# *ACCESSORY KIT INSTALLATION INSTRUCTIONS*

***Network Sensors with Fault Code Capability***
**S1-03103489000 SENSOR, NETWORK W/ FDD 80X80MM**
**S1-03103490000 SENSOR, NETWORK W/ FDD 80X120MM**


**FIGURE 1 - NETWORK SENSOR**

## APPLICATIONS

The surface-mounted Network Sensor with Fault Code Capability is an electronic zone sensor designed to function directly with Johnson Controls® BACnet® Master-Slave/ Token-Passing (MS/TP) digital controllers in HVAC systems. Models in this series monitor the temperature setpoint and zone temperature and transmit this data to a field controller on the Sensor Actuator (SA) Bus.

This sensor is designed to assist with the California Energy Code (Title 24), providing a visual indication of operational faults with rooftop equipment. The sensor displays codes that may indicate the system is operating inefficiently. Fault codes include air temperature sensor failure or fault, not economizing properly, economizer return air, economizer not using outdoor air, outdoor air not suitable, and damper not modulating. See Table 2 for additional Fault Code information.

You may adjust the setpoint while the sensor displays the fault. You must reset the fault at the equipment controller. The sensor cannot reset the fault.

All models feature a temperature setpoint dial and LCD designed to make adjusting the temperature setpoint and viewing the zone temperature easier.

A °F/°C push button is available on certain models to provide temperature scale options for display. An occupancy override function is featured on all models, which allows the user to signal the controller that the space is occupied, to request an override of time-of-day scheduling. Rotating the setpoint dial signals occupancy. See Temperature Setpoint Adjustment/ Occupancy Override/Fault Temporary Override for more information.

All models include an SA Bus access port for connecting accessories to access the SA Bus. This feature allows a technician to commission or service the controller via the network sensor.

**IMPORTANT:** The surface-mounted Network Sensor with Fault Code Capability is 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.

**IMPORTANT:** Le surface-mounted Network Sensor with Fault Code Capability est destiné à transmettre des données entrantes à un équipement dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du network sensor risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du network sensor.

## NORTH AMERICAN EMISSIONS COMPLIANCE

### UNITED STATES

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential

area may cause harmful interference, in which case the users will be required to correct the interference at their own expense. Understand and pay particular attention the signal words.

**CANADA**

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

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

**FIGURE 2 - NETWORK SENSOR KIT PARTS**

# INSTALLATION

## SPECIAL TOOLS NEEDED

A 1/16 in. (1.5 mm) Allen wrench or a Johnson Controls T-4000-119 Allen-Head Adjustment Tool is required during installation.

## MOUNTING

### LOCATION CONSIDERATIONS

Locate the network sensor:

- on a partitioning wall, approximately 5 ft (1.5 m) above away from direct sunlight, radiant heat, outside
- walls, outside doors, air discharge grills, or stairwells; and from behind doors the floor in a location of average temperature
- away from steam or water pipes, warm air stacks, unconditioned areas (not heated or cooled), or sources of electrical interference

**NOTE:** The network sensor is shock and vibration resistant; however, be careful not to drop the unit or mount it where it could be exposed to excessive vibration.

The following ambient operating conditions apply:

- Temperature: 32 to 104°F (0 to 40°C)
- Humidity: 10 to 90% Relative Humidity (RH), non-condensing; 85°F (29°C) maximum dew point

To mount the network sensor to the wall:

1. Use a 1/16 in. (1.5 mm) Allen wrench or Johnson Controls T-4000-119 Allen-Head Adjustment Tool to loosen the security screw on the top of the unit.
2. Insert a coin into the slot next to the security screw location, then carefully pry the top edge of the sensor assembly away from its mounting base and remove.

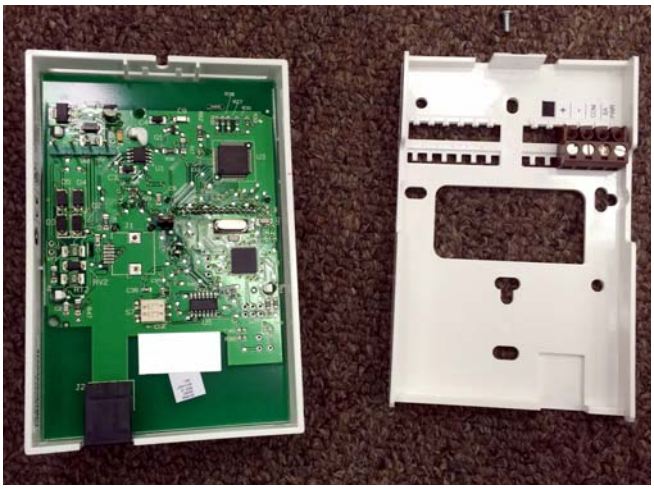

**FIGURE 3 - SENSOR MOUNTING BASE**

**IMPORTANT:** Do not remove the Printed Circuit Board (PCB). Removing the PCB voids the product warranty.

3. Pull out approximately 6 in. (152 mm) of cable from the wall, and insert the cable through the hole in the mounting base.
4. Align the mounting base on the wall, and use the base as a template to mark the location of the two mounting holes on the surface.

**NOTE:** Confirm that the mounting base is positioned with the proper edge up. The mounting base is positioned properly when the security screw is located on the top edge of the base.

5. Secure the mounting base to the wall using the appropriate mounting hardware (field furnished).

6. Wire the network sensor.

   Wire the screw terminal block as illustrated in Figure 5.

> **⚠ CAUTION**
>
> **Risk of Electric Shock.** Disconnect the power supply before making electrical connections to avoid electric shock.
>
> **MISE EN GARDE : Risque de décharge électrique.** Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

**IMPORTANT:** Failure to adhere to these wiring details causes the network sensor to function incorrectly. You will not be able to connect to the system using the wireless commissioning converter or the handheld VAV balancing tool, and you will not be able to expand the system with future offerings.

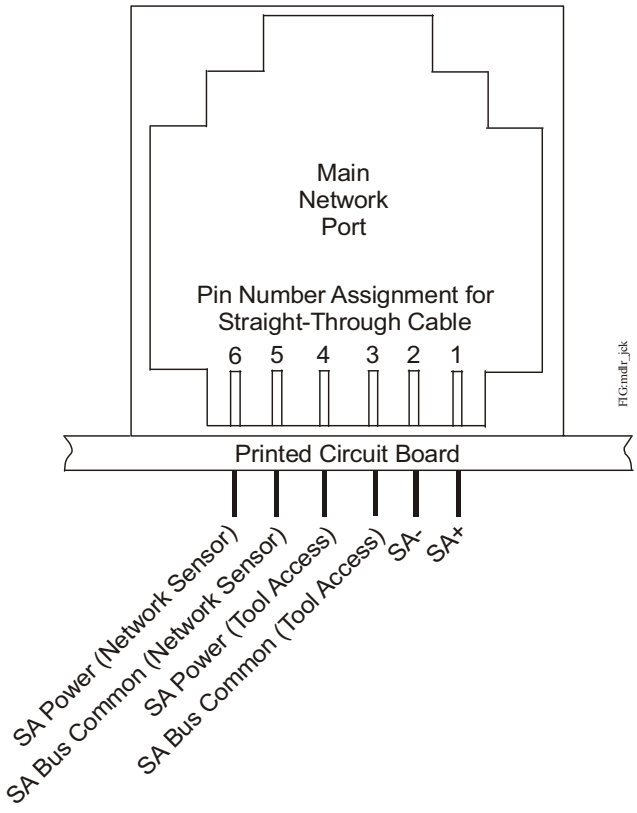


**FIGURE 4 - PIN NUMBER ASSIGNMENTS**

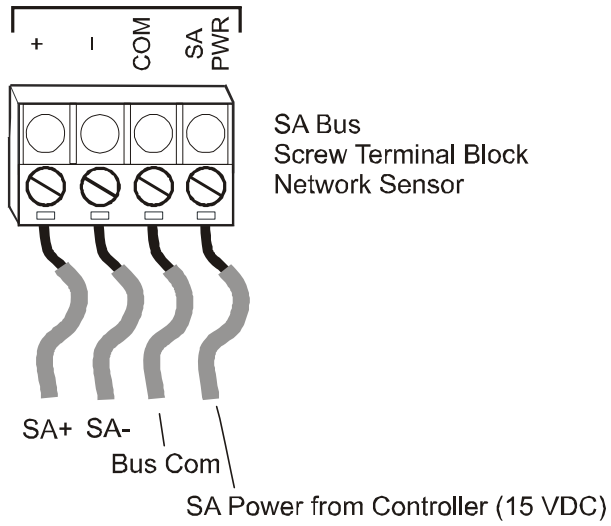


**FIGURE 5 - WIRING TO THE SCREW TERMINAL BLOCK**

7. Align the tabs on the bottom edge of the mounting base with the slots on the bottom edge of the network sensor assembly, and rotate the assembly onto its mounting base.

**NOTE:** Ensure the terminal block pins align with the holes in the terminal block.

8. Use a 1/16 in. (1.5 mm) Allen wrench or Johnson Controls T-4000-119 Allen-Head Adjustment Tool to tighten the security screw and fasten the network sensor assembly to the mounting base.

**NOTE:** Do not over tighten the security screw to avoid damaging the unit.

9. Use the local LCD on the controller to commission and configure the network sensor.

## SETUP AND ADJUSTMENTS

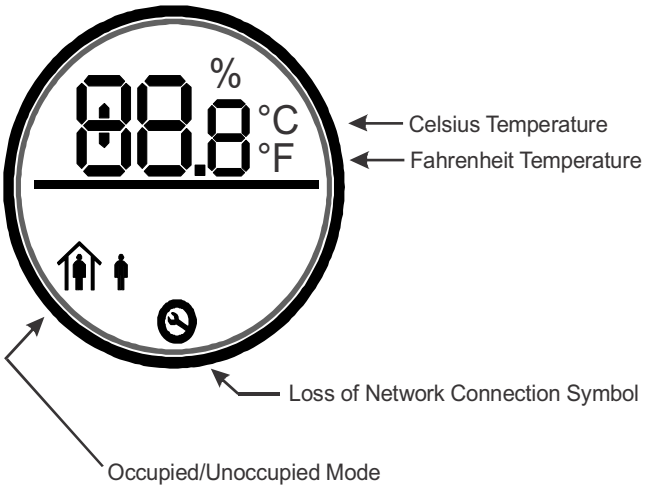


**FIGURE 6 - LCD FOR SENSORS WITH FAULT CODE CAPABILITY**

### TEMPERATURE SETPOINT ADJUSTMENT/OCCUPANCY OVERRIDE/FAULT TEMPORARY OVERRIDE

The large dial on the face of the network sensor functions in two ways: to increase or decrease the setpoint temperature, and to change the controller mode from unoccupied and occupied. When the dial is rotated slightly, the backlight on the LCD lights up. If the dial is rotated slightly again, and the controller is in the unoccupied mode, the controller changes from the after-normal-working-hours setback mode to the normal-working-hours comfort mode. To adjust the setpoint, continue rotating the dial until the current setpoint is displayed and flashing. Turn the dial clockwise to increase the setpoint and counterclockwise to decrease the setpoint. Stop turning the dial once the desired setpoint is reached. The new setpoint stops flashing and becomes fixed after a few seconds.

If a fault code appears, the setpoint operation continues to function. Rotate the dial slightly and the backlight on the LCD lights up. The fault code disappears and the setpoint reappears. You can adjust the setpoint. The fault reappears after approximately 35 seconds of adjusting the setpoint.

### °F/°C TEMPERATURE MODE SELECTION

Certain models include a °F/°C push button on the face of the network sensor to provide temperature scale options for display. Pressing the push button toggles the temperature mode between Fahrenheit and Celsius on the LCD.

### NETWORK SENSOR ADDRESSING

Most network sensors have a default device address of 199 on the SA Bus. For averaging models, the sensor address must be set on the dual-switch DIP switch block on the network sensor Printed Wire Board (PWB).

Averaging models are shipped with both switches set to ON, resulting in a device address of 203. Device addresses can be DIP switch set from 200 to 203; see Figure 7 and Table 1 for more details.

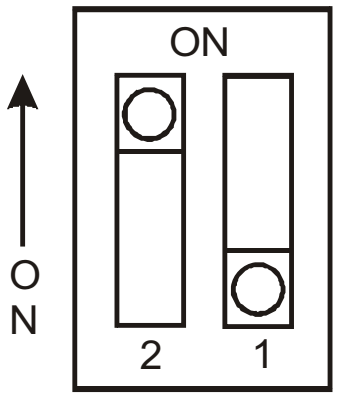


**FIGURE 7 - DUAL-SWITCH DIP SWITCH BLOCK**

**TABLE 1: NETWORK SENSOR ADDRESSING**

| DIP Switch Address | Switch 2 | Switch 1 |
|---|---|---|
| **200** | OFF | **OFF** |
| **201** | OFF | **ON** |
| **202** | ON | **OFF** |
| **203** | ON | **ON** |

**SENSORS WITH FAULT CODE CAPABILITY ERROR CODES**

The fault indication comes through the Network Sensor Bus when a Network Sensor is used in the Zone. The LCD indicates the code number for all the required state of California Title 24 economizer fault conditions. Table 2 describes the faults.

**TABLE 2: KIT CONTENTS - NETWORK SENSORS WITH FAULT CODE CAPABILITY ERROR CODES**

| Display Text | California Title 24 Economizer Fault Condition | Possible Problem |
|---|---|---|
| EF1 | Air temperature sensor failure/fault | Problem with one of the air temperature sensors. Check Outdoor Air, Return Air, or Supply Air sensors. |
| EF5 | Not economizing when it should | The economizer is not using outdoor air when it should. |
| EF6 | Economizing when it should | The economizer is allowing outdoor air inside when the conditions are not suitable for economizer operation. |
| EF8 | Damper not modulating | The economizer damper is not able to modulate properly. |
| EF9 | Excess outdoor air | The economizer is allowing excess outdoor air inside. |

## Ordering Information

These sensors are available through Source 1.

**TABLE 3: KIT CONTENTS - NETWORK SENSORS WITH FAULT CODE CAPABILITY ERROR CODES**

| Product Code Number | Size (mm), Width x Height | Vertical Wallbox-Mounted (WB) | LCD Display, F/C Scale Toggle | Screw Terminals | Address Switches | Temperature Adjustment: Setpoint (Set) or Warmer/ Cooler Dial (W/C) | VAV Balancing Feature |
|---|---|---|---|---|---|---|---|
| S1-03103489000 | 80 x 80 | Yes | Yes, Yes | Yes | Yes | Set | No |
| S1-03103490000 | 80 x 120 | Yes | Yes, Yes | Yes | Yes | Set | No |



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Supersedes: Nothing

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