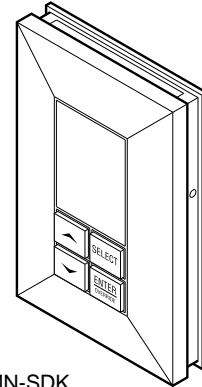## Application

MicroNet Sensors are digital room temperature sensors used with the MicroNet 2000™ family of controllers. Available in three models, all MicroNet Sensors include industry-standard thermistors for accurate room sensing and plug-in communication jacks for the MicroNet Controller Interface (DOS-based personal computer interface software).

MicroNet Sensors are suitable for direct-wall, 2 x 4 electrical box, 1/4 DIN electrical box, or surface box mounting.
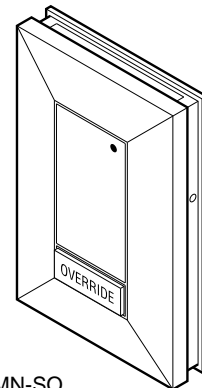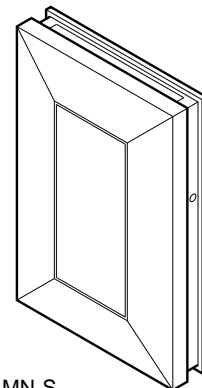

MN-SDK

Model Chart

Table-1 Model Chart.

Model	Description	Keypad	Display
MN-SDK	Deluxe	Four-button	Digital Liquid Crystal Display
MN-SO	Sensor with Override	One-button	Override Status Indication Only
MN-S	Sensor Only	No	No

MN-SO

MN-S

APPLICABLE DOCUMENTATION

Table-2 Applicable Documentation.

F-Number	Description	Audience	Purpose
F-25711	MicroNet 2000 Family Fundamentals Guide	– Sales Personnel – Application Engineers	Provides an introduction to the product family. Contains detailed product descriptions, wiring practices, and system architecture information.
F-25712	MicroNet Controller Interface User's Manual	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides installation instructions, startup and menu information, and a tutorial.
F-25713	Interface Air Balance Manual	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides step-by-step instructions for air balancing the MicroNet VAV Controller systems.
F-25714	MN-CIM MicroNet Controller Interface Module Installation Instructions	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides step-by-step installation procedures for the MicroNet Controller Interface Module.
F-25717	MN-ASDI MicroNet Integrator General Instructions (ASD Bus)	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides step-by-step installation and checkout procedures for the MicroNet Integrator.
F-25718	MN-FLO Series MicroNet VAV Controller Installation Instructions	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides step-by-step installation and checkout procedures for the MicroNet VAV Controller.
F-25720	MicroNet VAV Controller Reference Manual	– Application Engineers – Start-up Technicians – Service Personnel – Building Operators	Provides MicroNet VAV Controller setup, programming, and operating information using both the MicroNet Controller Interface PC software and the deluxe MicroNet Sensor. Also includes diagnostic/ troubleshooting information.
F-25722	MN-MSI MicroNet Integrator General Instructions (MicroSmart Bus)	– Application Engineers – Installers – Start-up Technicians – Service Personnel	Provides step-by-step installation and checkout procedures for the MicroNet Integrator.
SOFT-MNET-101	MicroNet VAV Controller Application Manual	– Application Engineers – Start-up Technicians – Service Personnel	Details all pre-engineered applications for the MicroNet VAV Controller, including bills of material, sequence of operation, wiring, etc.

INSTALLATION

The MicroNet Sensor is packaged disassembled in one container and consists of three major parts:

- A pre-wirable base plate which includes a MicroNet communication jack.
- An electronic assembly containing the sensor and associated circuitry.
- A removable cover.

Inspection

Inspect the carton for possible damage. If damaged, notify the appropriate carrier immediately. Inspect the components for obvious damage. Return damaged products.

Requirements

- Job wiring diagrams.
- Tools (not provided):
    - Appropriate screwdrivers for wiring terminals and mounting screws.
    - Digital Volt-ohm meter (DVM).
    - Level.
    - Drill and bits for mounting screws.
    - Wrist grounding strap.
- Training: Installer must be a qualified, experienced technician.
- Two appropriate mounting screws (not provided).
- Drywall screw anchors for direct-wall mount installations (not provided).

- Appropriate accessories:
  - AT-504   Auxiliary mounting base (beige)
  - AT-1104   Cast aluminum guard with steel base plate
  - AT-1155   Clear plastic guard with solid and ring base, tumbler type key lock
  - AT-1163   Wire guard with steel base plate
  - MNA-STAT-1   Replacement covers (qty. 12)
  - MNA-STAT-2   Designer inserts for MN-S model (qty. 25)
  - MNA-STAT-3   Designer inserts for MN-SO model (qty. 25)

Precautions

General

Warning:

- Electrical shock hazard! Disconnect power before installation to prevent electrical shock or equipment damage.

- Make all connections in accordance with the electrical wiring diagram and in accordance with national and local electrical codes. Use copper conductors that are suitable for 75°C.

Static

Caution:

- Static charges produce voltages high enough to damage the electronic components. The microprocessor and associated circuitry within the MicroNet Sensor are extremely sensitive to static discharge. Follow static electricity precautions when installing, servicing, or operating the system.

- Work in a static-free area.

- Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.

- Use a wrist strap when handling the MicroNet Sensor electronic assembly. The wrist strap clamp must be secured to earth ground.

Federal Communications Commission (FCC)

Note: 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 the 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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications (DOC)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Location

Caution:

- Avoid locations where excessive moisture, corrosive fumes, explosive vapors, or vibration is present.

- Avoid electrical noise interference. Do not install near large contactors, electrical machinery, or welding equipment.

- MicroNet Sensors are intended for indoor use only. Locate where ambient temperatures do not exceed 122°F (50°C) or fall below 32°F (0°C) and relative humidity does not exceed 95% or fall below 5%, non-condensing.

Locate the MicroNet Sensor on an inside wall where it will be exposed to unrestricted air circulation (30 ft./minute minimum) which represents the average temperature in the room or space. The location should be out of direct sunlight, away from sources of heat or cold, and away from concealed ducts or pipes.

Mounting

MicroNet Sensors can be direct-wall, 2 x 4 electrical box, 1/4 DIN electrical box, or surface box mounted. Refer to Figure-1 and Figure-2 for appropriate mounting method dimensions.
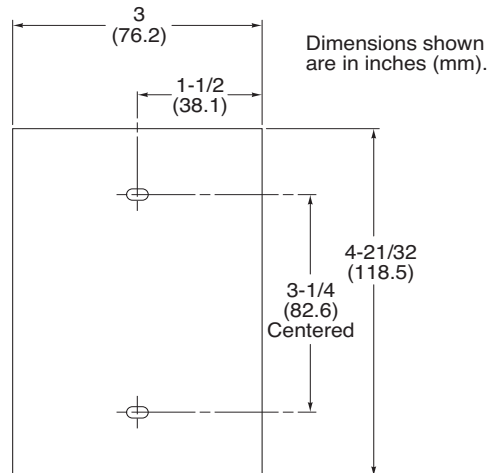

Figure-1 Mounting Dimensions for Direct-wall, 2 x 4 Electrical Box, and Surface Box Mounting.
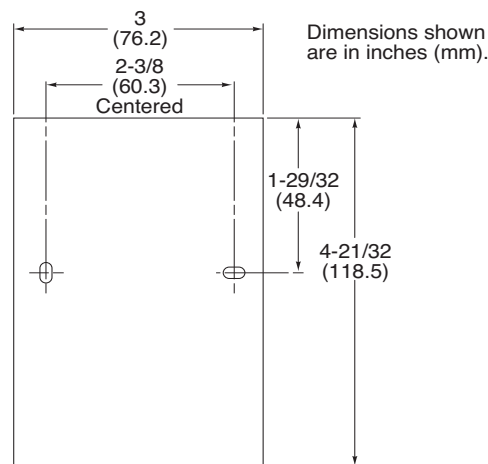

Figure-2 Mounting Dimensions for 1/4 DIN Electrical Box Mounting.

Direct-wall Mount

For direct-wall mounting:

1. Use the mounting dimensions shown in Figure-1.

2. Use drywall anchors as necessary.

3. Feed the two U-Link™ wires from the wall through the base plate feedthrough.

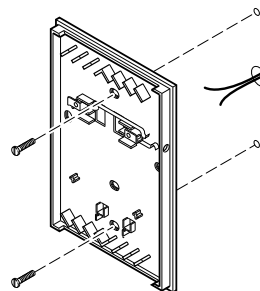4. Using two appropriate screws (not provided), mount the base plate to the wall (Figure-3).

Figure-3 Direct-wall Mounting.

  F-25715-4

2 x 4 Electrical Box Mount

For 2 x 4 electrical box mounting:
1. Use the mounting dimensions shown in Figure-1.
2. Feed the two U-Link wires from the electrical box through the two base plate feedthroughs.
3. Use two 6-32 x 5/8 in. flat head screws (not provided) to mount the base plate to the electrical box ((Figure-4)).
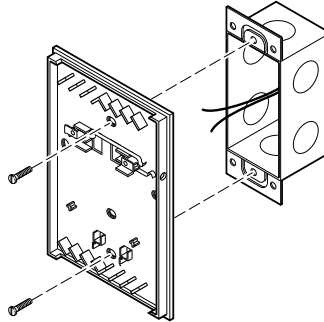
Figure-4 2 x 4 Electrical Box Mounting.

1/4 DIN Electrical Box Mount

For 1/4 DIN electrical box mounting:
1. Use the mounting dimensions shown in Figure-2.
2. Feed the two U-Link wires from the electrical box through the two base plate feedthroughs.
3. Using two appropriate screws (not provided), mount the base plate to the electrical box ((Figure-5)).
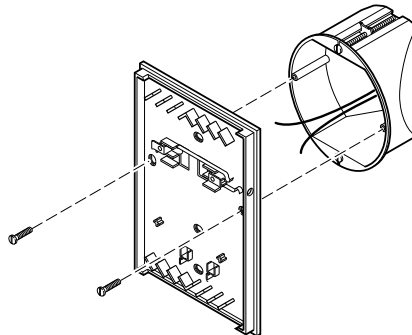
Figure-5 1/4 DIN Electrical Box Mounting.

Surface Box Mount

For surface box mounting:
1. Use the mounting dimensions shown in Figure-1.
2. Feed the two U-Link wires from the surface box through the two base plate feedthroughs.
3. Use two 6-32 x 5/8 in. flat head screws (not provided) to mount the base plate to the surface box (Figure-5).
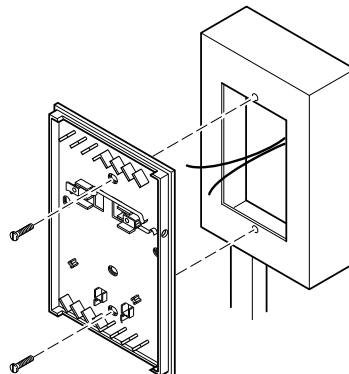
Figure-6 Surface Box Mounting.

Wiring

Caution: The MicroNet Sensor is a Class 2 *only* device and must be connected to a Class 2 source. Class 2 circuits must not intermix with Class 1 circuits.

Power is supplied to the MicroNet Sensor from the MicroNet Controller via the U-Link. Minimum wire quality for the U-Link is 24 gage, voice grade telephone wire. The capacitance between conductors should be no greater than 32 pF per foot. If shielded cable is used, the capacitance between any one conductor and the others, connected to the shield, should be no greater than 60 pF per foot. See Table-3 for maximum wire length.

Table-3 Maximum U-Link Length.

Number of MicroNet Sensors	Maximum U-Link Length
Single	200 ft. (61 m) from sensor to controller.
Multiple	400 ft. (122 m) total segment from sensor to controller to sensor. 200 ft. (61 m) from controller to any one sensor.

Note: The U-Link wire pairs must be dedicated to MicroNet communications. They cannot be part of an active, bundled telephone trunk.

To connect the MicroNet Sensor to the U-Link:

1. Strip 1/4 in. (6 mm) of insulation from the U-Link wires.

2. Connect the wires to screw terminals 1 and 2. No polarity maintenance is required ((Figure-7)).

3. Push excess wire back through the base plate to minimize air flow restriction.
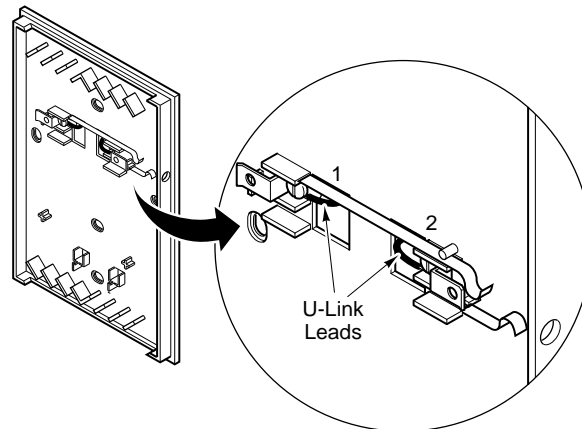

Figure-7   U-Link Connection.

Checkout

1. Verify that the wiring between the MicroNet Sensor base plate and the MicroNet controller is in accordance with the job wiring diagram and with national and local wiring codes.

Note: Wiring between the sensor and the controller is not polarity sensitive. Refer to the **MicroNet 2000 Family Fundamentals, F-25711,** for details.

Setting the Address

All MicroNet Sensors are shipped with the default address setting of 1. In installations where only one MicroNet Sensor is connected to a MicroNet Controller, this default address should not be changed. For those installations where two MicroNet Sensors are connected to one MicroNet Controller, the address of the second sensor must be changed to 2.

To change the address on the MicroNet Sensor:

1. Turn the electronic assembly upside down so that the electronic circuitry is visible.

2. Locate the copper trace in the lower left corner of the electronic assembly ((Figure-8)).

3. Use a knife or another sharp object to cut the trace somewhere between the two "holes."
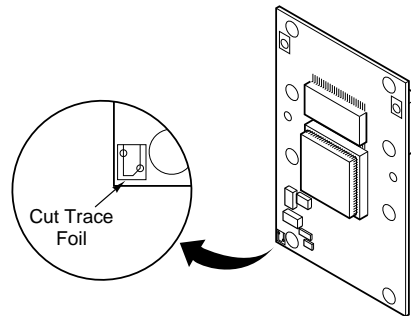
Cut Trace Foil

Figure-8   Setting the Address.

Electronic Assembly and Cover Installation

After completing checkout:

1. Set the electronic assembly onto the bottom hooks of the base plate.

2. Secure the electronic assembly to the base plate by tightening the two screws at the top of the assembly ((Figure-9)).
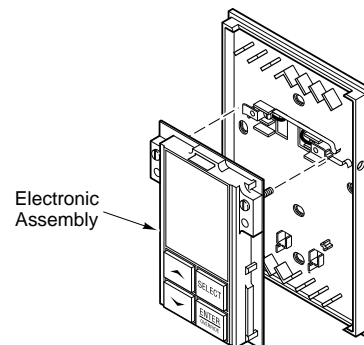
Electronic Assembly

Figure-9   Electronic Assembly Installation.

Note: Prior to installation, the sensor covers and optional inserts (MNA-STAT-2 and MNA-STAT-3) can be painted or papered to match the room decor.

3. Install the cover by inserting the bottom tabs first and snapping the top into place.

Note: Once installed, the sensor cover can be removed, if necessary. To remove the cover, place your thumb in the middle of the sensor, grasp the top edge of the cover with your fingers, and pull firmly.

THEORY OF OPERATION

Sensor Only

The Sensor Only model has no display or keypad. Its primary function is to provide room temperature sensing values to the MicroNet controller via the U-Link. A plug-in communication jack is provided so that you can connect a PC (desktop or portable), via a MicroNet Controller Interface Module, and use the MicroNet Controller Interface software to change or view settings. The communication jack is shown below in (Figure-10).
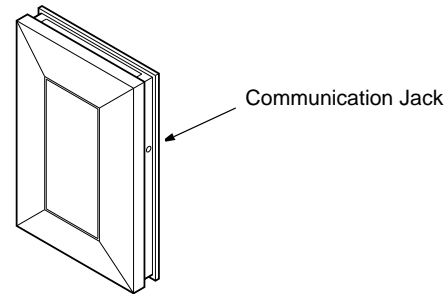

Figure-10   Sensor Only Features.

Sensor with Override

The Sensor with Override model provides the same functions as the Sensor Only model with the addition of an override button and override status indicator. The features of the Sensor with Override model are shown below in (Figure-11).
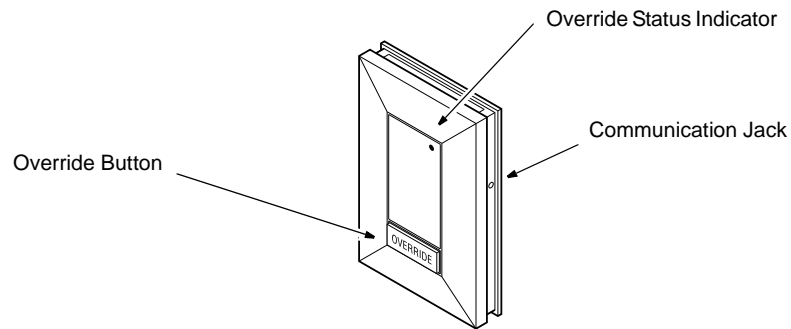

Figure-11   Sensor with Override Features.

The override button allows you to override the unoccupied mode setting within the controller.

The override status indicator is lit if the MicroNet controller is overridden to the occupied mode from the unoccupied mode. It is unlit if the controller is in the unoccupied mode or the normal, scheduled occupied mode. A plug-in communication jack is provided so that you can connect a PC (desktop or portable), via a MicroNet Controller Interface Module, and use the MicroNet Controller Interface software to change or view settings. The communication jack is shown in (Figure-11).

Deluxe Sensor

The Deluxe Sensor model provides the same functions as the Sensor Only model with the addition of a digital liquid crystal display and a four-button keypad. The features of the Deluxe Sensor are shown below in (Figure-12).
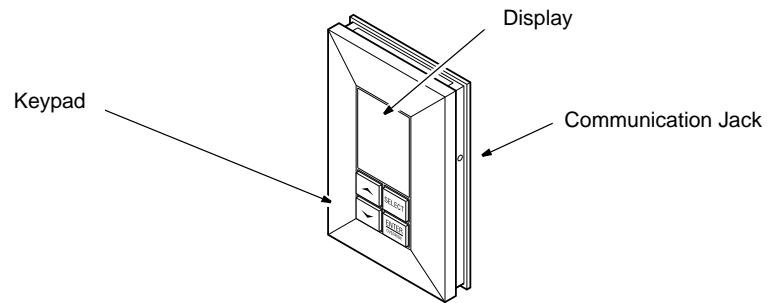

Figure-12   Deluxe Sensor Features.

The Deluxe Sensor's display and keypad allow you to view and change certain controller values. The database in the MicroNet Controller and your access level determine which values can be viewed and/or changed. Refer to Table-3 for keypad functions.

Table-4 Deluxe Sensor Keypad.

Button	Name	Function
$\wedge$	Up Arrow	Increases the currently displayed changeable value.
$\vee$	Down Arrow	Decreases the currently displayed changeable value.
SELECT	Select	Scrolls through the attribute list.
ENTER Override	Enter/Override	Stores the displayed changeable value in memory. Pressing and holding this key for four seconds in unoccupied mode causes the controller to go into timed occupied mode.

A plug-in communication jack is provided so that you can connect a PC (desktop or portable) and use the MicroNet Controller Interface software to change or view settings. The communication jack is shown in (Figure-12).

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.

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