PM175

POWER QUALITY ANALYZER

The PM175 is a compact, multi-function, three-phase AC powermeter and power quality analyzer specially designed to meet the requirements of users ranging from electrical panel builders to substation operators.

Selection of bright 3-row LED or 5.7" touch screen graphic color display provides easy local meter readings. The display module is freely detachable and can be located at a distance of up to 1000 meters from the device.

Two communication ports allow local and remote automatic meter readings and setup though the supplemental communication or user data acquisition software. Different communication options are available for remote communications with the meter including TCP/IP, Profibus and public telephone lines.

Features

- ➔ 3 voltage and 3 current transformer-isolated AC inputs for direct connection to power line or via potential and current transformers
- ➔ Multi-function 3-phase meter (true RMS, volts, amps, power, power factor, neutral current, voltage and current unbalance, frequency)
- ➔ Embedded harmonic analyzer, voltage and current THD, current TDD and K-Factor
- ➔ Voltage and current harmonic spectrum and angles, up to 50th order
- ➔ Inter-harmonics THD
- ➔ Ampere/Volt/THD/TDD demand meter
- ➔ Class 0.2S
- ➔ Time-of-Use (TOU), 8 tariff energy/demand registers x 8 tariffs, 4 seasons x 4 types of days, 8 tariff changes per day, easy programmable tariff schedule

- ➔ Automatic daily profile for energy and maximum demand readings (total and tariff registers)
- ➔ Embedded programmable controller; 16 control setpoints; programmable thresholds and delays; relay output control; 1/2-cycle response time
- ➔ Event recorder for logging internal diagnostics events, control events and I/O operations
- ➔ 16 data recorders; programmable data logs on a periodic basis and on any internal and external trigger
- ➔ Two waveform recorders; simultaneous 6-channel AC recording in a single plot; sampling rate of 32, 64 and 128 samples per cycle; 20 pre-fault cycles; up to 30 seconds of continuous recording at a rate of 32 samples per cycle

- EN50160, GOST13109 or GOST54149 Power Quality recorder (compliance statistics, EN50160 harmonics survey statistics, onboard power quality analyzer; programmable thresholds and hysteresis; ready-for-use reports)
- Real-time waveform capture and monitoring; simultaneous 6-channel 4-cycle capture at 128 samples per cycle
- Detachable display module with a 3-wire RS-485 interface; up to 1000 meters operation. Selection of one or two displays:
  - Easy to read 3-row (2x4 characters + 1x6 characters) bright LED display, adjustable update time, auto-scroll option with adjustable page exposition time, auto-return to a default page and LED bar graph showing percent load with respect to user-definable nominal load current
  - 5.7" large color graphic touch screen, displaying comprehensive information in easy to read screens that allow monitoring complex information at a glance. The touch screen makes the operation and configuration so simple that it completely eliminates the need for employee training. The PM175-TFT has full speed USB port.
- 2 standard plus 2 optional digital inputs for monitoring external contacts, and receiving pulses from energy, water and gas meters
- 2 standard plus 2 optional relay outputs for alarms and controls, and for output energy pulses

- 2 optional optically isolated analog outputs with an internal power supply; options for 0-20mA, 4-20mA, 0-1mA, ±1mA, ±5mA and 0-5mA output
- 2 optional optically isolated analog inputs with an internal power supply; options for 0-20mA, 4-20mA, 0-1mA, and ±1mA input
- Optional analog expander providing additional 2 x 8 analog outputs; options for 0-20mA, 4-20mA, 0-1mA, 0-5mA, ±1mA, 0-10V and ±10V
- Precise internal clock with battery backup
- 1 Mbyte RAM with battery backup for long-term data and waveform recording
- Two communication ports; communications options available:
  - COM1:
    - RS-232/RS-422/RS-485
    - 56K Dial-up modem
    - Ethernet 10/100BaseT, ExpertPower™ enabled
    - Profibus DP
    - 2G Cellular Modem (over RS-232)
  - COM2:
    - RS-422/RS-485
- Modbus RTU, Modbus ASCII and Modbus/TCP, DNP3 and DNP3/TCP (level 1 Rev. 2.3) communication protocols
- Password security for setup parameters and resets via the front panel and communications. Recording of tampering attempts to the device event log.
- Easy field upgrading device firmware through any communication port

Technical Specifications

ENVIRONMENTAL CONDITIONS	
Operating temp.	-20°C to +60°C (-4°F to 140°F)
Storage temperature	-25°C to +80°C (-13°F to 176°F)
Humidity	0 to 95% RH non-condensing

CONSTRUCTION	
Weight	1.23kg (2.7 lb.)
Dimensions (HxWxD)	127x127x143mm (5x5x5.6")

MATERIALS	
Case enclosure	Plastic PC/ABS blend
Display body	Plastic PC/ABS blend
Front panel	Plastic PC
PCB	FR4 (UL94-V0)
Terminals	PBT (UL94-V0)
Plug-in connectors	Polyamide PA6.6 (UL94-V0)
Packaging case	Carton and Stratocell® (Polyethylene Foam) brackets
Labels	Polyester film (UL94-V0)

POWER SUPPLY	
120/230 VAC-110/220 VDC Option	➔ Rated input 85-264VAC 50/60 Hz, 88-290VDC, Burden 10W ➔ Isolation ➔ Input to output: 3000 VAC ➔ Input to ground: 2000 VAC
12 VDC Option	Rated input 9.6-19 VDC
24 VDC Option	Rated input 19-37 VDC
48 VDC Option	Rated input 37-72 VDC
Wire size	up to 12 AWG (up to 3.5 mm^2)

Input Ratings

VOLTAGE INPUTS	
Operating range	690VAC L-L, 400VAC L-N
Direct input and input via PT	Up to 828VAC line-to-line, up to 480VAC line-to-neutral
Input impedance	1MΩ
Burden for 400V	< 0.4 VA
Burden for 120V	< 0.04 VA

Overvoltage withstand	1kV AC continuous, 2kV AC for 1 sec.
Galvanic isolation	3500 VAC
Wire size	Up to 12 AWG (up to 3.5mm^2)

CURRENT INPUTS	
Wire size	12 AWG (up to 3.5 mm^2)
Galvanic isolation	3500 VAC
Operating range	**5A:** Cont. 10A RMS, Burden: < 0.1 VA **1A:** Cont. 2A RMS, Burden: < 0.02 VA
Overload withstand	**5A:** Cont. 15A RMS, 300A for 1 sec **1A:** Cont. 6A RMS, 80A for 1 sec

RELAY OUTPUTS	
2 relays 3A/250 VAC; 3A/30 VDC, 2 contacts (SPST Form A)	
Wire size	14 AWG (up to 1.5 mm^2)
Galvanic isolation	➔ Between contacts and coil: 2000 VAC 1 min ➔ Between open contacts: 1000 VAC
Operate time	10 ms max.
Release time	5 ms max.
Update time	1 cycle

DIGITAL INPUTS	
2 Digital Inputs Dry Contacts	
Wire size	14 AWG (up to 1.5 mm^2)
Galvanic isolation	2000V RMS
Internal power supply	15V
Scan time	1 ms

OPTIONAL ANALOG INPUTS	
2 Analog Inputs (optically isolated)	
Ranges (upon order)	➔ ±1 mA (100% overload) ➔ 0-1 mA (100% overload) ➔ 0-20 mA ➔ 4-20 mA
Wire size	14 AWG (up to 1.5 mm^2)
Isolation	2,000 V RMS
Accuracy	0.5% FS
Scan time	1 cycle

OPTIONAL ANALOG OUTPUTS

2 Analog Outputs (optically isolated)

Ranges (upon order)	➔ 0-20 mA, maximum load 510 Ω ➔ 4-20 mA, maximum load 510 Ω ➔ ±1 mA, maximum load 5 kΩ (100% overload) ➔ 0-1 mA, maximum load 5 k Ω (100% overload) ➔ ±5 mA, maximum load 5 kΩ ➔ 0-5 mA, maximum load 5 kΩ
Isolation	2,000 V RMS
Power supply	Internal
Accuracy	0.5% FS
Wire size	14 AWG (up to 1.5 mm^2)
Update time	1 cycle

Communication Ports

COM1 (Optional modules)

Serial EIA RS-232 optically isolated port	➔ Isolation: 2,000 V RMS ➔ Connector type: DB9 female ➔ Baud rate: up to 115.2 kbps ➔ Supported protocols: Modbus RTU and Modbus ASCII, DNP3 (with firmware V25.2.01 & later)
RS-422/RS-485 optically isolated port	➔ Isolation: 2,000 V RMS ➔ Connector type: DB9 female ➔ Baud rate: up to 115.2 kbps ➔ Supported protocols: Modbus RTU and Modbus ASCII, DNP3 (with firmware V25.2.01 & later)
Ethernet Port	➔ Transformer-isolated 10/100BaseT Ethernet port ➔ Connector type: RJ45 modular ➔ Supported protocols: Modbus/TCP on Port 502, DNP3/TCP on Port 20000 (with firmware V25.2.01 & later) ➔ Number of simultaneous connections: 4 (4 Modbus/TCP or 2 Modbus/TCP + 2 DNP3/TCP)

Dial-up Modem	➔ Transformer-isolated internal 56K modem ➔ Connector type: RJ11 ➔ Supported protocols: Modbus RTU and Modbus ASCII

COM2

RS-422/RS-485 optically isolated port

Isolation	2,000 V RMS
Connector type	Removable, 5 pins
Wire size	Up to 14 AWG (up to 1.5 mm^2).
Baud rate	Up to 115.2 kbps
Supported protocols	Modbus RTU and Modbus ASCII, DNP3 (with firmware V25.2.01 and later).

REAL-TIME CLOCK

Accuracy	Typical error 30 seconds per month @ 25°C

LOG MEMORY

Onboard memory with battery backup	1 Mbytes

DISPLAY MODULE

Display	High-brightness seven-segment digital LEDs, two 4-digit + one 6-digit windows
Keypad	6 push buttons
Communication	EIA RS-485 port with 12V supply voltage
Connector type	DB15, 15 pins
Wires size	Up to 14 AWG (up to 1.5 mm^2)
Distance	Up to 1000 m (3200 feet)

Standards Compliance

➔ Accuracy Class 0.2S according to IEC 62053-22 (1A/5A versions)
➔ UL File no. E236895
➔ Directive complied with:
   ➔ EMC: 89/336/EEC as amended by 92/31/EEC and 93/68/EEC
   ➔ LVD: 72/23/EEC as amended by 93/68/EEC and 93/465/EEC

➔ Harmonized standards to which conformity is declared:
   ➔ EN55011: 1991
   ➔ EN50082-1: 1992
   ➔ EN61010-1: 1993
   ➔ A2/1995

➔ EN50081-2 Generic Emission Standard - Industrial Environment
➔ EN50082-2 Generic Immunity Standard - Industrial Environment
➔ EN55022: 1994 Class A
➔ EN61000-4-2
➔ ENV50140: 1983
➔ ENV50204: 1995 (900MHz)
➔ ENV50141: 1993
➔ EN61000-4-4: 1995
➔ EN61000-4-8: 1993

Order String

MODELS	
PM175 Power Quality Analyzer	**PM175**
PM175 with 5.7" touchscreen graphic color display	**PM175-TFT**
Transducer version	**RPM075**

OPTIONS	
VOLTAGE INPUTS	
690V AC Nominal Voltage Input	**-**
120V AC Nominal Voltage Input	**U**
CURRENT INPUTS	
5 Ampere	**5**
1 Ampere	**1**
5A split core remote high accuracy current sensor (HACS)	**RS5**
High Accuracy Current Sensors (HACS). Requires ordering of 3 HACS	**HACS**
CALIBRATION AT FREQUENCY	
50 Hz	**50Hz**
60 Hz	**60Hz**
POWER SUPPLY	
85-265V AC and 88-290V DC	**ACDC**
9.6-19V DC	**1DC**
19-37V DC	**2DC**
37-72V DC	**3DC**
I/O MODULE	
2 Digital Input /2 Digital Output (standard)	**-**
Additional 2 Digital Input /2 Digital Output (total 4DI/4DO)	**DIO**
2 Analog Outputs: ±1mA	**AO1**
2 Analog Outputs: 0-20mA	**AO2**
2 Analog Outputs: 0-1mA	**AO3**
2 Analog Outputs: 4-20mA	**AO4**
2 Analog Outputs: 0-5mA	**AO5**
2 Analog Outputs: ±5mA	**AO6**
2 Analog Inputs: ±1mA	**AI1**
2 Analog Inputs: 0-20mA	**AI2**
2 Analog Inputs: 0-1mA	**AI3**
2 Analog Inputs: 4-20mA	**AI4**
COMMUNICATION	
Standard Communications RS-232/422/485	**-**
Dial Up Modem	**MOD**
Ethernet (TCP/IP)	**ETH**
PROFIBUS	**PRO**
2G GPRS External Modem	**GPRS**