WTI Part No. 14328
Rev. A

NBB Series

Vertical Switched PDUs

User's Guide

Power & Console Solutions I wti.com

Warnings and Cautions:
Installation Instructions

Secure Racking

If Secure Racked units are installed in a closed or multi-unit rack assembly, they may require further evaluation by Certification Agencies. The following items must be considered.

1. The ambient within the rack may be greater than room ambient. Installation should be such that the amount of air flow required for safe operation is not compromised. The maximum temperature for the equipment in this environment is 55°C. Consideration should be given to the maximum rated ambient.
2. Installation should be such that a hazardous stability condition is not achieved due to uneven loading.
3. Side vents are used to dissipate heat generated within the unit. When mounting the unit in an equipment rack, make certain to allow adequate clearance for venting.

Input Supply

Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.

Grounding

Reliable earthing of this equipment must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit.

No Serviceable Parts Inside; Authorized Service Personnel Only

Do not attempt to repair or service this device yourself. Internal components must be serviced by authorized personnel only.

- **Shock Hazard - Do Not Enter**
- **Lithium Battery**
  CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Disconnect Power

If any of the following events are noted, immediately disconnect the unit from the outlet and contact qualified service personnel:

1. If the power cord becomes frayed or damaged.
2. If liquid has been spilled into the device or if the device has been exposed to rain or water.

Two Power Supply Cables

Note that some NBB series units feature two separate power circuits, and a separate power supply cable for each power circuit. If your NBB unit includes two power supply cables, make certain to disconnect both power supply cables from their power source before attempting to service or remove the unit.

Detached 15-Amp "Starter" Cable(s)

If the NBB unit includes a detached, 125 VAC, 15 Amp “Starter” Cable(s,) this allows you to connect the NBB to power for bench testing and initial start up and is adequate for applications that only require 15 Amps. For 20-Amp power switching applications, please refer to the WTI Power Cable guide supplied with the unit, or use appropriate 20-Amp cables.

Units with Attached Power Supply Cable(s)

For units with fixed Power Cords the socket-outlet shall be installed near the equipment and shall be easily accessible.

Agency Approvals

FCC Part 15 Regulation

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

WARNING: ***Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment***

EMC, Safety, and R&TTE Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

- **Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;**

  and

- **Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;**

  and

- **Council Directive 1999/5/EC of 9 March on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.**

Industry Canada - EMI Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Table of Contents

List of Figures

1. Introduction

WTI's NBB series Network Power Switches allow secure, remote management of AC powered rack mount equipment via SSL, SSH, SNMP, web browser, telnet, external modem or local terminal. NBB series units provide the ability to perform power reboot and power switching functions and automatically notify you when changes in rack temperature, ping command response, invalid access attempts, circuit breaker status and other factors are detected.

In addition to these power management and alarm functions, NBB models also include the ability to monitor power to your equipment, and automatically notify you when changes in current consumption exceed user-defined threshold values.

Security and Co-Location Features:

Secure Shell (SSHv2) encryption and address-specific IP security masks help to prevent unauthorized access to command and configuration functions.

The NBB provides four different levels of security for user accounts: Administrator, SuperUser, User and ViewOnly. The Administrator level provides complete access to all plug functions, operating features and configuration menus. The SuperUser level allows switching and rebooting of all plugs but does not allow access to configuration functions. The User level allows access to only a select group of Administrator-defined plugs. The ViewOnly level allows you to check plug status and unit status, but does not allow switching or rebooting of outlets or access to configuration menus.

NBB units also include full Radius support, LDAP capability, TACACS capability, MIB capability, DHCP and an invalid access lockout feature. An Audit Log records all user access, login and logout times and command actions.

Current and Power Metering:

NBB series units can measure and report current and power consumption trends. If the NBB detects that user defined thresholds for current consumption have been exceeded the unit can provide prompt notification to network administrators and IT personnel. The NBB also records current consumption data to a convenient log file, which can be retrieved in ASCII, XML, or CSV format or displayed in graph format.

NBB Models:

Model No.	Input Feeds	Input Voltage	Max. Load per Outlet	Max. Load per Input	Max. Load per Unit
NBB-20HD20-1	2 ea, 20 Amp	100 to 120 VAC	15 Amps	16 Amps*	32 Amps*
NBB-20HD20-2	2 ea, 20 Amp	100 to 240 VAC	10 Amps	16 Amps*	32 Amps*
NBB-20HD16-3	2 ea, 16 Amp	200 to 240 VAC	10 Amps	16 Amps	32 Amps

Typographic Conventions

^ (e.g. **^X**)	Indicates a control character. For example, the text "**^X**" (Control X) indicates **[Ctrl]** and **[X]** key must be pressed at the same time.
COURIER FONT	Indicates characters typed on the keyboard. For example, **/AC** or **/ON A2**.
[Bold Font]	Text set in bold face and enclosed in square brackets indicates a specific key. For example, **[Enter]** or **[Esc]**.
< >	Indicates required keyboard entries. For Example: **/P <n>**.
[ ]	Indicates optional keyboard entries. For Example: **/P [n]**.

2. Unit Description

2.1. NBB Front Panel

As shown in Figure 2.1 on page 2-2, the NBB Series Front Panel includes the following components:

1. **Power Circuit A - Switched Outlets:** AC Outlets that can be switched On, Off, rebooted or set to default state in response to user commands.
   - NBB-20VD20-1 Units: Ten Switched NEMA 5-15 Outlets
   - NBB-20VD20-2 Units: Ten Switched IEC 60320 C13 Outlets
   - NBB-20VD16-3 Units: Ten Switched IEC 60320 C13 Outlets
2. **Power Circuit B - Switched Outlets:** AC Outlets that can be switched On, Off, rebooted or set to default state in response to user commands.
   - NBB-20VD20-1 Units: Ten Switched NEMA 5-15 Outlets
   - NBB-20VD20-2 Units: Ten Switched IEC 60320 C13 Outlets
   - NBB-20VD16-3 Units: Ten Switched IEC 60320 C13 Outlets
3. **Power Circuit A Cable Retainer Bar Mounting Holes:** Two sets of screw holes for mounting the optional cable retainer bar for Power Circuit A as described in Appendix D.
4. **Power Circuit B Cable Retainer Bar Mounting Holes:** Two sets of screw holes for mounting the optional cable retainer bar for Power Circuit B as described in Appendix D.
5. **Line A Circuit Breakers:** Two circuit breakers, which protect Line A. One circuit breaker protects outlets A1 through A5, and the other circuit breaker protects outlets A6 through A10.
6. **Line B Circuit Breakers:** Two circuit breakers, which protect Line B. One circuit breaker protects outlets B1 through B5, and the other circuit breaker protects outlets B6 through B10.
7. **Current Usage Indicators:** Two sets of ten LEDs which light to indicate total current usage by the corresponding Power Circuit. The upper set of LEDs indicates total current usage by Line A, and the lower set of LEDs indicates total current usage for Line B. The first LED in each set lights when 0% to 9% of maximum rated current is used, and the last LED in the set lights when 100% of maximum rated current is used.
8. **SetUp Port:** An RJ45 RS232 serial port (DCE configuration) used for connection to a local terminal or external modem, as described in Section 4.3.2. For a description of the Setup Port interface, please refer to Appendix B.1.

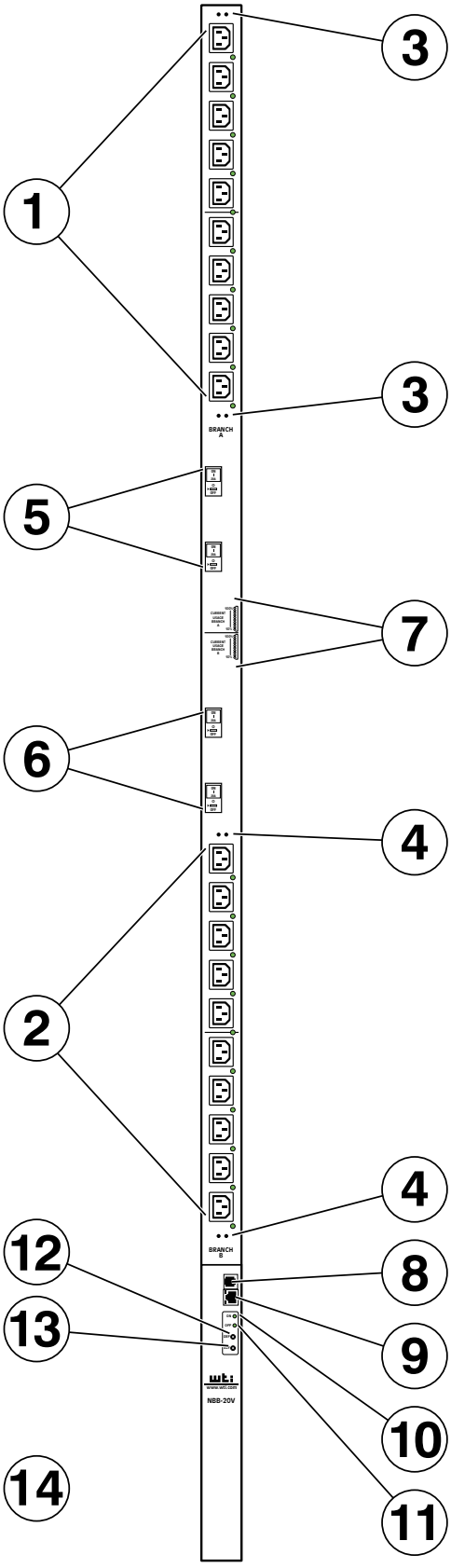

Figure 2.1: NBB Face Panel Components (Model NBB-20VD20-2 Shown)

9. **Network Port:** An RJ45 Ethernet port for connection to your 10/100Base-T, TCP/IP network. Note that the NBB features a default IP address (192.168.168.168). This allows you to connect to the unit without first assigning an IP address. Note that the Network Port also includes two, small LED indicators for Link and Data Activity. For more information on Network Port configuration, please refer to Section 5.9.
10. **"ON" Indicator:** An LED which lights when power is applied to the NBB.
11. **"RDY" Indicator:** (Ready) Flashes if unit is ready to receive commands.
12. **Default Button:** Toggles outlets On/Off or resets unit to factory default parameters as described in Section 2.2.
13. **Reset Button:** Reboots and/or resets the NBB to factory defaults as described in Section 2.2.

    Note: *All Front Panel Button functions can also be disabled via the System Parameters menu, as described in Section 5.3.*

14. **Power Inlets (Not Shown):** Two IEC C20 AC inlets, located on the underside of the unit, which supply power to the NBB control and switching functions. For power supply requirements for individual NBB units, please refer to the table in Section 1 or the product name plate.

2.2. Additional Button Functions

The Default and Reset buttons on the NBB unit can be used to perform the functions described below:

Notes:

- *All Front Panel Button functions can also be disabled via the System Parameters menu, as described in Section 5.3.*
- *When the NBB is reset to factory defaults, all user-defined configuration parameters will be cleared, and the default "super" user account will also be restored.*

1. **Reboot Operating System:**

   a) Press and hold the Reset button for five seconds, and then release it.

   b) The NBB will reboot it's operating system; all plugs will be left in their current On/Off state.

2. **Set Parameters to Factory Defaults:**

   a) Simultaneously press both the Default button and the Reset button, hold them for five seconds, and then release them.

   b) All NBB parameters will be reset to their original factory default settings, and the unit will then reboot. All plugs will be left in their current On/Off state.

3. **Toggle/Default All Plugs:**

   a) Press the Default button, hold it for five seconds, and then release the Default Button.

   b) The NBB will switch all plugs to the Off state. If all plugs are already in the Off state, then the unit will reset all plugs to their user defined default states.

3. Getting Started

This section describes a simplified installation procedure for the NBB series hardware which will allow you to communicate with the unit in order to demonstrate basic features and check for proper operation. In order to take full advantage of the features provided by this unit it is recommended that you should also refer to the remainder of this User's Guide.

3.1. Installing the NBB Hardware

3.1.1. Apply Power to the NBB

Refer to warnings and cautions at the beginning of this user's guide and the power rating nameplate on the NBB unit, and then connect the unit to an appropriate power source. Note that some NBB models feature two separate AC inputs and two separate power lines, while others feature a single power inlet. Connect power cable(s) to the Power Inlet(s) then connect the cables to an appropriate power supply.

Notes:

- *If you need to determine the exact model number for your NBB unit, either refer to the nameplate on the back of the unit, or access command mode as described in Section 5.1 and then type* `/J *` *and press* ***[Enter]****.*
- *For rack mounting instructions, please refer to Appendix C.*

3.1.2. Connect your Computer to the NBB

The NBB unit can either be controlled by a local computer, that communicates with the unit via the SetUp port, controlled via external modem, or controlled via TCP/IP network. In order to switch plugs or select parameters, commands are issued to the NBB via either the Network Port or SetUp Port. Note that it is not necessary to connect to both the Network and SetUp Ports, and that the SetUp Port can be connected to either a local computer or External Modem.

- **Network Port:** Connect your 10Base-T or 100Base-T network interface to the NBB Network port.
- **Setup Port:** Use the DX9F-WTI Adapter supplied with the unit to connect your computer COM port to the NBB SetUp Port.
- **External Modem:** Use the optional DX9M-RJ-KIT (not included) to connect your external modem to the NBB Setup (RS232) Port.

3.2. Communicating with the NBB

In order to ensure security, both Telnet and Web Browser Access are disabled when the NBB is shipped from the factory. To enable Telnet and/or Web Browser access, please refer to Section 5.9.2. When properly installed and configured, the NBB will allow command mode access via Telnet, Web Browser, SSH client, modem, or local computer.

Notes:

- *Default NBB serial port parameters are set as follows: 9600 bps, RTS/CTS Handshaking, 8 Data Bits, One Stop Bit, No Parity. Although these parameters can be easily redefined, for this Quick Start procedure, it is recommended to configure your communications program to accept the default parameters.*
- *The NBB features a default IP Address (192.168.168.168) and a default Subnet Mask (255.255.255.0.) This allows network access to command mode, providing that you are contacting the NBB from a node on the same subnet. When attempting to access the NBB from a node that is not on the same subnet, please refer to the Section 5.1 for further configuration instructions.*

1. **Access Command Mode:** The NBB includes two user interfaces; the Text Interface and the Web Browser Interface. The Text Interface is available via local computer, SNMP, SSH Client, Telnet, or Modem, and the Web Browser interface is only available via TCP/IP network. In addition, when contacted via PDA, the NBB will also present a third interface, which is similar to the Web Browser Interface, but offers limited command functions.

   a) **Via Local Device:** Start your communications program and then press **[Enter]**.

   b) **Via SSH Client:** Start your SSH client, enter the default IP address (192.168.168.168) for the NBB and invoke the connect command.

   c) **Via Web Browser:** Make certain that Web Browser access is enabled as described in the Section 5.9.2 in this User's Guide. Start your JavaScript enabled Web Browser, enter the default NBB IP address (192.168.168.168) in the Web Browser address bar, and then press **[Enter]**.

   d) **Via Telnet:** Make certain that Telnet access is enabled as described in Section 5.9.2. Start your Telnet client, and enter the NBB default IP address (192.168.168.168).

   e) **Via Modem:** Make certain the NBB SetUp Port is configured for Modem Mode as described in Section 5.8, then use your communications program to dial the number for the external Modem connected to the SetUp Port.

2. **Username** / **Password Prompt:** A message will be displayed, which prompts you to enter your username and password. The default username is "**`super`**" (all lower case, no quotes), and the default password is also "**`super`**". If a valid username and password are entered, the NBB will display either the Main Menu (Web Browser Interface) or the Port Status Screen (SSH, Telnet, or Modem.)

3. **Test Switching Functions:** You may wish to perform the following tests in order to make certain that the NBB is responding to commands. When switching and reboot commands are executed, the NBB Output Status LEDs will also turn On or Off to indicate the status of each outlet.

   a) **Reboot Outlet:**

      i. **Web Browser Interface:** Click on the "Plug Control" link on the left hand side of the screen to display the Plug Control Menu. From the Plug Control Menu, click the down arrow in the row for Plug A1 to display the dropdown menu, then select "Reboot" from the drop down menu and click on the "Execute Plug Actions" button.

      ii. **Text Interface:** Type **`/BOOT A1`** and press **[Enter]**.

   b) **Switch Outlet Off:**

      i. **Web Browser Interface:** From the Plug Control Menu, click the down arrow in the "Action" column for Plug A1 to display the drop down menu, then select "Off" from the drop down menu and click on the "Execute Plug Actions" button.

      ii. **Text Interface:** Type **`/OFF A1`** and press **[Enter]**.

   c) **Switch Outlet On:**

      i. **Web Browser Interface:** From the Plug Control Menu, click the down arrow in the "Action" column for Plug A1 to display the drop down menu, then select "On" from the drop down menu and click on the "Execute Plug Actions" button.

      ii. **Text Interface:** Type **`/ON A1`** and press **[Enter]**.

3. **Logging Out:** When you log off using the proper NBB command, this ensures that the unit has completely exited from command mode, and is not waiting for the inactivity timeout to elapse before allowing additional connections.

   a) **Web Browser Interface:** Click on the "LOGOUT" link on the left hand side of the screen.

   b) **Text Interface:** Type **`/X`** and press **[Enter]**.

This completes the Quick Start Guide for the NBB. Prior to placing the unit into operation, it is recommended to refer to the remainder of this User's Guide for important information regarding advanced configuration capabilities and more detailed operation instructions. If you have further questions regarding the NBB unit, please contact WTI Customer Support as described in Appendix E.

4. Hardware Installation

4.1. Connecting the Power Supply Cables

4.1.1. Rack Mounting

The NBB offers three different mounting options; the unit can either be mounted to the equipment rack using the supplied Mounting Buttons or Mounting Plates, or the optional Mounting Brackets. For more information on rack mounting, please refer to the instructions in Appendix C.

4.1.2. Connect the NBB to Your Power Supply

Refer to the cautions listed below and at the beginning of this User's Guide, and then connect the NBB unit to an appropriate power supply.

Note: *Some NBB units are shipped with one or two detachable 125 VAC, 15 Amp "Starter" Cables. These cable(s) will allow you to connect a 120 VAC NBB unit to power for bench testing and initial start up and are adequate for applications that only require 15 Amps. For higher amp power switching applications, please refer to the WTI Power Cable Guide (which can be found on the CDROM included with the unit) or use appropriate cables.*

CAUTIONS:

- ***Before attempting to install this unit, please review the warnings and cautions listed at the front of the user's guide.***
- ***This device should only be operated with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, please contact your local power company.***
- ***Reliable earthing (grounding) of this unit must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than directly to the branch circuit.***

4.2. Connection to Switched Outlets

Connect the power cord from your switched device to one of the AC Outlets on the NBB unit. Note that when power is applied to the NBB, the AC Outlets will be switched "ON" by default. Note that some NBB models feature two separate power liness, while others may feature only one power line.

4.2.1. Installing the Optional Cable Retainer Bars

The NBB unit is available with two optional cable retainer bars, one for the Line A outlets and one for the Line B outlets. To install the optional cable retainer bars, please refer to the instructions in Appendix D.

4.3. Serial SetUp Port Connection

The NBB SetUp Port is a female, RJ45 RS232 connector, wired in a DCE configuration. In the default state, the Setup port is configured for 9600 bps, no parity, 8 data bits, 1 stop bit. The Setup Port can be connected to either an external modem or a local PC, but not both items at the same time. Appendix B.1 describes the Setup Port interface.

4.3.1. Connecting a Local Computer or Terminal

Use the DX9F-WTI Adapter supplied with the unit to connect your PC COM port to the NBB Setup Port. The Setup Port Mode should be set to the default "Normal" state, as described in Section 5.8.

4.3.2. Connecting an External Modem

When connecting directly to an external modem, use the optional DX9M-RJ-KIT (not included) to connect your external modem to the NBB Setup Port. Make certain that the modem is initialized at the same default parameters as the NBB Setup Port and that the NBB Setup Port Mode is set to Modem or Modem PPP as described in Section 5.8.

4.4. Connecting the Network Cable

The Network Port is an RJ45 Ethernet jack, for connection to a TCP/IP network. Connect your 10/100Base-T cable to the Network Port. Note that the NBB include a default IP address (192.168.168.168) and a default subnet mask (255.255.255.0.) When installing the NBB in a working network environment, it is recommended to define network parameters as described in Section 5.9.

This completes the NBB installation instructions. Please proceed to the next Section for instructions regarding unit configuration.

5. Basic Configuration

This section describes the basic configuration procedure for all NBB units. For more information on Reboot Options and Alarm Configuration, please refer to Section 6 and Section 7.

5.1. Communicating with the NBB Unit

In order to configure the NBB, you must first connect to the unit, and access command mode. Note that, the NBB offers two separate configuration interfaces; the Web Browser Interface and the Text Interface.

In addition, the NBB also offers three different methods for accessing command mode; via network, via external modem, or via local console. The Web Browser interface is only available via network, and the Text Interface is available via network (SSH or Telnet), modem or local device.

5.1.1. The Text Interface

The Text Interface consists of a series of simple ASCII text menus, which allow you to set options and define parameters by entering the number for the desired option using your keyboard, and then typing in the value for that option.

Since the Web Browser Interface and Telnet accessibility are both disabled in the default state, you will need to use the Text Interface to contact the NBB via local device or SSH connection when setting up the unit for the first time. After you have accessed command mode using the Text Interface, you can then enable Web Access and Telnet Access, if desired, in order to allow future communication with the unit via Web Browser or Telnet. You will not be able to contact the unit via Web Browser or Telnet until you have enabled these options.

Once Telnet Access is enabled, you will then be able to use the Text Interface to communicate with the NBB via local device, Telnet or SSH connection. You can also use the Text Interface to access command mode via an external modem installed at the NBB serial Setup Port.

In order to use the Text Interface, your installation must include:

- **Access via Network:** The NBB must be connected to your TCP/IP Network, and your computer must include a communications program (such as HyperTerminal.)
- **Access via Modem:** An external modem must be installed at the NBB RS232 Setup Port (see Section 4.3.2), a phone line must be connected to the external modem, and the Setup Port must be configured for Modem Mode. In addition, your computer must include a communications program.
- **Access via Local Device:** Your computer must be physically connected to the NBB RS232 Setup Port as described in Section 4.3.1, the NBB Setup Port must be configured for Normal Mode, and your computer must include a communications program.

To access command mode via the Text Interface, proceed as follows:

Note: *When communicating with the unit for the first time, you will not be able to contact the unit via Telnet, until you have accessed command mode, via local computer or SSH Client, and used the Network Parameters Menu to enable Telnet as described in Section 5.9.2.*

1. Contact the NBB Unit:

   a) **Via Local Device:** Start your communications program and press **[Enter]**. Wait for the connect message, then proceed to Step 2.

   b) **Via Network:** The NBB includes a default IP address (192.168.168.168) and a default subnet mask (255.255.255.0.) This allows you to contact the unit from any network node on the same subnet, without first assigning an IP Address to the unit. For more information, please refer to Section 5.9.

      i. **Via SSH Client:** Start your SSH client, and enter the NBB IP Address. Invoke the connect command, wait for the connect message, then proceed to Step 2.

      ii. **Via Telnet:** Start your Telnet Client, and then Telnet to the NBB IP Address. Wait for the connect message, then proceed to Step 2.

   c) **Via Modem:** Use your communications program to dial the number for the external modem which you have connected to the NBB Setup Port.

2. **Login** / **Password Prompt:** A message will be displayed, which prompts you to enter a username (login name) and password. The default username is "**`super`**" (all lower case, no quotes), and the default password is also "**`super`**".

3. If a valid username and password are entered, the NBB will display the Plug Status Screen.

5.1.2. The Web Browser Interface

The Web Browser Interface consists of a series of web forms, which can be used to select configuration parameters and perform reboot operations, by clicking on buttons and/or entering text into designated fields.

Note: *In order to use the Web Browser Interface, Web Access must first be enabled via the Text Interface Network Parameters Menu (/N), the NBB must be connected to a TCP/IP network, and your computer must be equipped with a JavaScript enabled web browser.*

1. Start your JavaScript enabled Web Browser, key the NBB IP address (default = 192.168.168.168) into the web browser's address bar, and press **[Enter]**.

2. **Username** / **Password Prompt:** A message box will prompt you to enter your username and password. The default username is "**`super`**" (all lower case, no quotes), and the default password is also "**`super`**".

3. If a valid username and password are entered, the Plug Control Screen will be displayed.

5.1.3. Access Via PDA

In addition to the Web Browser Interface and Text Interface, the NBB command mode can also be accessed by PDA devices. Note however, that due to nature of most PDAs, only a limited selection of NBB operating and status display functions are available to users who communicate with the unit via PDA.

When the NBB is operated via a PDA device, only the following functions are available:

- Product Status Screen (Section 8.1)
- Plug Status Screen (Section 8.3)
- Plug Group Status Screen (Section 8.4)
- Plug Control Screen (Section 9.1.1)
- Plug Group Control Screen (Section 9.1.2)
- Current & Power Metering (Section 8.5)
- Current History Graph (Section 8.6)

These screens will allow PDA users to review Plug Status and Plug Group Status, invoke switching and reboot commands, display Current Metering Readings, show Current History and display the Site I.D. and firmware version. Note however, that PDA users are not allowed to change or review NBB configuration parameters.

To configure the NBB for access via PDA, first consult your IT department for appropriate settings. Access the NBB command mode via the Text Interface or Web Browser interface as described in this section, then configure the NBB Network Port accordingly, as described in Section 5.9.

In most cases, this configuration will be adequate to allow communication with most PDAs. Note however, that if you wish to use a BlackBerry® to contact the NBB, you must first make certain to configure the BlackBerry to support HTML tables, as described below:

1. Power on the BlackBerry, and then click on the BlackBerry Internet Browser Icon.
2. Press the Menu button, and then choose "Options."
3. From the Options menu, choose "Browser Configuration," then verify to make certain that "Support HTML Tables" is checked (enabled.)
4. Press the Menu button, and select "Save Options."

When you have finished communicating with the NBB via PDA, it is important to always close the session using the PDA's menu functions, rather than by simply closing the browser window, in order to ensure that the NBB has completely exited from command mode, and is not waiting for the inactivity timeout period to elapse. For example, to close a session on a BlackBerry, press the Menu button and then choose "Close."

5.2. Configuration Menus

Although the Web Browser Interface and Text Interface provide two separate means for selecting parameters, both interfaces allow access to the same set of basic parameters, and parameters selected via one interface will also be applied to the other. To access the configuration menus, proceed as follows:

- **Text Interface:** Refer to the Help Screen (/H) and then enter the appropriate command to access the desired menu. When the configuration menu appears, key in the number for the parameter you wish to define, and follow the instructions in the resulting submenu.
- **Web Browser Interface:** Use the links and fly-out menus on the left hand of the screen to access the desired configuration menu. To change parameters, click in the desired field and key in the new value or select a value from the pull-down menu. To apply newly selected parameters, click on the "Change Parameters" button at the bottom of the menu or the "Set" button next to the field.

The following sections describe options and parameters that can be accessed via each of the configuration menus. Please note that essentially the same set of parameters and options are available to both the Web Browser Interface and Text Interface.

Notes:

- *Configuration menus are only available when you have logged into command mode using a password that permits Administrator Level commands. SuperUser accounts are able to view configuration menus, but are not allowed to change parameters.*
- *Configuration menus are not available when you are communicating with the NBB via PDA.*
- *When defining parameters via the Text Interface, make certain to press the **[Esc]** key to completely exit from the configuration menu and save newly defined parameters. When parameters are defined via the Text Interface, newly defined parameters will not be saved until the "Saving Configuration" message has been displayed and the cursor returns to the command prompt.*

5.3. Defining System Parameters

The System Parameters menus are used to define the Site ID Message, set the system clock and calendar, and configure the Invalid Access Lockout feature and Callback feature.

To access the System Parameters menu via the Text Interface, type **`/F`** and press **[Enter]**. To access the System Parameters menu via the Web Browser Interface, place the cursor over the "General Parameters" link, wait for the flyout menu to appear and then click on the "System Parameters" link. The System Parameters Menus are used to define the following:

- **User Directory:** This function is used to view, add, modify and delete user accounts and passwords. As discussed in Section 5.4 and Section 5.5, the User Directory allows you to set the security level for each account as well as determine which plugs each account will be allowed to control.

  Note: *The "User Directory" option does not appear in the Web Browser Interface's System Parameters menu, and is instead, accessed via the "User Configuration" link on the left hand side of the menu.*

- **Site ID:** A text field, generally used to note the installation site or name for the NBB unit. (Default = undefined.)
- **Real Time Clock:** This prompt provides access to the Real Time Clock menu, which is used to set the clock and calendar, and to enable and configure the NTP (Network Time Protocol) feature as described in Section 5.3.1.

  Note: *The "Real Time Clock" option does not appear in the Web Browser Interface's System Parameters menu, and is instead, accessed via the "Real Time Clock" link in the General Parameters fly-out menu.*

- **Invalid Access Lockout:** If desired, this feature can be used to temporarily disable Console Port access, SSH access, Telnet access and/or Web access to the NBB command mode after a user specified number of unsuccessful login attempts are made. For more information, please refer to Section 5.3.2. (Default = On.)

  Note: *The "Invalid Access Lockout" item does not appear in the Web Browser Interface's System Parameters menu, and is instead, accessed via the link in the General Parameters fly-out menu.*

- **Temperature Format:** Determines whether the temperature is displayed as Fahrenheit or Celsius. (Default = Fahrenheit.)
- **Temperature Calibration:** Used to calibrate the unit's internal temperature sensing abilities. To calibrate the temperature, place a thermometer inside your equipment rack, in a location that usually experiences the highest temperature. After a few minutes, take a reading from the thermometer, and then key the reading into the configuration menu. In the Web Browser Interface, the temperature is entered at the System Parameters menu, in the Temperature Calibration field; in the Text Interface, the temperature is entered in a submenu of the System Parameters menu, accessed via the Temperature Calibration item. (Default = undefined.)

- **Log Configuration:** Configures the Audit Log, Alarm Log and Current Metering Log. For more information on event logging functions, please refer to Section 5.3.3. (Defaults: Audit Log = On without Syslog, Alarm Log = On without Syslog, Current Metering Log = On.)

  Notes:

  - *The Audit Log will create a record of all port connection/disconnection and login/logout activity at the NBB unit.*
  - *The Alarm Log will create a record of each instance where the Invalid Access Alarm is triggered or cleared at the NBB unit.*
  - *The Current Metering Log will create a record of current consumption by the NBB unit.*

- **Callback Security:** Enables / configures the Callback Security Function as described in Section 5.3.4. In order for this feature to function, a Callback number must also be defined for each desired user account as described in Section 5.5. (Default = On, Callback, Without Password Prompt.)

  Notes:

  - *In the Text Interface, Callback Security Parameters are defined via a submenu of the Systems Parameters Menu, which is accessed via the Callback Security item.*
  - *In the Web Browser Interface, Callback Security Parameters are defined via the "Callback Security" link in the General Parameters fly-out menu.*

- **Front Panel Buttons:** This item can be used to disable all front panel button functions. (Default = On.)

- **Modem Phone Number:** When an optional external modem is connected to the NBB Setup Port, the Modem Phone Number parameter can be used to denote the phone number for the external modem. (Default = undefined.)

- **Management Utility:** Enables/Disables the Device Management Utility (DMU.) When enabled, the DMU allows you to manage multiple WTI units via a single menu. (Default = Off.) For more information on the DMU, please refer to the DMU User's Guide, which can be found on the WTI website at:

  http://www.wti.com/t-product-manuals.aspx

  Note: *Although the Device Management Utility can be enabled/disabled via either the Web Browser Interface and Text Interface, the Device Management Utility can only be accessed and operated via the Web Browser Interface.*

- **Scripting Options:** Provides access to a submenu that is used to configure the Command Confirmation, Automated Mode, Command Prompt and IPS Mode parameters as described in Section 5.3.6.

  Note: *In the Text Interface, the Scripting Options submenu is accessed via item 12. To access the Scripting Options parameters via the Web Browser Interface, place the cursor over the "General Parameters" link, wait for the flyout menu to appear, then click on the "Scripting Options" link.*

- **Power Configuration:** In the Web Browser Interface, the Voltage Calibration parameter, Power Factor parameter and Power Efficiency parameter are defined via the System Parameters Menu. In the Text Interface, these parameters reside in a separate submenu, which is accessed via the Power Configuration option. For more information on Power Configuration, please refer to Section 5.3.5.

- **EnergyWise Configuration:** Defines parameters that are needed in order for the NBB to serve as an element in a Cisco® EnergyWise™ network. This item allows the following parameters to be defined. (Default = Off.)

  Note: *In the Web Browser Interface, EnergyWise parameters are defined via the "EnergyWise" link in the General Parameters fly-out menu.*

  - **Enable:** Enables/disables the NBB unit's ability to particapate in a Cisco Energywise network. (Default = Off)
  - **Domain:** The Energywise Domain Name; up to eighty characters long. (Default = Undefined.)
  - **Secret:** A password that is used to authenticate each element in a Cisco Energywise network. The Secret parameter can be up to eighty characters long. (Default = Undefined.)

- **Serial Number:** Allows the serial number for the NBB unit to be saved and displayed. When this parameter is defined, the serial number can be displayed via the Product Status screen in the Web Browser or by invoking the /J* command in the Text Interface. Since the serial number plate on the NBB unit is not always easily accessible after installation, it is often helpful to define the serial number here in order to simplify the process of determining the serial number later. (Default = undefined.)

5.3.1. The Real Time Clock and Calendar

The Real Time Clock menu is used to set the NBB internal clock and calendar. The configuration menu for the Real Time Clock offers the following options:

- **Date:** Sets the Month, Date, Year and day of the week for the NBB real-time clock/calendar.
- **Time:** Sets the Hour, Minute and Second for the NBB real time clock/calendar. Key in the time using the 24-hour (military) format.
- **Time Zone:** Sets the time zone, relative to Greenwich Mean Time. Note that the Time Zone setting will function differently, depending upon whether or not the NTP feature is enabled and properly configured. (Default = GMT (No DST).)
  - **NTP Enabled:** The Time Zone setting is used to adjust the Greenwich Mean Time value (received from the NTP server) in order to determine the precise local time for the selected time zone.
  - **NTP Disabled:** If NTP is disabled, or if the NBB is not able to access the NTP server, then status screens and activity logs will list the selected Time Zone and current Real Time Clock value, but will not apply the correction factor to the displayed Real Time Clock value.
- **NTP Enable:** When enabled, the NBB will contact an NTP server (defined via the NTP Address prompts) once a day, and update its clock based on the NTP server time and selected Time Zone. (Default = Off.)

Notes:

- *The NBB will also contact the NTP server and update the time whenever you change NTP parameters.*
- *To cause NBB to immediately contact the NTP server at any time, make certain that the NTP feature is enabled and configured, then type* **`/F`** *and press* **[Enter]**. *When the System Parameters menu appears, press* **[Esc]**. *The NBB will save parameters and then attempt to contact the server, as specified by currently defined NTP parameters.*

- **Primary NTP Address:** Defines the IP address or domain name (up to 64 characters long) for the primary NTP server. (Default = undefined.)

Notes:

- *In order to use domain names for web addresses, DNS parameters must first be defined as described in Section 5.9.5.*
- *The Web Browser Interface includes two separate fields that are allowed to define both an IPv4 protocol and IPv6 protocol format Primary NTP Address and Secondary NTP Address.*
- *When the Primary NTP Address and Secondary NTP Address are defined via the Text Interface, the NBB will display a prompt that instructs the user to select IPv4 or IPv6 protocol.*
- *The NBB allows parameters for both IPv4 and IPv6 protocols to be defined and saved.*

- **Secondary NTP Address:** Defines the IP address or domain name (up to 64 characters long) for the secondary, fallback NTP Server. (Default = undefined.)

Notes:

- *In order to use domain names for web addresses, DNS parameters must first be defined as described in Section 5.9.5.*
- *The Web Browser Interface includes two separate fields that are allowed to define both an IPv4 protocol and IPv6 protocol format Primary NTP Address and Secondary NTP Address.*
- *When the Primary NTP Address and Secondary NTP Address are defined via the Text Interface, the NBB will display a prompt that instructs the user to select IPv4 or IPv6 protocol.*
- *The NBB allows parameters for both IPv4 and IPv6 protocols to be defined and saved.*

- **NTP Timeout:** The amount of time in seconds, that will elapse between each attempt to contact the NTP server. When the initial attempt is unsuccessful, the NBB will retry the connection four times. If neither the primary nor secondary NTP server responds, the NBB will wait 24 hours before attempting to contact the NTP server again. (Default = 3 Seconds.)

- **Test NTP Servers:** Allows you to ping the IP addresses or domain names defined via the Primary and Secondary NTP Address prompts, or to ping a new address or domain defined via the Test NTP Servers submenu in order to check that a valid IP address or domain name has been entered.

Notes:

- *In order for the Test NTP Servers feature to function, your network and/or firewall must be configured to allow ping commands.*
- *In addition to the Test NTP Servers option, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping any user defined IP address in order to make certain that the IP address is responding.*

5.3.2. The Invalid Access Lockout Feature

When properly configured and enabled, the Invalid Access Lockout feature can watch all login attempts made via SSH connection, Telnet connection, web browser or the serial SetUp Port. If the counter for any of these exceeds the user-defined threshold for maximum invalid attempts, then the corresponding port or protocol will be automatically disabled for the length of time specified by the Lockout Duration parameter.

When Invalid Access Attempt monitoring is enabled for the serial SetUp Port, the NBB will count invalid access attempts at the serial SetUp Port. If the number of invalid access attempts exceeds the defined Lockout Attempts trigger value, the NBB will lock the serial SetUp Port for the defined Lockout Duration period. When Invalid Access Attempt monitoring for SSH, Telnet or Web are selected, a lockout will be triggered when the number of invalid access attempts during the defined Lockout Duration period exceeds the defined Hit Count for the protocol. For example, if the SSH Hit Count is set at 10 and the SSH Lockout Duration period is set at 120 seconds, then if over 10 invalid access attempts are detected within 120 seconds, the NBB will then lock out the MAC address that generated the excessive attempts for 120 seconds.

Note that when an Invalid Access Lockout occurs, you can either wait for the Lockout Duration period to elapse (after which, the NBB will automatically reactivate the port or protocol), or you can issue the /UL command (type **`/UL`** and press **[Enter]**) via the Text Interface to instantly unlock all NBB logical network ports and communication protocols.

Notes:

- *When the Serial Port Invalid Access Lockout Alarm has been enabled as described in Section 7.6, the NBB can also provide notification via email, Syslog Message, and/or SNMP trap whenever an Invalid Access Lockout occurs at the serial SetUp Port.*
- *If the Network Port has been locked by the Invalid Access Lockout feature, it will still respond to the ping command (providing that the ping command has not been disabled at the Network Port.)*

The Invalid Access Lockout configuration menus allow you to select the following parameters:

- **Serial Port Protection:** Enables/Disables the Invalid Access Lockout function for the serial SetUp Port and selects lockout parameters. When this item is enabled and excessive Invalid Access attempts are detected at the SetUp Port, the SetUp Port will be locked until the user-defined Lockout Duration period elapses, or until the /UL command is issued.
  - **Serial Port Protection:** Enables/Disables the Invalid Access Lockout feature for the serial SetUp Port. (Default = Off.)
  - **Lockout Attempts:** The number of invalid attempts that must occur in order to trigger the Invalid Access Lockout feature at the serial SetUp Port. (Default = 9.)
  - **Lockout Duration:** This option selects the length of time that the serial SetUp Port will remain locked when Invalid Access Lockout occurs. If the duration is set at "Infinite", then ports will remained locked until the /UL command is issued. (Default = 30 Minutes.)

- **SSH Protection:** Enables/Disables and configures the Invalid Access function for SSH connections. When this item is enabled and excessive Invalid Access Attempts via SSH are detected, then the NBB will lock out the offending MAC address for the user-defined SSH Lockout Duration Period or until the /UL command is issued. Note that for SSH protection, the lockout trigger is a function of the SSH Hit Count parameter and the SSH Lockout Duration Parameter.
  - **Lockout Enable:** Enables/Disables Invalid Access Lockout protection for SSH connections. (Default = Off.)
  - **SSH Hit Count:** The number of invalid attempts that must occur during the length of time specified by the SSH Lockout Duration period in order to trigger the Invalid Access Lockout feature for SSH protocol. For example, if the SSH Hit Count parameter is set to 10 and the SSH Lockout Duration parameter is set to 30 minutes, then the NBB will lock out the offending MAC address for 30 minutes when over 10 invalid access attempts occur during any 30 minute long period. (Default = 40.)
  - **SSH Lockout Duration:** This option selects both the length of time that an SSH Lockout will remain in effect and also the time period over which invalid access attempts will be counted. When an SSH Lockout occurs, the offending MAC address will be prevented from establishing an SSH connection to the NBB for the defined SSH Lockout Duration period. (Default = 120 Seconds.)
- **Telnet Protection:** Enables/Disables and configures the Invalid Access function for Telnet connections. When this item is enabled and excessive Invalid Access Attempts via Telnet are detected, then the NBB will lock out the offending MAC address for the user-defined Telnet Lockout Duration Period or until the /UL command is issued. Note that for Telnet protection, the lockout trigger is a function of the Telnet Hit Count parameter and the Telnet Lockout Duration Parameter.
  - **Lockout Enable:** Enables/Disables Invalid Access Lockout protection for Telnet connections. (Default = Off.)
  - **Telnet Hit Count:** The number of invalid attempts that must occur during the length of time specified by the Telnet Lockout Duration period in order to trigger the Invalid Access Lockout feature for the Telnet protocol. For example, if the Telnet Hit Count parameter is set to 10 and the Telnet Lockout Duration parameter is set to 30 minutes, then the NBB will lock out the offending MAC address for 30 minutes when over 10 invalid access attempts occur during any 30 minute long period. (Default = 20.)
  - **Telnet Lockout Duration:** This option selects both the length of time that a Telnet Lockout will remain in effect and also the time period over which invalid access attempts will be counted. When a Telnet Lockout occurs, the offending MAC address will be prevented from establishing a Telnet connection to the NBB for the defined Telnet Lockout Duration period. (Default = 120 Seconds.)

- **Web Protection:** Enables/Disables and configures the Invalid Access function for Web connections. When this item is enabled and excessive Invalid Access Attempts via Web are detected, then the NBB will lock out the offending MAC address for the user-defined Web Lockout Duration Period or until the /UL command is issued. Note that for Web protection, the lockout trigger is a function of the Web Hit Count parameter and the Web Lockout Duration Parameter.
  - **Lockout Enable:** Enables/Disables Invalid Access Lockout protection for web connections. (Default = Off.)
  - **Web Hit Count:** The number of invalid attempts that must occur during the length of time specified by the Web Lockout Duration period in order to trigger the Invalid Access Lockout feature for Web access. For example, if the Web Hit Count parameter is set to 10 and the Web Lockout Duration parameter is set to 30 minutes, then the NBB will lock out the offending MAC address for 30 minutes when over 10 invalid access attempts occur during any 30 minute long period. (Default = 80.)
  - **Web Lockout Duration:** This option selects both the length of time that a Web Lockout will remain in effect and also the time period over which invalid access attempts will be counted. When a Web Lockout occurs, the offending MAC address will be prevented from establishing a Web connection to the NBB for the defined Telnet Lockout Duration period. (Default = 60 Seconds.)

5.3.3. Log Configuration

This feature allows you to create records of command activity, alarm actions, temperature readings and current and power consumption for the NBB unit. The Log features are enabled and configured via the System Parameters Menus.

- **Audit Log:** Creates a record of all power switching at the NBB unit, including reboots and switching caused by Load Shedding, Load Shedding Recovery, Ping No Answer Reboots and Scheduled Reboots. Each Log record includes a description of the activity that caused the power switching, the username for the account that initiated the power switching or reboot and the time and date that the power switching or reboot occurred. In addition to power switching activity, the Audit Log will also include login/logout activity for each user account.
- **Alarm Log:** Creates a record of all Alarm Activity at the NBB unit. When an alarm is triggered, the NBB will generate a record that lists the time and date of the alarm, the name of the Alarm triggered, and a description of the Alarm.
- **Current Metering Log:** Provides a record of current consumption. Log records include the time and date, current and voltage readings and temperature readings. Current Metering Log data can be downloaded in ASCII, CSV or XML format.

5.3.3.1. Audit Log and Alarm Log Configuration Options

The Log Configuration options in the System Parameters menu allows you to enable/disable and configure the Audit Log and Alarm Log. The Audit Log and Alarm Log both offer the following parameters:

- **Off:** The Log is disabled, and command activity and/or alarm events will not be logged.
- **On - With Syslog:** The Log is enabled, and power switching, login/logout activity and/or alarm events will be logged. The NBB will generate a Syslog Message every time a Log record is created.
- **On - Without Syslog:** The Log is enabled, and power switching, login/logout activity and/or alarm events will be logged, but the NBB will *not* generate a Syslog Message every time a Log record is created. (Default Setting.)

Notes:

- *In order for the Audit Log or Alarm Log to generate Syslog Messages, Syslog Parameters must first be defined as described in Section 11.*
- *The Audit Log will truncate usernames that are longer than 22 characters, and display two dots (..) in place of the remaining characters.*

5.3.3.2. Reading, Downloading and Erasing Logs

To read or download the status logs, proceed as follows:

- **Text Interface:** Type **/L** and press **[Enter]** to access the Display Log menu. In the Text Interface, the Display Logs menu is used to download or display the Audit Log and Alarm Log as well as the Current Metering Log and Power Metering Log.
- **Web Browser Interface:** Move the cursor over the "Current Metering," "Power Metering" or "Logs" link. When the flyout menu appears, click on the desired option and then follow the instructions in the resulting submenu.

  Note: *You can also display current readings via the Current Metering function. In the Text Interface, type* **/M** *and then press* ***[Enter]****.*

Proceed as follows to download, display or erase logged data:

- **Audit Log and Alarm Log:** The Audit Log and Alarm Log can be displayed or downloaded via either the Text Interface or Web Browser Interface. When the Audit Log or Alarm Log are displayed via the Text Interface, the NBB will also offer the option to erase Audit Log or Alarm Log data.
- **Current Metering Log and Power Metering Log:** The Current Metering Log and Power Metering Log can be displayed or downloaded via either the Text Interface or Web Browser Interface. When the Current Metering Log is selected via the Text Interface, the NBB will also offer the option to erase Current Metering Log data.

Notes:

- *Temperature data is included in the Current History Log.*
- *When the Current Metering Log is erased, the Power Metering Log will also be erased.*
- *The NBB dedicates a fixed amount of internal memory for log records, and if log records are allowed to accumulate until memory is filled, data will eventually "wrap around," and older data will be overwritten by newer data.*
- *Note that once records have been erased or overwritten, they cannot be recovered.*

5.3.3.3. Current Metering Log Display Options

When the Current Metering Log (or Current History) is displayed, the NBB offers the option to display Current Metering data for either the entire unit or for an individual line. In addition, the Web Browser Interface also allows you to view Current Metering data and can also display Live current metering data, or data from the past day, week, month or year.

5.3.3.4. Power Metering Log Display Options

When the Power Metering Log (or Power History) is displayed, the NBB can display Power Metering data for a user specified date range, for either the entire unit or a single line. In addition, the Web Browser Interface also allows you to display Live power metering data, or data from the past day, week, month or year.

5.3.4. Callback Security

The Callback function provides an additional layer of security when callers attempt to access command mode via modem. When this function is properly configured, modem users will not be granted immediate access to command mode upon entering a valid password; instead, the unit will disconnect, and dial a user-defined number before allowing access via that number. If desired, users may also be required to re-enter the password *after* the NBB dials back.

In order for Callback Security to function properly, you must first enable and configure the feature via the System Parameters menu as described in this section, and then define a callback number for each desired user account as described in Section 5.5.

To access the Callback Security menu via the Text Interface, type **`/F`** and press **[Enter]** and then select the Callback Security option. To access the Callback Security menu via the Web Browser Interface, place the cursor over the General Parameters link, wait for the flyout menu to appear, and then Click on the "Callback Security" link. In both the Text Interface and Web Browser Interface, the Callback Security Menu offers the following options:

- **Callback Enable:** This prompt offers five different configuration options for the Callback Security feature: (Default = On - Callback (Without Password Prompt.)
  - **Off:** All Callback Security is disabled.
  - **On - Callback (Without Password Prompt):** Callbacks will be performed for user accounts that include a Callback Number, and the login prompt will *not* be displayed when the user's modem answers. If the account *does not* include a Callback Number, that user will be granted immediate access.
  - **On - Callback (With Password Prompt):** Callbacks will be performed for user accounts that include a Callback Number, and the login prompt *will* be displayed when the user's modem answers (accounts that include a Callback Number will be required to re-enter their username/password when their modem answers.) If the account *does not* include a Callback Number, then that user will be granted immediate access.
  - **On - Callback ONLY (Without Password Prompt):** Callbacks will be performed for user accounts that include a Callback Number, and the username/password prompt will *not* be displayed when the user's modem answers. Accounts that *do not* include a Callback Number will *not* be able to access command mode via modem.
  - **On - Callback ONLY (With Password Prompt):** Callbacks will be performed for accounts that include a Callback Number, and the username/password prompt *will* be displayed when the user's modem answers (users will be required to re-enter their username/password when their modem answers.) Accounts that *do not* include a Callback Number will *not* be able to access command mode via modem.

- **Callback Attempts:** The number of times that the NBB will attempt to contact the Callback number. (Default = 3 attempts.)
- **Callback Delay:** The amount of time that the NBB will wait between Callback attempts. (Default = 30 seconds.)

Notes:

- *After configuring and enabling Callback Security, you must then define a callback phone number for each desired user account (as described in Section 5.5) in order for this feature to function properly.*
- *When using the "On - Callback (With Password Prompt)" option, it is important to remember that accounts that do not include a callback number will be allowed to access command mode without callback verification.*

5.3.5. Power Source Configuration

The Power Configuration menu allows you to adjust power measurements in order to obtain a more accurate determination of how much "real power" is being used by devices connected to the NBB. Real Power is determined by the following equation:

$$\text{Real Power} = \frac{(\text{Voltage} * \text{Amps}) * \text{Power Factor}}{\text{Power Efficiency}}$$

To define Power Configuration parameters, access the command mode using an account that permits access to Administrator level commands and then activate the System Parameters Menu.

Notes:

- *In the Text Interface, power source configuration parameters are defined via the Power Configuration menu.*
- *In the Web Browser Interface, power source configuration parameters are selected via the System Parameters menu.*

The following Power Source Configuration parameters are available:

- **Voltage Calibration:** This option is used to calibrate the voltage readout on the NBB front panel. To calibrate the voltage, first determine the approximate voltage and then select the Voltage Calibration option and key in the correct voltage. In the Web Browser Interface, the voltage is entered at the System Parameters menu in the Voltage Calibration field. In the Text Interface, the voltage is entered in a submenu of the System Parameters menu. (Default = undefined.)
- **Power Factor:** Can be any value from 0.1 to 1.00. (Default = 1.00.)
- **Power Efficiency:** Can be any whole number from 1% to 100%. (Default = 100%.)

5.3.6. Scripting Options

The Scripting Options submenu provides access to parameters that are used to set up the NBB unit for running various scripts.

Notes:

- *To access Scripting Options parameters via the Text Interface, first type* **`/F`** *and press* **[Enter]** *to display the System Parameters Menu, then key in the number for the Scripting Options item and press* ***[Enter]****.*
- *To access the Scripting Options parameters via the Web Browser Interface, place the cursor over the "General Parameters" link, wait for the flyout menu to appear, then click on the "Scripting Options" link.*

The Scripting Options menu allows the following parameters to be defined:

- **Command Confirmation:** Enables/Disables the Command Confirmation feature. When enabled, a "Sure" prompt will be displayed before power switching and reboot commands are executed. When disabled, commands will be executed without further prompting. (Default = On.)
- **Automated Mode:** When enabled, the NBB will execute switching and reboot commands without displaying a confirmation prompt, status screen or confirmation messages. For more information, please refer to Section 5.3.6.1 or Section 9.3. (Default = Off.)

  Note: *When the Automated Mode is enabled, security functions are suppressed, and users are able to access configuration menus and control plugs without entering a password. If security is a concern and the Automated Mode is required, it is recommended to use the IP Security feature (Section 5.9.3) to restrict access.*

- **Command Prompt:** Allows the Text Interface command prompt to be set to either MPC, IPS, NPS, NBB, VMR, CCM, RPC or the currently defined Site ID message. (Default = NBB.)
- **IPS Mode:** This parameter sets up the NBB for use with command scripts that were written for WTI's IPS Series Remote Reboot Switches. When the IPS Mode is enabled, the "IPS" command prompt will be displayed in the Text Mode, User Accounts will not allow definition of a Username, and only the "password" prompt will be displayed when logging into the unit (IPS Mode units will not display a "username" prompt.) (Default = Off.)
  - The "IPS" command prompt will be displayed in the Text Mode.
  - Providing that no Administrator level user accounts are defined, the NBB will not display the username or password prompts upon login to command mode.
  - If one or more Administrator level user accounts have been defined, then the NBB will only display the password prompt upon login to command mode. If all Administrator level user accounts (aside from the default "super" account) are deleted, then the NBB will return to the status where no username or password prompts are displayed upon login to command mode.

5.3.6.1. Automated Mode

The Automated Mode allows the NBB to execute switching and reboot commands, without displaying menus or generating response messages. Automated Mode is designed to allow the NBB to be controlled by a device which can generate commands to control power switching functions without human intervention.

When Automated Mode is enabled, power switching and reboot commands are executed without a confirmation prompt and without command response messages; the only reply to these commands is the command prompt, which is re-displayed when each command is completed.

Although Automated Mode can be enabled using either the Web Browser Interface or Text Interface, Automated Mode is designed primarily for users who wish to send ASCII commands to the NBB without operator intervention, and therefore does not specifically apply to the Web Browser Interface. When Automated Mode is enabled, the Web Browser Interface can still be used to invoke switching and reboot commands.

Notes:

- *When the Automated Mode is enabled, password prompts will not be displayed at login, and you will be able to access Administrator Level command functions (including the configuration menus) and control plugs without entering a password.*
- *If you need to enable the Automated Mode, but want to restrict network access to configuration menus, it is strongly recommended to enable and configure the IP Security Function as described in Section 5.9.3.*

To enable/disable the Automated Mode, go to the System Parameters menu (see Section 5.3,) and then set the “Automated Mode” option to “On”. When Automated Mode is enabled, NBB functions will change as follows:

1. **All Password Security Suppressed:** When a user attempts to access command mode, the password prompt will not be displayed at either the Setup Port or Network Port. Unless specifically restricted by the IP Security Function, all users will be allowed to access both switching and configuration functions, and all commands will be immediately accepted without the requirement to enter a password.
2. **Status Screen Suppressed:** The plug status screen will not be automatically displayed after commands are successfully executed. Note however, that the /S command can still be invoked to display the status screen as needed.
3. **“Sure?” Prompt Suppressed:** All commands are executed without prompting for user confirmation.
4. **Error Messages Suppressed:** Most error messages will be suppressed. Note however, that an error message will still be generated if commands are invoked using invalid formats or arguments.

All other status display and configuration commands will still function as normal.

5.4. User Accounts

Each time you attempt to access command mode, you will be prompted to enter a username and password. The username/password entered at login determine which outlet(s) you will be allowed to control and what type of commands you will be allowed to invoke. Each username/password combination is defined within a "user account."

The NBB allows up to 128 user accounts; each account includes a username, password, security level, plug access rights, service access rights and an optional callback number.

5.4.1. Command Access Levels

In order to restrict access to important command functions, the NBB allows you to set the command access level for each user account. The NBB offers four access levels: Administrator, SuperUser, User and View Only. Command privileges for each account are set using the Add User or Modify User menus.

Each access level grants permission to use a different selection of commands; lower access levels are restricted from invoking configuration commands, while Administrators are granted access to all commands. The four different access levels are listed below:

- **Administrator:** Administrators are allowed to invoke all configuration and power switching commands, can view all status screens, and can always direct switching commands to all NBB switched outlets.
- **SuperUser:** SuperUsers are allowed to invoke all power switching commands and view all status screens. SuperUsers can view configuration menus, but are not allowed to change configuration parameters. SuperUsers are granted access to all NBB outlets.
- **User:** Users are allowed to invoke power switching commands and view all status screens, but can only apply commands to outlets that they are specifically granted access to. In addition, Users are not allowed to view configuration menus or change configuration parameters.
- **ViewOnly:** Accounts with ViewOnly access, are allowed to view Status Menus, but are not allowed to invoke switching commands, and cannot view configuration menus or change parameters. ViewOnly accounts can display the Plug Status screen, but can only view the status of plugs that are allowed by the account.

Section 17.2 summarizes command availability for all four access levels.

In the default state, the NBB includes one predefined account that provides access to Administrator commands and allows control of all NBB switched power outlets. The default username for this account is "**`super`**" (lowercase, no quotation marks), and the password for the account is also "**`super`**".

Notes:

- *In order to ensure security, it is recommended that when initially setting up the unit, a new user account with Administrator access should be created, and the "super" account should then be deleted.*
- *If the NBB is reset to default parameters, all user accounts will be cleared, and the default "super" account will be restored.*

5.4.2. Plug Access

Each account can be granted access to a different selection of power outlets (plugs) and plug groups. When accounts are created, the Plug Access parameter and the Plug Group Access parameter in the Add User menu or Modify User menu are used to grant or deny access to each plug or plug group. In addition, each access level also restricts the plugs and plug groups that the account will be allowed to access:

- **Administrator:** Administrator level accounts are always allowed to control all plugs and plug groups. Plug access cannot be disabled for Administrator level accounts.
- **SuperUser:** SuperUser accounts allow access to all plugs and plug groups. Plug access cannot be disabled for SuperUser accounts.
- **User:** User level accounts are only allowed to issue switching commands to the plugs and plug groups that have been specifically permitted via the "Plug Access" parameter in the Add User and Modify User menus.
- **ViewOnly:** ViewOnly level accounts are not allowed to issue switching commands. ViewOnly accounts can display the On/Off state of plugs and plug groups, but are limited to the plugs and plug groups specified by the account.

5.4.3. Port Access

The Port Access parameter is used to grant or deny access to the NBB RJ45 Setup Port. Normally, the Setup port is used for connection to a local control device or an external modem. The command access level will also determine port access rights for each account as summarized below:

- **Administrator and SuperUser:** Accounts with Administrator or SuperUser level command access are always allowed to connect to the Setup Port. Port access cannot be disabled for Administrator and SuperUser level accounts.
- **User:** User level accounts are only allowed to connect to the Setup Port when port access has been specifically enabled for the account.
- **ViewOnly:** Accounts with ViewOnly access are not allowed to create connections to the Setup Port.

5.5. Managing User Accounts

The User Directory function is employed to create new accounts, display parameters for existing accounts, modify accounts and delete accounts. Up to 128 different user accounts can be created. The "User Directory" function is only available when you have logged into command mode using an account that permits Administrator commands. In both the Text Interface and the Web Browser Interface, the User Directory menu offers the following functions:

- **View User Directory:** Displays currently defined parameters for any NBB user account as described in Section 5.5.1.
- **Add Username:** Creates new user accounts, and allows you to assign a username, password, command level, plug access plug group access, service access and callback number, as described in Section 5.5.2.
- **Modify User Directory:** This option is used to edit or change account information, as described in Section 5.5.3.
- **Delete User:** Clears user accounts, as described in Section 5.5.4.

Note: *After you have finished selecting or editing user account parameters, make certain to save the new account information before proceeding. In the Web Browser Interface, click on the "Add User" button to save parameters; in the Text Interface, press the* ***[Esc]*** *key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

5.5.1. Viewing User Accounts

The "View User Directory" option allows you to view details about each account. The View User option will not display actual passwords, and instead, the password field will read "defined". The View User Accounts function is only available when you have accessed command mode using a password that permits Administrator Level commands.

5.5.2. Adding User Accounts

The "Add Username" option allows you to create new accounts. Note that the Add User function is only available when you have accessed command mode using a password that permits Administrator Level commands. The Add User Menu can define the following parameters for each new account:

- **Username:** Up to 32 characters long, and cannot include non-printable characters. Duplicate usernames are not allowed. (Default = undefined.)
- **Password:** Five to sixteen characters long, and cannot include non-printable characters. Note that passwords are case sensitive. (Default = undefined.)
- **Access Level:** Determines which commands this account will be allowed to access. This option can set the access level for this account to "Administrator", "SuperUser", "User" or "ViewOnly." For more information on Command Access Levels, please refer to Section 5.4.1 and Section 17.2. (Default = User.)

- **Port Access:** Determines whether or not the account will be allowed to connect to the serial Setup Port. (Defaults; Administrator and SuperUser = Always Enabled, User = Disabled.)

  Note: *ViewOnly level accounts cannot be granted access to the Setup Port.*

- **Plug Access:** Determines which outlet(s) this account will be allowed to control. (Defaults; Administrator and SuperUser = All Plugs On, User = All Plugs Off, ViewOnly = All Plugs Off.)

  Notes:

  - *Administrator and SuperUser level accounts always have access to all plugs.*
  - *User level accounts will only have access to the plugs that are defined via the "Plug Access" parameter.*
  - *ViewOnly accounts are allowed to display the Plug Status Screen, but are limited to the plugs specified by the account. ViewOnly accounts are not allowed to invoke switching and reboot commands.*

- **Plug Group Access:** Determines which plug groups this account will be allowed to control. For more information on Plug Groups, please refer to Section 5.6. (Defaults; Administrator and SuperUser = All Plug Groups On, User = All Plug Groups Off, ViewOnly = All Plug Groups Off.)

  Notes:

  - *In order to use this feature, Plug Groups must first be defined as described in Section 5.6.*
  - *Administrator and SuperUser level accounts will always have access to all plug groups.*
  - *User Level accounts will only have access to the plug groups that are defined via the Plug Group Access parameter.*
  - *ViewOnly accounts are allowed to display the On/Off status of plug groups via the Plug Status Screen, but are limited to the plug groups specified by the account. ViewOnly accounts are not allowed to invoke switching and reboot commands.*

- **Service Access:** Determines whether this account will be able to access command mode via Serial Port, Telnet/SSH or Web. For example, if Telnet/SSH Access is disabled for this account, then this account will not be able to access command mode via Telnet or SSH. (Default = Serial Port = On, Telnet/SSH = On, Web = On.)

- **Current/Power Metering:** Enables/Disables current and power metering for this account. When disabled, this account will not be able to view current or power readings or display current or power history. Note that in order for accounts to be able to display these logs, Current and Power Metering must be enabled via the Systems Parameters menu as described in Section 5.3. (Default = Off.)

- **Callback Phone Number:** Assigns a number that will be called when this account attempts to access command mode via modem, and the Callback Security Function has been enabled as described in Section 5.3.4. (Default = undefined.)

Notes:

- *If the Callback Number is not defined, then Callbacks will not be performed for this user.*
- *If the Callback Number is not defined for a given user, and the Callback Security feature is configured to use either of the "On - Callback" options, then this user will be granted immediate access to command mode via modem.*
- *If the Callback Number is not defined for a given user, and the Callback Security feature is configured to use the "On - Callback ONLY" option, then this user will not be able to access command mode via Modem.*
- *When using the "On - Callback (With Password Prompt)" option, it is important to remember that accounts that do not include a callback number will be allowed to access command mode without callback verification.*

Note: *After you have finished selecting or editing account parameters, make certain to save the new account information before proceeding. In the Web Browser Interface, click on the "Add User" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

5.5.3. Modifying User Accounts

The "Edit User Directory" function allows you to edit existing accounts in order to change parameters, plug access rights or Administrator Command capability. Note that the Edit/Modify User function is only available when you have accessed command mode using a password that permits Administrator Level commands. Once you have accessed the Modify Users menu, use the menu options to redefine parameters in the same manner employed for the Add User menu, as discussed in Section 5.5.2.

Note: *After you have finished changing parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Modify User" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message.*

5.5.4. Deleting User Accounts

This function is used to delete individual user accounts. Note that the Delete User function is only available when you have accessed command mode using a password that permits Administrator Level commands.

Notes:

- *Deleted accounts cannot be automatically restored.*
- *The NBB allows you to delete the default "super" account, which is included to permit initial access to command mode. Before deleting the "super" account, make certain to create another account that permits Administrator Access. If you do not retain at least one account with Administrator Access, you will not be able to invoke Administrator level commands.*

5.6. The Plug Group Directory

The Plug Group Directory allows you to designate "groups" of plugs that are dedicated to a similar function, and will most likely be switched or rebooted all at the same time or controlled by the same type of user account.

For example, an individual equipment rack might include an assortment of devices that belong to different departments or clients. In order to simplify the process of granting plug access rights to the accounts that will control power to these devices, you could assign all of the plugs for the devices belonging to Department A to a Plug Group named "Dept_A", and all of the plugs for devices belonging to Department B to a Plug Group named "Dept_B". When user accounts are defined later, this would allow you to quickly grant access rights for all of the plugs for the devices belonging to Department A to the appropriate user accounts, by merely granting access to the Dept_A Plug Group, rather than by selecting the specific, individual plugs for each user account.

Likewise, Plug Groups allow you to direct On/Off/Boot commands to a series of plugs, without addressing each plug individually. Given the example above, you could quickly reboot all plugs for Department A, by either including the "Dept_A" Plug Group name in a /BOOT command line via the Text Interface, or by using the Plug Group Control menu in the Web Browser Interface.

The Plug Group Directory function is only available when you have logged into command mode using an account that permits Administrator commands. In both the Text Interface and the Web Browser Interface, the Plug Group Directory menu offers the following functions:

- **View Plug Group Directory:** Displays currently defined plug access rights for any NBB Plug Group as described in Section 5.6.1.
- **Add Plug Group to Directory:** Creates new Plug Groups, and allows you to assign plug access rights to each group as described in Section 5.6.2.
- **Modify Plug Group Directory:** This option is used to edit or change plug access rights for each Plug Group, as described in Section 5.6.3.
- **Delete Plug Group from Directory:** Clears Plug Groups that are no longer needed, as described in Section 5.6.4.

5.6.1. Viewing Plug Groups

The "View Plug Group Directory" option allows you to view the configuration of each Plug Group. Note that the View Plug Group Directory function is only available when you have accessed command mode using a password that permits Administrator Level commands. In the Web Browser Interface, the Plug Group Directory can be viewed by clicking on the link on the left hand side of the page. In the Text Interface, the Plug Group Directory can be viewed by typing `/G` and pressing **[Enter]** and then selecting the option from the resulting submenu.

5.6.2. Adding Plug Groups

The "Add Plug Group to Directory" option allows you to create new Plug Groups and assign plug access rights to each group. The Add Plug Group function is only available when you have accessed command mode using a password that permits Administrator Level commands. The Add Plug Group Menu can be used to define the following parameters for each new account:

- **Plug Group Name:** Assigns a name to the Plug Group. (Default = undefined.)
- **Plug Access:** Determines which plugs this Plug Group will be allowed to control. (Default = undefined.)

Notes:

- *In the Text Interface, Plug Access is configured by selecting item 2 and then selecting the desired plugs from the resulting submenu.*
- *In the Web Browser Interface, Plug Access is configured by selecting the desired plugs from a list of all plugs in the Add Plug Group menu.*
- *After you have finished defining or editing Plug Group parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Add Plug Group" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

5.6.3. Modifying Plug Groups

The "Modify Plug Group" function allows you to edit existing Plug Groups in order to change plug access rights. Note that this function is only available when you have accessed command mode using a password that permits Administrator Level commands. Once you have accessed the Modify Plug Group menu, use the menu options to redefine parameters in the same manner that is used for the Add Plug Group menu, as discussed in Section 5.6.2.

Note: *After you have finished changing or editing parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Modify Plug Groups" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

5.6.4. Deleting Plug Groups

This function is used to delete individual Plug Groups. Note that this function is only available when you have accessed command mode using a password that permits Administrator Level commands.

Note: *Deleted Plug Groups cannot be automatically restored.*

5.7. Defining Plug Parameters

The Plug Parameters Menu is used to define Plug Names, boot/sequence delay times and Power Up Default values for each NBB Switched AC Outlets. Note that this function is only available when you have accessed command mode using a password that permits Administrator Level commands. The Plug Parameters Menu allows you to define the following parameters:

- **Plug Name:** (Up to 16 Characters, Default = undefined.)

  Note: *Plug Names must begin with either a lower case alphabetic letter or upper case alphabetic letter. Plug Names cannot begin with a number character or symbol character.*

- **Boot/Seq. Delay:** When more than one plug is switched On or a reboot cycle is initiated, the Boot/Sequence delay determines how much time will elapse before the next plug is switched On. When the Boot/Sequence Delay is applied, the NBB will wait for the user-defined delay period before switching On the next plug. When Reboot cycles and switching actions are initiated, the Boot/Sequence Delay will be applied as follows: (Default = 0.5 Second.)

  - **Reboot Cycle Delay:** During a reboot cycle, the NBB will first switch all selected plugs "Off" (with a 0.5 second pause between each "Off" operation), and then begin to switch selected plugs back On again, pausing for the user-defined Boot/Sequence Delay before switching On the next plug. For example, if the Boot/Sequence Delay for Plug 3 is ten seconds, then the NBB will pause for ten seconds before proceeding to the next plug.

  - **"On" Sequence Delay:** When two or more plugs are switched On, the NBB will pause for the user-defined Boot/Sequence Delay before switching the next plug.

- **Power Up Default:** Determines how this plug will react when the Default command (/DPL) is invoked, or after power to the unit has been interrupted and then restored. After the default command is invoked, or power is restored, the NBB will automatically switch each plug On or Off as specified by the Power-Up Default. (Default = On).

  Note:

  - *If you have accessed command mode using an account that permits Administrator or SuperUser level commands, then the Default command will be applied to all switched plugs.*
  - *If you have accessed command mode via an User Level account, then the Default command will only be applied to plugs allowed by your account.*

- **Boot Priority:** The Boot Priority parameter determines the order in which plugs will be switched On. The Plug that has been assigned a Boot Priority of "1" will always be switched on first, followed by the plug that has been assigned the Boot Priority of "2", and so forth. For more information on the Boot Priority parameter, please refer to Section 5.7.1. (Default = All plugs prioritized according to Plug Number.)

5.7.1. The Boot Priority Parameter

Normally, when an "On" or "Reboot" command is invoked, the NBB will switch on its plugs in their default, numeric order. Although in many cases, the default, numeric order will work fine, there are other cases where an individual device (such as a router) must be switched on first, in order to support a second device that will be switched on later.

The Boot Priority Parameter simplifies the process of setting the order in which plugs are switched On, by assigning a priority number to each plug, rather than by requiring the user to make certain that devices are always connected to the NBB in a set order. Likewise, when new devices are added to your equipment rack, the Boot Priority Parameter eliminates the need to unplug all existing devices and then rearrange the plugs connected to the NBB (and re-define plug parameters) to ensure that they are switched on in the desired order.

Notes:

- *No two plugs can be assigned the same Boot Priority number.*
- *When a higher Boot Priority is assigned to any given plug, all subsequent plugs will have their boot priorities lowered by a factor of 1.*
- *The Boot Priority is also displayed on the Plug Status Screen.*

5.7.1.1. Example 1: Change Plug A3 to Priority 1

In the Example shown in Figure 5.1, we start out with all Plugs set to their default Boot Priorities, with Plug A1 first, Plug A2 second and so forth.

Next, the Boot Priority for Plug A3 is changed to Priority 1. This means that Plug A3 will now be switched On first after a reboot, and that Plug A1 will now be switched On second, Plug A2 will be third, etc..

Note that when the Boot Priority for Plug A3 is set to 1, the Boot Priorities for all plugs that were previously Booted before plug A1 are now lowered by a factor of one.

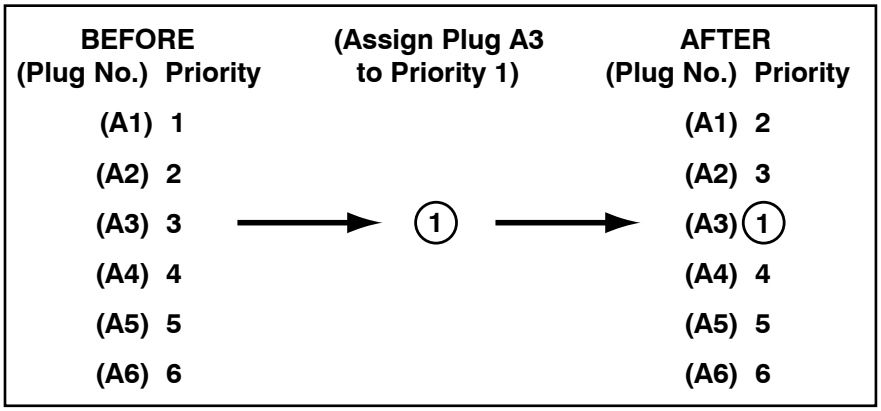

Figure 5.1: Boot Priority Example 1

5.7.1.2. Example 2: Change Plug A5 to Priority 2

In the second Example shown in Figure 5.2, we start out with Boot Priorities for the plugs set as they were at the end of Example 1; Plug A3 is first, Plug A1 is second, Plug A2 is third, Plug A4 is fourth, and Plug A6 is sixth.

Next, the Boot Priority for Plug A5 is changed to Priority 2. This means that Plug A3 will continue to be switched on first after a reboot, but now Plug A5 will be switched on second, Plug A3 will be third, Plug A2 will be fourth, Plug A4 will be fifth and Plug A6 will still be sixth.

Once again, note that when the Boot Priority for Plug A5 is set to 2, the Boot Priorities for all plugs that were previously Booted before plug A5 are now lowered by a factor of one

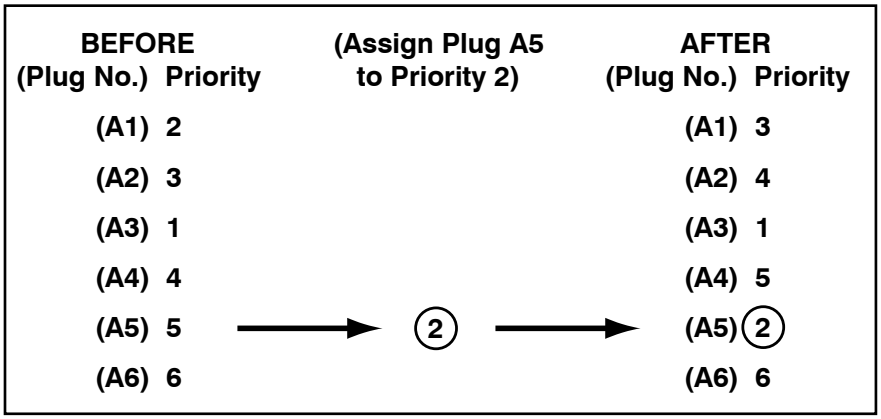

Figure 5.2: Boot Priority Example 2

5.8. Serial Port Configuration

The serial Port Configuration menus allow you to select parameters for the NBB serial Setup Port. In addition, the Serial Port Configuration menu (Port Parameters) can also be used to set communications parameters, disable Administrator level commands at the serial Setup Port and also select a number of other parameters described below.

Communication Settings:

- **Baud Rate:** Any standard rate from 300 bps to 115.2K bps. (Default = 9600 bps)
- **Bits/Parity:** (Default = 8-None)
- **Stop Bits:** (Default = 1)
- **Handshake Mode:** XON/XOFF, RTS/CTS (hardware), Both, or None. (Default = RTS/CTS)

General Parameters:

- **Administrator Mode:** Permits/denies port access to Administrator and SuperUser level accounts. When enabled (Permit), the port will be allowed to invoke Administrator and SuperUser level commands, providing they are issued by an account that permits them. If disabled (Deny), then accounts that permit Administrator and SuperUser level commands will not be allowed to access command mode via this port. (Default = Permit.)
- **Logoff Character:** The Logoff Character determines the command(s) or character(s) that must be issued at this port in order to disconnect this port from another port. Note that the Logoff Character does not apply to Direct Connections. (Default = **`^x.`**)
- **Sequence Disconnect:** Enables/Disables and configures the disconnect command. This item offers the option to disable the Sequence Disconnect, select a one character format or a three character format. (Default = One Character.)
- **Inactivity Timeout:** Enables and selects the Timeout Period for this port. If enabled, the Setup Port will disconnect when no additional data activity is detected for the duration of the timeout period. (Default = 5 Minutes.)
- **Command Echo:** Enables or Disables command echo at the Setup Port. When disabled, commands that are sent to the Setup Port will still be invoked, but the actual keystrokes will not be displayed on your monitor. (Default = On.)
- **Accept Break:** Determines whether the port will accept breaks received from the attached device. When enabled, breaks received at the port will be passed to any port that this port is connected to. When disabled, breaks will be refused at this port. (Default = On.)

Port Mode Parameters:

- **Port Name:** Allows you to assign a name to the Setup Port. (Default = Undefined.)
- **Port Mode:** Selects the port mode for the Serial port. The port mode can be set to Normal Mode, Modem Mode or Modem PPP Mode. (Default = Normal Mode)

  Depending on the Port Mode selected, the NBB will display additional prompts listed below. In the Text Interface, these parameters are accessible via a submenu, which will only be active when the appropriate port mode is selected. In the Web Browser Interface, fields will be "grayed out" unless the corresponding port mode is selected.

  - **Normal Mode:** Allows communication with a local computer and permits access to command mode. When the Normal Mode is selected, the following mode-specific parameter can also be defined:

    - **DTR Output:** Determines how DTR will react when the port disconnects. DTR can be held low, held high, or pulsed for 0.5 seconds and then held high. (Default = Pulse.)

  - **Modem Mode:** Permits access to command mode and simplifies connection to an external modem. Modem Mode ports can perform all functions normally available in Normal Mode, but Modem Mode also allows definition of the following, additional parameters:

    - **Reset String:** Redefines the modem reset string. The Reset String can be sent prior to the Initialization string. (Default = **`ATZ`**.)

    - **Initialization String:** Defines a command string that can be sent to initialize a modem to settings required by your application. (Default = **`ATE1M1&C1&D2S0=1&B1&H1&R2`**)

    - **Hang-Up String:** Although the NBB will pulse the DTR line to hang-up an attached modem, the Hang-Up string is often useful for controlling modems that do not use the DTR line. (Default = undefined.)

    - **Periodic Reset Value:** Determines how often the Reset String will be sent to the modem at this port.

    - **No Dialtone Enable:** When this item is "On" the No Dialtone Alarm can be enabled as described in Section 7.8. When the No Dialtone Alarm is enabled and properly configured, the NBB can provide notification if the unit detects that a phone line connected to a modem installed at this port is dead. (Default = Off.)

Note: *When communicating with the NBB via modem, these parameters will not be changed until after you exit command mode and disconnect.*

- **Modem PPP Mode:** Allows data that is normally sent via ethernet to be sent via phone line. When Modem PPP Mode is selected, the following modem-related parameters will be available:

  - **Reset String:** Redefines the modem reset string. The Reset String can be sent prior to the Initialization string. (Default = **`ATZ.`**)

  - **Initialization String:** Defines a command string that is used to initialize the modem to settings required for PPP communication (Default = **`ATQ0V1E1S0=0&C1&D2`**)

  - **Hang-Up String:** Although the NBB will pulse the DTR line to hang-up an attached modem, the Hang-Up string is often useful for controlling modems that do not use the DTR line. (Default = undefined.)

  - **Periodic Reset Interval:** Determines how often the Reset String will be sent to the modem at this port. (Default = 15 Minutes.)

  - **No Dialtone Enable:** When this item is "On" the No Dialtone Alarm can be enabled as described in Section 7.8. When the No Dialtone Alarm is enabled, the NBB can provide notification if the unit detects that a phone line connected to a modem installed at this port is dead. (Default = Off.)

  - **Periodic Reset Location:** The IP address or URL for the website that will be used to keep the PPP connection alive when not in use. The NBB will regularly ping the selected IP address or URL in order to keep the connection alive. (Default = undefined)

Notes:

- *In order to select a domain name as the Periodic Reset Location, you must first define the Domain Name Servers as described in Section 5.9.5.*
- *The IP Address, P-t-P and Subnet Mask parameters cannot be defined by the user and will be automatically supplied by the ISP when a PPP communication is started..*

  - **PPP Phone Number:** The phone number for the line that will be used for PPP communication. (Default = undefined)

  - **User Name:** The user name for the ISP account that will be used for PPP communication. (Default = undefined)

  - **Password:** The password for the ISP count that will be used for PPP communication (Default = undefined)

  - **IP Address:** The temporary IP address that will be assigned to the PPP communication session by the ISP. Note that this item cannot be defined by the user and will be automatically supplied by the ISP when a PPP communication session is started. (Default = undefined)

  - **P-t-P:** Note that this item cannot be defined by the user and will be automatically supplied by the ISP when a PPP communication session is started. (Default = undefined)

  - **Subnet Mask:** Note that this item cannot be defined by the user and will be automatically supplied by the ISP when a PPP communication session is started. (Default = undefined)

5.9. Network Configuration

The Network Parameters Menus are used to select parameters and options for the Network Port and also allow you to implement IP Security features, which can restrict access based on the user's IP Address.

Although the Web Browser Interface and Text Interface allow definition of essentially the same parameters, parameters are arranged differently in the two interfaces. In the Text Interface, most network parameters are defined via one menu which is accessed using the /N command. In the Web Browser Interface, network parameters are divided into separate menus which are accessed via the Network Configuration flyout menu.

Notes:

- *Settings for network parameters depend on the configuration of your network. Please contact your network administrator for appropriate settings.*
- *The Network Parameters Menu selects parameters for all 16 logical Network Ports.*
- *The IP Address, Subnet Address and Gateway Address cannot be changed via the Web Browser Interface. In order to change these parameters, you must access the unit via the Text Interface.*
- *When a new IP Address is selected, or the status of the DHCP feature is changed, the unit will disconnect and reconfigure itself with the new values when you exit the Network Parameters Menu. When configuring the unit, make certain your DHCP server is set up to assign a known, fixed IP address in order to simplify reconnection to the unit after the new address has been assigned. DHCP Parameters cannot be changed via the Web Browser Interface.*
- *The Network Parameters menu is only available when you have logged into command mode using an account and port that permit Administrator level commands (Supervisor Mode enabled.)*

The Network Parameters menu allows you to define the parameters discussed in the following sections. Note that although the descriptions of network parameters are arranged according to the Web Browser Interface, in the Text Interface, most parameters are found in two large menus: one for IPv4 and one for IPv6. Note that both the IPv4 configuration menu and the IPv6 configuration menu offer essentially the same parameters. To access the network configuration menus, proceed as follows:

- **Text Interface:** To define network parameters for the IPv4 protocol, type **`/N`** and press **[Enter]**. To define network parameters for the IPv6 protocol, type **`/N6`** and press **[Enter]**.
- **Web Browser Interface:** Place the cursor over the "Network Configuration" link on the left hand side of the screen. When the fly-out menu appears, click on the appropriate link to display the desired menu. Note that some submenus offer the option to define IPv4 or IPv6 parameters and that IPv4 and IPv6 menus include a link that can be used to jump to the other protocol.

5.9.1. Network Port Parameters

In the Text Interface, these parameters are found in the main Network Configuration menu. In the Web Browser Interface, these parameters are found by placing the cursor over the "Network Configuration" link on the left hand side of the screen, and then clicking on the "Network Port Parameters" link in the resulting fly-out menu.

- **Administrator Mode:** Permits/denies port access by accounts that allow Administrator or SuperUser level commands. When enabled (Permit), the port will be allowed to invoke Administrator and SuperUser level commands, providing they are issued by an account that permits them. If disabled (Deny), then accounts that permit Administrator and SuperUser level commands will not be allowed to access command mode via this port. (Default = Permit.)

- **Logoff Character:** Defines the Logoff Character for this port. This determines which command(s) must be issued at this port in order to disconnect from a second port. (Default = **^x** (**[Ctrl]** plus **[X]**).)

  Note: *The Sequence Disconnect parameter can be used to pick a one character or a three character logoff sequence.*

- **Sequence Disconnect:** Enables/Disables and configures the Resident Disconnect command. Offers the option to either disable the Sequence Disconnect, or select a one character, or three character command format. (Default = One Character.)

  Notes:

  - *The One Character Disconnect is intended for situations where the destination port should **not** receive the disconnect command. When the Three Character format is selected, the disconnect sequence **will** pass through to the destination port prior to breaking the connection.*
  - *When Three Character format is selected, the Resident Disconnect uses the format* "**[Enter]**`LLL`**[Enter]**"*, where* `L` *is the selected Logoff Character.*

- **Inactivity Timeout:** Enables and selects the Inactivity Timeout period for the Network Port. If enabled, and the port does not receive or transmit data for the specified time period, the port will disconnect. (Default = 5 Minutes.)

- **Command Echo:** Enables or Disables the command echo for the Network Port. (Default = On.)

- **Accept Break:** Determines whether the port will accept breaks received from the attached device, and pass them along to a connected port. When enabled, breaks received at this port will be passed to any port this port is connected to, and sent to the device connected to the other port. When disabled, breaks will be refused at this port. (Default = On.)

- **Multiple Logins:** (Text Interface Only) If the NBB is installed in an environment that *does not* include communication via an open network (local communication only), then the Multiple Logins parameter can be used to determine whether or not multiple users will be able to communicate with the unit at the same time. If this parameter is set to "Off" then only one user will be allowed to communicate with the unit at a time. (Default = On.)

5.9.2. Network Parameters

In the Text Interface, these parameters are accessed via the main Network Configuration menu, which can be activated by typing **/N** (for IPv4 parameters) or **/N6** (for IPv6 parameters) and then pressing **[Enter]**. In the Web Browser Interface, these parameters are found by placing the cursor over the "Network Configuration" link on the left hand side of the screen, and then clicking on the "Network Parameters" link in the resulting fly-out menu.

Note: *The IP Address, Subnet Mask, Gateway Address and DHCP status cannot be changed via the Web Browser Interface. In order to change these parameters, you must access the NBB via the Text Interface.*

- **IP Address:** (Default = 192.168.168.168.)
- **Subnet Mask:** (Default = 255.255.255.0.)
- **Gateway Address:** (Default = undefined.)
- **DHCP:** Enables/Disables Dynamic Host Configuration Protocol. When this option is "On", the NBB will perform a DHCP request. Note that in the Text Interface, the MAC address for the NBB is listed on the Network Status Screen. (Default = Off.)

  Note: *Before configuring this feature, make certain your DHCP server is set up to assign a known, fixed IP address. You will need this new IP address in order to reestablish a network connection with the NBB unit.*

- **Telnet Access:** Enables/disables Telnet access. When Telnet Access is "Off," users will not be allowed to establish a Telnet connection to the unit. Note that in the Text Interface, this item also provides access to the "Telnet Port" and "Maximum per Source" parameters. (Default = On.)
- **Telnet Port:** Selects the TCP/IP port number that will be used for Telnet connections. In the Text Interface, this item is defined via a submenu, displayed when the Telnet Access parameter is selected. (Default = 23.)
- **Max. Per Source:** The maximum number of Telnet sessions that will be allowed per user MAC address. (Default = 4.)

Notes:

- *In the Text Interface, the "Per Source" parameter is defined via a submenu of item 21 (Telnet Access) in the Network Parameters menu.*
- *After changing the "Max Per Source" parameter, you must log out of all pre-existing Telnet sessions in order for the new maximum value to be applied.*

- **SSH Access:** Enables/disables SSH communication. (Default = On.)
- **SSH Port:** Selects the TCP/IP port number that will be used for SSH connections. Note that in the Text Interface, this option is defined via a submenu that is displayed when the SSH Access parameter is selected (item number 22). (Default = 22.)
- **HTTP Access (Web Access):** Enables/disables the Web Browser Interface. When disabled, users will not be allowed to contact the unit via the Web Browser Interface. (Default = Off.)
- **HTTP Port:** Selects the TCP/IP port number that will be used for Web Access. (Default = 80.)
- **HTTPS Access:** Enables/disables HTTPS communication. For instructions on setting up SSL encryption, please refer to Section 14. (Default = On.)
- **HTTPS Port:** Selects the TCP/IP port number that will be used for HTTPS connections. (Default = 443.)

Notes:

- *In the Text Interface, HTTP and HTTPS parameters reside in a separate submenu. To enable and configure HTTP and HTTPS Access via the Text Interface, access the Network Configuration Menu as described in Section 5.9, then type* **23***, press* ***[Enter]*** *and use the resulting submenu to select parameters.*
- *When the Web Access parameter is defined via the Text Interface, the resulting submenu will also allow you to select SSL (encryption) parameters as described in Section 14.*

- **Harden Web Security:** When the Harden Web Security feature is On (default,) only the high and medium cypher suites for SSLv3 and TLSv1 will be enabled. When the Harden Web Security feature is Off, all SSL protocols will be enabled, allowing compatibility with older browsers. Note that in the Text Interface, the Harden Web Security option is found in the Web Access submenu. (Default = On.)
- **SYSLOG Addresses:** Defines the IP addresses for the Syslog Daemon(s) that will receive log records generated by the NBB. Allows definition of IP addresses for both a primary Syslog Daemon and an optional secondary Syslog Daemon. SYSLOG Addresses can be entered in either IPv4 or IPv6 format, or in domain name format (up to 64 characters.) For more information, please refer to Section 11. (Default = undefined.)

Notes:

- *The Syslog Address submenu in the Text Interface and the Network Parameters submenu in the Web Browser Interface both include a Ping Test function that can be used to ping the user-selected Syslog IP Addresses in order to verify that valid IP addresses have been entered. In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
- *In addition to the Ping Test feature, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping the currently defined Syslog Addresses in order to make certain that the IP addresses are responding.*

- **Ping Access:** Enables/Disables response to the ping command. When Disabled, the NBB will not respond to Ping commands. Note that disabling Ping Access at the Network Port will not effect the Ping-No-Access Alarm. (Default = On.)
- **Raw Socket Access:** Enables/disables Raw Socket Protocol access to the Network Port via Direct Connect and selects the port number for Raw Socket Access. This item can be used to enable or disable Raw Socket Protocol access and select either port 23 or port 3001 for use for Raw Socket connections. (Default = Off.)

Notes:

- *The Raw Socket Access option is often useful for users who encounter network problems when attempting to communicate with the NBB using a script that was previously written for our legacy IPS product line.*
- *If the "On (23)" option is selected, you must either disable Telnet Port 23 or use the Telnet Access option to select a port other than Port 23.*
- *When the Raw Socket Access option is enabled, you must connect to the NBB using the port number selected for Raw Socket Access. For example, if the NBB IP address is "1.2.3.4", and port 3001 has been selected for Raw Socket Acess, in order to establish a Raw Socket connection to the NBB's Network Port, then on a UNIX system, the connection command would be:* **`$ telnet 1.2.3.4 3001`** ***[Enter]***.

5.9.3. IP Security

The IP Security feature allows the NBB to restrict unauthorized IP addresses from establishing inbound connections to the unit via telnet or Web Browser. This allows you to grant access to only a specific group of Telnet or Web IP addresses, or block a particular IP address completely. In the default state, the NBB accepts incoming IP connections from all hosts.

In the Text Interface, IP Security parameters are defined via the Network Configuration menu. In the Web Browser Interface, these parameters are found by placing the cursor over the "Network Configuration" link, and then clicking on the "IP Security" link in the resulting fly-out menu. In the default state, IP Security is disabled. The IP Security Function employs a TCP Wrapper program which allows the use of standard, Linux operators, wild cards and net/mask pairs to create a host based access control list.

The IP Security configuration menus include "hosts.allow" and "hosts.deny" client lists. When setting up IP Security, you must enter IP addresses for hosts that you wish to allow in the Allow list, and addresses for hosts that you wish to deny in the Deny list. Since Linux operators, wild cards and net/mask pairs are allowed, these lists can indicate specific addresses, or a range of addresses to be allowed or denied.

When the IP Security feature is properly enabled, and a client attempts to connect, the NBB will perform the following checks:

1. If the client's IP address is found in the "hosts.allow" list, the client will be granted immediate access. Once an IP address is found in the Allow list, the NBB will not check the Deny list, and will assume you wish to allow that address to connect.
2. If the client's IP address is not found in the Allow list, the NBB will then proceed to check the Deny list.
3. If the client's IP Address *is* found in the Deny list, the client *will not* be allowed to connect.
4. If the client's IP Address *is not* found in the Deny list, the client *will* be allowed to connect, even if the address was not found in the Allow list.

Notes:

- *If the NBB finds an IP Address in the Allow list, it will not check the Deny list, and will allow the client to connect.*
- *If both the Allow and Deny lists are left blank, then the IP Security feature will be disabled, and all IP Addresses will be allowed to connect (providing that the proper password and/or SSH key is supplied.)*
- *When the Allow and Deny lists are defined, the user is only allowed to specify the Client List; the Daemon List and Shell Command cannot be defined.*

5.9.3.1. Adding IP Addresses to the Allow and Deny Lists

To add an IP Address to the Allow or Deny list, and begin configuring the IP Security feature, proceed as follows.

Notes:

- *Both the Allow and Deny list can include Linux operators, wild cards, and net/mask pairs.*
- *In some cases, it is not necessary to enter all four "digits" of the IP Address. For example, if you wish to allow access to all IP addresses that begin with "192," then you would only need to enter "192."*
- *The IP Security Configuration menu is only available when you have accessed command mode using an account that permits Administrator level commands.*
- *In order to use domain names in the Allow List and/or Deny List, you must first define IP address(es) for the desired Domain Name Server(s) as described in Section 5.9.5.*

1. Access the IP Security Configuration Menu.

   a) **Text Interface:** Type **`/N`** **[Enter]** to define addresses in IPv4 format, or type **`/N6`** and press **[Enter]** to define addresses in IPv6 format. The Network Configuration Menu will be displayed. From the Network Configuration Menu, type **`5`** **[Enter]** to display the IP Security Menu.

   b) **Web Browser Interface:** Place the cursor over the "Network Configuration" link on the left hand side of the screen. When the fly-out menu appears, click on the "IP Security" Link to display the IP Security Menu. The IP Security menu in the Web Browser Interface will accept addresses in either IPv4 or IPv6 format.

2. **Allow List:** Enter the IP Address(es) for the clients that you wish to allow. Note that if an IP Address is found in the Allow list, the client will be allowed to connect, and the NBB will not check the Deny list.

   a) **Text Interface:** Note the number for the first empty field in the Allow list, then type that number at the command prompt, press **[Enter]**, and then follow the instructions in the resulting submenu.

   b) **Web Browser Interface:** Place the cursor in the first empty field in the parameters menu, then key in the desired IP Address, operators, wild cards, and/or net/mask pairs.

3. **Deny List:** Enter the IP Address(es) for the clients that you wish to deny. Note that if the client's IP Address is not found in the Deny List, that client will be allowed to connect. Use the same procedure for entering IP Addresses described in Step 2 above.

5.9.3.2. Linux Operators and Wild Cards

In addition to entering a specific IP address or partial IP address in the Allow or Deny list, you may also use standard Linux operators or wild cards. In most cases, the only operator used is "EXCEPT" and the only wild card used is "ALL," but more experienced Linux users may note that other operators and wild cards may also be used.

EXCEPT: This operator creates an exception in either the "allow" list or "deny" list. For example, if the Allow list includes a line which reads "192. EXCEPT 192.255.255.6," then all IP address that begin with "192." will be allowed; except 192.255.255.6 (providing that this address appears in the Deny list.)

ALL: The ALL wild card indicates that all IP Addresses should be allowed or denied. When ALL is included in the Allow list, all IP addresses will be allowed to connect; conversely, if ALL is included in the Deny list, all IP Addresses will be denied (except for IP addresses listed in the Allow list.) For example, if the Deny list includes a line which reads "ALL EXCEPT 168.255.192.192," then all IP addresses except 168.255.192.192 will be denied (except for IP addresses that are listed in the Allow list.)

Net/Mask Pairs: An expression of the form "n.n.n.n/m.m.m.m" is interpreted as a "net/mask" pair. A host address is matched if "net" is equal to the bitwise AND of the address and the "mask." For example, the net/mask pattern "131.155.72.0/255.255.254.0" matches every address in the range "131.155.72.0" through "131.155.73.255."

5.9.3.3. IP Security Examples

1. **Mostly Closed:** Access is denied by default and the only clients allowed, are those explicitly listed in the Allow list. To deny access to all clients except 192.255.255.192 and 168.112.112.05, IP Security would be defined as follows:

   - Allow List:
     1. 192.255.255.192
     2. 168.112.112.05
   - Deny List:
     1. ALL

2. **Mostly Open:** Access is granted by default, and the only clients denied access, are those explicitly listed in the Deny list. To allow access to all clients except 192.255.255.192 and 168.112.112.05, the IP Security would be defined as follows:

   - Allow List:
     1. ALL EXCEPT 192.255.255.192, 168.112.112.05
   - Deny List:
     1. 192.255.255.192, 168.112.112.05

Notes:

- *When defining a line in the Allow or Deny list that includes several IP addresses, each individual address is separated by either a space, a comma, or a comma and a space as shown in Example 2 above.*
- *Take care when using the "ALL" wild card. When ALL is included in the Allow list, it should always include an EXCEPT operator in order to allow the unit to proceed to the Deny list and determine any addresses you wish to deny.*

5.9.4. Static Route

The Static Route menu allows you to type in Linux routing commands that will be automatically executed each time that the unit powers up or reboots. In the Text Interface, the Static Route menu is accessed via the Network Configuration menu. In the Web Browser Interface, the Static Route menu is accessed via the flyout menus under the Network Configuration link. Note that parameters defined via this menu will be applied to both IPv4 and IPv6 communication.

5.9.5. Domain Name Server

The DNS menu is used to select IPv4 or IPv6 format IP addresses for Domain Name Servers. When web and network addresses are entered, the Domain Name Server interprets domain names (e.g., www.yourcompanyname123.com), and translates them into IP addresses. In the Text Interface, the DNS menu is accessed via the Network Configuration menu. In the Web Browser Interface, the DNS menu is accessed via the flyout menus under the Network Configuration link. Note that if you don't define at least one DNS server, then IP addresses must be used, rather than domain names. Note that parameters defined via this menu will be applied to both IPv4 and IPv6 communication.

The Domain Name Server menu includes a Ping Test feature, that allows you to ping the IP addresses for each user-defined domain name server in order to check that a valid IP address has been entered.

> **Note:** *In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*

5.9.6. SNMP Access Parameters

These menus are used to select access parameters for the SNMP feature. The SNMP Access Parameters Menu allows the following parameters to be defined:

> **Note:** *After you have configured SNMP Access Parameters, you will then be able to manage the NBB User Directory, control power and reboot switching and display unit status via SNMP, as described in Section 13.*

- **Enable:** Enables/disables SNMP Polling. (Default = Off.)

  Note: *This item only applies to external SNMP polling of the NBB; it does not effect the ability of the NBB to send SNMP traps.*

- **Version:** Determines which SNMP Version the NBB will respond to. For example, if this item is set to V3, then clients who attempt to contact the NBB using SNMPv2 will not be allowed to connect. (Default = V1/V2 Only.)

- **Read Only:** Enables/Disables the "Read Only Mode", which controls the ability to access configuration functions and invoke switching commands. When Enabled ("Yes"), you will not be able to change configuration parameters or invoke other commands when you contact the NBB via SNMP. (Default = No.)

  Note: *In order to define user names for the NBB via your SNMP client, the Read Only feature must be disabled. When the Read Only feature is enabled, you will not be able to issue configuration commands to the NBB unit via SNMP.*

- **Authentication** / **Privacy:** Configures the Authentication and Privacy features for SNMPv3 communication. The Authentication / Privacy parameter offers two options, which function as follows:

  1. **Auth**/**noPriv:** An SNMPv3 username and password will be required at log in, but encryption will not be used. (Default Setting.)
  2. **Auth**/**Priv:** An SNMPv3 username and password will be required at log in, and all messages will be sent using encryption.

  Notes:

  - *The Authentication / Privacy item is not available when the Version parameter is set to V1/V2.*
  - *If the Version Parameter is set to V1/V2/V3 (all) and Authentication / Privacy parameter is set to "Auth/Priv", then only V3 data will be encrypted.*
  - *The NBB does not support "noAuth/noPriv" for SNMPv3 communication.*

- **SNMPv3 User Name:** Sets the User Name for SNMPv3. Note that this option is not available when the Version parameter is set to V1/V2. (Default = undefined.)
- **SNMPv3 Password:** Sets the password for SNMPv3. Note that this option is not available when the Version parameter is set to V1/V2. (Default = undefined.)
- **SNMPv3 Password Confirm:** This prompt is used to confirm the SNMPv3 password that was entered at the prompt above. Note that this option is not available when the Version parameter is set to V1/V2. (Default = undefined.)
- **Authentication Protocol:** This parameter determines which authentication protocol will be used. The NBB supports both MD5 and SHA1 authentication. (Default = MD5.)

  Notes:

  - *The Authentication Protocol that is selected for the NBB must match the protocol that your SNMP client will use when querying the NBB unit.*
  - *The Authentication Protocol option is not available when the Version parameter is set to V1/V2*

- **SNMP Contact:** (Default = undefined.)
- **SNMP Location:** (Default = undefined.)
- **Read Only Community:** Note that this parameter is not available when the SNMP Version is set to V3. (Default = Public.)
- **Read**/**Write Community:** Note that this parameter is not available when the SNMP Version is set to V3. (Default = Public.)

5.9.7. SNMP Trap Parameters

These menus are used to select parameters that will be used when SNMP traps are sent. For more information on SNMP Traps, please refer to Section 12. In the Text Interface, the SNMP Trap Parameters menu is accessed via the Network Configuration menu. In the Web Browser Interface, the SNMP Trap Parameters menu is accessed via the flyout menus under the Network Configuration link. The SNMP Trap Parameters menu allows the following parameters to be defined:

Notes:

- *In the Text Interface, SNMP Trap parameters are defined via two separate menus that are accessed via either the* **/N** *command (IPv4) or the* **/N6** *command (IPv6.)*
- *In the web browser interfrace, SNMP Trap parameters are defined via two separate submenus that are accessed via the IPv4 or IPv6 flyout menus, under the SNMP Traps link.*

- **SNMP Manager 1:** The IP Address for the first SNMP Manager. For more information, please refer to Section 12. (Default = Undefined.)

  Note: *In order to enable the SNMP Trap feature, you must define at least one SNMP Manager.*

- **SNMP Manager 2:** (Default = Undefined.)
- **Trap Community:** (Default = Public.)
- **Trap Version:** The assigned security level for SNMP traps. (Default = V1.)
- **Trap Engine ID:** The V3 SNMP agent's unique identifier. (Default = Undefined.)
- **Ping Test:** Allows you to ping the IP addresses or domain names defined via the SNMP Manager 1 and SNMP Manager 2 prompts in order to check that a valid IP address or domain name has been entered.

  Notes:

  - *In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
  - *In addition to the Ping Test feature, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping the currently defined SNMP Managers in order to make certain that the IP addresses are responding.*

5.9.8. LDAP Parameters

The NBB supports LDAP (Lightweight Directory Access Protocol,) which allows authentication via the "Active Directory" network Directory Service. When LDAP is enabled and properly configured, command access rights can be granted to new users without the need to define individual new accounts at each NBB unit, and existing users can also be removed without the need to delete the account from each NBB unit. This type of authentication also allows administrators to assign users to LDAP groups, and then specify which plugs the members of each group will be allowed to control at each NBB unit.

In order to apply the LDAP feature, you must first define User Names and associated Passwords and group membership via your LDAP server, and then access the NBB command mode to configure LDAP settings and define port access rights and command access rights for each group specified at the LDAP server. To access the LDAP Parameters menu, login to NBB command mode using a password that permits Administrator level commands. In the Text Interface, the LDAP Parameters menu is accessed via the Network Configuration menu (/N for IPv4 parameters or /N6 for IPv6 parameters.) In the Web Browser Interface, both IPv4 and IPv6 parameters are defined via a single LDAP Parameters menu, which is accessed via the flyout menus under the Network Configuration link.

Notes:

- *In the Web Browser Interface, both IPv4 and IPv6 parameters for LDAP are defined via a single menu. In the Text Interface IPv4 parameters are defined via the /N command and IPv6 parameters are defined via the /N6 command.*
- *Plug access rights are not defined at the LDAP server. They are defined via the LDAP Group configuration menu on each NBB unit and are specific to that NBB unit alone.*
- *When LDAP is enabled and properly configured, LDAP authentication will supersede any passwords and access rights that have been defined via the NBB user directory.*
- *If no LDAP groups are defined on a given NBB unit, then access rights will be determined as specified by the "default" LDAP group.*
- *The "default" LDAP group cannot be deleted.*

The LDAP Parameters Menu allows you to define the following parameters:

- **Enable:** Enables/disables LDAP authentication. (Default = Off)
- **Primary Host IPv4:** Defines the IP address or domain name for the primary LDAP server when IPv4 protocol is used to communicate with the NBB unit. (Default = Undefined.)
- **Primary Host IPv6:** Defines the IP address or domain name for the primary LDAP server when IPv6 protocol is used to communicate with the NBB unit. (Default = Undefined.)
- **Secondary Host IPv4:** Defines the IP address or domain name for the secondary (fallback) LDAP server when IPv4 protocol is used. (Default = Undefined.)
- **Secondary Host IPv6:** Defines the IP address or domain name for the secondary (fallback) LDAP server when IPv6 protocol is used. (Default = Undefined.)

- **LDAP Port:** Defines the port that will be used to communicate with the LDAP server. (Default = 389.)
- **TLS/SSL:** Enables/Disables TLS/SSL encryption. Note that when TLS/SSL encryption is enabled, the LDAP Port should be set to 636. (Default = Off.)
- **Bind Type:** Sets the LDAP bind request password type. In the Text Interface, when the Bind Type is set to "Kerberos," the LDAP menu will include an additional prompt used to select Kerberos parameters. In the Web Interface, Kerberos parameters are defined using the prompts at the bottom of the menu. (Default = Simple.)
- **Search Bind DN:** The username that will be allowed to search the LDAP directory. (Default = Undefined.)
- **Search Bind Password:** The Password for the user who is allowed to search the LDAP directory. (Default = Undefined.)
- **User Search Base DN:** The directory location for user searches. (Default = Undefined.)
- **User Search Filter:** Selects the attribute that lists the user name. Note that this attribute should always end with "=%s" (no quotes.) (Default = Undefined.)
- **Group Membership Attribute:** Selects the attribute that list group membership(s). (Default = Undefined.)
- **Group Membership Value Type:** (Default = DN.)
- **Fallback:** Enables/Disables the LDAP fallback feature. When enabled, the NBB will revert to it's own internal user directory if no defined users are found via the LDAP server. In this case, port access rights will then be granted as specified in the default LDAP group. (Default = Off.)
- **Kerberos Setup:** Kerberos is a network authentication protocol, which provides a secure means of identity verification for users who are communicating via a non-secure network. In the Text Interface, Kerberos parameters are selected via a submenu that is only available when Kerberos is selected as Bind Type. In the Web Browser Interface, Kerberos parameters are defined via the main LDAP Parameters menu. The following parameters are available:
  - **Port:** (Default = 88.)
  - **Realm:** (Default = Undefined.)
  - **Key Distribution Centers (KDC1 through KDC5):** (Default = Undefined.)
  - **Domain Realms 1 through 5:** (Default = Undefined.)
- **LDAP Group Setup:** Provides access to a submenu, which is used to define LDAP Groups as described in the Sections 5.9.8.1 through 5.9.8.4.

- **Debug:** This option is used to assist WTI Technical Support personnel with the diagnosis of LDAP issues. (Default = Off.)
- **Ping Test:** Allows you to ping IP addresses or domain names that have been defined via the LDAP Parameters menus in order to check that a valid IP address or domain name has been entered.

Notes:

- *In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
- *In addition to the Ping Test feature, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping any user defined IP address in order to make certain that the IP address is responding.*

5.9.8.1. Adding LDAP Groups

Once you have defined users and passwords via your LDAP server, and assigned users to LDAP Groups, you must then grant command and port access rights to each LDAP Group at each individual NBB unit. In order to Add an LDAP Group, you must access the NBB command mode using a password that permits Administrator Level commands. The Add LDAP Group menu allows the following to be defined:

- **Group Name:** Note that this name must match the LDAP Group names that you have assigned to users at your LDAP server. (Default = Undefined.)
- **Access Level:** Sets the command access level to either Administrator, SuperUser, User or ViewOnly. For more information on Access Levels, please refer to Section 5.4.1. (Default = User.)
- **Port Access:** Enables/disables this LDAP Group's access to the serial Setup Port. (Default = Disabled.)
- **Plug Access:** Determine which plugs members of this group will be allowed to control. (Default = All Plugs Off.)
- **Plug Group Access:** Determines which plug groups the members of this LDAP Group will be allowed to control. (Default = Undefined.)
- **Service Access:** Determines whether members of this LDAP group will be allowed to access command mode via the serial Setup Port, via Telnet/SSH or via both methods. (Default = Serial Port = On, Telnet/SSH = On, Web = On.)
- **Current/Power Metering:** Determines whether or not members of this LDAP Group will be allowed to view current, voltage and temperature readings.

Note: *After you have defined LDAP Group parameters, make certain to save changes before proceeding. In the Web Browser Interface, click on the "Add LDAP Group" button to save parameters; in the Text Interface, press the* ***[Esc]*** *key several times until the NBB displays the "Saving Configuration" message.*

5.9.8.2 Viewing LDAP Groups

If you need to examine an existing LDAP group definition, the "View LDAP Groups" function can be used to review the group's parameters and Plug Access Settings.

5.9.8.3. Modifying LDAP Groups

If you want to modify an existing LDAP Group in order to change parameters or plug access rights, the "Modify LDAP Group" function can be used to reconfigure group parameters. To Modify an existing LDAP Group, you must access the NBB command mode using a password that permits access to Administrator Level commands. Once you have accessed the Modify LDAP Group menu, use the menu options to redefine parameters in the same manner that is used for the Add LDAP Group menu, as discussed in Section 5.9.8.1.

> **Note:** *After you have finished modifying LDAP Group parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Modify LDAP Group" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

5.9.8.4. Deleting LDAP Groups

The Delete LDAP Group function is used to delete LDAP Groups that are no longer in use. In order to Delete an existing LDAP Group, you must access the NBB command mode using a password that permits access to Administrator Level commands.

5.9.9. TACACS Parameters

The TACACS Configuration Menus offer the following options:

- **Enable:** Enables/disables the TACACS feature at the Network Port. (Default = Off.)
- **Primary Address:** Defines the IP address or domain name (up to 64 characters) for your primary TACACS server. (Default = Undefined.)
- **Secondary Address:** Defines the IP address or domain name (up to 64 characters) for your secondary, fallback TACACS server (if present.) (Default = Undefined.)
- **Secret Word:** Defines the shared TACACS Secret Word for both TACACS servers. (Default = Undefined.)
- **Fallback Timer:** Determines how long the NBB will continue to attempt to contact the primary TACACS Server before falling back to the secondary TACACS Server. (Default = 15 Seconds.)

- **Fallback Local:** Determines whether or not the NBB will fallback to its own password/username directory when an authentication attempt fails. When enabled, the NBB will first attempt to authenticate the password by checking the TACACS Server; if this fails, the NBB will then attempt to authenticate the password by checking its own internal username directory. This parameter offers three options:
  - **Off:** Fallback Local is disabled (Default.)
  - **On (All Failures):** Fallback Local is enabled, and the unit will fallback to it's own internal user directory when it cannot contact the TACACS Server, or when a password or username does not match the TACACS Server.
  - **On (Transport Failure):** Fallback Local is enabled, but the unit will only fallback to it's own internal user directory when it cannot contact the TACACS Server.
- **Authentication Port:** The port number for the TACACS function. (Default = 49.)
- **Default User Access:** When enabled, this parameter allows TACACS users to access the NBB command mode without first defining a TACACS user account on the NBB. When new TACACS users access the NBB command mode, they will inherit the default Access Level, Port Access, Plug Access, Plug Group Access, Service Access and Current/Power Metering parameters that are defined via the items listed below: (Default = On.)
  - **Enable:** Enables/disables the Default User Access function. (Default = On.)
  - **Access Level:** Determines the default Access Level setting for new TACACS users. This option can set the default access level for new TACACS users to "Administrator", "SuperUser", "User" or "ViewOnly." For more information on Command Access Levels, please refer to Section 5.4.1 and Section 17.2. (Default = User.)
  - **Port Access:** Determines the default Port Access setting for new TACACS users. The Port Access setting determines whether or not the account will be allowed to connect to the serial Setup Port. (Defaults; Administrator and SuperUser = Always Enabled, User = Disabled.)

    Note: *ViewOnly level accounts cannot be granted access to the Setup Port.*
  - **Plug Access:** Determines the default Plug Access setting for new TACACS users. (Defaults; Administrator and SuperUser = All Plugs On, User = All Plugs Off, ViewOnly = All Plugs Off.)

    Notes:
    - *Administrator and SuperUser level accounts always have access to all plugs.*
    - *User level accounts will only have access to the plugs that are defined via the "Plug Access" parameter.*
    - *ViewOnly accounts are not allowed to invoke switching and reboot commands.*

➤ **Plug Group Access:** Determines the default Plug Group Access setting for new TACACS users. For more information on Plug Groups, please refer to Section 5.6. (Defaults; Administrator and SuperUser = All Plug Groups On, User = All Plug Groups Off, ViewOnly = All Plug Groups Off.)

Notes:

- *In order to use this feature, you must first define at least one Plug Group as described in Section 5.6.*
- *Administrator and SuperUser level accounts will always have access to all plug groups.*
- *User Level accounts will only have access to the plug groups that are defined via the Plug Group Access parameter.*
- *ViewOnly accounts are not allowed to invoke switching and reboot commands.*

➤ **Service Access:** Selects the default Service Access setting for new TACACS users. The Service Access setting determines whether each account will be able to access command mode via Serial Port, Telnet/SSH or Web. For example, if Telnet/SSH Access is disabled for an account, then the account will not be able to access command mode via Telnet or SSH. (Default = Serial Port = On, Telnet/SSH = On, Web = On.)

➤ **Current/Power Metering:** Selects the default enable/disable status for the Current/Power Metering setting. When Current/Power Metering is disabled, an account will not be able to view current or power readings or display current or power history. Note that in order for accounts to be able to display these logs, Current and Power Metering must be enabled via the Systems Parameters menu as described in Section 5.3. (Default = On.)

- **Ping Test (Ping TACACS Servers):** Allows you to ping IP addresses or domain names that have been defined via the TACACS Parameters menus in order to check that a valid IP address or domain name has been entered.

Notes:

- *In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
- *In addition to the Ping Test feature, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping any user defined IP address in order to make certain that the IP address is responding.*

5.9.10. RADIUS Parameters

In the Text Interface, the RADIUS Parameters menu is accessed via the Network Configuration menu (/N for IPv4 parameters or /N6 for IPv6 parameters.) In the Web Browser Interface, both IPv4 and IPv6 parameters are defined via a single RADIUS Parameters menu, which is accessed via the flyout menus under the Network Configuration link. The RADIUS Configuration Menus offer the following options:

- **Enable:** Enables/Disables the RADIUS feature at the Network Port. (Default = Off.)
- **Primary Address IPv4:** Defines the IP address or domain name for your primary RADIUS server when IPv4 protocol is used. (Default = Undefined.)
- **Primary Address IPv6:** Defines the IP address or domain name for your primary RADIUS server when IPv6 protocol is used. (Default = Undefined.)
- **Primary Secret Word:** Defines the RADIUS Secret Word for the primary RADIUS server. (Default = Undefined.)
- **Secondary Address IPv4:** Defines the IP address or domain name for your secondary, fallback RADIUS server when IPv4 protocol is used. (Default = Undefined.)
- **Secondary Address IPv6:** Defines the IP address or domain name for your secondary, fallback RADIUS server when IPv6 protocol is used. (Default = Undefined.)
- **Secondary Secret Word:** Defines the RADIUS Secret Word for the secondary RADIUS server. (Default = Undefined.)
- **Fallback Timer:** Determines how long the NBB will continue to attempt to contact the primary RADIUS Server before falling back to the secondary RADIUS Server. (Default = 3 Seconds.)
- **Fallback Local:** Determines whether or not the NBB will fallback to its own password/username directory when an authentication attempt fails. When enabled, the NBB will first attempt to authenticate the password by checking the RADIUS Server; if this fails, the NBB will then attempt to authenticate the password by checking its own internal username directory. This parameter offers three options:
  - **Off:** Fallback Local is disabled (Default.)
  - **On (All Failures):** Fallback Local is enabled, and the unit will fallback to it's own internal user directory when it cannot contact the Radius Server, or when a password or username does not match the Radius Server.
  - **On (Transport Failure):** Fallback Local is enabled, but the unit will only fallback to it's own internal user directory when it cannot contact the Radius Server.
- **Retries:** Determines how many times the NBB will attempt to contact the RADIUS server. Note that the retries parameter applies to both the Primary RADIUS Server and the Secondary RADIUS Server. (Default = 3.)
- **Authentication Port:** The Authentication Port number for the RADIUS function. (Default = 1812.)

- **Accounting Port:** The Accounting Port number for the RADIUS function. (Default = 1813.)
- **Debug:** (Text Interface Only) When enabled, the NBB will put RADIUS debug information into Syslog. (Default = Off.)
- **Ping Test:** Allows you to ping IP addresses or domain names that have been defined via the RADIUS Parameters menus in order to check that a valid IP address or domain name has been entered.

Notes:

- *In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
- *In addition to the Ping Test feature, the /TEST command in the Text Interface or the "Test" option in the Web Browser Interface can also be used to ping any user defined IP address in order to make certain that the IP address is responding.*

5.9.10.1. Dictionary Support for RADIUS

The RADIUS dictionary file can allow you to define users and assign command access rights and plug access rights from a central location. The RADIUS dictionary file, "dictionary.wti" is included on the CDROM along with this user's guide. To install the dictionary file on your RADIUS server, please refer to the documentation provided with your server; some servers will require the dictionary file to reside in a specific directory location, others will require the dictionary file to be appended to an existing RADIUS dictionary file. The WTI RADIUS dictionary file provides the following commands:

- **`WTI-Super`** - Sets the command access level for the user. This command provides the following arguments:

  `0` = ViewOnly
  `1` = User
  `2` = SuperUser
  `3` = Administrator

  For example, to set the access level to "SuperUser", the command line would be:

  `WTI-Super="2"`

- **`WTI-Plug-Access`** - Determines which plug(s) the user will be allowed to access. This command provides an argument that consists of a character string, with one character for each the NBB's switched outlets. The following options are available:

  `0` = Off (Deny Access)
  `1` = On (Allow Access)

  For example, to allow access to Plugs 2 and 4, the command line would be:

  `WTI-Plug-Access="0101"`

- **`WTI-Group-Access`** - Determines which plug group(s) the user will be allowed to access. The argument for this command includes a character for each, defined plug group. The first character in the string is used to represent the first plug group defined, and the last character in the string represents the last plug group defined. The following options are available for each plug group:

  `0` = Off (Deny Access)
  `1` = On (Allow Access)

  For example, to allow access to the first three defined plug groups out of a total of six defined plug groups, the command line would be:

  `WTI-Group-Access="111000"`

Example:
The following command could be used to set the command access level to "User", allow access to Serial Ports 1, 3, 5 and 7 and Plugs 1 and 2, and also allow access to the first two of five defined plug groups:

```
tom  Auth-Type:=Local, User-Password=="tom1"
   Login-Service=Telnet,
   Login-TCP-Port=Telnet,
   User-Name="HARRY-tom",
   WTI-Super="1",
   WTI-Plug-Access="11000000",
   WTI-Group-Access="11000",
```

5.9.11. Email Messaging Parameters

The Email Messaging menu is used to define parameters for email messages that the NBB can send to notify you when an alarm is triggered. To define email message parameters, you must access the NBB Command Mode using a password that permits access to Administrator Level commands and then proceed as follows:

- **Text Interface:** Type **/N** (for IPv4 parameters) or /N6 (for IPv6 parameters) and press **[Enter]** to access the Network Configuration Menu. Key in the number for the Email Messaging option and press **[Enter]** to display the Email Messaging Menu.
- **Web Browser Interface:** Place the cursor over the "Network Configuration" link on the left hand side of the screen. When the fly-out menu appears select either the link for IPv4 parameters or IPv6 parameters to display the Email Messaging Menu.

The Email Messaging menu offers the following options:

- **Enable:** Enables/Disables the Email Messaging feature. When disabled, the NBB will not be able to send email messages when an alarm is generated. (Default = Off.)
- **SMTP Server:** This prompt is used to define the address of your SMTP Email server. (Default = Undefined.)
- **Port Number:** Selects the TCP/IP port number that will be used for email connections. (Default = 25.)
- **Domain:** The domain name for your email server. (Default = Undefined.)

  Note: *In order to use domain names, you must first define Domain Name Server parameters as described in Section 5.9.5.*
- **User Name:** The User Name that will be entered when logging into your email server. (Default = Undefined.)
- **Password:** The password that will be used when logging into your email server. (Default = undefined)
- **Auth Type:** The Authentication type; the NBB allows you to select None, Plain, Login, or CRAM-MD5 Authentication. (Default = Plain)
- **From Name:** The name that will appear in the "From" field in email sent by the NBB. (Default = undefined)
- **From Address:** The email address that will appear in the "From" field in email sent by the NBB. (Default = undefined)
- **To Address:** The address(es) that will receive email messages generated by the NBB. Note that up to three "To" addresses may be defined, and that when Alarm Configuration parameters are selected as described in Section 7, you may then designate one, two or all three of these addresses as recipients for email messages that are generated by the alarms. (Default = undefined)
- **Send Test Email:** Sends a test email, using the parameters that are currently defined for the Email configuration menu.

5.10. Save User Selected Parameters

It is strongly recommended to save all user-defined parameters to a file as described in Section 15. This will allow quick recovery in the event of accidental deletion or reconfiguration of port parameters.

When changing configuration parameters via the Text Interface, make certain that the NBB has saved the newly defined parameters before exiting from command mode. To save parameters, press the **[Esc**] key several times until you have exited from all configuration menus and the NBB displays the "Saving Configuration" menu and the cursor returns to the command prompt. If newly defined configuration parameters are not saved prior to exiting from command mode, then the NBB will revert to the previously saved configuration after you exit from command mode.

5.10.1. Restore Configuration

If you make a mistake while configuring the NBB unit, and wish to return to the previously saved parameters, the Text Interface's "Reboot System" command (`/I`) offers the option to reinitialize the unit using previously backed up parameters. This allows you to reset the unit to previously saved parameters, even after you have changed parameters and saved them.

Notes:

- *The NBB will automatically backup saved parameters once a day, shortly after Midnight. This configuration backup file will contain only the most recently saved NBB parameters, and will be overwritten by the next night's daily backup.*
- *When the /I command is invoked, a submenu will be displayed which offers several Reboot options. Option 5 is used to restore the configuration backup file. The date shown next to option 5 indicates the date that you last changed and saved unit parameters.*
- *If the daily automatic configuration backup has been triggered since the configuration error was made, and the previously saved configuration has been overwritten by newer, incorrect parameters, then this function will not be able to restore the previously saved (correct) parameters.*

To restore the previously saved configuration, proceed as follows:

1. Access command move via the Text Interface, using a username/password that permits access to Administrator level commands (see Section 5.1.1.)
2. At the NBB command prompt, type `/I` and press **[Enter]**. The NBB will display a submenu that offers several different reboot options.
3. At the submenu, choose Item 5 (Reboot & Restore Last Known Working Configuration. Key in the number for the desired option, and then press **[Enter]**.
4. The NBB will reboot and previously saved parameters will be restored.

6. Reboot Options

In addition to performing reboot cycles in response to commands, the NBB can also be configured to automatically reboot outlets when an attached device does not respond to a Ping command (Ping-No-Answer Reboot) or according to a user defined schedule (Scheduled Reboot.)

- **Ping-No-Answer Reboot:** When the Ping-No-Answer feature is enabled, the NBB will Ping a user selected IP address at regular intervals. If the IP address does not respond to the Ping command, the NBB will reboot one or more user selected outlet(s). Typically, this feature is used to reboot devices when they cease to respond to the Ping command.
- **Scheduled Reboot:** A scheduled reboot is used to initiate a reboot cycle at a user selected time and day of the week. When properly configured and enabled, the NBB will reboot one or more outlets on a daily or weekly basis. The Scheduled Reboot feature can also be used to switch outlet(s) Off at a user selected time, and then switch them back On again at a later, user selected time.

This section describes the procedure for configuring and enabling Ping-No-Answer Reboots and Scheduled Reboots.

> **Note:** *When defining parameters via the Text Interface, make certain to press the **[Esc]** key to completely exit from the configuration menus and save newly defined parameters. When parameters are defined via the Text Interface, newly defined parameters will not be saved until the "Saving Configuration" message is displayed.*

6.1. Ping-No-Answer Reboot

A Ping-No-Answer Reboot can be used to reboot one or more outlets when an attached device does not respond to a Ping Command. In addition, the Ping-No-Answer Reboot feature can also be configured to send an email, Syslog Message or SNMP Trap to notify you whenever a Ping-No-Answer Reboot occurs. Please refer to Section 7.5 for instructions on setting up email alarm notification for Ping-No-Answer reboots.

To set up a Ping-No-Answer Reboot, you must access command mode using a password that permits Administrator level commands. In the Text Interface, the Ping-No-Answer configuration menu is accessed via the Reboot Options menu (/RB). In the Web Browser Interface, the Ping-No-Answer configuration menu is accessed via the Reboot Options link. The Ping-No-Answer configuration menu can be used to Add, Modify, View or Delete Ping-No-Answer Reboot functions.

Note: *In order for the Ping-No-Answer Reboot feature to work properly, your network and/or firewall, as well as the device at the target IP address must be configured to allow ping commands.*

6.1.1. Adding Ping-No-Answer Reboots

Up to 54 Ping-No-Answer Reboots can be defined. The Add Ping-No-Answer menu is used to define the following parameters for each new Ping-No-Answer Reboot:

- **IP Address or Domain Name:** The IP address or Domain Name for the device that you wish to Ping. When the device at this address fails to respond to the Ping command, the NBB will reboot the selected outlets. (Default = undefined)

  Notes:

  - *In order to use domain names, DNS Server parameters must first be defined as described in Section 5.9.5.*
  - *In the Text Interface, a submenu will be displayed that allows the user to choose either IPv4 protocol or IPv6 protocol.*
  - *In the Web Browser Interface, the Add Ping-No-Answer Reboot menu includes a menu item that is used to select IPv4 protocol or IPv6 protocol.*

- **Protocol:** (Web Interface Only) Allows definition of an IPv4 format IP Address or an IPv6 format IP Address. Note that if desired, both an IPv4 and an IPv6 format IP Address may be defined. (Default = IPv4)

- **Ping Interval:** Determines how often the Ping command will be sent to the selected IP Address. The Ping Interval can be any whole number, from 1 to 3,600 seconds. (Default = 60 Seconds)

  Note: *If the Ping Interval is set lower than 20 seconds, it is recommended to define the "IP Address or Domain Name" parameter using an IP Address rather than a Domain Name. This ensures more reliable results in the event that the Domain Name Server is unavailable.*

- **Interval After Failed Ping:** Determines how often the Ping command will be sent after a previous Ping command receives no response. (Default = 10 Seconds)

- **Ping Delay After PNA Action:** Determines how long the NBB will wait to send additional Ping commands, after a Ping-No-Answer Reboot has been initiated. Typically, this option is used to allow time for a device to fully "wake up" after a Ping-No-Answer Reboot before attempting to Ping the device again. (Default = 15 Minutes)

- **Consecutive Failures:** Determines how many consecutive failures of the Ping command must be detected in order to initiate a Ping-No-Answer Reboot. For example, if this value is set to "3", then after three consecutive Ping failures, a Ping-No-Answer Reboot will be performed. (Default = 5)

- **Reboot:** Enables/Disables the Ping-No-Answer Reboot function for the specified IP address. When this item is disabled, the NBB will not reboot the specified outlet(s) when a Ping-No-Answer is detected. However, the NBB can continue to notify you via Email, Syslog Message and/or SNMP Trap, providing that parameters for these functions have been defined as described in Section 5.9 and email notification for the Ping-No-Answer function has been enabled as described in Section 7.5. (Default = No)

  Notes:

  - *In order for Email/Text Message Notification to function, you must first define Email/Text Message parameters as described in Section 5.9.11.*
  - *In order for Syslog Message Notification to function, you must first define a Syslog Address as described in Section 5.9.2.*
  - *In order for SNMP Trap Notification to function, you must first define SNMP parameters as described in Section 5.9.7.*

- **PNA Action:** Determines how the NBB will react when the IP address fails to respond to a ping. The NBB can either continuously reboot the specified outlet(s) and send notification until the IP address responds and the Ping-No-Answer Reboot is cleared (Continuous Alarm/Reboot), or the NBB can reboot the specified outlet(s) and send notification only once each time the Ping-No-Answer Reboot is initially triggered (Single Alarm/Reboot.) (Default = Continuous Alarm/Reboot)

- **Plug Access:** Determines which outlet(s) will be rebooted when the IP address for this Ping-No-Answer operation does not respond to a Ping command. Note that in the Text Interface, Plug Access is defined via a separate submenu; in the Web Browser Interface, Plug Access is defined via a drop down menu, accessed by clicking on the "plus" sign in the "Configure Plug Access" field. (Default = undefined)

- **Plug Group Access:** Determines which Plug Group(s) the Ping-No-Answer Reboot for this IP Address will be applied to. Note that in the Text Interface, Plug Group Access is defined via a separate submenu; in the Web Browser Interface, Plug Group Access is defined via a drop down menu, which may be accessed by clicking on the "plus" sign. (Default = undefined)

- **Ping Test:** Sends a test Ping command to the IP Address defined for this Ping-No-Answer Reboot.

Notes:

- *In order for the Ping Test function to work properly, your network and/or firewall as well as the device at the target IP address must be configured to allow ping commands.*
- *After you have finished defining or editing Ping-No-Answer Reboot parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Add Ping No Answer" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the MPC displays the "Saving Configuration" message and the cursor returns to the command prompt.*

6.1.2. Viewing Ping-No-Answer Reboot Profiles

After you have defined one or more Ping-No-Answer Reboot profiles, you can review the parameters selected for each profile using the View Ping-No-Answer feature. In order to view the configuration of an existing Ping-No-Answer profile, you must access command mode using a password that allows Administrator level commands and then use the Ping-No-Answer menu's "View/Modify Ping-No-Answer" function.

6.1.3. Modifying Ping-No-Answer Reboot Profiles

After you have defined a Ping-No-Answer profile, you can modify the configuration of the profile using the Modify Ping-No-Answer feature. In order to modify the configuration of an existing Ping-No-Answer profile, you must access the command mode using a password that allows Administrator level commands and then use the Ping-No-Answer menu's "View/Modify Ping-No-Answer" function.

The NBB will display a screen which allows you to modify parameters for the selected Ping-No-Answer Reboot Profile. Note that this screen functions identically to the Add Ping-No-Answer Reboot menu, as discussed in Section 6.1.1.

Note: *After you have finished defining or editing Ping-No-Answer Reboot parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Change Ping No Answer" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

6.1.4. Deleting Ping-No-Answer Reboot Profiles

After you have defined one or more Ping-No-Answer profiles, you can delete profiles that are no longer needed using the Delete Ping-No-Answer feature. In order to delete an existing Ping-No-Answer profile, you must access the command mode using a password that allows Administrator level commands and then use the Ping-No-Answer menu's "Delete Ping-No-Answer" function.

6.2. Scheduled Reboot

The Scheduled Reboot feature can be used to reboot one or more outlets according to a user-defined schedule, or to automatically turn outlets Off and then On according to a user defined schedule.

In order to configure a Scheduled Reboot, you must access command mode using a password that permits access to Administrator level commands. In the Text Interface, the Scheduled Reboot configuration menu is accessed via the Reboot Options menu (/RB). In the Web Browser Interface, the Scheduled Reboot configuration menu is accessed via the Reboot Options link. The Scheduled Reboot configuration menu can be used to Add, Modify, View or Delete Scheduled Reboot functions.

> **Note:** *After you have finished defining or editing Scheduled Reboot parameters, make certain to save the changes before proceeding. In the Web Browser Interface, click on the "Add Scheduled Reboot" button to save parameters; in the Text Interface, press the **[Esc]** key several times until the NBB displays the "Saving Configuration" message and the cursor returns to the command prompt.*

6.2.1. Adding Scheduled Reboots

The NBB allows up to 54 Scheduled Reboots to be defined. The Add Scheduled Reboot menu allows you to define the following parameters for each new Scheduled Reboot:

- **Scheduled Reboot Name:** Assigns a name to this Scheduled Reboot. (Default = undefined.)
- **Plug Action:** Determines whether the Scheduled Reboot will result in the outlet(s) being switched Off, or cycled Off and then On again (Reboot.) Note that when "Turn Off" is selected, the "Day On" option and the "Time On" option can be used to select a time and day when the outlet(s) will be switched back On again. (Default = Turn Off.)
- **Time:** Determines the time of the day that this Scheduled Reboot will occur on. (Default = 12:00.)
- **Day Access:** This prompt provides access to a submenu which is used to determine which day(s) of the week this Scheduled Reboot will be performed. The Day Access parameter can also be used to schedule a daily reboot; to schedule a daily reboot, use the Day Access submenu to select every day of the week. (Default = undefined.)

  > **Note:** *If you wish to Schedule the NBB to switch an outlet On at one time and then switch the outlet Off at another time, you must define two separate scheduled actions. The first action would be used to switch the outlet On, and the second action would be used to switch the outlet Off.*

- **Plug Access:** Determines which outlet(s) this Scheduled Reboot action will be applied to. In the Text Interface, outlets are selected by typing 9, pressing [Enter] and then following the instructions in the resulting submenu. In the Web Browser Interface, outlets are designated by clicking on the "plus" sign in the Plug Access field, and then selecting the desired outlets from the drop down menu. (Default = undefined.)
- **Plug Group Access:** Determines which Plug Group(s) this Scheduled Reboot action will be applied to. Note that in the Text Interface, Plug Group Access is defined via a separate submenu; in the Web Browser Interface, Plug Group Access is defined via a drop down menu, which may be accessed by clicking on the "plus" sign in the Plug Group Access field. (Default = undefined.)

6.2.2. Viewing Scheduled Reboot Actions

After you have defined one or more Scheduled Reboots, you can review the parameters selected for each Reboot using the View Scheduled Reboot feature. In order to view the configuration of an existing Scheduled Reboot, you must access the command mode using a password that allows Administrator level commands and then use the Scheduled Reboot menu's "View/Modify Scheduled Reboot" function.

The NBB will display a screen which lists all defined parameters for the selected Scheduled Reboot action.

6.2.3. Modifying Scheduled Reboots

After you have defined a Scheduled Reboot, you can edit the configuration of the Reboot action using the Modify Scheduled Reboot feature. In order to modify the configuration of an existing Scheduled Reboot action, you must access the command mode using a password that allows Administrator level commands and then use the Scheduled Reboot menu's "View/Modify Scheduled Reboot" function.

The NBB will display a screen which allows you to modify parameters for the selected Scheduled Reboot action. Note that this screen functions identically to the Add Scheduled Reboot menu, as discussed in Section 6.2.1.

6.2.4. Deleting Scheduled Reboots

After you have defined one or more Scheduled Reboot actions, you can delete Reboot actions that are no longer needed using the Delete Scheduled Reboot feature. In order to delete an existing Scheduled Reboot, access the command mode using a password that allows Administrator level commands and then use the Scheduled Reboot menu's "Delete Scheduled Reboot" function.

7. Alarm Configuration

When properly configured, NBB units can monitor rack temperature, ping command response and other factors at network installation sites. In addition, NBB series units can also measure and record current, power and voltage conditions.

If user defined trigger levels for temperature are exceeded, the NBB can also perform load shedding; automatically shutting off user-designated power outlets in order to reduce the amount of heat generated in the rack. When temperatures return to acceptable levels, the NBB can then switch outlets back on again. The NBB can also perform load shedding when current consumption rises above user-defined threshold values. When any of the user-defined alarms are triggered, the NBB can send an alarm message to the proper personnel via Email, Syslog Message or SNMP trap.

This section describes the procedure for setting up the NBB to send alarm messages when critical situations are detected. For instructions regarding configuration of the Log function, please refer to Section 5.3.3.

Notes:

- *In order to send alarm notification via email, email addresses and parameters must first be defined as described in Section 5.9.11. Email alarm notification will then be sent for all alarms that are enabled as described in this Section.*
- *In order to send alarm notification via Syslog Message, a Syslog address must first be defined as described in Section 5.9.2. Once the Syslog address has been defined, Syslog Messages will be sent for every alarm that is discussed in this Section, providing that the Trigger Enable parameter for the alarm has been set to "On."*
- *In order to send alarm notification via SNMP Trap, SNMP Trap parameters must first be defined as described in Section 5.9.7. Once SNMP Trap Parameters have been defined, SNMP Traps will be sent for every alarm that is discussed in this Section, providing that the Trigger Enable parameter for the alarm has been set to "On."*
- *When defining parameters via the Text Interface, make certain to press the **[Esc]** key to completely exit from the configuration menu and save newly defined parameters. When parameters are defined via the Text Interface, newly defined parameters will not be saved until the "Saving Configuration" message is displayed.*

To configure the NBB Alarm functions, access the command mode using a password that allows Administrator level commands and then activate the Alarm Configuration menu (in the Text Interface, type **/AC** and press **[Enter]**; in the Web Browser Interface, click on the "Alarm Configuration" link.)

7.1. The Over Current Alarms

The Over Current Alarms are designed to inform you when current consumption reaches or exceeds user-defined levels. Depending on the specific NBB model, NBB units can have up to two Over Current Alarms:

- The Over Current Line (Initial) Alarm
- The Over Current Line (Critical) Alarm

The Initial alarm is used to provide notification when the level of current consumption reaches a point where you *might* want to investigate it, whereas the Critical alarm can provide notification when the level of current consumption approaches the maximum allowed level. The trigger level for the Initial alarm is generally set lower than the trigger levels for the Critical alarm.

When the user-defined trigger level for current load is exceeded, the NBB can automatically shut off power to non-essential devices ("Load Shedding") in order to decrease current load. After Load Shedding has taken place, the NBB can also restore power to the non-essential devices when current load drops to user-defined acceptable levels. For more information on Load Shedding, please refer to Section 7.1.1.

Notes:

- *In order for the NBB to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Over Current Alarms, access the NBB command mode using a password that permits Administrator Level commands, and then use the Alarm Configuration menu to select the desired alarm feature.

Note that the configuration menus for both Over Current Line Alarms offer essentially the same set of parameters, but the parameters defined for each alarm are separate. Therefore, parameters defined for a Critical Alarm will not be applied to an Initial Alarm and vice versa. The Over Current Alarm Configuration menus offer the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Notes:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Over Current Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then the triggers for all other NBB alarms will also be enabled.*

- **Alarm Set Threshold:** The trigger level for this alarm. When current load exceeds the Alarm Set Threshold, the NBB can send an alarm and/or begin load shedding (if enabled.) Note that the Alarm Set Threshold is entered as a percentage of maximum capacity. (Defaults: Initial = 80%; Critical = 90%.)
- **Alarm Clear Threshold:** Determines how low the current load must drop in order for the Alarm condition to be cancelled and for load shedding recovery (if enabled) to occur. The Alarm Clear Threshold is entered as a percentage of maximum capacity. (Defaults: Initial Alarms = 70%; Critical Alarms = 80%.)
- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)
- **Notify Upon Clear:** When this item is enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will first send notification when it detects that current consumption has exceeded the trigger value, and then send a second notification when it determines that the current consumption has fallen below the trigger value. (Default = On.)
- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)
- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously defined, then the text under the parameters will list the current, user selected email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by the alarm. (Defaults = "Alarm: Over Current (Initial)" or "Alarm: Over Current (Critical)")
- **Load Shedding:** Provides access to a submenu which is used to configure and enable the Load Shedding feature for the Over Current Alarm. When Load Shedding is enabled and properly configured, the NBB will switch user-selected plugs On or Off whenever the current load exceeds the Alarm Set Threshold value. If the Auto Recovery feature is enabled, the NBB can also return these user-selected plugs to their prior status when current load falls below the Alarm Clear Threshold value. For more information on the Load Shedding Feature and Auto Recovery, please refer to Section 7.1.1.

7.1.1. Over Current Alarms - Load Shedding and Auto Recovery

The Load Shedding feature is used to switch specific, user-defined, non-essential plugs On or Off whenever current load exceeds the Alarm Set Threshold value. This allows the NBB to automatically shut Off plugs in order to reduce current load when the load approaches user-defined critical levels. When the Auto Recovery feature is enabled, the NBB can also automatically "undo" the effects of the Load Shedding feature when current load again falls to a user-defined non-critical level.

Together, the Load Shedding and Auto Recovery features allow the NBB to shut off power to non-essential devices when the current load is too high, and then switch those same non-essential devices back On again when the load falls to an acceptable level.

The Load Shedding Configuration Menus allow you to define the following parameters:

Notes:

- *The Load Shedding Configuration Menus for the Over Current Alarms offer essentially the same set of parameters, but parameters defined for each alarm are separate and unique. For example, parameters defined for Over Current (Initial) Alarm Load Shedding will not be applied to Over Current (Critical) Alarm Load Shedding and vice versa.*
- *In the Web Browser Interface, the "Unit to Configure" and "Line" parameters are found in the Over Current Alarm configuration menus.*
- *The "Unit to Configure," and "Line" parameters are used to determine which unit or line the Load Shedding functions will be applied to.*

- **Unit to Configure:** In some WTI power control products, this item is used to select either a local unit or an auxiliary unit. In NBB series products, this option presently has no function. (Default = Local.)
- **Line A Load Shedding:** Defines the Load Shedding actions that will be executed when an Over Current Line Alarm is triggered at Line "A".
- **Line B Load Shedding:** Defines the Load Shedding actions that will be executed when an Over Current Line Alarm is triggered at Line "B".

  Note: *The Line B Load Shedding parameter is not available on single line NBB Models.*

After selecting the desired line, use the following parameters to configure Load Shedding functions for the desired line.

- **Enable:** Enables/Disables Load Shedding for the corresponding alarm. When enabled, the NBB will switch the user specified plugs whenever current load exceeds the Alarm Set Threshold value. (Default = Disable.)
- **Plug State:** Determines whether the selected plugs/plug groups will be switched On or Off when Load Shedding is enabled and current load exceeds the user-defined Alarm Set Threshold. For example, if the Plug State is "Off", then plugs or plug groups will be switched Off when the Alarm Set Threshold is exceeded. (Default = Off.)

- **Auto Recovery:** Enables/Disables the Auto Recovery feature for the selected line. When both Load Shedding and Auto Recovery are enabled, the NBB will return plugs to their former On/Off state after current load falls below the Alarm Clear Threshold value. This allows the NBB to "undo" the effects of Load Shedding after current load has returned to an acceptable level. (Default = Off.)
- **Plug Access:** Determines which Plug(s) will be switched when current load exceeds the Alarm Set Threshold and Load Shedding is triggered. For example, if plugs A1, A2 and A3 are selected, then these plugs will be switched On or Off whenever current load exceeds the Alarm Set Threshold. (Default = undefined.)
- **Plug Group Access:** Determines which Plug Group(s) will be switched when the Load Shedding feature is triggered. For example, if you have defined a Plug Group named "test", which includes Plugs B3, B4 and B5, and then selected the "test" Plug Group via the Plug Group Access parameter, then all of the plugs in the "test" Plug Group will be switched On or Off whenever the current load exceeds the Alarm Set Threshold. (Default = undefined.)

  Note: *Plug Groups must first be defined (as described in Section 5.6) before they will be displayed in the Load Shedding menu's Plug Group Access submenu.*

After setting parameters for a given line, you may also define additional parameters for the other line or lines (if present.) To set Load Shedding parameters for other lines, return to the Alarm Configuration menu and then repeat the procedure described in Section 7.1.1.

7.2. The Over Temperature Alarms

The Over Temperature Alarms are designed to inform you when the temperature level inside your equipment rack reaches or exceeds certain user-defined levels. There are two separate Over Temperature Alarms; the Initial Threshold alarm and the Critical Threshold Alarm.

Typically, the Initial Threshold alarm is used to notify you when the temperature within your equipment rack reaches a point where you *might* want to investigate it, whereas the Critical Threshold alarm is used to notify you when the temperature approaches a level that may harm equipment or inhibit performance. The trigger for the Initial Threshold alarm is generally set lower than the Critical Threshold alarm.

If the user-defined trigger levels for temperature are exceeded, the NBB can automatically shut off power to non-essential devices ("Load Shedding") in order to reduce the amount of temperature that is being generated within the rack. In addition, the Load Shedding feature can also be used to switch On additional components, such as fans or cooling systems in order to dissipate the excess heat. After Load Shedding has taken place, the Load Shedding Recovery feature can be used to return plugs to their previous state after the temperature drops to an acceptable level.

Notes:

- *In order for the unit to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the unit to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the unit to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Over Temperature Alarms, access the NBB command mode using a password that permits Administrator Level commands, and then use the Alarm Configuration menu to select the desired alarm feature.

Both the Initial Threshold menus and Critical Threshold menus offer essentially the same parameters, but the parameters defined for each alarm are separate. Therefore, parameters defined for the Critical Threshold Alarm will not be applied to the Initial Threshold Alarm and vice versa. Both the Over Temperature (Initial Threshold) alarm and the Over Temperature (Critical Threshold) alarm offer the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Note:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Over Temperature Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then all other NBB alarms will also be enabled.*

- **Alarm Set Threshold:** The trigger level for this alarm. When temperature exceeds the Alarm Set Threshold, the NBB can send an alarm (if enabled) and/or begin Load Shedding (if enabled.) For more information on Load Shedding for the Over Temperature Alarm, please refer to Section 7.2.1. (Initial Threshold: Default = 90°F or 32°C, Critical Threshold: Default = 100°F or 38°C.)

- **Alarm Clear Threshold:** Determines how low the temperature must drop in order for the Alarm condition to be cancelled and for Load Shedding (if enabled) to occur. For more information on Load Shedding for the Over Temperature Alarm, please refer to Section 7.2.1. (Initial Threshold: Default = 80°F or 27°C, Critical Threshold: Default = 90°F or 38°C.)

  Note: *The System Parameters menu is used to set the temperature format for the NBB unit to either Fahrenheit or Celsius as described in Section 5.3.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send notification was unsuccessful. (Default = 60 Minutes.)

- **Notify Upon Clear:** When this item is enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will send initial notification when it detects that the temperature has exceeded the trigger value, and then send a second notification when it determines that the temperature has fallen below the trigger value. (Default = On.)

- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)

- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses, defined via the "Email Messages" menu (see Section 5.9.11,) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously defined, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by this alarm. (Default = "Alarm: Over Temperature (Initial)" or "Alarm: Over Temperature (Critical)".)

- **Load Shedding:** Provides access to a submenu, which is used to configure and enable the Load Shedding feature for the Over Temperature alarms. When Load Shedding is enabled and properly configured, the NBB will switch specific, user-selected plugs On or Off whenever the temperature exceeds the Alarm Set Threshold value. If the Auto Recovery feature is enabled, the NBB can also return these user-selected plugs to their prior status, when the temperature falls below the Alarm Clear Threshold value. For more information on the Load Shedding Feature and Auto Recovery, please refer to Section 7.2.1.

7.2.1. Over Temperature Alarms - Load Shedding and Auto Recovery

For Over Temperature Alarms, the Load Shedding feature is used to switch specific, user-defined plugs On or Off whenever temperature exceeds the Alarm Set Threshold value. This allows the NBB to automatically shut Off non-essential devices in order to reduce the temperature generated within the rack, or automatically switch On devices such as fans or cooling systems in order to dissipate heat. When the Auto Recovery feature is enabled, the NBB can also automatically "undo" the effects of the Load Shedding feature when the temperature again falls to a user-defined non-critical level.

> **Note:** *Load Shedding Configuration Menus for both the Initial and Critical Over Temperature Alarms offer essentially the same set of parameters, but parameters defined for each alarm are separate and unique. For example, parameters defined for Over Temperature (Initial) Alarm Load Shedding will not be applied to Over Temperature (Critical) Alarm Load Shedding and vice versa.*

The Load Shedding Configuration menus allow you to defined the following parameters:

- **Unit to Configure:** In some WTI power control products, this item is used to select either a local unit or an auxiliary unit. In NBB series products, this option presently has no function. (Default = Local.)
- **Configure Loadshedding for Unit:** In the Text Interface, this item is used to access the Load Shedding parameters listed below. In the Web Browser Interface, Load Shedding parameters are accessed via the "Load Shedding" button in the Temperature Alarm configuration menus.
  - **Enable:** Enables/Disables Load Shedding for the Over Temperature Alarm. When enabled, the NBB will switch the user specified plugs whenever the temperature exceeds the Alarm Set Threshold value. (Default = Disable.)
  - **Plug State:** Determines whether the selected plugs/plug groups will be switched On or Off when Load Shedding is enabled and temperature exceeds the user-defined Alarm Set Threshold. For example, if the Plug State is set to "Off", then the selected plugs/plug groups will be switched Off when the Alarm Set Threshold is exceeded. (Default = Off.)
  - **Auto Recovery:** Enables/Disables the Auto Recovery feature for the selected unit. When both Load Shedding and Auto Recovery are enabled, the NBB will return plugs to their former On/Off state after the temperature falls below the Alarm Clear Threshold value. This allows the NBB to "undo" the effects of the Load Shedding feature after the temperature returned to an acceptable level. (Default = Off.)
  - **Plug Access:** Determines which Plug(s) will be switched when the temperature exceeds the Alarm Set Threshold and Load Shedding is triggered. For example, if plugs A1, A2 and A3 are selected, these plugs will be switched On or Off whenever the temperature exceeds the Alarm Set Threshold. (Default = undefined.)
  - **Plug Group Access:** Determines which Plug Group(s) will be switched when the Load Shedding feature is triggered. (Default = undefined.)

> **Note:** *In order to define Plug Group Access, you must first define at least one Plug Group as described in Section 5.6.*

7.3. The Circuit Breaker Open Alarm

The Circuit Breaker Alarm is intended to provide notification in the event that one of the NBB's circuit breakers is opened. When a circuit breaker is open, the NBB can provide prompt notification via Email, Syslog Message or SNMP Trap.

Notes:

- *In order for the NBB to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Circuit Breaker Alarm, you must access the NBB command mode using a password that permits Administrator Level commands. The Circuit Breaker Open Alarm Configuration Menu offers the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Note:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Circuit Breaker Open Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then all other NBB alarms will also be enabled.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)
- **Notify Upon Clear:** When this item is enabled, the unit will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the unit can send initial notification when it detects an open circuit breaker, and then send a second notification when it determines that the circuit breaker has been closed. (Default = On.)
- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)

- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously defined, then the text under the parameters will list the current, user selected email addresses.*

- **Subject:** Defines the text that will appear in the "Subject" field for email notification messages generated by this alarm. (Default = "Alarm: Circuit Breaker Open")

7.4. The Lost Voltage (Line In) Alarm

The Lost Voltage (Line In) Alarm can provide notification after the power supply to the NBB unit has been interrupted.

Notes:

- *The Lost Voltage (Line In) alarm is only available on NBB units that include two input power lines.*
- *The Lost Voltage (Line In) alarm will provide notification when one of the available power supplies is lost or disconnected. This alarm will not function if all input power to the NBB unit is lost. To provide notification when all input power is lost and restored, please use the Power Cycle Alarm as described in Section 7.7.*
- *In order for the NBB to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Lost Voltage (Line In) Alarm, you must access the NBB command mode using a password that permits Administrator Level commands. The Lost Voltage Alarm Configuration menu offers the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Note:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Lost Voltage Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then all other NBB alarms will also be enabled.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)
- **Notify Upon Clear:** When enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will send initial notification when it detects that one of it's power supplies has been lost or disconnected, and then send a second notification when it determines that power has been restored. (Default = On.)

- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)
- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously specified, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by this alarm. (Default = "Alarm: Lost Voltage (Line In)")

7.5. The Ping-No-Answer Alarm

The Ping-No-Answer Alarm is intended to provide notification when one of the IP addresses defined via the Ping-No-Answer Reboot feature (described in Section 6.1) fails to respond to a Ping command. When one of the user-defined IP addresses fails to answer a Ping command, the NBB can provide notification via Email, Syslog Message or SNMP Trap.

Notes:

- *In order for the Ping-No-Answer Alarm to work properly, your network and/or firewall, as well as the device at the target IP address, must be configured to allow ping commands.*
- *In order for this alarm to function, IP Addresses for the Ping-No-Answer reboot feature must first be defined as described in Section 6.1.*
- *When a Ping-No-Answer condition is detected, the NBB can still reboot the user-selected outlet(s) as described in Section 6.1, and can also send an email, Syslog Message and/or SNMP trap as described in this section.*
- *In order for the NBB to provide Email alarm notification, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide Syslog Message notification, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide SNMP Trap notification when this alarm is triggered, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Ping-No-Answer Alarm, you must access the NBB command mode using a password that permits Administrator Level commands. The Ping-No-Answer alarm configuration menu offers the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

  Note:

  - *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
  - *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Ping-No-Answer Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then all other NBB alarms will also be enabled.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)

- **Notify Upon Clear:** When this item is enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will send initial notification when it detects that a Ping command has failed, and then send a second notification when it determines that the IP address is again responding to the Ping command. (Default = On.)

- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)

- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously specified, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages that are generated by this alarm. (Default = "Alarm: Ping-No-Answer")

7.6. The Serial Port Invalid Access Lockout Alarm

The Serial Port Invalid Access Lockout Alarm can provide notification when the NBB has locked the serial SetUp Port due to repeated, invalid attempts to access command mode. Normally, the Invalid Access Lockout feature (discussed in Section 5.3.2) can lock the serial SetUp Port whenever the unit detects that a user-defined threshold for invalid access attempts at the SetUp Port is exceeded. When a serial port lockout occurs, the unit can provide notification via Email, Syslog Message or SNMP Trap.

Notes:

- *Note that Serial Port Invalid Access Lockout Alarm is only intended to provide notification when the Invalid Access Lockout feature has locked the serial SetUp Port. To apply the Invalid Access Lockout feature to the Network Port, please refer to Section 5.3.2.*
- *In order for this alarm to function, Invalid Access Lockout parameters for the serial port must first be configured and enabled as described in Section 5.3.2.*
- *If desired, the NBB can be configured to count Invalid Access attempts at the serial SetUp port, and provide notification when the counter exceeds a user defined trigger level, without actually locking the port in question. To do this, enable the Invalid Access Lockout Alarm as described here, but when you configure Invalid Access Lockout parameters as described in Section 5.3.2, set the Lockout Attempts and Lockout Duration as you would normally, and then set the "Lockout Enable" parameter to "Off."*
- *In order for the NBB to provide Email alarm notification, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide Syslog Message notification, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide SNMP Trap notification when this alarm is triggered, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Serial Port Invalid Access Lockout Alarm, you must access the NBB command mode using a password that permits Administrator Level commands. The Invalid Access Lockout alarm configuration menu offers the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Note:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify on Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Invalid Access Lockout Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then other NBB alarms will also be enabled.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)
- **Notify Upon Clear:** When this item is enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will send initial notification when it detects that an Invalid Access Lockout has occurred, and then send a second notification when it determines that the port has been unlocked. (Default = On.)
- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)
- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously specified, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by this alarm. (Default = "Alarm: Invalid Access Lockout")

7.7. The Power Cycle Alarm

The Power Cycle Alarm can provide notification when all input power to the NBB unit is lost and then restored. When the power supply is lost and then restored, the NBB can provide notification via Email, Syslog Message or SNMP Trap.

Notes:

- *This alarm will not function when only one power input line is disconnected. To provide notification when one power input line is lost or disconnected, please use the Lost Voltage (Line In) Alarm as described in Section 7.4.*
- *In order for the NBB to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

To configure the Power Cycle Alarm, you must access the NBB command mode using a password that permits Administrator Level commands. The Power Cycle Alarm configuration menu offers the following parameters:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

  Note:

  - *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
  - *The Trigger Enable, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the Power Cycle Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then other NBB alarms will also be enabled.*

- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)
- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously specified, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by this alarm. (Default = "Alarm: Power Cycle.")

7.8. The No Dialtone Alarm

The No Dialtone Alarm enables the NBB to monitor a telephone line connected to an external modem installed at the NBB Setup Port, and then provide notification if the NBB detects that the phone line is dead or no dialtone is present.

If the No Dialtone Alarm is enabled and the NBB determines that there is no dialtone signal, the No Dialtone Alarm can provide notification via email using a network connection. In the event that the NBB unit is not connected to a network cable, the NBB will also create an entry in the Alarm Log, indicating that the No Dialtone Alarm has been triggered.

Notes:

- *In order for this alarm to function, the No Dialtone Alarm parameter in the Serial Port Configuration menu must first be configured and enabled as described in Section 5.8.*
- *In order for the NBB to provide alarm notification via Email, communication parameters must first be defined as described in Section 5.9.11.*
- *In order for the NBB to provide alarm notification via Syslog Message, Syslog parameters must first be defined and Syslog Messages must be enabled as described in Section 5.9.2 and Section 11.*
- *In order for the NBB to provide alarm notification via SNMP Trap, SNMP parameters must first be defined, and SNMP Traps must be enabled as described in Section 5.9.7 and Section 12.*

The configuration menu for the No Dialtone Alarm allows the following parameters to be defined:

- **Trigger Enable:** Enables/Disables the trigger for this alarm. When Disabled, this alarm will be suppressed. (Default = On.)

Note:

- *When an alarm is generated, to cancel an alarm without correcting the condition that caused the alarm, simply toggle the Trigger Enable parameter Off and then back On again.*
- *The Trigger Enable, Notify Upon Clear, Email Message and Address 1, 2 and 3 Parameters all include "Copy to All Triggers" options that allow you to enable/disable the corresponding parameter for all NBB alarms. For example, if the No Dialtone Alarm's Trigger Enable parameter is set to "On (Copy to All Triggers), then all other NBB alarms will also be enabled.*

- **Resend Delay:** Determines how long the NBB will wait to resend an email message generated by this alarm, when the initial attempt to send the notification was unsuccessful. (Default = 60 Minutes.)

- **Notify Upon Clear:** When this item is enabled, the NBB will send additional notification when the situation that caused the alarm has been corrected. For example, when Notify Upon Clear is enabled, the NBB will send initial notification when it detects that the dialtone for the external modem has been lost, and then send a second notification when it determines that the dialtone has been restored. (Default = On.)
- **Email Message:** Enables/Disables email notification for this alarm. (Default = On.)
- **Address 1, 2, and 3:** These parameters are used to select which of the three email addresses defined via the "Email Messages" menu (see Section 5.9.11) will receive the email alarm notification messages generated by this alarm. The Address parameters can be used to select one, or any combination of the addresses defined via the Email Messages menu. (Default = All On.)

  Note: *If Email addresses have been previously specified, then the text under the parameters will list the current, user defined email addresses.*

- **Subject:** This parameter is used to define the text that will appear in the "Subject" field for all email notification messages generated by this alarm. (Default = "Alarm: No Dial Tone")

8. The Status Screens

The Status Screens are used to display status information about the switched outlets, Network Port, Plug Groups, Current and Power Metering and the Alarm Log and Audit Log. The Status Screens are available via both the Text Interface and Web Browser Interface.

8.1. Product Status

The Product Status Screen lists the model number, power rating and other information regarding your NBB unit. To display the Product Status Screen via the Text Interface, type `/J *` and then press **[Enter]**. To display the Product Status Screen via the Web Browser Interface, click on the "Product Status" link.

> **Note:** *The Information provided by the Product Status Screen is intended mainly to assist WTI support peronnel with the diagnosis of user equipment problems.*

8.2. The Network Status Screen

The Network Status screen shows activity at the NBB's 16 virtual network ports. To view the Network Status Screen, you must access command mode using a password that permits access to Administrator Level commands.

To display the Network Status Screen via the Text Interface, type `/SN` and press **[Enter]**. To display the Network Status Screen via the Web Browser Interface, click on the Network Status link.

8.3. The Plug Status Screen

The Plug Status screen shows the On/Off status of the NBB's switched outlets.

Note:

- *When the Plug Status Screen is viewed by an "Administrator" or "SuperUser" level account, all NBB plugs are listed. When the Plug Status Screen is viewed by a "User" or "ViewOnly" level account, the screen will list only the outlets that are allowed by that account.*
- *Section 5.7 describes the procedure for configuring the plug parameters that are listed in the Plug Status Screen.*

To display the Plug Status Screen via the Text Interface, type **/s** and press **[Enter]**. To display the Plug Status Screen via the Web Browser Interface, click on the "Plug Status" link.

Note that when the **/s** command is invoked via the Text Interface, the command line can also include arguments that display On/Off status for an individual outlet, two or more specific outlets, or a range of outlets:

/s Displays configuration details and ON/Off status for all switched outlets.

/s *s* Displays On/Off status for an individual outlet, where ***s*** is the name or number of the desired outlet.

/s *s*+*s* Displays On/Off status for two or more specific outlets, where ***s*** is the number or name of each desired outlet. A plus sign (+) is entered between each outlet number or name.

/s *s*:*s* Displays On/Off status for a range of outlets, where ***s*** is the number or name of the outlet at the beginning and end of the range of desired outlets. A colon (:) is entered between the two outlet numbers or names that mark the beginning of the range and the end of the range.

8.4. The Plug Group Status Screen

The Plug Group Status screen shows the configuration details and On/Off status for the NBB's user-defined Plug Groups.

Notes:

- *When the Plug Group Status Screen is viewed by an "Administrator" or "SuperUser" level account, all NBB plugs and plug groups are listed. When the Plug Status Screen is viewed by a "User" or "ViewOnly" level account, the screen will list only the plug groups that are allowed by that account.*
- *In order to display the Plug Group Status screen, you must first define at least one Plug Group as described in Section 5.6.*

To display the Plug Group Status Screen via the Text Interface, type **/SG** and then press **[Enter]**. To display the Plug Group Status Screen via the Web Browser Interface, click on the "Plug Group Status" link and then select the desired Plug Group from the resulting subment and click on the "Get Plug Group Status" button.

Note: *The SNMP Index item (Text Interface Only) lists the permanent reference number that the NBB assigns to each Plug Group. The SNMP Index number allows MIB commands to be addressed to a specific Plug Group. The SNMP Index number will not change when other Plug Groups are deleted or created.*

8.5. The Current Metering Status Screen

The Current Metering Status screen is primarily intended to be used to display up-to-date readings for Amps, Watts, Voltage and temperature for NBB unit. When the /M command is invoked, the command line can also include arguments that display the status of individual outlets, specific pairs of outlets or a range of outlets:

/M Displays the Current Metering Status Screen.

/M a Displays current, voltage and power readings for Line A.

/M b Displays current, voltage and power readings for Line B.

Note: *When current, voltage and power readings are displayed, readings will be displayed as three values separated by commas. Current will be displayed first, then voltage, then power.*

To display the Current Metering Status Screen, proceed as follows:

- **Text Interface:** Type **/M** and press **[Enter]**.
- **Web Browser Interface:** Place the cursor over the "Current Metering" link on the left hand side of the screen. When the fly-out menu appears, click on the "Current Metering Status" link.

8.6. The Current History Screen

The Current History Screen displays current, voltage and other readings as a function of time. In the Web Browser Interface, the Current History can be displayed as a graph or downloaded in ASCII, CSV or XML format. In the Text Interface, the Current History can be displayed as straight ASCII data, or can be downloaded in CSV or XML format. To view the Current History Screen, proceed as follows:

Text Interface: Type `/L` and press **[Enter]** to access the "Display Logs" menu. From the "Display Logs" menu, enter the desired option number and then press **[Enter]** to display the Current Metering Log Menu. The Text Interface also offers the option to select the following display parameters:

- **Display Current Metering Log:** Displays the Current Metering Log.
- **Download Current Metering Log in CSV Format:** Downloads the Current Metering Log (as determined by the current Display Data Option) in CSV format.
- **Download Current Metering Log in XML Format:** Downloads the Current Metering Log (as determined by the current Display Data Option) in XML format.
- **Erase Current Metering Log:** Clears all Current Metering Log data. Note that when the Current Metering Log is erased, the Power Metering Log will also be erased.

Web Browser Interface: Place the cursor over the "Current Metering" link on the left hand side of the screen. When the fly-out menu appears, click on the "Current History" link to display the Current Metering Log menu. At the Current Metering Log menu, you can display current history data as a graph, or download or display the log in ASCII, CSV or XML format. When the Current Metering Log is displayed as a graph, a date range can also be selected, allowing data to be displayed Live or for the previous Day, Week, Month or Year.

When the Current History Screen is displayed in ASCII, CSV or XML format, the NBB will show Line Current, Line Voltage and temperature readings in tabular format. When the Current History Screen is displayed in graph format, via the Web Browser Interface, the NBB will display a page with up to four graphs.

To save Current History data, access command mode using an account that permits Administrator level commands, and then proceed as follows:

- **Text Interface:** Type `/L` and press **[Enter]** to show the Display Logs menu. From the Display Logs menu, key in the number for the desired option and then press **[Enter]** to display the Current History menu, which allows you to either display the Current History log in ASCII format, download and save in CSV or XML format, or erase the Current History Log.
- **Web Browser Interface:** Place the cursor over the "Current Metering" link on the left hand side of the screen. When the fly-out menu appears, click on the desired action and then select graph format, or display/download the Current History in ASCII, CSV or XML format.

8.7. The Power Range Status Screen

The Power Range Status Screen can be used to display power consumption readings over a user-selected period of time, for the NBB unit. To view the Power Range Status Screen, access the NBB command mode using an account that permits access to Administrator or SuperUser level commands and then proceed as follows:

Text Interface:

1. Type **`/L`** and press **[Enter]** to access the "Display Logs" menu. From the Display Logs menu, type **`4`** and press **[Enter]** to display the Power Metering Log menu.
2. **Power Metering Log Menu:** The Power Metering Log Menu allows you to either display Power Metering Data or download Power History Data.
   a) **Display Power Metering:** The NBB will display the Power Metering menu, which allows you to set a date range for the desired data and display the data selected.
   b) **Download Power History:** See Section 8.8.

Web Browser Interface:

1. Place the cursor over the "Power Metering" link on the left hand side of the screen. When the fly-out menu appears, click on the "Power Range" link.
2. Use the List Power Range menu to select the desired date range, and then click on the "Get Chart" button.

8.8. The Power History Screen

The Power History Screen shows power consumption versus time. To view the Power History Screen, access the NBB command mode using an account that permits access to Administrator or SuperUser level commands, and then proceed as follows:

Text Interface:
Type **`/L`** and press **[Enter]** to access the "Display Logs" menu. From the Display Logs menu, type **`4`** and press **[Enter]** to display the Power Metering Log menu.

The Power History menu offers the following options:

1. **Display Power Metering:** Allows you to select the duration period (date) for the Power History screen and then display the resulting data.
2. **Download Power History:** Displays the Power History Screen or downloads Power History data in CSV or XML format.

Web Interface:
Place the cursor over the "Power Metering" link on the left hand side of the screen. When the fly-out menu appears, click on the "Power History" link to display the Power History menu.

The Power History menu offers the options to display Power History as a graph, or display/download the Power History in ASCII, CSV or XML format; click on the link for the desired option.

9. Operation

The NBB offers two separate command interfaces; the Web Browser Interface and the Text Interface. Both interfaces offer essentially the same command options and features, and in most cases, parameters defined via the Web Browser Interface will also apply when communicating via the Text Interface (and vice versa.)

9.1. Operation via the Web Browser Interface

When using the Web Browser Interface, switching commands are invoked via the Plug Control Screen and Plug Group Control Screen.

9.1.1. The Plug Control Screen - Web Browser Interface

The Plug Control Screen lists the On/Off status of the NBB's Switched Outlets and is used to control switching and rebooting of the outlets. To invoke power switching commands, first access the NBB command mode (for more information, see Section 5.1.) After accessing command mode, click on the "Plug Control" link on the left hand side of the screen to display the Plug Control Screen.

When the Plug Control Screen appears, click the down arrow in the "Action" column for the desired outlet(s), then select the desired switching option from the dropdown menu and click on the "Confirm Plug Actions" button.

When the "Confirm Plug Actions" button is pressed, the NBB will display a screen which lists the selected action(s) and asks for confirmation before proceeding. To implement the selected action(s), click on the "Execute Plug Actions" button. The NBB will display a message which indicates that a switching operation is in progress, then display the Plug Status screen when the command is complete. At that time, the Status Screen will list the updated On/Off status of each plug.

Notes:

- *When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.7.1.*
- *If a switching or reboot command is directed to a plug that is already in the process of being switched or rebooted by a previous command, then the new command will be placed in a queue until the plug is ready to receive additional commands.*
- *If the Status column in the Plug Control Screen includes an asterisk, this means that the corresponding outlet is busy completing a previously invoked command.*
- *When the Plug Control Screen is displayed by an account that permits Administrator or SuperUser level commands, all switched outlets will be displayed.*
- *When the Plug Control Screen is displayed by a User level account, the screen will only include the switched outlets that are allowed by the account.*

9.1.2. The Plug Group Control Screen - Web Browser Interface

The Plug Group Control Screen is used to send switching and reboot commands to the user-defined Plug Groups. As described in Section 5.6, Plug Groups allow you to specify a group of outlets that are dedicated to a similar purpose or client, and then direct switching commands to the group, rather than switching one plug at a time.

To apply power switching commands to Plug Groups, first access the NBB Command Mode (see Section 5.1.) Click on the "Plug Group Control" link on the left hand side of the screen to display the Plug Group Control Screen. When the Plug Group Control Screen appears, click the down arrow in the "Action" column for the desired Plug Group(s), then select the desired switching option from the dropdown menu and click on the "Confirm Plug Actions" button

When the "Confirm Plug Group Actions" button is pressed, the NBB will display a screen which lists the selected action(s) and asks for confirmation before proceeding. To implement the selected plug group action(s), click on the "Execute Plug Group Actions" button. The NBB will display a screen which indicates that a switching operation is in progress, then display the Plug Status screen when the command is complete. At that time, the Status Screen will list the updated On/Off status of each plug.

Notes:

- *When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.7.1.*
- *If a switching or reboot command is directed to a plug that is already in the process of being switched or rebooted by a previous command, then the new command will be placed in a queue until the plug is ready to receive additional commands.*
- *When the Plug Group Control Screen is displayed by an account that permits Administrator or SuperUser level commands, all user-defined Plug Groups will be displayed.*
- *When the Plug Control Screen is displayed by a User level account, the screen will only include the Plug Groups that are specifically allowed for that account.*

9.2. Operation via the Text Interface

When using the Text Interface, all switching functions are performed by invoking simple, ASCII commands. The Text Interface includes a Help Menu, which summarizes all available NBB commands. To display the Text Interface Help Menu, type **`/H`** and press **[Enter]**.

> **Note:** *When the Help Menu is displayed by a SuperUser, User or ViewOnly level account, the screen will not include commands that are only available to Administrator level accounts.*

9.2.1. Switching and Reboot Commands - Text Interface

These commands can be used to switch or reboot the NBB's switched plugs, and can also be used to set plugs to the user-defined Power-Up Default values. Plugs may be specified by name or number.

Notes:

- *If a switching or reboot command is directed to a plug that is already being switched or rebooted by a previous command, then the new command will be placed in a queue until the plug is ready to receive additional commands.*
- *If an asterisk appears in the "Status" column for any given plug, this indicates that the plug is currently busy, processing a previously issued command.*
- *Commands are not case sensitive. All commands are invoked by pressing* **[Enter]**.
- *When the Plug Control Screen is displayed by an account that permits Administrator level command access, all switched outlets will be displayed.*
- *When you have accessed command mode using an account that permits Administrator or SuperUser level commands, then switching and reboot commands can be applied to all plugs.*
- *When you have accessed command mode via a User level account, switching and reboot commands can only be applied to the plugs that are specifically allowed for that account.*
- *If command confirmation is enabled, the NBB will display the Status Screen after commands are successfully completed.*
- *When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.7.1.*
- *When used in On/Off/Reboot command lines, plug names and plug group names are* ***not*** *case sensitive.*

When switching and reboot commands are executed, the NBB will display a "Sure?" prompt, wait for user response, and then complete the command. The unit will pause for a moment while the command is executed, and then return to the Plug Status Screen. To Switch Plugs, or initiate a Reboot Cycle, proceed as follows:

1. **Switch Plug(s) On:** Type **/ON *n*** and press **[Enter]**. Where "**n**" is the alphanumeric number or name of the desired plug or Plug Group. For example:

   /ON A1 [Enter] or **/ON ROUTER [Enter]**

2. **Switch Plug(s) Off:** Type **/OFF n** and press **[Enter]**. Where "**n**" is the alphanumeric number or name of the desired plug or Plug Group. Note that the "**/OFF**" command can also be entered as "**/OF**". For example:

   /OFF B2 [Enter] or **/OF ROUTER [Enter]**

3. **Reboot Plug(s):** Type **/BOOT n** and press **[Enter]**. Where "**n**" is the alphanumeric number or name of the desired plug or Plug Group. Note that the "**/BOOT**" command can also be entered as "**/BO**". For example:

   /BOOT B3 [Enter] or **/BO ATMSWTCH [Enter]**

4. **Set All Plugs to Power Up Defaults:** Type **/DPL** and press **[Enter]**. All plugs permitted by your account will be set to their default On/Off status, which is defined via the Plug Parameters Menu as described in Section 5.7.

   Notes:

   - *When you have accessed command mode using an Administrator or SuperUser level account, the Default command will be applied to all plugs.*
   - *When you have accessed command mode using an account that permits only User level command access, the Default command will only be applied to the plugs specifically allowed by that account.*
   - *The /DPL command is not available in ViewOnly mode.*

5. **Suppress Command Confirmation Prompt:** To execute a power switching command without displaying the "Sure?" prompt, include the "**,Y**" option at the end of the command line. For example:

   /ON ROUTER,Y or **/BOOT B2,Y**

9.2.2. Applying Commands to Several Plugs - Text Interface

As described below, switching and reboot commands can be applied to only one Switched AC Outlet, or to an assortment of outlets.

Notes:

- *When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.7.1.*
- *When switching and reboot commands are invoked by a User level account, the command will only be applied to the plugs that are specifically allowed for that account.*

1. **Switch Several Plugs:** To apply a command to several plugs, enter the numbers of the desired plugs, separated by commas or plus signs. For example to switch plugs A1, A3, and A4 Off, enter either of the following commands:

   `/OFF A1+A3+A4` [Enter]
   or
   `/OFF A1,A3,A4` [Enter]

   Note: *In order for the "+" or "," operators to work, there must be no spaces between the plug name or number and the plus sign or comma.*

2. **Switch a Series of Plugs:** To apply a command to a series of plugs, enter the numbers for the plugs that mark the beginning and end of the series, separated by a colon. For example to switch On plugs A1 through A4 enter the following:

   `/ON A1:A4` [Enter]

3. **All Plugs:** To apply a command to all plugs, enter an asterisk in place of the name or number. For example, to Boot all plugs, enter the following:

   `/BO *` [Enter]

9.3. The Automated Mode

The Automated Mode allows the NBB to execute switching and reboot commands, without displaying menus or generating response messages. Automated Mode is designed to allow the NBB to be controlled by a device which can generate commands to control power switching functions without human intervention.

When Automated Mode is enabled, the /ON, /OFF, /BOOT, /DPL and /X commands are executed without a "Sure?" confirmation prompt and without command response messages; the only reply to these commands is the command prompt, which is displayed when the command is complete.

Note that although Automated Mode can be enabled using either the Web Browser Interface or Text Interface, Automated Mode is designed primarily for users who wish to send ASCII commands to the NBB without operator intervention, and therefore does not generally apply to the Web Browser Interface. When Automated Mode is enabled, the Web Browser Interface can still be used to invoke On / Off / Boot commands.

Notes:

- *When Automated Mode is enabled, all NBB password security functions are disabled, and users are able to access System Level command functions (including the configuration menus) and control plugs without entering a password.*
- *If you need to enable the Automated Mode, but want to restrict network access to NBB configuration menus, it is recommended to enable and configure the IP Security Function as described in Section 5.9.3.*

To enable/disable Automated Mode, access the System Parameters menu (see Section 5.3,) then set the "Automated Mode" option to "On". When Automated Mode is enabled, NBB functions will change as follows:

1. **All Password Security Suppressed:** When a user attempts to access command mode, the password prompt will not be displayed at either the SetUp Port or the Network Port. Unless specifically restricted by the IP Security Function, all users will be allowed to access both switching and configuration functions, and all commands will be immediately accepted without the requirement to enter a password.
2. **Status Screen Suppressed:** The status screens will not be automatically displayed after commands are successfully executed. Note however, that the /S command can still be invoked to display the status screen as needed.
3. **"Sure?" Prompt Suppressed:** All commands are executed without prompting for user confirmation.
4. **Error Messages Suppressed:** If the **[Enter]** key is pressed without entering a command, the NBB will not respond with the "Invalid Command" message. Note however, that an error message will still be generated if commands are invoked using invalid formats or arguments.

All other status display and configuration commands will still function as normal.

9.4. The SSH/Telnet Connect Function (Web Browser Interface Only)

The SSH/Telnet Connect function allows you to open an SSH Shell Session or Telnet Session without leaving the Web Browser interface. Once you have successfully opened an SSH Shell Session or Telnet Session, you can then use ASCII commands to configure and operate the NBB unit as described in Section 9.2 and Section 17.

9.4.1. Initiating an SSH Shell Session via the Web Browser Interface

To initiate an SSH Shell Session from the NBB Web Browser Interface, proceed as follows:

1. Place the cursor over the "SSH/Telnet Connect" button on the left hand side of the screen. When the flyout menu appears, click on the SSH option.

   Note: *If the RSP displays a message that indicates that your browser does not include the Java plugin, go to the Java website and download the latest version of the Java plugin.*

2. Start Java: Click on the File menu and select "Open Shell Session"

3. The NBB will display a prompt that asks the user to enter a valid username and host name (IP Address.) Key in the username and host name (IP address) using the following format and then click on the "OK" button:

   `username@ip_address`

   Notes:

   - *The username entered must be a valid username that has been previously defined via the NBB User Directory as described in Section 5.5.*
   - *The IP Address (host name) can either be the address to the machine that you are currently communicating with via the Web Browser Interface, or you can enter the IP address for another NBB unit, providing that the username entered is present on the other NBB unit too.*

4. After the username and host name are entered, the NBB will prompt you to enter your password. Key in the password that has been defined for the username entered in step 3 above and then click on the "OK" button.

5. The NBB will display the Circuit Status Screen, followed by the command prompt. You may now invoke NBB commands as described in Section 9.2 and 17.

6. To terminate the SSH Session, type **`/x`** and press **[Enter]**.

9.4.2. Initiating a Telnet Session via the Web Browser Interface

To initiate a Telnet Session from the NBB Web Browser Interface, proceed as follows:

1. Place the cursor over the "SSH/Telnet Connect" button on the left hand side of the screen. When the flyout menu appears, click on the Telnet option.

   Note: *If the RSP displays a message that indicates that your browser does not include the Java plugin, go to the Java website and download the latest version of the Java plugin.*

2. Log in to the Telnet Session:

   a) The NBB will display the "login" prompt. Key in a valid username that has been previously defined via the NBB User directory and then press **[Enter]**.

   b) The NBB will display the "password" prompt. Key in the valid password for the username entered above and then press **[Enter]**.

   Notes:

   - *The username entered must be a valid username that has been previously defined via the NBB User Directory as described in Section 5.5.*
   - *The IP Address (host name) can either be the address to the machine that you are currently communicating with via the Web Browser Interface, or you can enter the IP address for another NBB unit, providing that the username entered is present on the other NBB unit too.*

3. The NBB will display the Circuit Status Screen, followed by the command prompt. You may now invoke NBB commands as descrived in Section 9.2 and 17.

4. To terminate the Telnet Session, type **`/x`** and press **[Enter]**.

9.5. Manual Operation

In addition to the command driven functions available via the Web Browser Interface and Text Interface, some NBB functions can also be controlled manually. For a summary of front panel control functions, please refer to Section 2.2.

9.6. Logging Out of Command Mode

When you have finished communicating with the NBB, it is important to always disconnect using either the "LogOut" link (Web Browser Interface) or the /X command (Text Interface), rather than by simply closing your browser window or communications program. When communicating via a PDA, use the PDA's "Close" function to disconnect and logout.

When you disconnect using the LogOut link or /X command, this ensures that the NBB has completely exited from command mode, and is not waiting for the inactivity timeout period to elapse before allowing additional connections.

10. SSH Encryption

In addition to standard Telnet protocol, the NBB also supports SSH connections, which provide secure, encrypted access via network. In order to communicate with the NBB using SSH protocol, your network node must include an appropriate SSH client.

Note that when the /K (Send SSH Key) command is invoked, the NBB can also provide you with a public SSH key, which can be used to streamline connection to the NBB when using SSH protocol.

Although you can establish an SSH connection to the unit *without* the public key, the public key provides validation for the NBB, and once this key is supplied to the SSH client, the client will no longer display a warning indicating that the NBB is not a recognized user when the client attempts to establish a connection.

The /K command uses the following format:

`/K <k>` [Enter]

Where **`k`** is an argument that determines which type of public key will be displayed, and the **`k`** argument offers the following options:

1. SSH1
2. SSH2 RSA
3. SSH2 DSA

For example, to obtain the public SSH key for an SSH2 RSA client, type **`/K 2`** and then press **[Enter]**. Note that when capturing the SSH key, you can either configure your terminal application to receive the parameter file, or simply copy and paste the resulting SSH key.

Notes:

- *Although the NBB does not support SSH1, the /K 1 command will still return a key for SSH1.*
- *When capturing the SSH key, you can either configure your terminal application to receive the parameter file, or simply copy and paste the resulting key*

11. Syslog Messages

The Syslog feature can create log records of each Alarm Event. As these event records are created, they are sent to a Syslog Daemon, located at an IP address defined via the Network Parameters menu.

11.1. Configuration

If you wish to employ this feature, you must set the real-time clock and calendar via the System Parameters Menu, and define the IP address for the Syslog Daemon via the Network Port Configuration menu.

To configure the Syslog function, please proceed as follows:

1. **Access command mode:** Note that the following configuration menus are only available to accounts that permit Administrator level commands.
2. **System Parameters Menu:** Access the System Parameters Menu as described in Section 5.3, then set the following parameters:
   a) **Set Clock and Calendar:** Set the Real Time Clock and Calendar and/or configure and enable the NTP server feature.
3. **Network Parameters Menu:** Access the Network Parameters Menu as described in Section 5.9, then set the following parameters:
   a) **Syslog IP Address:** Determine the IP address for the device that will run the Syslog Daemon, then use the Network Port Configuration menu to define the IP Address for the Syslog Daemon.

Notes:

- *The Network Parameters Menu allows the definition of IP addresses for both a primary Syslog Daemon and an optional secondary Syslog Daemon.*
- *The Syslog Address submenu in the Text Interface includes a Ping Test function that can be used to ping the user-selected Syslog IP Address to verify that a valid IP address has been entered. In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*

4. **Syslog Daemon:** In order to capture messages sent by the NBB, a computer must be running a Syslog Daemon (set to UDP Port 514) at the IP address specified in Step 3 above.

Once the Syslog Address is defined, Syslog messages will be generated whenever one of the alarms discussed in Section 7 is triggered.

12. SNMP Traps

SNMP is an acronym for "Simple Network Management Protocol". The SNMP Trap function allows the NBB to send Alarm Notification messages to two different SNMP managers, each time one of the Alarms discussed in Section 7 is triggered.

Note:

- *The SNMP feature cannot be configured via the SNMP Manager.*
- *SNMP reading ability is limited to the System Group.*
- *The SNMP feature includes the ability to be polled by an SNMP Manager.*
- *Once SNMP Trap Parameters have been defined, SNMP Traps will be sent each time an Alarm is triggered. For more information on Alarm Configuration, please refer to Section 7.*

12.1. Configuration:

To configure the SNMP Trap function, proceed as follows:

1. Access command mode using an account that permits Administrator level commands.
2. **SNMP Trap Parameters:** Access the SNMP Trap Parameters Menu as described in Section 5.9.7. Set the following:
   a) **SNMP Managers 1 and 2:** The address(es) that will receive SNMP Traps that are generated by one of the Alarms discussed in Section 7. Consult your network administrator to determine the IP address(es) for the SNMP Manager(s), then use the Network Parameters menu to set the IP address for each SNMP Manager. Note that it is not necessary to define both SNMP Managers.

Notes:

- *To enable the SNMP Trap feature, you must define at least one SNMP Manager. SNMP Traps are automatically enabled when at least one SNMP Manager has been defined.*
- *The SNMP Trap submenu includes a Ping Test function that can be used to ping the user-selected SNMP Managers to verify that a valid IP address has been entered. In order for the Ping Test feature to function, your network and/or firewall must be configured to allow ping commands.*
- *Addresses for SNMP Managers can be defined in either IPv4 or IPv6 format, as described in Section 5.9.7.*

   b) **Trap Community:** Consult your network administrator, and then use the Network Parameters menus to set the Trap Community.

Once SNMP Trap Parameters have been defined, the NBB will send an SNMP Trap each time an alarm is triggered.

13. Operation via SNMP

If SNMP Access Parameters have been defined as described in Section 5.9.6, then you will be able to manage user accounts, control power and reboot switching and display unit status via SNMP. This section describes the procedure for SNMP communication with the NBB unit, and lists some common commands that can be employed to manage users, control switching and reboot actions and display unit status.

Note: *SNMP Commands are not available when the IPS mode is active.*

13.1. NBB SNMP Agent

The NBB's SNMP Agent supports various configuration, control, status and event notification capabilities. Managed objects are described in WTI-MPC-VMR-MIB.txt, which can be found in the user's guide archive on the WTI web site at: (http://www.wti.com/manuals.htm).

The WTI-MPC-VMR-MIB.txt document can be compiled for use with your SNMP client.

13.2. SNMPv3 Authentication and Encryption

The major limitations of SNMPv2 were the failure to include proper username/password login credentials (v2 only used a password type of login, i.e., community name) and the lack of support for encryption of transmitted data. SNMPv3 addresses both of these shortcomings.

For SNMPv3, the NBB supports two forms of Authentication/Privacy: Auth/noPriv which requires a username/password, but does not encrypt data going over the internet and Auth/Priv which requires a username/password AND encrypts the data going over the internet using DES or AES (in the case of the NBB, the default encryption format for SNMPv3 is DES.) For the Password protocol, the SRM supports either MD5 or SHA1.

13.3. Configuration via SNMP

NBB User accounts can be viewed, created, modified, and deleted via SNMP. User accounts are arranged in a table of 128 rows, and indexed 1-128. User account parameters, as seen through the SNMP, are summarized below.

- **`userTable::userName`** – 32 character username
- **`userTable::userPasswd`** – 16 character password
- **`userTable::userAccessLevel`** – Account access level.
  - `0` – View Access
  - `1` – User Access
  - `2` – Superuser Access
  - `3` – Administrator Access
- **`userTable::userLocalAccess`** – A string of 16 characters, with one character for each of the 16 possible plugs on the NBB unit. A '`0`' indicates that the account **does not** have access to the plug, and a '`1`' indicates that the user *does* have access to the plug.
- **`userTable::userGroupAccess`** – A string of 54 characters, with one character for each of the 54 possible plug groups in the system. '`0`' indicates that the account **cannot** access the group, and '`1`' indicates that the user *can* access the group.
- **`userTable::userSerialAccess`** – Access to the serial interface
  - `0` – No access
  - `1` – Access
- **`userTable::userTelnetSshAccess`** – Access to the Telnet/SSH interface.
  - `0` – No access
  - `1` - Access
- **`userTable::userOutboundTelSshAccess`** – Access to Outbound Telnet/SSH
  - `0` – No access
  - `1` - Access
- **`userTable::userWebAccess`** – Access to the Web interface.
  - `0` – No access
  - `1` - Access
- **`userTable::userCurrentPowerMetering`** – Access to the systems current/ power metering.
  - `0` – No access
  - `1` – Access
- **`userTable::userCallbackNum`** – 32 character callback number for account.
- **`userTable::userSubmit`** – Set to `1` to submit changes.

13.3.1. Viewing Users

To view users, issue a GET request on any of the user parameters for the index corresponding to the desired user.

13.3.2. Adding Users

For an empty index, issue a SET request on the desired parameters. Minimum requirement is a username and password to create a user, all other parameters will be set to defaults if not specified. To create the user, issue a SET request on the userSubmit object.

13.3.3. Modifying Users

For the index corresponding to the user you wish to modify, issue a SET request on the desired parameters to be modified. Once complete, issue a SET request on the userSubmit object.

13.3.4. Deleting Users

For the index corresponding to the user you wish to delete, issue a SET request on the username with a blank string. Once complete, issue a SET request on the userSubmit object.

13.4. Plug Control via SNMP

13.4.1. Plug Status/Control

ON, OFF, BOOT, and DEFAULT commands can be issued for plugs via SNMP. Plugs are arranged in a table of N rows, where N is the number of plugs in the system. Plug parameters are described below.

- **`plugTable::plugID`** – String indicating the plug's ID.
- **`plugTable::plugName`** – String indicating the plug's user-defined name.
- **`plugTable::plugStatus`** – Current state of the plug.
  - **`0`** – Plug is OFF
  - **`1`** – Plug is ON
- **`plugTable::plugAction`** – Action to be taken on plug.
  - **`1`** – Mark to turn ON (does not execute)
  - **`2`** – Mark to turn OFF (does not execute)
  - **`3`** – Mark to BOOT (does not execute)
  - 4 – Mark to DEFAULT (does not execute)
  - 5 – Mark to turn ON and execute plug actions
  - 6 - Mark to turn OFF and execute plug actions
  - 7 - Mark to BOOT and execute plug actions
  - 8 - Mark to DEFAULT and execute plug actions

Set **`plugTable::plugAction`** to desired action, as specified by values 1-4 above, for each plug index the action is to be applied to. For the last plug you wish to set before executing the commands, use values 5-8 instead, which will invoke the requested commands all at once.

- **`plugTable::plugCurrent`** – The current, in tenths of an Amp, that is being consumed by each switched outlet.
- **`plugTable::plugPower`** – The power, in Watts, that is being consumed by each switched outlet.

13.4.2. Plug Group Status/Control

ON, OFF, BOOT, and DEFAULT commands can be issued for plug groups via SNMP. Plug groups are arranged in a table of 54 rows, one row for each plug group in the system. Plug Group parameters are described below.

- **`plugGroupTable::plugGroupName`** – String indicating the plug groups name.
- **`plugGroupTable::plugGroupAction`** – Action to be taken on plug group
  - **`1`** – Mark to turn ON (does not execute)
  - **`2`** – Mark to turn OFF (does not execute)
  - **`3`** – Mark to BOOT (does not execute)
  - **`4`** – Mark to DEFAULT (does not execute)
  - **`5`** – Mark to turn ON and execute plug group actions
  - **`6`** – Mark to turn OFF and execute plug group actions
  - **`7`** – Mark to BOOT and execute plug group actions
  - **`8`** – Mark to DEFAULT and execute plug group actions

Set **`plugGroupTable::plugGroupAction`** to desired action, as specified by values 1-4 above, for each plug group index the action is to be applied to. For the last plug group you wish to set before executing the commands, use values 5-8 instead, which will invoke the requested commands all at once.

- **`plugGroupTable::plugGroupCurrent`** – The current, in tenths of an Amp, that is being consumed by each Plug Group.
- **`plugGroupTable::plugGroupPower`** – The power, in Watts, that is being consumed by each Plug Group.

13.5. Viewing NBB Status via SNMP

Status of various components of the NBB can be retrieved via SNMP. Plug Status, and Environmental Status are currently supported.

13.5.1. Plug Status

The status of each plug in the system can be retrieved using the command below.

- **`plugTable::plugStatus`** – The status of the plug.
  `0` – Plug is OFF
  `1` – Plug is ON
- **`plugTable::plugName`** - String indicating the plug's user-defined name.

13.5.2. Unit Environment Status

The environment status can be retrieved for various variables for all of the NBB units in the system. The environmentUnitTable contains four rows, one row for each unit in the system (LOCAL, AUX1, AUX2, AUX3.)

- **`environmentUnitTable::environmentUnitName`** – The unit (LOCAL.)
- **`environmentUnitTable::environmentUnitTemperature`** – The temperature of the given unit.
- **`environmentUnitTable::environmentUnitCurrentA`** – Unit's total current for Line A. Note that Current will be reported in tenths of an Amp (divide result by ten to determine value in Amps.)
- **`environmentUnitTable::environmentUnitVoltageA`** – Unit voltage for Line A
- **`environmentUnitTable::environmentUnitPowerA`** – Power drawn by Line A
- **`environmentUnitTable::environmentUnitCurrentB`** – Unit's total current for Line B. Note that Current will be reported in tenths of an Amp.
- **`environmentUnitTable::environmentUnitVoltageB`** – Unit voltage for Line B
- **`environmentUnitTable::environmentUnitPowerB`** – Power drawn on Line B
- **`environmentMonthlyPowerLog`** - The monthly power usage log.

13.6. Sending Traps via SNMP

Traps that report various unit conditions can be sent to an SNMP Management Station from the NBB. The following traps are currently supported.

- **`WarmStart`** Trap – Trap indicating a warm start
- **`ColdStart`** Trap – Trap indicating a cold start
- **`Test`** Trap – Test trap invoked by user via the Text Interface (CLI.)
- **`Alarm`** Trap – Trap indicating an alarm condition. A trap with a unique enterprise OID is defined for every possible alarm in the system, under which several specific trap-types are defined to indicate the setting or clearing of that particular alarm condition.
- **`overTemperatureInitialSetTrap`** - Indicates that the Over Temperature (Initial) Alarm has been triggered. The trap will also include a numerical value that indicates the current unit temperature.
- **`overTemperatureInitialClearTrap`** - Indicates that the Over Temperature (Initial) Alarm has been cleared.
- **`overTemperatureCriticalSetTrap`** - Indicates that the Over Temperature (Critical) Alarm has been triggered. The trap will also include a numerical value that indicates the current unit temperature.
- **`overTemperatureCriticalClearTrap`** - Indicates that the Over Temperature (Critical) Alarm has been cleared.
- **`pingNoAnswerSetTrap`** - Indicates that the Ping No Answer Alarm has been triggered. The trap will also include a numerical value that indicates the IP address of the device that failed to respond to the ping command.
- **`pingNoAnswerClearTrap`** - Indicates that the Ping No Answer Alarm has been cleared.
- **`lockoutSetTrap`** - Indicates that the Invalid Access Lockout Alarm has been triggered. The trap will also include a numerical value that indicates the number of the serial port where the lockout occurred.
- **`lockoutClearTrap`** - Indicates that the Invalid Access Lockout Alarm has been cleared.
- **`powercycleSetTrap`** - Indicates that the Power Cycle Alarm has been triggered (Note that there is no corresponding Clear Trap for the Power Cycle Alarm.)

14. Setting Up SSL Encryption

This section describes the procedure for setting up a secure connection via an https web connection to the NBB.

> **Note:** *SSL parameters cannot be defined via the Web Browser Interface. In order to set up SSL encryption, you must contact the NBB via the Text Interface.*

There are two different types of https security certificates: "Self Signed" certificates and "Signed" certificates.

Self Signed certificates can be created by the NBB, without the need to go to an outside service, and there is no need to set up your domain name server to recognize the NBB. The principal disadvantage of Self Signed certificates, is that when you access the NBB command mode via the Web Browser Interface, the browser will display a message which warns that the connection might be unsafe. Note however, that even though this message is displayed, communication will still be encrypted, and the message is merely a warning that the NBB is not recognized and that you may not be connecting to the site that you intended.

Signed certificates must be created via an outside security service (e.g., VeriSign®, Thawte™, etc.) and then uploaded to the NBB unit to verify the user's identity. In order to use Signed certificates, you must contact an appropriate security service and set up your domain name server to recognize the name that you will assign to the NBB unit (e.g., service.wti.com.) Once a signed certificate has been created and uploaded to the NBB, you will then be able to access command mode without seeing the warning message that is normally displayed for Self Signed certificate access.

```
WEB ACCESS:

HTTP:
1.  Enable: On
2.  Port:   80

HTTPS:
3.  Enable: Off
4.  Port:   443

SSL Certificates:
5.  Common Name:
6.  State or Province:
7.  Locality:
8.  Country:
9.  Email Address:
10. Organization Name:
11. Organizational Unit:
12. Create CSR:                      15. Export Server Private Key:
13. View CSR:                        16. Import Server Private Key:
14. Import CRT:                      17. Harden Web Security: On

Enter: #<CR> to change,
       <ESC> to return to previous menu ...
```

Figure 14.1: Web Access Parameters (Text Interface Only)

14.1. Creating a Self Signed Certificate

To create a Self Signed certificate, access the Text interface via Telnet or SSH, using a password that permits access to Administrator level commands and then proceed as follows:

1. Type **/N** and press **[Enter]** to display the Network Parameters menu.
2. At the Network Parameters menu, type **23** and press **[Enter]** to display the Web Access menu (Figure 14.1.) Type **3** and press **[Enter]** and then follow the instructions in the resulting submenu to enable HTTPS access.
3. Next, use the Web Access menu to define the following parameters.

   Note: *When configuring the NBB, make certain to define all of the following parameters. Although most SSL applications require only the Common Name, in the case of the NBB all of the following parameters are mandatory.*

   - **5. Common Name:** A domain name, that will be used to identify the NBB unit. If you will use a Self Signed certificate, then this name can be any name that you choose, and there is no need to set up your domain name server to recognize this name. However, if you will use a Signed certificate, then your domain name server must be set up to recognize this name (e.g., service.wti.com.)
   - **6. State or Province:** The name of the state or province where the NBB unit will be located (e.g., California.)
   - **7. Locality:** The city or town where the NBB unit will be located (e.g., Irvine.)
   - **8. Country:** The two character country code for the nation where the NBB will be located (e.g., US.)
   - **9. Email Address:** An email address, that can be used to contact the person responsible for the NBB (e.g., jsmith@yourcompany.com.)
   - **10. Organizational Name:** The name of your company or organization (e.g., Western Telematic.)
   - **11. Organizational Unit:** The name of your department or division; if necessary, any random text can be entered in this field (e.g., tech support.)

4. After you have defined parameters 5 through 11, type `12` and press **[Enter]** (Create CSR) to create a Certificate Signing Request. By default, this will overwrite any existing certificate, and create a new Self Signed certificate.

   a) The NBB will prompt you to create a password. Key in the desired password (up to 16 characters) and then press **[Enter]**. When the NBB prompts you to verify the password, key it again and then press **[Enter]** once. After a brief pause, the NBB will return to the Web Access Menu, indicating that the CSR has been successfully created.

   b) When the Web Access Menu is re-displayed, press **[Esc]** several times until you exit from the Network Parameters menu and the "Saving Configuration" message is displayed.

5. After the new configuration has been saved, test the Self Signed certificate by accessing the NBB via the Web Interface, using an HTTPS connection.

   a) Before the connection is established, the NBB should display the warning message described previously. This indicates that the Self Signed certificate has been successfully created and saved.

   b) Click on the "Yes" button to proceed. The NBB will prompt you to enter a user name and password. After keying in your password, the main menu should be displayed, indicating that you have successfully accessed command mode.

14.2. Creating a Signed Certificate

To create a Signed certificate, and eliminate the warning message, first set up your domain name server to recognize the Common Name (item 5) that you will assign to the unit. Next, complete steps one through five as described in Section 14.1 and then proceed as follows:

1. **Capture the Newly Created Certificate:** Type `13` and press **[Enter]** (View CSR). The NBB will prompt you to configure your communications (Telnet) program to receive the certificate. Set up your communications program to receive a binary file, and then press **[Enter]** to capture the file and save it. This is the Code Signing Request that you will send to the outside security service (e.g., VeriSign, Thawte, etc.) in order to have them sign and activate the certificate.

2. **Obtain the Signed Certificate:** Send the captured certificate to the outside security service. Refer to the security service's web page for further instructions.

3. **Upload the Signed Certificate to the NBB:** After the "signed" certificate is returned from the security service, return to the Web Access menu.

   a) Access the NBB command mode via the Text Interface using an account that permits Administrator level commands as described previously, then type **`/N`** and press **[Enter]** to display the Network Parameters menu, and then type **`23`** and press **[Enter]** to display the Web Access menu.

   b) From the Web Access menu, type **`14`** and press **[Enter]** (Import CRT) to begin the upload process. At the CRT Server Key submenu, type **`1`** and press **[Enter]** to choose "Upload Server Key."

   c) Use your communications program to send the binary format Signed Certificate to the NBB unit. When the upload is complete, press **[Escape]** to exit from the CRT Server Key submenu.

   d) After you exit from the CRT Server Key submenu, press [Escape] several times until you have exited from the Network Parameters menu and the "Saving Configuration" message is displayed.

4. After the configuration has been saved, test the signed certificate by accessing the NBB via the Web Browser Interface, using an HTTPS connection. For example, if the common name has been defined as "service.companyname111.com", then you would enter "**`https://service.companyname111.com`**" in your web browser's address field. If the Signed Certificate has been properly created and uploaded, the warning message should no longer be displayed.

14.3. Downloading the Server Private Key

When configuring the NBB's SSL encryption feature (or setting up other security/ authentication features), it is recommended to download and save the Server Private Key. To download the Server Private Key, access the Text interface via Telnet or SSH, using a password that permits access to Administrator level commands and then proceed as follows:

1. Type **`/N`** and press **[Enter]** to display the Network Parameters menu.

2. At the Network Parameters menu, type **`23`** and press **[Enter]** to display the Web Access menu (Figure 14.1.)

   a) To download the Server Private Key from the NBB unit, make certain that SSL parameters have been defined as described in Section 14.1, then type **`15`** and press **[Enter]** and store the resulting key on your hard drive.

   b) To upload a previously saved Server Private Key to the NBB unit, make certain that SSL parameters have been defined as described in Section 14.1, then type **`16`** and press **[Enter]** and follow the instructions in the resulting submenu.

15. Saving and Restoring Configuration Parameters

Once the NBB is properly configured, parameters can be downloaded and saved as an ASCII text file. Later, if the configuration is accidentally altered, the saved parameters can be uploaded to automatically reconfigure the unit without the need to manually assign each parameter.

Saved parameters can also be uploaded to other identical NBB units, allowing rapid set-up when several identical units will be configured with the same parameters.

The "Save Parameters" procedure can be performed from any terminal emulation program (e.g. HyperTerminal™, TeraTerm©, etc.,) that allows downloading of ASCII files.

> **Note:** *Configuration parameters can be downloaded and saved via either the Web Browser Interface or Text Interface. Saved configuration parameters can only be uploaded to the unit via the Text Interface.*

15.1. Sending Parameters to a File

15.1.1. Downloading & Saving Parameters via Text Interface

1. Start your terminal emulation program and access the Text Interface command mode using an account that permits Administrator level commands.
2. When the command prompt appears, type `/u` and press **[Enter]**. The NBB will prompt you to configure your terminal emulation program to receive an ASCII download.
   a) Set your terminal emulation program to receive an ASCII download, and the specify a name for a file that will receive the saved parameters (e.g. NBB.PAR).
   b) Disable the Line Wrap function for your terminal emulation program. This will prevent command lines from being broken in two during transmission.
3. When the terminal emulation program is ready to receive the file, return to the NBB's Save Parameter File menu, and press **[Enter]** to proceed. NBB parameters will be saved on your hard drive in the file specified in Step 2 above.
4. The NBB will send a series of ASCII command lines which specify currently selected parameters. When the download is complete, press **[Enter]** to return to the command prompt.

15.1.2. Downloading & Saving Parameters via Web Browser Interface

The Web Browser Interface also includes a download function that can be used to save NBB parameters to an XML format file on your PC or laptop. To save parameters via the Web Browser Interface, proceed as follows:

Notes:

- *Although NBB parameters can be saved to a file via either the Text Interface or Web Browser Interface, saved parameters can only be restored via the Text Interface. The Restore Parameters function is not available via the Web Browser Interface.*
- *This procedure may differ slightly, depending on the operating system and browser used. In some cases, your system may perform a security scan before proceding with the download.*

1. Access the Web Browser Interface command mode using an account that permits Administrator level commands.

1. When the Web Browser Interface appears, click on the "Download Unit Configuration" button on the left hand side of the screen.

2. After a brief pause, your browser may display a prompt asking if you want to open or save the downloaded file. At this point, you can either select the "Save" option to save the parameters file to the download folder on your PC, or select "Save As" to pick a different location and/or filename for the saved parameters file.

15.2. Restoring Saved Parameters

This section describes the procedure for using your terminal emulation program to send saved parameters to the NBB.

Note: *The Restore Parameters feature is only available via the Text Interface.*

1. Start your terminal emulation program and access the NBB's Text Interface command mode using an account that permits Administrator level commands.

2. Configure your terminal emulation program to upload an ASCII text file.

3. Upload the ASCII text file with the saved NBB parameters. If necessary, key in the file name and directory path.

4. Your terminal emulation program will send the ASCII text file to the NBB. When the terminal program is finished with the upload, make certain to terminate the Upload mode.

   Note: *If the NBB detects an error in the file, it will respond with the "Invalid Parameter" message. If an error message is received, carefully check the contents of the parameters file, correct the problem, and then repeat the Upload procedure.*

5. If the parameter upload is successful, the NBB will send a confirmation message, and then return to the command prompt. Type `/s` and press **[Enter]**, the Status Screen will be displayed. Check the Status Screen to make certain the unit has been configured with the saved parameters.

15.3. Restoring Previously Saved Parameters

If you make a mistake while configuring the NBB unit, and wish to return to the previously saved parameters, the Text Interface's "Reboot System" command (`/I`) offers the option to reinitialize the NBB unit using previously backed up parameters. This allows you to reset the unit to previously saved parameters, even after you have changed parameters and saved them.

Notes:

- *The NBB will automatically backup saved parameters once a day, shortly after Midnight. This configuration backup file will contain only the most recently saved NBB parameters, and will be overwritten by the next night's daily backup.*
- *When the /I command is invoked, a submenu will be displayed which offers several Reboot options. Options 5 is used to restore the configuration backup file. The date shown next to options 5 indicates the date that you last changed and saved unit parameters.*
- *If the daily automatic configuration backup has been triggered since the configuration error was made, and the previously saved configuration has been overwritten by newer, incorrect parameters, then this function will not be able to restore the previously saved (correct) parameters.*

To restore the previously saved configuration, proceed as follows:

1. Access command mode via the Text Interface, using a username/password that permits access to Administrator level commands (see Section 5.1.1.)
2. At the NBB command prompt, type `/I` and press **[Enter]**. The NBB will display a submenu that offers several different reboot options.
3. At the submenu, you may choose Item 5 (Reboot & Restore Last Known Working Configuration.) Type `5` and press **[Enter]**.

   Note: *When invoking the /I command to restore configuration parameters, Item 5 is recommended.*
4. The NBB will reboot and previously saved parameters will be restored.

16. Upgrading NBB Firmware

When new, improved versions of the NBB firmware become available, either the Firmware Upgrade Utility (recommended) or the "Upgrade Firmware" function (Text Interface only) can be used to update the unit. The following Section describes the procedure for updating the NBB unit using the Firmware Upgrade Utility or the Upgrade Firmware function.

16.1. Firmware Upgrade Utility (Recommended)

The preferred method for updating NBB units is via the WTI Firmware Upgrade Utility. The WTI Firmware Upgrade Utility allows you to manage firmware updates for multiple WTI units from a single interface.

A zip file that contains the installation files and other documentation for the WTI Firmware Upgrade Utility can be downloaded from WTI's FTP server, located at:

ftp://wtiftp.wti.com/pub/TechSupport/Firmware/Upgrade_Utility/

Please refer to the documentation included in the zip file for further instructions.

16.2. The Upgrade Firmware Function (Alternate Method)

The Upgrade Firmware function provides an alternative method for updating the NBB firmware. Updates can be uploaded via FTP or SFTP protocols.

Notes:

- *The FTP/SFTP servers can only be started via the Text Interface.*
- *All other ports will remain active during the firmware upgrade procedure.*
- *If the upgrade includes new parameters or features not included in the previous firmware version, these new parameters will be set to their default values.*
- *The upgrade procedure will require approximately 15 minutes.*

1. Obtain the update file. Firmware modifications can either be mailed to the customer, or downloaded from WTI. Place the upgrade CDR in your disk drive or copy the file to your hard drive.
2. Access Text Interface command mode via Serial Port, Telnet or SSH client session, using a username/password and port that permit Administrator level commands.

3. When the command prompt appears, type **/UF** and then press **[Enter]**. The NBB will display a screen which offers the following options:

   a) **Start FTP/SFTP Servers Only (Do NOT default parameters):** To proceed with the upgrade, while retaining user-defined parameters, type **1** and press **[Enter]**. All existing parameter settings will be restored when the upgrade is complete.

   b) **Start FTP/SFTP Servers & Default (Keep IP parameters & SSH Keys):** To proceed with the upgrade and default all user-defined parameters except for the IP Parameters and SSH Keys, type **2** and press **[Enter]**. When the upgrade is complete, all parameter settings except the IP Parameters and SSH Keys, will be reset to factory default values.

   c) **Start FTP/SFTP Servers & Default (Default ALL parameters):** To proceed with the upgrade, and reset parameters to default settings, type **3** and press **[Enter]**. When the upgrade is complete, all parameters will be set to default values.

   d) **Start FTP/SFTP Servers for Slip Stream Upgrade:** This option will upgrade only the WTI Management Utility, without updating the NBB's operating firmware. To update the WTI Management Utility only, type **4** and press **[Enter]**.

   Note that after any of the above options is selected, the NBB will start the receiving servers and wait for an FTP/SFTP client to make a connection and upload a valid firmware binary image.

4. To proceed with the upgrade, select the desired option. The NBB will display a message that indicates that the unit is waiting for data. Leave the current Telnet/SSH client session connected at this time.

5. Open your FTP/SFTP application and (if you have not already done so,) login to the NBB unit, using a username and password that permit access to Administrator level commands.

6. Transfer the md5 format upgrade file to the NBB.

7. After the file transfer is complete, the NBB will install the upgrade file and then reboot itself and break all port connections. Note that it will take approximately 10 minutes to complete the installation process. The unit will remain accessible until it reboots.

   a) Some FTP/SFTP applications may not automatically close when the file transfer is complete. If this is the case, you may close your FTP/SFTP client manually after it indicates that the file has been successfully transferred.

   b) When the upgrade process is complete, the NBB will send a message to all currently connected network sessions, indicating that the NBB is going down for a reboot.

   Note: *Do not power down the NBB unit while it is in the process of installing the upgrade file. This can damage the unit's operating system.*

8. If you have accessed the NBB via the Network Port, in order to start the FTP/SFTP servers, the NBB will break the network connection when the system is reinitialized.

   - If you initially selected "Start FTP/SFTP Servers and Save Parameters", you may then reestablish a connection with the NBB using your former IP address.
   - If you initially selected "Start FTP/SFTP Servers and Default Parameters", you must then login using the NBB's default IP address (Default = 192.168.168.168) or access command mode via Serial Port 1 or 2 or via Modem.

When firmware upgrades are available, WTI will provide the necessary files. At that time, an updated Users Guide or addendum will also be available.

17. Command Reference Guide

17.1. Command Conventions

Most commands described in this section conform to the following conventions:

- **Text Interface:** Commands discussed in this section, can only be invoked via the Text Interface. These commands *cannot* be invoked via the Web Browser Interface.
- **Slash Character:** Most NBB Text Interface commands begin with the Slash Character (**/**).
- **Apply Command to All Plugs:** When an asterisk is entered as the argument of the **/ON** (Switch Plugs On), **/OFF** (Switch Plugs Off) or **/BOOT** (Reboot Plugs) commands, the command will be applied to all plugs. For example, to reboot all allowed plugs, type **/BOOT * [Enter]**.
- **Command Queues:** If a switching or reboot command is directed to a plug that is already being switched or rebooted by a previous command, then the new command will be placed into a queue until the plug is ready to receive additional commands.
- **"Busy" Plugs:** If the "Status" column in the Plug Status Screen includes an asterisk, this means that the plug is currently busy, and is in the process of completing a previously issued command. If a new command is issued to a busy plug, then the new command will placed into a queue to be executed later, when the plug is ready to receive additional commands.
- **Plug Name Wild Card:** It is not always necessary to enter the entire plug name. Plug names can be abbreviated in command lines by entering the first character(s) of the name followed by an asterisk (*****). For example, a plug named "SERVER" can be specified as "**S***". Note however, that this command would also be applied to any other plug name that begins with an "S".
- **Suppress Command Confirmation Prompt:** When the **/ON** (Switch Plug On), **/OFF** (Switch Plug Off), **/BOOT** (Reboot Plug) or **/DPL** (Default All Plugs) commands are invoked, the "**,Y**" option can be included to override the Command Confirmation ("Sure?") prompt. For example, to reboot Plug A4 without displaying the Sure prompt, type **/BOOT A4,Y [Enter]**.
- **Enter Key:** Most commands are invoked by pressing **[Enter]**.
- **Configuration Menus:** To exit from a configuration menu, press **[Esc]**.

17.2. Command Summary

Function	Command Syntax	Command Access Level			
		Admin.	SuperUser	User	ViewOnly
Display					
Plug Status	**/S [n] [Enter]**	X❶	X❶	X❶	X❶
Port Parameters (Who)	**/W [n] [Enter]**	X❷	X❷	X❷	X❷
Plug Group Status	**/SG [Enter]**	X❷	X❷	X❷	X❷
Network Status	**/SN [Enter]**	X	X	X	X
Help Menu	**/H [Enter]**	X❸	X❸	X❸	X❸
Log Functions	**/L [Enter]**	X	X		
Current Metering	**/M [Enter]**	X	X		
Site ID / Unit Information	**/J [*] [Enter]❹**	X	X	X	X
Control					
Exit Command Mode	**/X [Enter]**	X	X	X	X
Boot Plug *n*	**/BOOT <n>[,Y] [Enter]❺**	X	X	X	
Turn Plug *n* On	**/ON <n>[,Y] [Enter]❺**	X	X	X	
Turn Plug *n* Off	**/OFF <n>[,Y] [Enter]❺**	X	X	X	
Default All Plugs	**/DPL[,Y] [Enter]❺**	X	X	X	
Connect to Port	**/C [n] [Enter]**	X	X	X	
Disconnect from Port	**/D [n] [Enter]**	X	X	X	
Send Parameter File	**/U [Enter]**	X			
Send SSH Keys	**/K <k> [Enter]**	X			
Unlock Invalid Access	**/UL [Enter]**	X			
Configuration					
System Parameters	**/F [Enter]**	X	❻		
Serial Port Parameters	**/P [n] [Enter]**	X	❻		
Plug Parameters	**/PL [Enter]**	X	❻		
Plug Group Parameters	**/G [Enter]**	X	❻		
Network Configuration - IPv4	**/N [Enter]**	X	❻		
Network Configuration - IPv6	**/N6 [Enter]**	X	❻		
Reboot Options	**/RB [Enter]**	X	❻		
Alarm Configuration	**/AC [Enter]**	X	❻		
Reboot System	**/I [Enter]**	X	X		
Upgrade Firmware	**/UF [Enter]**	X			
Test Network Configuration	**/TEST [Enter]**	X			

❶ In Administrator Mode and SuperUser Mode, all NBB outlets are displayed. In User Mode and ViewOnly Mode, the Plug Status Screen will only include the plugs that are allowed by your account.

❷ In Administrator Mode, all Plugs/Plug Groups are displayed. In SuperUser Mode, User Mode and ViewOnly Mode, the status screen will only include the Plugs/Plug Groups allowed by the account.

❸ In Administrator Mode, the Help Menus will list all NBB commands. In the SuperUser Mode, User Mode and ViewOnly Mode, the Help Menus will only list the commands that are allowed by the access level.

❹ If the optional asterisk (*****) argument is included in the command line, this command will also show model numbers, current ratings and software versions for the NBB unit.

❺ The "**,Y**" argument can be included in the command line to suppress the command confirmation prompt.

❻ In SuperUser Mode, configuration menus can be displayed, but parameters cannot be changed.

17.3. Command Set

This Section provides information on all Text Interface commands.

17.3.1. Display Commands

/S Display Plug Status Screen

Displays the Plug Status Screen, which lists the current On/Off state, plus the plug number, plug name, Boot/Sequence Delay value and Default On/Off value for each plug. For more information, please refer to Section 8.3. Note that the /S command line can also include arguments that display On/Off status for an individual outlet, two or more specific outlets, or a range of several outlets:

- **`/S`** Displays configuration details and On/Off status for all switched outlets.
- **`/S s`** Displays On/Off status for an individual outlet, where ***s*** is the name or number of the desired outlet.
- **`/S s+s`** Displays status information for two or more specific outlets, where ***s*** is the number or name of each desired outlet. A plus sign (+) is entered between each outlet number or name.
- **`/S s:s`** Displays status information for a range of outlets, where ***s*** is the number or name of the outlet at the beginning and end of the range of desired outlets. A colon (:) is entered between the two outlet numbers or names that mark the beginning of the range and the end of the range.

Notes:

- *In Administrator Mode and SuperUser Mode, all outlets are displayed. In User Mode and ViewOnly Mode, the Plug Status Screen will only include the outlets allowed by your account.*
- *The NBB will return a "0" to indicate that the plug is Off, or a "1" to indicate that the plug is On.*

Availability: Administrator, SuperUser, User, ViewOnly

Format: **`/S`** **[Enter]**

/W Display Port Parameters (Who)

Displays configuration information for the Setup Port, but does not allow parameters to be changed.

Availability: Administrator, SuperUser, User, ViewOnly

Format: **`/W`** **[Enter]**

/SG Display Plug Group Status Screen

Displays the Plug Group Status Screen, which lists the available Plug Groups, the numbers of the plugs included in each Plug Group, the current On/Off state, the user-defined Boot/Sequence Delay value, and other parameters for each plug.

> **Note:** *In Administrator Mode all user defined Plug Groups are displayed. In SuperUser Mode, User Mode and ViewOnly Mode, the Plug Group Status Screen will only include the Plug Groups allowed by your account.*

Availability: Administrator, SuperUser, User, ViewOnly

Format: `/SG` **[Enter]**

/SN Display Network Status

Displays the Network Status Screen, which lists current network connections to the NBB's Network Port. For more information, please refer to Section 8.2.

Availability: Administrator, SuperUser, User, ViewOnly

Format: `/SN` **[Enter]**

/H Help

Displays a Help Screen, which lists all available Text Interface commands along with a brief description of each command.

> **Note:** *In the Administrator Mode, the Help Screen will list the entire NBB Text Interface command set. In SuperUser Mode, User Mode and ViewOnly Mode, the Help Screen will only list the commands that are allowed by the account's access level.*

Availability: Administrator, SuperUser, User, ViewOnly

Format: `/H` **[Enter]**

/L Log Functions

Provides access to a menu which allows you to display the Audit Log, Alarm Log Current Metering Log and Power Metering Log. For more information on Log Functions, please refer to Section 5.3.3 and Section 8..

Availability: Administrator, SuperUser

Format: `/L` **[Enter]**

/M Current Metering Status

Displays the Current Metering Status Screen, which lists current, voltage and power readings, and also lists the trigger settings for the Over Temperature Alarm and the Over Current Alarm. For more information on Current Metering, please refer to Section 8.5. For more information on Alarm Configuration, please refer to Section 7.

When the /M command is invoked, the command line can also include arguments that display the status of individual outlets, specific pairs of outlets or a range of outlets:

/M Displays the Current Metering Status Screen.

/M a Displays current, voltage and power readings for Line A.

/M b Displays current, voltage and power readings for Line B.

Note: *When current, voltage and power readings are displayed for Line A or Line B, readings will be displayed as three values separated by commas. Current will be displayed first, then voltage, then power.*

Availability: Administrator, SuperUser

Format: /M [Enter]

/J Display Site ID / Unit Information

Displays the user-defined Site I.D. message. If the optional asterisk (*) argument is included in the command line, the command will also show model number, serial number, current rating and other information for the NBB unit.

Availability: Administrator, SuperUser, User, ViewOnly

Format: /J [*] [Enter]

Where * (asterisk) is an optional command argument, that is used to display the model number, current rating and software version for the NBB unit.

17.3.2. Control Commands

/X Exit Command Mode

Exits command mode. When issued at the Network Port, also ends the Telnet session.

Note: *If the /X command is invoked from within a configuration menu, recently defined parameters may not be saved. In order to make certain that parameters are saved, always press the **[Esc]** key to exit from all configuration menus and then wait until "Saving Configuration" message has been displayed and the cursor has returned to the command prompt before issuing the /X command.*

Availability: Administrator, SuperUser, User, ViewOnly

Format: /X [Enter]

/C Connect to Serial Port

When the RJ-45 SetUp Port has been configured as a Normal Mode Port as described in Section 5.8, the /C command can be used to create a connection between the Network port and the serial SetUp Port.

Notes:

- *User level accounts can only connect to the SetUp Port when serial port access is specifically permitted by the account.*
- *To terminate a port connection, either type* **^X** *(**[Ctrl]** plus **[X]**) or invoke the currently defined disconnect sequence.*

Availability: Administrator, SuperUser, User

Format: **/C 1 [Enter]**

/BOOT Initiate Boot Cycle

Initiates a boot cycle at the selected plug(s) or Plug Group(s). When a Boot cycle is performed, the NBB will first switch the selected plug(s) Off, then pause for the user-defined Boot/Sequence Delay Period, then switch the plug(s) back on. The /BOOT command can also be entered as /BO.

Note: *When this command is invoked in Administrator Mode or SuperUser Mode, it can be applied to all NBB plugs and Plug Groups. When this command is invoked in User Mode, it can only be applied to the plugs and/or Plug Groups that have been enabled for the account.*

Availability: Administrator, SuperUser, User

Format: **/BOOT <s>[,Y] [Enter]** or **/BO <s> [Enter]**

Where:

s	The number or name of the plug(s) or Plug Group(s) that you intend to boot. To apply the command to several plugs, enter a plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your account, enter an asterisk character (*).
,Y	(Optional) Suppresses the command confirmation prompt.

Example:

Assume that your account allows access to Plug A2 and Plug A3. To initiate a boot cycle at Plugs A2 and A3, without displaying the optional command confirmation prompt, invoke either of the following command lines:

/BOOT A2+A3,Y [Enter] or **/BO A2+A3,Y [Enter]**

/ON Switch Plug(s) ON

Switches selected plugs(s) or Plug Group(s) On, as described in Section 9.2.2. When the /ON command is used to switch more than one plug, Boot/Sequence Delay Period will be applied as described in Section 5.7.

> **Note:** *When this command is invoked in Administrator Mode or SuperUser Mode, it can be applied to all NBB plugs and Plug Groups. When this command is invoked in User Mode, it can only be applied to the plugs and/or Plug Groups that have been enabled for the account.*

Availability: Administrator, SuperUser, User

Format: **`/ON <s>[,Y]`** **[Enter]**

Where:

`s` The number or name of the plug(s) or Plug Group(s) that you intend to Switch On. To apply the command to several plugs, enter a plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your account, enter an asterisk character (*).

`,Y` (Optional) Suppresses the command confirmation prompt.

Example:

Assume that your account allows access to Plug A2 and Plug A3. To switch Plugs A2 and A3 On, without displaying the optional command confirmation prompt, invoke following command line:

`/ON A2+A3,Y` **[Enter]**

/OFF Switch Plug(s) OFF

Switches selected plugs(s) or Plug Group(s) Off, as described in Section 9.2.2. When the /OFF command is used to switch more than one plug, Boot/Sequence Delay Period will be applied as described in Section 5.7. The /OFF command can also be entered as /OF.

> **Note:** *When this command is invoked in Administrator Mode or SuperUser Mode, it can be applied to all NBB plugs and Plug Groups. When invoked in User Mode, the command can only be applied to the plugs and/or Plug Groups that are enabled for the account.*

Availability: Administrator, SuperUser, User

Format: **`/OFF <s>[,Y]`** **[Enter]** or **`/OF <s>[,Y]`** **[Enter]**

Where:

`s` The number or name of the plug(s) or Plug Group(s) that you intend to Switch Off. To apply the command to several plugs, enter a plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your account, enter an asterisk character (*).

`,Y` (Optional) Suppresses the command confirmation prompt.

Example:
Assume that your account allows access to Plug A2 and Plug A3. To switch Plugs A2 and A3 on your local NBB unit Off, without displaying the optional command confirmation prompt, invoke either of the following command lines:

`/OFF A2+A3,Y` **[Enter]** or **`/OF A2+A3,Y`** **[Enter]**

/DPL Set All Plugs to Default States

Sets all switched outlets to their user-defined default state. For information on setting outlet defaults, please refer to Section 5.7.

> **Note:** *When this command is invoked in Administrator Mode or SuperUser Mode, it will be applied to all NBB outlets. When invoked in User Mode, the command will only be applied to the plugs that are allowed by the account.*

Availability: Administrator, SuperUser, User

Format: **`/DPL[,Y]`** **[Enter]**

Where ,Y is an optional command argument, which can be included to suppress the command confirmation prompt.

/U Send Parameters to File

Sends all NBB configuration parameters to an ASCII text file as described in Section 15. This allows you to back up the configuration of your NBB unit.

Availability: Administrator

Format: **`/U`** **[Enter]**

/K Send SSH Key

Instructs the NBB to provide you with a public SSH key for validation purposes. This public key can then be provided to your SSH client, in order to prevent the SSH client from warning you that the user is not recognized when you attempt to create an SSH connection. For more information, please refer to Section 10.

Availability: Administrator

Format: **`/K k`** **[Enter]**

Where k is a required argument, which indicates the key type. The k argument provides the following options: 1 (SSH1), 2 (SSH2 RSA), 3 (SSH2 DSA.)

/UL Unlock Port (Invalid Access Lockout)

Manually cancels the NBB's Invalid Access Lockout feature. Normally, when a series of failed login attempts are detected, the Invalid Access Lockout feature can shut down the network port for a user specified time period in order to prevent further access attempts. When the /UL command is invoked, the NBB will immediately unlock all network ports that are currently in the locked state.

Availability: Administrator

Format: **`/UL`** **[Enter]**

Response: The NBB will unlock all NBB RS232 Ports.

17.3.3. Configuration Commands

/F Set System Parameters

Displays a menu which is used to define general parameters for the NBB unit. Note that all functions provided by the /F command are also available via the Web Browser Interface. For more information, please refer to Section 5.3.

Availability: Administrator

Format: **`/F`** **[Enter]**

/P Set Serial Port Parameters

Displays a menu that is used to select options and parameters for the NBB's serial Setup Port. Note that all functions provided by the /P command are also available via the Web Browser Interface. Section 5.8 describes the procedure for defining parameters for the serial Setup Port.

Availability: Administrator
Format: **`/P`** **[Enter]**

/PL Set Plug Parameters

Displays a menu that is used to select parameters for the NBB's switched outlets (plugs). All functions provided by the /PL command are also available via the Web Browser Interface. Section 5.7 describes the procedure for defining plug parameters.

Availability: Administrator
Format: **`/PL`** **[Enter]**

/G Plug Group Parameters

Displays a menu that is used to View, Add, Modify or Delete Plug Groups. For more information on Plug Groups, please refer to Section 5.6.

Availability: Administrator
Format: **`/G`** **[Enter]**

/N Network Port Parameters - IPv4

Displays a menu which is used to select IPv4 parameters for the Network Port. Note that all functions provided by the /N command are also available via the Web Browser Interface. For more information, please refer to Section 5.9.

Availability: Administrator
Format: **`/N`** **[Enter]**

/N6 Network Port Parameters - IPv6

Displays a menu used to select IPv6 protocol parameters for the Network Port. All functions provided by the /N6 command are also available via the Web Browser Interface. For more information, please refer to Section 5.9.

Availability: Administrator
Format: **`/N6`** **[Enter]**

/RB Reboot Options

Displays a menu that is used to configure Scheduled Reboots and Ping-No-Answer Reboots. The Scheduled Reboot function can be used to reboot devices connected to the NBB's switched outlets according to a user-defined schedule. The Ping-No-Answer Reboot function allows the NBB to automatically reboot user-designated outlets when a user-specified IP address does not respond to a Ping command. For more information on Reboot options, please refer to Section 6.

> **Note:** *If desired, the Ping-No-Answer Reboot function can also be configured to send email notification whenever a Ping-No-Answer Reboot is generated. For more information, please refer to Section 7.5.*

Availability: Administrator
Format: **`/RB`** **[Enter]**

/AC Alarm Configuration Parameters

Displays a menu that is used to configure and enable the NBB unit's monitoring and alarm functions. For more information on Alarm Configuration, please refer to Section 7.

Availability: Administrator
Format: **`/AC`** **[Enter]**

/I Reboot System (Default)

Reinitializes the NBB unit and offers the option to keep user-defined parameters or reset to default parameters. As described in Section 5.10.1, the /I command can also be used to restore the unit to previously saved parameters. When the /I command is invoked, the unit will offer the following reboot options:

- Unit to Reboot
- Reboot Only (Do NOT default parameters)
- Reboot & Default (Keep IP Parameters & SSH Keys)
- Reboot & Default (Default ALL parameters)
- Reboot & Restore Last Known Working Configuration

Availability: Administrator, SuperUser
Format: **`/I`** **[Enter]**

/UF Upgrade Firmware

When new versions of the NBB firmware become available, this command is used to update existing firmware as described in Section 16.

> **Note:** *When a firmware upgrade is performed, it will take about 15 minutes to upgrade the NBB unit.*

Availability: Administrator
Format: **`/UF`** **[Enter]**

/TEST Test Network Parameters

Displays a menu which is used to test configuration of the Syslog and SNMP Trap functions and can also be used to invoke a Ping Command.

Notes:

- *In order for the ping command to function with domain names, Domain Name Server parameters must be defined as described in Section 5.9.5.*
- *The Test Menu's Ping command is not effected by the status of the Network Parameters Menu's Ping Access function.*

Availability: Administrator

Format: **`/TEST`** **[Enter]**

Appendix A. Specifications

Physical/Environmental:

Dimensions:

Width: 1.75” (4.5 cm)
Depth: 3.25” (8.25 cm)
Height: 68.5” (174 cm) One Rack U

Operating Temperature: 32˚F to 122˚F (0˚C to 50˚C)
Humidity: 10 - 90% RH

Appendix B. Interface Descriptions

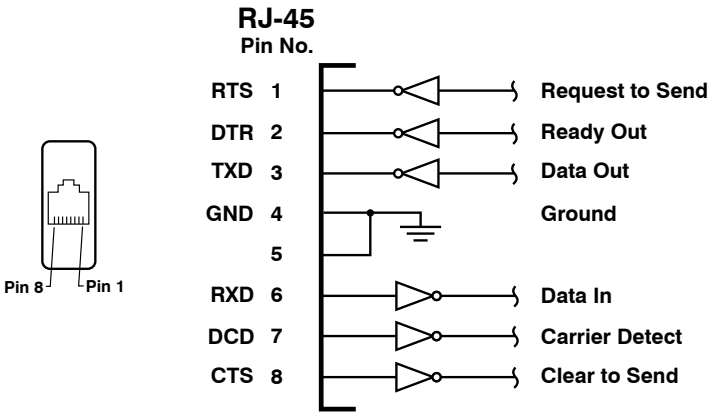

Figure B.1: RS232 SetUp Port Interface

B.1. SetUp Port (RS232)

DCD and DTR hardware lines function as follows:

1. **When connected:**

   a) If either port is set for Modem Mode, the DTR output at either port reflects the DCD input at the other end.

   b) If *neither* port is set for Modem Mode, DTR output is held high (active).

2. **When not connected:**

   a) If the port is set for Modem Mode, upon disconnect DTR output is pulsed for 0.5 seconds and then held high.

   b) If the port is *not* set for Modem Mode, DTR output is controlled by the DTR Output option (Serial Port Parameters Menu, Option 23). Upon disconnect, Option 23 allows DTR output to be held low, held high, or pulsed for 0.5 seconds and then held high.

Appendix C. Rack Mounting Instructions

The NBB offers a variety of different mounting options that allow the unit to be easily mounted in most common equipment racks. In addition to the mounting buttons and flat mounting plates included with the NBB unit, optional mounting brackets are also available.

C.1. Mounting Buttons

The Mounting Buttons allow NBB units to be mounted in any equipment rack that includes mounting button holes. Depending on the location of the mounting button holes, this allows the NBB to be mounted on the posts at the rear of the equipment rack, or in some cases, mounted on the outside of the rack corner posts.

1. **Determine the Appropriate Mounting Button Locations:** Refer to Figure C.1 and the table below to determine the appropriate button locations for your individual equipment rack:

Rack Type	Distance Between Buttons (Center)	Button Holes Used
APC, SMC, Wright Line	49"	A1 and A1 (or) A2 and A2
Standard Mounting Locations	36.75"	STD-1 and STD-1 (or) STD-2 and STD-2

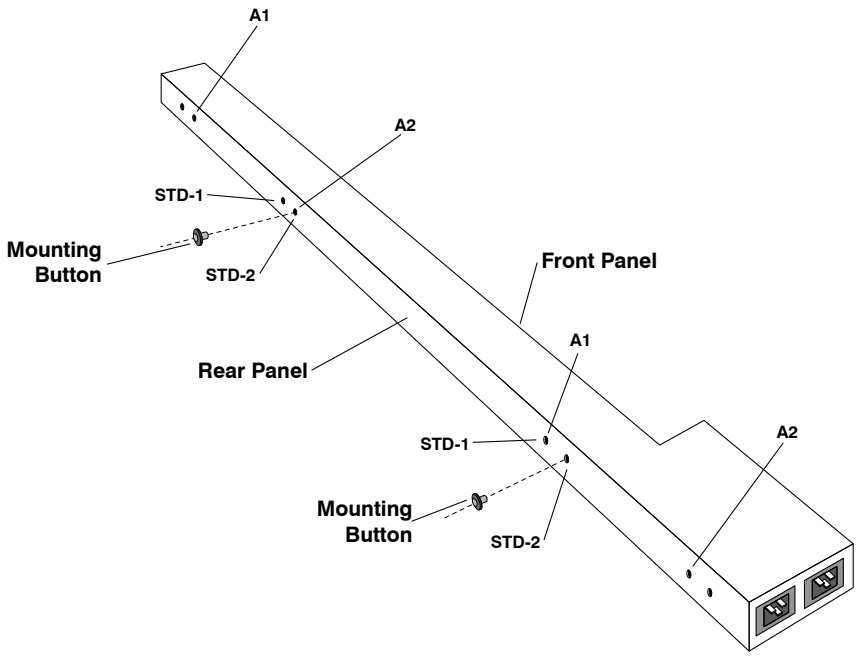

Figure C.1: Installing Mounting Buttons

2. Install two Mounting Button in the holes selected in Step 1 above. Refer to Figure C.2 below for further details regarding assembling the Mounting Buttons and attaching them to the NBB unit.

3. Refer to Figure C.3 below to make certain that the equipment rack includes appropriate mounting button holes and then attach the NBB unit to the rack by inserting the Mounting Buttons into the Mounting Button holes. When the NBB is in place, slide the unit downward to securely seat each Mounting Button in its corresponding hole.

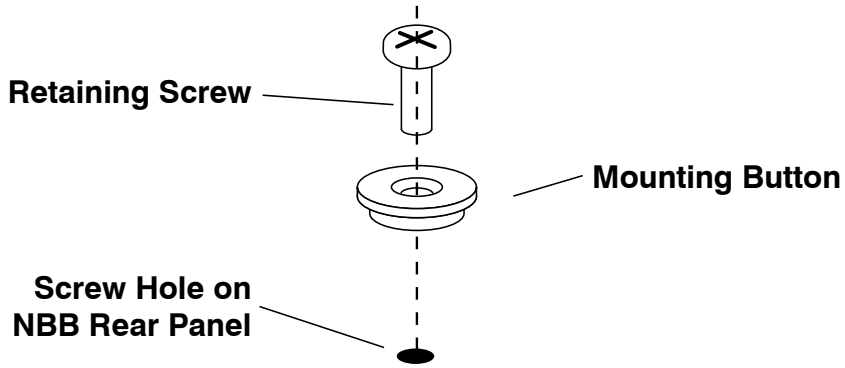

Figure C.2: Attaching Mounting Buttons to the NBB Unit

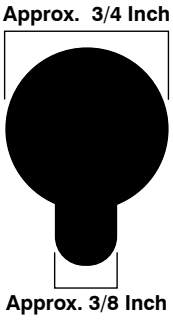

Figure C.3: Mounting Button Hole Specs

C.2. Mounting Plates

The flat Mounting Plates included with the unit, can be used to mount NBB units in most standard equipment racks. When the Mounting Plates are used, NBB units can be mounted facing either side of the rack.

1. **Attaching the Brackets to the NBB:** Determine which direction the NBB will face after mounting, and then secure the Mounting plates to the NBB as shown in Figure C.4, using the screws provided with the mounting brackets.

   The Mounting Plates can either be attached to the back or side of the unit, and the unit can also be installed to face the front, rear, or either side of the equipment rack.

2. **Attaching the Mounting Plates to the Equipment Rack:** Determine which direction the NBB unit will face in the rack, then line the screw holes in the Mounting Plates up with two holes in the equipment rack mounting strip. Make certain that the unit is level, and then use two screws to secure each Mounting Plate to the rack as shown in Figure C.4.

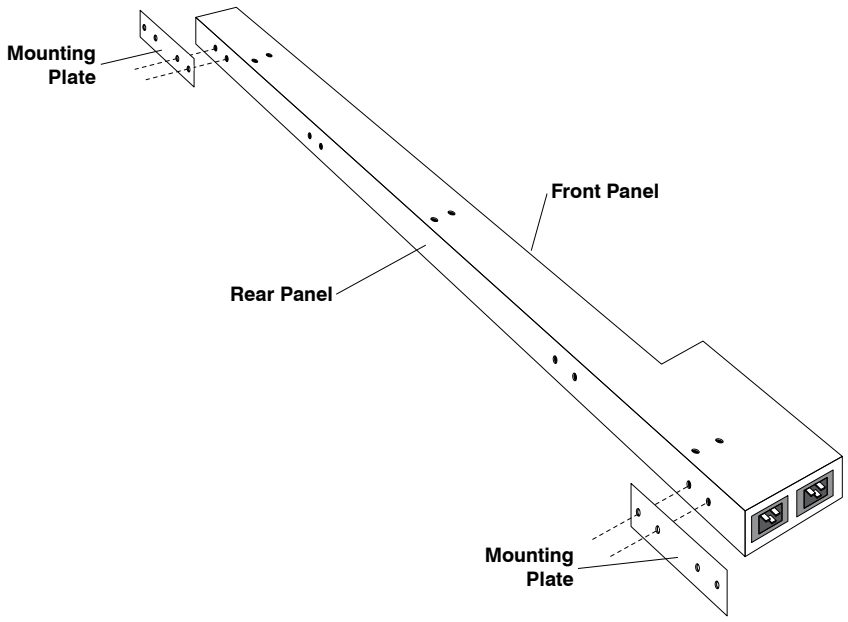

Figure C.4: Installing Mounting Plates

C.3. Mounting Brackets (Optional)

In addition to the Mounting Buttons and Mounting Plates that are included with the NBB unit, optional mounting brackets are also available. The Mounting Brackets allow the NBB to be installed on the mounting rails found in most standard equipment racks.

1. **Attaching the Mounting Brackets to the NBB:** The Mounting Brackets can be attached to the NBB unit using the three pairs of screw holes on either side of the NBB unit. Use screws supplied with the Mounting Bracket kit to secure three Mounting Brackets on one side of the NBB unit as shown in Figure C.5 below.

2. **Attaching the Mounting Brackets to the Equipment Rack:** Align the Mounting Brackets with the screw holes in the equipment rack's mounting rail and then use a retaining screw to secure each Mounting Bracket to the equipment rail.

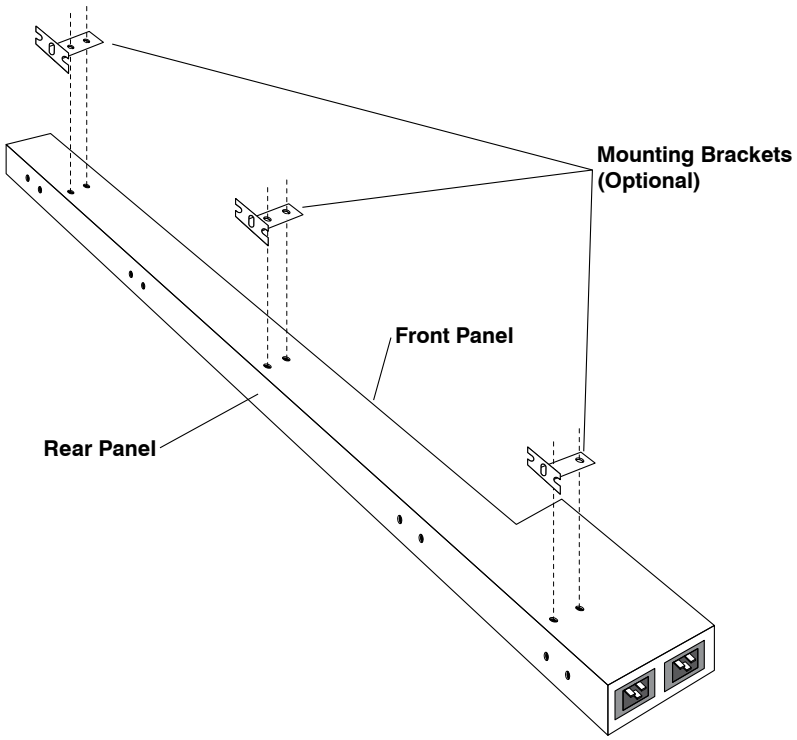

Figure C.5: Installing Optional Mounting Brackets

Appendix D. Optional Cable Retainer Bars

The optional cable retainer bars provide a convenient means to secure power cables to the NBB unit in order to reduce the chance of accidental disconnection. The NBB unit is designed to accept two separate cable retainer bars: one for the ten Line A outlets and a second cable retainer bar for the ten Line B outlets.

> **CAUTION:** ***Before mounting the cable retainer bars, make certain that the NBB unit is disconnected from the power source. If the NBB unit includes dual power inlets, make certain that both power inlets are disconnected.***

1. Refer to Figure 2.1 to locate the mounting holes for the cable retainer bars. In Figure 2.1, the cable retainer bar mounting holes are items 3 and 4.
2. Use the mounting screws included with the cable retainer bar kit to secure the Line A cable retainer bar and the Line B cable retainer bar to the NBB unit.
3. After attaching the cable retainer bars to the NBB unit, connect your power cables to the NBB unit and then use zip ties to secure each power cable to a cable retainer bar.
4. Connect the NBB unit to an appropriate power supply.

Appendix E. Customer Service

Customer Service hours are from 8:00 AM to 5:00 PM, PST, Monday through Friday. When calling, please be prepared to give the name and make of the unit, its serial number and a description of its symptoms. If the unit should need to be returned for factory repair it must be accompanied by a Return Authorization number from Customer Service.

WTI Customer Service
5 Sterling
Irvine, California 92618

Local Phone: (949) 586-9950
Toll Free Service Line: 1-888-280-7227
Service Fax: (949) 583-9514

Email: service@wti.com

Trademark and Copyright Information

January, 2013
Part Number: 14328, Revision: A

Trademarks and Copyrights Used in this Manual

Cisco and EnergyWise are registered trademarks of Cisco Systems, Inc.

Hyperterminal is a registered trademark of the Microsoft Corporation. Portions copyright Hilgraeve, Inc.

ProComm is a trademark of Datastorm Technologies, Inc™.

Teraterm is a copyright of Ayera Technologies, Inc.

BlackBerry is a registered trademark of Research In Motion Limited.

JavaScript is a trademark of Sun Microsystems, Inc.

Telnet is a trademark of Telnet Communications, Inc.

All other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.