

MBB300C

Vessel Monitoring and Control

Black Box

User's Manual

Revision 1.2

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Maretron Manual Part #: M003079

Revision History

Rev.	Description
1.0	Original document.
1.1	Change company name to Carling Technologies Added Warranty Information
1.2	Updated company profile and contact details Updated Firmware Revision reference Updated images used in multiple Figures Miscellaneous verbiage updates Updated Warranty details

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1 General

1.1 Introduction

Congratulations on your purchase of the Maretron MBB300C Vessel Monitoring and Control Black Box. Maretron has designed and built your system to the highest standards for years of dependable and accurate service.

Maretron's Black Box (MBB300C) is a dedicated processing unit that includes Maretron's N2KView® vessel monitoring and control software. Unlike a PC that allows any software to be loaded, the MBB300C runs only N2KView® software, making it extremely stable and dedicated to monitoring and controlling your vessel.

The MBB300C is ruggedized for marine use and includes a solid state disk drive to withstand the pounding associated with waves. And since the MBB300C dissipates less than 10 watts, there is no need for internal cooling fans that are noisy and wear out causing electronics to overheat and fail.

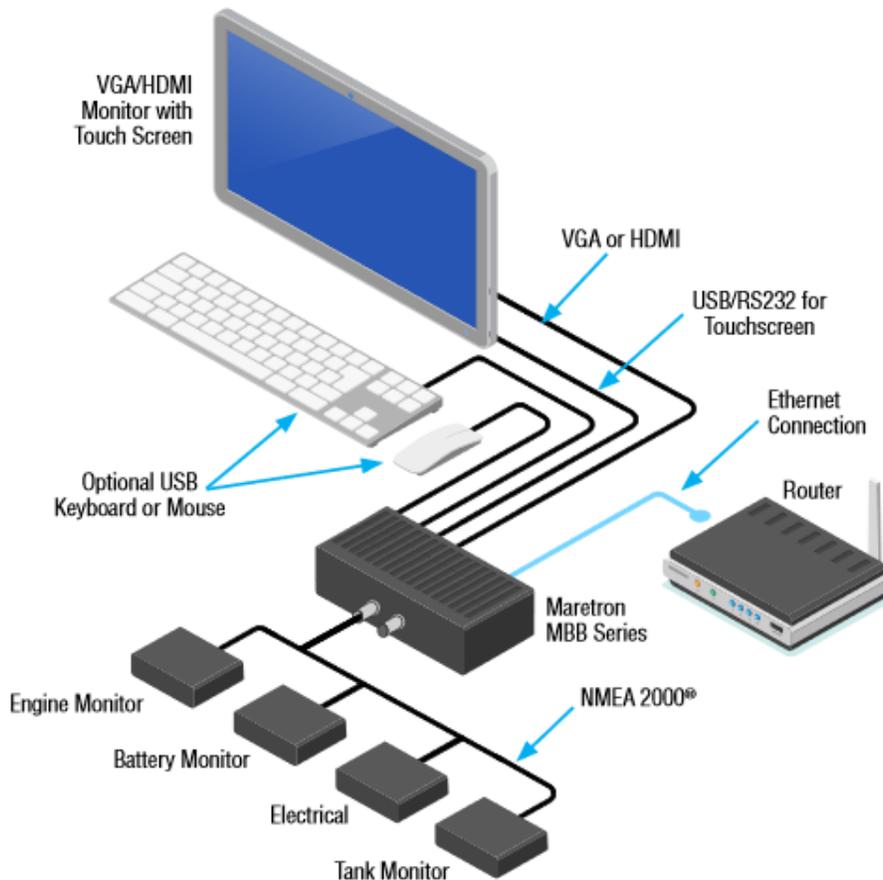


Figure 1 – MBB300C Network Diagram

The MBB300C connects to a monitor through a VGA or HDMI connector and associated touch screen through a USB or serial port connection.

Alternatives to controlling the N2KView® software through a touch screen include keyboards, mice, or track balls connected through USB. In addition to the two completely isolated CAN bus connectors (M12) for easy connection to single or redundant NMEA 2000® networks, the MBB300C has an Ethernet port for connecting Internet Protocol (IP) cameras for viewing within the N2KView® software.

Of course, you get the same flexibility using Maretron's N2KView® software from the MBB300C as you would running the software on a PC, which includes the ability to configure as many screens as you want with exactly the information you want to see. Plus, you get free upgrades to the software as improvements and new features are added.

The Maretron MBB300C is designed to operate within the harsh demands of the marine environment. However, no piece of marine electronic equipment can function properly unless installed, configured, and maintained in the correct manner. Please read carefully and follow these instructions for installation, configuration, and usage of the Maretron MBB300C in order to ensure optimal performance.

1.2 Firmware Revision

This manual corresponds to the MBB300C running N2KView® Version 6.4.1.

1.3 MBB300C Features

The Maretron MBB300C has the following features.

- Full version of N2KView® software preinstalled
- 9-36 Volt Power Supply
- Solid State Disk Drive
- Fanless Cooling System
- Dual CAN Bus for Single or Redundant NMEA 2000® Network Connections
- Four USB Ports for Touchscreen, Keyboard, Mouse, Trackball, or Thumb Drive Connections
- VGA or HDMI Video Connection (2560 x 1600 Maximum Resolution)
- Ethernet Connector for IP Camera Input or Email Alert Notification

1.4 Quick Install

Installing the Maretron MBB300C display involves the following four steps. Please refer to the individual sections for additional details.

- Unpacking the Box (Section 2.2)
- Choosing a Mounting Location (Section 2.3)
- Mounting the MBB300C (Section 2.4)
- Connecting the MBB300C (Section 2.5)
- Configuring the MBB300C (Section 2.6)

2 Installation

2.1 Unpacking the Box

When unpacking the box containing the Maretron MBB300C, you should find the following items:

- 1 – MBB300C Maretron Vessel Monitoring and Control Black Box
- 1 – 3-Pin Power Connector
- 1 – USB Flash Drive Containing System Documentation
- 1 – Warranty Registration Card

- Installation

2.2 Unpacking the Box

When unpacking the box containing the Maretron MBB300C, you should find the following items:

- 1 – MBB300C Maretron Vessel Monitoring and Control Black Box
- 1 – 3-Pin Power Connector
- 1 – USB Flash Drive Containing System Documentation
- 1 – Warranty Registration Card

If any of these items are missing or damaged, please contact Maretron.

2.3 Choosing a Mounting Location

The MBB300C must be mounted in an indoor location.

2.4 Mounting the MBB300C

The MBB300C can be mounted to a wall or other flat surface.

2.4.1 Mounting the System

To mount the MBB300C onto a wall or some other surface, please follow the steps below.

Step 1: Turn the MBB300C over.

Step 2: Drill holes in the intended installation surface.

Step 3: Align the mounting holes in the sides of the MBB300C with the predrilled holes in the mounting surface.

Step 4: Insert four retention screws, two on each side, to secure the MBB300C to the wall.

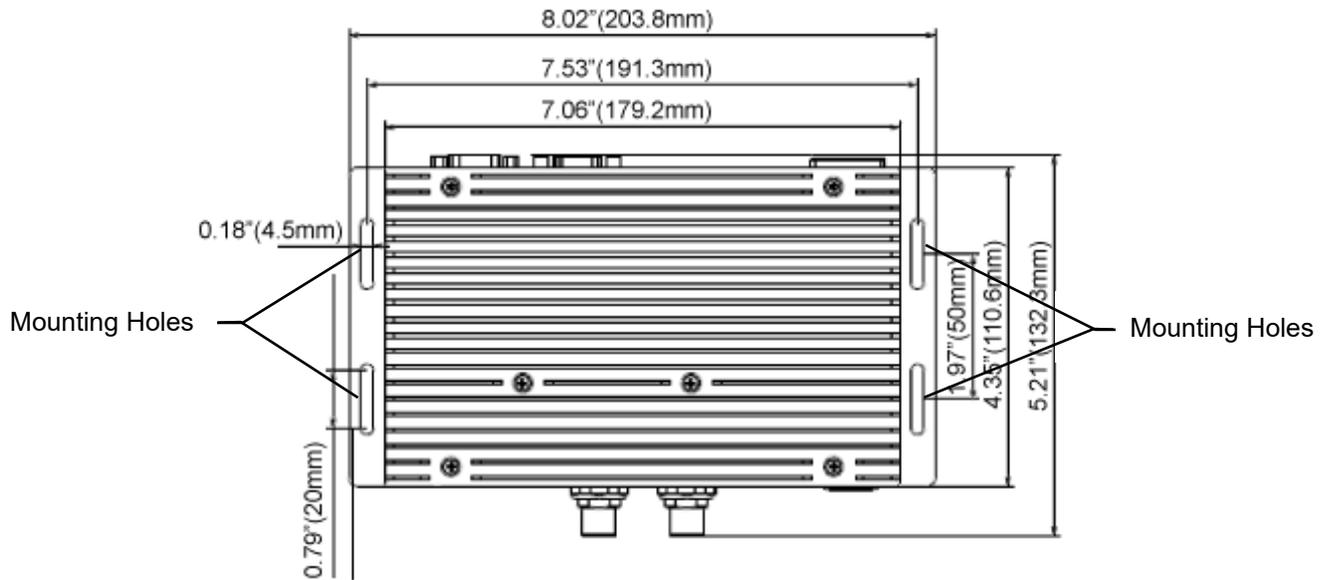


Figure 2 – Mounting Screw Hole Locations

2.5 Connecting the MBB300C

Some I/O interface connections of the MBB300C are found on the front panel (see Figure 3). The I/O interface panel located on the front of the MBB300C has the following I/O interface connectors:

- 2 x CAN-bus ports with isolation for connection to NMEA 2000®
- 2 x SATA HDD LED indicators
- 1 x Power Button with Power LED Indicator
- 2 x USB 2.0 connectors

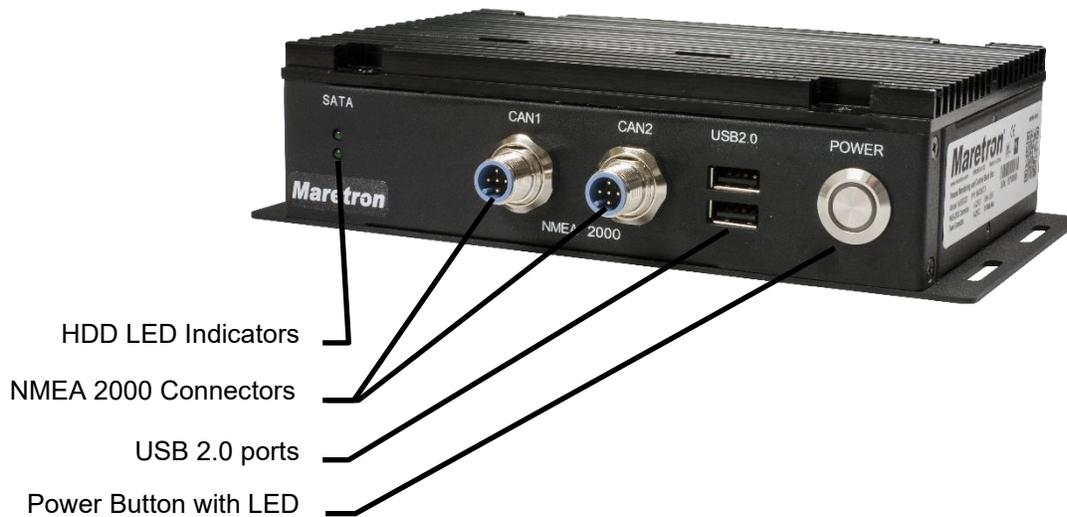


Figure 3 – MBB300C Front Panel Connections

The I/O interface panel located on the rear of the MBB300C (see Figure 4) has the following interface connectors:

- 1 x VGA output
- 1 x HDMI output
- 1 x RS-232 Serial Port
- 2 x USB 3.0 connectors
- 1 x Gigabit Ethernet (LAN) port
- 1 x 3-pin power terminal block with wide range power input (9V-36V)

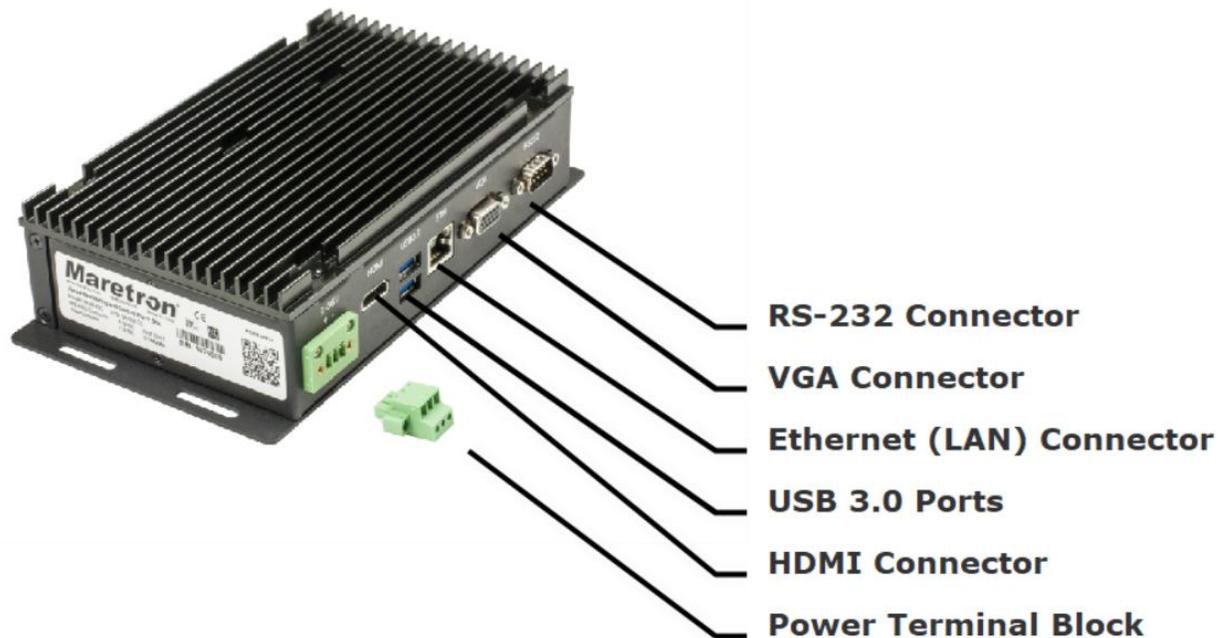


Figure 4 – MBB300C Front Panel

2.5.1 RS-232 Connection

There is one external RS-232 connector. The RS-232 connector enables connection to an external touch screen. To connect a serial cable with the RS-232 connector, please follow the instructions below.

Step 1: Locate the RS-232 connector on the rear panel of the MBB300C.

Step 2: Align the RS-232 connector on the serial cable with the RS-232 connector on the rear panel of the MBB300C.

Step 3: Once aligned, gently insert the serial cable RS-232 connector into the MBB300C RS-232 connector.

2.5.2 Video Connection



NOTE

- The MBB300C supports the connection of a single monitor through either the VGA or HDMI connection. It does not support the connection of multiple monitors.

2.5.2.1 VGA Connection

There is one external VGA connector. The VGA connector enables connection to a monitor. To connect a VGA cable with the VGA connector, please follow the instructions below.

Step 1: Locate the VGA connector on the rear panel of the MBB300C.

Step 2: Align the VGA connector on the cable with the VGA connector on the rear panel of the MBB300C.

Step 3: Once aligned, gently insert the cable VGA connector into the MBB300C VGA connector.

2.5.2.2 HDMI Connection

There is one external HDMI connector. The HDMI connector enables connection to a monitor. To connect a HDMI cable with the HDMI connector, please follow the instructions below.

Step 1: Locate the HDMI connector on the rear panel of the MBB300C.

Step 2: Align the HDMI connector on the cable with the HDMI connector on the rear panel of the MBB300C.

Step 3: Once aligned, gently insert the cable HDMI connector into the MBB300C HDMI connector.

2.5.3 LAN Connection

There is one external RJ-45 LAN connector. The RJ-45 connector enables connection to an external network. To connect a LAN cable with the RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connector on the rear panel of the MBB300C.

Step 2: Align the RJ-45 connector on the LAN cable with the RJ-45 connector on the rear panel of the MBB300C (see Figure 5).

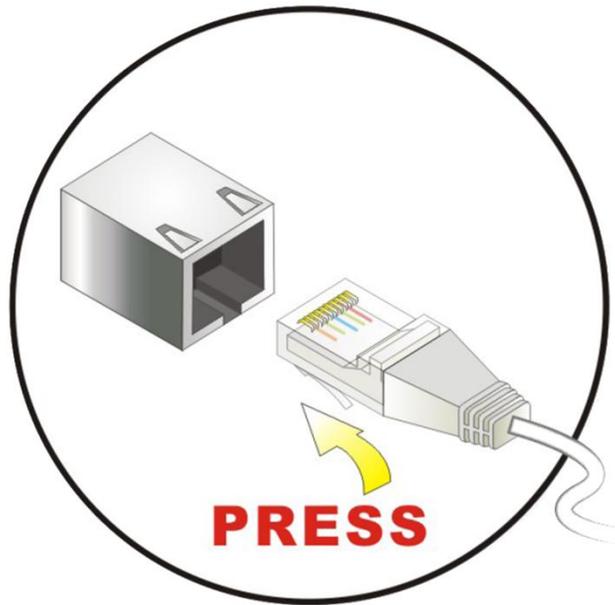


Figure 5 – LAN Connection

Step 3: Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

2.5.4 USB Device Connection

There are two external USB 2.0 connectors and two external USB 3.0 connectors. To connect a USB device, please follow the instructions below.

Step 1: The locations of the USB connectors are shown in Figure 3 and Figure 4.

Step 2: Align the USB device connector with one of the connectors (see Figure 6).

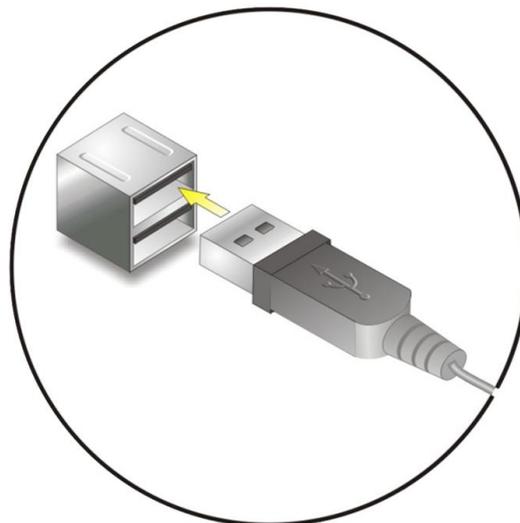


Figure 6 – USB Device Connection

Step 3: Once aligned, gently insert the USB device connector into the MBB300C connector.

2.5.5 Power Connection

The MBB300C can be connected to a power source in the following way (overcurrent protection should be provided and should be sized in accordance with ABYC E-11, AC and DC ELECTRICAL SYSTEMS ON BOATS):

Directly with 9-36VDC power source using the green power terminal block found on the rear panel of the MBB300C (see Figure 7).

- Connect the power source negative terminal to the right-hand terminal,
- Connect the power source positive terminal to the center terminal.

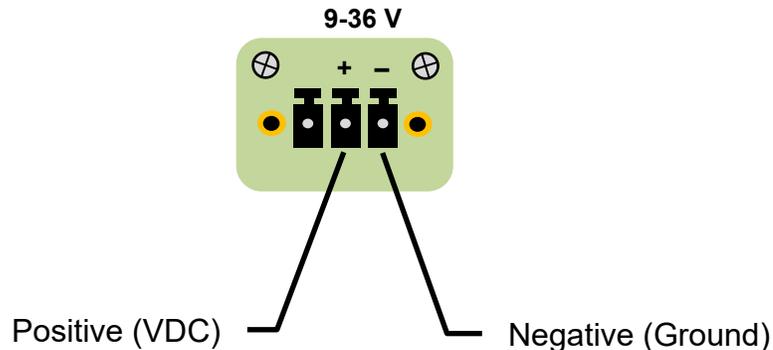


Figure 7 – MBB300C Power Terminal Block

2.5.6 Power Sequencing

When the MBB300C is connected to an appropriate power source, you can use the power switch located on the front panel (see Figure 4) to turn the MBB300C on or off. The MBB300C can also be switched on and off by applying or removing power through an external switch or breaker. Any time the power is reapplied to the MBB300C, it will turn on.

2.6 Configuring the MBB300C

In order to use the MBB300C, you must have it connected to the NMEA 2000® network.

The MBB300C will start up with the following warning screen:



Figure 8 – MBB300C Startup Screen

The first time you start the MBB300C, N2KView® will ask you to assign it a unique name. Assigning a unique name to the MBB300C is necessary in order to help you determine the source of alerts generated by a MBB300C or other Maretron device capable of generating alerts.

You are required to press **Accept** and thereby acknowledge this warning message before N2KView® will run in Live Mode.

Alternatively, you may **Enter Demo Mode**. In Demo Mode, you will not be able to connect to an NMEA 2000® network and view live data; instead, simulated data will be provided to stimulate the controls.

Finally, you may choose **Exit**, in which case the MBB300C will power off.

2.6.1 Manually Entering LAN Connection Information



NOTE

The LAN Connection is not necessary unless you are using any of the following features:

- Video
- E-mail actions on Alerts
- Online Updates
- Remote Support

If you intend to use the Video feature or send e-mails via the Alerts feature, you must ensure that the device can connect to your LAN (local area network). The MBB300C comes from the factory preconfigured to obtain its LAN connection information from a DHCP (Dynamic Host Control Protocol) server. If your local area network uses a DHCP server, no configuration is necessary, and the MBB300C should be able to successfully connect to the local area network.

If your local area network does not use DHCP, you must manually enter the LAN connection information into the MBB300C. This is done through the following steps:



Figure 9 – N2KView® Window with Tabs Displayed

- a. Click anywhere inside the N2KView® screen to display the screen tabs as shown in Figure 9 above.
- b. Click on the “**Commands & Settings**” tab (on the right) to display the Commands & Settings Dialog.

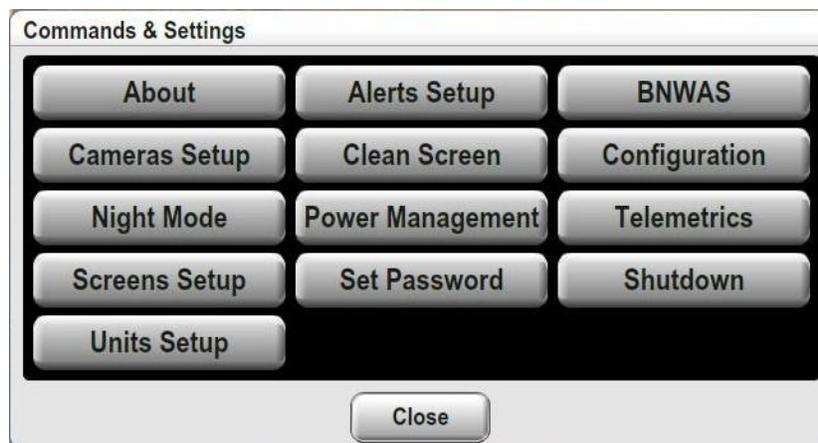


Figure 10 – Commands & Settings Dialog

- c. Click on the “**Configuration**” button in the Commands & Settings window to display the Configuration dialog.
- d. Click on the “**Ethernet**” tab in the Configuration dialog to display the Ethernet Configuration dialog.

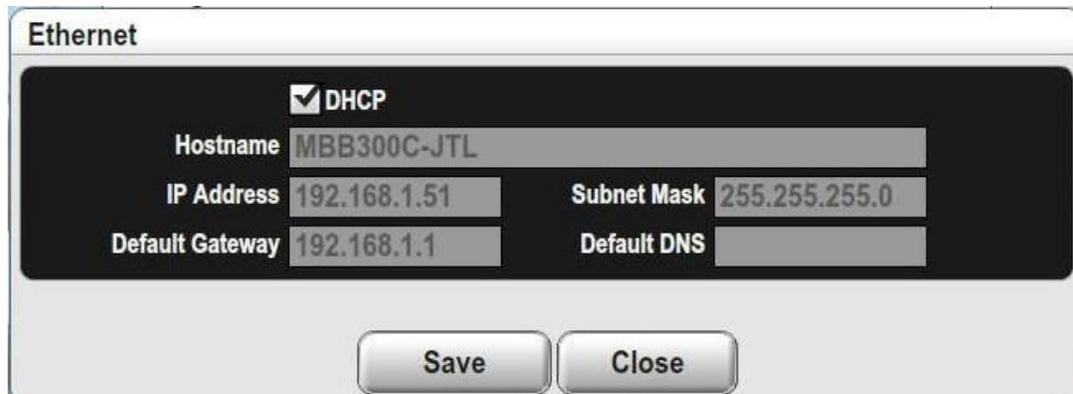


Figure 11 – Ethernet Configuration Dialog

- e. Uncheck the “**DHCP**” box to indicate that your LAN does not use DHCP.
- f. In the “**IP Address**” field, enter the IP address you wish to assign to the MBB300C.
- g. Click on the “**Configuration**” button in the Commands & Settings window to display the Configuration dialog.
- h. In the “**Subnet Mask**” field, enter the subnet mask value used on your LAN (in most cases, this value will be “255.255.255.0”).
- i. In the “**Default Gateway**” field, enter the IP address of the default gateway of your LAN.
- j. In the “**Default DNS**” field, enter the IP address of a DNS (Dynamic Name Service) Server used on your LAN.
- k. Click the “**Update**” button to make these changes permanent. The screen will go blank for a few seconds while this is being done.

3 Operating the MBB300C

3.1 Turning the MBB300C On

To turn on the MBB300C, press the power switch, located on the right-hand side of the front panel of the MBB300C. The power button LED will illuminate.

3.2 Turning the MBB300C Off

To turn the MBB300C off, use the “Shutdown” administrative tab of the N2KView® software. Alternatively, you can power down the unit by pressing the MBB300C’s power switch. Lastly, you can power down the unit by turning off the power source with an external breaker or external switch. The power button LED will turn off after the shutoff process has completed.

3.3 Using the MBB300C

The MBB300C runs a fully functional version of the Maretron N2KView® software. Please refer to the *N2KView® User's Manual*, packaged with the MBB300C, for detailed operating instructions.

4 Maintenance

Regular maintenance is important to ensure continued proper operation of the Maretron MBB300C. Perform the following tasks periodically:

- Clean the unit with a soft cloth. Do not use chemical cleaners as they may remove paint or markings or may corrode the MBB300C enclosure or seals. Do not use any cleaners containing acetone, as they will deteriorate the plastic enclosure. Do not spray cleaning liquids directly onto the MBB300C.
- Ensure that the unit is mounted securely and cannot be moved relative to the mounting surface. If the unit is loose, tighten the mounting screws.
- Check the security of the power and network cables connected to the MBB300C and tighten if necessary.

5 Troubleshooting

If you notice unexpected operation of the Maretron MBB300C, follow the troubleshooting procedures in this section to remedy simple problems.

Symptom	Troubleshooting Procedure
No activity on the display	Check the connection to the power and network connectors and tighten if necessary Ensure that power is supplied to the connected power cable. Check the connection to the power jack located on the rear of the device. Press the power switch located on the front of the device on the right-hand side. Check that the NMEA 2000 [®] interfaces are correctly connected to the NMEA 2000 [®] network.
Other Issues	Please refer to the Troubleshooting section of the <i>N2KView[®] User's Manual</i> .

If these steps do not solve your problem, please contact Maretron Technical Support (refer to Section Technical Support for contact information).

Warning: There are no user-serviceable components inside the Maretron MBB300C. Opening the MBB300C will expose the sensitive electronic components to adverse environmental conditions that may render the unit inoperative. Please do not open the MBB300C, as this will automatically void the warranty. If service is required, please return the unit to an authorized Maretron service location.

6 Technical Specifications

Specifications

Parameter	Value	Comment
Video Connector	VGA Port HDMI Port	For Monitor Connection
Monitor Resolution	2560 × 1600 Maximum (VGA) 1920 × 1080 Maximum (HDMI)	
USB Connector	Two USB 3.0 connections Two USB 2.0 connections	For connecting Peripherals (Mouse, keyboard, etc.) and or touch screen connectivity
Serial Connector	One RS232 9-Pin D Connector	For touch screen alternative connection
Touchscreen Drivers	TSHARC, 3M MicroTouch, ELO, eGalax, General Touch	Compatible with HID touch compliant panels
Ethernet Connector	RJ-45 GbE	For connection to IP cameras, email alert notifications, N2KView updates and remote support.
Controller Area Network (CAN) Ports	Two NMEA 2000 Micro-C Connectors	

Certifications

Parameter	Comment
FCC class A and CE Mark	Electromagnetic Compatibility
NMEA 2000®	

Electrical

Parameter	Value	Comment
Operating Voltage (Dedicated Supply Connection)	9–36 Volts	DC Voltage
Power Consumption (Dedicated Supply Connection)	10 Watts	Maximum
Operating Voltage (NMEA 2000® Connection)	8–32 Volts	DC Voltage
Power Consumption (NMEA 2000® Connection)	80 mA	Maximum When Transmitting 100%
Load Equivalence Number (LEN)	1	NMEA 2000® Spec. (1 LEN = 50 mA)
Reverse Battery Protection (NMEA 2000® Connection)	Yes	Indefinitely
Load Dump Protection (NMEA 2000® Connection)	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Overall Dimensions (D×W×H)	6.02" × 9.76" × 1.73" (132 mm x 204 mm x 49 mm)	Excluding Connectors and Wall Brackets
Weight	2.27 lbs (1.03 kg)	
Chassis Material	Aluminum	
Mounting	Wall Bracket	Any Orientation

Environmental

Parameter	Value
Operating Temperature	-20°C to 70°C
Storage Temperature	-40°C to 85°C
Humidity	10%–85% RH non-condensing

7 Technical Support

If you require technical support for Maretron products, you can reach us in any of the following ways:

Toll Free: 1-866-550-9100
Phone: 1-603-324-7900
E-mail: support@maretron.com
Customer Portal: Customer.Raymarine.com
World Wide Web: <http://www.maretron.com>
Mail: Raymarine-Maretron FL Service Center
120 Intracoastal Pointe Drive
Jupiter, FL 33477
USA



8 Maretron (2 Year) Limited Warranty

Maretron warrants the MBB300C to be free from defects in materials and workmanship for **two (2) years** from the date of original purchase. If within the applicable period any such products shall be proved to Maretron's satisfaction to fail to meet the above limited warranty, such products shall be repaired or replaced at Maretron's option. Purchaser's exclusive remedy and Maretron's sole obligation hereunder, provided product is returned pursuant to the return requirements below, shall be limited to the repair or replacement, at Maretron's option, of any product not meeting the above limited warranty and which is returned to Maretron; or if Maretron is unable to deliver a replacement that is free from defects in materials or workmanship, Purchaser's payment for such product will be refunded. Maretron assumes no liability whatsoever for expenses of removing any defective product or part or for installing the repaired product or part or a replacement therefore or for any loss or damage to equipment in connection with which Maretron's products or parts shall be used. With respect to products not manufactured by Maretron, Maretron's warranty obligation shall in all respects conform to and be limited to the warranty actually extended to Maretron by its supplier. The foregoing warranties shall not apply with respect to products subjected to negligence, misuse, misapplication, accident, damages by circumstances beyond Maretron's control, to improper installation, operation, maintenance, or storage, or to other than normal use or service.

THE FOREGOING WARRANTIES ARE EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE.

Statements made by any person, including representatives of Maretron, which are inconsistent or in conflict with the terms of this Limited Warranty, shall not be binding upon Maretron unless reduced to writing and approved by an officer of Maretron.

IN NO CASE WILL MARETRON BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, DAMAGES FOR LOSS OF USE, LOSS OF ANTICIPATED PROFITS OR SAVINGS, OR ANY OTHER LOSS INCURRED BECAUSE OF INTERRUPTION OF SERVICE. IN NO EVENT SHALL MARETRON'S AGGREGATE LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT(S) INVOLVED. MARETRON SHALL NOT BE SUBJECT TO ANY OTHER OBLIGATIONS OR LIABILITIES, WHETHER ARISING OUT OF BREACH OF CONTRACT OR WARRANTY, TORT (INCLUDING NEGLIGENCE), OR OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY MARETRON, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO.

Maretron does not warrant that the functions contained in any software programs or products will meet purchaser's requirements or that the operation of the software programs or products will be uninterrupted or error free. Purchaser assumes responsibility for the selection of the software programs or products to achieve the intended results, and for the installation, use and results obtained from said programs or products. No specifications, samples, descriptions, or illustrations provided by Maretron to Purchaser, whether directly, in trade literature, brochures or other documentation shall be construed as warranties of any kind, and any failure to conform with such specifications, samples, descriptions, or illustrations shall not constitute any breach of Maretron's limited warranty.

Warranty Return Procedure:

To apply for warranty claims, you must first contact Maretron or one of its dealers to describe the problem and determine the appropriate course of action. If a return is necessary, place the product in its original packaging together with proof of purchase and register your Maretron product via the Raymarine Customer Portal. Registration is required for all users. Within the Customer Portal, locate Repair and Service option and Create new Request. Users will be provided with a shipping label for product to be sent to a select Raymarine-Maretron Service Location. *Customer may incur charges for service and/or shipping if product is notably damaged by customer actions and not a behavior of manufacturing results. Maretron will return the replaced or repaired product with all shipping and handling prepaid except for requests requiring expedited shipping (i.e. overnight shipments). Failure to follow this warranty return procedure could result in the product's warranty becoming null and void.

Customer Portal: [Customer.Raymarine.com](https://www.raymarine.com/customer-portal)

Maretron reserves the right to modify or replace, at its sole discretion, without prior notification, the warranty listed above. To obtain a copy of the current warranty policy, please go to the following web page:

Warranty Information: <https://www.maretron.com/warranty/>