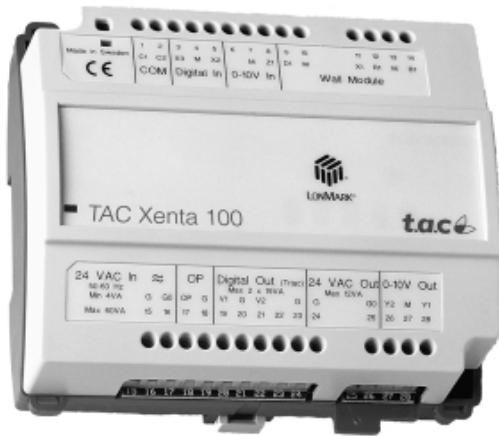




# TAC Xenta® 102-ES

VAV Controller with Airflow Sensor

14 Feb 2003



TAC Xenta® 102-ES is a zone controller intended primarily for VAV cooling applications with one or two stages of re-heating. 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.

The controller is a LONMARK®-compliant device that communicates 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 network variables can be monitored and configured via the TAC Xenta OP, if the OP version is 3.11 or higher.

The STR100 or ZS 100 ranges of wall modules are used with TAC Xenta 102-ES. There are plug-in terminal blocks available for the TAC Xenta 100 series which can be attached to the existing terminals.

## TECHNICAL DATA

Supply voltage ..... 24 V AC +/-20%, 50–60 Hz

Power consumption:

Controller with TAC Xenta OP ..... 6 VA

Digital outputs ..... max. 6 x 19 = 114 VA

Total ..... max. 120 VA

Ambient temperature:

Operation ..... 0 to 50 °C (32 to 122 °F)

Storage ..... -20 to 50 °C (-4 to 122 °F)

Humidity ..... max. 90% RH, non-condensing

Enclosure:

Material ..... ABS/PC plastic

Enclosure rating ..... IP 30

Color ..... grey/red

Dimensions ..... 122 x 126 x 50 (4.8 x 5 x 2 in)

Weight ..... 0.4 kg (0.88 lb)

Input for occupancy sensor, X2:

Voltage across open contact ..... 23 V DC ± 1 V DC

Current through closed contact ..... 4 mA

Minimum pulse input duration ..... 250 ms

Input for window contact, X3:

Voltage across open contact ..... 23 V DC ± 1 V DC

Current through closed contact ..... 4 mA

Minimum pulse input duration ..... 18 s

Outputs for damper actuator, V1-V2, reheat actuator, V3-V4, fan, V5, reheat actuator or free network output, V6:

Minimum output voltage ..... supply voltage – 1.5 V AC

Maximum load (per output) ..... 0.8 A

Input for bypass button on wall module, X1:

Minimum pulse input duration ..... 250 ms

Maximum current, LED ..... 2 mA, for ZS 100 series

Inputs for zone and auxiliary temperature sensor, B1-B2:

Thermistor type ..... 1800 Ω at 25 °C (77 °F)

Measuring range ..... -10 to 50 °C (14 to 122 °F)

Accuracy ..... ±0.2 °C (±0.4 °F)

Input for carbon dioxide sensor, U1:

Measuring range ..... 0–10 V DC

Accuracy ..... ±0.1 V

Air flow input based on TAC GV sensor characteristics at duct velocity 1 to 15 m/s (3 to 50 ft./s).

Input setpoint adjustment on wall module, R1:

Type ..... 10 kΩ linear potentiometer

Adjustment range ..... ±5 °C (±9 °F)

Accuracy ..... ±0.1 °C (±0.2 °F)

Output heating stage 1, Y1:

Output range ..... 0 – 10 V

Max current ..... 2 mA

Accuracy ..... 0.2 V at full load

Application program:

Cycle time ..... 6 s

Indication LED colors:

Power ..... green

Service ..... red

Interoperability:

Standard ..... conforms to  
LONMARK Interoperability Guidelines and  
LONMARK Functional Profile: VAV Controller

Communication protocol ..... LONTALK

Physical channel ..... TP/FT-10, 78 kbps

Neuron® type ..... 3150®, 10 MHz

Conformance to standards:

Emission ..... C-Tick, EN 50081-1, FCC Part 15

Immunity ..... EN 50082-1

Safety:

CE ..... EN 61010-1

UL 916 ..... Energy Management Equipment

ETL listing ..... UL 3111-1, first edition  
CAN/CSA C22.2 No. 1010.1-92

Flammability class, materials ..... UL 94 V-0

Part number, TAC Xenta 102-ES:

Controller ..... 0-073-0537

Manual (GB) ..... 0-004-7663

Plug-in Terminal Blocks TAC Xenta 100 ..... 0-073-0914

Disk with external interface files (XIF) for the  
TAC Xenta 100 series ..... 0-008-5582



## APPLICATION EXAMPLE

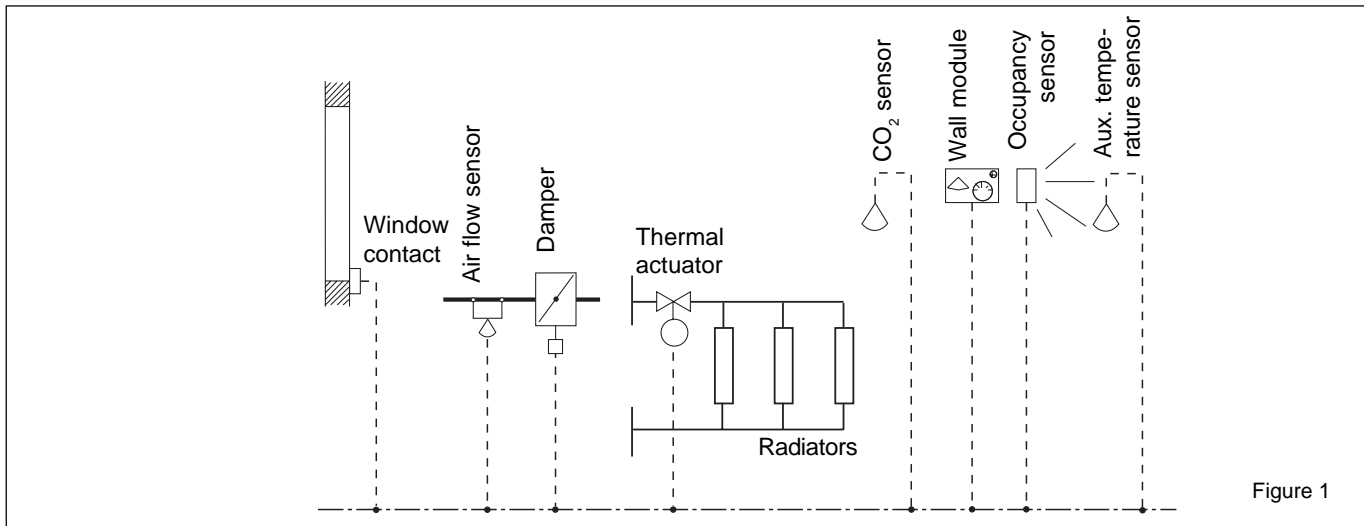


Figure 1

## FUNCTIONS

The TAC Xenta 102-ES VAV controller is intended for the following applications:

- Damper control (cooling) and one free network output.
- Damper control with reheat and one free network output.
- Damper control with primary and secondary reheat

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

The controller has an on-board air velocity sensor and should be connected to an external airflow sensor (e.g. TAC GV).

The controller includes an additional air quality controller, which will modulate the airflow to maintain the carbon dioxide level in the zone between set limits (see figure 3).

The controller also includes an auxiliary temperature sensor input for free network monitoring of any temperature point.

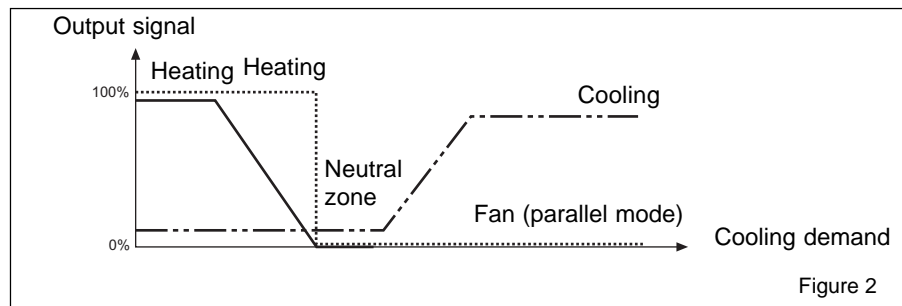


Figure 2

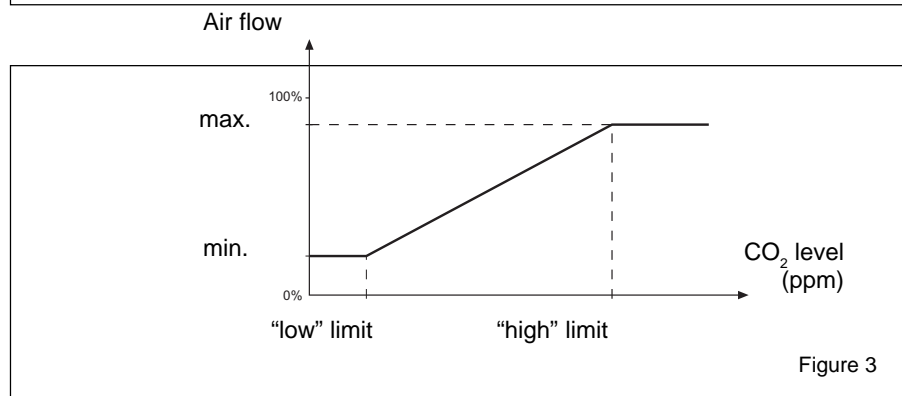


Figure 3

## OPERATING MODES

### Occupied mode

This mode is used when the zone is occupied. This mode is also the default mode after a reset or a power up. The fan runs if the fan is connected in a serial mode, or if heating is active in the parallel mode.

### Standby mode

This mode reduces energy consumption in the zone when enabled. The neutral zone is larger than that of the occupied mode, and the airflow is diminished from "min. occupied air flow" to "min. standby air flow".

### Bypass mode

To bypass the centrally set standby mode, press the bypass button on the wall module, upon which the controller starts running in occupied mode. When two hours have passed, the controller reverts to standby mode.

### Unoccupied and off modes

The controller stops running when centrally ordered or when a window is opened. The damper is fully closed.

### Slave mode

The following happens when the network variable *nciAppOptions* enables the slave mode:

The slave controller goes into off mode and controls airflow as set by the master controller.

In slave mode, both the slave and master controllers must be equipped with identical auxiliary units.

### Night purge mode

In night purge mode, the airflow is set to its maximum value in order to cool the zone with outdoor air. The heating is off.

## EMERGENCY MODE

Emergency mode is forced and has two different settings, see below:

### Shutdown or depressurize mode

The damper is fully closed.

### Purge or pressurize mode

The air flow is set to its nominal value, which equals a fully open damper.

## INSTALLATION

The controller may be mounted on a DIN rail or fastened onto a ceiling or a wall. Two sockets are provided for that purpose.

### Cable lengths

Communication cables: refer to the TAC Xenta Network Guide, part number 0-004-7460.

Other cables: maximum length 30 m (100 ft.), minimum wire size of 0.7 mm<sup>2</sup> (19 AWG) applies to all other cables and all other equipment. The cables are to be twisted, but not shielded.

## CONFIGURATION OPTIONS

By changing the network variable *nci-AppOptions* (see figure 4), it is possible to achieve different options with the TAC Xenta 102-ES.

The controller's default setting disables all auxiliary units. Below is a list of the different options:

- Occupancy sensor enabled/disabled
- Window contact enabled/disabled
- Fan enabled/disabled
- Fan control parallel/serial
- Air quality controller enabled/disabled
- Thermoactuators NC/NO
- Heating set up options
- Slave mode disabled/enabled
- Occupancy sensor normally open/normally closed
- Type of Wall Modules used

## LONMARK OBJECTS AND NETWORK VARIABLES

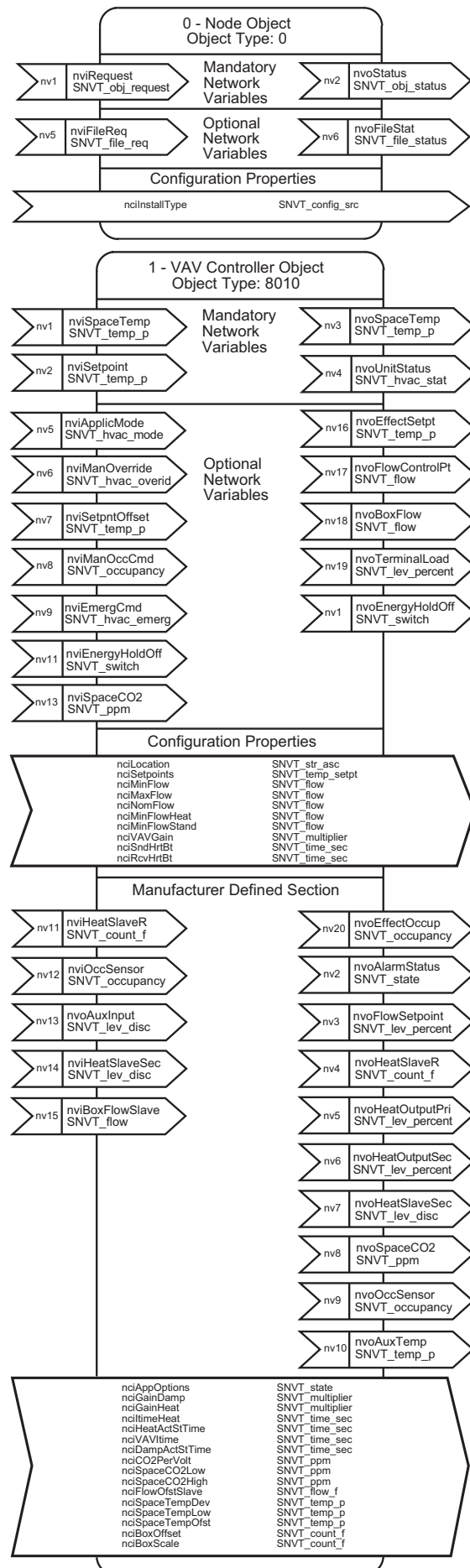
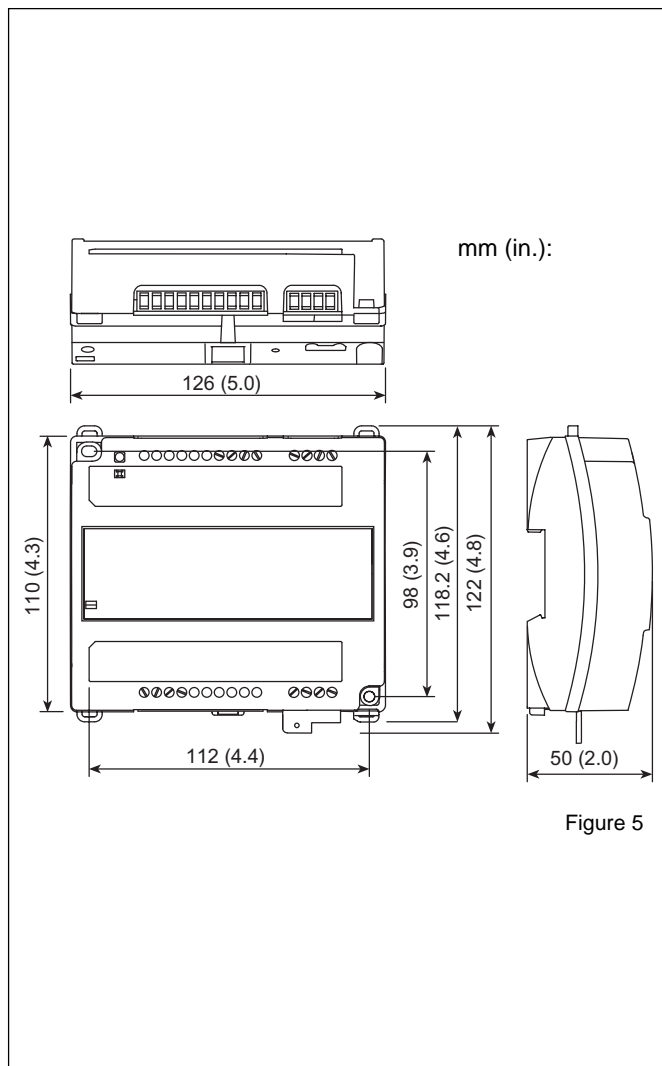


Figure 4

## HARDWARE INTERFACE

No.	Designation	Description	No.	Designation	Description
1	C1	TP/FT-10 communication channel	15	G	24 V AC (G) input
2	C2	TP/FT-10 communication channel	16	G0	24 V AC (G0) input
3	X3	Input, window contact	17	OP	24 V AC supply for TAC Xenta OP
4	M	Measurement neutral	18	G	24 V AC supply for TAC Xenta OP
5	X2	Input, occupancy sensor	19	V1	Output, damper increase
6	B2	Optional temperature input	20	G	24 V AC (G) output to V1 and V2
7	M	Measurement neutral	21	V2	Output, damper decrease
8	U1	Input, carbon dioxide sensor	22	V3	Reheat valve actuator, increase or thermal actuator
9	D1	Output, indication on wall module	23	M	Measurement neutral
10	M	Measurement neutral	24	V4	Reheat valve actuator, decrease
11	X1	Input, bypass button on wall module	25	V5	Fan on-off control
12	R1	Input, setpoint offset dial on wall module	26	G	24 V AC (G0) output to V5 and V6
13	M	Measurement neutral	27	V6	Free/network output, reheat thermal actuator stage 2
14	B1	Input, zone temperature sensor	28	Y1	Heating demand stage 1, 0-100%

## DIMENSIONS



## STR WALL MODULES

Designation Part number	Description
STR100 0-046-0010	Temperature sensor
STR101 0-046-0020	Temperature sensor, mode indication and OP connector
STR102 0-046-0030	Temperature sensor, setpoint dial, mode indication and OP connector
STR104 0-046-0040	Temperature sensor, setpoint dial, mode indication, bypass button and OP connector
STR150 0-046-0280	Temperature sensor, setpoint dial, mode indication, bypass button and OP connector

## ZS WALL MODULES

Designation Part number	Description
ZS 101 0-073-0908	Temperature sensor, mode indication and OP connector
ZS 102 0-073-0909	Temperature sensor, setpoint dial, mode indication and OP connector
ZS 103 0-073-0910	Temperature sensor, mode indication, bypass button and OP connector
ZS 104 0-073-0911	Temperature sensor, mode indication, bypass button, setpoint dial and OP connector

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