Schneider Electric

Installation Guide

NetBotz®
USB Coordinator
& Router

NBWC100U

Contents

NetBotz USB Coordinator & Router Installation

Introduction

Product description

The NetBotz® USB Coordinator & Router connects to a NetBotz appliance and allows you to monitor the temperature and humidity in your data center using the NetBotz Wireless Temperature Sensor (NBWS100T and NBWS100H). Additionally, you can use a Wireless Sensor Pod 180 (NBPD0180) to monitor multiple temperature readings and rack door access.

The USB Coordinator & Router can be configured as the Coordinator or as a Router in your wireless sensor network. The USB Coordinator & Routers, and any End Devices in the network, are monitored by a single NetBotz appliance.

> ⚠ **Warning:** The USB Coordinator & Router requires a minimum of BotzWare v4.4 and NetBotz Advanced View v4.4. To upgrade, use the **Upgrade** icon in your NetBotz appliance Advanced View, or visit the APC web site.

ZigBee® Certified. The USB Coordinator & Router is ZigBee Certified. ZigBee is a wireless mesh networking standard for low-power applications. Schneider Electric is a member of the ZigBee Alliance.

Full information on the ZigBee standard can be found at the ZigBee Alliance website: http://www.zigbee.org.

Document overview

The *NetBotz USB Coordinator & Router Installation Guide* describes how to install the USB Coordinator & Router, and configure its settings. Specific instructions on installing other devices on the wireless sensor network are in the installation instructions for each device.

Additional documentation

Unless otherwise noted, the following documentation is available on the CD provided with the NetBotz appliance, or on the applicable product page on the APC Web site, **www.apc.com**. To quickly find a product page, enter the product name or part number in the Search field.

NetBotz Appliance User's Guide – Includes all details for using, managing, and configuring a NetBotz system with one of the following appliances: NetBotz Room Monitor 455 (NBWL0455, NBWL0456), NetBotz Rack Monitor 450 (NBRK0450), NetBotz Rack Monitor 550 (NBRK0550), or NetBotz Rack Monitor 570 (NBRK0570).

Supported appliances

You can connect the USB Coordinator & Router to a wireless sensor network on any of the following appliances:

- NetBotz Rack Monitor 450 (NBRK0450)
- NetBotz Room Monitor 455 (NBWL0455, NBWL0456)
- NetBotz Rack Monitor 550 (NBRK0550)
- NetBotz Rack Monitor 570 (NBRK0570)

The NetBotz Rack Monitor 450 appliance supports a total of **26** wireless devices on the wireless sensor network.

The NetBotz Room Monitor 455, NetBotz Rack Monitor 550, and NetBotz Rack Monitor 570 appliances support a total of **48** wireless devices on the wireless sensor network.

Supported devices on the NetBotz wireless network

The following wireless devices can be configured as a Coordinator or a Router:

Sensor Name	Range	Part Number
NetBotz USB Coordinator & Router	100 ft - line of sight	NBWC100U
NetBotz Wireless Sensor Pod 180	100 ft - line of sight	NBPD0180

The following wireless devices can be configured as an End Device:

Sensor Name	Range	Part Number
NetBotz Temperature Sensor	100 ft - line of sight	NBWS100T NBWS100H
NetBotz Wireless Sensor Pod 180	100 ft - line of sight	NBPD0180

⚠️ **Warning:** Only the devices listed above are compatible with the USB Coordinator & Router. Other devices will not function and may damage the device**.**

Physical Description
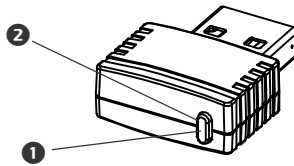
	Item	Description
❶	Status LED	Signifies the mode and the current state of the USB Coordinator & Router
❷	Reset button	Used to reboot the USB Coordinator & Router or reset it to factory defaults

Inventory

Inspect the contents of the package to ensure that the parts included match those shown below. Report missing or damaged contents to Schneider Electric or your 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.
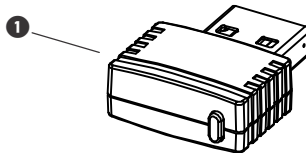
Item	Description
❶	NetBotz USB Coordinator & Router
	AC-USB adapter (not shown)
	Literature kit (not shown)

Components of the Wireless Sensor Network

The USB Coordinator & Router can be configured to act in two different modes on a wireless sensor network: Coordinator or Router. The mode of a USB Coordinator & Router is determined by the manner in which power is supplied to the device. The factory default is Router mode.

Host Appliance. A wireless sensor network is monitored by a single NetBotz appliance, listed in "Supported appliances" on page 2. The appliance collects data from the wireless sensor network, and generates alerts based on sensor thresholds.

The host appliance supports a total of **26** or **48** wireless devices on the wireless sensor network. For more information, see "Supported devices on the NetBotz wireless network" on page 2.

Coordinator. Each NetBotz host appliance and wireless sensor network must have one and only one Coordinator. The Coordinator is connected directly to the host appliance via USB. It reports data from the sensors on the network, and provides firmware updates to the wireless network, when available. Once it is connected to the USB Type A port on the NetBotz appliance, the USB Coordinator & Router is automatically configured as the Coordinator on your wireless sensor network.

Note: If a Wireless Sensor Pod 180 is used as the Coordinator, it must be configured as a serial device on the host appliance through the Wireless Sensor Setup task in the Advanced View interface.

Router. The factory default for the USB Coordinator & Router is Router mode. A USB Coordinator & Router configured as a Router extends the range of the wireless sensor network and passes information back and forth from the Coordinator to the End Devices, and from itself to the Coordinator. A wireless sensor network can contain multiple Routers; one Router for every three racks is recommended.

A USB Coordinator & Router, or a Wireless Sensor Pod 180, powered by an AC-USB adapter, not attached to the NetBotz appliance, is automatically configured as a Router.

If a USB Coordinator & Router has previously been configured as a Coordinator, you must first reset it to factory defaults before powering it as a Router. See "Using the Reset Button" on page 13.

End Device. An End Device monitors attached and internal sensors and sends data back to the monitoring appliance through the network. A Wireless Temperature Sensor, or a Wireless Sensor Pod 180 powered by batteries, is automatically configured as an End Device.

Note: For information about using the Wireless Temperature Sensor or the Wireless Sensor Pod 180 on your wireless network, see the installation manual that came with the product.

Installing the Wireless Sensor Network

Overview

The order in which you power and configure your wireless network is important. For best results, power and configure your wireless network as follows:

Scan the extended address (MAC) of each USB Coordinator & Router. You can use a hand-held USB scanner with document capture capabilities to scan the **MAC address** bar code on the label packaged with each USB Coordinator & Router, or the QR code on each Wireless Temperature Sensor or Wireless Sensor Pod 180, directly into the "Add Addresses" dialog, accessed from the *Wireless Sensor Setup* task in the Advanced View.

Alternatively, you can use any bar code or QR code scanner to save a list of MAC addresses to a text file, one address per line, and copy and paste it into the dialog, or enter the MAC addresses manually.

Some QR code scanners return the part number, serial number, and MAC address on one line:
XN:NBWC100U%SN:XXXXXX123456%MAC:**00C0B70000XXXXXX**.
To add a device to your wireless network, enter **only** the alphanumeric MAC address of each device in the "Add Addresses" dialog in the Advanced View.

Once the MAC addresses have been added to the list, you must click **Apply Commission List** to save the list to the NetBotz appliance.

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.

Mount the sensors. Choose the locations for the Routers (USB Coordinator & Router or Wireless Sensor Pod 180) and End Devices (Wireless Temperature Sensor or Wireless Sensor Pod 180). **Do not power the Routers or End Devices at this time.**

Note: For information about mounting the Wireless Temperature Sensor or Wireless Sensor Pod 180, see the manual that came with the device.

Power the Coordinator. Power the Coordinator **FIRST**. Connect **one and only one** USB Coordinator & Router to a USB Type A port on the NetBotz appliance.

Power the Routers. Power each Router using the included AC-USB adapter, not directly connected to the NetBotz appliance.

Power the End Devices. To power the Wireless Temperature Sensor, turn it on using the rocker switch on its side. To power the Wireless Sensor Pod 180, insert the included batteries. To preserve battery life, do not power the End Devices until after the Coordinator and the Routers are powered.

Note: For information about powering the Wireless Temperature Sensor or Wireless Sensor 180, see the manual that came with the device.

Scanning with a USB scanner

When you use a USB scanner, the extended address (MAC) of each USB Coordinator & Router will appear in the list in Advanced View in the correct format.

1. Attach a hand-held USB scanner to a computer running the NetBotz Advanced View.
2. With the Advanced View open to the "Add Addresses" dialog in the *Wireless Sensor Setup* task, scan the **MAC address** bar code on the label packaged with each USB Coordinator & Router.
3. Click **Apply Commission List** to save the list to the NetBotz appliance.

Note: Depending on the appliance model, you can add up to **26** or up to **48** wireless devices on the wireless sensor network, including the Coordinator and Routers. For more information, see "Supported devices on the NetBotz wireless network" on page 2.

Positioning the USB Coordinator & Router

When planning your installation locations, be sure to place each USB Coordinator & Router within range of the Coordinator or another Router. The maximum wireless range of the USB Coordinator & Router is 100 ft (line of sight). This range is a best-case scenario and the signal will be strongly affected by environmental interference. Use the RSSI sensor reading (available in the device's sensor listing in Advanced View) to tune device placement.

To improve connection strength, it is recommended to use a Router in every third rack to boost reception.

The recommended minimum distance between wireless devices is 2 ft.

Additional information on device placement may be found on the APC Knowledge Base, http://www.apc.com/support/answers.cfm.

Note: Install the USB Coordinator & Router in an environment compatible with the environmental specifications on page 16.

Powering the Coordinator

Power the Coordinator first. Connect one and only one Coordinator to a USB Type A port on the NetBotz appliance. The USB Coordinator & Router will be automatically configured in Advanced View as the Coordinator on your wireless sensor network.

Once the Coordinator is running, the other devices in the wireless sensor network will join the network automatically as long as their extended addresses are in the commission list, and they are powered.

To allow multiple wireless sensor networks to exist independently in the same area, the extended addresses in a commission list must not exist in another NetBotz appliance commission list.

Disconnecting a Coordinator

When you disconnect the Coordinator from the host appliance, all of the sensors on the wireless sensor network display as off line. When you reconnect the same Coordinator, the wireless network will restart, and the sensors on the network will begin reporting data again.

If you want to connect a different USB Coordinator & Router to the host appliance to become the Coordinator, you must FIRST remove the extended address of the previous Coordinator from the commission list. The sensor history of the devices in the wireless sensor network will not be affected.

To remove the Coordinator from the commission list:

1. Open the Wireless Sensor Setup task in the Advanced View.
2. Click **Safely Remove Coordinator** (available for the USB Coordinator & Router only).
3. Select the extended address (MAC) of the Coordinator.
4. Click **Remove** to remove the Coordinator's MAC address from the list.
5. Click **Apply Commission List** to save the list to the NetBotz appliance.

To remove the disconnected Coordinator from the Advanced View:

1. Right-click the disconnected Coordinator in the Navigation pane.
2. Select "Delete Pod".

To add a different device to become the Coordinator:

1. Connect a USB Coordinator & Router or Wireless Sensor Pod 180 to a USB Type A port on the NetBotz appliance.
2. Click **Add**.
3. Enter the extended address (MAC) of the new Coordinator.
4. Click **Apply Commission List** to save the list to the NetBotz appliance.
5. If a Wireless Sensor Pod 180 is used as the new Coordinator, click **Configure Coordinator** to identify its serial port ID and specify its port label.

Powering the Router

A USB Coordinator & Router must be connected to an AC-USB power source to become a Router. Once its extended address is added to the commission list in the Advanced View, and power is applied, it is automatically configured as a Router.

> **Warning: Do not use a NetBotz appliance as the USB power source for a Router device.**

To configure a USB Coordinator & Router as a Router:

1. Ensure its extended address is added to the commission list in the Advanced View.
2. Plug it into the included AC-USB power source.

> **Note:** Do not power the Router from a USB port on a server or a device that may attempt enumeration.

Sensor listing

When a Router is selected in the Navigation Pane in Advanced View, the following sensor is listed in the Sensor Pane:

Sensor	Description
RSSI	The Received Signal Strength Indicator. This indicates the strength of the signal the Router receives from its parent (either another Router or the Coordinator). A reading above 30% RSSI is ideal.

LED activity

The LED on the USB Coordinator & Router flashes to indicate certain statuses or alerts.

Boot process

LED Activity	Meaning
Flashes a quick green, yellow, red sequence	Power on
Alternately flashes green and yellow for about 45 seconds	Runtime check
Flashes green three times	Check OK
Turns solid yellow for 5 seconds	Firmware update check
Flashes a quick green, yellow, green sequence	Application started

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 USB Coordinator & Router signifies the following:

Coordinator LED activity

LED Activity	Meaning
Flashing green	Normal status The network was formed successfully.
Off	Forming a network
Solid green	Joined another network as a Router.
Solid red	Unable to form a network due to wireless energy interference. Relocate the Coordinator.

Router LED activity

LED Activity	Meaning
Solid green	Normal Status - network present
Solid yellow	Searching for network
Off	The pod was previously configured as a Coordinator. Reset the sensor pod to factory defaults.

To limit traffic on the network, the Router will attempt to rejoin the network after waiting the following number of seconds: 5, 15, 30, 60, 120, 300.

If the attempts to rejoin the network fail, the Router will scan the network every 300 seconds + a random number of seconds. This additional random time prevents multiple Routers from attempting to connect at the same time.

Using the Reset Button

Overview

The reset button on the front of the USB Coordinator & Router is used to reboot it, or reset it to the factory default settings.

Reboot. When the reset button is given a short press (less than 3 seconds), the Status LED flashes green, and the sensor reboots with the current settings in place.

Reset to factory defaults. Press and hold the reset button for at least 5 seconds. The Status LED flashes green, and after about three seconds, changes to solid red until the button is released. The sensor will reset, erase its current settings, and restore the factory default settings.
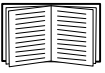
Note: During the initial 45-second startup time, the Reset button is disabled. Once startup is complete, the button functions normally.

Monitoring the USB Coordinator & Router

Overview

Once your wireless sensor network is installed and receiving power, you can begin monitoring your system using the software interface for the appliance.

See your appliance installation and quick configuration manual for system installation details and for instructions on accessing the software interface of the appliance.

Sensor listing

When a USB Coordinator & Router is selected in the Navigation Pane in Advanced View, the following sensor is listed in the Sensor Pane (Router mode only):

Sensor	Description
RSSI	The Received Signal Strength Indicator. This indicates the strength of the signal the Router receives from its parent (either another Router or the Coordinator). A reading above 30% RSSI is ideal.

Receiving and sending data

The USB Coordinator & Router passes data back and forth between the host appliance and any Routers or End Devices on the wireless sensor network as necessary.

If there is a significant change, each End Device sends its own data every 30 seconds. If there is no change, the End Device waits up to three (3) minutes before sending sensor data to indicate it is still alive.

End Devices do not extend the wireless network or pass data to other End Devices on the network.

Updating the USB Coordinator & Router

Firmware updates for the USB Coordinator & Router are included in the Botzware firmware releases. When a Botzware firmware update is available, you download it from the APC website and install it on the NetBotz appliance.

Once the Botzware firmware update is applied, and the Coordinator receives the firmware update package from the NetBotz appliance, the other devices on the wireless network, including any USB Coordinator & Router, Wireless Temperature Sensor, and Wireless Sensor Pod 180 devices, receive the update package from the Coordinator over the wireless network.

When all the devices on the network have received the update package, the Firmware Update Available button is activated in the Wireless Sensor Setup task in the Advanced View. You click the button to reboot each device on the wireless network to apply the firmware update.

Cleaning the USB Coordinator & Router

To clean the device, gently wipe surfaces with a clean, dry cloth.

Specifications

Electrical

Input voltage, nominal	5V USB
Maximum total current draw	33mA USB

Physical

Dimensions (H x W x D)	8.75 x 20.7 x 26.8 mm (0.34 x 0.81 x 1.05 in)
Shipping dimensions (H x W x D)	230.0 x 165.0 x 48.0 mm (9.0 x 6.5 x 2.0 in)
Weight with AC-USB adapter	0.0032 kg (0.0071 lb) 0.069 kg (0.152 lb)
Shipping weight	0.145 kg (0.32 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 45ºC (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

Compliance

Immunity/Emissions	CE, EMC Directive 2004/108/EC, R&TTE Directive 1999/5/EC, Canadian ICES-003, US FCC 47 CFR Part 15

Two Year Limited Factory Warranty

Schneider Electric IT Corporation (SEIT), warrants its products to be free from defects in materials and workmanship for a period of two (2) years excluding the batteries. The SEIT obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. Repair or replacement of a defective product or parts thereof does not extend the original warranty period.

This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase. Products may be registered online at warranty.apc.com.

SEIT 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, testing, operation or use of the product contrary to SEIT's recommendations or specifications. Further, SEIT shall not be liable for defects resulting from: 1) unauthorized attempts to repair or modify the product, 2) incorrect or inadequate electrical voltage or connection, 3) inappropriate on site operation conditions, 4) Acts of God, 5) exposure to the elements, or 6) theft. In no event shall SEIT have any liability under this warranty for any product where the serial number has been altered, defaced, or removed.

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To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support. Customers with warranty claims issues may access the SEIT worldwide customer support network through the SEIT Web site: **www.apc.com**. Select your country from the country selection drop down menu. Open the Support tab at the top of the web page to obtain information for customer support in your region. Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase.

Obtaining service

To obtain support for problems with your NetBotz USB Coordinator & Router:

1. Note the serial number. The serial number is printed on the label on the back of the device.
2. Contact Customer Support using the information on the back cover of this manual. A technician will try to help you solve the problem by phone.
3. If you must return the product, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement.
4. Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
5. Mark the RMA number clearly on the outside of the shipping carton.
6. Ship by insured, prepaid carrier to the address provided by the Customer Support technician.

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

This product's transmitter is in conformity with the requirements of EU Council Directive 199/5/EC on the approximation of the laws of the Member States relating to Radio and Telecommunications Terminal Equipment (R&TTE). This product may cause radio interference in which case the user may be required to take adequate measures.

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Schneider Electric cannot accept responsibility for any failure to satisfy the protection requirements resulting from an unapproved modification of the product.

Schneider Electric IT Worldwide Customer Support

Customer support for this product is available at no charge in any of the following ways:

- Visit the SEIT web site to access documents in the Knowledge Base and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)
    Connect to localized web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**
    Global support searching the Knowledge Base and using e-support.
- Contact the Customer Care Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

For information on how to obtain local customer support, contact the Schneider Electric representative or other distributors from whom you purchased your Schneider Electric product.