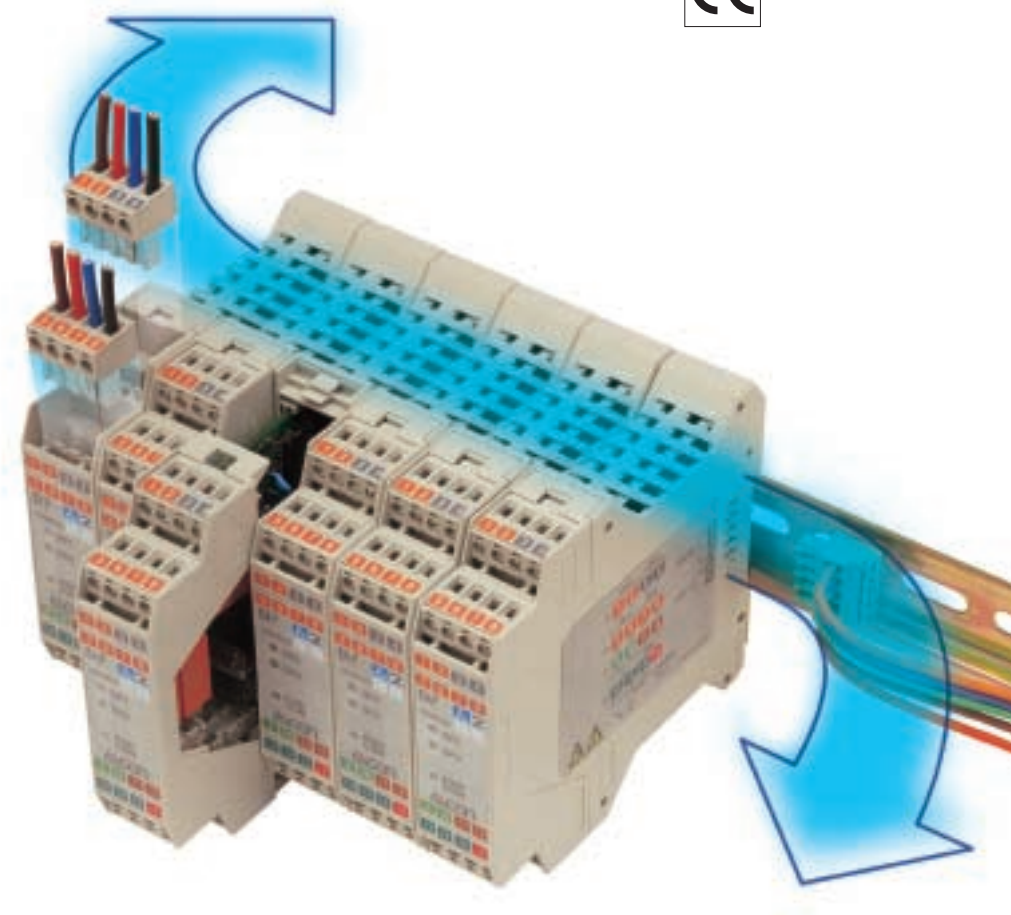
DIN rail mounting dual loop controller/analogue acquisition module deltadue® series D2 line

Two loops in the space of one

A common bus for serial power supply and communications, total withdrawability, ease of replacement even with the power supply on, digital inputs for remote commands , the option of acquiring or controlling two analogue variables makes the deltadue® D2 line a powerful and flexible instrument, suitable for solving the most diverse problems of field signal management. Together with the DX module, it can be used in PROFIBUS DP® and DeviceNet® networks, with the automatic reconfiguration option (hot swapping).



E

ISO 9001 certified



deltadue®
distributed control

Advantages and peculiarities

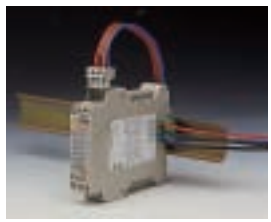
Keeping costs low

Modular construction and compact dimensions:
- Quick mounting on DIN rail;
- Possibility of prewiring;
- Common bus for power supply and serial communications.



Wiring error reduction

- Polarised connectors;
- Coloured Terminal identification.



High integration

- On -machine or rear panel mounting
- Remote/centralised control;
- RS485/CanBus;
- PROFIBUS DP, DeviceNet (with DX module).



Easy maintenance

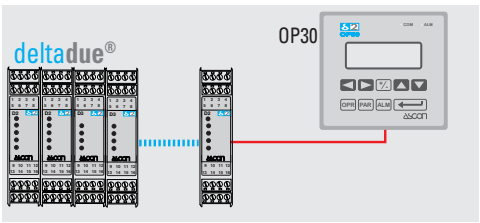
- Withdrawable;
- Easy replacement without switching off the power supply;
- Hot swapping, automatic configuration of the new or replaced modules (with DX module).



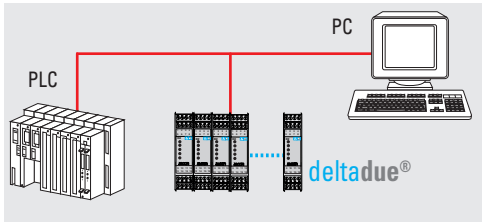


Typical applications

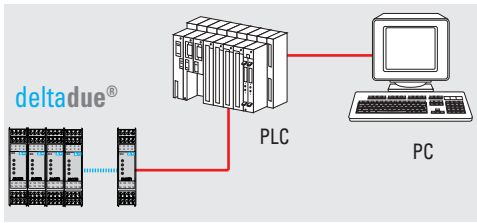
Local control with operator panel OP30



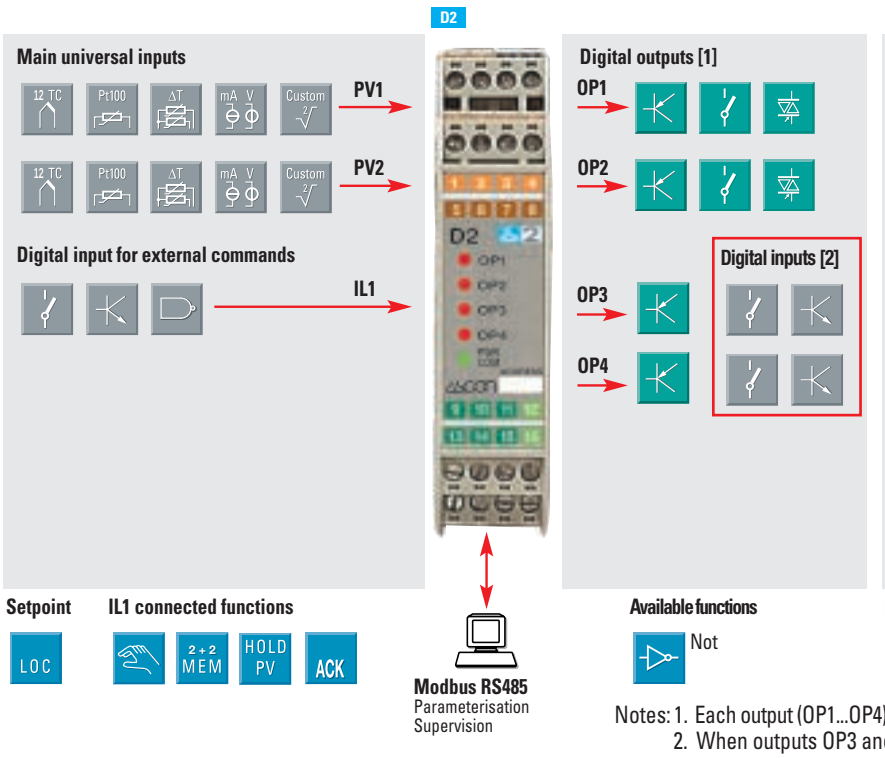
Distributed control with PLC with dedicated modules for critical loops



Distributed control with PC supervision



Resources



Operating modes

		Control		Alarms		
	0	Acquisition only		OP1	OP2	
PV1	1	Single action	OP1	OP2		
	2	Single action	OP2	OP1		
	3	Acquisition only			OP3	OP4
PV2	4	Single action	OP3			OP4
	5	Single action	OP4		OP3	
PV1	6	Single action	OP1	OP2	OP3	
PV2	7	Single action	OP4			

Fuzzy tuning with automatic selection

One shot Auto tuning

One shot Natural Frequency

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 used as voltage free or voltage digital inputs.

Technical data

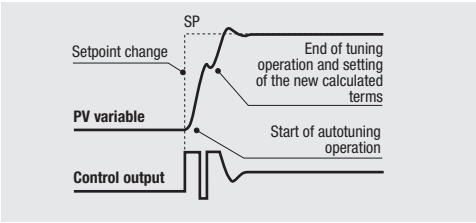
Features at env. 25°C	Description			
Total configurability	By means of the configuration tool it is possible to select: - type of input - the type of control input - type of output - type and functionality of the alarms - type of Set-point - control parameter values			
PV1 and PV2 inputs	Common characteristics	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		
	Mutual isolation	Isolation voltage 500V		
Digital input	Closing the external contact allows:	Auto/Man mode change, switching between 2 stored setpoints, measure hold, alarms acknowledge, outputs lock		
Operating mode	2 acquisition channels, 2 single action loops PID or ON/OFF with 1, 2, 3 or 4 alarms			
Control mode	Algorithm	PID with overshoot control or ON/ OFF		
	Proportional band (P)	0.5…999.9%		Single action PID algorithm
	Integral time (I)	0.1…100.0 min	OFF = 0	
	Derivative time (D)	0.01…10.00 min		
	Error dead band	0.1…10.0 digit		
	Overshoot control	0.01…1.00		
	Manua reset	0.0…100.0%		
	Cycle time (time proportional only)	1…200s		
	Control output high limit	10.0…100.0%		
	Soft start output value	0.1…100.0%	OFF = 0	
	Output safety value	0.0…100.0%		
	Control output hysteresis	0.1…10.0%		ON/OFF algorithm

Fuzzy-Tuning

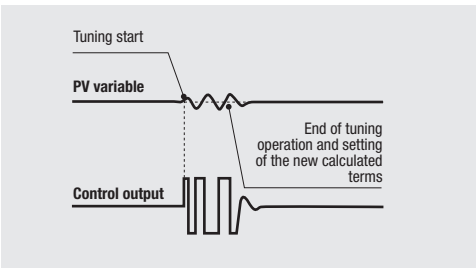
Two methods of tuning are available:
- **Auto-Tuning "one shot"**
- **Natural frequency "one shot"**

The **Fuzzy-Tuning** automatically selects one of the two methods which assures the best result for each condition.

Auto-Tuning method best works on the step response basis.
When activated, if a deviation exists between the Setpoint and process variable larger than 5% of scale range, the controller modifies the output value. Then, in a short time, it calculates the PID parameters and the new algorithm is operational immediately.
The main advantages of this method are fast calculation and quick implementation.



The **Natural frequency** method best works when the process variable is very near to the Setpoint. When activated, it causes a process oscillation around the Setpoint value in orer to calculate the optimal PID parameters .
The main advantage of this method is the better definition of PID parameters.



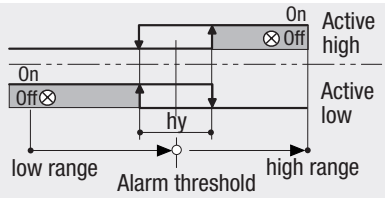
Technical data

Features at 25°C Env. Temp.	Description				
OP1-OP2 outputs	SPST relay NO, 2A/250Vac (4A/110 Vac) for resistive load SSR, 1A/250Vac for resistive load SSR drive: 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	Action type	Deviation threshold	±range
				Band threshold	0…range
		Active low		Absolute threhold	whole range
		Special functions	Sensor break, Loop break		
			Alarm acknowledge (latching), activation inhibit (blocking)		
Setpoint (for each loop)	Local		Up and down ramps 0.1…999.9 digit/min (OFF=0) Low limit: from low range to high limit High limit: from low limit to high range		
	Local plus 2 stored				
Fuzzy-Tuning one shot (1 loop at a time)	The controller automatically selects the best method according to the process conditions		One shot Auto Tuning		
			One shot Natural Frequency		
Auto/Man station	Standard with bumpless function, Switched by digital input or serial communications				
Serial communications	RS 485 isolated, Modbus/Jbus 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			
	Control output	Safety value: -100…100%			
	Parameters	Parameters and configuration data are stored in a non volatile memory for an unlimited time			
	Outputs lock				
General characteristics	Power supply (PTC protected)	24Vac (-20...+12%) 50/60Hz and 24Vdc (-15...+25%)	Power consuption 3 W max.		
	Safety	EN61010-1 (IEC1010-1) installation class 2 (2,5kV), pollution class 2, instrument class II			
	Electromagnetic compatibility	Compliance to the CE standards			
	Protection	Terminal blocks IP20			
	Dimensions	Pitch: 22.5 mm - height: 99 mm - depth 114.5 mm			

Alarms

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

A - Function

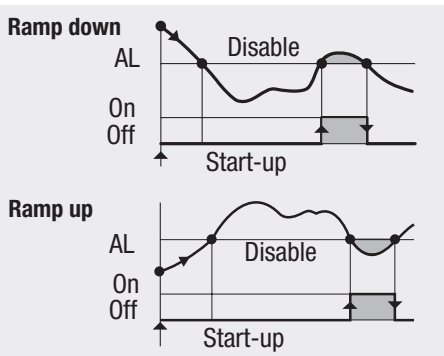


B - Functionality of the alarm acknowledge

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.

Start-up disabling

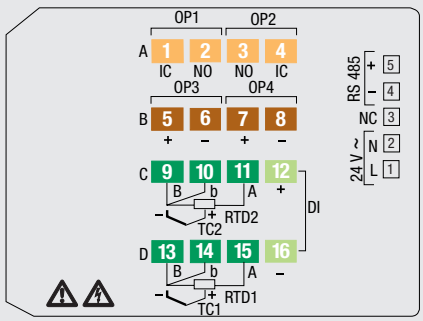


Digital input

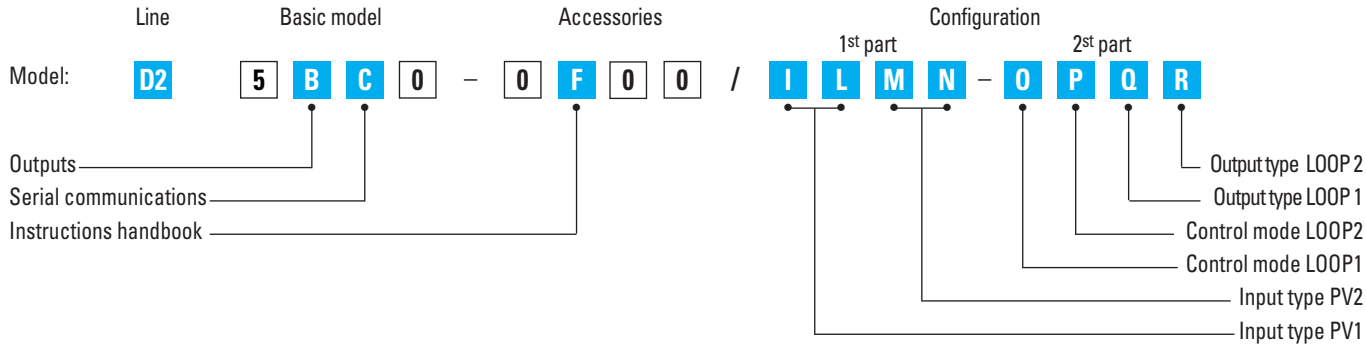
During the configuration procedure, to the IL digital input can be connected one of the following functions:

- Measure Hold: PV1, PV2 or PV1 and PV2.
- Auto/Man mode change: PV1, PV2 or PV1 and PV2.
- Recall of the 2nd stored Setpoint: 2° setpoint LOOP1, 2° setpoint LOOP2 or 2° setpoint LOOP 1 and LOOP2.
- Alarm acknowledge;
- Outputs block.

Electrical connections



Ordering codes



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

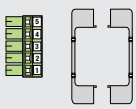
Serial communications	C
CanBus	3
RS 485 Modbus/Jbus SLAVE	5

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

Installation kit

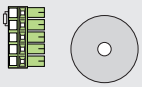
Each set of interconnected controllers requires one model **AD3-KIT/BA.RT.PC.CD** kit:

Power supply and serial communications connector code AD3/BA



Couple of connector protections code AD3/PC

Connector with termination resistor for serial communications code AD3/RT



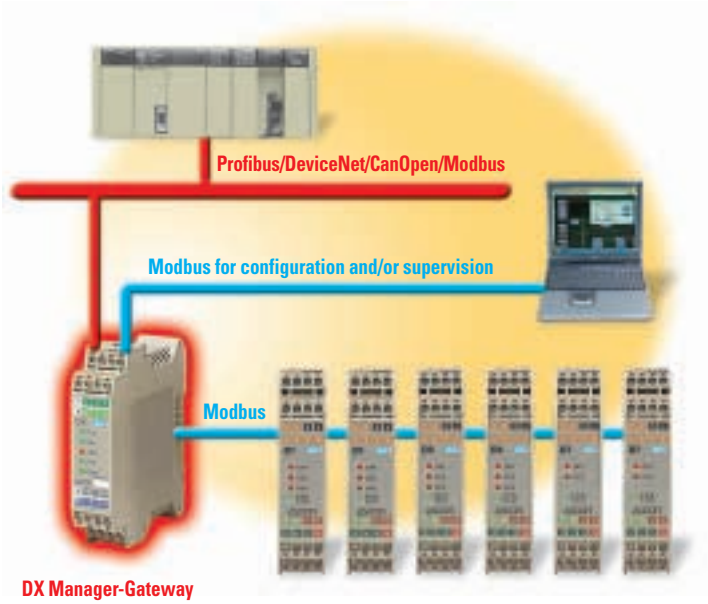
CD Rom with configuration software tool code AD3/CD

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 "Custom" scale	On request					1	6
Action type	LOOP 1					O	
Action type	LOOP 2					P	
ON/OFF reverse action						0	
ON/OFF direct action						1	
PID reverse single action						2	
PID direct single action						3	
Control output type	LOOP1					Q	
Control output type	LOOP 2					R	
None						0	
OP1						1	
OP2						2	

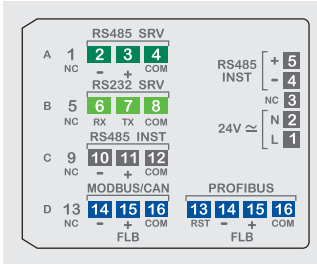
If not differently specified the controller will be supplied with standard version
Model: D2 5350-0000

DX line - Manager Gateway

ASCON spa
20021 Bollate
(Milan) Italy
Via Falzarego, 9/11
Tel. +39 02 333 371
Fax +39 02 350 4243
http://www.ascon.it
e-mail sales@ascon.it



Electrical connections



Ordering codes

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

N° of instruments backed up
Fieldbus communications
Instructions handbook

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

Fieldbus communications	C
None	0
CANopen	3
RS 485 Modbus/Jbus	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 controller will be supplied with standard version
Model: DX 5100-0000

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, CANopen and RS485/RS232 converter
Communications ports	Instruments Bus		RS485 Modbus protocol master replicated on the terminal connectors (max. 19200 baud)
	Support		RS485, RS232 Modbus protocol slave, isolated (max. 38400 baud)
			RS485 Modbus protocol slave, isolated (max. 57600 baud)
	Fieldbus	Profibus DP slave	DP control: SPC3
			DP interface: RS485 isolated, max. 12 Mb/s
			CAN 2.0b, isolated, max. 1Mb/s
General characteristics	See the entry "General characteristics" of the other module for details		

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