NSW8000 Series Wireless Network Sensors Product Bulletin

LIT-12014442

2025-01-31

Overview

Figure 1: NSW8000 Series Wireless Network Sensors LCD fixed segment display, Warmer/Cooler interface, and No display models

The NSW8000 Series Wireless Network Sensors use the WRG1830/ZFR183x Pro Series Wireless Field Bus System to communicate directly with the Metasys BAS system and is compatible with the following controllers:

- Field Equipment Controllers (FECs)
- Advanced Application Field Equipment Controller (FACs)
- Metasys VAV Box Equipment Controllers (CVx)
- General Purpose Application Controllers (CGx)
- VAV Modular Assembly (VMA16) Controllers
- Facility Explorer FX-PC Series Programmable Controllers (FX-PCGs, FX-PCVs, and FXPCXs)

The NSW8000 Series Sensors monitor zone temperature, relative humidity (RH), carbon dioxide (CO_2), passive infrared (PIR), and local temperature setpoint adjustments. The sensor transmits this data wirelessly over the ZFR Pro 2 network.

Some NSW8000 Series Sensor models include an onboard passive infrared (PIR) occupancy sensor that detects motion to determine if a space is occupied. This feature adjusts the temperature of the space based on the occupancy status and maximizes up to 30% energy savings in high-energy usage environments such as schools, dormitories, offices, hospitals, and hotels. In addition, the PIR occupancy sensor facilitates trending of floor space usage in these environments.

Interaction with the sensor sets the occupancy override function to signal to the controller that the zone is occupied and to override the scheduled mode. All NSW8000 Sensors have DIP switches to set a unique address for applications that require multiple sensors.

Display models of the NSW8000 Series Sensors are available with an LCD fixed segment display interface. These models enable the user to view zone temperature, RH, CO_2, and adjust the zone temperature setpoint and fan speed. Display models include the following fan speeds: automatic, off, low, medium, or high. To prevent tampering with the sensor, display models also include a screen lockout feature.

Fixed segment display models have the capability to set the default display to temperature, RH, or temperature setpoint. Instead of a display, Warmer/Cooler models have two buttons with seven LED lights that represent the current setpoint and enable adjustment of the zone temperature.

Note: Device programming for the NSW8000 Series Sensors connected to the controller does not include balancing functionality and features.

You can surface mount or vertical wallbox mount the NSW8000 Series Sensors to meet the requirements of the specific application. All display models are optimized for the California Energy Code.

There are three different models of the NSW8000 Series Wireless Network Sensors available. See Table 1 for ordering information.

- **LCD fixed segment display:** View zone temperature, RH, CO_2, occupancy status, and adjust the zone temperature setpoint and fan speed. These models have the capability to set the default display to temperature, RH, or temperature setpoint.
- **Warmer/Cooler interface:** This interface features buttons with seven LED lights that represent the current setpoint status.
- **No display:** The NSW8000 Series Sensors are available in white with the Johnson Controls logo.
- **Serialized sensors:** Based on the serial number, the user can obtain certificates of conformance for quality and warranty purposes.

Features and benefits

The following table outlines the features and benefits of the NSW8000 Series Wireless Network Sensors.

Features	Benefits
Wireless mesh communication	Zone sensing without the need for wiring.
Extended battery life on select models	10 years battery life on all non-CO_2 models. 5+ years battery life on CO_2 models. Two AA alkaline batteries are supplied but you can subsitute with Li-ion batteries.
Single and multifunctional sensors	Choose temperature, RH, CO_2, and occupancy sensing depending on HVAC needs.
Large fixed segment display available on select models	Provides real-time status of the environment with intuitive and easy to understand notifications and icons.
Simple temperature setpoint adjustment or Warmer/Cooler mode available on select display models	Configure simple setpoint adjustment or Warmer/Cooler mode.
Onboard occupancy sensor available on select PIR models	Maximizes up to 30% energy savings in high-energy usage environments, and facilitates trending of floor space usage.
Temporary occupancy included on all display and Warmer/Cooler models	Provides a timed override command that initiates a temporary occupancy state.
Field-selectable default display setting on display models	Toggle between temperature, RH, or temperature setpoint on the display, and set the required default for continuous viewing.
°F/°C selectable on display models	Display temperature in °F or °C.
All display models meet California Energy Code	Displays the required State of California Title 24 economizer fault conditions.
Adjustable DIP switch addressing	Simple and field-adjustable.
Intuitive CO_2 notification	CO_2 good, elevated, and bad indication for California AB 841 Section 1625.
All display models include a screen lockout	Prevents sensor tampering.
Serialized sensors and calibration certificates	Obtain factory calibration certificates for all models.

Note: Keep the Metasys system software up to date as previous releases of Metasys, Facility Explorer, Verasys, or Johnson Controls Smart Equipment system software do not support some NSW8000 Series Wireless Network Sensor features.

CAUTION

Risk of personal injury or property damage

The NSW8000 Series Wireless Network Sensors are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the network sensor could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of, or protect against, failure or malfunction of the network sensor.

North American emissions compliance

United States

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning (Part 15.21)

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

Canada

This Class (B) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (B) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Industry Canada Statement(s)

This device complies with Industry Canada licence-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.

Ordering information

All models of the NSW8000 Series Wireless Network Sensors are only compatible with the ZFR183x. See Table 1 for the different NSW8000 Series Wireless Network Sensor models available. All models are available in white only with the Johnson Controls logo. See Table 2 for accessories.

Table 1: NSW8000 Series Wireless Network Sensor models

Product code	Model type	Description	Display and interface	PIR occupancy sensor
NSW8BTN200	Temperature only model	Wireless Network Temperature Sensor, battery level and signal strength LCD.	Fixed segment display	No
NSW8BHN200	Temperature and 3% RH model	Temperature and 3% RH model. Wireless Network Temperature and Humidity Sensor, battery level and signal strength LCD.		No
NSW8MHN200		Wireless Network Temperature and Humidity Sensor, battery level and signal strength LCD, manual occupancy override button		Yes
NSW8BHC200	Temperature, 3% RH, and CO_2 model	Wireless Network Temperature, Humidity, and CO_2 Sensor, battery level and signal strength LCD		No
NSW8MHC200		Wireless Network Temperature, Humidity, and CO_2 Sensor, battery level and signal strength LCD, manual occupancy override button		Yes

Table 1: NSW8000 Series Wireless Network Sensor models

Product code	Model type	Description	Display and interface	PIR occupancy sensor
NSW8BTN100	Temperature only model	Wireless Network Temperature Sensor, battery level and signal strength LED, manual occupancy override button	Warmer/Cooler interface	No
NSW8BTC100	Temperature and CO_2 model	Wireless Network Temperature and CO_2 Sensor, battery level and signal strength LED, manual occupancy override button		No
NSW8BHC100	Temperature, 3% RH, and CO_2 model	Wireless Network Temperature, Humidity, and CO_2 Sensor, battery level and signal strength LED, manual occupancy override button		No
NSW8BTN000	Temperature only model	Wireless Network Temperature Sensor, battery level and signal strength, manual occupancy override button	No display	No
NSW8BHN000	Temperature and 3% RH model	Wireless Network Temperature and Humidity Sensor, battery level and signal strength, manual occupancy override button		No
NSW8MHN000				Yes
NSW8BHC000	Temperature, 3% RH, and CO_2 model	Wireless Network Temperature, Humidity, and CO_2 Sensor, battery level and signal strength manual occupancy override button		No

Table 2: Accessories

Product code	Description
NS-WALLPLATE-0	Wall plates fit seamlessly around the NSW8000 Series Wireless Sensor models and enable you to mount a sensor where a larger one was previously mounted.

Repair information

If the NSW8000 Series Wireless Network Sensor fails to operate within its specifications, replace the unit. For a replacement sensor, contact the nearest Johnson Controls representative.

Technical specifications

Table 3: NSW8000 Series Wireless Network Sensors technical specifications

Specification	Description	
Power requirements	Two 1.5 VDC AA alkaline batteries included with the sensor supply 3 VDC. You can optionally use two Lithium Iron Disulfide (Li/FeS_2) batteries to power the device. Battery life: Up to 10 years on all models except those with CO_2 sensors, which have a battery life of 5 years. Low battery indicator occurs at 2.2 VDC.	
Addressing	DIP switches, field-adjustable MS/TP address, network number, and zone address	
Ambient conditions	Operating: 32°F to 122°F (0°C to 50°C), 5% RH to 95% RH, noncondensing. Indoor use only. 85°F (29°C) maximum dew point. Storage: -40°F to 140°F (-40°C to 60°C), 5% RH to 95% RH, noncondensing	
Wireless band	Direct-sequence spread-spectrum, 2.4 GHz ISM band	
Transmission power	100 mW maximum	
Transmission range	150 ft (46 m)	
Transmissions	Every 60 s ±20 s	
Temperature accuracy	Sensor	±1°F (±0.6°C)
	Element only	±0.36°F (±0.2°C) at 70°F (21°C)
Temperature sensor type	Digital temperature sensor	

Table 3: NSW8000 Series Wireless Network Sensors technical specifications

Specification	Description
Humidity sensor type	Thin film capacitive sensor
Humidity calibrated range	10% RH to 90% RH at 73°F (23°C)
Humidity accuracy	±3% RH for 20% RH to 80% RH at 50°F to 95°F (10°C to 35°C)
CO_2 accuracy	± (30 ppm + 3% of reading) for 400 ppm to 1500 ppm, ±75 ppm for 1500 ppm to 2000 ppm at 77°F (25°C) and 978 hPa (1,000 ft/300m). Temperature dependence: ±1.4 ppm/°F (± 2.5 ppm/°C) Pressure dependence: 1.6% reading per kPa deviation from normal pressure.
PIR occupancy sensor motion detection	Minimum 94 angular degrees up to a distance of 16 ft (5 m), approximately 47 degrees from center in horizontal and vertical directions. Based on clear line of sight.
Materials	NEMA 1 white UV resistant plastic housing
Mounting	Screw mount or double-sided adhesive foam tape mount, double-sided adhesive foam tape included
Dimensions, H x W x D	5 in. x 3.4 in. x 1.1 in. (127.5 mm x 86 mm x 28 mm)
Shipping weight	0.7 lb (0.32 kg)
Compliance	United States: Transmission complies with FCC Part 15.247 regulations for Low Power Unlicensed Transmitters. Transmitter FCC Identification: OEJ-NSWRADIO.
	Canada: Industry Canada IC: 279A-NSWRADIO.

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Patents

Patents: https://jcipat.com

Single point of contact

APAC	EU	UK	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS VOLTAWEG 20 6101 XK ECHT THE NETHERLANDS	JOHNSON CONTROLS TYCO PARK GRIMSHAW LANE MANCHESTER M40 2WL UNITED KINGDOM	JOHNSON CONTROLS 5757 N GREEN BAY AVE. GLENDALE, WI 53209 USA

Contact information

Contact your local Johnson Controls representative: www.johnsoncontrols.com/locations
Contact Johnson Controls: www.johnsoncontrols.com/contact-us