

# ProQ 100

Revenue meter with leading edge power quality features



Advanced communications



High precision revenue metering



Power quality analytics

High precision, comprehensive power quality measurements  
multiple communications channels, easy integration

ProQ 100 is a true innovation that combines precision class revenue metering with leading edge power quality measurement. The product range covers HV and MV configurations for applications at different hierarchy levels in generation, transmission and distribution grids. ProQ 100 provides a wide range of features and meets high accuracy standards while providing power quality measurements in line with the latest power quality standards. ProQ 100 is well suited for use by grid operators and industrial customers to:

- Monitor and manage electricity grids and energy contracts
- Monitor supply quality and ensure regulatory compliance
- Analyze industrial plant supply networks for disturbances (origin) and impact on sensitive loads

With the flexibility to retrofit/upgrade existing systems, multiple communications channels and standard protocol support, ProQ 100 is easy to integrate with multiple systems for simultaneous communications (e.g. power quality monitoring, SCADA and remote meter reading applications).



## Application

- High precision revenue metering
- Contracts requiring compliance with latest power quality standards e.g. IEC 61000-4-30 Class A
- Installations requiring compliance verification with voltage supply standards e.g. EN50160, IS 17036
- Requirement of harmonic control i.e. IEEE 519
- Harmonic analysis for power quality problems for both voltage & current upto 50th harmonic
- Integrated power quality monitoring and analysis solution for utility supply and industrial networks
- Providing metering and power quality (PQ) data to substation and industrial automation systems

## Benefits

- Accurate measurements for energy contracts
- Power quality measurements in accordance with latest standards
- Multiple industry standard communications ports
- Multiple protocols for integration with SCADA and other automation systems (e.g. IEC 61850, Modbus)
- Easy retrofit for all rack-mounting meters
- Large, high-resolution graphical display with intuitive interface
- Comprehensive power quality monitoring and analytics, using ProQ View® software

## Features

- PQ measurements certified to IEC 61000-4-30 class A and instrument to IEC 62586-2
- Power quality events logging for sag, swell, interruption and rapid voltage change
- Harmonics and inter-harmonics up to 50th order
- Distortion factors THD, TDD, THD-I, THD2550 and waveform quality indices e.g. K factor and crest factor
- Transients recording and reporting
- Unbalance including positive, negative and zero sequence measurements
- Comprehensive logging of instantaneous, energy and power quality parameters (dual loggers)
- Voltage and current recording for pre and post event analysis with RMS value (half-cycle) capture
- Built-in web server to access real-time values and powerful analytical capability through ProQ View
- Power Quality data interface using PQDIF over ftp

# ProQ 100

## High precision revenue metering

- Range covers HV3 and HV4 connections
- Accuracy as per IEC 62053-22 (Active, Class 0.2S) and IEC 62053-24 (Reactive, Class 0.5S)
- Highly accurate instantaneous parameter measurement. e.g. voltage, current power, frequency
- Error compensation for CT/VT and line losses (linear/non-linear)
- Two metrology LEDs for accuracy testing
- Wide-range dual auxiliary power supply
- Sealing options for utility metering
- Advanced revenue protection features

## Power quality monitoring and analytics

ProQ 100 combined with ProQ View - Secure's web-based, state of the art software - provides power quality data acquisition and analysis for comprehensive monitoring of electrical and power quality parameters and overall system health.

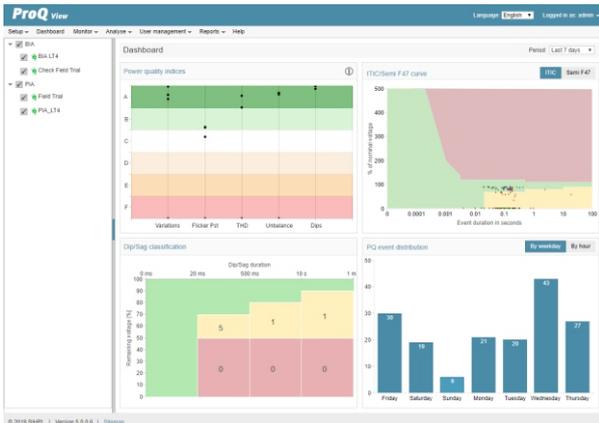
Through the acquisition of instantaneous values, energy and power quality parameters, ProQ View provides data in graphical and tabular formats, as well as voltage compliance and harmonic reports.

From the raw data provided by ProQ 100, ProQ View provides a wide range of analytics, including:

- Intuitive dashboard for all critical power quality parameters
- Monitoring of power quality parameters and events
- Power quality compliance reporting to EN 50160, IEC and SEMI F47
- Supply quality indices - SAIFI, SAIDI, CAIDI
- Monitoring TDD and THD for voltage and current
- Real-time data monitoring
- Reports and trend monitoring

## Advanced features

- 1 Gb/s fibre/copper for high-speed data exchange between meter and system
- DLMS (serial and TCP), Modbus (RTU and TCP), with optional IEC 61850 protocol support
- Optical port for IEC1107 and ANSI C12.18 communications
- Simultaneous communication on all ports, including multiple sessions on ethernet
- Independent pulse input and output for integration with other devices/systems
- Time synchronization options through SNTP
- Large intuitive colour graphical display for real-time data viewing, vector diagrams, waveforms, harmonic spectrum analysis and configuration settings
- Two LEDs for status/event indication
- PQ data export in CSV format

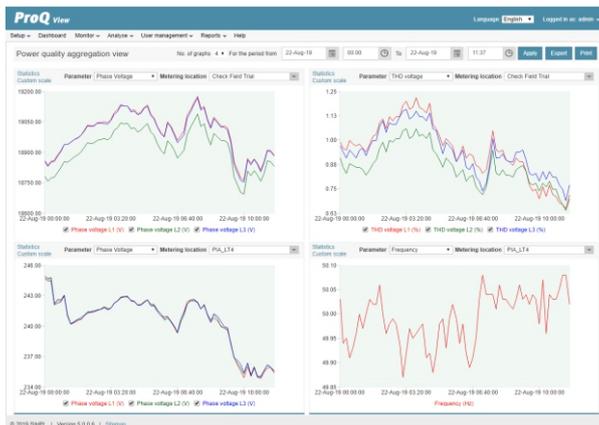


The screenshot displays the EN50160 compliance table with the following columns: Parameter name, Lower limit, Upper limit, Compliance limit (% of limit), Actual compliance (% of limit), Total samples, Samples inside range, Samples outside range, and Result.

Parameter name	Lower limit	Upper limit	Compliance limit (% of limit)	Actual compliance (% of limit)	Total samples	Samples inside range	Samples outside range	Result
Flicker Pst L1	NA	1	95	98.7	77	76	1	●
Flicker Pst L2	NA	1	95	97.4	77	76	1	●
Flicker Pst L3	NA	1	95	97.4	77	76	1	●
Voltage unbalance	NA	2 (% of max Ph-Beg)	95	100	833	833	0	●
Max signing voltage V1	NA	9	99	100	188965	188965	0	●
Max signing voltage V2	NA	9	99	100	188965	188965	0	●
Max signing voltage V3	NA	9	99	100	188966	188966	0	●
Frequency condition 1	-1 (% of Freq)	1 (% of Freq)	99.5	100	56009	56009	0	●
Frequency condition 2	-4 (% of Freq)	4 (% of Freq)	100	100	56009	56009	0	●
Voltage V1 condition 1	-10 (% of Us0)	10 (% of Us0)	99	100	833	833	0	●
Voltage V2 condition 1	-10 (% of Us0)	10 (% of Us0)	99	100	833	833	0	●
Voltage V3 condition 1	-10 (% of Us0)	10 (% of Us0)	99	100	833	833	0	●
Voltage V1 condition 2	-15 (% of Us0)	15 (% of Us0)	100	100	833	833	0	●
Voltage V2 condition 2	-15 (% of Us0)	15 (% of Us0)	100	100	833	833	0	●
Voltage V3 condition 2	-15 (% of Us0)	15 (% of Us0)	100	100	833	833	0	●

The screenshot shows a table of PQ events with columns: Meter serial number, Occurrence time, Restoration time, Type, Phase, Duration, Direction, Magnitude, and Pst. The table lists multiple events for 'Check Fast Trip' at various times and locations.

Meter serial number	Occurrence time	Restoration time	Type	Phase	Duration	Direction	Magnitude	Pst
PQM0000	10-Aug-19 11:57:05	10-Aug-19 11:57:20	Sag	Voltage L1	100ms	Upstream	80.8%	✓
PQM0000	10-Aug-19 11:58:46	10-Aug-19 11:58:53	Sag	Voltage L1	170ms	Upstream	80.3%	✓
PQM0000	11-Aug-19 00:22:29	11-Aug-19 00:22:30	Sag	Voltage L1	90ms	Upstream	81.4%	✓
PQM0000	11-Aug-19 10:18:40	11-Aug-19 10:18:60	Sag	Voltage L1	90ms	Upstream	77.7%	✓
PQM0000	11-Aug-19 00:30:19	11-Aug-19 00:30:21	Sag	Voltage L2	90ms	Upstream	80.8%	✓
PQM0000	11-Aug-19 00:45:60	11-Aug-19 00:45:70	Sag	Voltage L1	100ms	Upstream	86.2%	✓
PQM0000	12-Aug-19 01:38:03	12-Aug-19 01:38:20	Sag	Voltage L1	170ms	Upstream	79.7%	✓
PQM0000	12-Aug-19 02:11:50	12-Aug-19 02:11:58	Sag	Voltage L1	90ms	Upstream	79.3%	✓
PQM0000	13-Aug-19 00:26:96	13-Aug-19 00:26:37	Sag	Voltage L1	70ms	Upstream	86.1%	✓
PQM0000	14-Aug-19 05:58:42	14-Aug-19 05:58:42	Sag	Voltage L2	90ms	Upstream	79.3%	✓
PQM0000	14-Aug-19 10:13:01	14-Aug-19 10:13:01	Sag	Voltage L2	90ms	Upstream	87.6%	✓
PQM0000	14-Aug-19 23:42:08	14-Aug-19 23:42:07	Sag	Voltage L3	70ms	Upstream	80.9%	✓
PQM0000	15-Aug-19 00:21:15	15-Aug-19 00:21:27	Sag	Voltage L1	140ms	Downstream	78.2%	✓
PQM0000	15-Aug-19 07:02:44	15-Aug-19 07:02:54	Sag	Voltage L1	100ms	Upstream	86.7%	✓
PQM0000	15-Aug-19 14:02:48	15-Aug-19 14:02:58	Sag	Voltage L2	90ms	Downstream	85.8%	✓
PQM0000	15-Aug-19 10:58:63	15-Aug-19 11:00:00	Sag	Voltage L2	90ms	Upstream	84.7%	✓
PQM0000	15-Aug-19 11:33:30	15-Aug-19 11:33:31	Sag	Voltage L1	100ms	Downstream	77%	✓
PQM0000	15-Aug-19 14:02:48	15-Aug-19 14:02:58	Sag	Voltage L2	90ms	Downstream	85.8%	✓
PQM0000	15-Aug-19 15:44:51	15-Aug-19 15:44:51	Sag	Voltage L2	130ms	Upstream	79.2%	✓
PQM0000	15-Aug-19 20:25:07	15-Aug-19 20:25:08	Sag	Voltage L2	190ms	Upstream	82.8%	✓
PQM0000	16-Aug-19 05:44:34	16-Aug-19 05:44:33	Sag	Voltage L2	130ms	Upstream	79.2%	✓
PQM0000	16-Aug-19 00:00:00	16-Aug-19 00:00:00	Sag	Voltage L3	90ms	Upstream	82.9%	✓
PQM0000	16-Aug-19 21:38:57	16-Aug-19 21:38:57	Sag	Voltage L1	90ms	Upstream	80.8%	✓
PQM0000	17-Aug-19 10:48:09	17-Aug-19 10:48:09	Sag	Voltage L3	150ms	Upstream	89.7%	✓





## Technical specifications

### Electrical

Connection types	HV4/HV3
Measurement voltage range	3 x 57.7/100 or 3 x 63.5/110 (3P4W)   2 x 100....120 V (3P3W)
Measurement current range	In: 1..5A   I <sub>max</sub> : up to 10 A (configurable)
Accuracy	Class: 0.2S
<ul style="list-style-type: none"><li>• Energy</li><li>• Voltage</li><li>• Current</li><li>• Power</li><li>• Frequency</li></ul>	0.1% for measurement range of voltage & current 0.1% for measurement range of voltage & current Class: 0.2S, or better for measurement range of voltage & current ±0.01 Hz
Burden of measurement inputs with auxiliary supply	Current circuit: <0.01 VA/phase @1A   <0.25 VA/phase @5A
Maximum overload voltage on voltage measurement inputs	1.5 x V <sub>nom</sub> continuously   2 x V <sub>nom</sub> for 0.5 sec
Maximum overload current on current measurement inputs	1.2 x I <sub>max</sub> continuously   10 x I <sub>max</sub> for 3 sec   20 x I <sub>max</sub> for 1 sec

### Compliance

Metering	IEC62052-11 and IEC62053-22, IEC62053-24, IS14697, IS15959
Power quality	IEC61000-4-30 Ed. 3 (Class A), IEC62586-2, IEC61000-4-7, IEC61000-2-4, IEC61000-3-8, IEC61000-4-15, EN50160, IS 17036, IEEE 519-2014, IEEE 1159.3 (PQDIF)
Safety	IEC61010-1
Electromagnetic compliance	CISPR 22 (class A) for radiated and conducted emissions IEC61000-4-2 (electrostatic discharge), IEC61000-4-3 (radiated susceptibility), IEC61000-4-4 (electric fast transients), IEC61000-4-5 (surge & impulse), IEC61000-4-6 (conducted susceptibility), IEC61000-4-12 (damped oscillatory waves)

### Mechanical

Dimensions	Rack as per DIN 43862 and IEC 60297
Sealing provision	Meter, rack and back terminals

### Environmental

IP compliance	Meter front fascia: IP 54   Inside panel: IP20
Operating temperature	-20 °C to +60 °C
Limit range of operation	-40 °C to +70 °C
Storage temperature	-40 °C to +70 °C
Essailec® connectors	-10 °C to +55 °C

### Communication

Optical port	IEC1107 & ANSI C12.18
RS-232 port	Protocol: DLMS, Modbus (configurable) Baud rate: 1200 bit/s to 56 kbit/s, half duplex
RS-485 port	Protocol: configurable DLMS/MODBUS RTU Baud rate: 1200 bit/s to 56 kbit/s, half duplex
Ethernet port	Ethernet 1 over RJ-45, 10/100 Mbit/s Ethernet 2 SFP port 1 Gbit/s (for ethernet or FO termination) Optional IEC 61850 edition 1.0 and 2.0 on both ports
Power quality data	Power quality data exchange through IEEE 1159.3 PQDIF
USB port	Micro-B connector (DLMS)
Time synchronization	Through SNTP protocol



## Technical specifications

### Power supply

Type	Self powered and auxiliary supply
Auxiliary supply range	50-230 V AC/DC +/- 20%, 50 Hz/60 Hz

### Inputs and outputs

Independent fixed outputs	Fixed 4 outputs (24-230 V AC/DC @ 100 mA)
Independent configurable I/O	Configurable block of 4 I/Os (24-230 V AC/DC)

### Display characteristics

Display type	4.3 inch colour graphical TFT display, size(105.5 x 67.2 mm), 480 x 272 pixels, pixel size (0.198 x 0.198 mm)
Languages	English, Swedish, German, French, Italian, Russian, Arabic (field configurable)
Remote display	Web server for monitoring and basic configuration Browser support: Google Chrome, IE9 or above

### Measurements, data logging and analytics

Load profiling (typical)	<ul style="list-style-type: none"><li>- Two time-based loggers</li><li>- Total 150 parameters configurable including both loggers</li><li>- 28 energy channels, with integration period 1 to 60 minutes</li><li>- Logging of more than 80 instantaneous and PQ parameters, with integration period 1 to 60minutes</li><li>- Up to 300 days (@ 30 minute SIP for parameters 1..100)</li><li>Up to 10 days (@ 1 minute SIP for parameters 1..100)</li></ul>
Logging and configurable parameters	<ul style="list-style-type: none"><li>- 16 time-of-use tariff, 16 seasons, 16 day types and 16 time zones, 53 billing dates, daylight saving dates for 25 years</li><li>- Alarms and compartments for event logging</li><li>- Logging of 24 sets of historical data logging</li><li>- Logging of 65 days for daily energy snapshot</li></ul>
PQ measurement and event logging	<ul style="list-style-type: none"><li>- Measurements as per IEC 61000-4-30 ed. 3 class A</li><li>- Logging of sags/swells, interruptions and RVC</li><li>- Short- and long-term flicker values as per IEC 61000-4-15</li><li>- Unbalance and individual sequence parameters logging</li><li>- Alarms on display for PQ and revenue events</li><li>- Transients logging</li></ul>
Harmonic distortion	<ul style="list-style-type: none"><li>- Up to 50th individual harmonic for voltage and current inputs</li><li>- THD, TDD, THD-I, THD2550 and K factor, Crest factor</li></ul>
Analytics	<ul style="list-style-type: none"><li>- Comprehensive analytics through ProQ View software</li></ul>

#### Australia

sales\_australia@securemeters.com  
www.securemeters.com/au

#### Dubai

sales\_middleeast@securemeters.com  
www.securemeters.com/me

#### Europe

sales\_europe@securemeters.com  
www.securemeters.com/eu

#### India, SE Asia, Africa

sales\_india@securemeters.com  
www.securemeters.com/in

#### UK

sales\_uk@securemeters.com  
www.securemeters.com/uk