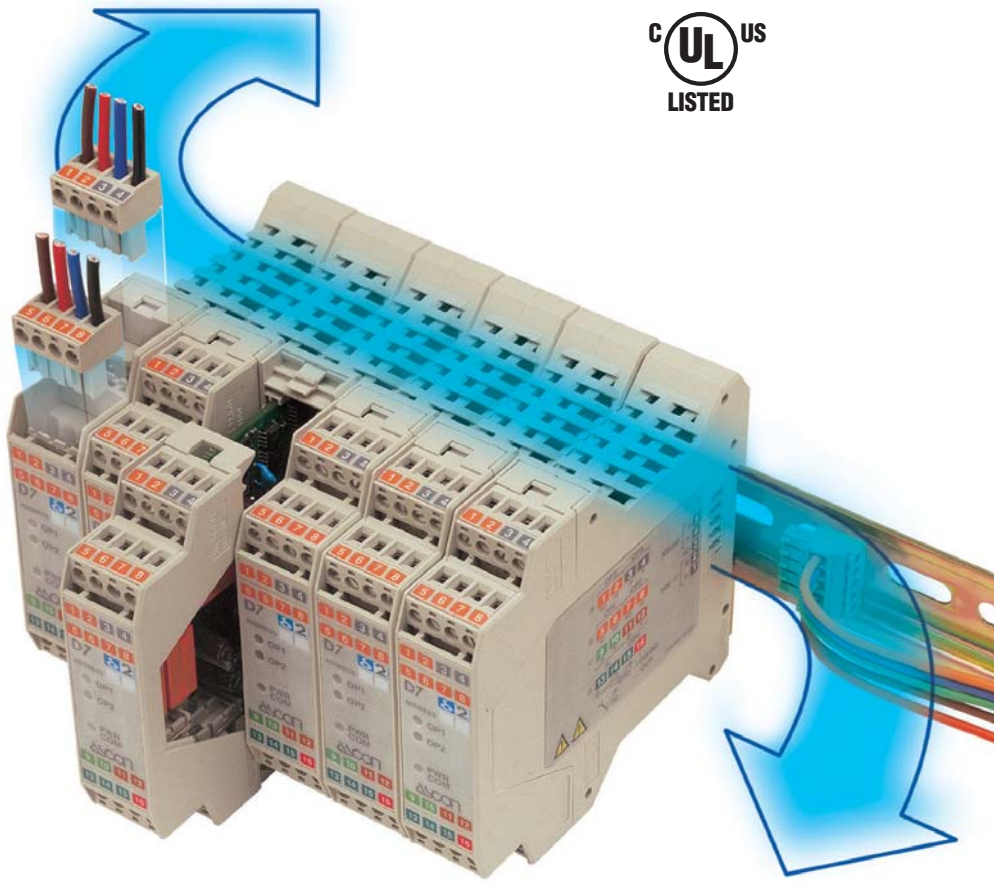
S E R I E S

DIN rail mounting analogue and digital acquisition modules deltadue® series D7 - D8 - D9 lines

Analogue and digital acquisition modules with fieldbus, analogue transmitters with thresholds

- On-machine or rear panel mounting;
- Stand-alone or multiple modules systems with a common bus for power supply and RS485 Modbus;
- Suitable as I/O modules for:
  - Data Acquisition Systems (DAS);
  - PC Based Control Systems;
  - Supervision Systems (SCADA);
  - PLC systems;
- Analogue universal input transmitters with thresholds (D7);
- Equipped with special functions for inputs and outputs;
- PC configurable;
- Hot swappable;
- PROFIBUS DP, DeviceNet or CAN interfacing.



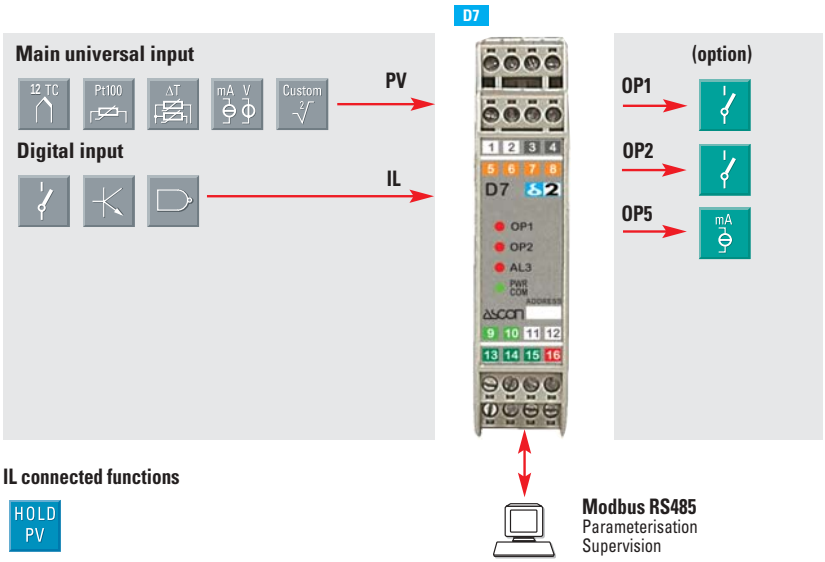
C UL US LISTED

E

ISO 9001 certified

D7 line - Data acquisition, isolation, transmitter module with alarms

Resources

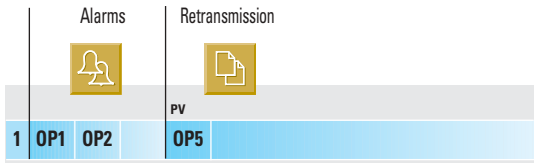


IL connected functions

HOLD PV

Modbus RS485
Parameterisation
Supervision

Outputs (option)



Ordering codes

	Line	Basic model				Accessories					Configuration 1st part					Configuration 2nd part			
Model:	D7	5	B	5	D	–	0	F	0	0	/	I	L	0	1	–	O	P	Q	0

Outputs
Options
Instructions handbook
Alarm AL3
Alarm AL2
Alarm AL1
Input

Outputs	OP1	OP2	B
	None		0
	Relay	Relay	1

Options	D
None	0
OP5 Retransmission	5

Instructions handbook	F
Italian-English (std)	0
French-English	1
German-English	2
Spanish-English	3

Inpt type	Range scale				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
TC J 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-Pt 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-NiMo 18%	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
0…50mV linear	Engineering units				1	4
10…50mV linear	Engineering units				1	5
mV "Custom" scale	On request				1	6

AL1-AL2-AL3 type and function		O-P-Q
Disabled		0
Sensor break		1
Absolute	active high	2
	active low	3

Installation kit common for all the modules

Each set of interconnected controllers requires one model **AD3-KIT/BA.RT.PC.CD** kit:

Power supply and serial comm.s connector code AD3/BA

Couple of connector protections code AD3/PC

Connector with termination resistor for serial comm.s code AD3/RT

CD Rom with configuration software tool code AD3/CD

If not differently specified the instrument will be supplied with standard version
Model : D7 5050-0000

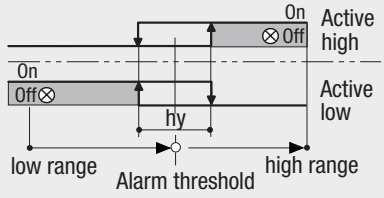
Technical data

Features at T. env. 25°C	Description			
Total configurability	By means of the configuration tool it is possible to select: - type of input - type of output - functionality of the alarms			
PV input	Common characteristics	A/D converter with resolution of 50,000 points Update measurement time: 0.2 s Sampling time: 0.5 s Input bias: - 60…+ 60 digit Input filter: 1…30 s OFF = 0		
	Accuracy	0.25% ±1 digit (for temperature sensor) 0.1% ±1 digit (for mA e mV)		Between 100…240Vac the error is minimal
	Resistance thermometer (for ΔT: R1+R2 must be <320Ω)	Pt100Ω at 0°C (IEC 751) °C/°F selectable	2 or 3 wires connection Burnout (with any combination)	Line: 20Ω max. (3 wire) Input drift: 0.35°C/10°C Env. Temp. <0.35°C/10Ω Wire Res.
	Thermocouple	L, J, T, K, S, R, B, N, E, W3, W5 (IEC 584) °C/°F selectable	Internal cold junction compensation with NTC Error 1°C/20°C ±0,5°C Burnout	Line 150Ω max. Input drift: <2µV/°C Env. Temp. <5µV/10Ω Wire Res.
	DC input (current)	0/4…20mA, 2.5Ω external shunt Rj >10MΩ	Burnout. Engineering units, decimal point position configurable low range: -999…9999 high range: -999…9999 (min range of 100 digits)	Input drift: <0.1% / 20°C Env. Temp. <5µV/10Ω R. Wire Res.
	DC input (voltage)	10...50mV, 0...50mV Rj >10MΩ		
Digital input	The closure of external contact produces any of the following action:		Measure hold	
Operating mode	Data acquisition, isolator, transmitter with 1, 2 o 3 alarms (the 3rd one only by serial comm.s)			
OP1-OP2 Outputs (Opt.)	SPST Relay NO, 2A/250Vac (4A/120Vac) for resistive load Too meet the double isolation requirements OP1 and OP2 must have the same load type			
OP5 Analogue oputput (option)	PV retransmission	Galvanic isolation: 500Vac/1 min Resolution: 12 bit Accuracy: 0.1%		In current: 0/4…20mA, 750Ω /15V max.
AL1- AL2 - AL3 alarms	Hysteresys	0.1…10.0%		
	Action	Active high Action low	Action Type	Absolute threshold, whole range
		Special functions	Sensor break Acknowledge (latching), activation inhibit (blocking)	
Serial Comm.s	RS485 isolated, Modbus/Jbus RTU protocol, 1,200, 2,400, 4,800, 9,600 bit/s, two 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 (-20...+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 block IP20		
	Dimensions	Pitch: 22.5 mm - height: 99 mm - depth 114.5 mm		
	Weight	155 g approx.		

Alarms

Three thresholds are available on the serial communications and can be addressed to the two relay outputs. Each alarm can be configured to be active high or low:

A - Function

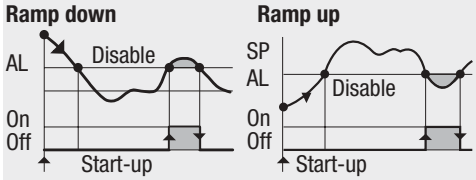


B - Functionality of the alarm acknowledge

Alarm acknowledge function

The alarm is memorized and available on the serial communications and/or on one of the output relays. By serial communications the alarm can be acknowledged. If the alarm disappears before the acknowledgment action the alarm status is maintained.

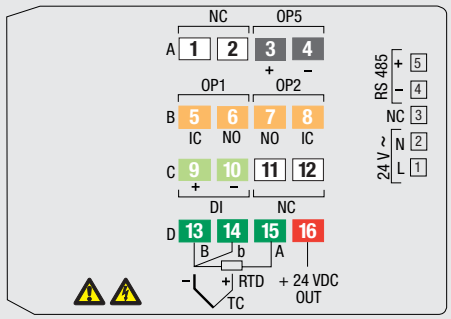
Start-up disabling



Digital input

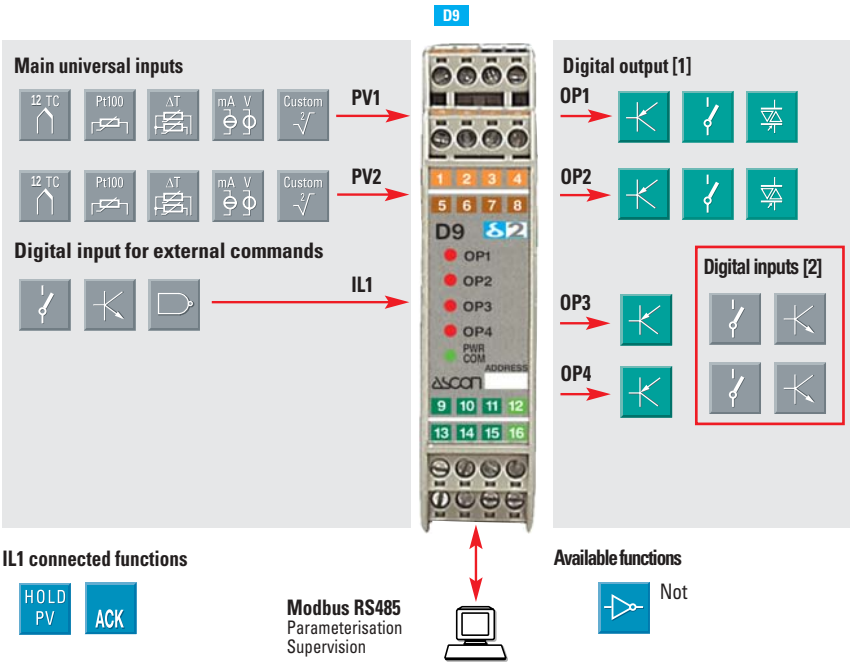
The digital input is used to hold the measured value.

Electrical connections



D9 line - 2 independent channels acquisition module

Resources



Operating modes

		Operating mode	Alarms
PV1	1	Acquisition	OP1 OP2 OP3 OP4
PV2	2	Acquisition	
PV1	3	Acquisition	OP1 OP2 OP3
PV2	4	Acquisition	OP4
PV1	5	Acquisition	OP1 OP2
PV2	6	Acquisition	OP3 OP4

Notes: 1. Each output (OP1...OP4) can freely be associated with one of the two inputs (PV1 or PV2).
2. When outputs OP3 and OP4 are not used as such, they can be connected to voltage or no voltage inputs.

Ordering codes

	Line	Basic model				Accessories				Configuration 1st part				Configuration 2st part			
Model:	D9	5	B	5	0	–	0	F	0	0	/	I	L	M	N	–	0	0	0	0

Outputs
Instructions handbook
Input type PV2
Input type PV1

OP1 and OP2 Outputs	B
Relay/Relay	1
Relay/SSR drive	2
SSR drive/SSR drive	3
SSR/SSR	4
SSR/SSR drive	5

Instructions handbook	F
Italian-English (standard)	0
French-English	1
German-English	2
Spanish-English	3

If not differently specified the instrument will be supplied with standard version
Model: D9 5350-0000

Input type	Range scale				PV1	I	L
Input type	Range scale				PV2	M	N
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
TC J 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-Pt 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-NiMo 18%	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
0…50mV linear	Engineering units					1	4
10…50mV linear	Engineering units					1	5
mV scala "Custom" scale	On request					1	6

Technical data

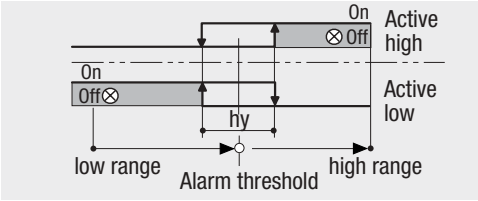
Features at T. env. 25°C	Description			
Total configurability	By means of the configuration tool it is possible to select: - type of input - type of output - type and functionality of the alarms			
PV1 and PV2 inputs	Common characteristics	A/D converter with resolution of 50,000 points Update measurement time: 0.2 s Sampling time: 0.5 s Input bias: -60…+60 digit Input filter: 1…30 s OFF = 0		
	Accuracy	0.25% ±1 digit (for temperature sensor) 0.1% ±1 digit (for mA and mV)		Between 100…240Vac the error is minimal
	Resistance thermometer (for ΔT: R1+R2 dmust be <320Ω)	Pt100Ω at 0°C (IEC 751) °C/°F selectable	2 or 3 wires connection Burnout (with any combination)	Line: 20Ω max. (3 wires) Input drift: 0.35°C/10°C Env. Temp. <0.35°C/10Ω Wire Res.
	Thermocouple	L, J, T, K, S, R, B, N, E, W3, W5 (IEC 584) °C/°F selectable	Internal cold junction compensation with NTC Error 1...20°C ±0,5°C ±0.5°C Burnout	Line 150Ω max. Input drift <2µV/1°C Env. Temp. <5µV/10Ω Wire Res.
	DC input (current)	0/4…20mA, 2.5Ω ext. shunt Rj >10MΩ	Burnout. Engieering inputs, decimal point position configurable low range: -999…9999 high range: -999…9999 (min range: 100 digits)	Input drift: <0.1%/20°C Env. Temp. <5µV/10Ω Wire Res.
	DC input (voltage)	10...50mV, 0...50mV Rj >10MΩ		
	PV1 and PV2 mutual isolation	Isolation voltage 500 V		
Digital input	Closing the external contact allows:	Measures hold, alarms acknowledge, outputs lock		
Operating mode	2 acquisition channels with 1, 2, 3 or 4 alarms			
OP1-OP2 outputs	SPST relay NO, 2A/250Vac (4A/110 Vac) for resistive load SSR, 1A/250Vac for resistive load Non isolated logic: 0/5Vdc, ±10% 30 mA max. Too meet the double isolation requirements, OP1 and OP2 must have the same load type			
OP3-OP4 outputs	Non isolated logic: 0/5Vdc, ±10% 30 mA max.			
Outputs functions	For all the outputs the inversion function (NOT) is available			
AL1 - AL2 - AL3 - AL4 alarms	Hysteresys	0.1…10.0%		
	Action	Active high Active low	Action type	Absolute threshold, whole range
		Special functions	Sensor break, soop break alarm acknowledge (latching), activation inhibit (blocking)	
	Source	Associates the alarms to PV1 and/or PV2		
	Alarm output	Allows to associate the alarm condition to OP1, OP2, OP3 and OP4 outputs. If this parameter is not configured, the alarm information is available on the internal status		
Serial communications	RS 485 isolated, Modbus/Jbus RTU protocol, 1,200, 2,400, 4,800, 9,600 bit/s 2 wires			
Operational safety	Measure input	Detection of out of range, or input problems causes automatic activation of the safety strategies		
	Parameters Outputs lock	Parameters and configuration data are stored in a non volatile memory for an unlimited time		
	Power supply (PTC protected)	24Vac (-20...+12%) 50/60Hz and 24Vdc (-15...+25%)		Power consuption 3 W max.
General characteristics	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 blocks IP20		
	Dimensions	Pitch: 22.5 mm - height: 99 mm - depth 114.5 mm		
	Weight	156 g approx.		

Alarms

Four thresholds can be addressed to the two relay outputs. For each alarm can be configured:

A - Source

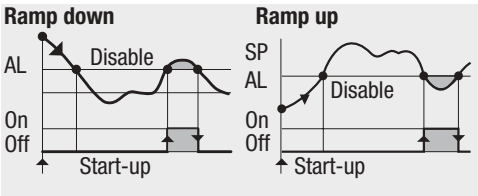
B - Type and mode of operation



C - Alarm acknowledge function

The alarm status remains until the acnowledge signal arrives through the serial communications port or the digital input. After this operation alarm status disappears only when the alarm condition is o longer present.

D - Start-up disabling



E - Sensor break function

F - Output associated to each alarm

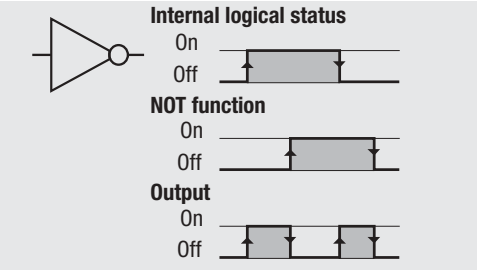
Digital input

During the configuration procedure, to the IL digital input can be connected one of the following functions:

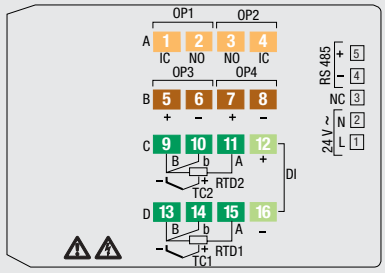
- PV HOLD;
- Alarm aknowledge;
- Outputs block.

Output functions

It's possible to set the inversion function (NOT) separately for each output.

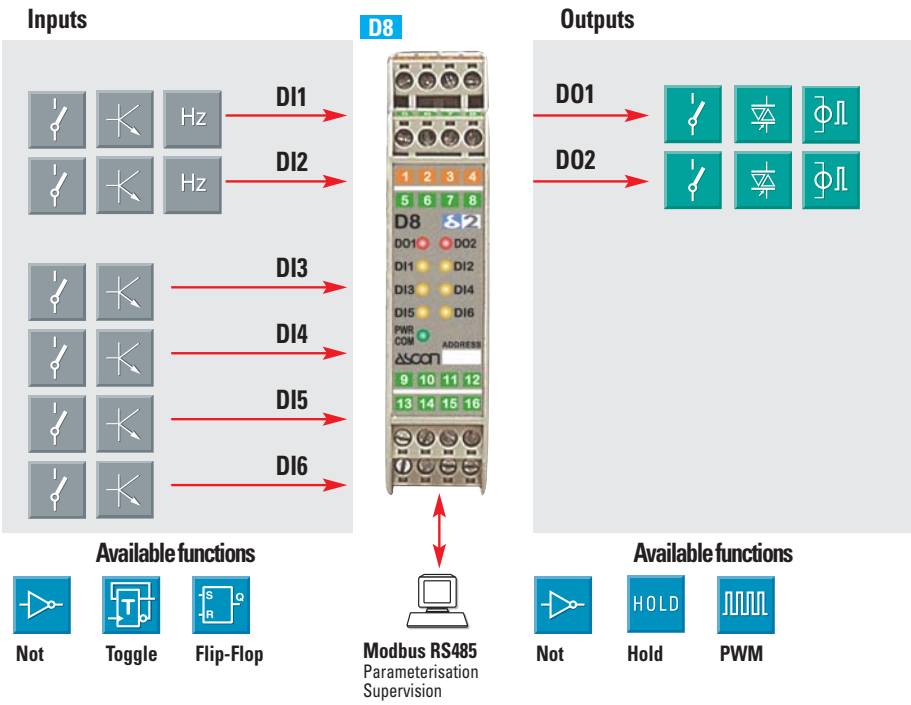


Electrical connections

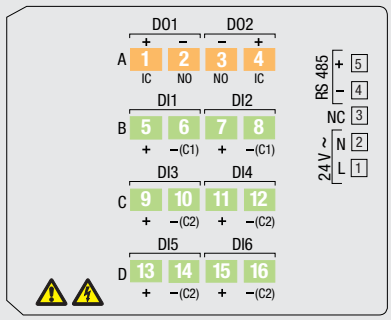


D8 line - Digital I/O module with 6 inputs and 2 outputs

Resources



Electrical connections



Ordering codes

	Line	Basic model				Accessories				Configuration			
Model:	D8	5	B	5	0	– 0	F	0	0	/ I	L	0	0

Outputs

Instructions handbook

Output type

Input type

Outputs	DO1	DO2	B
	Relay	Relay	1
	Relay	SSR drive	2
	SSR drive	SSR drive	3
	SSR	SSR	4
	SSR	SSR drive	5

Instructions handbook	F
Italian-English (standard)	0
French-English	1
German-English	2
Spanish-English	3

If not differently specified the instrument will be supplied with standard version
Model: D8 5150-0000

Input type	I
No frequency input	0
Input frequency on DI1	1
Input frequency on DI1 and DI2	2

Output type		L
No PWM output		0
PWM on DO2 output	[1]	1
PWM on DO1 and DO2 outputs	[2]	2

Notes:
[1] Only when **B** = 2, 3, 4 and 5;
[2] Only when **B** = 3, 4 and 5.

Technical data

Features at 25°C of environment temperature	Description	
Total configurability	By means of the configuration tool it is possible to select: - type of input - the functions to be applied to the inputs/outputs - type of output	
Inputs	6 digital inputs, in 2 groups optically isolated (DI1, DI2 and DI3, DI4, DI5, DI6)	
	DC inputs	Standard EN61131-2 compatible, voltage logical status 1 ≥ 5 Vdc, voltage logical status 0 ≤ 2 Vdc, admitted voltage: 24 Vdc max.
	Frequency inputs (DI1 and DI2)	0...10 kHz
	No voltage inputs	Minimum signal width: 16 ms
Outputs	Relay SPST NA, 2A/250Vac (4A/120Vac) for resistive load; SSR, 1A/250Vac for resistive load; SSR drive, voltage 5Vdc ±20%, max. 30mA	
Serial communications	RS485 isolated, Modbus/Jbus RTU protocol, 1,200, 2,400, 4,800, 9,600 bit/s, two wires	
Operational safety	Parameters	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%) — 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 block IP20
	Dimensions	Pitch: 22.5 mm - height: 99 mm - depth 114.5 mm
	Weight	152 g approx.

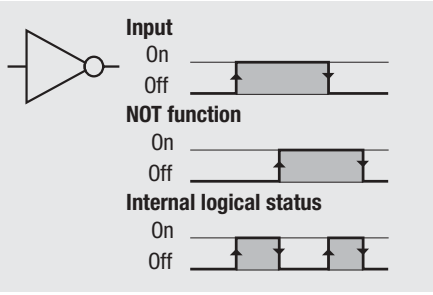
Digital inputs

Processing functions

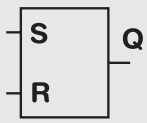
Processing functions, the result of which is available by serial communication, can be applied to the acquired value of the digital inputs. The functions are:

- **NOT**
  It is possible to set the status inversion function (NOT) separately for each input

Note: the inversion function also influences the Toggle (TG.I_) and Flip-Flop (FF.I_) function inputs.

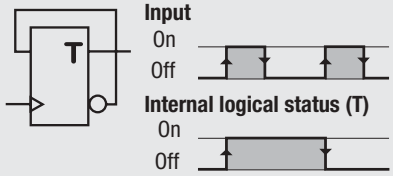


- **FLIP-FLOP**
  Bistable that switches to Q=1 on the rising edge of the input SET and switches to Q = 0 on the rising edge of the input RESET (type SR).
  The inputs SET and RESET are made up of pairs of unalterable inputs (DI1-DI2, DI3-DI4, DI5-DI6).
  DI1, DI3 and DI5 are associated with the command SET;
  DI2, DI4, DI6 with the command RESET.



Input		Internal logical status (Q)
S	R	
0	0	Unchanged
0	1	0
1	0	1
1	1	0

- **TOGGLE**
  Bistable that switches on the rising edge (type T). Each input is associated with a logical status (T), whose value is inverted with each input operation from 0 to 1.



Frequency inputs

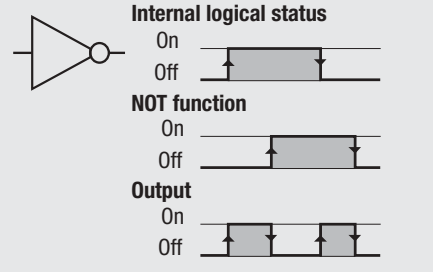
Inputs DI1 and DI2 can be configured to acquire frequency signals in the range 0.1...10 kHz.

Outputs

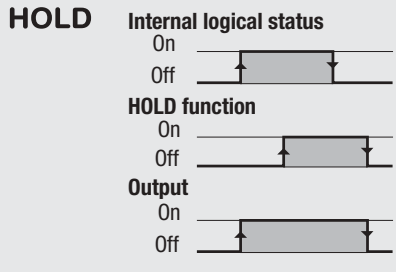
Output operational method

Processing functions can be applied to the internal logical status. These are:

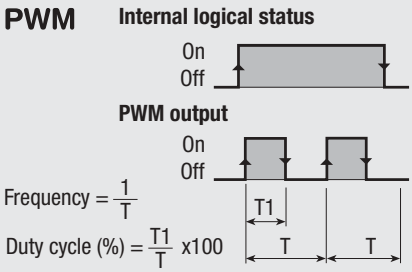
- **NOT**
  It is possible to set the inversion function (NOT) separately for each output.



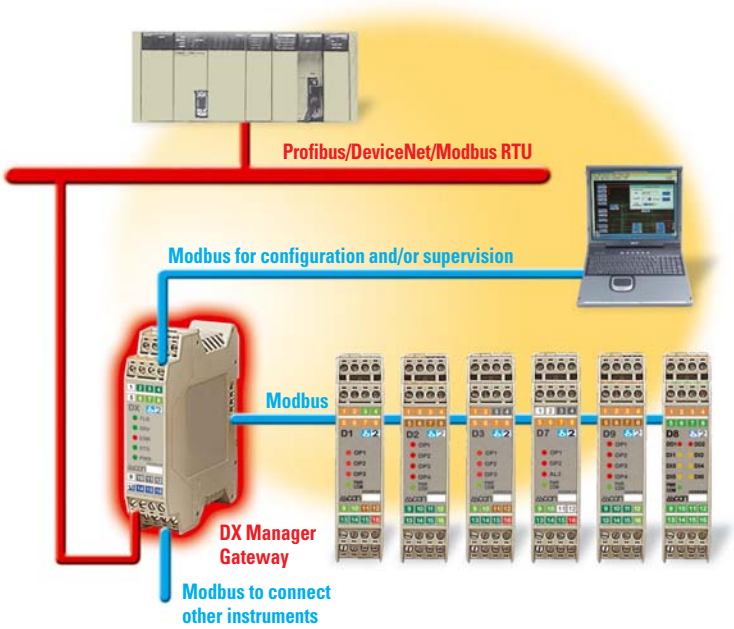
- **HOLD**
  It is possible to set the status freezing function (HOLD) separately for each input



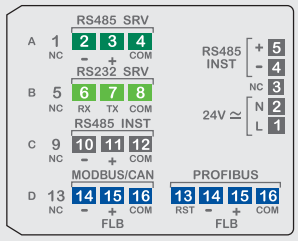
- **PWM**
  Outputs (without relays) can be configured as PWM (Pulse Width Modulation) outputs with adjustable frequency and duty cycle



DX line - Manager Gateway



Electrical connections



Ordering codes

	Line	Basic model				Accessories				Configuration			
Model:	DX	5	B	C	0	– 0	F	0	0	/ 0	0	0	0

No. of instruments backed up
Fieldbus communications
Instructions handbook

Number of instruments to be backed up	B
0	0
4	1
8	2
16	3
32	4

Fieldbus communications	C
None	0
Devicenet	1
RS 485 Modbus/Jbus RTU	5
Profibus DP slave	7

Instructions handbook	F
Italian-English (standard)	0
French-English	1
German-English	2
Spanish-English	3

If not differently specified the instrument will be supplied with standard version
Model: DX 5000-0000

Note: the instrument executes the RS232/485 converter hardware function only for the Modbus RTU protocol.

Technical data

Features at env. 25°C	Description		
Functions	Manager	OFF line configuration and parameterization. Backup of the configuration and parameter data of the connected modules. Hot swapping, automatic configuration and parameterization of the replaced modules	
	Gateway	Network adapter for Profibus DP, DeviceNet, Modbus RTU and RS485/RS232 converter	
Communications ports	Instruments Bus	RS485 Modbus protocol master replicated on the terminal connectors (max. 19200 baud)	
	Support	RS485, RS232 Modbus RTU protocol slave, isolated (max. 38400 baud)	
	Fieldbus	RS485 Modbus RTU protocol slave, isolated (max. 57600 baud)	
		Profibus DP slave	DP control: SPC3
			DP interface: RS485 isolated, max. 12 Mb/s
		CAN 2.0b, isolated, max. 1Mb/s (for DeviceNet)	
General characteristics	See the entry "General characteristics" of the other module for details		

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