

**I/A Series<sup>®</sup>**

# MicroNet<sup>™</sup> VAV Series Controller

The I/A Series MicroNet VAV (Variable Air Volume) Controller is an interoperable controller designed in accordance with LONMARK<sup>®</sup> guidelines. When programmed using WorkPlace Tech Tool (WP Tech) or loaded with a pre-engineered application, it provides control strategies for pressure independent terminal boxes with, or without, reheat capabilities. The VAV series controller features Sensor Link (S-Link) support, LED indication, one digital input, one universal input, three digital outputs, one analog output, an integral patented pressure transducer, and two triac outputs for interface with an external actuator. These controllers can function either in a standalone mode or as part of a LONWORKS<sup>®</sup> TP/FT-10 Free Topology communications network.

## Applications

Designed for new or existing systems, the VAV series controller may be applied to pressure independent terminal boxes with, or without, reheat capabilities. The VAV controller offers the following types of Box Configuration and Reheat control strategies:

- Cooling
- Staged Electric Reheat
- Series Fan
- Floating/Proportional Hydronic Reheat
- Parallel Fan
- Time Proportioned
- Induction

## Connectivity

The VAV series controller offers the advantages of standalone or networked control. Using an I/A Series MicroNet Sensor (MN-Sx Series), the operator can monitor controller performance and edit operational values. The WorkPlace Tech Tool software is used to program the controllers or download applications from the application library.



## Features —

- Capability to function in standalone mode or as part of a LONWORKS TP/FT-10 Free Topology communications network.
- Proportional (P), Proportional Plus Integral (PI), and Proportional Plus Integral and Derivative (PID) control for cooling and heating.
- Patented pressure transducer for years of reliable, accurate air flow readings.
- Air balancing using the I/A Series MicroNet VAV Flow Balance software.
- Directly compatible with terminal boxes which contain a synchronous-motor-driven damper actuator.
- Conforms to the LONMARK VAV controller profile.
- Plenum-rated enclosure allows direct mounting in plenum.

## Model Chart

Model	Inputs/Outputs	Control Strategies		
		Box Configuration	Reheat Type	Other
MNL-V3RVx <sup>a</sup>	3 Digital Outputs (DO)	<ul style="list-style-type: none"> <li>• Cooling</li> <li>• Series Fan</li> <li>• Induction</li> <li>• Parallel Fan</li> </ul>	<ul style="list-style-type: none"> <li>• Staged Electric Reheat</li> <li>• Floating/Proportional Hydronic Reheat</li> <li>• Time Proportioned</li> </ul>	<ul style="list-style-type: none"> <li>• Occupancy</li> <li>• Satellite<sup>b</sup></li> </ul>
	1 Analog Output (AO)			
	2 Triac Outputs (TO)			
	1 Universal Input (UI)			
	1 Digital Input (DI)			

<sup>a</sup> V denotes LONMARK VAV (Variable Air Volume) profile. "x" denotes profile version.

<sup>b</sup> Available control strategies depend on controller I/O.

## Hardware Specifications

**Dimensions** 4 1/2" high x 5" wide x 1 5/8" deep  
(114 mm x 127 mm x 41 mm).

**Enclosure** Conforms to NEMA-1 requirements. Meets UL94-5V flammability for plenum application use.

**Conduit Knockouts** Not applicable. Order optional MicroNet Enclosure, MNA-FLO-1, if wiring to flexible conduit is desired.

**Power Supply Input** 20.4 to 30 Vac, 50/60 Hz.

**Maximum Power Consumption** 102 VA (12 VA plus DO loads @24 VA each and Triac load (total 18 VA)).

**Surge Immunity Compliance**  
IEEE C62.41 (IEEE-587, Category A & B).

### Agency Listings

**FCC** Class B.

**UL**

UL-916 (File # E71385 Category PAZX).

UL Listed to Canadian Safety Standards (CAN/CSA C22.2).

### European Community – EMC Directive 89/336/EEC

EN61326

### Ambient Limits

**Operating Temperature** 32 to 131 °F (0 to 55 °C).

**Shipping and Storage Temperature** -40 to 160 °F (-40 to 71 °C).

**Humidity** 5 to 85% RH, non-condensing.

**Wiring Terminals** Screw terminals. Single AWG #14 (2.08 mm<sup>2</sup>) wire. Up to two AWG #18 (0.823 mm<sup>2</sup>) or smaller wires.

### Velocity Pressure Input

**Operating Range** 0.0 to 2.5 in. of W.C. (0.0 to 0.622 kPa).

**Control Range** 0.01 to 2.00 in. of W.C. (0.0025 to 0.498 kPa).

**Accuracy** ± 5% @ 1.00 in. of W.C. (0.249 kPa) with Laminar flow @ 77 °F (25 °C) and suitable flow station.

**Sensor Type** Self-calibrating flow sensor (differential pressure).

**Tubing Connections** Barb fittings for 0.170" I.D. FRPE polyethylene tubing or 1/4" O.D./0.125" I.D. tygon tubing (high and low pressure taps).

**Tubing Length** 5 ft. (1.52 m) maximum each tube.

### Inputs from MN-Sx I/A Series MicroNet Sensor.

Inputs	Description	MN-Sx Sensor
Space Temperature	32 to 122 °F (0 to 50 °C)	MN-S1, MN-S1HT, MN-S2, MN-S2HT, MN-S3, MN-S3HT, MN-S4, MN-S4HT, MN-S4-FCS, MN-S4HT-FCS, MN-S5 and MN-S5HT
Space Humidity	5 to 95% RH, Non-condensing	MN-S1HT, MN-S2HT, MN-S3HT, MN-S4HT, MN-S4HT-FCS, and MN-S5HT
Adjustable Setpoint	40 to 95 °F (4 to 35°C)	MN-S3, MN-S3HT, MN-S4, MN-S4HT, MN-S4-FCS, MN-S4HT-FCS, MN-S5, and MN-S5HT
Override Pushbutton	For standalone occupancy control or remote status monitoring of local status condition.	MN-S2, MN-S2HT, MN-S3, MN-S3HT, MN-S4, MN-S4HT, MN-S5, and MN-S5HT
Fan Operation and Speed	Fan mode selection: On, Speed (Low/Medium/High), or Auto.	MN-S4, MN-S4HT, MN-S4-FCS, MN-S4HT-FCS, MN-S5, and MN-S5HT
System Mode	System mode selection: Heat, Cool, Off, or Auto.	MN-S4, MN-S4HT, MN-S5, and MN-S5HT
Emergency Heat	Emergency heat mode selection: Enable or Disable	MN-S5 and MN-S5HT

## Digital Outputs

### Relay Outputs

**SW24H1, SW24H2, and SW24H3 Current Ratings** 24 VA each at 24 Vac, 50/60 Hz. Form A, Single-Pole, Single-Throw (SPST), Normally-open. 300K cycles at 24 Vac, 24 VA (0.4 power factor).

### Triac Outputs

**Current Ratings** 18 VA (0.75 A) each output at 24 Vac. Total of 18 VA for both outputs.

**Typical Load** 24 Vac synchronous motor with impedance protected windings.

**Digital Input** Dry Contact. Detection of closed switch requires less than 300  $\Omega$ . Detection of open switch requires more than 100K  $\Omega$ .

## Universal Input

**1K  $\Omega$  Balco Input** -40 to 250 °F (-40 to 121 °C) range. TSMN-81011, TS-8000 Series or equivalent.

**1K  $\Omega$  Platinum Input** -40 to 240 °F (-40 to 116 °C) range. TSMN-58011, TS-5800 Series or equivalent.

**1K Resistance** 0 to 1.5K ohms.

**10K  $\Omega$  Thermistor w/ 11K  $\Omega$  Shunt Resistor** -40 to 250 °F (-40 to 121 °C) range. TSMN-57011-850, TS-5700-850 Series or equivalent.

**10K Resistance** 0 to 10.5K ohms.

**Voltage** 0 to 5 Vdc.

**Current** 0 to 20 mA requires an external 250  $\Omega$  shunt resistor.

**Digital Input** Dry Contact. Detection of closed switch requires less than 300  $\Omega$ . Detection of open switch requires more than 1.5K  $\Omega$ .

## Analog Output

**Current** 0 to 20 mA (output load range from 80 to 550  $\Omega$ ).

## Software Capabilities

- Conforms to the LONMARK guidelines.
- WorkPlace Tech Tool is capable of reconfiguring and editing application configuration data to fit a wide range of variable air volume control requirements.
- HVAC interoperability achieved through use of LONMARK HVAC profiles.
- Air balancing provided by the I/A Series MicroNet VAV Flow Balance software.

## I/A Series MicroNet VAV Flow Balance Software

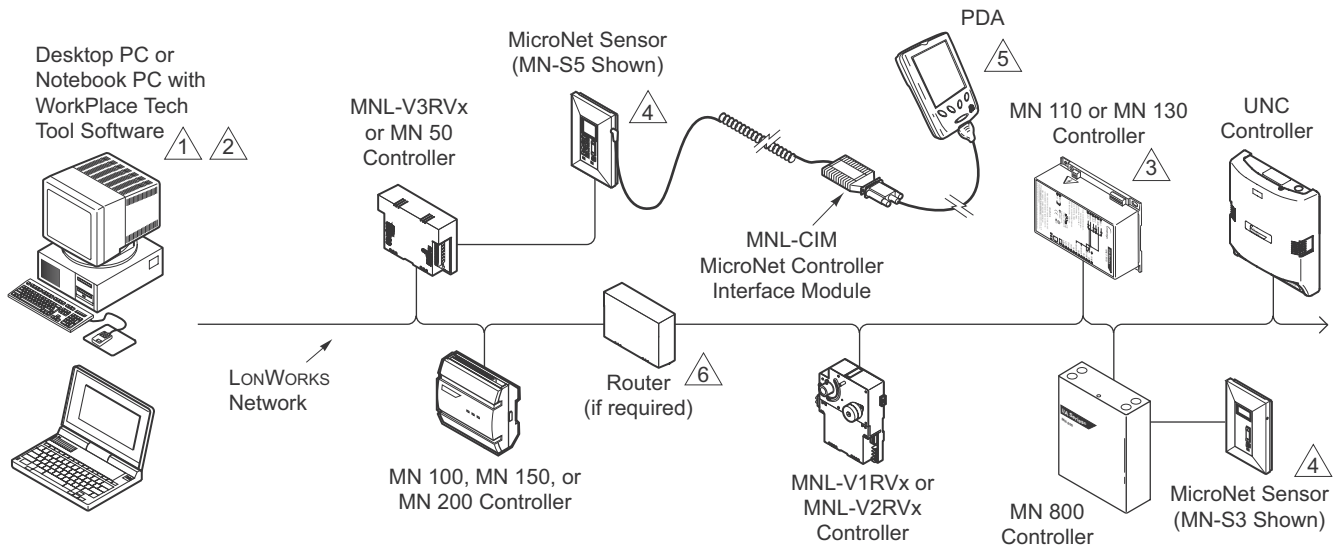
Provides flow balancing for networked and standalone VAV series controllers. Features include:

- Local network control.
- Damper and fan adjustment.
- Setpoint monitoring and adjustment.
- Flow validation and calibration.
- Sequence, calibration, and control setpoint logs.

## Communications

**LONWORKS Networks** A LONWORKS communications network uses an TP/FT-10 Free Topology configuration. Controllers on a LONWORKS network can communicate with each other in a peer-to-peer fashion. A LONWORKS network has a communications speed of 78k baud, using unshielded, twisted-pair cabling, with connections that are not polarity sensitive.

**S-Link** The Sensor Link (S-Link) communications wiring provides power and a communication interface for an MN-Sx 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 wire length allowed between a controller and an I/A Series MicroNet Sensor is 200 ft (61 m).



- 1 A PC can be connected to the LONWORKS TP/FT-10 Network, either directly or through the LONWORKS® network jack of a LONWORKS controller or MN-Sxxx Wall Sensor. The PC must have an Echelon® LonTalk® adapter card.
- 2 Programming any of the I/A Series controllers, or the I/A Series MN 800 controller, requires WorkPlace Tech Tool.
- ⚡ 3 This controller is not suitable for exposed mounting on a wall or panel, or in any other easily accessible place due to the possibility of personal contact with the high-voltage terminals. It must be mounted inside a suitable grounded metal enclosure.
- 4 MicroNet Sensors can be connected to any MN controller.
- 5 A PDA running the Pocket I/A interface software may be used to communicate with MicroNet I/A Series controllers.
- 6 When routers are used, WP Tech is able to communicate through them to any of the I/A Series devices on the network.

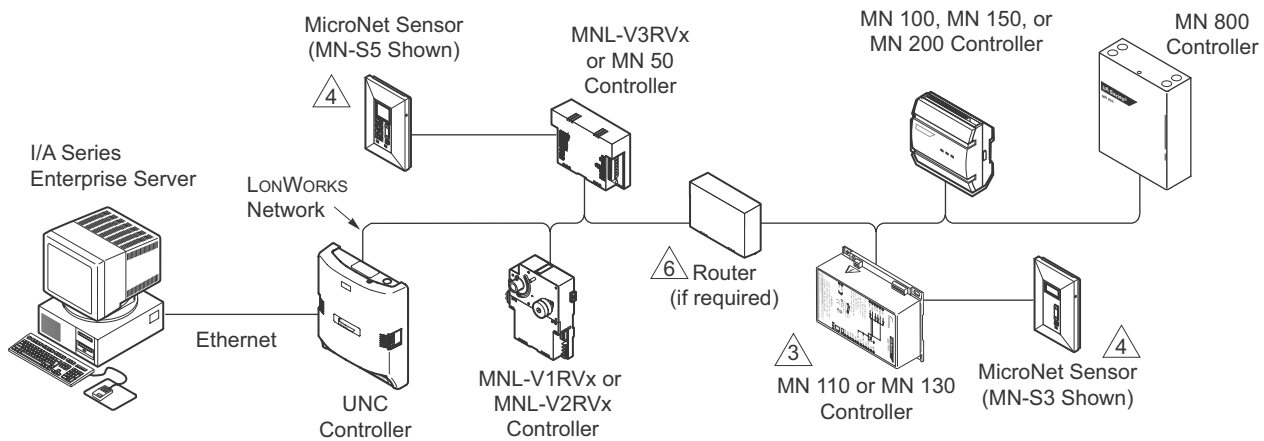


Figure-1 I/A Series MicroNet MN VAV Series Controller Connectivity.

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