A.I.S. PROCESSOR

Product part number: 90-60-501-000

USER MANUAL
&
INSTALLATION INSTRUCTIONS

Content

1. UTILISATION

1.1. INTRODUCTION

Thank you for purchasing the **nke** A.I.S. processor**.**

A.I.S. (**A**utomatic **I**dentification **S**ystem) is a worldwide system for exchanging information between ships and stations ashore. A.I.S uses dedicated VHF frequencies to automatically broadcast information such as ship's identification, status, position and route. This information is available to any ship or traffic control station within the signal reception area.

The *nke AIS-Processor* combined with an A.I.S. receiver or receiver/transponder allow to calculate collision risks and to send an alarm to the *nke Gyrographic* (version 3.20 and up) out in the cockpit.


⚠️ **DISCLAIMER**

Data provided by the *nke A.I.S.-processor* provides an indication only. The users acknowledge that they are aware that data received can be partial and / or incorrect and that they are solely responsible for any risks related to the use of this instrument. In no event shall *nke* be liable for any direct, indirect, incidental, or consequential damage related to the use of this instrument..

⚠️ **IMPORTANT**

Please take time to read this manual carefully before you start installation

Any connection to the *TOPLINE bus* must be performed through the specific interface box # 90-60-417 and <u>only</u> with the *TOPLINE bus* cable # 20-61-001

System configuration

Figure 1 : Connection AIS Computer to the Gyrographic
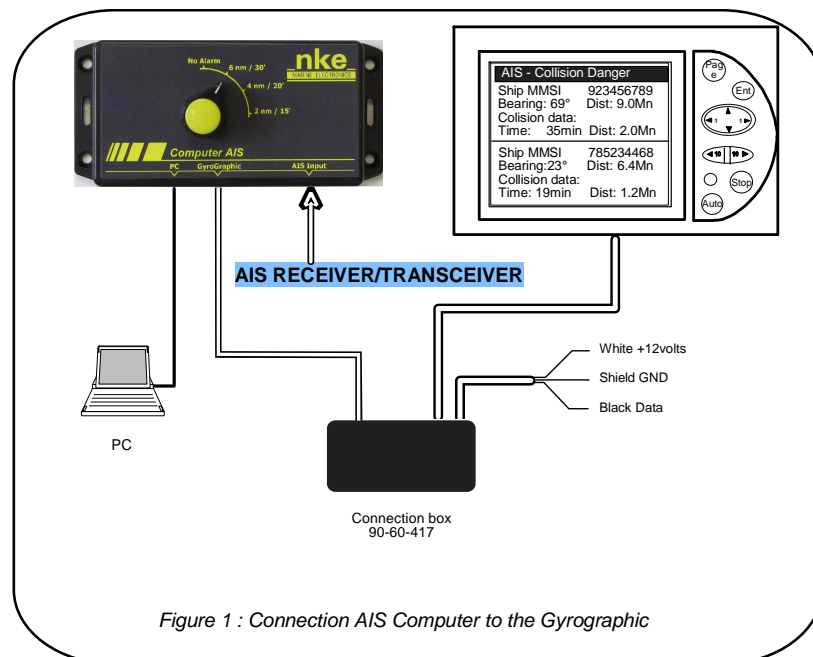
1.2. A.I.S. PROCESSOR DESCRIPTION

This is a programmable processor which, combined with a AIS receiver or receiver/transponder, calculates the range and bearing of the alarm target, its **CPA** (Closest Point of Approach) and **TCPA** (Time Closest Point of Approach).
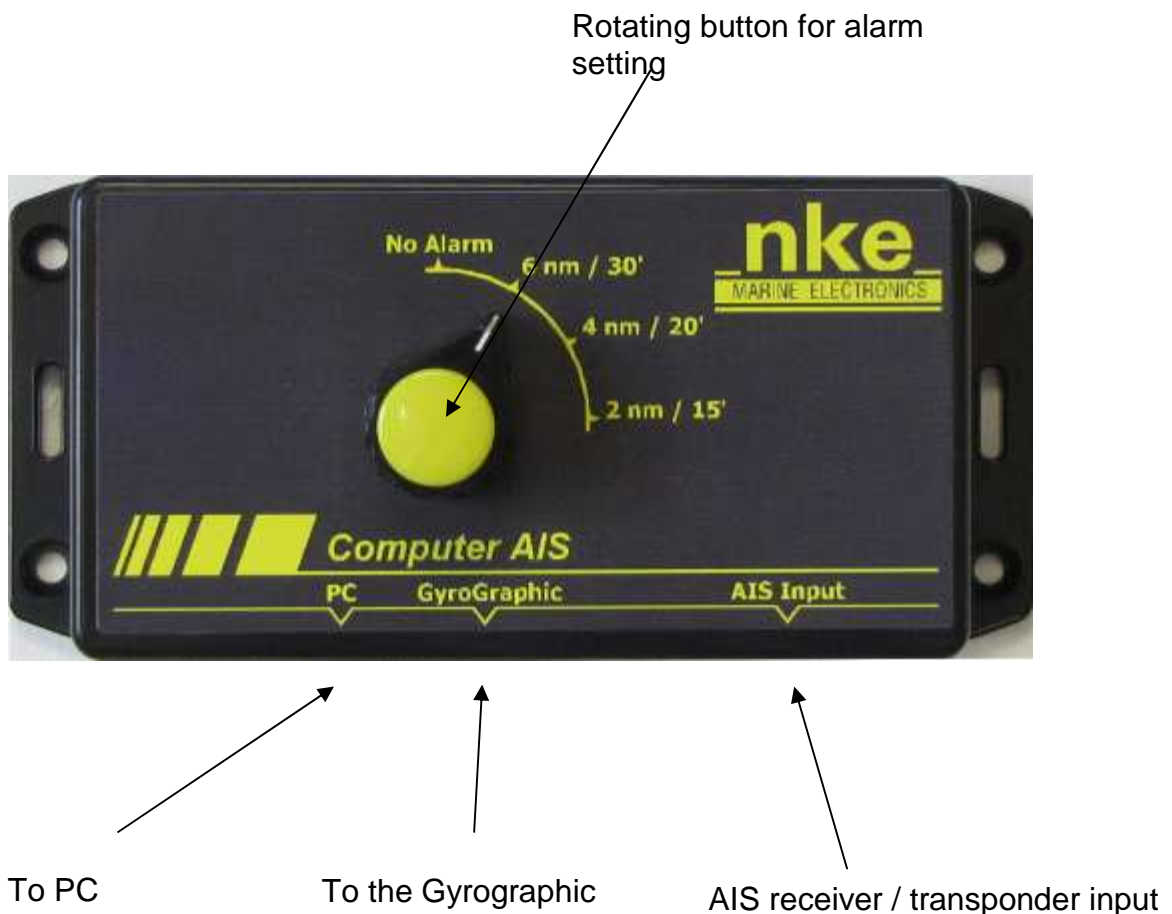
A rotating button allows the selection between 4 alarm ranges:

1. Off
2. Alarm if **CPA** < 6 nautical miles and **TCPA** < 30 minutes
3. Alarm if **CPA** < 4 nautical miles and **TCPA** < 20 minutes
4. Alarm if **CPA** < 2 nautical miles and **TCPA** < 15 minutes

The **A.I.S** port consists of a Db 9 male plug where an **A.I.S** receiver or receiver/transponder will be connected*.*

The output to PC is a Db 9 female plug carrying RS232 signal which echoes **A.I.S.** and GPS data for use with navigation softwares.

A 5 wire cable connects the **A.I.S. Processor** to the **Topline** system. The **Gyrographic** display will receive the alarm messages. The Topline bus also supplies power to the **A.I.S Processor**.

Rotating button for alarm setting

To PC   To the Gyrographic   AIS receiver / transponder input

1.3. OPERATION

1.3.1 Collision avoidance data processing

The **A.I.S Processor** continually processes the signals received from the A.I.S. device connected. For each A.I.S. message received, it will check the safety zone and generate alarms according to the level activated::

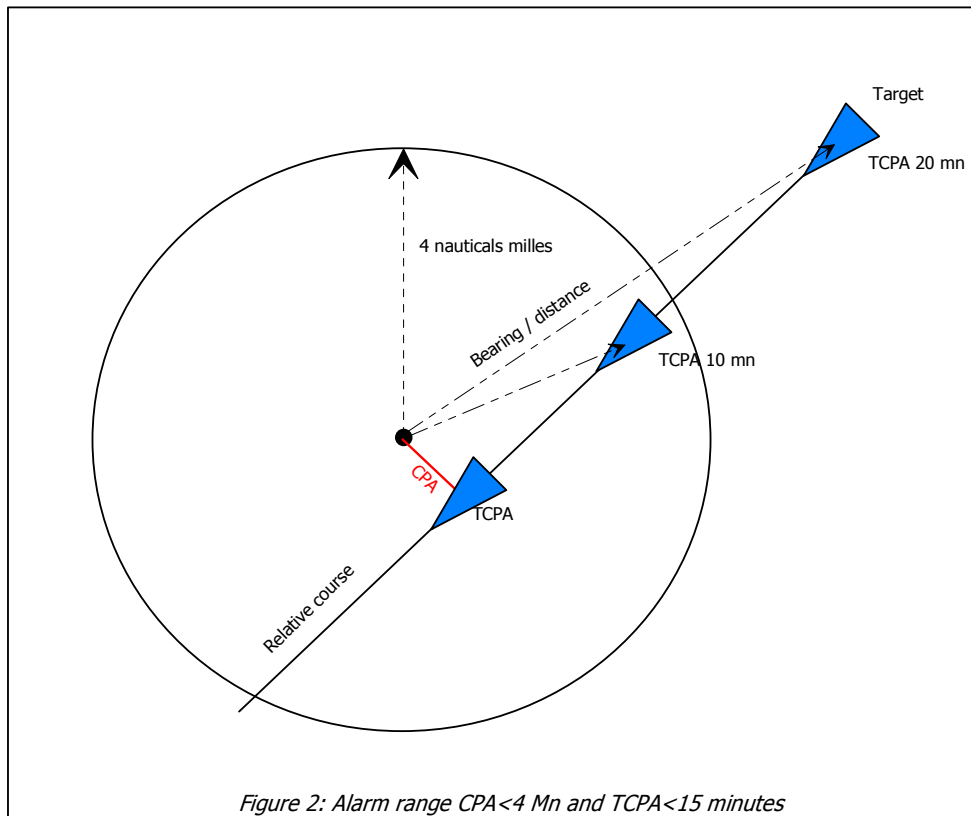Alarm if **CPA** < 6 nautical miles and **TCPA** < 30 minutes

Alarm if **CPA** < 4 nautical miles and **TCPA** < 20 minutes

Alarm if **CPA** < 2 nautical miles and **TCPA** < 15 minutes

CPA, **TCPA,** bearing and distance of the target are calculated and sent to the **Gyrographic**.

Alarm principle

The unit will generate an alarm if a target is detected and its **CPA** and **TCPA** are both below the level defined in the alarm settings.

Figure 2: Alarm range CPA<4 Mn and TCPA<15 minutes

In the example (figure 2) the alarm level selected is **« CPA < 4 Nm and TCPA < 20 minutes »**. When the value of the **CPA** calculated is below 4 nautical miles **and** the **TCPA** calculated is less than 20 minutes, an alarm message will be sent to the **Gyrographic**. For **CPA** below 4 nautical miles with a **TCPA** greater than 20 minutes, no alarm will be sent to the **Gyrographic** display

1.3.2 is collision avoidance data displayed on the Gyrographic?

When receiving the first collision avoidance message from the **A.I.S Receiver/Processor** the system sounds an alarm and displays a Collision Alert page on the **Gyrographic**.
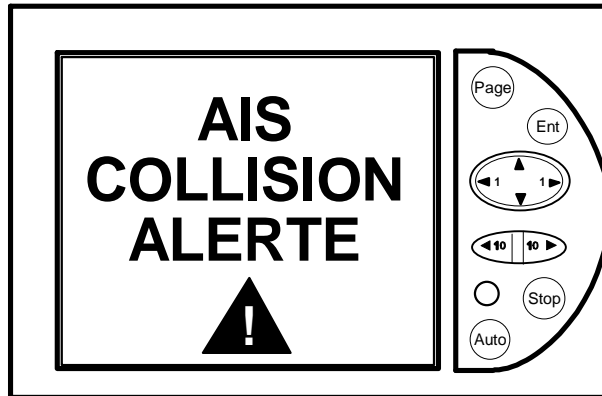
Press the (Page) button once to quit the alarm, and display the collision avoidance data.

⚠️ **WARNING**

Pressing the (Page) button quits the **COLLISION ALERT** page as long as the unit receives collision avoidance messages. It will be active again in standby mode 30 seconds after the reception of the last collision avoidance message.
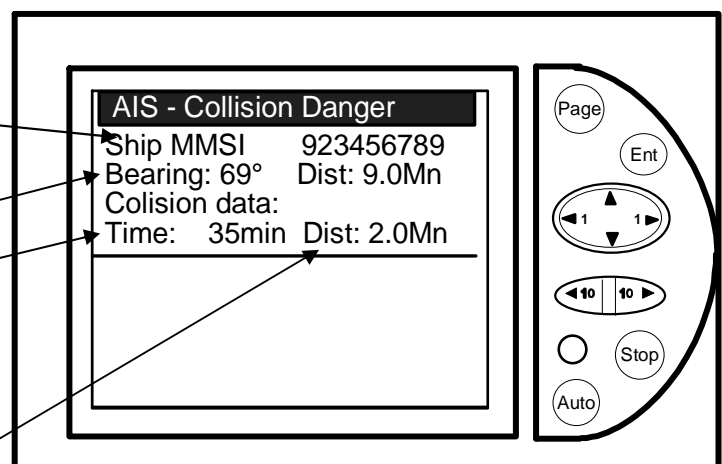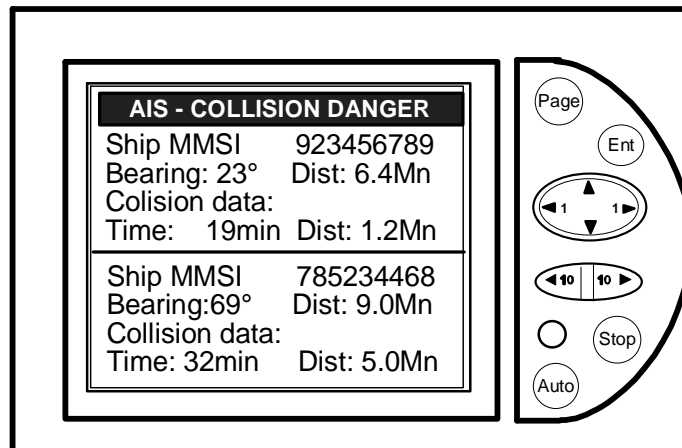

Collision avoidance data:

Target's MMSI number

Bearing and distance to the target

TCPA

CPA

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The collision avoidance page can display data for two targets simultaneously. The target with the lowest **CPA** value will display on the top


```
AIS - COLLISION DANGER
Ship MMSI      923456789
Bearing: 23°    Dist: 6.4Mn
Colision data:
Time:    19min   Dist: 1.2Mn

Ship MMSI      785234468
Bearing:69°     Dist: 9.0Mn
Collision data:
Time: 32min       Dist: 5.0Mn
```

You can scroll through the pages "Pilot", "Multifunction", "Main Menu" and back to *« A.I.S »* at any time by pressing the (Page) button

1.3.3 Fault states

1.3.3.1 No GPS signal (no-fix or out of order)

If the system receives invalid GPS sentences (GPS no-fix) the collision avoidance data will be processed with the last valid GPS position data received within the last 4 minutes. If GPS position data has been invalid for longer than 4 minutes, the **A.I.S.** page will be frozen and will no longer be available once the user displays another page (i.e. "Pilot"…).

1.3.3.2 Lost connection between the Gyrographic and the A.I.S Processor

If the *Gyrographic* and the *A.I.S Processor* are not able to communicate, the *Gyrographic* will display an alarm message

**AIS
CONNECTION
LOST**

⚠

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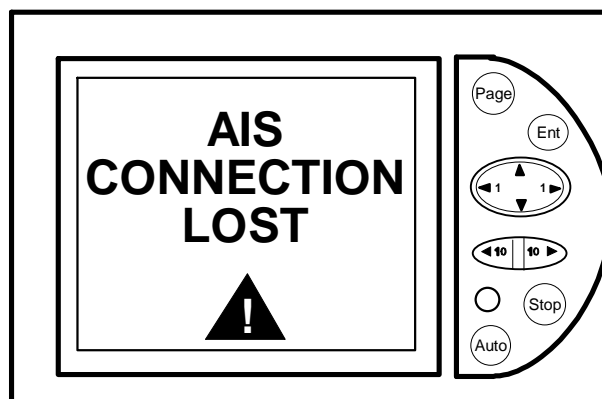
1.4. TECHNICAL SPECIFICATION

- power supply: 12 volts

- Power consumption: ~ 100mA

- Input: AIS 38400 bauds (can be switched to 4800 bauds by internal switch SW1 = ON). Reads NMEA GPS sentence « RMC » and AIS

- Output to PC: NMEA 38400 bauds. Sends GPS sentence « RMC » multiplexed with AIS messages (echoes the A.IS. incoming messages)

- Protection: IP20 (not waterproof)

- Weight: 250g

- Dimension 145mm x 65 mm x 40 mm

2. FIRST LEVEL TROUBLE-SHOOTING

In this section you will find information to help you handle small problems yourself. Please take time to read the table for solutions before calling technical support.

Issues	Possible Causes and solutions
Gyrographic does not display any alarm while a vessel in the vicinity transmits A.I.S. messages and is in an alert situation.	Please check the incoming NMEA and PNKED data on the Gyrographic display. Check the A.I.S. device connected.
The navigation software on the PC does not receive A.I.S. nor GPS data	Please check that the RS232 port is set for 38400 bauds

In the event that you cannot solve the problem by yourself, please contact you dealer

3. INSTALLATION
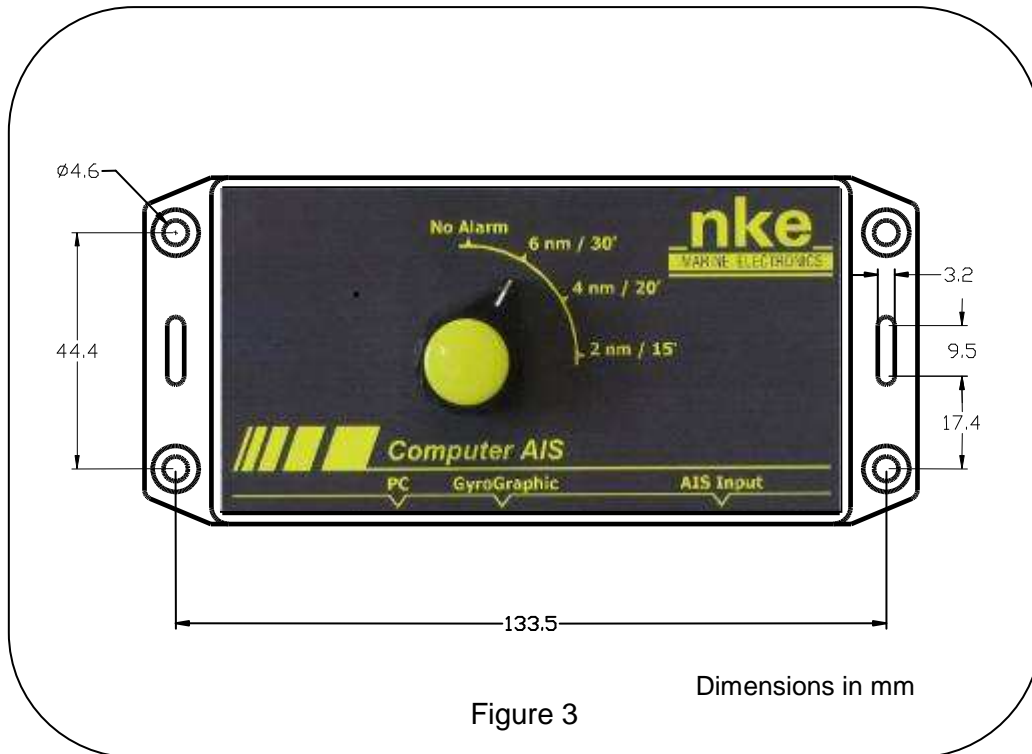
3.1. LIST OF ACCESSORIES
- 90-60-417: Topline connection kit. Junction box and cables

3.2. INSTALLATION CAUTION

The *A.I.S Receiver/Processor* is not waterproof. It must be installed in a protected environment.

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3.3. MOUNTING THE A.I.S. PROCESSOR UNIT

The unit is fastened with Ø 4mm screws

Dimensions in mm

Figure 3

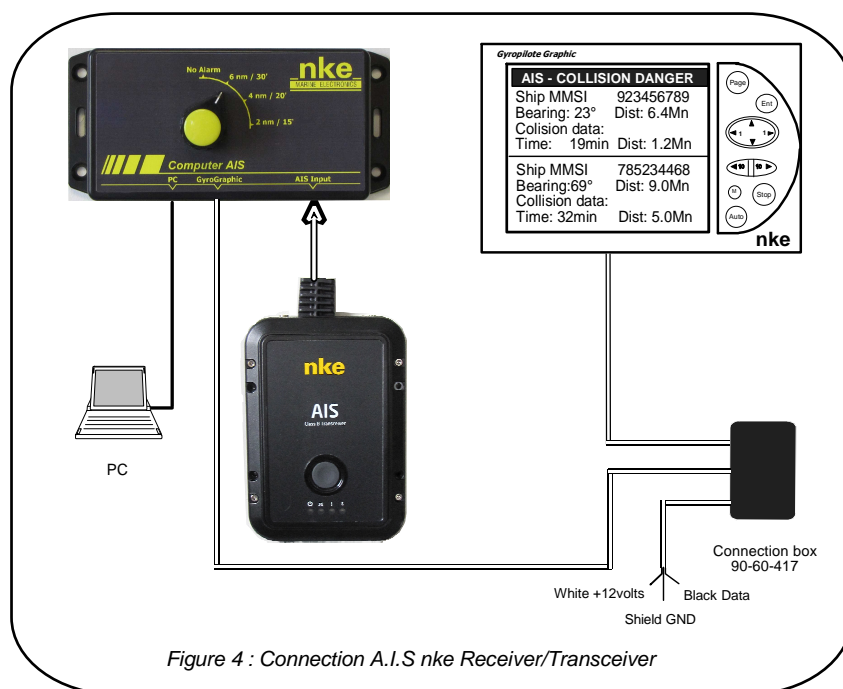### 3.4. CONNECTING THE A.I.S. PROCESSOR UNIT

> ⚠️ **WARNING**
>
> All Topline bus connections must be performed while the system is powered off. The **Gyrographic** chosen to display A.I.S data must be exclusively dedicated and not receive any other NMEA data

- Run the cable from the junction box situated near the dedicated **Gyrographic** to the A.I.S. display

- Connect the white wires and the shield in the junction box

- Connect the green wire to NMEA – position, and the yellow wire to NMEA+ position

- Connect the 9 pin plug to the serial port of the PC running navigation software with A.I.S. features. Use either a serial RS232 port or a USB/RS232 adaptor

3.4.1 Connecting the A.I.S processor to the nke A.I.S receiver/transponder

Figure 4 : Connection A.I.S nke Receiver/Transceiver

- Simply connect the 9 pin female plug from the *A.I.S. receiver/transponder* to the relevant 9 pin socket on the *A.I.S. processor*.

⚠ **CAUTION**

There is no visual indicator on the A.I.S. processor. The good operation of the system is checked by reading the RMC and PNKE data received on the Gyrographic NMEA monitor.

3.4.2 Connecting the A.I.S processor to another A.I.S receiver

- Cut the 9 pin plug of the « A.I.S. Input » cable.
- Connect the brown wire to the NMEA + (signal) of your A.I.S. source device and the white wire to the NMEA -.
- The NMEA default rate of the A.I.S. input is 38400 bauds. It can be adjusted to 4800 bauds: open the case and push the « SW1 » to the "ON" position, using a small screw-driver.
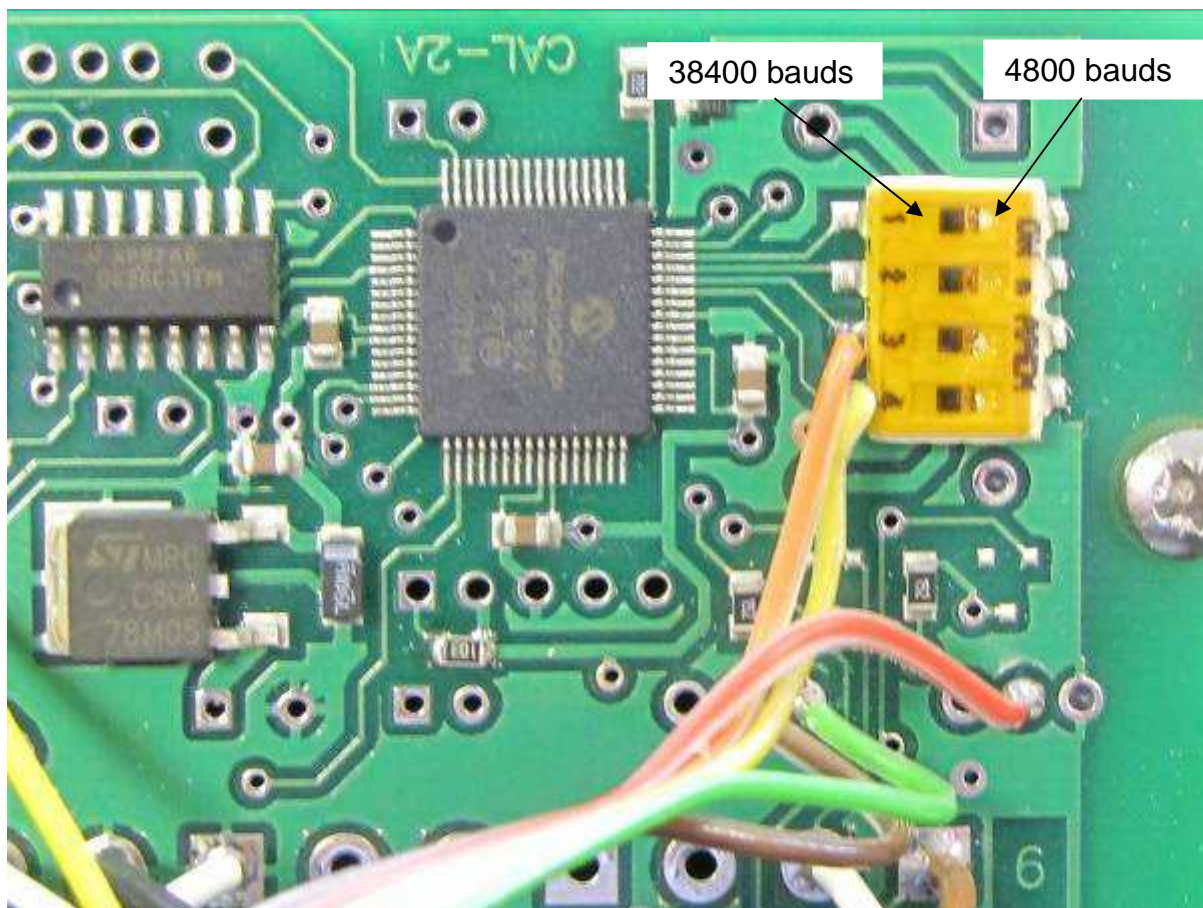
38400 bauds   4800 bauds

⚠️ **CAUTION**

There is no visual indicator on the A.I.S. processor. The good operation of the system is checked by reading the RMC and PNKE data received on the Gyrographic NMEA monitor.

- *Connection cable to Gyrographic – Wires colour code*

Cable to Gyrographic	Function
White	+ 12 volts
Shield	GND
Black	NC
Red	NC
Yellow	+ NMEA
Green	- NMEA

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- *A.I.S. input cable wires colour code*

AIS input	Function
Brown	+ NMEA (pin 2 bD)
White	- NMEA (pin 5 bD)

- *PC connection cable wires colour codes*

PC cable	Function
Brown	+ NMEA (pin 2 bD)
White	- NMEA (pin 5 bD)

4. GLOSSARY

AIS

(Automatic Identification System) is a worldwide navigation information exchange system. It is automated and permits vessels and shore stations to exchange information such as identity, status, position and route using the VHF radio signal

MMSI

(Maritime Mobile Service Identity), is a unique 9 digit code which identifies each vessel

CPA

(Closest Point of Approach) is the shortest distance to the meeting point of two vessels in approach

TCPA

(Time Closest Point of Approach) is the time remaining until CPA.

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