



TAC Xenta[®] 280

Programmable Controller

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TAC Xenta[®] 280 belongs to a family of programmable controllers designed for Zone control or small sized heating and air handling systems.

A TAC Xenta 280 controller holds basic HVAC functionality including control loops, curves, time control, alarm handling etc.

The Xenta 280 controller is available with two different I/O configurations, TAC Xenta 281 and TAC Xenta 282. The controllers are designed for cabinet mounting.

The TAC Xenta 280 controller is simple to program and put into operation, using the graphical software tool TAC Menta[®].

The controller communicates on a LON^{TALK}[®] TP/FT-10 network via a twisted-pair, unpolarized cable. It is able to operate both as a stand-alone unit and can be easily connected to a large LON^{WORKS} based network.



For local use the TAC Xenta OP operator panel can be connected to TAC Xenta. The OP has a display and push buttons for navigating and altering settings.

The operator panel can be snapped onto the TAC Xenta controller unit, be mounted in the cabinet front or be used as a portable terminal.

TECHNICAL DATA

Supply voltage	24 V AC $\pm 20\%$, 50/60 Hz or 19–40 V DC
Power consumption	max. 5 W
Transformer sizing	10 VA
Ambient temperature:	
Storage	–20 to +50 °C (–4 to +122 °F)
Operation	0 to +50 °C (+32 to +122 °F)
Humidity	max. 90% RH non-condensing
Mechanical:	
Enclosure	ABS/PC
Enclosure rating	IP 20
Dimensions, mm (in.)	180 x 110 x 75 (7.1 x 4.3 x 3.0)
Weight	1,0 kg (2.2 lbs)
Real time clock:	
Accuracy at +25 °C (77 °F)	± 12 minutes per year
Power failure protection	72 h
Digital inputs (X1–X2):	
Quantity	2
Voltage across open contact	33 V DC
Current through closed contact	4 mA
Pulse input duration	min. 20 ms
Universal Inputs (U1–U4):	
Quantity	4
– as Digital Inputs;	
Voltage across open contact	26 V DC
Current through closed contact	4 mA
Pulse input duration	min. 20 ms
– as Thermistor Inputs;	
TAC thermistor sensor	1800 ohm at 25 °C (77 °F)
Measuring range	–50 to +150 °C (–58 to +302 °F)
– as Voltage inputs;	
Input signal	0–10 V DC
Input resistance	100 kohm
accuracy within 1% of full scale	
Sensor inputs (B1–B2, only TAC Xenta 282):	
Quantity, TAC Xenta 282	2
TAC thermistor sensor	1800 ohm at 25 °C (+77 °F)
Measuring range	–50 to +150 °C (–58 to +302 °F)

Digital outputs (relays; K1–K3 or K1–K4):	
Quantity, TAC Xenta 281	3
Quantity, TAC Xenta 282	4
Control voltage, relay outputs	up to 230 V AC
Control current, to be protected by max. 10 A fuse,	
.....	max. 2 A
Analog outputs (Y1–Y3 or Y1–Y4):	
Quantity, TAC Xenta 281	3
Quantity, TAC Xenta 282	4
Control voltage	0–10 V DC
Control current, short-circuit proof	max. 2 mA
Deviation	max $\pm 1\%$
Communication:	
TAC Menta	9600 bps, RS232, RJ45
TAC Vista (version IV or higher), also for appl. program	
download	TP/FT-10, screw terminal
TAC Xenta OP	TP/FT-10, modular jack
LON ^{MARK} [®] standard:	
Interoperability	LON ^{MARK} Interop. Guidelines v 3.0
Application ..	LON ^{MARK} Functional Profile: Plant Controller
Agency Compliances:	
Emission	C-Tick, EN 50081-1
Immunity	EN 50082-1
Product standard	EN 61326-1
Safety:	
CE	EN 61010-1
UL 916	Energy Management Equipment
Flammability class, materials	UL 94 V-0
Part numbers:	
Electronics part TAC Xenta 281/N/P	0-073-0030
Electronics part TAC Xenta 282/N/P	0-073-0031
Terminal part TAC Xenta 280/300	0-073-0901
Operator terminal TAC Xenta OP	0-073-0907
TAC Xenta: Programming Serial Kit	0-073-0920



DESIGN

The TAC Xenta 280 controller has been designed as a general purpose unitary (one-to-one) controller. Thus it can be mounted in close proximity to the controlled equipment, minimizing the wiring required.

TAC Xenta 280 is microprocessor based. It consists of a terminal and electronics mounted together (figure 1).

The Xenta 280 can be interfaced with a wide variety of field sensors/transducers and controlled devices. All terminations of field wires are made to the terminal part only. Thus the electronics part may be removed for service without affecting the terminal connections.

Local operator terminal

The TAC Xenta OP is a small operator terminal which can be connected to the unit through its enclosure. The operator can read point status, perform manual override, read measured values, alter set points etc., from the TAC Xenta OP.

The functions are selected from an automatically generated menu tree. Access to the unit is enabled by an access code. It is possible to access other TAC Xenta units on the same network.

Power failure protection

With non-volatile (flash) memory, the unit will start up with user settings and work normally after a power failure.

Real-time clock

The clock provides data such as year, month, date, day, hour, minute and second.

A built-in capacitor maintains operation of the clock for at least 72 hours in the event of a power failure.

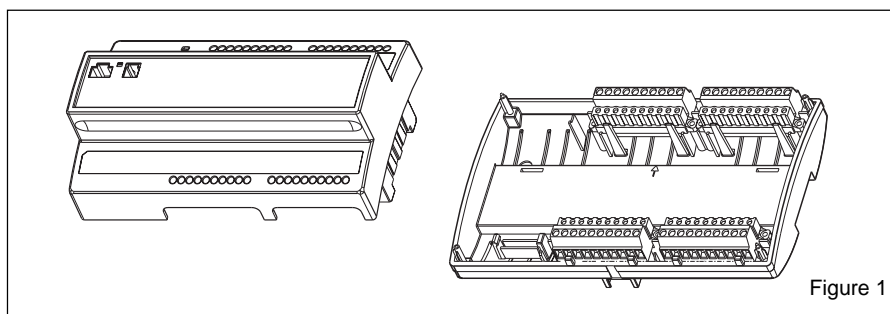


Figure 1

Daylight Saving Time: European, Australian or for USA/Canada

Once set, Daylight Saving Time (DST) is fully automatic. The date of the time change, as well as the magnitude of time change can be programmed. This function can also be disabled.

Digital Inputs

The DIs are used to sense alarm contacts, status indications, pulse counting, etc. Each digital input can be used as a pulse counter (e.g. for flow measurement). Another application is alarm monitoring. Each time an alarm is tripped, the corresponding counter can be incremented, providing data for operating statistics.

The Digital Input circuits are internally powered.

Universal Inputs

The Universal Inputs can be individually configured as an Analog or Digital Input.

A high and a low limit can be set for each Universal Input. If configured as Digital Inputs, the Universal Inputs may be used, for example, for sensing switch positions.

The Universal Input types are selected via the application program.

Thermistor Inputs

The Thermistor Inputs have a measuring range of $-50\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$ ($-58\text{ }^{\circ}\text{F}$ to $+302\text{ }^{\circ}\text{F}$), 1800 ohm at $25\text{ }^{\circ}\text{C}$ ($+77\text{ }^{\circ}\text{F}$).

Digital Outputs

There are Digital Outputs for the control of equipment such as fans, pumps or similar devices. The output signal can be pulse width modulated.

Analog Outputs

There are Analog Outputs to control actuators or the connection to controllers.

LONWORKS® SNVT support

The use of Standard Network Variable Types according to Echelon® specification makes it possible to communicate with nodes from other manufacturers.

I/O CONFIGURATIONS

The Xenta 280 controller is available with two different I/O configurations, TAC Xenta 281 and TAC Xenta 282.

The table gives an overview of the different numbers of inputs and outputs. No external I/O modules are used with TAC Xenta 280.

TAC Xenta	DI	DO	UI	TI	AO
281	2	3	4	-	3
282	2	4	4	2	4

DI (X): Digital input
 DO (K): Digital output
 UI (U): Universal input
 TI (B): Thermistor input
 AO (Y): Analog output

SOFTWARE FEATURES

With the assistance of TAC Menta, a graphical programming tool using Functional Block Diagrams (FBDs), the TAC Xenta 280 may be easily adapted to different control and monitoring tasks.

The basic software includes pre-programmed routines for:

- reading of Digital Inputs (alarms, pulse counting, interlocks)
- reading of Universal Inputs (individually selectable as analog or digital)
- control of Digital Outputs
- control of Analog Outputs
- on and off delays

- pulse counting (Digital Inputs only)
- alarm handling: alarm conditions may be detected via the digital or the analog inputs.
- equipment run time totals, on selected objects.
- one time schedule block with four entries (start and stop times in hours and minutes): weekly and/or holidays
- optimum start/stop programs
- control characteristic curves
- PID control loops (loops may be connected in cascade)
- trend logging (max. 5 kB)
- local level operator interface via TAC Xenta OP with a standardized menu structure
- network communication according to the LONTALK® protocol

The basic software is adapted to the current application by connecting pre-programmed Functional Blocks and by adjusting the relevant parameters. These connections and parameters are stored in a non-volatile memory.

The parameters may be changed during ongoing operation either from the Central System or locally from the TAC Xenta OP operator panel.

Communication capabilities

The TAC Xenta 280 has several communication capabilities: within the Network, with a central presentation system and with a hand-held Operator Panel.

LONWORKS connection

TAC Xenta controllers communicate with each other using a common network, LONWORKS TP/FT-10, 78 kbps. A number of controllers can form a network and exchange data.

The LONTALK protocol makes it possible to use Network Variables, defined in equipment from other manufacturers.

The Functional Block applications are modelled as true LONMARK® Controller Objects.

The Network Variable interface (including the Standard Network Variable Types, SNVTs) can be customized, and External Interface Files (XIFs) can be generated in the field with the TAC Menta tool.

TAC Vista presentation system

When connected to a TAC Vista Central System (version IV or higher), the operating conditions of the fans, pumps, recovery units etc. can be monitored in color graphics or printed reports.

Temperatures and alarms can be read, while setpoints, time settings may be altered as required.

TAC Xenta controllers can be reached from TAC Vista in one of the following ways.

- 1 Any controller in the network via a PCLTA card.
- 2 A specific controller via the RS232 connection.
- 3 Any controller in the network via TAC Xenta 901 LonTalk adapter.

Application programs generated in TAC Menta may be downloaded from TAC Vista via the network.

TAC Xenta OP port

The operator panel is also connected to the network and can thus act as an operator panel for other units in the network. The connection is made to the modular jack on the front of the controller or directly to the network cable.

RS232 port

The TAC Xenta 280 controller has an RS232 port. This port is intended for connection to a PC with the TAC Menta programming tool for loading and commissioning the application program.

The port can also be used for connection between TAC Vista and specific TAC Xenta 280 units (see above). Connection via modem is not supported.

SYSTEM CONFIGURATIONS

The TAC Xenta 280 controllers can be used in different configurations.

- Stand-alone.
- Controllers and OPs in a network.
- Controllers, OPs and other equipment in a full network with suitable adapters, possibly with connection to a TAC Vista Central System (CS)

Figure 2 shows an example of TAC Xenta network configuration.

Sensors and actuators on the Field level are mostly connected to the conventional inputs/outputs of the controllers.

Some external units, however, may connect directly to the network to communicate input/output data, using Standard Network Variables (SNVTs).

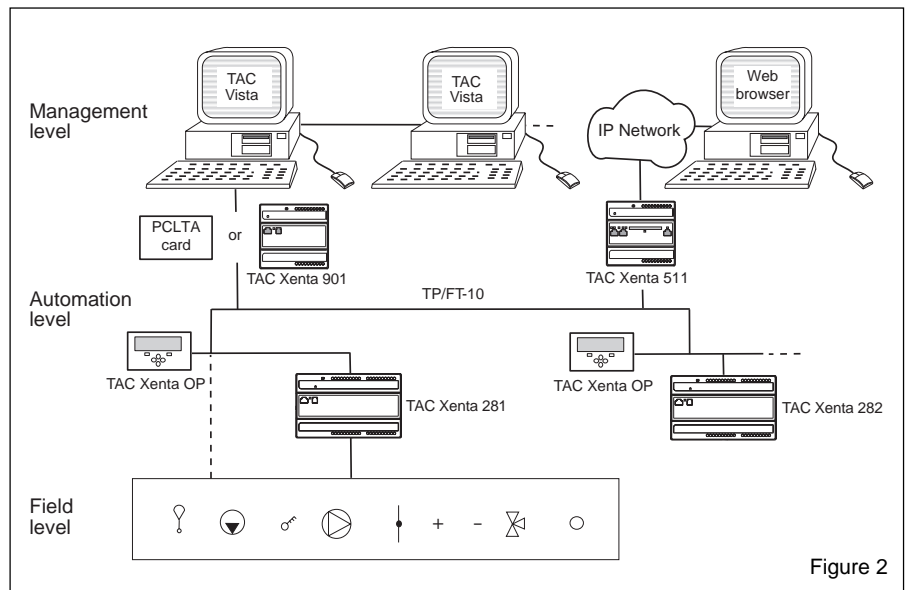


Figure 2

TAC XENTA NETWORK AND UNIT PERFORMANCE

No. of TAC Xenta controllers	400
No. of I/O modules	200
No. of Operator Panels	100
No. of TAC Xenta Groups	30
No. of Xenta controllers per Group ...	30
No. of subscriptions *	
In	max. 15
Out	max. 30

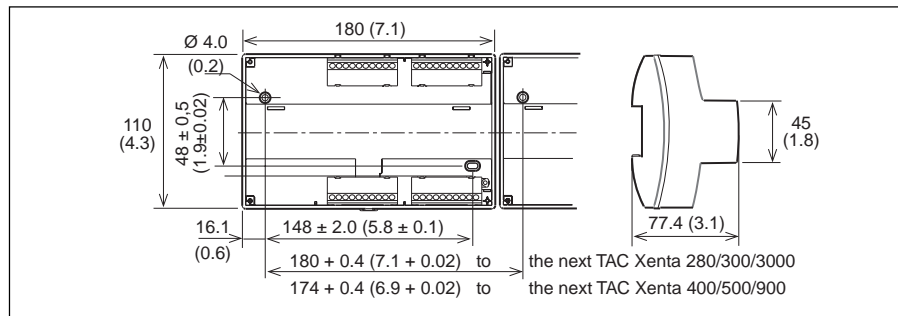
Trend logging in TAC Xenta 280	
Channels	1 – 50
Interval	10 s – 530 weeks
Total logging cap. ...	~ 650 float. no.s
..... or ~ 1300 integers	
..... or ~ 10 000 digital values	
Optimized storage	Yes
Time Channels	1
Application size	
program and data	max. 56 kB
parameters	max. 64 kB

* Subscriptions may utilize standard SNVTs or TACNVs (TAC Network Variables). These may be combined if the following restrictions are observed: The sum of the TACNV subscriptions and the number of SNVT members (no. of values in structured SNVTs) must not exceed the stated figures.

MOUNTING

The TAC Xenta 280 controller is cabinet mounted on a TS 35 mm Norm rail EN 50 022.

The controller consists of two parts; a terminal with the screw terminals, and the electronics with the circuit boards. To simplify installation, the terminal can be pre-mounted in the cabinet (see figure 1). If the Xenta 280 controller is to be wall mounted a wide range of standardized boxes are available.



CABLES

G and G0:

Min. cross-sectional area 0,75 and 1,5 mm² (19 and 16 AWG).

Cable with modular jack for RS232 serial communication port: Max. 10 m (32 ft).

Terminals X:

Min. wire size 0,25 mm² (23 AWG).
Max. cable length 200 m (650 ft).

Terminals U, B, Y:

Min. wire size of 0,25–0,75 mm² (23 to 19 AWG).

Max. cable length 20–200 m (65 to 650 ft) (see TAC Xenta 280/300/401 manual for details).

Terminals K:

Wire size 0,75–1,5 mm² (19 to 16 AWG).
Max. cable length 200 m (650 ft).

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, see the table below.

The TAC Xenta Network guide gives a more detailed description.

Cable	Max. bus length, doubly terminated bus topology m (ft)	Max. node-to-node distance, singly terminated free topology m (ft)	Max. length, singly terminated free topology m (ft)
Belden 85102, single twisted pair	2700 (9000)	500 (1600)	500 (1600)
Belden 8471, single twisted pair	2700 (9000)	400 (1300)	500 (1600)
UL Level IV 22AWG, twisted pair	1400 (4600)	400 (1300)	500 (1600)
Connect-Air 22AWG, one or two pairs	1400 (4600)	400 (1300)	500 (1600)
Siemens J-Y(st)Y 2x2x0.8	900 (3000)	320 (1000)	500 (1600)
4-wire helical twist, solid, shielded			
TIA568A Cat. 5 24AWG, twisted pair	900 (3000)	250 (820)	450 (1500)

INSTALLATION

The two TAC Xenta 280 controllers have different inputs and outputs. The adjacent table shows the terminal connections of the two TAC Xenta controllers.

There is a label on the front of the controller with both the numbers and the names of the terminals (1 C1, 2 C2 and so on). The numbers are also shown in the plastic of the terminal part.



Note! Installation of high voltage cables must be performed by qualified personnel!

For detailed information, please refer to the TAC Xenta 280/300/401 Handbook.

Operator panel

The operator panel is easily connected to the network by means of the modular socket on the front of the controller.

LED indicator

An indicator on the electronic unit of the TAC Xenta 280 indicates when the application program is running.

Service pin

To simplify network commissioning, there is a service pin on the electronic unit which, when pressed, identifies the unit on the network.

Terminal connections: Inputs

Term. no.	Term.name	Description
	281 282	
1	C1 C1	LonWorksTP/FT-10
2	C2 C2	
3	U1 U1	Universal
4	M M	Measurement. neutral
5	U2 U2	Universal
6	U3 U3	Universal
7	M M	Measurement. neutral
8	U4 U4	Universal
9	– B1	Thermistor
10	– M	Measurement. neutral
11	– B2	Thermistor
12	– –	
13	– M	Measurement. neutral
14	– –	
15	X1 X1	Digital
16	M M	Measurement. neutral
17	X2 X2	Digital
18	– –	
19	M M	Measurement. neutral
20	– –	

Terminal connections: Outputs

Term. no.	Term.name	Description
	281 282	
21	G G	24 V AC (or DC+)
22	G0 G0	24 V AC common
23	Y1 Y1	0–10 V
24	M M	Output neutral
25	Y2 Y2	0–10 V
26	Y3 Y3	0–10 V
27	M M	Output neutral
28	– Y4	0–10 V
29	– –	
30	– –	
31	– –	
32	– –	K5, K6 common
33	– –	
34	K1 K1	Relay
35	KC1 KC1	K1, K2 common
36	K2 K2	Relay
37	K3 K3	Relay
38	KC2 KC2	K3, K4 common
39	– K4	Relay
40	– –	

MAINTENANCE

The only care needed is to keep the controller dry and to clean it externally with a dry cloth when needed.

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