

DATASHEET

SMART
energy meter

MT5Q3D

Three-phased



Measuring

In measuring block, 7x sigma delta A/D converter (3 channels for phase voltage, 3 channels for phase current and 1 channel for neutral current) is realized with high resolution and fast samples speed. These features enable identification up to 100th harmonics voltage and current. Individual samples (voltage/current) are processing in computer engine to the basic values including **FFT analyses**. In further step, these information are passed to the control block that decide future processing – view on LCD, create profiles and histories of register, record, statistics, ...

Active energy measuring according EN 50 470 (MID class A, B)

According phases, tariffs, direction and total

Reactive energy measuring according EN 62053-23 (class 1, 2,3)

According phases, direction/quadrants and total

Apparent and Deformation energy measuring

According phases and total

Active, reactive, apparent, deformation power measuring

Auxiliaries values measuring – voltage, current, phase shift

Neutral current measuring with analysis

Non electric value measure – DC magnetics field, temperature

Daily, Weekly, Monthly and annual registers with history

Registers for minimum and maximum, Time registers

Universal text and numeric register

Interpreter of scripts/commands

Control, condition, calculation commands

RTC – IC with own battery; High accuracy; time/age compensation

Event logger with time stamp; filter - change power direction; exceeded limit for registers; remote commands; scheduler action; change state sensors; communication; RTC; intelligent readout of event logger – filter for time, type of event, last 10 events

Load Profile - Period 1min to 256min (4hour); up to 64 channels; up to 1024 records per channel; ID group of registers

History - Period 1hour to 24hour; up to 32 channels; up to 256 records per channel; ID group of registers

Scheduler – RTC includes TOU table; several times per minute check validity of plan events; time zone; automatic switch winter/summer time; Up to 1024 planned events; activation/deactivation recorders/events; daily, weekly, monthly yearly plans (holidays); 16 type of days, 8 type of weeks, 4 type of season; accuracy 1minute; acceptable deviation in sec; commands or scripts for action – switch tariffs, relay, recording events

Alarms - Events ID, State events, time stamp, data; priority setting – up to 7 levels; transmission filter – time limit, from last repeat, count – for time period; count – for time period

Statistics – categorization: Command OK/ERR; clear/set value; communication OK/ERR (packets); time delivery - time category/number of repeats; measured value – range/category U, I, P, Q, S, f, PF; voltage – outages according time (short, middle, long) time limit

Multimedia – water, gas, heat; periodically downloads value from meters – period, registers, units; profile and history registers; possibility to view selected registers, Calculation value – averaging, difference, profiles, records, State of individual meters, Send alarms with critical events – battery low, outflow, accident

Credits - up to 8 credits; setting individual credits (clear, addition, set, conversion on other credit); join credit with register (value credit per register); send warning – under limit, multi-level; limitation/restriction when credit is under limit; record event, action, alarms; setting credit from head-end system or locally by buttons

Disconnect - state indication on LCD; control local (on/off, enable/disable) by button; remote control – command from central; TOU table – control by plan in meter; control by limiter – exceeding register value; control by credit – under limit credit; event record – time stamp, source, alarm,...

Limitation - state indication on LCD; 16 presets, multi-activation; phase current or energy with time; calculation method – exceeding, average, running average, accumulation; period – fix or running; change from head-end system or scheduler; record event – time stamp, source, alarm,...

Upgrade - local or remote changes; configuration change – clock by block (immediately); script change – new function from existing function; firmware change – new function that supports actual hardware; all is recording in event logger with time stamp

FFT – power quality according EN 50160

Based on FFT with 1024 samples calculation; Calculate up to 100th harmonics for voltage and current; minimum, maximum, average, categorization for each harmonics; out of range checking – record or/and alarms; individual limit for each harmonics – statistics – count; Total harmonics distortion THD – calculation: falling voltage, flicker, frequency limits, asymmetric voltage, overvoltage – limits, voltage drop-out voltage and time limits

Power quality (according Energy Regulatory Office 540/2005)

for each meter position

SAIFI – System Average Interruption Frequency Index

SAIDI – System Average Interruption Duration Index

CAIDI – Customer Average Interruption Frequency Index

MAIFI - Momentary Average Interruption Frequency Index

End-User function - remote control by PLC or Bluetooth; independent on utility functions; read only values that offer utility scheduler for user devices, sending information from meter to user - Bluetooth

Communication and security - automatic logging to system; physical address – unique number derivate from produce number; logic (group) address – up to 32 addresses with filter, communication security in compliance with NSA Suite B standards, AES256 encryption; symmetric encryption for common data, ECC-P256 asymmetric encryption for keys, time stamp with time validation, digital signature ECDSA-P256, key exchange ECDH-P256, packet counter, up to 8 keys per meter, defined rights for keys – read only, configuration, all rights; batch commands, communication optimizing

Local communication - optical head, according EN 62056-21, readout, configuration

PLC Communication - modem inside meter; remote upgrade: modem's firmware, modulation, encryption, protocol; CENELEC band A or B or C, high sensitivity and reliability

RS485 - RJ connector under terminal cover, galvanic isolated from meter include supply; communication with other devices – multiutility; intelligent building, home automation; external module possibility – put in terminal cover

M-BUS – in compliance with EN 13757 standards, RJ connector under terminal cover, master up to 4 devices, Multi-utility devices

Wireless M-BUS - in compliance with EN 1357-4 standards, SMA connector under terminal cover, energy safe optimizing, multiutility

ZigBee - SMA connector under terminal cover, in compliance with ZigBee association standards

Technical Data

Basic Data

Accuracy Class	class A or B as per EN 50470-1, 50470-3 class 2 or 3 as per EN 62053-23
Meter Constant	10 000 imp. / kWh

Voltage

Nominal Voltage U_N	3 x 230 / 400 V
Nominal Frequency	50 Hz
Operation Voltage Range	0.7 U_N to 1.15 U_N
Operation Frequency	45 Hz to 55 Hz

Consumption

Actual Consumption of Each Voltage Circuit	max 1 W
Actual Consumption of Each Current Circuit	max 0.01 VA

Current

Reference Current I_{REF}	5 A
Maximum Current I_{MAX}	up to 100 A
Start-Up Current I_{ST}	from 10 mA
Minimum Current I_{MIN}	0.25 A
Transitional Current I_{TR}	0.5 A
Maximum Measuring Range	10 mA to 125 A

Output Relay Parameters

Number of Output Relays	4
Switching Capability	4 A, $\cos \phi = 1$
Relays Electrical Service Life)	min 2×10^5 cycles ON/OFF
Output Relays Mechanical Service Life	min 1×10^6 cycles ON/OFF

Disconnecter Parameters

Maximum Tripping Current I_C	100 A, $\cos \phi = 1$
Disconnecter Electrical Service Life	min 5×10^3 cycles ON/OFF
Disconnecter Mechanical Service Life	min 1×10^6 cycles ON/OFF

Real Time Function

Accuracy	as per EN 62054-21
Back-Up Time	min 15 years
Battery Type	Li/MnO ₂
Battery Capacity	min 240 mAh
Battery Nominal Voltage	3.0 V

Impact of Surroundings

Temperature Range	
Operation	-40°C to + 70°C
Storage	-40°C to + 70°C
Ingress Protection IP	51 as per EN 60529

Display

Type	FSTN
Viewing size	90x30mm
Main value/character	10mm

OBIS code	6,5mm
Temperature operation	-25°C to + 55°C
Backlighting	4x white LED

PLC communication

Amplitude	128 dB/ μ V as per EN 50065-1
Sensitivity inputs	< 1mV

Resistance to Voltage Impulses

Impulse Voltage and shape	6 kV and 1.2 μ s / 50 μ s
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Resistance to Permanent Overvoltage

Voltage Between Phase and Neutral Wire	up to 450 V
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Electromagnetic Compatibility

Electrostatic Discharges	as per EN 61000-4-2
Test Voltage	8 kV
Number of Discharges	10
High-Frequency Electromagnetic Field	as per EN 61000-4-3
Difficulty Level 3, Vertical and Horizontal Polarization	
Frequency Zone	80 MHz thru 2 GHz
Electric Field Intensity	30 V/m
Fast Transient Phenomena (Impulse Groups)	as per EN 61000-4-4
Impulse Groups Time	15 ms
Impulse Groups Period	300 ms
Test Time	60 s
Test Voltage	4 kV
Radio Interference Suppression as per EN 55022	
Peak Course of Interference Voltage within Band	0.15 ÷ 30 MHz
Peak Course of EM Field Intensity within Band	30 ÷ 2000 MHz
Resistance to Interference Propagating Along Wiring as per EN 61000-4-6	0.15 ÷ 80 MHz

Weight and Dimensions

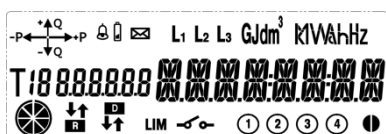
Weight	2.5 kg
Width	174 mm
Height	301,9 mm
Depth	101 mm
Installation as per Dimensional Sketch (width x height)	150 mm x 230 mm
Case Dimensions	as per DIN 43857

Connection of Current and Neutral Wires

Terminals Diameter	9.5 mm
Wire Cross-Section Maximum	35 mm ²
Wire Cross-Section Minimum	4 mm ²
Connecting Screws	M6 x 12 mm
Head Shape and Diameter	CH (cylindrical head) / 6.5 mm
Cross Groove	SL-PZ (Combination Slot – Pozidrive, size 2 as per ISO 4757)
Strength Class	5.8
Torque	5.6 (M6) Nm

Non-specified parameters as per EN 62052-11, EN 62053-21 or MID (EN 50 470-1, EN 50 470-3) and EN 62053-23

LCD



Dimensions

