

Integrated smart meters Sx40y series



Three-phase and single-phase smart meters
with integrated communication modem and switching device



SM401 / ST401

Integrated PLC modem and switching device
with additional RS485 port

SM402 / ST402

Integrated GPRS/3G/LTE modem and switching device

SM405 / ST405

RS485 communication interface and switching device



Sx40y is the series of three-phase and single-phase smart meters designed for measurement of active and reactive electrical energy of residential, commercial and industrial consumers / prosumers, with integrated communication and switching modules for reading and power management via PLC data concentrator (Sx401), GPRS/3G/LTE network (Sx402) or via RS485 port (Sx405).

Single-phase meters are available in direct grid connection, while three-phase meters are available in both direct and CT connection. All functions are compliant with the following specifications and standards: IDIS (Sx401), DLMS/COSEM, IEC 62052-11, IEC 62053-21/22/23, EN 50470-1/3 (MID), and M-Bus.

Key features

- Measurement of electrical values
- Internal real-time clock with DST
- Flexible tariff policy with up to 4 tariffs
- Maximum demand
- Optical port
- MID certificate
- DLMS/COSEM
- IDIS interoperability (Sx401)
- Fraud detection
- No-power reading and parameterization
- Billing profile
- Fraud profile
- Load profiles
- Power limit
- Code red
- Event logs
- Measurement of energy quality
- Firmware update
- Functional inputs / outputs
- M-Bus port / Wireless M-Bus for G, W, H meters reading
- Support for in-home customer display
- Integrated PLC or GPRS/3G/LTE modem
- Data security

Measurements

- Measurement of power and energy in both directions and absolute values (A+, A-, |A|, R+, R-, R1, R2, R3, R4, S+, S- and by quadrants)
- Measurement of voltages and currents per phase, network frequency and power factors

Maximum demand

- Proqramable maximum demand integration period (typically 5, 10, 15, 30 or 60 minutes)

Multi-rate registration and TOU

- Programmable tariff structure (up to 4 tariffs)
- Up to 4 seasons, up to 4 weekly programs
- Up to 9 day types, up to 31 holidays
- Up to 24 daily changeovers

Internal real-time clock with DST

- In accordance with IEC 62054-21
- Automatic DST (Daylight Saving Time) switching
- Backup battery supply, optionally super-capacitor

Visual communication with meter

- Proqramable selection of data and display sequence
- LED (1000 / 10000) imp/kWh (kvarh) for direct / CT connected meters

Optical port

- Physical layer in accordance with IEC 62056-21
- Communication protocol - DLMS/COSEM mode C or mode E

M-Bus micro master port

- Suitable for connection of gas, water or heat meters and in-home display
- Physical layer in accordance with EN 13757-2 (wired M-Bus), communication protocol EN 13757-2/3

Inputs and outputs

- Relay output 1 230 V AC for load management, 5 A or 2 inputs 230 V AC (can be used as tariff inputs)
- Relay output 2 230 V AC, 5 A for load management or OptoMOS* output 230 V / 0,1 A
- * OptoMOS output can be used as tariff output or for external devices management
- 1 SO control input (alarms, external button for reconnection of switching module...)
- SO input 2 or Low voltage output (OptoMOS or optocoupler)

Communication options Sx401 Integrated PLC modem with additional RS485 port

- S-FSK or G3-PLC modulation in CENELEC A frequency range
- Speed up to 2 400 bit/s (S-FSK), 33 600 bit/s (G3-PLC)
- Two-way, half-duplex channel
- Sx402 Integrated GPRS modem
- GPRS, 3G, LTE connection supported
- Operating with dynamic IP addresses
- Frequency range: 900/1800/2100 MHz
- Replaceable SIM card
- Antenna connector: SMA
- Sx405 RS485 port
- Allows local communication with meter, data reading and meter parameterization. Suitable for connection of up to 31 meters into single communication loop
- Half-duplex RS485 bus
- 9 600 bit/sec communication speed

Integrated switching module (optional)

- Bi-stable switching module placed under meter cover for remote or local connection / disconnection
- Phase current break up to 100 A, whilst neutral stays closed
- In accordance with IEC 62055-31, UC3
- Minimum 10 000 mechanical disconnections/reconnections under maximum load

Billing profiles

- Billing profile 1: recording billing data at the end of the proqramable billing period with automatic reset of maximum demand. Proqramable with up to 32 channels.
- Billing profile 2: recording billing data in case of fraud detection without reset of maximum demand

Load profiles

- 4 load profiles for measured values
- 4 M-Bus profiles for registration of measured data from other types of measuring devices (multi-utility)
- Proqramable and independent registration periods (5, 10, 15, 30, 60 minutes and 24 hours)

Log books

- Standard log book
- Fraud detection log book
- Disconnect control log book
- M-Bus log book
- Quality event log book
- Long power interruption log
- 4 M-Bus event logs which records events from other measuring devices which are connected to M-Bus port

Energy quality measurement

- In accordance with EN 50160
- Maximum and minimum voltage registration
- Voltage variation registration
- Maximum current registration
- Outage registration (short outage – Event counter, long outage – Long power interruption log)
- Under-voltage and over-voltage measurement and registration in Quality Event log book

Fraud detection

- Detection of meter cover opening / closing
- Detection of terminal block cover opening / closing
- Detection of wrong authorization for meter parameterization

- Detection of strong magnetic field
- Detection of strong EMF
- Detection of neutral conductor interruption
- Recording of events in the Fraud event log book
- Optional switching module disconnection on fraud detection

Power limiting

- Power or current limiting of electrical consumers by defining the limit value of power or current in dedicated meter registers
- Proqramable Tolerance time and Penalty time
- Disconnect control log book recording switch on / switch off events

Code Red

- Enables synchronous power limiting of groups (large number) of users in case of irregular situation on distribution network (e.g. lack of power)

Firmware update

- Enabled locally or remotely with no impact on accuracy, parameter configuration or billing data

No-power reading (optional)

- Local reading via display or via optical port in no power condition
- Integrated battery supply

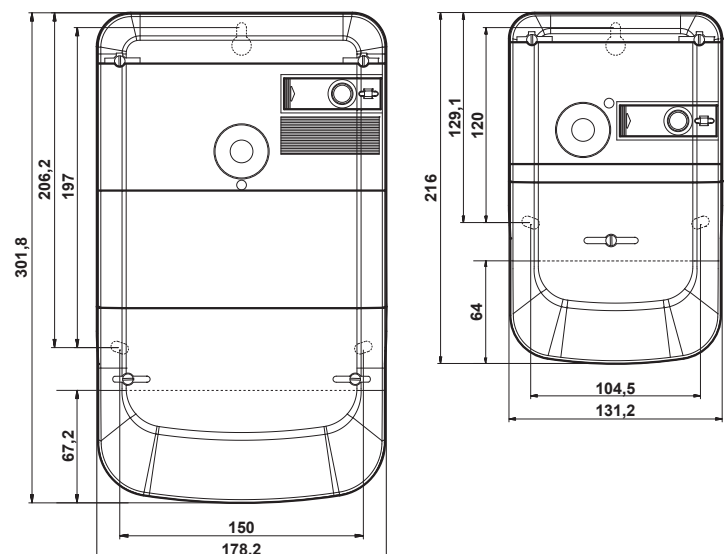
Current terminal block

- For current up to 100 A
- For all types of conductors up to 35 mm²

Compact meter case

- Dimensions and fixing points in accordance with DIN 43857
- High quality, transparent, reinforced, self-extinguishing polycarbonate case
- IP54 protection against water and dust (in accordance with IEC 60529)

Accuracy Class	
Active energy	0,5S, 1 or 2 (C, B or A)
Reactive energy	2 or 3
Nominal and maximum current	5 (100) A, 5 (6) A (for CT)
Nominal voltage, Un	230 V (1-ph), 3x230 / 400 V (3-ph)
Voltage range	0,8 Un – 1,15 Un
Frequency	50 Hz
Optical port	IEC 62056-21 (physical layer) IEC 62056-46 (DLMS) communication protocol
Self-consumption	IEC 62053-21/22/23/61
Operational temperature range	-40 °C - +70 °C
Storage temperature range	-40 °C - +80 °C
Insulation AC strength	4 kV, 50 Hz, 1 min
Insulation impulse strength	6 kV; 1,2 / 50 µs
IP protection level	IP54, in accordance with IEC 60529
Dimensions (mm)	302 x 178 x 81 (three-phase) 216 x 131 x 81 (single-phase)
Weight	Approx. 1,80 kg (three-phase) Approx. 0,83 kg (single-phase)



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Solutions for smart energy management