

Apex 150

Precision metering series



Field
configurable
installations



Hot pluggable
communication
modules



Interoperable
communication

Bulk energy measurement, modular multi comms options, wall mounted, long range site configurable with in-built IEC 61850 support

Apex 150, series of next generation energy meter designed for power transfer points requiring precise measurements and revenue transactions. Flexible and modular communications ensure integration with existing AMR/AMI/SCADA systems and upgrade to future SAS systems. 4 quadrant energy measurement allows monitoring of generation, transmission and bulk power transfer point.



Application

- Metering for availability based tariffs (ABT) and open access systems
- Energy transfer measurement and reconciliation
- Power plants, feeder monitoring, grid substations, wind turbines
- On-line monitoring of energy exchange at various interface points
- Energy accounting, automation and system integration

Benefits

- Minimal integration cost through multiple communication interfaces
- Suitable for diverse applications through wide-range voltage, current and auxiliary supply inputs
- Support of industry standard DLMS, MODBUS and IEC 61850 meter reading protocols
- Meter reading and display viewing under power outage
- Field replaceable hot pluggable communication modules

Features

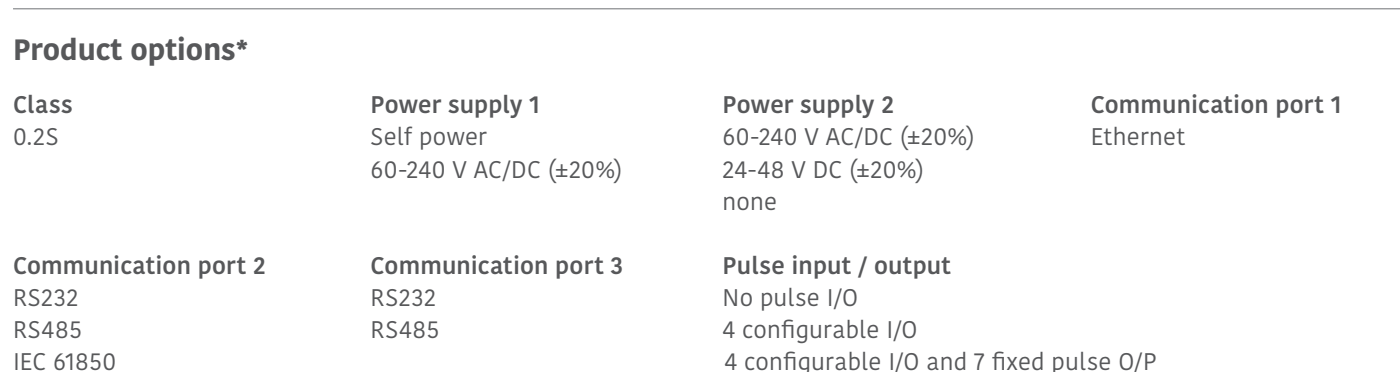
- 0.2S accuracy for active and reactive measurement
- Wide-range dual auxiliary supply with options for AC/DC and self-power (VT powered)
- Power quality features including THD, sag, swell, voltage unbalance and interruption recording
- Dynamic error compensation for CT/VT
- Transformer/Line loss adjustment (Copper and Iron losses)
- Intuitive graphical display including vector diagram, wave forms and bar chart for consumption
- Remote configuration of communication ports
- Support of meter reading/display over field replaceable battery
- In built IEC61850 along with RS232/RS485 and Ethernet ports in a single product & capability of simultaneous communication through all these ports
- Simultaneous DLMS and MODBUS over Ethernet port
- Flexible time-of-day tariff, maximum demand support with automatic billing dates
- Meter cover and terminal cover open detection
- RS232 port compatible with meter-powered modem

The diagram illustrates the RS485 and Ethernet port scheme for a station. It shows the following components and connections:

- Substation communication panels:** Two panels are shown. The top panel has a "Service port 502 for MODBUS" and a "Service port 4059 for DLMS". The bottom panel has a "control unit".
- LAN switch:** A central switch connecting the Ethernet ports of the substation communication panels and the digital pulse output devices.
- Digital pulse output devices:** Six devices are shown, each with an "Ethernet port" and an "RS485 Port".
- Online monitoring system:** Includes a "Server" connected to a "Network switch" and "Clients".
- RS232/RS485 Converter:** Connects the "Server" to the "Network switch".
- WAN:** A cloud icon representing the Wide Area Network, connected to the substation communication panels.

Legend:

- Blue line: RS485 network
- Yellow line: Ethernet network
- Black line: Digital pulse output



Class 0.2S	Power supply 1 Self power 60-240 V AC/DC (±20%)	Power supply 2 60-240 V AC/DC (±20%) 24-48 V DC (±20%) none	Communication port 1 Ethernet
Communication port 2 RS232 RS485 IEC 61850	Communication port 3 RS232 RS485	Pulse input / output No pulse I/O 4 configurable I/O 4 configurable I/O and 7 fixed pulse O/P	

Communication port 2	Communication port 3	Pulse input / output
RS232	RS232	No pulse I/O
RS485	RS485	4 configurable I/O
IEC 61850		4 configurable I/O and 7 fixed pulse O/P



Technical specifications

Electrical

Connection type	HV3/HV4
Measurement voltage range	57.7 V or 63.5 V (L-N) for HV4, 100 or 110 V (L-L) for HV3
Measurement current range	1-10 A (configurable)
Frequency	50 Hz \pm 5%
Burden with auxiliary/self (VT) powered	Current circuit: < 0.1 VA/phase @ 1A, < 0.5 VA/phase @ 5A Voltage circuit in case of Aux power: < 0.1 VA/phase Voltage circuit in case of internal/self power: < 6 VA/phase
Accuracy	Class 0.2S
Maximum overload Voltage	1.5 times of nominal voltage continuously 2 times of nominal voltage for 0.5 second
Maximum overload current	1.5 times of I _{max} continuously 10 times I _{max} for 1 second 20 times I _{max} for 0.5 second

Compliance

Standards*	IS 14697 IS 15959 DLMS Indian companion standard, category B IEC 61850 (edition 2)
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Mechanical

Dimension	300mm x 200 mm x100 mm (H x W x D)
Weight	2 kg (+/- 200 gm)

Environmental

Ingress protection	IP54
Operating temperature	-10 °C to + 60 °C
Limit range of operation	-25 °C to + 70 °C
Storage temperature	-40 °C to + 80 °C
Temperature coefficient	<0.3%/100C for class 0.5
Temperature coefficient	<0.1%/100C for class 0.2

Features

Power supply	Dual/single auxiliary supply Range: 60-240 V AC/DC (\pm 20%), burden: <10VA Optional range: 24-48 V DC (\pm 20%), burden: <10VA
Display	Graphical, with green backlight Extended temperature range -200C to 700C Size: 69 x 39 mm (H x W), 128x80 pixels Pixel size: 0.5 mm ² Max display character size 10 x 5 mm (H x W)
Battery	Field-replaceable battery for RTC back up



Technical specifications

Software

- Data logging:
 - Maximum 50 parameters configurable
 - Logging of up to 28 energy channels, with integration period 1 to 60 minutes
 - 80+ parameters available for logging of instantaneous values with integration period 1 to 60 minutes
 - ~9600 Parameter-days capacity at 30 minute interval
- Configurable parameters:
 - 8 time-of-use tariffs, 16 seasons, 16 day types and 16 time zones, 53 billing dates
 - Logging of up to 100 day for daily energy snapshots
 - 7 configurable display sequences along with fixed, auto and sealed button sequences
 - 40+ events and 10+compartments for event logging
- Logging of up to 15 sets of historical data logging
- Up to 31st individual harmonic component measurement
- Power quality features, including voltage sag, swell, unbalance recording

Inputs and Outputs

- 7 fixed pulse outputs
- 4 configurable as pulse inputs/outputs
- Pulse outputs:
 - Type: Volt-free, 100 mA
 - Voltage: 48-240 V AC/DC, Option for 24-40 V DC,
 - Pulse width: 20 - 300 ms
- Configurable as pulse input/output:
 - Pulse output Type: volt-free, 100mA
 - Pulse input type: optical isolator
 - Voltage: 24-240 V AC/DC
- Indicator:
 - Six LEDs: 2 for metrology, 3 LEDS for Pulse out put and 1 LED for Alarm

Communication

- Optical 1107 port
 - Protocol: DLMS, Baud rate: 1200 – 19200 bps, Half duplex
- RS232 port
 - Built-in supply of 4 V @ 550 mA, Protocol: DLMS,
 - Baud rate: 1200 –57600 bps, Half duplex
- RS485 port
 - Protocol: configurable DLMS/MODBUS RTU,
 - Baud rate: 1200 – 57600 bps, Half duplex
- Ethernet port
 - 10/100 Mbps, Protocol: DLMS and MODBUS TCP simultaneous client
 - Full duplex
- IEC 61850 port
 - Optional
- Connector type: standard RJ45 for all the ports except optical
- Panel mounting kit/RS232 communication module/
- RS485 communication module/Terminal modem/Software

Accessories (optional)

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

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