

TAC Xenta[®] 102-AX

VAV Controller with Actuator and Airflow Transducer

TAC Xenta 102-AX is a zone controller intended for VAV heating and cooling applications with one or two stages of reheating. The controller keeps a constant temperature in the zone by controlling the air flow and heating stages. By using a carbon dioxide sensor, the air quality can be controlled in the zone.

TAC Xenta 102-AX is equipped with an integrated, static air velocity transducer and a motorized bidirectional actuator in a single package.

The differential pressure air velocity transducer requires a minimum of maintenance. Thus it is also well suited to be placed in the zone return air duct.

The controller is a LonMark compliant device aimed at communicating on a LonTalk TP/FT-10 network via a twisted-pair, unpolarized cable. It is able to operate both as a stand-alone unit and as part of a system. All relevant network variables can be monitored and configured via the Network Plug-in or, locally, via the intelligent thermostat device I/STAT or the commissioning device M/STAT.

TECHNICAL DATA

Supply voltage

.....single class two source
 24 V AC \pm 10%, 50–60 Hz

Power consumption

Controller 9 VA
 Digital outputs, each max. 12 VA
 Total, all outputs max. 36 VA

Ambient Temperature

Storage $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $122\text{ }^{\circ}\text{F}$)
 Operation $0\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ ($32\text{ }^{\circ}\text{F}$ to $122\text{ }^{\circ}\text{F}$)
 Humidity max. 90% RH non-condensing

Mechanical

Enclosure ABS/PC
 Enclosure rating NEMA 1 and IP 10
 Flammability class, materials UL 94-5VB
 Dimensions see Fig. 1
 Weight 1.04 kg (2.3 lb.)

Inputs – Digital

Dry Contact, excitation 5 V DC at 0.5 mA

Inputs – Analog

Thermistor type 10 kOhm NTC (Dale 1M1002-C3)
 Accuracy 0.25% typical span (resistance)
 Resolution 0.1% span
 Voltage 0-5 V

Velocity Pressure Input

Span 0–249 Pa (0–1.0" Water column)
 Accuracy 5% at 250 Pa (1.0" Water column)
 Resolution 1.07 Pa (0.0043" Water column)
 Sensor fitting FRPE polyethylene tubing 6.3 mm ($\frac{1}{4}$ "")
 Dead-End device – No air consumption

Outputs

Low voltage TRIAC 24 V AC, voltage sourcing,
 max. 0.75 A (2 A total for all three outputs)
 Torque rating 6 Nm (53 lb.-in.)
 Stroke 0° to 95° , fully adjustable
 Timing 2.4 sec./degree rotation (50 Hz)
 2 sec./degree rotation (60 Hz)
 Position indication Visual indication
 Manual override Push-button clutch release

Terminations

..... Removable screw terminal connectors

Damper Linkage

Round shaft extending a minimum of 25 mm (1")
 from the box, diameter 12.7 mm ($\frac{1}{2}$ "")

Application Program

Cycle time 1 sec.

Indication LED Colors

Power On green
 LON network activity transmission amber
 LON network activity receive green
 Neuron service amber

LonMark Standard

..... LonMark Interoperability Guidelines
 LonMark Functional Profile: VAV Controller
 Communication protocol LonTalk
 Physical channel TP/FT-10, 78 kbps
 Neuron type 3150, 10 MHz

Agency Compliances

Emission:C-Tick; EN 61000-6-3; FCC Part 15, Subpart B, Class B
 Immunity: EN 61000-6-1

Safety: CEEN 61010-1
 UL916 Enclosed Energy Management Equipment
 Approved for plenum applications
 US Patent no. RE37, 245E (reissue of no. 5,450,999)
 RoHS directive 2002/95/EG

Part Numbers

Controller 007305401
 I/STAT, LED version ISTAT-A-C
 I/STAT, LCD version ISTAT-LDC-C
 M/STAT, LED version MSTAT-A-C
 STR200 004603000
 STR200-W 004603010
 STR202 004603200
 STR250 004603300
 S/STAT SLIDESTAT
 TTS100WJ TTS100WJ
 Installation Handbook 04-7838-01
 SW and HW Reference Handbook 04-7839-01
 Installation Instruction 02-00041-01
 Pocket Reference Card 02-00042-01

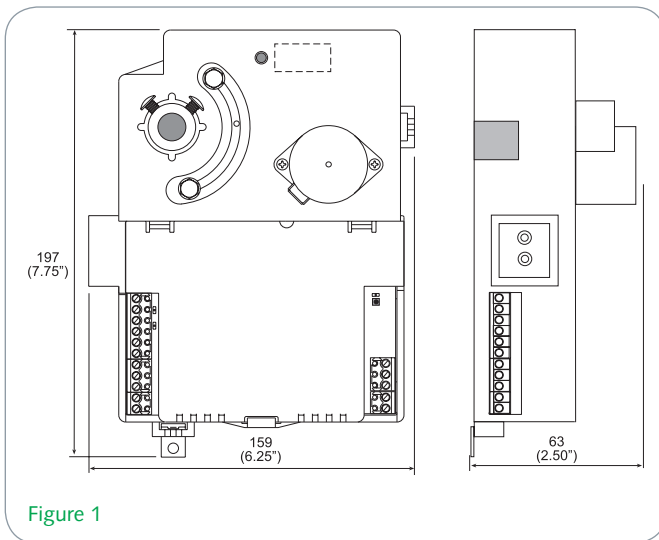


Figure 1

APPLICATION EXAMPLE

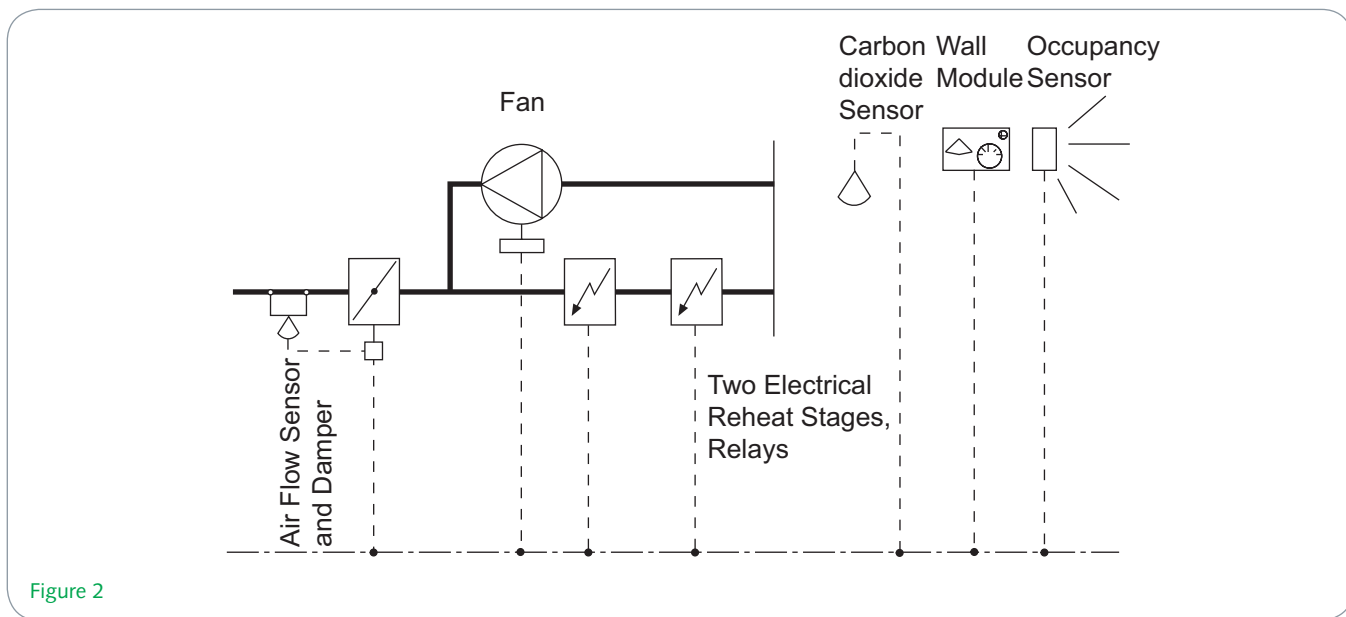


Figure 2

FUNCTIONS

The TAC Xenta 102-AX VAV controller is a component of a single path VAV air delivery system (fig. 3).

The controller has an integrated static air velocity transducer and a motorized bidirectional actuator. Other features:

- CO₂ monitoring;
- reheat control;
- damper control;
- heating/cooling changeover;
- occupancy/light control.

Reheating control may be done in several ways:

- 3-stage heating
- Pulse Width Modulation (up to 999 s)
- Increase/decrease (floating)

Fan control can be enabled/disabled, either in a parallel or serial mode.

The TAC Xenta 102-AX VAV can operate in a stand-alone configuration or as part of an interconnected network.

All network variables are preconfigured at the factory. This reduces setup time for both stand-alone and integrated configurations and allows stand-alone operation by providing the required data. See fig. 4.

Air flow calibration and essential configuration can be made directly from the wall module (I/STAT) and the hand-held M/STAT.

Plug-In

When the controller is connected to a LonMaker LNS 3 network, a software Plug-In is provided to simplify the setting and monitoring of the controller functions, for example the Network Variables and the Configuration Parameters.

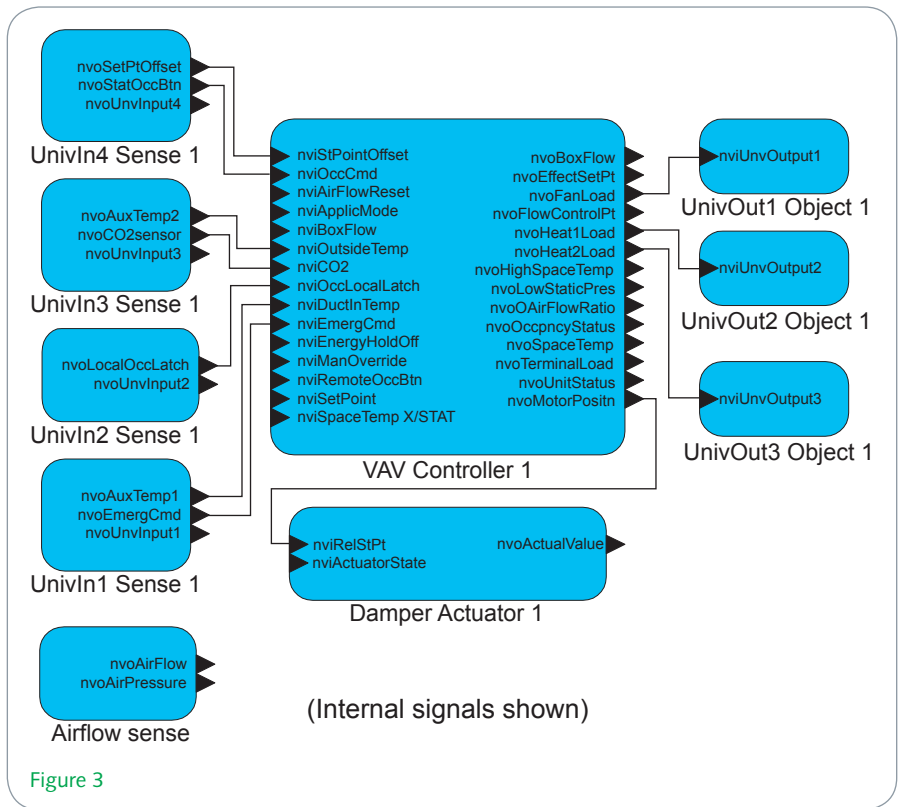


Figure 3

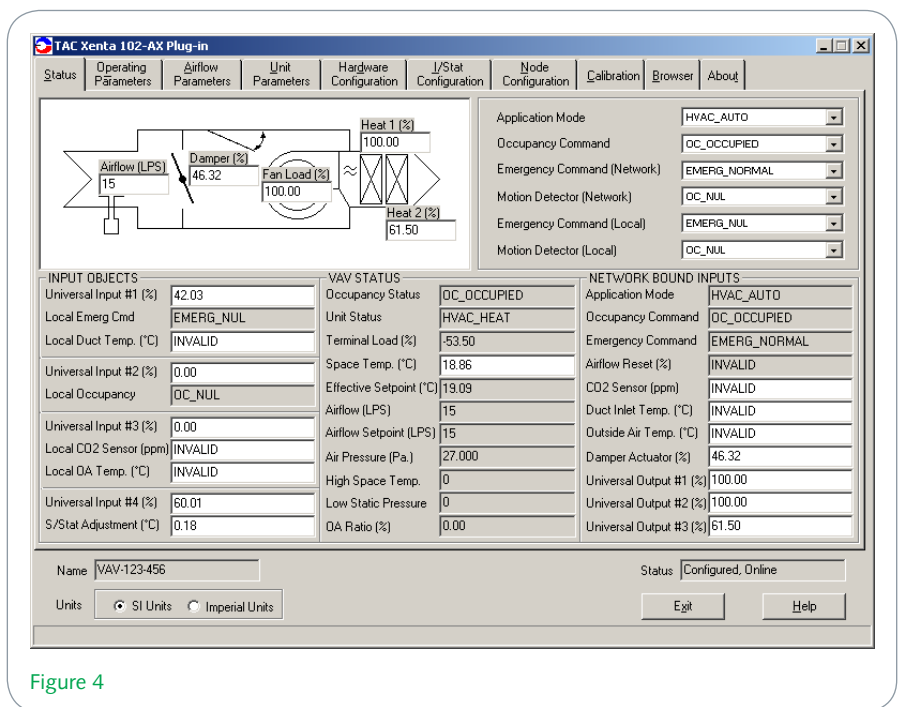


Figure 4

OPERATING AND APPLICATION MODES

Occupied mode

Occupied mode is used when the zone is occupied. This mode is also the default mode after a reset or a power up.

Standby mode

The standby mode is to raise the active cooling setpoint/lower the heating setpoint when the zone is temporarily unoccupied.

Bypass mode

When the TAC Xenta VAV controller is in unoccupied scheduled times of the day or week, a push-button Bypass, or manual override from the local wall module (for example I/STAT or S/STAT) can activate the Bypass mode to the occupied setpoints for an adjustable override period.

If the button is pressed again before the defined override period expires, the unit will return operation to unoccupied setpoints unless the local hardware input or the network input are calling for occupancy.

Unoccupied mode

Unoccupied is to prevent the zone from overheating/overcooling after-hours.

Morning Warmup

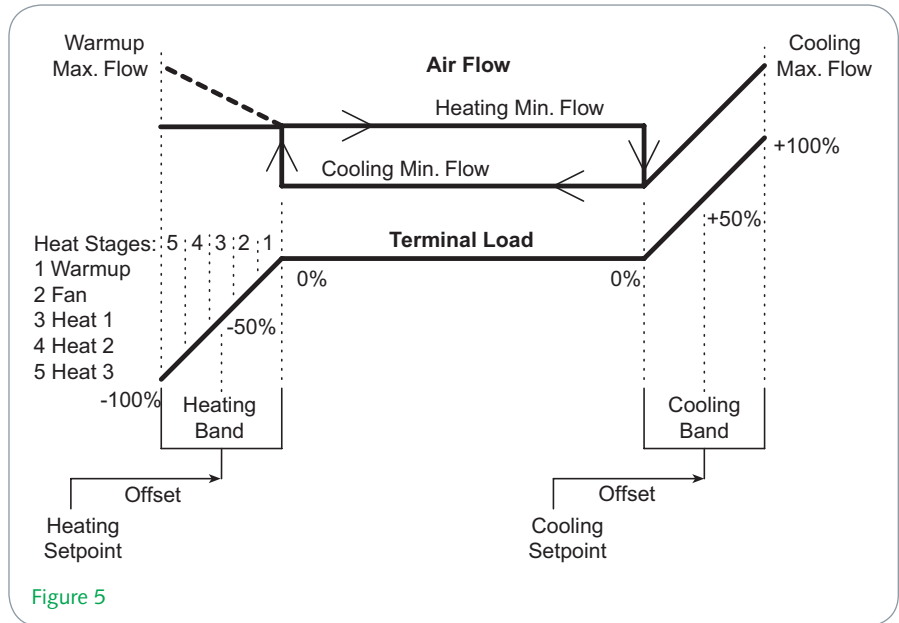
Adjusting the temperature, before a set time, so that the correct comfort temperature is reached as required.

Night Purge

Using cool night air to ventilate the building in Unoccupied mode.

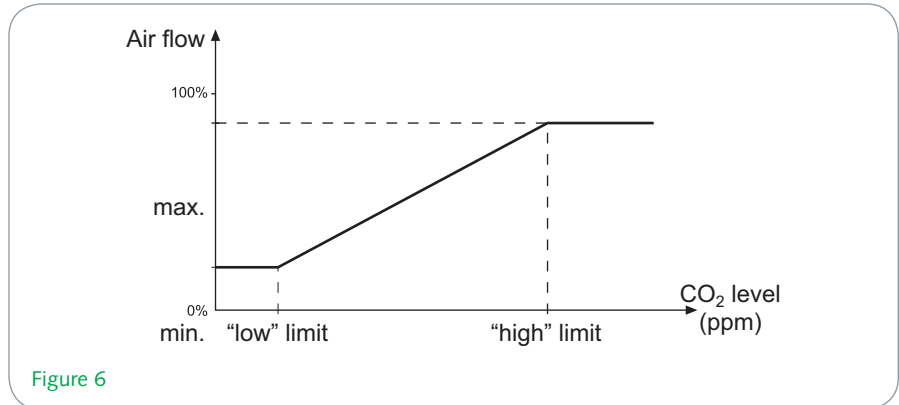
Emergency pressurization/depressurization

Optional pressurization control supporting smoke control systems for the entire area served.



Air Quality Control

The controller includes an additional air quality controller, which will modulate the air flow to maintain the carbon dioxide level in the zone between set limits, see figure 6.



Pre-cooling

Lowering the temperature during the night to anticipate and lessen the cooling demand during the day.

CABLES

G and G0: Min. cross-sectional area 0,75 and 1,5 mm² (AWG 18 and 14).

C1 and C2: TP/FT-10 allows the user to wire the control devices with virtually no topology restrictions.

The max. wire distance in one segment depends on the type of wire and the topology.

The TAC Xenta Network guide (part no. 0-004-7460) gives a more detailed description.

ACCESSORIES

I/STAT – An intelligent wall-mount sensor with display and keypad control.

M/STAT – Portable maintenance version of I/STAT, equipped with interface cable and connector.

S/STAT – A wall-mount sensor with bypass button, a slide potentiometer to adjust the temperature setpoint and an M/STAT communication jack.

TTS100WJ – A thermistor wall-mount sensor with an M/STAT communication jack.

STR200 – Wall module with temperature sensor

STR200-W – As STR200, but all white.

STR202 – Wall module with temperature sensor, bypass button and setpoint offset wheel.

STR250 – Wall module with temperature indication, setpoint adjustment, bypass button, fan speed control and display.

LONMARK OBJECTS AND NETWORK VARIABLES

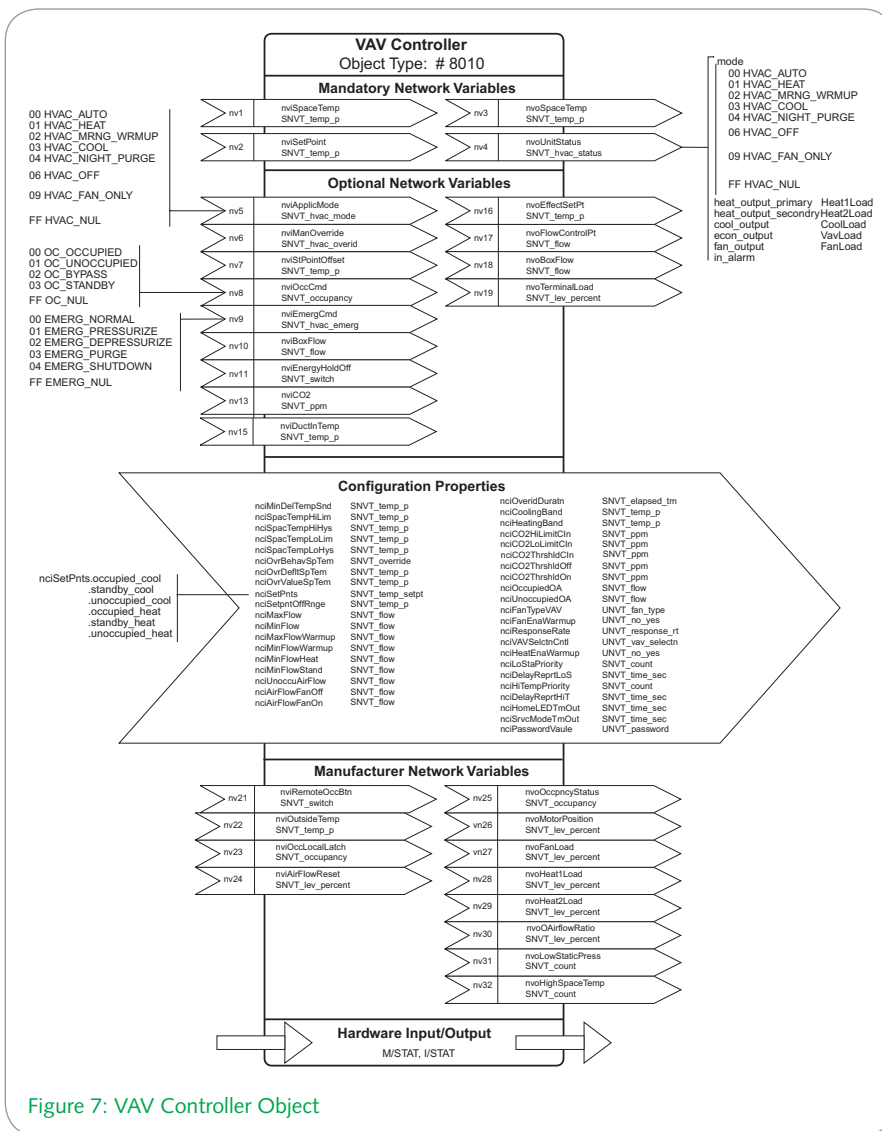


Figure 7: VAV Controller Object

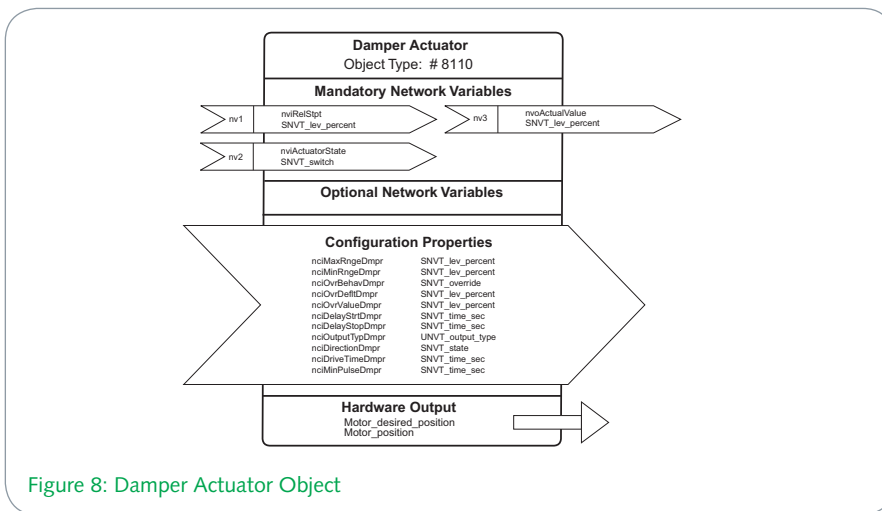


Figure 8: Damper Actuator Object

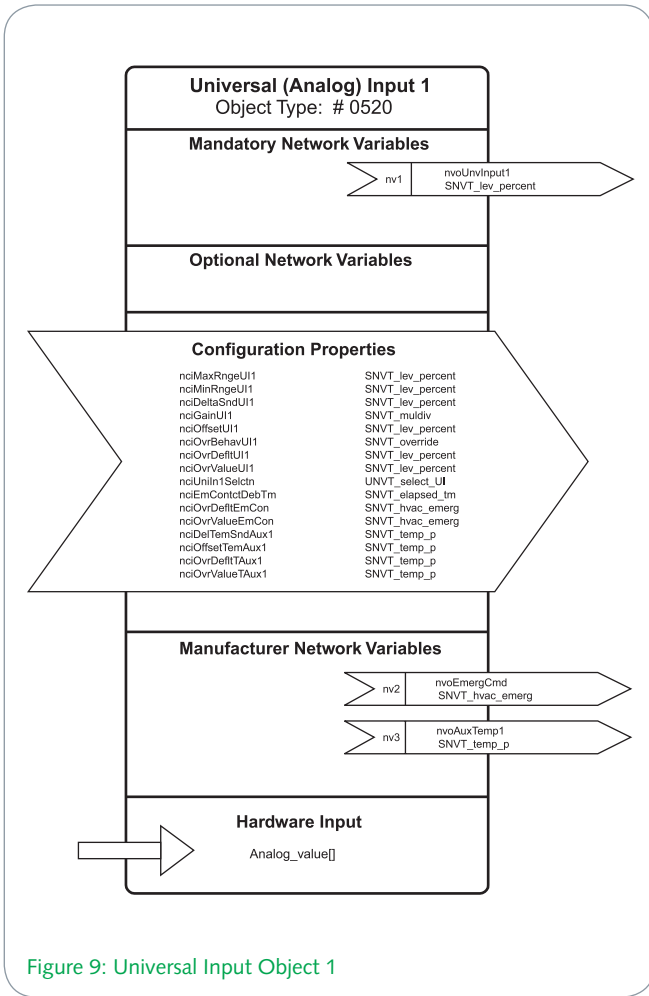


Figure 9: Universal Input Object 1

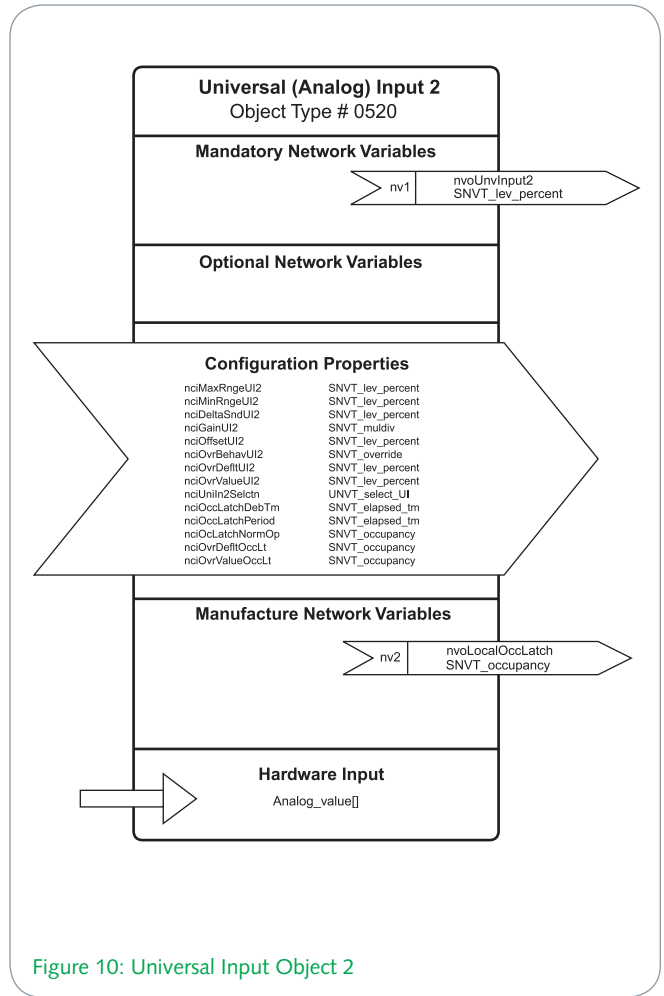


Figure 10: Universal Input Object 2

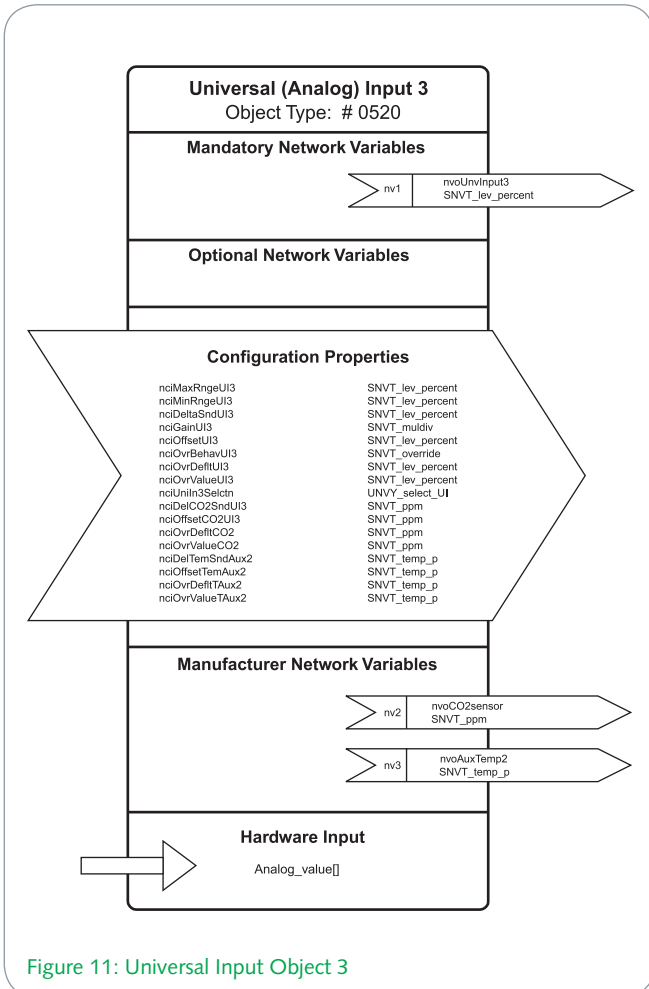


Figure 11: Universal Input Object 3

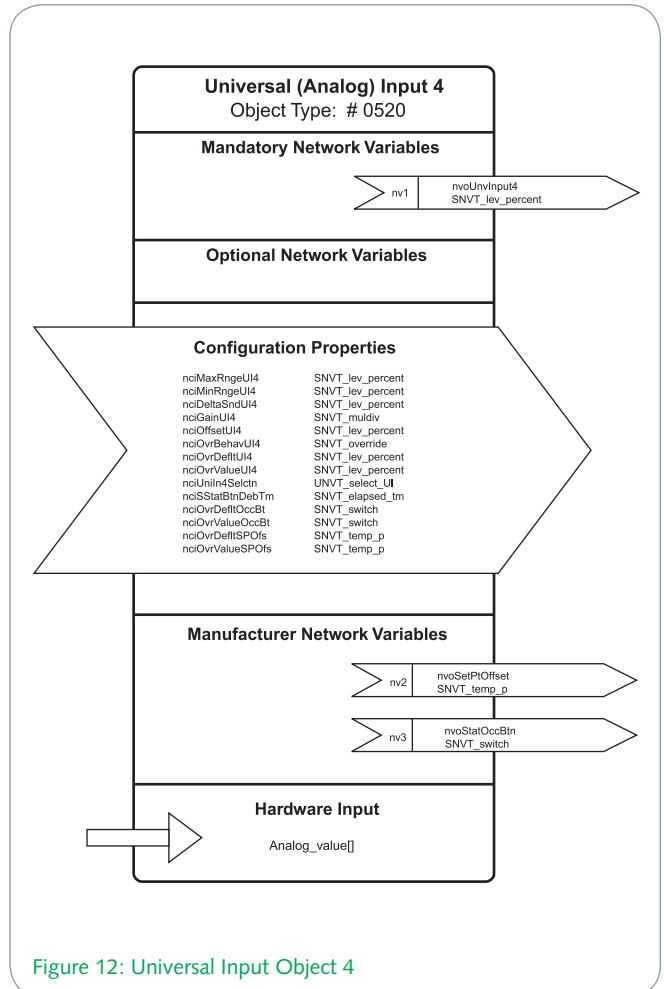


Figure 12: Universal Input Object 4

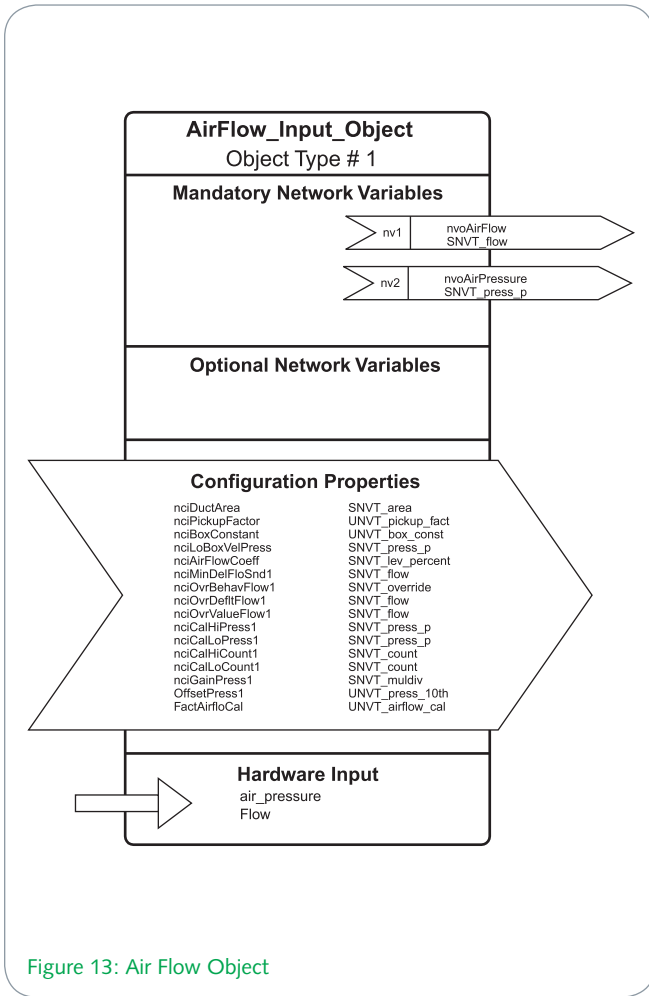


Figure 13: Air Flow Object

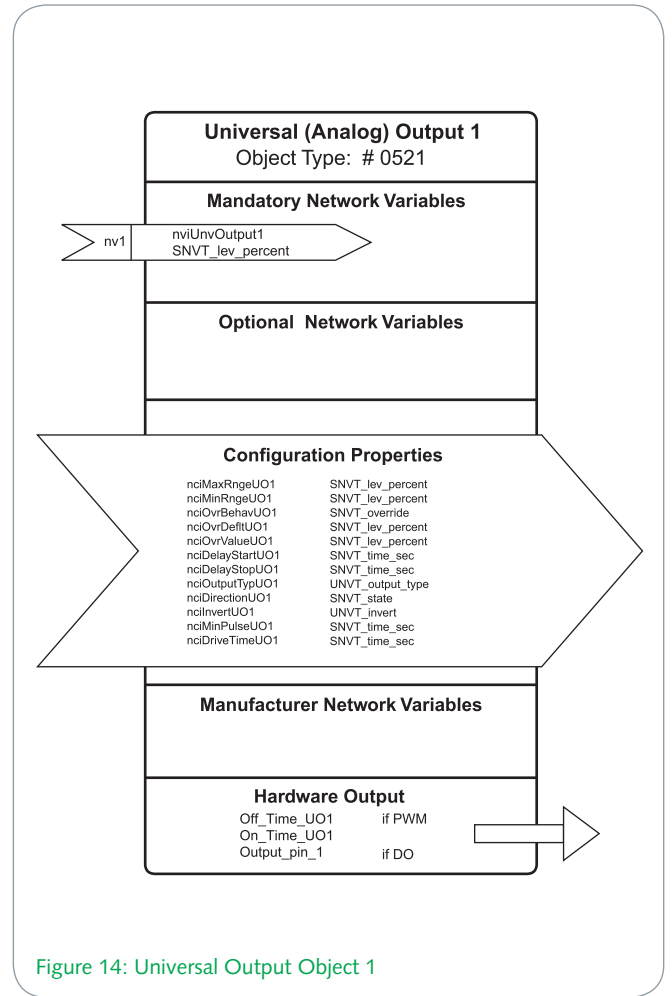


Figure 14: Universal Output Object 1

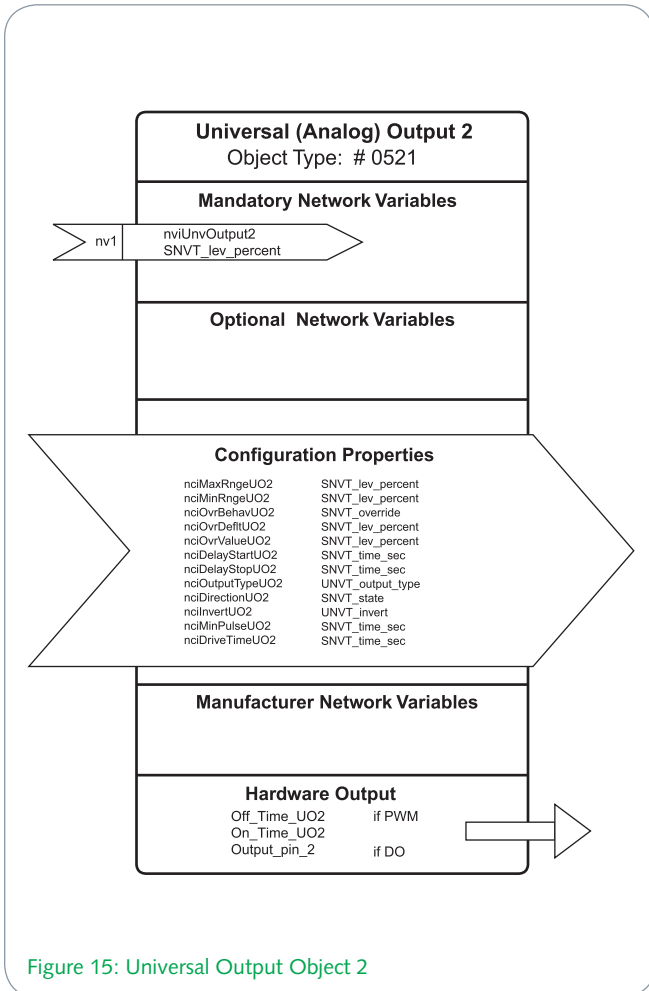


Figure 15: Universal Output Object 2

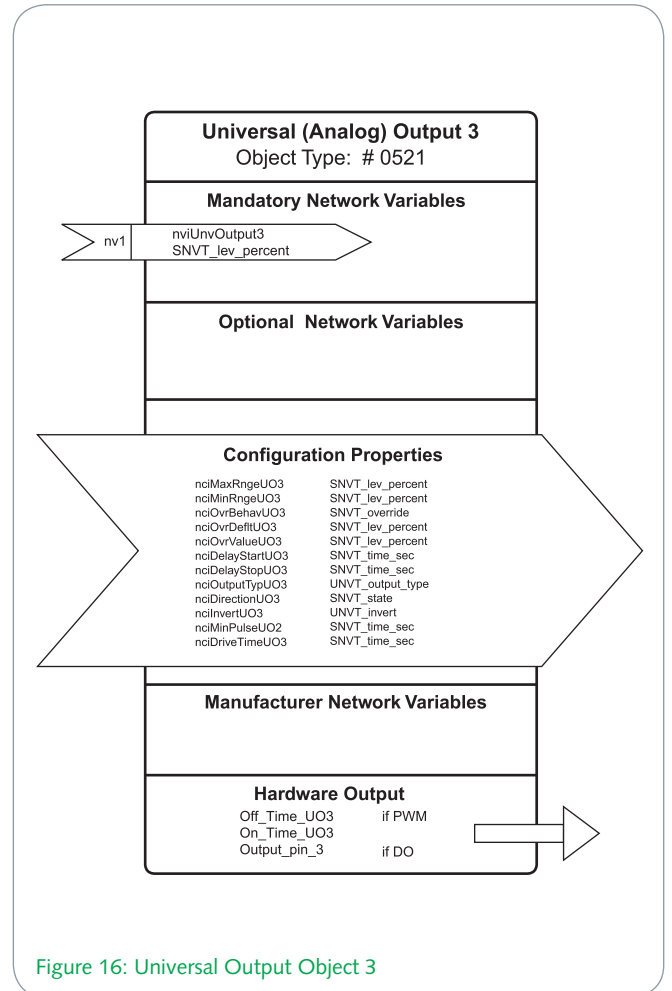


Figure 16: Universal Output Object 3

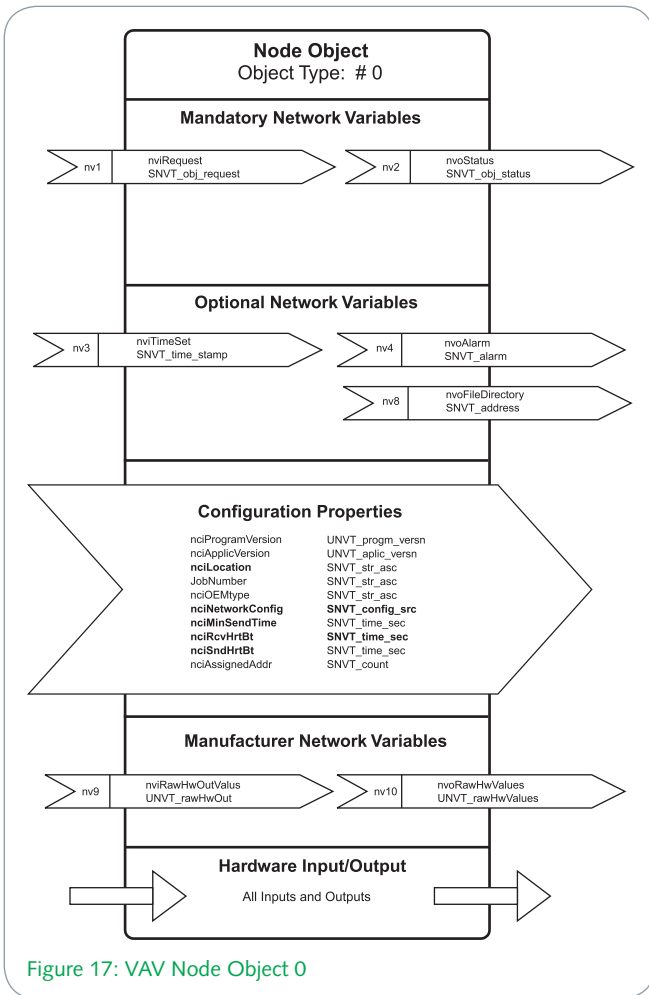


Figure 17: VAV Node Object 0

HARDWARE INTERFACE

TB	Term. no.	Label no.	Designation	Description
1	1	12	G	24 V AC (G) input
	2	13	G0	24 V AC (G0) input
2	1	14	V1	Digital Out.: Fan Relay Load
	2	15	V2	Digital Out.: H1 Aux/Heat Relay Load (Increase)
	3	16	V3	Digital Out.: H2 Aux/Heat Relay Load (Decrease)
3	1	10	C1	TP/FT-10 LON communication channel
	2	11	C2	TP/FT-10 LON communication channel
4	1	7	STAT-DATA	I/STAT, M/STAT or S/STAT, white connection STR200-202 Signal 11 STR250 Data 11
	2	8	STAT-PWR	I/STAT, M/STAT or S/STAT, red connection STR200-202 Pwr 12 STR250 Pwr 12
	3	9	STAT-GND	I/STAT, M/STAT or S/STAT, black connection STR200-202 Gnd 13 STR250 Gnd 13
5	1	1	U1	Universal Input: Thermistor / Discrete (Duct temp. or Emergency contact)
	2	2	U2	Universal Input: Thermistor / Discrete (Occupancy sensor)
	3	3	U3	Universal Input: Thermistor / Discrete (CO2 or Outside air)
	4	4	U4	Universal Input: Resistor / Discrete (S/STAT blue and yellow) STR202 Adjust and Switch
	5	5	-	Not used
6	6	6	M	Measurement neutral

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