

**Advanced Distribution Amplifier
FDA-160i**

Operation and Maintenance Manual

P/N: 900000141

**For Brandywine Communications products
with the following Part Numbers:**

022050005

Safety Warnings



WARNING:

This unit contains lethal AC voltages. Disconnect the unit from the AC supply before removing the cover.



WARNING:

This unit contains dual power supplies. Isolate BOTH power supplied from AC Power before removing the top cover.



WARNING:

The lightning flash with an arrowhead inside of an equilateral triangle is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure. The “dangerous voltage” may be of sufficient magnitude to constitute a risk of electrical shock to people. Do not attempt to repair the unit without first unplugging it.



CAUTION:

The exclamation point inside of an equilateral triangle is intended to alert the user to the presence of important operation and maintenance instructions in the user guide. Only qualified personnel should repair this unit. Several board assemblies contain static sensitive devices. Appropriate procedures must be used when handling these board assemblies.



Revision History:

Revision	Date
Initial Release	8/7/14

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1 Introduction

The FDA-160i is a general-purpose frequency distribution amplifier designed for use with Brandywine high precision time and frequency sources.

The FDA-160i is contained in a compact IU rack-mount chassis. The FDA accepts two sets of inputs, comprising the reference frequency (typically 1-20MHz) and status from the source. The FDA provides automatic changeover should one of the on-line source inputs fail. Manual source select override is available on the front panel, or through the Ethernet interface.

A variety of status indicators are located on the front panel for instant visual feedback, together with manual controls for source selection.

A 10/100 base T Ethernet interface provides full control over the functionality of the system, including reference selection and output amplitude (on a per channel basis).

User control of the unit is via a built-in Web Browser with user-friendly graphical interface, or via SNMP for system applications.

Applications for the FDA-160i include secure communications systems, manufacturing facilities, digital television broadcasting and any system requiring highly reliable frequency outputs.

2 Unpacking the FDA-160i

Remove the FDA-160i from the shipping carton. The following items should be included in the shipment:

- 1 x FDA-160i
- 2 x Power supply cables
- 1 x Quick Start Guide

2.1 Installation

2.1.1 Mounting

The FDA-160i can be installed into a 19" rack mount cabinet either using rack slides or only using the front panel flanges. For static applications, the short depth and lightweight of the FDA-160i ensures that the front panel is not stressed when only the front panel is used for support.

If the FDA-160i is installed on a mobile platform and must survive shock and vibration, the use of slides is required. Slides are installed using 10-32 UNF-2B hardware.

Optional Rack Mount Slides:

P/N 002000123, SLIDE, RACK, 24", 21" TRAVEL, 85 LB

P/N 002000150, SLIDE, RACK, 28", 27" TRAVEL, 80 LB

Original Manufacturer: General Devices Chassis Trak Type C300.

2.1.2 Power

Insert the power cord of the FDA-160i into an electrical socket to power up the unit. The Power LED indicator will illuminate green.

If dual redundant power is required, connect both power sources to independent power sources

2.1.3 Ethernet

Connect one end of an Ethernet patch cable to the FDA-160i Ethernet port J21. Connect the other end of the Ethernet cable to your network with an Ethernet hub or switch.

2.1.4 Frequency Inputs

Connect a frequency input sources to the frequency input connectors J17 and/or J18

2.1.5 Frequency Outputs

Connect the frequency outputs J1 through J16 to your coaxial infrastructure.

2.1.6 Console Port

Connect a DB-9F cable to port J20 in order to enable RS-232 access to the unit. (Straight, pin3 is RX pin2 is TX)

2.1.7 Alarm Output Port

Connect a DB-9M cable to port J19 to access the alarm output port. Please see the following diagram for the pinout of the connector:

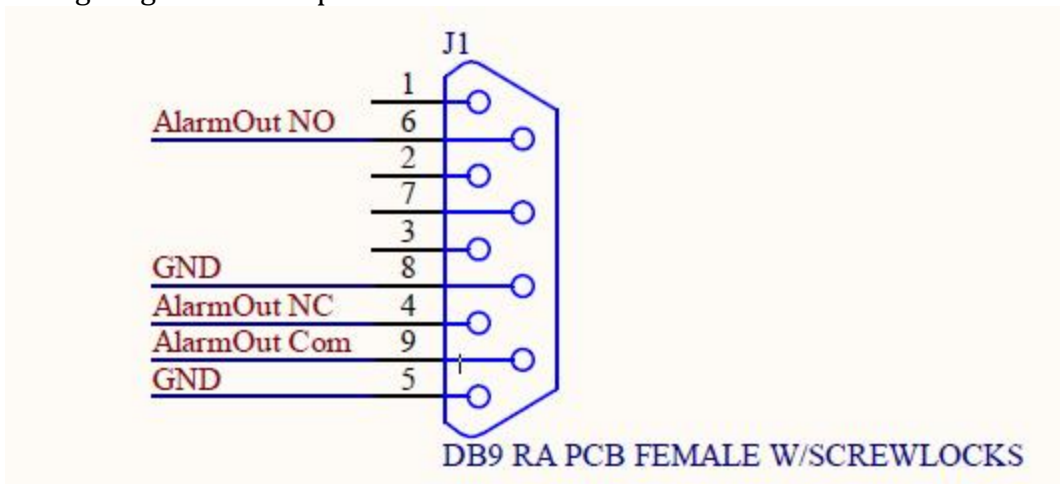
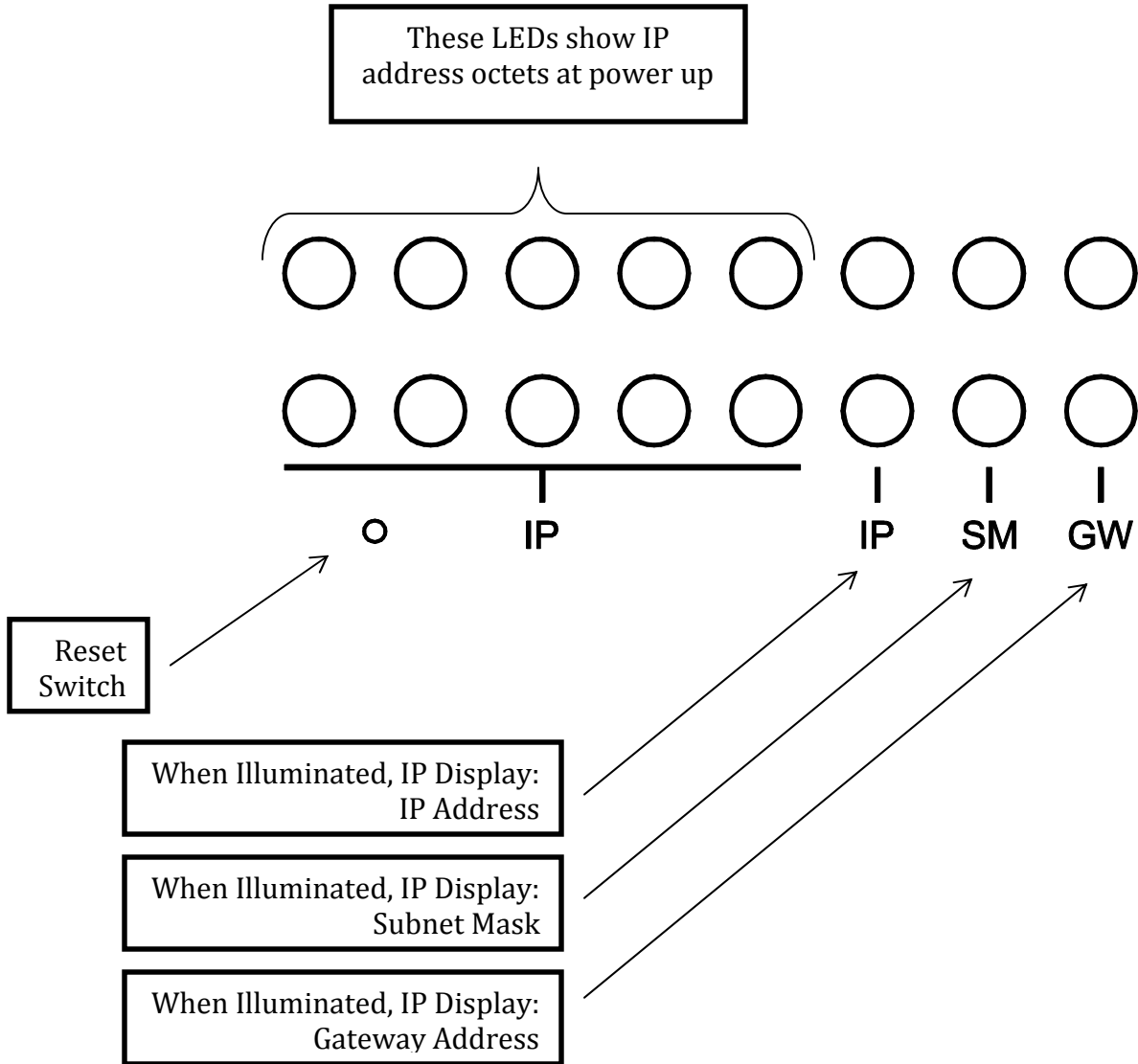


Figure 1 - Alarm output pinout

3 Setting up the FDA-160i

Power on the system by flipping switches SW1 and SW2 on the rear of the unit to the ON position. The system will display its power-on cycle on the front panel. The system will use LED lamps D7 through D17 to indicate each octet of the device's IP Address.



Write these values down and keep them in a safe place.

If you need to display the IP address again, you can reset the unit by pressing the RESET switch (SW2) on the front panel, using a paper clip or similar through the front panel.

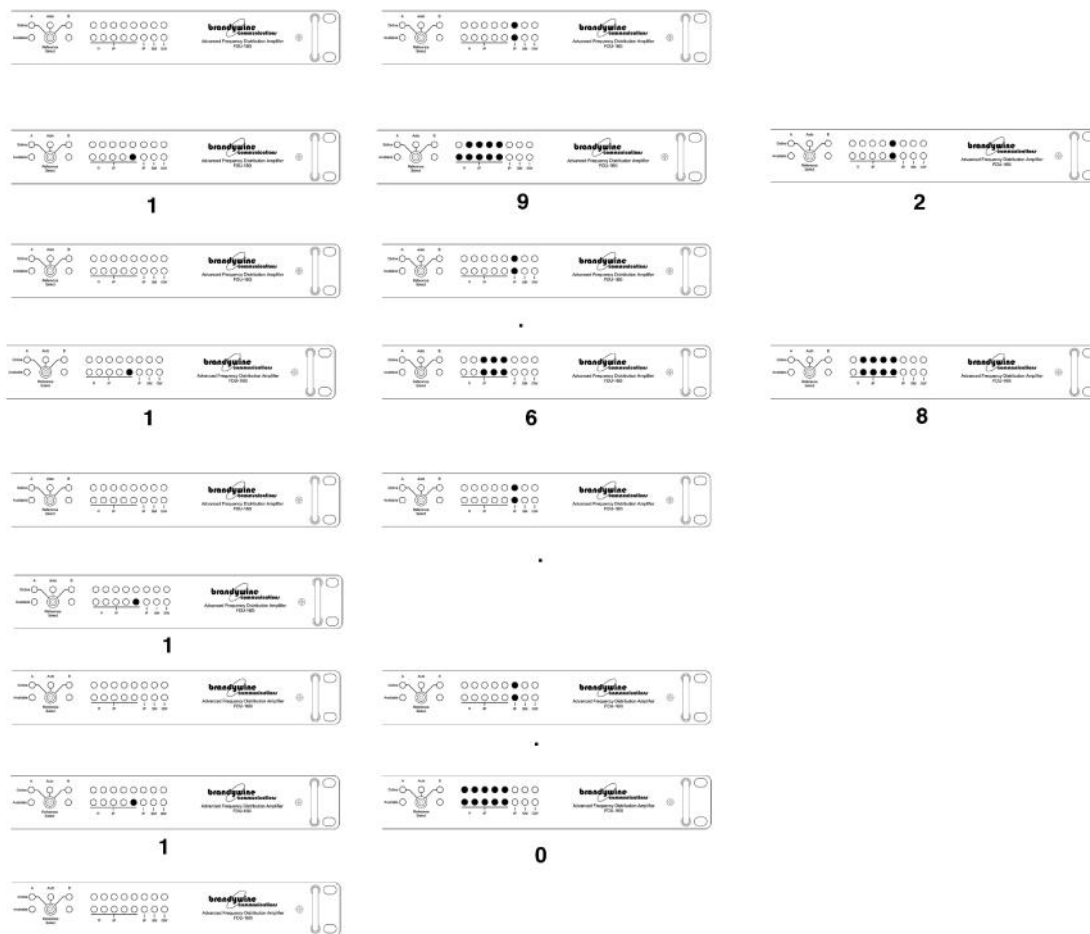


Figure 2 - FDA-160i Power Up Sequence Showing IP Address

The IP Address illustrated above shows 192.168.1.10.

Following the IP address, the Subnet Mask (SM) LED will be illuminated and the Network Mask will be displayed. (The Network Mask has a factory default of 255.255.255.0)

Upon completion of the Network Mask, the Gateway (GW) LED will be illuminated, and the Gateway IP address will be displayed

4 Accessing the FDA-160i's Network Interface

Connect to the FDA-160i by entering the unit's IP address into the address bar of the web browser on your PC, Smartphone or Tablet.



Figure 3 - FDA-160i Web Page Interface

Use the dropdown menu to select different functions of the FDA-160i to view the status of the system and to adjust different functions of the unit.

4.1 Accessing Functions on the FDA-160i

To access different functions of the FDA-160i management web page, select the button labeled "MENU" in the top left hand corner of the web page.

4.1.1 Viewing the Current Status of the FDA-160i system

From the “MENU” button, select “General” from the status menu. This shows information such as the current output time, UTC time, up time, the current input reference, the current output format, current system state, alarm status, battery status, and current internal temperature.



Figure 4 - FDA-160i Status Page

Output Time: The current time of day being displayed or being output by the FDA-160i



UTC Time: The current time of day from the selected NTP server in Universal Time Coordinate (UTC)

Up Time: The length of time that the FDA-160i has been powered on

Hour Meter: This is the accumulated number of operating hours since the FDA-160i was first built.

Reference: The current reference input being used by the FDA-160i

System Alarms: If the system is currently displaying any alarms

Output Units: The current unit setting the unit is using

5 Changing the Settings on the FDA-160i

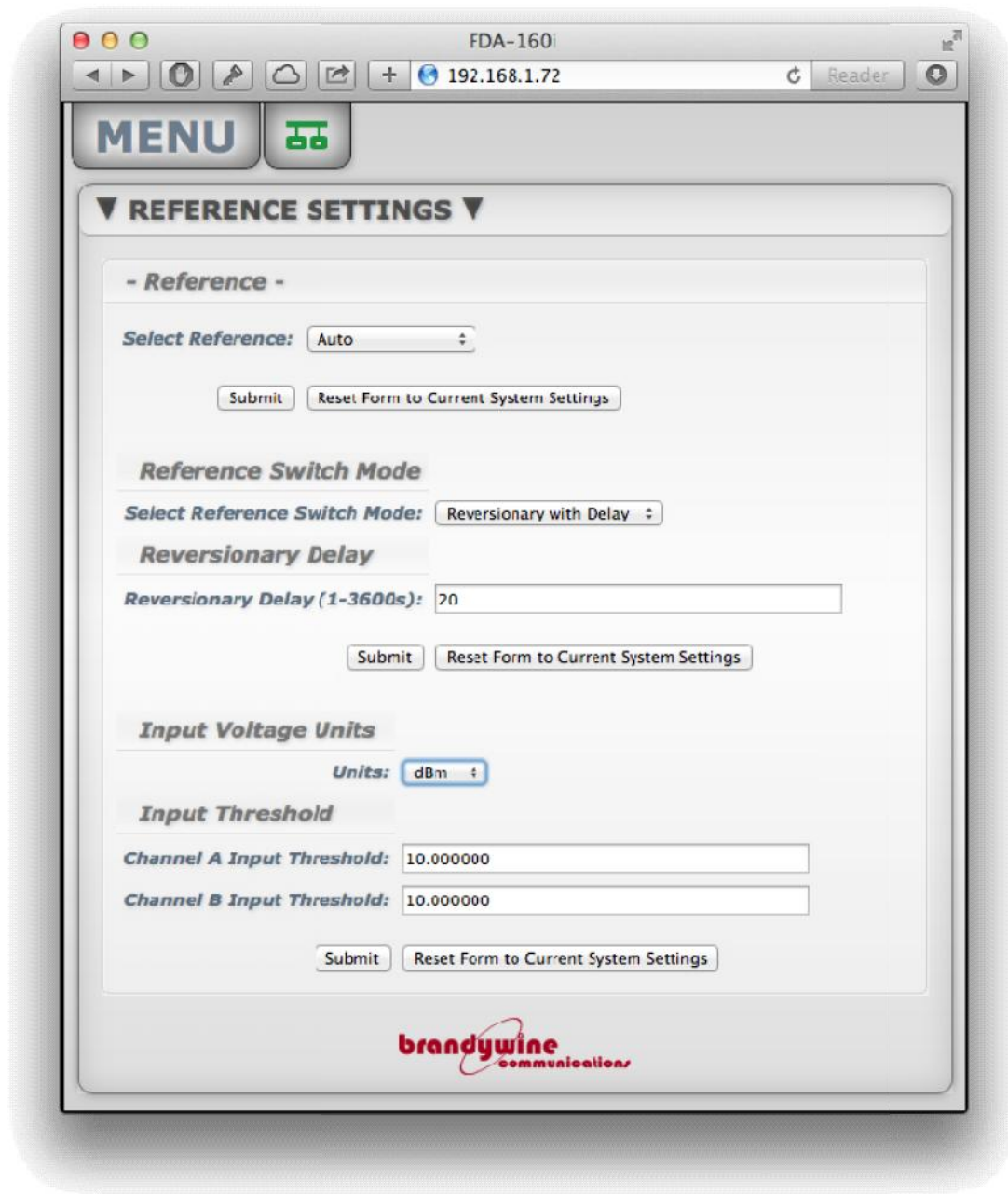


Figure 5 - Reference Settings Page

5.1 Selecting a Reference

From the menu, select “Reference” from the settings submenu. From the “Select Reference” dropdown menu, you can select between reference sources A or B.

5.1.1 Changing the reference switch mode.

From the dropdown labeled, “Select Reference Switch Mode” you can select which mode the unit uses to switch references in the event of a problem. The available modes are listed below.

- **Non-Reversionary:** If the primary reference source fails or is out of threshold, the system will automatically switch over to the secondary reference source, and continue to use the secondary until manually switched back to the primary source, or the secondary source fails and the system automatically switches back to the primary.
- **Reversionary:** The system will switch to the secondary source automatically if the primary source fails or is out of threshold, however once the primary source is restored, the unit will immediately switch back
- **Reversionary with Delay:** The system will automatically switch to the secondary source in the event the primary source fails or is out of threshold. Once the primary source is restored, it will automatically switch back after waiting for a user-specified delay. This setting is useful for helping the unit deal with intermittent problems on a primary frequency source.

5.1.1.1 Adjusting the reversionary delay.

The text box “Reversionary Delay” is used to set the delay time in seconds used when the system is set to the “Reversionary with Delay” Reference Switch mode.

5.1.2 Input Voltage Units

The dropdown menu under the heading “Input Voltage Units” enables the user to select the units for the input threshold setting.

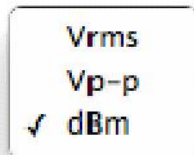


Figure 6 - Input Voltage Units

5.1.3 Input Threshold

The input thresholds for channels A and B enable the user to adjust the minimum voltage, above which the unit will start distributing frequency.

5.2 Adjusting the Output Settings

MENU

▼ **OUTPUT SETTINGS** ▼

J1 - J16 Output Level Settings

Output Voltage Units

Units: Vrms ▼

J1

Output Setting: 1.0

Alarm Threshold: 0.7

J2

Output Setting: 1.0

Alarm Threshold: 0.7

J14

Output Setting: 1.0

Alarm Threshold: 0.7

J15

Output Setting: 1.0

Alarm Threshold: 0.7

J16

Output Setting: 1.0

Alarm Threshold: 0.7

Figure 7 - Output Settings

From the main menu, select “Output” from the settings submenu. This lets you change the Output levels of each individual frequency output. The “units” dropdown lets you select which units the output settings are in. In this screen you can also manually set the unit’s internal clock.

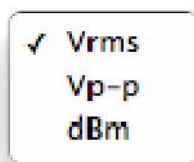


Figure 8 - Available Output Units

5.3 Changing the IP Address

From the main menu, select “IP” from the settings submenu. From here you can change the IP Address, Subnet Mask, Gateway address and NTP Server address of

the unit. From here you can also enable DHCP by setting the IP address to 0.0.0.0, however this action is not recommended.

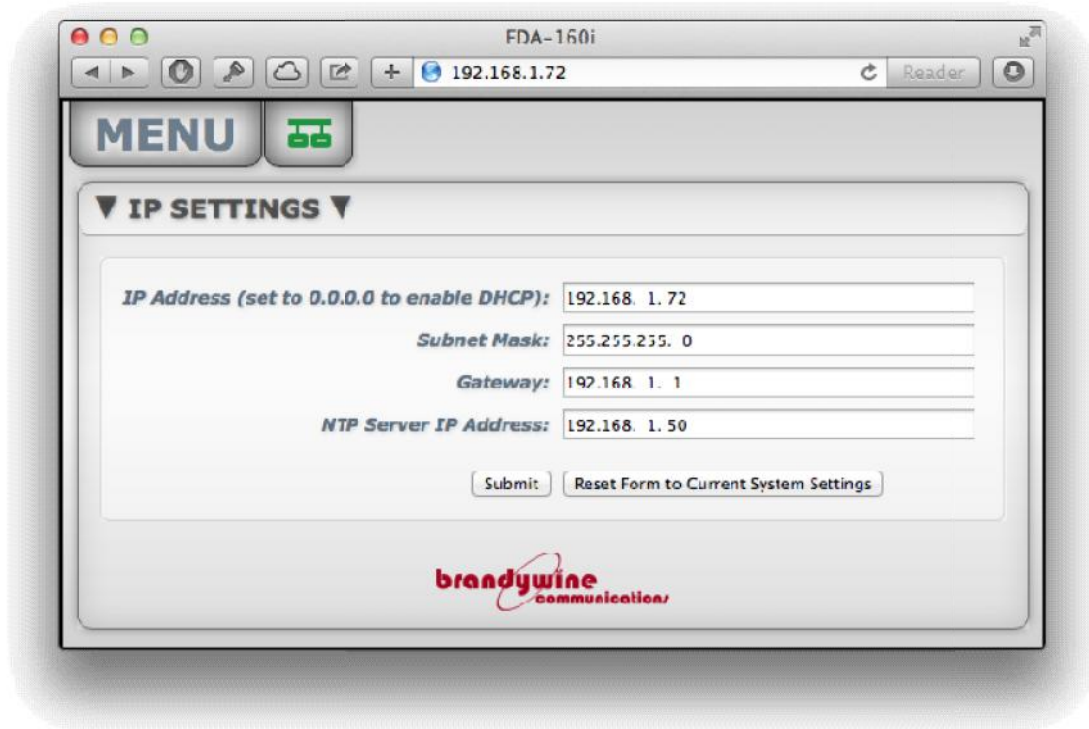


Figure 9 IP Address Settings

5.3.1 NTP Server Address

The field sets the address of the NTP server that the unit will listen to in order to set the unit's internal time of day.

5.4 Changing SNMP Settings

From the main menu, select “SNMP” from the settings submenu. From here you can set the Read Community, Write Community, and both Trap IP Addresses. In addition, the MIB file needed for controlling the unit can be downloaded from here.

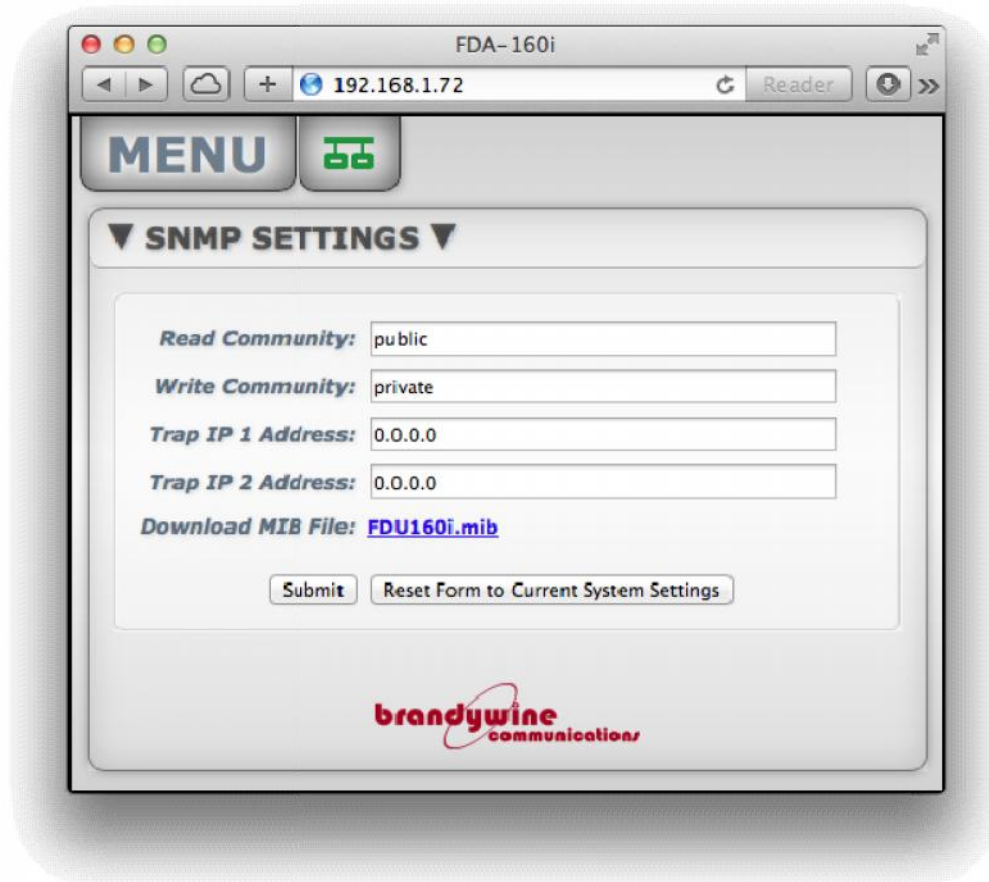


Figure 10 - SNMP Settings

5.4.1 Monitoring the FDA-160i using SNMP

To monitor the FDA-160i via Simple Network Management Protocol (SNMP), you will need to download an MIB file from the SNMP settings page of the unit’s built-in web page interface.

5.5 Changing The Location Setting

From the main menu, select “Location” from the settings submenu. This setting tells the user where the unit is physically located within a facility. (e.g. Room 102)

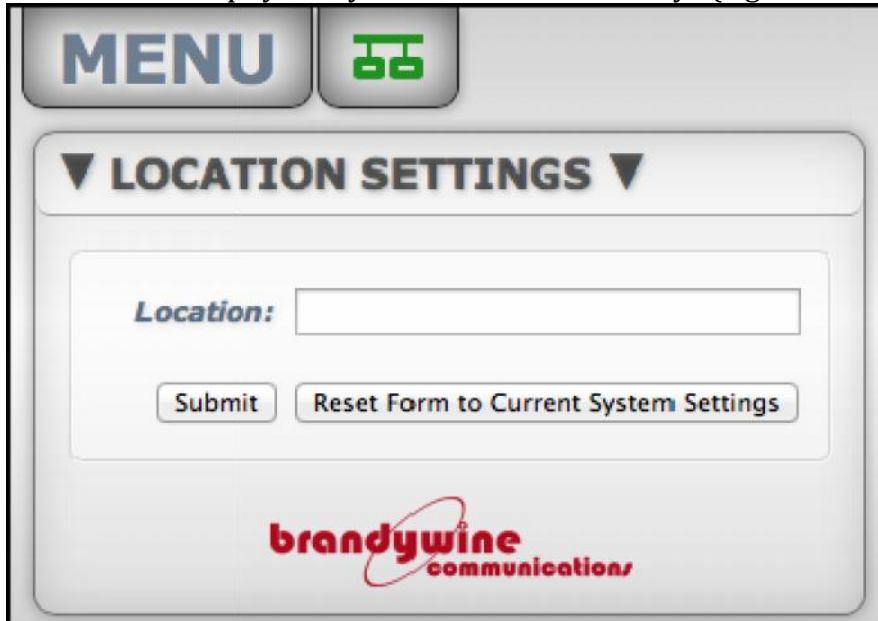


Figure 11 - Location Setting Screen

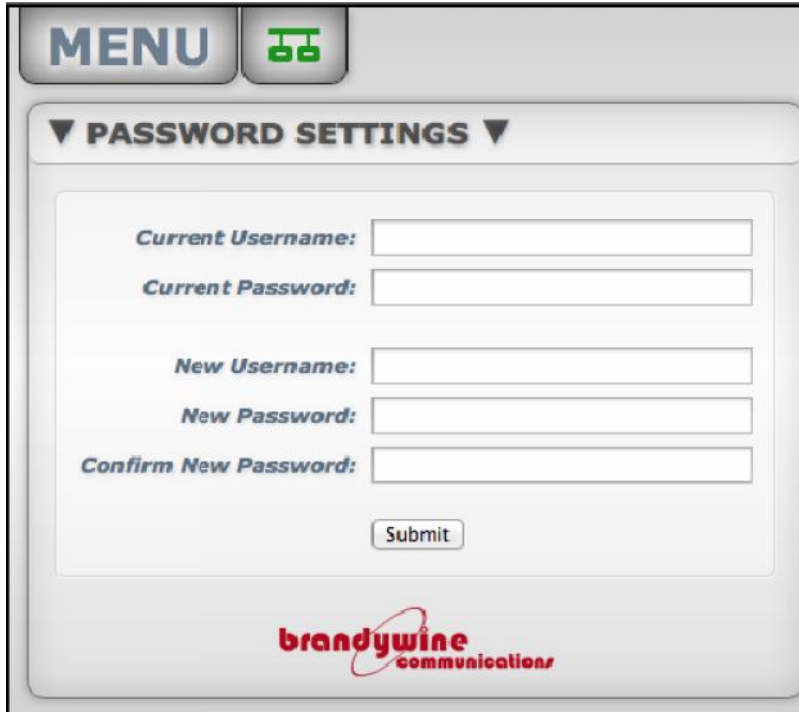
5.6 Changing The Access Password

From the main menu, select “Password” from the settings submenu. From here you can change the access password for the unit to prevent other users from changing settings. You must have the current Username and Password in order to reset the existing username and password.

The factory default login credentials are:

Username: BRANDYWINE

Password: BRANDYWINE



The screenshot shows a web interface for password settings. At the top left is a 'MENU' button and a green icon of a server rack. Below this is a header '▼ PASSWORD SETTINGS ▼'. The main area contains five input fields: 'Current Username:', 'Current Password:', 'New Username:', 'New Password:', and 'Confirm New Password:'. A 'Submit' button is located below the 'Confirm New Password' field. The Brandywine Communications logo is at the bottom center of the interface.

Figure 12 - Password Settings

5.7 Time Zone And Daylight Savings Settings

To adjust the Time Zone and DST settings of the output, select the “TimeZone” menu option from the main menu. From here you can adjust the time zone and daylight savings offsets of the unit. To adjust the Time zone offset, enter the number of hours EAST of UTC as a positive value, and the number of hours WEST of UTC as a negative value.

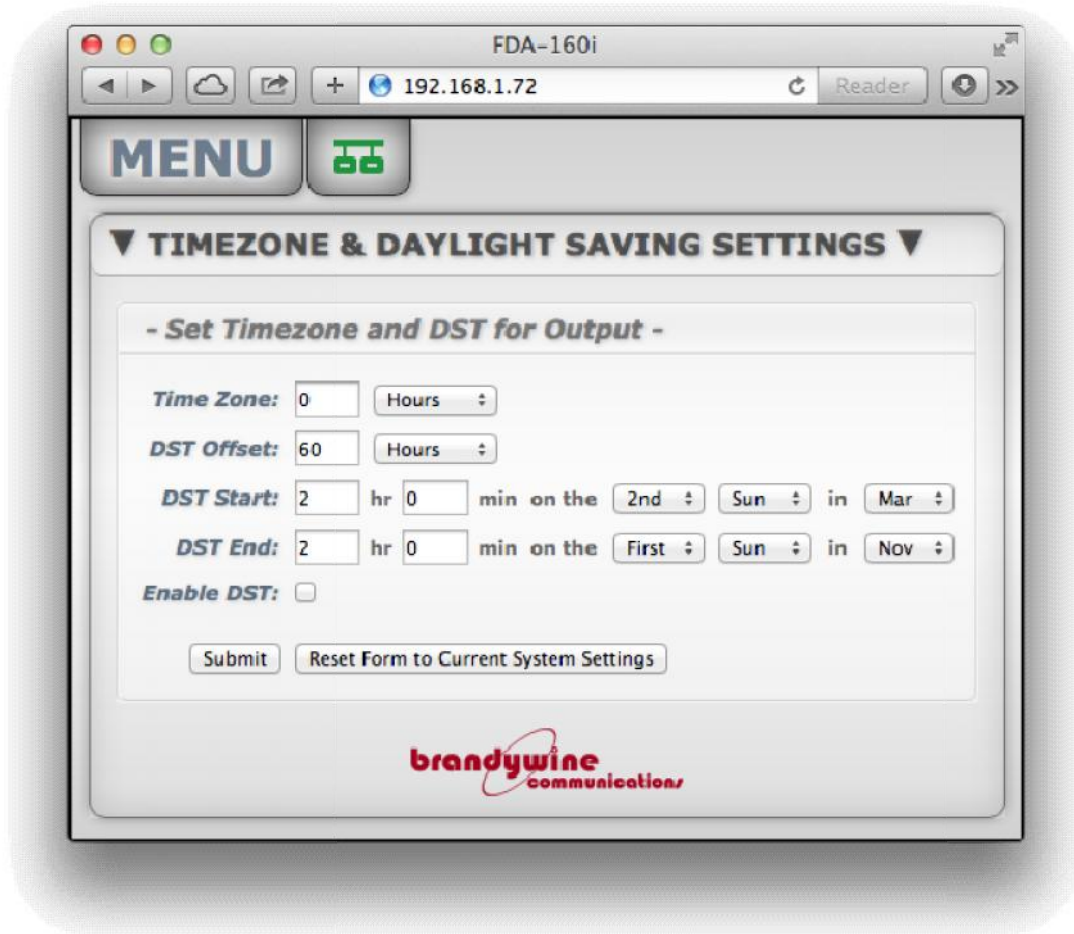


Figure 13 - Timezone and Daylight Savings Settings

6 Alternate Access

If you are in an area where you cannot access the unit over the network, but you still have physical access to the device, the FDA-160i can still be accessed and controlled via RS-232 over the serial port.

6.1.1 User Commands and Responses

The FDA-160i Serial port (115200, 8, 1, 1, no parity) provides status and setting data on request from the user.

The user can obtain information from the FDA-160i by sending HELP command terminated by CR. The FDA-160i will display the HELP MENU as below:

```
-----
FDA-160i System Setup - (925000131) 1.01.02 Jul 30 2014
SN# 36770 - Hardware Ver: A
MAC Address: 00-21-34-00-02-EB
-----
```

COMMAND Description

```
-----
COMMAND Description
-----
HELP          Show this screen
IPADDR        IP Address (set to 0.0.0.0 to enable DHCP) (192.168.1.121)
IPMASK        IP Mask (255.255.255.0)
IPGATEWAY     IP Gateway (192.168.1.1)
FACT          Factory Reset to Defaults Setting
RESET         Reset System
```

Enter a menu command:

The FDA-160i user commands are described in the table below.

COMMAND	FUNCTION	COMMENTS
HELP	Show Help	Show Help Menu Example: HELP<CR> Displays the above Help Menu.
IPADDR	Set IP Address	Set the IP Address (decimal number) IP4, IP3, IP2, IP1 and Store into NVM. Example:

		<p>IPADDR<CR> New Setting:192.168.1.121<CR></p> <p>Sets the IP address to 192.168.1.121 and displays the above Help Menu.</p> <p>To enable DHCP enter IP address 0.0.0.0<CR></p>
IPMASK	Set IP Mask Address	<p>Set/Get the IP Mask Address (decimal number) IP4, IP3, IP2, IP1 and Store into NVM.</p> <p>Example: IPMASK<CR> New Setting:255.255.255.0<CR></p> <p>Sets IP Mask and displays the above Help Menu.</p>
IPGATEWAY	Set Gateway Address	<p>Set/Get the Gateway Address (decimal number) Gateway4, Gateway 3, Gateway 2, Gateway 1 and Store into NVM.</p> <p>Example IPGATEWAY<CR> New Setting:192.168.1.1</p> <p>Sets IP Gateway and displays the above Help Menu.</p>
MACADDR	Set MAC Address	<p>Set/Get the Mask Address (decimal number) Mask4, Mask 3, Mask 2, Mask 1 and Store into NVM.</p> <p>Example: MACADDR<CR> New Setting: 00-21-34-00-02-EB<CR></p> <p>Sets MAC address and displays the above Help Menu.</p>
FACT	Recall Factory defaults	<p>Recall all factory default settings</p> <p>Example: FACT <CR> Are you sure you want to continue (Y/N)? Y</p>

		Resets to factory default and displays the above Help Menu.
RESET	Reset the Unit	<p>Reset the Unit</p> <p>Example: RESET <CR> Are you sure you want to continue (Y/N)? Y Reset System</p> <p>Resets the unit and displays the above Help Menu.</p>
	Upgrade Application	<p>Use PIC32 Boot loader Application program to upgrade main application through Ethernet. Follow the below commands:</p> <ol style="list-style-type: none"> 1. Connect computer Ethernet cable direct to FDA-160i unit. 2. Set the computer IP Address = 192.168.254.101 3. Run the PIC32UBL.exe 4. Set the Subnet mask Address = 255.255.255.0 5. Set the unit IP Address = 192.168.254.100 6. Hit the "Load Hex File". Browse to "FDA-160i.hex" to send the hex file. 7. Hit the "Upload" button and recycle the power supply within 2 seconds so that the program starts with the boot loader section. It will display the boot loader version 1.1 and start the update process automatically. 8. When it done uploading, it will run the application program and display the message "Command issued to run application". 9. Connect the FDA-160i Ethernet cable to the switch box. 10. Reconnect the computer Ethernet cable to the switch box and reset the computer IP address to DHCP.

Table 2



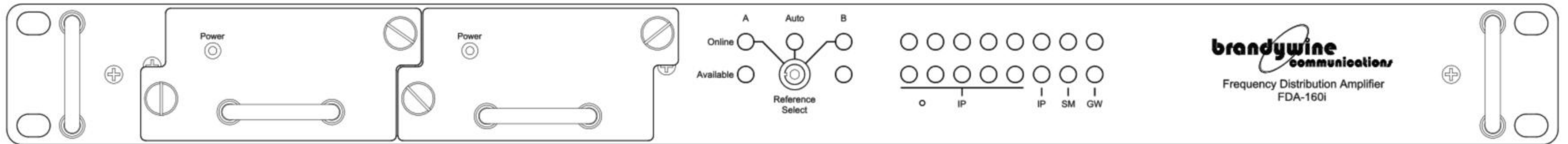
7 Support Information

All Brandywine Communications products come with a one-year warranty.

If your unit is still exhibiting problems not covered by the above troubleshooting guide, please contact us for technical support at support@brandywinecomm.com or call us at 714-755-1050.

If it becomes necessary to return your unit to the factory for repairs, please call us at 714-755-1050 extension 113 to arrange an RMA.

8 Front Panel View



9 Rear Panel View

