Double action controller with analogue output 1/8 DIN - 48 x 96 X3 line

Quick Guide • ISTR-FX3ENG02

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Model Code

The product code indicates the specific hardware configuration of the instrument, that can be modified by specialized engineers only.

	Line	Basic	Accessories	Configuration 1st part	Configuration 2nd part
Model:	X 3	A B C D -	E 9 0 0 /	I L M N -	O P Q R

Line	X	3

Power supply	A
100...240Vac (-15...+10%)	3
24Vac (-25...+12%) or 24Vdc (-15....+25%)	5

Outputs OP1 - OP2 - OP4	B
Relay - Relay - SSR Drive	1
Relay - Relay - Relay	9

Serial Communications	C
None	0
RS485 Modbus/Jbus SLAVE	5

Options	D
None	0
Valve drive output	2
Analogue output + Remote Setpoint	5
Valve drive output + Analogue output (retr.) + Remote Setpoint	7

Setpoint Programmer - special function	E
Not fitted	0
Start-up + Timer	2
One "8 segments" program	3

Declaration of Conformity and Manual retrieval

X3 is panel mounting, Class II instrument. It has been designed with compliance to the European Directives.
All information about the controller use can be found in the User Manual: **MIU_X3_EN.pdf**.
The Declaration of Conformity and the manual of the controller can be downloaded (free of charge) from the web-site:
www.ascontecnologic.com
Once connected to the web-site, search:
X3
then click on **X3** from the result list.
In the lower part of the product page (in any language) is present the download area with links to the documents available for the controller (in the available languages).

⚠ Warning!

- Whenever a failure or a malfunction of the device may cause dangerous situations for persons, things or animals, please remember that the plant must be equipped with additional devices which will guarantee safety.
- We warrant that the products will be free from defects in material and workmanship for 18 months from the date of delivery. Products and components that are subject to wear due to conditions of use, service life and misuse are not covered by this warranty.

Configuration Code

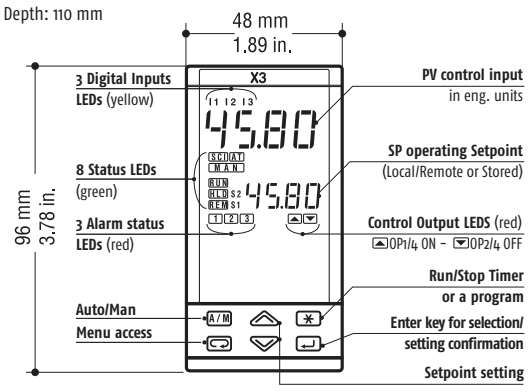
A 4 + 4 digits index code follows the model (letters from I... R). This code must be set to configure the controller. Using UP ( ) and DOWN ( ) keys insert the desired configuration code. When not configured the 1st part of the code is 9999.

Input type and range			I	L
TR Pt100 IEC751	-99.9...300.0°C	-99.9...572.0°F	0	0
TR Pt100 IEC751	-200...600°C	-328...1112°F	0	1
TC L Fe-Const DIN43710	0...600°C	32...1112°F	0	2
TCJ Fe-Cu45% Ni IEC584	0...600°C	32...1112°F	0	3
TC T Cu-CuNi	-200...400°C	-328...752°F	0	4
TC K Chromel-Alumel IEC584	0...1200°C	32...2192°F	0	5
TC S Pt10%Rh-Pt IEC584	0...1600°C	32...2912°F	0	6
TC R Pt13%Rh-Pt IEC584	0...1600°C	32...2912°F	0	7
TC B Pt30%Rh Pt6%Rh IEC584	0...1800°C	32...3272°F	0	8
TC N Nichrosil-Nisil IEC584	0...1200°C	32...2192°F	0	9
TC E Ni10%Cr-CuNi IEC584	0...600°C	32...1112°F	1	0
TC NI-NiMo18%	0...1100°C	32...2012°F	1	1
TC W3%Re-W25%Re	0...2000°C	32...3632°F	1	2
TC W5%Re-W26%Re	0...2000°C	32...3632°F	1	3
Dc input 0...50mV linear	Engineering and units		1	4
Dc input 10...50mV linear	Engineering and units		1	5
Custom input and range **[1]**			1	6

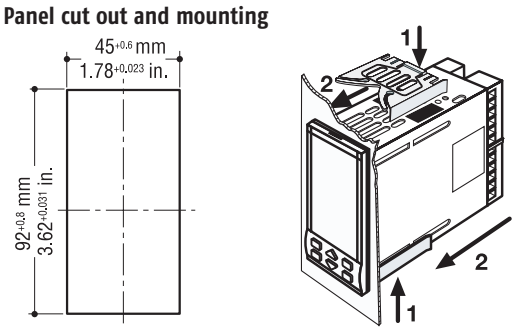
[1] For instance, other thermocouples types, ΔT (with 2 PT100), custom linearisation etc.

Description and dimensions

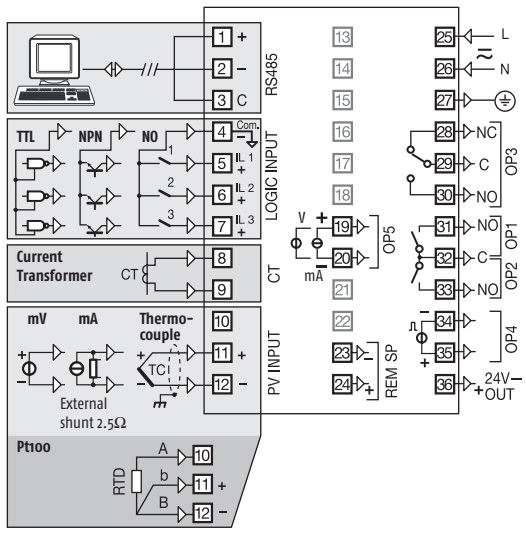
Depth: 110 mm



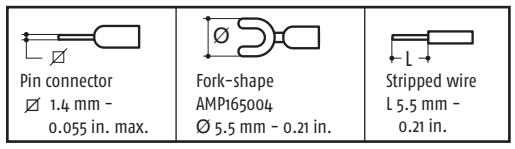
Panel cut out and mounting



Electrical connections



Terminals



Control mode		M
ON-OFF reverse action		0
ON-OFF direct action		1
PID single reverse action		2
PID single direct action		3
PID double action	Linear cool output	4
	ON-OFF cool output	5
	Water cool output [2]	6
	Oil cool output **[2]**	7

[2] 2 different correcting methods of the control output are available. One for water and the other for oil:
OP water=100•(OP2/100)2 - OP oil=100•(OP2/100)1.5

Output Configuration		N
Single action	**Double action**	
Relay (OP1)	Heat OP1, Cool OP2	0
SSR drive (OP4)	Heat OP1, Cool OP4	1
Analogue (OP5)	Heat OP4, Cool OP2	2
Valve drive (OP1 and OP2)	Heat OP1, Cool OP5	3
	HeatOP5, CoolOP2	4
	HeatOP4, CoolOP5	5
	HeatOP5, CoolOP4	6

Alarms 1, 2 and 3 type and function		O	P	Q
Disabled (or, only for alarm AL3, used by Timer or related to the Program)		0	0	0
Sensor break/Loop break alarm (LBA)		1	1	1
Absolute	active high	2	2	2
	active low	3	3	3
Deviation	active high	4	4	4
	active low	5	5	5
Band	active out	6	6	6
	active in	7	7	7
Heater break by CT [3]	active during ON output state	8	8	8
	active during OFF output state	9	9	9

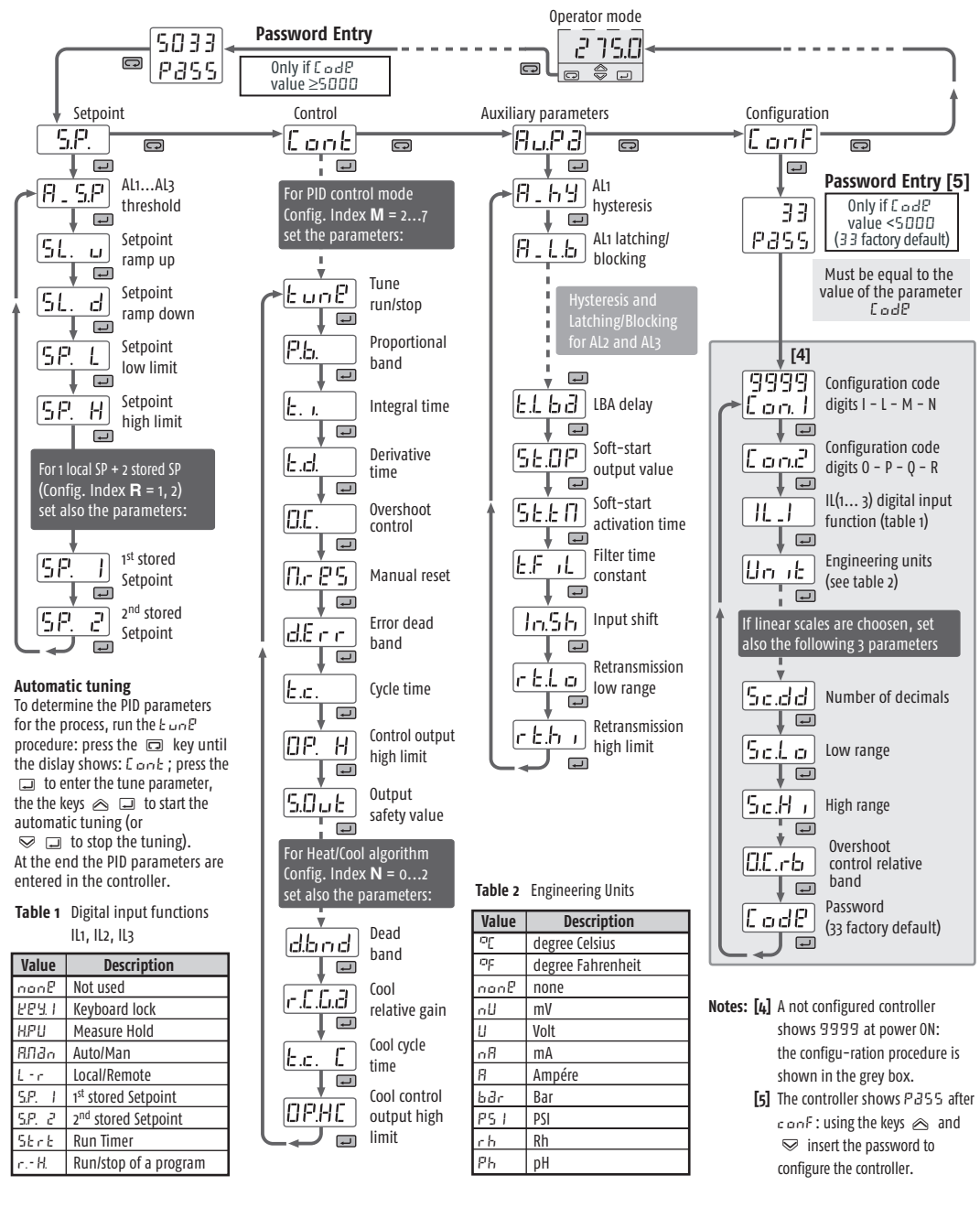
[3] Only possible whether "Output configuration" (N = 0 or 1) and HtF.S is NOT set to OFF

Setpoint type	R
Local only	0
Local and 2 tracking stored Setpoints	1
Local and 2 Stand-by stored Setpoints	2
Local and Remote (only if option is installed)	3
Local with trim (only with remote Setpoint)	4
Remote with trim (only if option is installed)	5
Time programmable (if option installed)	6

Controller configuration chart

The present chart includes only the basic parameters
For the list and the description of all the controller parameters see the User Manual.
When the controller is new and not configured shows the code 9999 at power ON. In this case NO PASSWORD is needed to configure the instrument (see the grey box in the chart below). Enter the configuration code in accordance with the desired functional characteristics.

Warning! If the parameter CodE has previously set to a value ≥5000, (for example 5033 in the chart) the controller is locked in operator mode; insert the correct password to access both the parameter and the configuration menus.



Automatic tuning
To determine the PID parameters for the process, run the tunE procedure: press the key until the dislay shows: Cont ; press the to enter the tune parameter, the the keys to start the automatic tuning (or to stop the tuning).
At the end the PID parameters are entered in the controller.

Table 1 Digital input functions IL1, IL2, IL3

Value	Description
nonE	Not used
KEY.L	Keyboard lock
HPU	Measure Hold
AMAn	Auto/Man
L-r	Local/Remote
S.P. 1	1st stored Setpoint
S.P. 2	2nd stored Setpoint
Strt	Run Timer
r-H.	Run/stop of a program

Table 2 Engineering Units

Value	Description
°C	degree Celsius
°F	degree Fahrenheit
nonE	none
mU	mV
U	Volt
mA	mA
A	Ampére
bAr	Bar
PSI	PSI
rh	Rh
Ph	pH

Notes: **[4]** A not configured controller shows 9999 at power ON: the configu-ration procedure is shown in the grey box.
[5] The controller shows PASS after conF: using the keys and insert the password to configure the controller.

Parameter list

The parameters pointed out with grey background are those necessary to configure the options and are NOT shown in the "*Configuration chart*". All the parameters are fully described and explained in the user manual of the controller.

Code	Parameter Name	Value Default	Value User
Con.1	1st Configuration code	9999	
Con.2	2nd Configuration code	0000	
IL.1	IL1 digital input function	OFF	
IL.2	IL2 digital input function	OFF	
IL.3	IL3 digital input function	OFF	
Unit	Engineering units	NONE	
Sc.dd	Decimal point	0	
Sc.Lo	Low range for engineering units	0	
Sc.Hi	High range for engineering units	9999	
rS.In	Remote Setpoint input range	4... 20	
HtF.S	Current transformer range	OFF	
Prot	Communications protocol	JBUS	
baud	Baud rate	9600	
rPtr	Continuous Output range	4... 20	
rtH	Retransmitted signal selection	PV	
CodE	Password	33	
L-r	Local/Remote Setpoint Selection	LOCAL	
S.SEL	Stored Setpoint Selection	NONE	
StAt	Program Start/Run/Hold	START	
A1S.P	AL1 alarm threshold	0	
A2S.P	AL2 alarm threshold	0	
A3S.P	AL3 alarm threshold	0	
SL. u	Slope up	OFF	
SL. d	Slope down	OFF	
S.P. L	Setpoint low limit	PV.LO	
S.P. H	Setpoint high limit	PV.HI	
S.P. 1	1st stored Setpoint	0	
S.P. 2	2nd stored Setpoint	0	
rt io	Ratio remote Setpoint	1.00	
b iAS	Bias Remote Setpoint	0	
hy	Control output hysteresis	0.5	
tunE	Start/Stop One shot tuning (0=Stop 1=Run)	STOP	
P.b	Proportional band (hysteresis ON - OFF)	5.0	
t. i.	Integral time	5.0	
t.d.	Derivative time	1.00	

Code	Parameter Name	Value Default	Value User
O.C.	Overshoot Control	1.00	
O.C.r.b.	Overshoot Control relative band	0.5	
M.rES	Manual reset	50.0	
dErr	Error Dead Band	OFF	
t.c.	Output Cycle time	20	
OP. H	Control output high limit	100.0	
S.Out	Output safety value	0.0	
M tM	Motor travel time	60	
M .HY	Minimum output step	0.5	
dbnd	Heat/Cool Dead band	0.5	
r.C.Ga	Relative Cooling Gain	1.0	
hy. C	Cool output Hysteresis	0.5	
t.c. C	Cool cycle time	20	
OP.HC	Cool output maximum value	100.0	
A1hy	AL1 Alarm Hysteresis	0.5	
A1L.b	AL1 latching and blocking functions	NONE	
A2hy	AL2 Alarm Hysteresis	0.5	
A2L.b	AL2 latching and blocking functions	NONE	
A3hy	AL3 Alarm Hysteresis	0.5	
A3L.b	AL3 latching and blocking functions	NONE	
tLbA	LBA delay	OFF	
StOP	Soft start output high value	0.5	
StEn	Soft start time	1	
tF iL	Input filter	OFF	
InSh	Input shift	OFF	
Addr	Serial communications address	1	
rtLo	Retransmission low range	PV.LO	
rtHi	Retransmission high range	PV.HI	
tMod	Timer/Start-up operating mode	OFF	
tAct	Timer Action	OFF	
t i E	Timer Setting	0.5	
S.P.SB	Stand-by Setpoint	0	
tH.SU	Hold time	1	
S.P.SU	Start-Up Setpoint	0	
OP.HS	Output high limit during Start-up	100.0	