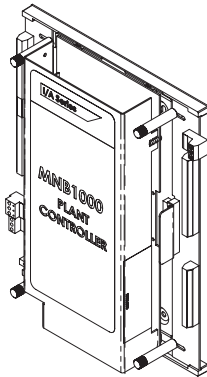


**MicroNet™ BACnet™
 Plant Controller
 Installation Instructions**

Application

The I/A Series® MicroNet BACnet Plant Controller is an interoperable controller with native BACnet, IP, and MS/TP communications support. The controller features Sensor Link (S-Link) support, LED status and output indication, two Ethernet ports, and screw terminal blocks.

The Plant Controller's sequence of operation and BACnet image are fully programmable using WorkPlace Tech Tool, and can be applied to a wide range of mechanical equipment. Typical applications include central station air handlers, VAV air handlers, and cooling towers.



Model Chart

Model	Inputs and Outputs			
	UI	DI	UO	DO (Triacs)
MNB-1000	12	4	8	8

Installation

Inspection

Inspect carton for damage. If damaged, notify carrier immediately. Inspect controllers for damage upon receipt.

Requirements

- Installer must be a qualified technician
- The following items are *not provided*.
- Job wiring diagrams
- Tools:
 - Drill and bits for mounting screws
 - Screw drivers
 - Nut drivers
 - Digital Volt-ohm meter (DVM)
 - Static protection wrist strap
- MNB-1000-ENC enclosure for wall-mounting (optional)
- Class 2 power transformer supplying a nominal 50 VA at 24 Vac plus DO load; in European Community, transformer must conform to EN 60742
- Four #10 pan head screws for wall-mounting
- Four #10 pan head screws for panel-mounting
- If needed, end-of-line termination resistor, 120 Ω ±5%, part number 40-1758

Precautions



When installing the MNB-1000 controller, be sure to follow the guidelines outlined in "Precautions" on page 4.

Location

The MNB-1000 controller is suitable for indoor use only.

Caution:

- Avoid locations where excessive moisture, corrosive fumes, vibration, or explosive vapors are present.
- Avoid electrical noise interference. Do not install near large contactors, electrical machinery, or welding equipment.
- Locate where ambient temperatures do not exceed 140 °F (60 °C) or fall below -40 °F (-40 °C) and relative humidity does not exceed 85% or fall below 5%, non-condensing.

Dimensions

Mounting dimensions for the MNB-1000 controller are shown in Figure-1. Refer to Figure-3 for mounting dimensions for optional enclosure MNB-1000-ENC.

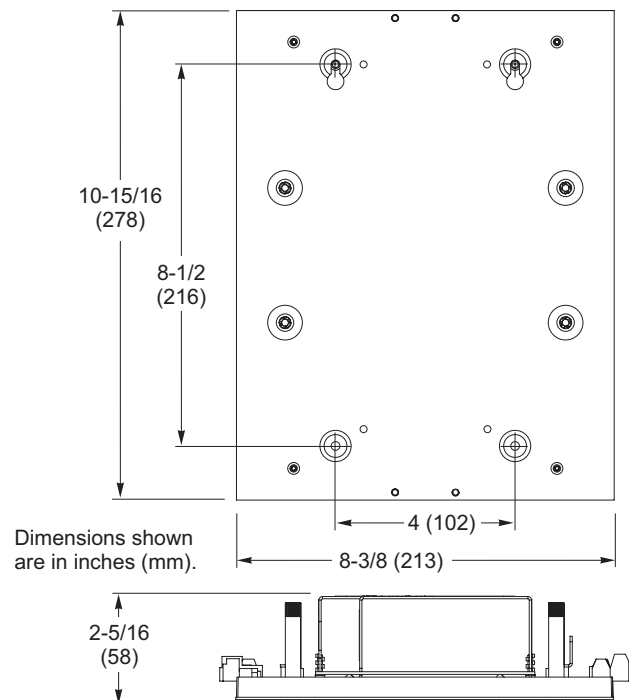


Figure-1 MNB-1000 Mounting Dimensions.

Mounting

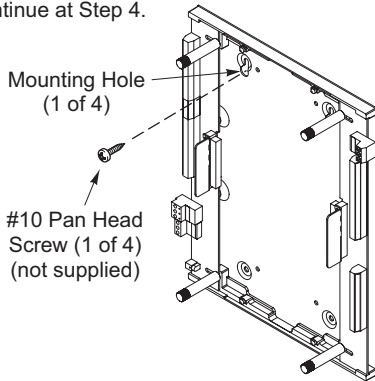
Mount the controller to the wall according to Figure-2.

Warning: Electrical shock hazard! Disconnect power before installing or removing the cover.

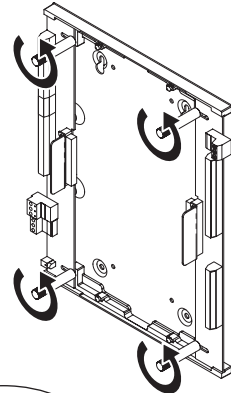
- ① Select a mounting location. The MNB-1000 may be panel-mounted or, optionally, enclosure-mounted. To panel-mount the MNB-1000, go to Step 2. To mount the MNB-1000 inside optional Enclosure MNB-1000-ENC, go to Step 3.

Note: The MNB-1000 may be mounted in any orientation.

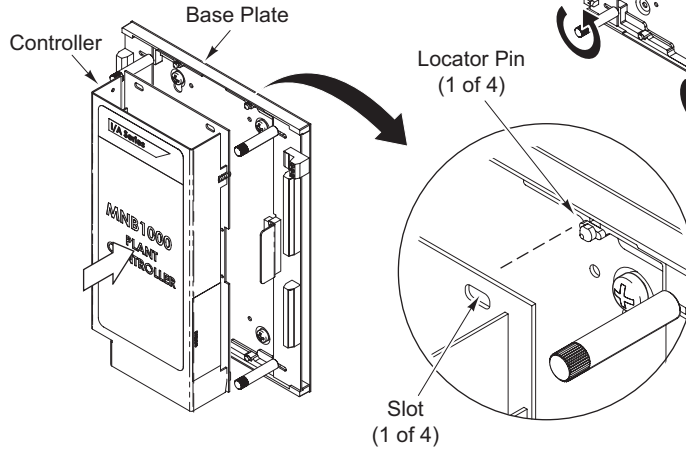
- ② To mount the MNB-1000 to a panel, proceed as follows:
 - a. Holding the controller's base plate in position, mark the locations of the four mounting holes on the panel.
 - b. Set the base plate aside and drill the marked mounting holes, using a drill bit sized to the mounting screws.
 - c. Secure the base plate to the panel, using four #10 screws (not supplied).
 - d. Continue at Step 4.



- ④ Be sure the input and output boards are spread apart as far as possible. If needed, loosen the four thumb screws by turning them CCW and then reposition the boards.

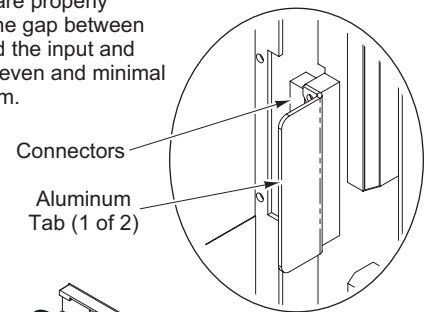


- ⑤ Position the controller onto the base plate.



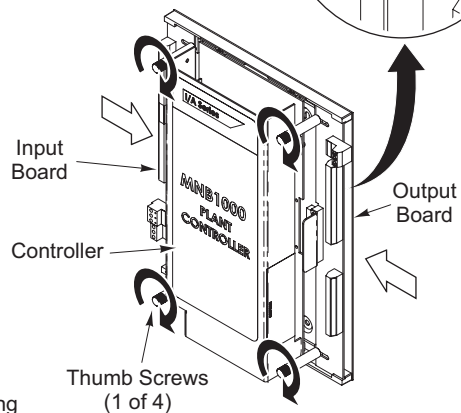
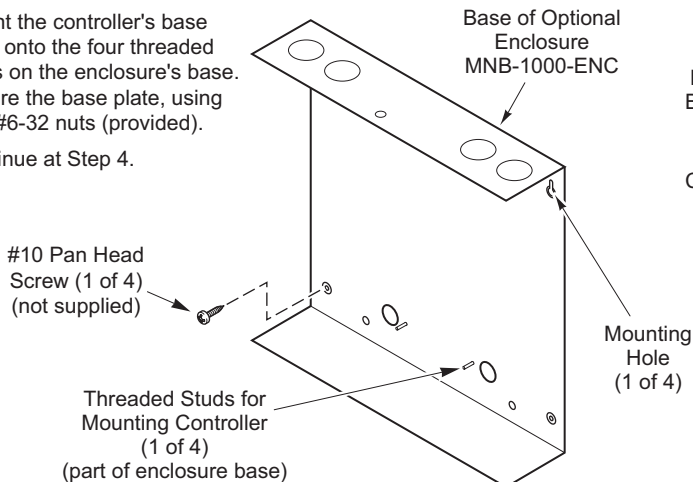
- ⑥ Press on the aluminum tabs to slide the input and output boards into the controller, making sure the mating connectors engage fully.

Note: The connectors are properly engaged when the gap between the controller and the input and output boards is even and minimal from top to bottom.



- ③ **Optional** To mount the MNB-1000 inside Enclosure MNB-1000-ENC, proceed as follows:

- a. Separate the enclosure cover from the enclosure base.
- b. Holding the enclosure's base in position on the wall, mark the locations of the four mounting holes.
- c. Set the enclosure base aside and drill the marked mounting holes, using a drill bit sized to the mounting screws.
- d. Secure the enclosure base to the wall, using four #10 screws (not supplied).
- e. Mount the controller's base plate onto the four threaded studs on the enclosure's base. Secure the base plate, using four #6-32 nuts (provided).
- f. Continue at Step 4.



- ⑦ Tighten the four thumb screws CW to secure the input and output boards in place.

Figure-2 MNB-1000 Mounting.

Enclosure

Optionally, the MNB-1000 may be mounted inside an enclosure. Refer to Figure-3 for mounting dimensions for enclosure MNB-1000-ENC.

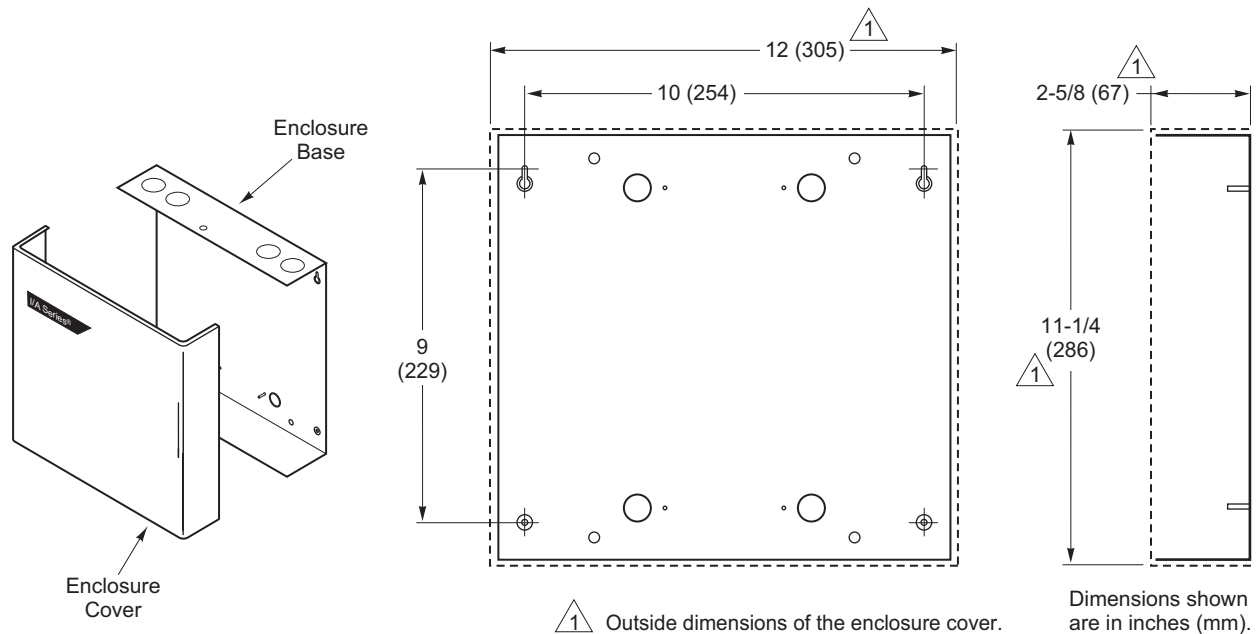


Figure-3 Enclosure MNB-1000-ENC Mounting Dimensions.

Controller Addressing

DIP Switch

Each MicroNet BACnet controller is equipped with a DIP switch for setting the controller's MS/TP network address. Once the address is set, the network is properly wired, and all routers are configured, WorkPlace Tech Tool (must be version 5.0 or greater) and other Invensys tools will be able to "see" and work with all the networked BACnet devices. For guidance in assigning a DIP switch setting that will optimize system performance, refer to the *WorkPlace Tech Tool 5.0 Engineering Guide Supplement*, F-27356.

Other BACnet Devices

The UNC and other BACnet devices on the network can work with the MicroNet BACnet controller once they are assigned unique identifiers and names. MicroNet BACnet controllers are configured in this way through the Commissioning Tool.

Note: The logical addressing of devices (i.e. the assignment of unique identifiers and names) is not a prerequisite for using Invensys network management tools. It is, however, a prerequisite for using the UNC and third-party BACnet devices with MicroNet BACnet controllers.

EOL Termination

The MNB-1000 is equipped with a jumper-selectable end-of-line (EOL) termination resistor. The default position for the EOL jumper is "EOL termination *not* present." If the controller is at the end-of-line, set termination according to the *MicroNet BACnet Wiring and Networking Practices Guide*, F-27360.

Note: If another device is at the end-of-line on the MS/TP trunk, use an end-of-line termination resistor, 120 Ω \pm 5%, part number 40-1758.

Network Bias Resistors

The MNB-1000 is equipped with two internal, jumper-selectable, network bias resistors for the MS/TP trunk. The default position for these jumpers is "disabled." For more information on these resistors, refer to the *MicroNet BACnet Wiring and Networking Practices Guide*, F-27360.

Installation Completion

Finish installing the MNB-1000 controller by performing the wiring and network configuration tasks outlined in the *MicroNet BACnet Wiring and Networking Practices Guide*, F-27360. Information covered in this Guide include:

- Communications wiring
 - MicroNet BACnet wiring
 - Sensor Link (S-Link) wiring
- Input/Output wiring
- Power supply wiring
- Mechanical hardware checkout
- Logical addressing of devices
- Configuration of routers
- Communications hardware checkout
- Troubleshooting
- A list of related documentation

Precautions



General

Warning: Electrical shock hazard! Disconnect power before installing or removing the cover.

- Follow Static Precautions (below) when installing this equipment.
- Use copper conductors that are suitable for 167°F (75°C).
- Make all connections according to electrical wiring diagram, national and local electrical codes.

Static Precautions

Static charges damage electronic components. The microprocessor and associated circuitry are extremely sensitive to static discharge. Use the following precautions when installing, servicing, or operating the system.

- Work in a static-free area.
- Discharge static electricity by touching a known, securely grounded object.
- Use a wrist strap connected to earth ground when handling the controller's printed circuit board.

Federal Communications Commission (FCC)

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

European Community Directives

This equipment meets all requirements of European Community Directives for Low Voltage (72/23/EEC), General Safety (92/59/EEC), and Electromagnetic Compatibility (89/336/EEC).

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