

TAC Xenta[®]



TAC Xenta[®] 400 I/O Modules

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Contents

INTRODUCTION

1	Introduction	9
1.1	Structure	9
1.2	Terminology	9
1.3	New in this Edition.....	9
1.4	Typographic Conventions	10
1.5	More information	10

REFERENCE

2	I/O Modules in the TAC Xenta 400 series	13
2.1	Hardware Units	13
2.2	Configurations.....	15
3	Technical Description	17
3.1	Common Features	17
3.1.1	Terminals.....	17
3.1.2	Indicators and Service pin	17
3.1.3	Technical data, common to all	18
3.2	TAC Xenta 411/412 Digital Input module.....	19
3.3	TAC Xenta 421/422 Digital Input and Output module.....	20
3.4	TAC Xenta 421A/422A Universal Input and Digital Output module	22
3.5	TAC Xenta 451/452 Analog Input and Output module	24
3.6	TAC Xenta 451A/452A Universal Input and Analog Output module.....	26
3.7	TAC Xenta 471 Analog Input module	29
3.8	TAC Xenta 491/492 Analog Output module	31
4	Installation	33
4.1	Mounting	33
4.2	Electrical installation.....	34
4.2.1	General considerations	34
4.2.2	Input/Output Circuit Principles	34
4.2.3	Terminals and units	38
4.2.4	Cables	42
4.3	Commissioning	44
	Index	45

INTRODUCTION

1 Introduction

1 Introduction

The TAC Xenta 400 is a series of input/output modules designed to be connected to the TAC Xenta 300 or 401 type controllers.

The installation procedures and technical data are similar between the different modules.

For information on how to install software, we refer to the instructions delivered with the software.

If you discover errors and/or unclear descriptions in this manual, please contact your TAC representative.



Note

We are continuously improving and correcting our documentation. This manual may have been updated.

Please check our Docnet site at www.tac.com for the latest version.

1.1 Structure

The manual is divided into the following parts:

- **Introduction**
The Introduction section contains information on how this manual is structured and where to find additional information.
- **Reference**
The Reference section contains comprehensive information about the products. It also provides you with information on mounting and electrical installation.

1.2 Terminology

Term	Description
ASIC	Application Specific Integrated Circuit

1.3 New in this Edition

In this edition the new ASIC-based modules TAC Xenta 421A/422A and TAC Xenta 451A/452A have been added, mainly in chapter 3.

1.4 Typographic Conventions

Throughout the manual four specially marked texts may occur.



Warning

Used to emphasize operations that can cause serious personal injury or damage to property if not handled correctly.



Caution

Used to emphasize operations that can cause serious problems if not handled correctly.



Note

Used to emphasize certain information.



Hint

Used to emphasize processes that may ease operation.

1.5 More information

The TAC Xenta 400 I/O modules and the other TAC Xenta units are also described in the following documents:

- the “TAC Xenta 280/300/401 Handbook”, part no. 0-004-7768
- the “TAC Xenta OP Handbook”, part no. 0-004-7506
- the “Engineering Classic Networks”, part no. 0-004-7841
- the “Endangering LNS Networks”, part no. 0-004-7842
- the “Engineering Applications in TAC Menta”, part no. 0-004-7843 (to be replaced by 0-004-7896)
- data sheets for the TAC Xenta 4xx range (C-92-nn)
- the TAC Xenta OP Operator panel data sheet (C-98-05)
- a brief installation instruction, “OFL”, included at delivery

REFERENCE

- 2 I/O Modules in the TAC Xenta 400 series
- 3 Technical Description
- 4 Installation

2 I/O Modules in the TAC Xenta 400 series

2.1 Hardware Units



Warning

The TAC Xenta 400 I/O modules and the other products of the TAC Xenta family must not be used for any other purpose than those for which they were designed.

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

The TAC Xenta freely-programmable controllers consist of the following units.

- The *TAC Xenta 301/302/401 controller*. The controller is the brain of the system. It contains the database of the inputs and outputs of the plant. It also contains the system and application software for all the functions that are to be performed by the controller and connected peripheral units.
- *I/O expansion modules*, which provide the inputs and outputs of the TAC Xenta controller.
- The *TAC Xenta OP* is an easy-to-use operator panel, with a display. The values are presented in plain language in a menu system. The OP can be connected to any controller in the network.

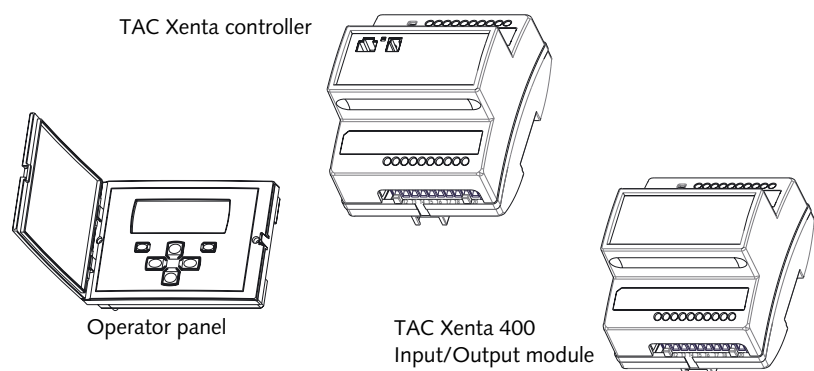


Fig. 2.1: TAC Xenta units; the Operator panel, the TAC Xenta controller (here: 401) and an I/O expansion module

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

The TAC Xenta OP operator panel is used to give the user access to certain parameters and make it possible to present alarms without communicating with a central system. The most important functions of the operator panel are status monitoring, adjustment of setpoints and time channels and the display of alarms.

A maximum of two OPs may be connected to each controller.

The I/O modules are used as expansion modules for the TAC Xenta controllers, connected to these via the common TP/FT-10 network.

The modules have different I/O configurations to suit different applications. Some models have indicators for the digital input status and a manual override for the digital or analog outputs. An overview of the available models is shown below.

Table 2.1: Available I/O modules and their I/O configuration

I/O Module TAC	DI	DI status	DO	DO override	UI	TI	AO	AO override
Xenta 411	10	-	-	-	-	-	-	-
Xenta 412	10	10	-	-	-	-	-	-
Xenta 421	4	-	5	-	-	-	-	-
Xenta 422	4	4	5	5	-	-	-	-
Xenta 421A	-	-	5	-	4 ^a	-	-	-
Xenta 422A	-	4 ^b	5	5	4 ^a	-	-	-
Xenta 451	-	-	-	-	4 ^c	4	2	-
Xenta 452	-	4 ^b	-	-	4 ^c	4	2	2
Xenta 451A	-	-	-	-	8 ^a	-	2	-
Xenta 452A	-	8 ^b	-	-	8 ^a	-	2	2
Xenta 471	-	-	-	-	8 ^d	-	-	-
Xenta 491	-	-	-	-	-	-	8	-
Xenta 492	-	-	-	-	-	-	8	8

a. DI, 0–10 V DC or 0–20 mA, 1.8/10 kohm TI

b. Status indication only when the corresponding universal inputs (UI) are being used as digital inputs.

c. DI, 0–10 V DC, 1.8 kohm TI

d. 0–10 V DC or 0–20 mA

where

DI: Digital input

DO: Digital output

UI: Universal input

TI: Thermistor input

AO: Analog output

2.2 Configurations

The I/O modules of the TAC Xenta 400 series can be used in different configurations, for example:

- Together with a stand-alone controller.
- With controllers and OPs in a network.
- Controllers, OPs, I/O modules and other equipment in a full network with suitable adapters, possibly connected to a TAC Vista Central System.

For further information, please consult the “Engineering Network” guides.

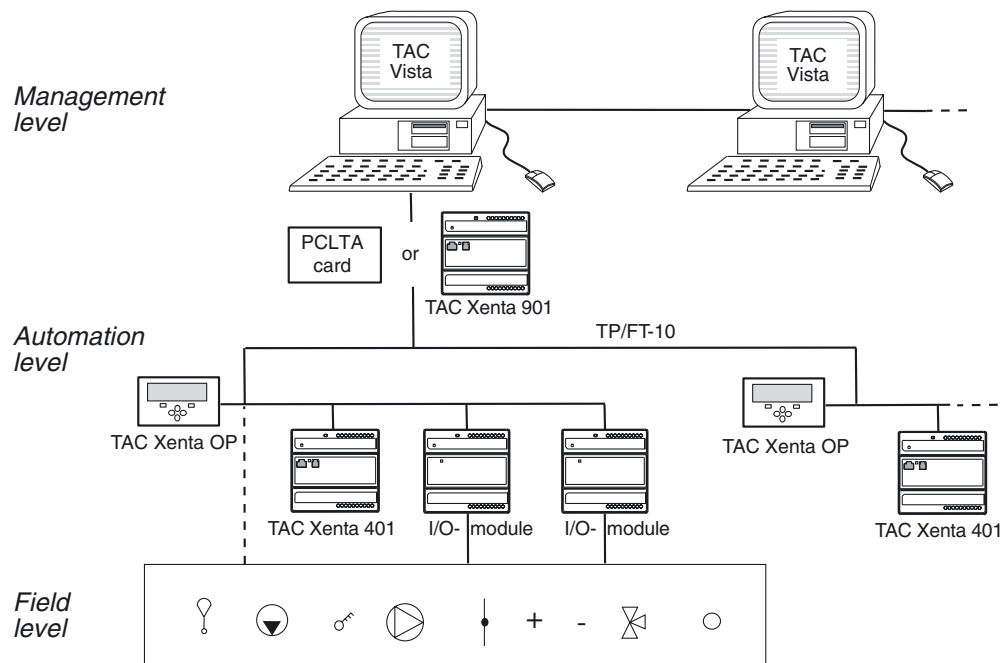


Fig. 2.2: An example of a TAC Xenta network

3 Technical Description

3.1 Common Features

3.1.1 Terminals

In all the modules, the first four screw terminals are used in the same way, i.e. two for the power supply and two for network communication.

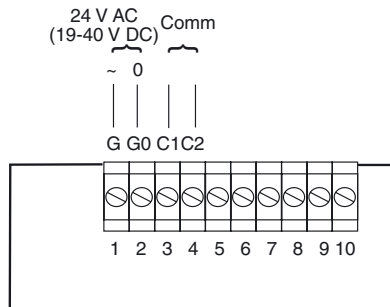


Fig. 3.1: Terminals 1-4 of the TAC Xenta I/O modules

3.1.2 Indicators and Service pin

On the front, there is a small hole through which the Service pin may be activated. There are also two LED indicators, one red and one green.

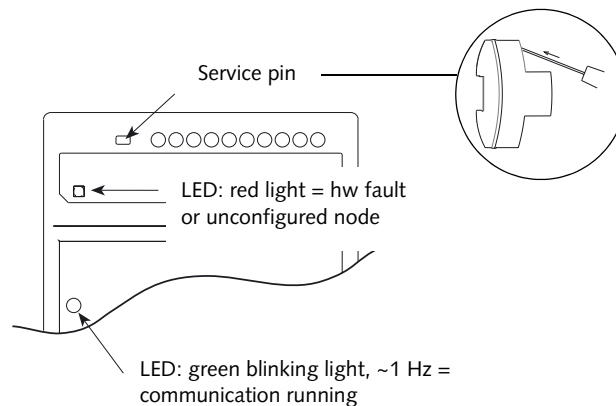


Fig. 3.2: LEDs and Service pin of the I/O modules

3.1.3 Technical data, common to all

Ambient temperature (*except* TAC Xenta 421XT and 422XT, page 21):

Storage.....–20 °C to +70 °C (–4 °F to +158 °F)

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

Mechanical:

Enclosure ABS/PC

Enclosure rating.....IP 20

Flammability class, materialsUL 94 V-0

Dimensions.....90×110×77 mm (3.5×4.3×3.1 in.)

Weight 0.2 kg (0.44 lbs)

Communication (C1–C2; transceiver type FTT10A; pol. insensitive):

TAC Xenta Controller TP/FT-10, screw terminal

Agency compliances:

Please refer to the data sheet for the corresponding product.

Part numbers:

Electronics part TAC Xenta 4010-073-0101

Terminal part TAC Xenta 400.....0-073-0902

Operator terminal TAC Xenta OP.....0-073-0907

Connection cable TAC Xenta – RS232.....0-073-0903

Electronics part TAC Xenta 411 (10 DI)0-073-0201

Electronics part TAC Xenta 412 (10 DI)
(with LED indicators)0-073-0203

Electronics part TAC Xenta 421 (4 DI, 5 DO).....0-073-0241

Electronics part TAC Xenta 421XT.....0-073-0242

Electronics part TAC Xenta 422 (4 DI, 5 DO)
(with LED indicators and DO override).....0-073-0243

Electronics part TAC Xenta 422XT.....0-073-0244

Electronics part TAC Xenta 421A (4 UI, 5 DO).....0-073-0245

Electronics part TAC Xenta 422A (4 UI, 5 DO)
(with LED indicators and DO override).....0-073-0246

Electronics part TAC Xenta 451 (4 UI, 4 TI, 2 AO).....0-073-0281

Electronics part TAC Xenta 452 (4 UI, 4 TI, 2 AO)
(with LED indicators and AO override).....0-073-0283

Electronics part TAC Xenta 451A (8 UI, 2 AO).....0-073-0285

Electronics part TAC Xenta 452A (8 UI, 2 AO)
(with LED indicators and AO override).....0-073-0286

Electronics part TAC Xenta 471 (8 UI, mA/VDC).....0-073-0291

Electronics part TAC Xenta 491 (8 AO).....0-073-0301

Electronics part TAC Xenta 492 (8 AO)
(with AO override).....0-073-0303

3.2 TAC Xenta 411/412 Digital Input module

The modules have ten digital inputs, these inputs can also be used as pulse counters.

The TAC Xenta 412 is also equipped with LED status indicators, one for each digital input. The LED colors, red or green, can be selected individually by the setting switches under the front cover.

Terminals (411, 412) and Indicators (412)

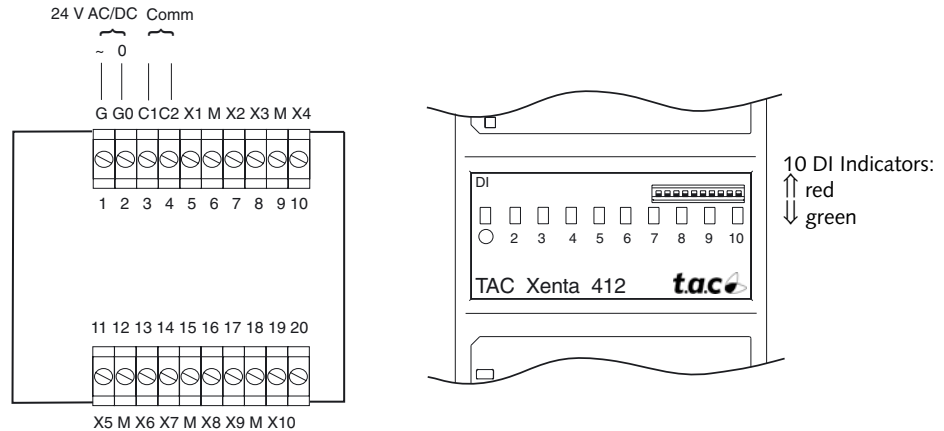


Fig. 3.3: TAC Xenta 411/412 terminals and TAC Xenta 412 DI indicators

Table 3.1: TAC Xenta 411/412 summary

Type	No.	TAC Menta Block type	Terminal ref.	Indicators (412)
Digital input	10	DI - Digital input <i>or</i>	X1 - X10	red or green
		CNT - Pulse counter	X1 - X10	red or green

Technical data TAC Xenta 411 and 412

Supply voltage (G, G0)24 V AC ±20%, 50/60 Hz
 or 19–40 V DC

Power consumptionmax. 2 W

Transformer sizing2 VA

Digital inputs (X1–X10):

Quantity10

Voltage across open contact 33 V DC

Current through closed contact4 mA

Pulse input duration (TAC Menta CNT block).....min. 20 ms

LED digital input status indicators (TAC Xenta 412 only):

Quantity10

Color.....red or green, selected with a DIP switch

3.3 TAC Xenta 421/422 Digital Input and Output module

The modules have four digital inputs and five digital outputs. The inputs can also be used as pulse counters.

The TAC Xenta 422 is also equipped with LED status indicators, one for each digital input and manual override switches for the digital outputs. The LED colors, red or green, can be selected individually by altering the DIP switch settings under the front cover.

Terminals (421, 422) and Switches/Indicators (422)

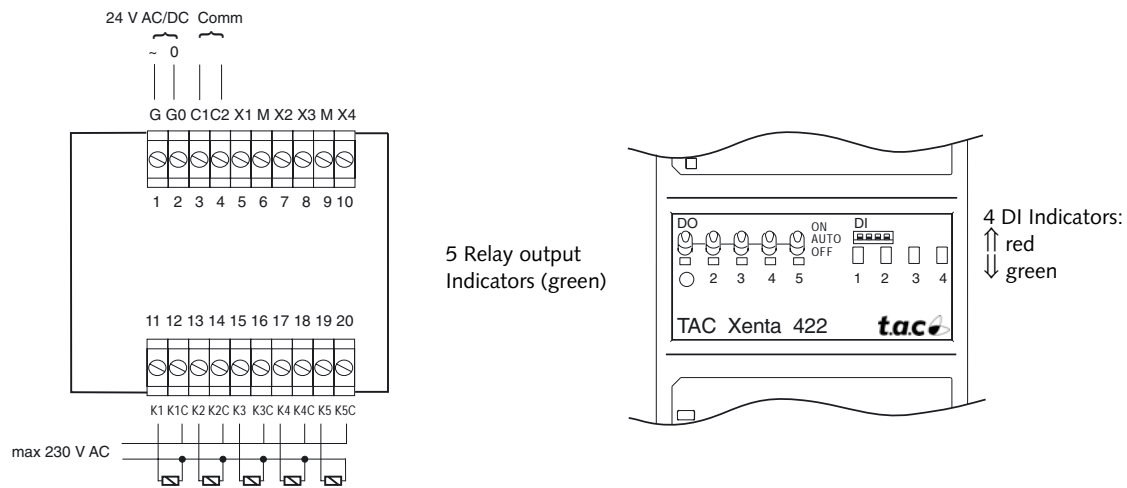


Fig. 3.4: TAC Xenta 421/422 terminals and TAC Xenta 422 relay output switches and Indicators

Table 3.2: TAC Xenta 421/422 summary

Type	No.	TAC Menta Block type	Terminal ref.	Ind./Override (422)
Digital inputs	4	DI - Digital input <i>or</i> CNT - Pulse counter	X1 - X4 X1 - X4	red or green / - red or green / -
Relay outputs / Digital outputs	5	DO - Digital output <i>or</i> DOPU - Dig. pulse output	K1 - K5 K1 - K5	green ^a / ON-AUTO-OFF green ^a / ON-AUTO-OFF

a. **Note!** The five output indicators always show the AUTO output status, irrespective of the output override switch position (ON-AUTO-OFF).

Technical data TAC Xenta 421 and 422

Supply voltage (G, G0)	24 V AC \pm 20%, 50/60 Hz
or	19–40 V DC
Power consumption	max. 2 W
Transformer sizing	5 VA
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
Digital outputs (K1–K5):	
Quantity	5
Control voltage, relay output	
.....	protected by a max. 10 A fuse, 230 V AC
Control current	max 2 A
Pulse length (TAC Menta DOPU block)	min. 0.5 s
LED digital input status indicators (TAC Xenta 422 only):	
Quantity	4
Color	red or green, selected with a DIP switch
Manual override for digital outputs (TAC Xenta 422 only):	
Quantity	5
Switch positions	ON, AUTO, OFF
Indicators for Auto output status	green LEDs
Ambient temperature TAC Xenta 421XT and 422XT:	
Storage and Operation	–20 °C to +70 °C (–4 °F to +158 °F)
Humidity	max. 90 % RH non condensing

3.4 TAC Xenta 421A/422A Universal Input and Digital Output module

The modules have four universal inputs and five digital outputs. The universal inputs can be used as analog inputs, digital inputs or pulse counters.

The TAC Xenta 422A is also equipped with LED status indicators for each universal input (when used as digital inputs) and manual override switches for the digital outputs. The LED colors, red or green, and the polarity (lit when contact is open or closed) can be selected individually by altering the parameter settings in TAC Menta.

Terminals (421A, 422A) and Switches/Indicators (422A)

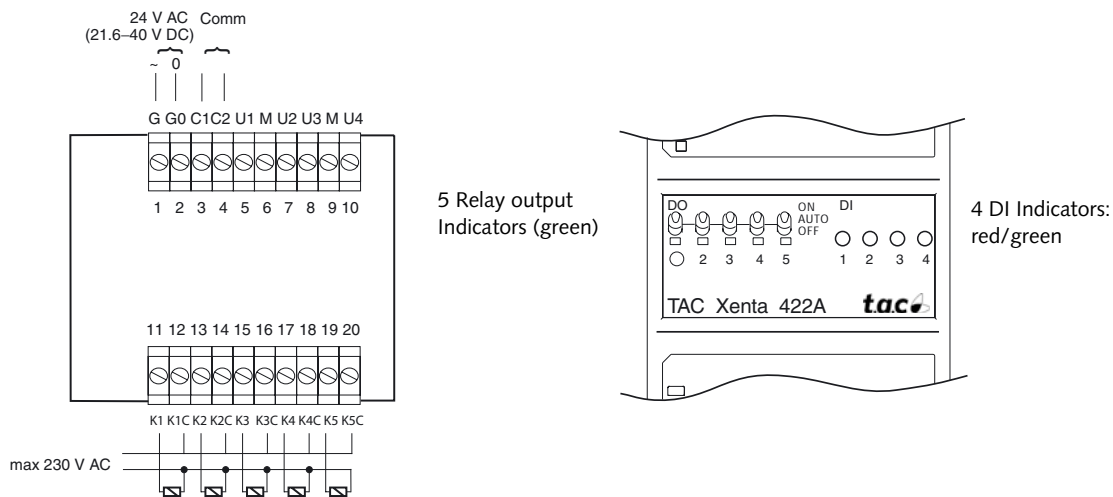


Fig. 3.5: TAC Xenta 421A/422A terminals and TAC Xenta 422A relay output switches and Indicators

Table 3.3: TAC Xenta 421A/422A summary

Type	No.	TAC Menta Block type	Terminal ref.	Ind./Override (422A)
Universal inputs	4	AI - Analog input <i>or</i>	U1 - U4	red or green / -
		DI - Digital input <i>or</i>	U1 - U4	
		CNT - Pulse counter	U1 - U4	
Relay outputs / Digital outputs	5	DO - Digital output <i>or</i>	K1 - K5	green ^a / ON-AUTO-OFF
		DOPU - Dig. pulse output	K1 - K5	green ^a / ON-AUTO-OFF

a. **Note!** The five output indicators always show the AUTO output status, irrespective of the output override switch position (ON-AUTO-OFF).

These modules can also be used as certified LONMARK® devices. The configuration and use of SNVTs are explained in the 0FL-4181 Configuration Instruction.

Technical data TAC Xenta 421A and 422A

Supply voltage (G, G0)	24 V AC $\pm 20\%$, 50/60 Hz
or	21.6–40 V DC
Power consumption	max. 4 W
Transformer sizing	8 VA
Universal inputs (U1–U4):	
Quantity	4
A/D-resolution	12 bits
–as Digital Inputs;	
Voltage across open contact	20 V DC
Current through closed contact	3 mA
Pulse input duration (TAC Menta CNT block)	min. 20 ms
–as Thermistor Inputs;	
TAC thermistor sensor	1800 ohms at 25 °C (77 °F)
Supply voltage	1 V DC
or (individually selectable)	
TAC thermistor	10 kohms at 25 °C (77 °F)
Supply voltage	5 V DC
Measuring range	–50 °C to +150 °C (–58 °F to 302 °F)
Inaccuracy:	
–50 °C to –30 °C (–58 °F to –22 °F)	± 1.5 °C (± 2.7 °F)
–30 °C to 0 °C (–22 °F to +32 °F)	± 0.5 °C (± 0.9 °F)
± 0 °C to +50 °C (+32 °F to +122 °F)	± 0.2 °C (± 0.4 °F)
+50 °C to +100 °C (122 °F to 212 °F)	± 0.5 °C (± 0.9 °F)
+100 °C to +150 °C (212 °F to 302 °F)	± 1.5 °C (± 2.7 °F)
–as Current Inputs;	
Input signal (terminals U–M; over-current protected)	0–20 mA
Input resistance	47 ohm
Inaccuracy within	$\pm (0.03 \text{ mA} + 0.4 \% \text{ of reading})$
–as Voltage Inputs;	
Input signal	0–10 V DC
Input resistance	>100 kohm
Inaccuracy within	$\pm (7 \text{ mV} + 0.2 \% \text{ of reading})$
LED digital input status indicators (TAC Xenta 422A only):	
Quantity	4
Color	red or green, selected using TAC Menta
Polarity	non-inverted or inverted, selected using TAC Menta
Digital outputs (K1–K5):	
Quantity	5
Control voltage, relay outputs	max. 2A, 250 V AC
Control current, to be protected by a max. 10 A fuse,	
.....max 2 A (greater current allowed for short periods)	
Pulse length	min. 0.5 s
Manual override for digital outputs (TAC Xenta 422A only):	
Quantity	5
Switch positions	ON, AUTO, OFF
Indicators for Auto output status	green LEDs

3.5 TAC Xenta 451/452 Analog Input and Output module

The modules have four universal inputs, four thermistor inputs and two analog outputs. The universal inputs can be used as analog inputs, digital inputs or pulse counters.

The TAC Xenta 452 is also equipped with LED status indicators, one for each universal input, when used as a digital input, and manual override controls for the analog output values. The LED input status colors, red or green, can be selected individually by setting switches under the front cover.

Terminals (451, 452) and Controls/Indicators (452)

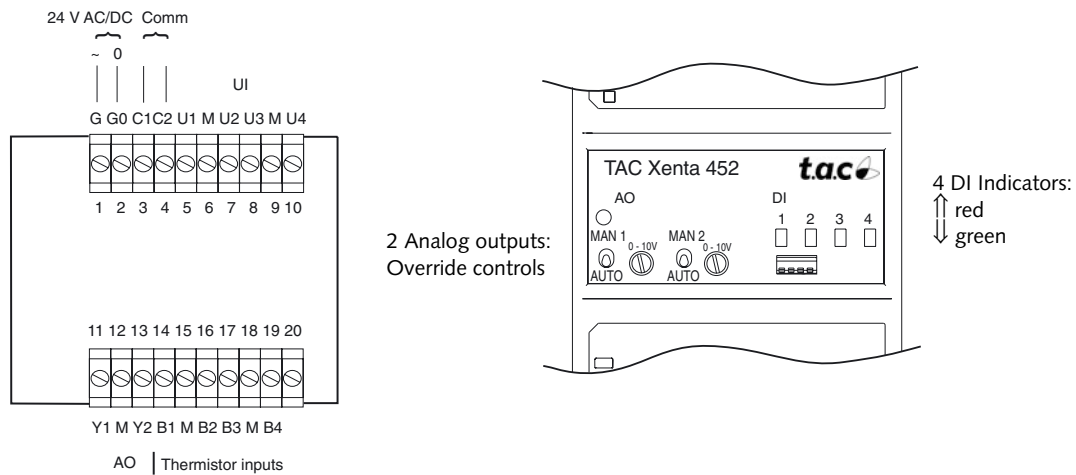


Fig. 3.6: TAC Xenta 451/452 terminals and TAC Xenta 452 Analog output override controls and Indicators

Table 3.4: TAC Xenta 451/452 summary

Type	No.	TAC Menta Block type	Terminal ref.	Ind./Override (452)
Thermistor inputs	4	AI - Analog input	B1 - B4	-
Universal inputs	4	AI - Analog input <i>or</i>	U1 - U4	-
		DI - Digital input <i>or</i>	U1 - U4	red or green / -
		CNT - Pulse counter	U1 - U4	-
Analog outputs	2	AO - Analog output	Y1 - Y2	- / Man-Auto

Technical data TAC Xenta 451 and 452

Supply voltage (G, G0) 24 V AC $\pm 20\%$, 50/60 Hz
 or 19–40 V DC
 Power consumption max. 2 W
 Transformer sizing 4 VA

Universal inputs (U1–U4):

Quantity 4
 A/D-resolution 12 bits

–as Digital Inputs;

Voltage across open contact max. 28 V DC
 Current through closed contact 4 mA
 Pulse input duration (TAC Menta CNT block) min. 80 ms

–as Thermistor Inputs;

Supply voltage 0.6 V DC
 TAC thermistor sensor 1800 ohms at 25 °C (77 °F)

–as Voltage Inputs;

Input signal 0–10 V DC
 Input resistance 100 kohms
 accuracy 1% of full scale

LED digital input status indicators (TAC Xenta 452 only):

Quantity 4
 Color red or green, selected with a DIP switch

Thermistor inputs (B1–B4):

Quantity 4
 A/D-resolution 12 bits
 TAC thermistor sensor 1800 ohms at 25 °C (77 °F)
 Measuring range –50 °C to +150 °C (–58 °F to 302 °F)
 Accuracy:
 –50 °C to –30 °C (–58 °F to –22 °F) ± 4 °C (± 7.2 °F)
 –30 °C to –10 °C (–22 °F to +14 °F) ± 2 °C (± 3.6 °F)
 –10 °C to +10 °C (+14 °F to +50 °F) ± 1 °C (± 1.8 °F)
 +10 °C to +30 °C (50 °F to 86 °F) ± 0.5 °C (± 0.9 °F)
 +30 °C to +60 °C (86 °F to 140 °F) ± 1 °C (± 1.8 °F)
 +60 °C to +120 °C (140 °F to 248 °F) ± 2 °C (± 3.6 °F)
 +120 °C to +150 °C (248 °F to 302 °F) ± 4 °C (± 7.2 °F)

Analog outputs (Y1–Y2):

Quantity 2
 D/A-resolution 12 bits
 Control voltage 0–10 V DC
 Control current, short-circuit proof max. 2 mA
 Deviation max $\pm 1\%$

Manual control of the analog outputs (TAC Xenta 452 only):

Quantity 2
 Switch positions MAN, AUTO
 Control voltage 0–10 V DC

3.6 TAC Xenta 451A/452A Universal Input and Analog Output module

The modules have eight universal inputs and two analog outputs. The universal inputs can be used as analog inputs, digital inputs or pulse counters.

The TAC Xenta 452A is also equipped with LED status indicators for each universal input (when used as a digital input) and manual override controls for the analog output values. The LED input status colors, red or green, and the polarity (lit when contact is open or closed) can be selected individually by altering the parameter settings in TAC Menta.

Terminals (451A, 452A) and Controls/Indicators (452A)

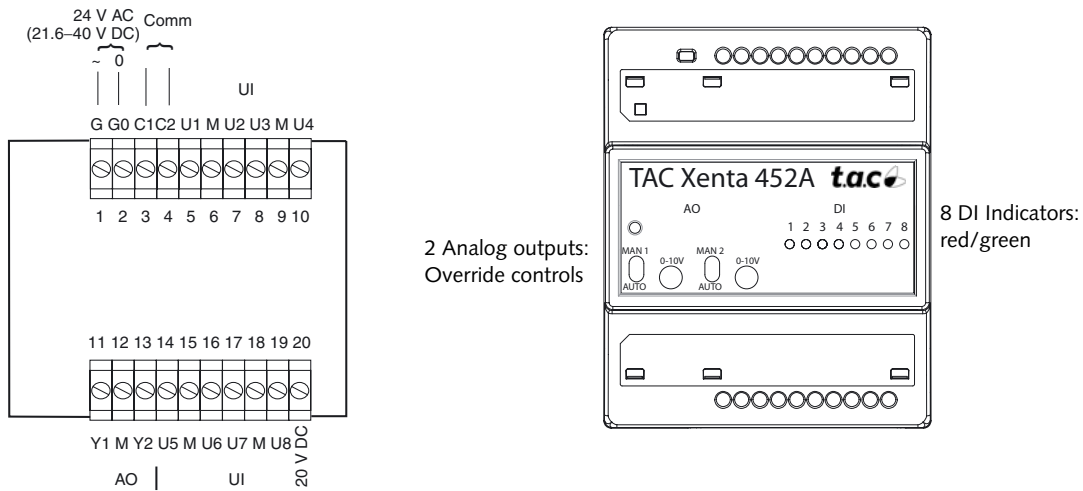


Fig. 3.7: TAC Xenta 451A/452A terminals and TAC Xenta 452A Analog output override controls and Indicators

Table 3.5: TAC Xenta 451A/452A summary

Type	No.	TAC Menta Block type	Terminal ref.	Ind./Override (452A)
Universal inputs	8	AI - Analog input <i>or</i>	U1 - U8	-
		DI - Digital input <i>or</i>	U1 - U8	red or green / -
		CNT - Pulse counter	U1 - U8	-
Analog outputs	2	AO - Analog output	Y1 - Y2	- / Man-Auto

These modules can also be used as certified LONMARK® devices. The configuration and use of SNVTs are explained in the 0FL-4182 Configuration Instruction.

Technical data TAC Xenta 451A and 452A

Supply voltage (G, G0)	24 V AC $\pm 20\%$, 50/60 Hz
or	21.6–40 V DC
Power consumption	max. 3W
Transformer sizing	6 VA
Universal inputs (U1–U8):	
Quantity	8
A/D-resolution	12 bits
–as Digital Inputs;	
Voltage across open contact	20 V DC
Current through closed contact	3 mA
Pulse input duration (TAC Menta CNT block)	min. 80 ms
–as Thermistor Inputs;	
TAC thermistor sensor	1800 ohms at 25 °C (77 °F)
Supply voltage	1 V DC
or (individually selectable)	
TAC thermistor	10 kohms at 25 °C (77 °F)
Supply voltage	5 V DC
Measuring range	–50 °C to +150 °C (–58 °F to 302 °F)
Inaccuracy:	
–50 °C to –30 °C (–58 °F to –22 °F)	± 1.5 °C (± 2.7 °F)
–30 °C to 0 °C (–22 °F to +32 °F)	± 0.5 °C (± 0.9 °F)
± 0 °C to +50 °C (+32 °F to +122 °F)	± 0.2 °C (± 0.4 °F)
+50 °C to +100 °C (122 °F to 212 °F)	± 0.5 °C (± 0.9 °F)
+100 °C to +150 °C (212 °F to 302 °F)	± 1.5 °C (± 2.7 °F)
–as Current Inputs;	
Input signal (terminals U–M; over-current protected)	0–20 mA
Input resistance	47 ohm
Inaccuracy within	\pm (7 mV +0.4 % of reading)
Power supply for one 2-wire 4–20 mA transmitter	20 V DC/25 mA
–as Voltage Inputs;	
Input signal	0–10 V DC
Input resistance	>100 kohm
Inaccuracy within	\pm (7 mV +0.2 % of reading)
LED digital input status indicators (TAC Xenta 452A only):	
Quantity	8
Color	red or green, selected using TAC Menta
Polarity	non-inverted or inverted, selected using TAC Menta
Analog outputs (Y1–Y2):	
Quantity	2
D/A-resolution	8 bits
Control voltage	0–10 V DC
Control current, short-circuit proof	max. 2 mA
Deviation	max $\pm 1\%$

Manual override for analog outputs (TAC Xenta 452A only):

Quantity	2
Switch positions	MAN, AUTO
Potentiometer range.....	0–10.5 V DC

3.7 TAC Xenta 471 Analog Input module

The module has eight universal analog inputs (U). The analog inputs can independently be used for current input or as voltage inputs. The current inputs use either the internal power (24V DC) or the external power (M).

Terminals on 471

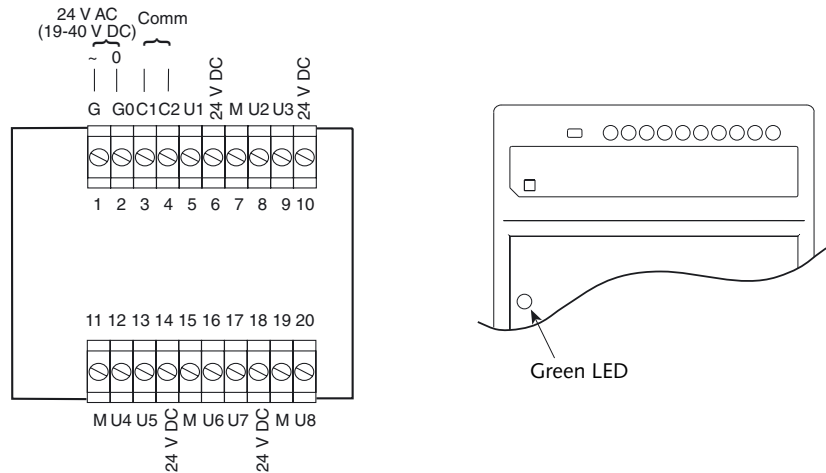


Fig. 3.8: The TAC Xenta 471 terminal

Table 3.6: TAC Xenta 471 summary

Type	No.	TAC Menta Block type	Terminal ref.	Override
Universal inputs	8	AI - Analog inputs	U1 - U8	(n.a.)

Technical data TAC Xenta 471

- Supply voltage (G, G0) 24 V AC ±20%, 50/60 Hz
or 19–40 V DC
- Power consumption max. 10 W
- Transformer sizing 10 VA
- Universal inputs (U1–U8):
 - Quantity 8
 - A/D-resolution 12 bits
 - as current input with an external power supply;
 - Input signal (terminals U–M) 0/4–20 mA
 - Input resistance 20 ohms
 - accuracy within 0.02 mA
 - as current input with an internal power supply;
 - Input signal (terminals 24 V DC–U) 4–20 mA
 - Input resistance 20 ohms

accuracy	within 0.02 mA
Voltage	24 V DC \pm 2 V
Current limit, total value	200 \pm 20 mA
– as Voltage input;	
Input signal (terminals U–M)	0–1, 0/2–10 V DC
Input resistance	100 kohms
accuracy	within 0.01 V

Resetting default values

If you press the Service Pin for seven seconds during the first minute following a restart, the parameters of the module will automatically be reset to the factory default settings. A restart occurs following power on.

The green LED on the front will light continuously during activation (about 7 seconds) and when the reset is completed, it will flash rapidly (off-line indication).

- The parameters of the I/O module are now reset:
- Domain table index 0: ID len = 1, ID = 11_{hex}, Subnet = 1, Node = 1 and Clone Domain = 0 (internal parameter making the unit silent, until its correct address has been set by the system).
- Domain table index 1: Unused.
- Address table index 0: Domain = 0, Node = 0, Rpt Tmr = 16, Retries = 0, Rcv Tmr = 128, Tx Tmr = 16, Subnet = 0.
- Address table index 1: Unused.
- Non_Group_Receive_Timer = 768 ms.
- Node Mode: Unconfig.
- Network Management Authentication = Off
- Pre-emption Timeout = Forever
- The inputs will be configured as voltage inputs.

3.8 TAC Xenta 491/492 Analog Output module

The modules have eight analog outputs.

The TAC Xenta 492 also has switches for manually controlling the analog outputs.

Terminals (491, 492) and switches (492)

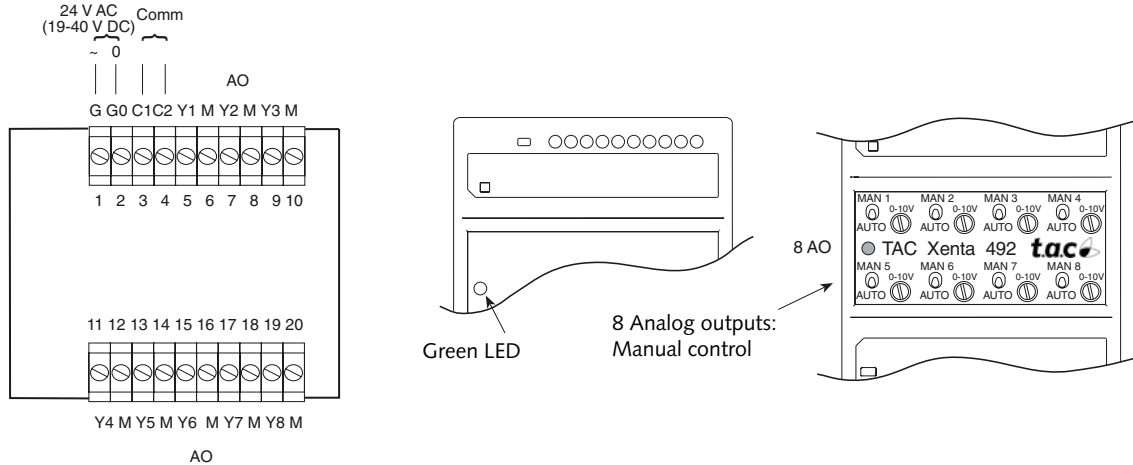


Fig. 3.9: TAC Xenta 491/492 terminals and manual control of the TAC Xenta 492

Table 3.7: TAC Xenta 491/492 summary

Type	No.	TAC Menta Block type	Terminal ref.	Override (492)
Analog outputs	8	AO - Analog outputs	Y1 -Y8	- / Man-Auto

Technical data TAC Xenta 491 and 492

Supply voltage (G, G0) 24 V AC ±20%, 50/60 Hz
 or 19–40 V DC

Power consumption max. 2 W

Transformer sizing 3 VA

Analog outputs (Y1–Y8):

Quantity 8

D/A-resolution 12 bits

Control voltage 0–10 V DC

Control current, short-circuit proof max. 2 mA

Deviation max ±1%

Manual control of the analog outputs (TAC Xenta 492 only):

Quantity 8

Switch positions MAN, AUTO

Control interval 0–10 V

Resetting default values

If you press the Service Pin for seven seconds during the first minute following a restart, the parameters of the module will automatically be reset to the factory default settings. A restart occurs following power on.

The green LED on the front will light continuously during activation (about 7 seconds) and when the reset is completed, it will flash rapidly (off-line indication).

The parameters of the I/O module are now reset:

- Domain table index 0: ID len = 1, ID = 11_{hex}, Subnet = 1, Node = 1 and Clone Domain = 0 (internal parameter making the unit silent, until its correct address has been set by the system).
- Domain table index 1: Unused.
- Address table index 0: Domain = 0, Node = 0, Rpt Tmr = 16, Retries = 0, Rcv Tmr = 128, Tx Tmr = 16, Subnet = 0.
- Address table index 1: Unused.
- Non_Group_Receive_Timer = 768 ms.
- Node Mode: Unconfig.
- Network Management Authentication = Off
- Pre-emption Timeout = Forever
- The start values of the analog outputs will be reset.

4 Installation

4.1 Mounting

The TAC Xenta controllers and I/O modules are designed for mounting on a DIN rail inside a cabinet. They can also be mounted directly on a wall. In such cases, a wide range of standard enclosures are available which meet DIN 43 880, with different enclosure ratings.

The enclosure mainly consists of a terminal part containing screw terminals, as well as an electronics part, where the printed circuit boards are situated. The enclosure is designed so that electrical installation can be carried out using the screw terminals of the terminal part, when mounted on a DIN rail or wall.

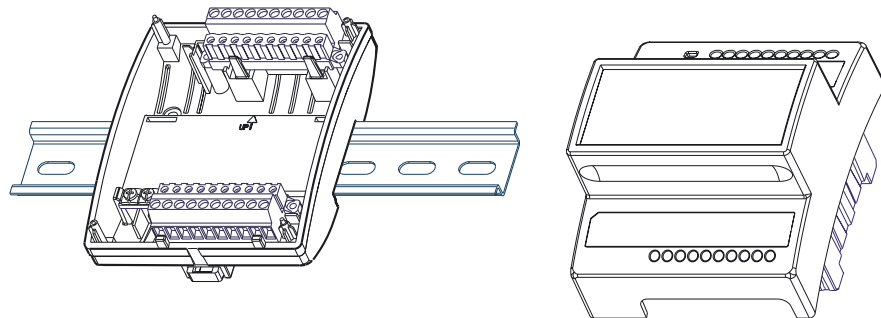


Fig. 4.1: The terminal part and the electronics part of the TAC Xenta I/O module

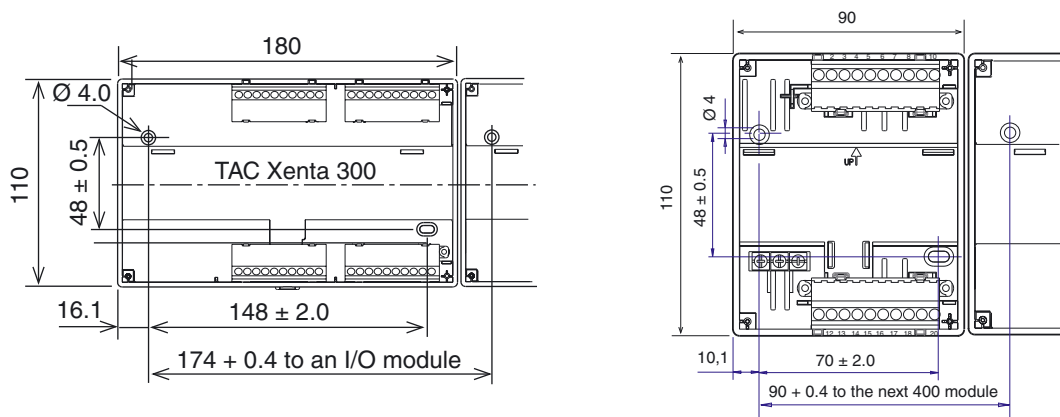


Fig. 4.2: Mounting distances for TAC Xenta controllers and one or more I/O modules

4.2 Electrical installation

4.2.1 General considerations

Installation is normally treated as category CAT III (IEC 664), which in principle means permanent connection to a 230 V AC mains supply. For the Xenta 400, this is only applicable to the relay outputs of the I/O modules.

All equipment connected to the TAC Xenta units 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 an 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 powered by a 230 V mains supply.

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

We strongly recommend that switches are installed to make it possible to separate external equipment when the relay output terminals control equipment using a 230 V mains supply.

4.2.2 Input/Output Circuit Principles

The input/output circuit principles and key values are shown below.

Current Input 0-20 mA

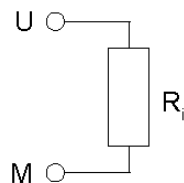


Table 4.1:

Unit	R _i ohm
Xenta 420A	47
Xenta 450A	47
Xenta 470	20

Fig. 4.3: Current Input - internal resistance

Voltage Input 0-10 V

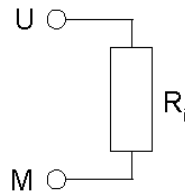


Fig. 4.4: Voltage Input - internal resistance

Table 4.2:

Unit	R_i ohm
Xenta 420A	>100k
Xenta 450	100k
Xenta 450A	>100k
Xenta 470	>100k

Digital Input

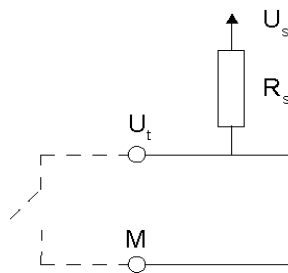


Fig. 4.5: Digital Input - voltage and resistance values

Table 4.3:

Unit	U_s V	R_s ohm	U_t V
Xenta 410	33	6.6k	14
Xenta 420	33	6.6k	14
Xenta 420A	20	6.8k	10
Xenta 450	28	6.6k	14
Xenta 450A	20	6.8k	10

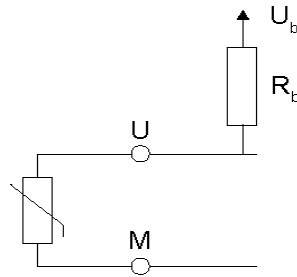


Note

When connected to this input, a pulse generator must use an npn-type output transistor.

Thermistor Input 1.8 kohm @25 °C

Table 4.4:



Unit	U_b V	R_b ohm	Char
Xenta 420A	1	1.5k	a*
Xenta 450	0.85	1.22k	b*
Xenta 450A	1	1.5k	a*

* Thermistor curves are shown below

Fig. 4.6: Thermistor Input 1.8 kohm - voltage and resistance values

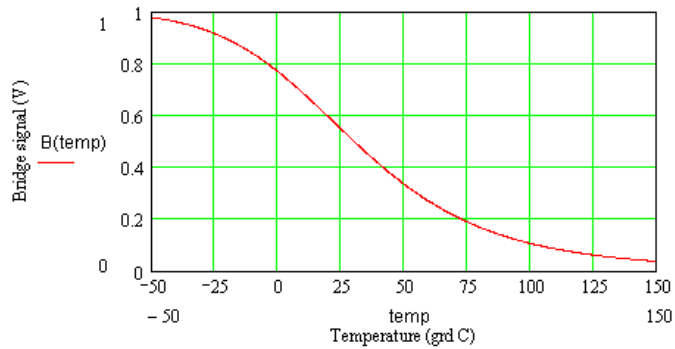


Fig. 4.7: Thermistor curve type a- Xenta 420A and 450A

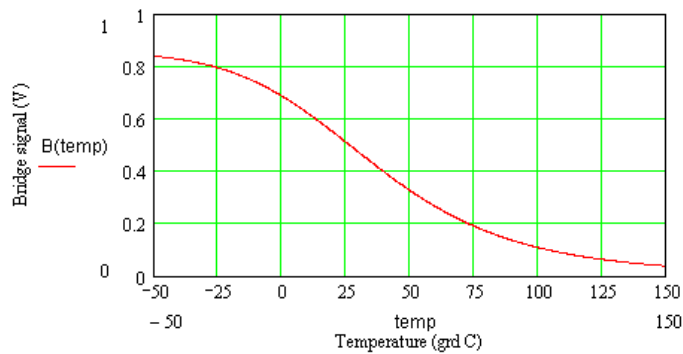


Fig. 4.8: Thermistor curve type b - Xenta 450

Thermistor Input 10 kohm @25 °C

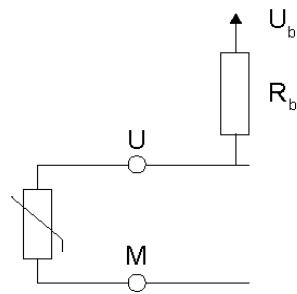


Table 4.5:

Unit	U _b V	R _b ohm	Char
Xenta 420A	10	6.8k	c*
Xenta 450A	10	6.8k	c*

* Thermistor curve is shown below

Fig. 4.9: Thermistor Input 10 kohm - voltage and resistance values

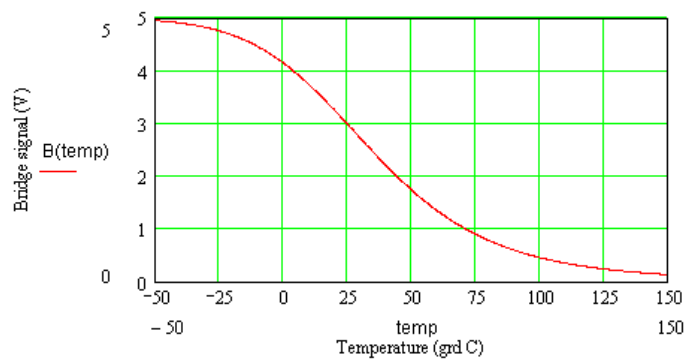


Fig. 4.10: Thermistor curve type c - Xenta 420A and 450A

Analog Output

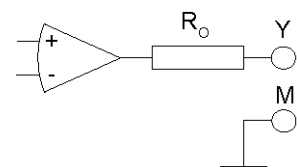


Table 4.6:

Unit	R _o ohm
Xenta 450	47
Xenta 450A	22
Xenta 490	44

Fig. 4.11: Analog Output - resistance value

Relay Output

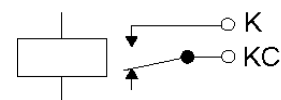


Fig. 4.12: Relay Output - Normally open

4.2.3 Terminals and units

- Mount the terminal part on a DIN rail.
- Connect the cables to the correct terminals, see the figure below.
- Put the electronics part of the module on the terminal part.

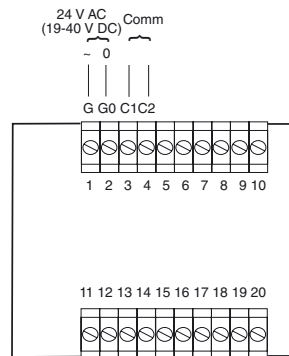


Fig. 4.13: The terminal blocks of a TAC Xenta 400

Connections

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

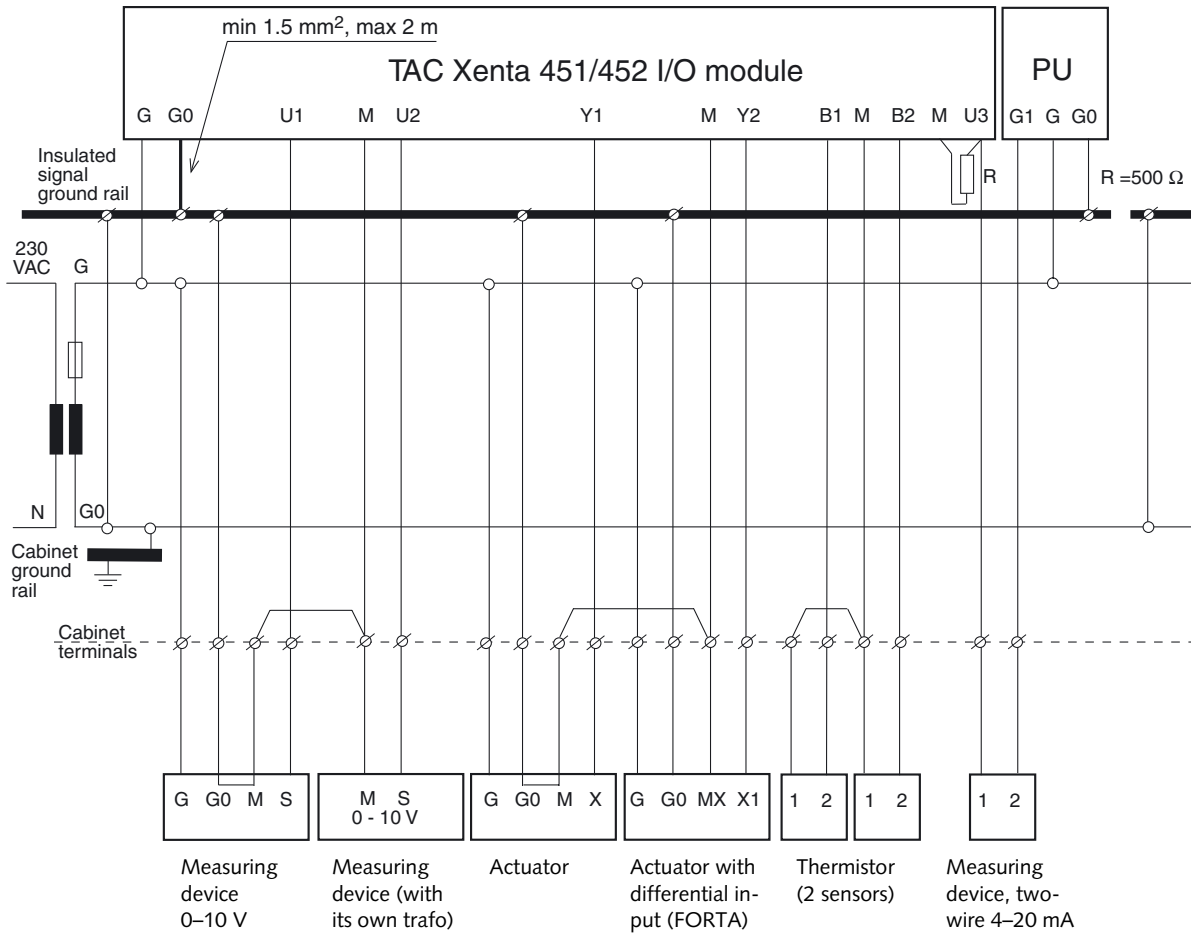


Fig. 4.14: Basic circuit diagram for cabinet connections of TAC Xenta 451/452 I/O modules

A corresponding diagram for the TAC Xenta 471 is shown on the next page.

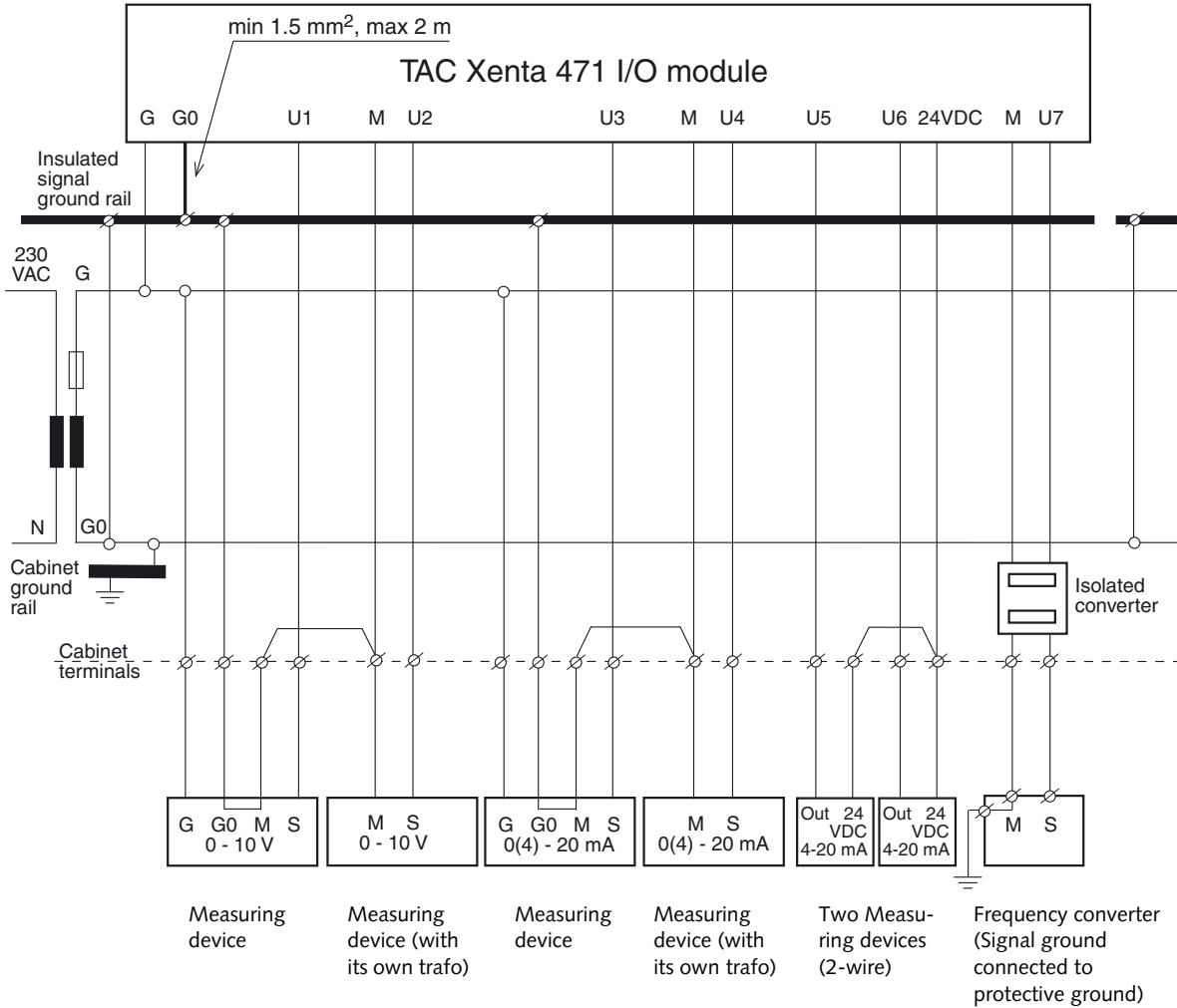


Fig. 4.15: Basic circuit diagram for cabinet connections of TAC Xenta 471 I/O module

When connecting G0 to ground, each TAC Xenta unit must have its own connection to the ground rail, i.e. 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 with 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.

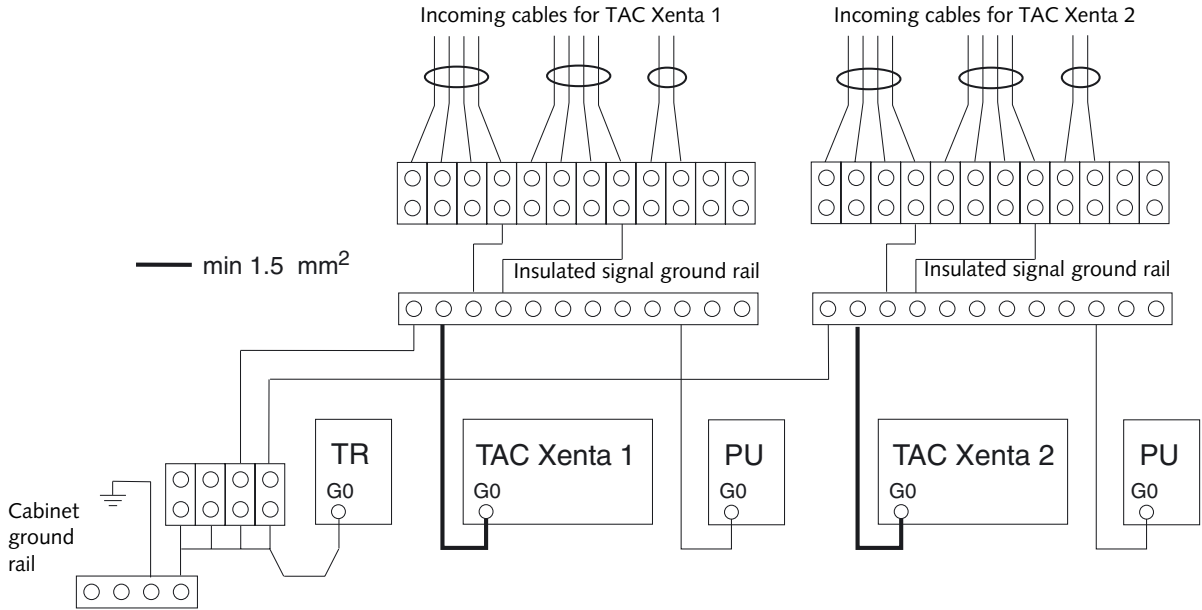


Fig. 4.16: Connections between insulated signal ground rails and the cabinet ground rail

When a Wall Module (ZS101–105) is connected to TAC Xenta 400 I/O modules, the following terminals can be used (term. B2: v 3.0 or later).

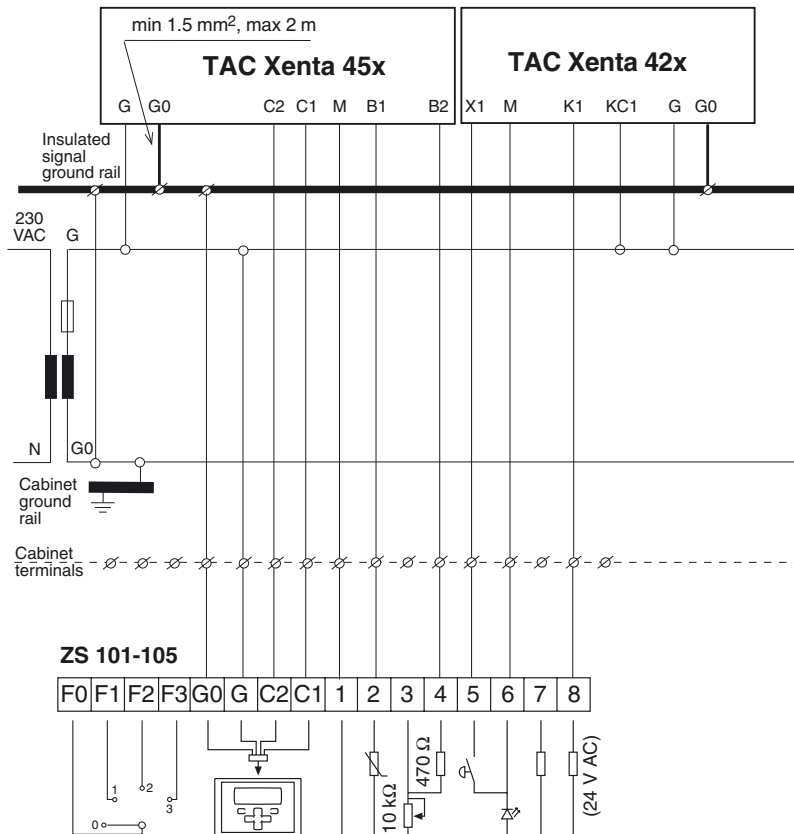


Fig. 4.17: Basic circuit diagram for connecting Wall Module ZS 101–105 to TAC Xenta 400 I/O modules

4.2.4 Cables

Power and Communication

G and G0 (Power supply):

G, min. cross-sectional area0.75 mm² (19 AWG)

G0 to TAC Xenta, min. cross-sectional area....1.5 mm² (16 AWG)

C1 and C2 (Network):

The TP/FT-10 system allows the user to wire the control devices with virtually no topology restrictions.

Min. cross-sectional area0.65 mm² (22 AWG)

The max. wire length in one segment depends on the type of wire and the topology, see the table below.

The wires are not polarity sensitive, but must be a twisted-pair.

For more details, please refer to the "TAC Xenta Network guide".

One of the following cable types must be used:

Table 4.7: Recommended TP/FT-10 communication cables

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 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, 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 pair	900 (3000)	250 (820)	450 (1500)

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

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

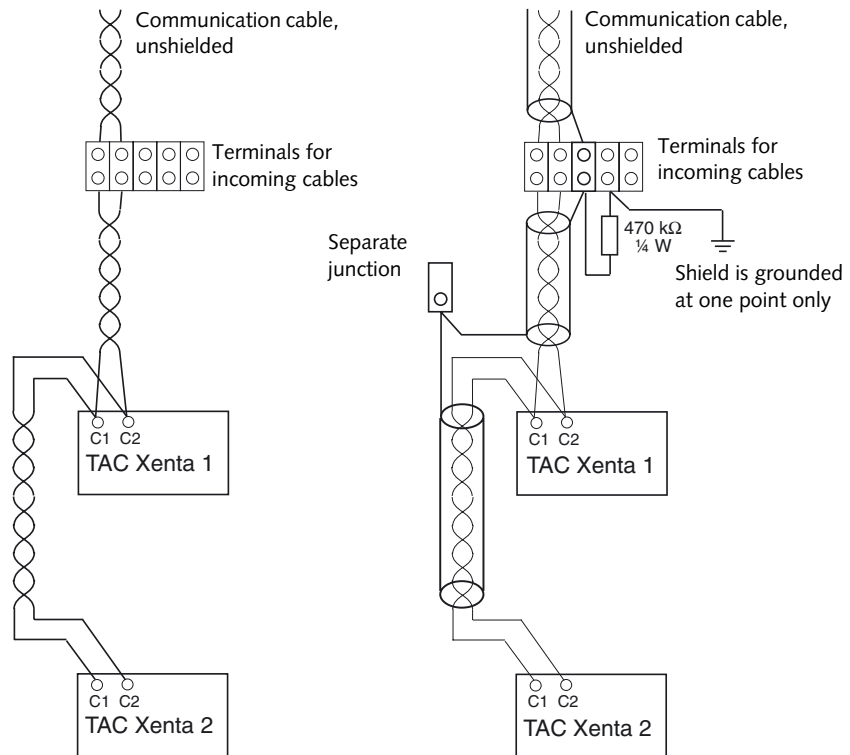


Fig. 4.18: Connecting the communication cable

TAC Xenta 400 input/output cable requirements

Terminals type X:

- Min. cross-sectional area..... 0.25 mm² (22 AWG)
- Max. cable length..... 200 m (660 ft.)

Terminals type U, connected as

- a) digital inputs,
- b) measurement devices using voltage signals that are *not* powered via the same transformer as the I/O module or
- c) measurement devices using current signal

- Min. cross-sectional area..... 0.25 mm² (22 AWG)
- Max. cable length..... 200 m (660 ft.)

Terminals type U, connecting measurement devices, using voltage signals that are powered via the *same* transformer as the I/O module:

- Min. cross-sectional area..... 0.75 mm² (19 AWG)
- Max. cable length..... 20 m (66 ft.)

Terminals type B or U, as thermistor inputs:

Min. cross-sectional area	0.75 mm ² (19 AWG)
Max. cable length, up to 75 °C (167 °F), cross-sectional area 0.75 mm ² (19 AWG)	75 m (250 ft.)
.....	150 m (500 ft.)
up to 75 °C (167 °F), cross-sectional area 1.5 mm ² (16 AWG)	150 m (500 ft.)
.....	75 m (250 ft.)
up to 150 °C (302 °F), cross-sectional area 1.5 mm ² (16 AWG)	75 m (250 ft.)
.....	75 m (250 ft.)

Terminals type K (relay outputs):

Cross-sectional area.....	0.75 – 1.5 mm ² (19 – 16 AWG)
Max. cable length	200 m (660 ft.)

Terminals type Y (for actuators powered via
the *same* transformer as the I/O module):

Min. cross-sectional area	0.75 mm ² (16 AWG)
Max. cable length ¹	20 m (66 ft.)

Terminals type Y (for actuators power supplied via
their *own* transformer, external or internal;
or when the outputs have isolated converters):

Min. cross-sectional area	0.25 mm ² (22 AWG)
Max. cable length	200 m (660 ft.)

¹ Some actuators allow greater cable lengths, for example:

EM52	0.5 mm ² (20 AWG)	80 m (260 ft.)	..three wires
EM15LBB	0.75 mm ² (19 AWG)	80 m (260 ft.)	..three wires
EM42	0.75 mm ² (19 AWG)	80 m (260 ft.)	..four wires
TAC Forta	0.75 mm ² (19 AWG)	80 m (260 ft.)	..four wires
TAC Forta	1.5 mm ² (16 AWG)	100 m (330 ft.)	..three wires(part nos. xxxx-010)

4.3 Commissioning

Commissioning of the I/O modules is normally carried out together with the TAC Xenta controller units that they belong to.

The procedure is therefore described in the TAC Xenta 280 - 300 - 401 manual.

However, TAC Xenta 421A/422A and 451A/452A can also be used as certified LONMARK® devices. When the open LonTalk® (SNVT) protocol is used, some additional configuration is required. This is explained in the Configuration instructions

- OFL-4181 for TAC Xenta 421A/422A and
- OFL-4182 for TAC Xenta 451A/452A.

Index

A

- agency compliances 18
- Analog Input and Output module 24
- Analog Input module 29
- Analog Output 37
- Analog Output module 31
- AO 15
- ASIC 9

B

- B1 - B4 24

C

- C1 and C2 (Network) 42
- cabinet mounting 39
- cable
 - input/output, requirements 43
 - shielded 42
- cables 42
- commissioning 44
- Configuration instructions 44
- connections 39
- Current Input 0-20 mA 34

D

- DI 15
- Digital Input 35
- Digital Input and Output module 20
- Digital Input module 19
- DIN rail 33
- DIP switch 19, 21, 25
- DO 15
- Docnet 9

E

- external power 29

G

- G and G0 (Power supply) 42
- ground
 - communication cable 42
 - G0 40
 - measuring inputs 40

- protective 39
- rail 40–41
- signal 41

I

- I/O configuration 14
- I/O expansion modules 13
- indication
 - off-line 30, 32
 - status 14
- indicators
 - LED 17
- input/output circuits 34
- installation 33
- internal power 29

J

- jumpers
 - G0 40
 - M terminals 39

K

- K1 - K5 20, 22

L

- LonMark® device 44
 - TAC Xenta 421A/422A 22
 - TAC Xenta 451A/452A 26
- LonTalk® (SNVT) protocol 44

M

- manual control
 - analog outputs 24, 26, 31
 - digital outputs 20, 22
- mounting distances 33

N

- network 14

P

- parameters
 - default values 30, 32
- part
 - electronics 33
 - terminal 33
- part numbers 18

polarity
 network wires 42
 Xenta 422A LED 22
 Xenta 452A LED 26
pulse generator 35

R

Relay Output 37
relay output 34
relay outputs 20, 22, 34
reset to default
 TAC Xenta 471 30
 TAC Xenta 491/492 32

S

safety 34
service pin 17
SNVT 44
 TAC Xenta 421A/422A 22
 TAC Xenta 451A/452A 26
standards
 compliance with 34
switch
 external equipment 34

T

TAC Menta 22, 26
TAC Xenta 301/302/401 13
TAC Xenta 400 9
TAC Xenta 400 I/O modules 13
TAC Xenta 411/412 19
TAC Xenta 421/422 20
TAC Xenta 421A/422A 22, 44
TAC Xenta 421XT and 422XT
 ambient temperature 21
TAC Xenta 451/452 24, 39
TAC Xenta 451A/452A 26, 44
TAC Xenta 471 29, 40
TAC Xenta 491/492 31
TAC Xenta OP 13
technical data
 common 18
 TAC Xenta 411 and 412 19
 TAC Xenta 421 and 422 21
 TAC Xenta 421A and 422A 23
 TAC Xenta 451 and 452 25
 TAC Xenta 451A and 452A 27
 TAC Xenta 471 29
 TAC Xenta 491 and 492 31
terminals 17
Thermistor Input
 1.8 kohm @25 °C 36
 10 kohm @25 °C 37

thermistor inputs 25, 27
TI 15
TP/FT-10
 communication cables 42
 network 14

U

U1 - U4 24
U1 - U8 26, 29
UI 15
Universal Input and Analog Output module 26
Universal Input and Digital Output module 22
universal inputs (UI) 14

V

Voltage Input 0-10 V 35

W

Wall Module 41

X

X1 - X4 20
X1-X10 19

Y

Y1 - Y2 24, 26
Y1 -Y8 31

Z

ZS10x Sensors 41

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