Companion Device to
Mintaka STAR

ENET

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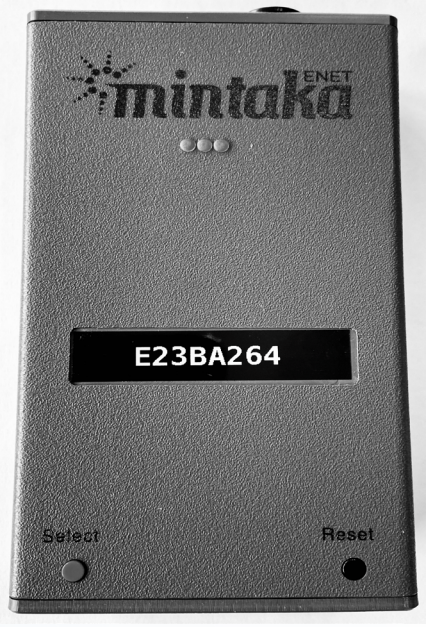
USER'S GUIDE



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Mintaka ENet User's Guide

v1.4

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The Mintaka STAR Ethernet Adapter (ENet) is the communication bridge between the Mintaka STAR dual-sensor electronic barograph, which uses USB to power the instrument and communicate collected data, and a NWS VOS ship's IT infrastructure which uses Ethernet as its communication protocol. Mintaka ENet is available to government programs, such as the NOAA / NWS VOS Program. It is not currently available as a consumer retail product.

The Mintaka ENet is sold & distributed exclusively by Barber Creations, LLC DBA Mintaka Innovations.

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INTRODUCTION

PRODUCT DESCRIPTION

The Mintaka STAR Ethernet Adapter (ENet) is a companion device to the Mintaka STAR electronic barograph. It is designed to receive weather observation data from the STAR and STAR**X** devices and broadcast this data on a local Internet subnet via an Ethernet connection. The broadcast data can then be received by TurboWin+ so it can be passed on the national weather services. Mintaka ENet addresses the issue where USB ports are not available on the computer that is running TurboWin+, most notably, virtual terminals, which are becoming more common on ships today.

Mintaka ENet can be used it two ways:

1. Connected to an Ethernet cable, power, and a Mintaka STAR, it functions as described above as a bridge between the STAR and (usually) the virtual terminal running TurboWin+.
2. Connected to a PC running Mintaka Commander, new firmware builds can be installed in Mintaka ENet.

GETTING STARTED

Upon receipt of a Mintaka ENet device, it is a good idea to verify that the latest firmware is installed. This is done using the MintakaCommander application.

STEP 1 If needed, install the applicable driver on your computer.

If the PC is running Windows 10 or later, no drivers need to be installed. If the PC is running an earlier version of Windows then the driver located at the following address needs to be installed before the ENet is connected to the PC: https://www.st.com/en/development-tools/stsw-stm32102.html.

STEP 2 Install or update MintakaCommander. Only the latest version of MintakaCommander supports the ENet. If you are setting up multiple ENet devices, you only need to do this once.

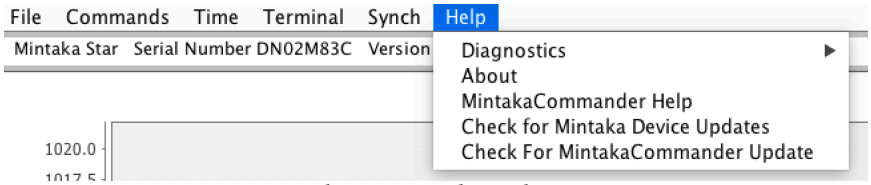
To install: Enter or paste the appropriate address in a browser address window:

Windows: http://mintakainnovations.com/downloads/MintakaCommander.exe

Mac: http://mintakainnovations.com/downloads/MintakaCommander.zip

Double-click the downloaded file to install the application on the computer.

To update: Run MintakaCommander. Select “Check for MintakaCommander Update” from the Help Menu.



MintakaCommander Help Menu

When the update process is complete, Quit MintakaCommander. Move the application from the browser downloads folder to the desired location on your computer.

STEP 3 Connect the ENet to the computer using the supplied 0.5m/1.6’ USB cable. Run MintakaCommander. Choose the ENet device in the dialog box. Select “Check for Mintaka Device Update” from the Help Menu. Update the firmware if necessary.

INSTALLATION

Installation of the device on a ship is straight-forward.

STEP 1 Connect the ENet device to the ships Ethernet with an Ethernet cable. It must be on the same subnet as the computer running TurboWin+.

STEP 2 Connect the ENet device to a Mintaka STAR using the 12.7cm / 5" USB On-The-Go Host adapter cable. ⚠ Use the 12.7cm / 5" USB cable that is supplied with the Mintaka ENet device. Other cables may not work and could damage the device.

STEP 3 Connect the ENet device to power. ⚠ Assemble and use the AC power adapter that is supplied with the Mintaka ENet device. Other adapters may not work and could damage the device.

After power is connected it will take a couple of seconds for the lights to start to come on and for the connected Mintaka STAR to power up.

Note: it may be necessary to adjust the contrast on the Mintaka STAR when connected to the ENet device.

The connected devices should look like this:

Mintaka ENet with Mintaka STAR

Note: ENet and STAR do not need to be installed side by side as shown above. ENet connects to the ship infrastructure running TurboWin+ via Ethernet. The STAR needs to be located where the WIFI connection with the STAR**X** / STAR**XG** is strong.

STEP 4 Install the Mintaka STAR / ENet devices in accordance with the Mintaka STAR and STAR**X/XG** User's Manuals. Heavy-duty Velcro is supplied with the ENet and STAR.

OPERATION

STATUS LED LIGHTS

There are 3 status lights on the Mintaka ENet:

- The red (leftmost) light indicates that the device is powered and the software is up and running.
- The blue (center) light indicates that the ENet is in USB host mode and is connected to a device (a STAR).
- The green (rightmost) light indicates that the IP address for the ENet device has been configured. This can either be done with DHCP (default) or by statically configuring the IP address. When weather data is broadcast over the Ethernet connection this light blinks (goes out and then comes back on).

SELECT AND RESET BUTTONS

Select Button

The leftmost button, “Select”, is used for testing. Pressing this button will cause weather information to be broadcast to TurboWin+. You should also see the green light blink. If TurboWin+ is running, this weather data should be display in TurboWin+.

Reset Button

The right most button is “Reset”. If any cable is unplugged or plugged back in while the ENet device is powered up, it is always a good idea to press the reset button to insure the device restarts and detects the cable changes.

IP AND MAC ADDRESSES

If it is necessary to determine the IP address of the ENet device this can be found on the WiFi Status screen on the Mintaka Star as shown below.

STAR WiFi Status Screen

The MAC address can be found on the ENet’s website; discussed in the following section.

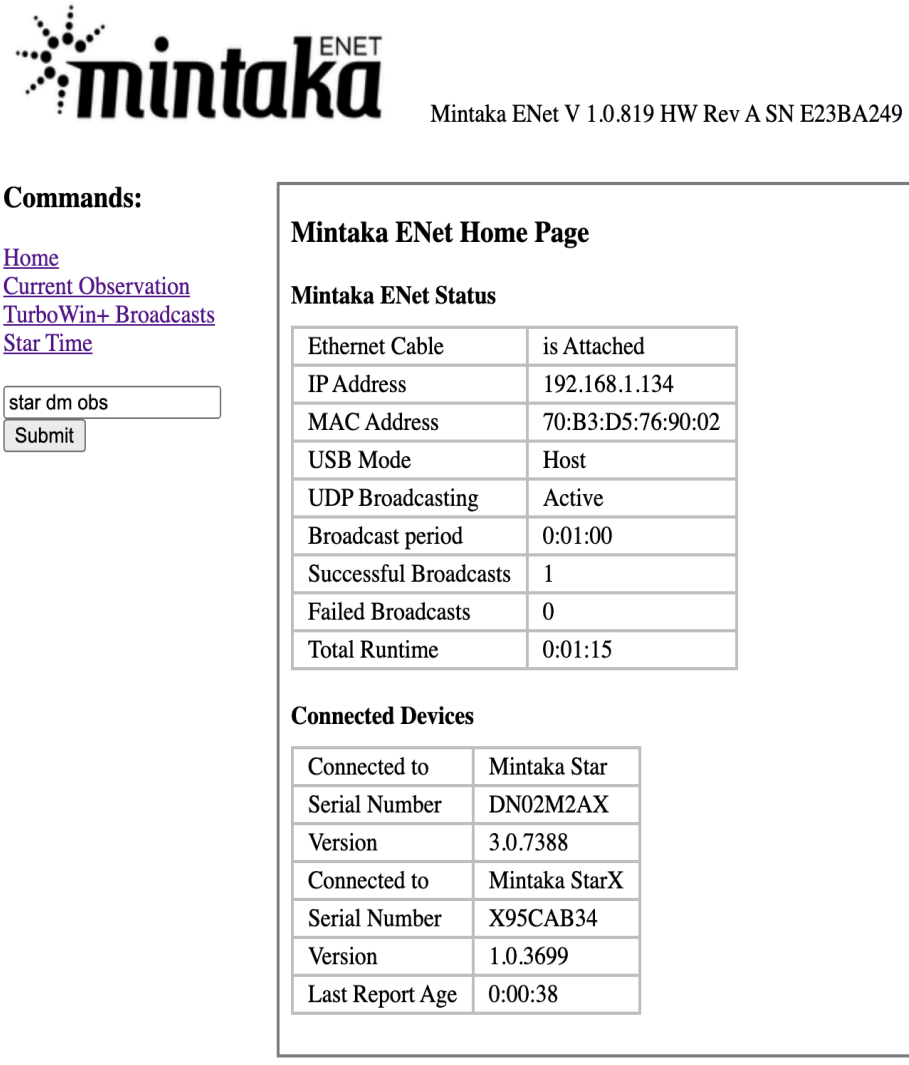
Another method for determining the IP address in use is to connect to the ENet's command processor (see section Connecting to ENet's Command Processor).

Once connected, issue the command 'ip'; and this will print out the IP address details:

```
ip
MAC address 70:B3:D5:76:90:03
IPAddress 192.168.1.50
Net mask 255.255.255.0
Gateway 192.168.1.1
OK
```

ENET WEBSITE

Once the IP address is determined, the ENet's website can be accessed using any internet browser to configure and view the status of the ENet device, and connected devices. Using a computer, tablet or smartphone connected to the same network as the ENet, type his IP address into a web browser. The ENet's Home Page will be displayed, as below:



ENet Home Page

The status of the ENet device is shown, including it's MAC address if that is needed. Useful information here includes how many successful or failed broadcasts have occurred to determine if the ENet device is working correctly.

Below the ENet status table is the status of any connected device. In the example shown above a STAR and a STAR**X** (via the STAR) are connected to the ENet.

Other commands:

Current Observation

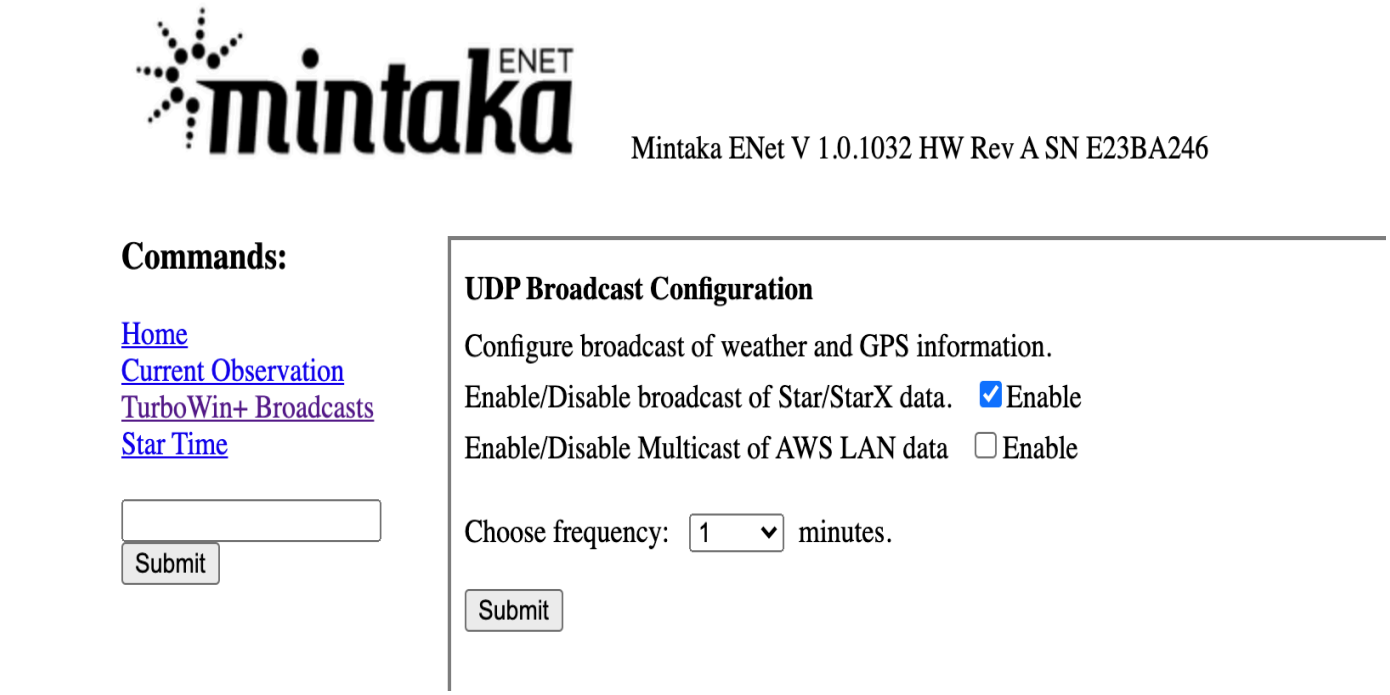
Selecting this menu item displays the data from the current observation.

Current Observation

TurboWin+ Broadcasts

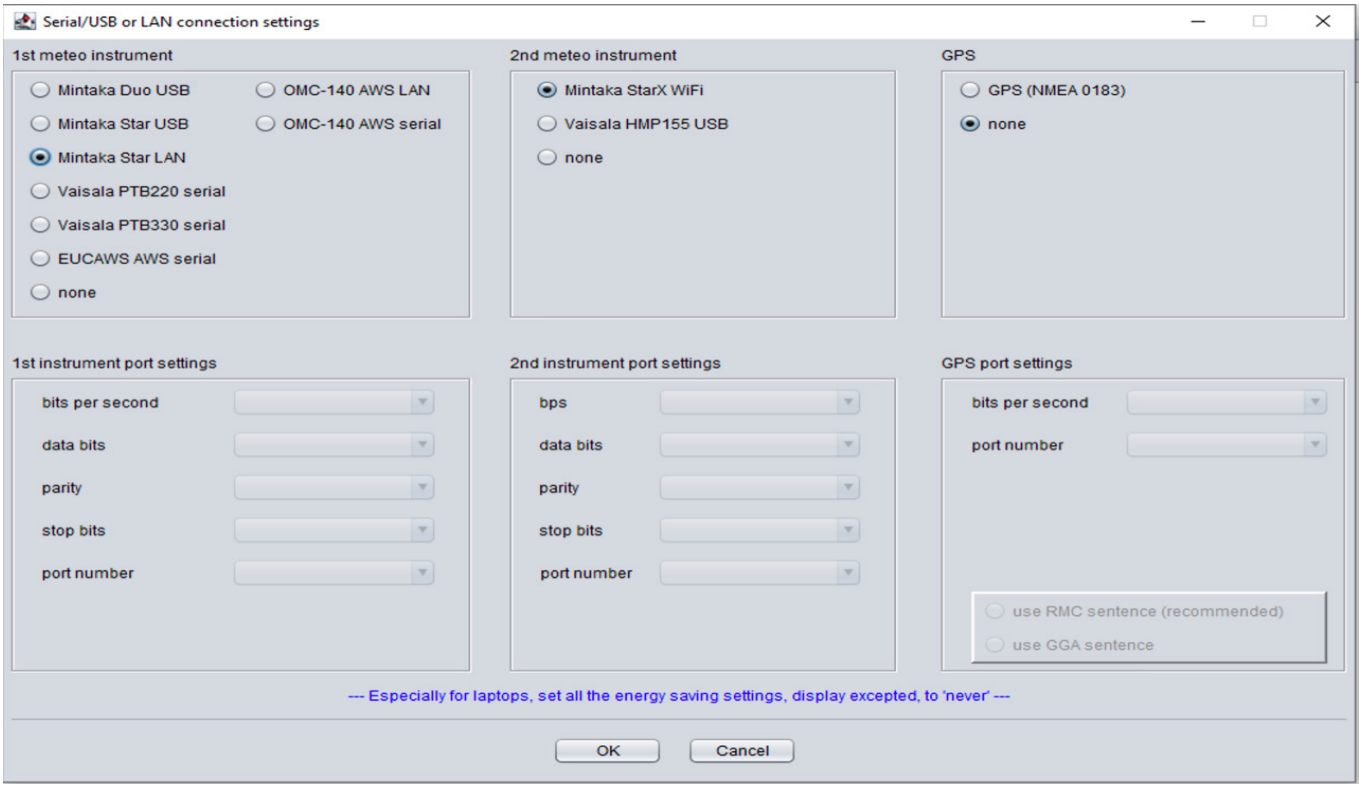
Selecting this menu item displays a page on which selections made control which TurboWin+ broadcasts are active, and their frequency.

The first check box will have information sent to TurboWin+ via UDP broadcast.



TurboWin+ Broadcasts

The corresponding selection in TurboWin+ under the 'Serial/USB or LAN connection settings', maintenance dialog 'Mintaka USB LAN' should be chosen. Additionally, if a STAR**X** or STAR**XG** is in use, the 'Mintaka StarX WiFi' option should be selected under the '2nd meteo instrument' options.



The second check box in the TurboWin+ Broadcasts - AWS LAN data - should be chosen to send information to TurboWin+ in the standard reporting format. In this case the option to choose in TurboWin+ is the 'OMC-140 AWS LAN' option.

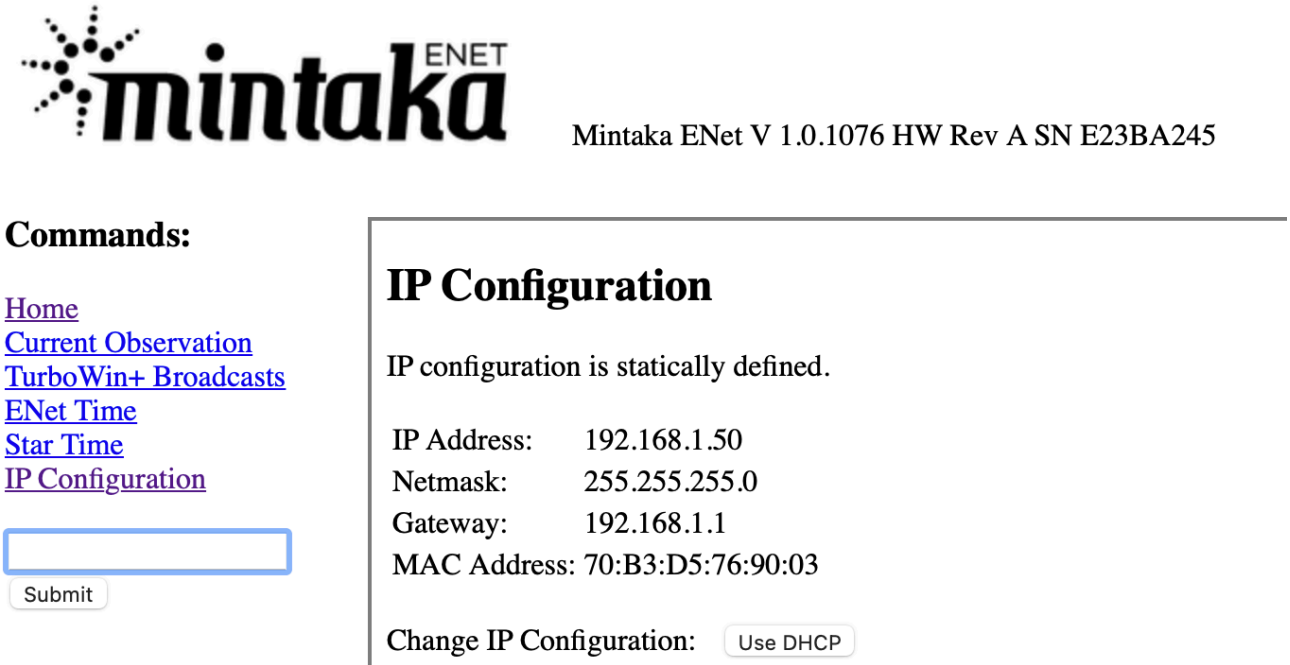
The frequency option allow you to choose how often information is sent. TurboWin+ expects reports every minute so it is best to leave this at 1 minute.

STAR Time

This menu item displays the time from the connected STAR device.

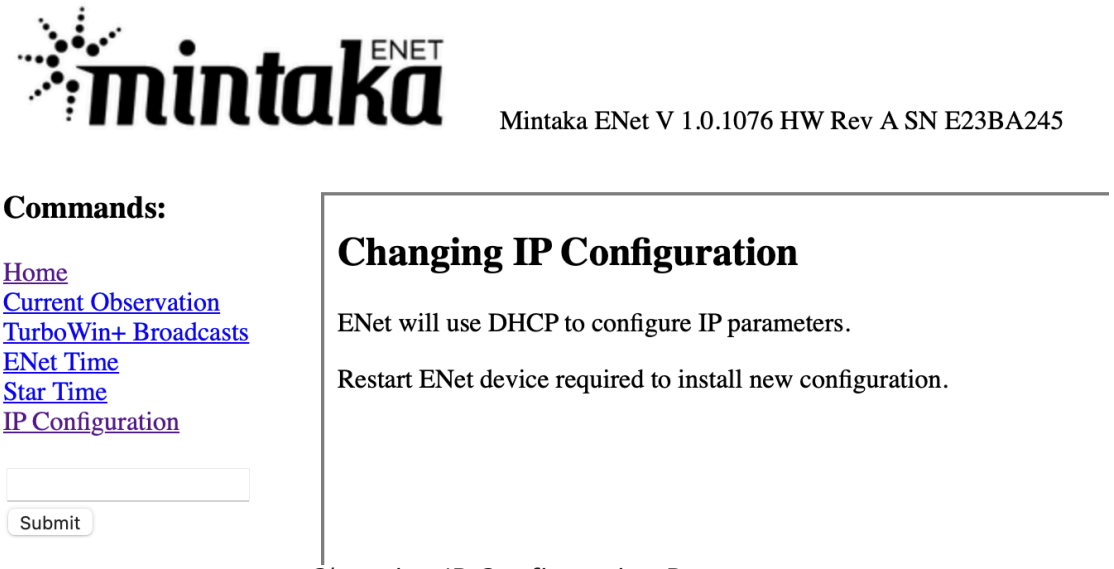
IP Configuration

This menu item displays the current IP Configuration. Here, the IP address is statically assigned.



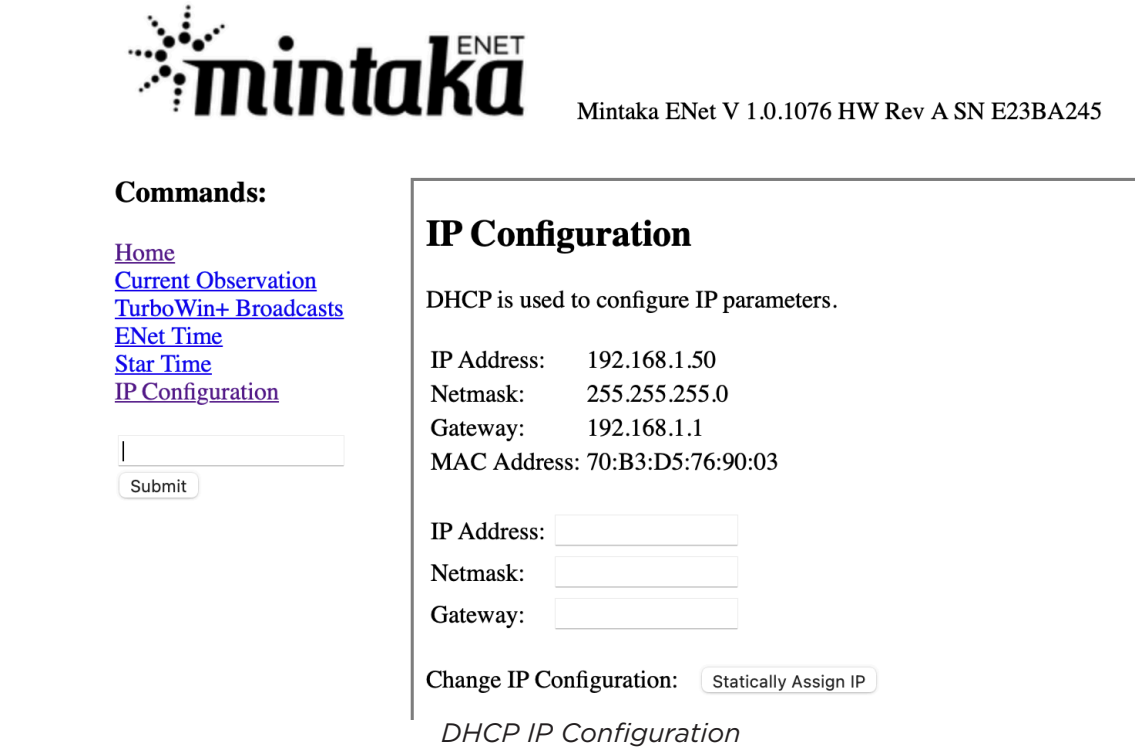
Statically Assigned IP Configuration

To change the IP Configuration between DHCP and a statically assigned IP address, select the option next to "Change IP Configuration. In this example, select "Use DHCP". The following page will display.



Changing IP Configuration Page

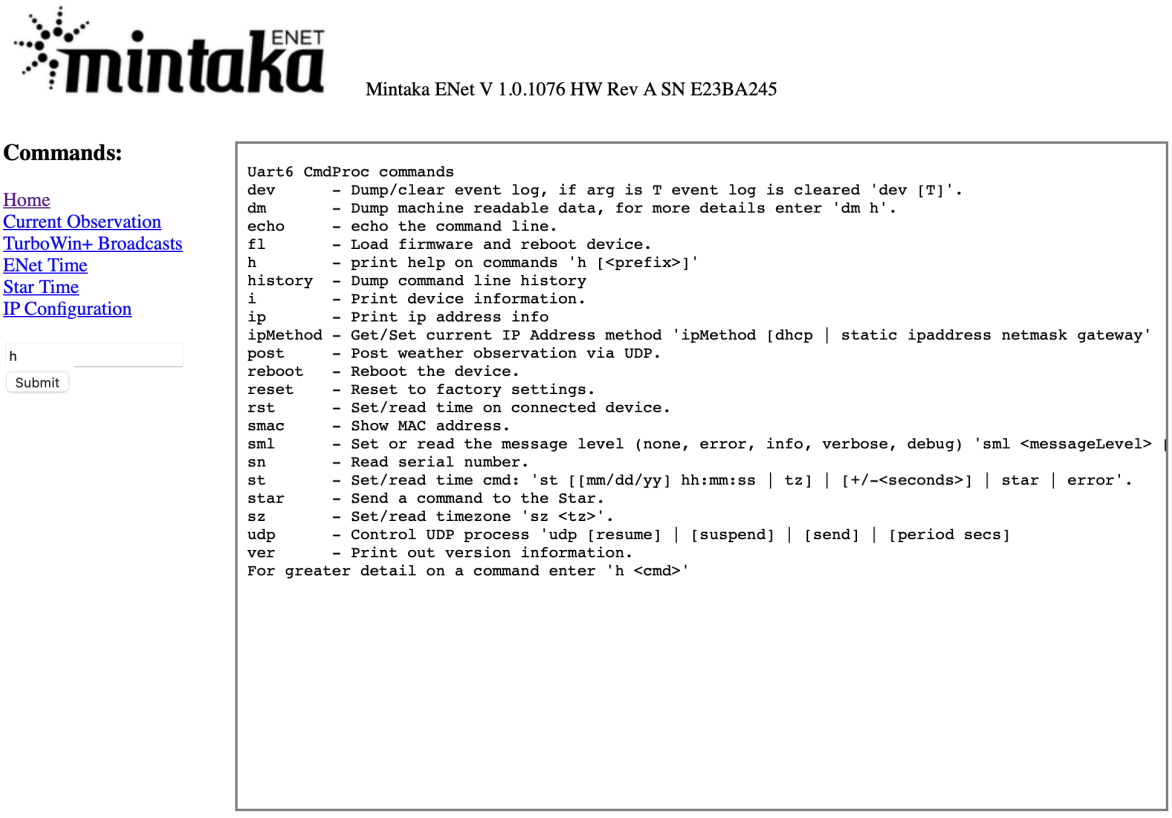
In this example, the ENet device is using DHCP. To change to a statically assigned IP address, complete the IP address, Netmask and Gateway fields, then select 'Statically Assign IP'.



DHCP IP Configuration

Submit Field

This field sends a command to the ENet device to be executed and the output is printed in the window to the right of the field. The command 'h' will list all the commands that can be executed on the ENet device.



Submit Field, "h" output

One command of note is the ‘star’ command. When receiving this command the ENet device will take it’s arguments, execute in the STAR and print the output in the window to the right.

For example the command ‘star sx’ will cause ENet to execute the ‘sx’ command on the STAR and print the output. The ‘sx’ command prints out the latest data that the STAR has received from a STAR**X**.

TECHNICAL DETAILS

Connecting to ENet’s Command Processor

There are two ways to interact with the ENet device’s command processor, USB and Telnet.

1. USB Connection

When you connect the ENet device to a PC a virtual comm port is created on the computer. Using a terminal emulator (e.g., CoolTerm is one freely available) you can connect to the ENet device as described below.

On a PC the port will appear as COMn; using the Device Manager you can determine which is the right COM port. On a Mac, the ENet’s port will appear something like “submodem_Exxx”. With the right port chosen use the following serial port parameters:

Baudrate: 57600

Data bits: 8

Parity None

Stop bits 1

2. Telnet Connection

If you know the ENet devices IP address and it is connected to the Internet you can use the following command to connect to the ENet.

telnet <ipAddress>

To terminate the connection type the command ‘q’.

IP Configuration Using ENet’s Command Processor

The command to use with the command processor is:

ipMethod - Get/Set current IP Address method ‘ipMethod [dhcp | static ipaddress netmask gateway’

Typing just ipMethod will print out the current configuration:

ipMethod

Using static IP address:

IP Address 192.168.1.50

Netmask 255.255.255.0

Gateway 192.168.1.1

OK

To change to DHCP:

ipMethod dhcp

Using DHCP to configure IP address.

Restart required to take affect.

OK

To statically assign an IP address use:

ipMethod static 192.168.1.50 255.255.255.0 192.168.1.1

Using static IP address:

IP Address 192.168.1.50

Netmask 255.255.255.0

Gateway 192.168.1.1

Restart required to take affect.

OK

To restart, either use the Reset button on the front of the device, type the “reboot” command, or power cycling the ENet device.

RESTful Access to Current Observation

The ENet device can be accessed to retrieve the details of the current weather observation via a RESTful call. The call is:

http://<ENetIPAddress>/CurrentObs

As a result a JSON string is returned with the data:

{“Title”:”Observation”,”Time”:”8/14/2020:18:25UTC+0”,”stpMb”:1015.599304,”slpMb”:1015.599304,”-tendMb”:-1.728000,”ptcc”:8,”latitude”:” 34 47.3955N”,”longitude”:”111 45.4269W”,”courseT”:0,”-speedK”:1,”elevationM”:1288,”tempC”:30.2,”rh”:26,”wetbulbTempC”:17.4,”dewpointC”:8.6,”obsAg-eS”:32}

The details for the JSON entries are described below:

stpMb	station pressure in millibars
slpMb	sea level pressure in millibars
tendMb	3 hour pressure tendency in millibars
ptcc	pressure tendency characteristic code
courseT	course true
speedK	speed knots
elevationM	elevation in meters
tempC	temperature in celcius
rh	relative humidity 0-100
wetbulbTempC	in celcius
dewpointC	likewise
obsAgeS	age of the observation in seconds

Sending Ship's Data to ENet (Proposed)

For a full weather report that ENet can send to TurboWin+, access to weather information from the ship is necessary. Below is the additional data that is needed and a RESTful call that will add this data to TurboWin+ reports.

- Wind Speed
- Wind Direction (true not magnetic)
- Wind Mode (Apparent or True)
- Sea Surface Temperature (degrees C)
- Observation date and time

The following call will update this supplemental weather information in ENet.

http://<ENetIPAddress>/WxUpdate?WindSpeed=<windspeed>&WindDir=<winddir>&Wind-Mode=<mode>&sst=<sst>&

ObsTimestamp=<timestamp>

Each of the entries in the query string is defined below.

- <windspeed> - a number indicating the windspeed in knots
- <winddir> - 0-359, true wind direction
- <mode> - A or T for apparent or true.
- <sst> - a number indicating the sea surface temperature in degrees C
- <timestamp> - year-month-day-hour-mins, in UTC+0, separated by -'s.
- year - 4 digits for year
- month - 01 - 12 for month
- day - 01 31 - for day
- hour - 00 - 23 for hour
- mins - 00 - 59 for minutes

MAINTENANCE

The Mintaka ENet, like the Mintaka STAR precision barograph, requires no regular maintenance. The case can be cleaned with a damp cloth and mild soap.

LIMITED WARRANTY

Barber Creations, LLC / Mintaka Innovations products are warranted to be free of defects in materials and construction and, when properly installed and operated, will be free of defects for a period of one (1) year from the date of purchase, subject to noted exclusions. Liability is limited to repair or replacement of the defective item.

Warranty exclusions - damage attributable to: improper installation; lack of reasonable care; improper use: acts of nature; abuse; to opening/closing the enclosure backplate; ordinary wear and tear; and being repaired or altered by others than our authorized representatives.

SPECIFICATIONS SUMMARY

Dimensions (L x W x H): 5 11/16" x 3 1/4" x 1.5" (144.8 mm x 82.8 mm x 37mm)

Power: 7 V DC via AC adaptor 90-264 V AC

USB On-the-Go full-speed device and host via USB micro-AB connector

Ethernet compliant with IEEE-802.3-2002 10M/100M