

TAC MicroNet™ VAV Series Controller

The TAC I/A Series MicroNet VAV (Variable Air Volume) Controller is an interoperable controller designed in accordance with LonMark® 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® TP/FT-10 Free Topology communications network.

The VAV series controller offers the advantages of standalone or networked control. Using a TAC 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.

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

Table-1 Model Chart.

Model	Inputs/Outputs	Control Strategies		
		Box Configuration	Reheat Type	Other
MNL-V3RV ^a	3 Digital Outputs (DO)	Cooling Series Fan Induction Parallel Fan	Staged Electric Reheat Floating/Proportional Hydronic Reheat Time Proportioned	Occupancy Satellite ^b
	1 Analog Output (AO)			
	2 Triac Outputs (TO)			
	1 Universal Input (UI)			
	1 Digital Input (DI)			

^a V denotes LONMARK VAV (Variable Air Volume) profile. "x" denotes profile version.

^b Available control strategies depend on controller I/O.

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.

TAC I/A Series 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.

Table-2 Inputs from MN-Sx TAC 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

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 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 wire length allowed between a controller and a TAC I/A Series MicroNet Sensor is 200 ft (61 m).

SPECIFICATIONS

Dimensions

4-1/2 H x 5 W x 1-5/8 D
(114 x 127 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 mm²) wire. Up to two AWG #18 (0.823 mm²) 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.

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 ohm. Detection of open switch requires more than 100K ohm.

UNIVERSAL INPUT

1K ohm Balco Input

-40 to 250 °F (-40 to 121 °C) range.
TSMN-81011, TS-8000 Series or equivalent.

1K ohm Platinum Input

-40 to 240 °F (-40 to 116 °C) range.

TSMN-58011, TS-5800 Series or equivalent.

1K ohm Resistance

0 to 1.5K ohms.

10K ohm Thermistor w/ 11K ohm 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 ohm shunt resistor.

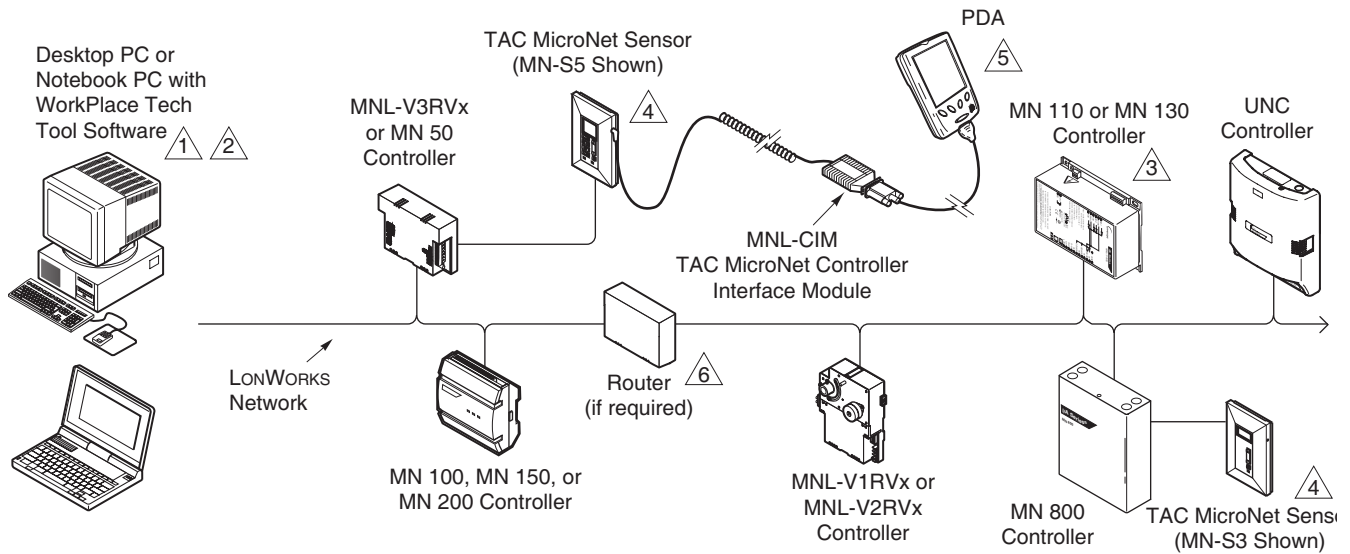
Digital Input

Dry Contact. Detection of closed switch requires less than 300 ohms. Detection of open switch requires more than 1.5K ohms.

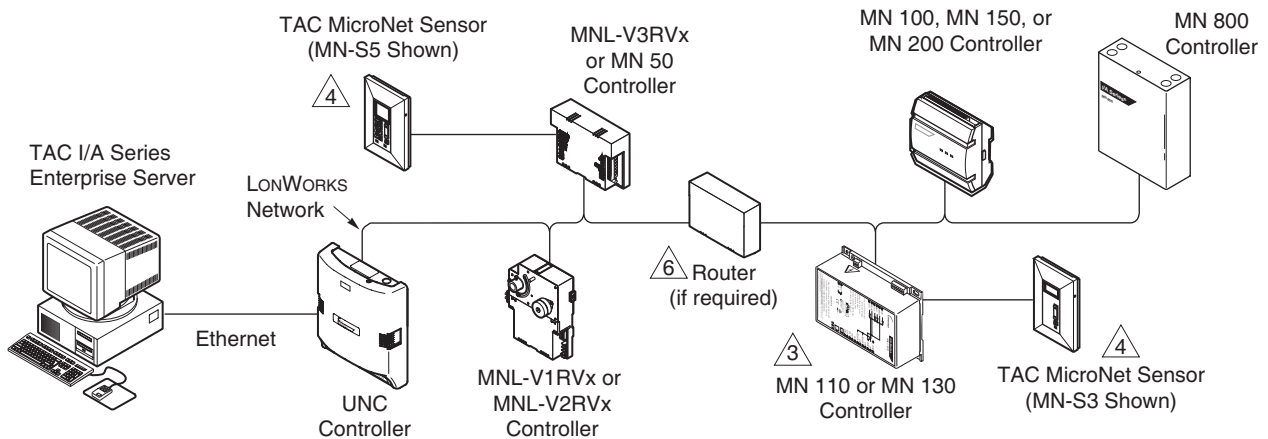
ANALOG OUTPUT

Current

0 to 20 mA (output load range from 80 to 550 ohms).



- 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 TAC I/A Series controllers, or the TAC 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 TAC MicroNet Sensors can be connected to any MN controller.
- 5 A PDA running the Pocket TAC I/A interface software may be used to communicate with TAC MicroNet I/A Series controllers.
- 6 When routers are used, WP Tech is able to communicate through them to any of the TAC I/A Series devices on the network.



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