

Installation and Quick Configuration

NetBotz® Rack Monitor 250

125 kHz Access Control Appliance

13.56 MHz Access Control Appliance

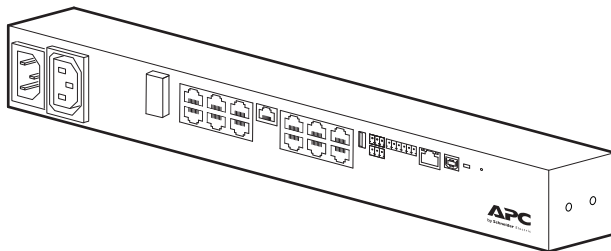
NBRK0250

NBACS125

NBACS1356

990-9814D-001

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Safety

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

Safety Information for the Rack Monitor 250

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- No user-serviceable parts inside. Refer servicing to qualified personnel.
- Use indoors only in a dry location.

Failure to follow these instructions will result in death or serious injury.

CAUTION

FALLING EQUIPMENT HAZARD

Do not create a hazardous condition due to uneven mechanical loading. For example, do not use the appliance as a shelf.

Failure to follow these instructions can result in injury or equipment damage.

Introduction

Product Description

The APC by Schneider Electric NetBotz[®] Rack Monitor 250 is a rack-mountable central hardware appliance for an environmental monitoring and control system. Once installed, you can monitor and control your system using the Web User Interface (Web UI) or Command Line Interface (CLI).

The Rack Monitor 250 includes six ports for connecting temperature and humidity sensors, and other sensors including fluid detection sensors and third-party dry contact sensors. Using other ports on the Rack Monitor 250, you can connect two door switch sensors, two rack door handles, a beacon, and temperature and humidity sensors with digital display.

To expand your system, you can connect the Rack Monitor 250 to your building management system, connect up to six NetBotz Rack Sensor Pod 150s and additional sensors, and use ports that provide power to or allow control of other devices.

NOTE: The Rack Monitor 250 cannot be connected to or networked with any other NetBotz appliances. It uses unique software that is not compatible with other NetBotz products.

Document Overview

The NetBotz Rack Monitor 250 *Installation and Quick Configuration Manual* describes how to install the Rack Monitor 250, connect the provided temperature/humidity sensor and other additional devices, and configure the network settings. After performing the quick configuration procedures in this manual, you can access your system through its software interface, perform additional configuration tasks, and begin monitoring the environment.

Additional Documentation

Unless otherwise noted, the following documentation is available on the applicable product page on the APC by Schneider Electric website, www.apc.com. To quickly find a product page, enter the product name or part number in the Search field.

NetBotz Rack Monitor 250 User Guide: Includes details for using, managing, and configuring the system with a NetBotz Rack Monitor 250 (NBRK0250).

Security Handbook: Describes security features for the APC Network Management Card and for devices with embedded components of the Network Management Card.

Release Notes: Describes new features, fixed issues, and known issues for the latest firmware version.

Modbus Register Map: Defines NetBotz Rack Monitor 250 (NBRK0250) Modbus datapoint registers for communication with a building management system using the Modbus protocol.

Modbus Over Serial Line Specification & Implementation Guide: The Modbus standard. Available at www.modbus.org.

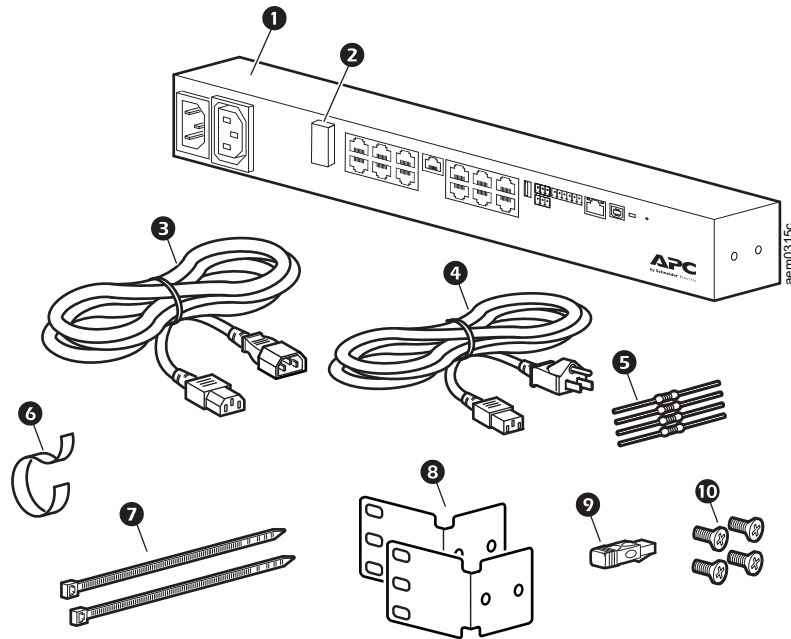
Receiving Inspection

Inspect the package and its contents for shipping damage and see that the parts included in the shipment match the parts listed in the inventory table. Immediately report any shipping damage to the shipping agent. Report missing contents, damage, or other problems to APC by Schneider Electric or your APC by Schneider Electric reseller.

Inventory

Inspect the contents of the package to see that the parts included match those shown below. Report missing or damaged contents to APC by Schneider Electric or your APC by Schneider Electric reseller. However, if damage was due to shipping, immediately report the damage to the shipping agent.

The shipping and packaging materials are recyclable. Please save them for later use or dispose of them appropriately.



Item	Description	Not Shown
1	NetBotz Rack Monitor 250	<ul style="list-style-type: none"> •USB A-USB mini B configuration cable •Temperature and Humidity Sensor (AP9335TH) and hardware kit •Wireless Temperature Sensor (NBWS100T) and hardware kit •Base mount hardware kit (0M-814726) •NetBotz 125 kHz Handle Kit (NBHN125) (Only included with NBACS125) •NetBotz 13.56 MHz Handle Kit (NBHN1356) (Only included with NBACS1356)
2	USB Coordinator (NBWC100U) for wireless sensor network (installed in the Wireless port under a plastic cover)	
3	1.8 m (6 ft) IEC-320-C13 to IEC-320-C14 power cord	
4	1.8 m (6 ft) NEMA 5-15P to IEC-320-C13 power cord	
5	1/4 W, 150 ohm resistors (2) 1/4 W, 499 ohm resistors (2)	
6	203 mm (8 in) hook and loop cable strap	
7	203 mm (8 in) nylon tie wraps (2)	
8	Mounting brackets for a standard 19 in rack (2)	
9	A-Link terminator	
10	8-32 x 1/4 in Phillips-head screws (4)	

Additional Options

The following options are available for the Rack Monitor 250. For more information, contact your APC by Schneider Electric representative or the distributor from whom you purchased your APC by Schneider Electric product.

- NetBotz Rack Sensor Pod 150 (NBPD0150)
- Temperature/Humidity Sensor with Digital Display (AP9520TH)
- Temperature Sensor (AP9335T)
- Temperature/Humidity Sensor (AP9335TH)
- Wireless Temperature/Temperature & Humidity Sensor (NBWS100T/NBWS100H)
- USB Coordinator & Router (NBWC100U)
- NetBotz 3.65 m (12 ft) Door Switch Sensor for APC by Schneider Electric Racks (NBES0303)
- NetBotz 15.24 m (50 ft) Door Switch Sensor for Rooms or Third Party Racks (NBES0302)
- NetBotz 125 kHz Handle Kit (NBHN125)
- NetBotz 13.56 MHz Handle Kit (NBHN1356)
- NetBotz Dry Contact Cable (NBES0304)
- Alarm Beacon (AP9324)
- NetBotz Vibration Sensor (NBES0306)
- NetBotz Smoke Sensor (NBES0307)
- NetBotz Spot Fluid Sensor (NBES0301)

Network Management With Other Applications

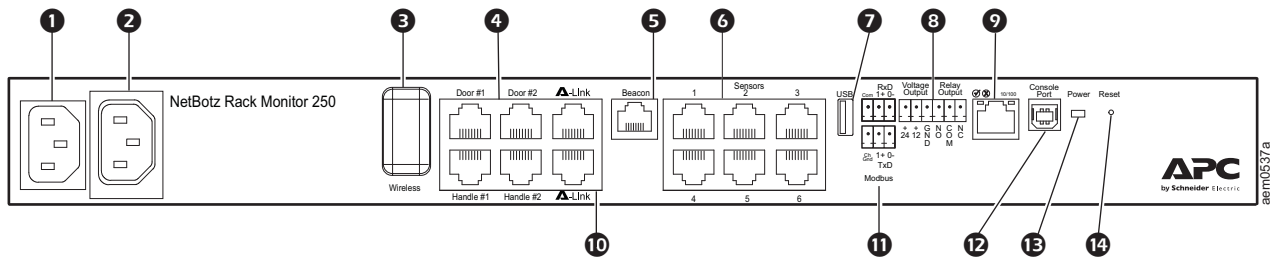
When your appliance is connected to the network, it is compatible with the following applications:

- StruxureWare Data Centers Expert[®] (DCE)
- EcoStruxure IT[®]

NOTE: The NetBotz Rack Monitor 250 communicates with DCE and EcoStruxure IT via SNMPv1 or SNMPv3.

Physical Description

Front



Item	Description
1 AC Line Inlet	The input power connection; see “Specifications” on page 25 for voltage information.
2 Switched Outlet	Provides power to a device at a total maximum amperage of 10 A. Activates a connected device when configured events occur. (For example, a fan may be connected to this outlet, and the outlet may be configured to turn on when a high threshold violation occurs for a temperature sensor.)
3 Wireless Network Coordinator	USB port with NetBotz USB Coordinator (NBWC100U) installed. Used with included Wireless Temperature Sensor (NBWS100T) to monitor temperature. Additional wireless sensors can be purchased separately.
4 Rack Access ports	Ports for the door switch sensors on doors #1 and #2 Ports for the handle sensors (NBHN125 or NBHN1356) on doors #1 and #2
5 Beacon port	Used for connecting an alarm beacon (AP9324).
6 Universal sensor ports	Used to connect APC by Schneider Electric sensors and third-party dry contact sensors. (See “Connect Sensors and Devices” on page 10 for a list of sensors.) Third-party dry contact sensors require a Dry Contact Cable (NBES0304).
7 USB port	Used to connect USB devices to the appliance.
8 Voltage Output	Provides 12 VDC or 24 VDC (75 mA) to a connected device.
Relay Output	Used for connecting relay-controlled external devices.
9 10/100 Network Port	Provides the connection to the network. Status and link LEDs indicate network traffic. See “Status LED” on page 6.
10 A-Link ports	Used to cascade NetBotz Rack Sensor Pod 150s (NBPD0150), or connect Temperature/Humidity Sensors with Digital Display (AP9520TH). Provides communications and power using standard CAT-5 cabling with straight-through wiring. NOTE: To cascade multiple devices, connect a supplemental power supply (100–240 VAC/24 VDC, part number AP9505i) to a NetBotz Rack Sensor Pod 150. For details, see “Cascade devices to A-Link ports” on page 11.
11 Modbus RS-485 port	Provides the connection to a building management system using the Modbus protocol.
12 Console Port	Used to connect the USB A-USB mini B configuration cable, when configuring initial network settings. NOTE: If you are unable to access the appliance using the console port, you may need to install a serial-to-USB virtual COM port driver. The USB vendor is FTDI; the driver type is VCP. Driver downloads are available on the FTDI Chip website.
13 Power LED	Indicates whether the unit is receiving power (blue = receiving power; dark = not receiving power).
14 Reset button	Restarts the Rack Monitor 250 network management interface.

Rear

Toolless mounting pegs allow for installation in APC by Schneider Electric NetShelter® VX and SX racks and enclosures without using any U-spaces. (For more details, see “Toolless peg-mount installation” on page 8.)

LED Descriptions

Status LED

This LED (light-emitting diode) indicates the status of the Rack Monitor 250.

Condition	Description
Off	One of the following situations exists: <ul style="list-style-type: none">•The Rack Monitor 250 is not receiving input power.•The Rack Monitor 250 is not operating properly. It may need to be repaired or replaced. Contact Customer Support at www.apc.com.
Solid green	The Rack Monitor 250 has valid TCP/IP settings.
Solid orange	A hardware malfunction has been detected in the Rack Monitor 250. Contact Customer Support at www.apc.com .
Flashing green	The Rack Monitor 250 does not have valid TCP/IP settings.*
Flashing orange	The Rack Monitor 250 is making BOOTP requests.*
Rapidly flashing green	A user initiated a LED blink test from the user interface.
Alternately flashing green and orange	If the LED is flashing slowly, the Rack Monitor 250 is making DHCP [†] requests.* If the LED is flashing rapidly, the Rack Monitor 250 is starting up.

*If you do not use a BOOTP or DHCP server, see “TCP/IP Configuration Methods” on page 13 to configure the TCP/IP settings.

†To use a DHCP server, see “BOOTP and DHCP configuration” on page 14.

Link-RX/TX (10/100) LED

This LED indicates the network status of the Rack Monitor 250.

Condition	Description
Off	One or more of the following situations exist: <ul style="list-style-type: none">•The Rack Monitor 250 is not receiving input power.•The cable that connects the Rack Monitor 250 to the network is disconnected or not functioning properly.•The Rack Monitor 250 is turned off or not operating correctly. It may need to be repaired or replaced. Contact Customer Support at www.apc.com.
Solid green	The Rack Monitor 250 is connected to a network operating at 10 Megabits per second (Mbps).
Solid orange	The Rack Monitor 250 is connected to a network operating at 100 Mbps.
Flashing green	The Rack Monitor 250 is receiving or transmitting data packets at 10 Mbps.
Flashing orange	The Rack Monitor 250 is receiving or transmitting data packets at 100 Mbps.

Installation

Install the Rack Monitor 250

You can install the Rack Monitor 250 in the front or the rear of the rack using the rack-mount option (requires 1 U of rack space). If you are using an APC by Schneider Electric NetShelter VX or SX rack, you can use the toolless peg-mounts (does not use any U-space).

NOTE: Install the Rack Monitor 250 in an environment compatible with the environmental specifications on page 30.

NOTICE

Use only the hardware provided when installing the brackets.

Cage Nuts

CAUTION

FALLING EQUIPMENT HAZARD

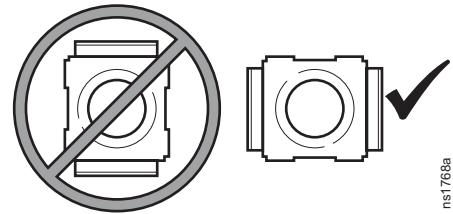
Do NOT install cage nuts vertically with the ears engaging the top and bottom of the square hole.

Failure to follow these instructions can result in injury or equipment damage.

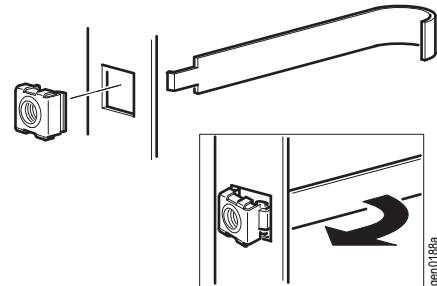
Install a cage nut. APC by Schneider Electric offers a cage nut hardware kit (AR8100) for use with square holes.

1. Install cage nuts horizontally, with the ears engaging the sides of the square hole. Insert the cage nut into the square hole by hooking one ear of the cage nut assembly through the far side of the hole.

NOTE: Install the cage nuts on the interior of the vertical mounting rail.



2. Place the cage nut tool on the other side of the cage nut and pull to snap it into position.

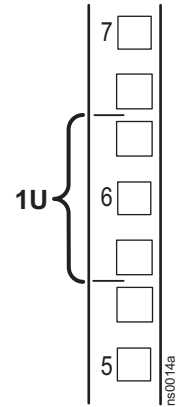


Remove a cage nut.

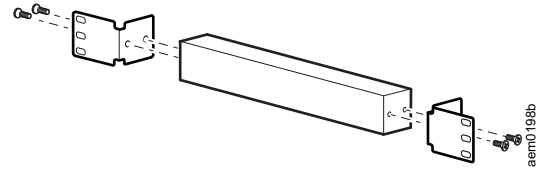
1. Remove any attached screw.
2. Grasp the cage nut and squeeze the sides to release it from the square hole.

Rack-mount installation

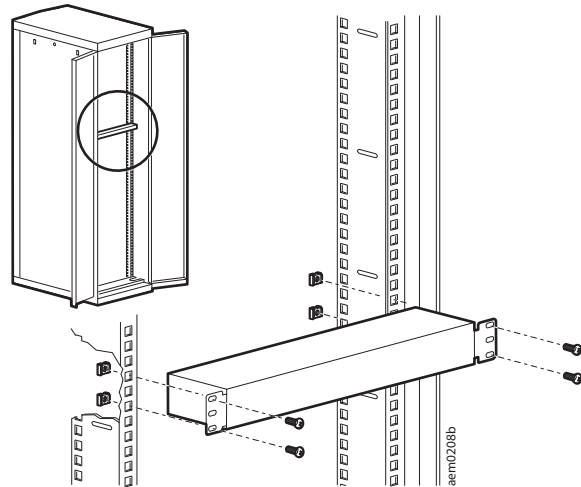
1. Choose a location for the Rack Monitor 250 in the front or rear of the rack. The Rack Monitor 250 occupies one U-space. A notched hole or a number on the vertical rail of the rack denotes the middle of a U-space.



2. Install the brackets using the provided 8-32 x 1/4 in Phillips screws.



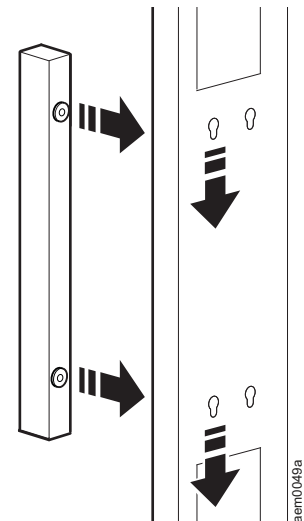
3. Secure the Rack Monitor 250 to the rack, using cage nuts and screws (not provided).
4. See “Power cord and network cable connections” on page 9.



Toolless peg-mount installation

The toolless peg-mount installation is only available with a NetShelter VX or SX rack or enclosure.

1. In the left or right cable channel in the rear panel of the enclosure, install the Rack Monitor 250 in a set of mounting holes. Push down until it locks.
2. See “Power cord and network cable connections” on page 9 to complete the installation.



Power cord and network cable connections

⚠ CAUTION

UNEXPECTED EQUIPMENT OPERATION

- Before you energize the Rack Monitor 250, review the electrical specifications on page 31 to avoid overloading the circuit providing power.
- Make sure you properly ground the Rack Monitor 250; plug it directly into a wall outlet or verify the ground path if you connect it to a power strip.

Failure to follow these instructions can result in injury or equipment damage.

NOTE: The NetBotz Rack Monitor 250 is not a PoE compatible device. Do not connect a NetBotz Rack Monitor 250 to a PoE (Power over Ethernet) switch.

Connect the appropriate power cord to the AC Line Inlet of the Rack Monitor 250.

1. Secure the power cord using the tie wraps.
2. Connect a standard network cable to the Rack Monitor 250.
3. Plug the power cord into a power source.
4. Use the hook and loop cable strap and the 25 mm (1 in) wide tie wrap to secure cables.

Connect Sensors and Devices

NOTICE

Only connect approved devices to ports on the Rack Monitor 250 as directed in this manual. Plugging in other devices may result in equipment damage, and will cause the Rack Monitor 250 to reboot.

The following sensors and devices connect to specific ports and outlets (see “Physical Description” on page 5 for port details):

Sensor/Device	Port/outlet
Alarm beacon AP9324	Beacon port*
Door switch sensors •NBES0302 •NBES0303	Universal sensor ports and Rack Access ports (Door #1 and Door #2) NOTE: When using both a handle kit and a door switch sensor, connect the door switch sensor to a Rack Access Door port.
Handles •NBHN125 •NBHN1356	Rack Access ports: Handle #1 and Handle #2
Sensor Pod150 (NBPD0150)	A-Link ports†
Temperature sensors •Temperature/Humidity Sensor with Display (AP9520TH) •Temperature Sensor (AP9335T) •Temperature/Humidity Sensor (AP9335TH)	A-Link ports† Universal sensor ports
Other NetBotz Sensors •Dry Contact Cable (NBES0304) •Vibration Sensor (NBES0306) •Smoke Sensor (NBES0307) •Spot Fluid Sensor (NBES0301)	Universal sensor ports
Third-party dry contact sensors	Universal sensor ports Third-party dry contact sensors require the NetBotz Dry Contact Cable (NBES0304). To connect a sensor to the cable, follow the instructions provided with the sensor and the instructions provided with the cable.

*See “Configure Outlet-controlled Devices” on page 24 for configuration details.

†See “**Cascade devices to A-Link ports**” on page 11 to cascade multiple devices.

NOTE: The length of a sensor cable can be extended using RJ-45 female-to-female couplings and standard CAT5 cabling. See “System Specifications” on page 27 for maximum cable lengths.

NOTE: The Rack Monitor 250 is not compatible with the following:

- Door switch cable included with the NetBotz Rack Access PX-HID (AP9361)
- NetBotz Sensor Pod 180 (NBPD0180)

Cascade devices to A-Link ports

You can cascade up to six NetBotz Rack Sensor Pod 150s (NBPD0150) and up to eight Temperature/Humidity Sensors with Digital Display (AP9520TH) to A-Link ports.

A-Link is an APC by Schneider Electric proprietary CAN (Controller Area Network) bus. Devices compatible with A-Link are not Ethernet devices and cannot coexist on an Ethernet bus with other networking devices, such as hubs and switches.

You cannot cascade Rack Monitor 250s or other NetBotz appliances.

Before performing this procedure, follow the installation instructions provided with your NetBotz Rack Sensor Pod 150s and sensors. If you cascade several devices, be sure you have a supplemental power supply (Power Supply 100–240 VAC/24 VDC—AP9505i) to connect to your system.

NOTICE

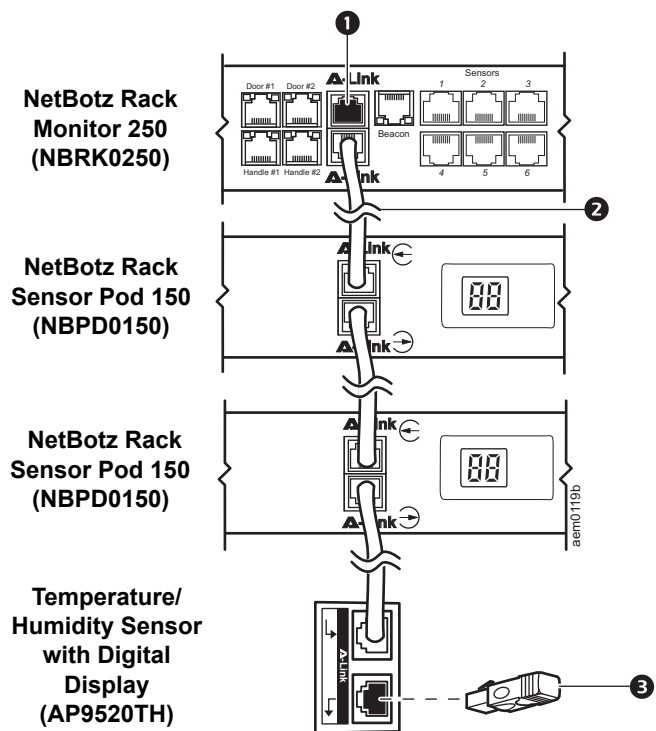
Do not use crossover cables.

1. Connect sensors and NetBotz Rack Sensor Pod 150s to the Rack Monitor 250, as shown.

- Use CAT-5 (or equivalent) Ethernet patch cables (2).
- Connect to in and out ports as shown.
- The maximum combined length of all A-Link cables must not exceed 1000 m (3,280 ft).

2. Plug an A-Link terminator into the unused A-Link ports (1 and 3).

3. If you have cascaded several devices, connect a supplemental power supply (AP9505i) to the 24 VDC Input jack of one of the Rack Sensor Pod 150s.
NOTE: The first time a NetBotz Rack Sensor Pod 150 receives power, it obtains a unique identification address for communication over the A-Link bus. To avoid communication problems, you must complete steps 1 and 2 before you connect a supplemental power supply.



Wire the Modbus Interface

The NetBotz Rack Monitor 250 connects to your building management system using the Modbus RS-485 interface. The Modbus interface supports 2-wire and 4-wire RS-485, plus ground.

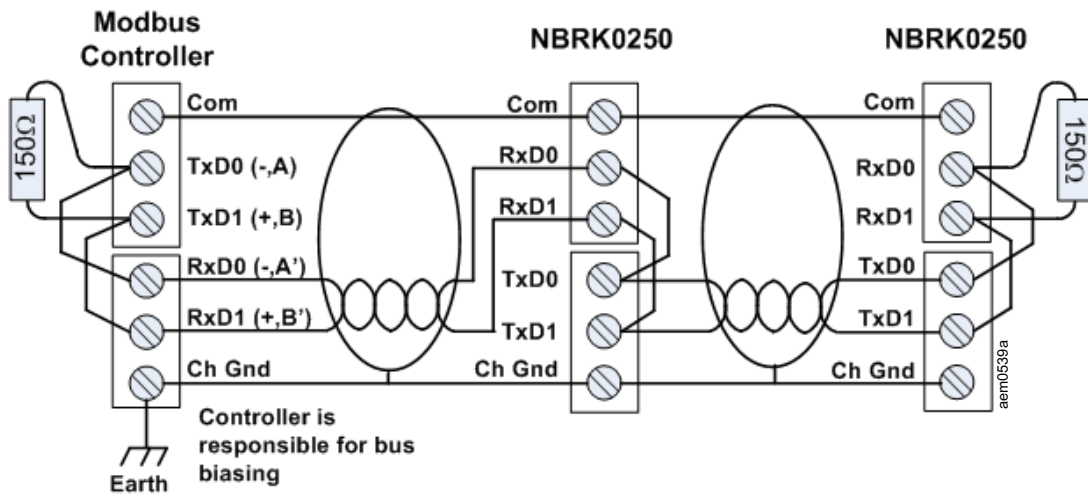
For more information, see the Modbus standard available at www.modbus.org.

For details on Modbus register settings, see the Modbus register map document for your specific Modbus-enabled device.

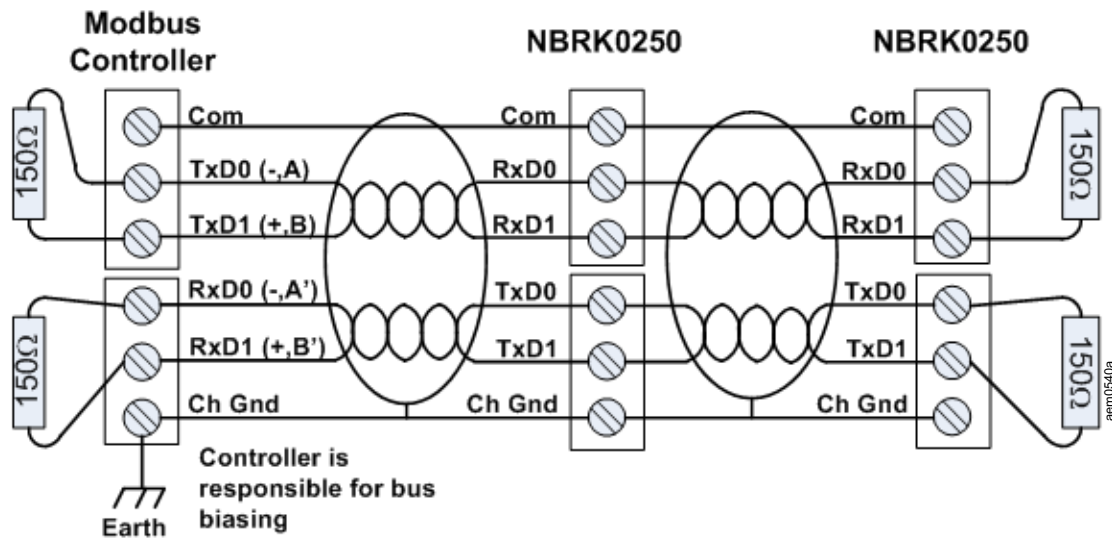
The Modbus standard specifies 150 ohm termination resistors at each end of a bus. Unless the bus is very long and operating at high data rates, these resistors are not needed.

Busses under 2000 feet operating at 9600 baud, or under 1000 feet operating at 19,200 baud, should not require termination.

2-wire (half duplex) connection diagram



4-wire (full duplex) connection diagram



Quick Configuration

Disregard the procedures described in this chapter if you have StruxureWare Data Center Expert as part of your system. See the documentation for your StruxureWare device for more information.

You must configure the following TCP/IP settings before the Rack Monitor 250 can operate on a network:

- IP address
- Subnet mask
- Default gateway (See the *NetBotz Rack Monitor 250 User Guide* on www.apc.com for more information about the watchdog role of the default gateway.)

NOTE: If a default gateway is unavailable, use the IP address of a computer that is located on the same subnet as the Rack Monitor 250 and that is usually running. The Rack Monitor 250 uses the default gateway to test the network when traffic is very light.

NOTE: Do not use the loopback address (127.0.0.1) as the default gateway address. It disables the network interface and requires you to reset TCP/IP settings to their defaults using a local serial login.

TCP/IP Configuration Methods

Use one of the following methods to define the TCP/IP settings for the Rack Monitor 250 for IPv4:

- “Device IP Configuration Utility” on this page
- “BOOTP and DHCP configuration” on page 14
- Networked computer:
 - “Local access to the Command Line Interface” on page 15
 - “Remote access to the Command Line Interface” on page 15
- “How to Recover from a Lost Password” on page 17

Device IP Configuration Utility

The Device IP Configuration Utility can discover the Rack Monitor 250 if it does not have an IP address assigned. Once discovered, you can configure its IP address settings.

System requirements. The Utility runs on Microsoft Windows 2000, Windows Server[®] 2003, Windows Server 2012 and on both 32- and 64-bit versions of Windows XP, Windows Vista, Windows 2008, Windows 7, Windows 8 and Windows 10 operating systems.

This utility supports IPv4 only.

Installation. To install the Utility from a downloaded executable file:

1. Go to www.apc.com/tools/download.
2. Select your country.
3. In the **Filter By Software/Firmware** drop-down menu, select **Software Upgrades - Wizards and Configurators**.
4. Download the latest version of the Network Management Device IP Configuration Wizard and run the executable file.

When installed, the Utility is available through the Windows “Start Menu” option.

BOOTP and DHCP configuration

The default TCP/IP configuration setting, DHCP, assumes a properly configured DHCP server is available to provide TCP/IP settings to the Rack Monitor 250. You can also configure the setting for BOOTP.

A user configuration (.INI) file can function as a BOOTP or DHCP boot file. For more information, see the TCP/IP configuration section of the *Rack Monitor 250 User Guide* on the APC by Schneider Electric website, www.apc.com.

NOTE: If no servers are available, see “Device IP Configuration Utility” on page 13, “Local access to the Command Line Interface” on page 15, or “Remote access to the Command Line Interface” on page 15 to configure the needed TCP/IP settings.

BOOTP. For the Rack Monitor 250 to use a BOOTP server to configure its TCP/IP settings, it must find a properly configured RFC951-compliant BOOTP server.

In the BOOTPTAB file of the BOOTP server, enter the MAC address of the Rack Monitor 250, IP address, subnet mask, and default gateway, and, optionally, a bootup file name. Look for the MAC address on bottom of the Rack Monitor 250 or on the Quality Assurance Slip included in the package.

When the Rack Monitor 250 reboots, the BOOTP server provides it with the TCP/IP settings.

- If you specified a bootup file name, the Rack Monitor 250 attempts to transfer that file from the BOOTP server using TFTP or FTP. The Rack Monitor 250 assumes all settings specified in the bootup file.
- If you did not specify a bootup file name, you can configure the other settings of the Rack Monitor 250 remotely through its Web UI (see “Web User Interface” on page 18) or CLI (see “Remote access to the Command Line Interface” on page 15) The default user name and password are **apc** for both interfaces. You will be instructed to change the password after your initial login.

To create a bootup file, see your BOOTP server documentation.

DHCP. You can use an RFC2131/RFC2132-compliant DHCP server to configure the TCP/IP settings for the Rack Monitor 250.

This section summarizes the Rack Monitor 250 communication with a DHCP server. For more detail about how a DHCP server can configure the network settings for a Rack Monitor 250, see the *Rack Monitor 250 User Guide* on www.apc.com.

1. The Rack Monitor 250 sends out a DHCP request that uses the following to identify itself:
 - A Vendor Class Identifier (APC by default)
 - A Client Identifier (by default, the MAC address of the Rack Monitor 250)
 - A User Class Identifier (by default, the identification of the application firmware installed on the Rack Monitor 250)
2. A properly configured DHCP server responds with a DHCP offer that includes all the settings the Rack Monitor 250 needs for network communication. The DHCP offer also includes the Vendor Specific Information option (DHCP option 43). The Rack Monitor 250 can be configured to ignore DHCP offers that do not encapsulate the APC cookie in DHCP option 43 using the following hexadecimal format. (The Rack Monitor 250 does not require this cookie by default).

```
Option 43 = 01 04 31 41 50 43
```

where

- the first byte (01) is the code
- the second byte (04) is the length
- the remaining bytes (31 41 50 43) are the APC cookie.

See your DHCP server documentation to add code to the Vendor Specific Information option. The Rack Monitor 250 Web UI has options to use vendor-specific data to require the DHCP server to provide an “APC” cookie. See the *Rack Monitor 250 User Guide* on www.apc.com for information.

Local access to the Command Line Interface

For local access, connect a computer to the Rack Monitor 250 to access the CLI.

1. Select a USB port at the computer, and disable any service that uses that port.
2. Connect the provided USB A-USB mini B configuration cable from the selected port on the computer to the console port on the Rack Monitor 250.

NOTE: If you are unable to access the appliance using the console port, you may need to install a serial-to-USB virtual COM port driver. The USB vendor is FTDI; the driver type is VCP. Driver downloads are available on the FTDI Chip website, www.ftdichip.com.

3. Run a terminal program (e.g. 3rd party terminal emulator programs like HyperTerminal™, PuTTY, or Tera Term) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control. Save the changes.
4. Press ENTER, repeatedly if necessary, to display the User Name prompt.
5. Use **apc** for the user name and password the first time you access the appliance.

NOTE: You will be prompted to enter a new password the first time you connect to the appliance.

See “Command Line Interface” on page 16 to finish the configuration.

Remote access to the Command Line Interface

From any computer on the same network as the Rack Monitor 250, you can use ARP and Ping to assign an IP address to the Rack Monitor 250, and then use Secure SHell (SSH) to access its CLI and configure the other TCP/IP settings.

After the Rack Monitor 250 has its IP address configured, you can use SSH or Telnet, without first using ARP and Ping, to access that Rack Monitor 250.

1. Use the MAC address of the Rack Monitor 250 in the ARP command to define the IP address.

NOTE: Look for the MAC address on the bottom of the Rack Monitor 250 or on the Quality Assurance Slip included in the package.

For example, to define 156.205.14.141 as the IP address of a Rack Monitor 250 with 00 c0 b7 63 9f 67 as its MAC address, use one of the following commands:

– Windows command format:

```
arp -s 156.205.14.141 00-c0-b7-63-9f-67
```

– LINUX command format:

```
arp -s 156.205.14.141 00:c0:b7:63:9f:67
```

2. Use Ping with a size of 113 bytes to assign the IP address defined by the ARP command. For the IP address defined in step 1, use one of the following commands:

– Windows command format:

```
ping 156.205.14.141 -l 113
```

– LINUX command format:

```
ping 156.205.14.141 -s 113
```

3. Use SSH to access the Rack Monitor 250 at its newly assigned IP address. For example:

```
ssh apc@156.205.14.141 -c aes256-cbc
```

Where **-c** indicates the cipher (aes256-cbc or 3des-cbc).

4. Use **apc** for both user name and password, then change the password as directed. It is recommended that you use strong passwords which conform to your company's password requirements.

See “Command Line Interface” on page 16 to finish the configuration.

Command Line Interface

After you log on at the CLI, as described in “Local access to the command line interface” on page 20 or “Remote access to the command line interface” on page 21, you can manually configure network settings.

1. Contact your network administrator to obtain the IP address, subnet mask, and default gateway for the Rack Monitor 250.
2. Use this command to configure network settings. (Text in italics indicates a variable.)

```
tcpip
-i yourIPAddress
-s yourSubnetMask
-g yourDefaultGateway
```

For each variable, type a numeric value that has the format xxx.xxx.xxx.xxx.

The command can be entered on one line. For example, to set a system IP address of 156.205.14.141, a Subnet Mask of 255.255.255.0 and a default gateway of 156.205.14.1, type the following command and press ENTER:

```
tcpip -i 156.205.14.141 -s 255.255.255.0 -g 156.205.14.1
```

3. Type `reboot`. The Rack Monitor 250 restarts to apply the changes.

.INI file utility

You can use the .INI file export utility to export .INI file settings from configured Rack Monitor 250s to one or more unconfigured Rack Monitor 250s. The utility and documentation are available in FAQ article FA156117 on the APC by Schneider Electric website: Go to www.apc.com, select **Support > FAQs**, then enter the article number in the search bar.

How to Recover from a Lost Password

You can use a local computer that connects to the Rack Monitor 250 through the serial port to access the CLI.

1. Select a serial port at the local computer, and disable any service that uses that port.
2. Connect the provided USB A-USB mini B configuration cable to the selected port at the computer and to the console port at the Rack Monitor 250.

NOTE: If you are unable to access the appliance using the console port, you may need to install a serial-to-USB virtual COM port driver. The USB vendor is FTDI; the driver type is VCP. Driver downloads are available on the FTDI Chip website.

3. Run a terminal program (such as HyperTerminal, Tera Term or PuTTY) and configure the selected port for 9600 bps, 8 data bits, no parity, 1 stop bit, and no flow control.
4. Press ENTER, repeatedly if necessary, to display the User Name prompt. If you are unable to display the User Name prompt, verify the following:
 - The serial port is not in use by another application.
 - The terminal settings are correct as specified in step 3.
 - The correct cable is being used as specified in step 2.
5. Press the Reset button. The Status LED will flash alternately orange and green. When the LED begins to flash, immediately press the Reset button a second time to temporarily reset the user name and password to their defaults.
6. Press ENTER, repeatedly if necessary, to display the User Name prompt again, then use the default, **apc**, for the user name and password. (If you take longer than 30 seconds to log on after the User Name prompt is redisplayed, you must repeat step 5 and log on again.)
7. At the CLI, use the following commands to change the Password setting, which is **apc** at this stage:

```
user -n user name -pw user password
```

For example, to change the Super User password to XYZ, type:

```
user -n apc -pw XYZ
```

NOTE: For security reasons, it is possible to disable the Super User account. To verify that the Super User account is enabled, type:

```
user -n <user name>
```

If `Access: Disabled` is returned, you can re-enable the Super User by typing:

```
user -n <user name> -e enable
```

8. Type quit or exit to log off, reconnect any serial cable you disconnected, and restart any service you disabled.

Access the Rack Monitor 250

After the Rack Monitor 250 is running on your network, you can access the following Rack Monitor 250 software user interfaces to finish configuring and to begin monitoring your system:

- Web UI (HTTP or HTTPS protocol)
- Telnet or Secure SHell (SSH)
- SNMP
- Modbus

For more information on the interfaces, see the *NetBotz Rack Monitor 250 User Guide* on www.apc.com.

Web User Interface

You can use the latest version of Microsoft Internet Explorer® 11 and higher, Firefox®, or Chrome® to access the Web UI of the Rack Monitor 250. Other commonly available browsers and versions may work but have not been tested.

For initial access the Web UI, enter `https://<your_device_IP_address>` or `https://<your_device_dns_name>` in your Web browser address field. You will be prompted for a user name and password. Enter the default, **apc** for each, to log on. Then change the default password as directed. It is recommended that you use strong passwords which conform to your company's password requirements.

You may receive a message that the Web page is not secure. This is normal, and you can continue to the Web UI. The warning is generated because your Web browser does not recognize the default certificate used for encryption over HTTPS. However, information transmitted over HTTPS is still encrypted. See the *Security Handbook* on www.apc.com for more details on HTTPS and instructions to resolve the warning.

HTTP and HTTPS

When you use a Web browser to access the Web UI, you can use either HTTP or HTTPS.

- HTTP (disabled by default) provides authentication by user name and password but no encryption.
- HTTPS (enabled by default) provides security through Secure Sockets Layer (SSL); encrypts user names, passwords, and data being transmitted; and authenticates the Rack Monitor 250 using digital certificates.

To enable or disable HTTP or HTTPS, go to **Configuration > Network > Web > Access**.

For more information on selecting and configuring network security, see the *Security Handbook* on www.apc.com. For details on how to access the *Security Handbook*, see "Additional documentation" on page 2.

Command Line Interface

You can access the CLI through Telnet or Secure SHell (SSH), depending on which is enabled. Go to **Configuration > Network > Console > Access** to enable or disable either protocol. SSH is enabled by default.

SSH

SSH encrypts user names, passwords, and transmitted data. If you use Secure Sockets Layer (SSL) for the Web UI, use Secure Shell (SSH) for access to the CLI.

The interface, user accounts, and user access rights are the same whether you access the CLI through SSH or Telnet. However, to use SSH, you must first configure SSH and have an SSH client program installed on your computer.

See the *NetBotz Rack Monitor 250 User Guide* on www.apc.com for more information on configuring and using SSH.

Telnet

Telnet provides authentication by user name and password, but not the benefits of encryption. Telnet is disabled by default.

To use Telnet to access the CLI of the Rack Monitor 250:

1. At a command prompt, use the following command line, and press ENTER:

```
telnet address
```

As *address*, use the IP address of the Rack Monitor 250 (or DNS name if configured).

2. Enter the user name and password (by default, **apc** and **apc** for an Administrator). You will be prompted to enter a new password the first time you connect to the appliance.

Simple Network Management Protocol (SNMP)

SNMP is disabled by default. You must be an Administrator to enable or disable SNMP access. Go to **Configuration > Network > SNMPv1** or **SNMPv3 > Access** in the Web UI, or use the `SNMP` or `SNMPv3` commands in the CLI. See the *NetBotz Rack Monitor 250 User Guide* on www.apc.com for more information.

To to manage the Rack Monitor 250 with StruxureWare Data Center Expert or EcoStruxure IT, you must enable SNMPv1 or SNMPv3 in the unit interface. See your StruxureWare Data Center Expert or EcoStruxure IT documentation for detailed instructions.

SNMPv1

After you add the PowerNet[®] MIB to a standard SNMP MIB browser, you can use that browser to access the Rack Monitor 250. All user names, passwords, and community names for SNMP are transferred over the network as plain text.

SNMPv2c is also supported by the SNMPv1 interface and configuration settings. For more information, see FAQ article FA156193: Go to www.apc.com, select **Support > FAQs**, then enter the article number in the search bar.

SNMPv3

SNMPv3 uses a system of user profiles to identify users for GETs, SETs, and trap receivers. An SNMPv3 user must have a user profile assigned in the MIB software program to perform GETs and SETs, browse the MIB, and receive traps.

NOTE: To use SNMPv3, you must have a MIB program that supports SNMPv3. The Rack Monitor 250 supports MD5 or SHA authentication and DES or AES privacy (encryption).

Modbus

In the Rack Monitor 250 user interface, go to **Configuration > Network > Modbus > serial** (or **TCP**).

1. Check the box to enable access to the Modbus serial or TCP interface.
2. Set the connection parameters for the Modbus connection:
 - For the TCP connection, specify a port number (502, or 5000 to 32768). Click **Apply**.
 - For the serial connection, specify the parameters. The default serial connection settings are 9600 baud, 8 data bits, parity even, and 1 stop bit.
 - a. Set Parity to None.
 - b. Specify the Target Unique ID (1 to 247).
 - c. Click **Apply**.

NOTE: The Rack Monitor 250 sets the value for stop bits automatically based on parity according to the Modbus standard. When parity is set to None, 2 stop bits are used.

Other Configuration

Configure Rack Access Proximity Cards

Both handles must be the same model, either two 125 kHz handles or two 13.56 MHz handles. The proximity card type must be the same for both handles. The Rack Monitor 250 can support up to 200 registered cardholders. You may be able to configure more than 200 cardholders by using a RADIUS server for authentication.

The Rack Monitor 250 with the NetBotz 125 kHz Handle Kit (NBHN125) supports the following 125 kHz proximity cards:

- H10301 26-bit
- H10302 37-bit
- H10304 37-bit with facility code
- CORP-1000

The Rack Monitor 250 with the NetBotz 13.56 MHz Handle Kit (NBHN1356) supports the following 13.56MHz proximity cards:

- MIFARE Classic 4-byte UID
- MIFARE Classic 7-byte UID
- MIFARE DESFIRE
- MIFARE PLUS
- iClass 8-byte

To register a new proximity card:

1. Go to **Configuration > Device > Lock Properties** in the Rack Monitor 250 user interface.
2. Check the box to enable the card reader. Specify the card type for the installed handle(s), the auto-relock time (10–60 seconds), and the time to wait before the door open alarm is activated for Door 1, Door 2, or both (1–120 minutes). Click **Apply**.
3. Hold the card in front of the proximity reader on the handle until you hear a beep.
4. Go to **Configuration > Device > User Access > Unregistered Users**.
5. Click the card ID number to specify the user name, door access (Door 1, Door 2, or both), the access schedule (24 x 7 by default), and enable account access.
6. Click **Apply**.

To view, modify, or delete registered users, go to **Configuration > Device > User Access > Registered Users**.

For more information about configuring rack access, see the *NetBotz Rack Monitor 250 User Guide* on www.apc.com.

The Wireless Sensor Network

NOTICE

Only the devices listed here are compatible with the NetBotz wireless sensor network. Other devices may not function and may damage the appliance and other wireless devices.

The wireless sensor network is made of a host appliance, a coordinator, routers, and end devices.

- The **host appliance** (the Rack Monitor 250) collects data from the wireless sensor network and generates alerts based on sensor readings.
- The **coordinator** is connected directly to the host appliance via USB. It reports data from the sensors on the network. Each wireless sensor network must have only one coordinator, which is connected to a USB Type A port on the NetBotz appliance. Your Rack Monitor 250 includes a USB Coordinator (NBWC100U) connected to the Wireless port under a plastic cover.
- **Routers** extend the range of the wireless sensor network. Routers pass information between themselves and the coordinator, and between the coordinator and end devices. Routers are optional. In a data center environment where obstructions are common, routers are recommended if sensors are more than 50 feet from the coordinator. Each router is powered by an AC-USB adapter connected to a power outlet, not directly connected to the NetBotz appliance.
- **End devices** monitor attached and internal sensors and send data back to the host appliance through the network. End devices are powered by batteries.

The following devices can be configured on your wireless network:

Wireless device	Network role
USB Coordinator & Router (NBWC100U)	coordinator or router
Wireless Temperature Sensor (NBWS100T)	end device
Wireless Temperature/Humidity Sensor (NBWS100H)	end device

NOTE: Each wireless device has a maximum line-of-sight range of 30.5 m (100 ft). In a data center environment where obstructions are common, a range of 15 m (50 ft) is typical.

Connect the Wireless Sensor Network

The order in which you set up your wireless sensor network and apply power to your wireless devices is important:

1. **Select the coordinator and routers:** Choose the USB Coordinator & Router that will become the coordinator. **Note the extended address of the coordinator.** Choose one or more USB Coordinator & Routers to become routers.
2. **Mount the sensors.** Choose the locations for the routers and end devices. Do not power the routers or end devices at this time.
3. **Power the coordinator first:** Connect one USB Coordinator & Router to a USB Type A port on the NetBotz appliance.
4. **Apply power to the routers:** Power each router using an AC-USB adapter, not directly connected to the NetBotz appliance.
5. **Power the end devices:** To preserve battery life, do not power the end devices until after the coordinator and the routers are powered.
6. **Configure your appliance:** See “TCP/IP Configuration Methods” on page 13, then complete the configuration of the wireless network on the Web UI of your appliance (see “Configure the Wireless Sensor Network” on page 23).

Configure the Wireless Sensor Network

The Rack Monitor 250 must be communicating on the network, and you must have access to its Web UI to configure the wireless sensor network. For information, see “Access the Rack Monitor 250” on page 18.

To configure the wireless sensor network:

1. Log in to the Rack Monitor 250 user interface, and go to **Configuration > Device > Wireless Sensor Network**.
2. Position and turn on your Wireless Temperature Sensor(s).
3. Enable Auto Join until all the wireless sensors in the network have been discovered, or click **Add New Sensor** to add sensors manually.

NOTE: You must enter the extended address (MAC) for each sensor you manually add to the network.

The wireless sensors appear in the list as they join the network. Auto Join runs for five hours, or until you end it manually.

You can add up to 47 wireless sensors without rebooting the network.

When you remove one or more wireless sensors, you must commit the sensor list to reboot the wireless network and allow it to reform. This can take several minutes.

Disabling the wireless sensor network

You can disable the wireless sensor network through the Web UI or the CLI. A reboot is required for this change to take effect, and the appliance will reboot automatically when all users have logged off.

Web UI: Go to **Configuration > Device > Wireless Sensor Network**, then select **Disable Coordinator**.

CLI: Enter `zw -wn disabled`.

NOTE: Store the USB Coordinator and the Wireless Temperature Sensor in a safe place when not in use. APC by Schneider Electric is not responsible for misplaced parts. You can purchase replacements or extra USB Coordinators (NBWC100U) and Wireless Temperature Sensors (NBWS100T) from www.apc.com.

Troubleshooting the wireless sensor network

During the boot process, the Coordinator LED activity is as follows:

- Flashes a quick green, yellow, red sequence
- Alternately flashes green and yellow for about 30 seconds
- Flashes green 3 times
- Turns solid yellow for 5 seconds
- Flashes a quick green, yellow, green sequence

NOTE: If the LED flashes red three times, then slowly flashes red, contact Technical Support.

After the boot process is complete, LED activity on the Coordinator signifies its status:

Condition	Description
Flashes green	Normal. The network was formed successfully.
Off	Forming a network or Not communicating with the Rack Monitor 250. Reboot the Coordinator.*
Solid red	Unable to form a network. Reboot the Coordinator.*

*To reboot the Coordinator, remove the plastic cover and press and hold the reset button (the LED) for no more than three seconds.

NOTE: For more information, see the *Quick Start Guide* and *Installation Manual* for your wireless device, or go to www.apc.com.

Configure Outlet-controlled Devices

This procedure applies to the alarm beacon, or any device attached to the relay output or switched outlet.

1. Connect all sensors and devices to the appropriate ports (see “Connect Sensors and Devices” on page 10).
2. Configure sensor warning thresholds. See the *User Guide* on www.apc.com for details.
3. Go to **Configuration > Device > Outputs**, and select the port or outlet to which your device is connected.
4. Configure the device to activate when sensors generate specific alarms. See the *User Guide* on www.apc.com for details.

Specifications

NetBotz Rack Monitor 250 (NBRK0250)

Electrical

Input voltage, nominal, for AC Line Inlet	100–240 VAC; 50/60 Hz
Maximum total current draw for AC Line Inlet	10 A (defined by Switched Outlet load + 0.25 A)
Maximum output voltage for Switched Outlet	Defined by input voltage
Maximum output current for Switched Outlet	10 A (defined by Switched Outlet load)
Voltage for Voltage Output contacts	12 VDC, 24 VDC
Current for Voltage Output contacts	75 mA total for 12 V and 24 V load
Current capacity of Relay Output contacts	1 A, 30 V AC/DC (rated for Class 2 circuits only)

Physical

Dimensions (H x W x D)	43.6 x 431.8 x 59.2 mm (1.72 x 17.00 x 2.33 in.)
Shipping dimensions (H x W x D)	67 x 450 x 225 mm (2.6 x 17.8 x 8.9 in.)
Weight	1.26 kg (2.80 lb)
Shipping weight	3.00 kg (6.50 lb)

Environmental

Elevation (above MSL) Operating Storage	0 to 3000 m (0 to 10,000 ft) 0 to 15 000 m (0 to 50,000 ft)
Temperature Operating Storage	0 to 45°C (32 to 113°F) –15 to 65°C (5 to 149°F)
Humidity Operating Storage	0 to 95%, non-condensing 0 to 95%, non-condensing

Performance

Typical Rack Monitor 250 response time for dry contact sensor or door switch sensor state changes	200 ms
---	--------

Compliance

- CE
 - UL listed to 60950-1 and CSA C22.2 No 950
 - TUV tested to IEC 60950–1, 2nd ed.,am1;am2
 - ICES-003:2012
 - AS/NZS CISPR 22
 - VCCI V-3:2015
 - FCC 47 CFR Part 15 Radiated Emissions
 - FCC 47 CFR Part 15 Conducted Emissions
 - EN 55022:2010+AC:2011, Class A
 - EN 55024:2010
 - EN 61000-3-2
 - EN 61000-3-3
 - EN 61000-4-2
 - EN 61000-4-3
 - EN 61000-4-4
 - EN 61000-4-5
 - EN 61000-4-6
 - EN 61000-4-8
 - EN 61000-4-11
-

Wireless Compliance

- CE
 - EMC Directive 2004/108/EC
 - RED Directive 2014/53/EU
 - Canadian ICES-003
 - US FCC 47 CFR Part 15
 - IC: 3351C-NBWC100U
 - FCC ID:SNSNBWC100U
-

Temperature/Humidity Sensor (AP9335TH)

Specifications

Temperature accuracy	±1°C (± 2°F), from 0 to 40°C (32 to 104°F)
Humidity accuracy	± 4% RH, 20 to 90% RH, at 25°C (77°F)
	± 8% RH, 30 to 80% RH, from 15 to 30°C (59 to 95°F)
Sensor operating temperature	–10 to 70°C (14 to 159°F)
Cable length	4 m (13 ft)

System Specifications

A-Link

Maximum combined length of all A-Link cables	1000 m (3,280 ft)
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Maximum number of NetBotz Rack Sensor Pod 150s that can be cascaded on the A-Link bus†	six (6)
--	---------

Maximum number of sensors (Temperature/Humidity Sensors with Digital Display [AP9520TH]) that can be cascaded on the A-Link bus†	eight (8)
--	-----------

Temperature/Humidity Sensor (AP9335TH), Temperature Sensor (AP9335T)

Maximum length of cable	15 m (50 ft)
-------------------------	--------------

Beacon

Maximum length of cable	100 m (330 ft)
-------------------------	----------------

NetBotz Dry Contact Cable (NBES0304), NetBotz 3.65 m (12 ft) Door Switch Sensor for APC Racks (NBES0303), NetBotz 15.24 m (50 ft) Door Switch Sensor for Rooms or Third Party Racks (NBES0302)

Maximum length of cable	30.48 m (100 ft)
-------------------------	------------------

Handles

Maximum length of cable	100 m (330 ft)
-------------------------	----------------

Door switches

Maximum length of cable	100 m (330 ft)
-------------------------	----------------

Gap distance	Less than 1 in. (2.54 cm) in air
--------------	----------------------------------

†If several devices (NetBotz Rack Sensor Pod 150s [NBPD0150], and Temperature/Humidity Sensors with Digital Display [AP9520TH]) are cascaded on the A-Link bus, a supplemental power supply (Power Supply 100–240 VAC/24 VDC—AP9505i) is required. The power supply connects to the 24 VDC Input on a NetBotz Rack Sensor Pod 150. Go to www.apc.com for more information.

Two-Year Factory Warranty

This warranty applies only to the products you purchase for your use in accordance with this manual.

Terms of warranty

APC by Schneider Electric warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. APC by Schneider Electric will repair or replace defective products covered by this warranty. This warranty does not apply to equipment that has been damaged by accident, negligence or misapplication or has been altered or modified in any way. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory-remanufactured.

Non-transferable warranty

This warranty extends only to the original purchaser who must have properly registered the product. The product may be registered at the APC by Schneider Electric website, www.apc.com.

Exclusions

APC by Schneider Electric shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user's or any third person's misuse, negligence, improper installation or testing. Further, APC by Schneider Electric shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC by Schneider Electric recommendations or specifications or in any event if the APC by Schneider Electric serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

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Warranty claims

Customers with warranty claims issues may access the APC by Schneider Electric customer support network through the Support page of the APC by Schneider Electric website, www.apc.com/support. Select your country from the country selection pull-down menu at the top of the Web page. Select the Support tab to obtain contact information for customer support in your region.

Radio Frequency Interference

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

USA—FCC

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.

NOTE: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. such modifications could void the user's authority to operate the equipment

FCC ID: SNSNBWC100U

Canada—ICES

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC: 3351C-NBWC100U

European Union

The wireless USB Coordinator with this product is in conformity with the requirements of EU Council Radio Equipment Directive 2014/53/EU.

This product is in conformity with the requirements of EU Council Directive 2014/53/EU. This product may cause radio interference in which case the user may be required to take adequate measures. APC by Schneider Electric cannot accept responsibility for any failure to satisfy the protection requirements resulting from an unapproved modification of the product.

Worldwide Customer Support

Customer support is available at www.apc.com.

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