TAC Xenta® 280 UC-01 UC-02 UC-03

Programmable Controller **15 Dec 2002**

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 LonTalk® 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 LonWorks 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 ±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 ±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

LonMark® standard:
- Interoperability ..... *LonMark Interop. Guidelines v 3.0*
- Application .. *LonMark Functional Profile*: Plant Controller

Agency Compliances:
- Emission ..... C-Tick, EN 50081-1, FCC Part 15
- Immunity ..... EN 50082-1
- Safety:
  - CE ..... EN 61010-1
  - UL 916 ..... Energy Management Equipment
  - Flammability class, materials ..... UL 94 V-0
  - ETL listing ..... UL 3111-1, first edition ..... CAN/CSA C22.2 No. 1010.1-92

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.

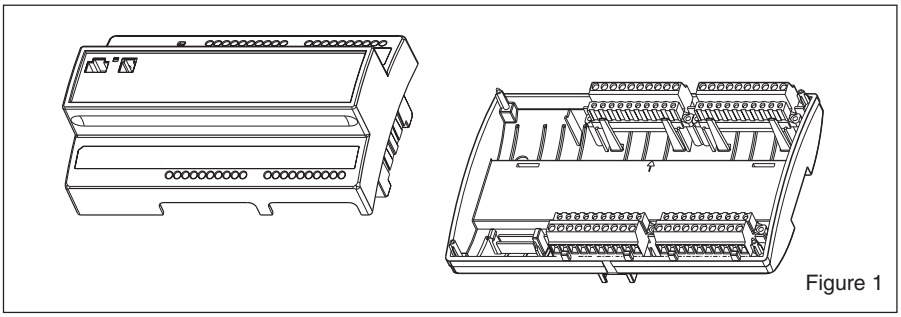


Figure 1

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 menues. 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.

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 ° C ¨to +150 °C (–58 °F to +302 °F), 1800 ohm at 25 °C (+77 °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 withTAC 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

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).

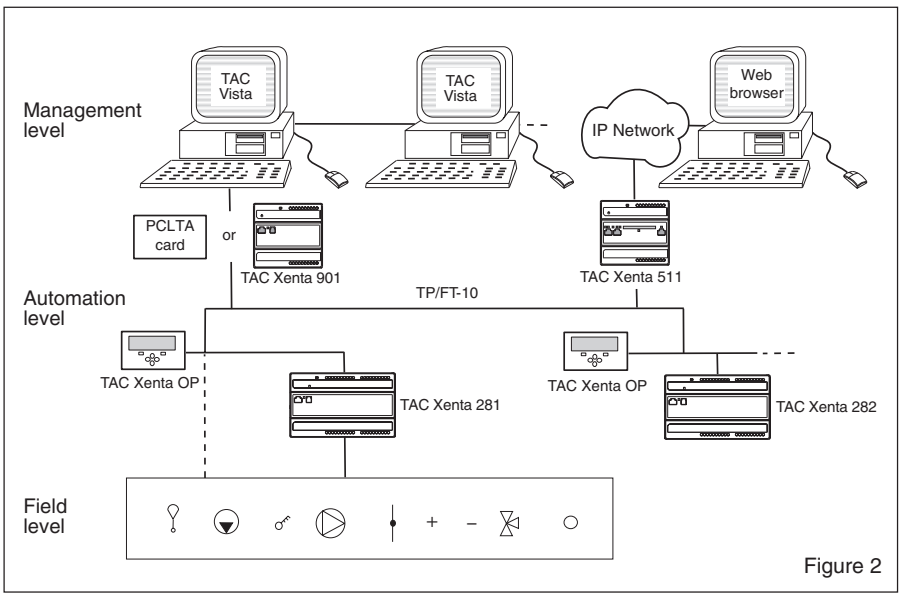


Figure 2

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

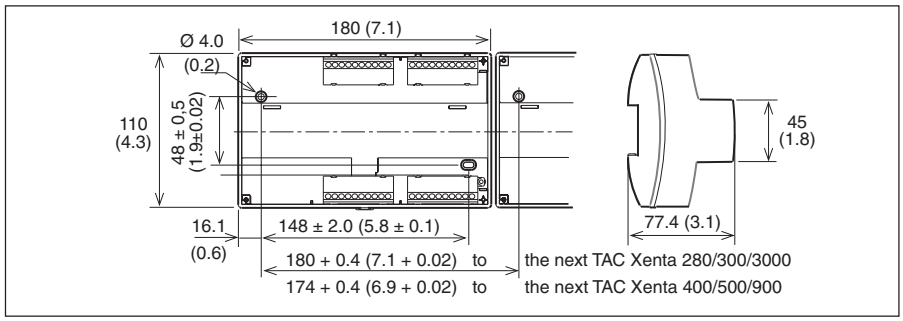
* Subscriptions may utilize standard SNVTs or TACNVs (TAC Network Variables). These may be combined if the following restrictions are observed: The sum of the TACNV subscriptions and the number of SNVT members (no. of values in structured SNVTs) must not exceed the stated figures.

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 4-wire helical twist, solid, shielded	900 (3000)	320 (1000)	500 (1600)
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 281	282	Description
1	C1	C1	LonWorksTP/FT-10
2	C2	C2	
3	U1	U1	Universal
4	M	M	Measurem. neutral
5	U2	U2	Universal
6	U3	U3	Universal
7	M	M	Measurem. neutral
8	U4	U4	Universal
9	–	B1	Thermistor
10	–	M	Measurem. neutral
11	–	B2	Thermistor
12	–	–	
13	–	M	Measurem. neutral
14	–	–	
15	X1	X1	Digital
16	M	M	Measurem. neutral
17	X2	X2	Digital
18	–	–	
19	M	M	Measurem. neutral
20	–		

Terminal connections: Outputs

Term. no.	Term.name 281	282	Description
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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TAC Xenta®

TAC Xenta® 280 - 300 - 401
Handbook

t.a.c®

0-004-7768-3 (EN), 15Dec 2002

Revision history

Part number	*Comments*	*Author*	*Date*
0-004-7768-0	New manual.	KW	1999-11-20
0-004-7768-1	Changed the description of the clock synchronization and the voltage across X1-X4 in Technical data.	KW	2000-10-01
0-004-7768-2	TAC Xenta 280 added to the contents.	KW	2002-04-08
0-004-7768-3	TAC Xenta 280 menu-tree limitations removed.	KSD	2002-12-15

Foreword

Welcome to the TAC Xenta 280 - TAC Xenta 300 - TAC Xenta 401 Handbook.

This handbook describes the TAC Xenta 281/282, the 301/302 and TAC Xenta 401 controllers, all with system program version 3.5.

This handbook also mentions the operation of the TAC Xenta OP. For additional information about the TAC Xenta OP, refer to manual 0-004-7506 “TAC Xenta OP Handbook”.

For descriptions of the I/O modules in the TAC Xenta 400 series, refer to manual 0-004-7771 “TAC Xenta 400 I/O modules”.

This edition of the handbook was issued to include a chapter to describe the new TAC Xenta 280 controllers.

The text has also been revised in many places.

If you have any comments about this handbook, or identify any errors or unclear descriptions, please contact your TAC representative. You may also want to send an e-mail to **helpdesk@tac.se**.

TAC Xenta 280
TAC Xenta 300
TAC Xenta 401
Handbook

Contents

This manual contains a total of 66 pages.

1 Introduction

1.1 TAC Xenta 280, 300 and 401 controllers

TAC Xenta 280, TAC Xenta 300 and TAC Xenta 401 are a family of controllers, partly based on similar hardware.

The installation procedures and the technical data are similar for members of the product family.

Please note!

The TAC Xenta 280/300/401 controller and the other products of the TAC Xenta family must not be used for any other purposes than that for which they were designed.

Installation, connection and repair should only be performed by authorized personnel.

1.2 About this manual

This handbook has the following contents:

Chapter 2

This chapter contains general information about the components of the TAC Xenta 280, 300 and 400 family.

Chapter 3

This chapter contains technical information about the TAC Xenta 280/300/401 controllers, including information about inputs and outputs and technical data.

Chapter 4

This chapter contains information about how to install TAC Xenta 280, 300 and 401.

Chapter 5

This chapter contains information on how to commission stand-alone TAC Xenta controllers or in simple configurations.

Chapter 6

TAC Xenta 280/300/401 and any I/O modules can be commissioned by using the Service menu of TAC Xenta OP. The chapter contains a description of the Service menu and its submenus.

Appendix 1

Depending on the type of restart, different values are used in TAC Xenta. Appendix 1 provides these values.

Appendix 2

After a program download in TAC Xenta 280/300/401 or after a power failure, the Base unit and the I/O modules will be up and running at different points in time and with different start values. Appendix 2 contains a graphical overview of these sequences.

At the end of the manual there is a reply form, which you can fill in if you have any comments on this handbook.

1.3 Related documents

TAC Xenta 280, 300, 401 and other units are also described in the following documents:

- TAC Xenta 400 I/O Modules, part no. 0-004-7771
- TAC Xenta OP Handbook, part no. 0-004-7506
- TAC Xenta Network Guide, part no. 0-004-7460
- TAC Vista IV, Engineering Applications in TAC Menta, part no. 0-004-7843
- TAC Xenta 280 data sheet (C-90-02)
- TAC Xenta 300 data sheet (C-90-05)
- TAC Xenta 401 data sheet (C-92-05)
- TAC Xenta 4xx data sheets (C-92-nn)
- TAC Xenta OP Operator panel data sheet (C-98-05)
- installation instructions, shipped with the product

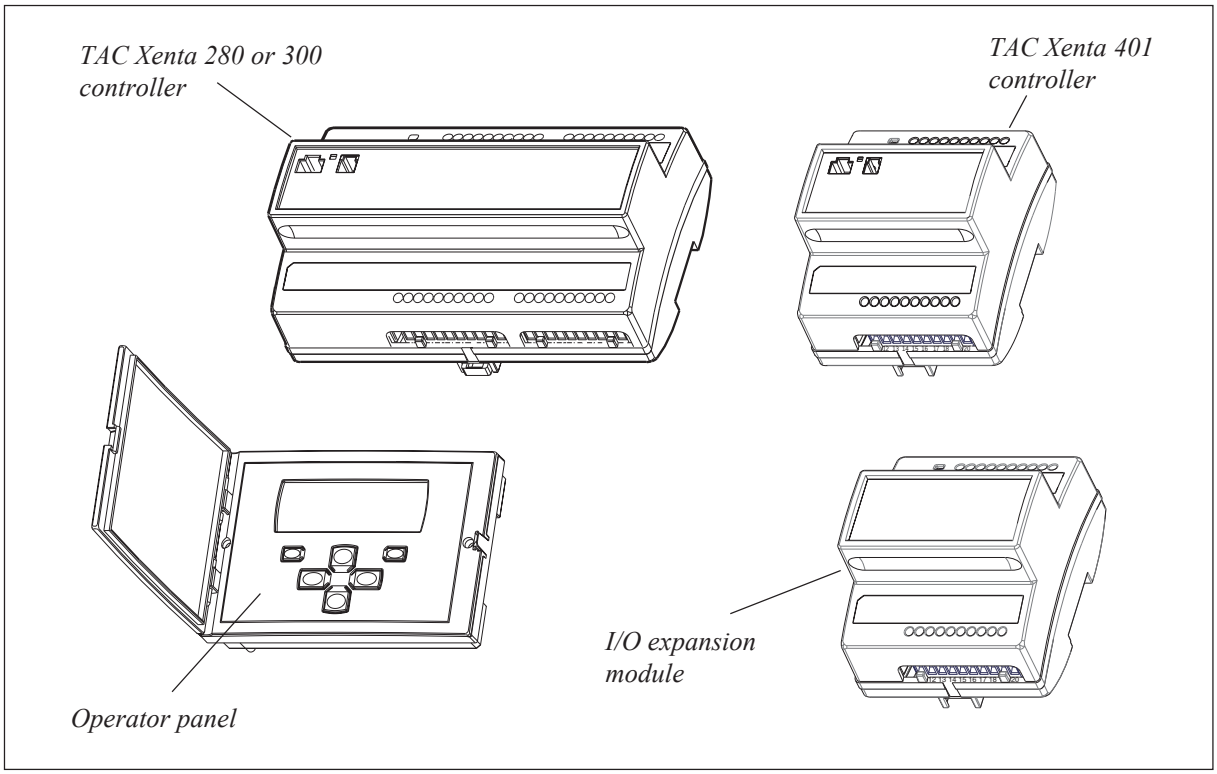
2 TAC Xenta Components

2.1 Hardware units

The TAC Xenta 280/300/400 family consists of these units:

- *The TAC Xenta 280/300/401 controller*. The controller contains the database of the inputs and outputs of the TAC Xenta system. It also contains the system and application software for all the functions that are to be performed by the controller and the connected peripheral units.
- *TAC Xenta OP*. The operator panel includes control buttons and a screen displays the values and menus. TAC Xenta OP can be connected to any controller in the network.
- *I/O expansion modules*. These can be used to extend the number of inputs and outputs on a TAC Xenta 300/401 controller.

  The I/O modules are described in a separate manual, the *TAC Xenta 400 I/O Modules*.



The basic units of TAC Xenta: the Operator panel, the controller and an I/O expansion module

	Inputs	Outputs	I/O Modules	See section
TAC Xenta 280				3.1
TAC Xenta 281	6	6	none	
TAC Xenta 282	8	8	none	
TAC Xenta 300				3.2
TAC Xenta 301	12	8	up to 2	
TAC Xenta 302	12	8	up to 2	
TAC Xenta 401	none	none	up to 10	3.3

A number of controllers and I/O modules can form a local network and exchange data.

The TAC Xenta OP operator panel allows the user to

- get access to certain parameters
- monitor system status
- adjust setpoints and time channels
- display alarms (without communicating with a central system)

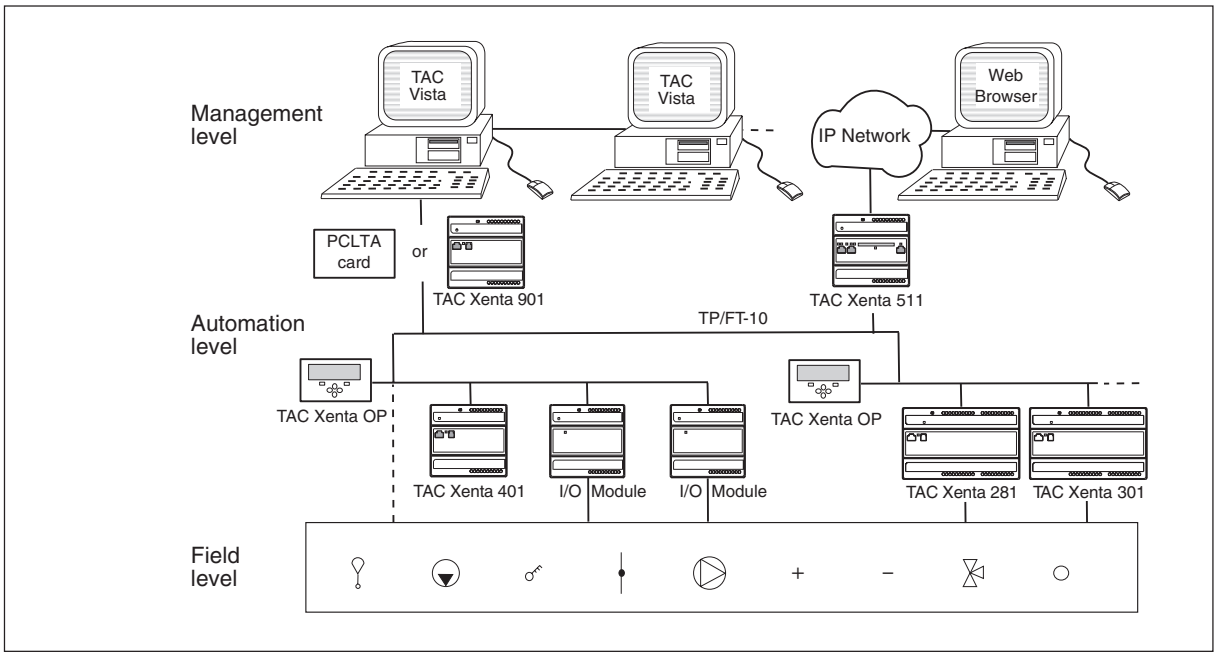
Up to two OPs may be connected to each controller.

2.2 Configurations

The TAC Xenta controllers can be used in different configurations, for example:

- as a stand-alone unit (for TAC Xenta 401 with at least one I/O module).
- with controllers and OPs in a network, with extra I/O modules as required.
- with controllers, OPs, I/O modules and other equipment in a full network with suitable adapters, possibly with connection to a TAC Vista Central System.

For further information, please consult the *TAC Xenta Network Guide*.



A TAC Xenta network example

2.3 Communications

The TAC Xenta units communicate with each other in a network using a common bus, Echelon® LonWorks® Free Topology 78 kbps (FTT-10). Additional I/O units also connect to the network and may be added as required. An I/O unit can only be associated with one controller.

Explicit LonTalk® messages are used in the communications between the operator panel and the controller.

The LonTalk protocol makes it possible to use Network Variables, defined in foreign equipment.

The Functional Block applications are modelled as true LonMark Controller Objects.

SNVT-list: see

www.tac-global.com/tarai/

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. Available SNVTs are listed in an appendix in the *TAC Menta Reference manual* and on the *web*: www.tac-global.com/tarai/ , Software Prod., TAC Menta.

When connected to a TAC Vista Central System, the operating conditions of the fans, pumps, recovery units etc. can be displayed as graphs on the monitor and printed as reports. Temperatures and alarms may all be read, while setpoints, time settings may be altered as required.

TAC Xenta devices, for example the TAC Xenta 280, 300 and 401 controllers, can be reached from TAC Vista in one of the following ways.

1 Any device in the network via a PCLTA card.
2 A specific device via the RS232 connection, possibly via modem (all v 3.x, but not TAC Xenta 280).
3 Any device in the network via TAC Xenta 901 LonTalk adapter (and an optional modem connection), with the added possibility for the base unit to initiate the dial-up (the latter only for v 3.2).

Starting with v 3.1, application programs generated in TAC Menta may be downloaded from TAC Vista via the network.

TAC Xenta 280/300/401 can perform the following communication:

- send alarm and trend logging (versions 3.2 and higher) messages,
- answer requests for the status of inputs and outputs,
- send/modify any of the parameters/variables in the program that are freely available (“Public signal”),
- communicate with other TAC Xenta controllers to exchange data,
- communicate with the Operator Panel, the I/O-modules and TAC Vista.

For further details, please consult the *TAC Xenta Network Guide*.

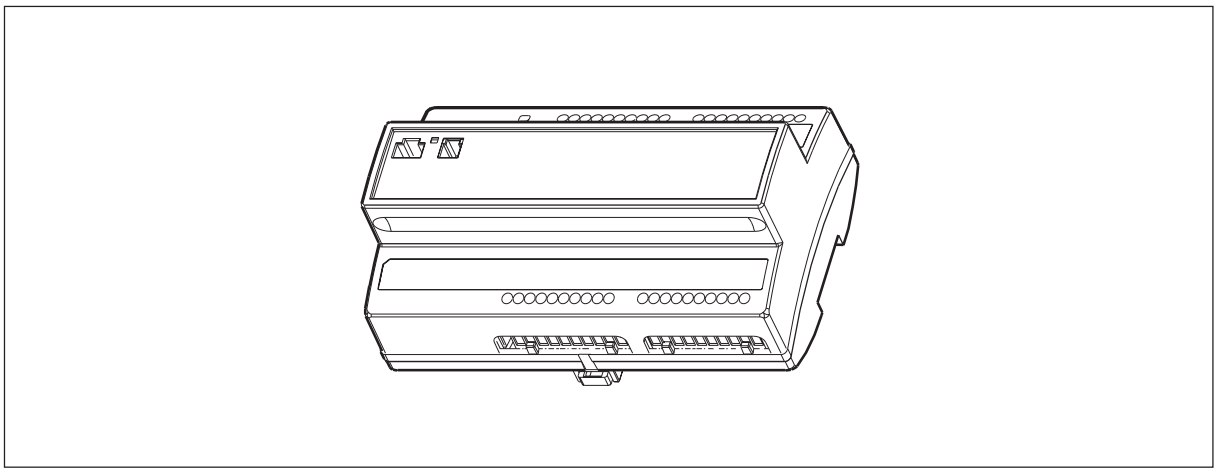
RS232

The TAC Xenta 280/300/401 controller has an RS232 port that can be used to:

- load the system software,
- load the application software from the programming tool TAC Menta,
- connect TAC Menta when used as a commissioning tool,
- connect a specific controller with TAC Vista directly or via modem (*modem connection not available with TAC Xenta 280*),
- fetch the “System Error Log File” using the program “Xenta System Error Log Viewer” (available at www.tac-global.com/tarai/).

3 Technical Description

3.1 The TAC Xenta 280 controller



The TAC Xenta 280 controller

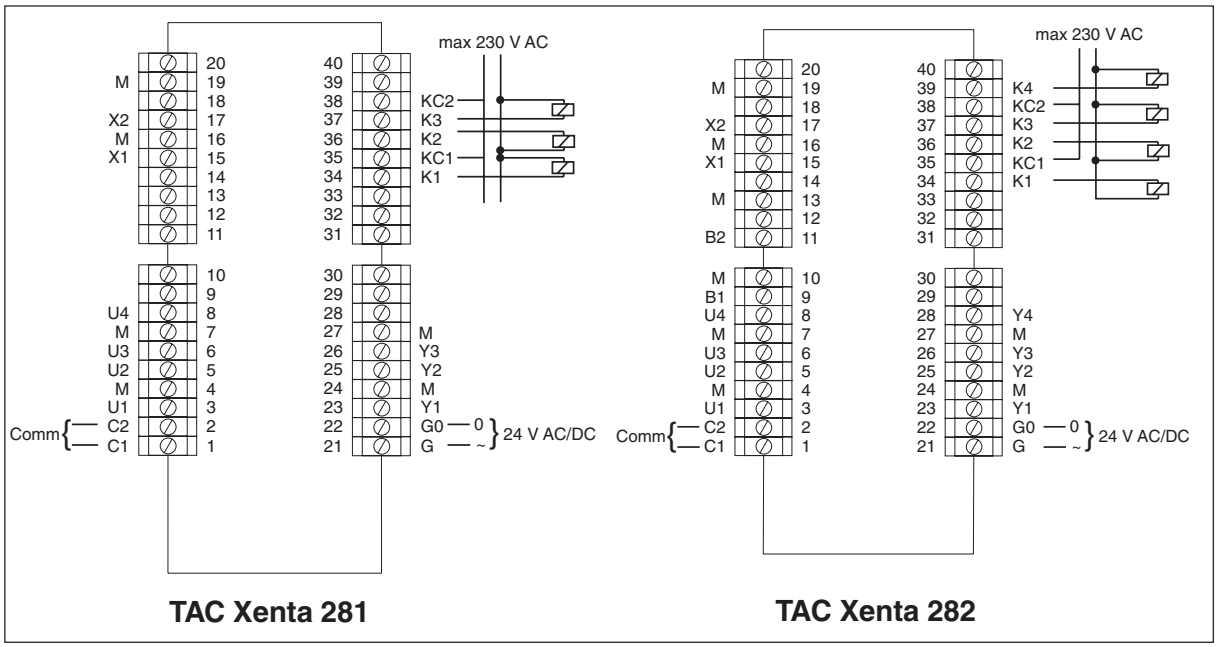
3.1.1 Terminals

TAC Xenta 281 and 282

TAC Xenta 280 has two I/O configurations, called *TAC Xenta 281* and *TAC Xenta 282*.

No external TAC Xenta 400 I/O can be used.

	Digital inputs	Thermistor inputs	Universal inputs	Relay outputs	Analog output
Term. notation	**X**	**B**	**U**	**K**	**Y**
TAC Xenta 281	2	-	4	3	3
TAC Xenta 282	2	2	4	4	4



The terminals of TAC Xenta 281 and 282

Inputs

The TAC Xenta 280 controllers have two digital inputs (X1–X2) and four universal (analog or digital, U1–U4) inputs. The universal inputs can be used for three types of signals:

- TAC thermistor 1,8 kohm at 25 °C (the same as the thermistor inputs),
- voltage input 0–10 V, and
- open/closed contact (the same as the digital inputs).

The TAC Xenta 282 also has two thermistor inputs (labelled B1–B2).

All controller inputs are protected from transients, in compliance with the EN 50082-1 norm.

Outputs

The TAC Xenta 280 controllers have these outputs

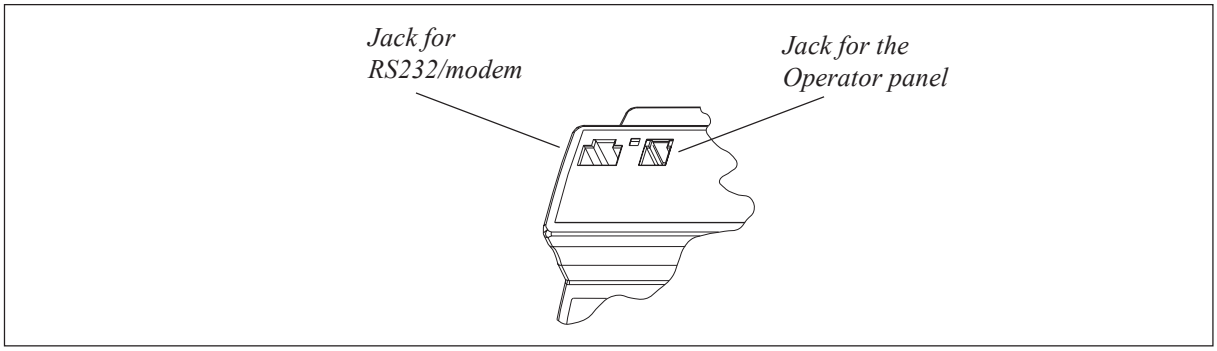
- analog — 0–10 V DC outputs
- digital — relay potential-free outputs

3.1.2 Jacks

TAC Xenta 280 has two modular jacks–one for the TAC Xenta OP operator panel and one for an RS232 connection with TAC Menta.

The socket for the operator panel provides the operator panel with 24 V AC or DC, depending on the supply.

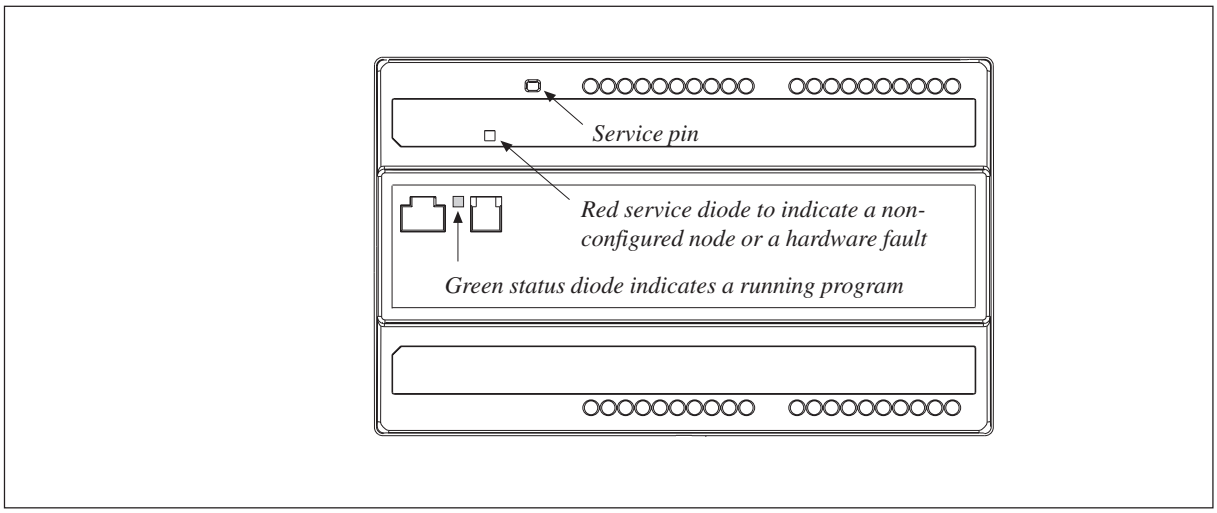
At distances greater than 10 m (32 ft) between the TAC Xenta controller and the OP, an external power supply should be used. In addition, the communication connection must follow the same rules as for other nodes.



Location of jacks on TAC Xenta 280 controller

3.1.3 LED indicators and Service pin

The Service pin can be activated through a small hole on the front. Also on the are front are two LED indicators–one red and one green.



LEDs and service pin of the controller

The red service diode is primarily an error indication. It also lights up if the Service pin is activated.

The green status diode turns on and off every second to indicate that the program is running.

3.1.4 Technical data TAC Xenta 280

Supply voltage (G, G0) ..... 24 V AC ±20%, 50/60 Hz
..... or 19–40 V DC
Power consumption ..... max. 5 W

Ambient temperature:
Storage .....–20 °C to +50 °C (–4 °F to +122 °F)
Operation ..... ±0 °C to +50 °C (+32 °F to +122 °F)
Humidity ..... max. 90 % RH non condensing

Mechanical:
Enclosure ..... ABS/PC
Enclosure rating .....IP 20
Dimensions mm (in.) ..... 180×110×70 (7.09 x 4.33 x 2.95)
Weight..... 1.0 kg (2.2 lb.)

Real time clock:
Accuracy at +25 °C ..... ±12 minutes per year
Power failure protection ..... 72 h

Program cycle time ..... min. 1 s

Digital inputs (X1–X2):
Quantity 2
Voltage across open contact .....33 V DC
Current through closed contact ..... 4 mA
Pulse input duration (TAC Menta CNT block) ..... min. 20 ms

Universal inputs (U1–U4):
Quantity 4
A/D-resolution ..... 12 bits

– as Digital Inputs;
Voltage across open contact .....26 V DC
Current through closed contact ..... 4 mA
Pulse input duration (TAC Menta CNT block) ..... min. 20 ms
– as Thermistor Inputs;
Supply voltage .....0,6 V DC
TAC thermistor sensor..... 1800 ohm at 25 °C (+77 °F)
– as Voltage Inputs;
Input signal .....0–10 V DC
Input resistance ..... 100 kohm
Accuracy ..... 1% of full scale

Thermistor inputs (B1–B2, only TAC Xenta 282):
Quantity 2
A/D-resolution ..... 12 bits
TAC thermistor sensor..... 1800 ohm at 25 °C (+77 °F)
Measuring range .....–50 °C to +150 °C (–58 °F to +302 °F)

Accuracy[1]:
–50 °C to –30 °C ..... ±4 °C
–30 °C to –10 °C ..... ±2 °C
–10 °C to +10 °C ..... ±1 °C
+10 °C to +30 °C ..... ±0,5 °C
+30 °C to +60 °C ..... ±1 °C
+60 °C to +120 °C ..... ±2 °C
+120 °C to +150 °C ..... ±4 °C

Digital outputs (K1–K3 or K1–K4):
- Quantity
- TAC Xenta 281 3
- TAC Xenta 282 4
- Control voltage, relay outputs to be protected by max. 10 A fuse (EN 61010-1), ... max. 250 V AC
- Control current ..... max 2 A
- Pulse length (TAC Menta DOPU block) ..... min. 0,5 s

Analog outputs (Y1–Y3 or Y1–Y4)[1]:
- Quantity
- TAC Xenta 281 3
- TAC Xenta 282 4
- D/A-resolution ..... 12 bits
- Control voltage ..... 0–10 V DC
- Control current, short-circuit proof ..... max. 2 mA
- Deviation ..... max ±1%

Network communication (C1–C2; polarity insensitive):
- Protocol ..... FTT-10, LonTalk®
- Communication speed ..... 78 kbits/s

Other communication:
- TAC Menta ..... RS232, up to 9600 bits/s, RJ45
- TAC Vista (version IV or higher required); also for appl.pgm download ..... TP/FT-10, screw term.
- TAC Xenta OP ..... TP/FT-10, modular jack

LonMark® standard:
- Interoperability ..... *LonMark Interop. Guidelines v 3.0*
- Application ..... *LonMark Functional Profile*: Plant Controller

Agency Compliances : C-Tick CE UL
- 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 UL94 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

[1] If the active sensor (0–10 V), analog actuators and the TAC Xenta controller itself are fed from the same transformer, the following restrictions ensure the specified accuracy (for thermistor inputs, universal inputs and for analog outputs):

Cable length from controller to:
- Transformer ..... 3 m (10 ft)
- Active sensor/actuator ..... 20 m (65 ft)

Number of active sensors ..... max. 4
Number of actuators ..... max. 6

3.1.5 TAC Xenta 280 Capacity

Per TAC Xenta 280 unit:

Number of I/O modules ..... None

Number of subscriptions *
- In ..... max. 15
- Out ..... max. 30

Trend logging in TAC Xenta 280
- Channels ..... 1 – 50
- Interval ..... 10 seconds – 530 weeks
- Total logging capacity ..... ~ 650 floating point numbers
  ..... or ~ 1 300 integers
  ..... or ~ 10 000 digital values

Optimized storage ..... Yes

Time Channels 1

TAC Xenta OP Menu tree ..... Configurable

Application size **
- program and data ..... max. 56 kB
- parameters ..... max. 64 kB

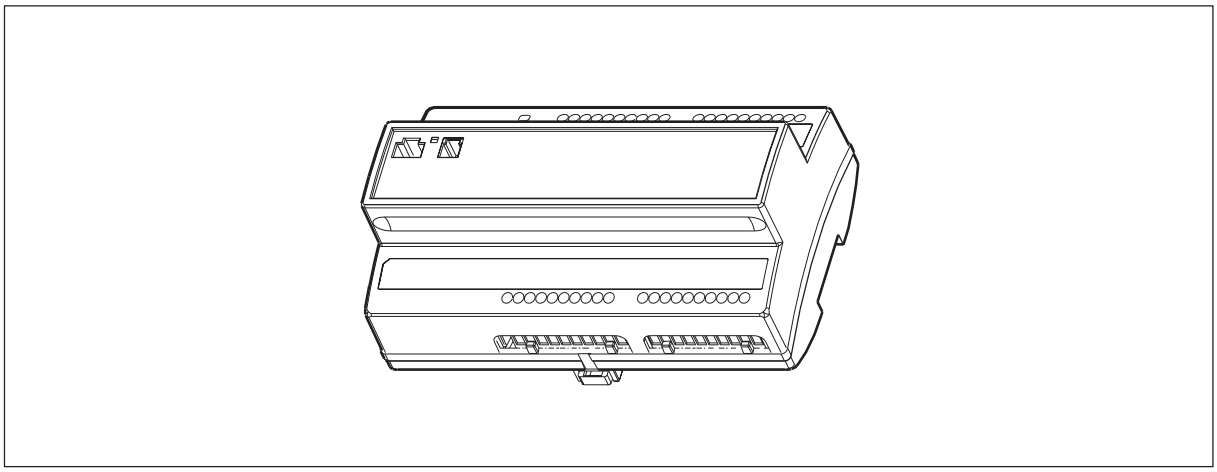
* Subscriptions may utilize standard SNVTs or TANVs (TAC Network Variables). These may be combined if the following restrictions are observed: The sum of the TANV subscriptions and the number of SNVT members (no. of values in structured SNVTs) must not exceed the stated figures.

Available SNVTs are listed in an appendix in the *TAC Menta Reference manual* and on the *web*: www.tac.se/tarai/ , Software Prod., TAC Menta.

** TAC Menta contains support to calculate the application size in the Options – Memory usage window.

A Binding tool is required to perform the SNVT bindings.

3.2 The TAC Xenta 300 controller



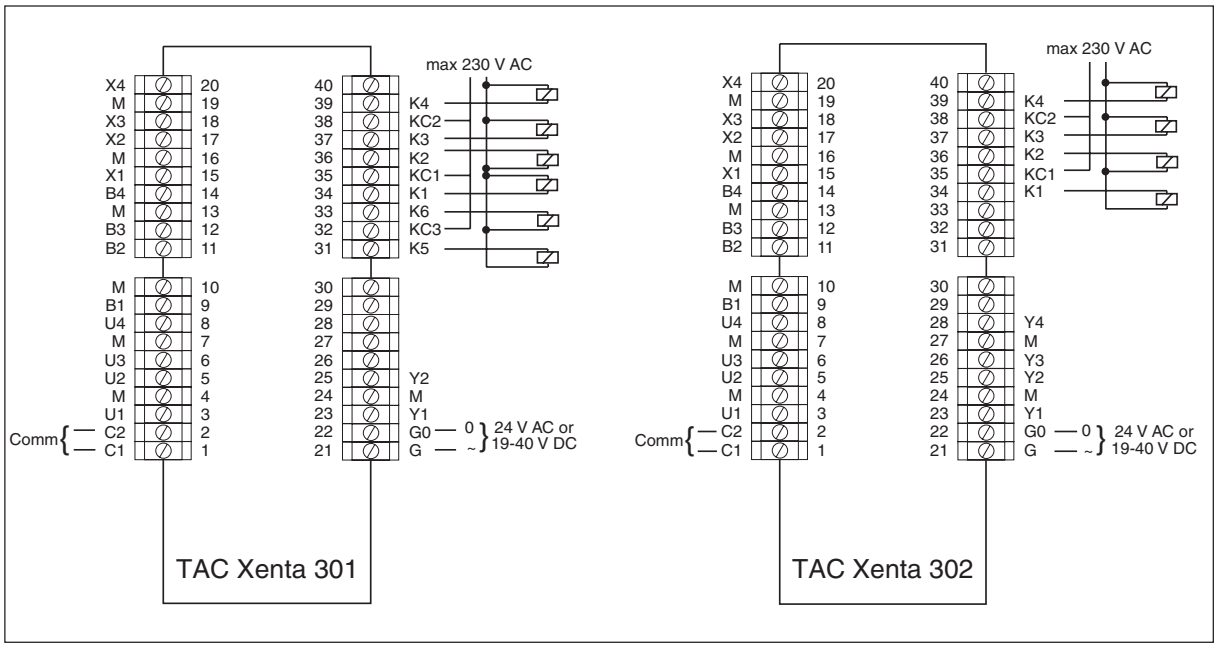
The TAC Xenta 300 controller

3.2.1 Terminals

TAC Xenta 301 and 302

TAC Xenta 300 has two I/O configurations: *TAC Xenta 301* and *TAC Xenta 302*.

	Digital inputs	Thermistor inputs	Universal inputs	Relay outputs	Analog outputs
Term. notation	**X**	**B**	**U**	**K**	**Y**
TAC Xenta 301	4	4	4	6	2
TAC Xenta 302	4	4	4	4	4



The terminals of TAC Xenta 301 and 302

Inputs

The TAC Xenta 300 controllers have twelve inputs:

- four thermistor inputs (labelled B1–B4)
- four universal (analog or digital, U1–U4)
- four digital (X1–X4).

The universal inputs can be used for three types of signals:

- TAC thermistor 1,8 kohm at 25 °C (the same as the thermistor inputs),
- voltage input 0–10 V, and
- open/closed contact (the same as the digital inputs).

All controller inputs are protected from transients, in compliance with the EN 50082-1 norm.

Outputs

The TAC Xenta 300 controllers have eight outputs:

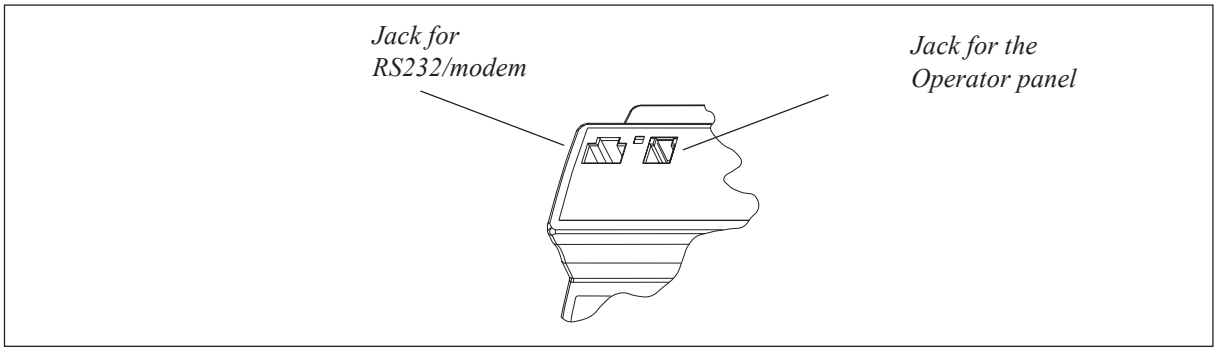
- analog — 0–10 V DC outputs
- digital — relay potential-free outputs

3.2.2 Jacks

TAC Xenta 300 has two modular jacks–one for the TAC Xenta OP operator panel and one for an RS232 connection with TAC Menta.

The socket for the operator panel provides the operator panel with 24 V AC or DC, depending on the supply.

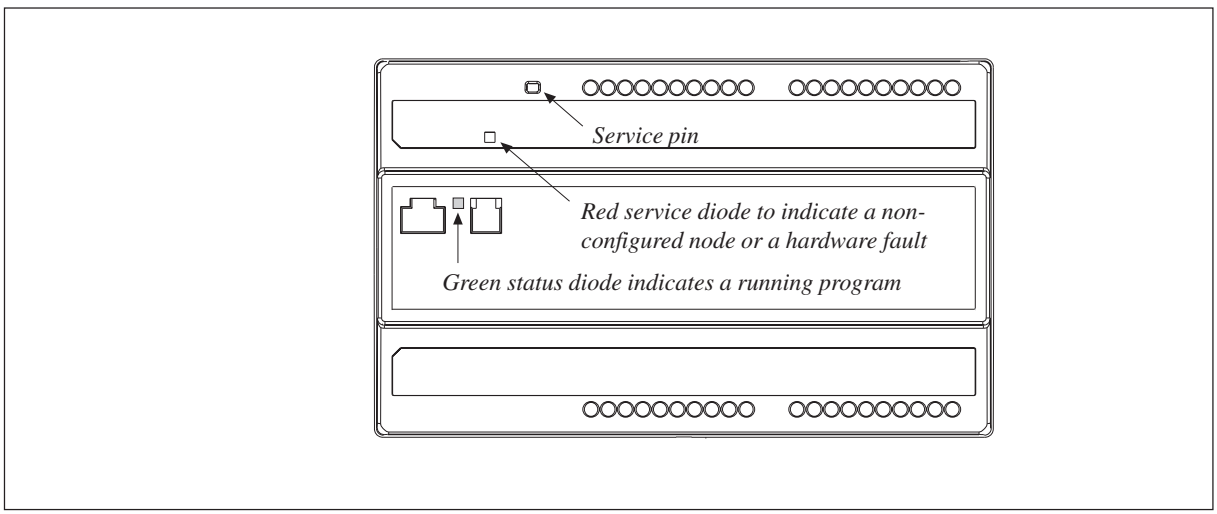
At distances greater than 10 m (32 ft) between the TAC Xenta controller and the OP, an external power supply should be used. In addition, the communication connection must follow the same rules as for other nodes.



Location of jacks on TAC Xenta 280 controller

3.2.3 LED indicators and Service pin

The Service pin can be activated through a small hole on the front. Also on the are front are two LED indicators–one red and one green.



LEDs and service pin of the controller

The red service diode is primarily an error indication. It also lights up if the Service pin is activated.

The green status diode turns on and off every second to indicate that the program is running.

3.2.4 Technical data TAC Xenta 300

Supply voltage (G, G0) ..... 24 V AC ±20%, 50/60 Hz
..... or 19–40 V DC
Power consumption ..... max. 5 W

Ambient temperature:
Storage .....–20 °C to +50 °C (–4 °F to +122 °F)
Operation ..... ±0 °C to +50 °C (+32 °F to +122 °F)
Humidity ..... max. 90 % RH non condensing

Mechanical:
Enclosure ..... ABS/PC
Enclosure rating .....IP 20
Dimensions mm (in.) ..... 180×110×70 (7.09 x 4.33 x 2.95)
Weight..... 1.0 kg (2.2 lb.)

Real time clock:
Accuracy at +25 °C ..... ±12 minutes per year
Power failure protection ..... 72 h

Program cycle time ..... min. 1 s

Digital inputs (X1–X4):
Quantity 4
Voltage across open contact .....33 V DC
Current through closed contact ..... 4 mA
Pulse input duration (TAC Menta CNT block) ..... min. 20 ms

Universal inputs (U1–U4):
Quantity 4
A/D-resolution ..... 12 bits

– as Digital Inputs;
Voltage across open contact .....26 V DC
Current through closed contact ..... 4 mA
Pulse input duration (TAC Menta CNT block) ..... min. 20 ms
– as Thermistor Inputs;
Supply voltage .....0,6 V DC
TAC thermistor sensor..... 1800 ohm at 25 °C (+77 °F)
– as Voltage Inputs;
Input signal .....0–10 V DC
Input resistance ..... 100 kohm
Accuracy ..... 1% of full scale

Thermistor inputs (B1–B4):
Quantity 4
A/D-resolution ..... 12 bits
TAC thermistor sensor..... 1800 ohm at 25 °C (+77 °F)
Measuring range .....–50 °C to +150 °C (–58 °F to +302 °F)
Accuracy[1]:
–50 °C to –30 °C ..... ±4 °C
–30 °C to –10 °C ..... ±2 °C
–10 °C to +10 °C ..... ±1 °C
+10 °C to +30 °C ..... ±0,5 °C
+30 °C to +60 °C ..... ±1 °C
+60 °C to +120 °C ..... ±2 °C
+120 °C to +150 °C ..... ±4 °C

Digital outputs (K1–K6 or K1–K4):
- Quantity
- TAC Xenta 301 6
- TAC Xenta 302 4
- Control voltage, relay outputs to be protected by max. 10 A fuse (EN 61010-1), ... max. 250 V AC
- Control current ..... max 2 A
- Pulse length (TAC Menta DOPU block) ..... min. 0,5 s

Analog outputs (Y1–Y2 or Y1–Y4)[1]:
- Quantity
- TAC Xenta 301 2
- TAC Xenta 302 4
- D/A-resolution ..... 12 bits
- Control voltage ..... 0–10 V DC
- Control current, short-circuit proof ..... max. 2 mA
- Deviation ..... max ±1%

Network communication (C1–C2; polarity insensitive):
- Protocol ..... FTT-10, LonTalk®
- Communication speed ..... 78 kbits/s

Other communication:
- Modem; TAC Menta ..... RS232, up to 9600 bits/s, RJ45
- TAC Vista, also for appl.pgm download ..... TP/FT-10, screw term.
- TAC Xenta OP ..... TP/FT-10, modular jack

LonMark® standard:
- Interoperability ..... *LonMark Interop. Guidelines v 3.0*
- Application ..... *LonMark 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 UL94 V-0

Part number:

Electronics part TAC Xenta 301/N/P	0-073-0009
Electronics part TAC Xenta 302/N/P	0-073-0011
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

[1] If the active sensor (0–10 V), analog actuators and the TAC Xenta controller itself are fed from the same transformer, the following restrictions ensure the specified accuracy (for thermistor inputs, universal inputs and for analog outputs):

Cable length from controller to:
- Transformer ..... 3 m (10 ft)
- Active sensor/actuator ..... 20 m (65 ft)

Number of active sensors ..... max. 4
Number of actuators ..... max. 6

3.2.5 TAC Xenta 300 Capacity

Per TAC Xenta 300 device:

Number of I/O modules
TAC Xenta 301 /N/P, 302 /N/P 2

Note! The figures below only apply to TAC Xenta 300 version 3.0 or later.

Number of subscriptions *
In ..... max. 15
Out ..... max. 30

Trend logging in TAC Xenta 300 (from v 3.2, hw version 2 required)
Channels ..... 1 – 50
Interval ..... 10 seconds – 530 weeks
Total logging capacity (from v 3.3) ~ 4 000 floating point numbers
..... or ~ 8 000 integers
..... or ~ 60 000 digital values
Optimized storage ..... Yes

TAC Xenta OP Menu tree ..... Configurable

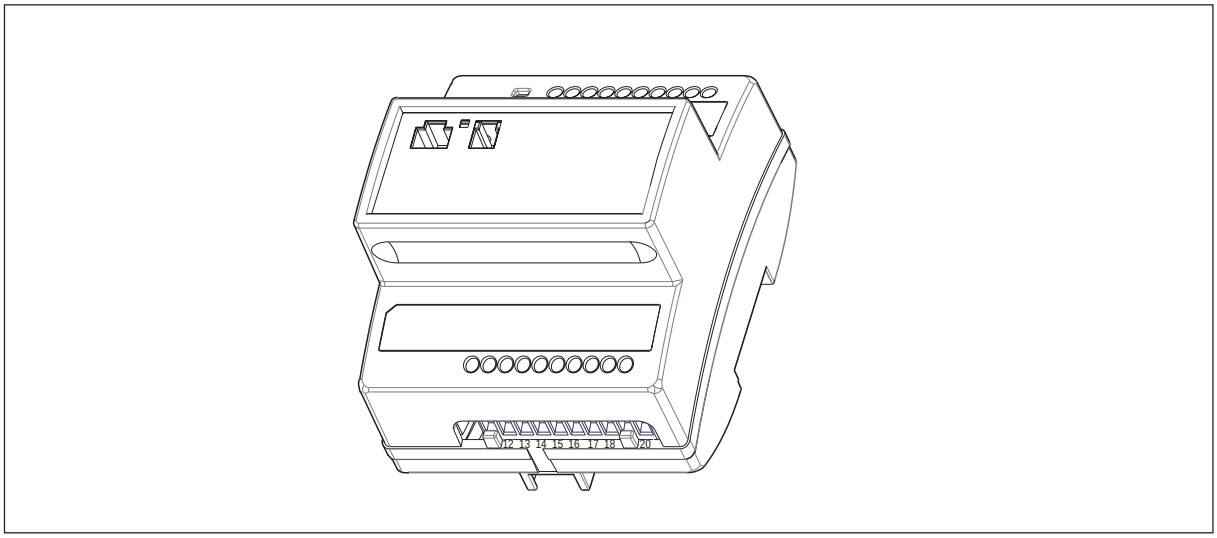
Application size **
program and data ..... max. 56 kB
parameters ..... max. 64 kB

* Subscriptions may utilize standard SNVTs or TANVs (TAC Network Variables). These may be combined if the following restrictions are observed: The sum of the TANV subscriptions and the number of SNVT members (no. of values in structured SNVTs) must not exceed the stated figures.
Available SNVTs are listed in an appendix in the *TAC Menta Reference manual* and on the *web*: www.tac.se/tarai/ , Software Prod., TAC Menta.

** TAC Menta contains support to calculate the application size in the Options – Memory usage window.

A Binding tool is required to perform the SNVT bindings.

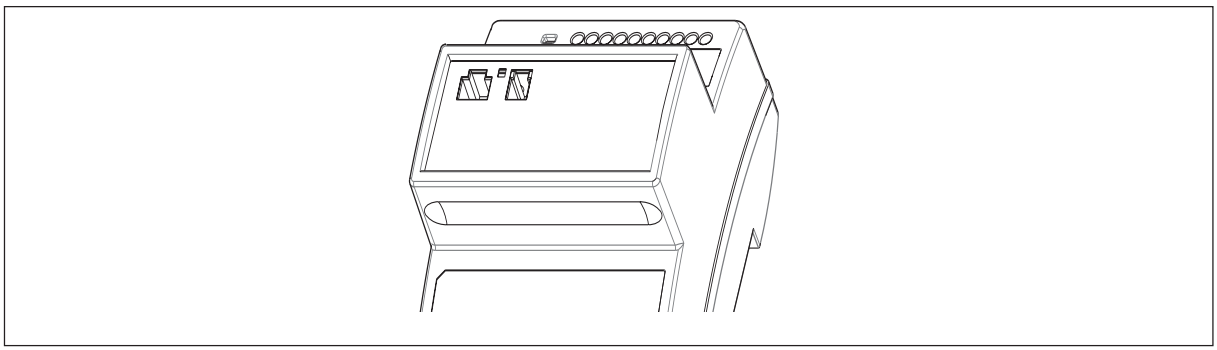
3.3 The TAC Xenta 401 controller



The TAC Xenta 401 controller

3.3.1 Terminals

The TAC Xenta 401 controller uses four of the screw terminals–two for power supply and two for the network communication.



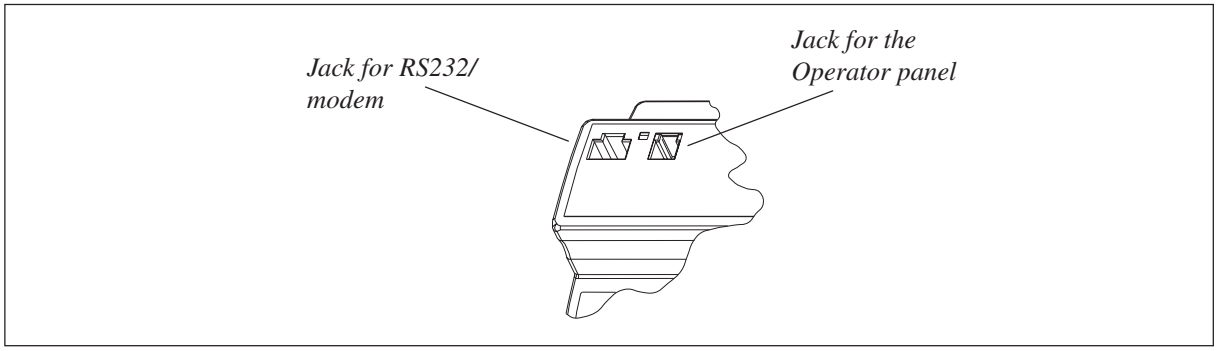
The terminals of TAC Xenta 401

3.3.2 Jacks

TAC Xenta 401 has two modular jacks on the front–one for the TAC Xenta OP operator panel and one for an RS232 connection with TAC Menta.

The socket for the operator panel provides the operator panel with 24 V AC.

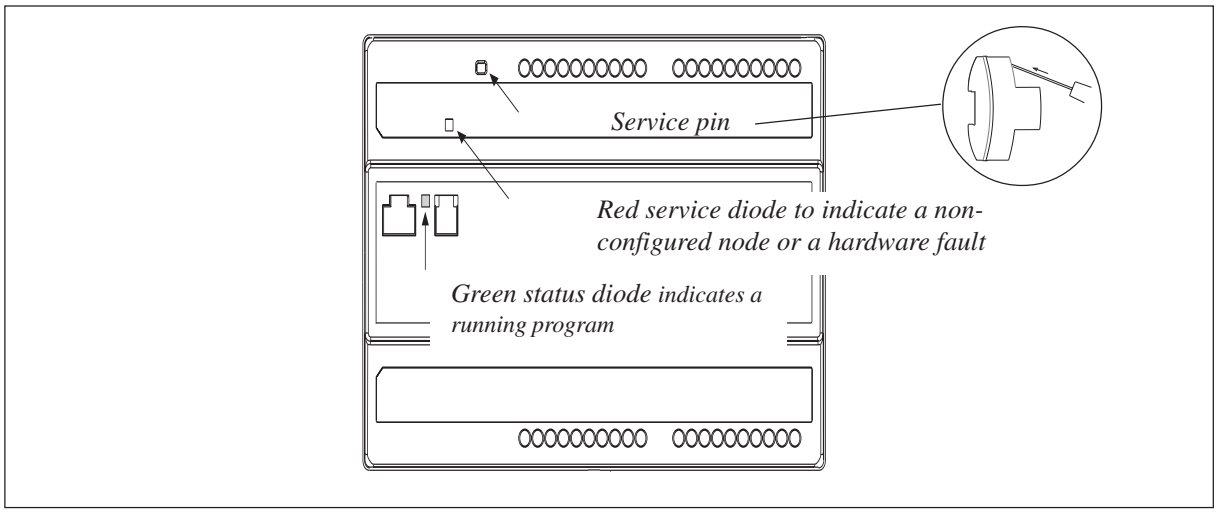
At distances greater than 10 m (32 ft) between the TAC Xenta controller and the OP, an external power supply should be used. In addition, the communication connection must follow the same rules as for other nodes.



Location of jacks on TAC Xenta 401 controller

3.3.3 LED indicators and Service pin

The Service pin can be activated through a small hole on the front. Also on the are front are two LED indicators–one red and one green.



LEDs and Service pin of the controller

The red service diode is primarily an error indication. It also lights up if the Service pin is activated.

The green status diode turns on and off every second to indicate that the program is running.

3.3.4 Technical data TAC Xenta 401

Supply voltage (G, G0) ..... 24 V AC ±20%, 50/60 Hz
..... or 19–40 V DC
Power consumption ..... max. 5 W

Ambient temperature:
Storage ..... –20 °C to +50 °C(–4 °F to +122 °F)
Operation ..... 0 °C to +50 °C (+32 °F to +122 °F)
Humidity ..... max. 90 % RH non condensing

Mechanical:
Enclosure ..... ABS/PC
Enclosure rating ..... IP 20
Dimensions mm (in.) ..... 90×110×77 (3.54 x 4.33 x 3.03)
Weight ..... 0.5 kg (1.1 lb.)

Real time clock:
Accuracy at +25 °C ..... ±12 minutes per year
Power failure protection ..... 72 h

Program cycle time ..... min. 1 s

Network communication (C1–C2; polarity insensitive):
Protocol ..... FTT-10, LonTalk®
Communication speed ..... 78 kbits/s

Other communication:
Modem; TAC Menta ..... RS232, up to 9600 bits/s, RJ45
TAC Vista, also for appl.pgm download ..... TP/FT-10, screw term.
TAC Xenta OP ..... TP/FT-10, modular jack

LonMark® standard:
Interoperability ..... *LonMark Interop. Guidelines v 3.0*
Application ..... *LonMark 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 UL94 V-0

Part number:
Electronics part TAC Xenta 401 0-073-0101
Terminal part TAC Xenta 400 0-073-0902
Operator terminal TAC Xenta OP 0-073-0907
TAC Xenta: Programming Serial Kit 0-073-0920

3.3.5 TAC Xenta 401 Capacity

Per TAC Xenta 401 unit:

Number of I/O modules 10

Note! The figures below only apply to TAC Xenta 401 version 3.0 or later.

Number of subscriptions *

- In ..... max. 125
- Out ..... max. 125

Trend logging in TAC Xenta 401 (from v 3.2)

- Channels ..... 1 – 50
- Interval ..... 10 seconds – 530 weeks
- Total logging capacity (from v 3.3) ~ 7 000 floating point numbers
  ..... or ~ 15 000 integers
  ..... or ~ 110 000 digital values
- Optimized storage ..... Yes

TAC Xenta OP Menu tree ..... Configurable

Application size **

From v 3.2

- program and data ..... max. ~ 234 kB
- parameters ..... max. ~ 234 kB

Up to, and including v 3.1

- program and data ..... max. ~ 57 kB
- parameters ..... max. ~ 64 kB

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

Available SNVTs are listed in an appendix in the *TAC Menta Reference manual* and on the *web*: www.tac.se/tarai/ , Software Prod., TAC Menta.

** TAC Menta contains support to calculate the application size in the Options – Memory usage window.

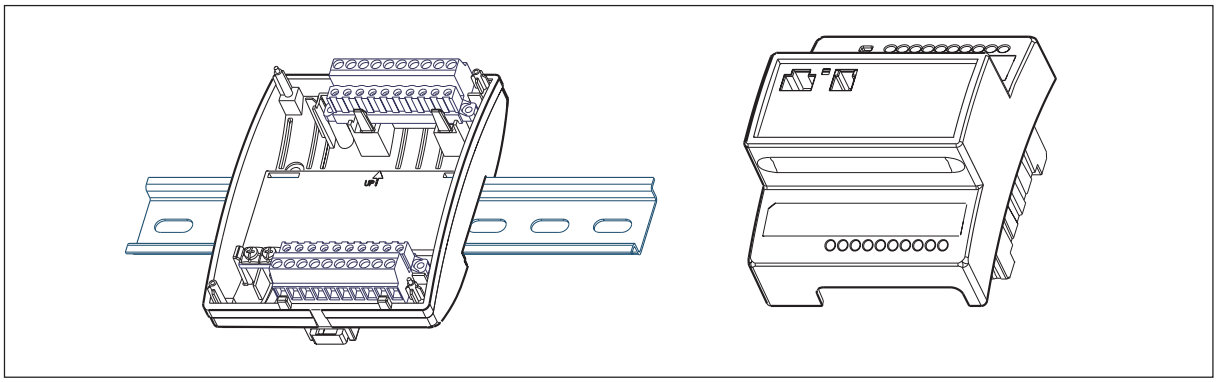
A Network Manager is required to perform the SNVT bindings.

4 Installation

4.1 Mounting the controller

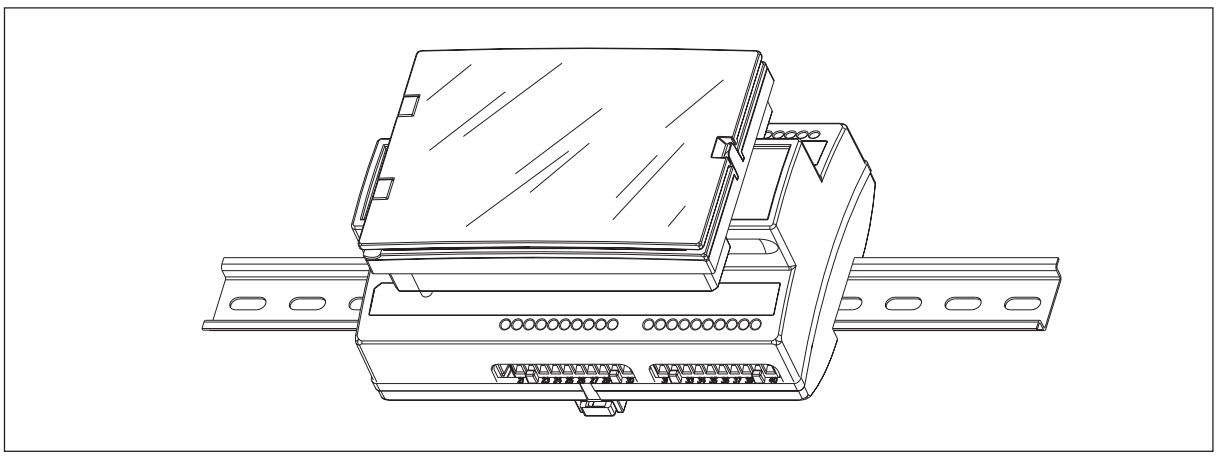
The TAC Xenta 280/300/401 controller is designed for mounting on a DIN rail inside a cabinet. The controller can also be mounted directly on a wall. A wide range of standard enclosures, meeting DIN 43 880, with different enclosure ratings, are available for mounting on a wall.

The enclosure primarily consists of a terminal part with screw terminals, and an electronics part, where the printed circuit boards are situated. The enclosure is designed so that the whole electrical installation can be done to the screw terminals of the terminal part, when mounted on a DIN rail or on a wall.

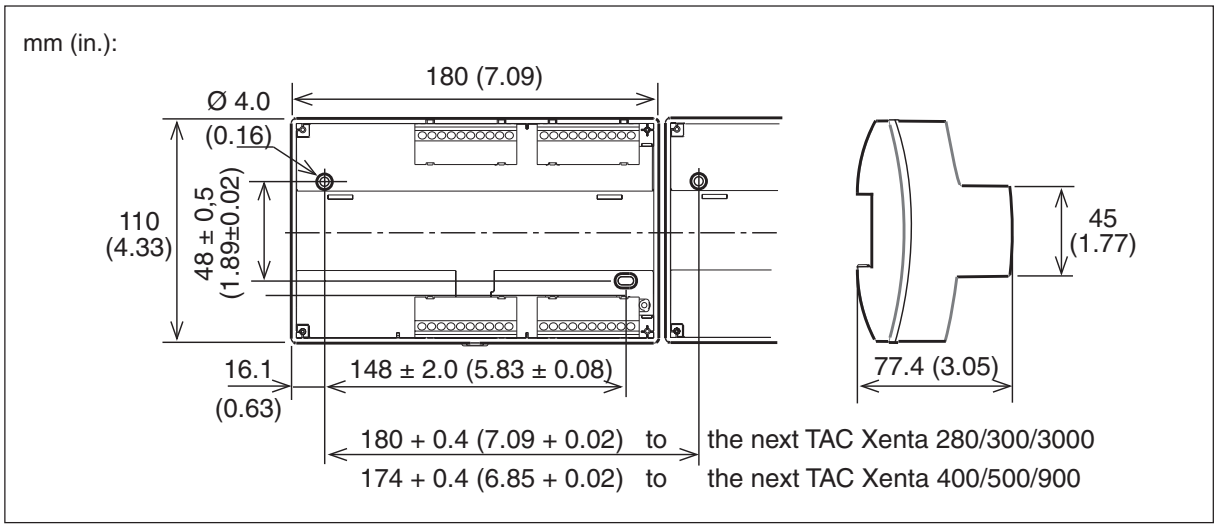


The terminal part and the electronics part of TAC Xenta 401

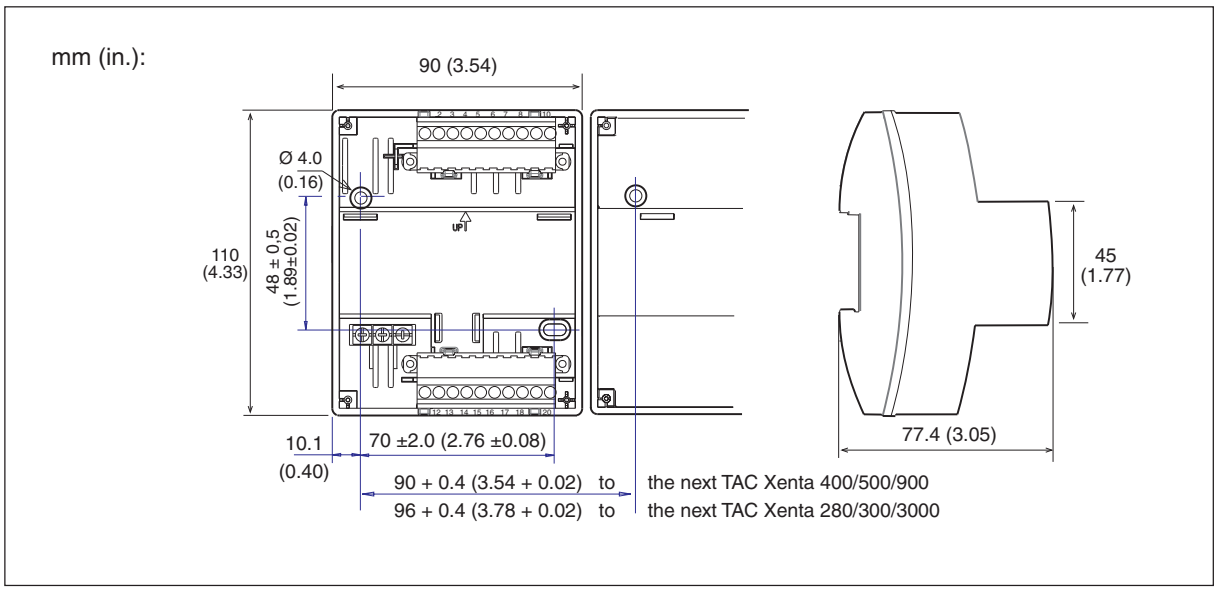
The operator panel can be mounted in the cabinet front, mounted on top of a TAC Xenta controller or used for hand-held operation.



The TAC Xenta 280/300 controller and the TAC Xenta OP operator panel mounted on a DIN rail



Mounting distances for TAC Xenta 280/300



Mounting distances for TAC Xenta 401

4.2 Electrical installation

4.2.1 General considerations

The installation is normally treated as a CAT III category (IEC 664), which in principle means permanent connection to a 230 V AC mains. For TAC Xenta 280/300 and the I/O modules this is applicable to the relay outputs only.

All equipment that is connected to the controller must comply with the following standards:

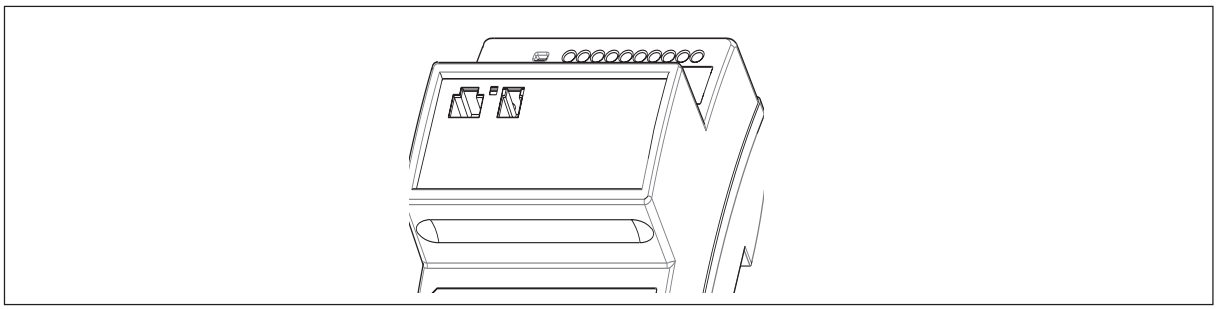
- **EN 60 742** (or other relevant safety standard; for example ETL listing UL 3111-1, first version and CAN/CSA C22.2 No. 1010.1-92) for the device(s) that provide ELV-type power supply (normally 24 V AC) to the controller and other connected equipment.
- **EN 61 010** or **IEC 950** (or other relevant safety standard) for computers, modems and other equipment supplied by 230 V mains.

If equipment using 230 V mains is connected to a relay output terminal of the controller, low-voltage equipment connected to the other relay terminals of the controller must provide at least basic insulation to all touchable parts.

Caution! It is strongly recommended that switches are installed to make it possible to separate the external equipment when the relay output terminals control equipment which uses the 230 V mains.

Terminals G, G0 and C1, C2

- Mount the terminal part of TAC Xenta 280, 300 or 401 on a DIN rail.
- Connect the cables to the correct terminals (see figure below).
- For TAC Xenta 401 put the electronics part of the contoller onto the terminal part (the remaining terminals are not used).



Terminals for power supply and network communication

Remaining terminals (TAC Xenta 280 and 300)

The remaining terminal connections for TAC Xenta 281/282 and 301/302 are listed below. A label on the front of the controller lists the numbers and the names of the terminals (1 C1, 2 C2, etc.). The numbers are also shown in the plastic of the terminal part.

Terminal connections TAC Xenta 280 Inputs

Term. label	Signal type 281	282	Description
1	C1	C1	LonWorks™ connection
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	–	–	

Note! *Do not use unlabelled terminals!*

Terminal connections TAC Xenta 280 Outputs

Term. label	Signal type 281	282	Description
21	G	G	24 V AC or 19–40 V DC+
22	G0	G0	24 V AC common or 19–40 V DC–
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	–	–	
33	–	–	Relay
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	–	–	

Terminal connections TAC Xenta 300 Inputs

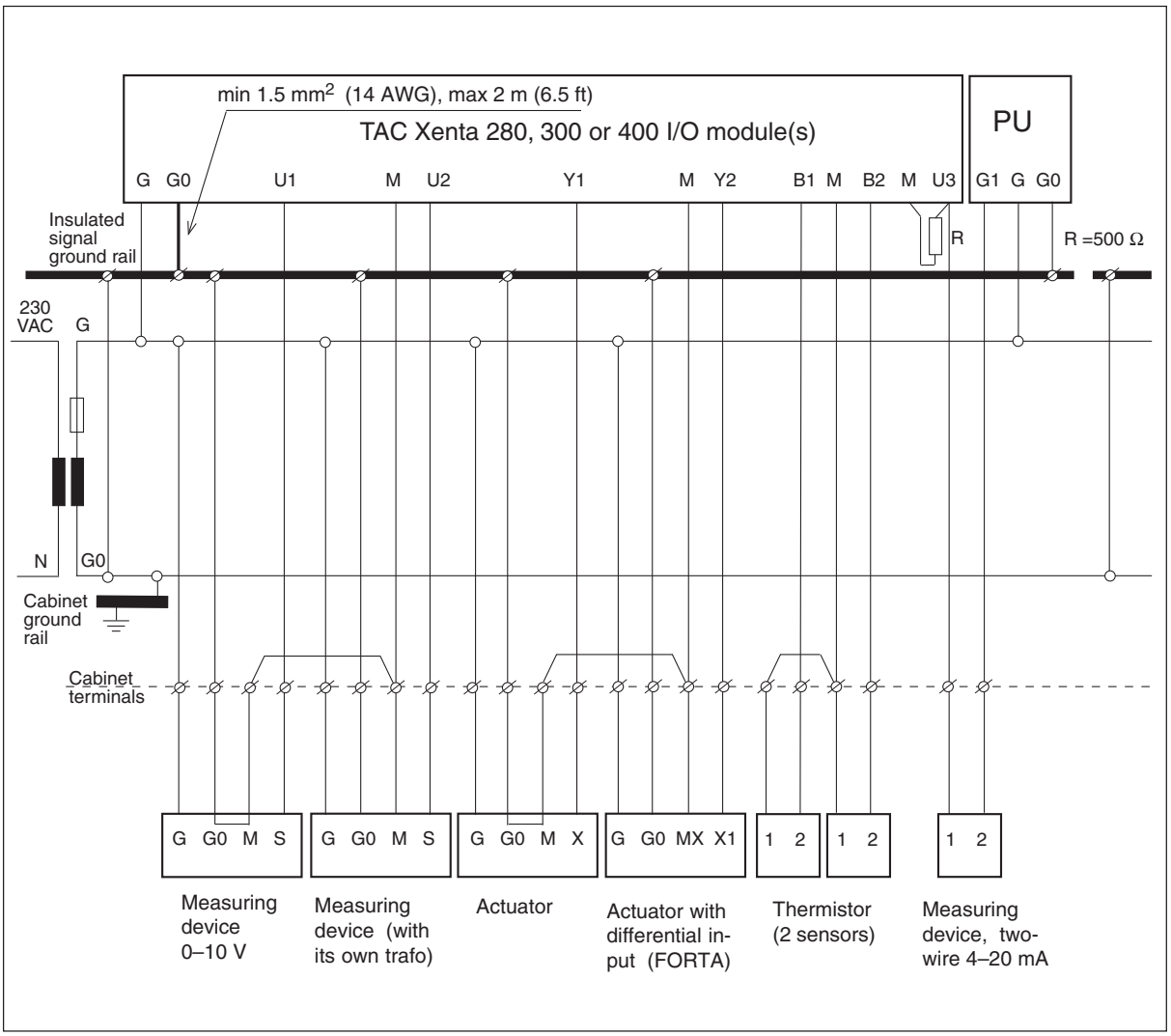
Term. label	Signal type 301/302	Description
1	C1	LonWorks™ connection
2	C2	
3	U1	Universal
4	M	Measurement neutral
5	U2	Universal
6	U3	Universal
7	M	Measurement neutral
8	U4	Universal
9	B1	Thermistor
10	M	Measurement neutral
11	B2	Thermistor
12	B3	Thermistor
13	M	Measurement neutral
14	B4	Thermistor
15	X1	Digital
16	M	Measurement neutral
17	X2	Digital
18	X3	Digital
19	M	Measurement neutral
20	X4	Digital

Terminal connections TAC Xenta 300 Outputs

Term. label	Signal type 301	302	Description
21	G	G	24 V AC or 19–40 V DC+
22	G0	G0	24 V AC common or 19–40 V DC–
23	Y1	Y1	0–10 V
24	M	M	Output neutral
25	Y2	Y2	0–10 V
26	–	Y3	0–10 V
27	–	M	Output neutral
28	–	Y4	0–10 V
29	–	–	
30	–	–	
31	K5	–	Relay
32	KC3	–	K5, K6 common
33	K6	–	Relay
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	K4	Relay
40	–	–	

4.2.2 Cabinet connections

When cabinet mounting is used, jumpers may be used between M (measurement neutral) terminal pairs, as shown in the figure below. All G0 points must be connected to protective ground.

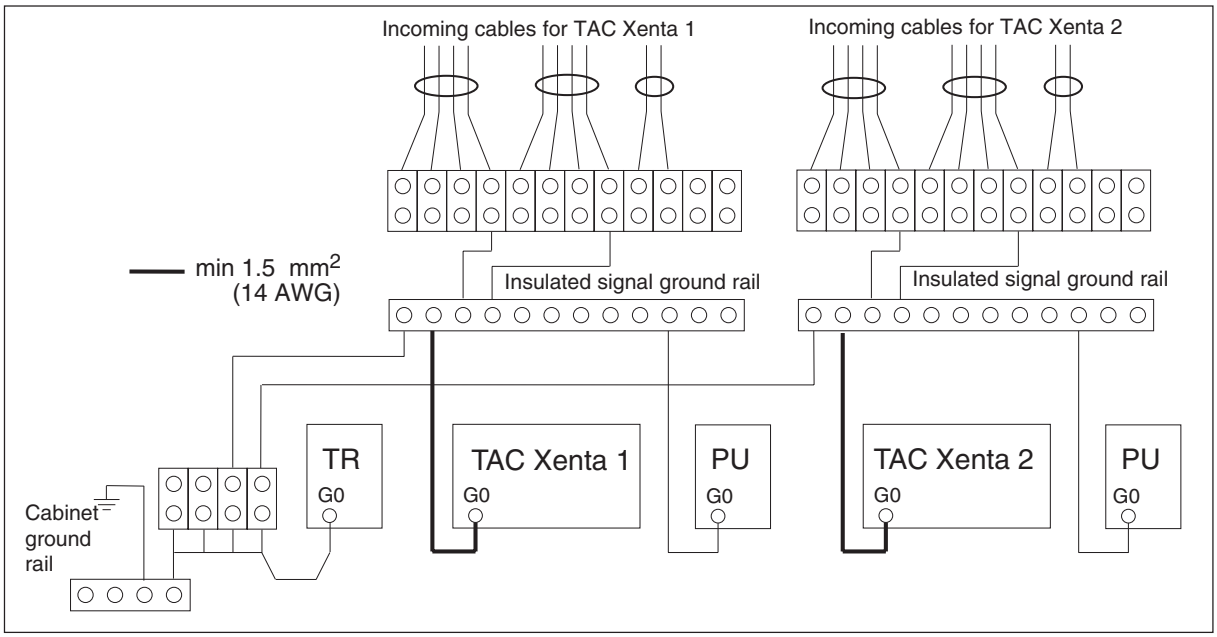


Principle diagram for cabinet connections

When connecting G0 to ground, each TAC Xenta unit must have its own connection to the ground rail, that is, jumpers cannot be used for the G0 terminals. Please refer to the figure on the next page.

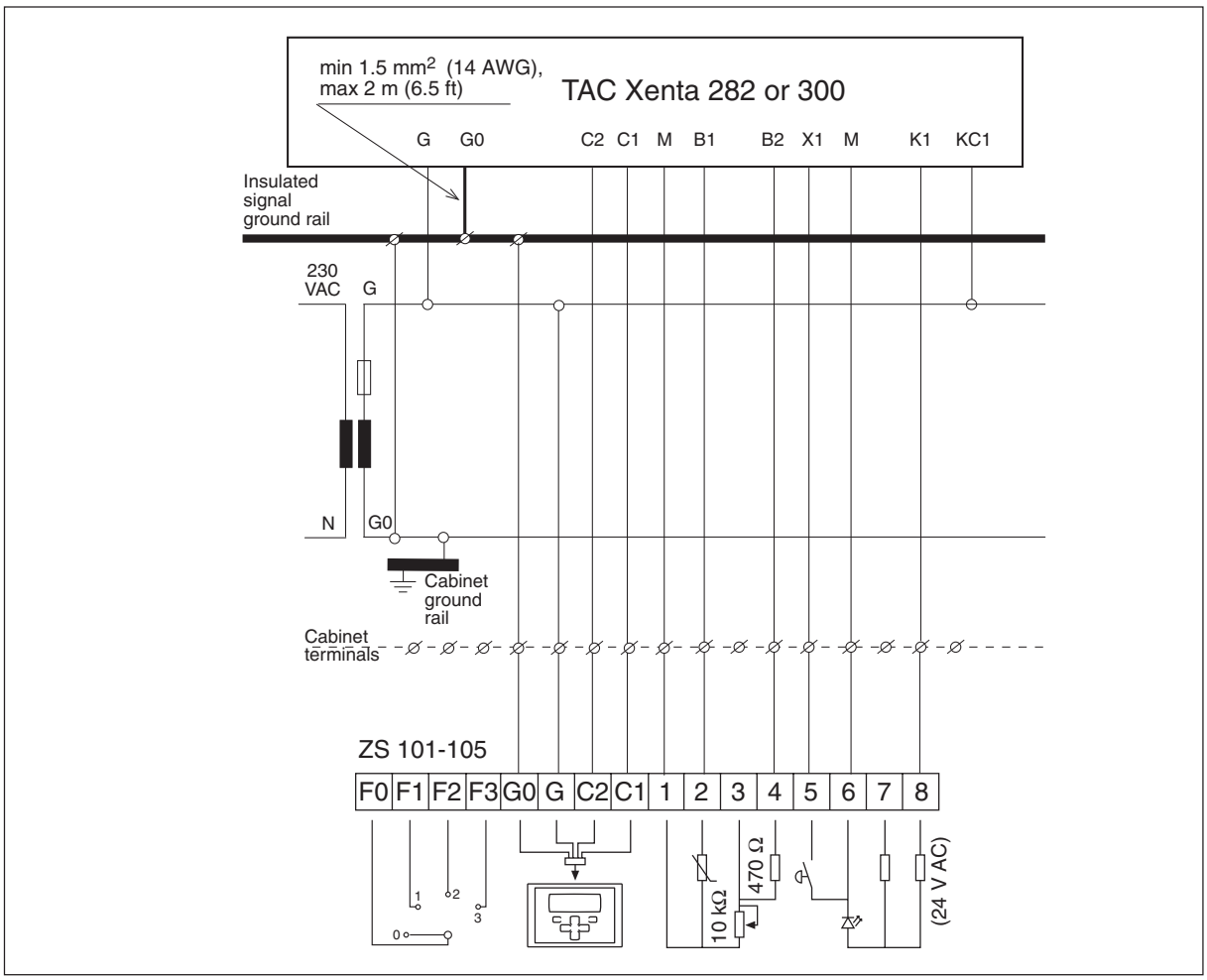
Several units may share the same ground rail, but every unit with measuring inputs and/or analog outputs must have all its ground connections to the same ground rail.

In other words, a discontinuation in the ground rail must not split a controller or separate it from the connected units.



Connections between insulated signal ground rails and the cabinet ground rail

When a Wall Module (ZS101–105) is connected to TAC Xenta 280 or 300, the following terminals can be used (term. B2: v 3.0 or later).



Principle diagram for the connection of Wall Module ZS 101–105 to TAC Xenta 282 or 300

4.2.3 Cables

G and G0 (Power supply):
G, min. cross-sectional area ..... 0.75 mm² (18 AWG)
G0 to TAC Xenta, min. cross-sectional area ... 1.5 mm² (14 AWG)

C1 and C2 (network):
The FTT-10 system allows the user to wire the control devices with virtually no topology restrictions.
Min. cross-sectional area ..... 0.65 mm² (18 AWG)
Note: The max. wire distance in one segment depends on the type of wire and the topology, see the table on the next page.

The wires are polarity insensitive, but must be a twisted-pair.
For more details, please refer to the *TAC Xenta Network Guide*.

Terminals X (Digital inputs):
Min. cross-sectional area ..... 0.25 mm² (22 AWG)
Max. cable length ..... 200 m (660 ft)

Terminals U (Universal inputs as digital inputs):
Min. cross-sectional area ..... 0.25 mm² (22 AWG)
Max. cable length ..... 200 m (660 ft)

Terminals U (Universal inputs, devices power supplied via the *same* transformer as the Base unit):
Min. cross-sectional area ..... 0.75 mm² (18 AWG)
Max. cable length ..... 20 m (65 ft)

Terminals U (Universal inputs, measurement devices power supplied via their *own* transformer, external or internal):
Min. cross-sectional area ..... 0.25 mm² (22 AWG)
Max. cable length ..... 200 m (660 ft)

Terminals B, U (as thermistor inputs):
Min. cross-sectional area ..... 0.75 mm² (18 AWG)
Max. cable length
up to 75 °C, cross-sectional area 0.75 mm² ..... 75 m (250 ft)
up to 75 °C, cross-sectional area 1.5 mm² ..... 150 m (500 ft)
up to 150 °C, cross-sectional area 1.5 mm² ..... 75 m (250 ft)

Terminals K1–K6 (Relay outputs):
Cross-sectional area ..... 0.75 – 1.5 mm² (18–14 AWG)
Max. cable length ..... 200 m (660 ft)

Terminals Y (Analog outputs, for actuators power supplied via the *same* transformer as the Base unit):
Min. cross-sectional area ..... 0.75 mm² (18 AWG)
Max. cable length [1] ..... 20 m (65 ft)

Terminals Y (Analog outputs, for actuators power supplied via their *own* transformer, ext. or int.; or when the outputs have isolated converters):
Min. cross-sectional area ..... 0.25 mm² (22 AWG)
Max. cable length ..... 200 m (660 ft)

[1] Some actuators allow greater cable length, for example:

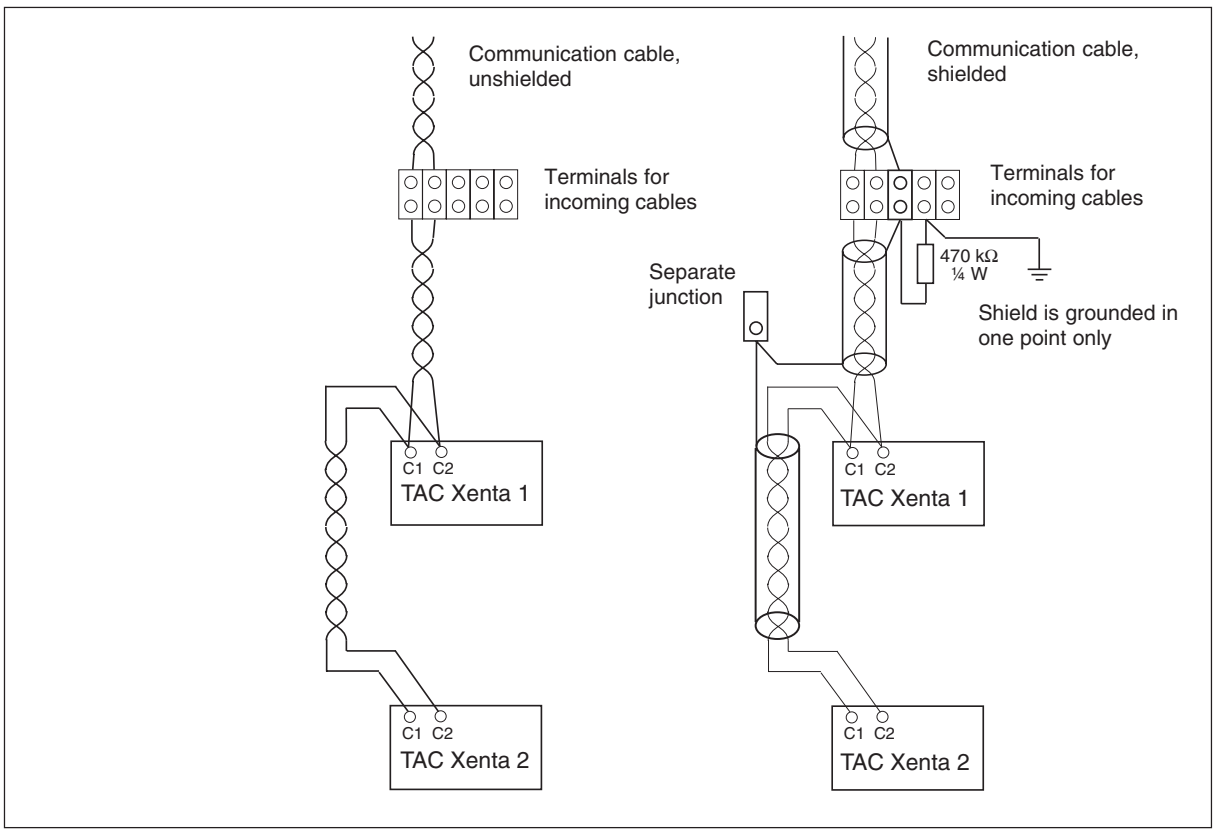
EM52	0.5 mm²	(20 AWG)	80 m	(260 ft)	three wires
EM15LBB	0.75 mm²	(18 AWG)	80 m	(260 ft)	three wires
EM42	0.75 mm²	(18 AWG)	80 m	(260 ft)	four wires
TAC Forta	0.75 mm²	(18 AWG)	80 m	(260 ft)	four wires

One of the following cable types must be used:

Cable	Max. bus length, doubly terminated bus topology [m (ft)]	Max. node-to-node distance, single terminated free topology [m (ft)]	Max. total wire length single terminated free top. [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, 1 or 2 pairs	1400 (4600)	400 (1300)	500 (1600)
Siemens J-Y(st)Y 2x2x0.8 4-wire helical twist, solid, shielded	900 (3000)	320 (1000)	500 (1600)
TIA568A Cat. 5 24AWG, twisted p.	900 (3000)	250 (820)	450 (1500)

If a shielded communication cable is used, the shield must be grounded in one point only.

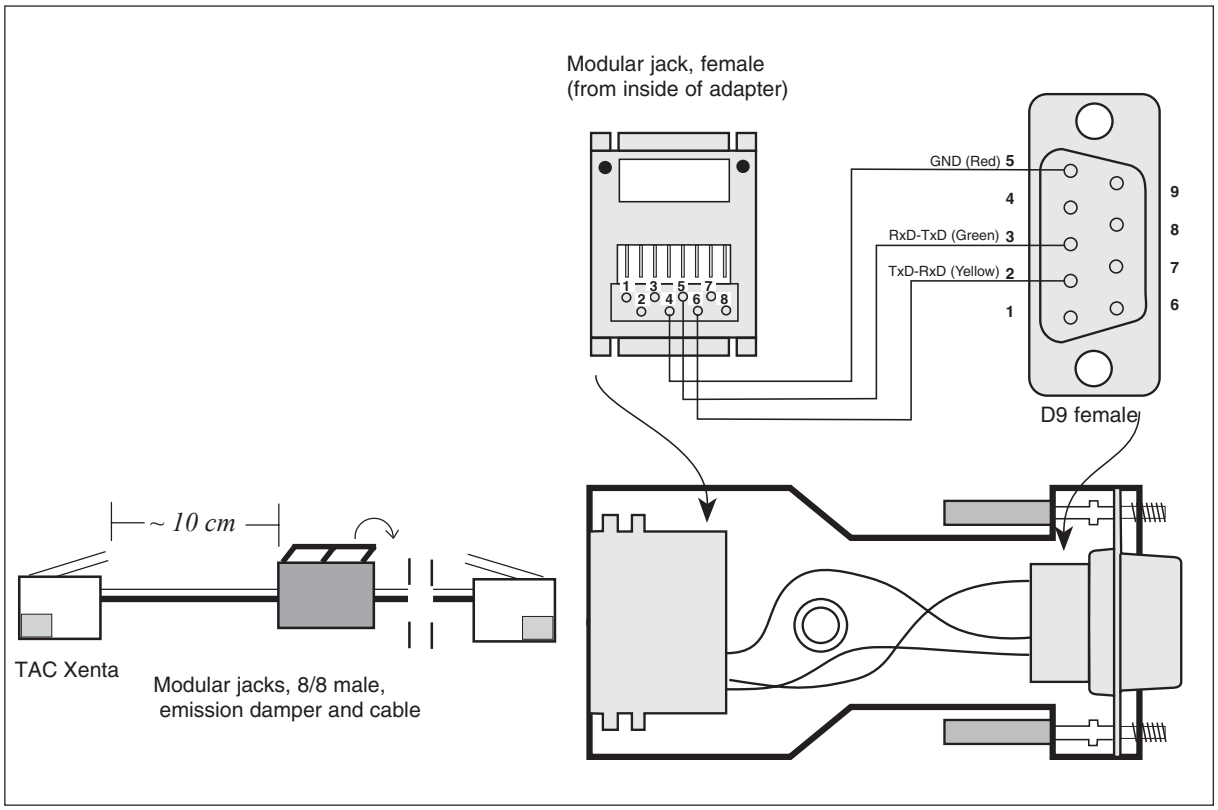
Obsolete wires (second pair of Siemens J-Y(st)Y) are cut at end of shield.



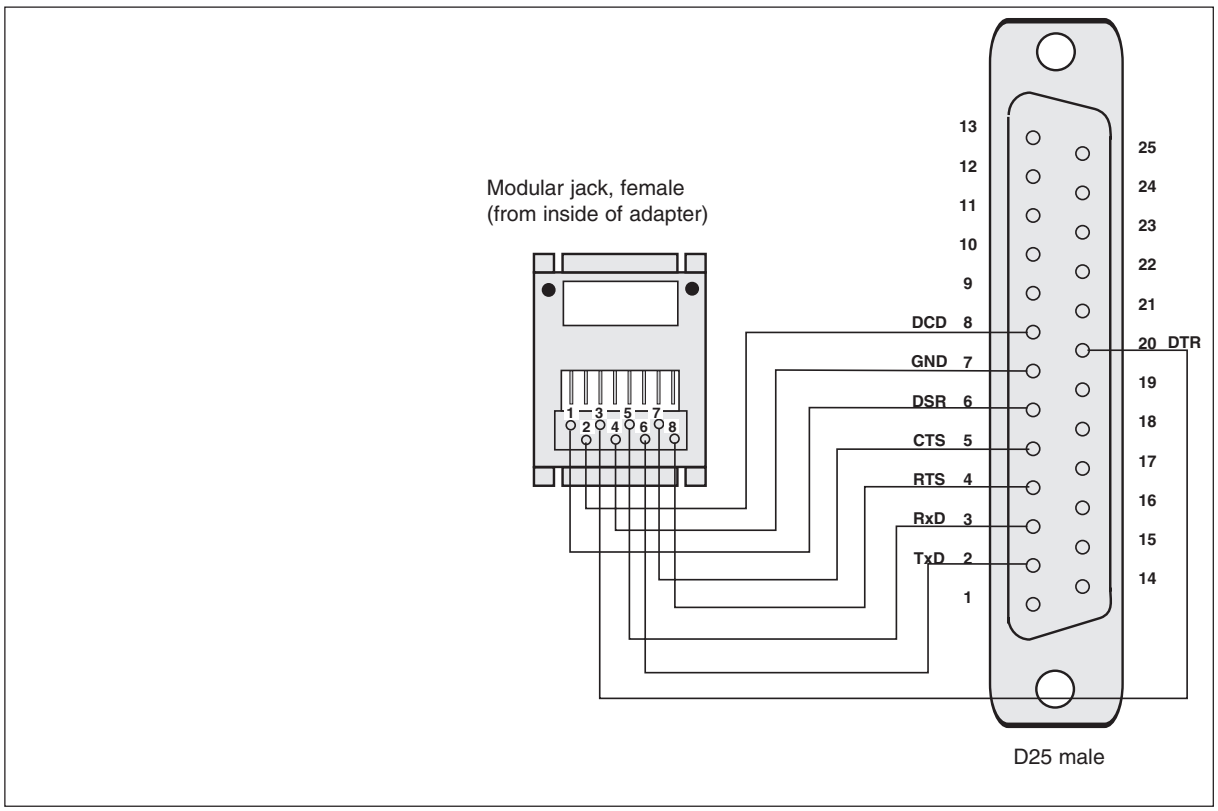
Connecting the communication cable

RS232

Modular jack for RS232 serial comm port ..... max. 10 m (32 ft)



RS232 cable connections and adaptor for PC



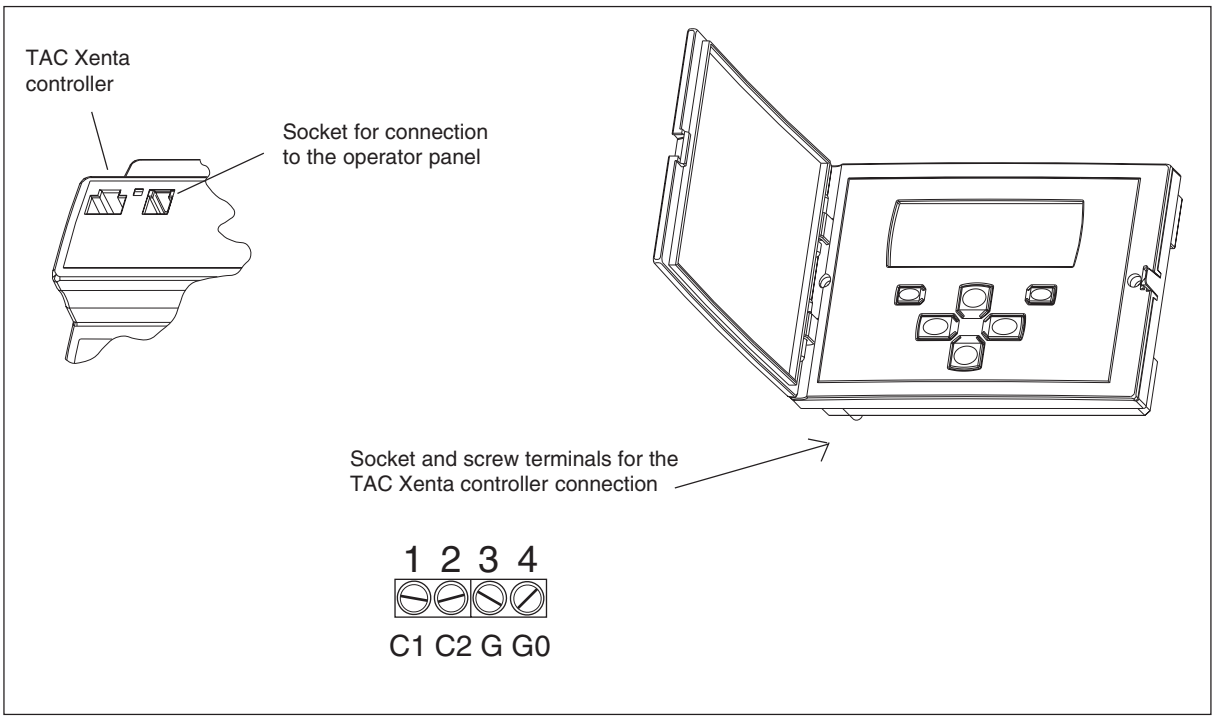
RS232 connection between the TAC Xenta controller and a modem

4.2.4 TAC Xenta OP Operator panel

Cable between controller and Operator panel..... max. 10 m (32 ft)

There are two ways to connect the operator panel (see figures below):

- Use the modular socket on the front of the TAC Xenta controller and on the back of the operator panel. A modular jack 4/4 cable is supplied with the OP for this.
- Use the screw terminals on the back of the operator panel, labelled 1–4. Terminals 1 and 2 are used for communication and terminals 3 and 4 for 24 V AC.

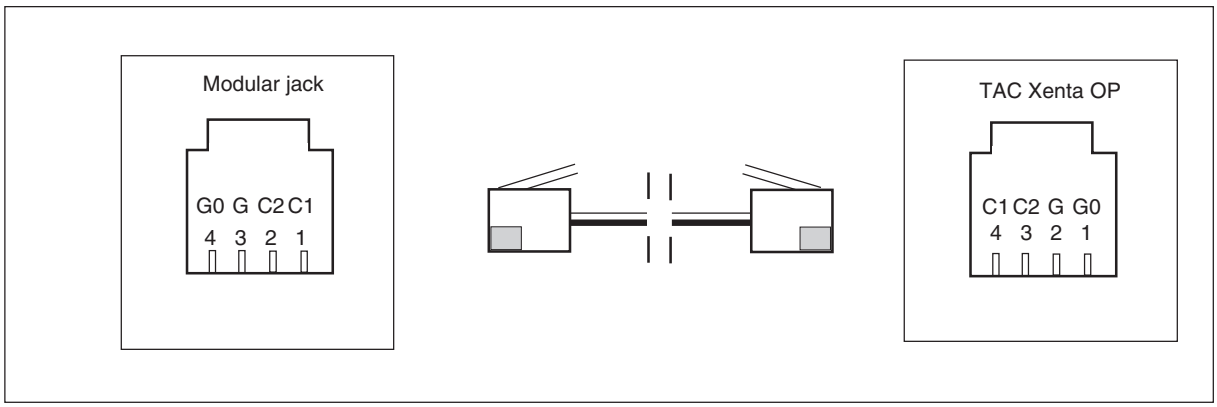


TAC Xenta OP connectors

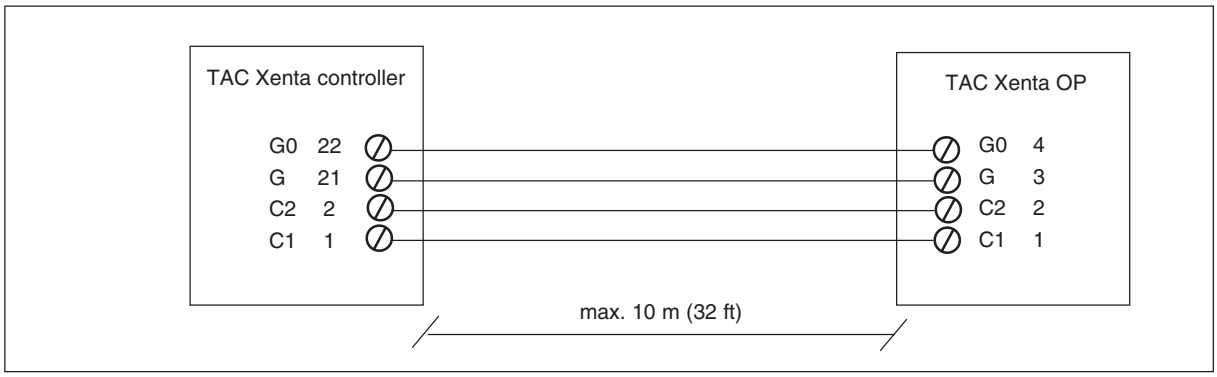
To adjust the contrast of the display, use the potentiometer on the rear of the operator panel.

Normally, there is a time-out when you have logged in on the OP. It is, however, possible to override the time-out and get a permanent display by setting a bit in the SYSREG block. Please refer to the new *Engineering Applications in TAC Menta* manual.

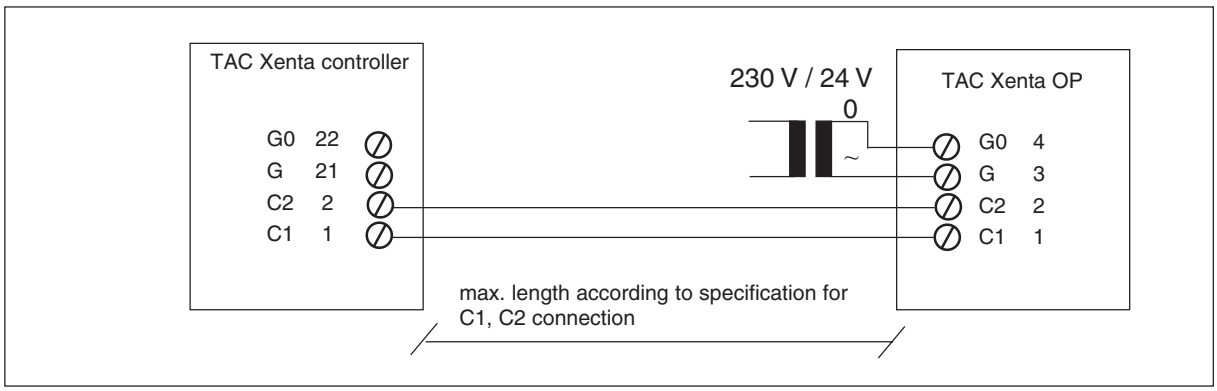
Options for connecting the OP to the Controller



Modular jack for connection of TAC Xenta OP to TAC Xenta 280/300/401 or to a separate jack



Terminal connection TAC Xenta 280/300/401 - TAC Xenta OP, power supply from the controller



Terminal connection TAC Xenta 280/300/401 (or the network directly) - TAC Xenta OP, local power supply

5 Configuring Your System

5.1 Overview

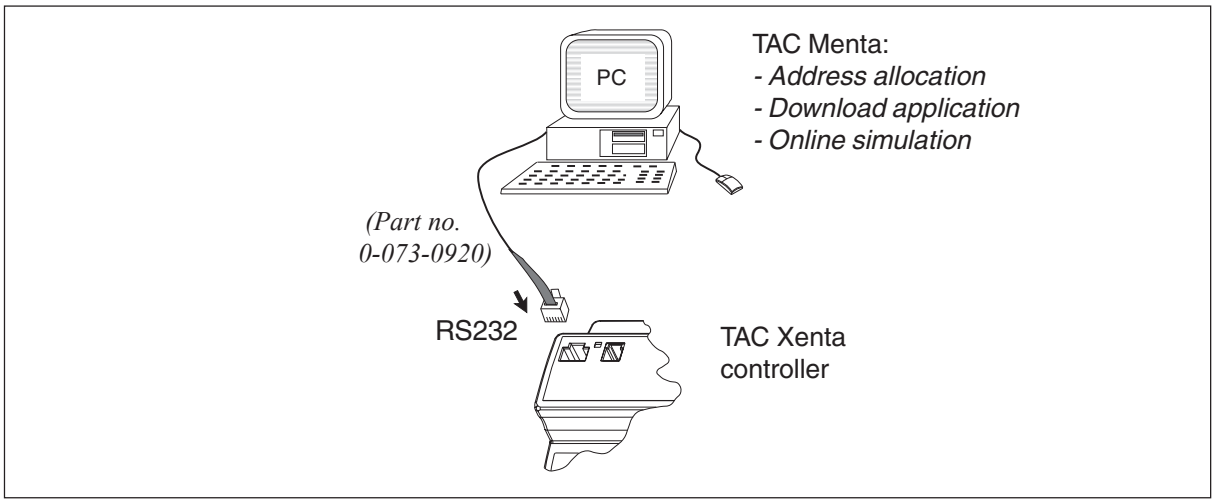
A TAC Xenta 280/300/401 controller is delivered as a freely programmable controller. A customer-specific application is created with the programming tool TAC Menta.

A PC with TAC Menta installed and running is connected, using the Programming Serial Kit cable (part no. 0-073-0920), to the RS232 port of the TAC Xenta controller to be loaded. How this is done is described in the *Engineering Applications in TAC Menta* manual.

During the customization process, the on-line/simulation mode of TAC Menta can also be used to monitor the input and output status of the TAC Xenta controller. Parameter tuning can also be done from TAC Menta.

Note! Starting with TAC Xenta v 3.1 the application program download may also be made from TAC Vista via the network (The procedure is described in *Engineering Networks in TAC Vista*).

The online/simulation in TAC Menta, however, must still use the RS232 port.



Commissioning tool (principle)

Devices must be configured in these situations:

- There are I/O modules (see sections 5.3 and 5.4 in this manual)
- There are several controllers (see section 5.5 in this manual)

5.2 A single TAC Xenta 280/300/401 controller

5.2.1 Initial checking

Caution! *TAC Xenta 280/300:* It is important that the electronics part has the *same* input/output configuration as the terminal part.

After the wires have been connected, but before the electronics part is mounted on the terminal part, perform these checks:

1 Turn on the power.

2 Check that the supply voltage, 24 V AC or 19–40 V DC, is connected to the proper terminals G and G0.

3 *TAC Xenta 280/300*: Check that the voltage levels of the input and output terminals are appropriate, considering their use and possible pre-set values.

4 *TAC Xenta 280/300:* Check the voltage, both AC and DC, between G0 and all other (labelled) terminals.

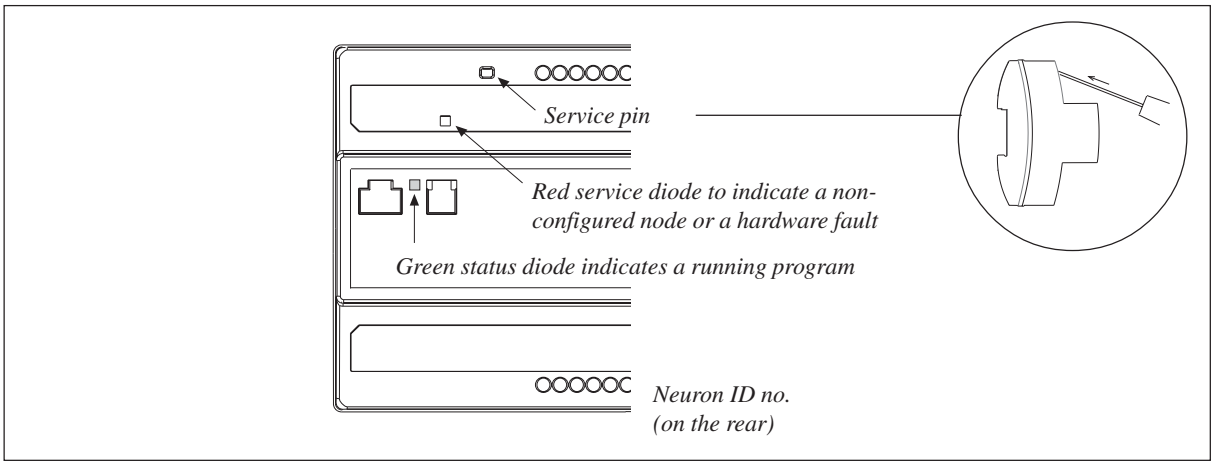
5 Repeat step 4 with G as the reference terminal.

6 Turn off the power and mount the electronics part on the terminal part.

7 Turn on the power again.

8 If previously unloaded, load the program, using TAC Menta, according to the method described in the *Engineering Applications in TAC Menta* manual.

9 Check that the green status LED on the front starts to blink, indicating that the internal program is running.



LEDs and service pin in the controller

10 If *additional I/O-units* are used, follow the steps in section 5.4.

5.2.2 OP Panel activities

1 Connect the TAC Xenta OP to the TAC Xenta unit.

2 *TAC Xenta 280/300:* Select the Temp & Status menu (or corresponding) to check that all inputs have appropriate values.

5.3 Two or more TAC Xenta 280/300/401 units

5.3.1 Initial checking

Perform the steps described in section 5.2.1.

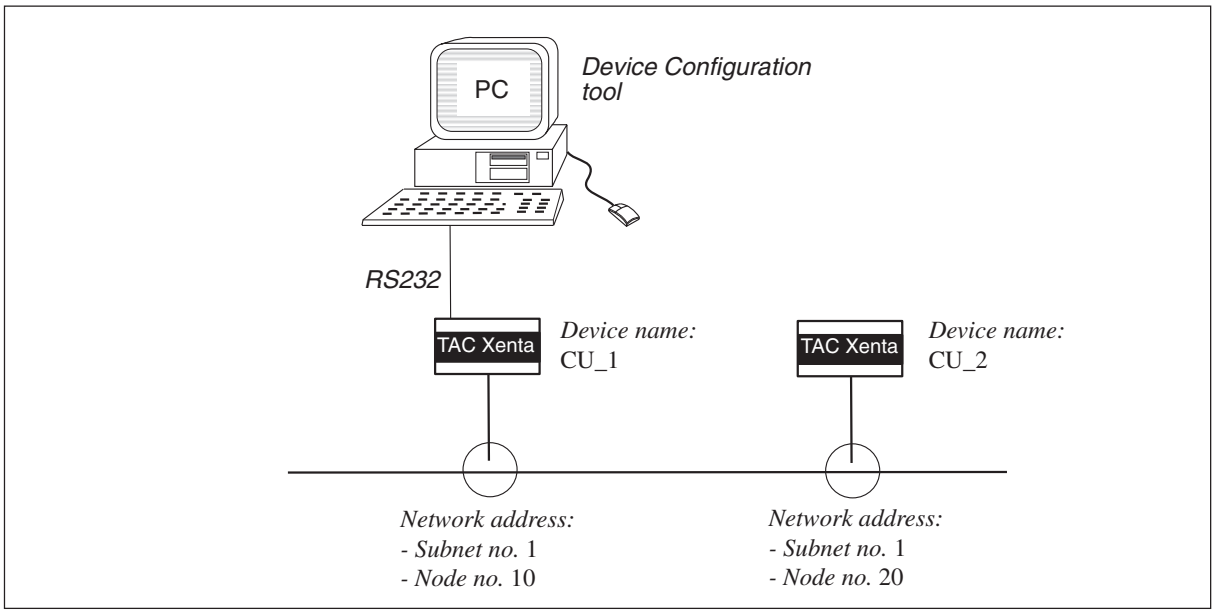
5.3.2 Device configuration

Before it can start to communicate, each TAC Xenta unit must be assigned a network address (a *subnet/node address* and a *device name)*. This is done with a separate Device Configuration programming tool. The tool is run on a PC and is started from TAC Menta, or run stand-alone.

The procedure is fully explained in the *Engineering Applications in TAC Menta* manual.

If two or more units have the same Device name, they must be given separate names. This is also done from the Device Configuration tool.

The figure below indicates some of the parameters that are involved. The use of network addresses is explained in the *TAC Xenta Network Guide*.



Device Configuration parameters (example)

5.3.3 OP Panel activities

When an operator panel is connected to a network with a number of TAC Xenta controllers, the following will happen:

1 The operator panel (OP) sends a request to the network that any TAC Xenta controller that is not occupied will start acting as a server and send texts to the operator panel.

2 The first available Xenta controller sends a list of all groups in the network. These are shown on the OP and when one of them has been selected, the TAC Xenta controllers of the group are shown on the operator panel. As all TAC Xenta controllers know what other TAC Xenta controllers are present in the network, an operator panel can be served by any TAC Xenta controller in the network.

3 From this list the desired TAC Xenta controller is chosen by the user, and the controller that first acted as a server is released from its duties.

4 The chosen TAC Xenta controller then supplies the operator panel with the menu on the highest level in the program.

5 *TAC Xenta 280/300:* Select the Temp & Status menu (or corresponding) to check that all inputs have reasonable values.

6 Now select another controller from the top menu and repeat steps 5-6, as many times as required.

5.4 Additional I/O-units

5.4.1 Selecting I/O modules

There are two types of I/O modules:

- configured (older, for older versions of the Base unit)
- unconfigured (newer, for Base units version 3.2 or higher)

Note! *TAC Xenta 280* does not use extra I/O modules.

5.4.2 Initial checking

Note! It is important that the electronics part has the *same* input/output configuration as the terminal part.

After the wires have been connected to the I/O modules, but before the electronics part is mounted on the terminal part, perform these checks.

1 Turn on the power.

2 Check that the supply voltage, 24 V AC or 19–40 V DC, is connected to the proper terminals G and G0.

3 Check that the voltage levels of the input and output terminals are appropriate, considering their use and possible pre-set values.

4 Check the voltage, both AC and DC, between G0 and all other terminals.

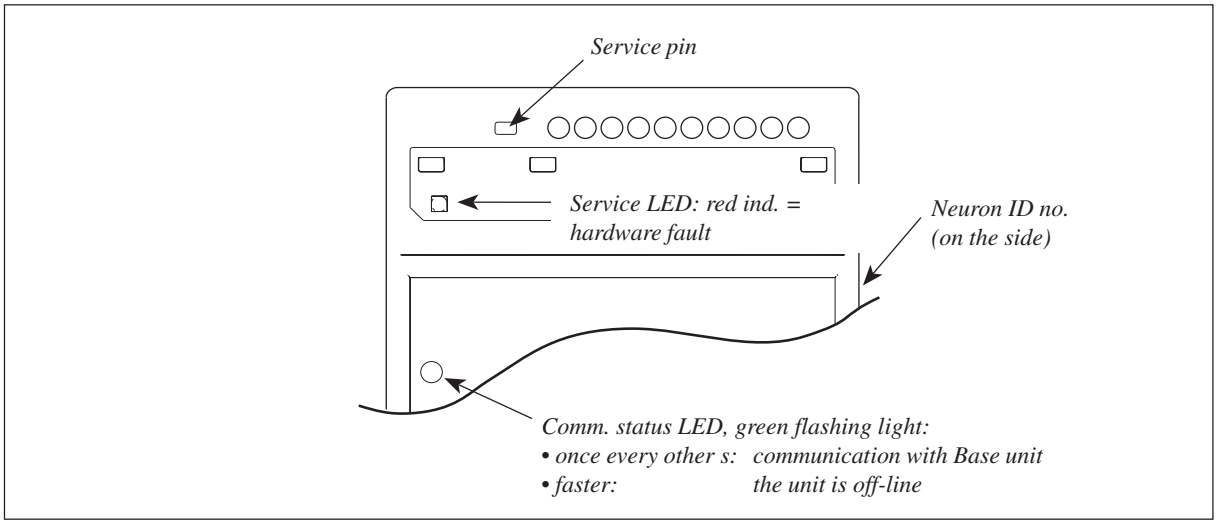
5 Repeat steps 1-4 with G as the reference terminal.

6 Turn off the power and mount the electronics part on the terminal part.

7 Turn on the power again.

8 Check the LEDs:

- The red service LED on the front will now blink once.
- The green communication statusLED on the front starts flashing rapidly (about 2-3 Hz), indicating that the unit is off-line.



LEDs and service pin of the I/O modules

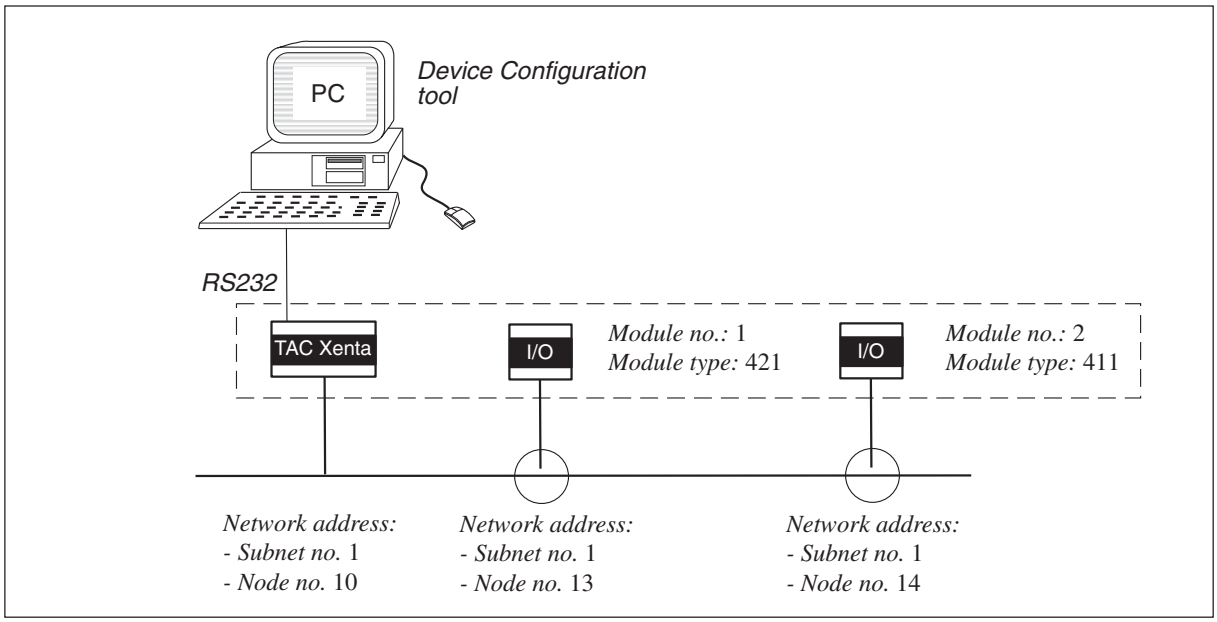
5.4.3 I/O module configuration

An I/O module always belongs to a specific TAC Xenta controller. Before the module can be utilized, it must be linked to that controller by using the Device Configuration programming tool. The tool is run on a PC and is started from TAC Menta, or run stand-alone.

The procedure is described in the manual *Engineering Applications in TAC Menta*.

For some versions of TAC Xenta OP, these items can also be set from the Service menu. This is described in chapter 6 (‘IO Module Config’) of this manual. Please note that this menu is only reached from the Service access level.

The figure below indicates some of the parameters that are involved. The use of network addresses is described in the *TAC Xenta Network Guide*.



I/O module configuration parameters (example)

About 45 s after the configuration procedure has been completed, the green LED should start to blink, at the rate of about once every other second, to indicate that the unit is communicating with the application in the Base unit.

5.5 Setting the Date and Time

Set the current date and time from TAC Menta during commissioning (On-line mode). The setting affects only the controller that is connected to TAC Menta. Please refer to the *Engineering Applications in TAC Menta* manual for further details.

Date and time can also be set from the TAC Xenta OP, if the operator has logged on at the appropriate access level (usually the medium level). For details, refer to the *TAC Xenta OP Handbook*.

If the controllers are connected to a supervisory system like TAC Vista, date and time can be set in *all* units with one command from TAC Vista.

A TAC Xenta Master unit broadcasts its clock time once each 24 hours.

In both cases date and time are sent periodically, so that even if some units should be offline when the time data are sent, they will eventually be updated with the values from the central system or, in the standalone case, from the Master.

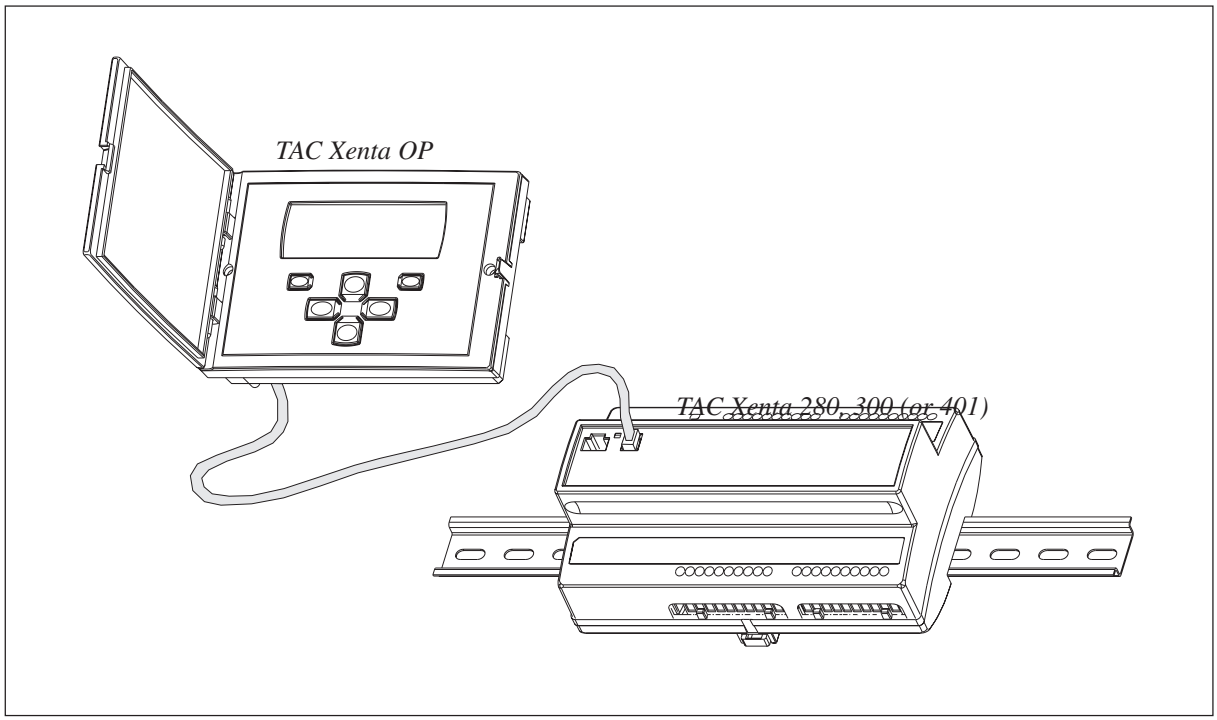
TAC Vista sends the time in GMT format. The time value is transformed in each separate TAC Xenta to the valid time zone and the current standard or daylight saving time.

6 The TAC Xenta Service Menu

6.1 Accessing the Service menu

When a TAC OP is connected to a TAC Xenta controller 280, 300 or 401 menus appear on the display.

Use the password-protected Service menu for system information and actions.



Connecting TAC Xenta OP to the controller

The Service menu has the following options (the rectangle symbolizes the four-line display window of the OP):

```
   TAC Service menu
1. Name
2. LON Address
3. Wink
4. Restart
5. IO Module Config
6. Test Dial
7. System info
```

To access the Service menu, press “Enter” () directly after start-up. The menu may look something like this:

```
AHU2:  West
Status
Temperature
Alarm
  .
  .
Password
```

Move the cursor to `Password` and press Enter to get:

```
     Password
CODE:
Enter code to
extend menu
```

Enter the code ”`1919`” by using + or – , Enter and finally “Home” (). The Start-up menu reappears.
The bottom line will now include the Service menu option.

```
  .
  .
Status
Password
Service menu
```

6.2 Submenus 1-8

Submenu 1: Device Name and Submenu 2 LON address

To get the Name and address of a specific controller:

1 Disconnect the controller from the network.

2 Connect the OP to this unit and select the Service menu, where the name and address can be checked. Please note that this menu is only available from the access level “Service”.

3 Select submenu “`1. Name`” or ”`2. LON address`”:

```
Name
```

```
LON address
Subnet: 1
Node  : 10
```

4 Reconnect the unit to the network.

5 Repeat steps 1–4, as many times as needed.

Submenu 3: Wink node

In some cases it may be necessary to know which physical unit corresponds to a certain node address. Select submenu “`3. Wink`”:

```
  Wink node
When pressing HOME
LED is ON during
3 seconds.
```

When you press the **Home** key (), the green status diode of the selected Base unit will light up for about three seconds.

Submenu 4: Restart

There are different types of restart. These are selected from submenu "`4. Restart`":

```
    Restart type:   _
0:No restart
1:Warm  2:Cold
3:Orig. appl.
```

At the restart parameters and values are fetched according to the following (refer also to Appendix 1, Restart Values).

`1:Warm` Most values according to the ones already present in RAM.

`2:Cold` Most values are reset to the original, downloaded application, except for saved PV Block values, Public parameters and certain OPT values.

`3:Orig. appl.` Reset all values to the the original, downloaded application.

Submenu 5: IO module Config, Configuring I/O modules via the OP

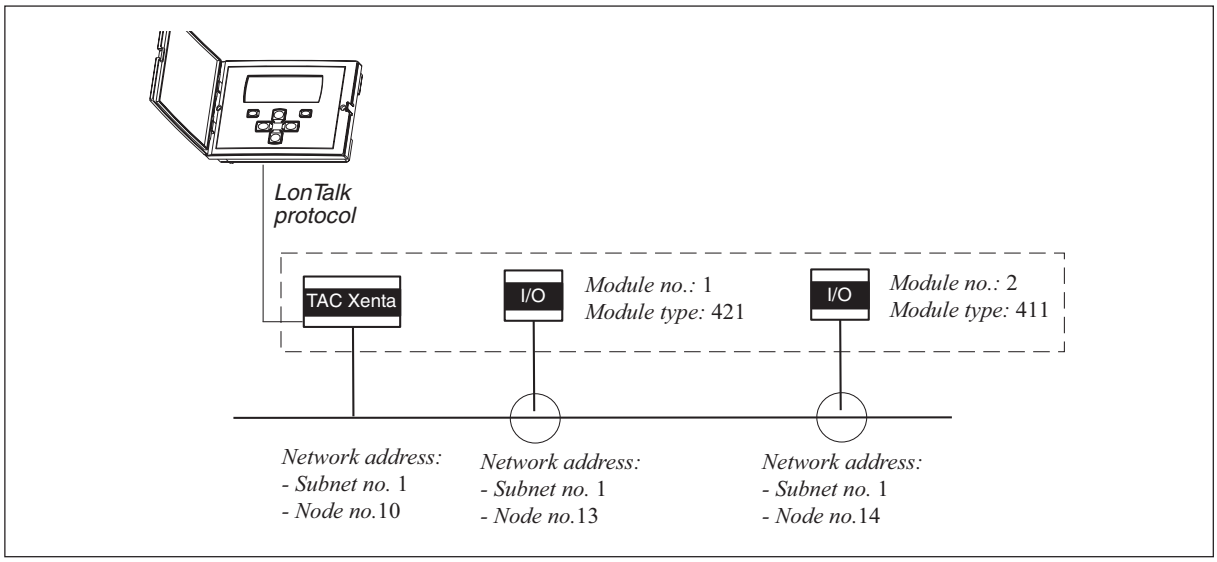
Chapter 5 contains information about configured and unconfigured I/O modules as well as instructions for "Initial checkings" of the new, connected units.

An I/O module always belongs to a specific TAC Xenta controller (the Base unit). Before an I/O module can be utilized, it must be linked to that controller.

To do this, go to menu "`5. IO Module Config`".

The I/O modules will automatically get the same *Subnet no*. as the base unit. Normally this is the number that should be used.

The figure below indicates the parameters that are involved.



I/O module configuration parameters (example)

1 On the operator panel select the list of controllers on the network.

2 Select the TAC Xenta to configure.

3 Select submenu "`5. IO Module Config`" and enter the address value:

```
   IO Module Config
Module No: 1
Node Addr.: 13
Valid Service Pin: 0
```

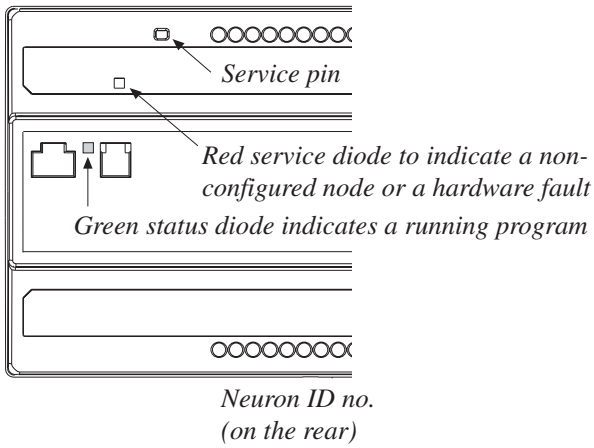
4 Press the service pin on the corresponding unit (see diagram below). Following this, `Valid Service Pin: 0` should change to **`1`**.

5 **Within about 20 seconds** press Enter, to confirm the configuration.

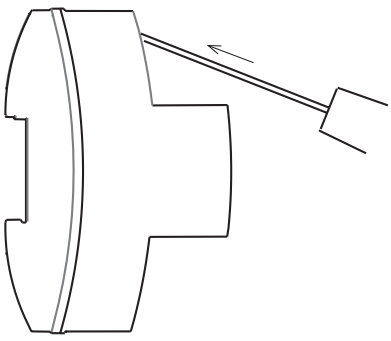
6 About 45 s after the configuration has finished, the green LED starts blinking slowly, showing that the unit is communicating with the Base unit.

7 Repeat steps 3–6 if there is a second I/O module.

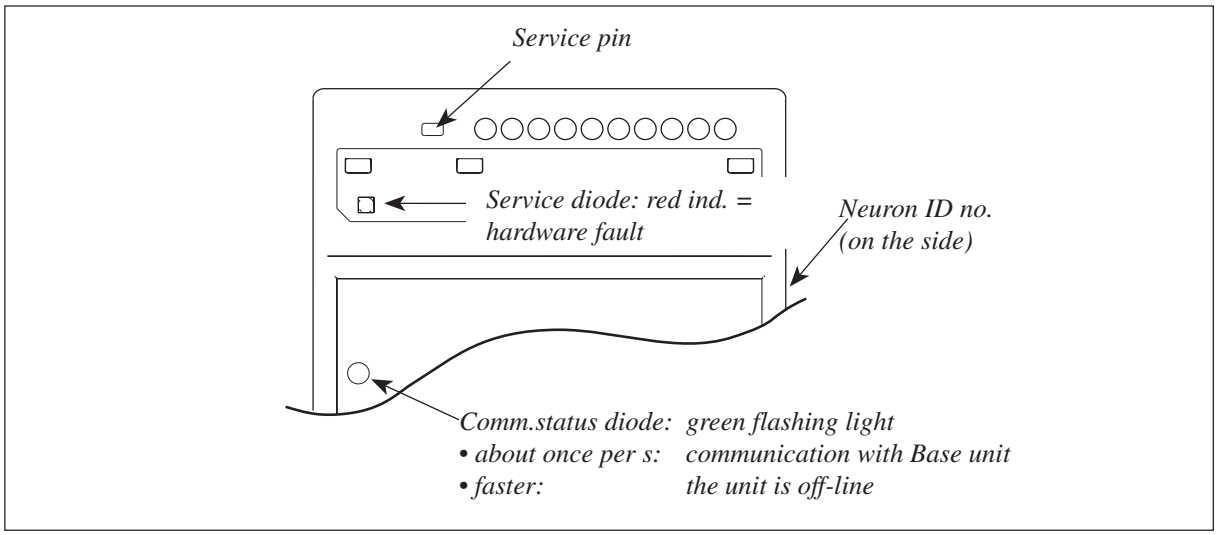
8 Repeat steps 2-7 for all listed controllers with I/O modules.



LEDs and service pin of the controller (Base unit)



Activating the service pin of the controller or the I/O module



LEDs and service pin of the TAC Xenta 400 I/O modules

Submenu 6: Test dial

This function is used in dial-up systems (not applicable for TAC Xenta 280) and is explained in the *TAC Xenta Network Guide*.

1 Select 6. Test dial and the following menu will appear.

```
 Test dial
Dial                  0
Status               08
 0000 0000 0010 0100
```

2 At Dial use

- the value **0** for the normal telephone no.

or toggle to

- the value **1** for the alternative telephone no.

3 Press Enter to initiate a dial-up from the controller to a supervisory system.

The two Status lines will display codes with information about the procedure as described below.

(Dynamic) `Status` (**upper** integer value) shows the progress of the dial-up sequence.

Code	*Meaning*
IDLE **00**	This is the state before any dial attempts have been made.
LINE_BLOCKED **01**	The line was blocked.
NO_DIAL_STRING **02**	No dial string was defined, so no dial attempt was made.
SENDING_DIAL_STR. **03**	We are either in the process of sending the dial string to the modem, or waiting for the response.
BUSY **04**	The line was busy.
NO_ANSWER **05**	No one picked up the phone at the other end.
NO_CARRIER **06**	There was no modem at the other end that could answer.
ERROR **07**	Something was wrong with the dial string.
NO_DIAL_TONE **08**	No normal dial tone.
TIMEOUT **09**	The modem did not reply to the dial string at all.
CONNECT **10**	We are connected to the remote modem.
NO_LOGIN_REPLY **11**	Attempt to log in, but noreply from TAC Vista.
LOGIN_FAIL **12**	Our password (and/or network ID) was not accepted by TAC Vista.
LOGIN_OK **13**	Connection established!

(Static) `Status` (**lower** 16-bit string) pertains to the modem and communication environment, such as availability of modem etc.

Code	*Meaning*
`---- ---- ---- ---1`	DSR is set if TAC Xenta detects that the modem drives the Data Set Ready line. Possible reasons for DSR being low: modem not connected, modem not powered on, DSR line not connected in the cable.
`---- ---- ---- --1-`	AT OK is set when TAC Xenta has sent an AT command to the modem and received an OK reply. Possible reasons for not receiving AT OK: modem configured to not return any response to modem commands.
`---- ---- ---- -1--`	Reset OK is set when AT OK is not set **and** TAC Xenta sent an AT&F sequence ordering the modem to return to factory defaults, and an OK reply was received. Possible reasons for not receiving Reset OK: RX line not connected in the cable or the modem is configured not to return any response to modem commands.

`---- ---- ---- 1---`	Init string defined is set if TAC Vista has defined a modem initialization string.
`---- ---- ---1 ----`	Init OK is set when Init string defined is set **and** Xenta sent the init string and received an OK reply. Possible reasons for not receiving Init OK: the init string contained a command that turned replies off, the init string contained an illegal command.
`---- ---- --1- ----`	No contact.
`---- ---- -1-- ----`	Ready.
`---- ---- 1--- ----`	Phone number defined is set when TAC Vista has defined a modem dial string.

Submenu 7: System info'and

Submenu 8: Boot info

To get information about the controller program version, select submenu "`7. System info`".

```
   Date: 2002-02-11
Ver: X300 3.50
By:  TAC
302NP    (Neuron ID: 12 chrctrs)
```

To get information about the Boot program, select submenu "`8. Boot info`".

```
   Date: 2002-02-11
Ver: X400 B 3.52-01
By:  TAC
```

Appendix 1 Restart Values

There are two kinds of memory in the controller:

1 RAM working memory, current values;
the contents are lost after 72 hours without power

2 Flash program memory, nonvolatile storage memory

Certain items which are used in RAM are also saved in the Flash memory, when the value is changed, so that it will not be lost during lengthy power failures.

The Flash memory is also the location of the *original application* and the *trend log definition* values. These are the values specified in the *latest application down-loaded from TAC Menta*.

At a restart, whether caused by a power failure or by operator demand, it is important to know which start values will apply.

Below are some examples where the value may be taken from RAM, from the value saved in Flash memory, or from the original application value, also in Flash memory.

- Internal status and output values for Function Blocks
(may affect the control of actuators, fans, etc.)
- PV Blocks, for example the setvalues
(it may be important not to lose the new, adjusted setvalues)
- Public parameters
(values which affect other nodes of the plant)
- Trend log definition
(log channels, log interval, storage area)
- Trend log data
(stored values)
- Optimization parameters
(automatically adjusted values, taking a long time to settle)
- Time parameters
(local time zone, current Daylight Saving Time status)
- Modem parametters
(telephone numbers, dial-up interval, initializing commands, etc.)

At a restart, the system must have usable start values in the working areas of RAM. Which start values will be used will depend on

- which type of restart has been ordered,
- if the RAM contents are still valid (<72 h after a power failure) and
- if the Backup boxes for the Function and PV Blocks in TAC Menta have been checked.

If the Backup box has been checked, it means that as soon as a value has been changed, the system will save it and use it as a start value at Warm start and, for the PV Blocks, also at Cold start.

The Public parameters (which do not use the RAM at all) and certain calculated OPT-values are always saved in the Flash memory.

The table below shows the principal storage locations.

Value	Backup indication	Stored in
Status and output values for Function Blocks	x (default)	RAM
PV Blocks	x (default)	Flash
Public parameters	(always)	Flash
Trend log definition	(always)	Flash
Trend log data	(always)	RAM
Certain OPT values	(always)	Flash
Time parameters	(always)	Flash
Modem parameters	(always)	Flash

Applied to the three types of restart we get:

* **Warm start** (operator request or due to power failure <72 h; RAM intact)

  Almost all values are the current ones, kept in RAM; among them the trend log definitions and data. An event is added to the trend log data, stating that a Warm start has occurred.

  Exception: Function Block internal state values, if Backup was ***not*** checked, in which case the original values will be used instead.

* **Cold start** (operator request or due to power failure >72 h; RAM *not* intact)

  Almost all values (for example all Function Block internal state values) are fetched from the original application values resident in the Flash memory. The trend log definitions are restored in the RAM, based on the stored values in the Flash memory, while the trend log values are cleared.

  Exceptions: - The latest stored PV Block values, ***if*** Backup was checked
  - Public constants
  - Trend log definitions
  - Certain OPT values
  - Modem parameters

* **Original application**

All start values are fetched from the original application values resident in the Flash memory. All SNVT bindings (version 3.0 and later) are erased.

"Original application" means the latest application that has been downloaded from TAC Menta.
(If no application has been loaded, there is always the the LONMARK "Plant Controller" application included at the factory.)

The table below shows which status the different start values will have at different types of restart.

Value	Backup indication	Restart type: Warm start (<72h) [1]	Cold start	Original appl.
FB internal state values	x –	Current value Original value [2]	Original value [2] Original value	Original value [2] Original value
PV Block	x –	Current value Original value	Current value Original value	Original value Original value
Public parameters	(always)	Current value	Current value	Original value
Trend log def.	(always)	Current value	Current value	Original value
Trend log data	(always)	Current value	Cleared	Original value
Certain OPT values [3]	(always)	Current value	Current value	Original value
Time parameters	(always)	Current value	Default value	Current value
Modem parameters	(always)	Current value	Current value	Current value

Notes.

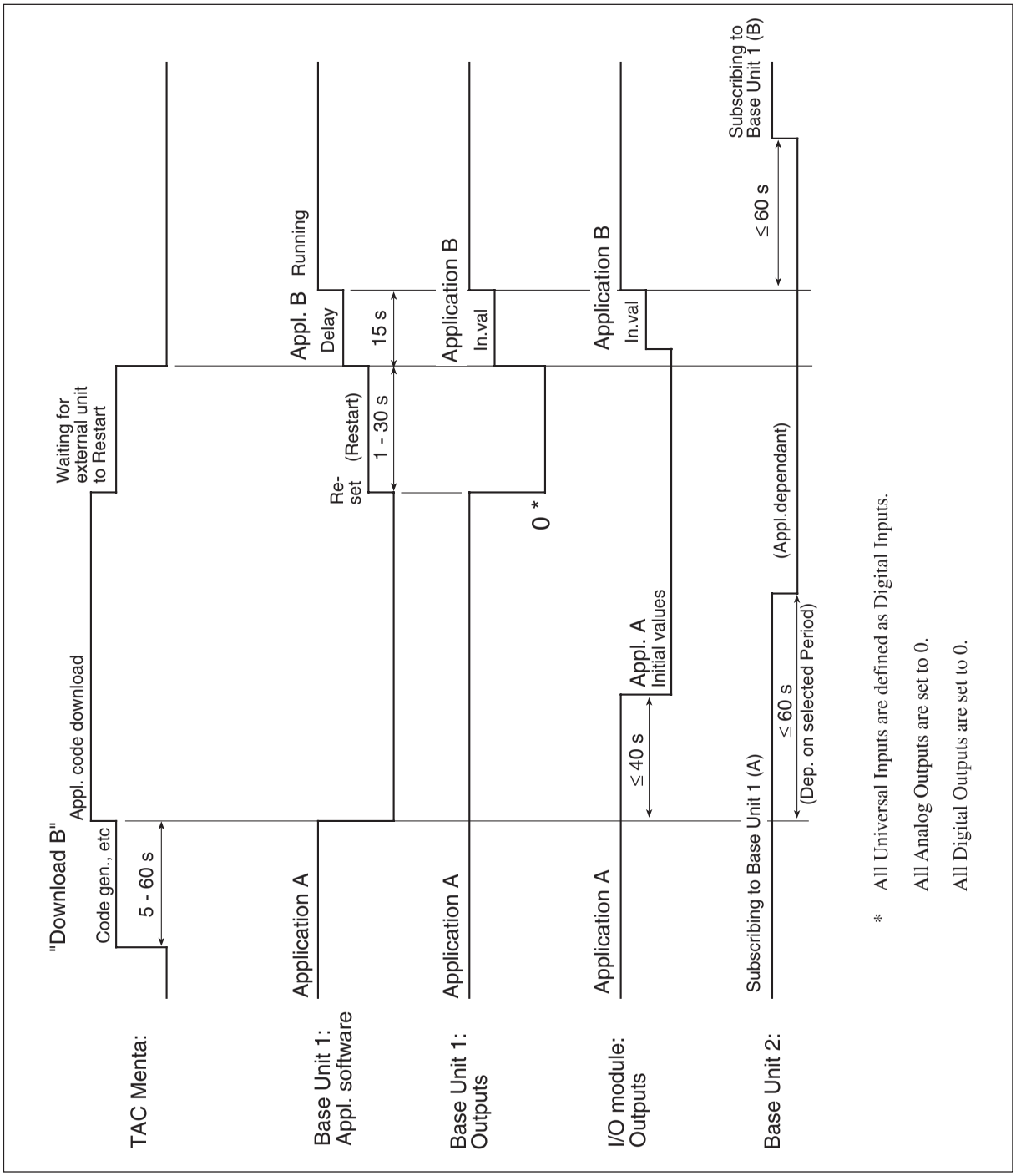
1 After a power failure > (more than) 72 hours, a restart type Warm start must *not* be used, as the 'Current value' in the memory may have been changed.

2 *Original value* means the values from the latest application downloaded from TAC Menta.

3 Applies to the following values of the OPT-block:
- Curve points
- Holiday compensation

Blank page.

Appendix 2 Restart Sequences



TAC Xenta 280 and 300

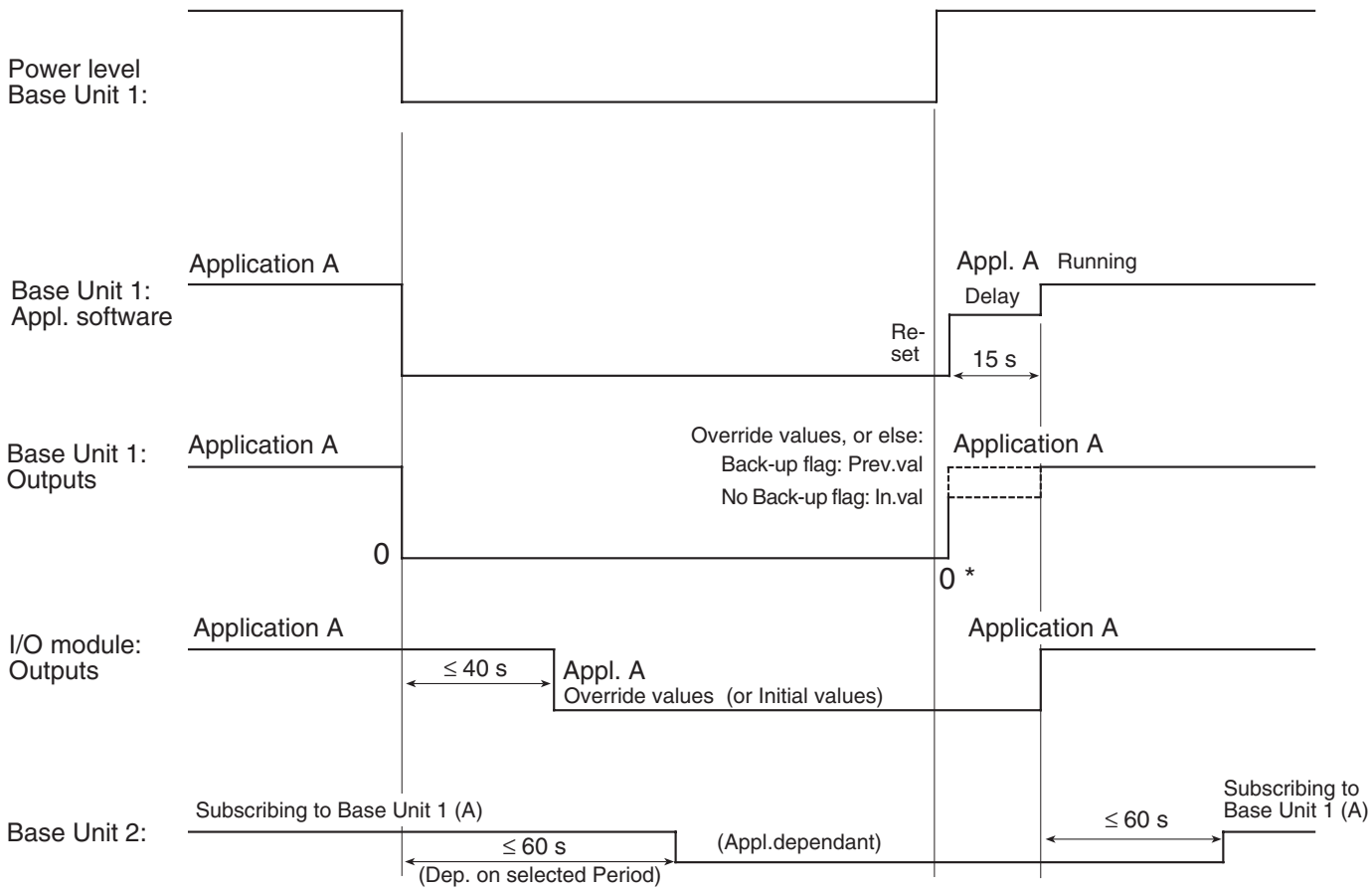
The figure shows the **Download** sequence for

- TAC Menta, which initiates the Downloading of a new application, B, to Base Unit 1.
- Xenta Base Unit 1, whose application A is disrupted to be replaced by the new application, B.
- The Outputs of Base Unit 1, that will be reset for 1–30 seconds after the Restart of Base Unit 1.
- The I/O module Outputs that will change to Initial Values, first of Appl A then of Appl B, as the module temporarily loses contact with its Base Unit.
- Base Unit 2, which subscribes to a value in Base Unit 1 and also temporarily loses contact with that unit.

TAC Xenta 280 and 300

The figure shows the **Power failure** (less than 72 h) sequence for

- Xenta Base Unit 1, whose application A goes down and, after a restart and delay, starts running again.
- The Outputs of Base Unit 1, which go down during the power failure and whose values during the restart will be set to the Override values, or, if these are not set, different values depending on the status of the backup flags in TAC Menta.
- The I/O module Outputs that will change to the Forced values (or, if these are not set, the Initial values of the application), as the module temporarily loses contact with its Base Unit.
- Base Unit 2, which subscribes to a value in Base Unit 1 and also temporarily loses contact with that unit.



* All Universal Inputs are defined as Digital Inputs.

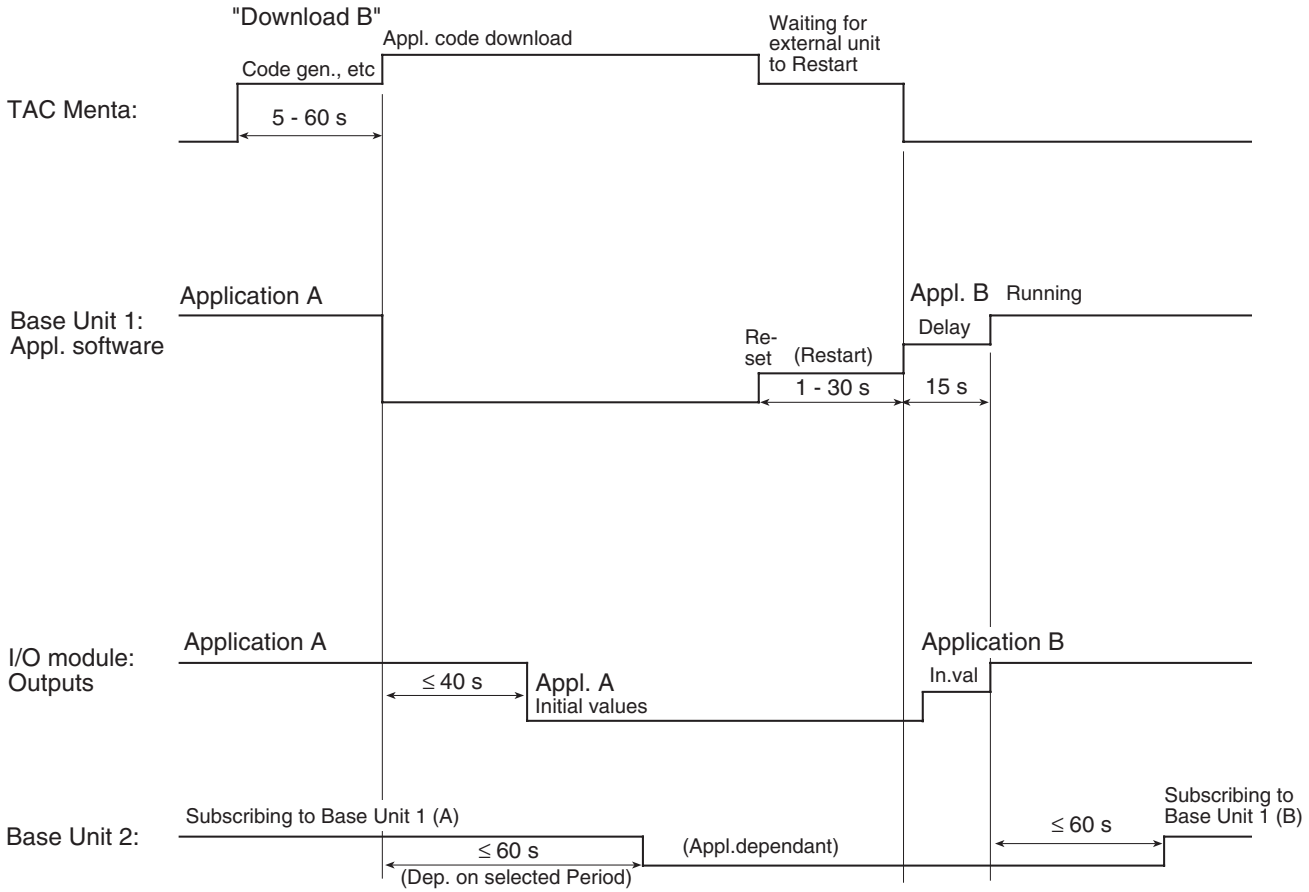
All Analog Outputs are set to 0.

All Digital Outputs are set to 0.

TAC Xenta 401

The figure shows the **Download** sequence for

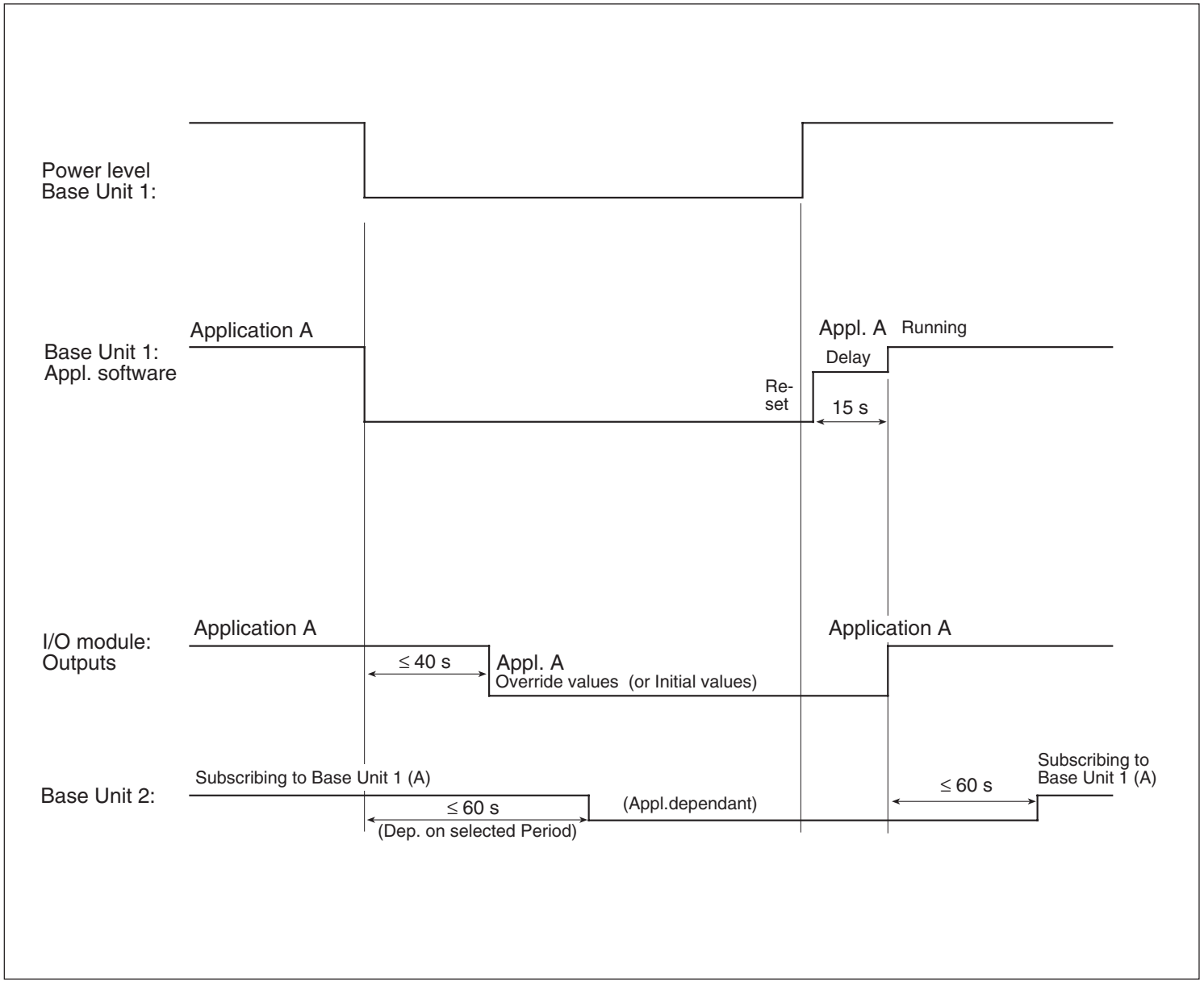
- TAC Menta, which initiates the Downloading of a new application, B, to Base Unit 1.
- Xenta Base Unit 1, whose application A is disrupted to be replaced by the new application, B.
- The I/O module Outputs that will change to Initial Values, first of Appl A then of Appl B, as the module temporarily loses contact with its Base Unit.
- Base Unit 2, which subscribes to a value in Base Unit 1 and also temporarily loses contact with that unit.



TAC Xenta 401

The figure shows the **Power failure** (less than 72 h) sequence for

- Xenta Base Unit 1, whose application A goes down and after a restart and delay starts running again.
- The I/O module Outputs that will change to Override values (or, if there are none, to the Initial values of the application), as the module temporarily loses contact with its Base Unit.
- Base Unit 2, which subscribes to a value in Base Unit 1 and also temporarily loses contact with that unit.



Index

U

V

W

X

Y

Z

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