

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

SM402/ST402

Integrated GPRS/3G modem and switching device

SM405/ST405

RS485 communication port and switching device

IDIS¹DLM
Reg No: 0015
Reg No: 0018



Sx40y is the series of three-phase and single-phase smart meters designed for measurement of electrical energy of residential, commercial and industrial consumers, with integrated communication and switching modules for remote reading and power management via PLC data concentrator (Sx401), GPRS/3G 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, Swiss METAS 213N01, IEC 62052-11, IEC 62053-21/22/23, EN 50470-1/3 (MID) and M-Bus.

Key features

- Measurement of electrical values
- Integrated PLC (S-FSK) or GPRS/3G modem and switching device
- 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 for G, W, H meters reading (Wireless M-Bus on demand)
- Optionally additional RS485 for one-way communication instead of M-Bus port (Sx402)
- Support for in-home customer display
- 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 factor

Maximum demand

- Programmable 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

- Programmable 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 2 230 V AC inputs (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**
- S-FSK modulation in CENELEC A frequency range
- Speed up to 2 400 bit/s
- Two-way, half-duplex channel
- **Sx402 - Integrated GPRS modem**
- GPRS/3G connection supported
- Operating with static IP addresses
- Frequency range: 900/1800/2100 MHz
- Replaceable SIM card
- Antenna connector: SMA
- Optional RS485 instead of M-Bus
- **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 programmable billing period with automatic reset of maximum demand. Programmable 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)
- Programmable 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
- 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
- Programmable Tolerance time and Penalty time

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 (single-phase), 3x230/400 V (3-phase)
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	302 x 178 x 81 mm (three-phase) 216 x 131 x 81 mm (single-phase)
Weight	Approx. 1.80 kg (three-phase) Approx. 0.83 kg (single-phase)

