

Generation 4 MTR 1000 IEC Single Phase Smart Meters

A Proven Residential Smart Meter and
Powerful Grid Sensor All-in-One

nes

Networked Energy Services

What's New In Generation 4

- Options for 2 external tamper inputs, 2 MEP (Multipurpose Expansion Port) ports and 2 SO pulse output terminals
- Options for backlit LCD display
- Super Cap Real Time Clock backup option
- Mechanical improvements including safety cover for power mains terminals
- Apparent power and apparent energy measurements
- Enhanced security using AES-128
- Load disconnect contactor is UC3 compliant up to 100A

Additional Generation 4 MTR 1000 Key Features

- Forward and reverse active and reactive energy measurements
- 4x16 channels of load profile data; each with independent configuration of interval, size and collection settings.
- Time-of-use supporting multi-tariff energy measurements configurable to time of day, weekends, holidays and seasonal changes
- Advanced tamper and fraud detection
- Measurement technology designed to withstand electromagnetic fields
- Secure remote firmware upgrades
- Power quality measurements include voltage, current, active power, reactive power, power factor, sine of phase angle and total harmonic distortion (THD)

Proven, Safe Choice

Reliable, field-tested and accurate, the MTR 1000 is based on NES's proven power line (PL) technology used in millions of smart meters, making it Europe's market leading solution. As with the entire line of NES smart meters, the MTR 1000 joins in a highly reliable power line based meshed network. With daily communication reads proven to deliver 99.7-100% reliability, NES's Smart Metering Solution consistently gives you the power consumption and power quality data you need to gain visibility at the edge of the grid.



Protect Revenue and Reduce Operational Costs

NES smart meters create a reliable and robust power line network that detects electricity theft and fraud, and also identifies unexpected technical losses. The energy measurement technology used by NES smart meters is highly resistant to magnetic fields. Tamper events are detected and logged - even during power failures - and then securely communicated in a timely manner. For additional operational costs savings, software-enabled features like the remote disconnect/reconnect switch and secure remote firmware upgrades allow you to manage rate plans, add time-of-use tariffs, or update meters without a trip to the field.

The Generation 4 MTR 1000 is fully compatible with the prior generation of NES meters and Data Concentrators from the perspective of its power line communication capabilities and functionality.

A Smart Meter and Powerful Grid Sensor In One

Heightened demand for power availability, distributed generation, and greater efficiency are creating a need for more consumption and power quality measurements at the edge. To meet this need, the MTR 1000 offers 4 sets of load profile data. Each data set can include up to 16 channels, and can be configured independently for interval, size and collection settings.

Now you can have a dedicated data set for billing and up to three additional data sets for collecting power quality metrics like voltage, current, THD, and net micro-generation output. You have the flexibility to store this data locally (in the meter) or pull measurements back whenever you need them - daily, weekly or even on a monthly basis.

Open Communications for Expandability and Interoperability

Invest in a meter that can grow with you as your requirements evolve. The MTR 1000 provide options that allow you to accommodate auxiliary meters (gas, water, heat) through a standards compliant interface, and is fully capable of securely connecting to wireless M-Bus (RF), M-bus, MEP or Open Smart Grid Protocol (OSGP) devices for Home Area Network (HAN) integration, energy management or other expanded services. Supports AES 128-bit encryption.

Generation 4 MTR 1000 meters support two MEP ports under the terminal cover, which allow it to be used for versatile wired and wireless applications.

Specifications

All specifications subject to change without notice.

Voltage

Nominal Voltage: 120V to 240V phase-to-neutral
Range: -20% to +15%

Frequency

Nominal Frequency: 50 Hz / 60 Hz
Tolerance: +/- 5%

Power Consumption

Voltage Circuit: 1W typical, 1.2W maximum
Apparent Power: <5VA
Current Circuit @ Imax: < 6.0 VA @100A, <5.0VA@ 80A, <0.015VA @5A

Temperature

Specified Operating Range: -40° to +70° C (3K7), display fully operational from -25° to +60° C

Storage and Transport: -40° to +70° C (3K7)

Humidity: <=95% RH, non-condensing

Current (amperage depends on local regulatory requirements)

Basic: 5A

Maximum: 100A

Starting: 20 mA

Service and Connection Types

Designed for direct line/load connections in residential or small commercial single phase systems.

Installation

Mounting: DIN 43857

Enclosure: Outdoor (IP54), insulated encased meter of protective class 2

Control wiring terminals: Wire size 0.4mm-1.3mm diameter

Power wiring terminals: Line, load, 2 neutrals. Maximum wire size is 35mm sq (used cables may not fit). The terminal inside diameter is 9mm.

Communications

Optical Port: Certified to IEC 62056-21 [2002] (physical and electrical requirements); ANSI C12.18 [2006] (communications protocol); ANSI C12.19 [1997] (data structure)

Channel Type: CENELEC A-band power line communication channel.

Data Security: Password protection for optical communication; authenticated, password-protected transactions and encryption for power line communication.

Certifications

Measurement Accuracy (for 5A basic current and 100A maximum current)

Active Energy: Class 1 certified to IEC 62053-21 [2003], Class 0.5S certified to IEC 62053-22 [2003] upon request, MID Class B certified to EN 50470-3 [2006], MID Class C certified to EN 50470-3 [2006] upon request, Class 1 certified to OIML R 46-1/-2 [2012]

Reactive Energy: Class 2 certified to IEC 62053-23 [2003], Class 1 certified to IEC 62053-24 [2003] upon request

Other Specifications

Safety Ratings: Certified to IEC 61010-1 [2001], CE marked.

Timing/Real Time Clock: Accurate per IEC 62052-21 [2004] and IEC 62054-21 [2004] to +/- 0.5 seconds per day.

Load Disconnect Impulse Voltage: IEC 62052-11 [2003]

SO Pulse Output: IEC 62053-31, Class A

Physical and Electrical Requirements: IEC 62056-21 [2002]

PLC A-band Signaling: EN 50065-1[2001]

M-Bus Compliance: DIN EN 13757-2 [2002], DIN EN 13757-3 [2002]

Pulse Output/SO: DIN 43864

Load Disconnect Contactor, With Remote Disconnect and Enable

UC3 compliant up to 100A

Mechanical Endurance: 100,000 cycles

Electrical Endurance: 10,000 cycles at maximum current (5,000 @ PF=1 followed by 5,000 @ PF0.5 inductive)

Maximum Switching Current: 100A

Maximum Overload Current: 120A, 150A (30 minutes)

Maximum Switching Voltage: 277Vac under normal operating conditions.

Can switch 440Vac when mains lines fault conditions exist.

Maximum Switching Power: 27,700VA

Short Circuit: UC2/UC3 compliant

Insulation Strength: 4kV at 50Hz, 1 minute

Contact to Contact: 2kV

Coil to Contact: 4kV

Impulse Voltage: 1.2 / 50µS to IEC 62052-11

Contact to Contact: > 4kV

Coil to Contact: > 12kV

Energy Measurements and Data Collection

Units Measured: kW forward, reverse; kWh forward, reverse, forward + reverse, forward - reverse; kvar import, export; kvarh import, export; RMS voltage; RMS current; power factor; frequency; rolling and block demand for energy sources and per quadrant kvarh (optional); apparent power (VA) per quadrant; apparent energy per quadrant (kVAh)

Verification Output: 2 pulse-output LEDs representing kWh and kvarh; signaling at 1,000 impulses per kWh or kvarh.

Power Quality Analysis: Sag; swell; number of over-current occurrences; number of short power outages; number of long power outages; duration and time of the last 10 long power outages; maximum and minimum frequency; phase loss; total harmonic distortion, earth fault detection (Delta service networks only).

Time of Use: Supports up to 8 tariffs with 10 possible tier switches per day; 12 seasons per perpetual calendar (set by day/month); perpetual holiday calendar for up to 25 holidays per year; perpetual daylight savings changeover; 2 separate holiday day schedules per season; 1 weekday, 1 Saturday, and 1 Sunday day schedule per season.

Data Logging: Up to 16 channels available for load profiling per dataset. Up to 4 load profile datasets are supported. Logging intervals user-selected at 5, 10, 15, 20, 30, 60 minutes, or 1 day and configurable per dataset.

Data Storage: Non-volatile memory.

Optional Features

Control Relay: Single-pole single-throw normally-open (1P-1T NO) dry (no output voltage) switch. The maximum load rating is 5A.

Maximum switching voltage: 250VAC / 30VDC

Maximum switching current: 5A

Maximum switching power: 1250VA / 150W

Pulse Output/SO: 1 reference and 1 signal terminal per IEC 62053-31 / DIN 43864. Up to 2 SOs can be supported depending on the other I/O configuration.

Tamper Input: Up to 2 tamper input channels can be supported depending on the other I/O configuration.

Wired M-Bus: Up to 4 devices; isolated; short-circuit protection; encryption supported; DIN EN 13757-2 and DIN EN 13757-3 compliant

Wireless M-Bus: EN-13757-4, 868MHz to 870MHz, T1, T2, S1, S2, C1. AES-128 encryption. Up to 6 meters supported (Gas, water, heat).

MEP: Isolated powered or unpowered MEP port for adding secure hardware extensions to meter for communication with other devices like in-home displays or gas/water meters. Up to 2 MEP ports can be supported.

Internal MEP: A MEP device inside the top meter cover which can be used for wireless communication with external devices; e.g. ZigBee, Wireless M-Bus, and others.

Ordering Information

Product

MTR 1000 Series Generation 4 Single Phase Meter

Model Number: 83334-1XXXXX

ANY INFORMATION IN THIS DATA SHEET IS SUBJECT TO CHANGE WITHOUT NOTICE.

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Meter Dimensions

Meter Dimensions	
A	130.00mm (5.12")
B	210.00mm (8.27")
C	66.00mm (2.60")
D	39.80mm (1.57")
E	64.90mm (2.56")
G	10.00mm (0.39")
H	9.00mm (0.35")
I	14.60mm (0.57")
J	31.28mm (1.23")
K	18.00mm (0.71")
L	23.50mm (0.93")
M	10.00mm (0.39")
N	155.66mm (6.13")
O	148.79mm (5.86")
R	103.59mm (4.08")
S	106.41mm (4.19")

