 NMEA 0183 Connection

The data cable assembly to bare tails (provided) mates with the 9-pin D-type female connector mounted at the rear of the T200B. This cable is to be used for a NMEA 0183 connection (IEC 61162-1).



13.2.1 Pin Identifications (by function)

The following table shows the pin identifications of the 9-way D-sub connector on the rear of the unit. This connector handles the NMEA 0183 inputs and outputs:

Pin:	Cable core colours ³	Function:	Description:
1	Brown, BR	No connection	-
2	Red, RD	NMEA Output Port 1	(+) Default 38400 Baud
4	Yellow, YE	NMEA Output Port 2	(+) Default 4800 Baud
5	Green, GN	NMEA Output Ports 1 & 2	(-) NMEA Outputs Common (-)
6	Blue, BU	AIS Transmission OFF	Connect via external switch to pin 5
3	Orange, OG	NMEA Input Port 2	(+) Default 4800 Baud
7	Violet, VT	NMEA Input Port 2	(-) Default 4800 Baud
8	Grey, GY	NMEA Input Port 1	(+) Default 38400 Baud
9	Black, BK	NMEA Input Port 1	(-) Default 38400 Baud

³ With IEC 60757 colour abbreviations

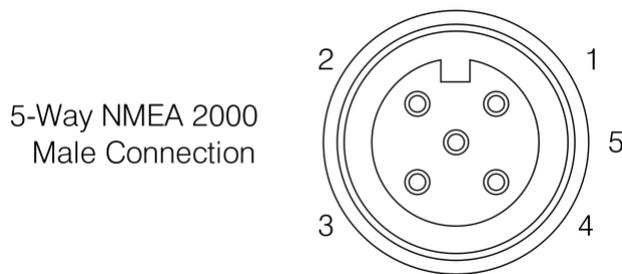
13.2.2 Connection to a NMEA 0183 Plotter or Radar

The T200B may be connected to a chart plotter or a RADAR using the 9-way data cable supplied and using the following connections:

Pin:	Cable core colour	T200B Connection:	Plotter Connection:
2	Red, RD	NMEA Output Port 1 (38400 Baud default) (+)	NMEA Input (+)
5	Green, GN	NMEA Output Port 1 (38400 Baud default) (-)	NMEA Input (-)

13.3 NMEA 2000 Connection

For a NMEA 2000 connection (IEC 601162-3) a specialist drop cable will be required (not supplied). This should be connected from the rear connector of the T200B into the trunk of your existing NMEA 2000 network. COMAR recommends that you obtain advice from a professional installer if a NMEA 2000 installation is required.



Pin:	NMEA 2000 Designation:	Function:
1	Screen	Screen (shield)
2	NET-S	+ 12 v dc
3	NET-C	0 v return
4	NET-H	Data High (CAN-H)
5	NET-L	Data Low (CAN-L)

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13.4 Connection Summary

- To connect to a computer: Use the USB cable (supplied)
- To configure the T200B: Run the software ProAIS 2 which uses the USB connection. When configuration is completed, disconnect the USB cable from the unit. Refer to *9.7 Disconnect the USB cable*
- To connect to a NMEA 2000 network: Use an industry-standard NMEA 2000 drop cable (not supplied; seek specialist advice for this kind of connection)
- To connect to a NMEA 0183 compliant device: Use the 9-way data cable (supplied)
- To Disable AIS Transmission: Connect the **BLUE** wire of the 9-way data cable (pin 6) to the **GREEN** wire of the data cable (pin 5) via a switch. The AIS transmissions will be re-enabled when the switch is opened

14 MAINTENANCE

No scheduled maintenance is required. It is recommended to gently wipe away any accumulated dust periodically. The T200B contains no serviceable parts. Contact your local dealer if the unit fails to function correctly.

WARNING: Unauthorised opening of the T200B unit will invalidate the warranty.

**CAUTION: Avoid using chemical solvents to clean the T200B.
Solvents may damage the case material.**

15 SPECIFICATION

15.1 Physical	
Dimensions:	L 135 x W 128 x H 50 mm
Weight:	600 g
Connectors:	Power: 1 m 2-core captive cable Antenna: SO239 UHF Connector GPS Antenna: TNC Connector Data In/Out: 9-pin D-sub Connector NMEA 2000: 5-pin; 2x Data; 2x 12 V dc Power; 1x Shield USB: USB 2.0 Type B Connector

15.2 Electrical	
Power Supply:	12 V dc nominal; 9.6-15.6 V dc
Power Consumption:	4 W
Peak Power Rating:	2 A

15.3 Operational	
Indicators:	On, TX, RX, Status, TX Timeout, Error, TX Off
Internal GPS Receiver:	RS232 38.4 KBaud bi-directional; RS422 38.4 KBaud bi-directional
GPS Antenna Port:	Impedance: 50 Ohms
	Frequency: 1575 MHz
	Gain: >20 dB including LNA
	LNA bias voltage: 5 V dc max. 50 mA
Internal VHF Transponder:	Transmitter x 1; Receiver x 2 One receiver time shared between AIS and DSC (T200B-S model)
	Frequency Range: 156.025 MHz to 162.025 MHz in 25 kHz steps
VHF Antenna Port:	Impedance: 50 Ohms
	Frequency Range: 156 – 162 MHz
	Gain: 3dBi nominal
	VSWR: <2:1
Output Power:	33 dBm ± 1.5 dB
Channel Bandwidth:	25 kHz
Channel Step:	25 kHz

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Modulation Modes:	25 kHz GMSK (AIS, TX and RX); 25 kHz AFSK (DSC, RX only; T200B-S model)
Bit Rate:	9600 b/s \pm 50 ppm (GMSK); 1200 b/s \pm 30 ppm (FSK)
RX Sensitivity:	Sensitivity – 107 dBm 25 kHz (Message Error Rate 20%); Co-Channel 10 dB; Adjacent Channel 70 dB; IMD 65 dB; Blocking 84 dB
Data Rates:	4800 Baud, 38400 Baud (software configurable)
NMEA 0183 messages:	VDM, VDO, RMC, ACA, ACS, ALR, TXT and ACK

15.4 Environmental

Operating Temperature:	-15°C to +55°C
Operating Humidity:	Up to 93%
Storage Temperature:	-20°C to +70°C
Compass:	Safe distance 0.5 m

16 VHF SHIP LICENCE

 **IMPORTANT:** In most countries, the operation of an AIS unit is included under the vessels marine VHF licence provisions. The vessel on which the AIS unit is to installed must therefore possess a current VHF radiotelephone licence which lists the AIS system and the vessel Call Sign and MMSI number. Please contact the relevant authority in your country for more information.

17 DECLARATION OF CONFORMITY

COMAR SYSTEMS LTD. of Vittlefields Technology Centre, Forest Road, Newport, Isle of Wight, PO30 4LY, United Kingdom, hereby declares that the T200B is in compliance with the essential requirements and other relevant provisions of EC Directive 1999/5.

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

18 FCC NOTICE

 **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 into this device. The MMSI and Static Data in this transponder must be configured by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels. In no event shall the entry of static data into this Class 'B' device be performed by the end user. Knowingly programming a Class 'B' device with inaccurate static data, or causing a Class 'B' AIS to be programmed with inaccurate static data, is prohibited.

19 GENERAL WARNINGS

All marine Automatic Identification System (AIS) units utilise a satellite based system such as the Global Positioning Satellite (GPS) network or the Global Navigation Satellite System (GLONASS) network to determine position. The accuracy of these networks 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.

It is desirable wherever possible therefore to verify both your vessel's AIS derived position data and other vessels AIS derived position data with visual or RADAR based observations.

19.1 VHF Antenna Connection

Connecting a badly mismatched VHF antenna, leaving the VHF antenna port disconnected, or shorting the VHF antenna port will activate the VSWR alarm, cause the unit to stop sending position reports or cause damage to the transponder.

19.2 Radio Frequency Exposure

To meet the requirements for Radio Frequency Exposure it is necessary to install the VHF antenna correctly and operate the AIS equipment according to the instructions.

The VHF antenna must be mounted at a minimum distance (vertical separation) of 3 metres from the head of any person standing on deck in order to meet international safety directives on Maximum Permissible Exposure (MPE) / Specific Absorption Rate (SAR).

Where no suitable structure exists to achieve a 3 metre vertical separation then the antenna base must be mounted at least 1 metre above the head of any person within range, all persons should stay outside the 3 metre safety radius and if practical, a grounded RF shield should be interposed between people and the antenna.

Failure to adhere to these limits could expose persons within the 3 metre radius to RF radiation in excess of the MPE / SAR limits.

20 LIMITED WARRANTY

COMAR SYSTEMS LTD. warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. Comar Systems Ltd will, at its sole discretion, 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 incurred in returning the unit to COMAR SYSTEMS LTD.

This warranty does not cover failures due to abuse, misuse, accident or unauthorised alteration or repairs. This does not affect the statutory rights of the consumer.

Changes or modifications not made by Comar Systems or an authorised repairer will: (1) Void the warranty issued by Comar Systems (2) Void the user's authority to operate the equipment.

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21 DISCLAIMER

COMAR SYSTEMS LTD. is not responsible for damages or injuries caused by your use of, or inability to use the T200B correctly. The T200B is intended for use only by persons trained in navigation and only as a navigational aid, not as the sole method of navigation.

COMAR SYSTEMS LTD. disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

Every effort has been made to ensure that all information contained in this manual is accurate at the time of going to press.

We advise that you take normal steps to ensure that you have the most up to date product information.

NOTES



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