

DIN rail mounting data acquisition, isolation, transmitter



D7 line User manual

ASCOT spa
ISO 9001
certified

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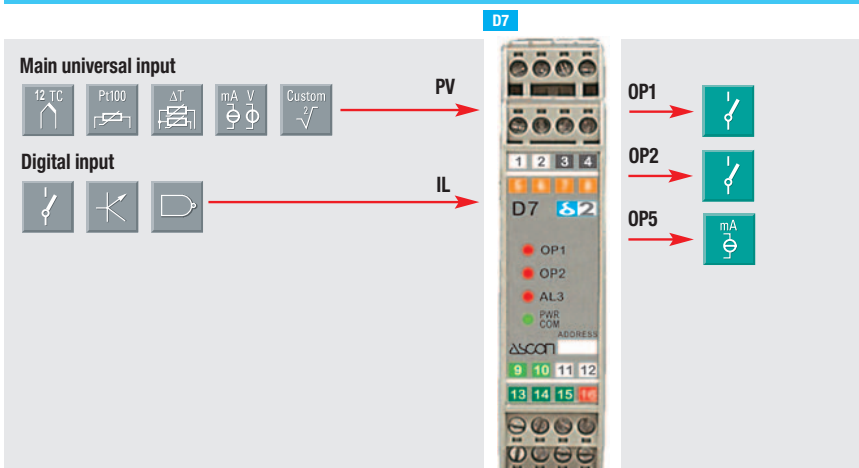
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D7 line

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Resources



Digital input IL function

HOLD
PV

Modbus RS485
Parameterisation
Supervision

Outputs (Option)

	Control		Retransmission	
	OP1	OP2	OP5	
1	OP1	OP2	OP5	

Model code

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

Configuration

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

Line **D 7**

Output 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		1	2	3
Sensor break		0	0	0
Absolute active high		1	1	1
Absolute active low		2	2	2
		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

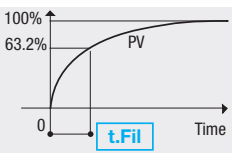
A1S.P AL1 - AL2 - AL3 threshold

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.

A2S.P

A3S.P

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

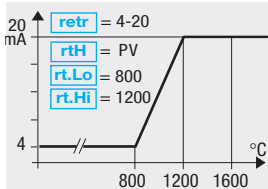
In.Sh Input shift

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.

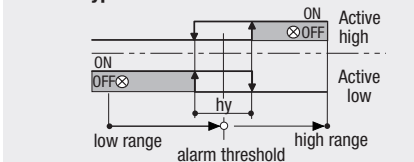
Alarms AL1 - AL2 and AL3 (available on the serial port), respectively linked to OP1 - OP2 outputs

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.

B/C- Latching and blocking enable

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

A- Alarm type and function



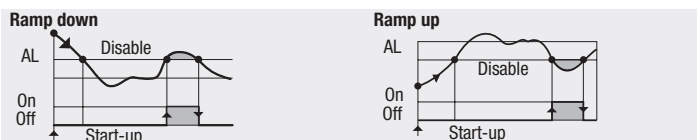
For each alarm is possible to select the following functions:

- 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).

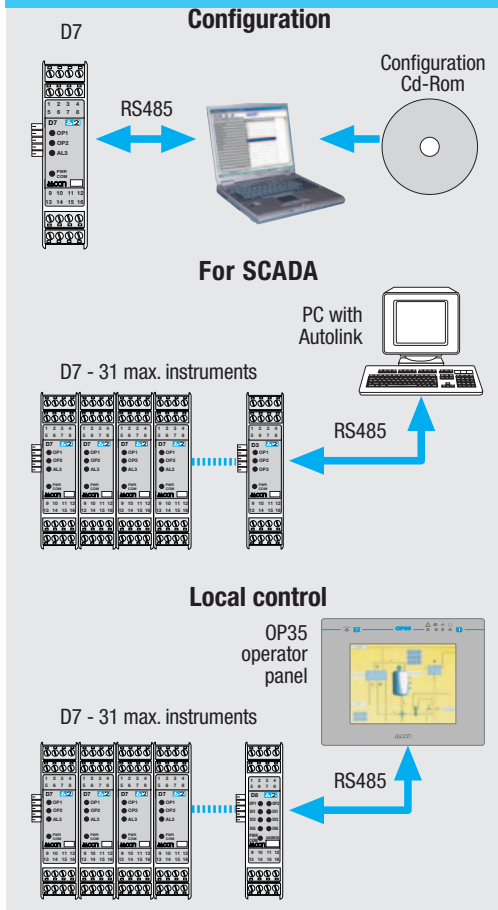
The activation of the function through the digital input has the highest priority than through the keypad or through the serial communications.

Table of standard parameters

Configuration					
Mnemonic code	Parameter description	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 description	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
RFL	RF low range	low range...RF.H	Engineering unit	0	writing RF parameter through the communications port and retransmitting it, is possible to
RFH	RF high range	RF.L...high range	Engineering unit	0	generate a 4... 20 mA signal on the OP5 output
RF	Reference value	range	Engineering unit	----	

Serial communications connection example



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	Input drift: <0.1%/20°C Env. Temperature <5μV/10Ω Wire Resistance
DC input	10...50mV, 0...50mV Rj > 10MΩ	Full Scale -999...9999 (min. range of 100 digits)		
Digital input	The closure of the external contact produces the measure hold			
Operating modes	Data acquisition, isolator, transmitter with 1, 2 or 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	Action type	Absolute threshold whole range
		Active low	Sensor break	
Special functions	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.			

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.

Commandes

Blocage des sorties

Les sorties peuvent être forcées à OFF via la communication série.

⚠ La fonction est sauvegardée en cas de coupure secteur.

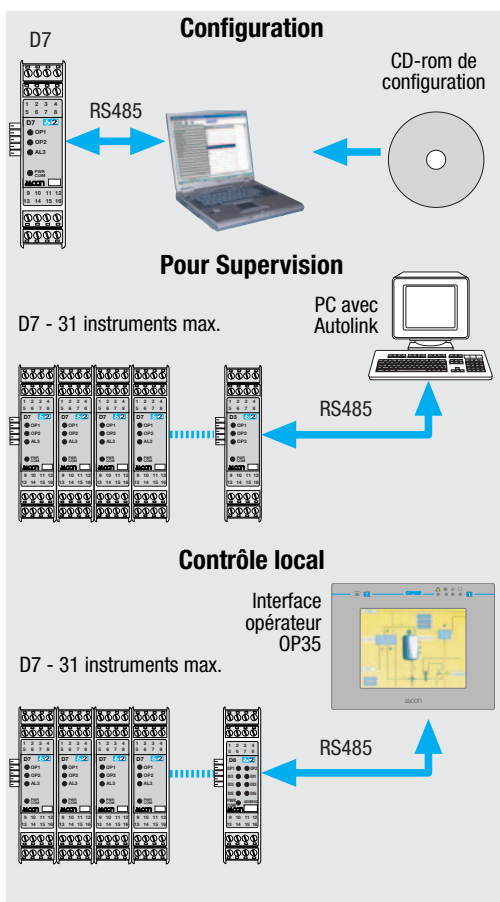
Commandes par Entrée logique

Contact entrée logique	Fonction réalisée		Remarques
	Ouvert	Fermé	
Aucune	—	—	Non utilisé
Maintien de la mesure	Mode normal	Mesure PV1 en maintien	La mesure est maintenue dès la fermeture du contact

La fonction est active lorsque l'entrée logique (contact libre de potentiel ou collecteur ouvert) est en état ON (fermé). Elle est désactivée lorsque le contact est ouvert.

La commande par entrée logique a une priorité supérieure aux commandes par liaison série

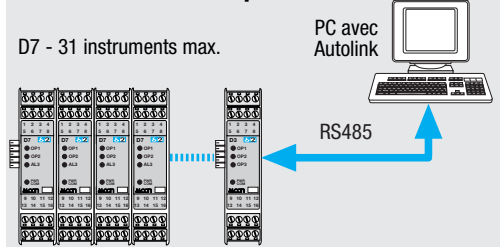
Exemples de connexion de communication série



Configuration



Pour Supervision



Contrôle local

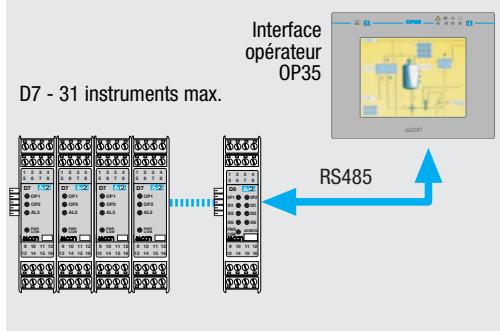


Tableau des paramètres standards

Configuration					
Code mnémotechnique	Paramètre	Plage de réglage	Unité de mesure	Réglage effect. en usine	Remarques
IL	Fonction de l'entrée logique IL		voir tableau 1	inutilisée	
PStr	Position occupée par le module		Seul/Latérale gauche/Centrale/Latérale droite	seul	
Unit	Unités physiques		voir tableau 2	aucune	
Sc.dd	Nombre de décimales	0...3		0	Seulement pour entrées linéaires
Sc.Lo	Début d'échelle	-999...9999	physiques	Début d'échelle	Echelle minimum 100 digits
Sc.Hi	Fin d'échelle	-999...9999	physiques	Fin d'échelle	
Prot	Protocole de communication		Modbus/Jbus	Modbus	
baud	Vitesse	1200, 2400, 4800, 9600	baud	9600	
retr	Echelle de la sortie analogique	0...20/4...20	mA	4...20	Si options sortie OP5 présentes
rth	Sélection du signal retransmis		PV/SP	PV	

Alarmes et divers					
Code mnémotechnique	Paramètre	Plage de réglage	Unité de mesure	Réglage effect. en usine	Remarques
A1S.P	Seuil d'alarme AL1	échelle PV	physiques	0	Non valable si l'alarme nest pas activée ou configurée en alarme sur rupture capteur
A1hy	Hystérésis AL1	0.1...10.0	% échelle	0.5	
A1LB	Mémorisation et inhibition AL1	none/Ltch/Bloc/Ltbl		aucune	Paramètres disponibles pour AL2 et AL3
t.Lba	Décalage de LBA	OFF / 1...9999	s	inhibée	OFF = rupture capteur
t.Fil	Constante de temps du filtre	OFF/1...30	s	inhibée	
in.Sh	Décalage de l'entrée	OFF/60...+60	digit	inhibée	
Addr	Adresse liaison série	1...247		247	
rt.lo	Echelle basse de retransmission	échelle	physiques	----	Si options sortie OP5 présentes
rt.hi	Echelle haute de retransmission	échelle	physiques	----	Si options sortie OP5 présentes
RFL	Limite basse de RF	début d'échelle ... RF.H	physiques	----	Le paramètre RF peut être écrit par la liaison série et permet de générer un signal 0/4...20 mA sur OP5
RF.H	Limite haute de RF	RFL... fin d'échelle	physiques	----	
RF	Valeur de référence	échelle PV	physiques	----	

Spécifications techniques

Caractéristiques (à 25°C T. amb.)	Description
Entièrement configurable	Par l'outil de configuration il est possible de choisir: - le type d'entrée - le type de sortie - les types d'alarmes et leurs modes de fonctionnement
Caractéristiques communes	Convertisseur A/D à 50.000 points
	Temps d'échantillonnage de la mesure: 0.2 seconde
	Temps d'échantillonnage (rafraîchissement des sorties): 0.5 s
	Décalage d'entrée: - 60...+ 60 digits
	Filtre sur la mesure: 1...30 s, ou exclusion (OFF= 0)
Précision	0.25% ± 1 digit (T/C et Pt100)
	0.1% ± 1 digit (per mA e mV)
Sonde à résistance (pour ΔT: R1+R2 doit être <320Ω)	Pt100Ω a 0°C (IEC 751) avec sélection °C/°F
	Câblage 2 ou 3 fils Détection rupture (toute combinaison)
Thermocouple	L, J, T, K, S, R, B, N, E, W3, W5 (IEC 584) avec sélection °C/°F
	Compensation interne soudure froide Erreur 1°C/20°C ± 0.5°C, Burnout
Courant continu	0/4...20mA, sur shunt 2.5Ω Rj >10MΩ
	Unité physique et point décimal configurables Ech. basse: -999...9999
Tension continue	10...50mV, 0...50mV Rj >10MΩ
	Ech. haute: -999...9999 100 digit minimum
Entrée logique	La fermeture du contact externe permet le maintien de la mesure
	Acquisition de données, transmetteur avec 1, 2 ou 3 alarmes (la troisième uniquement par la communication série)
Mode de fonctionnement	Relais, 1 contact N.O, 2A/250Vac pour charge résistive.
	Pour obtenir une double isolation OP1 et OP2 doivent avoir la même tension d'alimentation
Sorties OP1-OP2 (option)	Retransmission mesure PV
	Isolée galvaniquement: 500Vac/1 min Résolution: 12 bit Précision: 0.1%
OP5 (option) Sortie analogique	Hystérésis
	Active haut Active bas
Alarmes AL1- AL2 - AL3	Mode d'intervention
	Fonctions
	Spéciales
Liaison série	RS 485 isolée, Protocole Modbus/Jbus 1200, 2400, 4800, 9600 bit/s, trois fils
Alim. auxiliaire	+24Vdc ±20%, 30 mA max. pour alimentation d'un transmetteur externe
Sécurité de fonctionnement	Entrée mesure
	Paramètres
	Blocage des sorties
Caractéristiques générales	Alimentation (protection par PTC)
	Sécurité électrique
	Compatibilité Electromagnetique
	Certification UL et cUL
	Protection
	Dimensions
Poids	

Garantie

L'appareil est garanti exempt de tout défaut de fabrication pendant 3 ans à dater de la livraison.
La garantie ne s'applique pas aux défauts causés par une utilisation non conforme aux instructions décrites dans ce manuel.