MicroNet BACnet Plant Controller

MicroNet BACnet Plant Controller MNB-1000
The TAC I/A Series™ MicroNet™ BACnet™ Plant Controller is an interoperable controller with native BACnet/IP, BACnet Ethernet, and MS/TP communications support and routing functionality between physical networks. The controller features: Sensor Link (S-Link) support; remote I/O support; LED status and output indication; two Ethernet ports; screw terminal blocks; and a panel-mount subbase with a removable electronics module.

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.

The MicroNet BACnet Plant Controller can function either in a standalone mode or as part of a BACnet building automation system (BAS) network. The MNB-1000 is BACnet Testing Laboratories (BTL) listed as a BACnet Application Specific Controller (B-ASC).

AMBIENT LIMITS
Operating Temperature
-40 to 140 °F (-40 to 60 °C).
Shipping and Storage Temperature
-40 to 160 °F (-40 to 71 °C).
Humidity
5 to 95% non-condensing.

WIRING TERMINALS
Remote I/O (IO+, IO-, SLD)
Removable screw terminals; single AWG #14 (2.08 mm²) wire or up to two AWG #18 (0.823 mm²) or smaller wires.

MS/TP (MS+, MS-, SLD)
Removable screw terminals; single AWG #14 (2.08 mm²) wire or up to two AWG #18 (0.823 mm²) or smaller wires.

I/O Points
Fixed screw terminals; single AWG #14 (2.08 mm²) wire or up to two AWG #18 (0.823 mm²) or smaller wires.

Power
Removable screw terminals; up to two AWG #14 (2.08 mm²) or smaller wires.
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**INPUTS FROM MN-SX MICRONET SENSOR**

**Space Temperature**
32 to 122 °F (0 to 50 °C).

**Space Humidity**
5 to 95% RH, non-condensing.

**Local Setpoint**
Adjustable within limits set by application programming tool.

**Fan Operation and Speed Mode**
On/off, speed (low/medium/high), or auto.

**System Mode**
Heat, cool, off, or auto.

**Emergency Heat**
Enable or disable.

**UNIVERSAL INPUTS (12)**
Universal Input characteristics are software-configured to respond to one of the following input types:

- **10k ohm Thermistor with 11k ohm Shunt Resistor**
  Sensor operating range -40 to 250 °F (-40 to 121 °C), model TSMN-57011-850, TS-5700-850 series, or equivalent.

- **1k ohm Balco**
  -40 to 250 °F (-40 to 121 °C), model TSMN-81011, TS-8000 series, or equivalent.

- **1k ohm Platinum**
  -40 to 240 °F (-40 to 116 °C), model TSMN-58011, TS-5800 series, or equivalent.

- **1k ohm Resistive**
  0 to 1500 ohms.

- **10k ohm Resistive**
  0 to 10.5k ohms.

- **Analog Voltage**
  Range 0 to 5 Vdc.

- **Analog Current**
  Range 0 to 20 mA; requires external 250 ohm shunt resistor (AD-8969-202).

- **Digital**
  Dry switched contact; detection of closed switch requires less than 300 ohms resistance; detection of open switch requires more than 2.5k ohms.

**DIGITAL INPUTS (4)**

- **Dry Switched Contact**
  Detection of closed switch requires less than 300 ohms resistance; detection of open switch requires more than 2.5k ohms.

**FAST PULSE INPUT (DIGITAL INPUT ONLY)**

- **Minimum Rate**
  1 pulse per 4 minutes.

- **Maximum Rate**
  10 pulses per second.

**DIGITAL OUTPUTS – TRIAC (8)**

12 VA at 24 Vac, 50/60 Hz, each output individually isolated.

**UNIVERSAL OUTPUTS (8)**

- **0 to 20 mA**
  Output load from 80 to 550 ohms.

- **0 to 10 V**
  With external 500 ohms, 1/2 W, 1% resistor.

- **Capable of Driving Functional Devices RIBU1C Relay**
  UO configured for 0 to 20 mAdc, no external resistor.

- **20 VDC OUTPUT**
  20 Vdc ±10% at 100 mA.

**OPTIONS**

- **MNB-1000-ENC**
  Wall-mount enclosure

- **MNB-BASE-1000**
  Controller Base assembly only

- **MNB-CNTLR-1000**
  Controller assembly only

- **MNB-15**
  Remote I/O Module

- **S-Link Sensors**
  Temperature and humidity Wall Sensors with digital communication

- **TSMN Series**
  Room Temperature Sensors

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**MODEL**

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<tr>
<th>Part Number</th>
<th>Inputs and Outputs³</th>
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<td>MNB-1000</td>
<td>12</td>
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³ The I/O point count can be greatly expanded with the addition of one to eight Remote I/O Modules, each of which adds 15 I/O points. Refer to the MNB-1000-15 Remote I/O Module sales data sheet, F-27487.
FEATURES
- The MicroNet BACnet Plant Controller’s sequence of operation and BACnet image are fully programmable using WorkPlace Tech Tool.
- Capability to function in standalone mode or as part of a TAC I/A Series building automation network.
- Removable electronics module mates with panel-mounted subbase.
- Removable terminals for power and communications, to facilitate commissioning.
- Integral MS/TP jack for direct connection of PC with WorkPlace Tech Tool Suite.
- Optional rugged, NEMA 1 sheet metal enclosure.
- MS/TP DIP switch addressable.
- Service pin button for BACnet “I am” message broadcast.

COMMUNICATIONS

BACnet Networks
The MicroNet BACnet Plant Controller incorporates a fully functional BACnet router between its 3 fully configurable communications ports.

MS/TP
Isolated EIA-485 (formerly RS-485) transceiver, providing support for up to 128 MS/TP devices communicating at 9.6 up to 76.8 kbaud, using standard MS/TP wiring methods.

Ethernet/IP
Dual 10/100 Ethernet ports with modular RJ-45 jacks. Both ports are set to be an Ethernet Bridge, saving on network wiring.

BACnet Ethernet
Standard BACnet Ethernet communications.

BACnet/IP
Communications choices are Standard BACnet/IP; BBMD, or Foreign Device.

S-Link
The Sensor Link (S-Link) communications wiring provides power and a communication interface for one MN-Sx TAC I/A Series MicroNet sensor. The various MN-Sx sensors can provide room temperature, room humidity, setpoint adjustment, and occupancy override. This connection uses two-wire, unshielded cable and is not polarity sensitive. Maximum S-Link bus length is 200 ft (61 m).

Remote I/O
The remote I/O communications wiring provides an interface for one to eight optional MNB-1000-15 Remote I/O Modules, which can be used to expand upon the Plant Controller’s onboard I/O.

Isolated EIA-485 (formerly RS-485) transceiver for MS/TP communications.
- MS/TP baud rate selection from 9.6 up to 76.8 kbaud.
- LED indication of MS/TP and Ethernet IP communication activity, controller status, DO state, and UO state.
- Application-programmable LED provides on/off indication of a user-defined application parameter.
- Firmware upgradeable over the network.
- 72 hour, battery-backed real time clock.
- BBMD, remote connectivity across subnets.
- Support for Remote I/O Modules and S-Link Sensor.
- IP/Ethernet bridge.
- BACnet router functionality.

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TAC I/A SERIES BACnet TOPOLOGY

Ethernet TCP/IP and BACnet/IP

MicroNet BACnet MNB-1000 Plant Controller

S-Link Sensor

One to Eight MicroNet BACnet MNB-1000-15 Remote I/O Modules

Remote I/O Module

MicroNet BACnet MNB-300 Unitary Controller

S-Link Sensor

MicroNet BACnet MNB-V1 or V2 VAV Controller

S-Link Sensor

MicroNet BACnet MNB-70 Zone Controller

S-Link Sensor

MicroNet BACnet MNB-V1 Cooling Controller

S-Link Sensor

MicroNet BACnet MNB-V2 Deluxe Controller

S-Link Sensor

PC Workstation with WorkPlace Tech Tool Software Suite

TAC I/A Series MicroNet devices are interoperable devices designed to operate in standalone mode or as part of a building management system (BAS) network.