UPM215
DIN-Rail LCD Power Meter

$C\epsilon$

- Compact 6 DIN Modules Size
- Fully Bi-Directional Four Quadrants Readings
- True RMS Measurement
- High Contrast Graphic LCD Display with Excellent Visibility
- Neutral Current Monitoring
- THD and Individual FFT Harmonic Analysis up to 31st Order
- Power and Current Demand Calculation During User-Definable Time Period
- 128 or 512 kBytes On-Board Memory
- Programmable Min/Avg/Max & Energy Data Logging
- No PTs Required up to 600 (750)V_{AC}
- Programmable PT and CT values

General Description

The UPM215 is a multifunction metering device with advanced functionality features, suitable for electrical parameters measurement.

The UPM215 provides accurate True RMS values on graphic LCD display, or via communication port. Four or more parameters displayed simultaneously give the complete situation of the electrical line at first sight.

It performs clear graphical functions such as: harmonic spectrum and phasor diagrams.

The UPM 215 stores minimum, average and maximum values on eight selectable parameters and daily energy consumption values.

A simple menu structure makes the instrument easy-to-use and allows a quick check of the instrument set-up and memory status. Five languages can be selected easily: English, German, Italian, French and Spanish.

The backlighted LCD display is highly efficient therefore it guarantees perfect visibility in all light conditions.

The power meter replaces multiple existing analog meters as well as all single function meters or transducers. The powerful capabilities offered by the instrument make it ideal for stand-alone metering or energy management systems.

Benefits

- The UPM215 provides hundreds of accurate True RMS metering values at low cost.
- The UPM215 offers complete and accurate information about circuit loading; it calculates neutral current and performs load trending. This data is essential for network overloads detection and circuit optimization.
- It provides peak average current and power demand information that allow to work out proper strategies aimed at avoiding uncontrolled power peaks and consequent penalties.
- 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 values trends, event and alarm reporting, 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

Main Features

Measurements

- Single-phase and 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, Min/Max values, Demand and more.

- Individual & total harmonic distortion for voltage and current up to the 31st order.

- Direct measurement up to 600 (750)V_{AC}.

- Programmable PT and CT values.

On-Board Memory

- 128 or 512 kBytes 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. Are stored the individual consumptions of more than 300 days.

Communication

- RS232 or RS485 optoisolated communication port.

- Modbus protocol or Standard ASCII protocol.

- Communication speed programmable up to 57600 bps.

Inputs & Outputs

- Up to 4 digital outputs for energy pulsing or for alarm tripping.

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.

- Calculation of capacitor bank value for PF compensation.

- Optional internal interface for Rogowski transducer. Available range 200, 1000 or 3000A on request.

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	●
COS Ø	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)	P_{AV} - S_{AV} - I_{AV}	●
VOLTAGE THD	THD_{L1} - THD_{L2} - THD_{L3} [%]	○
CURRENT THD	THD_{L1} - THD_{L2} - THD_{L3} [%]	○
FFT ANALYSIS 31ST	V_{L1-N} - V_{L2-N} - V_{L3-N} - I_{L1} - I_{L2} - I_{L3} [%, V, A]	○
PHASE REVERSAL	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	P_{AV} - S_{AV} - I_{AV} - I_{L1} - I_{L2} - I_{L3}	●

PROGRAMMABLE RECORDINGS

DAILY CONSUMPTION (More than 300 days)	[Wh, VAh, varh]	■
MIN / AVG / MAX VALUES[1]	[1]	●

● = Standard   ■ = Bi-directional value   ○ = Optional

(1) Programmable every 1, 5, 10, 15, 30, 60 min - Maximum 8 parameters selected among voltage, current, power, THD, frequency, PF.

Specifications

Power supply
Rated voltage: 230 V$_{AC}$ or 115 V$_{AC}$ on request +15% -20%
Consumption: 2VA max

Voltage inputs
Maximum measurable voltage: 600 (750)V$_{AC}$ max L-L
Input impedance: >1.3 MOhm
Burden: Max 0.15 VA per phase
Frequency: 45 - 65 Hz

Current inputs
Rated current (Ib):   1 / 5 A$_{RMS}$ programmable
Min / max measurable current: 20 mA / 7 A$_{RMS}$
Maximum overload: 10A$_{RMS}$ continuous - 100 A$_{RMS}$ for 1 sec.
Input impedance: 0.02 Ohm approximately
Burden: Max 0,5 VA per phase
Insulation voltage: 150 V$_{AC}$ max between phases

Typical accuracy
Voltage: ± 0.2% reading ± 0.05% full scale
Current: ± 0.2% reading ± 0.1% full scale (5 A$_{RMS}$)
Active power: ± 1% reading ± 0.1% full scale (PF=1)
Power factor: 1% reading (0.5 inductive - 0.8 capacitive)
Active energy: 1.5% reading (0.5 inductive - 0.8 capacitive)
Frequency: ± 0.05% reading ± 2 digits from 45 to 65 Hz

Display and operating controls
Display: Back-lighted graphic LCD 132x64 dots
Keypad: 4 push-buttons

Data memory
Type: On-Board non-volatile FLASH
                                        128 or 512 kBytes

Communication port
Type: RS232 or RS485 on request, optoisolated
Baud Rate: 300 to 57600 bps

Real Time Clock
Type: With battery backup
Accuracy: ± 30 ppm

Digital outputs
Type: No.2+2 isolated Optomos (50V - 300mA$_{AC-DC}$)

Environmental conditions
Operating temperature: From -15°C to +60°C
Storage temperature: From -25°C to +75°C
Relative humidity: 80% max. without condensation

Mechanical characteristics
Material: Plastic enclosure - noryl UL94-V0
Protection degree: IP20
Terminals: Conductors 2.5mm^2
Size / Weight: 106 x 90 x 57 mm, 300 gr

Standards compliance
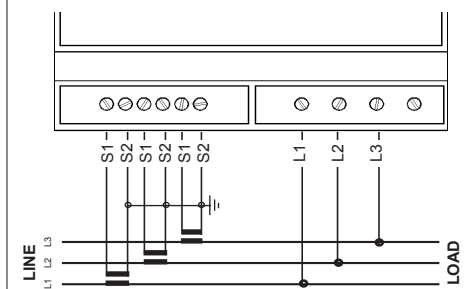Safety: 73/23/EEC and 93/68/EEC directives,
                                        EN61010.1 safety standard
EMC: 89/366/EEC directive and following
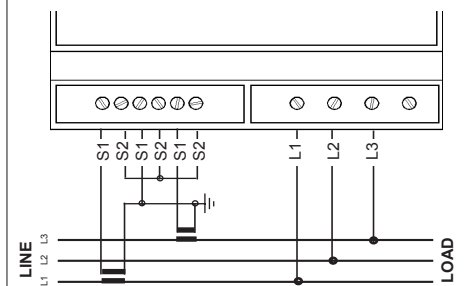   modifications 93/31/EEC and 93/68/EEC,
                                        EN50081-2, EN50082-2, EN61326/A1

## TYPICAL WIRING DIAGRAMS
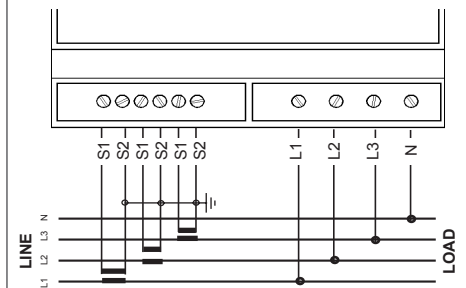
3-Phase 4-Wire up to 600V

3-Phase 3-Wire/3CTs up to 600V

3-Phase 3-Wire/2CTs up to 600V

Instruments Comparison Table

	UPM204/UPT2010	UPM215/UPT2020
DISPLAY (UPM only)	LED 6x3 digits	graphic LCD
MEASURED PARAMETERS	56 / 59 (1)	61+375(2)
VOLTAGE AND CURRENT THD		●
INDIVIDUAL HARMONICS (FFT)		○
DPF CALCULATION		○
H/L TARIFF REGISTERS	○	
MEMORY + PROGRAMMABLE RECODINGS		128 or 512 kBytes
WAVEFORM DOWNLOADING(3)		●
REAL TIME CLOCK		●
DIGITAL OUTPUTS	No.2 - pulse	No.4 - alarm+pulse
DIGITAL INPUTS	1	
WIRING MODES	2	3

(1) = On display / On serial port   ● = Standard

(2) = Harmonics + DPF   ○ = Optional

(3) = The sampled waveform can be downloaded in real time via serial port.

DIN Rail mounting and size (mm)

106

58

94 max
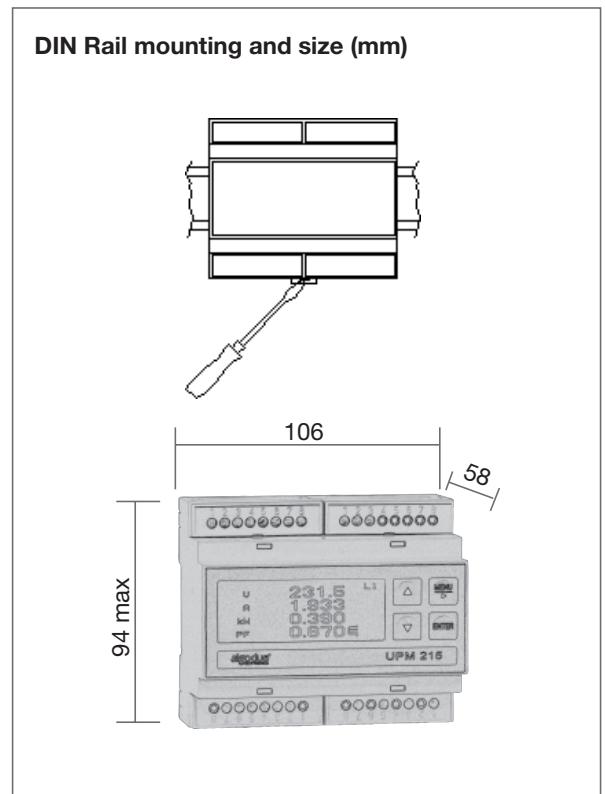
DEDALO Communication Software

- For Microsoft Windows environment
- User-friendly
- Single point and network version
- Real-time data viewing and trending
- Quick instruments setup
- Up to 5 data logging files

DEDALO software enables power meters to be connected to a PC. It allows to download, to display, to collect and analyse all electrical parameters.

It is also an easy and fast tool for direct or remote connection. It allows to connect to the meters by serial communication port (RS232 or RS485) or by external devices such as telephone line or Ethernet/Internet. This remote monitoring function allows to carry out all the functions from instrument setup to data monitoring or downloading.

The DEDALO software is available in two different versions:

- DEDALO SP: software for single meter connection.

- DEDALO NET: software version for a meter network up to 512 instruments. It is available as workstation package or for multiple user access (LAN version).

Main Features

DEDALO software performs the following main functions:

- Real-time Data Viewing and trending
- Instrument recordings download
- Quick Instrument Setup
- Alarms & Limits
- Up to 5 data logging files & Printouts
- Export Data File

Both the software basic versions can grow by additional functions as the requirements change.

ORDERING INFORMATION

| ALQ | A | | | | | | X | | X | X | |

UPM215

Series

Manual Language
D = German
I = Italian
U = English

Communication Protocol
B = ASCII Standard
C = MODBUS

Aux Power Supply
A = 115V_{AC} +15% -20%
B = 230V_{AC} +15% -20%

Serial Port
2 = RS232
5 = RS485

Memory
1 = 128 kBytes (basic version)
2 = 512 kBytes

Firmware Options
2 = Basic version
3 = HARM - Harmonics to 31st + DPF

Unused
X = None

Other
X = None
P = RGW - Rogowski inputs 200A
R = RGW - Rogowski inputs 1000A
S = RGW - Rogowski inputs 3000A
C = RGW - Rogowski inputs (customized val.)

Inputs
X = None

Analog Outputs
X = None

Digital Outputs
X = None
2 = No.2 optomos outputs (50V - 300mA$_{AC-DC}$)
4 = No.4 optomos outputs (50V - 300mA$_{AC-DC}$)

NOTES
1) The basic instrument configuration includes:
- Power Supply 115 or 230V_{AC} on request (+15% -20%)
- 128 kBytes data recording memory
- Real Time Clock with battery backup
- RS232 or RS485 Serial Port (to be specified)

Subject to change without notice

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INNOVATIVE ELECTRONIC SYSTEMS

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