Prometer 540

Prometer 540 is a series of next-generation energy meters designed for bulk power transfer points requiring accurate and precise measurements, revenue protection and cyber security compliance. Flexible and highly modular communication interfaces ensure integration with AMR / AMI and the latest generation substation automation systems. Four quadrant of energy measurement allow for various types of revenue metering applications in electricity networks. Additionally, power quality measurements and reporting provide enhanced value to the utility.

Applications

- Bulk energy transfer and reconciliation. Examples: Power generation plants, conventional or renewable and transmission networks
- Online monitoring of bulk exchange points in the power network
- Integration into substation automation and SCADA / EMS systems to provide accurate electrical measurements
- Retrofit existing main and check statistical meters for grid code compliance

Benefits

- Highest precision measurement for accurate billing and settlement at bulk energy transfer points
- Measurements for supply quality assessment
- Easy integration through multiple communication protocol interface
- Suitable for diverse applications through wide-range voltage, current and auxiliary supply inputs
- Easy to use and highly configurable communication modules
- Support of industry-standard DLMS, MODBUS and IEC 61850 reading protocols
- Field replaceable hot-pluggable communication modules
- Multilingual support on display (English, Swedish, German, French, Spanish, Italian, Russian, Arabic, Vietnamese and Indonesian)

Features

- 0.1 S accuracy for energy measurement as per IEC 62053-22 standard (edition 2.0)
- Wide-range dual auxiliary supply with options for AC / DC and self-power (VT powered)
- Large memory capacity for data storage
- Modular communication option with in-built 4G / RS-232 / RS-485 and Ethernet. All these ports are capable of simultaneous communication
- Multi communication protocols DLMS, MODBUS and IEC 61850 (editions 1 and 2)
- High-level DLMS security (data encryption and authentication)
- Harmonic measurement for voltage and current up to 50th order
- Powered RS-232 / RS-485 port for third-party modem integration
- Touch sense keypad
- Advance power quality features, including THD, sag, swell, voltage unbalance and interruption recording
- Dynamic error compensation for CT / VT
- Transformer / line loss adjustment (copper and iron losses)
- Intuitive graphical display including vector diagram, waveforms and bar chart for consumption
- Support of meter display over field-replaceable battery
- User configurable meter constant
- Dual loggers for energy and instantaneous parameters
- Flexible time-of-day tariff, maximum demand support, DST (daylight saving time) support with automatic billing dates
- Anomaly system events include critical meter cover and terminal cover open detection

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Selection option for pluggable modules

Option	Left side module Select any one	Right side module Select any one
1	RS-232	RS-232 / RS-485 / Ethernet / IEC 61850
2	RS-485	RS-232 / RS-485 / Ethernet / IEC 61850
3	4G modem	RS-232 / RS-485 / Ethernet / IEC 61850
4	Ethernet	RS-232 / RS-485 / IEC 61850
5	IEC 61850	RS-232 / RS-485 / Ethernet

Note: Auxiliary supply is required if comms modules are selected as 4G modem in left side slot 1 and IEC 61850 in right side slot 2. In the absence of an auxiliary supply, self-powered supply priority would be applicable for IEC 61850.
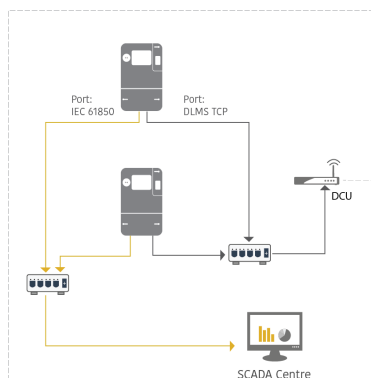
Billing data over 4G network and real time monitoring over Ethernet
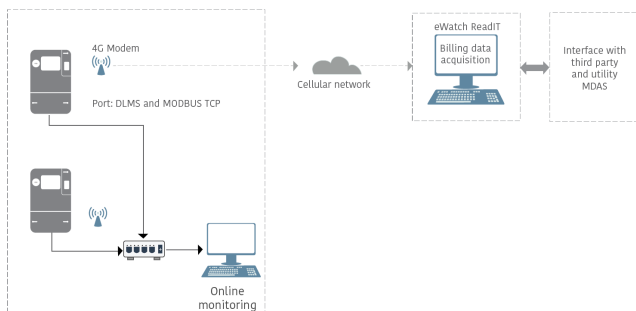
Real time monitoring through multi-drop scheme over RS-485
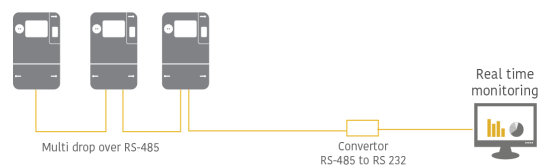
Real time monitoring over IEC 61850 and billing data over Ethernet using gateway

Technical data display

Electrical

Connection type	HV3 / HV4 / LV4
Measurement voltage range	Nominal voltage 57.7 to 240 V (L-N) / 100 to 415 V (L-L) 3P4W, 100 V to 120 V (L-L) 3P3W
Measurement current range	1-10 A (configurable)
Frequency	50 / 60 Hz
Burden with auxiliary / self (VT) powered	As per compliance standards
Accuracy	Class 0.1 S / 0.2 S
Maximum withstand voltage	1.3 times of nominal voltage continuously 2 times of nominal voltage for 0.5 second
Maximum withstand current	1.3 times of Imax continuously 10 times Imax for 1 second 20 times Imax for 0.5 second
Compliance	Standards IEC 62052-11, IEC 62053-22, IEC 62053-24, (as per edition 2.0) IEC 62052-31, IEC 62059-31-1, IEC 62056-21, CE, UKCA CoP, IEC 61850

Environmental

Ingress protection	IP54
Operating temperature	-10°C to +55°C
Limit range of operation	-25°C to +70°C
Storage temperature	-25°C to +70°C
Temperature coefficient	<0.05% / 10°C (UPF)

Mechanical

Dimension	276 x 176 x 90 mm (± 2 mm) (H x W x D)
Weight	2 kg (+/- 200 gm)

Software

- Two data loggers: Maximum 50 parameters configurable in each logger. Logging of up to 34 energy channels and 80+ instantaneous values, with integration period 1/5/10/15/20/30/60 minutes ~4800 Parameter-days capacity at 30-minute intervals in each logger, resolution up to 0.1mWh, data compression option to reduce meter reading time. Option for cumulative or consumption-based logging
- Configurable parameters: 16 time-of-use tariffs, 16 Seasons, 16 Day types and 16 time zones, 53 billing dates, DST for 25 years. Logging of up to 100 days for daily energy snapshots, 7 configurable display sequences along with fixed, auto and sealed button sequences, 50+ alarms and 10+ compartments for event logging
- Logging of up to 15 sets of historical data
- Up to 50th individual harmonic component measurement
- Power quality features, including voltage sag, swell, and unbalance recording. Supply quality report

Technical specifications

Features

Power supply	Self-powered supply Auxiliary supply 48-240 V DC ±10% or 110-240 V AC ±10% Burden: <10VA (without communication)
Display	Graphical, with white backlight extended temperature range -20^{0}C to +70^{0}C Size: 69 x 39 mm (H x W), 128x80 pixels Pixel size: 0.5 mm² Max display character size 10 x 5 mm (H x W)
Battery	Field-replaceable battery for RTC backup and display viewing during power outage

Inputs and outputs

4 fixed pulse outputs
4 configurable as pulse inputs / outputs

- Pulse outputs:
  Type: Volt-free, 100 mA
  Voltage: 48 - 240 V AC / DC
  Pulse width: 20 – 1000 ms (for both 50Hz and 60Hz)
- Configurable as pulse input / output:
  Pulse output type: Volt-free, 100mA
  Pulse input type: Optical isolator
  Voltage: 24 - 240 V AC / DC
- Indicator: Four LEDs: 2 for metrology, 2 for alarms / events

Communication

Optical port	Protocol: DLMS, Baud rate: (300 bps sign on) 9600 – 19200 bps, Half duplex, MODE-E
RS-232 port	Built-in supply of 9V, 4W, Protocol: DLMS, Baud rate: 9600 – 57600 bps, half duplex
Cellular comms module	4G fallback to 2G, SIM: 4G enabled nano SIM card; Inbuilt antenna, optional high gain extended antenna; Frequency bands 850, 900, 1800, 2100 MHz
RS-485 port	Protocol: Configurable DLMS / MODBUS RTU, Baud rate: 9600 – 57600 bps, Half duplex
Ethernet port	10 / 100 Mbps, Protocol: DLMS, MODBUS TCP simultaneous client and IEC 61850 (separate communication module)
Time synchronisation	Internal crystal time or mains based time synchronised SNTP
Connector type	Standard RJ45 for all the ports except optical

Accessories (optional)

Panel mounting kit / RS-232 communication module / RS-485 communication module / 4G modem / Ethernet module / IEC 61850 module / Software

* Electrical, compliance, mechanical, software, features options depend on variant selected