

# UPM310

## DIN96x96 LED power meter

- DIN 96 cutout for new or retrofit applications
- Fully bi-directional four quadrants readings
- Neutral current monitoring
- Up to 2 optional plug-in boards
- Large and bright LED alphanumeric display
- Power and current demand calculation during user-definable time period
- THD and individual FFT harmonic analysis up to 31<sup>st</sup> order
- On-board memory up to 128 kB
- Programmable Min/Avg/Max & energy data logging



### » General description

UPM310 is a multifunction metering device suitable to measure the electrical parameters. It provides accurate True RMS measurements on bright LED display, or via serial communication port. The WINTOOL software can be downloaded for free from Algodue web site and allows to show on a PC all the measured values and to carry out settings in a faster way. The power meter replaces multiple existing analog meters as well as all single function meters or transducers. The powerful capabilities offered by the instruments make it ideal for stand-alone metering or energy management systems. UPM310 offers a compact unit making it suitable for new installations as well as retrofit applications. The power meter fits in DIN96 square cutouts. The modularity and the upgrade path allow a low initial investment, but as well, to meet future needs. These features allow to build specific meter configurations as required.

### » Benefits

- UPM310 provides hundreds of accurate True RMS metering values at low cost.
- It provides peak average current and power demand information. This data is essential to work out proper strategies aimed at avoiding uncontrolled power peaks and consequent penalties.
- Being ultra-compact with flexible mounting, UPM310 is suitable for replacing conventional meters. It fits in DIN96 cutout allowing retrofit to existing equipment.
- UPM310 allows time and cost saving on mounting, compared to many individual single-function instruments.
- Via communication port it is possible to read and log on a PC all the readings and download the stored data.
- The recorded data allows to generate on a PC consumption profiles, logged value trends, cost allocation and reports as well as to identify critical values.

### » Applications

- Switchboards, gensets, motor control centers, etc.
- Power monitoring & control systems
- Individual machine load monitoring
- Demand management
- Harmonics monitoring
- Remote metering and cost allocation

### » Related Products

- Dedalo Software
- Wintool Software
- AO plug-in board (2 Analog Outputs)

## » Main features

### Measurements

- Three-phase 3-wire or 4-wire unbalanced load operation.
- True rms metering provides accurate measurement even for distorted waveform.
- Fully bi-directional, four-quadrant readings.
- Volts, Amps, Power, PF, Frequency, Energy, Demand and more.
- Individual & total harmonic distortion for voltage and current up to the 31<sup>st</sup> order.
- Direct measurement up to 600 (750) VAC.
- Programmable 1A / 5A current full scale.

### Modularity

- Two slots for optional AO plug-in boards (up to no. 4 analog outputs 0-20 or 4-20 mA).

### On-board memory

- 128 kB non-volatile memory for data storage.
- Programmable start/stop time of recordings.
- Wraparound or Fill (FIFO/Stack) selectable recording mode.
- Min/Avg/Max logging every 1, 5, 10, 15, 30, 60 minutes, programmable up to eight selectable parameters.
- Total and daily energy consumption recording. The individual consumptions are stored more than 300 days.

### Communication

- Both RS232 and RS485 selectable by dip-switches.
- Selectable MODBUS or A2 ASCII protocol.
- Communication speed programmable up to 57600 bps.
- Optional Profibus interface.

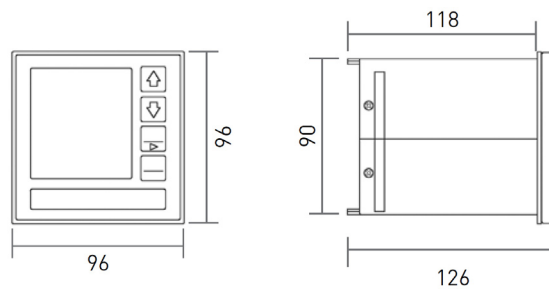
### Digital & analog outputs

- Two digital outputs for energy pulsing or for alarm tripping.
- Up to 4 analog outputs 0-20 or 4-20 mA.

### Other

- Real time waveform downloading via communication port. This function allows to represent graphically on the PC the three voltages and the three currents with 128 samples per cycle.
- Real time clock with battery backup.

## » Technical drawing



INSTANTANEOUS MEASUREMENTS			
PHASE VOLTAGE	$V_{L1-N} - V_{L2-N} - V_{L3-N}$ [V]	●	
LINE VOLTAGE	$V_{L1-L2} - V_{L2-L3} - V_{L3-L1}$ [V]	●	
SYSTEM VOLTAGE	V [V]	●	
LINE CURRENT	$I_{L1} - I_{L2} - I_{L3} - I_N$ [A]	■	
SYSTEM CURRENT	I [A]	■	
POWER FACTOR	$PF_{L1} - PF_{L2} - PF_{L3}$	●	
SYSTEM POWER FACTOR	PF	●	
DISPLACEMENT POWER FACTOR (COSØ)	$DPF_{L1} - DPF_{L2} - DPF_{L3}$	●	
APPARENT POWER	$S_{L1} - S_{L2} - S_{L3}$ [VA]	■	
SYSTEM APPARENT POWER	S [VA]	■	
ACTIVE POWER	$P_{L1} - P_{L2} - P_{L3}$ [W]	■	
SYSTEM ACTIVE POWER	P [W]	■	
REACTIVE POWER	$Q_{L1} - Q_{L2} - Q_{L3}$ [var]	■	
SYSTEM REACTIVE POWER	Q [var]	■	
FREQUENCY	f [Hz]	●	
DEMAND (AVERAGE VALUES)	$I_{AVG} - S_{AVG} - P_{AVG}$	●	

INSTANTANEOUS MEASUREMENTS			
VOLTAGE THD	$THD_{L1} - THD_{L2} - THD_{L3}$ [%]	●	
CURRENT THD	$THD_{L1} - THD_{L2} - THD_{L3}$ [%]	●	
FFT ANALYSIS 31 <sup>st</sup>	[%, V, A]	●	
PHASE SEQUENCE	123 / 132	●	
REAL TIME CLOCK	Date, Time	●	
STORED DATA			
SYSTEM ACTIVE ENERGY	[Wh]	■	
SYSTEM APPARENT ENERGY	[VAh]	■	
SYSTEM LAGGING REACTIVE ENERGY	[varh ind]	■	
SYSTEM LEADING REACTIVE ENERGY	[varh cap]	■	
PEAK VALUES	$I_{AVG} - 3 \times I_{LAVG} - S_{AVG} - P_{AVG}$	●	
DAILY CONSUMPTION (more than 300 days)	[Wh, VAh, varh]	■	
PROGRAMMABLE RECORDINGS			
MIN/AVG/MAX VALUES	[max 8 parameters]	●	
Programmable every 1, 5, 10, 15, 30, 60 min			

### LEGEND

- = Standard
- = Bi-directional value

## » Specifications

<b>POWER SUPPLY</b>	
Rated voltage:	65...250 VAC / 90...250 VDC on request
	19...60 VDC on request
Consumption:	5 VA max
<b>VOLTAGE INPUTS</b>	
Maximum measurable voltage:	600 (750) VAC max L-L
Input impedance:	>1.3 MOhm
Burden:	0.15 VA max per phase
Frequency:	45 - 65 Hz
<b>CURRENT INPUTS (TRMS)</b>	
Rated current (Ib):	1 / 5 A programmable
Min / max measurable current:	20 mA / 7A
Maximum overload:	10 A continuous - 100 A for 1 sec
Input impedance:	0.02 Ohm approximately
Burden:	0.5 VA max per phase
Insulation voltage:	150 VAC max between phases
<b>TYPICAL ACCURACY</b>	
Voltage:	±0.1% reading ±0.03% full scale
Current:	±0.1% reading ±0.05% full scale
Active power:	±0.5% reading ±0.1% full scale (PF=1)
Power factor:	1% reading (0.5 inductive - 0.8 capacitive)
Active energy:	1% reading (0.5 inductive - 0.8 capacitive)
Frequency:	±0.05% reading ±2 digits from 45 to 65 Hz
<b>DISPLAY AND OPERATING CONTROLS</b>	
Display:	high brightness 13.8 mm LED display, three lines, 4 alphanumeric digits
Keypad:	4 push-buttons
<b>DATA MEMORY</b>	
Type:	on-board non-volatile FLASH, 128 kB
<b>COMMUNICATION PORT</b>	
Type:	1 selectable RS232 or RS485, optoisolated
Baud rate:	programmable from 300 to 57600 bps
Protocols:	A2 ASCII, MODBUS
<b>REAL TIME CLOCK</b>	
Type:	with battery backup
Accuracy:	±30 ppm
<b>DIGITAL OUTPUTS</b>	
Type:	2 optoisolated (50 V - 300 mADC)
<b>ENVIRONMENTAL CONDITIONS</b>	
Operating temperature:	from -15°C to +60°C
Storage temperature:	from -30°C to +75°C
Relative humidity:	80% max without condensation
<b>MECHANICAL CHARACTERISTICS</b>	
Material:	metal enclosure
Protection degree:	IP54 (front panel); IP20 (terminals)
Terminals:	EU standard pluggable terminals
Size / weight:	96 x 96 x 130 mm / 750 g
<b>STANDARD COMPLIANCE</b>	
Safety:	73/23/EEC and 93/68/EEC directives, EN 61010.1 safety standard
EMC:	89/366/EEC directive and following modifications
	93/31/EEC and 93/68/EEC, EN50081-2, EN50082-2, EN61326/A1

ORDER CODE	POWER SUPPLY	COM PORT	SELECTABLE COM PROTOCOL		COM2 PROTOCOL	MEASUREMENTS	MEMORY	I/O		REMOTE MANAGEMENT
	Auxiliary	RS232/RS485	A2 ASCII	MODBUS (Sign bit)	PROFIBUS	Harmonics, DPF, THD (V, A)	128kB	DO	AO	WINTOOL (only with A2 ASCII)
<b>FOR 1/5A CTs (not included)</b>										
1204.0001.0001	65...250VAC/90...250VDC	●	●			up to 31 <sup>st</sup>	●	●		●
1204.0002.0001	65...250VAC/90...250VDC	●	●			up to 31 <sup>st</sup>	●	●	2	●
1204.0003.0001	65...250VAC/90...250VDC	●	●			up to 31 <sup>st</sup>	●	●	4	●
1204.0004.0001	19...60VDC	●	●			up to 31 <sup>st</sup>	●	●		●
1204.0005.0001	19...60VDC	●	●			up to 31 <sup>st</sup>	●	●	2	●
1204.0006.0001	19...60VDC	●	●			up to 31 <sup>st</sup>	●	●	4	●
1204.0007.0001	65...250VAC/90...250VDC	●		●		up to 31 <sup>st</sup>	●	●		●
1204.0008.0001	65...250VAC/90...250VDC	●		●		up to 31 <sup>st</sup>	●	●	2	●
1204.0009.0001	65...250VAC/90...250VDC	●		●		up to 31 <sup>st</sup>	●	●	4	●
1204.0010.0001	19...60VDC	●		●		up to 31 <sup>st</sup>	●	●		●
1204.0011.0001	19...60VDC	●		●		up to 31 <sup>st</sup>	●	●	2	●
1204.0012.0001	19...60VDC	●		●		up to 31 <sup>st</sup>	●	●	4	●
1204.0013.0001	65...250VAC/90...250VDC	●	●		●	up to 31 <sup>st</sup>	●	●		●
1204.0014.0001	65...250VAC/90...250VDC	●	●		●	up to 31 <sup>st</sup>	●	●	2	●
1204.0015.0001	65...250VAC/90...250VDC	●	●		●	up to 31 <sup>st</sup>	●	●	4	●
1204.0016.0001	19...60VDC	●	●		●	up to 31 <sup>st</sup>	●	●		●
1204.0017.0001	19...60VDC	●	●		●	up to 31 <sup>st</sup>	●	●	2	●
1204.0018.0001	19...60VDC	●	●		●	up to 31 <sup>st</sup>	●	●	4	●

**LEGEND**

**SELECTABLE COM PROTOCOL:** A2 ASCII/MODBUS user selectable. The instrument is factory preset on the protocol checked in the table.

**DO:** 2 digital outputs for alarm or pulse emission.

**AO:** Analog outputs for real time parameter variation transmission. The output number changes according to the model (see table).

**WINTOOL:** Software for instrument remote management, downloadable for free at [www.algodue.it](http://www.algodue.it), in the Client protected area.

NOTE: Subject to change without notice



Innovative Electronic Systems

Via Passerina, 3/A - 28010 Fontaneto d'Agogna (NO) - Italy - Tel.: +39 0322 89307

sales@algodue.it - [www.algodue.com](http://www.algodue.com)

72PG01\_2\_201705\_1