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CAMINO-101 [Class B AIS]

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Version 1.3.3

WARNING!

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

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 in this device.

★ The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.

★ Instructions on how to accurately enter and confirm static data in the device can be found in Section 3.3 of this user manual.

The equipment said in this manual must only be used to which it was designed. Improper operation or installation may cause damage to the equipment or injury to personnel. AMEC will not incur any liability of equipment damage or personal injury due to improper use or installation of the equipment. It is strongly recommended to read this manual and the following safety instructions before proceeding to installation or operation.

SAFETY INSTRUCTIONS

WARNING
 **ELECTRICAL SHOCK HAZARD.** Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.
TURN OFF THE POWER IMMEDIATELY IF WATER LEAKS INTO THE EQUIPMENT OR OBJECT DROPS INTO THE EQUIPMENT. Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.
DO NOT DISASSEMBLE OR MODIFY THE EQUIPMENT. Improper disassemble or modification could cause electrical shocks, fire, or personal injury.
AVOID OPERATING THE EQUIPMENT WITH WET HANDS. Electrical shocks could be resulted if operating with wet hands.

WARNING
TURN OFF THE POWER IMMEDIATELY IF THE EQUIPMENT IS EMMITTING SMOKE OR FIRE. Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.
EVEN THOUGH THE EQUIPMENT IS WATERPROOF, PLEASE AVOID DIRECT CONTACT WITH RAIN OR SPLASHING WATER. Electrical shock or fire could be resulted if water leaks into the equipment.
DO NOT PLACE ANY LIQUID-FILLED CONTAINER ON TOP OF THE EQUIPMENT. Electrical shocks could be resulted if the device is contaminated with liquid.

FORWARD

Congratulations on the purchase of your new CAMINO-101 Automatic Identification System (hereinafter called “AIS”). No matter where you sail now, you can have a better control of your surrounding sea, and have an enjoyable voyage.

Camino-101 AIS is strictly tested to meet the rigorous demands of the marine environment. Unless improper use, installation**,** or maintenance, the equipment should function properly at its optimum.

We thank you for choosing our product and we wish you a bon voyage.

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1 INTRODUCTION

1.1 CAMINO-101 Overview

The CAMINO-101 is a Class B AIS transponder using carrier-sense TDMA (CSTDMA) technology. It is designed to inter-operable and compatible with Class A or other Class B ship borne mobile AIS stations or any other AIS station operating on the AIS VHF data link.

CAMINO-101 AIS uses marine VHF channels with frequency set universally from 156.025 MHz to 162.025 MHz. Having CAMINO-101 AIS on board, not only can you monitor the status of the vessels in the surrounding area, but also receive the dynamic information (position, speed, SOG, and etc.), static information (ship name, MMSI, call sign, and etc.), and voyage related information (cargo type, destination, and etc.) from any vessels equipped with AIS. An external computer installing with AMEC AIS Viewer software or a similar compatible device is required in order to view the AIS information above mentioned.

CAMINO-101 AIS is one of the cutting-edge navigational aid equipment allowing real-time information exchanges within AIS network. It is also capable of integrating with other maritime systems such as Electronic Chart System (hereinafter called “ECS”) for various maritime navigation applications.

CAMINO-101 is designed with 2 RF receivers and 1 RF transmitter. One of the RF receivers is time-shared between AIS and DSC. On the front panel, CAMINO-101 equips with 3 LED indicators. At rear panel, CAMINO-101 equips with 1 VHF antenna connector, 1 GPS antenna connector, 1 optional Bluetooth connector and antenna, 1 NMEA interface connector, 1 RS232 interface connector, 1 power connector, and 1 power switch.

***NOTE:** The CAMINO-101 is an equipment to be used in protected environmental conditions. It is not intended to expose to rain or spray longer than minute.

1.2 Type of AIS

There are mainly two types of AIS transponder: Class A and Class B. The intended nature of these AIS systems in navigations is different as illustrated in the following table. CAMINO-101 is a Class B AIS transponder.

Table 1-2 Type of AIS

Class A AIS	• Transmits and receives AIS signal in SOTDMA protocols. • Intended for vessels meeting the IMO AIS carriage requirements. • It is mandatory for all commercial vessels that exceed 300 tons to be equipped with Class A AIS.
Class B AIS	• Transmits and receives AIS signal in CSTDMA protocols. • Not necessarily in accord with IMO AIS carriage requirements. • It is not mandatory for vessels to be equipped with Class B AIS. • Suitable for recreational vessels or fishing boats, in enhancing its safety at sea.

1.3 AIS Message Type

The CAMINO-101 transmits following message types.

Table 1-3 CAMINO-101 AIS message type

Type of Message	Data Details
Static Data	Maritime Mobile Service Identity number (“MMSI”) Call sign and name Type of ship Length and beam GPS Antenna location
Dynamic Data	Position of the vessel Course Over Ground (hereinafter called “COG”) Speed Over Ground (hereinafter called “SOG”) Heading
Dynamic Reports	Speed of the ship Status of the ship
SRM	Alarm Safety

1.4 AIS Report Rate

The CAMINO-101 supports following report rate in accordance to ITU-R M.1371 and IEC 62287-1.

Table 1-4 CAMINO-101 AIS report rate

Platforms Condition	Nominal Reporting Interval
Class B Ship-borne mobile equipment not moving faster than 2 knots	3 Minutes
Class B Ship-borne mobile equipment moving faster than 2 knots	30 Seconds
Report rate by command of VTS	5 Seconds highest

1.5 About this Manual

The manual contains installation instructions and operating information for CAMINO-101. While most of the installation can be performed by the owner or the crew, a final commissioning can be done by your local agent/dealer where needed or required. AMEC and the local agent/dealer will not bear any responsibilities over any damages resulted in improper installation by unauthorized agent/dealer.

1.6 Important Notice

The intended use of the AMEC CAMINO-101 AIS is to enhance the safety of vessels at sea. However, a few points must be noted as below,

- Any AIS cannot guarantee in monitoring and receiving signals from all vessels in the surroundings unless those vessels equip with AIS device.

- It is important to note that the AIS is designed for the purpose of anti-collision and is serves as a compliment to navigation. It is not navigational equipment and does not replace any navigational system installed on board.

- Although AIS is operated automatically by itself, the owner or the crew on the vessel should still maintain a proper lookout for the surroundings. While the AIS is capable of setting alarm of Distance to Closest Point of Approach (hereinafter called “CPA”) and Time to the Closest Point of Approach (hereinafter called “TCPA”), vessel owner or the crew should be aware of the fact that there are vessels that are not equipped with AIS, and this function will not apply on these vessels.

- Incorrect data and information entered into the AIS is considered as erroneous information. Erroneous information or improper configuration will cause risk to other vessels and the own vessel when these information are transmitted. Users must be aware of this risk and make sure that all the information entered into the system is correct and up to date.

2 INSTALLATION

2.1 General

2.1.1 Safety Instructions

Before proceeding with installation, take note of the following safety instructions and read through this installation manual carefully.

SAFETY INSTRUCTIONS

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.

TURN OFF THE POWER BEFORE PROCEEDING WITH INSTALLATION.
Proceeding with installation with the power on could cause electrical shock or fire.

AVOID INSTALLING THE EQUIPMENT WHERE THERE IS DIRECT CONTACT WITH RAIN OR SPLASHING WATER.
Electrical shock or fire could be resulted if water leaks into the equipment.

MAKE SURE THE POWER SOURCE AND THE POWER INPUT OF THE EQUIPMENT ARE COMPATIBLE.
Damage to the equipment and fire could be resulted if the power **sources are** not correct. Please check the correct power input on the adaptor.

FOLLOW THIS INSTRUCTION MANUAL TO PROCEED WITH THE INSTALLATION.
AMEC and your local agent/dealer will not bear any responsibility of equipment damage or personnel injury due to improper installation.

WARNING

Warning Label
A warning label (Figure 2-1-1) is attached underneath the equipment. Warranty of the equipment will be invalid if this label is detached or broken. AMEC and your local agent/dealer will not bear any responsibility of any damage to the equipment, or damage in related to the equipment, personnel injury, and etc. Reject the equipment if this label is detached or broken. Please contact your local agent/dealer if this label is missing.

Figure 2-1-1 Warning label

2.1.2 Unpacking and Handling the Unit

① **Move and handle with cautious. Do not drop or bump.**

② **Visual inspection should be taken on the box to see if it is intact.**

③ **Unpack the product on a flat and level surface.**

④ **Unpack the box with the "this side up" sign facing up.**

⑤ **Take extra caution if requiring sharp object to unpack.**

⑥ **After unpacked, check if all the accessories and unit are included.**

2.1.3 Items in the Package

The CAMINO-101 is typically delivered with standard package as shown in Table 2-1-3-1. It is also illustrated in Figure 2-1-3 (except viewer CD and manual). Table 2-1-3-2 also shows optional accessories available from AMEC.

Table 2-1-3-1 Standard equipment list

No.	Description		Product Code	Qty
1	CAMINO-101 Class B AIS main unit		CAMINO-101	1
2	Manual		AIS-MNL-B101-E	1
3	Installation Kit	Power Cable, 1.5m, AWG 18	M-ACC-CAB-338-002-0001	1
		NMEA 0183 interface cable, 1.5m	ACC-CAB-WA-733A	1
		RS-232 interface cable, 1.2m	ACC-CAB-002	1
		M6×20 Screws	ASM-SCR-M6×20	4
4	Software CD: AMEC AIS Configuration & AMEC AIS Viewer		CAMINO-101 SW CD	1

***NOTE:** (1) AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

(2) If an extension power cable is required, use large gauge cable to minimize voltage drops.

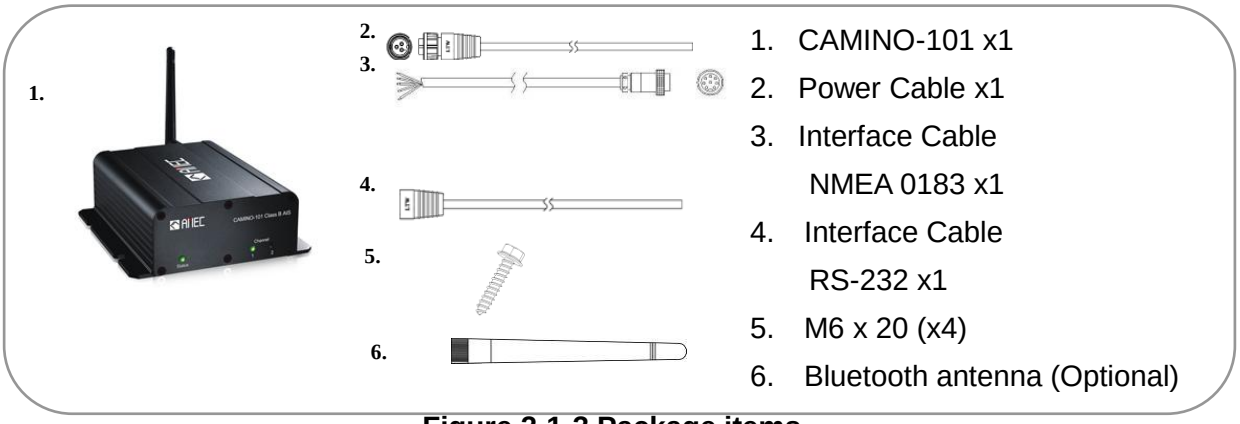


Figure 2-1-3 Package items

2.1.3.1 Optional Supply

Table 2-1-3-2 Optional equipment list

No.	Description	Remarks
1	VHF Antenna	--
2	GPS Antenna	10m cable included
3	VHF Antenna Cable	10m

***NOTE:** AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

2.2 Installation Procedure

2.2.1 Installation Precautions

1. **Installation should proceed in a safe environment and does not have direct contact with rain or splashing water.**
2. **If it is required to use a ladder to install the equipment, take extra caution and be careful of falling down.**
3. **Do not place or install the equipment beneath or near any container that filled with water or liquid.**
4. **Do not place or install the equipment where it is easily tripped, stepped on, or kicked at.**
5. **Do not place or install the equipment near any generator or engine.**
6. **When installation is completed, please remember to key in own ship's MMSI data and related information through AMEC AIS Configuration software. Please refer to Section 3.3.**

2.2.2 Step by Step Installation Instructions

AMEC CAMINO-101 can be installed and mounted on flat surface, or it can be hung on the wall as shown below.

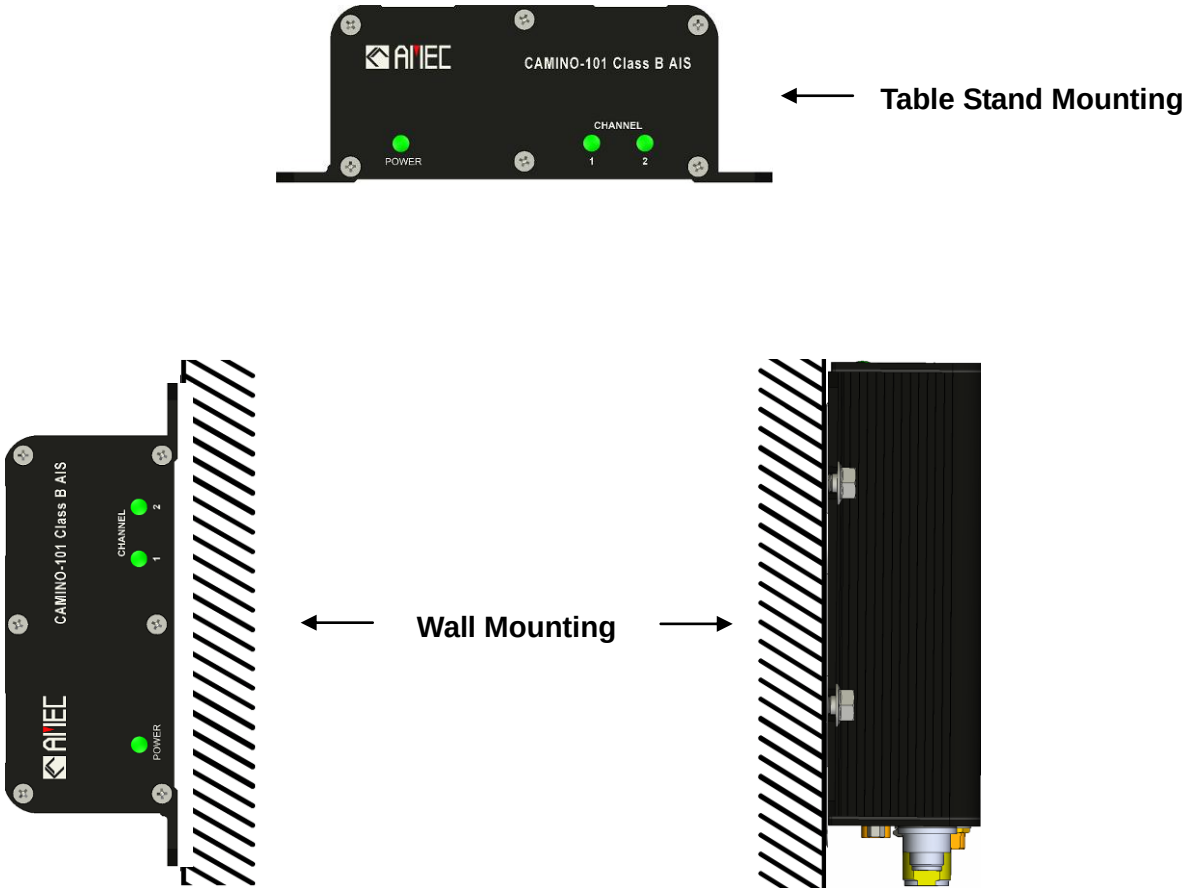


Figure 2-2-2-1 Installation overview

I. Installation Instructions

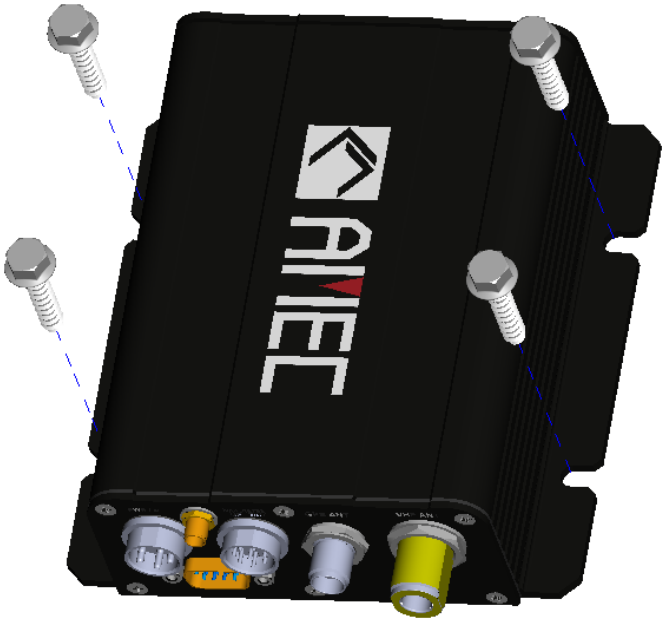


Figure 2-2-2-2 Installation instruction

Step 1:
Place CAMINO-101 on the desired spot for installing. (Refer to figure 2-2-2-2)

Step 2:
Use the 4 M6 × 20 screws in the accessories box to screw into the hole. (Refer to figure 2-2-2-2)

II. Cabling Instructions

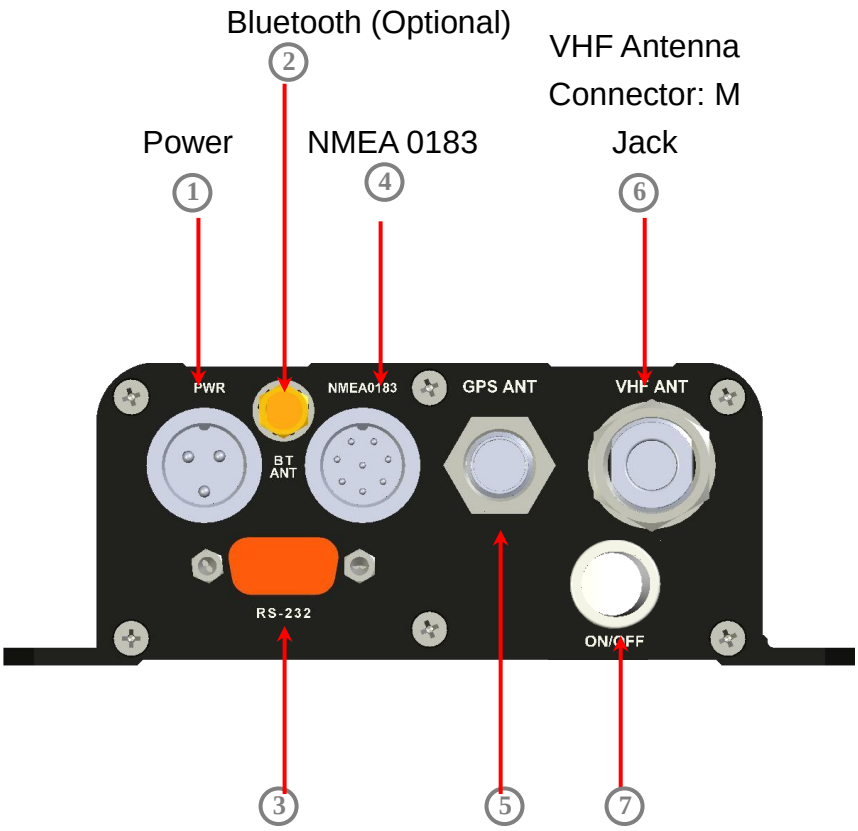


Figure 2-2-2-3 Cabling instructions

Step 1:
Connect the GPS cable to the GPS ANT (5) *

Step 2:
Connect the VHF cable to the VHF ANT (6) .

Step 3:
Connect NMEA 0183 compatible system to the NMEA interface (4).

Step 4:
Connect either RS-232 or Bluetooth antenna to your computer if needed.
*** DO NOT CONNECT THE TWO INTERFACES SIMULTANEOUSLY.**

Step 5:
Pairing Bluetooth to your computer if needed. (Please refer to 2.7).

Step 6:
Connect the Power cable to the PWR (1).

Step 7:
Open the CAMINO-101by switching (7) to “ON”

***NOTE:** CAMINO-101 SUPPLIES ONLY 3.3V FOR GPS ANTENNA. PLEASE NOTED WHEN CONNECTING WITH A 5V GPS ANTENNA WOULD CAUSE SIGNIFICANT DAMAGE. AN AMEC GPS ANTENNA IS HIGHLY SUGGESTED.

2.2.3 Connector Pin Definition and Wiring

2.2.3.1 Power Connector

A red wire and a white wire are included in the power cable.

Table 2-2-3-1 Power wiring details

Pin	Wire Color	Name	Function
1	-	-	-
2	Black	GND	Power Ground
3	Red	PWR	Positive (+); the input should be 24V DC

2.2.3.2 NMEA 0183 Connector

The wiring details of the NMEA cable are listed below.

Table 2-2-3-2 NMEA 0183 wiring details

Pin	Wire color	Name	Function
1	Brown	RXP	Positive(+); NMEA0183 Data input
2	Blue	RXN	Negative (−); NMEA0183 Data input
3	White	TXP	Positive(+); NMEA0183 Data output
4	Green	TXN	Negative (−); NMEA0183 Data output
5	/	/	/
6	Red	/	Reserved
7	Purple	/	Reserved
8	/	/	/

NMEA 0183 Wiring

Refer to the following wiring method for the external NMEA device with NMEA 0183 interface or RS-422.

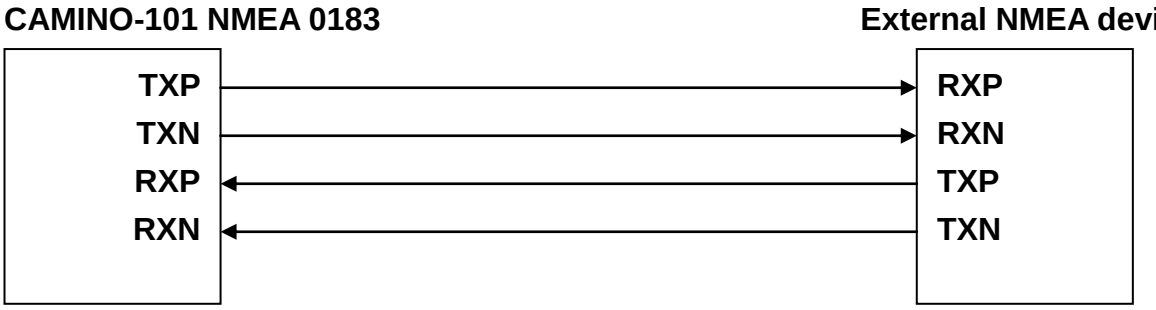


Figure 2-2-3-1 NMEA 0183 connections

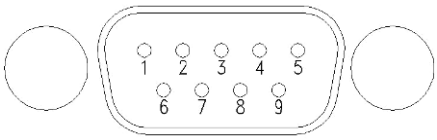
***NOTE:** Please make sure the external device is fully NMEA 0183 compiled.

2.2.3.3 RS-232 Connector

The cable contains 9 different wires. Refer to the following table for the wiring details.

Table 2-2-3-3 RS-232 wiring details

NO.	NAME	FUNCTION
1	/	/
2	RX	Receive Data
3	TX	Transmit Data
4	/	/
5	GND	Power Ground
6	/	/
7	/	/
8	/	/
9	/	/



RS-232 Wiring

Refer to the following wiring method for the external RS-232 device with RS-232 interface.

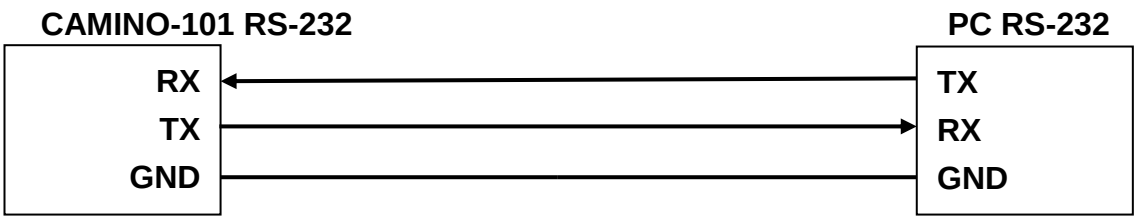


Figure 2-2-3-3 Connecting to PC via RS-232

III. Start-Up Setting

Step 1:
Connect the power cable to the power input and turn on the CAMINO-101 by switching ① to "ON".

Step 2:
Check if the POWER indication light ② is working properly.
Please refer to Section 3.1

Figure 2-2-3-6 Installation instruction

IV. Remarks

① Set up the GPS and VHF Antenna in an appropriate spot.
(Refer to Section 2.2)

② The power voltage of CAMINO-101 is 24V DC. Use an adaptor if the supply voltage is not within the range.

⚠ **INCORRECT INPUT VOLTAGE WILL DAMAGE THE EQUIPMENT!**

2.2.4 VHF Antenna Installation

The quality and positioning of the antenna is the most important factor dictating AIS performance. It is recommended that a VHF antenna with omni directional vertical polarization be specifically tuned for AIS operation band. Since the range of VHF signals is largely decided by line of sight distance, AIS antenna should be placed as high as possible and at least 5 meters away from any constructions made of conductive materials.

To avoid interference, the VHF antenna location should be placed in accordance to Figure 2-2-4.

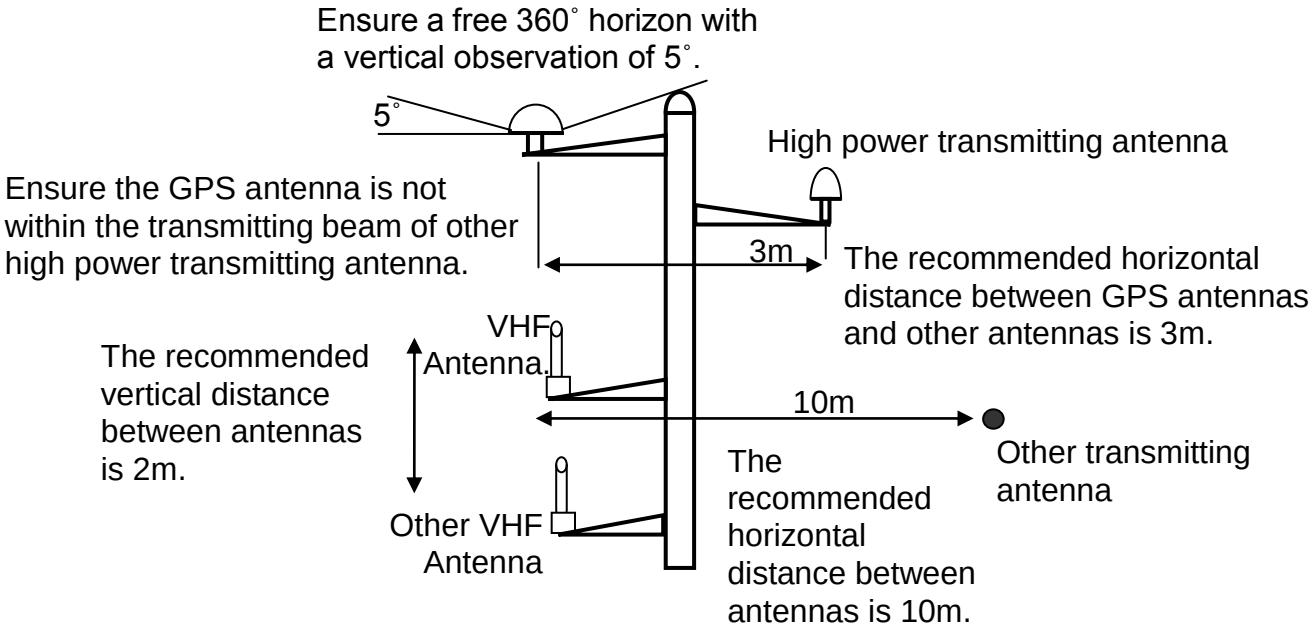


Figure 2-2-4 VHF/GPS Antenna Location

We recommend you choose AMEC AIS VHF antenna. To save space, you can also choose VHF/GPS combo antenna provided by AMEC

2.2.5 GPS Antennas Installation

The GPS antenna must be installed where it has a clear view of the sky, so that it accesses the horizon freely through 360°, with a vertical observation of 5 to 90 degrees above the horizon as illustrated in Figure 2-2-5.

GPS ANTENNA LOCATION

Enter the external and internal GPS antenna location data after installing them. Input the data in “SHIP SETTING”. Following is the GPS antenna location offset arm.

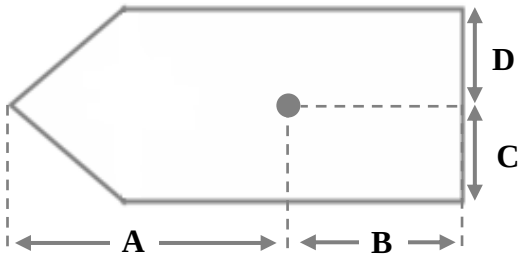


Figure 2-2-5 GPS Antenna location

We recommend you choose AMEC AIS GPS antenna. To save space, you can also choose VHF/GPS combo antenna provided by AMEC.

2.2.6 Antenna Cabling

When connecting the cable(s) with the CAMINO-101, take note of the following precautions.

① Do not bend the cable(s).

② Each coaxial cable should be set up separately and can only be set up in a single cable tube.

③ Each coaxial cable should keep a 10m safe distance with the power cable.

④ Connecting port of the coaxial cable should be insulated.

2.2.7 CAMINO-101 External Connections

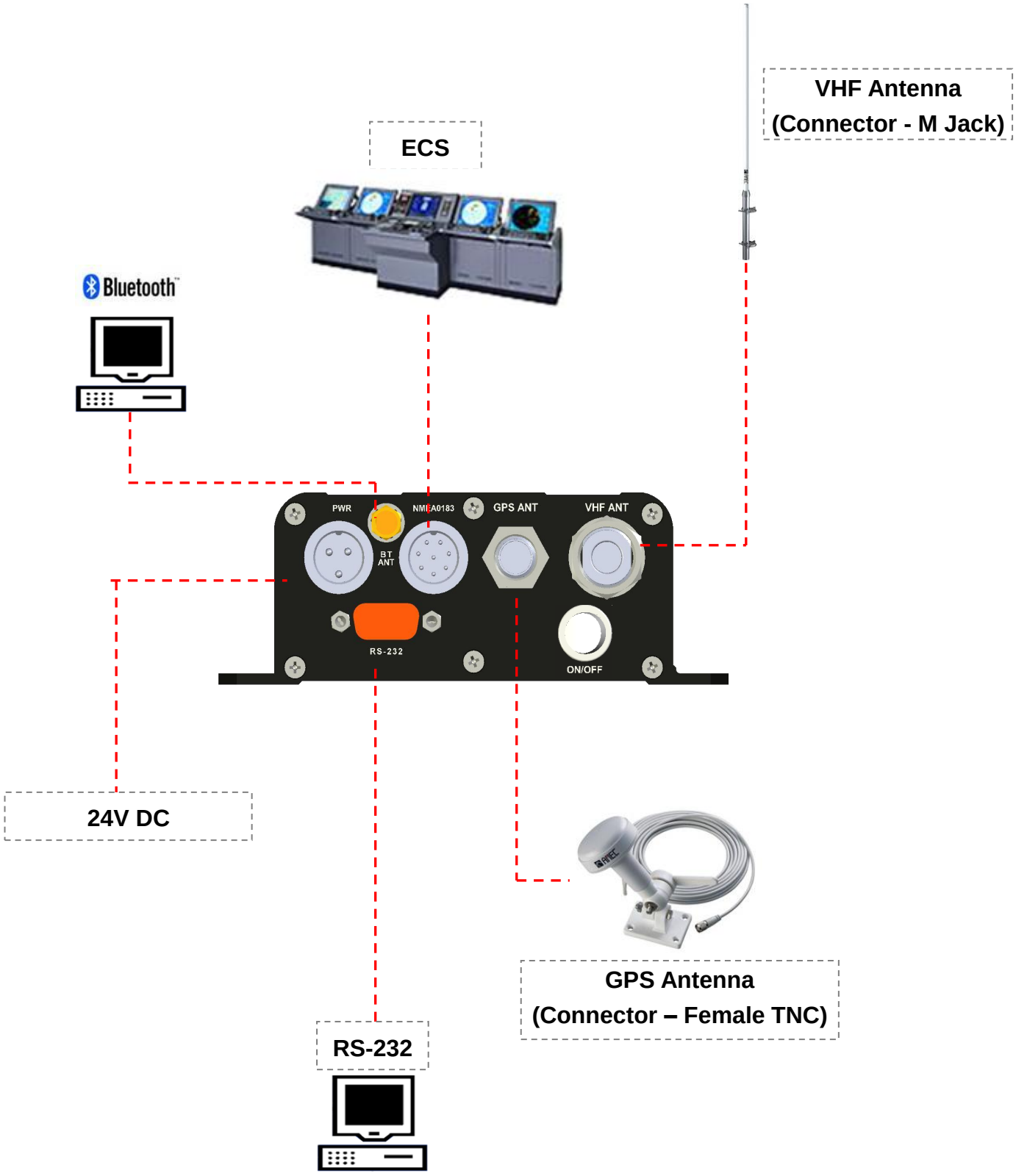


Figure 2-4 External configurations

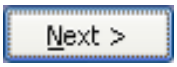
2.2.8 AMEC AIS Configuration Software Installation

This program enabled users to set up the own ship's dynamic, static and voyage related information through computer.

Please find the AMEC AIS Configuration program in the CD which provided by AMEC; and follow the following steps to install the AIS Configuration.

Step 1: Please open the AMEC AIS Configuration file and click on the set up icon 

to start the installation process of AMEC AIS Configuration.

Step 2: Please click on 

to continue.

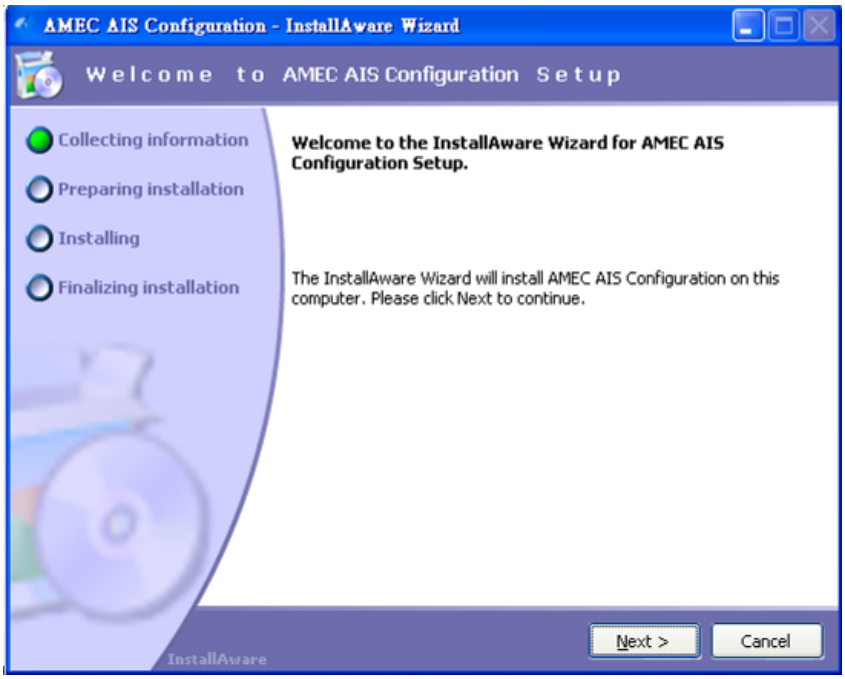
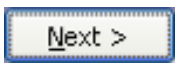


Figure 2-5-1 Set up Configuration

Step 3: Please fill in the required information and click on 

to continue.

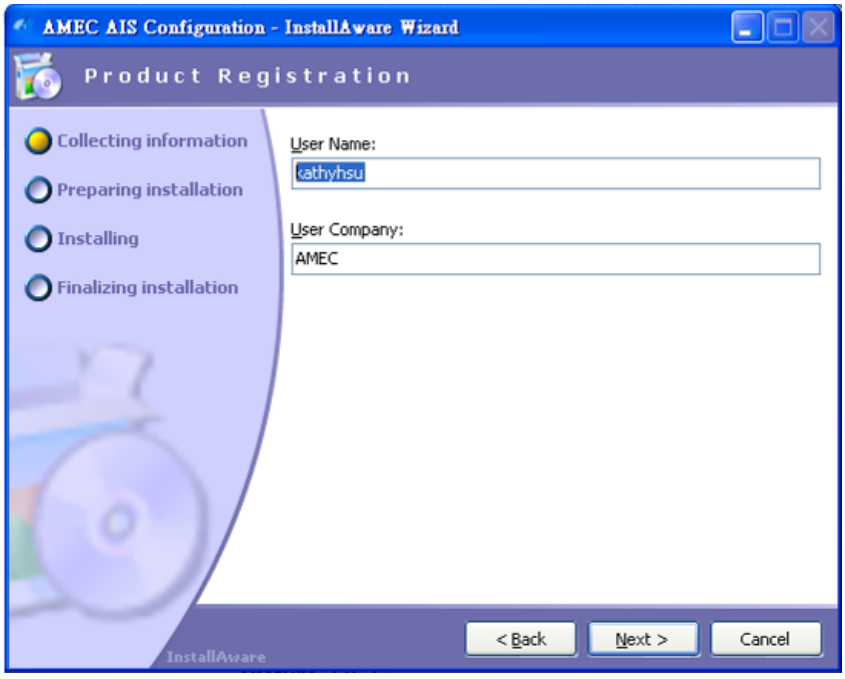
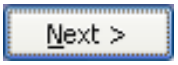


Figure 2-5-2 Set up Configuration

Step4: Select the destination folder and click on  to continue.

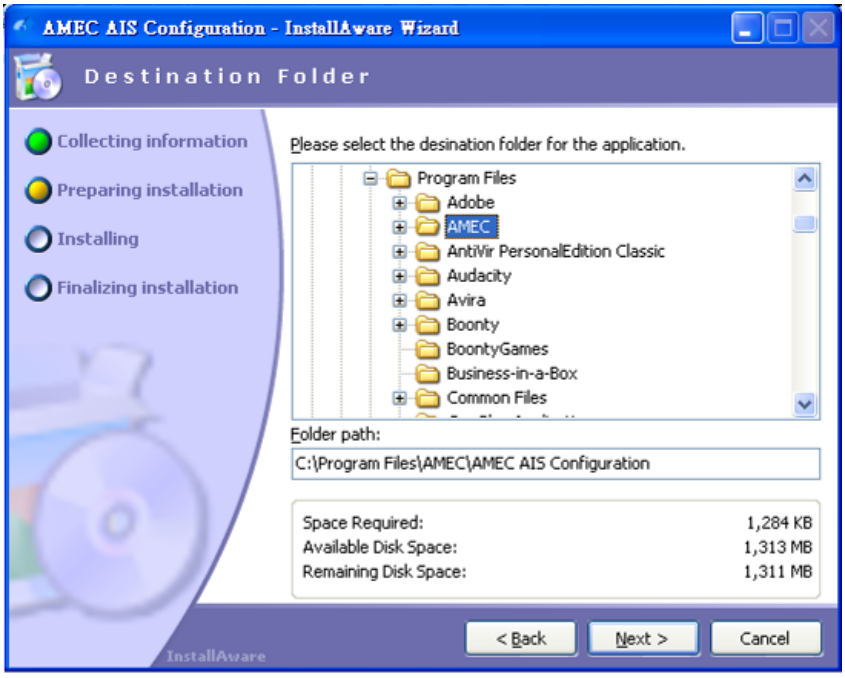
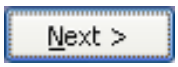


Figure 2-5-3 Set up Configuration

Step5: Select the Start Menu group for the application and choose users for the program and click on  to continue.

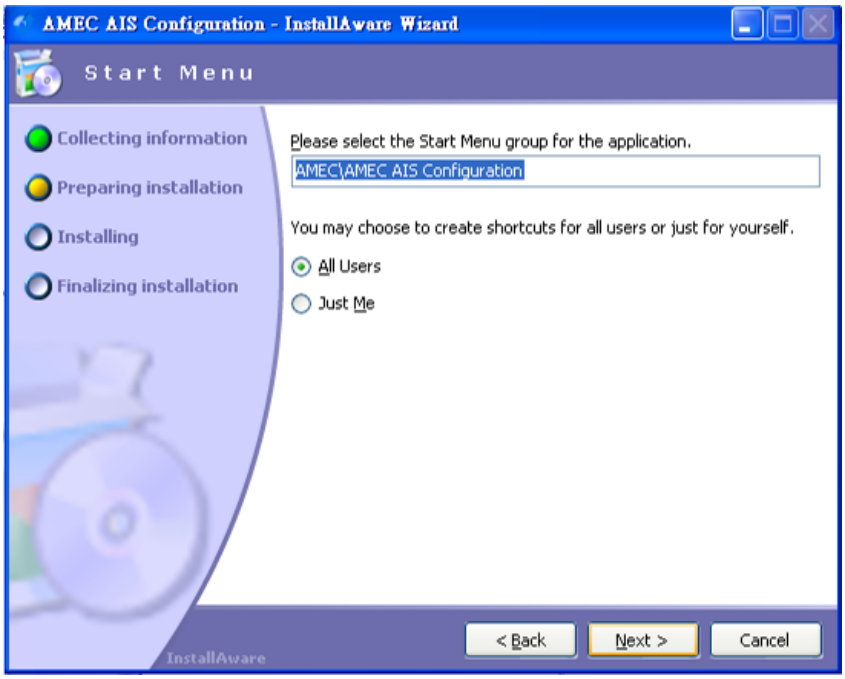


Figure 2-5-4 Set up Configuration

Step6: The installation will start immediately, please wait a few minutes.

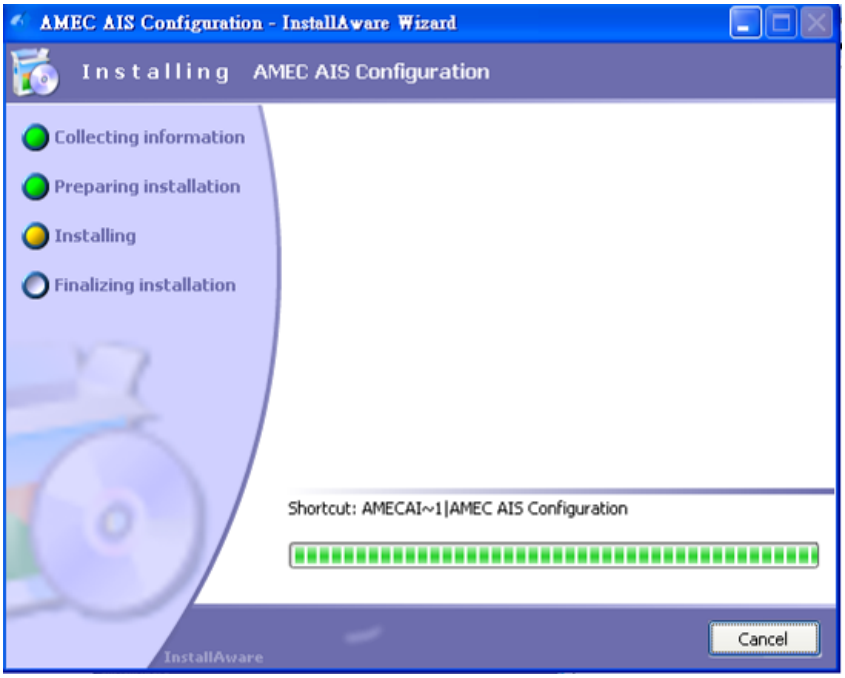
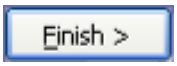


Figure 2-5-5 Set up Configuration

Step 7: Please click on 

to finish the setting.

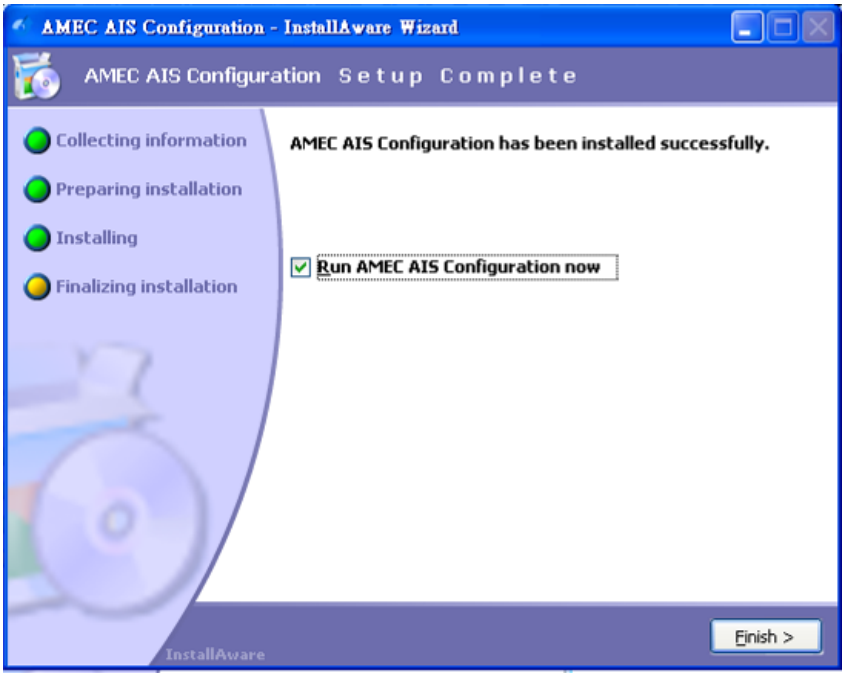
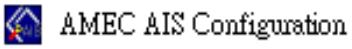


Figure 2-5-6 Set up Configuration

Step 8: Click on 

to run AMEC AIS Configuration program..

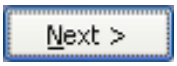
2.3 AMEC AIS Viewer Software Installation

The viewer program provides users with AIS information on computer; users may browse the relative positions of surrounding vessels and the dynamic and static information regulated by IMO. For professional users or further details, we suggest connecting AMEC CAMINO-101 with other marine electronic products such as ECS or Radar to achieve better performances.

Please find the AMEC AIS Viewer program at the CD we provided; and follow the following steps to install the viewer program.

Step 1: Put the program disk into your computer, and double click on

.

Step 2: A welcome window will pop out. Please click  to continue.

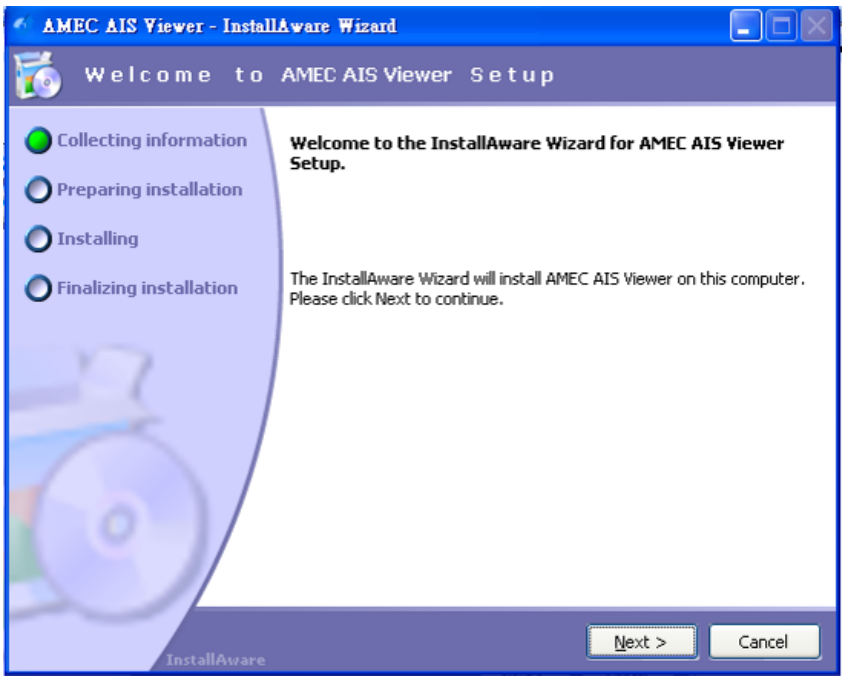
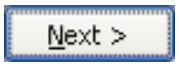


Figure 2-3-1 Set up Viewer

Step 3: Please fill in the required information and click on 

to continue.

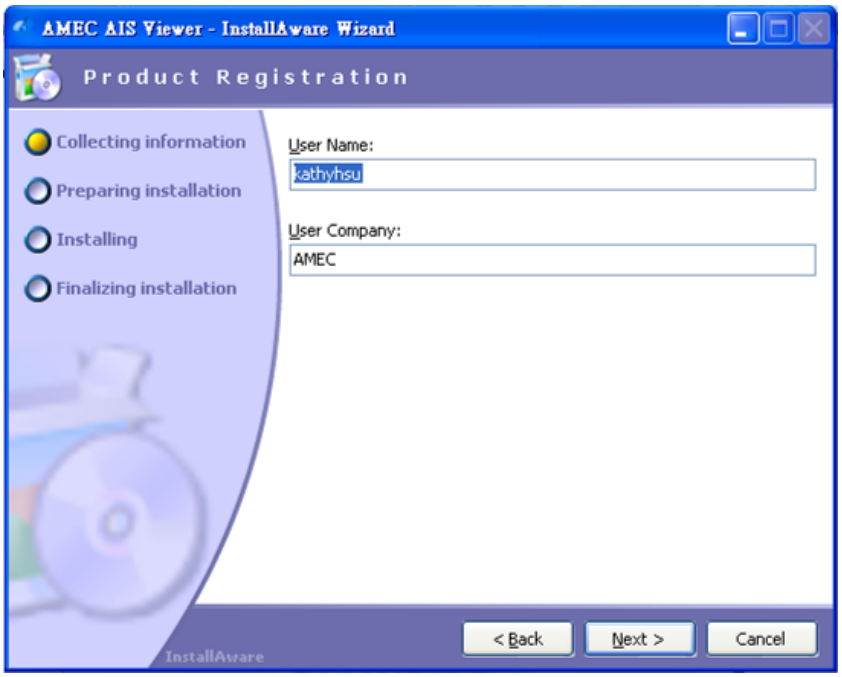
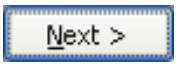


Figure 2-3-2 Set up Viewer

Step 4: Please choose a folder to install this viewer; and then click on 

to continue.

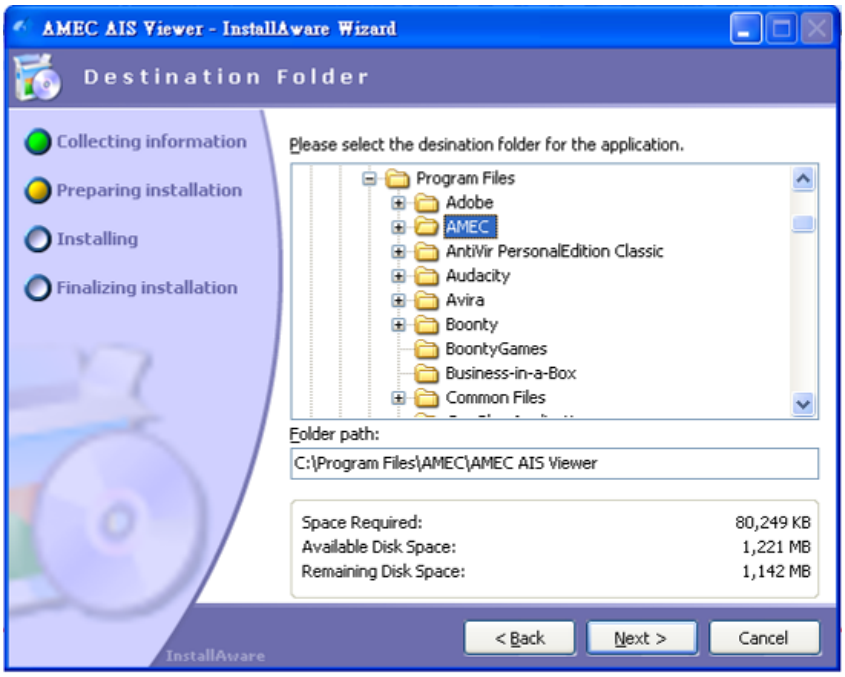
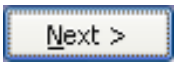


Figure 2-3-3 Set up Viewer

Step 5: Please click on  to continue the installation.

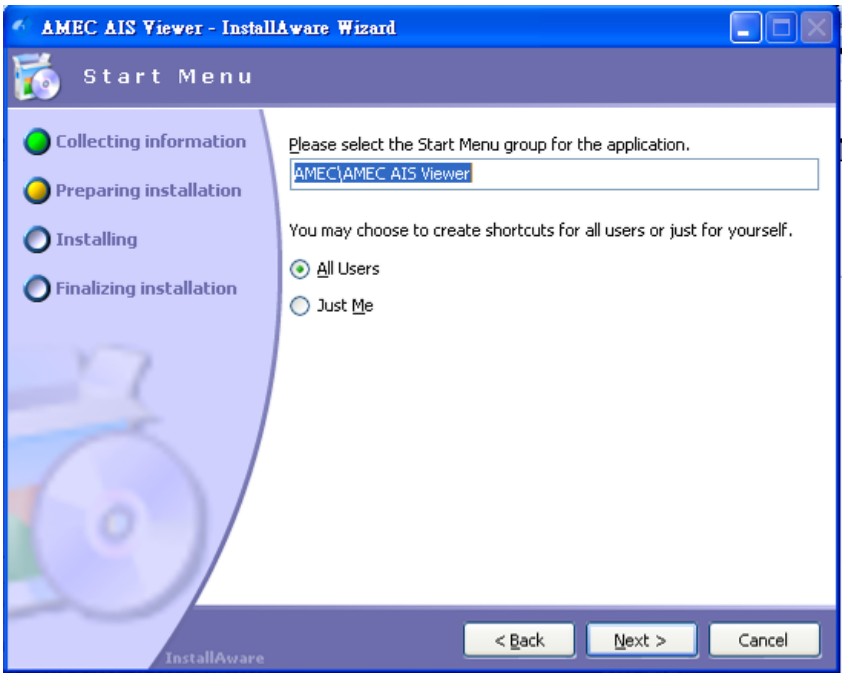


Figure 2-3-4 Set up Viewer

Step 6: The AMEC AIS Viewer starts to install, please wait for a few seconds.

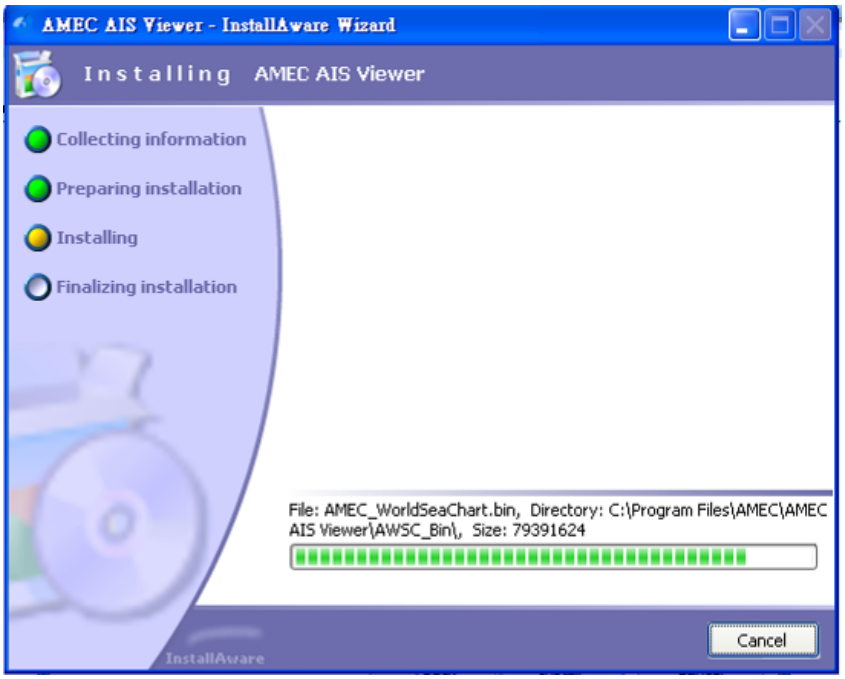
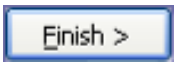


Figure 2-3-5 Set up Viewer

Step 7: When the installation is completed, please click on 

to complete the setting.

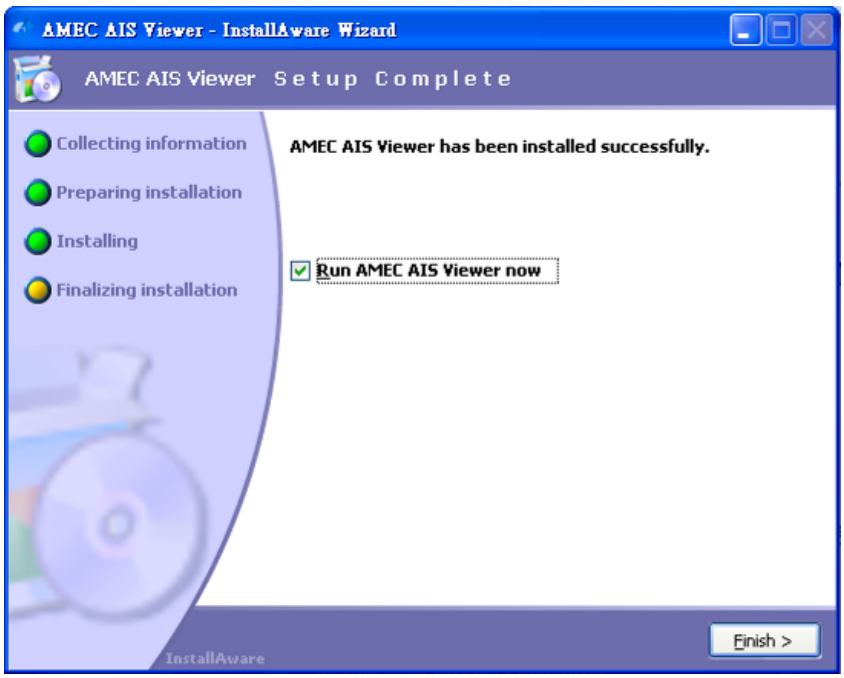


Figure 2-3-6 Set up Viewer

Step 8: Click on 

to start the AMEC AIS viewer program.

2.4 Bluetooth Pairing (Optional Feature)

For CAMINO-101 with Bluetooth, please consult your Bluetooth device for connection. AMEC's default encryption key is "0000.

3 GET STARTED

3.1 Turning Power ON / OFF

TURNING POWER ON:

Step 1: Check the input voltage. CAMINO-101 input voltage is 24V DC.

Step 2: Connect the CAMINO-101 with power input.

Step 3: Switch the power to “ON”.

Step 4: The power status indicator will turn to green from flashing green light.

Step 5: When the power status indicator turns green, the unit will function automatically. The channel indicator flashes once the AIS signal is received.

TURNING POWER OFF:

Step 1: Switch the power to “OFF”.

Step 2: The unit shuts down and the power status indicator turns off.

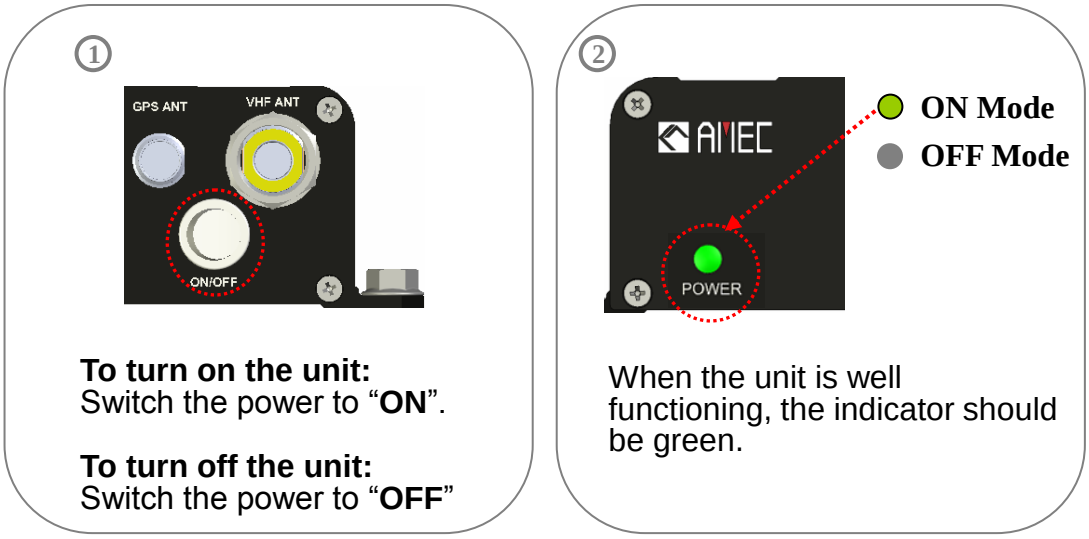


Figure 3-1 Description of Power Switch & Indication

3.2 Front Panel LED Indicators

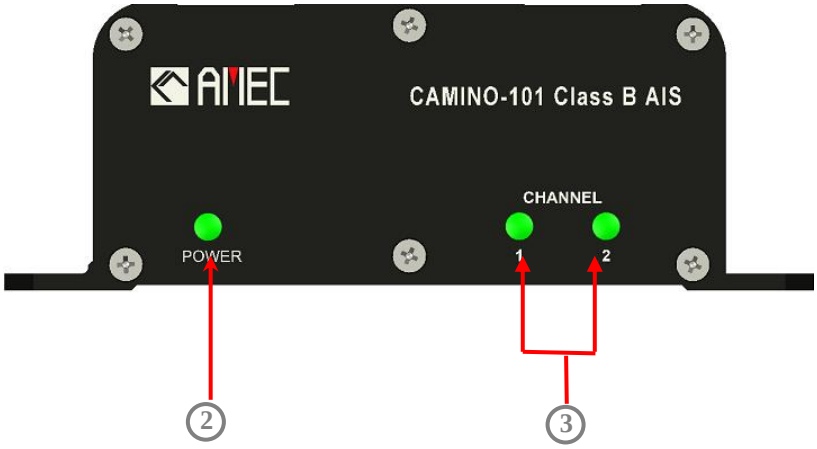


Figure 3-2 LED indicators on front panel

Table 3-2-1 Description of LED indicators on front panel

1. Power	Indicator of power status
2. Channel 1 & 2	Channel 1 & 2 indicator

Table 3-2-2 Power LED Indicator

POWER LED INDICATOR			
LED Color		**Indication**	**Description**
Green	On	Normal	Device in normal operation
	Flash	Initialization	System initialization and checking
Yellow	On	Silent mode	MMSI is not yet programmed into the device, such that the device can not perform as transmit mode, it can perform only as a “receive mode” device.
	Flash	TX timeout	(1) Quiet time command imposed by harbor authorities; (2) Transmission ceased due to carrier-sensing of high VDL load
Red	On	Power error	Power system is in failure
	Flash	BIIT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

Table 3-2-3 Channel LED Indicators

CHANNEL LED INDICATOR		
Channel	**Status**	**Indication**
1	Flash Green	Incoming data received at Channel 1.
2	Flash Green	Incoming data received at Channel 2.
1	Flash Yellow	Transmitting data at Channel 1
2	Flash Yellow	Transmitting data at Channel 2

3.2.1 Built-in Integrity Test (BIIT)

With BIIT (Built in Integrity Test) function, the Camino-101 is constantly monitoring and testing the integrity of the AIS transceiver. Should an abnormal condition be detected within the device, the Power LED will display an alarm in flash red. Abnormal condition may include situations like following:

- GPS is unable to gain lock after 30 minutes of losing GPS track
- Background noise level exceeds allowable threshold (-77dBm)

3.3 CAMINO-101 Configuration Settings

CAMINO-101 own ship configuration settings can be performed through AMEC AIS Configuration software provided in the standard product package. These configuration settings include MMSI, Static, Voyage, Transceiver, and Baud Rate data. MMSI setting is a mandatory setting in order to make CAMINO-101 work properly.

The following steps (step 1 ~ 7) describe the details of configuration settings.

Step 1: Serial Port and Baud Rate Setting

(1) Select auto or manual for serial port number and its baud rate setting.

■ Auto: The system will identify and show the serial port number and baud rate automatically.

■ Manual: Select appropriate serial port number and baud rate manually. If you can't find the desired serial port no. under the list, you may key in the serial port number directly.

(2) Click on 

to connect to the desired serial port and baud rate.

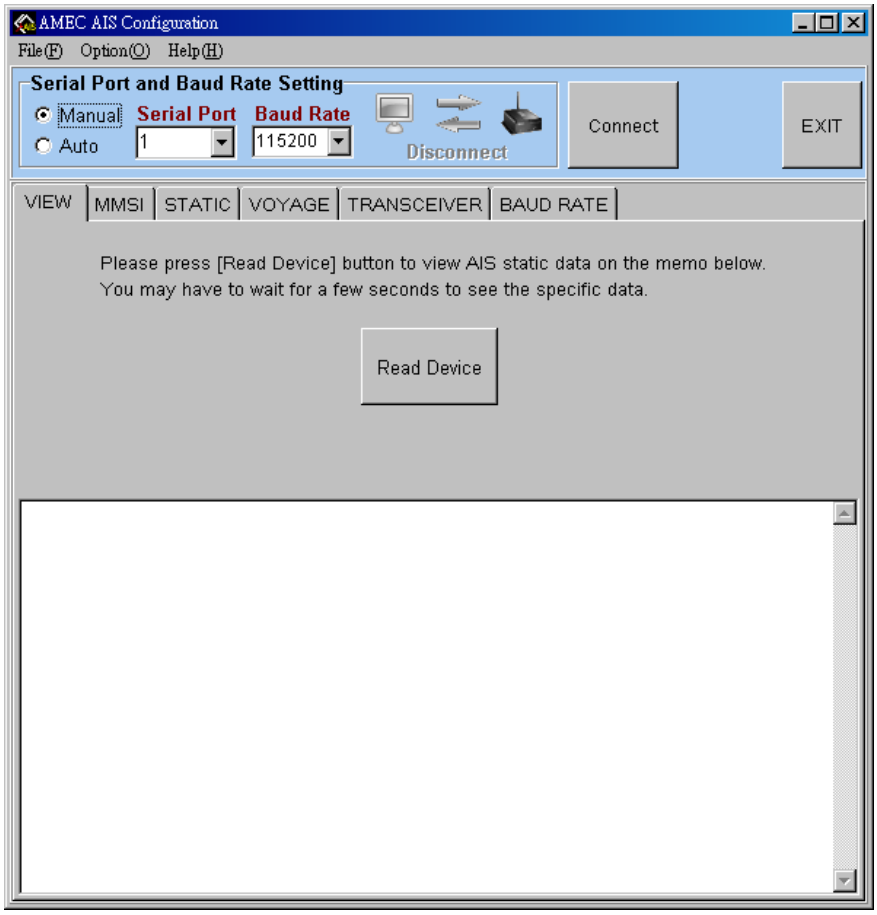


Figure 3-3-1 Serial Com Port and Baud Rate Setting

Step 2: MMSI Setting

(1) Click on “MMSI” tab.

(2) Check and select “MMSI” button.

(3) Enter your MMSI (Maritime Mobile Service Identity) number in the designated square area.

(4) Click on 

to confirm and complete the MMSI setting.

(5) To perform other setting, click on specific tab to go further.

(6) To escape from the AMEC AIS Configuration software, click on “EXIT”.

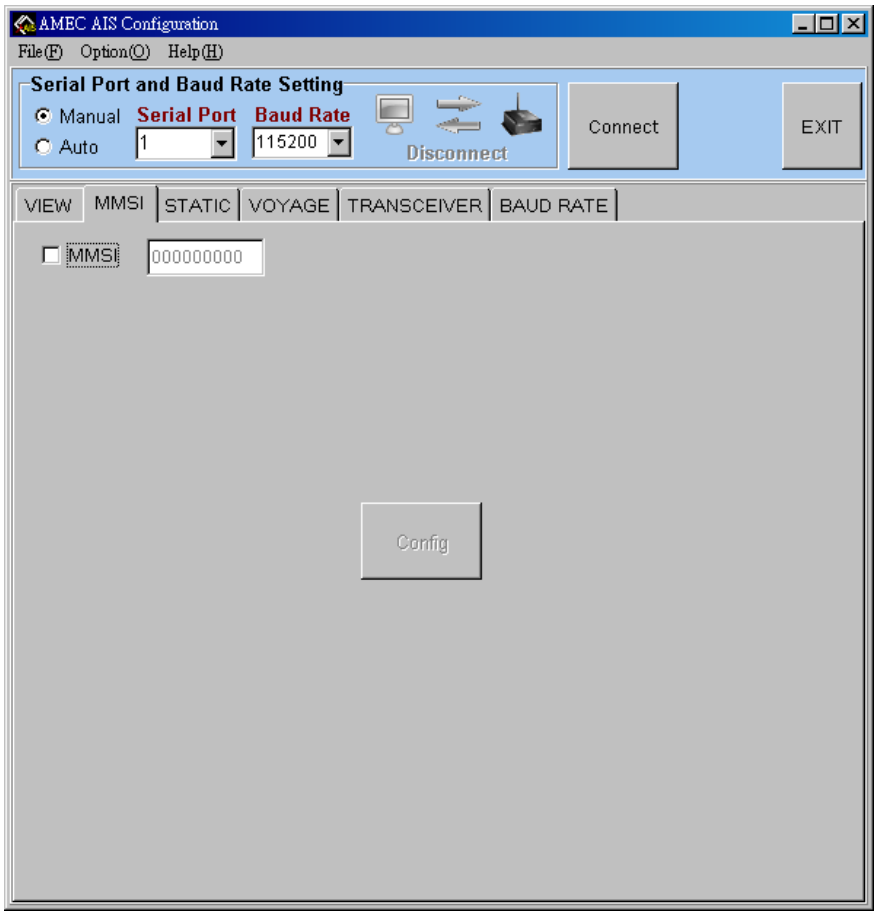


Figure 3-3-2 MMSI Setting

! WARNING: MMSI can only be input once, please make sure and input the correct MMSI.

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

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 in this device.

Step 3: Static Data Setting

(1) Click on “STATIC” tab.

(2) Enter your CALL SIGN and NAME.

(3) Select the “DIMENSION SETTING” to fill in the dimension of your own ship.

(4) Click on 

to confirm and complete the setting.

(5) To perform other setting, click on specific tab to go further.

(6) To escape from the AMEC AIS Configuration software, click on “EXIT”.

Figure 3-3-3 Static Data Setting

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.

Step 4: Voyage Setting

(1) Click on “VOYAGE” tab.

(2) Select “Ship_Cargo Type Setting”.

(2) Select suitable items under “Ship Type” and “Cargo Type”.

(3) Click on 

to confirm and complete the setting.

(4) To perform other setting, click on specific tab to go further.

(5) To escape from the AMEC AIS Configuration software, click on “EXIT”.

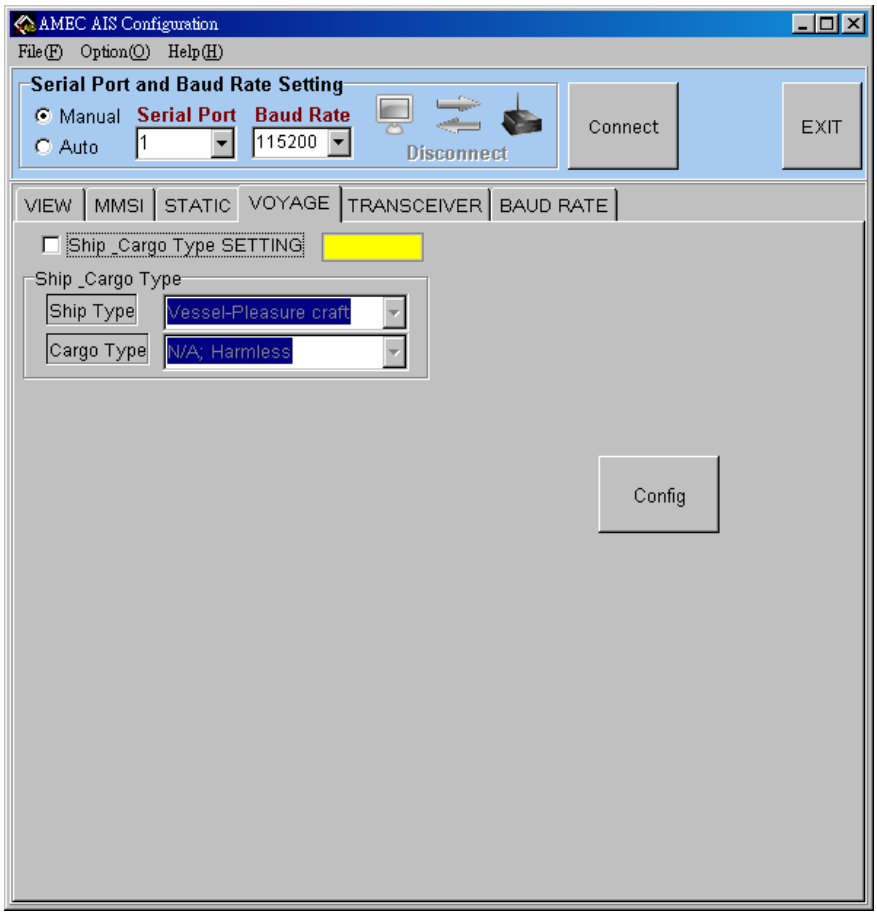


Figure 3-3-4 Voyage Setting

Step 5: Transceiver Setting

(1) Click on “TRANSCEIVER” tab.

(2) Select the “Enable DSC monitoring” button to enable the DSC function. The factory default setting is “selected” which means DSC is enabled. The DSC shall be enabled under normal operation.

(3) Un-select the “Enable DSC monitoring” button if you want to disable DSC monitoring function. This is not allowed in normal operation.

(4) Select “GPS Output” at “ON” to enable the GPS message transmission. This is factory default setting and required for normal operation.

(5) Select the “GPS Output” at “OFF” if you want to disable the GPS message transmission. This is not allowed in normal operation.

(6) Click on 

to confirm and complete the setting.

(7) To perform other setting, click on specific tab to go further.

(8) To escape from the AMEC AIS Configuration software, click on “EXIT”.

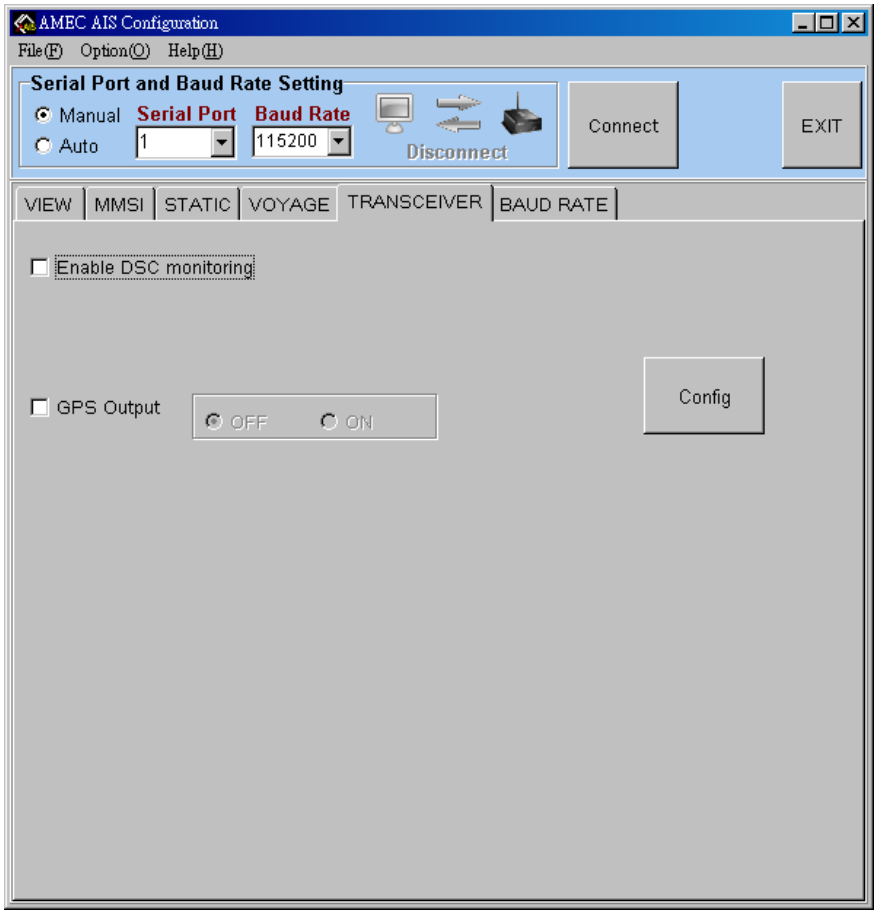


Figure 3-3-5 Transceiver Setting

Step 6: Baud Rate Setting

(1) Click on “BAUD RATE” tab.

(2) The default baud rate for RS-232 is 115200, enter your desired baud rate if necessary.

(3) The default baud rate for NMEA is 38400, enter your desired baud rate if necessary.

(4) Click on 

to confirm and complete the setting.

(5) To perform other setting, click on specific tab to go further.

(6) To escape from the AMEC AIS Configuration software, click on “EXIT”.

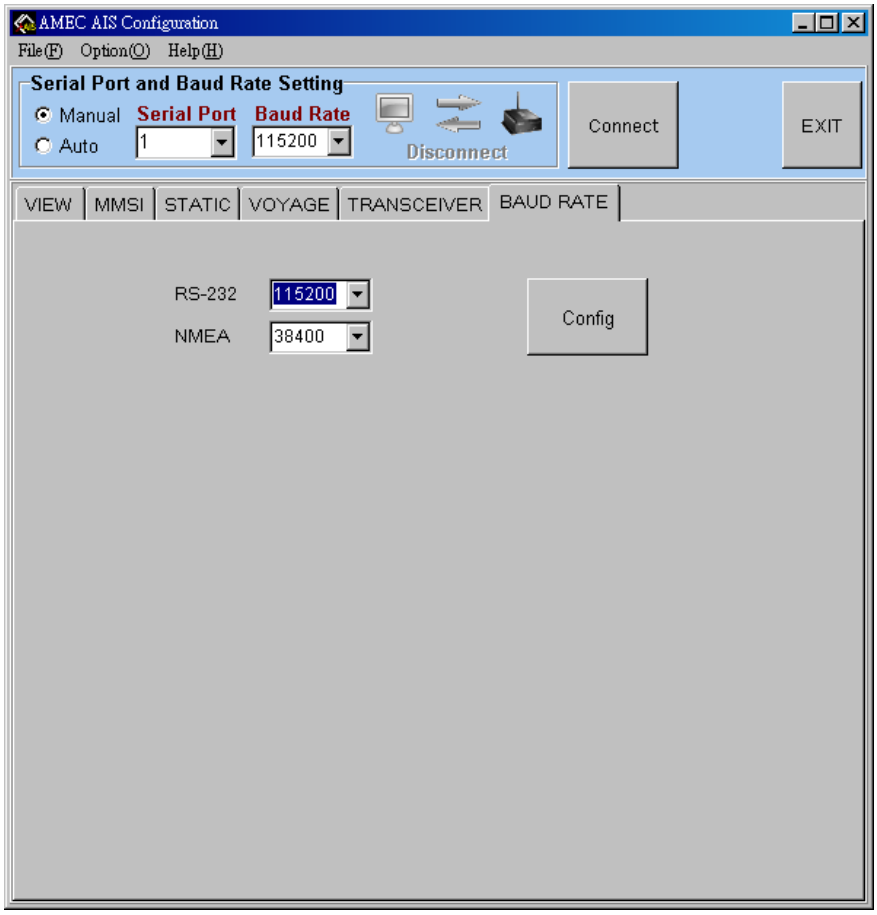


Figure 3-3-6 Baud Rate Setting

Step 7: Setting Review

(1) Click on “VIEW” tab.

(2) Click on the “Read Device” button, all the device setting information will be displayed in text format, including MMSI, static, voyage, transceiver, and baud rate data.

(3) Review and reconfirm if the data has been appropriately set.

(4) If specific data was not properly set, go to that specific tab to make further revision. And then, come back to “VIEW” tab, to see the latest data.

(5) After review and reconfirmation, click on 

to complete the whole setting and to escape from this AMEC AIS Configuration software.

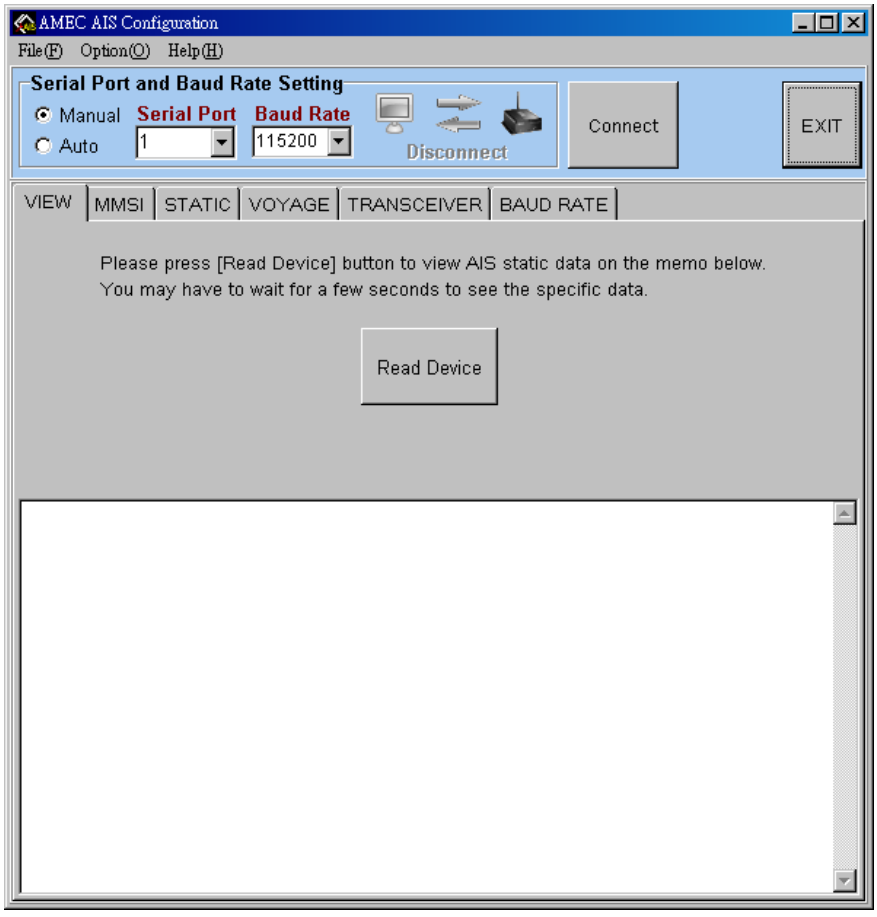


Figure 3-3-7 Setting Review

4 AMEC AIS VIEWER DESCRIPTION

4.1 RS-232 Serial Port Selection

Please follow below steps to ensure the serial port is correctly selected if needed.

1. Please use RS-232 port to connect with PC and AMEC AIS if desired.

   ***NOTE:** CAMINO-101 can also be connected to the USB ports of PC/Laptop through RS-232/USB converter (not included in the accessory kit; purchase separately). Please install the USB driver before connecting to the USB ports.

2. Go to My Computer / Control Panel / System / Hardware / Device Manager / Ports (COM&LPT).

3. Click on Ports (COM&LPT) in the Device Manager, and then find the possible COM port number for your PC.

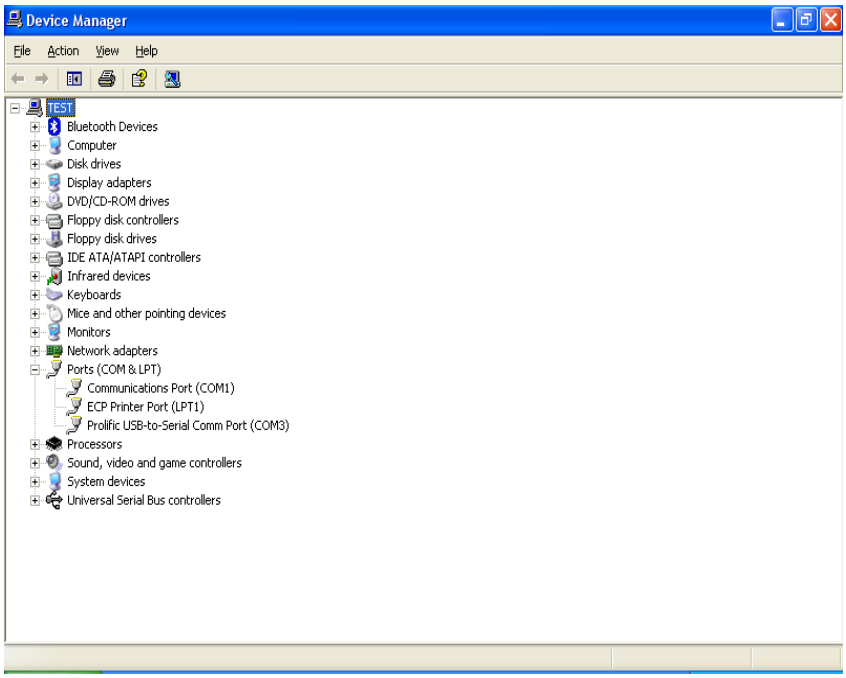


Figure 4-1 Serial Port Setting

4. Back to the AIS Viewer Program, please select **"File"** tab and click **"Connect AIS"**. Please select the suitable serial port number in the pop out window.

4.2 Running AMEC AIS Viewer

By following the steps below, user may start the AIS Viewer in a very short time after finishing all the installation:

Step 1: Open the viewer and go to "**File**"→ "**Connect AIS**" to set the serial port and baud rate (Refer to figure 4-2-1). Please refer to **Section 4.3.2.1"Connect AIS"** for the details.

Step 2: If additional information is required from another GPS, please go to ""**File**"→ "**Connect GPS Receiver**" to set the serial port and baud rate for GPS receiver (Refer to figure 4-2-1). Please refer to **Section 4.3.2.1 "Connect GPS Receiver"** for the details.

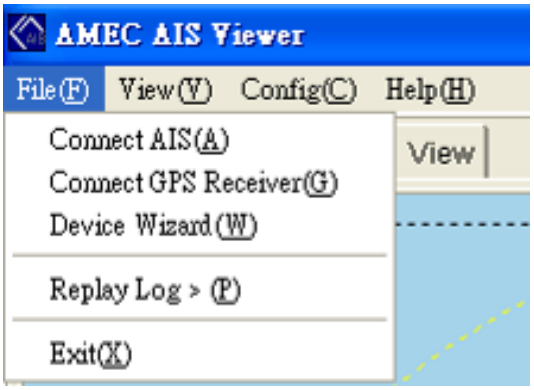


Figure 4-2-1 Quick Start

You may also click on ""**File**"→ "**Device Wizard**" to connect AIS with the AIS Viewer easily.

Please select Manual or Auto for serial port and baud rate setting. Click on 

to connect to the desired serial port and baud rate. (Refer to figure 4-2-2)

- Auto: the system will identify and show the serial port number and baud rate automatically.
- Manual: Select appropriate serial port and baud rate manually. If you can't find the desired serial port under the list, you may key in the serial port number directly.

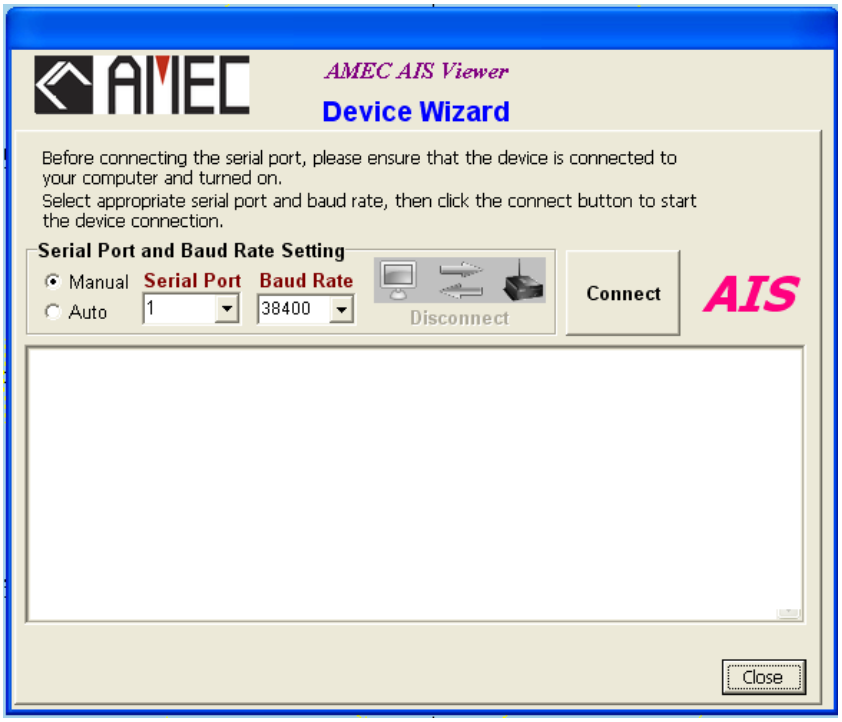


Figure 4-2-2 Quick Start

Step 3: Go to "**Config**"→ **"CPA/TCPA"** to set the threshold value of CPA and TCPA (Refer to figure 4-2-3). Please refer to **Section 4.3.2.3 "CPA/TCPA"** for the details.

***NOTE 1:** This function would be invalid without GPS data input.

***NOTE 2:** AMEC AIS devices merely provide AIS data, and they are NOT allowed to set CPA/TCPA. However, users may set up CPA/TCPA through other maritime equipments: Chartplotter, Radar Plotter, for PC (through AMEC AIS Viewer Program). For certain audio alarm, users should refer to your own interfaces. PC and AMEC AIS Viewer Program DO NOT support any kind of audio alarm.

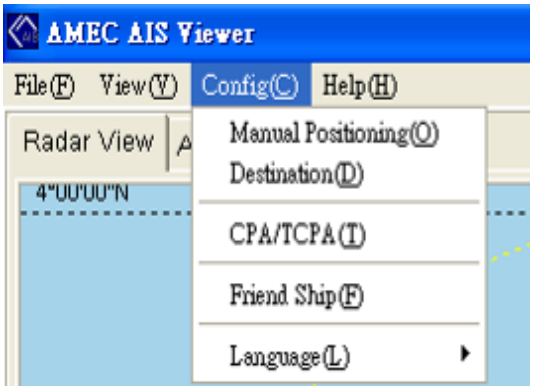


Figure 4-2-3 Quick Start

After complete the steps above, you may start to use the AIS Viewer.

4.3 Display Indications

Below (**Figure 4-3**) is the main screen of the viewer; which contains 5 blocks. Each block displays different information. Please see details as following.

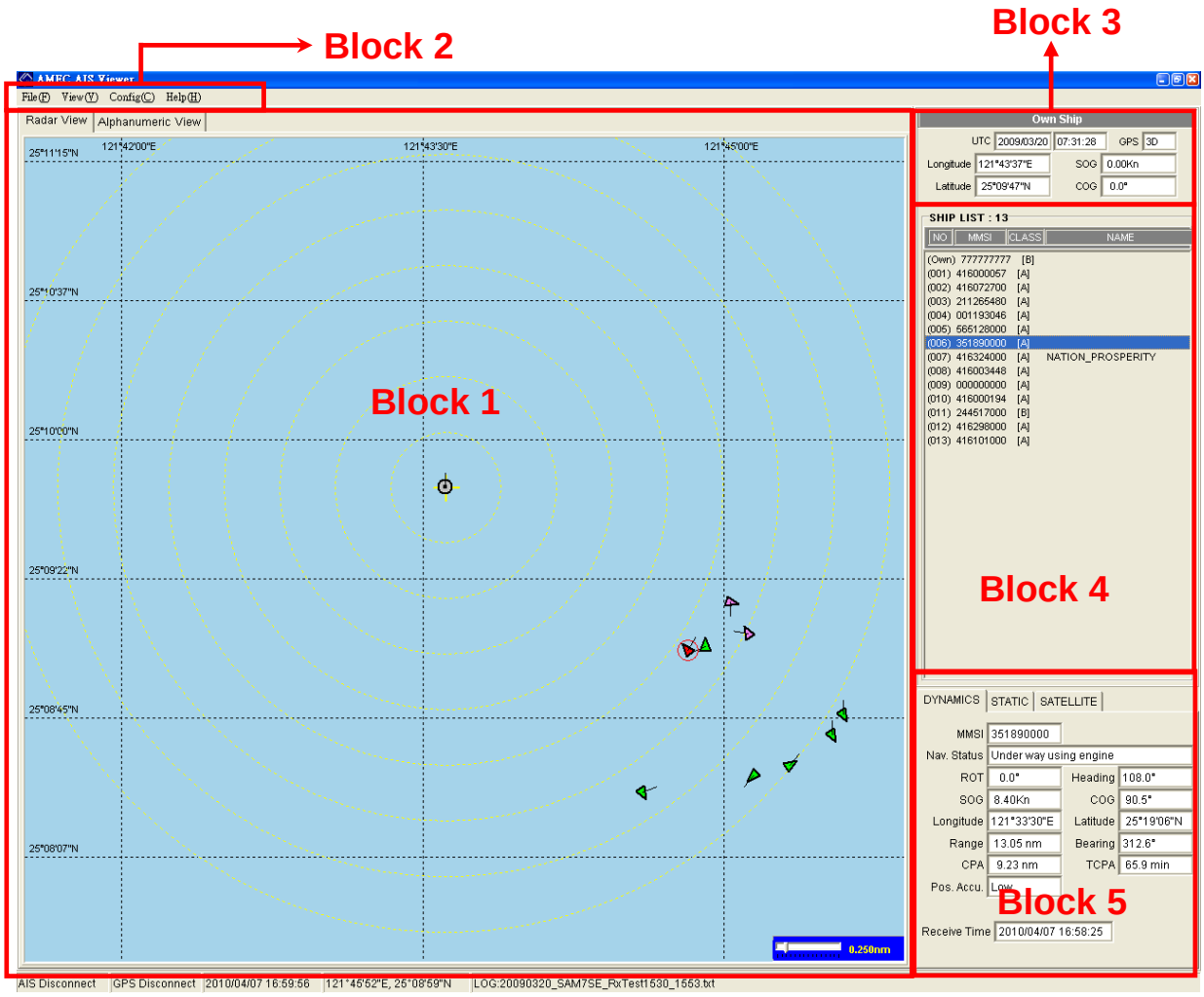


Figure 4-3 Main Display

4.3.1 Block 1: Screen View

There are 2 viewing options in this block.

4.3.1.1 Radar View

The AIS targets are displayed on your PC screen in the form as shown below. Under this viewing mode, all targets will be displayed on the Radar display. (Refer to **Picture 4-3-1-1**).

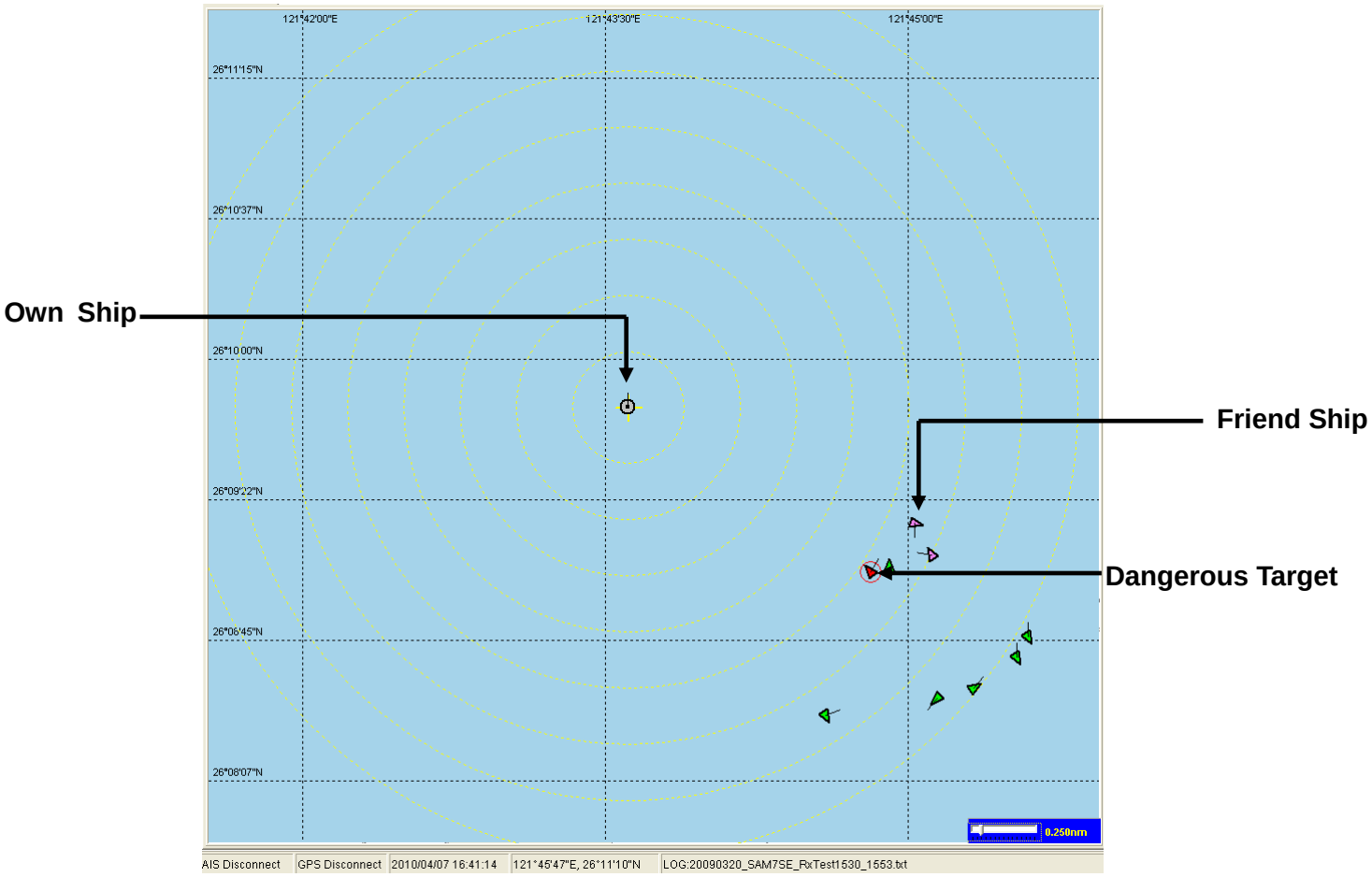


Figure 4-3-1-1 Main Display

On the Radar View shown above, some characteristics of the AIS targets are as described below,

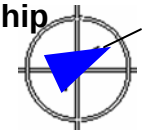
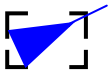
- Each AIS ship is in the shape of a triangle.
- Under normal GPS reception, own ship is located in the center of the radar view.
- When there is no GPS reception, you can manual reset own ship's longitude and latitude or the viewer will accord the received targets to predict the location of the own ship and a reference location will appear.

- A maximum number of 500 AIS targets can be displayed on the radar plotter at a time.
- The straight line extended from AIS target represents the course of the ship.
- Under the situation of NO GPS data input, double click at any position on the Radar display to make it the center. Please refer to **Section 4.3. "Center View"** to return to the mode of your own ship as the center.

***NOTE:** Own ship position will be fixed at the center of the Radar display WITH GPS data input**.**

- Please use the scale to change the scale setting at the lower right corner if needed. The scales are 800, 400, 200, 96, 48, 24, 12, 6, 3, 1.5, 0.75, 0.5, 0.25, 0.125 and 0.05 (nm).
- AIS target symbol description: Symbol for each AIS target displayed on the radar plotter is as described below (refer to Table 4-3-1-1).

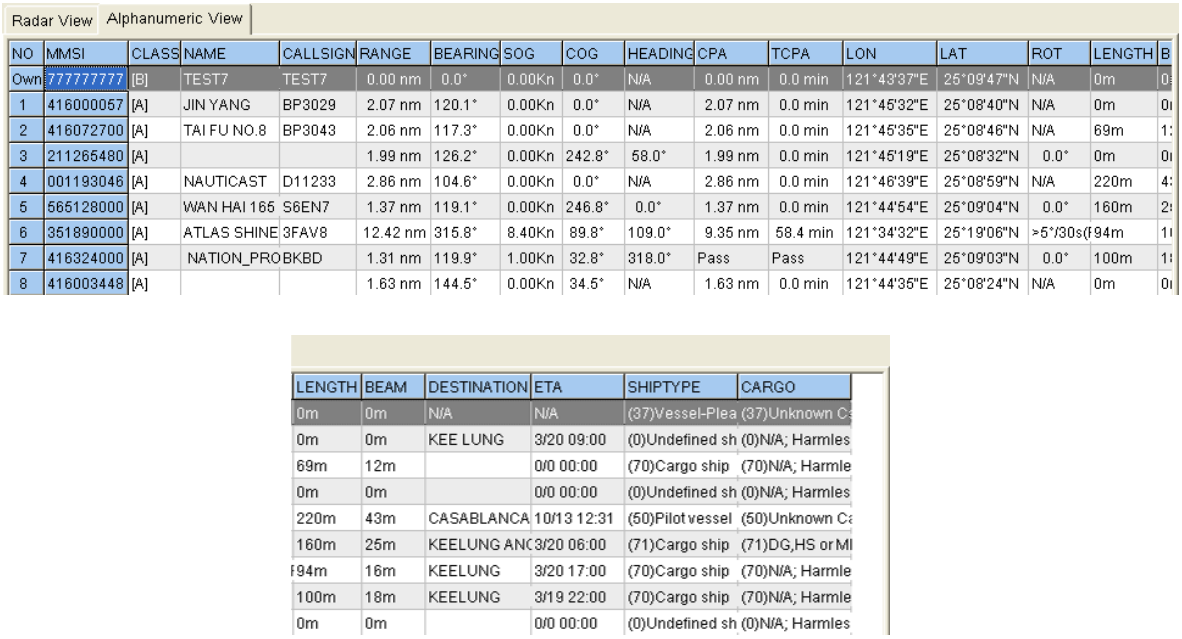
Table 4-3-1-1 AIS target symbol

Own Ship 	**GPS Reception: Normal / Color: Blue** Under normal GPS reception, own ship is located in the center of the radar view.
AIS Target 	**Color: Blue** Ship equipped with AIS system in the surrounding sea will appear on the radar view as an AIS target.
Selected Target 	**Color: Blue / Flashing Black Frame** Use the arrow keys to select any target on the radar view. After selected, press <ENT> and the detailed information on each target can be viewed.
Dangerous Target 	**Color: Red / Circled Frame** When distance to a ship is smaller than CPA/TCPA, the target will be circled in RED. Use the arrow keys to select the dangerous target and to view its detailed information.
Friend Ship 	**Color: Magenta** If any pre-stored Friend Ship is nearby, the Friend Ship will appear in Magenta on the radar view.
Lost Signal Target 	**Color: Blue / Crossed** If reception of an AIS target is lost over 10 minutes, a "**X**" will be displayed over it. The target will disappear from the Radar View when its reception is lost for one hour.
AtoN 	**Color: Green / Spot** The icon will be displayed if any AtoN AIS is in the range of reception.

***NOTE:** The straight line extended from AIS target represents the course of the ship.

4.3.1.2 Alphanumeric View

Under this mode, all ship details will be displayed alphanumerically. To browse the entire information, please use the bar on the screen to help locating the desired data. (Refer to **Figure 4-3-1-2**)



Radar View | Alphanumeric View

NO	MMSI	CLASS	NAME	CALLSIGN	RANGE	BEARING	SOG	COG	HEADING	CPA	TCPA	LON	LAT	ROT	LENGTH	B
Own	777777777	[B]	TEST7	TEST7	0.00 nm	0.0°	0.00Kn	0.0°	N/A	0.00 nm	0.0 min	121°43'37"E	25°09'47"N	N/A	0m	0
1	416000057	[A]	JIN YANG	BP3029	2.07 nm	120.1°	0.00Kn	0.0°	N/A	2.07 nm	0.0 min	121°45'32"E	25°08'40"N	N/A	0m	0
2	416072700	[A]	TAI FU NO.8	BP3043	2.06 nm	117.3°	0.00Kn	0.0°	N/A	2.06 nm	0.0 min	121°45'35"E	25°08'46"N	N/A	69m	1
3	211265480	[A]			1.99 nm	126.2°	0.00Kn	242.8°	58.0°	1.99 nm	0.0 min	121°45'19"E	25°08'32"N	0.0°	0m	0
4	001193046	[A]	NAUTICAST	D11233	2.86 nm	104.6°	0.00Kn	0.0°	N/A	2.86 nm	0.0 min	121°46'39"E	25°08'59"N	N/A	220m	4
5	565128000	[A]	WAN HAI 165	S6EN7	1.37 nm	119.1°	0.00Kn	246.8°	0.0°	1.37 nm	0.0 min	121°44'54"E	25°09'04"N	0.0°	160m	2
6	351890000	[A]	ATLAS SHINE	3FAV8	12.42 nm	315.8°	8.40Kn	89.8°	109.0°	9.35 nm	58.4 min	121°34'32"E	25°19'06"N	>5°/30s	94m	1
7	416324000	[A]	NATION_PRO	BKBD	1.31 nm	119.9°	1.00Kn	32.8°	318.0°	Pass	Pass	121°44'49"E	25°09'03"N	0.0°	100m	1
8	416003448	[A]			1.63 nm	144.5°	0.00Kn	34.5°	N/A	1.63 nm	0.0 min	121°44'35"E	25°08'24"N	N/A	0m	0

LENGTH	BEAM	DESTINATION	ETA	SHIPTYPE	CARGO
0m	0m	N/A	N/A	(37)Vessel-Plea	(37)Unknown C
0m	0m	KEE LUNG	3/20 09:00	(0)Undefined sh	(0)N/A; Harmles
69m	12m		0/0 00:00	(70)Cargo ship	(70)N/A; Harmle
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
220m	43m	CASABLANCA	10/13 12:31	(50)Pilot vessel	(50)Unknown C
160m	25m	KEELUNG ANC	3/20 06:00	(71)Cargo ship	(71)DG,HS or MI
94m	16m	KEELUNG	3/20 17:00	(70)Cargo ship	(70)N/A; Harmle
100m	18m	KEELUNG	3/19 22:00	(70)Cargo ship	(70)N/A; Harmle
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles

Figure 4-3-1-2 Main Display

- **MMSI:** Marine Mobile Service Identity.
- **CLASS:** AIS Message class type:
  [A]: Class A AIS**,** **[B]:** Class B AIS**,**
  [Base]: Base Station, **[AtoN]:** Aids to Navigation**,**
  [N/A]: Unknown.
- **NAME:** Ship Name.
- **CALL SIGN:** Ship's Call Sign.
- **RANGE:** The distance between target ships to own ship. The unit of range is "nm" (Nautical Mile).
- **BEARING:** The relative angle between target ship and own ship.
- **SOG:** Speed Over Ground, the unit of SOG is "kn" (knot).
- **COG:** Course Over Ground.
- **HEADING:** The heading of the target ship.
- **CPA:** Distance to Closest Point of Approach, the unit of CPA is "nm" (Nautical Miles)
- **TCPA:** Time to Closest Point of Approach, the unit of TCPA is "min" (Minutes).
- **LON:** Longitude of the target ship.
- **LAT:** Latitude of the target ship.
- **ROT:** Rate Of Turn.

- **LENGTH:** The length of the target ship, the unit of LENGTH is “m” (meters).
- **BEAM:** The beam of the target ship, the unit of BEAM is “m” (meters).
- **DESTINATION:** The destination of the target ship.
- **ETA:** Estimated Time of Arrival, (Month/Date/Hour/Minutes)
- **SHIPTYPE:** Ship type of the target ship.
- **CARGO:** Cargo information.

4.3.2 Block 2: Main Menu

This block contains the program menu of the AIS Viewer.

4.3.2.1 File

Click on **“File”**, and the window is shown as the below picture. (Refer to figure 4-3-2-1)

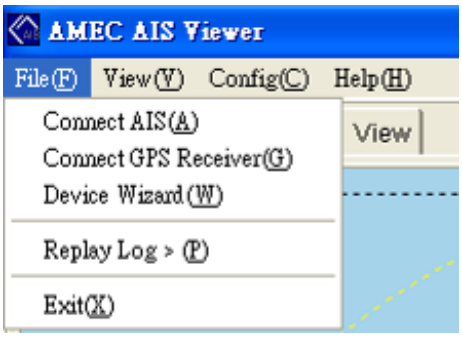


Figure 4-3-2-1-1 Menu Tree under File

“Connect AIS”: Click on “**Connect AIS**”, and the “**Config AIS Serial Port**” window would pop up (Refer to figure 4-3-2-1-2). Please select the proper Serial Port and the desired Baud Rate (CAMINO-101 default Baud Rate: 115,200). Click on Connect to connect AIS serial port. And click on Finish to complete the setting.

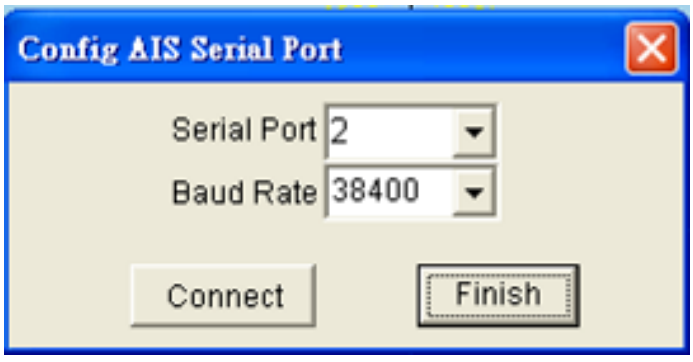


Figure 4-3-2-1-2 Config AIS Serial Port

“Connect GPS Receiver”: Click on “**Connect GPS Receiver**”, and the “Config GPS Serial Port” window would pop up as below (Refer to Figure 4-3-2-1-3). Please select the suitable “Serial Port” and “Baud Rate” for your GPS. Click on Connect to connect GPS serial port. Click on Finish to complete the setting.

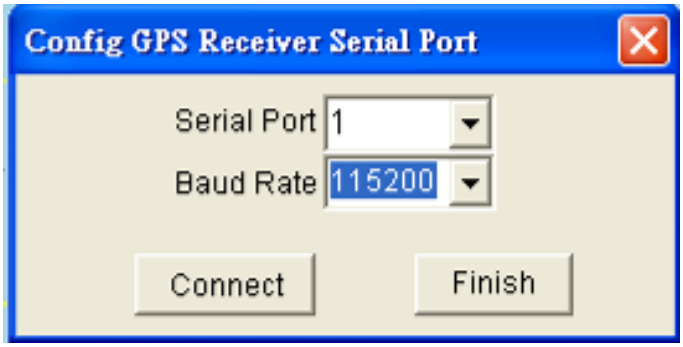


Figure 4-3-2-1-3 Config GPS Receiver Serial Port

“Device Wizard”: Click on **“Device Wizard”** to select appropriate serial port and baud rate to start the device connection.

“Replay log”: Click on **“Replay log”** to open the data saved before and play the selected log data.

***NOTE 1:** Before playing the log data, user should go to **“File”**/ **“Disconnect AIS”** and **“File”**/ **“Disconnect GPS”** to disconnect AIS and GPS.

***NOTE 2:** To pause or stop the log play, please go to **“File”**/ **“Pause play”** or **“File”**/ **“Stop play”**.

“Exit”: Click on **“Exit”** to close AMEC AIS Viewer.

4.3.2.2 View

Click on **“View”**, and the window is shown as the below picture. (Refer to figure 4-3-2-2-1)

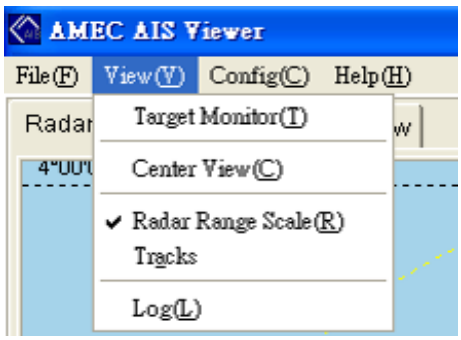


Figure 4-3-2-2-1 Menu Tree under View

“Target Monitor”: Click on it to monitor the vessel information of the selected target.

“Center View”: There are two scenario under this viewing mode, **1)** without GPS data input **2)** with GPS data input. Without GPS input, user may select this viewing mode; the viewer would calculate the rough position and set your own ship at the center of the Radar display. User may also set the own ship position manually (refer to **Section 4.3.2.3 “Manual positioning”**). Please refer to **Section 4.3.1.1 “Radar View”** for more viewing options. Under the situation with GPS input, the viewer will set your own ship as the center of the Radar display automatically and the “Center View” would be invalid.

“Radar Range Scale”: Click on it to show the radar range scale on the radar view.

“Tracks”: Click on it to see the tracks of the vessels.

"Log": Click on **"Log"**, and the window is shown as the below picture. (Refer to figure 4-3-2-2-2). Select "Enable Log" to display the collected data in the box. Click on Save to save the data, click on Clear to delete it.

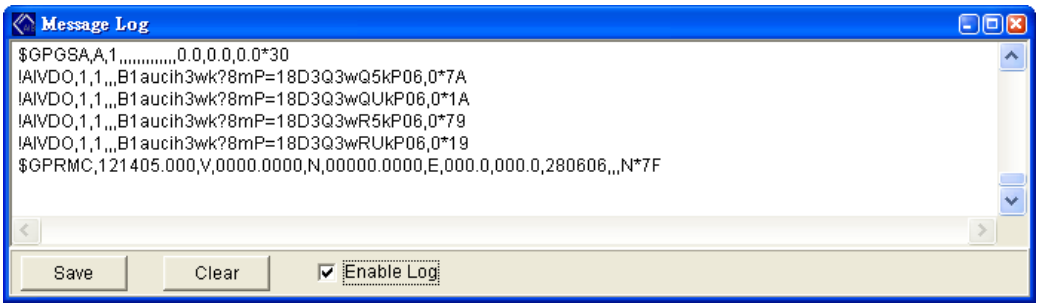


Figure 4-3-2-2-2 Message Log

4.3.2.3 Config

Click on **"Config"**, and the window is shown as the below picture. (Refer to figure 4-3-2-3-1)

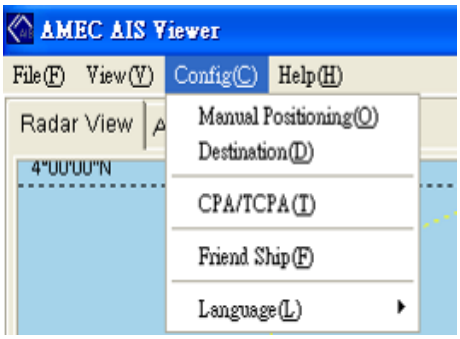


Figure 4-3-2-3-1 Menu Tree under Config

"Manual positioning": User can manually enter the position of your vessel as the center of the Radar display when GPS position is unavailable (Refer to figure 4-3-2-3-2). Click on OK to complete the setting.

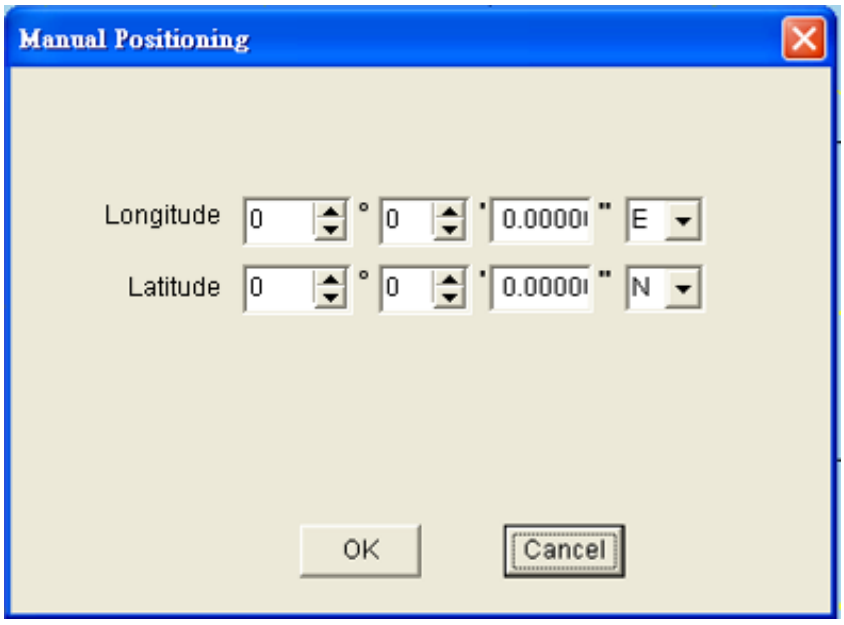


Figure 4-3-2-3-2 Manual Positioning

"Destination": Click on "Destination", and the "Destination Setting" window would jump out as below (Refer to figure 4-3-2-3-3). User could enter the name, longitude and latitude of your destination. After that, please click on OK to complete the setting, then a red pin would be positioned on your destination.

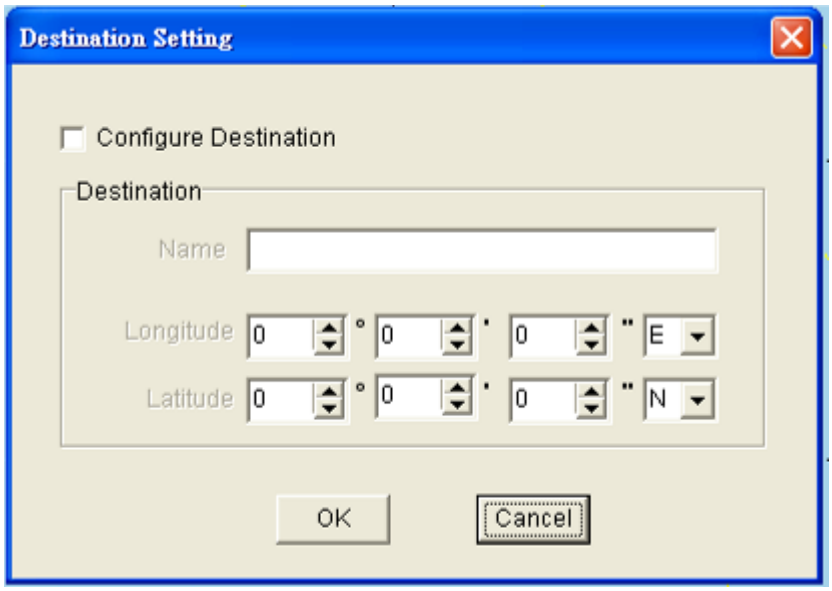


Figure 4-3-2-3-3 Destination Setting

“CPA/TCPA” (Distance to Closest Point of Approach/Time to Closest Point of Approach): Click on “CPA/TCPA”, and the window will pop up as below (Refer to figure 4-3-2-3-4). User can set the CPA and TCPA according to your requirement. When a ship is entering the alert area, it would be marked in red color (Refer to **Section 4.3.1.1 “Radar View”**). Click on OK to complete the setting.

- nm: Nautical Mile
- min: Minute

***NOTE 1:** This function would be invalid without GPS data input.

***NOTE 2:** AMEC AIS devices merely provide AIS data, and they are NOT allowed to set CPA/TCPA. However, users may set up CPA/TCPA through other maritime equipments: Chartplotter, Radar Plotter, or PC (through AMEC AIS Viewer Program). For certain audio alarm, users should refer to your own interfaces. PC and AMEC AIS Viewer Program DO NOT support any kind of audio alarm.

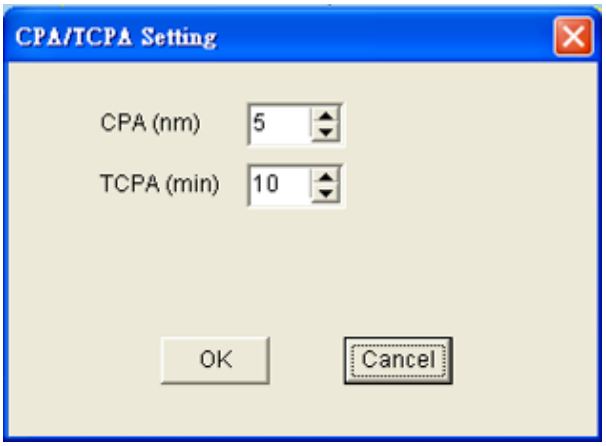


Figure 4-3-2-3-4 CPA/TCPA Setting

"Friend Ship": Click on "Friend Ship", and the window would pop up as below (Refer to figure 4-3-2-3-5). User can set specific ships as friend ships by simply entering the MMSI number and a "**Y**" at "Friend" column; the icon of the selected targets will turn to pink in the Radar display (Refer to **Section 4.3.1.1 "Radar View"**).

Click on 

to complete the setting.

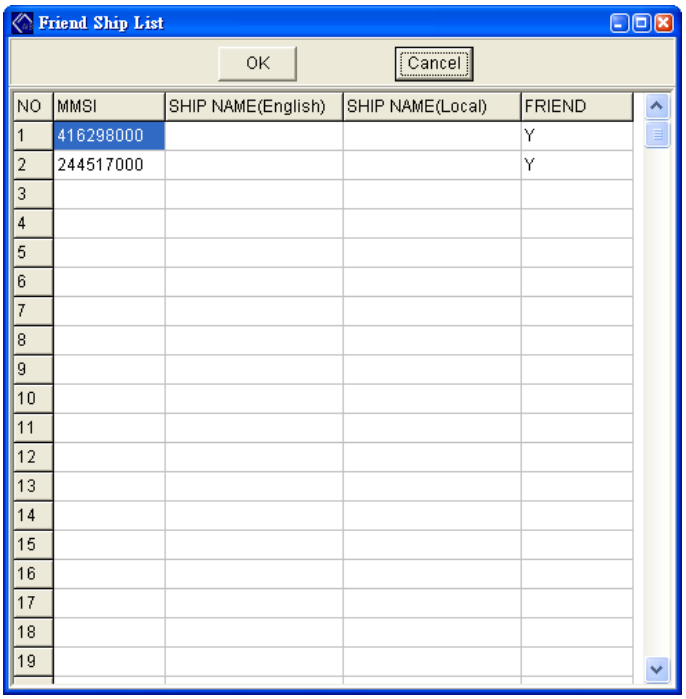


Figure 4-3-2-3-5 Friend Ship List

"Language": Click on "**Language**", you may change the AMEC AIS Viewer user language in English or Traditional Chinese. (Refer to Figure 4-3-2-3-6).

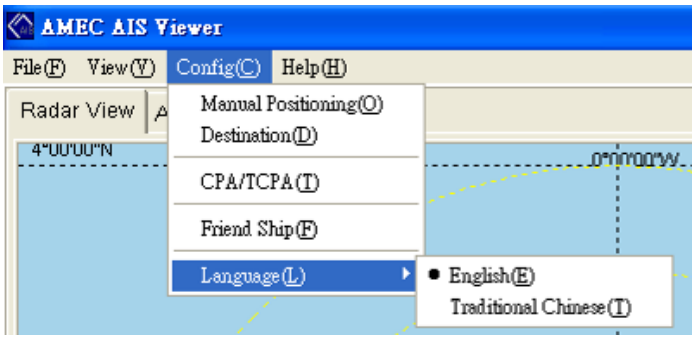


Figure 4-3-2-3-6 Language Selection

4.3.2.4 Help

Click on “About”, and the window will pop up as below (Refer to figure 4-3-2-4).

Figure 4-3-2-4-1 Menu Tree under Help

“About”: Click on “About”, and the window will pop up as below (Refer to figure 4-3-2-4-2). It is the information of the software including the established date and the software version.

Figure 4-3-2-4-2 About AMEC AIS Viewer

4.3.3 Block 3: Own ship's position information

The own ship information is displayed in this block (Refer to Figure 4-3-3).

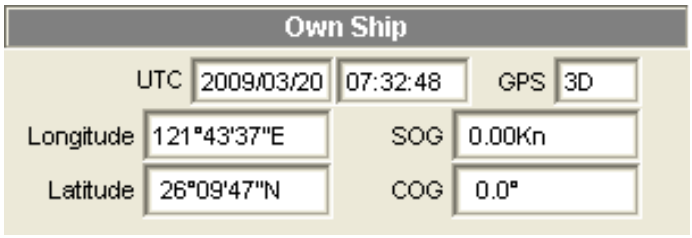


Figure 4-3-3 Own Ship Position Information

- **UTC:** Coordinated Universal Time.
- **GPS:** GPS related information. Usually it would indicate 2D or 3D to show the accuracy of the GPS data. (3D is more accurate)
- **Longitude:** Current Longitude of own ship.
- **Latitude:** Current Latitude of own ship.
- **SOG:** Speed Over Ground.
- **COG:** Course Over Ground.

4.3.4 Block 4: Ship List

In this block, it shows the MMSI, class type, and name of the target ships (Refer to figure 4-3-4).

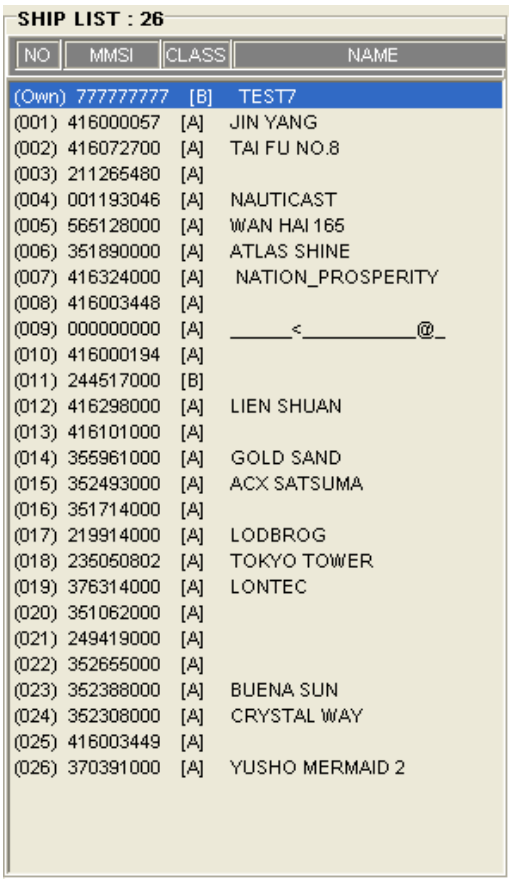


Figure 4-3-4 Ship List

- **SHIP LIST:** The numbers indicates the total received targets, excluding the own ship.
- **NO.:** The order numbers of the received targets.
- **MMSI:** Maritime Mobile Service Identity.
- **CLASS:** It shows the AIS class type of received targets;
  [A]: Class A AIS, [AtoN]: Aids to Navigation,
  [B]: Class B AIS, [N/A]: Unknown.
  [Base]: Base Station,
- **NAME:** The name of the target ship.

4.3.5 Block 5: Ship Details Information

This area shows the dynamic and static of the target ship, and GPS satellite status.

4.3.5.1 Dynamic Data

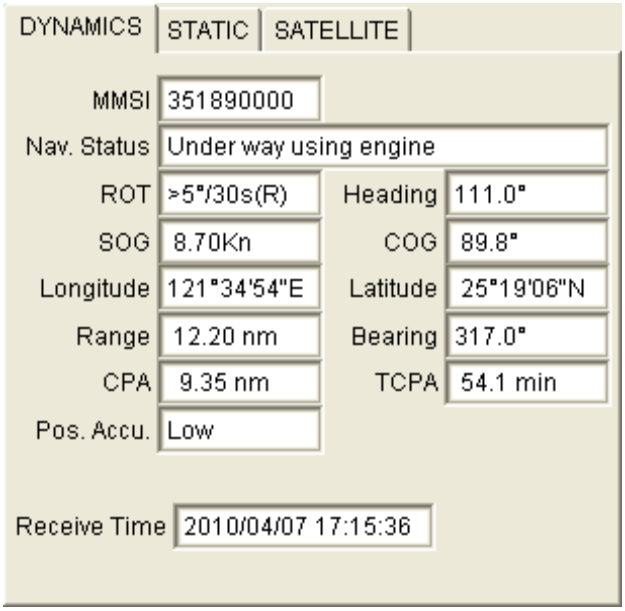


Figure 4-3-5-1 Dynamic Data

- **MMSI:** Maritime Mobile Service Identity of the target ship.
- **Nav.** Status: Navigational status of the target ship.
- **ROT:** Rate Of Turn.
- **Heading:** The direction of the target ship's stem.
- **SOG:** Speed Over Ground.
- **COG:** Course Over Ground.
- **Longitude:** Current Longitude of target ship.
- **Latitude:** Current Latitude of target ship.
- **Range:** Range between the selected target and own ship.
- **Bearing:** The related position between own ship and target ship. The unit of bearing is degree(°).
- **CPA:** Distance of Closest Point of Approach between own ship and target ship.
- **TCPA:** Time to Closest Point of Approach between own ship and target ship.
- **Pos. Accu.:** Position Accuracy; related to the GPS device used.
- **Received Time:** The latest received time of the target ship.

4.3.5.2 Static Data

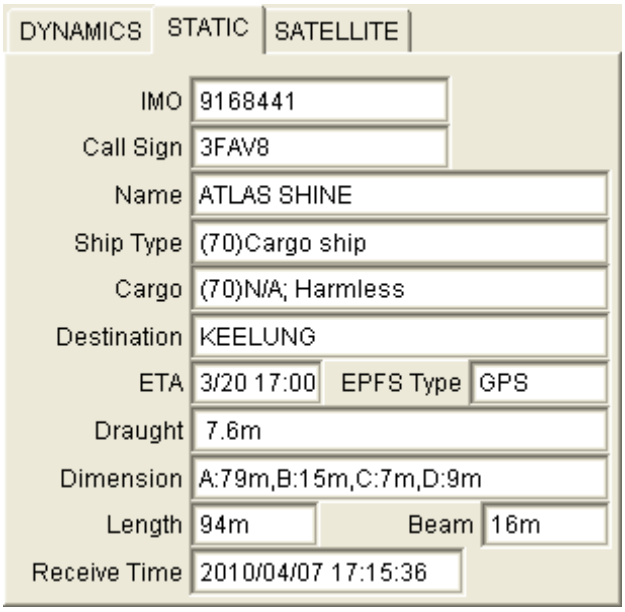


Figure 4-3-5-2 Static Data

- **IMO:** International Marine Organization Number
- **CALL SIGN:** The call sign of the target ship.
- **NAME:** The name of the target ship.
- **SHIP TYPE:** The type of the target ship.
- **CARGO:** Cargo information of the selected target ship.
- **DESTINATION:** The destination of the selected target ship.
- **ETA:** Estimate Time of Arrival.
- **EPFS TYPE:** Type of Electronic Position Fixing device.
- **DRAUGHT:** The draught of the target ship.
- **DIMENSION:** The dimension of the target ship.
- **LENGTH:** The length of the target ship.
- **BEAM:** The width of the target ship.
- **Receive Time:** The latest received time of the target ship.

4.3.5.3 GPS Satellite Status

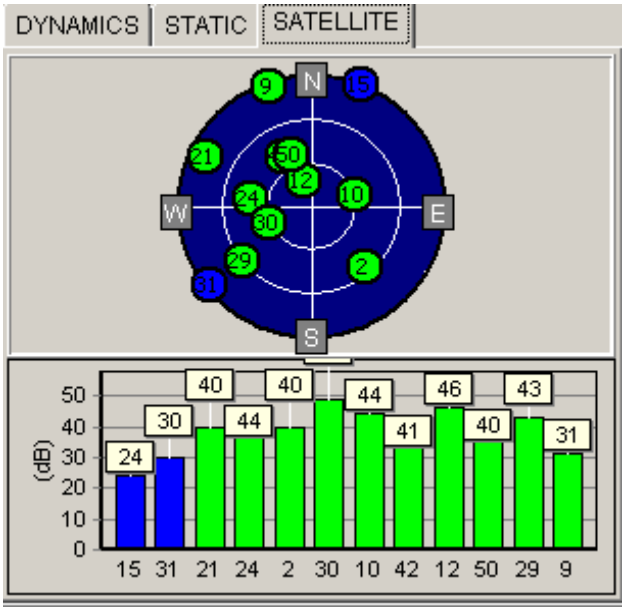


Figure 4-3-5-3 GPS Satellite Status

- The green spots and bars are the displays of GPS status with individual satellite position and signal strength of the satellites those are in use.
- The blue spots and bars represent the GPS status with position and signal strength of the satellites those are not in us

5 APPENDIX

5.1 Product Specifications

AMEC CAMINO-101 SPECIFICATIONS

STANDARDS

IEC 62287-1 (2006)
IEC 61162-1 (2000)
IEC 61162-2 (1998)

VHF CHANNELS

Frequency Range	156.025 MHz~162.025 MHz
Channel Bandwidth	25 KHz
Number of RF Channels	2 Receivers (one time-shared between AIS and DSC) / 1 Transmitter
CH-1	CH 87B (161.975 MHz)
CH-2	CH 88B (162.025 MHz)
DSC	CH 70 (156.525 MHz)
Number of DSC	1

VHF TRANSMITTER

Power Output	2 Watt (33 dBm ± 1.5 dB)
Modulation	GMSK/FM
Data Rate	9600 bps
Modulation Spectrum	Per IEC 62287

VHF RECEIVER

Message Format	AIS Class A & B messages
Data Rate	9600 bps / per channel
Max. Usable Sensitivity	-107 dBm

DSC RECEIVER

Modulation	1300 Hz / 2100 Hz FSK
Data Rate	1200 bps ± 30 ppm
Frequency Stability	< ± 3 ppm
Spurious Response Rejection	≧ 70 dB for signal@ -104 dBm; BER ≦1%
Blocking	≧ 84 dB for signal@ -104 dBm; BER ≦1%

GPS RECEIVER

Receiving Channels	12 channels
Acquisition Sensitivity	-140 dBm
Tracking Sensitivity	-150 dBm
Position Accuracy	CEP (50%) 5m without SA
Output Rate	1 Hz

POWER SUPPLY

Supply Voltage	24V DC
Power Consumption	Less than 10W

LED INDICATIONS

1. One Power (Status) Indicator
2. Two Channel Indicators

INTERFACES

NMEA0183	
RS-232	D-SUB9
Bluetooth (Optional)	SMA
GPS Antenna	Female TNC
VHF Antenna	M Jack (Type N Optional)

ENVIRONMENT

Operating Temperature	-15°C~55°C
Storage Temperature	-25°C~70°C
Humidity Operation	0~95% RH at 40°C
Vibration	IEC 60945
Waterproof	IPX5
Standard Magnetic Compass Safe Distance	0.45 m
Steering Magnetic Compass Safe Distance	0.30 m

PHYSICAL

Size in mm (W)	140 mm
Size in mm (H)	50 mm
Size in mm (D)	200mm w/o connectors
Weight	＜1kg

AMEC AGGRESSOR-111-C GPS Antenna SPECIFICATIONS (Optional)

GENERAL

Center Frequency	1575.42 ± 2 MHz
Gain	30 dB, typical
Noise Figure	1.5 dB, typical
Bandwidth	2 MHz min.
Axial Ratio @ Zenith	3 dB max.
VSWR	1.2 typical (1.5 max)
Output Impedance	50 ohm

ENVIRONMENT

Operating Temperature	－25°C to ＋55°C
Relative Humidity	40% to 95% non-condensing
Storage Temperature	－25°C to ＋70°C
Water Resistance	In accordance with IEC 60945, exposed
Operating Temperature	－25°C to ＋55°C

PHYSICAL CHARACTERISTICS

Dimensions	90.5 mm (diameter) × 108.5 mm (H)
Ground Size	74 mm (diameter)
Weight	150 grams (without cable)
Connector	TNC female
Cable	10 m, RG-58 cable included

5.2 Dimensions

Front View

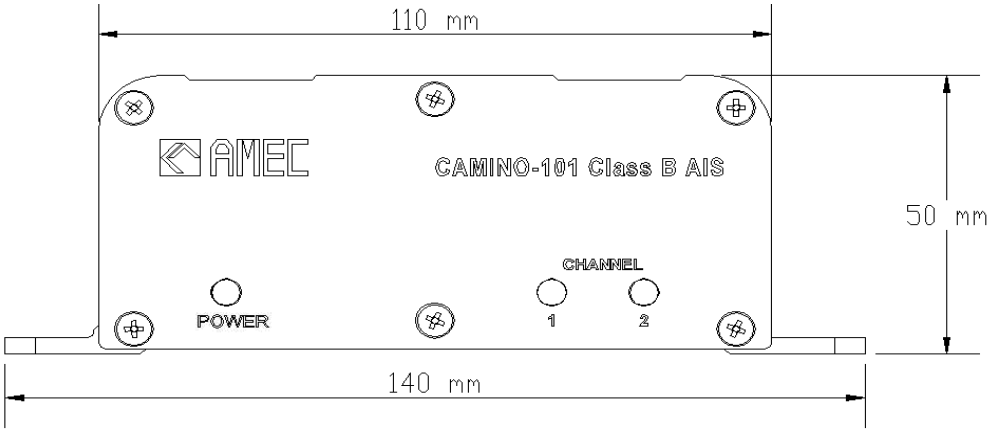


Figure 5-2-1 CAMINO-101 front view

Top View

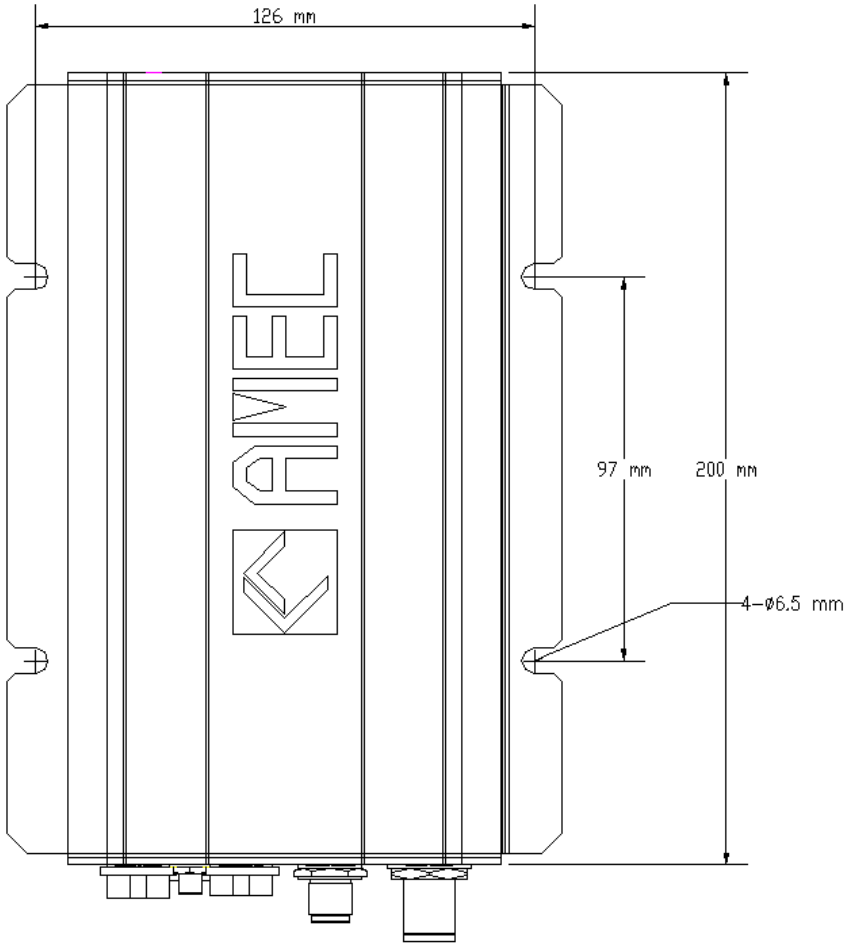


Figure5-2-2 CAMINO-101 top view

Side View

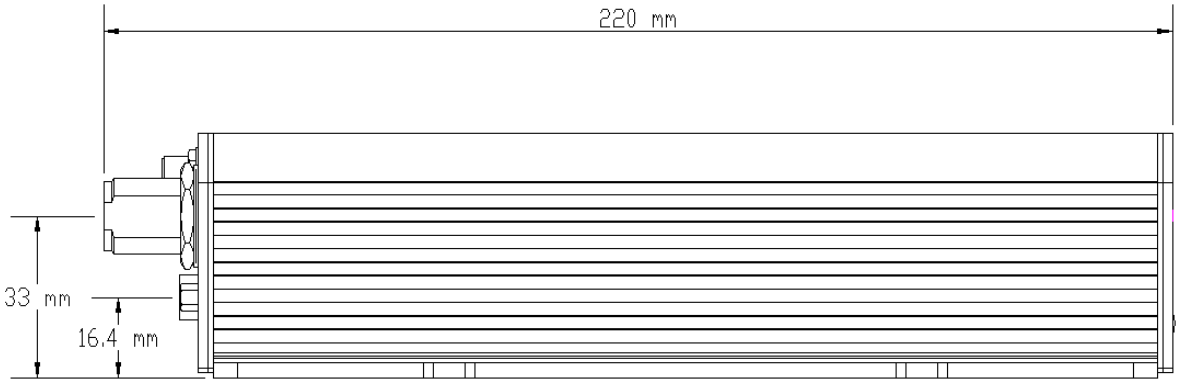


Figure 5-3-3 CAMINO-101 side view

5.3 Accessories

The following accessories are available from AMEC. Contact our local dealer/agent for more details.

Table 5-3 Accessories

Item	Description	Product Code	Remark
1	VHF Antenna	TENTA-110	Length: 1,200 mm
2	GPS Antenna	AGGRESSOR-111-C	Dimension: 90.5 mm(Diameter) x 108.5 mm(H)
3	VHF/GPS Combo Antenna	TENTA-160C	Length: 1,680 mm

5.4 Trouble Shooting

5.4.1 Diagnosis by LED Indicators

- The color of the power status indication light will change in different status. User is able to make a general analysis base on the status described below,

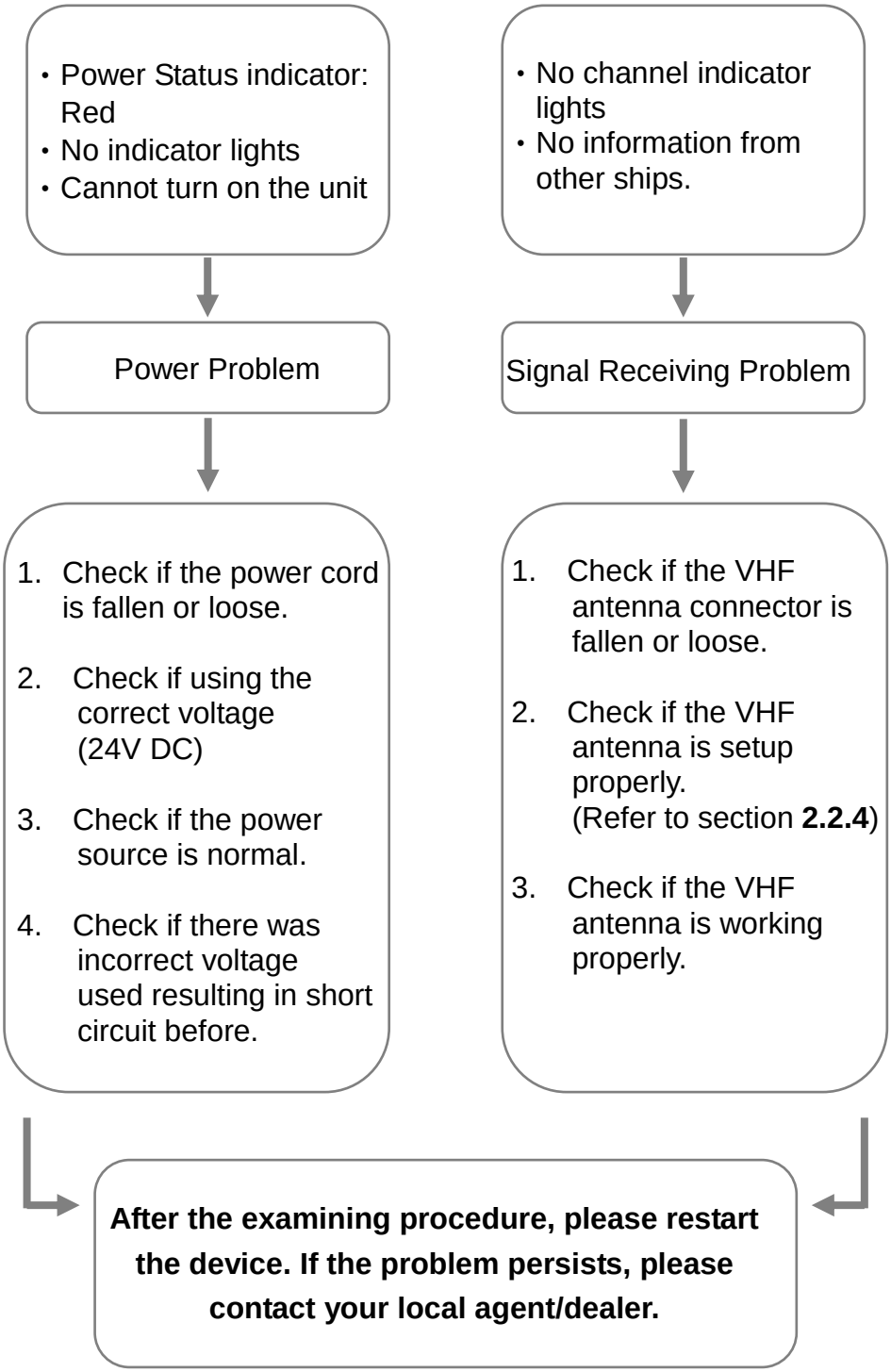
Table 5-4-1 Power LED indicator

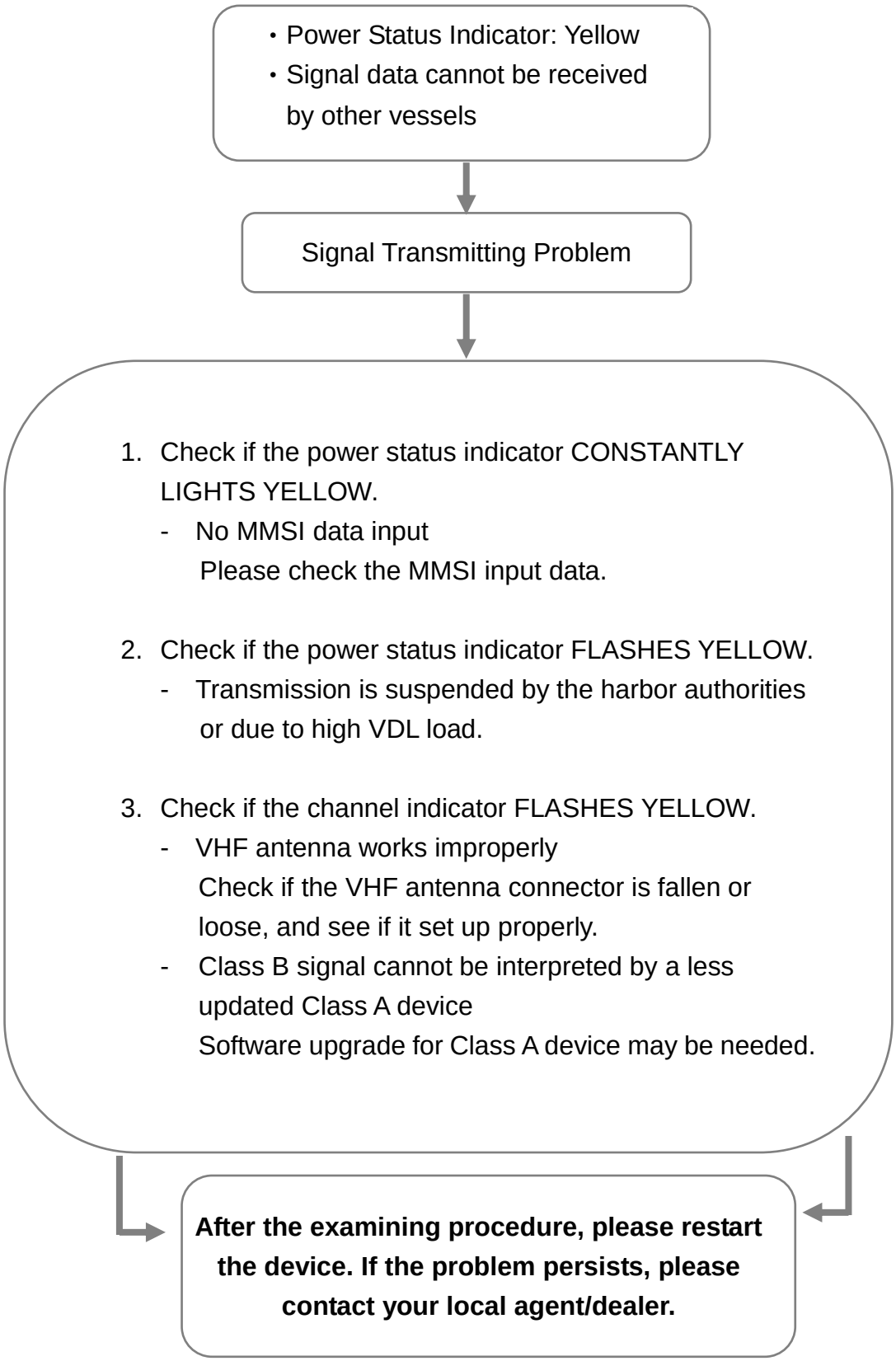
POWER LED INDICATOR			
Color	**Status**	**Indications**	**Descriptions**
Yellow	ON	Silent mode	No MMSI data is input
Yellow	Flash	TX timeout	Quiet mode commanded by harbor authorities or due to High VDL load
Red	ON	Power Error	Power system is in failure
	Flash	BITT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

- If the problem persists, please follow the below step and restart the unit.
  1. **Disconnect the power cord off the unit, reconnect after 1~2 minutes.**
  2. **Please Refer to section 3.2 to turn on the unit.**

- If the problem still persists, contact your local agent/dealer.

5.4.2 Problem Analysis




• Power Status Indicator: Yellow
• Signal data cannot be received by other vessels
Signal Transmitting Problem
1. Check if the power status indicator CONSTANTLY LIGHTS YELLOW.
- No MMSI data input
Please check the MMSI input data.
2. Check if the power status indicator FLASHES YELLOW.
- Transmission is suspended by the harbor authorities or due to high VDL load.
3. Check if the channel indicator FLASHES YELLOW.
- VHF antenna works improperly
Check if the VHF antenna connector is fallen or loose, and see if it set up properly.
- Class B signal cannot be interpreted by a less updated Class A device
Software upgrade for Class A device may be needed.
After the examining procedure, please restart the device. If the problem persists, please contact your local agent/dealer.

6 AMEC WORLD WIDE WARRANTY

Limited warranty

Subject to the terms, conditions and limitations set forth in this Worldwide Limited Warranty (hereinafter the “Warranty”), AMEC warrants that its products, when properly installed and used, will be free from defects in material and workmanship for a period of twelve (12) months, from the date of first purchase (the ‘Warranty Period’)

For the purposes of this warranty, ‘date of first purchase’ means the date that the product was purchased by the first retail customer, or by the institutional customer, or in the case of a product installed on a new vessel or any other marine related platform by a certified AMEC original equipment manufacturer (a ‘AMEC OEM’), the date that such vessel was purchased by the first retail customer.

AMEC will, at its sole option, repair or replace any defective products or components returned during the Warranty Period in accordance with the terms, conditions and limitations set forth below. **Such repairs or replacement will be the sole remedy of the customer under this Warranty.**

Standard Warranty Service

To qualify for standard warranty service the product must be returned to a AMEC-certified service agent (i) within the Warranty Period, and (ii) within thirty (30) days of the alleged product failure. Any products returned must be securely packaged and sent pre-paid and insured to AMEC or to a AMEC-certified service agent. All products returned must be accompanied by a copy of the original sales receipt to be eligible for standard warranty service.

Obtaining Warranty Service

A list of AMEC-certified service agents is available from AMEC Technical Support at www.alltekmarine.com

Other conditions

This Warranty is fully transferable provided that you furnish the original proof of purchase to the AMEC -certified service agent. This Warranty is void if the label bearing the serial number has been removed or defaced.

Limitation and Exclusions

In addition to any other limitations and exclusions set forth herein, AMEC is not responsible for, and this Warranty does not cover:

- Failure due to abuse, misuse, accident, unauthorized alteration, modification or repair, improper installation or operation (whether or not by a AMEC-certified service agent) or improper storage, shipping damage or corrosion;
- Costs associated with routine system checkouts, alignment/calibration, sea trials or commissioning;
- Defects or damage that result from the use of non-AMEC branded or certified products, accessories or other peripheral equipment, including without limitation housings, parts, or software;
- Aftermarket software (i.e. all software other than the original operating software sold with the products);
- Products that have been refurbished, reconditioned, or remanufactured (The foregoing does not apply to products repaired or replaced pursuant to the terms of this Warranty).
- Products that have been dismantled resulting in the broken label on the Products;
- costs associated with overtime or premium labor costs;
- differences in material, coloring or size that may exist between actual products and the pictures or descriptions of such products in our advertising, advertising literature or on the Internet;

TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS AMEC'S SOLE WARRANTY AND IS APPLICABLE ONLY TO NEW PRODUCTS PURCHASED WORLDWIDE. THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WRITTEN WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THE LIABILITY OF AMEC TO A CUSTOMER UNDER THIS WARRANTY, WHETHER FOR BREACH OF CONTRACT, TORT, BREACH OF STATUTORY DUTY OR OTHERWISE SHALL IN NO EVENT EXCEED AN AMOUNT EQUAL TO THE TOTAL PURCHAE PRICE OF THE PRODUCT GIVING RISE TO SUCH LIABILITY AND IN NO EVENT SHALL AMEC BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES OR LOST OF GOODWILL, REPUTATION, LOSS OF OPPORTUNITY OR INFORMATION, DATA, SOFTWARE OR APPLICATIONS.

SOME JURISDICTIONS DO NOT ALLOW EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFICLEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM JURISDICTION TO JURISDICTION.

This Warranty supersedes and replaces all previous Warranties.

In the event that any term or provision contained in this Warranty is found to be invalid, illegal or unenforceable by a court of competent jurisdiction, then such provision shall be deemed modified to the extent necessary to make such provision enforceable by such court, taking into account the intent of the parties.

No oral or written representations made by AMEC or any seller, reseller or distributor of the products, including employees and agents thereof, shall create any additional warranty obligations, increase the scope, or otherwise modify in any manner the terms of this Warranty.

All AMEC products sold or provided hereunder are merely aids to navigation. It is the responsibility of the user to exercise discretion and proper navigational skill independent of any AMEC product.

7 DECLARATION OF CONFORMITY

Hereby, Alltek Marine Electronics Corp. (AMEC) declares that this CAMINO-101 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

8 ABBREVIATIONS

AIS	Automatic Identification System
COG	Course Over Ground
CPA	Distance to Closest Point of Approach
CSTDMA	Carrier-Sense Time Division Multiple Access
DSC	Digital Selective Calling
ECS	Electronic Chart System
ETA	Estimated Time of Arrival
GPS	Global Positioning System
IMO	International Maritime Organization
MMSI	Maritime Mobile Service Identity
SOG	Speed Over Ground
SRM	Safety Related Message
TCPA	Time to Closest Point of Approach
TDMA	Time Division Multiple Access
UTC	Coordinated Universal Time
VHF	Very High Frequency
VTS	Vessel Traffic Services

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