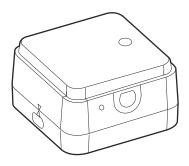
Installation Manual

NetBotz[®] Wireless Temperature Sensor

NBWS100T NBWS100H

990-5327F-001

Publication Date: August 2018





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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.

NOTE: The Wireless Temperature Sensor requires a minimum of BotzWare ™ v4.4 and NetBotz Advanced View v4.4 on a Rack Monitor 450 or 570, or on a Room Monitor 455. Firmware upgrades are available on the APC by Schneider Electric website, **www.apc.com**.

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, **www.zigbee.org**.

Additional documentation

Unless otherwise noted, the following documentation is available on the applicable product pages of 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.

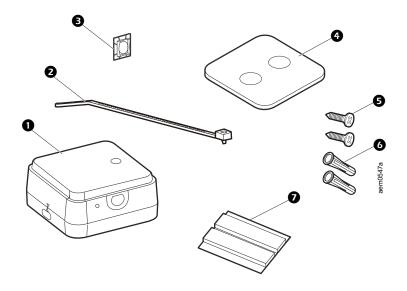
Release Notes: The *Release Notes* for your NetBotz appliance include details about the latest software updates.

NetBotz Appliance User Guides: The *User Guide* for your NetBotz appliance includes all details for using, managing, and configuring a NetBotz system.

Inventory

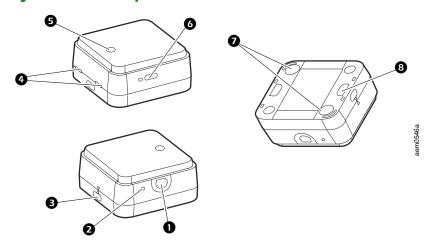
Inspect the contents of the package to ensure that the parts included match those shown below. Report missing or damaged contents to APC by Schneider Electric or your reseller. However, if damage was due to shipping, immediately report the damage to the shipping agent.

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
2	Tie wraps (3)
•	3/4 in x 3/4 in adhesive cable tie holders (2)
4	Wall-mounting bracket
6	#8 x 3/4 in Phillips head screws (2)
6	Plastic wall anchors (2)
Ø	Foam adhesive strips (2)

Physical Description



Item		Description				
0	Covered data port	For factory use only				
0	Reset button	Used to reboot the sensor or reset the sensor to factory defaults (see "Reset button" on page 4)				
€	Side mounting slot	Used to secure the sensor with tie wraps				
4	Pry slots	Used to separate the case to replace the battery				
6	Status LED	Signifies the current state of the sensor (see"LED Activity" on page 5)				
6	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				

Reset button

You can use the reset button on the side of the Wireless Temperature Sensor to reboot the sensor or reset the sensor to the factory defaults.

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, and after about 3 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.

LED Activity

The LED on the sensor blinks to indicate certain statuses or alerts. LED activity during the boot process is different from LED activity during normal operation.

Boot process. 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 3 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
Flashes red 3 times, then slowly flashes red	Contact APC by Schneider Electric technical support at www.apc.com/support.

Normal operation. During normal operation, LED activity on the Wireless Temperature Sensor is as follows:

LED Activity	Meaning
Flashes yellow twice every 2 seconds	Searching for network
Turns solid green, then turns off	Joined the network
Off	Joined the networkHas 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 6 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.

The Wireless Sensor Network

A ZigBee wireless network consists of a host appliance, a coordinator, and one or more devices in router mode or end device 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.
- Coordinator: Each NetBotz host appliance and wireless sensor network must have only one coordinator. The coordinator is connected directly to the host appliance via USB. It reports data from the sensors on the network, 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 appliance through the network. The Wireless Temperature Sensor is automatically configured as an end device.

Devices on the wireless sensor network

Supported devices vary by host appliance. Check the documentation for your appliance to see which devices are supported.

Device	Possible network roles
NetBotz USB Coordinator & Router (NBWC100U)	Coordinator Router
NetBotz Wireless Sensor Pod 180 (NBPD0180)	Coordinator Router End device
NetBotz Wireless Temperature Sensor (NBWS100T/NBWS100H)	End device

Wireless devices have a range of up to 30.5 m (100 ft), line of sight. In a data center environment where obstructions are common, a range of 15 m (50 ft) is typical.

Install the wireless sensor network

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

- Select the coordinator and routers. Choose a device to become
 the coordinator. Note the extended address of the coordinator.
 NOTE: Some appliances come with a USB Coordinator and
 Router unit (NBWC100U) installed. This unit is automatically
 configured as the coordinator. Do not connect an additional
 coordinator to the appliance.
- 2. **Mount the sensors.** Choose the locations for the routers and end devices (Wireless Temperature Sensor). Do not apply power to the routers or end devices at this time.
- 3. **Apply power to the coordinator first.** If a coordinator is not already installed on your appliance, connect one coordinator to a USB Type A port on the appliance.
- 4. **Apply power to the routers.** Each router is powered by the included AC-USB adapter, not connected to the appliance.
- Apply power to the end devices. To apply power to the Wireless Temperature Sensor, turn it on using the switch on its side. To preserve battery life, do not apply power to the sensors until after the coordinator and the routers are powered.

Add Sensors to the Wireless Network

The method to add sensors to the wireless sensor network varies by host appliance. See the documentation for your host appliance on **www.apc.com** for specific instructions.

Depending on the NetBotz appliance, you may 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.

NOTE: Some bar code and QR code scanners return the part number, serial number, and MAC address on one line, for example: XN:NBWC100U%SN:XXXXXXX123456%MAC:**00C0B70000XXXXXX**. To add a device to your wireless network, enter only the alphanumeric MAC address of each device.

Install the Wireless Temperature Sensor

When planning your installation locations, place each Wireless Temperature Sensor within range of a router or a coordinator. The maximum wireless range of the Wireless Temperature Sensor is 100 ft (line of sight). This range is a best-case scenario and the signal is strongly affected by environmental interference. The minimum recommended distance between wireless devices is 2 ft. Once the sensor is added to the wireless sensor network, you can use the **RSSI** or **Signal** reading (in the Web UI of your appliance) to tune sensor placement.

See additional information on device placement in the Frequently Asked Questions (FAQs). Go to **www.apc.com**, select your country from the drop-down list, and select **Support > Resources and Tools > FAQs**.

Install the Wireless Temperature Sensor in an environment compatible with the specifications on page 13. Choose an installation option that fits the location of your sensor: magnetic, cable tie, or wall bracket.

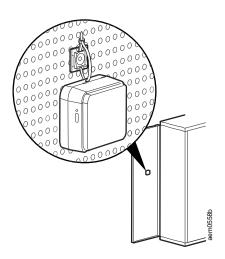
Magnetic installation

Use the magnets on the base of the Wireless Temperature Sensor to mount it in the desired location on the rack.

Cable tie installation

To mount the Wireless Temperature Sensor on a rack door,

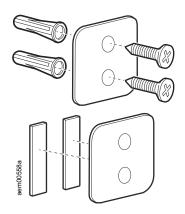
- Place one or both cable tie holders in the desired location on the rack door. Press until each tie holder is firmly seated.
- Insert a tie wrap through the tie holder and into the mounting slots on the sensor.
- 3. Gently tighten the tie wrap.



Wall bracket installation

Use the provided screws and wall anchors or adhesive strips to secure the wall bracket to any surface. The magnets on the Wireless Temperature Sensor will stick to the bracket.

NOTE: Do not apply foam adhesive strips directly on the sensor. This makes it difficult to access the QR code and replace batteries.



Monitor the Wireless Temperature Sensor

Once your wireless sensor network is installed and receiving power, you can monitor your system with the software interface of your appliance.

See your appliance's *Installation and Quick Configuration Manual* for system installation details and instructions to access the software interface of the appliance.

Receiving and sending data

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 3 minutes before sending sensor data to indicate it is still active.

The Wireless Temperature Sensor does not extend the wireless network or pass data to other end devices on the network. The coordinator passes data back and forth between the host appliance and any routers or end devices on the wireless sensor network as necessary.

Advanced View 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.				

NOTE: Check the documentation for your host appliance to see if Advanced View is supported on the appliance.

Replace the Battery

The Wireless Temperature Sensor uses a 3 V CR2477 battery. Battery life is estimated at an average of 3 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, and gently twist to open the case.
- 3. Carefully remove the board, and slide the spent battery out.
- 4. Insert the new battery with the + sign facing the bottom of the battery holder.
- 5. Place the board in the cover.
- 6. Align the arrows on the base and the cover, and press together to close.
- Turn on the sensor using the rocker switch on its side, and wait for it to join the network.

NOTE: Dispose of used batteries according to local regulations.

Clean the Wireless Temperature Sensor

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

Specifications

E	lectrical	ı

Input voltage, nominal	3 V battery, CR2477 non-rechargeable primary cell
Maximum total current draw	33 mA 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	0.03 kg (0.07 lb) 0.05 kg (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 Humidity	±1° C (1.8° F) from 15° C to 50° C (32° F to 122° F) ±3% RH from 11% to 89% RH; ±7% RH from 0% RH to 10% RH and 90% RH to 100% RH
Compliance	
	CE, EMC Directive 2004/108/EC, RED 2014/53/EU, Canadian ICES-003, US FCC 47 CFR Part 15

Two Year Limited Factory Warranty

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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 APC by Schneider Electric worldwide customer support network through the APC by Schneider Electric website: 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.

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: 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 2004/108/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 2014/53/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility. APC by 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	請 Applicant							者	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					種	別	証明規則第2条第1項第19号の無線設備			
	皮の st pes of i				***				G1D 2405~2480MHz (5MHz間隔 16波) 0.0008W			
型	- 7	Type of	又 specif	lied rac	は tio equ	2 ipment		称	NetBotz Wireless Sensor System			
認 証 番 号 The number of construction design certificate						gn cert	ificate	0.70	010-100153			
認	離	촌	し Date	of cert		年	月	B	平成27年1月27日 27th January,2015			
備			F	Remark	¢.			考	Model Name: NBWS100T又はNBWS100H			

Russia



Australia



Brazil



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."

Worldwide Customer Support

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990-5327F-001 8/2018