



# WideLink B600

AIS Class B Transponder  
(SOTDMA)

USER MANUAL





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## WARNING!

**WARNING:** The device must be installed and configured in conformity with the provided instructions in the manual by qualified installer in order to ensure the device performance.

**WARNING:** It is the responsibility of the operator to handle the AIS device with care. The device cannot replace human vigilance. Therefore it is important to keep a diligent outlook at all times.

**WARNING:** Please bear in mind that not all vessels are equipped with AIS transponders and therefore may not be visible to this device. Likewise, certain conditions, such as device malfunction, the environment, improper use, and overcrowded port traffic, may exist whereby the vessel equipped with this AIS device is not visible to other AIS transponders.

**WARNING:** DO NOT DISASSEMBLE OR MODIFY THE EQUIPMENT. Improper disassembly or modification could impair its performance and will invalidate the guarantee.

### 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 this user manual.

## **FOREWORD**

We thank you for the purchase of your new WideLink B600, AIS SOTDMA class B transponder. Wherever you sail now, you can have a better overview of your surroundings at sea and voyage with more safety.

WideLink B600 is strictly tested to meet the rigorous demands of the marine environment. With proper installation and use, the equipment will serve loyally and reliably at its optimum.

For sales, services, and technical supports, please contact your local AMEC representatives or Alltek Marine Electronics Corp at [sales@alltekmarine.com](mailto:sales@alltekmarine.com) or [service@alltekmarine.com](mailto:service@alltekmarine.com). You are always welcome to visit our website at [www.alltekmarine.com](http://www.alltekmarine.com) for new product status and company update.

Thank you again. Be safe.

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# 1 System Overview

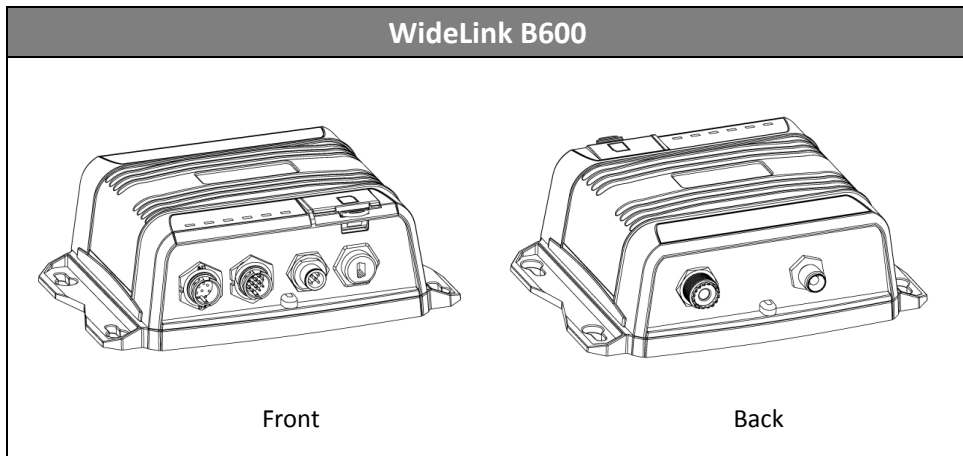
## 1.1 Product Description

WideLink B600 is an SOTDMA AIS class B, the next evolution of AIS technology. Its 5W transmit power, higher reporting rate and professional grade time division management make B600 an overall more advanced product compared to AIS class B based on CSTDMA scheme.

The globally approved device contains 1 VHF transmitter, 2 AIS receivers on 2 VHF channels and 1 MCU with cutting edge software defined radio technology. Its internal GNSS receiver with 50 channels is able to process signals from GPS, Gallileo, BeiDou and GLONASS with differential capability. It receives DSC, time-sharing with AIS receivers.

Its enhanced housing with IPx7 waterproof and shock and temperature robustness is ideal to survive harsh marine environments. Chart plotter and PC can be easily integrated over its NMEA2000, NMEA0183 and waterproof USB port. Its built-in data logger can record AIS data on micro SD card in the most intuitive way.

The integrated high performance Wi-Fi (WideLink B600W only) together with AMEC AIS App makes your favorite smart phone or tablet a real-time AIS position plotter.



B600 exchanges the following navigational data with other AIS equipped vessels within VHF range to increase the safety of your journey at sea:

- Static data:
  - Ship's name
  - Call sign
  - MMSI
  - Ship type

- Location of GPS antenna on the ship
- Dynamic data:
  - Position of the vessel
  - Course over ground (COG)
  - Speed over ground (SOG)
  - True heading

It receives also safety related messages (SRM) from other vessels or persons who are in distress.

SOTDMA Class B AIS broadcasts ship’s static data every 6 minutes. Ship dynamic data will be transmitted per following reporting interval:

| Ship Speed                         | Nominal Reporting Interval | Increased reporting interval |
|------------------------------------|----------------------------|------------------------------|
| >23 knots                          | Every 5 seconds            | Every 15 seconds             |
| between 14-23 knots                | Every 15 seconds           | Every 30 seconds             |
| between 2-14 knots                 | Every 30 seconds           | Every 30 seconds             |
| ≤ 2 knots or at anchored or moored | Every 3 minutes            | Every 3 minutes              |

The Class B “SO” AIS follows the rules set by ITU-R M.1371-5, and increases the reporting interval to “Increased Reporting Interval” in accordance with Table above when less than 50 % of the slots of each of the last four consecutive frames are free. When more than 65 % of the slots of each of the last four consecutive frames are free, the Class B “SO” AIS reports at the “Nominal Reporting Interval”.

## 1.2 Class A vs. SOTDMA Class B vs. CSTDMA Class B

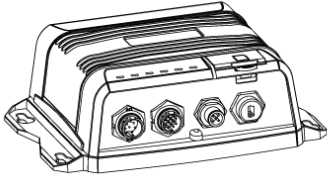
A brief comparison between class A and class B AIS is illustrated in the following table. WideLink B600 is an SOTDMA class B AIS transponder.

| Type of AIS                 | Class A AIS  | Class B SOTDMA   | Class B CSTDMA                               |
|-----------------------------|--|--|--|
| Primary Access Scheme       | SOTDMA (Self-organizing)   | SOTDMA (Self-organizing)   | CSTDMA (Carrier-Sense)                       |
| Standard                    | IEC 61993-2  | IEC 62287-2  | IEC 62287-1                                  |
| Transmit Power and range    | 12.5W  | 5W   | 2W   |
| IMO Mandate                 | Mandatory for all SOLAS vessels  | No mandate   | No mandate                                   |
| Reporting rate dynamic data | Highest (transmission up to every 2 sec)   | Higher (transmission up to every 5 sec)                          | Low (transmission up to every 30 sec)        |
| AIS data presented          | Static, Dynamic, Voyage  | Static and Dynamic data  | Static and Dynamic data                      |
| Applications                | Commercial vessels, fishing boats, working boats, passenger boats with more than 12 passengers | Smaller commercial, fishing and work boats, recreational vessels | Recreational vessels and small fishing boats |



### 1.3 Equipment in the Box

Upon receiving the product please verify items in the box. If any is missing, please contact your local AMEC representative immediately.



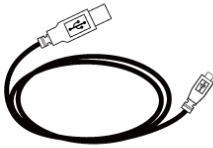
AIS SOTDMA Class B Transponder



12pin data cable:



8pin power cable



Mini USB to USB cable



TP3x3/4 Screws

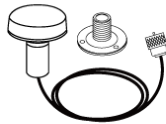


User Manual



Software CD: configuration utility, USB driver, AIS Viewer, user manual

Optional Accessory



GPS antenna GA-22 with 10m cable

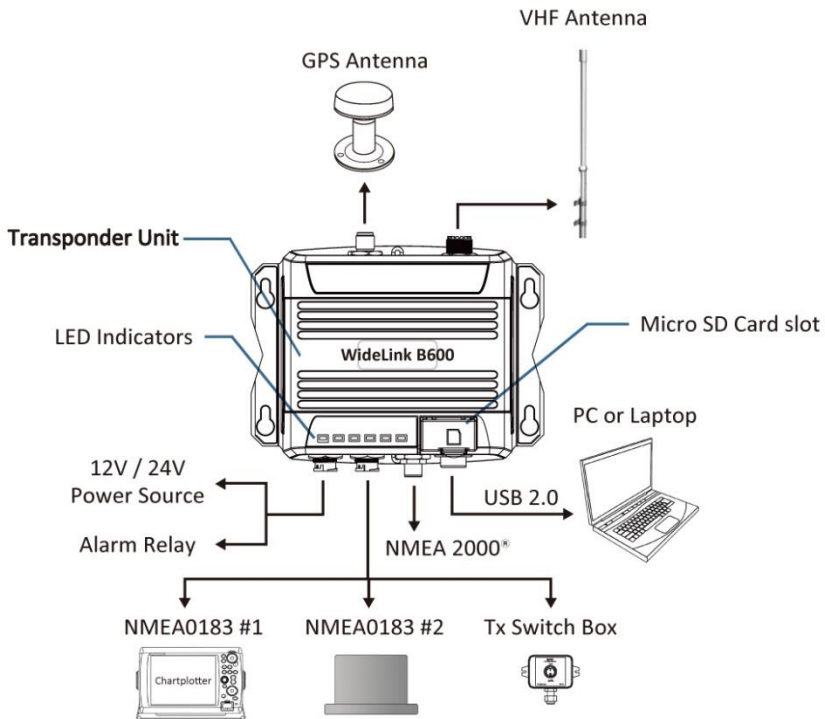
A rectangular box with a grey header containing the text "Optional Accessory". Below the header is a line drawing of a GPS antenna (GA-22) with a 10m cable. The antenna has a circular base and a vertical probe. The cable has a standard RJ45 Ethernet connector on one end and a 12-pin D-sub connector on the other.

## 2 Installation

### 2.1 Installation Procedures

Please familiarize the manual content before installation. Depending on your hardware configuration, use the following recommended steps to install the device.

- 1) Mount the device unit to an appropriate location
- 2) Install VHF antenna
- 3) Install GPS antenna
- 4) Connect to a chart plotter via NMEA 0183 and/or other instruments
- 5) Connect to a chart plotter via NMEA 2000 and/or other instruments
- 6) Connect to a Tx switch box and/or external alarm system(optional)
- 7) Connect to an appropriate power source (12V / 24V DC, 2A)

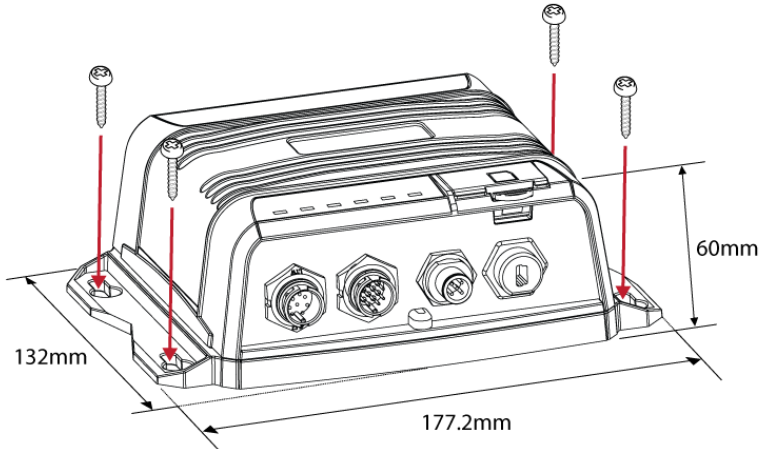


**Figure 1 External Connections**

## 2.2 Mounting Device Main Unit

The following guidelines should be noticed when selecting the environment to install your AMEC WideLink B600:

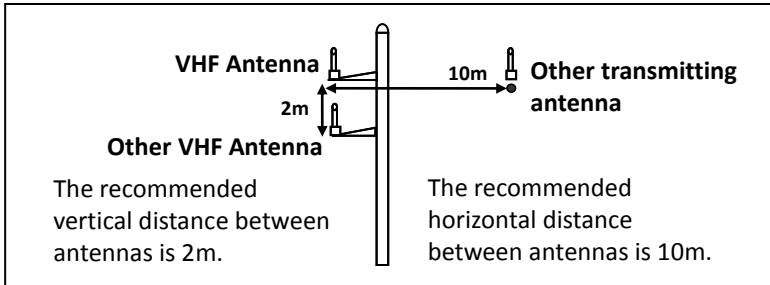
- Do not install the device in a flammable or hazardous atmosphere such as in an engine or generator room or close to fuel tanks.
- Installation of the device should be undertaken in a safe environment without being exposed to any splashing water or rain.
- There should be adequate space around the device for routing of cables. See figure below for details of the device dimensions.
- The safe distance of the device to any magnetic compass is at least 0.3m.
- The operating temperature is between  $-15^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$ .
- The device can be installed and mounted on flat surface, or it can be mounted on wall with the four self tapping screws supplied.
- The device should be mounted in a location where the indicators can readily be observed as these indicators deliver relevant information on the status of the device.



**Figure 2 Mounting the Device**

## 2.3 VHF Antenna Installation

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

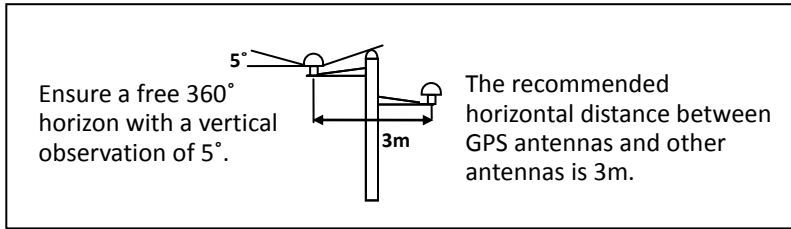


**Figure 3 VHF Antenna Locations**

The VHF antenna connector type on WideLink B600 is SO239 which is designed to work with a PL259 connector.

## 2.4 GPS Antenna Installation

Install the GPS antenna where it has a clear view to the sky, so that it may access the horizon freely with 360° degrees.



**Figure 4 GPS Antenna Locations**

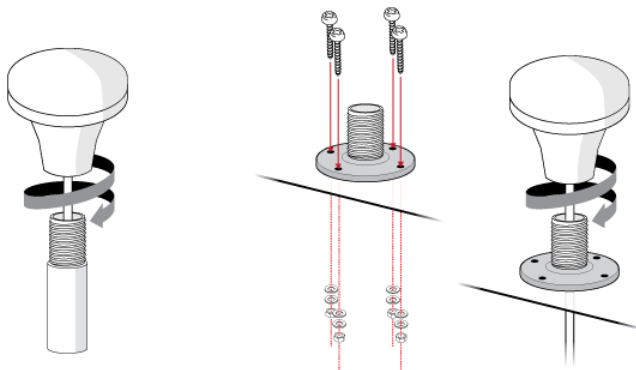
It is recommended to keep the GPS antenna out of the transmitting beam of high-power transmitters such as Inmarsat devices and radar.

When connecting the cables, take note of the following precautions.

- Bending cables may cause damages to the inner wires and impair overall the performances.
- Each coaxial cable should be set up separately and can only be set up in a single cable tube.
- Insulation on connector port of the coaxial cable should be considered.

WideLink B600 is tested and certified with the GPS antenna GA-22. It's recommended to use GA-22 with B600 series to ensure optimal reliability of your AIS system.

For pole mounting the GA-22, a 1 inch 14 TPI thread pole will be required.



**Figure 5 Mounting GPS Antenna**

## 2.5 Connecting with NMEA 0183 Devices

WideLink B600 supports two NMEA 0183 ports and external silent mode switch with its 12-pin data cable. The default NMEA 0183 baud rates are 38400-bps (high speed) and 4800-bps (low speed). User can change the baud rates using the provided configuration utility. Typically the high speed setting is primarily for chart plotter connection, while the low speed setting can be used for NMEA 0183 compatible instruments.

WideLink B600 NMEA 0183 supports multiplexer function. Received NMEA 0183 data from both ports will be multiplexed and forwarded to all output ports as well as USB and Wi-Fi (B600W only).

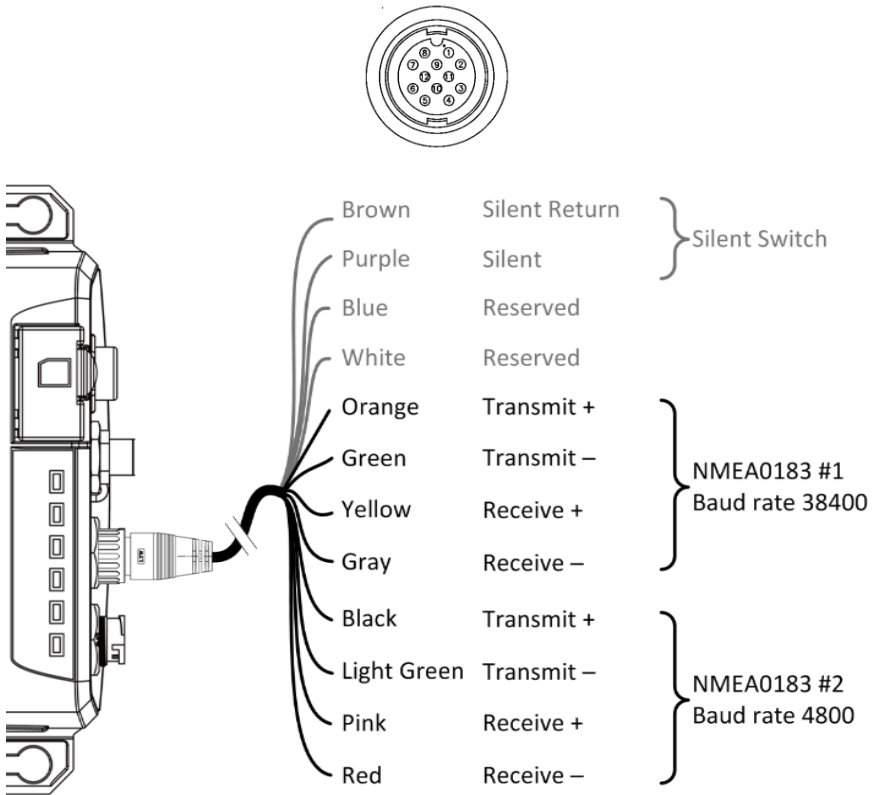


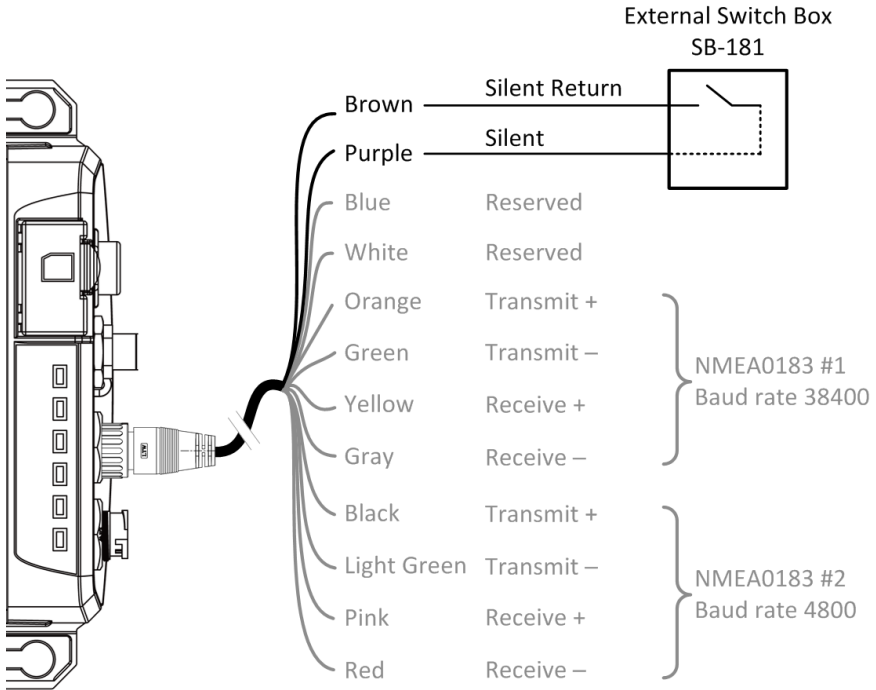
Figure 6 NMEA 0183 Connection



**Warning:** During installation, you may have to peel off some wires to make the appropriate connections. After completing the installation, please cover all exposed wires with a rubber-vulcanized tape to prevent the devices from malfunctioning or short-circuited.

## 2.6 AIS Silent Mode Connection

When Silent Mode is required, it is possible to connect an external toggle switch to WideLink B600. Connect the toggle switch between the purple and brown wires to enable Silent Mode function, as depicted in Figure below. An optional Tx Switch Box (part number SB-181) is available from AMEC for Silent Mode activation.

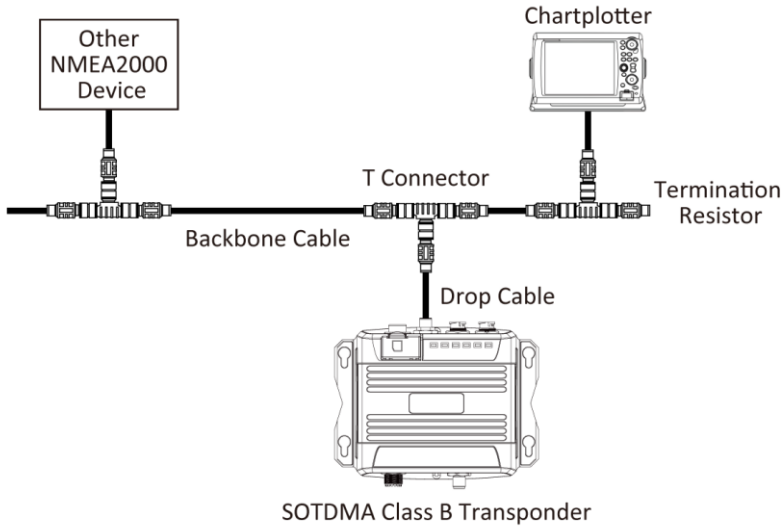


**Figure 7 Silent Switch Connection**

## 2.7 Connection to NMEA 2000 Network

The Widelink B600 is equipped with NMEA 2000 interface with LEN=1. The device is able to send AIS data and forward received GPS data (from NMEA 0183) via NMEA 2000 network to other NMEA 2000 devices. For further applications e.g. heading sensor connection, please refer to supported PGN in 5.3. An updated PGN list is available at AMEC website under Support/FAQ.

A compatible T-connector and drop cable/spur available by your local service partner are needed to connect the device to your chart plotter with NMEA 2000 interface:



**Figure 8 NMEA 2000 Network**



## 2.8 Connecting Power Cable

Connect the WideLink B600 to vessel's power source as illustrated below. The device requires a 12V or 24V DC power supply (9.6 to 31.2V) capable of supplying 2A peak current @12V DC. Always use a minimum 3A fuse panel before connecting directly to battery or power supply. Power on the power source will turn on the device unit automatically.

B600's power cables are marked with bullet connectors.

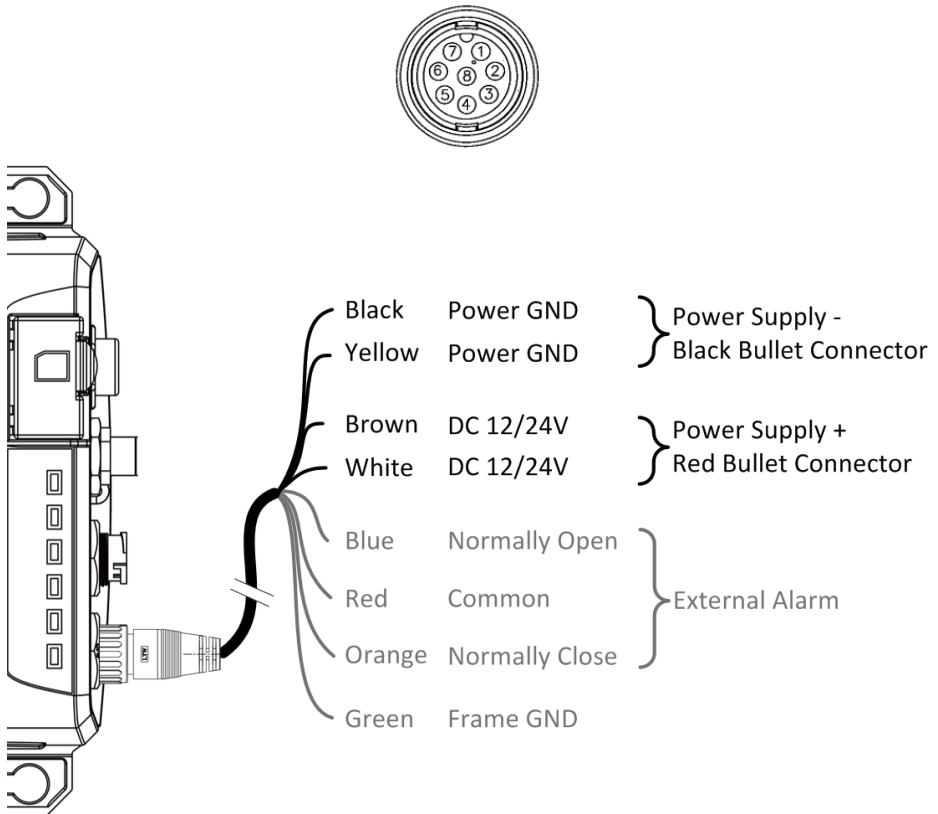


Figure 9 Power and Alarm Connection

## 2.8.1 Alarm Relay

WideLink B600 supports internal alarm relay with its 8-pin power cable. Connect the alarm relay to an audible alarm device or the ships alarm system, if available.

The maximum switching current is 1 A.


The maximum switching voltage is 250 VAC, 220 VDC.

| Signal            | Function                    |
|-------------------|-----------------------------|
| ALARM COM (Red)   | Alarm relay common          |
| ALARM NC (Orange) | Alarm relay normally closed |
| ALARM NO (Blue)   | Alarm relay normally open   |

## 3 Configuring Your WideLink B600

For configuration and firmware upgrade purpose, B600 series can be powered only by USB. When USB power is in use, the device will not transmit any data. To configure the Wi-Fi of B600W, user needs a regular 12/24V DC power supply.

The AMEC AIS Class B SO-TDMA Configuration is a powerful tool allowing users to set up the transponder and make real time diagnosis. A more detailed user guide of Configuration software can be found in the “Help” of the configuration software.

To install the software, open the AMEC AIS Configuration file on the CD and click on the setup  icon to start the installation process. Follow the on-screen instructions to complete the installation and check the checkbox to start the AMEC AIS Class B SO-TDMA Configuration at the end of the installation.

### 3.1 Establish Connection to PC

#### 3.1.1 USB Driver Installation

Before preceding the configuration procedure, make sure the following items are available:

##### Required Items

- USB Driver (included in the software CD)
- USB cable (included in the box)
- PC/Laptop with Windows operating system (not included). WideLink B600 USB Driver supports Windows XP, Windows Vista, Windows 7, Windows 8/8.1 and Windows 10
- One available USB port on PC
- Available CD-ROM drive on PC

The USB driver has to be installed before linking the device to your PC. Power on the device and connect it to PC with the attached USB cable. A new hardware found prompt will show up. In most cases the USB driver will be installed automatically by Windows system.

When USB driver installation is not done automatically, user can also manually install the USB driver which can be found on the attached CD. Follow the on screen instructions and assign the correct file path of the USB driver to complete the installation. You can also install the USB driver via the Device Manager in the Control Panel.

### 3.1.2 Serial Port Connection

After the USB driver is installed and the device is recognized as a “Virtual Com Port”, launch the Configuration Software, select Option in the menu bar, then Connection, and “serial port”. There are 2 options to connect the software with your device:

- **Auto:** The system will scan all connected ports and their available baud rates and establish connection automatically.
- **Manual:** Configure baud rate and port manually. The default baud rate is 115200. To determine serial port with which the device is connected, please refer to Appendix in this manual.

Click on “**Connect**”, to connect the Configuration Software with your device.

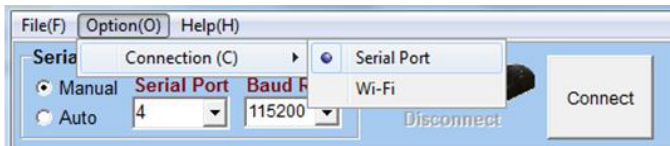


Figure 10 Serial Port Connection

### 3.1.3 Wireless Connection (only for WideLink B600W)

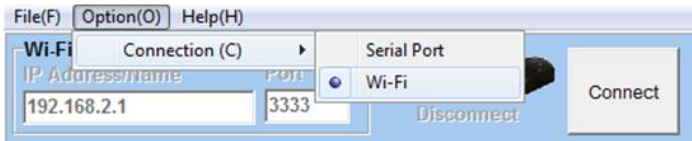


Figure 11 Wi-Fi Connection for WideLink B600W

For WideLink B600W, the connection between the Configuration Software and the device can also be established wirelessly. Please refer to 4.4 “Wi-Fi Configuration” about how to access WideLink B600W from your PC as Access Point.

After your PC is wirelessly connected with the device, go to Option in the menu bar, then Connection, and “Wi-Fi”. The IP address and Port are already preprogrammed to fit WideLink B600W’s configuration. Click on “**Connect**”, to connect the Configuration Software with your device.

## 3.2 Programming your vessel data

After the device is successfully connected with the Configuration Software, click on the “STATIC DATA” tab. You will require the following information in order to configure the device:

- Vessel’s name: limited to 20 characters
- Call sign: limited to 7 characters
- MMSI: Enter your MMSI (Maritime Mobile Service Identity) number
- Ship type: choose your ship type from the drop down list
- Ship dimensions: Enter the vessel dimensions by appointing position of your GPS antenna



**WARNING:** The MMSI number can only be entered once. Be sure to enter the correct MMSI number, as it cannot be corrected if entered incorrectly.

The screenshot displays the Configuration Software interface. At the top, there is a menu bar with 'File(F)', 'Option(O)', and 'Help(H)'. Below the menu bar is a 'Serial Port and Baud Rate Setting' section with 'Manual' and 'Auto' radio buttons, 'Serial Port' set to '10', and 'Baud Rate' set to '115200'. A 'Connected' status indicator with a computer and modem icon is shown, along with a 'Disconnect' button and an 'EXIT' button.

The main interface is divided into two tabs: 'Configuration' and 'Diagnosis'. The 'Configuration' tab is active and contains three sub-tabs: 'STATIC DATA', 'TRANSCIVER', and 'BAUD RATE'. The 'STATIC DATA' sub-tab is selected and shows the following fields:

- NAME: BALU
- CALLSIGN: AMEC101
- MMSI: 123456790
- Ship Type: 37 = Vessel-Pleasure craft (with a yellow '37' button next to it)

The 'SHIP DIMENSION' section features a diagram of a house-shaped vessel with a central dot representing the GPS antenna. Dimension lines and input fields are provided for:

- Height: 0 (0~511m)
- Antenna height: 0 (0~511m)
- Width: 0 (0~63m)
- Antenna width: 0 (0~63m)

The 'Firmware Version: V1.2.6.1' is displayed at the bottom right of the configuration area. At the bottom of the window, there are two buttons: 'Config Device' and 'Read Device'.

Figure 12 Static Data Setting

## 4 GET STARTED

The device starts up whenever the connected power source is ON. It will operate automatically when the device has been properly configured and GPS/VHF antennas are properly installed. The device transmits its own ship positions depending on vessel's moving speed and should receive information of other vessels in the vicinity. The operation status of the device can be observed with the LED lights on the unit. Description of the LED indications is provided in the following section.

### 4.1 LED Indicators

| Indicator            | Light           | Description   |
|----------------------|-----------------|---|
| <b>Power</b>         | Green, steady   | The device has been powered up correctly.<br>By USB power, the Power LED does not light showing that the device is in low power mode. |
| <b>Tx / Silent</b>   | Green, flashing | The device is transmitting AIS data. The flashing interval varies depending on vessel speed.  |
|                      | Orange, steady  | The device is in silent mode, no AIS transmission at all.   |
| <b>Rx</b>            | Green, flashing | The device is receiving AIS data.   |
| <b>SD</b>            | Green, flashing | SD card is being accessed.  |
|                      | Green, steady   | SD card is inaccessible due to malfunction.   |
| <b>Wi-Fi (B600W)</b> | Green, flashing | The green LED indicates an active Wi-Fi traffic   |
| <b>Error</b>         | Red, steady     | MMSI is not properly programmed   |
|                      | Red, flashing   | A BIIT system error is detected referring to chapter 4.4, or by USB power   |

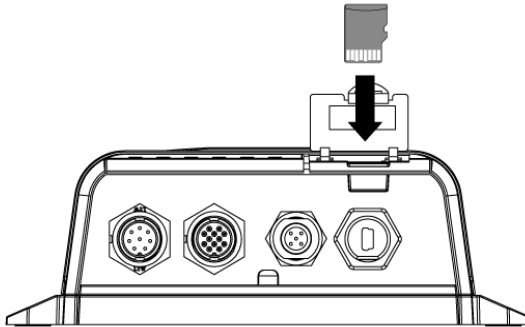
## 4.2 Micro SD Card Data Logging

The Widelink B600 records voyage data onto a micro SD card in .txt format. The compatible micro SD card types are listed as follows:

- Standard “SD” with maximum 2GB size
- Standard “SDHC” with maximum 32GB size
- Supported data format: FAT12/16 by SD, FAT32 by SDHC

Insert the Micro SD card into the slot as shown below and data logging will start immediately. When the device begins recording, the green SD LED indicator blinks. When recorded data gets full, it overwrites new data as deleting from the oldest data. Removing Micro SD card from the device stops data logging immediately, and the SD LED will turn off.

The log files have naming convention of AIS\_XXXXXX.txt with increment from 000001 to 999999. Entry in the log file is vessel’s GPS sentence in IEC61162 format. The log file can be read by chart plotting PC software like AMEC AIS Viewer or NaviPro ECS.



**Figure 13** Inserting SD Memory Card

## 4.3 Wi-Fi Configuration (WideLink B600W only)

WideLink B600W has high performance Wi-Fi module and antenna built in. It can work in Access Point Mode or Client Mode.

The information below details the information required for connecting the WideLink B600W to another device using Wi-Fi.

### 4.3.1 Access Point Mode

WideLink B600W is featured with powerful Wi-Fi performance supporting wireless connection with up to 32 mobile devices. After the configuration is done, press “Configure Device” to save the settings to the device.

The screenshot displays the configuration interface for the WideLink B600W device. At the top, there is a menu bar with 'File(F)', 'Option(O)', and 'Help(H)'. Below the menu bar, there is a 'Serial Port and Baud Rate Setting' section with radio buttons for 'Manual' and 'Auto'. The 'Manual' option is selected, and the 'Serial Port' is set to '15' and the 'Baud Rate' is set to '115200'. To the right of this section, there is a 'Connected' status indicator, a 'Disconnect' button, and an 'EXIT' button.

The main configuration area is divided into two tabs: 'Configuration' and 'Diagnosis'. The 'Configuration' tab is active and contains several sub-sections:

- STATIC DATA**: A tab for static data settings.
- TRANSCEIVER**: A tab for transceiver settings.
- BAUD RATE**: A tab for baud rate settings.
- Wi-Fi**: The active tab for Wi-Fi settings.

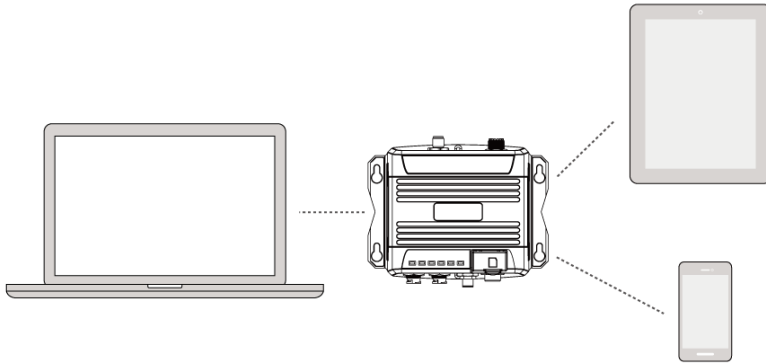
Under the 'Wi-Fi' tab, the following settings are visible:

- Enable Wi-Fi
- Select Wi-Fi Mode:  Access Point,  Client
- Access Point Mode: A sub-section containing:
  - SSID: AIS-WiFi
  - Password: [Redacted]  None
  - Channel: [Redacted]  Auto selected
  - IP Address: 192.168.2.1
  - Port: 3333
- Factory Reset: A button to reset the device to factory settings.
- Device IP Address: 192.168.2.1
- Port: 3333
- Wi-Fi Module Firmware Version: V1.2.2

At the bottom of the interface, there are two buttons: 'Configure Device' and 'Read Device'.

Figure 14 Access Point Mode





**Figure 15 Connect to Mobile Devices**

■ **SSID (Service Set Identifier):**

The SSID for the WideLink B600W is AIS-WiFi. When user wants to create their own SSID, just input the preferred SSID in the SSID field and then press “Configure Device”.

■ **Password:**

By default the Wi-Fi network has no password. Users are allowed to create their own key with an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?\*&\_) and spaces.

■ **System IP:**

Default system IP is **192.168.2.1**

User can create IP by inputting value in individual field.

■ **Port:**

Default port is **3333**. User can set the port between 3000-65535.



**Note: By default AMEC WideLink B600W uses WPA2-Personal wireless security protocol.**

### 4.3.2 Client Mode

WideLink B600W is able to join an existing Wi-Fi network. When clicking on „Client”, it can take up to 30 seconds until WideLink B600 scans all available Wi-Fi networks. Pick the network you want to join and enter the password and click on “Connect”.

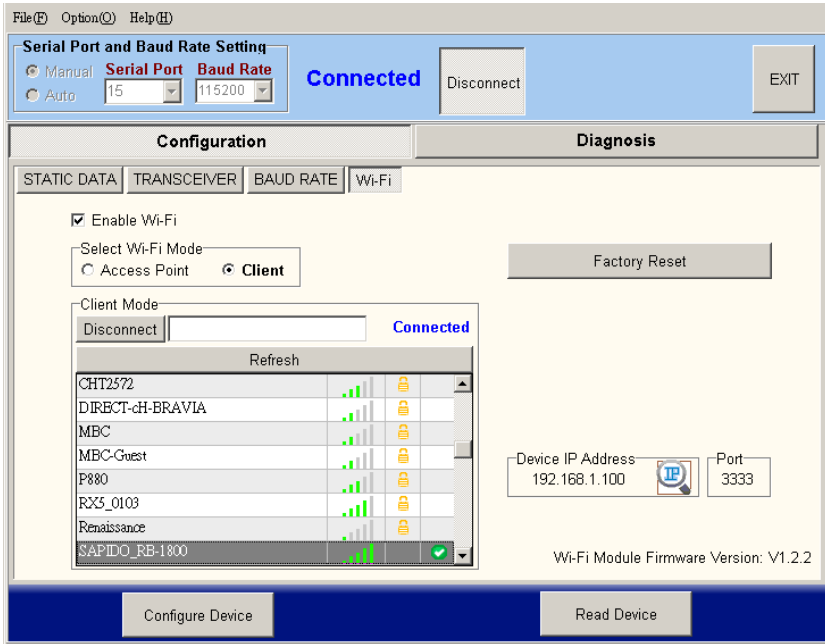


Figure 16 Client Mode

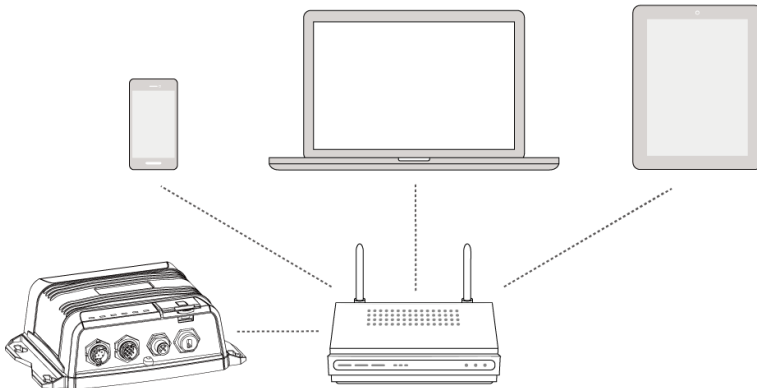


Figure 17 Join an Existing Wi-Fi Network

## 4.4 Built-in Integrity Test (BIIT)

With BIIT (Built in Integrity Test) function, the WideLink B600 is constantly monitoring and testing the integrity of the AIS device. Should an abnormal condition as listed below be detected, the Error LED will alert:

- MMSI not set (Error LED steady on)
- Antenna VSWR exceeding the maximum allowed level (Error LED flashing)
- Background noise level exceeds allowable threshold (-77dBm) (Error LED flashing)
- GPS is unable to gain lock (3D fixed) after 30 minutes of losing GPS signal (Error LED flashing)
- Unusual power input (<9V or >36V DC) or by USB power (Error LED flashing)

## 4.5 AIS Viewer Description

The AIS Viewer is a complementary charting software supplied with your WideLink B600 purchase. The software installation file and its user manual can be found in the provided CD-ROM.

This powerful tool allows users to display AIS targets either on a basic line map or in an alphanumeric view. It transforms your PC to a user-friendly AIS data logger and can trace other vessels with voyage track. Besides, the software offers various safety features to help users be alerted during their voyage.

Once the program is installed, you can establish a connection to PC either automatically or manually by assigning the COM port and baud rate. Please notice that before trying to connect to PC, you should quit the Configuration Software or vice-versa. The device can only establish connection to one software at a time. The AIS CPA/TCPA setting can be configured via AIS Viewer.

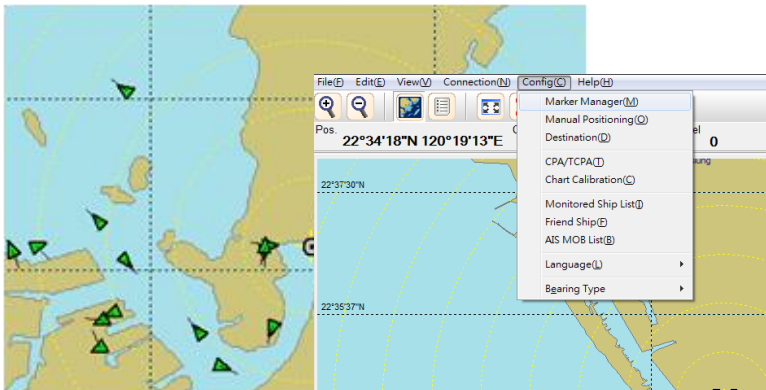


Figure 18 AMEC AIS Viewer

## 4.6 Introducing AMEC AIS App



The AMEC AIS App is a complimentary App with the purchase of an AMEC AIS Widelink B600W. The App enables users to monitor the surrounding AIS traffics on your smart phone or tablet PC wirelessly.

The AIS targets are displayed clearly in radar view or in an alphanumeric vessel list format. Data of own vessel can be traced in real time. The App also offers various safety features to help users be alerted during their voyage.

The AMEC AIS App is now available on Apple App Store for iOS devices as well as on Google Play for Android mobile devices.

### Legal



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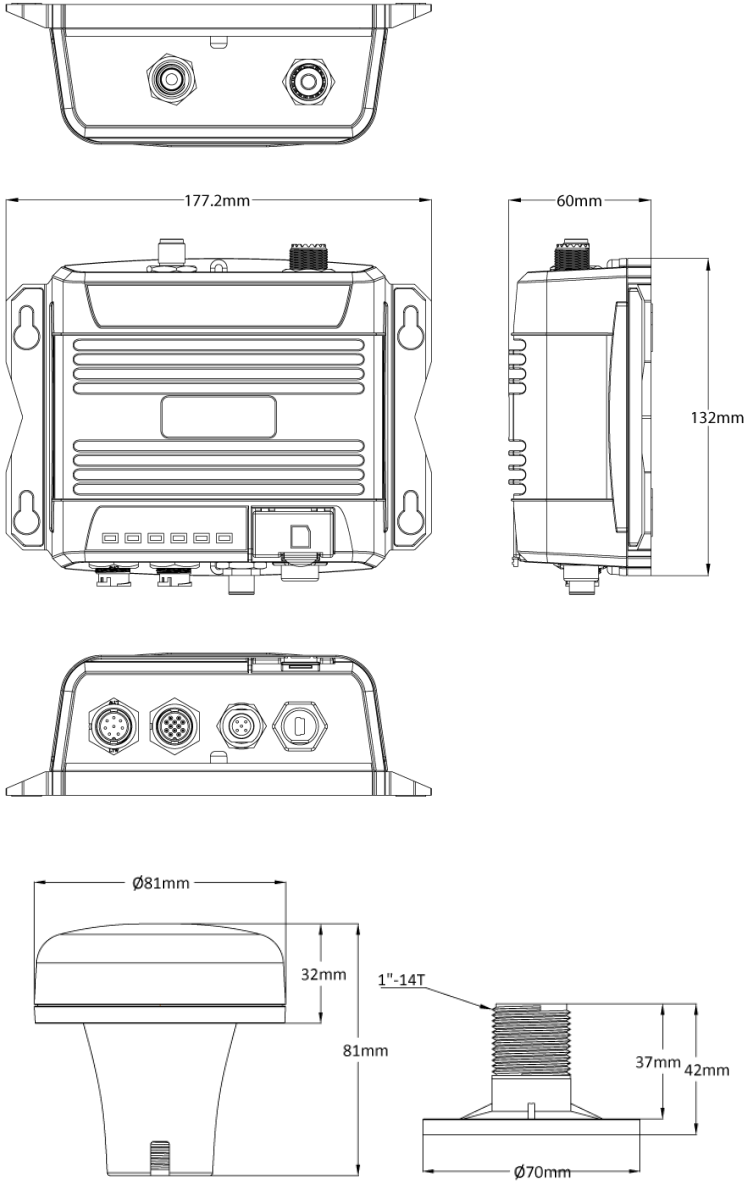
# 5 SPECIFICATIONS

## 5.1 Product Specifications

| APPLICABLE STANDARDS                                      |  |
|---|--|
| ISO MSC. 74(69) Annex                                     | IEC 60945 Ed. 4.0:2002                               |
| ITU-R M. 825-3:1998                                       | IEC 61108-1 Ed. 2.0:2003                             |
| ITU-R M. 1084-5:2012                                      | IEC61162-1 Ed. 5.0:2016                              |
| ITU-R M. 1371-5:2014                                      | IEC61162-2 Ed. 1.0:1998                              |
| EN 300 440 V2.1.1 (Final Draft)                           | IEC 62287-2 Ed. 2.0:2017                             |
| EN 301 489-1 V2.1.0(Draft) / EN 301 489-3 V2.1.0(Draft)   | EN 300 328 V2.1.1                                    |
| EN 301 489-1 V2.1.0(Draft) / EN 301 489-17 V3.1.0(Draft)  | EN 62311:2008  |
| EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 |  |
| VHF TRANSPONDER   |  |
| Frequency Range   | 156.025 MHz ~ 162.025 MHz                            |
| Access Scheme   | SOTDMA   |
| Channel Bandwidth   | 25 KHz   |
| Modulation  | GMSK / FM  |
| Data Rate   | 9,600 bps  |
| Number of AIS Transmitter                                 | 1  |
| Number of AIS Receiver                                    | 2 (one time-shared between AIS and DSC)              |
| Number of DSC Receiver                                    | 1 (time-shared between AIS and DSC)                  |
| AIS Channel 1   | CH 87B (161.975 MHz)                                 |
| AIS Channel 2   | CH 88B (162.025 MHz)                                 |
| Tx Power Output   | 5 Watt (37 dBm ± 1.5 dB)<br>1 Watt (30 dBm ± 1.5 dB) |
| Rx Sensitivity  | < -107 dBm @ 20% PER                                 |
| Rx Message Format   | AIS Class A & B messages                             |
| DSC RECEIVER  |  |
| Modulation  | 1,300 Hz / 2,100 Hz FSK                              |
| Data Rate   | 1,200 bps ± 30 ppm                                   |
| Spurious Response Rejection                               | ≥ 70 dB for signal @ -104 dBm; BER ≤ 1 %             |
| Blocking  | ≥ 84 dB for signal @ -104 dBm; BER ≤ 1 %             |
| GNSS RECEIVER (integrated)                                |  |
| Receiving Channels  | 50 channels  |
| Accuracy  | IEC 61108-1 compliant                                |
| Output Rate   | 1 Hz   |
| Support: GPS, Galileo, Beidou, GLONASS                    |  |
| POWER SUPPLY  |  |
| Supply Voltage  | 12V / 24V DC, 2A                                     |
| Power Consumption   | Typically less than 3W average @ 12V DC              |

| <b>CONNECTION INTERFACE</b>                           |  |
|---|--|
| GPS Antenna Connector                                 | TNC (Female)   |
| VHF Antenna Connector                                 | SO-239 (Female)  |
| NMEA 2000   | Standard connector   |
| NMEA 0183 (RS-422)                                    | Support two NMEA 0183 interfaces<br>Default baud rate 38,400 & 4,800bps<br>Configurable and separate Tx/Rx baud rate<br>Standard IEC 61162-1 / IEC 61162-2 sentences |
| Silent Mode Setting                                   | Set by dedicated pins in the 12-pin cable  |
| Internal Alarm Relay Setting                          | Set by dedicated pins in the 8-pin cable   |
| USB   | Mini-B type, waterproof  |
| <b>ENVIRONMENTAL</b>                                  |  |
| Operating Conditions                                  | IEC 60945 "protected" category   |
| Operating Temperature                                 | -15°C ~ +55°C (+5°F ~ +130°F)  |
| Waterproof  | IP67   |
| <b>PHYSICAL</b>                                       |  |
| Width   | 177 mm (6.97 inches)   |
| Height  | 60 mm (2.36 inches)  |
| Depth   | 132 mm (5.20 inches) (exclude connector)   |
| Weight  | 500 g  |
| <b>SOFTWARE TOOL</b>                                  |  |
| AMEC AIS Configuration, AMEC AIS Viewer, AMEC AIS App |  |
| <b>COMPASS SAFETY DISTANCE</b>                        |  |
| Standard Magnetic Compass                             | 0.30m  |
| Steering Magnetic Compass                             | 0.30m  |
| <b>GA-22 GPS ANTENNA (OPTIONAL)</b>                   |  |
| Cable   | Integral 10m RG-174 cable plus mounting bracket  |
| Supply Voltage  | 3.3V   |
| <b>Wi-Fi POWER (B600W ONLY)</b>                       |  |
| Tx Transmit Power                                     | 19.53 dBm (EIRP)   |
| Frequency Range                                       | 2412 MHz ~ 2462 MHz  |

## 5.2 Dimensions



(GPS antenna is an optional item)

## 5.3 NMEA 2000 PGN Information

| Transmit |   |
|----------|---|
| PGN      | Description                                 |
| 59392    | ISO Acknowledgment                          |
| 59904    | ISO Request                                 |
| 60928    | ISO Address Claim                           |
| 126464   | PGN List - Transmit PGN's group function    |
| 126996   | Product Information                         |
| 129025   | Position Rapid Update                       |
| 129026   | COG SOG Rapid Update                        |
| 129029   | GNSS Position Data                          |
| 129038   | AIS Class A Position Report                 |
| 129039   | AIS Class B Position Report                 |
| 129040   | AIS Class B Extended Position Report        |
| 129041   | AIS Aids to Navigation (AtoN) Report        |
| 129539   | GNSS DOPs                                   |
| 129540   | GNSS Sats in View                           |
| 129792   | AIS DGNSS Broadcast Binary Message          |
| 129793   | AIS UTC and Date Report                     |
| 129794   | AIS Class A Static and Voyage Related Data  |
| 129795   | AIS Addressed Binary Message                |
| 129796   | AIS Acknowledge                             |
| 129797   | AIS Binary Broadcast Message                |
| 129800   | AIS UTC/Date Inquiry                        |
| 129801   | AIS Addressed Safety Related Message        |
| 129802   | AIS Safety Related Broadcast Message        |
| 129803   | AIS Interrogation                           |
| 129804   | AIS Assignment Mode Command                 |
| 129805   | AIS Data Link Management Message            |
| 129806   | AIS Class A Position Report                 |
| 129807   | AIS Group Assignment                        |
| 129808   | DSC Call Information                        |
| 129809   | AIS Class B "CS" Static Data Report, Part A |
| 129810   | AIS Class B "CS" Static Data Report, Part B |
| Receive  |   |
| PGN      | Description                                 |
| 59392    | ISO Acknowledgment                          |
| 59904    | ISO Request                                 |
| 60928    | ISO Address Claim                           |
| 127250   | Vessel Heading                              |
| 127258   | Magnetic Variation                          |



## 5.4 Supported NMEA 0183 Sentences

| Transmit   |  |
|------------|--|
| Sentence   | Description                              |
| <b>GGA</b> | Global Positioning System Fix Data       |
| <b>GSA</b> | GNSS DOP and Active Satellites           |
| <b>GSV</b> | GNSS Satellites In View                  |
| <b>GLL</b> | Geographic Position – Latitude/Longitude |
| <b>RMC</b> | Recommended Minimum Specific GNSS Data   |
| <b>VDO</b> | AIS VHF Data-Link Own-Vessel Report      |
| <b>VDM</b> | AIS VHF Data-link Message                |
| Receive    |  |
| Sentence   | Description                              |
| <b>DTM</b> | Datum Reference                          |
| <b>GBS</b> | GNSS Satellite Fault Detection           |
| <b>GSA</b> | GNSS DOP and Active Satellites           |
| <b>HDT</b> | Heading, True                            |
| <b>RMC</b> | Recommended Minimum Specific GNSS Data   |

## 6 TROUBLESHOOTING

### **The transmitting LED (Green color) is not illuminated, why?**

- The Class B device requires GPS information from GPS antenna before making AIS transmission. Please check if your GPS antenna is connected correctly. The Tx LED will flash orange every 5 seconds meaning that the device is still acquiring a GPS fix and therefore not ready yet to make transmission.
- For each transmission, the Tx LED indicator will flash once quickly. The green light from the Tx LED could be missed if not observed carefully.

### **WideLink B600 receives AIS signals normally, but no one in the surrounding can see me, why?**

- VHF antennas interference: if you are using a dedicated AIS/VHF antenna for your transponder, be sure that it is placed following the instructions in chapter 2.3. In several tests, mounting two VHF antennas next to another typically reduces the transmitting range to both antennas by 50-70%.
- GPS is not fixed: If your GPS antenna is not connected or setup correctly, your transponder will see other vessels fine, but you will not be sending out your vessel position. The Tx LED will flash orange every 5 seconds meaning that the transponder is still acquiring a GPS fix and therefore not ready yet to make transmission.
- The location of VHF antenna is directly related to AIS transmitting range. The VHF antenna should be installed at mast as high as possible.

### **No data is being received by chart plotter, why?**

- Please check that the power supply is connected correctly at WideLink B600.
- Please check that the power supply is 12V or 24V with sufficient current capacity (no less than 2A).
- Please make sure that the connections between WideLink B600 to the chart plotter are correct.

### **My MMSI is being received by other vessels but my vessel name is not shown on their chart plotter or PC, why?**

- Older software and AIS displays may not be fully compatible with Class B transponders. In some of these cases, older equipment might only have Class B vessel show up on their displays with just MMSI number without the vessel name. This is usually due to the receiving device not knowing how to process the Message 24 static data from Class B transponders. Please contact the chart plotter maker and ask for software upgrades (for these older chart plotters) to resolve this issue.

### **The Red Error LED indication at WideLink B600 is illuminated, why?**

- The unit may not have a valid MMSI. Please check if the AIS transponder is correctly entered with a valid MMSI.

- Please make sure that both VHF and GPS antennas and their cables are working properly and not damaged.
- Return the unit to your dealer/service partner for technical check.

**Why is the Wi-Fi signal weak and how can I improve it?**

- The router is too far from the client devices. To improve the Wi-Fi signal strength reallocated the device to a more central location.
- There might be intervening barriers (e.g. a large expanse of metal) that is blocking the Wi-Fi signals. Relocated the device to the center of the area where the client devices are placed, or to a position where the router and the devices are within a visible distance without interfering barrier.
- Nearby devices (e.g. microwaves/wireless phones) using the same frequency band may interfere with the router's 2.4GHz Wi-Fi transmission. To improve the Wi-Fi signal strength, try to avoid channel overlapping by reassigning their operation channels to channels 1, 6 or 11.

If you still encounter difficulties to set up or operate WideLink B600 correctly, please email to [service@alltekmarine.com](mailto:service@alltekmarine.com) for further instructions.

## 7 ABBREVIATIONS

|        |  |
|--------|--|
| AIS    | Automatic Identification System              |
| COG    | Course Over Ground                           |
| CPA    | Distance to Closest Point of Approach        |
| CSTDMA | Carrier-Sense Time Division Multiple Access  |
| SOTDMA | Self-Organized 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                            |
| TCPA   | Time to Closest Point of Approach            |
| TDMA   | Time Division Multiple Access                |
| UTC    | Coordinated Universal Time                   |
| VHF    | Very High Frequency                          |
| VTS    | Vessel Traffic Services                      |

## **8 FCC INTERFERENCE STATEMENT**

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by AMEC for compliance could void of the user's authority to operate the equipment.

## 9 RF Exposure Warning

**WARNING:** This device generates and radiates RF electromagnetic energy and must be installed and operated according to the instructions contained in this manual. Failure to do so may result in product malfunction and/or exposure to potentially harmful levels of radio frequency radiation.

**WARNING:** Never operate this device unless it is properly connected to a VHF antenna. To maximize performance and minimize human exposure to RF energy, always mount the antenna at least 3m from the device.

The system has a Maximum Permissible Exposure (MPE) radius of 50cm from the antenna, and 20cm from Wi-Fi antenna (B600W only). This has been determined assuming the maximum power of the transmitter and using a standard half-wave monopole VHF antenna with a maximum gain of 3dBi and termination impedance of 50 ohms.

When installing the antenna and operating the equipment consider the following:

- The antenna should be mounted at a minimum vertical distance of 5m above the deck in order to meet international safety directives on Maximum Permissible Exposure (MPE). Failure to adhere to these limits could expose persons within the radius to RF radiation in excess of the recommended MPE limits.
- Higher gain VHF antennas will require a larger MPE radius.
- Do not operate the unit when anyone is within the MPE radius of the antenna.
- The antenna should not be co-located or operated in conjunction with any other transmitting antenna.

### DECLARATION OF CONFORMITY

Hereby, Alltek Marine Electronics Corp. (AMEC) declares that this WideLink B600/B600W is in compliance with the essential requirements and other relevant provisions of Directive **2014/53/EU RED**.

# **AMEC WORLDWIDE 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.

## **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 seal label is removed or defaced.

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 PURCHASE 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 LOSS OF GOODWILL, REPUTATION, LOSS OF OPPORTUNITY OR INFORMATION, DATA, SOFTWARE OR APPLICATIONS.

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. 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.

## Appendix: How to Determine Serial Port

If your PC/laptop does not have an available serial port, you may use an RS232-to-USB adapter. To find out the proper serial port for connection, use the following instructions.

### Windows 7 or VISTA version:

Click on "Start" → Select "Control Panel" → Select "Device Manager" → Click Port (COM&LPT)

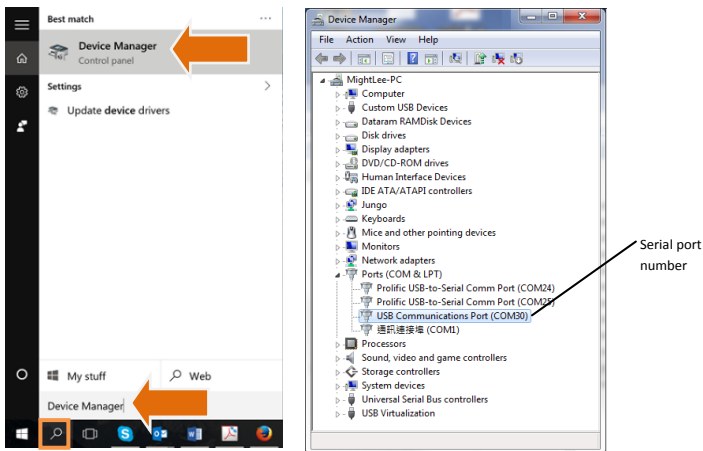
### Windows 8 and 8.1:

Click (W)\* + I and then click on Control Panel → Select "Device Manager" → Click Port (COM&LPT)

### Windows 10

**⊞** + S → type Device Manager in the search box, and select Device Manager from the list of results. Expand the Ports (COM & LPT) and port number are presented with numerical number within a parenthesis in the following format (COMXX).

\* means Windows button





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