

WTI Part No. 14532
Rev. A

NBB Series

Network Power Switches • Vertical Mount

Products Covered:

NBB-20VS20/16 Series

NBB-20VS30/32 Series

NBB-20VD20/16 Series

NBB-20VD30/32 Series

Hardware Guide



Power & Console Solutions | 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 60°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.

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 inlets and a separate power supply cable for each power inlet. Make certain to disconnect all power supply cables from their power source before attempting to service or remove the unit.

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 is adequate for applications that only require 15 Amps. For 20-Amp power switching applications, please refer to the WTI Power Cable guide, 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 and Safety Directive Compliance

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

- **Council Directive 2014/30/EU of 26 February 2014 on the approximation of the laws of Member States relating to electromagnetic compatibility;**
- and
- **Council Directive 2014/35/EC of 26 February 2014 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.**

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.

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1. Introduction

This Hardware Guide covers set-up and installation for our NBB Series Network Power Switches. NBB Series units are designed to simplify the process of remotely managing vital network elements located at distant network equipment sites and off-site facilities by providing secure remote access to power switching and reboot functions at the remote network equipment site.

Note: *For instructions regarding configuration and operation of the NBB Series Device, please refer to the [WTI Firmware Guide](#).*

Model Numbers Covered

This User's Guide discusses all WTI NBB Series products. Throughout this Hardware Guide, all of these units are referred to as the "NBB."

2. Unit Description

2.1. NBB Front Panel

As shown in [Figure 2.1](#), the NBB Series Front Panel includes the following components:

- 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-1 Series Units: Ten Switched NEMA 5-15 Outlets
 - NBB-2 Series Units: Ten Switched IEC 60320 C13 Outlets
 - NBB-3 Series Units: Ten Switched IEC 60320 C13 Outlets
- 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-1 Series Units: Ten Switched NEMA 5-15 Outlets
 - NBB-2 Series Units: Ten Switched IEC 60320 C13 Outlets
 - NBB-3 Series Units: Ten Switched IEC 60320 C13 Outlets
- 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](#).
- 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](#).
- 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.
- 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.
- 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.
- Setup Port:** An RJ45 RS232 serial port (DCE configuration) used for connection to a local terminal or external modem, as described in [Section 4.4](#). For a description of the Setup Port interface, please refer to [Appendix B](#).

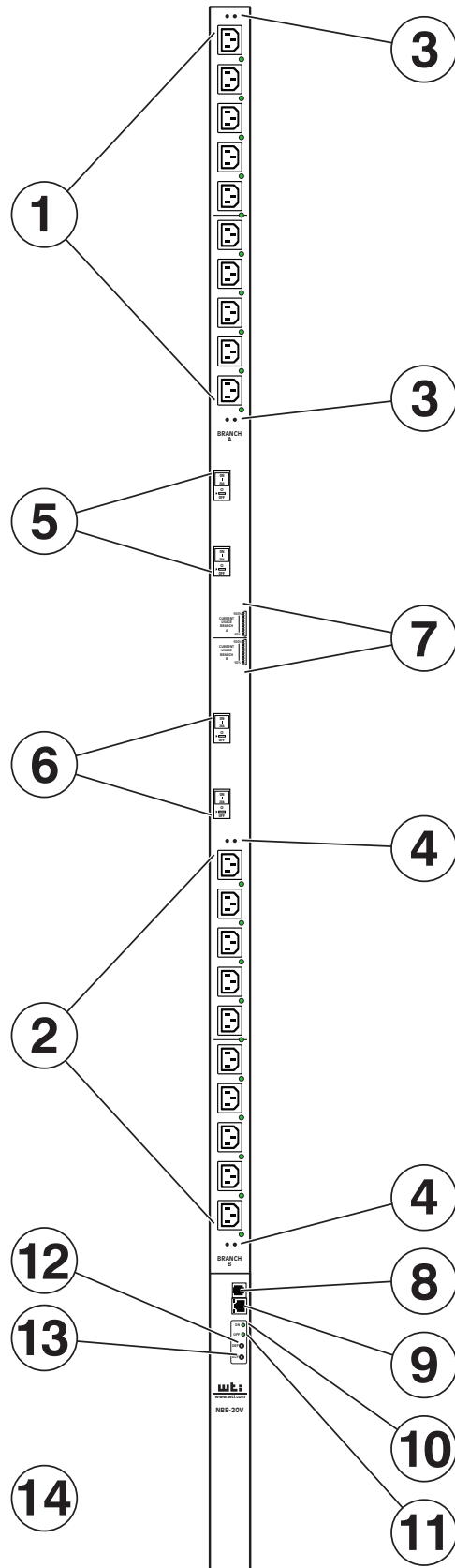


Figure 2.1: NBB Face Panel Components (Model NBB-20VD20-2 Shown)

9. **Network Port:** An RJ45 Ethernet port for connection to your 10/100Base-T, TCP/IP network. Note that the Network Port also includes two, small LED indicators for Link and Data Activity. For more information on Network Port configuration, please refer to the [WTI Firmware Guide](#).
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 [The WTI Firmware Guide](#).

14. **Power Inlets (Not Shown):** One or Two 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 product name plate. Note that some NBB Models feature one or two IEC 60320 C20 inlets with detachable cables, while other NBB Models feature one or two attached cables as described below:
 - NBB-20VS20-1 Units: One IEC C20 Inlet, Detachable Cable, 100-125V, 20 Amp
 - NBB-20VS20-2 Units: One IEC C20 Inlet, Detachable Cable, 100-250V, 20 Amp
 - NBB-20VS16-3 Units: One IEC C20 Inlet, Detachable Cable, 200-250V, 16 Amp
 - NBB-20VS30-1 Units: One NEMA L5-30P Attached Cable, 100-125V, 30 Amp
 - NBB-20VS30-2 Units: One NEMA L6-30P Attached Cable, 100-250V, 30 Amp
 - NBB-20VS32-3 Units: One IEC 60320 (Commando) Attached Cable, 200-250V, 32 Amp
 - NBB-20VD20-1 Units: Two IEC C20 Inlets, Detachable Cables, 100-125V, 20 Amp
 - NBB-20VD20-2 Units: Two IEC C20 Inlets, Detachable Cables, 100-250V, 20 Amp
 - NBB-20VD16-3 Units: Two IEC C20 Inlets, Detachable Cables, 200-250V, 16 Amp
 - NBB-20VD30-1 Units: Two NEMA L5-30P Attached Cables, 100-124V, 30 Amp
 - NBB-20VD30-2 Units: Two NEMA L6-30P Attached Cables, 100-124V, 30 Amp
 - NBB-20VD32-3 Units: Two IEC 60320 (Commando) Attached Cables, 200-250V, 32 Amp

2.2. Additional Button Functions

The Default and Reset buttons on the NBB front panel 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 the [WTI Firmware Guide](#).*
- *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 its 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 bench test procedure for NBB Series products, which will allow you to communicate with the unit in order to demonstrate basic features and check for proper operation.

- For more information regarding installing the NBB hardware in a working network environment, please refer to [Section 4](#).
- For instructions regarding configurations options and advanced operating features, please refer to the [WTI Firmware Guide](#).

3.1. Apply Power to the NBB

First, check the safety precautions listed at the beginning of this Hardware Guide, and refer to the power rating label on the unit regarding power requirements and maximum load and then connect the NBB to an appropriate power source. Note that some NBB Series products feature two power inlets. When power is applied to the NBB, the ON LED on the instrument front panel should light, and the RDY LED should begin to flash within 90 seconds, indicating that the unit is ready to receive commands.

Note: *To determine the exact model number and power requirements for your NBB unit, either refer to the nameplate on the back of the unit.*

3.2. Connect Your Computer to the NBB

In the default state, communication with the NBB via Telnet, HTTP and HTTPS are disabled. Although communication via Telnet, HTTP and/or HTTPS can be enabled as described in the [WTI Firmware Guide](#), during this bench test procedure, the NBB will be controlled via the Command Line Interface (CLI) using a local PC, connected to either the Serial SetUp Port or Network Port:

- **Serial SetUp Port:** Use the Ethernet Cable and Adapter supplied with the NBB. In the default state, the Serial SetUp Port is configured for 9600 bps.
- **Network Port:** Use the Ethernet Cable supplied with the unit. The default IPv4 address for the Network Port is 192.168.168.168.

3.3. Communicating with the NBB

Notes:

- *Default 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 bench test 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 IPv4 access to the Command Line Interface, providing that you are contacting the NBB from a node on the same subnet.*
1. **Access the User Interface:** Start your communications program, (e.g., Tera Term, PuTTY, etc.) then press **[Enter]**.
 2. **Username / Password Prompt:** A message will be displayed, which prompts you to enter your username (Login) 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 (Text Interface.)

3.4. Controlling Power Outlets

If you wish to verify that the NBB is operating properly before deploying the unit in a working network environment, proceed as follows to connect ports and switch outlets:

1. **Review the Help Menu:** At the Text Interface command prompt, type **/H** and press **[Enter]** to display the Help Menu.
2. **Controlling Power Outlets:** You may wish to perform the following tests in order to make certain that the switched outlets are functioning properly.
 - a) **Reboot Outlet:** At the command prompt, type **/BOOT 1** and press **[Enter]**. The status indicator for Plug 1 should go Off, pause for a moment and then go back On, indicating that the boot cycle has been successfully completed.
 - b) **Switch Outlet Off:** At the command prompt, type **/OFF 1** and then press **[Enter]**. The status indicator for Plug 1 should go Off, indicating that the command has been successfully completed. Leave Plug 1 in the "Off" state, and then proceed to the next step.
 - c) **Switch Outlet On:** At the command prompt, type **/ON 1** and press **[Enter]**. The status indicator for Plug 1 should then go back On, indicating that the command has been successfully completed.
3. **Exit from User Interface:** To exit the user interface, type **/x** and press **[Enter]**.

4. Hardware Installation

This section describes the installation procedure for the NBB hardware.

Note: For a detailed description of configurations options and advanced operating features, please refer to the [WTI Firmware Guide](#).

4.1. 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](#).

4.2. Connecting Power to the NBB



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.**
- **Some NBB models include two power inlets.**

4.2.1. Connect the NBB to Your Power Supply

Refer to the cautions listed below and at the beginning of this User's Guide, and the information on the instrument name plate, 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](https://www.wti.com/guides/powercables_refguide.pdf) (which can be found at https://www.wti.com/guides/powercables_refguide.pdf.)

4.2.2. Installing the Power Supply Cable Keepers

NBB series units with removable power supply cables include pre-installed cable keepers. When attaching the power supply cables to the unit, first swing the cable keepers out of the way, then plug the power cables securely into the power inputs. When the cables are in place, snap the cable keepers over each plug to secure the cables to the unit.

4.3. 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 include two separate power branches, while others feature only one power branch.

4.3.1. 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](#).

4.4. 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](#) describes the Setup Port interface.

4.4.1. Connecting a Local PC

Use the DX9F-WTI Adapter supplied with the unit to connect your PC COM port to the NBB Setup Port. Make certain that the Serial Port Mode is set to “Normal” as described in the WTI Firmware Guide.

4.4.2. 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 Serial Port Mode is set to “Modem” as described in the [WTI Firmware Guide](#).

4.5. Connecting the Network Cable

The Network Port is an RJ45 Ethernet jack, for connection to a TCP/IP network. Connect your network cable to the Ethernet Port on the NBB unit. Note that NBB units include a default IPv4 format IP address (192.168.168.168) and a default IPv4 protocol 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 the [WTI Firmware Guide](#).

Note: *The NBB features a 10/100/1000Base-T auto-negotiating Interface; speed and duplex mode will be automatically negotiated. When connecting to an Ethernet interface, most router switches will autosense to determine if the device is 1000Base-T, 100Base-T or 10Base-T, and then configure the network interface accordingly. If your router switch does not autosense, the NBB will auto negotiate speed and duplex mode.*

4.6. Emergency Shut Off Function

NBB Series units also include an Emergency Shut Off function, that can be used to immediately shut off all NBB power outlets in case of emergency. For more information regarding the Emergency Shut Off feature, please contact WTI Tech Support at service@wti.com.

This completes the NBB Hardware Guide. Prior to placing the unit into operation, it is recommended to refer to the [WTI Firmware Guide](#) for important information regarding advanced configuration options, security functions and more detailed operation instructions. If you have further questions regarding the NBB unit, please contact WTI Customer Support as described in [Appendix E](#).

Appendix A. Specifications

Physical/Environmental:

Width: 1.75" (4.5 cm)

Depth: 3.5" (8.9 cm)

Height: 68.75" (174.6 cm) Zero Rack Units

Operating Temperature: 32°F to 122°F (0°C to 50°C)

Humidity: 10 - 90% RH

Appendix B. Serial Interface Description

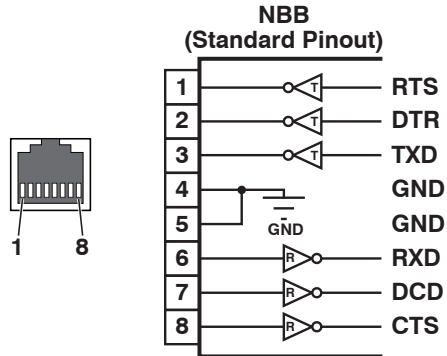


Figure B.1: NBB Series RS232 SetUpPort Interface (RJ45 - Standard Pinout)

B.1. Serial 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.) 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

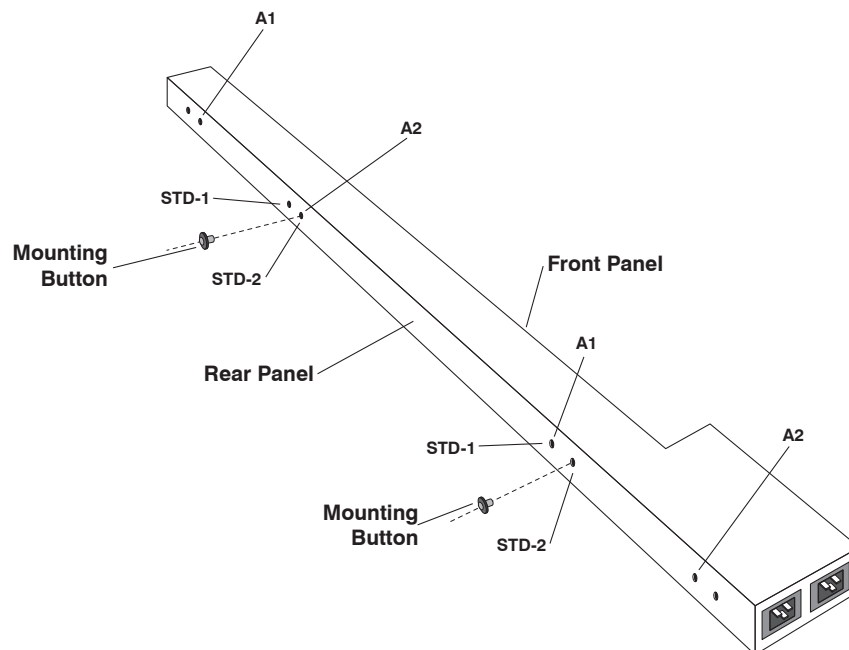


Figure C.1: Installing Mounting Buttons

2. Install two Mounting Buttons 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.

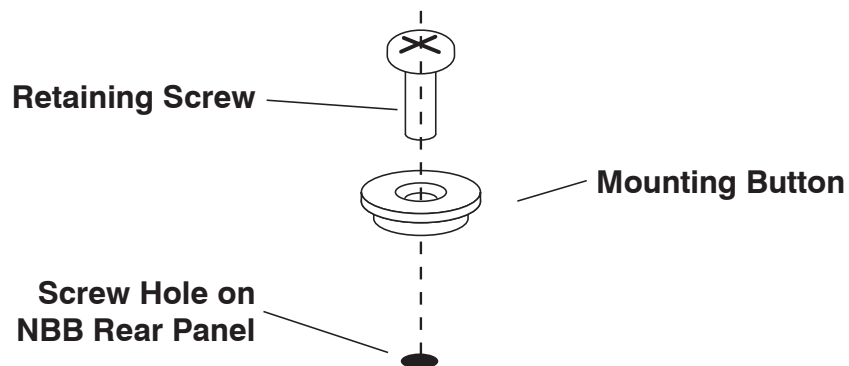


Figure C.2: Attaching Mounting Buttons to the NBB Unit

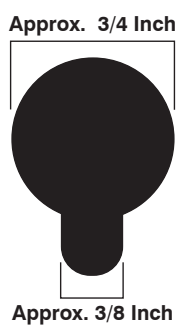


Figure C.3: Mounting Button Hole Specs

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](#).

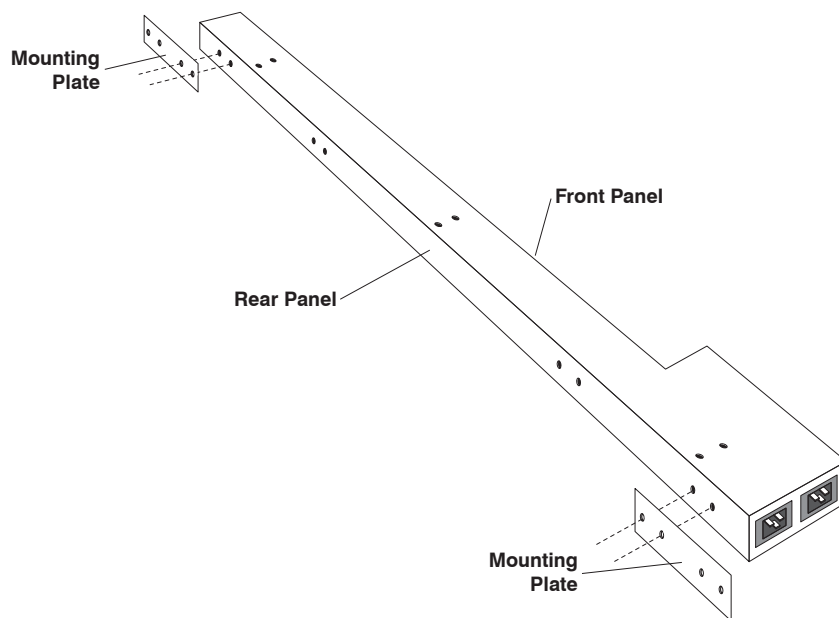


Figure C.4: Installing Mounting Plates

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.

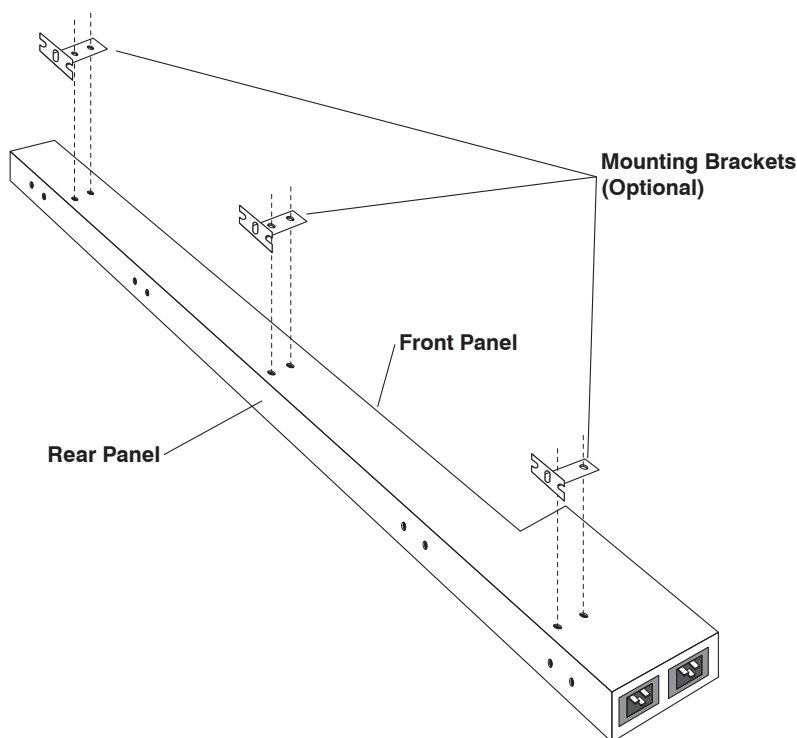


Figure C.5: Installing Optional Mounting Brackets

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

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