Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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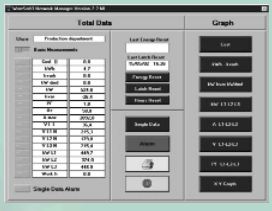
CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

Solutions for Energy Management



- Softwares
- Accessories
- Components for fieldbus

- Modular Power Quality Transducers
- Modular Transducers

- Modular Power Analyzers
- Modular Energy Meters
- Modular Utility Meters

- Multifunction Meters, for DIN-rail and flush mounting

- Universal Utility Meters
- Modular Power Analyzers

Control

Energy Management

Introduction

Big Industries

Nowadays saving energy is becoming increasingly important not only to save the resources of the planet but also because the costs related to energy consumption now have a major role in the final price of the products (as far as industries are concerned) and in the bills of private users.
By means of the measurement and control of some important electrical parameters, such as:

- active and reactive power (fixed costs of the supply);
- active and reactive energy (variable costs of the supply);
- power factor (correct operating of the loads).

It's possible to control the energy consumption and as a consequence the relevant costs.
The more and more widely spread presence of non-linear loads and power electronic devices that produce and are sensitive to electrical disturbances such as:

- inverters for compressors and pumps;
- inverters for industrial automation;
- switching power supplies for computers and communication systems;
- power converters.

All this requires to make a deeper analysis and control of the mains and of the loads, not only taking into account the above mentioned parameters, but also measuring the pollution degree of the electrical lines. The latter parameter is a result of the analysis (FFT) of the harmonic distortion. A continuous harmonic distortion analysis allows to carry out an effective action of control and prevention of the failures in the loads, thus avoiding interruptions in the production processes.

Substations

Shopping centers

Apartment buildings

The problems

The problems can therefore be summed up into two parts:

- the costs due to the consumption of electrical energy
- the costs due to the maintenance and to the stopping of the machinery.

The Solutions

Carlo Gavazzi presents a complete package of products for the energy management, such as:

- Current transformers and voltage transformers for transducers / measuring instruments: TAD and TVX, TVY;
- Transducers for the remote retransmission of all the parameters of an electrical line: CVT, SPT and PQT;
- Energy meters for single-phase and three-phase systems: EM1, EM2, EM3 and EM4.
- Instruments for the analysis of the main parameters and control of the power quality: WM1, WM12, WM2, WM22, WM23, WM24, WM3 and WM4.
- Accessories for the conversion and the adaptation of the serial communication: SIU-PC85, SIU-DIN8585
- Software for analysis and management of electrical parameters: WattSoft2 and WattSoft3.

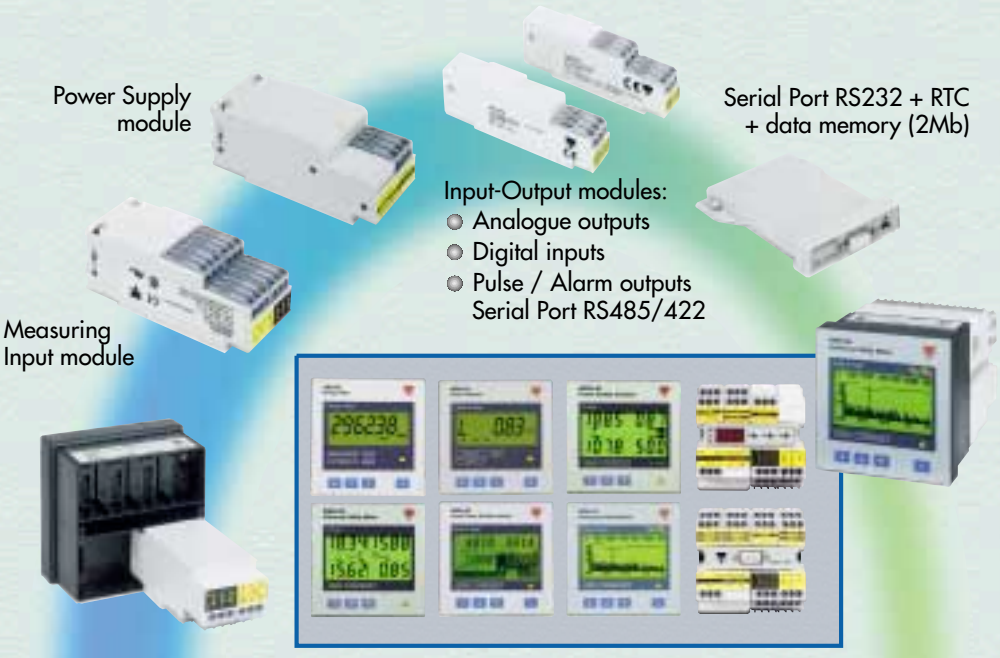
Today this package, together with measuring and accuracy characteristics granted by all the Carlo Gavazzi Instrumentation, offers a further advantage, which is given by a new concept of modularity available for the flush-mounting and DIN-Rail mounting instruments.

A new concept of modularity

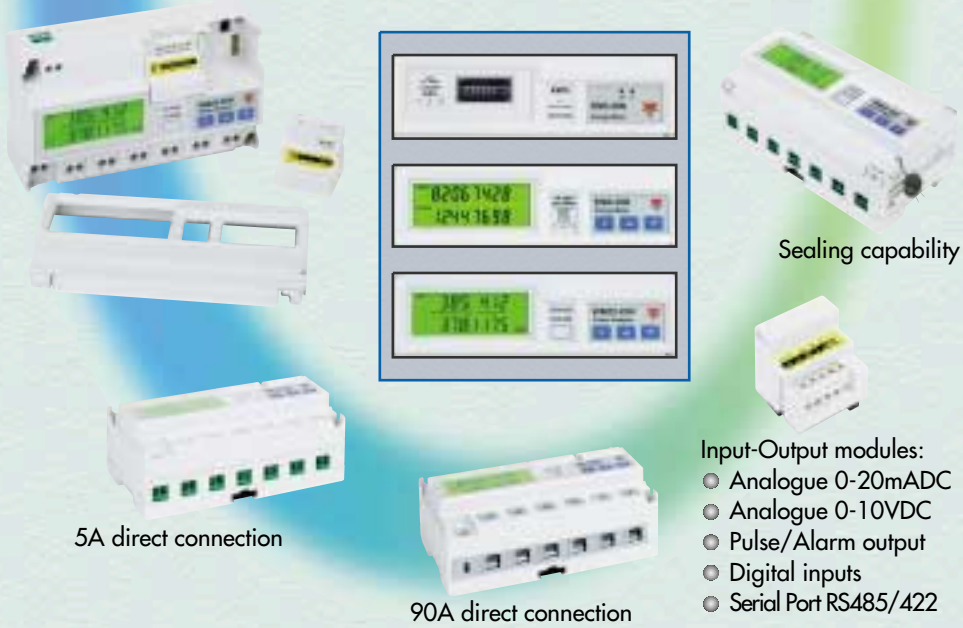
In addition to the obvious need to improve the performances of the measuring instruments in order to keep them up-to-date with the state-of-the-art technology, it is more and more important to offer user-friendly instruments being easily and quickly adaptable to the application and management needs of the customers.

These needs have resulted in a new and modern range of instruments which, according to various criteria of signal processing and displaying, can be turned into:

- transducers
- indicators
- controllers.



The circle of modularity



Technical Advantages and Cost Benefits

- PLUG and PLAY modules common to all models; Maximum in-field flexibility;
- Possibility to expand the number and the kind of outputs according to new application needs without replacement of the instruments in-field.
- Small number of models in-house, with a high offer of possible combinations at the same time.
- Investments in the instrumentation are only limited to the present needs with the possibility to expand it in the future for any additional requirements.

List of the Characteristics Icons

- Accuracy of the main variables
- Standard-compliant energy metering
- Housing front protection degree
- Max measured current in case of direct connection
- Digit number of display
- Harmonic analysis
- Asymmetry control
- Max and/or minimum signal detection and storage
- Data logging
- Internal clock
- Energy metering by time period
- Load profile displaying and recording
- Digital filter with action on display and signals output
- Energy, gas, water metering and displaying
- Instantaneous variables displaying
- Digital inputs for gas/water metering or Wdmd synchro
- Pulse outputs for energy retransmission
- Analogue outputs for variable retransmission
- Alarm outputs for variable control
- Communication port
- Management of external analogue modem
- Management of external GSM modem and SMS messages

The product range

Model	EM1-DIN	EM2-DIN	EM2-96	EM3-DIN
Description	Energy meter	Energy meter	Energy meter	Energy meter
Housing	Front: 89x35mm	Front: 89x107mm	Front: 96x96mm	Front: 90x162.5
Type	STD	STD	Modular	Modular
Display type	Mechanical	LCD (back lighted)	LCD (back lighted)	Mechanical
Variab. on display	YES	YES	YES	YES
Instant. variables	N.A.	N.A.	N.A.	N.A.
Energy variables	5+1 DGT (0.1kW res.)	6 DGT	6 DGT	6+1 DGT
Accuracy	Class 2 (EN 61036)	Class 1	Class 1	Class 2 (EN61036) Class 3 (EN61268)
Temperature drift	≤200ppm/°C	≤250ppm/°C	≤250ppm/°C	≤ 250ppm/°C
Sampling rate	2 samples/s	3 samples/s	3 samples/s	2 samples/s
System type	1-phase	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 3-phase Unbalanced: 3-phase
Voltage inputs (Un)	230VAC	250/433VAC	250/433VAC	120/208VAC, 230/400VAC 380/660VAC
Current inputs (In)	Ib: 15A, Imax: 22.5AAC	5AAC	5AAC	Ib: 20A, Imax: 90AAC
Digital inputs	N.A.	N.A.	N.A.	N.A.
Primary of CT / VT	N.A.	CT: prog. up to 5000A	CT: prog. up to 5000A	N.A.
Measurements: **Variables**	TRMS method kWh	TRMS method Total: kWh, kvarh Partial: kWh, kvarh	TRMS method Total: kWh, kvarh Partial: kWh, kvarh	TRMS method kWh or kvarh (selectable)
Harmonic distortion	N.A.	N.A.	N.A.	N.A.
Outputs: **Pulse** **Alarm** **Analogue** **Serial** **Digital filter**	N.A. 1 (open collector type) N.A. N.A. N.A. N.A.	Up to 2 N.A. Driven by the RS485 port N.A. RS422/485 (Modbus) Action: on RS485 output	Up to 1 N.A. N.A. N.A. RS422/485 (Modbus) Action: on RS485 output	Up to 2 2 (open collector type) N.A. N.A. N.A. N.A.
Other characteristics	Start-up current: 50mAAC	N.A.	Modular concept Plug-in modules: AC power supply DC power supply Relay output Open collector output RS485 port	Start-up current: 80mAAC
Power supply	Self power supply	24VAC, 48VAC 115VAC, 230VAC	24V, 48V, 115V, 230VAC 18 to 60V , 90 to 260VDC	Self power supply, 115VAC, 230VAC
Protection degree	IP40	IP40	IP65	IP40





	EM4-DIN	WM1-DIN	WM12-DIN	WM12-96	WM2-96
	Energy meter	Power analyzer	Multifunction meter	Multifunction meter	Power analyzer
	Front: 90x162.5 mm	Front: 89x71.5mm	Front: 107.5x90mm	Front: 96x96mm	Front: 96x96mm
	Modular	STD	STD	STD	Modular
	LCD (back lighted)	LED	LED	LED	LCD (back lighted)
	YES	YES	YES	YES	YES
	3 1/2 DGT	3 DGT	3 DGT	3 DGT	3 DGT to 3 1/2 DGT accord. to the CT primary
	8 DGT + 7 1/2 DGT	3 DGT	N.A.	N.A.	6 DGT
	Class 1 (EN61036) Class 2 (EN61268)	V-A: ±2% F.S.	W-VA:±(1% F.S.+1DGT) var: ±(2% F.S.+ 1DGT) V_{LL}: ±(1.5% F.S.+ 1DGT) V_{LN}-A: ±(0.5% F.S. +1DGT)	W-VA:±(1% F.S.+1DGT) var: ±(2% F.S.+ 1DGT) V_{LL}: ±(1.5% F.S.+ 1DGT) V_{LN}-A: ±(0.5% F.S. +1DGT)	V-A: ±1% F.S.
	≤200ppm/°C	≤250ppm/°C	≤200ppm/°C	≤200ppm/°C	≤250ppm/°C
	2 samples/s	1 sample/s	1.5 samples/s	1.5 samples/s	3 samples/s
	Balanced: 3-phase Unbalanced: 3-phase	Balanced: 1-3-phase	Balanced: 1-2-3-phase	Balanced: 1-2-3-phase	Balanced: 1-3-phase Unbalanced: 3-phase
	57/100V,120/208VAC 230/400V, 380/660VAC	250/430VAC	100/208VAC, 400/660VAC	100/208VAC, 400/660VAC	250/433VAC
	Ib: 5A, Imax: 10AAC Ib: 20A, Imax: 90AAC	5AAC and 27AAC	5AAC	5AAC	5AAC
	2 indep. (H_2O/gas count., 4 time period selection)	1 for key-pad enabling	N.A.	N.A.	N.A.
	CT: prog. up to 5000A VT: prog. up to 20kV	CT: prog. up to 5000A	CT: prog. up to 5000A VT: prog. up to 10kV	CT: prog. up to 5000A VT: prog. up to 10kV	CT: prog. up to 5000A
	TRMS method Total: kwh, kvarh, H_2O, gas t1-t2-t3-t4: kWh, kvarh; t1-t2: gas; W_{L1}, W_{L2}, W_{L3}, Wdmd	STD System: V, A, VA, W, var, PF, Wh, VAh varh. Max: VA, W, var	TRMS method System: V_{LL}, V_{LN}, An, VA, VAdmd, Wdmd, W, var, PF, Hz. Max: A, Wdmd Single phase: V_{LL}, V_{LN}, A, VA, W, var, PF	TRMS method System: V_{LL}, V_{LN}, An, VA, VAdmd, Wdmd, W, var, PF, Hz. Max: A, Wdmd Single phase: V_{LL}, V_{LN}, A, VA, W, var, PF	TRMS method System: V_{LL}, V_{LN}, A, W, var, PF; Total: Wh, varh; Partial: Wh, varh; Single phase: V_{LL}, V_{LN}, A, W, var, PF
	N.A.	N.A.	N.A.	N.A.	N.A.
	Up to 3 2 (open collector type) 1 (open collector or relay) N.A. RS422/485 (Modbus) N.A.	Up to 1 1 (open collector type) 1 (TRIAC type) N.A. RS485 N.A.	Up to 1 N.A. N.A. N.A. RS422/485 (Modbus) Action: on variables and outs	Up to 1 N.A. N.A. N.A. RS422/485 (Modbus) Action: on variables and outs	Up to 2 1 (open collector type) N.A. N.A. RS422/485 (Modbus) Action: on RS485 output
	Modular concept Plug-in modules: Relay output Open collector output RS485 port Digital inputs	Display scrolling of all the variables by means of the front key-pad	Over neutral current or under and overvoltage indication (warning signal)	Over neutral current or under and overvoltage indication (warning signal)	Modular concept Plug-in modules: AC power supply DC power supply Relay output Open collector output RS485 port
	Self power supply, 24, 48VAC 115V, 230VAC, 18-60VDC	115VAC 230VAC	24VAC, 48VAC, 115VAC, 230VAC, 18 to 60VDC	24VAC, 48VAC, 115VAC, 230VAC, 18 to 60VDC	24V, 48V, 115V, 230VAC 18 to 60V , 90 to 260VDC/AC
	IP40	IP40	IP50	IP50	IP65

The product range

Model	WM2-DIN	WM22-DIN	WM23-96	WM24-96
Description	Power analyzer	Power analyzer	Power quality analyzer	Universal Utility Meter
Housing	Front: 89x107mm	Front: 90x162.5mm	Front: 96x96mm	Front: 96x96mm
Type	STD	Modular	Modular	Modular
Display type	LCD (back lighted)	LCD (back lighted)	LCD (back lighted)	LCD (back lighted)
Variab. on display	YES	YES	YES	YES
Instant. variables	3 DGT to 3 1/2 DGT accord. to the CT primary	4x3 1/2 DGT	4x3 1/2 DGT	4x3 1/2 DGT
Energy variables	6 DGT	7 1/2 DGT	N.A.	7 1/2 DGT
Accuracy	V_{LN}-A: ±1% F.S.	V_{LN}-A: ±(0.5% RDG+1DGT) W-VA: ±(1% RDG+1DGT) Class 1 (EN61036) Class 2 (EN61268)	V_{LN}-A: ±(0.5% F.S.+2DGT) V_{LL}-W-VA: ±(1% F.S. +2DGT) var: ±(2% F.S. +2DGT) THD: ±(3% F.S. +2DGT)	V_{LN}-A: ±(0.5% RDG+1DGT) W-VA: ±(1% RDG+1DGT) Class 1 (EN61036) Class 2 (EN61268)
Temperature drift	≤250ppm/°C	≤200 ppm/°C	≤200 ppm/°C	≤200 ppm/°C
Sampling rate	3 samples/s	2 samples/ s	1.5 samples/s	1.5 samples/s
System type	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 3-phase Unbalanced: 3-phase	Balanced: 3-phase Unbalanced: 3-phase	Balanced: 3-phase Unbalanced: 3-phase
Voltage inputs (Un)	250/433VAC	57/100VAC, 120/208VAC 230/400VAC, 380/660VAC	57/100VAC, 120/208VAC 230/400VAC, 380/660VAC	57/100VAC, 120/208VAC 230/400VAC, 380/660VAC
Current inputs (In)	5AAC	Ib: 5A, Imax: 10AAC Ib: 20A, Imax: 90AAC	5A	5A
Digital inputs	N.A.	N.A.	2 for Wdmd and VAdmd synchro. 1 for prog. lock	3 for time period management
Primary of CT / VT	CT: prog. up to 5000A	CT: prog. up to 5000A VT: prog. up to 10kV	CT: prog. up to 5000 VT: prog. up to 20kV	CT: prog. up to 5000 VT: prog. up to 20kV
Measurements: Variables	TRMS method System: V_{LL}, A, W, var, PF; Total: Wh, varh; Partial: Wh, varh; Single phase: V_{LN}, A, W, var, PF	TRMS method System: V_{LN}, VA, W, var, PF, Hz, total Wh, total varh, partial Wh, partial varh Single phase: V_{LN}, A, VA, W, var, PF, THD. Average: W, VA	TRMS method System: V_{LN}, V_{LL}, An, VA, W, var, PF, Hz, Single phase: V_{LN}, V_{LL}, A, W, var, PF, THD. Average: W, VA	TRMS method System: V_{LN}, VA, W, var, PF, Hz, total Wh, total varh, partial Wh, partial varh, gas, H_2O Single phase: V_{LN}, A, VA, W, var, PF. Average: W, VA
Harmonic distortion	N.A.	Up to the 7th H (V and A)	Up to the 16th H (V and A)	N.A.
Outputs: **Pulse** **Alarm** **Analogue** **Serial** **Digital filter**	Up to 2 1 (open collector type) N.A. N.A. RS422/485 (Modbus) Action: on RS485 output	Up to 3 2 (open collector type) 1 (open collector or relay) 1 (20mA, 10V) RS422/485 (Modbus) Action: on variables and outs	Up to 4 N.A. Up to 2 (relay or o. coll.) Up to 1 (20 mA, 10V) RS485 (Modbus), RS232 Action: on variables and outs	Up to 3 Up to 2 (open collector type) Up to 2 (relay or o. coll.) N.A. RS485 (Modbus), RS232 Action: on variables and outs
Other characteristics	Display scrolling of all the variables by means of the front key-pad	Modular concept Plug-in modules: Relay output Open collector output RS485 port Analogue output Phase asymmetry ctrl	Modular concept Plug-in modules: Relay output Open collector output RS232/RS485 port Analogue output Phase asymmetry ctrl	Modular concept Plug-in modules: Relay output Open collector output RS232/RS485 port Phase asymmetry ctrl Energy time period management
Power supply	24VAC, 48VAC 115VAC, 230VAC	Self power supply, 24, 48VAC 115V, 230VAC, 18-60VDC	24V, 48V, 115V, 230VAC, 18-60V, 90 to 260VAC/DC	24V, 48V, 115V, 230VAC, 18-60V, 90 to 260VAC/DC
Protection degree	IP40	IP40	IP65	IP65





	WM3-96	WM4-96	SPT-90	PQT-90	CVT-DIN
	Power quality analyzer	Universal utility meter	Power transducer	Power quality transducer	Compact transducer
	Front: 96x96mm	Front: 96x96mm	Front: 90x90mm	Front: 90x90mm	Front: 89x71.5mm
	Modular	Modular	Modular	Modular	STD
	Graph LCD, 128x64 pixels (back light.)	Graph LCD, 128x64 pixels (back light.)	LED	N.A.	N.A.
	YES	YES	N.A.	N.A.	N.A.
	Select.: 4x3 1/2 DGT or 4x4 DGT	Select.: 4x3 1/2 DGT or 4x4 DGT	N.A.	N.A.	N.A.
	4x9 DGT, 4x6 DGT	4x9 DGT, 4x6 DGT	N.A.	N.A.	N.A.
	V_{LN}-A: ±(0.5% RDG+1DGT) Hz: ±0.1% F.S. THD: ±1% F.S.; Class 1 (EN61036) Class 2 (EN61268)	V_{LN}-A: ±(0.5% RDG+1DGT) Hz: ±0.1% F.S. THD: ±1% F.S.; Class 1 (EN61036) Class 2 (EN61268)	V_{LN}: ±0.5% F.S. A: ±0.5% F.S. Hz: ±0.5% F.S.	V_{LN}-A: ±(0.5% RDG+1DGT) Hz: ±0.1% F.S. THD: ±1% F.S.; Class 1 (EN61036) Class 2 (EN61268)	Voltage: ±0.5% F.S. Current: ±0.5% F.S. Frequency: ±0.5% F.S.
	≤200ppm/°C	≤200ppm/°C	≤300ppm/°C	≤200ppm/°C	≤200ppm/°C
	10 samples/s	10 samples/s	Response time: ≤250ms	Response time: ≤200ms	Response time: ≤300ms
	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 1-3-phase Unbalanced: 3-phase	Balanced: 1-3-phase Unbalanced: 3-phase	1-phase
	Autoranging 240/415VAC, 400/690VAC	Autoranging 240/415VAC, 400/690VAC	57/100VAC 250/433VAC	Autoranging 240/415VAC, 400/690VAC	100VAC, 500VAC 60mVDC, 10VDC 200VDC
	Autoranging: 1/5AAC	Autoranging: 1/5AAC	1AAC, 5AAC	Autoranging: 1/5AAC	1AAC, 5AAC, 1ADC
	3 independent, for time period synchro.	Up to 6 independent, for time period synchro.	3 independent (to be used with RS485)	Up to 6 independent, for time period synchro.	N.A.
	CT: prog. up to 30000A VT: prog. up to 600kV	CT: prog. up to 30000A VT: prog. up to 600kV	CT: prog. up to 5000A VT: prog. up to 100kV	CT: prog. up to 30000A VT: prog. up to 600kV	All
	TRMS method System: V_{LN}, V_{LL}, An, VA, W, var, PF, Hz, Wh, varh. Single phase: V_{LN}, V_{LL}, A, VA, W, var, PF, THD Average: W, VA, An, PF	TRMS method System: V_{LN}, V_{LL}, VA, W, var, PF, Hz, Wh, varh, gas, H_2O Single phase: V_{LN}, V_{LL}, A, VA, W, var, PF, THD Average: W, VA, var, PF	TRMS method System: V, Amax, VA, W, var, PF, Hz, Wh, varh. Single phase: V Average: W	TRMS method System: V_{LN}, V_{LL}, VA, W, var, PF, Hz, Wh, varh, gas, H_2O Single phase: V_{LN}, V_{LL}, A, VA, W, var, PF, THD Average: W, VA, var, PF	STD V AC V DC A AC A DC Hz (45-65Hz, 350-450Hz)
	Up to the 50th H (V and A)	Up to the 50th H (V and A)	N.A.	Up to the 50th H (V and A)	N.A.
	Up to 8 Up to 4 (open collector type) Up to 4 (relay or o. coll.) Up to 4 (20 mA, 10V) RS485 (Modbus), RS232 Action: on variables and outs	Up to 8 Up to 4 (open collector type) Up to 4 (relay or o. coll.) N.A. RS485 (Modbus), RS232 Modem - GSM management Action: on variables and outs	Up to 3 1 (open collector type) 1 (relay or open coll.) Up to 2 (20mA, 10V) RS485 (Modbus), RS232 Action: on variables and outs	Up to 8 Up to 4 (open collector type) Up to 4 (relay or o. coll.) Up to 4 (20mA, 10V) RS485 (Modbus), RS232 Modem - GSM management Action: on variables and outs	1 N.A. N.A. 0-20, 4-20mA; ±1, 0-10V N.A. N.A.
	Real time clock with alarms and Min/Max variable recording. W, VA, PF and An integration time programming. Energy time period management.	Real time clock with alarms and Min/Max variable continuos recording (2Mb memory). Energy time period and gas, H_2O management. Official watt-hour meter interf.	W integration time programming. Parameter programming by means of removable key-pad or by RS232 port (with proper Software)	Real time clock with alarms and Min/Max variable continuos recording (2Mb memory). Energy time period and gas, H_2O management. Official watt-hour meter interf.	Current or voltage input in the same transducer. Field adjustment from 50 to 130% of the A/V input
	18 to 60VAC/DC, 90 to 260VAC/DC	18 to 60VAC/DC, 90 to 260VAC/DC	18 to 60VAC/DC, 90 to 260VAC/DC	18 to 60VAC/DC, 90 to 260VAC/DC	24VAC, 48VAC 115VAC, 230VAC
	IP65	IP65	IP40	IP65	IP40

Accessories

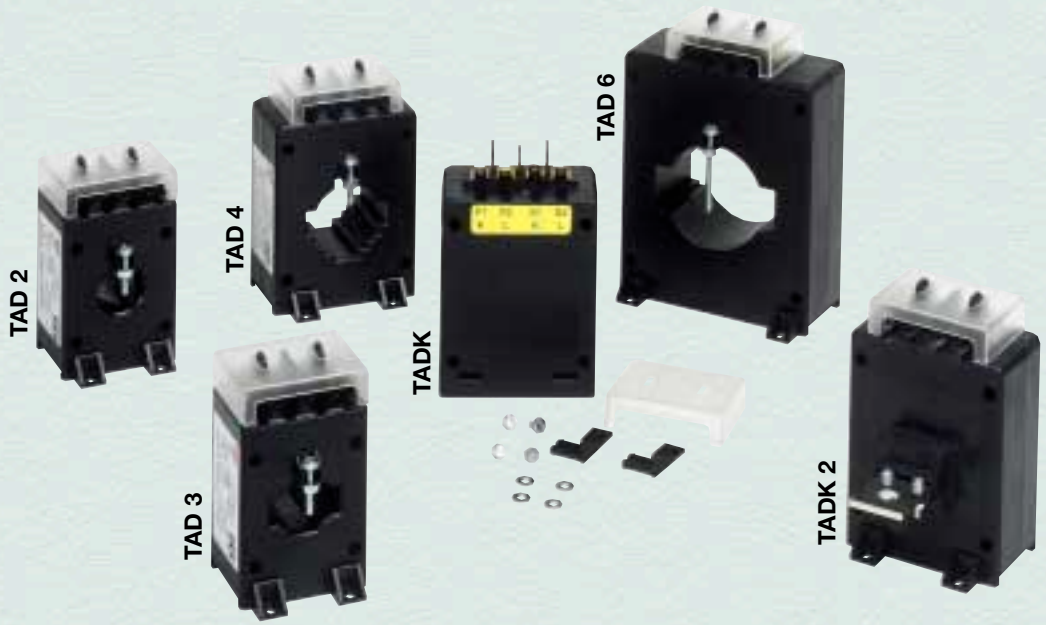
Model	SIU-PC85	SIU-DIN.8585	SIU-DIN.RLY	PSU-DIN (DC/AC)	PSU-DIN (AC/DC)
Description	Serial communication line adapter	Serial communication line amplifier, driver	Serial communication relay outputs	Power supply unit DC to AC	Power supply unit AC to DC
Housing	Front:165x80mm	Front: 89x71.5mm	Front: 89x71.5mm	Front: 89x71.5mm	Front: 89x71.5mm
Signal input:	RS232	RS485, RS422	RS485, RS422	N.A.	N.A.
Working mode	2-wire comm.	2 or 4-wire comm.	2 or 4-wire comm.	N.A.	N.A.
Line Bias	N.A.	YES	N.A.	N.A.	N.A.
Line termination	N.A.	YES	YES	N.A.	N.A.
Connections	9-pole, female	Screw terminal block	Screw terminal block	Screw terminal block	Screw terminal block
Output:	RS422 RS485	RS422	4 relays 5A, 250V	24VDC (max. 50mA) 48VDC (max.125mA) 115VDC (max.250mA)	5VDC (max. 200mA) 12VDC (max. 100mA) 24VDC (max. 50mA)
Working mode	4-wire comm.	4-wire comm.	SPDT contacts	Switching mode	By transformer
Line Bias	YES	YES	N.A.	N.A.	N.A.
Line termination	YES	YES	N.A.	N.A.	N.A.
Connections	Screw terminal block	Screw terminal block	Screw terminal block	Screw terminal block	Screw terminal block
Baud rate	Max. 19200 Baud	Max. 19200 Baud	Max. 9600 Baud	N.A.	N.A.
Protection	All inputs/outputs	All inputs/outputs	N.A.	Output: by fuse	Output: electronic
Indication (by means of LEDs)	Power-on Data-stream	Power-on	Power-on Comm. status Output status	Power-on	Power-on
Insulation	Input/output: 2kV Input/output and power supply: 4kV	N.A.	Input/output: 4kV Input/output and power supply: 4kV	N.A.	Input/output: 4kV
Operating temperature	0 to +50°C (R.H. <90% non condensing) -10 to +60°C (R.H. <90% non condensing)	0 to +50°C (R.H. <90% non condensing) -10 to +60°C (R.H. <90% non condensing)	0 to +50°C (R.H. <90% non condensing) -10 to +60°C (R.H. <90% non condensing)	0 to +50°C (R.H. <90% non condensing) -10 to +60°C (R.H. <90% non condensing)	0 to +50°C (R.H. <90% non condensing) -10 to +60°C (R.H. <90% non condensing)
Included set	1.8m cable with 9 to 9-pole connectors, 9 to 25-pole adapter, power supply cable	N.A.	N.A.	N.A.	N.A.
Other characteristics	Wrong-line connection and full overvoltage protection. Reverse conversion capability	Dual purpose: distance increase by 1200m per unit; network increase	4 relay outputs to be driven by an RS485 communication port	Stabilised AC voltage output. Stability: ≤4% Un @ max. current	Stabilised DC voltage output. Stability:≤0.5% Un @ max. current. Non-stabilised DC voltage outputs: 2V-20V-30VDC
Power supply	24VAC, 48VAC, 115VAC, 230VAC	24VAC, 48VAC, 115VAC, 230VAC	24VAC, 48VAC, 115VAC, 230VAC	9 to 16VDC 18 to 60VDC 80 to 240VDC	24VAC, 48VAC, 115VAC, 230VAC
Protect. degree	IP20	IP40	IP40	IP40	IP40

Current transformers

Model	TADK	TADK2	TAD 2	TAD 3	TAD 4
Class	0.5	0.5	0.5/ 1/ 3	0.5/ 1	0.5/1
Bus–bar size		25x5 mm	20x8 mm	21x14 or 31x11 mm	32x16 or 41x11 mm
Dimensions (H x W x D)	115.5x75x44 mm	115.5x75x44 mm	98.5x58x44 mm	98.5x58x44 mm	75x115.5x44 mm
Standards	IEC 60185	IEC 60185	IEC 60185	IEC 60185	IEC 60185
Accuracy class depending on the burden output	Class 0.5 Burden VA	Class 0.5 Burden VA	Class 0.5 1 3 Burden VA VA VA	Class 0.5 1 Burden VA VA	Class 0.5 1 Burden VA VA
Primary current Nominal output current 1A/5A	1 A 10 5 A 10 10 A 10 15 A 10 25 A 10 40 A 10	1 A 10 5 A 10 10 A 10 15 A 10 25 A 10 40 A 10 50 A 10 60 A 10 80 A 10 100 A 10 150 A 10 200 A 10 250 A 10	40 A 3 50 A 3 60 A 3 80 A 3 100 A 3 4 150 A 3 4 6 200 A 3 4 6 250 A 5 8 10 300 A 5 8 10	100 A 3 150 A 3 4 200 A 3 4 250 A 5 8 300 A 5 8 400 A 6 10 500 A 6 10 600 A 6 10	100 A 3 150 A 3 200 A 4 250 A 6 300 A 6 400 A 10 500 A 10 600 A 10 800 A 10

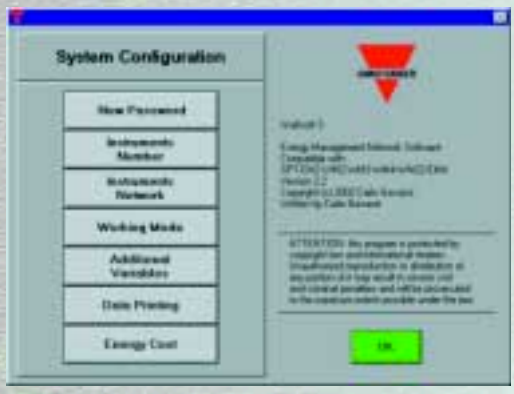
Model	TAD 6	TAD8	TAD 12	TACO 110	TACO 200
Class	0.5/1	0.5/1/5P10	0.5/1/5P10	0.5/1/5P10	0.5/1/5P10
Bus–bar size	55x22 or 65x20 mm	82x32 or 65x34 mm	127x51 or 102x53 mm	Max 110 mm	Max 200 mm
Dimensions (H x W x D)	105x145x44 mm	140x120x55 mm	183x170x65 mm	183x170x 65 mm	295x280x45 mm
Standards	IEC 60185	IEC 60185	IEC 60185	IEC 60185	IEC 60185
Accuracy class depending on the burden output	Class 0.5 1 Burden VA VA	Class 0.5 1 5P10 Burden VA VA VA	Class 0.5 1 5P10 Burden VA VA VA	Class 0.5 1 5P10 Burden VA VA VA	Class 0.5 1 5P10 Burden VA VA VA
Primary current Nominal output current 1A/5A	400 A 6 12 500 A 6 12 600 A 10 20 800 A 10 20 1000A 20 40 1200A 20 40 1500A 30 60 2000A 30 60	400 A 4 12 5 500 A 6 12 5 600 A 10 20 5 800 A 15 20 5 1000A 20 40 5 1200A 30 40 5 1500A 40 60 5 2000A 50 60 5 2500A 60 100 5	800 A 15 30 10 1000A 20 40 10 1200A 30 60 10 1500A 40 80 10 2000A 50 100 10 2500A 60 120 10 3000A 80 160 10 4000A 100 200 10	800 A 15 30 10 1000A 20 40 10 1500A 40 80 10 2000A 50 100 10 2500A 60 120 10 3000A 80 160 10 4000A 100 200 10	1000A 15 30 10 1500A 15 30 10 2000A 15 30 10 2500A 40 80 10 3000A 40 80 10 4000A 50 100 10 5000A 50 100 10 6000A 50 100 10

Cable/Bus–bar type current transformers. Standard output 5A (1A on request). Rated primary currents from 40A to 6000A. DIN–rail or panel mounting. Current transformer 1-phase AC; operating frequency: 40 to 60 Hz; max system voltage: 0.72 kV; rated insulation level: 3kV/1min @ 50Hz; security factor: ≤5; rated secondary current: 5A standard (1A on request).

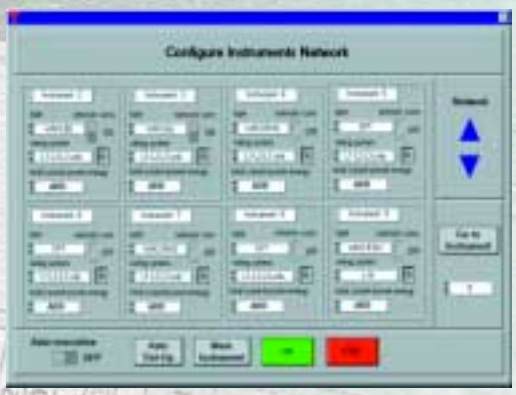


WattSoft2 and WattSoft3

WattSoft2 and WattSoft3 are a Windows 95/98/NT/2000 and Windows XP SCADA software for energy management. These powerful virtual instruments combined with the Carlo Gavazzi hardwares are the most updated answer to all the power and energy parameter control needs. WattSoft3 is a software package that is able to figure-out two basic problems: the management up to 255 mixed field hardwares like: SPT, EM2, EM4, WM2, WM22, WM3, WM4 and so on by means of a MODBUS (RS485) linking system; the supervision and control of all the electrical variables being measured in order to optimize the energy consumption and therefore to save money.
WattSoft2 is a Software package that is addressed to those application where there is a limited instruments network (one or up to 12 instruments) and neither energy costs nor tariffs management are needed. The graph analysis is limited just to the main instrument.



The set-up menus
The following configuration submenus are available:
- Data protection PASSWORD;
- NUMBER OF INSTRUMENTS which belong to the network.
- Details belonging to the INSTRUMENTS NETWORK.
- Kind of network WORKING MODE.
- ADDITIONAL VARIABLE which has to be managed and displayed.
- Parameters belonging to the ENERGY COSTS management.
- Parameters of the DATA PRINTING MODE.



The instruments network configuration menu
For the parameter selection of:
- The instrument number (address) given by the software.
- The type of field hardware: SPT, EM2, EM4, WM2, WM22, WM3, WM4 and so on.
- The network communication activation: ON / OFF.
- The type of wiring system.

In the WattSoft2 the network is limited to 12 instruments.

The alarm set-points menu
The available parameters are:
- Label programming;
- List of network available instruments;
- Type of set-point variable.
- Type of alarms
- SW and HW alarm working mode.

In the WattSoft2 the alarms are limited to the main instrument.

The define Cost Parameters menu
The available cost parameters are:
- Installed power;
- Monthly tariff;
- Over power demand tariff;
- Active energy tariff;
- Reactive energy limit 1 and limit 2;
- Reactive energy tariff 1 and tariff 2;
- Tax on used energy;
- Tax on used power;

The energy costs can be managed by single tariff or dual tariff (night and day).
In the WattSoft2 this page is not available.

Total data page
The main page “TOTAL DATA” shows the execution status of the measurements, indicating the list of all the variables with the measurement results; giving the possibility to reset the total consumed energies, the alarms, the hour counter and allowing the operator to enter various graphs: cost, energy, power, current, voltage, power factor and combination of variables.

Single data page
The page “SINGLE DATA” shows the details of a group of up to six instruments, indicating: the number of the displayed monitoring page, the labels of the instruments “USERS”; the list of all the variables with the measurements results and those measurements indicating the presence of alarm status; the user is allowed to enter every single data page and to see where an alarm condition has been detected by Wattsoft3.
In the WattSoft2 the alarms in this page are not managed.

Data graph page
This monitoring page can be divided into four parts:
- on the upper area it is possible to select the instrument to which the graph belongs and the type of time base needed to be displayed; this page also shows the alarm status of the system, the user label, the wiring system of the instrument, the current date and time;
- on the middle left, the graph of up to four variables;
- on the middle right, all the info connected to the graph (including zoom functions and selection between automatic or manual axis range);
- on the lower right, manual printing enabling of the graph and possibility to go back to the TOTAL DATA page.

In the WattSoft2 this page is available only for the main instrument.

Alarm history page
This page shows the whole list of the occurred alarms with the indication of the relevant instrument, of the variable (variable name, set-point, actual value and hysteresis), of the start and stop time of the alarm.
The Clear key, protected by password, resets the alarms which are called off.
By means of the Print key, the whole alarm history is printed by the default printer.
Note: exiting the execution, the alarm history is reset.
In the WattSoft2 the Alarm history page is managed only for the main instrument.

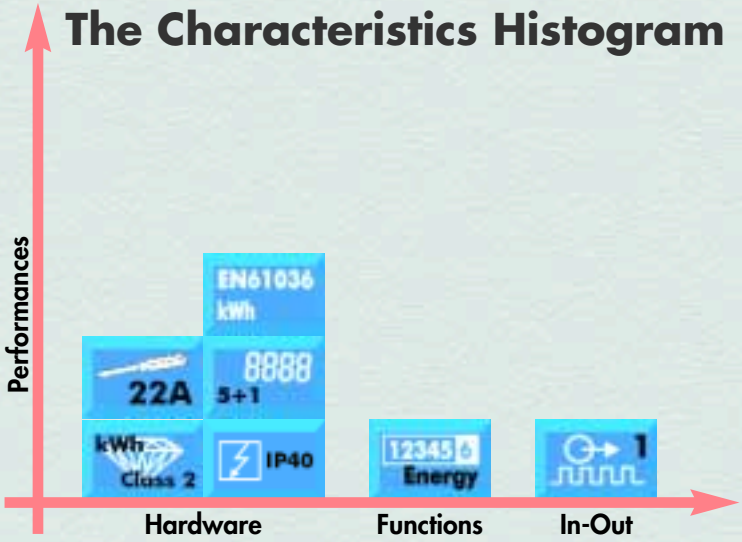
Simplyfied single data page
This page shows the data of up to 18 instrument by page. The measurements are related to cost-kWh-kvarh-kW-PF variables. According to the kind of instrument the ON/OFF switch allows to turn on or off the relevant load.

EM1-DIN

Compact Energy Meter

In the household applications and in the services it is often necessary to measure the consumed active energy of loads belonging to a certain part of the electrical installation. The meter has to be space saving and very easy to connect and to use. EM1-DIN represents the ideal solution: in only one 2-DIN module housing there is a complete active energy meter offering many advantages.

The Characteristics Histogram



- direct connection up to 22.5 A, no CT is needed
- TRMS measurement
- Self power supply, easy connection

EM2-DIN

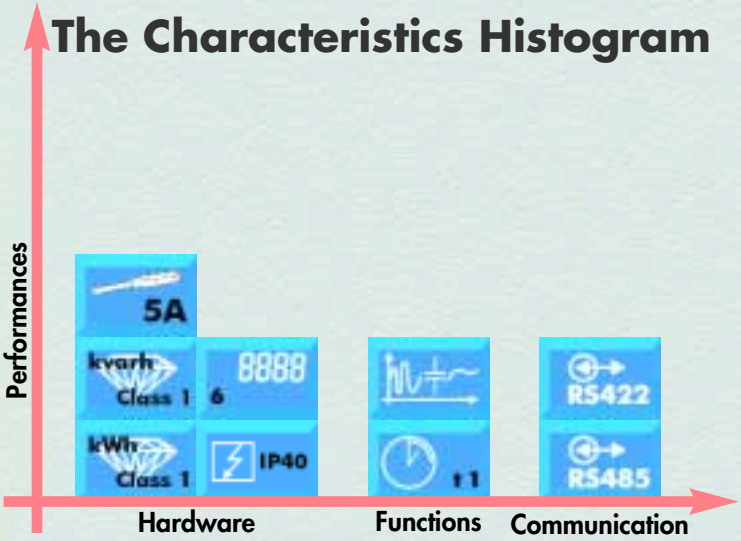
Energy Meter

- **Large display**
- **Compact housing, only 107mm wide**
- **User friendly**

EM2-DIN has been developed for energy metering in various services and light/medium industries.

EM2-DIN displays the total or partial active and reactive energy (kWh and kvarh). In addition, the relay output can be activated via the RS485 interface and can be used, for example, for the remote control of the connection or disconnection of the loads.

The Characteristics Histogram



EM2-96

Modular Energy Meter

EM2-96 is suitable to measure the consumed energy in various services and light/medium industries. This instrument is normally connected downstream the official Watt-hour meter to measure the energy consumed by machines or other kind of loads and branches according to the application needs in order to split the costs accordingly.

EM2-96 displays the total and the partial active and reactive energy (kWh and kvarh). In addition, either the relay or the open collector output can be activated via RS485 interface and can be used, for example, for the remote control of load connection/disconnection.

The advantages given by the exclusive Carlo Gavazzi modular system

- **Plug and play modules**
- **Maximum in-field flexibility**
- **Possibility to add any outputs only when really needed by the application**

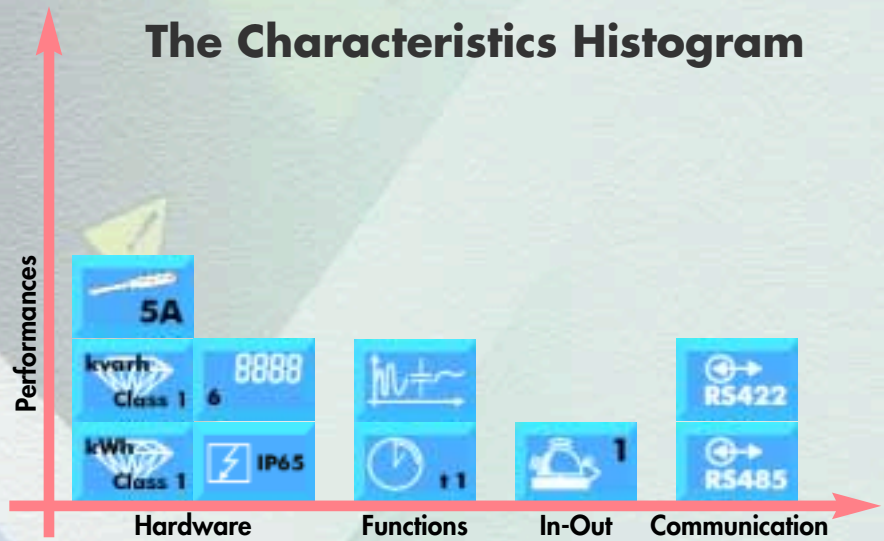
EM2 96 is the ideal solution for:

- Panel makers
- Installers
- Engineering companies
- Building automation
- OEM's

The most significant applications are:

- In the industry, the consumption measurement of lines and loads
- In the services sector the energy measurements in offices, buildings, shopping centres and supermarkets.

The Characteristics Histogram



The displayed energies

EM3-DIN

Energy Meter

The advantages given by the exclusive Carlo Gavazzi modular system

- **Plug and play modules**
- **Maximum in-field flexibility**
- **Possibility to add any outputs only when really needed by the application**

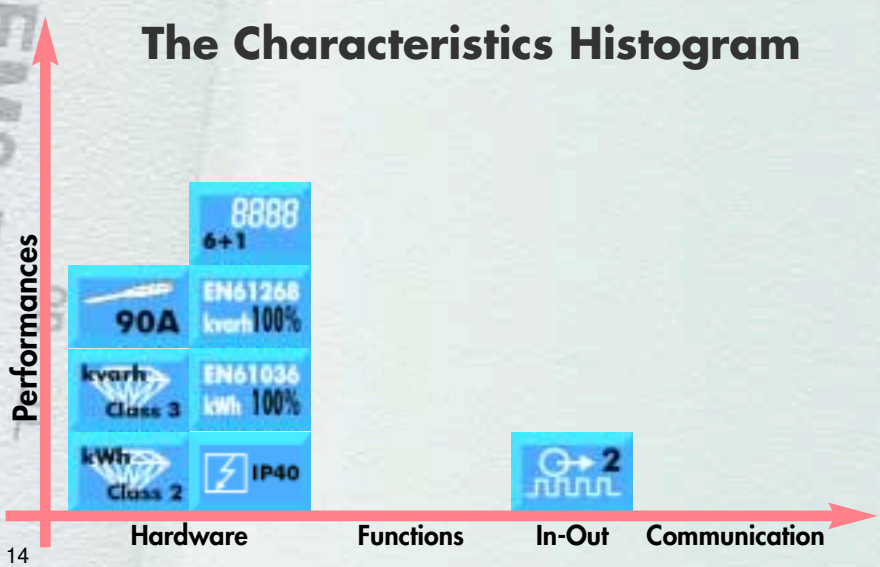
EM3-DIN is an energy meter that has been developed to meet the requirements of those applications where a very simple and reliable instrument is needed.

The main advantages

- Electromechanical display allowing the user to read the consumed energy even when the load or the meter is not power supplied.
- Easy installation avoiding any programming set-up.
- Self power supply making the installation easier and more reliable.
- Direct connection up to 90A allowing the user to save the costs of external current transformers and relevant wiring.
- Dual pulse output transmitting to a PLC or other equipment the active and reactive energy simultaneously.
- Wall mounting avoiding any other protection enclosure.
- Full compliance with both EN61036 (active energy) and EN61268 (reactive energy) granting more reliable and accurate measurements.

EM3-DIN is suitable to be used to meter the active or reactive energy in the light/medium industries, in the services sector and tourism to allocate downstream the official watt-hour meter the production or services costs.

The Characteristics Histogram



The screw terminals
Connections for cables with cross-section area from 6 to 35mm^2 instead of passing-by types assuring a “contactor type” wiring and connection protection.

EM4-DIN

Modular Energy Meter

The advantages given by the exclusive Carlo Gavazzi modular system

- **Plug and play modules**
- **Maximum in-field flexibility**
- **Possibility to add any outputs only when really needed by the application**

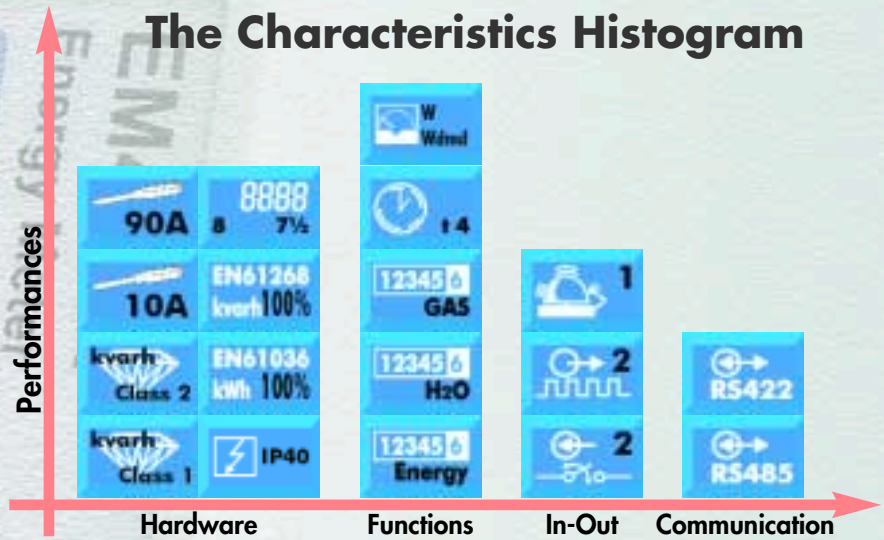
EM4-DIN is an advanced utility meter capable to measure not only the usual consumed energies but also Gas and Water by means of the optional dual contact inputs module.

The main advantages

- High accuracy and resolution for a fine cost calculation.
- Simultaneous indication of both active and reactive energy allowing the user to read the variables at a glance.
- Displaying of the active power demand with manual or external synchronisation. The fixed power supply costs are calculated with the same system used by the electricity board.
- Management of the pulses from gas and water meters based on single or dual tariff calculation and energy multi tariff management (by means of two selection contact inputs) giving more flexibility and meeting the application needs.
- Metering of energy, water and gas in the same instrument allowing the data transmission by means of the same communication port.
- Effective control of phase sequence, serial communication and wrong connection of the current inputs statuts making the instrument installation: easy, fast and free of wiring errors.
- Self power supply working even in case of one phase line failure granting continuous metering of energy.

EM4-DIN has been designed to meet all the application needs in the light/medium industry, offices, buildings, shopping centres, supermarkets and so on in order to allocate, downstream the official watt-hour meter, the production or services costs.

The Characteristics Histogram



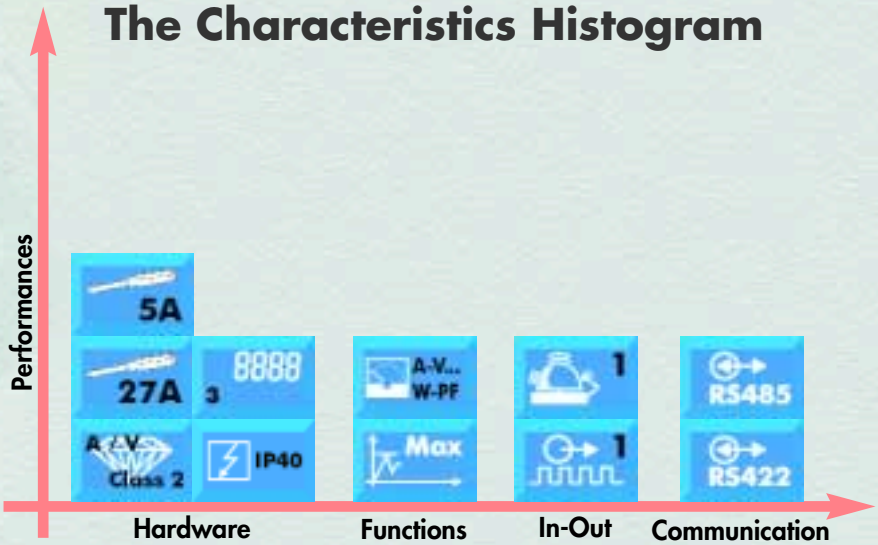
The sealing capability
The new housing concept grants a full sealing capability and connection protection.

WM1-DIN

Compact Power Analyzer

WM1-DIN is a 3-digit power analyser for the manual scrolling of 8 different measurements (among the possible 12), to be carried out on a single-phase or three-phase, balanced load system. This instrument is suitable to be used in those applications where a simple and reliable instrument is needed. The direct connection up to 27 A simplifies the connections and allows to save money since the CT is not needed.

The Characteristics Histogram



WM1-DIN is suitable to measure the main electrical parameters of:

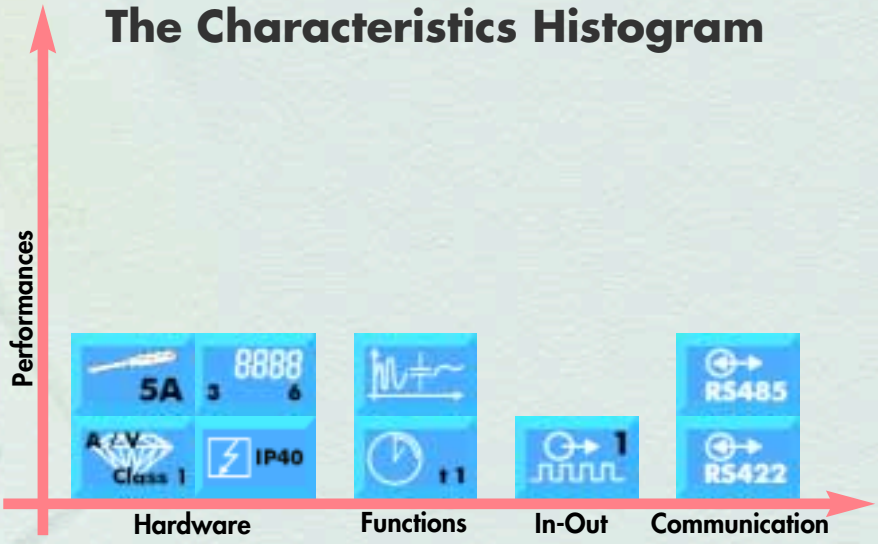
- motors and machines
- oven
- other 3-phase balanced loads

WM2-DIN

Power Analyzer

- **Large display**
- **Compact housing, only 107mm wide**
- **User friendly**

The Characteristics Histogram



WM2-DIN is capable to measure all the electrical parameters of an electrical line or load. Its user friendless allows it to be mounted in the switch and control gears as local indicator instead of the classical single function instruments. WM2-DIN can also be used as remote unit to transmit the measured energy to a PLC by means of the pulse output or all the available measurements to a Personal Computer by means of the RS485 port.

WM12-DIN and WM12-96

Multi Function Meter

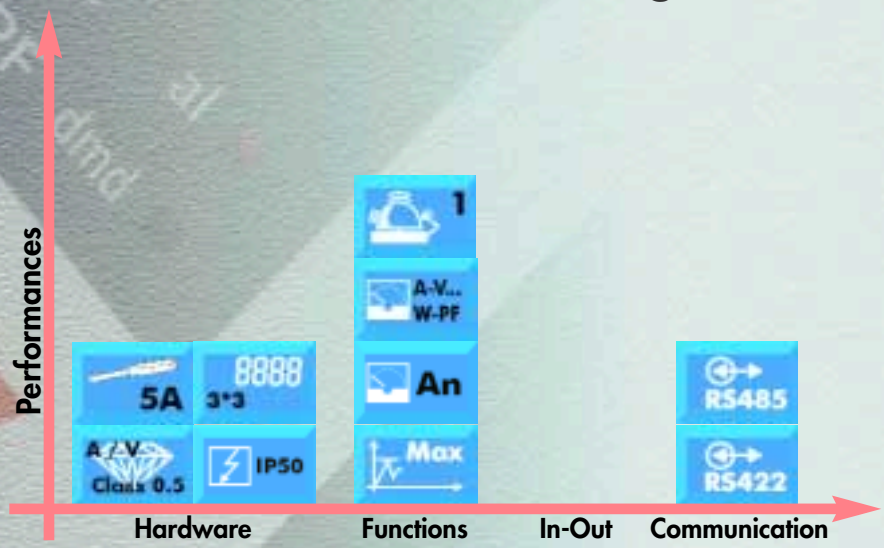
WM12-DIN and WM12-96 are general purpose multi function meters that allow to monitor all the mains parameters of an electrical line or load. The compact housings combined with a complete selection of measurements allow the instruments to be mounted in all the switch and control gears as local indicators, instead of the classical single function analogue or digital panel meters.

- **Replacement of ordinary "DPMs and analogue instrumentation combined by rotary switches"**
- **Status of system power supply and neutral current available at a glance**
- **96x96 version with only 46 mm housing behind the panel, suitable for all switch and control gears**

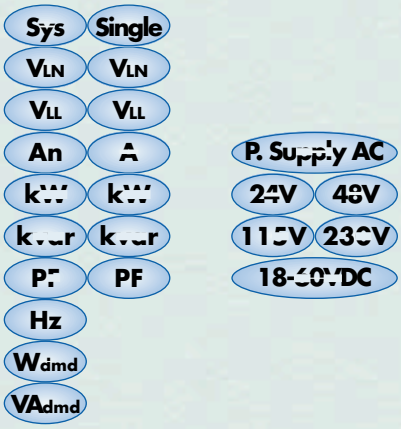
The unit is provided with some unique installation visual status functions like:

- the window control of the mains 3-phase voltage notifying the user at a glance if the mains is supplied out of the requested power supply tolerance,
- the neutral current control showing immediately any load or installation anomaly due to high harmonic distortion or load insulation loss (high earth leakage current).

The Characteristics Histogram



The displayed variables and the available power supplies



WM2-96

Modular Power Analyzer

WM2-96 is a general purpose analyser capable to measure all the electrical parameters of an electrical line or load. Its user friendliness allows it to be mounted in the switch and control gears as local indicator instead of the classical single function instruments.

The same instrument can also be used as remote unit to transmit the measured energy to a PLC by means of the pulse output or all the available measurements to a Personal Computer by means of the RS485 port.

The advantages given by the exclusive Carlo Gavazzi modular system

- **Plug and play modules**
- **Maximum in-field flexibility**
- **Possibility to add any outputs only when really needed by the application**

WM2-96 is the ideal solution for:

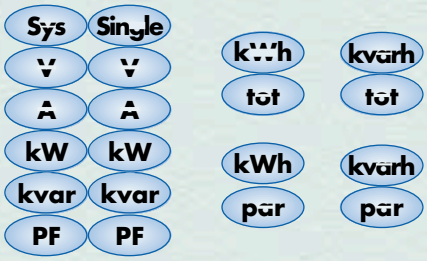
- Panel makers
- Installers
- Engineering companies
- Building automation
- OEM's

The most significant applications are:

- In the industry, monitoring of main and branch lines.
- In the services sector, monitoring of main and branch lines of offices, buildings, shopping centres, super-markets and so on.

The Characteristics Histogram

The displayed variables



WM22-DIN

Modular Power Analyzer

The advantages given by the exclusive Carlo Gavazzi modular system

- **Plug and play modules**
- **Maximum in-field flexibility**
- **Possibility to add any outputs only when really needed by the application**

WM22-DIN is a modular power analyser that allows to monitor all the mains parameters of an electrical line or load. The amazing design of the housing combined with outstanding performances makes WM22-DIN an instrument to be used in all the applications up to 5000A and up to 200kVL-L.

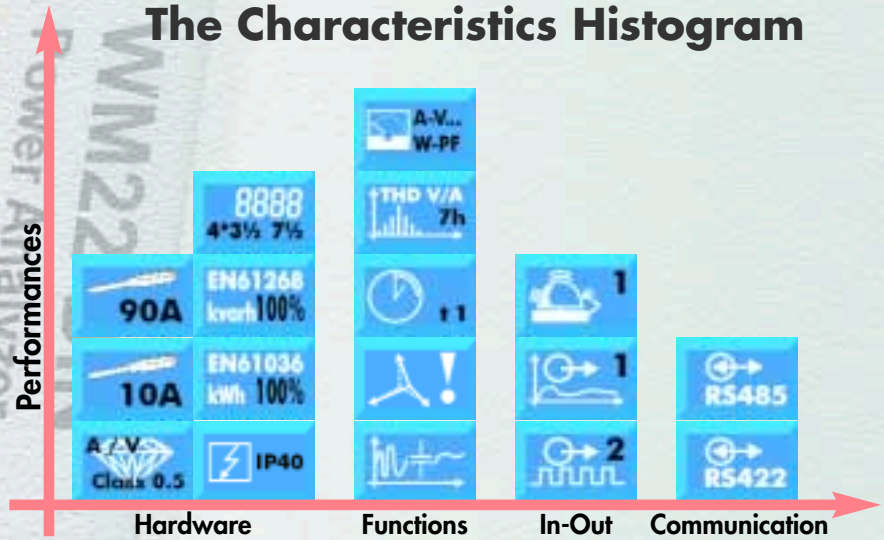
The four remarkable features of WM22-DIN

- Direct measurement of up to 90A. No external current transformer needed.
- Simultaneous display of four variables. Information available at a glance.
- A full range of measurements available. Everything under control.
- Plug and play output modules. Easy interfacing to external devices

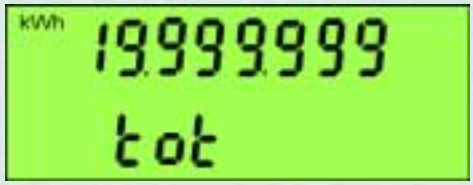
The main advantages

- Total harmonic analysis of both current and voltage notifying potential load failures.
- Phase asymmetry control notifying line failures.
- Dual pulse output, analogue output or RS485 port providing the communication to PLC's and PC's.
- The alarm output connectable to all the system variables, thus providing a local control.
- Serial communication and wrong connection of the current inputs status indication making the instrument installation: easy, fast and out of wiring errors.
- Self power supply working even in case of one phase line failure granting the measurement of all the variables all the time.

The Characteristics Histogram



Example of variables displayed with serial communication diagnostics: r.t (Rx/Tx)



Example of 7 1/2 digit energy displaying

Energy Management and Dupline Field Bus

When an idea becomes a great idea ...
Metering of Energy together with Dupline, all the advantages of a versatile Bus for industrial applications and building automation.

Dupline® Fieldbus Installationbus

The introduction of the Climate Change Levy is affecting consumers of energy in one way or another. The basic outcome is that users who are inefficient in their use of energy will pay more than efficient users. There are several ways to avoid or reduce the extra costs of the CCL but most of them involve some major investments in plants or new technologies such as CHP, wind power or other renewable energy sources. The easiest way to offset these extra costs is to control your consumption of energy.

The fundamental questions you have to ask in order to find a solution to save energy and money

- How much energy is consumed?
- Is there any energy waste?

... and the answers?

- Find an easy way to measure it
- For sure, there are loads that are running even if it is not necessary. For instance, lights and extractor fans when the building is empty. Therefore a smart system to turn the loads ON and OFF is needed.

... the solution is a complete package for Energy Metering and Building Automation available now by Carlo Gavazzi ...

The meters



The other Fieldbus compatible instruments:
DIN-rail mounting: EM1-WM1-SPT-PQT
Flush mounting: WM2-WM3-WM24-WM4.

The main Bus devices

G 4420 7401
4 individual counter inputs for:
4*kWh meters;
2*kWh + 2*kvarh meters.
Reset feature. Data retention in case of power failure.

G 3890 0014
G 3800 0015
Master channel generator.
Power supply:
115V, 230VAC
or 10 to 30VDC

The data acquisition system

The Dupline DDE Server to acquire the information of the Energy meters through the Dupline field Bus system.

The Dynamic Data linked to an Excel spreadsheet to show all the measurements and make all the cost calculations in a simple and powerful way.

energy management by

Energy

Power Generation
Distribution

New modular concept

Maximum field flexibility
Same power supply and output modules for different instruments:
SPT-90
PQT-90
EM2-96
WM2-96
WM23-96
WM24-96
WM3-96
WM4-96

WattSoft3 Energy Meter Management Software. Windows95/98/NT/2000/XP software compatible to manage and to display the energy consumption metered by EM2/ EM4/ WM2/ WM22/ WM3/ WM4/ SPT and so on. Remote ON/OFF switch of the single loads.

Values Management and Transmission

Energy Consumption

Future North American Approvals

CVT-DIN Compact Transducer
Class 0.5, 3 basic models: V-A AC, V-A DC, Hz.
0-20mA, 4-20mA, 0-10V,
0 to ±1VDC output.
Field adjustment capability

V A Hz

SPT-90 Modular TRMS Power Transducer
Class 0.5 (V-A), 2 basic models: 1-ph, 3-ph, 4 input types (from 57V to 433V, 1 or 5A) Available modules: dual analogue output, relay/static output, 3 digital inputs, RS422/485 and RS232 ports, programming keypad. 90x90 mm housing.

Modbus

A V VA
var W Wdmd
PF Wh

PQT-90 Power Quality Transducer
Class 0.5 (V-A);
10 samp./s. Graph display. Harmonic analysis. Measurements on: 1-ph., 3-ph. bal./unbal. load. Up to 4 relay/static outputs and mA-V outputs . RS485 or RS232 port. Up to 6 digital inputs. 2Mb data memory.

Modbus

A V VA
VAdmd var W
Wdmd PF Hz
THD kWh kvar

EM1-DIN Compact TRMS Energy Meter
Class 2 (EN61036). 5+1-DGT readout. kWh meter.
Up to 22.5A direct connection. 1-ph. system.

kWh
tot

EM2-DIN TRMS Energy Meter
Class 1, 6-DGT readout. Measurements on: 1-ph, 3-ph. balanced/ unbalanced load.
2 total and 2 partial energy meters.
Relay output, RS422/485 port.

Modbus

kWh kvarh
tot/par tot/par

Management

Metering, Recording and Reporting

EM2-96 Modular TRMS Energy Meter
Class 1, 6-DGT readout. Measurements on: 1-ph, 3-ph. balanced/unbalanced load. 2 total and 2 partial energy meters. Relay output, RS422/485 port. 96x96 mm housing.

EM3-DIN Modular TRMS Energy Meter
Class 2 (EN61036), class 3 (EN61268), 6+1-DGT readout. Direct connection up to 90A. 3-phase unbalanced load. 2 pulse outputs available on request. 9-DIN housing.

EM4-DIN Modular TRMS Energy Meter
Class 1 (EN61036) class 2 (EN61268), 8-DGT readout. kWh, kvarh, Gas and H_2O meter. Multi tariff management: t1-t2-t3-t4. Direct connection up to 90A or by CT and VT. 2 pulse outputs, RS422/485 port. 9-DIN housing.

WM1-DIN Compact Power Analyzer
Class 2 (V-A), 3-DGT readout. Measurements on: 1-ph, 3-ph. balanced load. Up to 27A direct connection. Alarm or pulse output, RS422/485 port. 4-DIN housing.

WM12-DIN Multifunction Meter
Class 0.5 (V-A), 3*3 DGT readout. Measurement on: 1-ph, 2-ph, 3-ph balanced/unbalanced loads. Visual An or window V control. RS422/RS485 port. 6-DIN housing.

Modbus
kWh kvarh
tot/par tot/par

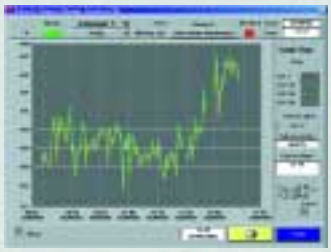
Modbus
kWh kvarh
tot tot

Modbus
kWh kvarh Gas m³
tot/par tariff H_2O m³

A V VA
var W PF

Modbus
A V VA
An var W
Wdmd VAdmd
PF Amax Wdmd max

Energy Man



Wattsoft2 and Wattsoft3 SCADA software for EM2-EM4-WM2-WM22-WM3-WM4-SPT instruments compatible with Windows 95/98/NT/2000/XP.

Back view of the full assembled instrument.

Electrical Parameters monitoring, analysis and control

Future North American Approvals

WM12-96 Multifunction Meter
Class 0.5 (V-A), 3*3 DGT readout. Measurement on: 1-ph, 2-ph, 3-ph balanced/unbalanced loads. Visual An or window V control. RS422/RS485 port. 96x96mm housing.

WM2-DIN TRMS Power Analyzer
Class 1, 3-DGT/ 6-DGT readout. Measurements on: 1-ph, 3-phase bal./unbal. load. System and single phase measurements. Pulse output, RS422/485 port.
6-DIN housing

WM2-96 Modular TRMS Power Analyzer
Class 1, 3-DGT/ 6-DGT readout. Measurements on: 1-ph, 3-phase bal./unbal. load. System and single phase measurements. Pulse output, RS422/485 port.
96x96 mm housing.

WM22-DIN Modular TRMS Power Analyzer.
Class 0.5 (V-A). 4*3 1/2-DGT readout (istant. variables), 7 1/2-DGT (energies). Direct connection up to 90A or by CT and VT. 2 pulse outputs, 10V/20mA DC and alarm outputs, RS422/485 port.
9-DIN housing.

Future North American Approvals

WM23-96 Power Quality Analyzer
Class 0.5 (V-A), 3x3 1/2 DGT read out Measurements on 3-ph. unbalanced loads. Connection by CT and VT. Up to 2 alarms, one analogue output. 96x96mm housing.

Modbus

A V VA An var W Wdmd VAdmd Hz PF Amax Wdmd max

Modbus

A V var W PF kWh kvarh tot/par

Modbus

A V var W PF kWh kvarh tot/par

Modbus

A V VA VAdmd var W Wdmd PF Hz T.D kWh kvar

Modbus

A/An V VA VAdmd var W Wdmd PF Hz T.D Wdmd max PFmin

agement

TopRex®
Top Performances

The modularity family, same modules for different instruments: SPT-90, PQT-90, EM2-96, WM2-96, WM23-96, WM24-96, WM3-96 and WM4-96.

- 4 static outputs module, 100mA pulse according to DIN43864/ alarm outputs (WM3, WM4 and PQT only)
- 3 digital inputs module and excitation output (16 to 24 VDC) (WM4 and PQT only)
- RS232 + real time clock 2Mb data memory module (WM4 and PQT only)

PQT-90

SPT-90

- RS232 (SPT-90 and WM3-96) + real time clock module (WM3-96 only)
- 3 digital inputs module (WM2 and EM2 excluded)
- Single/dual analogue output module: 5-10-20mA, 1-5-10VDC (WM4 and WM24 excluded)

The Modularity Concept

Maximum field flexibility

DEPENDING ON THE MODEL

ALL MODELS

- Single/dual relay output module
- Single/dual static output module 100mA pulse according to DIN43864/ alarm outputs
- RS485 communication module
- Universal power supply module
  18 to 60VAC/DC
  90 to 260VAC/DC

Integrated load profile indication

Future North American Approvals

c UL us

WM24-96 Universal Utility Meter
Class 0.5 (V-A), 3x3 ½ DGT read out. Measurements on 3-ph. unbalanced loads. Connection by CT and VT. Up to 2 pulse outputs, up to 2 alarms. 96x96mm housing.

c UL us

TopRex®

WM3-96 Power Quality Analyzer
Class 0.5 (V-A); 10samp./s. Graph display. Harmonic analysis. Measurements on: 1-ph., 3-ph. bal./unbal. load. Up to 4 relay/static outputs. Up to 4 mA, V outputs. RS485 or RS232 port.

c UL us

TopRex®

WM4-96 Universal Utility Meter
Class 0.5 (V-A); 10samp./s. Graph display. Harmonic analysis. Measurements on: 1-ph., 3-ph. bal./unbal. load. Up to 4 relay/static outputs. RS485 or RS232 port. Up to 6 digital inputs. 2Mb data memory.

WM2-96

EM2-96

Modbus

A/V VA VAdmd
var W Wdmd
PF ∠ kWh
kvar GAS H₂O

Modbus

A/An V VA
VAdmd var W
Wdmd PF ∠
T.D kWh kvar

Modbus

A V VA VAdmd
var W Wdmd PF
PFAVG ∠ T.D Min Max
kWh kvar GAS H₂O

... making energy metering easy in very noisy plants

Many problems… One solution … One supplier!

The unlimited efficient solution possibilities provided by the Dupline Field Bus

- Light control, switching ON/OFF and dimming lights;
- Temperature control, detecting signals from infrared remote controls or PIR sensors and acting on heating elements and/or valves;
- Ventilation control, measure of room and outdoor temperature;
- Monitoring of doors, locks and windows;
- Monitoring of fire alarms from smoke detectors;
- Water leakage detection using proper sensors;
- And many others …

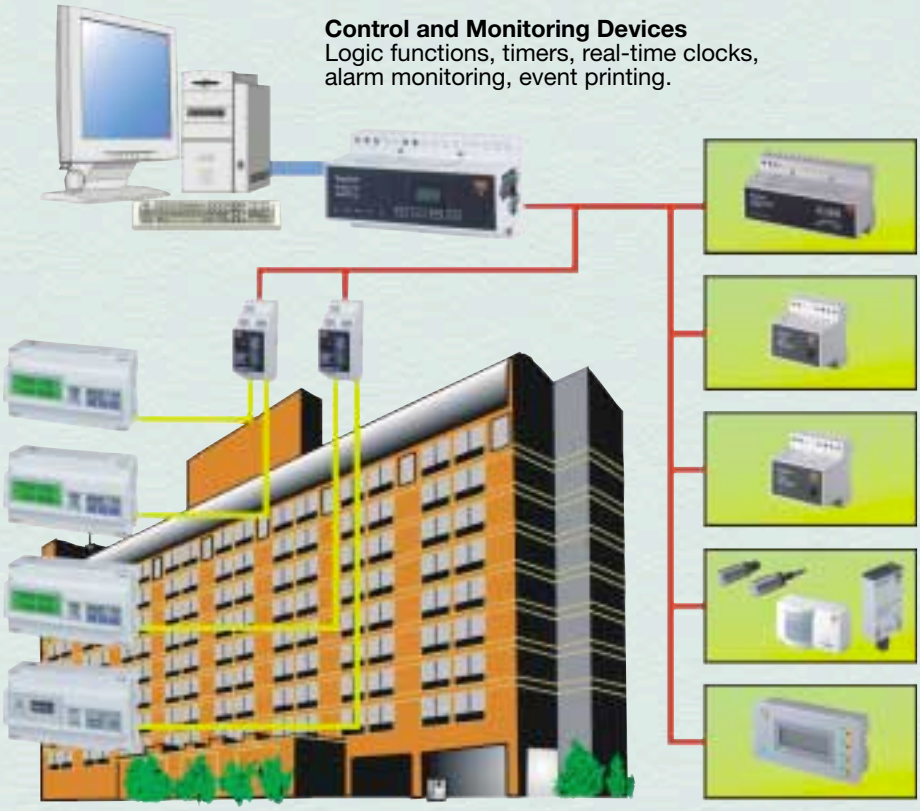

Touristic ports


Apartment buildings


Shopping centers


Industrial applications

Full load control... Energy saving... Cash saving!



Control and Monitoring Devices
Logic functions, timers, real-time clocks, alarm monitoring, event printing.

The Dupline components

Gateways and Interfaces
Profibus-DP, Devicenet, Lon-Work, Interbus-S, ModBus. PLC direct interfaces, Modem.

Digital I/O Modules
1 to 8 contact inputs, 1 to 8 outputs, combined I/O modules.

Analogue I/O Modules
1or 4*20mA/10VDC inputs, 1or 4*20mA/10VDC outputs.

Bus-Powered Sensors
Inductive-magnetic proximity switches, PIR-sensors, temperature sensors.

Displays and accessories
LCD text display, LED display, coding units, repeater.

Main application advantages

- Free topology for a fast, flexible and easy to build step-by-step installation; the system can be easily adapted to new unexpected requirements.
- User friendly: easy to code addresses and test, easily accessible data from a PC/PLC.
- High electrical noise immunity, no shielded cables are needed therefore existing cable/conduit/pipe can be exploited.
- Data communication up to 10 km, no signal repeaters are needed.
- Integration of the metering system with the Dupline door-light-intrusion-remote controls and load switching.
- Cost-effective solution when compared with the ordinary systems.