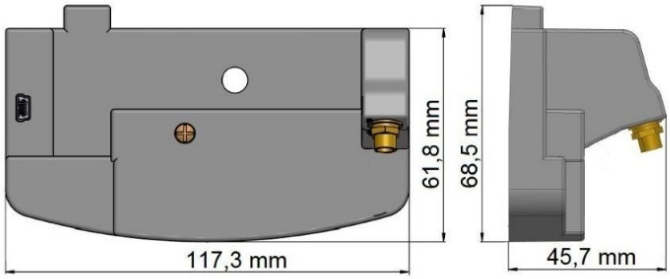
COMMUNICATION MODULE
BASED ON UP-TO DATE FOR RESIDENTIAL METERING

CM1

COMMUNICATION MODULE FOR SINGLE-PHASE METERS DESIGNED FOR USE IN UP-TO-DATE AMI/AMR SYSTEMS

OVERALL DIMENSIONS



PLACEMENT UNDER METER TERMINAL BLOCK COVER

TERMINAL BLOCK COVER

THE MAIN FEATURE OF CM1 is:
Data exchange via auxiliary communication interface
Due to 3GPP communication interface, CM1 allows performing of various tasks related to data collection and transmission, depending on the network needs and its topology.

3GPP INTERFACE

- **2G bands**: GSM/GPRS/EDGE 900/1800 MHz
- GPRS multi-slot class: 12
  uplink time slots number: 4
- Direct communication upstream with the head-end system
- Data transmission: by schedule or on request from the head-end system
- Built-in protocol stack: TCP/IP, UDP/IP
- IPv4/IPv6 support
- SMA connector for external antenna

RS-485 INTERFACE

- RS-485 interface provides
  - a link between the meter and communication module
  - communication with other meters connected to the same RS-485 bus.

STATUS LEDs

- The module supports two RGB LEDs to indicate:
  - 2G/3G level: low, fair or strong signal level
  - power supply and indication of modem state.
- Status LEDs are placed on the terminal block cover

POWER CONSUMPTION

- Self-consumption in stand-by mode: not more, than 1.5 W
- Self-consumption during transmission: not more, than 2 W

POWER SUPPLY

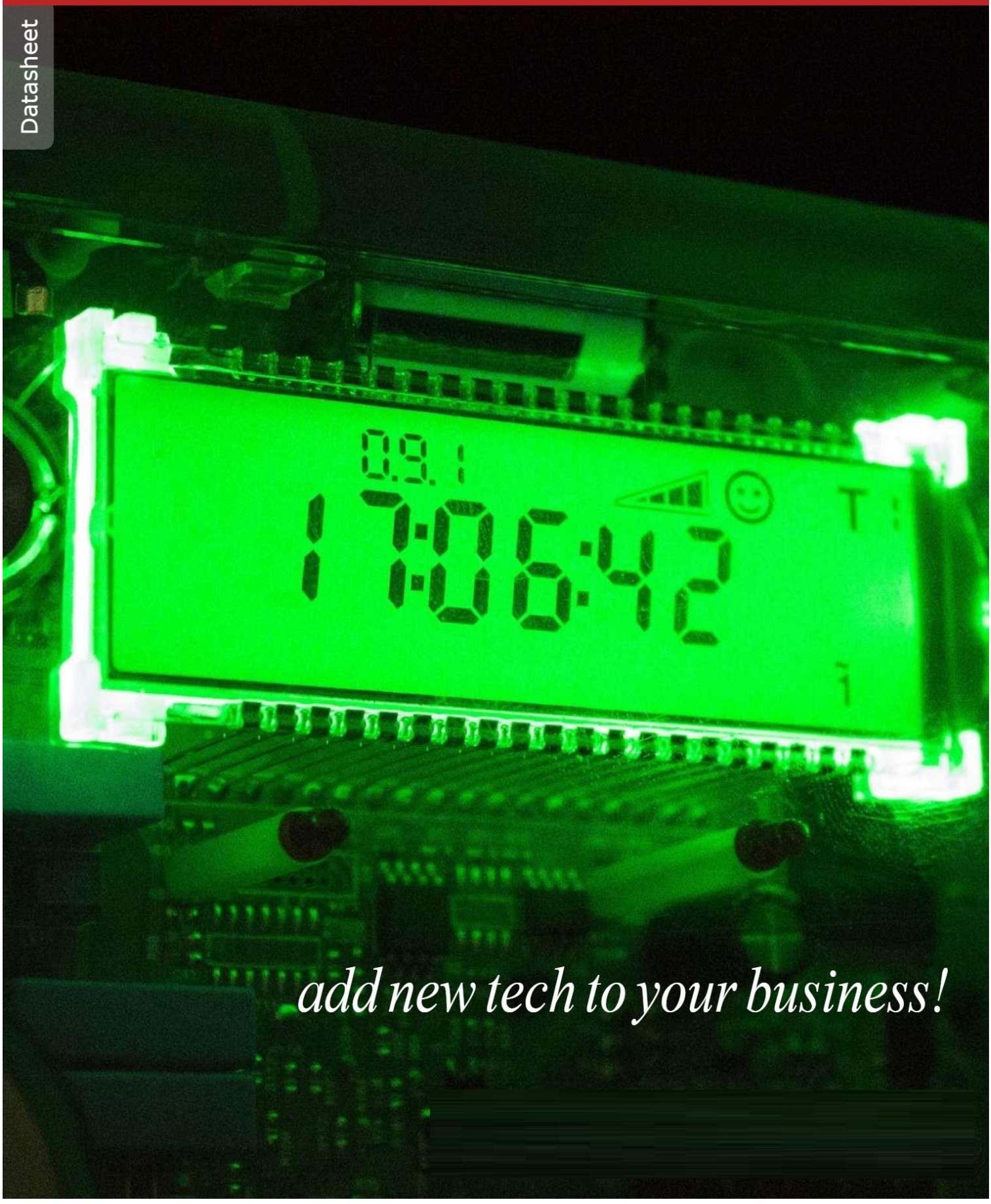
- Supply voltage: 12 V, is ensured via meter. In terms of design, CM and RS-485 interface power supply is applied to the same connector.

DESIGN

- Interchangeable modules
- Installation under sealable meter terminal block cover
- Housing made of light-tone non-flammable polycarbonate
- Optionally, a barcode can be added on CM1 housing (according to contract)

ADVANCED SERIES METERS

Datasheet



add new tech to your business!

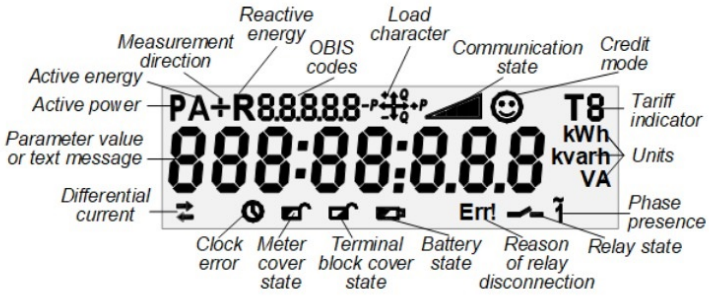
ADVANCED SERIES METERS

AD11A SERIES

MULTI-FUNCTION & MULTI-TARIFF SINGLE-PHASE ELECTRONIC METERS DESIGNED FOR USE IN AMI/AMR SYSTEM

OVERALL VIEW

DISPLAY INDICATIONS



kWh kVArh VAh	Active energy *(export/import)* Reactive energy *(4 quadrants)* Apparent energy
V A	Measured quantities
THD	Calculation of total harmonic distortion factor
T1-T6	Multirate registration
	Built-in clock
	Event Log
	Load profile
I1≠I2	Differential current detection
IP54	Protection level
	Reserve power supply
	Standard data model, open protocols
	Optical port
	Disconnecting relay
	Sensor of meter cover opening
	Sensor of terminal block cover opening
	Magnetic field sensor
PLC	PLC universal platform
	Authentication & Encryption

FUNCTIONALITY

DLMS/COSEM SUPPORT
- Standard data model
- Standard communication protocols
- Interoperability

BUILT-IN CLOCK
- Real Time Clock, accuracy 0.5 s.
- IEC 62052-21 standard compliant
- External synchronization
- Sleep mode, battery
- Daylight saving time support

MEASURED QUANTITIES
- Active energy, class B, export/import
- Reactive energy, class 2, 4 quadrants
- Apparent energy
- Power, Max Demand
  - integration period: 15', 30', 60', day
  - average interval: day, month
- Phase voltage/current, instantaneous value, RMS, neutral current, difference between phase and neutral currents

METERING DATA
- Actual meter readings
- Periodic meter readings: daily, monthly
- Interval meter readings: 1', 5', 10', 15', 20', 30', 60'
- Timestamp

DATA STORAGE
- Non-volatile memory
- Storage capacity depends on data type and number of parameters and can be expanded for one type of data on the expense of another
- Up to 3 interval profiles and 1 billing profile. For example:
  - *15 minutes interval profile*: 6 parameters for about 63 days
  - *hourly interval profile:* 6 parameters for about 13 days
  - *monthly billing profile:* 6 parameters for about 110 months

MULTI-RATE METERING
- Up to 6 tariff registers
- Up to 12 changeovers per day
- Tariff indicator is displayed on LCD and transmitted to an external system
- Active and passive tariff plans, configurable activation time of the passive tariff plan

CALENDAR
- Up to 12 seasons per year
- Up to 7 daily profiles per week
- Up to 30 special days per year
- Support of movable holidays

EVENTS & ALARMS HANDLING
- Continuous control of current state of meter functional nodes and alarms/events, timestamps
- Standard set of events processing including: registration in the special logs and registers, event report sending, states displaying, load switching off on special cases
- Different types of event logs

TEST OUTPUTS
- Outputs: 2 optical outputs (LEDs), optical port
- Parameters under control: active energy, reactive energy

BUILT-IN DISPLAY
- LCD, 8 digits, configurable decimal place (up to 3 digits)
- Special symbols, data identification according to IEC 62056-61 (OBIS)
- Metering data and specified messages displaying
- Service/client lists of parameters
- Manual/automatic modes of scrolling
- Display self-testing
- Configurable backlight mode
- Sleep mode

LOAD CONTROL
- Built-in relay (100 A)
- Operating 10000 times
- Control modes:
  - remote (by command)
  - local (by condition)
  - manual (by push button)
- Continuous relay state control
- Relay status displaying
- Events registering

ENERGY QUALITY CONTROL
- Quality indexes:
  - average voltage
  - voltage sags and swells
  - outages
  - network frequency
  - THD for voltage/current harmonics
- Remote or local configuring of parameters thresholds
- Events registering

FRAUD & THEFT PROTECTION
- Continuous monitoring, including sleep mode time
- Fraud types under control:
  - meter/terminal block cover opening
  - inadmissible differential current
  - strong external magnetic field
- Hall sensor for magnetic field detection
- Protective seals
- Events registering

DATA TRANSMISSION
- Data transmission on demand or by schedule
- Request types:
  - Concentrator request (via RS485)
  - Hand Held Unit request (via optical port)

INFORMATION SECURITY
- Communication encryption (AES-GCM-128 security suite)
- Data access according to stated rights
- Firmware protection
- Events registering

THRESHOLDS MANAGEMENT
- Configurable thresholds values
- Possibility to disconnect consumer from the network, when a threshold is crossed
- Events registering

METER SELF-CONTROL
- Built-in test for continuous self-control
- Quick response on severe error
- Events registering

COMMUNICATION OUTPUTS
- Modular GSM module 2G/3G/4G
- Optical Fiber port (Optional)

POWER LINE COMMUNICATION (PLC)
- Built-in PLC modem
- OFDM (PRIME), ITU-T G.9904 standard compliant
- PLC features:
  - CENELEC A Band
  - EMC standards compliance
  - Auto-discovery
  - Repeating

OPTICAL PORT
- IEC 62056-21 standard compliant
- Data transmission rate 115200 bps
- Possibility of local data exchange and meter parameterization

METER PARAMETERIZATION
- Remote (via communication channel) or local (via optical port)
- Assignment of the access rights from HES
- Events registering

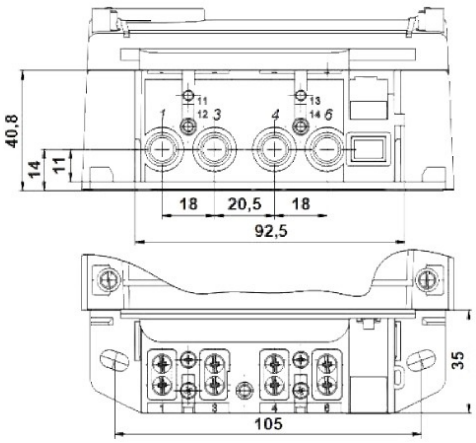
SOFTWARE UPGRADE
- Remote (via communication channel) or local (via optical port)
- Events registering

BACKUP POWER SUPPLY
- Battery for meter backup supply in sleep mode
- Battery lifetime - not less than 20 years

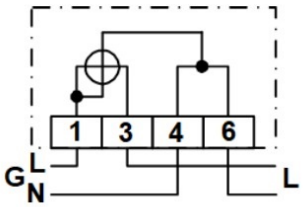
TECHINCAL SPECIFICATIONS

Accuracy class: **- Active energy** **- Reactive energy**	 B (1) 2
Reference current, Iref	5 A
Maximum current, Imax	100 A
Minimum current	0.05 Iref
Starting current: **- Active energy** **- Reactive energy**	 0.04 Iref 0.05 Iref
Reference voltage, Un	240 V
Voltage range	0.7 Un.... 1.2 Un
Reference frequency	50 Hz
Meter constant: **- Active energy** **- Reactive energy**	 1000 imp/kWh 1000 imp/kvarh
Temperature range	-40°C ... +85°C
Internal clock	quartz crystal 32 kHz
Clock accuracy (at 25°C) (IEC 62052-21)	≤0.5 s /24 h
Data transmission rate via PRIME OFDM PLC (on physical layer, with coding)	21-64 kbps
Inherent consumption of current circuit, not more (IEC 62053-61)	1 VA
Inherent consumption of voltage circuit, active/total, not more (IEC 62053-61)	2 W / 10 VA
Insulation strength (IEC 61010-1-90)	4 kV, 50 Hz, 1 min
Impulse voltage (IEC 60060-1)	12 kV, 1.2/50 μs
Electrostatic discharge (IEC 61000-4-2)	15 kV
High frequency radiant field (IEC 61000-4-3)	10 V/m
High frequency interferences (IEC 61000-4-4)	4 kV
Surge immunity test (IEC 61000-4-5)	6 kV
IP rating	IP54
Mean total lifetime, not less	20 years
Dimensions	213.5x127.5x62 mm

TERMINAL BLOCK DIMENSIONS



CONNECTION DIAGRAM (IEC)



DESIGN FEATURES

TERMINAL BLOCK

- DIN 43857 standard specifications
- Universal clamping type for terminals of current circuits: D = 8,5 mm

HOUSING

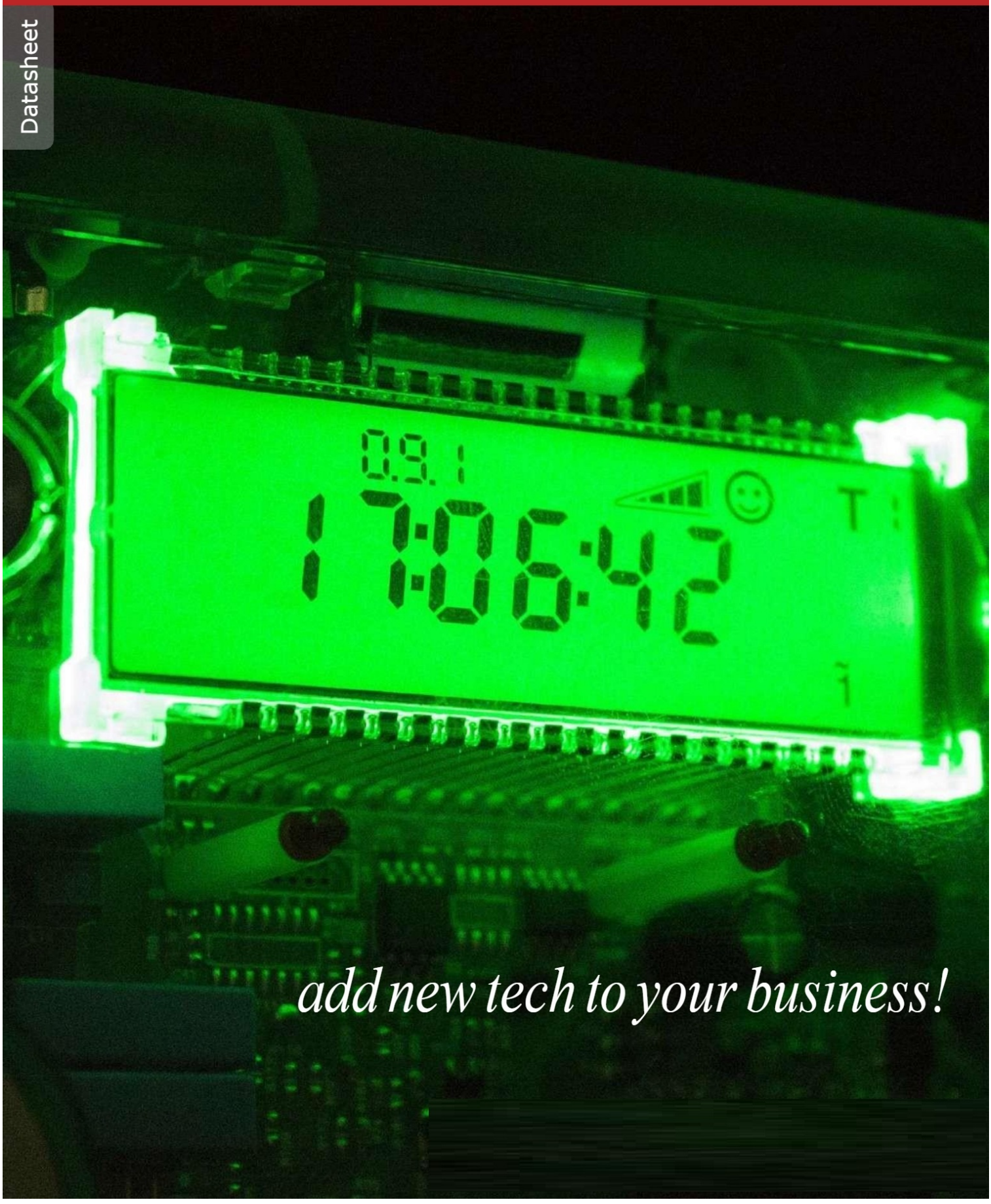
- Light-tone non-flammable polycarbonate
- IP 54 protection against dust and water

MOUNTING

- By 3 fixing points or on DIN rail (35 mm)

ADVANCED SERIES METERS

Datasheet



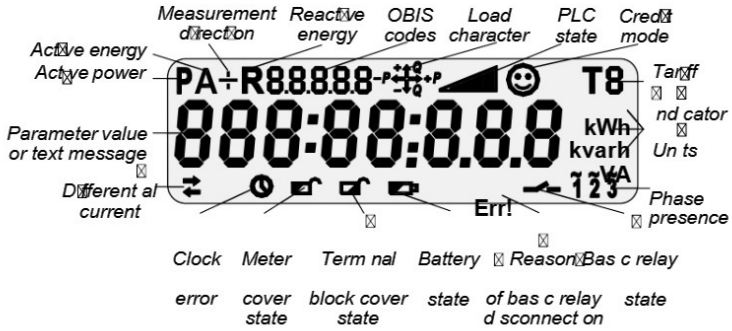
ADVANCED SERIES METERS

AD13A SERIES

MULTI-FUNCTION & MULTI-TARIFF
THREE-PHASE ELECTRONIC METERS
DESIGNED FOR USE IN AMI/AMR SYSTEM

OVERALL VIEW

DISPLAY INDICATIONS



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	Built-in clock
	Event Log
	Load profile
I1≠I2	Differential current detection
IP54	Protection level
	Backup power supply
	Standard data model, open protocols
	Optical port
	Built-in relay
	Sensor of meter cover opening
	Sensor of terminal block cover opening
	Magnetic field sensor
PLC	PRIME communication
	RS-485 communication interface
	Authentication & Encryption

FUNCTIONALITY

DLMS/COSEM SUPPORT
- Standard data model
- Standard communication protocols
- Interoperability

BUILT-IN CLOCK
- Real Time Clock (RTC), accuracy 0.5 s.
- IEC 62052-21 standard compliant
- External synchronization
- Daylight saving time (DST) support

MEASURED QUANTITIES
- Active energy, class B (1), export and import
- Reactive energy, class 2, 4 quadrants
- Apparent energy
- Power, Max Demand
  - integration period: 15', 30', 60', 1 day
  - average interval: day, month
- Phase voltage/current, instantaneous value, RMS, neutral current, difference between phase and neutral currents

METERING DATA
- Actual meter readings
- Periodic meter readings: daily, monthly
- Interval meter readings: 5', 10', 15', 20', 30', 60'
- Timestamp

DATA STORAGE
- Non-volatile memory
- Capacity depends on data type and number of parameters and can be expanded for one type of data on the expense of another
- Up to 3 interval profiles and 1 billing profile. For example:
  - *15 minutes interval profile*: 6 parameters for about 63 days
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- Up to 6 tariff registers
- Up to 12 changeovers per day
- Tariff indicator is displayed on LCD and transmitted to HES
- Active and passive tariff plans, configurable activation time of the passive tariff plan

CALENDAR
- Up to 12 seasons per year
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- Up to 30 special days per year
- Support of movable holidays

EVENTS & ALARMS HANDLING
- Continuous control of current state of meter functional nodes and alarms/events, timestamps
- Standard set of events processing including: registration in the special logs and registers, event report sending, states displaying, load switching off on special cases
- Different types of event logs

TEST OUTPUTS
- Outputs: 2 optical outputs (LEDs), optical port
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BUILT-IN DISPLAY
- LCD, 8 digits, configurable decimal place (up to 3 digits)
- Special symbols, data identification according to IEC 62056-61 (OBIS)
- Metering data and specified messages displaying
- Service and client lists of parameters
- Manual and automatic modes of screens scrolling
- Display self-testing
- Configurable backlight mode

LOAD CONTROL
- Built-in relay (100A)
- Operating 100.000 times
  Control modes:
  - remote (by command)
  - local (by condition)
  - manual (by push button)
- Continuous relay state control
- Relay status displaying
- Load switch events registering

ELECTRICAL ENERGY QUALITY CONTROL
- Quality indexes:
  - average voltage
  - voltage sags and swells
  - outages
  - network frequency
  - angles between phases
  - THD for voltage/current harmonics
- Remote or local configuring of parameters thresholds
- Quality events registering

FRAUD & THEFT PROTECTION
- Continuous monitoring;
- Fraud types under control:
  - meter case cover opening
  - meter terminal block cover opening
  - inadmissible differential current
  - strong external magnetic field
- Hall sensor for magnetic field detection
- Protective seals
- Fraud events registering

THRESHOLDS MANAGEMENT
- Configurable thresholds values
- Possibility to disconnect consumer from the network, when a threshold is crossed

METER SELF-CONTROL
- Built-in test for continuous self-control
- Quick response on severe error
- Meter state events registering

INFORMATION SECURITY
- Communication encryption (AES-GCM-128 security suite)
- Data access according to access rights
- Firmware protection
- Secure events registering

DATA TRANSMISSION
- Data transmission on demand or by schedule
- Request types:
  - Data Concentrator request (via communication channel)
  - Hand Held Unit request (via optical port)

POWER LINE COMMUNICATION (PLC)
- Built-in PRIME PLC modem
- PRIME ITU-T G.9904 standard compliant
- PLC features:
  - CENELEC A band
  - EMC standards compliance
  - Auto-discovery
  - Repeating

RS-485 COMMUNICATION INTERFACE
- Built-in RS-485 interface:
  - provides a link between the meter and an extension communication module via mini USB port;
  - ensures the power supply of communication module;
  - provides a link between the meter and other devices via WAGO connectors
  - baud rate - up to 19 200 bps.

COMMUNICATION MODULE
- Two LEDs placed on the terminal block cover to reflect the state of communication module

COMMUNICATION OUTPUT
- Modular GSM module 2G/3G/4G
- Optical Fiber Port (Optional)

OPTICAL PORT
- IEC 62056-21 standard compliant;
- Data transmission rate 38 400 bps;
- Possibility of local data exchange and meter parameterization.

SOFTWARE UPDATE
- Remote (via communication channel) or local (via optical port);
- Software update events registering.

METER PARAMETERIZATION
- Remote (via communication channel) or local (via optical port);
- Access rights assignment from HES;

BACKUP POWER SUPPLY
- Battery for meter backup supply when the power is off
- Battery lifetime - not less than 20 years.

TECHINCAL SPECIFICATIONS

Accuracy class: - **Active energy** - **Reactive energy**	 B (1) 2
Reference current, Iref	5 A
Maximum current, Imax	100 A
Minimum current	0.05 Iref
Starting current: - **Active energy** - **Reactive energy**	 0.04 Iref 0.05 Iref
Reference voltage, Un	3×240 V
Voltage range	from 0.7 Un to 1.2 Un
Reference frequency	50 Hz
Meter constant: - **Active energy** - **Reactive energy**	 1 000 imp/kWh 1 000 imp/kvarh
Temperature range	from -40°C to +85°C
Internal clock	quartz crystal 32 kHz
Clock accuracy (at 25°C) (IEC 62052-21)	≤0.5 s /24 h
Inherent consumption of current circuit, not more (IEC 62053-61)	2.5 VA
Inherent consumption of voltage circuit, active/total, per phase, not more (IEC 62053-61)	2 W / 10 V
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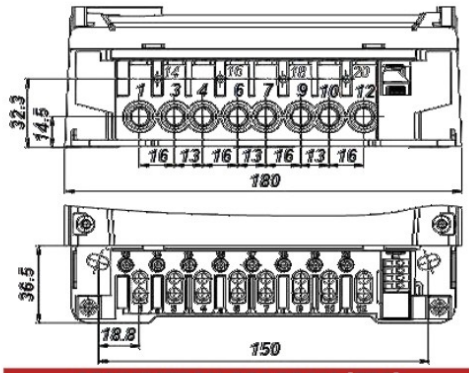
High frequency interferences (IEC 61000-4-4)	4 kV
Surge immunity (IEC 61000-4-5)	6 kV
IP rating	IP54
Mean total lifetime, not less	20 years
Dimensions, W x H x D	180 x 280 x 68 mm

TERMINAL BLOCK DIMENSIONS



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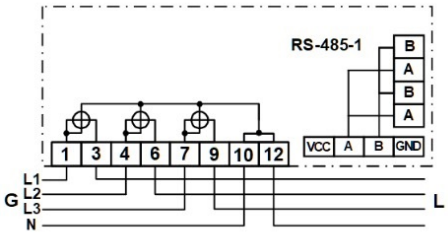


DESIGN FEATURES

DESIGN

- Compliance to DIN 43857 standard specifications

HOUSING

- Light-tone non-flammable polycarbonate

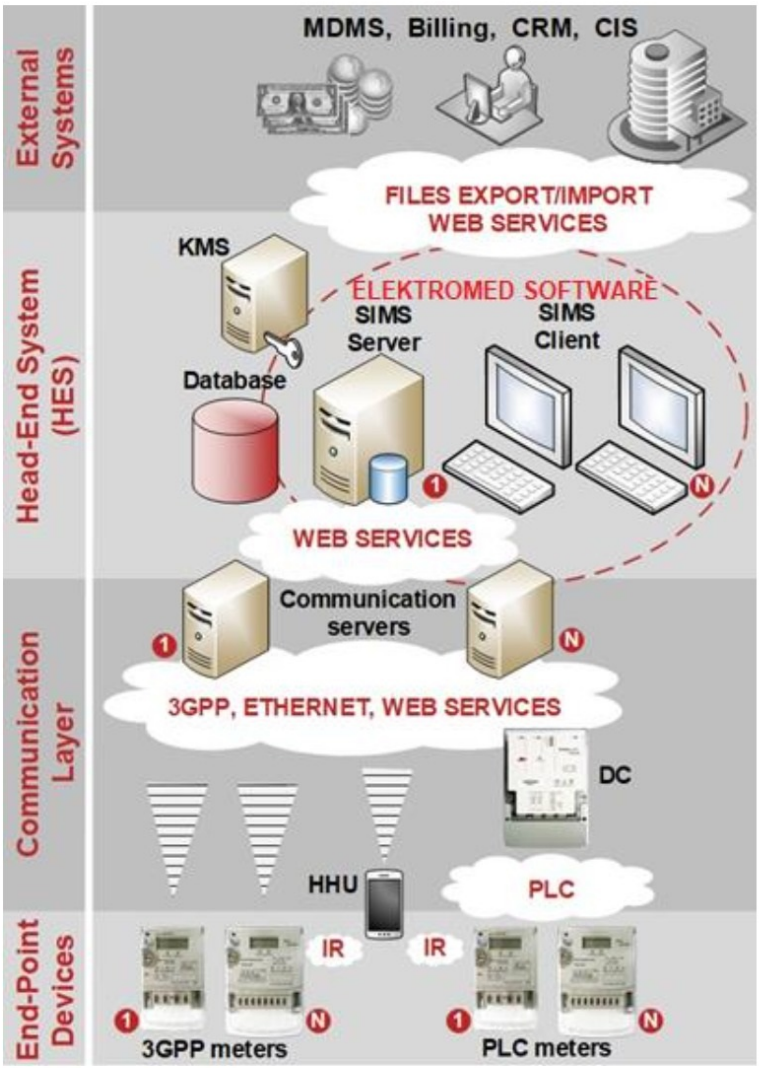
MOUNTING

- By 3 fixing points or on DIN rail (35mm)

SOFTWARE SOLUTION

BASED ON UP-TO DATE RESIDENTIAL METERING

SMART SOFTWARE SOLUTION SIMS 8.0



	Microsoft Windows Platform
SQL	SQL Server Database
	Data Exchange With External Systems
	Differentiation of Access Rights
	Four Eyes Principle
	Remote Software Upgrade & Parameterization of Controlled Devices
	Remote Time Synchronization of Controlled Devices
TOU	Support of Multi-Rate Registration
	Schedulling of Devices Operation
	Remote Relay Triggering & Control
	Tamper-Proof Control
	Control of Consumption Imbalance
	Event Log
	Alarms Management & Control
	Long Term Data Storage
	Generating & Printing Reports
	Graphical Visualisation of Meter Data
PLC	Support of PLC
	Support of 3GPP Communication
	Network Management & Control
DCU	Tools to Control & Debug Data Concentrator Operation
WEB	Support of Web-Services Architecture
IP	Support of IPv4/v6 Protocol
P3.2	Support of P3.2Ex Protocol
	Strenghtented Security
OPS	On-Premises Software
24/7	Uninterrupted Operation