

# UPT2010

## DIN-Rail Power Transducer



- Compact 6 DIN Modules Size
- True RMS Measurement
- More than 50 Electrical Parameters Measured
- Neutral Current Monitoring
- Bi-Directional, Four Quadrants Values on Serial Communication Port
- Power and Current Demand Calculation During User-Definable Time Period
- Available with Built-In Ethernet 10/100 Base-T
- No PTs Required up to 600 (750)V<sub>AC</sub>
- Programmable CT Ratio
- WINTOOL Communication Software Available for Free on the Web



### General Description

The UPT2010 is a digital transducer able to measure the electrical parameters on three-phase systems.

It provides accurate measurements even by distorted waveform.

The RS232 or RS485 serial communication port allows to transfer the three-phase electrical parameters from the instrument.

Two different software are available for PC:

- WINTOOL: available for free on the internet, allows to show on a PC all the measured values and to program the instrument in a fast way
- DEDALO: a powerful software with a complete range of function, for a single instrument connection or for a meter network up to 512 instruments.

The UPT2010 replaces multiple analog transducers as well as single function devices such as voltmeters, ammeters, wattmeters, varmeters, frequency-meters, powerfactor-meters, energy-meters, etc.

The UPT2010 is a compact, cost effective multi-function transducer suitable for energy monitoring and management network.

See the UPM204 / UPM215 and UPT2010 / UPT2020 comparison table on page 4

### Benefits

- The UPT2010 is the low cost solution for monitoring of all the main electrical parameters.
- 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.
- The UPT2010 being ultra-compact and easy to mount is suitable for replacing conventional transducers. The UPT2010 provides powerful capabilities not offered by traditional analog transducers.
- The UPT2010 offers time and cost saving on mounting, compared to many individual single-function devices.
- Via communication port it is possible to read and log on a PC all the readings. The remote connection allows to generate on a PC consumption profiles, logged values 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
- Remote metering and cost allocation

**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 values on serial communication port
- More than 50 electrical parameters measured (instantaneous, demand, peak values, energies, etc.)
- Direct measurement up to 600 (750)V<sub>AC</sub>
- Programmable CT ratio
- Optional temperature indication

**Communication**

- RS232 or RS485 optoisolated communication port
- Modbus protocol or standard ASCII protocol
- Communication speed programmable up to 57,600 bps

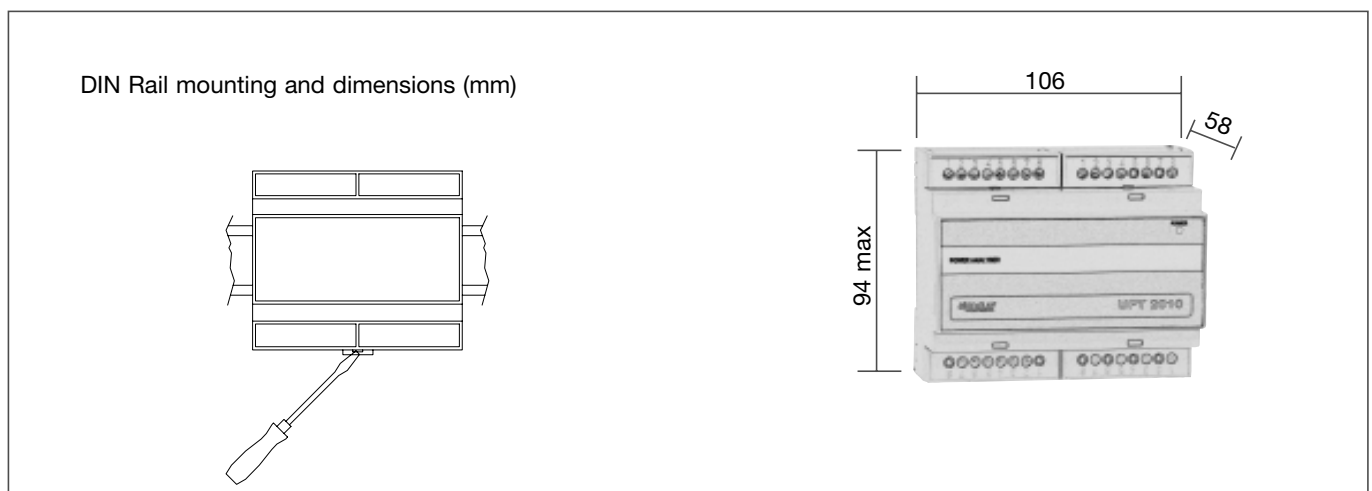
**Inputs & Outputs**

- Two digital outputs for energy pulsing
- Optional one digital input for tariff sincronization

**UPT2010 ETH**

- Built-in 10/100 Base-T ethernet interface
- On-board HTML Web Page server or direct communication through Ethernet / Internet network using Modbus or standard ASCII protocol

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	●
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)	$3 \times I_{AVG} - S_{AVG} - P_{AVG}$	●
PHASE REVERSAL	123 / 132	●
TEMPERATURE	T [°C, F]	○
TIME COUNTER	Elapsed Time [Hours]	○
STORED DATA		
SYSTEM ACTIVE ENERGY	[Wh]	■
SYSTEM APPARENT ENERGY	[VAh]	■
SYSTEM LAGGING REACTIVE ENERGY	[varh ind]	■
SYSTEM LEADING REACTIVE ENERGY	[varh cap]	■
H/L TARIFF REGISTERS	[Wh, VAh, varh]	○
PEAK VALUES	$3 \times V_{L-N} - 3 \times V_{L-L} - 3 \times I_L - 3 \times I_{AVG} - I_N - P_{AVG} - S_{AVG}$	●
● = Standard   ■ = Bi-directional value   ○ = Optional		



**Specifications**

**Power supply**

Rated voltage: Selectable 115 / 230 V<sub>AC</sub> +15% -20%  
 Consumption: 2VA max

**Voltage inputs**

Maximum measurable voltage: 600 (750)V<sub>AC</sub> max L-L  
 Input impedance: >1.3 MΩ  
 Burden: max 0.15 VA per phase  
 Frequency: 45 - 65 Hz

**Current inputs**

Rated current (I<sub>b</sub>): 5 A<sub>RMS</sub>  
 Min / max measurable current: 20 mA / 7 A<sub>RMS</sub>  
 Maximum overload: 10A<sub>RMS</sub> continuous - 100 A<sub>RMS</sub> for 1 sec.  
 Input impedance: 0.02 Ω approximately  
 Burden: max 0,5 VA per phase  
 Insulation voltage: 150 V<sub>AC</sub> max between phases

**Typical accuracy**

Voltage: ± 0.3% reading ± 0.05% full scale  
 Current: ± 0.5% reading ± 0.05% full scale (5 A<sub>RMS</sub>)  
 Active power: ± 1% reading ± 0.2% full scale (PF=1)  
 Power factor: ± 1,5% reading (0.5 inductive - 0.8 capacitive)  
 Active energy: ± 1,5% reading (0.5 inductive - 0.8 capacitive)  
 Frequency: ± 0.05% reading ± 1 digits from 45 to 65 Hz

**Communication port**

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

**Ethernet interface**

Type: 10/100 Base-T  
 Protocols: TCP, UDP, IP, ICMP, Ethernet MAC  
 Connector: RJ45 standard

**Digital outputs**

Type: No.2 optoisolated (50V-100mA<sub>DC</sub>)

**Digital inputs**

Type: No.1 optoisolated (19÷130V<sub>AC-DC</sub>)

**Environmental conditions**

Operating temperature: from -20 °C to +60 °C  
 Storage temperature: from -30 °C to +75 °C  
 Relative humidity: 80% max. without condensation

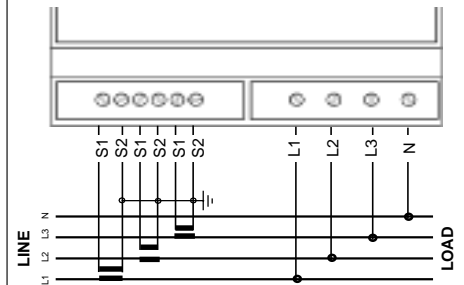
**Mechanical characteristics**

Material: Plastic enclosure - noryl UL94-V0  
 Protection degree: IP20  
 Terminals: Conductors 2.5mm<sup>2</sup>  
 Size / Weight: 106 x 90 x 57 mm 300 gr

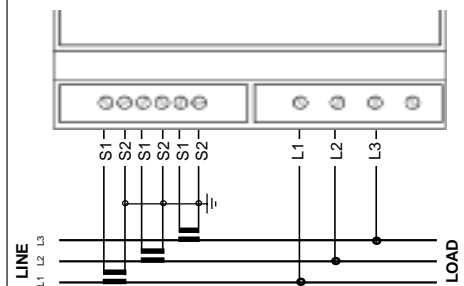
**Standards compliance**

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

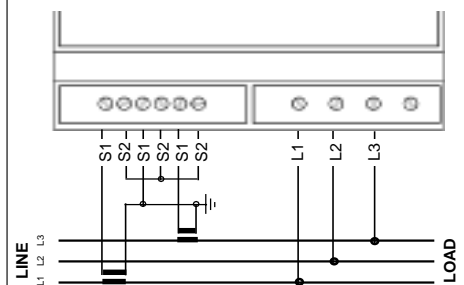
**TYPICAL WIRING DIAGRAMS**



**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 <sup>(1)</sup>	61+375 <sup>(2)</sup>
VOLTAGE AND CURRENT THD		●
INDIVIDUAL HARMONICS (FFT)		○
DPF CALCULATION		○
H/L TARIFF REGISTERS	○	
MEMORY + PROGRAMMABLE RECORDINGS		128kBytes
WAVEFORM DOWNLOADING <sup>(3)</sup>		●
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

**Ethernet 10/100 Interface (UPT2010ETH)**

The UPT2010 can be equipped with built-in 10/100 Ethernet interface.

By the supplied software it is possible to program on each instrument a proper IP address.

It can be connected to the Ethernet network and can communicate to a host using Modbus or standard ASCII protocol.

Moreover the Ethernet interface includes a HTML Web Page server.

If an Internet access is available, all the measurement carried out by the unit are available on a remote point.

**Main Features**

- Protocols: TCP, UDP, IP, ICMP, Ethernet MAC
- Network interface:10/100 Base-T
- Communication Speed: 10/100 Mbps
- Connection: RJ-45
- No. 5 LEDs for: link, duplex, 10Mbps, 100Mbps, collision.
- Software for setup and communication included

**WINTOOL - Communication and Monitoring Software**

- For Microsoft Windows environments
- User-friendly
- Real-time Data Viewing
- Quick Instruments Setup
- Parameters verification
- Available for free on the Web

WINTOOL software enables the power meters to be connected to a PC for measured data viewing.

It allows an easy and fast way to set the instrument parameters by a desktop or portable PC.

The remote monitoring is carried out through serial communication port (RS232 or RS485) or Ethernet TCP/IP / Internet connection.

It is a multilanguage software, at present the available languages are: English, German, Italian, French, Spanish, Hungarian.

It is the “free-of-charge” solution to configure and display the readings from instruments with or without display.



**Real-time Data Viewing**

WINTOOL displays real-time values from the instruments.

The available information includes:

- Real time values (voltage, current, power, PF, power)
- Energy consumption values (active, reactive and apparent)

**Quick instrument Setup**

Because of user-friendly approach, the power meters can be configured more quickly by the WINTOOL software than by using keypad.

The software shows the hardware configuration of the connected meter.

A SEARCH function allows to automatically detect the connected meter without the need of writing the serial number.

**DOWNLOAD IT FROM OUR WEB SITE**

**ORDERING INFORMATION**

AUF A A X X X 2 X X

**UPT2010**

**Series**

**User's Manual Language**

- D = German
- I = Italian
- U = English

**Communication Protocol**

- B = ASCII Standard
- C = Modbus

**Aux Power Supply**

- A = 115V<sub>AC</sub> / 230V<sub>AC</sub> +15% -20%

**Serial Port**

- 2 = RS232
- 5 = RS485
- E = Ethernet 10/100 Base-T (UPT2010ETH)

**Memory**

- X = None

**Firmware Options**

- X = None

**Hardware Options**

- X = None

**Other**

- X = None
- P = Rogowski inputs 200A
- R = Rogowski inputs 1000A
- S = Rogowski inputs 3000A
- C = Rogowski inputs (customized value)
- T = Enviromental temperature sensor

**Inputs**

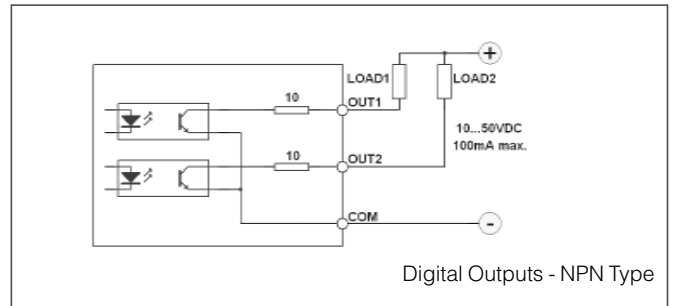
- X = None

**Analog Outputs**

- X = None

**Digital Outputs**

- 2 = No.2 on-board optoisolated outputs NPN type



**NOTES**

- 1) The basic instrument configuration includes:
  - Power Supply 115 / 230VAC +15% -20% selectable
  - No.2 Optoisolated Outputs (50V - 100mADC)
  - Serial communication port RS485 (or RS232 on request)

Subject to change without notice



**ENERGY MEASUREMENT AND CONTROL**

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