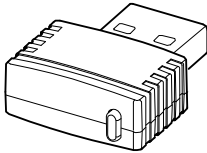# Installation Manual

NetBotz®

USB Coordinator & Router

NBWC100U

990-5333D-001

Publication Date: February 2021

APC
TM
by Schneider Electric

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Contents

Introduction

The NetBotz® USB Coordinator & Router connects to a NetBotz appliance and allows your NetBotz appliance (the Rack Monitor or Room Monitor) to monitor wireless sensors via a wireless sensor network.

NOTE: On NetBotz 4.x appliances, the USB Coordinator & Router requires a minimum of BotzWare v4.4 and NetBotz Advanced View v4.4. To update, use the **Upgrade** icon in your NetBotz appliance Advanced View, or visit **www.apc.com**.

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: **www.zigbee.org**.

Document overview

The *NetBotz USB Coordinator & Router Installation Manual* 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

The following documentation is available on applicable product pages of **www.apc.com**. To find a product page, enter the product name or part number in the Search field.

NetBotz appliance installation manuals. The USB Coordinator and Router is compatible with most NetBotz appliances. If applicable, the *Installation Manual* for an appliance provides the location of ports for the USB Coordinator and Router and information about wireless network setup.

NetBotz Appliance User Guides. The *User Guide* for each NetBotz appliance provides detailed information on how to set up and manage a wireless sensor network through the appliance interfaces.

Documentation is updated regularly. Check the website, **www.apc.com**, for updates to the documentation.

Compatible appliances

- NetBotz Rack Monitor 750 (NBRK0750)
- NetBotz Room Monitor 755 (NBWL0755)
- NetBotz Rack Monitor 250 (NBRK0250)
- NetBotz Rack Monitor 550/570 (NBRK0550/NBRK0570)
- NetBotz Room Monitor 455 (NBWL0455)

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.
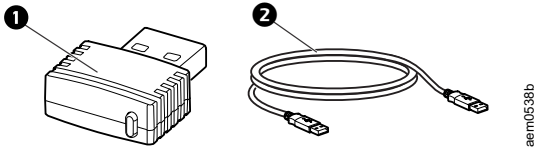
Item	Description
❶	NetBotz USB Coordinator & Router
❷	USB-A extender cable
	AC-USB adapter (not shown)

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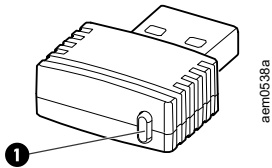
Item		Description
❶	Status LED/ Reset button	• Signifies the mode and the current state of the USB Coordinator & Router • Used to reboot the USB Coordinator & Router or reset it to factory defaults

The Wireless Sensor Network

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 how 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. The appliance collects data from the wireless sensor network, and generates alerts based on sensor thresholds.

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

Coordinator. If the USB Coordinator and router is connected to a USB type A port on a NetBotz appliance, it is automatically configured as a coordinator. The coordinator reports data from the sensors on the network and provides available firmware updates to the wireless network. Each wireless sensor network must have only one coordinator.

Router. 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.

A USB Coordinator & Router powered by an AC-USB adapter—one 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 reset it to factory defaults before powering it as a router. See "Using the Reset Button" on page 7.

End device. End devices monitor attached and internal sensors and send data back to the host appliance through the network. End devices are powered by batteries. See "Supported devices on the wireless network" on page 3for a list of available end devices.

Supported devices on the wireless sensor network

NOTICE
Only the devices listed here are compatible with the USB Coordinator & Router. Other devices will not function and may damage the USB Coordinator and Router**.**

The following devices can be configured on your wireless sensor network:

Wireless device	Network role
USB Coordinator & Router (NBWC100U)	coordinator when connected to the appliance router when powered by an AC-USB adapter
Wireless Temperature Sensor (NBWS100T)	end device
Wireless Temperature/Humidity Sensor (NBWS100H)	end device

Positioning wireless devices

When you plan the sensor locations, be sure to place each USB Coordinator & Router within range of the coordinator or another router.

Wireless devices have a maximum, line-of-sight range of 30.5 m (100 ft). This range is a best-case scenario, and the signal will be strongly affected by environmental interference. In a data center environment where obstructions are common, a range of 15 m (50 ft) is typical. Routers are recommended if sensors are more than 15 m (50 ft) from the coordinator. The recommended minimum distance between wireless devices is 2 ft.

It is recommended that you mount the routers and coordinator above the racks to reduce physical obstructions and increase signal coverage. Mounting the routers 3–4.5 m (10–15 ft) away from the coordinator also helps to increase the signal range.

You can use the USB-A extender cable to place the wireless coordinator on top of the rack or in a cable tray above the rack as needed.

In the appliance interfaces, you can use the RSSI reading for wireless devices to tune device placement (see "Monitoring the wireless sensor network" on page 6). If the RSSI is still below 80 after adjusting the router placement, consider mounting the end devices on the outside of the rack to reduce physical obstructions to the network.

See additional information on device placement in the Frequently Asked Questions (FAQs) at **www.apc.com/us/ en/faqs/home**, or go to **www.apc.com** and select **Support > Resources and Tools > FAQS**.

NOTE: Install the USB Coordinator & Router in an environment compatible with the environmental specifications on page 9.
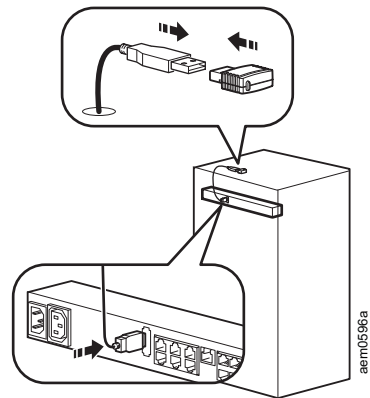
Installing the wireless sensor network

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

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.
   NOTE: Some NetBotz appliances come with a coordinator connected to the wireless port. The coordinator is powered when the appliance is turned on.
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. Power the routers. Connect each router to the included AC-USB adapter, not the NetBotz appliance.
   NOTE: Do not power a router from a USB port on a server or a device that may attempt enumeration.

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. Follow the instructions in your appliances *User Guide* to add wireless devices to the wireless sensor network.

Wireless devices will join the wireless sensor network automatically as long as their extended addresses are in the commission list, they are powered, and the coordinator is operating.

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.

For detailed information about installing and configuring your wireless devices, see the installation manual for each device.

Adding sensors to the wireless sensor network

Depending on the NetBotz appliance, you may be able to add wireless sensors to the network in any or all of the following ways:

- Enter the MAC addresses for the wireless sensors manually.
- 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 sensor list.
- Use a hand-held USB scanner to manually scan the MAC address bar code on the USB Coordinator & Router label directly into the sensor list.
- Once the coordinator is connected to the appliance, allow powered wireless devices to automatically join and form the network using Auto Join.

NOTE: Some bar code and QR code scanners return the part number, serial number, and MAC address on one line. To add a device to your wireless network, enter only the alphanumeric MAC address of each device. For example, you would only enter the bolded numerals in the line below:
XN:NBWC100U%SN:XXXXXX123456%MAC:**00C0B70000XXXXXX**

For more information on the wireless sensor network, see the documentation for your NetBotz appliance.

Monitoring the wireless sensor network

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's documentation for system installation details and for instructions on accessing the software interface of the appliance.

RSSI. The Received Signal Strength Indicator (RSSI) is a measurement that appears for wireless devices in the interface of your host appliance. This indicates the strength of the signal the wireless device receives from its parent (either a router or the coordinator). A reading above 30% RSSI is ideal.

RSSI is not measured for the coordinator, which is connected directly to the appliance.

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 in sensor readings, each end device sends its own data every 30 seconds. If there is no change, the end device waits up to three minutes before sending sensor data to indicate it is still operational.

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

LED Activity

Status LED activity varies depending on whether the USB Coordinator and Router is starting up (boot process), acting as a coordinator, or acting as a router.

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 at **www.apc.com**.

After the boot process is complete:

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

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. Press the reset button for 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 at first. After about three seconds, it changes to solid red until the button is released. The USB Coordinator and Router 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.

Disconnecting the Coordinator

When you remove the coordinator from the host appliance, all of the sensors on the wireless sensor network will go 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, 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.

Restarting the wireless network can take up to 20 minutes if a new channel is selected. The sensors do not report data during this time.

For more information, see the *User Guide* for your NetBotz appliance on **www.apc.com**.

Updating the USB Coordinator & Router Firmware

NetBotz v4.4.x and above

Firmware updates for the USB Coordinator & Router are included in the BotzWare firmware releases. When a BotzWare firmware update is available, you can download it from **www.apc.com** and install it on the NetBotz appliance.

Once the BotzWare firmware update is applied, the coordinator receives the firmware update package from the NetBotz appliance. Then the other devices on the wireless network 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. Click the button to reboot each device on the wireless network and apply the firmware update.

NOTE: You can also use the NetBotz Wireless Firmware Update Utility available on **www.apc.com** to update the firmware on your wireless sensors.

NetBotz Rack Monitor 250, 750, and 755

These NetBotz appliances do not use BotzWare.

To update wireless firmware on a NetBotz Rack Monitor 250, download the NetBotz Wireless Firmware Update Utility on **www.apc.com.**

Wireless device firmware for the NetBotz Rack Monitor 750 and Room Monitor 755 are included with the appliance firmware. Follow the instructions provided in the NetBotz 5.x *User Guide* on **www.apc.com** to update the firmware for wireless devices.

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	33 mA 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)	235.0 x 143.0 x 81.0 mm (9.2 x 5.6 x 3.2 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 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

Compliance

	CE, RED 2014/53/EU, Canadian ICES-003, US FCC 47 CFR Part 15

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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. Go to **www.apc.com** and select **Support**. A technician will try to help you solve the problem.

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 RED 2014/53/EU on the approximation of the laws of the Member States. This product may cause radio interference in which case the user may be required to take adequate measures.

Japan

This radio equipment is accredited in accordance with the Japanese Radio Law Article 38, Section 24(1).

工 事 設 計 認 証 書

Certificate of construction type

申　　　　　請　　　　　者 Applicant	シュナイダーエレクトリック株式会社
特 定 無 線 設 備 の 種 別 Type of specified radio equipment	証明規則第2条第1項第19号の無線設備
電 波 の 型 式 、 周 波 数 及 び 空 中 線 電 力 Types of radio wave, Frequency and Antenna power	G1D 2405～2475MHz（5MHz間隔 15波） 0.0007W
型　　式　　又　　は　　名　　称 Type of specified radio equipment	NetBotz Wireless Router and Coordinator
認　　　　　証　　　　　番　　　　　号 The number of construction design certificate	010-100154
認　証　を　し　た　年　月　日 Date of certified	平成27年1月27日 27th January,2015
備　　　　　　　　　　　　　　　考 Remark	Model Name： NBWC100U

Russia

EAC

Australia

Brazil

ANATEL

Agência Nacional de Telecomunicações

MODELO: NBWC100U
05272-16-10099

"Este equipamento opera em caráter secundário, isto é, não tem direito à proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário."

Worldwide Customer Support

Customer support for this product is available at **www.apc.com**.