

C-NavTM

CM145 Interface Manual

Revision 5

Revision Date: March 29, 2018

C-Nav Positioning Solutions
730 E. Kaliste Saloom Road
Lafayette, LA 70508 U.S.A.
www.oceaneering.com/cnav



Release Notice

This is the March 2018 release of the CM145 Interface Manual.

Revision History

| 5 | 3/29/2018 | Updated for new domain | L. Cortes |
|----------|------------|---------------------------------|--------------------------|
| 4 | 1/14/2017 | Updated for new rear panel | L. Cortes |
| 3 | 05/27/2016 | Updated for OII standards | C. Thompson L. Cortes |
| 2 | 03/02/2015 | Updated for CM145 version 1.1.0 | C. Thompson |
| 1 | 08/01/2014 | Initial document creation | L. Cortes C. Thompson |
| Revision | Date | Description | Author |

Trademarks

The Oceaneering logo is a trademark of Oceaneering International, Inc. C-Nav and *C-Nav3050* are trademarks of Oceaneering International, Inc. All other brand names are trademarks of their respective holders.

Disclaimer of Warranty

EXCEPT AS INDICATED IN “LIMITED WARRANTY” HEREIN, OCEANEERING INTERNATIONAL, INC. SOFTWARE, FIRMWARE AND DOCUMENTATION ARE PROVIDED “AS IS” AND WITHOUT EXPRESSED OR LIMITED WARRANTY OF ANY KIND BY EITHER OCEANEERING INTERNATIONAL, INC., OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, OR DISTRIBUTION INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK, AS TO THE QUALITY AND PERFORMANCE OF THE OCEANEERING INTERNATIONAL, INC. HARDWARE, SOFTWARE, FIRMWARE AND DOCUMENTATION, IS WITH YOU. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

Limitation of Liability

IN NO EVENT WILL OCEANEERING INTERNATIONAL, INC., OR ANY PERSON INVOLVED IN THE CREATION, PRODUCTION, OR DISTRIBUTION OF THE OCEANEERING INTERNATIONAL, INC. SOFTWARE, HARDWARE, FIRMWARE AND DOCUMENTATION BE LIABLE TO YOU ON ACCOUNT OF ANY CLAIM FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY DAMAGES ASSESSED AGAINST OR PAID BY YOU TO ANY THIRD PARTY, ARISING OUT OF THE USE, LIABILITY TO USE, QUALITY OR PERFORMANCE OF SUCH OCEANEERING INTERNATIONAL, INC. SOFTWARE, HARDWARE, AND DOCUMENTATION, EVEN IF OCEANEERING INTERNATIONAL, INC., OR ANY SUCH PERSON OR ENTITY HAS BEEN ADVISED OF THE POSSIBILITY OF DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SO, THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Table of Contents

CM145 Interface Manual..... 1

 Trademarks3

 Disclaimer of Warranty3

 Limitation of Liability3

List of Figures5

List of Tables6

 Manual Organization7

 Related Documents.....7

 Related Standards.....8

 NMEA 01838

 Manual Conventions.....9

Section 1 - Overview..... 10

Section 2 - Hardware 11

 Major Components 11

 3U High 19” Rack Mount Case..... 11

 Rear Panel 11

 DC POWER Connector 12

 LAN 12

 There are two Ethernet connectors available. 12

 GNSS Inputs 12

 1PPS Inputs 12

 Acoustic Input..... 13

 IMU POWER/DATA Connector 13

 Serial Output Ports 13

 Front Panel..... 14

 LED Status 14

 4” Touchscreen Display Monitor 14

 Power Supply Board..... 14

 5 Port Ethernet Switch..... 15

 BF-480 TCP/IP to Serial Converter 15

 1PPS TTL / RS422..... 15

 Power Supply Pig Tail 15

 C-Mariner / Interface Data / Power Cable 16

| | |
|--|----|
| Section 3 - Software..... | 17 |
| Introduction | 17 |
| Status Bar | 18 |
| Menu | 18 |
| AHRS Page..... | 19 |
| Numeric Page..... | 20 |
| Status Page..... | 21 |
| Quality Page..... | 23 |
| Data Page | 24 |
| Trend Page | 25 |
| Alarms Page..... | 26 |
| About Page | 27 |
| Appendix A - Serial Configuration..... | 28 |
| Serial Input / Output Parameters..... | 28 |
| Appendix B - BF-480 Reset | 31 |

List of Figures

| | |
|---|----|
| Figure 1: CM145 Interface | 10 |
| Figure 2: CM145 Rear Panel | 12 |
| Figure 3: CM145 Interface Front Panel..... | 14 |
| Figure 4: Status Bar | 18 |
| Figure 5: Menu Page | 18 |
| Figure 6: AHRS Page | 19 |
| Figure 7: Numeric Page | 20 |
| Figure 8: Status Page | 21 |
| Figure 9: Quality Page | 23 |
| Figure 10: Data Page..... | 24 |
| Figure 11: Trend Page | 25 |
| Figure 12: Alarms Page | 26 |
| Figure 13: About Page | 27 |
| Figure 14: Ethernet / Serial Login Page..... | 29 |
| Figure 15: Ethernet / Serial Network Settings Page..... | 29 |

Figure 16: Ethernet / Serial, Serial Type-Port 130
 Figure 17: BF-480 Ethernet TCP/IP to Serial Bridge Reset Button31
 Figure 18: PC Local Area Network Settings.....32
 Figure 19: Web Browser to BF-480 IP Address32
 Figure 20: Login Screen.....33
 Figure 21: Network Settings Page33
 Figure 22: Updated Network Setting Page.....34
 Figure 23: Operating Mode Setup Page34
 Figure 24: TCP Client Page34
 Figure 25: Serial Port Setup Page35

List of Tables

Table 1: 3 Pin XLR Power Connector 12
 Table 2: COM7 & COM8 Inputs 12
 Table 3: 1PPS TTL Inputs..... 12
 Table 4: Acoustic Input COM6 13
 Table 5: 23 Pin Female Bulkhead Connector 13
 Table 6: Serial Output Ports Pin Assignments 13
 Table 7: Front Indicator LEDs 14
 Table 8: Power Data Cable Pin Assignments 16
 Table 9: AHRS Page Capabilities 19
 Table 10: Numeric Page Capabilities.....20
 Table 11: Available Indicators Per Aiding Source 22
 Table 12: Quality Page Capabilities23
 Table 13: Trend Page Capabilities.....25
 Table 14: Default Channel to Com Port Mapping28
 Table 15: TCP Client Configuration52able.....35
 Table 16: Baud Rate Default Settings.....36

Manual Organization

The purpose of this document is to provide instructions on how to use the CM145 Interface to communicate with the C-Mariner line of products. Sections are organized in a manner that facilitates quick operator orientation.

[Section 1 - Overview](#) (Page 10) provides a brief overview of this document.

[Section 2 - Hardware](#) (Page 11) provides a hardware description of the CM145.

[Section 3 - Software](#) (Page 17) provides details about the software running on the touchscreen display unit of the CM145.

[Appendix A - Serial Configuration](#) (Page 28) provides instructions on configuring the serial ports on the BF-480 Ethernet TCP/IP - to Serial Bridge.

[Appendix B - BF-480 Reset](#) (Page 31) provides instructions on properly resetting the configurations on the BF-480 Ethernet TCP/IP - to Serial Bridge.

Related Documents

[CNAV-MAN-034.2 \(C-Mariner With CM145 Quick Start Guide\)](#)

The C-Mariner with CM145 Quick Start Guide provides instructions on how to quickly setup a C-Mariner using the CM145 Interface. It is available by contacting C-Nav Support at cnavsupport@oceanengineering.com.

[CNAV-MAN-014.2 \(C-Mariner User Guide\)](#)

The C-Mariner User Guide provides the user with information on the C-Mariner family of systems, such as the operation, setup, installation, configuration, and calibration of the C-Mariner. Please contact cnavsupport@oceanengineering.com for a copy of the user guide.

Related Standards

NMEA 0183

National Marine Electronics Association Standard For Interfacing Marine Electronic Devices. NMEA National Office; 7 Riggs Avenue; Severna Park, Maryland 21146

Manual Conventions

Arial font is used for plain text in this document.

Arial italic font is used for settings names.

“Arial quoted” font is used for settings values.

Arial Bold font is used for button names.

Arial Bold Italic font is used for menu items.

[Arial Blue](#) font is used for cross-references.

[Arial Blue Underline](#) font is used for hyperlinks.

Arial red italic is used for typed commands.

Arial **Bold** font size 10 is used for captions.

ARIAL BLACK ALL-CAPS font is used for port connection names.



This symbol means Reader Be Careful. It indicates a caution, care, and / or safety situation. The user might do something that could result in equipment damage or loss of data.



This symbol means Danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical and RF circuitry and be familiar with standard practices for preventing accidents.

Important notes are displayed in shaded text boxes.

Please note:

Such note boxes display important information that should not be ignored.

Simple file content is displayed in Courier New Black font in a text box.

```
#Sample File  
Version 0.1
```

Section 1 - Overview

This section describes the CM145 Interface between the C-Mariner and all external connections. It explains all major components, functionalities, and performance of the interface. The CM145 Interface is 3U high 19" rack mount case. The case houses hardware components that interface the C-Mariner to GNSS aiding devices and provides configurable serial outputs. It contains a power board that provides regulated voltages to the sensor and internal components. It has Ethernet access to configure the C-Mariner and serial output ports, two GNSS serial inputs, one acoustic input, five configurable serial outputs, voltage status LEDs, a 4" touchscreen display to decode / display the C-Mariner output messages, and converts two GPS time marks (1PPS) from TTL to RS422 format required by the C-Mariner.



Figure 1: CM145 Interface

Section 2 - Hardware

Major Components

- 3U High 19" Rack Mount
- Power Supply Board
- 4" Touchscreen Display Monitor
- Status LEDs
- 5 Port Ethernet Switch
- BF-480 TCP/IP to Serial Converter
- C-Mariner Power / Data Cable

3U High 19" Rack Mount Case

The enclosure is a 3U high black anodized aluminum (19" Wide x 14.5" Deep x 5.25" High) rack mount enclosure. The rear of the enclosure is used for connecting all the inputs / outputs, power, and protection fuses. The front side is used for on / off, power status LEDs, and it has a 4" touchscreen display that decodes NMEA and TSS1 messages from the C-Mariner.

Rear Panel

The interface accepts a 24V DC input voltage using a 3 pin XLR female connector and it has a 5A slow blow protecting fuse. It has two Ethernet LAN connectors to access configurations for the C-Mariner and output serial ports. It uses two female DB9 connectors for GNSS input and two BNC 1PPS (one pulse per second) connectors for time marks. For acoustic input it uses one male DB9 connector. The **POWER/DATA** is a 23 pin female bulkhead connector which provides the power, communications, and 1PPS to the C-Mariner and it has a 5A slow blow protection fuse. The serial output of the C-Mariner is through five female DB9 connectors.



Figure 2: CM145 Rear Panel

DC POWER Connector

| 3 Pin XLR Female | Description |
|------------------|---------------|
| 1 | Not Connected |
| 2 | + 24V DC |
| 3 | - Negative |

Table 1: 3 Pin XLR Power Connector

LAN

There are two Ethernet connectors available.

GNSS Inputs

| DB9 Male Connector | Description |
|--------------------|-------------|
| 2 | RX |
| 3 | TX |
| 5 | Ground |

Table 2: COM7 & COM8 Inputs

1PPS Inputs

| Isolated BNC Connector | Description |
|------------------------|-------------|
| Inside Pin | Data (TTL) |
| Outside Shell | Ground |

Table 3: 1PPS TTL Inputs

Acoustic Input

| DB9 Female Connector | Description |
|----------------------|-------------|
| 2 | TX |
| 3 | RX |
| 5 | Ground |

Table 4: Acoustic Input COM6

IMU POWER/DATA Connector

| AMPHENOL PT06A-16-23P | Description |
|--------------------------|--|
| Z | 28V DC Primary Power |
| A | 28V DC Power Return |
| D | + Sense |
| C | - Sense |
| F | Time Mark, Sense, and Power drain (Chassis Ground) |
| L | Ethernet TX + (White/Orange) |
| M | Ethernet TX- (Orange) |
| Y | Ethernet RX+ (White/Green) |
| X | Ethernet RX - (Green) |
| V | *GPS1 Primary Time Mark (A) |
| W | *GPS1 Primary Time Mark (B) |
| H | *GPS2 Primary Time Mark (B) |
| J | *GPS2 Primary Time Mark (A) |

Table 5: 23 Pin Female Bulkhead Connector

Serial Output Ports

| DB9 Female Connector | Description |
|----------------------|-------------|
| 2 | TX |
| 3 | RX |
| 5 | Ground |

Table 6: Serial Output Ports Pin Assignments

Please note:

The baud rate for COM5 is fixed at 19200.

Front Panel

The front panel has an illuminated **ON/OFF** button with a protecting cover guard, three LED power indicators, and a 4” touchscreen display.



Figure 3: CM145 Interface Front Panel

LED Status

Upon powering up the CM145 Interface, the front LEDs should be lit green, indicating the following:

| Component | Description | Description |
|-----------|---------------------------------------|---------------------------------------|
| INPUT OK | Green = Input power distribution okay | Off = No Input power |
| 28V OK | Green = 28V distribution okay | Off = No output voltage from DC/DC #1 |
| 12V OK | Green = 12V distribution okay | Off = No output voltage from DC/DC #2 |

Table 7: Front Indicator LEDs

4” Touchscreen Display Monitor

The Touchscreen Display Monitor displays and decodes the C-Mariner messages. See [Section 3 - Software](#) for more information.

Power Supply Board

The CM145 Interface uses two ultra-compact high power DC/DC converters to

provide a stable voltage and handle up to 85 Watts. One power supply provides 28V DC to power the C-Mariner, BF-480 TCP/IP to Serial Converter, and 4" touchscreen display. The second 12V DC internal power supply powers the Ethernet Switch. These DC/DC converters provide isolation between the power supply lines and signal ground.

5 Port Ethernet Switch

The Ethernet Switch is used to communicate through the C-Mariner LAN network, BF-480 TCP/IP to Serial Converter, and to external devices using the RJ45 (**LAN #1 & 2**) on the back panel. It is set to auto-negotiate to 10/100/1000 Mbit / second.

BF-480 TCP/IP to Serial Converter

The BF-480 Ethernet to Serial Converter permits the communications between the C-Mariner and serial devices. It has eight input / output ports. It is configured as a TCP Client Mode and uses two ports as inputs for the GNSS and four for data outputs, leaving two spare ports. Manual configuration is done by connecting an Ethernet cable to the external RJ45 connector and using a web browser console. The converter has been configured to use a default IP address and subnet mask of 192.168.1.11 and 255.255.255.0. At power up initialization, the BF-480 TCP/IP to Serial Converter connects automatically to the C-Mariner configured ports. Should the serial outputs need to be changed, refer to [Appendix A - Serial Configuration](#) (Page 28) for configuration instructions. In the event the TCP/IP to Serial Converter needs to be reset, refer to [Appendix B - BF-480 Reset](#) (Page 31).

1PPS TTL / RS422

The C-Mariner sensor accepts up to 2 x RS422 time mark inputs (1PPS). The **Oceanering[®] C-Nav3050[®]** GNSS receiver provides this signal at a TTL logic level; therefore, a TTL / RS422 converter on the main PCB is included. The 1PPS inputs are only required for the INS option (CM600); a second 1PPS is fitted for sensors with the Dual GNSS Option. INS operation is possible without a 1PPS input but with reduced performance. 1PPS is not required for the Gyro (CM300) or the AHRS (CM400) options.

Power Supply Pig Tail

The CM145 Interface comes with a 6' power cable with an XLR 3 pin male connector and the other end unterminated to connect to a 24V power supply

(supplied by customer). Two power supplies options are available: a desktop type and a dual 19” rack mount power supply.

C-Mariner / Interface Data / Power Cable

Power and Data Cable Connections:

| C-Mariner Side (AMPHENOL MS27467T17B35S) | Description | CM145 Side (AMPHENOL PT02A-16-23S) |
|---|-----------------------------------|---|
| 1 | 28V DC Primary Power | Z |
| 2 | 28V DC Primary Return | A |
| 1 | + Sense | D |
| 2 | - Sense | C |
| | Time Mark, Sense, and Power Drain | F |
| 5 | Ethernet RX + (White/Green) | Y |
| 6 | Ethernet TX+ (White/Orange) | L |
| 7 | Ethernet RX- (Green) | X |
| 8 | Ethernet TX - (Orange) | M |
| 9 | C-Mariner Chassis Ground | |
| 41 | Ethernet Shield | |
| 49 | *GPS2 Primary Time Mark (A) | J |
| 54 | *GPS2 Primary Time Mark (B) | H |
| 50 | *GPS1 Primary Time Mark (A) | V |
| 55 | *GPS1 Primary Time Mark (B) | W |

Table 8: Power Data Cable Pin Assignments

Section 3 - Software

Introduction

The CM145 Interface has a 4" touchscreen display unit that decodes messages from the C-Mariner sensor. Upon power up, the display unit goes through a boot up sequence lasting approximately 45 seconds. After initialization, the display unit will decode the different messages and display the data in six different pages. The touchscreen buttons on the right side of the screen are used to navigate between pages.

The CM145 display unit is capable of decoding the following messages:

- \$GGA
- \$GST
- \$HDT
- \$ROT*
- \$STS
- \$THS
- \$VTG
- \$ZDA*
- TSS1

Please note:

* Denotes NMEA sentences that are not currently used by the touchscreen monitor.

Each page will display information available from the C-Mariner based on the model of the C-Mariner. For example, the CM300 is not capable of outputting heave, so the AHRS page will only display pitch, roll, and heading. The description of each page will detail which information is available from each C-Mariner model.

For each field, if the required information from the C-Mariner is not present, the field will show "--".

The \$HDT and \$THS messages both report heading, and the CM145 display unit is capable of using either. Therefore, it is not necessary to have both enabled. If both do happen to be available, the \$THS message will be used.

Status Bar



Figure 4: Status Bar

At the top of the CM145 display unit's screen, a status bar will always show the current heading, pitch, roll, and mode of the C-Mariner. The *Mode* field shows the current *Operating Mode* and the *Aiding Sources*.

Menu



Figure 5: Menu Page

The CM145 display unit's menu can be accessed at any time via the **Menu** button at the top-right of the screen. The menu can be dismissed by pressing the **Close** button in the same location.

AHRS Page

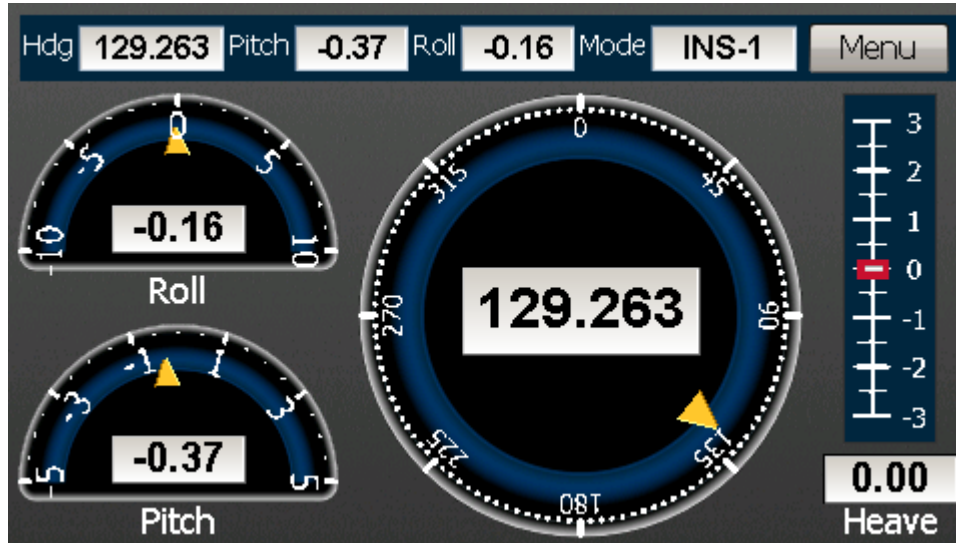


Figure 6: AHRS Page

The AHRS uses the TSS1, \$HDT, and \$THS messages to decode the pitch, roll, heave, and heading of the C-Mariner. This is the default page of the CM145 display unit.

| | Heading | Pitch | Roll | Heave |
|--------------|---------|-------|------|-------|
| CM300 | X | X | X | |
| CM400 | X | X | X | X |
| CM600 | X | X | X | X |

Table 9: AHRS Page Capabilities

Numeric Page

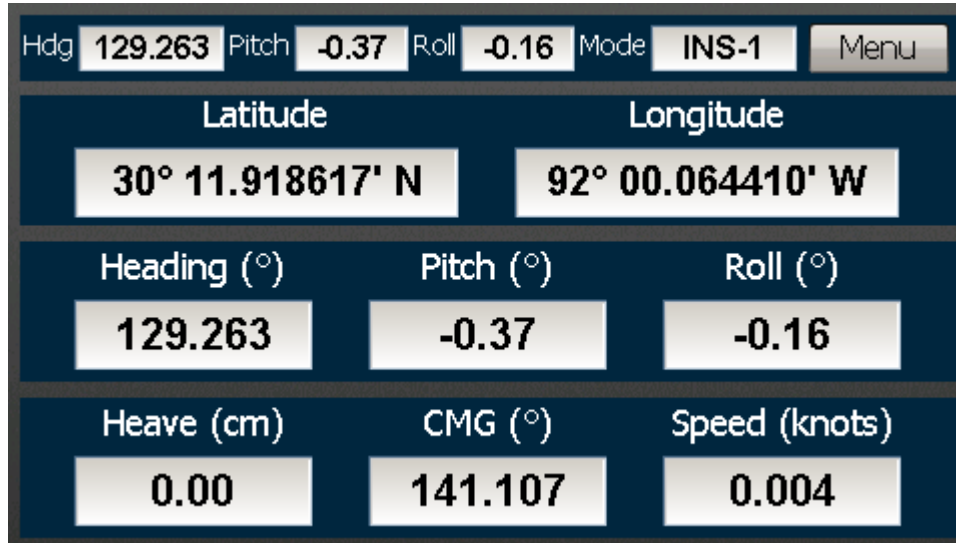


Figure 7: Numeric Page

The Numeric page displays the raw numerical values from the \$GGA, \$HDT, \$THS, TSS1, and \$VTG messages.

| | Position | Heading | Pitch | Roll | Heave | CMG | Speed |
|--------------|----------|---------|-------|------|-------|-----|-------|
| CM300 | | X | X | X | | | |
| CM400 | | X | X | X | X | | |
| CM600 | X | X | X | X | X | X | X |

Table 10: Numeric Page Capabilities

Status Page

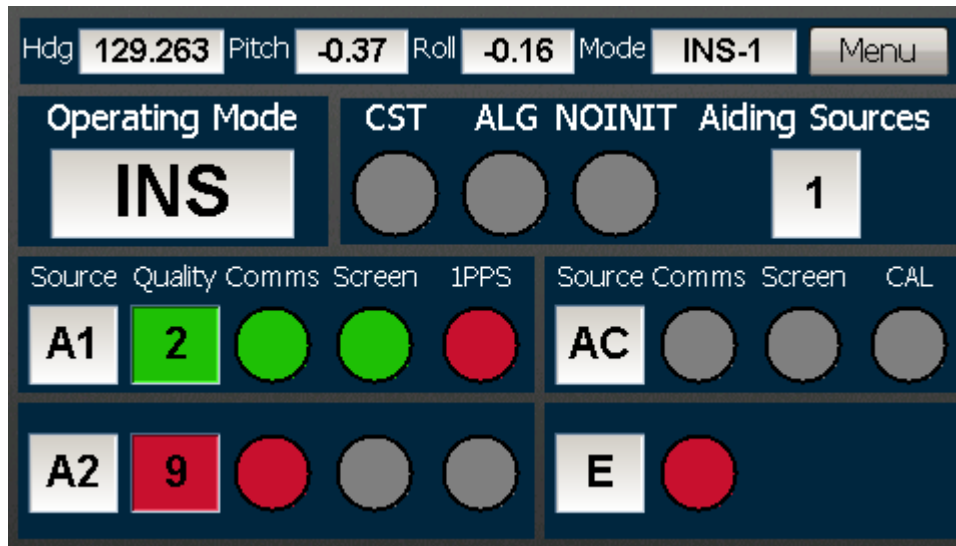


Figure 8: Status Page

Operating Mode: The current operating mode of the C-Mariner unit. This will be one of the following:

- GYC
- AHRS
- INS
- FLT

Please note:

When the C-Mariner is in INS mode and the system is powered up with no GNSS input, it will fallback to GYC mode.

There are three indicator lights that represent On Occurrence messages from the C-Mariner.

CST: This indicator will be triggered during the following conditions:

- When coasting for more than one minute, the indicator will be yellow.
- When coasting for more than two minutes, the indicator will be orange.
- When coasting for more than three minutes, the indicator will be red.
- When the C-Mariner is in dead reckoning mode, the indicator will flash red.

ALG: This indicator will be yellow when the C-Mariner unit is aligning. This will occur during initialization until the C-Mariner reaches a heading variance of less than 1.25°.

NO INIT: This indicator will be red in one of two situations:

- When the C-Mariner is in GYC mode and has no latitude input.
- When the C-Mariner is in AHRS or INS mode and has no latitude or no longitude input.

Aiding Sources: Indicates the number of GNSS input sources received.

Each aiding source has several indicators that describe the validity of its input.

Quality: This indicator is green when good data is available from the GNSS aiding source and red when no valid data is available. The numerical value of the indicator is the Quality Indicator field of the \$GGA message.

Comms: This indicator is green when receiving good data and red when not receiving valid data.

Screen: This indicator is green when the C-Mariner accepts good data, red when the C-Mariner rejects invalid GNSS or Acoustics data, and grey when not applicable.

1PPS: This indicator is green when the C-Mariner receives 1PPS input, red when it does not, and grey when not applicable.

CAL: This indicator is red when the Acoustics input to the C-Mariner has not been calibrated, and grey when not applicable

| | Quality | Comms | Screen | 1PPS | CAL |
|------------------|----------------|--------------|---------------|-------------|------------|
| GNSS 1 | X | X | X | X | |
| GNSS 2 | X | X | X | X | |
| Acoustics | | X | X | | X |
| EM Log | | X | | | |

Table 11: Available Indicators Per Aiding Source

Quality Page

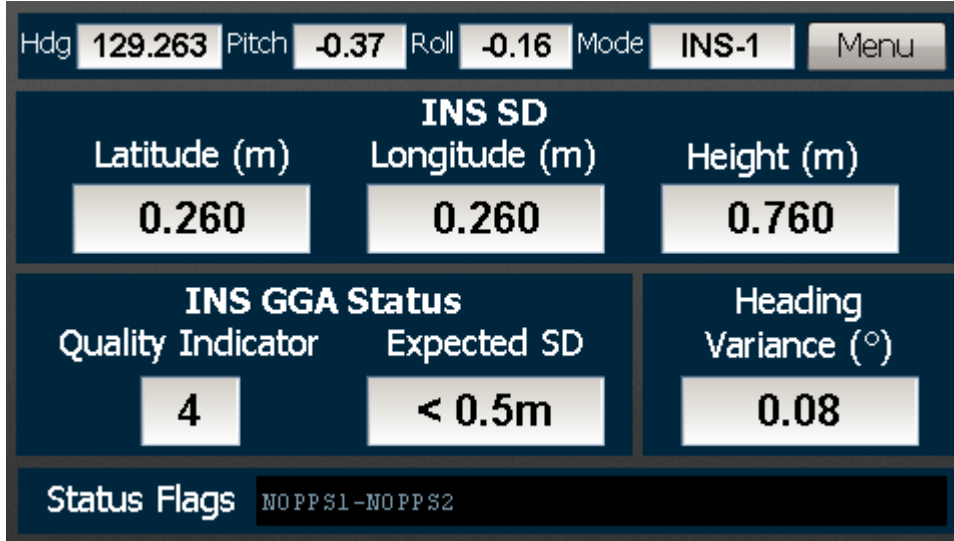


Figure 9: Quality Page

The Quality page displays position standard deviation information from the \$GST message, heading variance and On Occurrence messages from the \$STS message, and the GNSS Quality Indicator from the \$GGA message. It also displays an expected value for position standard deviation based on the INS Quality Indicator.

| | Position SD | GGA Quality Indicator | Expected SD | Heading Variance |
|--------------|-------------|-----------------------|-------------|------------------|
| CM300 | | | | X |
| CM400 | | | | X |
| CM600 | X | X | X | X |

Table 12: Quality Page Capabilities

Data Page

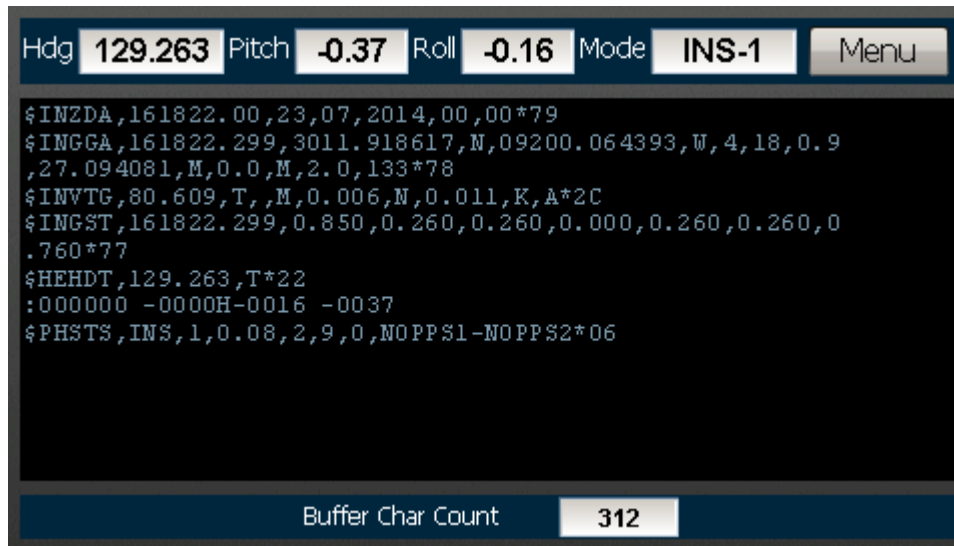


Figure 10: Data Page

The Data page displays the incoming data in real-time for all C-Mariner products.

Trend Page

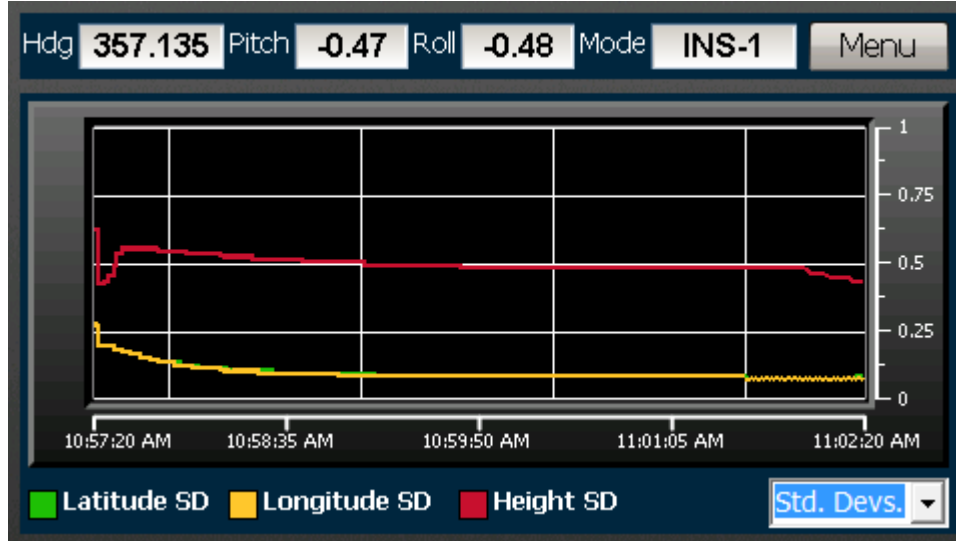


Figure 11: Trend Page

The Trend page shows a five minute history of select values from the C-Mariner. The graph will auto-scale according to the input data.

| | Heading | Pitch / Roll | Heave | Position SD |
|--------------|---------|--------------|-------|-------------|
| CM300 | X | X | | |
| CM400 | X | X | X | |
| CM600 | X | X | X | X |

Table 13: Trend Page Capabilities

Alarms Page

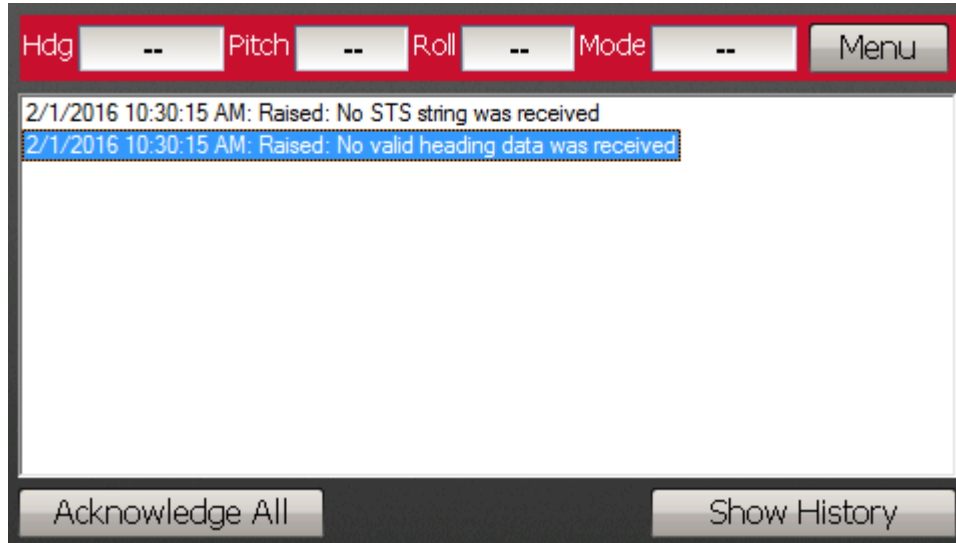


Figure 12: Alarms Page

The Alarms page shows any current, and all previous, alarms that occurred based on the C-Mariner data.

There are two screens in the Alarms page: Current and History. The Current screen will show any active alarms while the History screen will show any active and all previous alarms. To switch between the two screens, press the **Show History** and **Show Current** buttons.

Please note:

If there is an active alarm, the status bar will flash red. It will flash until the alarm has been acknowledged or until the alarm reason has been cleared.

To acknowledge an active alarm, and to stop the status bar from flashing, press the **Acknowledge All** button. This will move all current alarms to the History screen.

About Page



Figure 13: About Page

The About page lists the current version of the CM145 display unit software as well as contact information for C-Nav support.

Appendix A - Serial Configuration

The I/O channels of the C-Mariner are mapped to serial ports using a BF-480 Ethernet TCP/IP Serial Bridge. This component has its own web browser configuration utility, and is set to be on the same local network as the C-Mariner. It is preprogrammed as follows.

Find below the default serial input / output settings:

| C-Mariner Ports | Ethernet / RS232 Converter | CM145 Ports |
|------------------------|---|--|
| Output Channel 1: 4660 | COM1 9600,8,N,1 | COM 1 (Output) |
| Output Channel 2: 4661 | COM2 9600,8,N,1 | COM 2 (Output) |
| Output Channel 3: 4662 | COM3 9600,8,N,1 | COM 3 (Output) |
| Output Channel 4: 4663 | COM4 9600,8,N,1 | COM 4 (Output) |
| Output Channel 5: 4664 | COM5 19200, 8, N,1 Output to Beijer Display | COM 5 (Output) Fixed 19200 Baud Rate |
| Input Channel 1: 4650 | COM7 9600,8,N,1 | (Input) COM7 |
| Input Channel 2: 4651 | COM8 9600,8,N,1 | (Input) COM8 |
| Input Channel 3: 4652 | COM6 9600,8,N,1 | (Input) COM6 |

Table 14: Default Channel to Com Port Mapping

Serial Input / Output Parameters

If the serial default parameters are not satisfactory, they may be modified.

1. Using an Ethernet straight cable from a PC to the RJ45 Connector (**LAN #1**) on the CM145 Interface box, open a web browser and type "192.168.1.11". This will take you to a login page as shown in [Figure 14: Ethernet / Serial Login Page](#) (Page 29).
2. A Login Screen will prompt for a User Name and Password. Type "admin" for both.

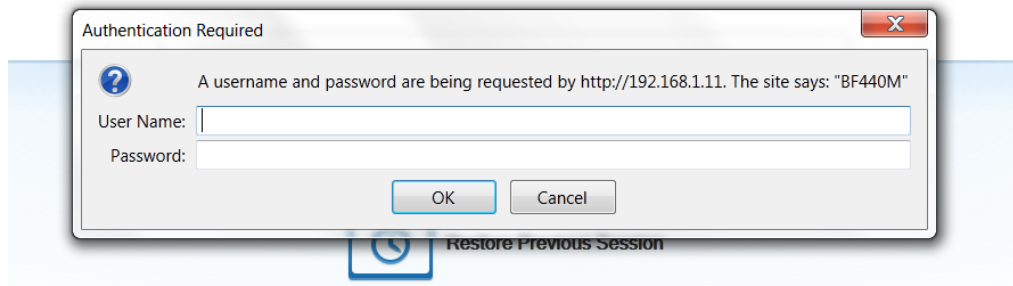


Figure 14: Ethernet / Serial Login Page

3. The **Network Settings** page will be shown by default. Click on **Serial Type** in the left-hand menu.

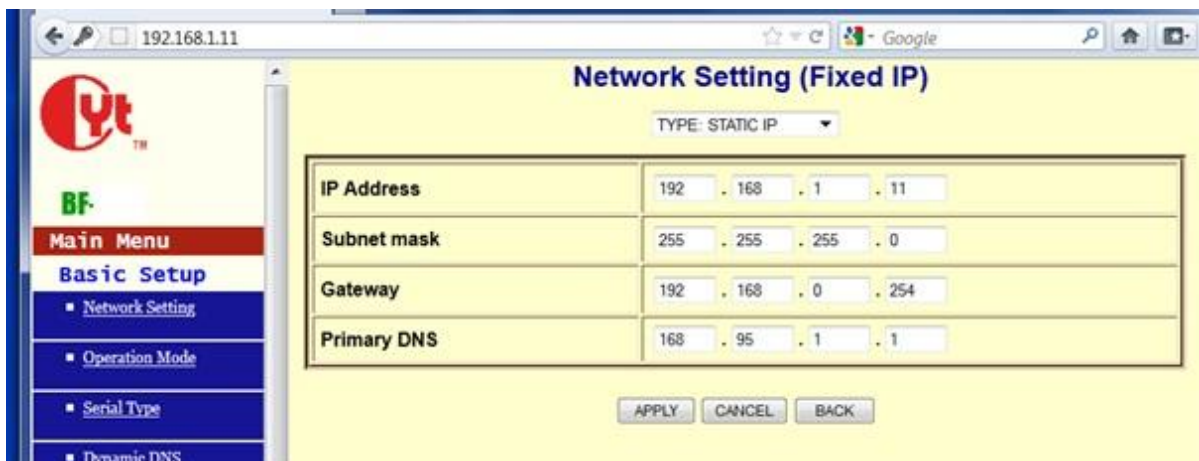


Figure 15: Ethernet / Serial Network Settings Page

4. Click **Port 1** in the left-hand sub-menu. Note: **PORT 1** is COM1 Output. Select "9600" for the *Baud Rate* then click **Apply**.

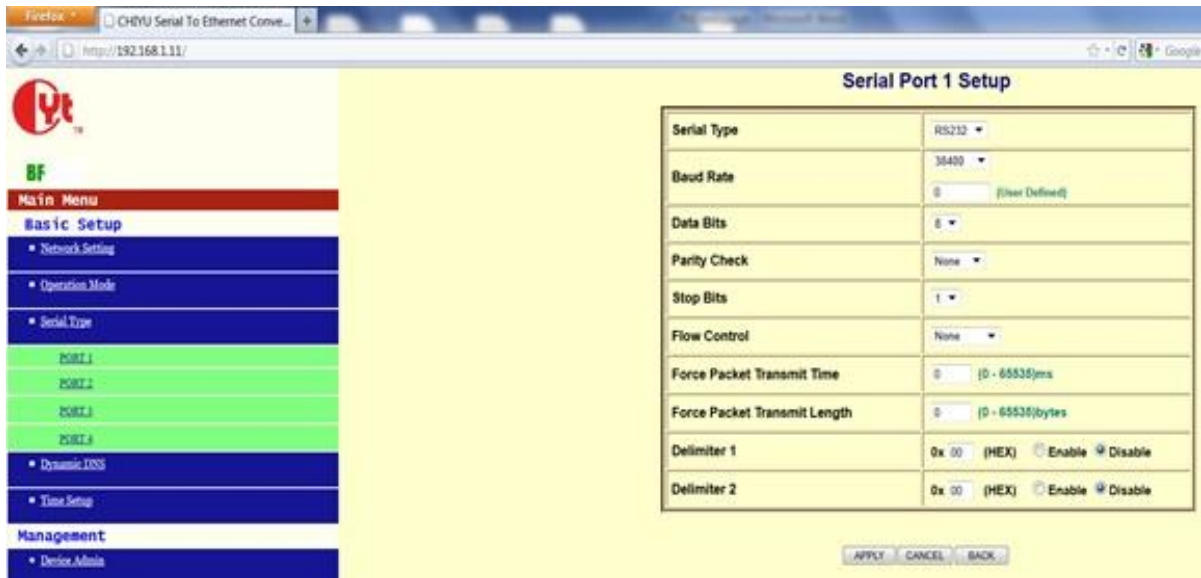


Figure 16: Ethernet / Serial, Serial Type-Port 1

5. Repeat steps 3 & 4 for any other ports' baud rate changes see [Table 14](#).
6. To exit the configuration page, click the **X** in the right-hand top side of the page.

Appendix B - BF-480 Reset

In the event that the BF-480 Ethernet TCP/IP to Serial Bridge hangs up the network, and turning the interface off / on does not resolve the problem, follow the instructions below to reset the BF-480.

1. While the unit is running, remove the seven screws (six screws on the top lid; the seventh on the rear of the top lid) of the CM145 Interface box using a Phillips screw driver.
2. Locate the BF-480 Ethernet TCP/IP to Serial Bridge.



Figure 17: BF-480 Ethernet TCP/IP to Serial Bridge Reset Button

3. Locate the reset hole just beside the RJ45 connector. Using a paper clip, introduce one side through the hole and hold it for ten seconds. This will reset the BF-480 to the factory defaults settings.
4. Turn off the CM145 Interface, wait five seconds, then turn it on.
5. Connect a straight Ethernet cable from a PC to the RJ45 connector outside the CM145 Interface.
6. Configure the computer's Local Area Network as shown in [Figure 18: PC Local Area Network Settings](#) (Page 32).
 - a. IP address: "192.168.0.100"
 - b. Subnet mask: "255.255.255.0"

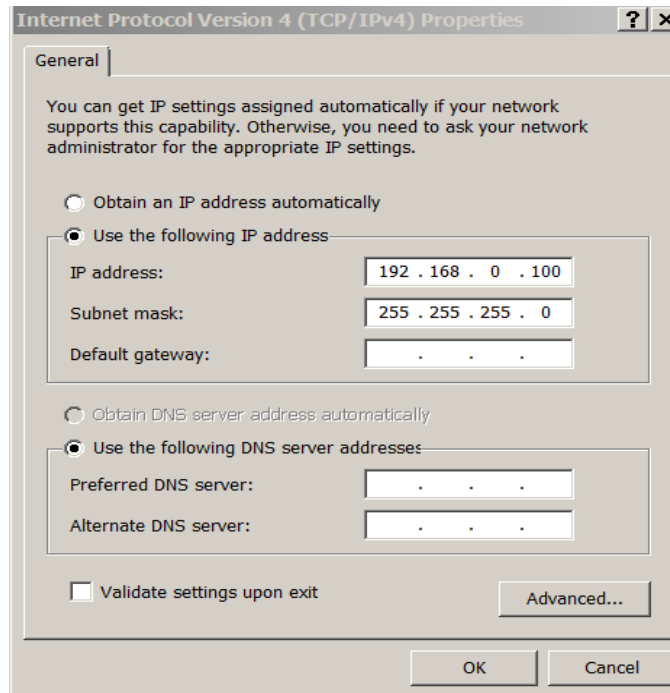


Figure 18: PC Local Area Network Settings

7. Open a web browser and type “192.168.0.125” in the address bar.

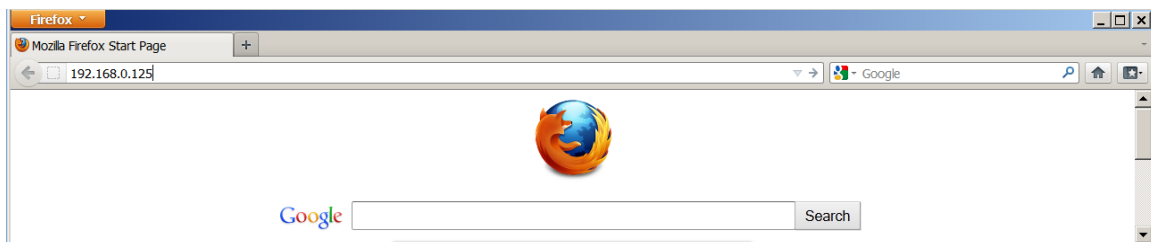


Figure 19: Web Browser to BF-480 IP Address

8. A Login Screen will prompt for a User Name and Password. Type “admin” for both.

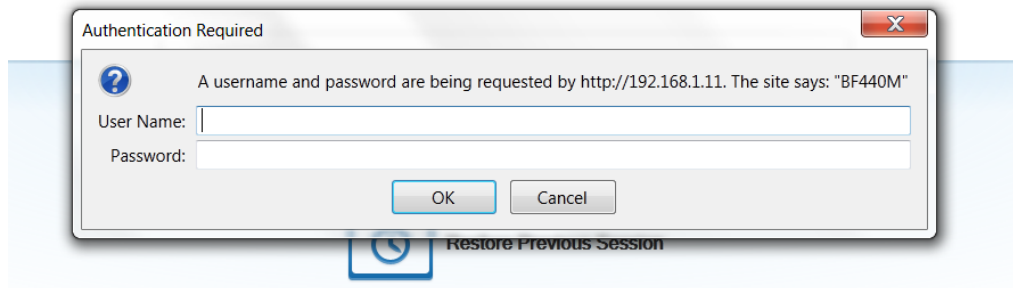


Figure 20: Login Screen

9. By default, the **Network Settings** page with default IP address information will be displayed.

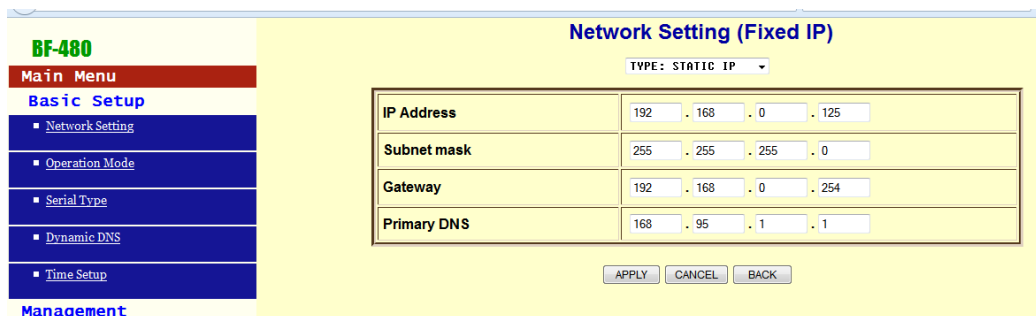


Figure 21: Network Settings Page

10. Replace the current IP address to “192.168.1.11” and click “Apply”.
11. Close this web browser by clicking at the “X” on the right hand top corner.
12. Go back to the computer Local Area Network and change the IP address to “192.168.1.100”.
13. Open a web browser and type “192.168.1.11”.
14. Type “admin” for the User Name and “admin” for the Password.

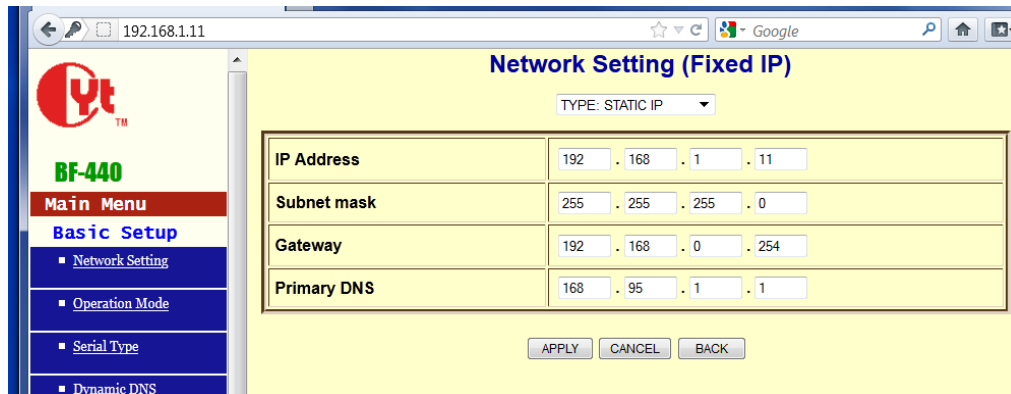


Figure 22: Updated Network Setting Page

15. Click at “Operation Setting” and click at “Port1”

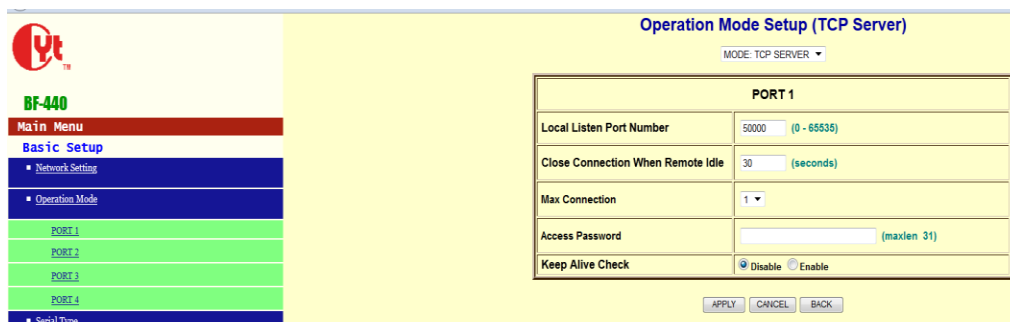


Figure 23: Operating Mode Setup Page

16. Select from the drop down menu under Operation Mode Setup, “MODE: TCP CLIENT”.



Figure 24: TCP Client Page

17. Under Destination IP Address 1, enter “192.168.1.10” and for Port enter “4660”. Under the “TCP Connect On” leave the “Setup” enable and click “Apply”.
18. For the rest of the ports use the following table.

| Destination | IP Address | Port | Number | TCP Connect On |
|--------------------------|--------------|--------|--------|----------------|
| Destination IP address 1 | 192.168.1.10 | Port 1 | 4660 | Startup |
| Destination IP address 1 | 192.168.1.10 | Port 2 | 4661 | Startup |
| Destination IP address 1 | 192.168.1.10 | Port 3 | 4662 | Startup |
| Destination IP address 1 | 192.168.1.10 | Port 4 | 4663 | Startup |
| Destination IP address 1 | 192.168.1.10 | Port 5 | 4664 | Startup |
| Destination IP address 1 | 192.168.1.10 | Port 6 | 4652 | Any Character |
| Destination IP address 1 | 192.168.1.10 | Port 7 | 4650 | Any Character |
| Destination IP address 1 | 192.168.1.10 | Port 8 | 4651 | Any Character |

Table 15: TCP Client Configuration Table

19. Once ports have been configured in the “Operation Mode”. Click at the “Serial Type”.

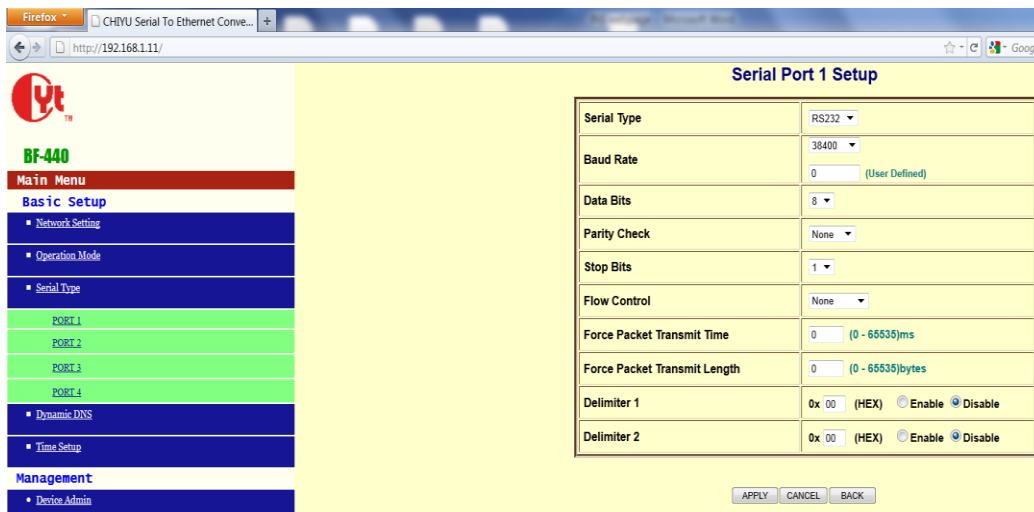


Figure 25: Serial Port Setup Page

20. Click on Port 1. Select 9600 baud rate (leave any other configuration as default) then click “Apply”. Use the following table to configure the rest of the ports.

| Port | Baud Rate |
|--------|-----------|
| Port 1 | 9600 |
| Port 2 | 9600 |
| Port 3 | 9600 |
| Port 4 | 9600 |
| Port 5 | 19200 |
| Port 6 | 9600 |
| Port 7 | 9600 |
| Port 8 | 9600 |

Table 16: Baud Rate Default Settings

21. Click the “X” at the top right hand corner to exit.