



## MEASURING TERMINAL MT-40S

Measurement Program

PM-28019E

### Application and Functional description

MT-40 series Measuring terminals are designed for measuring, monitoring, recording and power quality analysis in electric energy systems for energy production, distribution and transmission. Measurement is based on fast sampling of input currents and voltages, and afterwards calculation of true RMS values of currents, voltages, powers, power factors, energies and frequency. In addition to measuring instantaneous values of electrical quantities, processor calculates the maximum, medium and minimum values of current, voltage, power in the time interval (MD) and registers specified quantities. In accordance to European standard EN 50160 and IEC 61000-4-30, Class A Ed.2 and Ed.3 Measuring terminal analyzes the power quality parameters of the electrical grid (harmonic distortion, harmonic content, voltage swells and voltage dips, voltage flicker, asymmetry, etc.) and serves in resolving disputes between the utility and the end customers. All information about the condition of a particular part of the grid are available locally on color graphic LCD display or remotely using Web server. Measuring terminal provides local display of EN 50160 parameters on the device. Reports are available via e-mail. Four communication lines and software packages MT DIALOG 3, MT QUALITY, IPQS or Web server enable remote monitoring of network power quality.

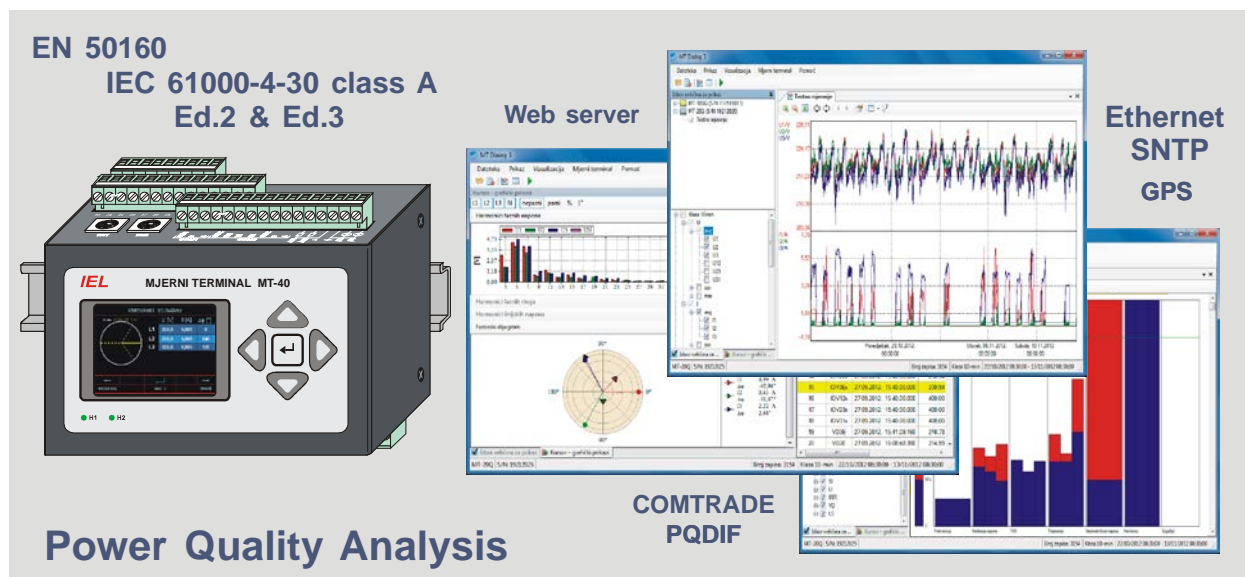


Figure 1. Measuring Terminal MT-40S and software package MT DIALOG 3

### Main features

#### Measurement and Analysis

- instantaneous true RMS measurement of current, voltages, frequency, power, power factor
- measurement and analysis (EP, EQ) in tariffs
- harmonic component measurement for voltage and current (up to 63. harmonic) and THD, RVC
- power quality analysis in accordance to standard IEC 61000-4-30 class A, Ed.2 and Ed.3 IEC 61000-4-7, IEC 61000-4-15, IEC 61000-3-6/7

#### Measurement values registration

- maximum, mean and minimum value registration of currents, voltages, powers and energies with time tag. Local display of EN 50160 on the device.
- active and reactive energy registration in tariffs and total (maximum 4 tariffs)
- high flexibility of measuring value registration in SD card capacity up to 8GB (1GB per year)

#### Monitoring and Control

- 4 digital inputs and 4 digital outputs
- 2 inputs for temp. and humidity (STH-3 sensor)
- 4 analog inputs and 2 analog outputs

#### Program equipment

- Web server for parameterization and analysis
- MT DIALOG 3 for parameterization and analysis
- MT QUALITY, IT DIALOG for data acquisition, analysis and data exchange with expert system

#### Communication

- 2 configurable serial ports RS232/RS485/F.O. for communication with measuring monitoring and control systems and data readout
- 10/100 Base-Tx (Fx) Ethernet port communication via LAN/WAN network and Info terminal ITK-20
- data readout using USB disk or computer

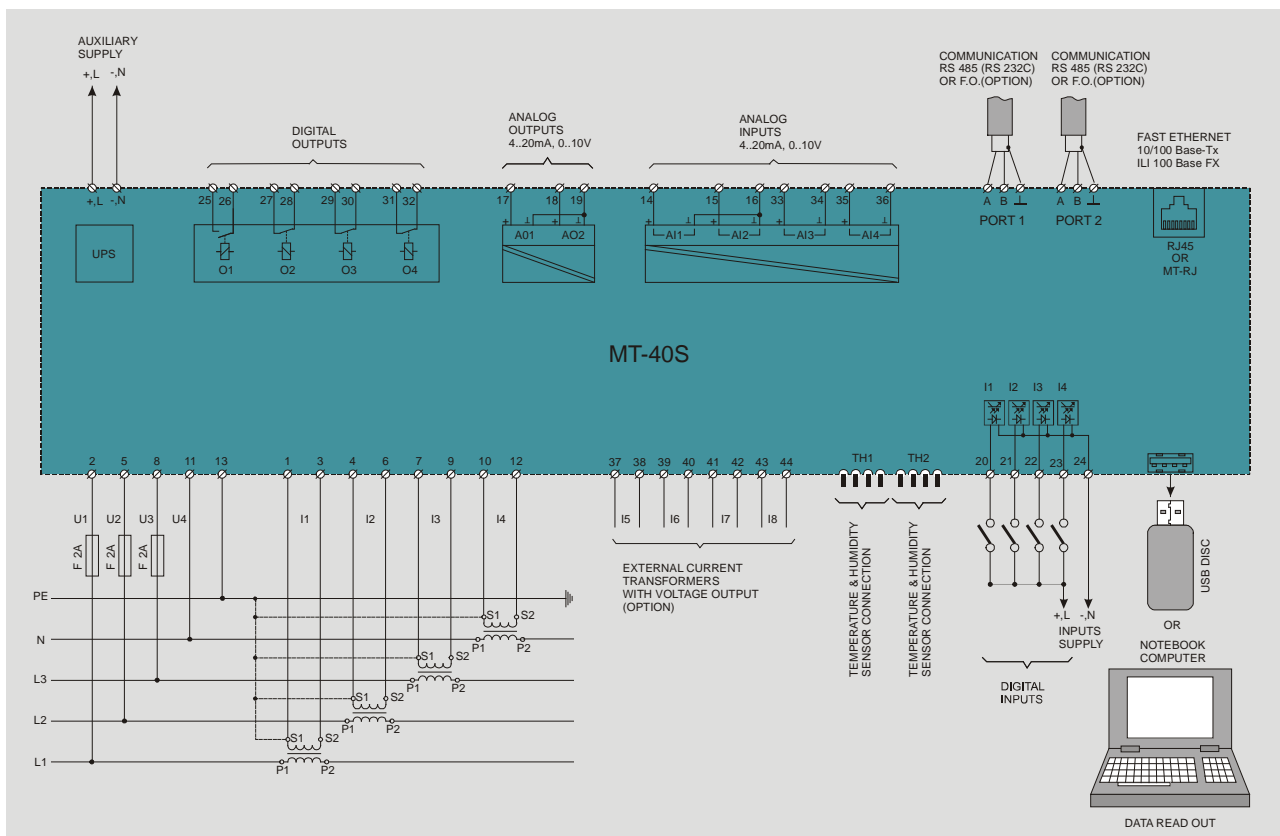


Figure 2. MT-40S connection in three phase four wire system

## Technical data

### Current inputs 4(8):

input current $I_N$ .....	do 5A (auto range)
measuring range .....	0 do 1,5 $I_N$ option 0-20 $I_N$ option 4I + 4I
burden .....	<0,1 VA
overload .....	cont.: 4 x $I_N$ 1s: 50 x $I_N$ 3s: 25 x $I_N$

### Voltage inputs 4:

input voltage .....	0 do 600V (auto range)
declared input voltage $U_{DIN}$ .....	50 do 300V
extended frequency range .....	2-150 kHz
measuring range .....	0,1 do 2,0 $U_{DIN}$
burden .....	<0,1 VA
overload .....	cont.: 1000V 1min: 2500V

### Digital inputs:

number of inputs .....	4
voltage supply (external) .....	48, 110, 220 V DC

### Digital outputs:

relay outputs .....	4, 220V DC: 80W NO contact
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### Analog input (option):

.....	4 (4-20mA, 0-10V)
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### Analog output (option):

voltage or current .....	2 (4-20mA, 0-10V)
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### Temperature and humidity meas...

.....	2 (sensor STH-3)
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### MD interval:

.....	1 to 30 min
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### Memory:

.....	SD, max 8GB
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### Power quality measurement:

.....	EN 50160, IEC 61000-4-30 class A, Ed.2/Ed.3
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### Accuracy:

U .....	0,1% $U_{DIN}$
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I .....	0,1% MV $\pm$ 0,02% FSR
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P,Q,S, $\cos\phi$ .....	0,2% MV $\pm$ 0,02% FSR
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Harmonic, THD .....	IEC 61000-4-7, class 1
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f .....	$\pm$ 10mHz
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EP .....	EN61557-12 class 0,2S
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EQ .....	EN61557-12 class 1
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<b>Display:</b> .....	graphical color LCD, 320x240
signaling LED H1, H2 .....	multi LED, programmable

<b>Supply:</b> .....	
auxiliary supply .....	230V AC +10% -20% 24V, 48V, 110V, 220V DC +45% -20%
UPS .....	10s, option 30 min
power consumption .....	<5 VA

<b>Communication:</b> .....	
ETHERNET .....	10/100Base-Tx (Fx)
USB .....	2.0
RS 485/RS232C .....	2 ports
optical (option) .....	GFO ili PFO 820 nm, connector ST 660 nm, connector snap-in
reports .....	e-mail, .gif
remote access .....	built in Web server, HTML
communication protocols .....	MODBUS RTU/TCP IEC 60870-5-101/103/104 IEC 61850 option

### Synchronization

.....	SNTP, GPS
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### Program equipment

.....	Web server, MT DIALOG 3, MT QUALITY, IT DIALOG
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### data format:

.....	PQDIF, COMTRADE
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### General data:

temperature range .....	0°C...+50°C
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extended temp. range .....	-20°C...+60°C
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insulation .....	2,5 kV, 50Hz, 1min between all galv. Insulated circuits
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EMC .....	IEC 61000-6-2; 61000-6-4 IEC 61000-3-2; 61000-3-3
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### Mechanical data:

mounting .....	on 35 mm DIN rail,
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dimensions .....	142x90x72 mm
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