

## I/A SERIES® MICRONET MN VAV CONTROLLERS

Order Types:  
 MNL-V1RV3 - VAV Controller with Integral Actuator  
 MNL-V2RV3 - VAV Controller with Integral Actuator and fan and/or reheat control

The I/A Series MicroNet LONMARK® VAV Series (Variable Air Volume) Controllers are interoperable, LONMARK-compliant controllers. When loaded with an application from the WorkPlace Tech application library or programmed with the WorkPlace Tech Tool, they provide a wide range of control strategies for pressure independent terminal boxes with, or without, reheat capabilities. Both models provide an integral actuator with manual override, an integral patented pressure transducer, Sensor Link (S-LK) support, LED indication, and over-the-shaft damper mounting. In addition, the MNL-V2RV3 model provides one analogue output and three digital outputs. These controllers can function either in a standalone mode or as part of a LONWORKS® FTT-10 Free Topology communications network.



I/A Series is a registered trademark of The Foxboro Company.  
 Windows is a trademark of Microsoft.  
 LON, LONMARK, LonMaker and LonWORKS are registered trademarks of Echelon Corporation.

## FEATURES

- LONMARK Compliant, programmable
- Capability to function in standalone mode or as part of a LONWORKS FTT-10 Free Topology communications network.
- Integrated packaging with actuator, pressure transducer, and controller.
- Patented pressure transducer for years of reliable, accurate air flow readings.
- Integral actuator with manual override and travel limit settings for easy set up and support.
- Proportional (P), Proportional Plus Integral (PI), and Proportional Plus Integral and Derivative (PID) control for cooling and heating.
- Plenum-rated enclosures.
- Air balancing using the I/A Series MicroNet VAV Flow Balance software.
- Conforms to the LONMARK VAV Controller Profile.

**SPECIFICATION**

Order Type	Description	Inputs/Outputs				Control Strategies		
		D/I	D/O	U/I	A/O	Box Configuration	Reheat Type	Other
MNL-V1RV3	LONMARK VAV Controller with Integral Actuator	1	0	1	0	<ul style="list-style-type: none"> <li>• Cooling</li> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
MNL-V2RV3	LONMARK VAV Controller with Integral Actuator and fan and/or reheat control	1	3	1	1	<ul style="list-style-type: none"> <li>• Cooling</li> <li>• Series Fan</li> <li>• Induction</li> <li>• Parallel Fan</li> <li>• Time Proportioned</li> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Staged Electric Reheat</li> <li>• Floating/Proportional Hydronic Reheat</li> <li>• Time Proportioned</li> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Occupancy</li> <li>• Satellite<sup>a</sup></li> </ul>

a Available control strategies depend on controller I/O.

**HARDWARE SPECIFICATIONS**

**Dimensions:** 197mm Height x 159mm Width x 63mm Depth

**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 30Vac, 50/60Hz

**Maximum Power Consumption:** **MNL-V1RV3:** Maximum 12VA.  
**MNL-V2RV3:** Maximum 84VA (12VA plus DO loads @ 24VA each).

**Surge Immunity Compliance:** IEC 1000-4-5. ANSI C62.41 (IEEE-587, Category A & B).

**Agency Listings:** FCC, Class A  
Canadian Department of Communications, Class A  
UL Listed - UL-916  
UL - Listed to Canadian Safety Standards

**European Community – EMC Directive 89/336/EEC:** EN50081-1 (Emissions)  
EN50082-1 (Immunity)

**Compliance:** CE

**Ambient Limits:** **Operating Temperature:** 0 to 55°C  
**Shipping and Storage Temperature:** -40 to 71°C  
**Humidity:** 5 to 95%rh, non-condensing.

**Wiring Terminals:** Screw terminals max. conductor size Ø1.5mm (14AWG).

**Velocity Pressure Input:** **Operating Range:** 0.0 to 0.622kPa  
**Control Range:** 0.0025 to 0.498kPa  
**Accuracy:** ± 5% @ 0.249kPa with Laminar flow @ 25°C and suitable flow station.  
**Sensor Type:** Self-calibrating flow sensor (differential pressure).  
**Tube 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).  
**Tube Length:** 1.52m maximum each tube.

**Input (from I/A Series MicroNet Sensor):** **Space Temperature:** 0 to 50°C  
**Adjustable Setpoints:** 4.4 to 35°C  
**Operational Mode:** Heat/Cool/Auto/Off.  
**Override Pushbutton:** For stand-alone occupancy control or remote status monitoring of local status condition.

**Actuator Output:** **Torque Rating:** 6Nm  
**Stroke:** Fully adjustable from 0° to 90°.  
**Timing:** Approximately 3 minutes at 60Hz (3.6 minutes at 50Hz) for 90° rotation @ 24Vac.  
**Position Indication:** Provides a visual indication of position.  
**Manual Override:** Pushbutton to allow manual positioning of the damper.  
**Damper Linkage:** 12.75mm or 9.5mm diameter round shaft extending 22.23mm minimum from terminal box. 9.5mm diameter shaft requires AM-135 adapter kit.

**Digital (Relay) Outputs (MNL-V2RV3):** **SW24H1, SW24H2, and SW24H3**  
**Current Ratings:** 24VA each at 24Vac, 50/60Hz. Form A Single Pole Single Throw (SPST). Normally open. 300K cycles at 24Vac, 24VA (0.4 power factor).

**Digital Input:** **Input Type:** Dry Contact. Detection of closed switch requires less than 300Ω. Detection of open switch requires more than 100KΩ.

**Universal Input:** **10K Thermistor Input:** -40 to 121°C range. TS-5700-850 Series.  
**Voltage:** 0 to 5Vdc.  
**Current:** 0 to 20mA requires an external 250Ω shunt resistor.  
**Digital Input:** Detection of closed switch requires less than 300Ω. Detection of open switch requires more than 1.5KΩ.  
**Current:** 0 to 20mA (output load from 80 to 550Ω).

**ACCESSORIES**

AD-8961-220 Voltage divider (converts 1 to 11Vdc signal to 0.45 to 5Vdc signal)

AD-8969-202 250Ω shunt resistor kit for 4 to 20mA universal inputs

AM-135 3/8" (9.5mm) to 1/2" (12.8mm) shaft adapter

LON-TERM1 Single LON<sup>®</sup> Terminator for Free Topologies

LON-TERM2 Double LON Terminator for Bus Topologies (2 required)

MN Sx I/A Series MicroNet Sensor

MNA-FLO-1 MicroNet VAV Enclosure for conduit applications

MNL-FLOW-BAL MicroNet Flow Balance Software

WPA-LON-1 PC ISA card (16-bit) to connect PCs to LONWORKS FTT-10 network controllers

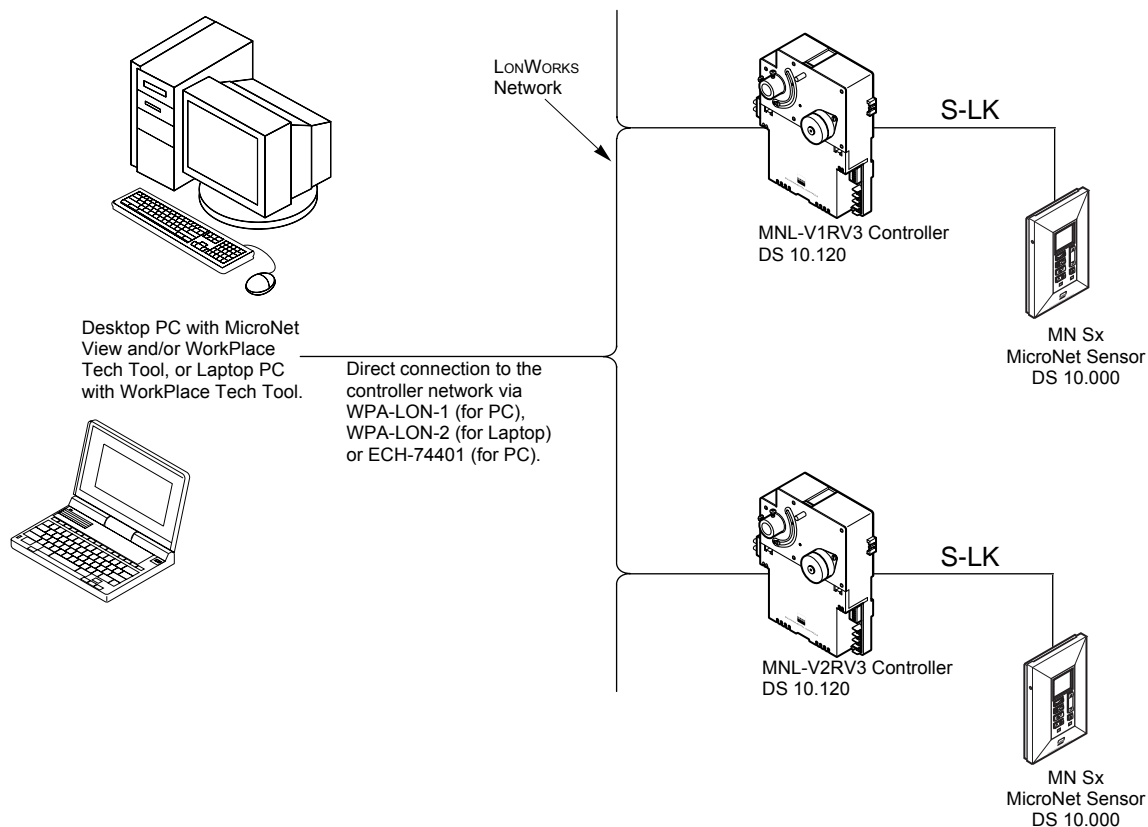
WPA-LON-2 PCMCIA card to connect Laptop PCs to LONWORKS FTT-10 network

ECH-74401 PCLTA-20/FT-10 PCI (32-bit) Desktop Interface

WP-TECH-CD-0-UK WorkPlace Tech Tool

## TYPICAL SYSTEM DIAGRAM

### I/A SERIES MICRONET VAV CONTROLLER



## SOFTWARE CAPABILITIES

- LONMARK-compliant (VAV Controller Profile 8010).
- 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.

## COMMUNICATIONS

**LONWORKS** A LONWORKS FTT-10 Free Topology communications network can host up to 63 devices per segment. This can be increased to 128 using a repeater. Details of network design and wiring requirements can be found at [www.echelon.com/Products](http://www.echelon.com/Products). Controllers on this network communicate with other controllers in a peer-to-peer fashion and connect to MicroNet View and the WorkPlace Tech Tool via the standard LON FTT-10 cards. MicroNet View provides alarm management and dynamic logging. Applications can be prepared and downloaded to application-specific I/A Series MicroNet controllers from the WorkPlace Tech Tool. A LONWORKS FTT-10 network has a communications speed of up to 78k baud.

**S-LK** Provides power and communication interface to the I/A Series MicroNet Sensor. Maximum 61m between controller and I/A Series MicroNet Sensor.

## I/A SERIES MICRONET VAV FLOW BALANCE SOFTWARE

Provides flow balancing for networked and standalone MicroNet VAV Controllers. Features include:

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

## APPLICATIONS

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

- Cooling
- Series Fan
- Parallel Fan
- Induction
- Static Pressure
- Staged
- Floating Proportional
- Proportional
- Time Proportioned
- Staged Lead/Lag Proportional
- Proportional Lead/Lag Floating Proportional

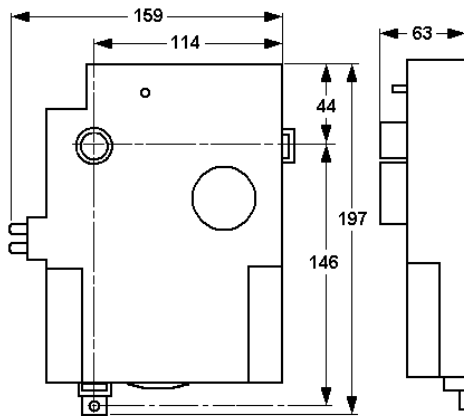
## CONNECTIVITY

The MicroNet VAV Controllers offer 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 download applications from the application library to program these controllers directly via the LON PC cards. If used on a network, MicroNet View provides network-level management functions for MN VAV controllers.

Note:

Standard LON binding tools such as Echelon's LonMaker<sup>®</sup> for Windows<sup>®</sup> are used to create network bindings between MicroNet devices.

## DIMENSION DRAWING



Dimensions in mm



**Climate Controls Europe**  
 Farnham Road  
 Slough  
 Berkshire SL1 4UH  
 United Kingdom

Telephone +44 (0)1753 611000  
 Facsimile +44 (0)1753 611001  
 Web site [www.climate-uk.invensys.com](http://www.climate-uk.invensys.com)

#### Cautions

- Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.
- If any equipment covers have to be removed during the installation of this equipment, ensure that they are refitted after installation to comply with UL and CE safety requirements.
- This is a 24Vac device. Do not exceed rated voltage. Local wiring regulations and usual safety precautions apply.
- 24Vac must be supplied by a transformer conforming to EN 60742.
- Do not exceed the maximum ambient temperature.
- Interference with parts under sealed covers invalidates guarantee.
- The design and performance of Invensys equipment is subject to improvement and therefore liable to alteration without notice.
- Information is given for guidance only and Invensys does not accept responsibility for the selection or installation of its products unless information is given by the company in writing relating to a specific application.
- A periodic check of the Building Management System is recommended. Please contact Customer Care for details.