HPO-9001 Distribution Module
Installation Guide

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INTRODUCTION

The HPO-9001 Distribution Module allows up to **eight** STE-9000 series **NetSensors** (with firmware version R5.1.0.10 or later installed) to be linked to one BAC-5900/9000/9300 series controller (with firmware version R1.2.0.9 or later installed). The module provides power (from a connected 24 VAC transformer) and addressing (according to the connected port) for each NetSensor.

Alternately, it allows **one STE-6010/6014/6017** analog temperature sensor to be connected to a controller along with up to **seven NetSensors**.

NOTE: **Applications require custom configuration and programming**. See **Configuration and Programming on page 3**.

The module may be connected to a controller with a standard (Category 5 or better) Ethernet patch cable up to 150 feet (45 meters) long. Cables from the module to any NetSensors may also be up to 150 feet (45 meters) long. See **Accessories and Replacement Parts on page 5**.

NOTE: For module specifications, see that section in the **Conquest STE-9000 NetSensor** data sheet on the web at **kmccontrols.com**.

For physical and ESD (ElectroStatic Discharge) protection, the module board **should be mounted inside a suitable enclosure** using the supplied Snap Track (or track that is integrated into the enclosure). Complete the steps in the following sections to install the module.

NOTICE
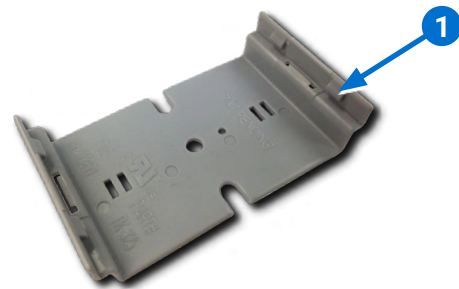OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

MOUNT IN SNAP TRACK

1. Install the (included) Snap Track **1** in an enclosure using the provided screws.

   NOTE: When mounting in an enclosure, provide clearance for cables plugged into ports.

2. Snap the HPO-9001 board into the Snap Track slots **1**.

NOTE: If mounting in an **HCO-1101** enclosure, which has Snap Track integrated into its lower section, the Snap Track included with the HPO-9001 does not need to be installed. The HCO-1101 enclosure can mount on a flat surface (via screw holes) or on a DIN rail (via an integrated DIN rail channel).

NOTE: If protection from dust is also a factor, mount in a **NEMA 1 (IP10)** rated enclosure such as an **HCO-1034/1035/1036**.

CONNECT CONTROLLER

3. Feed the **Ethernet cable** ② from the Conquest controller's **Room Sensor port** ③ to the HPO-9001 distribution module's **Controller port** ④.
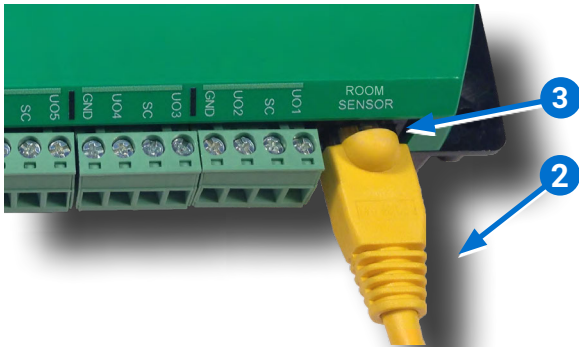
CAUTION

Do not plug the cable from the controller into any of the sensor ports on the board. Voltage from the controller could potentially damage the board.

NOTE: Use a standard (Category 5 or better) Ethernet patch cable up to a maximum length of 150 feet (45 meters). (See **Miscellaneous Hardware on page 5**.)
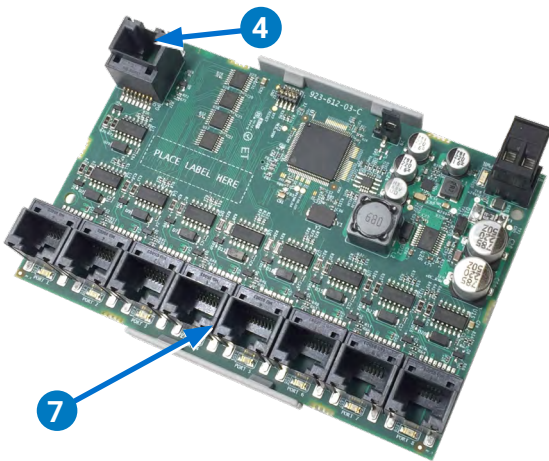

CONNECT SENSORS

4. Mount and connect Ethernet patch cables to the **STE-9000 Series NetSensors** and optional **STE-6010** or **STE-6014/6017** analog sensor according to their respective installation guides.

NOTE: Only one optional STE-6010, STE-6014, or STE-6017 analog sensor can be used, and it must be plugged into (the lower left) Sensor Port 1.

NOTE: Use standard (Category 5 or better) Ethernet patch cables up to a maximum length of 150 feet (45 meters). (See **Miscellaneous Hardware on page 5**.)
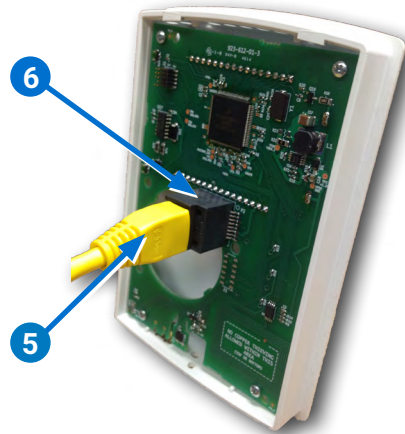
5. Plug the **Ethernet cable** ⑤ into the **modular jack** ⑥ of the sensor.

6. Plug the other end of the **Ethernet cable** ⑤ into a **sensor port** (jack) ⑦ of the distribution module.

NOTE: For best performance if fewer than eight STE-9000 series NetSensors are used, install them in consecutive sensor ports starting at Port 1 (or Port 2 if one STE-6010/6014/6017 is installed).

CONNECT POWER

NOTE: Follow all local regulations and wiring codes.

NOTE: Use either shielded connecting cables or enclose all cables in conduit to maintain RF emissions specifications.

7. Connect a 24 VAC, Class-2 transformer capable of supplying 12 VA to the removable **black power terminal block** of the expansion module:

◆ Connect the **neutral** side of the transformer to the module's **common terminal (GND)** 8.

◆ Connect the **AC phase** side of the transformer to the module's **phase terminal (+ 24 VAC)** 9.
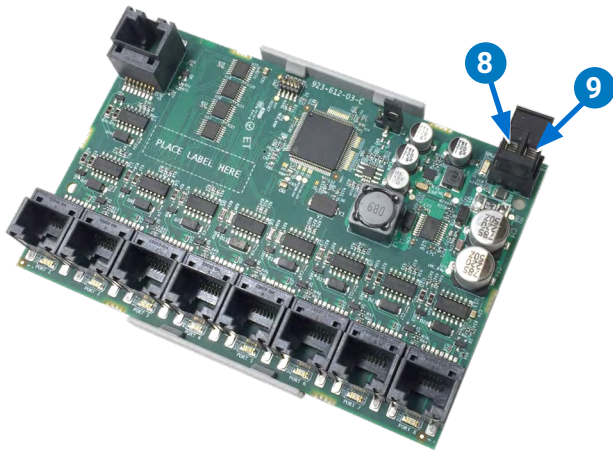

NOTE: Connect only **one** module or controller to a 24 VAC, Class-2 transformer with 12–24 AWG copper wire. (See **Transformers, 120 to 24 VAC on page 5**.)

NOTE: The NetSensors will start showing the correct time and temperature within a minute after all connections are made. If not, see **Troubleshooting on page 4**.

CONFIGURATION AND PROGRAMMING

8. Using KMC Connect (1.0.4.2 or later), KMC Converge (3.8.1.6 or later for AX; 4.1.1.5 or later for N4), or TotalControl (4.0.0.20 or later), configure unused AV, BV, MSV, and NetSensor objects for additional temperature values, setpoints, modes, etc. for ports 2 through 8 as needed 10.
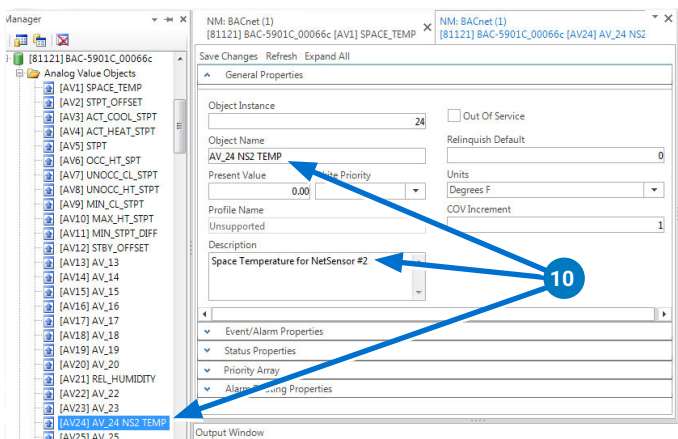
NOTE: Depending on the application, each NetSensor object might need multiple unique AV, BV, and MSV objects. For example, each NetSensor object will need (at least) a separate space temperature AV for each NetSensor.

NOTE: In the NetSensor objects, use the drop-down boxes 11 to select different objects.
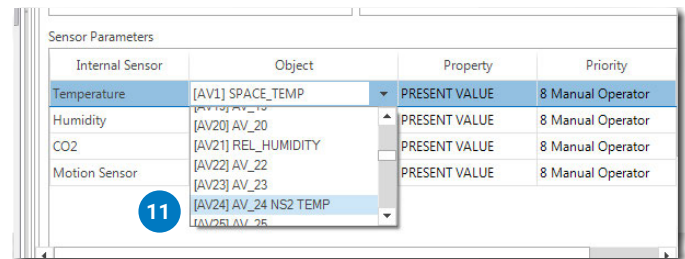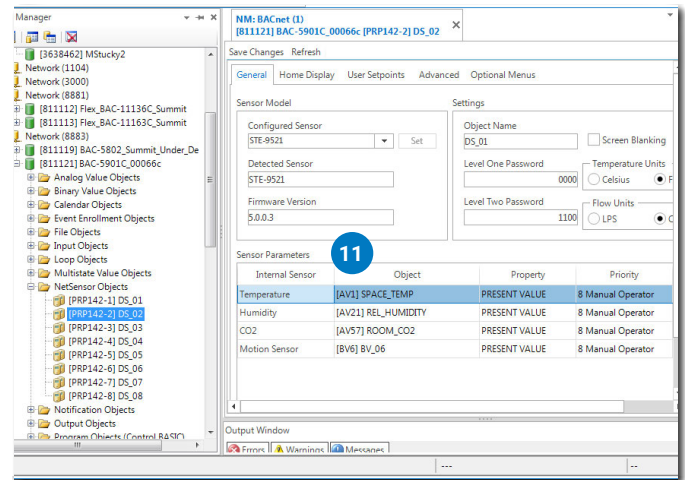
NOTE: If an STE-6010/6014/6017 is plugged into Port 1 (instead of a NetSensor), configure Input Object AI1 for temperature sensing (instead of configuring NetSensor DS_01). For an STE-6014/6017, also configure AI2 for the setpoint offset.

9. Create Control Basic programming according to the individual need. (For samples, see the supplied files under **Sample Applications on page 4**.)

SAMPLE APPLICATIONS

Multiple NetSensors could control a single zone using the **average (or highest or lowest)** of all the **temperature** values from all the sensors. (See the downloadable sample files on the HPO-9001 product page for more information about such an application using three NetSensors.)

> **NOTE:** Analogous applications include multiple NetSensors controlling a zone using:
>
> - The **average or highest** of all the **humidity** values (if any).
>
> - The **highest CO$_2$** value (if any).
>
> - **Any motion** detected by any sensor for occupancy mode.

As another example, multiple NetSensors could be set up for an RTU shared by small offices with a **common cooling setpoint and unique heating zones/setpoints.** Each office would have individually controlled baseboard heat. (See the downloadable sample files on the HPO-9001 product page for more information about such an application using up to eight NetSensors.)

ACTIVE NETSENSOR DETERMINATION

To determine which ports have an active NetSensor connected, the following Control Basic code could be adapted. The x in DS**x**.KMC_STAT_STATUS is the number of the port (e.g., DS**3**.KMC_STAT_STATUS for port 3).

```
R = DSx.KMC_STAT_STATUS
IF TIMEOFF( R ) > 0:00:10 THEN A
  = 0 , GOTO NO_WALLSENSOR
```

TROUBLESHOOTING

If (one or more of) the displays on the NetSensors remain **blank**:

- Check the connections to the NetSensors.

- Check the power to the HPO-9001 (if all NetSensors are blank).

If the NetSensor screens all appear **frozen** (time is not changing) or are flashing "**NO COMM**":

- Check the connection from the controller.

- Check the power to the controller.

> **NOTE:** If the HPO-9001 loses communication with the controller, the last valid time and present value of the temperature will remain on the NetSensor screens for about three minutes. Then "NO COMM" will start flashing on the screens.

If (a minute or more after startup) the displayed **time** is incorrect, update the time in the controller.

> **NOTE:** KMC Controls recommends that all NetSensors connected to the same HPO-9001 module have the **same firmware** version (R5.1.0.10 or later) in them (for consistency and ease of troubleshooting). To check the NetSensor firmware version, press the Up and Enter buttons simultaneously.

> **NOTE:** The linked BAC-5900/9000/9300 series controller must have firmware version R1.2.0.9 or later installed (checked through KMC configuration software or app).

ACCESSORIES AND REPLACEMENT PARTS

Miscellaneous Hardware

HCO-1101	Enclosure, plastic with internal integrated Snap Track and external DIN-rail or flat surface mounting
HCO-103x	Enclosures, steel, NEMA 1
HPO-9901	Conquest hardware replacement parts kit (which includes various controller parts, but only the black power terminal block is used with the HPO-9001)
HSO-9001	Ethernet patch cable, 50 feet
HSO-9011	Ethernet patch cable, 50 feet, plenum rated
HSO-9012	Ethernet patch cable, 75 feet, plenum rated

Room Sensors

STE-9000 Series	NetSensor digital room temperature sensors with optional humidity, occupancy, and CO_2 sensing
STE-6010W10	Temperature sensor, analog, white
STE-6014W10	Temperature sensor, analog, with rotary setpoint dial, white
STE-6017W10	Temperature sensor, analog, with rotary setpoint dial and override button, white

> **NOTE:** To order the STE-601x sensor with light almond color instead of white, drop the W on the end of the model number (e.g., STE-6010W is white and STE-6010 is light almond).

Transformers, 120 to 24 VAC

XEE-6111-040	40 VA, single-hub
XEE-6112-040	40 VA, dual-hub

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