

## **SI-TEX Marine A.I.S. Engine**

The AIS Engine receives AIS data, converts it to a NMEA format, and sends it on to any display equipped to receive it. The engine can also receive NMEA information from a GPS receiver (at 4800 baud) which it then sends on to the display with the AIS data (at 38,400 baud).

### **Installing the AIS Engine**

The AIS Engine requires its own marine VHF antenna and cannot be shared with a transceiver antenna. It should be mounted as high as possible to maximize range but should be spaced not less than 1 meter from a transmitting antenna. The antenna cable should be at least 3 meters long and the antenna should be sited at least 2 meters from the AIS receiver. The antenna should be a 50 ohm general purpose marine VHF antenna.

The AIS Engine is not watertight so it must be mounted in a position, which is dry at all times.

Few display units will have a socket for both a GPS receiver and an AIS Engine so provision has been made in the Engine to relay the GPS position. Connect the power cable to the 12-volt supply. The red wire to positive and the wire with a black stripe to negative. If a GPS is to be fitted then connect the GPS NMEA output (or NMEA +VE) to the blue fly lead of the data cable. If the GPS has a NMEA - VE (or NMEA REF) connect this to the supply negative. Ensure the GPS is connected to the same negative supply as the AIS Engine. The NMEA 0183 signal from the GPS must swing above and below 2 volts (ref to the supply negative) and contain the **RMC** sentence.

This instrument, and software are used at your own risk. Use prudently and check operation from time to time against other data. Inspect the installation from time to time and seek advice if any part thereof is not fully seaworthy.

### **SeaClear PC Plotter CD software**

SeaClear software is freeware and is given freely with the AIS Engine. Before use consult SeaClear license conditions, particularly the last paragraph. SI-TEX Marine accepts no liability for page 28 of the instruction file. Insert the disk in your CD drive and double click on the seaclear.exe icon.

### **CAUTION**

**Some vessels do not carry A.I.S. It is important at all times to keep a proper lookout. The AIS Engine is not a substitute for good seamanship.**

## Specifications for AIS Engine

### Electronic Interface

Power input:	+10Volts to +16Volts
<u>RS232 Interfaces</u>	
Data format:	8 bits, 1 start bit, no parity, 1 stop bit
Connector:	9-pin D-type socket mounted on the board
Pin 2 - BLK:	38,400 Baud output from Engine to PC
Pin 3 - RED:	38,400 Baud input to Engine from PC
Pin 5 - DRAIN:	common (ground)
Pin 9 - BLUE:	4800 Baud NMEA input from GPS receiver to Engine (optional, not required)
Amplitudes:	standard PC RS232 (0 to 5V)
Message headers:	(see below)

### Data format (AIS sentences from Engine to PC)

The signals sent by the Engine shall comprise strings conforming with the NMEA 2000 specification at 38,400 Baud. AIS message types 1, 2, 3, 4, 5, 11 and 21 shall be formatted as UAIS VHF Data-link Messages, as defined in NMEA 0183 Version 3, and having the header code !AIVDM. Whereas the NMEA 0183 specifies a channel number of 1 or 2 for the AIS receive channel, the AIS Engine signifies the channel by A for channel 1, and B for channel 2.

### Data format (Status sentences from Engine to PC)

Status sentences will be transmitted following transmission of a valid !AIVDM message or following detection of an AIS message with reception errors. Erroneous reception causes and increment of the threshold setting, which is shown by a status sentence without a preceding !AIVDM sentence. For valid !AIVDM sentences, the status sentence always follows the AIS Encapsulation sentence it applies to.

Status sentences sent by the Engine shall comprise strings conforming with the NMEA 2000 specification at 38,400 Baud. They will have the proprietary format \$PNMLS,ss,tt,r\*cc<CR><LF>.

The field ss is a decimal value in the range 0 to 63, signifying the signal level for the preceding message. The value tt is the present detection threshold setting. The value r is the interval in seconds (values between 1 and 7) between reductions of the threshold setting. The threshold is continually adjusted upwards in the Engine to minimize the error rate, whilst maintaining maximum signal sensitivity by reducing it at the rate specified by the r field.

### Data format (GPS RMC sentences from Engine to PC)

NMEA RMC sentences received on a separate input channel at 4,800 Baud (on pin 9 of the 9-pin socket) will be copied through on the 38,400 Baud output channel whenever they are available. RMC sentences are re-transmitted only if the CRC check on the incoming data is passed, and are sent whenever they are available.

## Data format (PC to Engine)

The unit is shipped with factory default settings as follows :

Alternating receive channel A, channel B every 36 seconds, threshold setting 19 (corresponding to approximately 1  $\mu$ Volt). These settings can be changed using the following commands:

The signals sent by the PC shall comprise the following types:

- Channel setting sentence (C):

\$PNMLC,c\*hh<CR><LF>

Where:

c is the channel receive mode as follows:

A = Channel A (channel 1)

B = Channel B (channel 2)

S = Alternating every 36 seconds between channel A and channel B.

Note setting channel A or B cancels alternation

hh = Checksum as defined in NMEA 0183

<CR><LF> = Carriage Return, Line Feed sequence as defined in NMEA 0183

- Threshold sentence (T):

\$PNMLT,t\*hh<CR><LF>

Where:

t is the required threshold rate setting. The value specifies the interval between decrements of the tracking threshold value. The actual threshold and rate settings are always sent after a valid message is received (see above). Values between decimal 1-7 may be sent. Any other value forces a return to the default value of three seconds.

Typical threshold values for tt correspond with signal input sensitivities as follows:

19 = 1  $\mu$ Volt

29 = 10  $\mu$ Volt

40 = 100  $\mu$ Volt

hh = Checksum as defined in NMEA 0183

<CR><LF> = Carriage Return, Line Feed sequence as defined in NMEA 0183

## Transmission priority (PC to Engine)

If the PC transmits a command to the receiver at the same time as the Engine is receiving a packet on-air, the command will not be implemented in the Engine until after the completion of the packet reception.