Installation Manual

NetBotz®

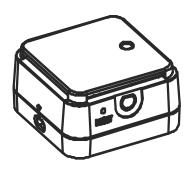
Wireless Temperature Sensor

NBWS100T

NBWS100H

990-5327C-001

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Introduction

The NetBotz[®] Wireless Temperature Sensor connects to a NetBotz wireless sensor network, allowing you to monitor the temperature (NBWS100T) or the temperature and humidity (NBWS100H) in your data center.

NOTICE: The Wireless Temperature Sensor 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 Wireless Temperature Sensor 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 Wireless Temperature Sensor Installation Guide describes how to install the Wireless Temperature Sensor, and configure its settings. Specific instructions on installing other devices on the wireless sensor network are in the installation instructions for each component.

Additional documentation

Unless otherwise noted, the following documentation is available 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 450 (NBRK0450), NetBotz Rack Monitor 550 (NBRK0550), or NetBotz Rack Monitor 570 (NBRK0570). There is a separate user's guide for the NetBotz Rack Monitor 250 (NBRK0250).

Supported appliances

The Wireless Temperature Sensor, and the other devices in the wireless sensor network, are monitored by a single NetBotz appliance. You can connect the Wireless Temperature Sensor 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)
- NetBotz Rack Monitor 250 (NBRK0250)

The NetBotz Room Monitor 455, and the NetBotz Rack Monitor 450, 550 and 570 each support total of **48** wireless devices (the Coordinator plus 47 devices) in a wireless sensor network. In NetBotz versions prior to v4.5.3, the NetBotz Rack Monitor 450 supports a total of **26** wireless devices (the Coordinator plus 25 devices) in a wireless sensor network.

Supported devices on the NetBotz wireless network

The Wireless Temperature Sensor is always configured as an End Device in your wireless sensor network.

The following wireless devices can be configured as a Coordinator or 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

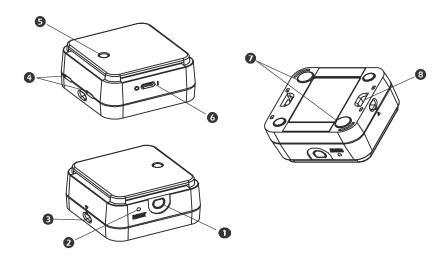
The following wireless devices can be configured as an End Device:

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

NOTICE: In a data center environment where obstructions are common, a range of 50 feet is typical.

NOTICE: Only the devices listed above are compatible with the Wireless Temperature Sensor. Other devices will not function and may damage the device.

Physical description



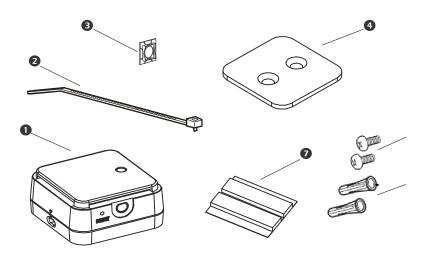
	Item	Description	
0	Covered data port	For factory use only	
2	Reset button	Used to reboot the sensor or reset the sensor to factory defaults	
₿	Side mounting slot	Used to secure the sensor with tie wraps	
0	Pry slots	Used to separate the case to replace the battery	
6	Status LED	Signifies the current state of the sensor	
0	Slide switch	Used to turn the sensor on or off	
0	Magnets	Used to mount the sensor	
8	Bottom mounting slot	Used to secure the sensor with tie wraps	

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	
0	NetBotz Wireless Temperature Sensor	
0	Tie wraps (3)	
€	3/4-in. x 3/4-in. adhesive cable tie holder (2)	
4	Wall-mounting bracket	
6	#8 x 3/4-in Phillips head screws (2)	
6	Plastic wall anchor (2)	
0	Foam adhesive strips (2)	
	Literature kit (not shown)	

Components of the wireless sensor network

Wireless sensor network. A ZigBee wireless network consisting of a host appliance, one Coordinator, and one or more devices in Router or End Device 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 **48** wireless devices on the wireless sensor network, listed in "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 its internal sensors and any attached external sensors (NBSP0180 only), and provides firmware updates to the wireless network, when available.

Router. A wireless sensor configured as a Router extends the range of the wireless sensor network and passes information back and forth from the NetBotz device to the 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.

End Device. An End Device monitors its internal sensors, and any attached sensors, and sends data back to the monitoring appliance through the network.

The Wireless Temperature Sensor is automatically configured as an End Device.

For information about using the USB Coordinator & Router or the Wireless Sensor Pod 180 on your wireless network, see the installation manual that came with the product.

Installing the wireless sensor network

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

Select the Coordinator and Routers. Choose the device that will become the Coordinator. **Note the extended address of the Coordinator**.

NOTICE: The NetBotz Rack Monitor 250 comes with the USB Coordinator & Router connected to the Wireless port. The Coordinator is powered when the appliance is turned on.

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

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

NOTICE: For the NetBotz Rack Monitor 250, use the USB Coordinator & Router connected to the Wireless port. Do not connect an additional Coordinator.

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 switch on its side. To preserve battery life, do not power the sensors until after the Coordinator and the Routers are powered.

Adding sensors to the wireless network

Depending on the NetBotz appliance, you can add wireless sensors to the network in the following ways:

- · Enter the MAC addresses for the wireless sensors manually.
- Use any barcode 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, or the QR code on the Wireless Temperature Sensor or Wireless Sensor Pod 180, 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.

NOTICE: Some bar code and 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.

For more information, see the documentation for your NetBotz appliance.

LED activity

The LED on the sensor blinks to indicate certain statuses or alerts.

During the boot process, LED activity on the Wireless Temperature Sensor is as follows:

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	Ready to attempt to join the network

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

The following table lists possible LED activity and its meaning:

LED Activity	Meaning
Flashes yellow twice every 2 seconds	Searching for network
Turns solid green, then turns off	Joined the network
Off	Joined the network Has not joined the network, and is conserving battery power.

To conserve power, the sensor will attempt to join the network after waiting the following number of seconds: 5, 15, 30, 60, 120, 300, 300, 600, 600, 1200.

If the attempts to rejoin the network fail, the sensor will scan the network every six hours to re-try the connection. If it cannot join the network after approximately 24 hours, it will reboot, and attempt to join the network again, repeating the wait interval starting at 5 seconds, until it joins the network.

To force an attempt to join the network, press the reset button.

Using the Reset Button

Overview

The reset button on the side of the Wireless Temperature Sensor is used to reboot the sensor, or reset the sensor 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 Wireless Temperature Sensor

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 Wireless Temperature Sensor is selected in the Navigation Pane in Advanced View, the following sensors are listed in the Sensor Pane:

Sensor	Description	
Temperature	The temperature sensor reading.	
Humidity	The humidity sensor reading (NBWS100H only)	
Battery	The voltage of the battery.	
RSSI	The Received Signal Strength Indicator. This lists the strength of the wireless signal between the sensor and the Router or Coordinator to which it sends data. A reading above 30% is ideal.	

Receiving and sending data

The Coordinator on the wireless sensor network 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 change of 1°C or 1% RH or more, each Wireless Temperature Sensor sends its own data every 30 seconds. If there is no change, the Wireless Temperature Sensor waits up to three (3) minutes before sending sensor data to indicate it is still alive.

The Wireless Temperature Sensor does not extend the wireless network or pass data to other Wireless Temperature Sensors, or other End Devices on the network.

Updating the Wireless Temperature Sensor

NetBotz v4.4.x and above

Firmware updates for the Wireless Temperature Sensor 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.

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

NetBotz Rack Monitor 250 only

The NetBotz Rack Monitor 250 does not run BotzWare. To update the firmware for the USB Coordinator & Router and other wireless sensors on the Rack Monitor 250 wireless network, download the NetBotz Wireless Firmware Update Utility on apc.com.

Mounting the Wireless Temperature Sensor

When planning your installation locations, be sure to place each Wireless Temperature Sensor within range of a Router or a Coordinator device. The maximum wireless range of the Wireless Temperature Sensor is 75 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.

Choose the option below that fits your installation location.

NOTICE: Install the Wireless Temperature Sensor in an environment compatible with the environmental specifications on page 13.

Magnetic installation

Mount the Wireless Temperature Sensor in the desired location in the rack using the magnets on its base.

Cable tie installation

The Wireless Temperature Sensor ships with a pair of adhesive cable tie holders and tie wraps used to mount it on a perforated rack door.

To mount the Wireless Temperature Sensor on a rack door:

- 1. Place the sensor in the desired location on the rack door.
- Place the cable tie holders in the desired location on the rack door. Press until each tie holder is firmly seated.
- 3. Insert a tie wrap through the mesh grating and into the mounting slots on one side of the sensor.
- 4. Gently tighten the tie wrap.
- 5. Repeat steps 3 and 4 on the other side of the sensor, if desired.

Wall bracket installation

The Wireless Temperature Sensor ships with a wall bracket, and screws or foam adhesive strips, used to mount it outside the rack using the magnets on its base.

NOTICE: To maintain access to the QR code, and to make battery replacement easier, using the foam adhesive strips directly on the Wireless Temperature Sensor is not recommended.

Replacing the Battery

The Wireless Temperature Sensor uses a 3V CR2477 battery. Battery life is estimated at up to 5 years under normal use.

To replace the battery:

- 1. Turn the Wireless Temperature Sensor off.
- 2. Insert a thin flat screwdriver into a pry slot on the side of the sensor.
- Gently twist to open the case.
- 4. Carefully remove the board, and slide the spent battery out.
- 5. Insert the new battery with the + sign facing the bottom of the battery holder.
- 6. Place the board in the cover.
- 7. Align the arrows on the base and the cover, and press together to close.
- 8. Turn the sensor on using the rocker switch on its side, and wait for it to join the network.

Cleaning the Wireless Temperature Sensor

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

Specifications

Electrical	
Input voltage, nominal	3V battery, CR2477 non-rechargeable primary cell
Maximum total current draw	33mA USB
Physical	
Dimensions (H x W x D)	38.0 x 38.0 x 19.8 mm (1.5 x 1.5 x 0.78 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 batteries with batteries and bracket	0.03kg (0.07 lb) 0.05kg (0.11 lb)
Shipping weight	0.18 kg (0.4 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
Accuracy Temperature	±1°C (1.8°F) from 15°C to 50°C (32°F to 122°F)
Humidity	±3% RH from 11% to 89% RH; ±7% RH from 0% RH to 10% RH and 90% RH to 100% RH

Specifications, continued

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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NOTHING IN THIS LIMITED WARRANTY SHALL SEEK TO EXCLUDE OR LIMIT SEIT'S LIABILITY FOR DEATH OR PERSONAL INJURY RESULTING FROM ITS NEGLIGENCE OR ITS FRAUDULENT MISREPRESENTATION OF TO THE EXTENT THAT IT CANNOT BE EXCLUDED OR LIMITED BY APPLICABLE LAW.

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 Wireless Temperature Sensor:

- 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.
- 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: SNSNBWS100

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: 3351-NBWS100

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.

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			Ar	請 pplican	t			者	シュナイダーエレクトリック株式会社		
特	定 Ty	定無線設備の種別 Type of specified radio equipment						別	証明規則第2条第1項第19号の無線設備		
	波の型 pes of ra						444	電力 wer	G1D 2405~2480MHz (5MHz間隔 16波) 0.0008W		
型	式 T)	•	又 specifi	ied rad	は io equij	名 pment		称	NetBotz Wireless Sensor System		
認	The nu	TIE The number of constru		truction	番 uction design certificate			号	010-100153		
	RIE	촌	し Date	た of certi		F	月	B	平成27年1月27日 27th January,2015		
認		_							Model Name: NBWS100T又はNBWS100H		

Russia



Australia





Agência Nacional de Telecomunicações

MODELO: NBWS100T/NBWS100H 05270-16-10099

"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."

APC Worldwide Customer Support

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

- Visit the APC 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 APC representative or other distributors from whom you purchased your APC product.

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