DIN rail mounting data acquistion, isolation, transmitter

D7 line

User Manual • M.I.U. D7 - 4/06.01 • Cod. J30-478-1AD7 FE

D7 line
User manual

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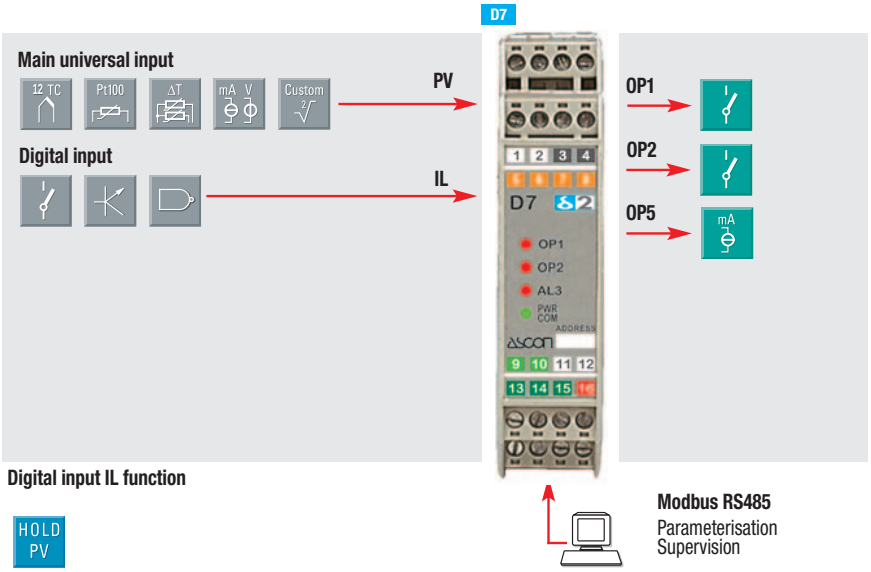
Resources



Digital input IL function

HOLD PV

Modbus RS485
Parameterisation
Supervision

Outputs (Option)

	Control		Retransmission
			PV
1	OP1	OP2	OP5

Model code

Configuration

Mod.	D 7	5 B C D	-	0 F 0 0	/	I L 0 1	-	0 P Q 0
	Line	Basic		Accessories		1st part		2nd part

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

Line	D 7

Ouput OP1-OP2	B
None	0
Relay - Relay	1

Serial communications	C
CanBus	3
RS485 Modbus/Jbus SLAVE	5

Options	D
None	0
Retransmission OP5	5

User manual	F
Italian/English (std)	0
French/English	1
German/English	2
Spanish/English	3

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…1,112 °F	0	1
TC L Fe-Const DIN43710	0…600 °C	32…1,112 °F	0	2
TC J Fe-Cu45% Ni IEC584	0…600 °C	32…1,112 °F	0	3
TC T Cu-CuNi	-200 …400 °C	-328…752 °F	0	4
TC K Chromel-Alumel IEC584	0…1,200 °C	32…2,192 °F	0	5
TC S Pt10%Rh-Pt IEC584	0…1,600 °C	32…2,912 °F	0	6
TC R Pt13%Rh-Pt IEC584	0…1,600 °C	32…2,912 °F	0	7
TC B Pt30%Rh Pt6%Rh IEC584	0…1,800 °C	32…3,272 °F	0	8
TC N Nichrosil-Nisil IEC584	0…1,200 °C	32…2,192 °F	0	9
TC E Ni10%Cr-CuNi IEC584	0…600 °C	32…1,112 °F	1	0
TC NI-NiMo18%	0…1,100 °C	32…2,012 °F	1	1
TC W3%Re-W25%Re	0…2,000 °C	32…3,632 °F	1	2
TC W5%Re-W26%Re	0…2,000 °C	32…3,632 °F	1	3
Dc input 0…50mV	Engineering units		1	4
Dc input 10…50mV	Engineering units		1	5
Custom input range			1	6

Alarm 1 type and function AL..		0	P	Q
Disabled		0	0	0
Sensor break		1	1	1
Absolute	active high	2	2	2
	active low	3	3	3

Standard parameters description

The parameters shown in the table at page 3 are divided into groups which work in the same way. Below they will be described as they are listed in the table.

Configuration

IL **Digital input function**

Table 1
Not used
PV measure hold

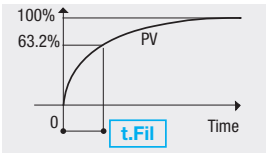
unit **Engineering Units**

Table 2		
°C (degree Centigrade)	V (Volt)	Rh
°F (degree Fahrenheit)	A (Ampere)	psi
- (none)	bar	pH
mV (millivolt)	mA (milliampere)	

Alarms

A1S.P **AL1 - AL2 - AL3 threshold**
A2S.P
A3S.P
Alarm thresholds of OP1,OP2 outputs, respectively linked to AL1, AL2 and AL3 threshold (available on the serial port). The range of the alarm threshold corresponds to the whole span.

t.Fil **Input filter time constant**



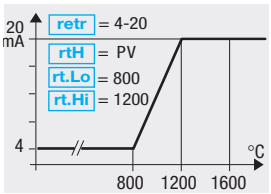
Time constant, in seconds, of the RC input filter applied to the PV input.
When this parameter is set to Off the filter is bypassed.

Auxiliary

In.Sh **Input shift**
This value is added to the measured PV input value.
Shifts the whole PV scale of up to ±60 digits.

Addr **Controller address**
The address ranges from 1 to 247 and must be unique for each controller on the communications bus to the supervisor.

OP5 Retransmission output (if option installed)

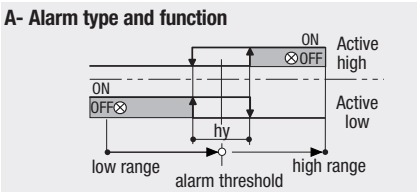


When OP5 output is present and not configured as control output, it retransmits linearised PV or SP.
With rt.Lo greater than rt.Hi it is possible to obtain a reverse scale.

Alarms AL1 - AL2 and AL3 (available on the serial port), respectively linked to OP1 - OP2 outputs

For each alarm is possible to configure:
A - The type and the operation condition of the alarm;
B - The functionality of the alarm latching;
C - The blocking function at start-up;
C - The Sensor break alarm.

A- Alarm type and function



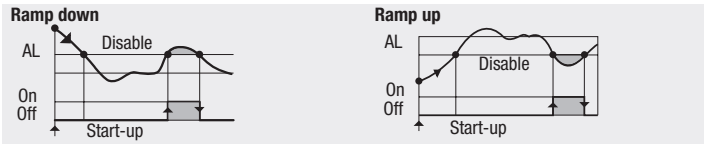
B/C- Latching and blocking enable

A1L.b **AL1, AL2, AL3 latching and blocking**
A2L.b
A3L.b

For each alarm is possible to select the following functions:
- None;
- latching;
- blocking;
- both latching and blocking.

Alarm acknowledge function
The alarm, once occurred, is maintained until the acknowledgement. The acknowledge operation is performed by serial communications. **After this operation, the alarm leaves the alarm state only when the alarm condition is no longer present.**

Start-up disabling



D - Sensor break alarm

t.Lba **LBA delay**
The alarm works as Sensor break with immediate action.
When the cause of the alarm disappears, the alarm status stops.

Commands

Output lock

The outputs are switched OFF via serial communications.

⚠ **The outputs lock/unlock is maintained in case of power failure.**

Digital input commands

Function	Performed operation		Note
	Open	Closed	
None	—		Not used
Measure hold	Normal operation	PV is hold	PV value is "frozen" at the time the digital input goes to the close state

The configured function is activated when the digital input (free voltage contact or open collector output) is in the On state (closed).
It is deactivated by putting the input to the Off state (open).
The activation of the function through the digital input has the highest priority than through the keypad or through the serial communications.

Table of standard parameters

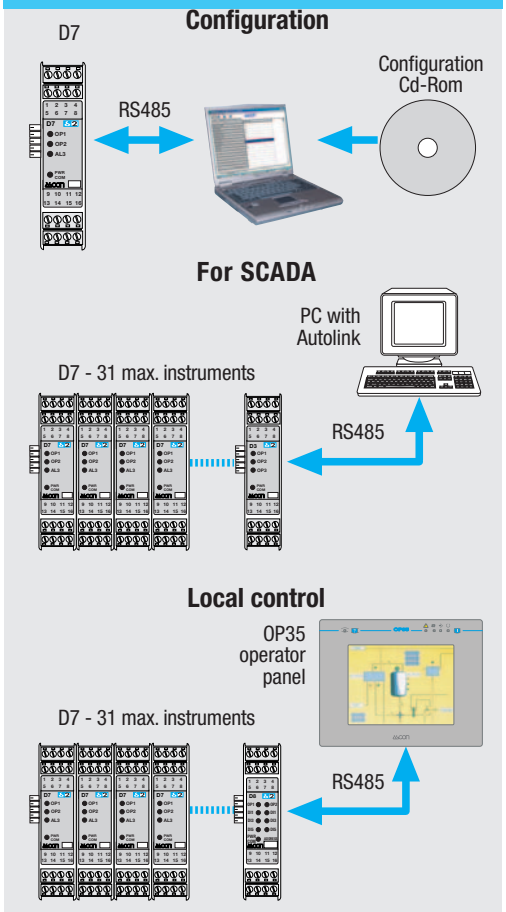
Configuration

Mnemonic code	Parameter descritption	Setting range	Unit	Factory setting	Note
IL	Digital input function IL	see table 1		not used	
Unit	Engineering unit	see table 2		none	
PStr	Instrument position	Alone/left side/central/right side		Alone	
Sc.dd	Number of decimals	0...3		0	Linear scales only
Sc.Lo	Low range	-999...9999	Engineering unit	Low range	Range min. 100 digit (linear scales only)
Sc.Hi	High range	-999...9999	Engineering unit	High range	
Prot	Communication protocol	M.bus/Jbus		M.bus	
baud	Baud rate	1200, 2400, 4800, 9600 baud		9600	
retr	Retransmitted signal range	0...20/4...20	mA	4...20	If output OP5 option is present
rtH	Retransmitted signal	PV/RF		PV	

Alarms and auxiliary

Mnemonic code	Parameter descritption	Setting range	Unit	Factory setting	Note
A1SP	AL1 alarm threshold	PV range	Engineering unit	0	If the alarm is configured (different to sensor break). The same parameters are available for AL2 and AL3 alarms
A1hy	AL1 hysteresis	0.1...10.0	% range	0.5	
A1Lb	Latching/blocking alarm functions	None/Ltch/Bloc/LtbL		None	
t.Fil	Filter time constant	OFF/1...30	s	Inhibited	
In.Sh	Input shift	OFF/-60...+60	Digit	Inhibited	
Addr	Communications address	1...247		247	
rt.lo	Retransmission low range	PV range	Engineering unit	----	If output OP5 option is present
rt.hi	Retransmission high range	PV range	Engineering unit	----	If output OP5 option is present
RF.L	RF low range	low range...RF. H	Engineering unit	0	writing RF parameter through the communica-
RF.H	RF high range	RF. L...high range	Engineering unit	0	tions port and retransmitting it, is possible to
RF	Reference value	range	Engineering unit	----	generate a 4... 20 mA signal on the OP5 output

Serial communications connection example



Warranty

We warrant that the products will be free from defects in material and workmanship for 3 years from the date of delivery.
The warranty above shall not apply for any failure caused by the use of the product not in line with the instructions reported on this manual.

Technical specifications

Features (at 25°C T. envir. temp)	Description			
Total configurability	By means of the configuration tools is possible to choose: input type; output type; alarms types and functionality.			
PV Input	Common characteristics	A/D converter with resolution of 50,000 points; Update measurement time: 0.2 s; Sampling time: 0.5s; Input bias: - 60…+60 digit; input filter: 1…30 s. OFF = 0		
	Accuracy	0.25% ±1 digits for temperature sensors 0.1% ±1 digits (for mV and mA)		Between 100…240Vac the error is minimal
	Resistance thermometer (for ΔT: R1+R2 must be < 320 Ω)	Pt100Ω at 0°C (IEC 751) °C/°F selectable	2 or 3 wires connection Burnout (with any combination)	Max. wire Res: 20Ω max. (3 wires) Sensitivity: 0.35°C/10° E. T. <0.35°C/10Ω Wire Res.
	Thermocouple	L,J,T,K,S, R, B, N, E, W3, W5 (IEC 584) Rj >10MΩ °C/°F selectable	Internal cold junction compensation con NTC Error 1°C/20°C ±0.5°C Burnout	Line: 150Ω max. Input drift: <2μV/°C. Env. Temperature <5μV/10Ω Wire Res.
	DC input (current)	4…20mA, 0...20mA with external shunt 2.5Ω Rj >10MΩ	Burnout. Engineering units Conf. decimal point position Init. Scale -999…9999 Full Scale -999…9999 (min. range of 100 digits)	Input drift: <0.1%/20°C Env. Temperture <5μV/10Ω Wire Resistance
	DC input	10…50mV, 0...50mV Rj >10MΩ		
Digital input	The closure of the external contact produces the measure hold			
Operating modes	Data acquisition, isolator, transmitter with 1, 2 o 3 alarms (the 3rd one only by serial communications)			
OP1-OP2 outputs (opt.)	- SPST Relay N.O., 2A/250Vac (4A/120Vac) for resistive load; - SSR, 1A/250Vac for resistive load To meet the double isolation requirements OP1 and OP2 must have the same load voltage			
OP5 output (opt.)	PV/SP Retransmission.; Galvanic isolation: 500Vac/1 min.; Resolution 12bit (0.025%); Accuracy 0.1%; 4...20 mA; 750Ω 15V max.			
AL1 - AL2 - AL3 Alarms	Hysteresys 0.1...10%			
	Action	Active high Active low	Action type	Absolute threshold whole range
		Special functions	Sensor break Acknowledge (latching), activation inhibit (blocking)	
Serial comm.s	RS485 isolated, Modbus/Jbus protocol, 1,200, 2,400, 4,800, 9,600 bit/s, 3 wires			
Auxiliary supply	+24Vdc ±20% 30mA max. - for external transmitter supply			
Operational Safety	Measure input	Detection of out of range short circuit or sensor break with automatic activation of the safety strategies		
	Parameters Outputs lock	Parameter and configuration data are stored in a non volatile memory for an unlimited time		
General characteristics	Power supply (PTC protected)	24Vac (-25... +12%) 50/60Hz and 24Vdc (-15...+25%)		Power consumption 3W max.
	Safety	EN61010-1 (IEC1010-1). installation class 2 (2.5kV), pollution class 2, **instrument class II**		
	Electromagnetic compatibility	Compliance to the CE standards		
	UL and cUL Approval	File E176452		
	Protection	Terminal strip IP20		
	Dimensions	Pitch: 22.5 mm - height: 99 mm - depth: 114.5 mm		
	Weight	155 g approx.		