MEASURING TERMINAL MT-40

Measurement Program   PM-28016E

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 Measuring terminal analyzes the power quality parameters of the electrical network (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 network 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, IT DIALOG, IPQS or Web browser enable remote monitoring of network power quality.
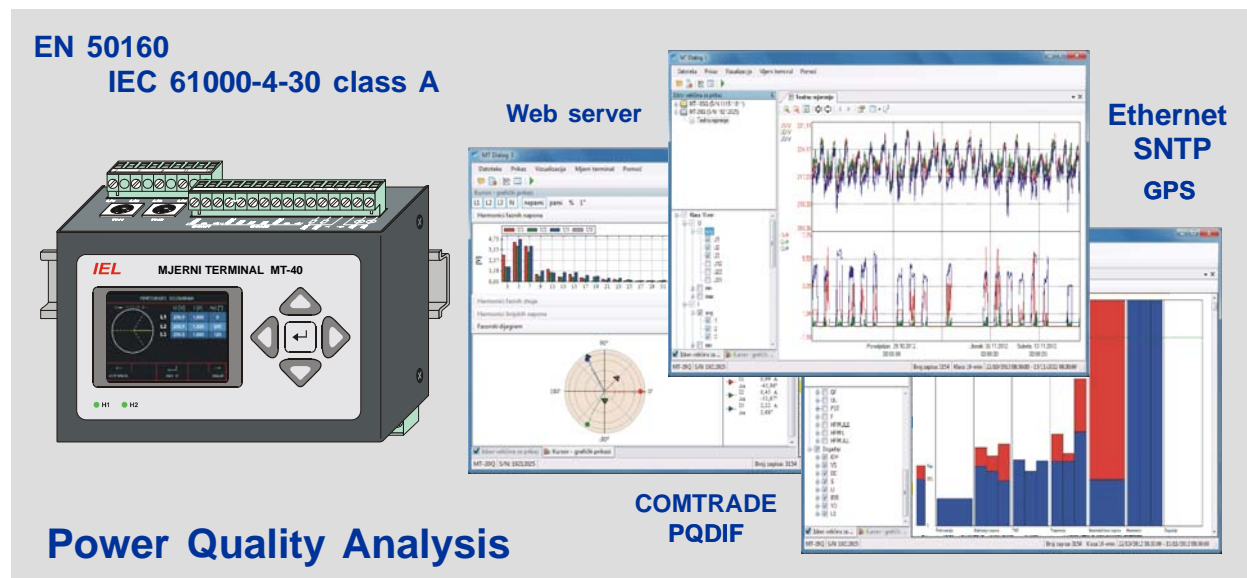

Figure 1. Measuring Terminal MT-40 and software package MT DIALOG 3

Osnovne karakteristike

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 50. harmonic) and THD
- power quality analysis in accordance to European standard EN 50160, IEC 61000-4-30 class A, 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)
- 2 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
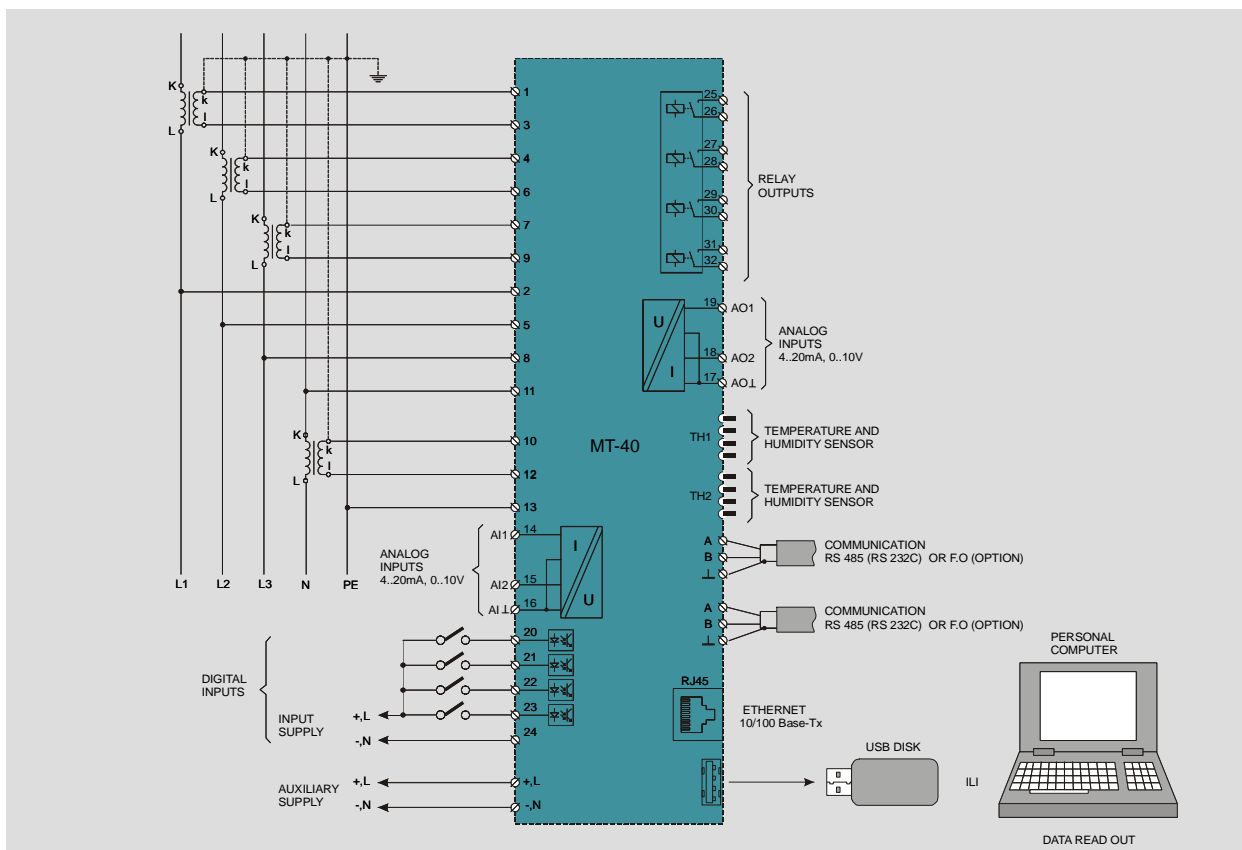- data readout using USB disk or computer

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

Technical data

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

Voltage inputs (3+1):
input voltage .... 0 do 600V (auto range)
declared input voltage U_{DIN} .... 50 do 300V
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

Analog input (option): 2 (4-20mA, 0-10V)

Analog output (option):
voltage or current 2 (4-20mA, 0-10V)

Temperature and humidity meas. ... 2 (sensor STH-3)

MD interval: .... 1 to 30 min

Memory: .... SD, max 8GB

Power quality measurement: .... EN 50160,
    IEC 61000-4-30 class A,
    IEC 61000-4-7,
    IEC 61000-4-15

Accuracy: U .... 0,1% U_{DIN}
    I .... 0,1%MV $\pm$ 0,02% FSR
    P,Q,S, cosφ .... 0,2% MV $\pm$ 0,02% FSR
    Harmonic, THD ...... IEC 61000-4-7, class 1
    f .... $\pm$10mHz
    EP .... EN61036 class 0,5
    EQ .... EN61268 class 1

Display: .... graphical color
    LCD, 320x240
signaling LED H1, H2 .... multi LED, programmable

Supply:
auxiliary supply .... 230V AC +10% -20%
    24V, 48V, 110V,
    220V DC +45% -20%
    option: from meas. circuit
power consumption .... <5 VA

Communication:
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

Synchronization .... SNTP, GPS

Program equipment .... Web server,
    MT DIALOG 3,
    MT QUALITY, IT DIALOG
data format: .... PQDIF, COMTRADE

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

Mechanical data:
mounting .... on 35 mm DIN rail,
dimensions .... 142x90x72 mm