

**CARLO GAVAZZI**  
Automation Components



## ***Digital Panel Meters***

- *DC or AC Current and Voltage*
- *Temperature and Resistance*
- *Frequency and Speed*



**Controls**



## What are and Why use the Digital Panel Meters

In the manufacturing industry and in the process control applications, it is of vital importance the monitoring and control by means of alarms of several physical variables. In addition, an analogue or serial retransmission of the measured value can be required in order to provide a feedback to the system which controls the process, or to log the history of the monitored plant. Whatever are your needs and requirements in the process you have to control, Carlo Gavazzi has the right solution.

Should you need a simple indicator, a controller for every kind of variable, or a more complex instrument - able for example to manage four alarms, to be connected in an RS485 network, to linearise the non-linear input signals or to show different conditions with different display colours - we have the panel meter that better suits your demands. The range is completed with a universal signal conditioner, whose flexible and advantageous modular architecture is common to the other medium and high-end panel meters.



## The Characteristics

Wide range of available inputs for all the applications: voltage, current, frequency, resistance, temperature.

Modular architecture available in the medium and high-end meters, making them flexible and easy to configure.

Different type of outputs available to retransmit the measured variable: analogue signal, alarm contacts or serial port

Easy programmability by means of a handy keypad. The more complex instruments are configurable by means of dedicated software tools.

3-, 3 1/2-, 4-digit LED display or 2 x 6-digits display with alarm and over range indication.



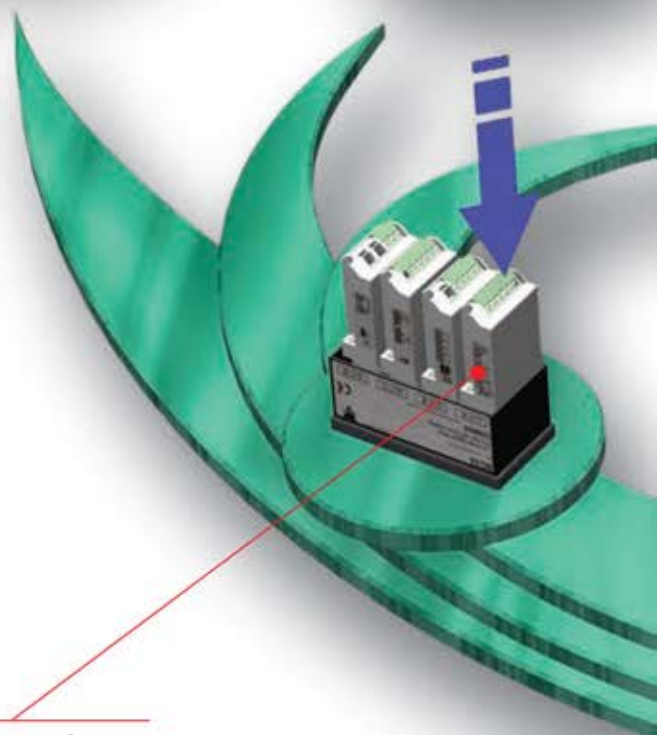
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Controls

## A new Concept of Modularity

- **Maximum in-field flexibility**
- **Quick assembly and configuration**
- **Easy future expansion**

### USC: 5-slot Module holder



### **Measurement inputs**

0.2-2-20mA AC/DC  
0.2-2-20mA AC/DC + excitation output  
0.2, 2, 5A AC/DC; 20, 200, 500V AC/DC  
TC: J-K-S-T-E, Pt100-250-500-1000, Ni100  
 $\Omega$ : 0.02, 0.2, 2, 20k $\Omega$   
Tachometer: 0.001Hz to 50kHz

**UDM35: 3 1/2-digit read-out,  
or 3-digit + dummy 0 read-out**

**UDM40: 4-digit  
read-out, 3-colour display**

**UDM60: 2 x 6-digit  
read-out**

**Display base**

**Power supply**

90 to 260V AC/DC  
18 to 60V AC/DC

**Communication port**

RS485 and RS232 ports

**Outputs**

Analogue outputs:  
Max 1 analogue output  
0 to 20mA and 0 to 10VDC

Alarm outputs:  
1 relay output  
2 relay outputs  
2 relay + 2 open collector outputs  
4 relay outputs.

## Features and Benefits of the Digital Panel Meters

### LDI35, LDM35H

- Multi range and multi signal indicator and controller
- Powerful scaling capability
- Universal power supply (LDM35H only)

### LDM40

- Multi range and multi signal indicator and controller
- Universal power supply
- 4-digit display

### UDM35

- Powerful performance
- Plug and play modules
- Maximum in-field flexibility
- Possibility to expand the inputs/outputs only when really needed by the application

### UDM40

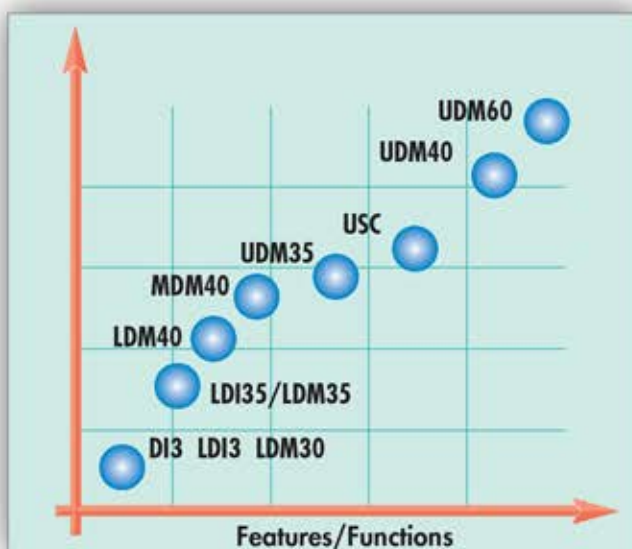
- State of the art performances
- Maximum in-field flexibility
- Input signal linearization capability
- 3-colour display

### UDM60

- Advanced tachometer features
- Two independent instruments in one housing
- Dual pulse metering and totalizing in one instrument
- Dual line 6-digit display with analogue indicators

### USC

- Universal signal conditioner
- Maximum in-field flexibility
- Input signal linearization capability
- Programming and network software



### UDM40 Colour Display

**RED** - High priority, abnormal condition

**AMBER** - Low priority, abnormal condition

**GREEN** - Normal condition



### DI3 DIN, DI3 72, LDI3, LDM30

The instruments are easily configurable by dip-switches, this allowing to set the position of the decimal point and the primary of the current transformer or to connect the potential transformer.



### UDM60, two variables available at a glance

The 6-digit format provides very accurate measurements while the analogue indicators show where the variable is compared to its full-scale.

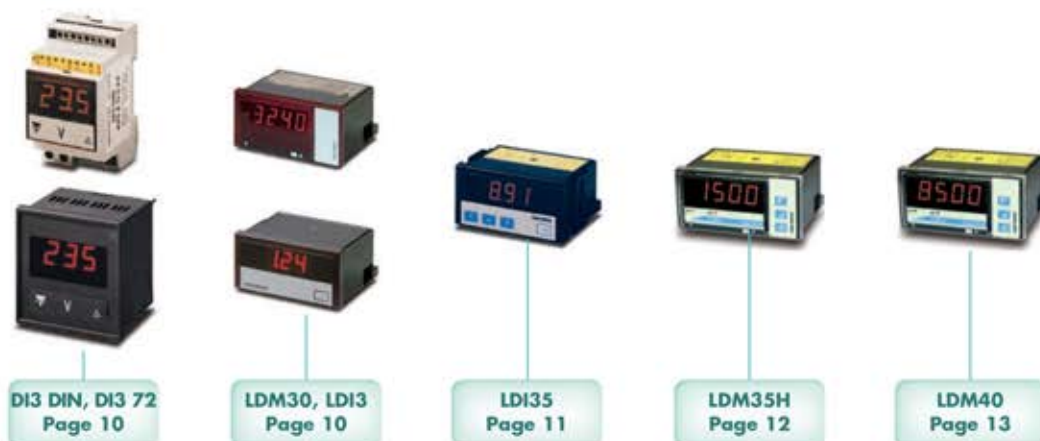


## The available Modules

Type	Ch	UDM35	UDM40	UDM60	USC	OrderingCode
UDM35 base		●				BD35
UDM40 base			●			BD40
UDM60 base				●		BD60
USC base				●		BDXX
AC/DC inputs: 200μA, 2mA, 20mA, 200mV, 2V, 20V	1	●	●		●	BQLSX
AC/DC inputs: 200μA, 2mA, 20mA, 200mV, 2V, 20V + excitation output	1	●	●		●	BQLSE
AC/DC inputs: 200mA, 2A, 5A, 20V, 200V, 500V	1	●	●		●	BQHSX
Inputs: 20Ω, 200Ω, 2kΩ, 20kΩ; TC: J-K-S-T-E, Pt100-250-500-1000, Ni100	1	●	●		●	BQTRX
Tachometer input: PNP, NPN, NAMUR, TTL, contact	2	●	●	●	●	BQTF1
Tachometer input: pick-up, voltages up to 500VAC	2	●	●	●	●	BQTF2
Analogue output: 0 to 20mA, 0 to 10V DC	1	●	●	●	●	BOAV
Relay output	1	●	●	●	●	BOR1
Relay output	2	●	●	●	●	BOR2
Outputs: 2 relays + 2 open collectors	4	●	●	●	●	BOR4
Relay output	4	●	●	●	●	BOR5
RS485 communication port	1	●	●	●	●	BRSX
RS232 communication port	1	●	●	●	●	BRSY
18 to 60V AC/DC power supply		●	●	●	●	BPL
90 to 260V AC/DC power supply		●	●	●	●	BPH

Slot	UDM35/UDM40/UDM60				USC				
	A	B	C	D	A	B	C	D	E
Inputs/Outputs	1	2	3	4	1	2	3	4	5
Measurement inputs: LSX, LSE, HSX, TRX, TF1/2	●				●				
RS485 communication port: SX		●				●			
RS232 communication port: SY		●				●			
Analogue output (*): AV		●	●			●	●	●	
Relay and open collector outputs: R1, R2, R4, R5			●				●		
Power supply: H, L				●					●

(\*) Note: max one analogue output module



DIN rail mounting

Panel mounting

Modular

Indicator

Controller

3-colour display

Dual line display

Signal conditioner

Linearization capability

Multi input (A-V)

Temperature measurement

Tachometer

Command inputs

Up to 1 alarm

Up to 2 alarms

Up to 4 alarms

Analogue output

Serial communication

Universal power supply

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UDM35  
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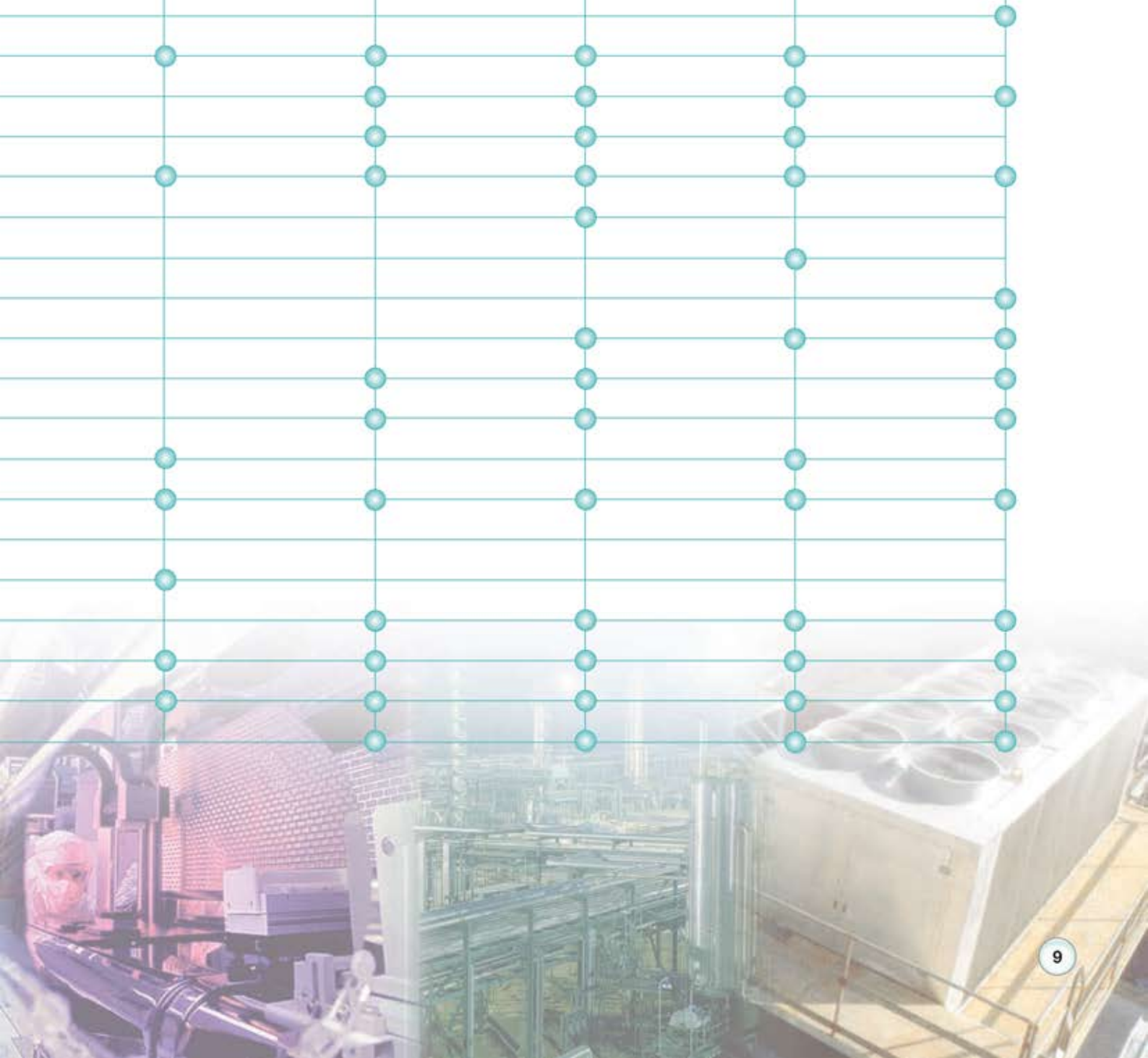
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USC  
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Controls



## DI3 DIN DI3 72 LDI3 LDM30

With just four basic models this product family is the ideal solution for the panel builders.

The product philosophy meets the panel builder and distributor requests in terms of features and flexibility granting therefore a significant stock reduction.

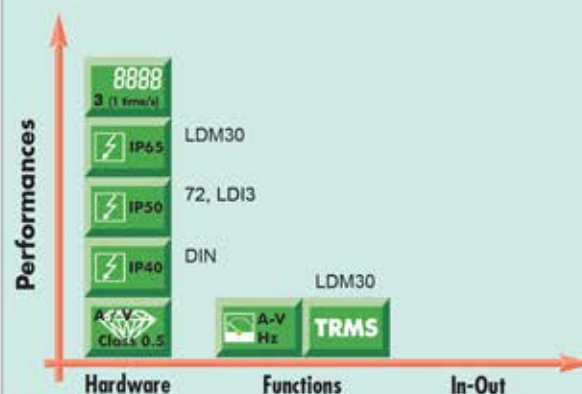


LDM30

### DI3 DIN DI3 72 LDI3 LDM30

<b>Description</b>	3-DGT $\mu$ P-based indicator
<b>Housing (H x W x D)</b>	89 x 53.5 x 58.8 mm (DIN) 72 x 72 x 75 mm (72) 48 x 96 x 83 mm (LDI3)
<b>Mounting</b>	DIN rail, panel mounting (72, LDI3, LDM30)
<b>Display type</b>	DI3, LDI3: 3 DGT, red LED; LDM30: 3 DGT+ dummy zero
<b>Variables on display</b>	YES
<b>Measured signals</b>	1A/60mV/100-500VDC 1A/100VAC, 5A/500VAC 1 to 1000Hz
<b>Type signals</b>	DC or AC
<b>Engineering units</b>	mA, A, V, Hz
<b>Accuracy</b>	$\pm(0.5\%FS, +1DGT)$
<b>Temperature drift</b>	$\pm 350ppm/^{\circ}C$
<b>Sampling rate</b>	1 time/s
<b>Command inputs</b>	NO
<b>Outputs:</b>	Alarm NO Analogue NO Serial NO
<b>Signal/display scaling</b>	YES (CT and VT/PT sel. by dip-switch)
<b>Power supply</b>	24V, 48V, 115V, 230V AC
<b>Approvals</b>	CE, DI3 72: c CSA us; LDI3, LDM30: c CSA us, UR
<b>Protection degree</b>	IP40 (DIN); IP50 (72), IP50 (LDI3), IP65 (LDI3 on request; LDM30)

### The best to suit your needs!





## LDI35

The family is available in two basic versions:

- LDI35, simply as indicator;
- LDI35, up to 1 alarm relay output.

On each basic model it is possible to have a specific version for:

- process applications with 2-20mA and 0.2-20V-200V input;
- panel builders with 2-5A and 200-500VAC/DC input.

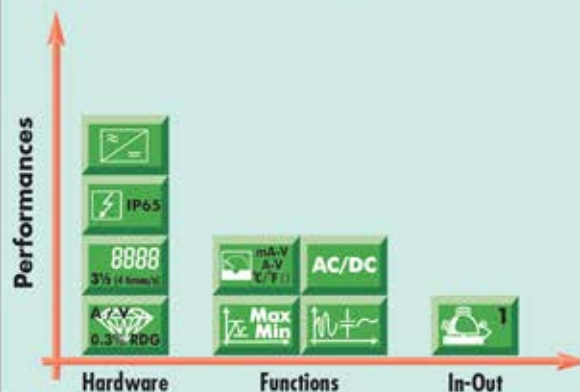


The range is completed by a multi probe temperature controller and ohmmeter.

### LDI35

<b>Description</b>	3 1/2-DGT $\mu$ P-based indicator and controller
<b>Housing (H x W x D)</b>	48 x 96 x 83 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	3 1/2-DGT or 3DGT+ dummy 0, red LED
<b>Variables on display</b>	YES
<b>Measured signals</b>	(2-20mA, 20-200V); (2-5A, 200-500V); (TC: J-K-S-T-L, Pt100-1000, Ni100, 200-2000 $\Omega$ )
<b>Type signals</b>	DC and AC
<b>Engineering units</b>	Label set
<b>Accuracy</b>	DC: $\pm(0.3\%FS + 1DGT)$ AC: $\pm(0.5\%FS + 1DGT)$
<b>Temperature drift</b>	$\pm 200ppm/^{\circ}C$
<b>Sampling rate</b>	4 times/s
<b>Command inputs</b>	NO
<b>Outputs:</b>	Up to 1
Alarm	NO
Analogue	NO
Serial	NO
<b>Other available characteristics</b>	Signal/display scaling. Digital filter, Peak and Valley. Burn-out control on temperature input
<b>Power supply</b>	24, 48, 115, 230VAC, 9 to 32VDC, 40 to 150VDC
<b>Approvals</b>	CE, c CSA us, UR
<b>Protection degree</b>	IP65 (on request)

### The best to suit your needs!





## LDM35H

The family is available in two basic versions:

- LDM35H, simply indicator;
  - LDM35H, indicator with up to 2 alarm relay outputs.
- Both of them provided with universal power supply.

On each basic model it is possible to have a specific version for:

- process applications with 0.2-2-20mA and 0.2-2-20V DC/AC input;

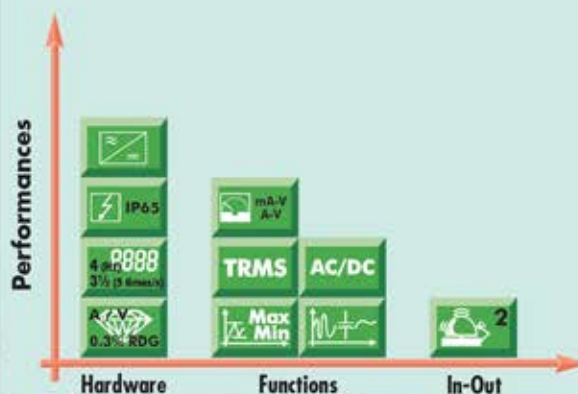
### LDM35H

<b>Description</b>	3 1/2-DGT $\mu$ P-based indicator and controller
<b>Housing (H x W x D)</b>	48 x 96 x 83 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	3 1/2-DGT or 3-DGT + dummy 0, red LED
<b>Variables on display</b>	YES
<b>Measured signals</b>	(0.2-2-20mA, 0.2-2-20V); (0.2-2-5A, 20-200-500V)
<b>Type signals</b>	DC and AC TRMS
<b>Engineering units</b>	Self sticking label set
<b>Accuracy</b>	DC: $\pm(0.3\%RDG + 3DGT)$ AC: $\pm(0.5\%RDG + 3DGT)$
<b>Temperature drift</b>	$\pm 150ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	NO
<b>Outputs:</b>	Up to 2
Alarm	NO
Analogue	NO
Serial	NO
<b>Other available characteristics</b>	Signal/display scaling, Digital filter, Peak and Valley.
<b>Power supply</b>	90 to 260V AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE, c CSA us and UR pending
<b>Protection degree</b>	IP65

- panel builders with 0.2-2-5A and 20-200-500V AC/DC input.

Furthermore the TRMS method improves significantly the accuracy of the measurement on both distorted current and voltage.

### The best to suit your needs!





## LDM40

The family of the LDM series is now extended to a new performing digital controller which characteristics belong, in fact, to a higher class product.

The most important features which distinguish this model from the LDM35H are the extended communication capability and the 4-digit display.

### LDM40

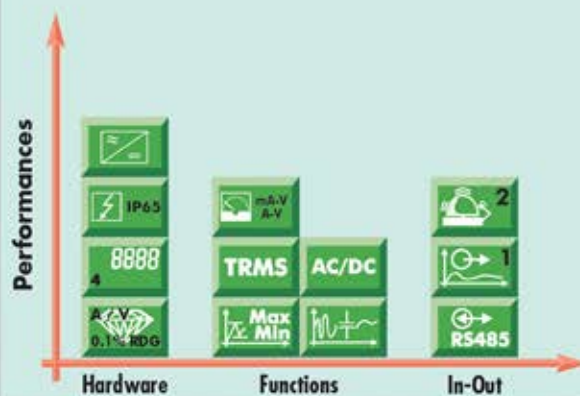
<b>Description</b>	4-DGT $\mu$ P-based indicator and controller
<b>Housing (H x W x D)</b>	48 x 96 x 83 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	4-DGT, red LED
<b>Variables on display</b>	YES
<b>Measured signals</b>	(0.2-2-20mA, 0.2-2-20V); (0.2-2-5A, 20-200-500V)
<b>Type signals</b>	DC and AC TRMS
<b>Engineering units</b>	Self sticking label set
<b>Accuracy</b>	DC: $\pm(0.1\%RDG + 2DGT)$ AC: $\pm(0.3\%RDG + 2DGT)$
<b>Temperature drift</b>	$\pm 150ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	NO
<b>Outputs:</b>	<b>Alarm</b> Up to 2 <b>Analogue</b> 1 (20mA, 10VDC) <b>Serial</b> RS485
<b>Other available characteristics</b>	Signal/display scaling. Digital filter, Peak and Valley.
<b>Power supply</b>	90 to 260V AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE, c CSA us and UR pending
<b>Protection degree</b>	IP65

The main characteristics can be summarized in two main points:

- the RS485 serial communication;
- the analogue output proportional to the variable being measured by the instrument.

LDM40 can be provided either with serial communication or analogue signal retransmission but also, in case of demanding applications, with both of these.

### The best to suit your needs!



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Controls



## MDM40

MDM40 tachometer is an extract of flexibility and performances in only one product.

This instrument is suitable to be used in all applications thanks to:

- the capability to measure a very slow speed/frequency (0.001 Hz);
- the management of pulse signals from proximity switches,

### MDM40

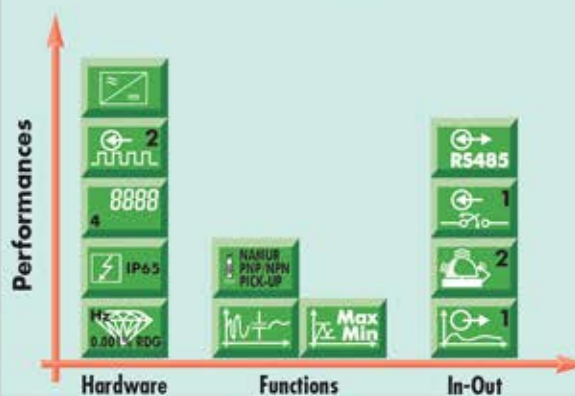
<b>Description</b>	4-DGT multi-range controller for pulse signal
<b>Housing (H x W x D)</b>	48 x 96 x 124 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	4 DGT, red LED
<b>Variables on display</b>	YES
<b>Measured signals</b>	Speed, frequency, rate, period
<b>Type signals</b>	DC or AC
<b>Engineering units</b>	Label set
<b>Accuracy</b>	$\pm(0.001\% \text{ RDG} + 3\text{DGT})$
<b>Temperature drift</b>	$\pm 100\text{ppm}/^{\circ}\text{C}$
<b>Sampling rate</b>	Programmable
<b>Command inputs</b>	1 (display hold, key pad lock)
<b>Outputs:</b>	
Alarm	2
Analogue	1 (20 mA, 10 VDC)
Serial	RS485
<b>Other available characteristics</b>	Signal/displ. and analogue out. scaling. Digital filter. Peak and valley.
<b>Power supply</b>	24, 48, 115, 120, 230, 240 VAC 9 to 32, 40 to 150 VDC
<b>Approvals</b>	CE, UR
<b>Protection degree</b>	IP65

photo switches, NAMUR proximities, encoders and magnetic pick-up's;

- the rate-tacho-frequency-period meter functions.

The two independent inputs, with proper parameter programming, are able to measure rate, speed, frequency and period variables using mathematical formulas like: A, B, 1/A, A/B, A-B, (A-B)/B, B/(A+B) and revers speed control.

### The best to suit your needs!





## UDM35

UDM 35 is a universal high-tech instrument that has been developed to meet the most advanced application needs. UDM35 offers to the user many solutions and advantages that can be summarized in:

- quick assembly and maintenance using plug and play modules;
- easy and quick parameter programming and parameter cloning on other UDM's by means of UdmSoft or PC Hyperterminal;

### UDM35

<b>Description</b>	µP-based controller with modular housing
<b>Housing (H x W x D)</b>	48 x 96 x 105 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	3 1/2-DGT or 3-DGT + dummy 0, red LED (4-DGT in case of tacho function)
<b>Variables on display</b>	YES
<b>Measured signals</b>	(0.2-2-20mA, 0.2-2-20V); (0.2-2-5A, 20-200-500V); (TC: J-K-S-T-E, RTD, Ω); speed, frequency, rate, period (0.001Hz to 50kHz)
<b>Type signals</b>	DC and AC TRMS
<b>Engineering units</b>	Self sticking label set
<b>Accuracy</b>	Pulse: $\pm(0.001\%RDG + 3DGT)$ DC: $\pm(0.1\%RDG + 3DGT)$ AC: $\pm(0.3\%RDG + 3DGT)$
<b>Temperature drift</b>	$\pm 150ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	1 (display hold, key pad lock or latch alarm reset)
<b>Outputs:</b>	
Alarm	Up to 4
Analogue	1 (20mA, 10VDC)
Serial	RS485, RS232
<b>Other available characteristics</b>	Signal/display scaling. Analogue output scaling. Digital filter, Peak and Valley. Burn-out control on temperature inputs only.
<b>Power supply</b>	90 to 260 AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE; c CSA us and UR
<b>Protection degree</b>	IP65



- powerful variable control by means of up to 4 alarms;
- remote control facilities like analogue output and RS485, RS232 communication ports.

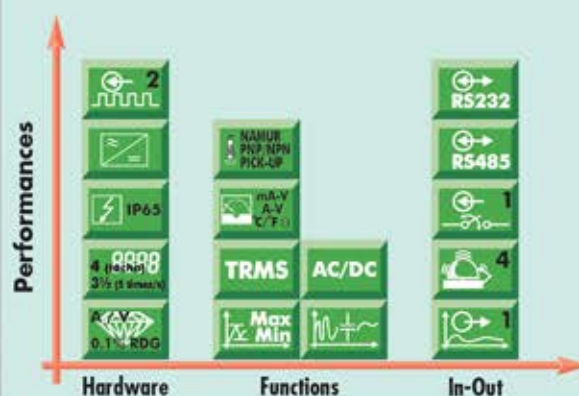
#### The different types of alarm controls:

- up-down functions with automatic reset;
- up-down functions with manual reset;
- down with disabling function at power-on.

These alarms can be combined so to have up to 4 abnormal steps notified as pre-alarms and alarms.

al1 ▼	al2 ▼	al3 ▼	al4 ▼
UDM Universal Digital Meter			

### The best to suit your needs!





## UDM40

UDM40 has the same basic characteristics of UDM35. Other benefits can be summarized as follows:

- display colour adaptable to other existing instruments by means of a 3-colour choice;
- management of non linear signals coming from special process transmitters using a 16-point linearization capability;
- reliable information to the process, working out a complex or disturbed signal by a programmable input integration time and/or a smart digital filter.

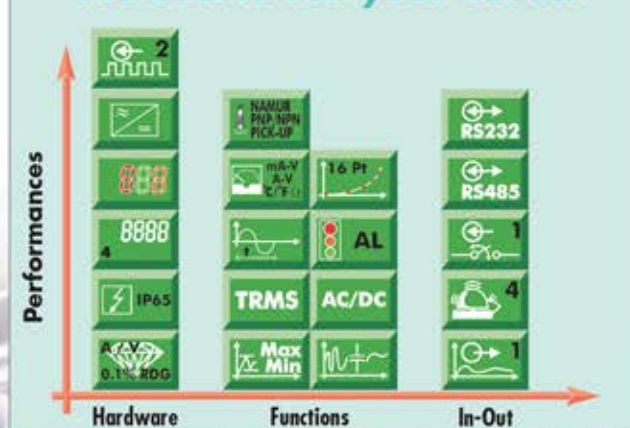
### UDM40

<b>Description</b>	4-DGT $\mu$ P-based controller with modular housing
<b>Housing (H x W x D)</b>	48 x 96 x 105 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	4-DGT, colour LED
<b>Variables on display</b>	YES
<b>Measured signals</b>	(0.2-2-20mA, 0.2-2-20V); (0.2-2-5A, 20-200-500V); (TC: J-K-S-T-E, RTD, $\Omega$ ); speed, frequency, rate, period (0.001Hz to 50kHz)
<b>Type signals</b>	DC and AC TRMS
<b>Engineering units</b>	Self sticking label set
<b>Accuracy</b>	Pulse: $\pm(0.001\%RDG + 3DGT)$ DC: $\pm(0.1\%RDG + 3DGT)$ AC: $\pm(0.3\%RDG + 3DGT)$
<b>Temperature drift</b>	$\pm 150ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	1 (display hold, key pad lock or latch alarm reset)
<b>Outputs:</b>	Alarm: Up to 4 Analogue: 1 (20mA, 10VDC) Serial: RS485, RS232
<b>Other available characteristics</b>	Signal/display scaling. Analogue output scaling. Digital filter. Integration time. Peak and valley. Burn-out control on temp. inputs only. Linearization. Traffic light function.
<b>Power supply</b>	90 to 260 AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE; c CSA us and UR
<b>Protection degree</b>	IP65



Alarm status given at a glance using the easy traffic lights principle. The instrument may show the alarm status based on a sequence of colours that can be programmed by the user.

### The best to suit your needs!





## UDM60

The successful and unique UDM series is now gaining a new model: UDM60, a universal tachometer and counter with dual indication. One advanced unit capable to display simultaneously two independent variables like being two instruments in one. This solution allows the user to save both space on the control-gear and money. This unique feature as well as its modular philosophy show at a glance an accurate digital readout but also the behaviour of the instantaneous variable versus its full-scale. The heart of the in-

### UDM60

<b>Description</b>	6-DGT $\mu$ P-based controller with modular housing
<b>Housing (H x W x D)</b>	48 x 96 x 105 mm
<b>Mounting</b>	Panel mounting
<b>Display type</b>	6-DGT, LCD backlighted display
<b>Variables on display</b>	YES
<b>Measured signals</b>	Speed, frequency, rate, period, totalizer (0.001Hz to 50kHz)
<b>Type signals</b>	DC or AC
<b>Engineering units</b>	Self sticking label set
<b>Accuracy</b>	$\pm(0.001\%RDG + 3DGT)$
<b>Temperature drift</b>	$\pm 100ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	1 (display hold, key pad lock or latch alarm reset)
<b>Outputs:</b>	Up to 4
<b>Alarm</b>	1 (20mA, 10VDC)
<b>Analogue</b>	RS485, RS232
<b>Serial</b>	
<b>Other available characteristics</b>	Signal/display scaling. Analogue output scaling. Digital filter. Peak and valley. Linearization. Combination of the inputs according to predefined functions. Pulse metering and totalizing.
<b>Power supply</b>	90 to 260 AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE; c CSA us and UR
<b>Protection degree</b>	IP65

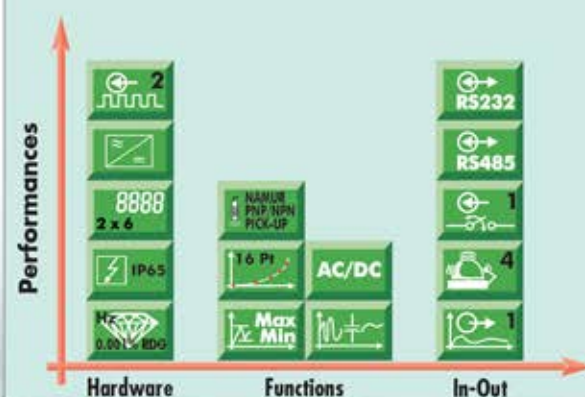


strument is the BQ TFX module which can be combined with the existing UDM series providing a 4-digit readout which is red for UDM35 and red-amber-green for UDM40. The same inputs (A and B) can also be connected between each other to provide specific controls and display func-



tions like 1/A, A/B, A-B, (A-B)/B and B/(A+B) so to manage, for instance, speed or frequency difference or rate.

### The best to suit your needs!





## USC

The winning point of the USC "Universal Signal Conditioner" is its architecture. It is formed by a module holder on which it is possible to plug in modules with different purposes: power supply-measurement-alarm control-signal retransmission. The different combination of the modules allows to have a simple signal conditioner or a very sophisticated controller with communication port. The main advantages given by USC can be summarized as follows:

### USC

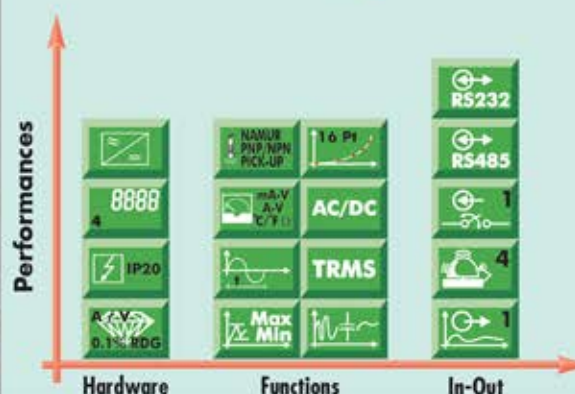
<b>Description</b>	$\mu$ P-based signal conditioner with modular housing
<b>Housing (H x W x D)</b>	44 x 113 x 107 mm
<b>Mounting</b>	DIN-rail mounting
<b>Display type</b>	NO
<b>Variables on display</b>	NO
<b>Measured signals</b>	(0.2-2-20mA, 0.2-2-20V); (0.2-2-5A, 20-200-500V); (TC: J-K-S-T-E, RTD, $\Omega$ ); Speed, frequency, rate, period, totalizer
<b>Type signals</b>	DC and AC TRMS
<b>Engineering units</b>	NO
<b>Accuracy</b>	DC: $\pm(0.1\%RDG + 3DGT)$ AC: $\pm(0.3\%RDG + 3DGT)$ RPM/Hz: $\pm(0.001\%RDG + 3DGT)$
<b>Temperature drift</b>	$\pm 150ppm/^{\circ}C$
<b>Sampling rate</b>	5 times/s
<b>Command inputs</b>	1 (latch alarm reset)
<b>Outputs:</b>	Alarm: Up to 4 Analogue: 1 (20mA, 10VDC) Serial: RS485, RS232
<b>Other available characteristics</b>	Signal/display scaling. Analogue output scaling. Digital filter. Integration time. Peak and valley. Burn-out control on temp. inputs only. Linearization up to 16 points.
<b>Power supply</b>	90 to 260 AC/DC, 18 to 60V AC/DC
<b>Approvals</b>	CE; c CSA us and UR
<b>Protection degree</b>	IP20



















The LEDs on modules show the power supply and communication status all the time.

- easy and quick parameter programming and parameter cloning on other USC's by means of UscSoft or PC Hyperterminal;
- powerful variable control by means of up to 4 alarms;
- remote control facilities like analogue output and RS485, RS232 communication ports;
- management of non linear signals coming from special process transmitters using a 16-point linearization capability;
- reliable information to the process, working out a complex or disturbed signal by a programmable input integration time and/or smart digital filter;
- speed, frequency, rate, period and totalizer functions as UDM60.

### The best to suit your needs!



Accuracy of the main variables	
Front housing protection degree	
Display digits and (sampling rate)	
3-colour display	
Excitation output	
"Traffic light" function. Alarm level connected to the display colour	
Pulse measuring input	
Peak and valley function	
Digital filter with action on the display and signal outputs	
Integration time	
Linearization	
Instantaneous variables displaying	
Analogue output for variable retransmission	
Alarm outputs for variable control	
Digital inputs for external command	
Communication port	

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