

# SIEMENS

*Ingenuity for life*



## PAC3200 Power Meter

### Reliable and precise monitoring of electrical power systems

The PAC3200 is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 50 parameters or as part of an industrial control, building automation or global power monitoring system.

Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub billing or cost allocation installations with multiple

tariffs. The PAC3200 can also be used to support LEED certification and provide the needed energy metering data for federal/local government energy reduction programs.

The PAC3200 provides open communications using Modbus RTU/TCP, PROFINET and PROFIBUS-DP protocols for easy integration into any local or remote monitoring system. Simple configuration of the meter can be done from the front display or by using a PC with SENTRON powerconfig setup software, supplied with the meter.



- Full Graphic LCD Display to indicate:
- Display title or designation of the displayed measurements
  - Phase
  - Measured value Unit
  - Labeling of function keys



#### Example of operating menu:

The texts can be displayed in several languages, which can be selected directly on the device.<sup>1)</sup> The large graphic LCD display facilitates reading even from a distance. For optimum visibility even in poor light conditions the PAC3200 comes with a gradually adjustable background illumination.

## When, where and how much power is consumed?

#### PAC3200 makes consumption apparent

To accomplish a sustainable reduction of power costs, you must first analyze the electrical system's current consumption and power flows. The PAC3200 power meter precisely and reliably delivers the required information of power values to put you on the path to reduce your power cost.

#### Applications summary

- Replace multiple analog meters  
An ideal replacement for analog meters. Use it for stand-alone metering in custom panels, switchboards, switchgear, gensets, motor control center and UPS systems, PDU, RPPs, etc.
- Basic Metering  
The PAC3200 offers high-accuracy power, energy and demand measurements.

Modbus TCP integrated into the meter as standard

PAC3200 PROFIBUS DP, MODBUS RTU, PROFINET and In / Idiff, analog expansion modules for remote data transmission.

Terminal blocks for voltage and current measuring, control power (available with compression terminals)



1 DI and 1 DO for remote switching, and DI also for kWh, kVAh, kvarh pulse measurement

- **Cost allocation / Energy monitoring**  
Perfect for monitoring right down to the tool level, the meter can help monitor cost centers, identify opportunities for demand control and check energy consumption patterns.
- **Automation integration**  
Monitor critical equipment processes and tie directly to the Siemens family of PLCs and automation networks.
- **Sub-metering**  
Low cost, high accuracy and simple retrofit installation enables economical measurement of commercial and residential tenant space. Integrate the PAC3200 with existing energy management systems and RTUs. Reduce energy consumption by eliminating previously uncontrolled expenses.

These revenue accurate values can be used for bill verification, monitoring backup power on critical systems and offering cost-effective energy solutions.

#### **Power management and PAC3200**

The PAC3200 can easily be integrated into a power management system using Modbus TCP (standard), Modbus RTU (option), PROFINET (option) or PROFIBUS. With communication, the PAC3200 transmits measured values to the supervisory systems, where the data can be further processed for display and control.

Siemens offers a low cost Powermanager or enterprise level WinPM.Net power monitoring software which can provide easy integration to the PAC3200 meter. Powermanager or WinPM.Net provide standard overview displays allowing detailed analysis of the electrical power, which allows for easy allocation of power consumption and cost. Additionally, unexpected operating conditions can be detected on a timely basis.

<sup>1)</sup> Languages included as standard in the meter are English, German, French, Spanish, Italian, Portuguese, Polish, Turkish, Russian and Chinese.

## Functional features

| Instantaneous values  |  |   |
|---|--|---|
| Voltage   | Phase-phase / phase-neutral  | ✓   |
| Currents  | Per phase  | ✓   |
| Apparent, active and reactive power   | Per phase and total  | ✓   |
| Power factor  | Per phase and total  | ✓   |
| Frequency   | 45...64 Hz   | ✓   |
| THD for voltage and current   | Per phase  | ✓   |
| Min. / max. values  | Voltage – phase-phase, phase-neutral<br>Current / Power / Power factor / THD per phase<br>Frequency<br>Three phase average voltage and current | ✓   |
| Average values  | Voltage – phase-phase, phase-neutral<br>Voltage min. / max. for phase-phase-phase-neutral<br>Current<br>Current min. / max.                    | ✓   |
| Energy measurement  |  |   |
| Active energy   | Import / export; high / low tariff   | ✓ / ✓   |
| Reactive energy   | Positive / negative; high / low tariff   | ✓ / ✓   |
| Apparent energy   | High / low tariff  | ✓   |
| Energy demand per measuring period  | Three phase average rating for active and reactive power   | 1 to 60 min.  |
| Min. / max. rating values within the measuring period                               |  | ✓   |
| Meter running counter   | Uptime in hours  | ✓   |
| Universal counter   | Pulse counting of external devices like water, gas, etc.   | ✓   |
| Measurement accuracy  |  |   |
| Voltages  |  | ±0.3%   |
| Currents  |  | ±0.2%   |
| Power factor and power  |  | ±0.5%   |
| Active energy   |  | Class 0.5S in acc. with IEC 62053-22 / ANSI 12.20 class 0.5                                       |
| Reactive energy   |  | Class 2 according to IEC61557-12 and/or IEC62053-23   |
| Monitoring functions  |  |   |
| Set point monitoring  | V, I, power, VAR, VA, Freq. THD, PF  | Up to 6 values  |
| Simple logic functions for alarming   | Alarm via digital  | Output or software  |
| Phase unbalance   | Voltage and / or >> current  | ✓   |
| Communication   |  |   |
| Ethernet  | Integrated   | 10 Base-T (10 Mbit/sec)   |
| Modbus TCP  | Integrated RJ45 port   | 10 Base-T (10 Mbit/sec)   |
| PROFIBUS DP expansion module  | Optional<br>• Parameterization via device front or with SENTRON powerconfig software<br>• Transition of data via GSD file                      | • Support of all baud rates from 9600 BPS to 12 MBPS (9.6 Kbit/sec to 12 Mbit/sec)                |
| Modbus RTU expansion module   | Optional<br>• Parameterization via device front or with SENTRON powerconfig software<br>• Transition of data via MODBUS register based points  | • Support of all baud rates of 4800, 9600, 19.2K and 38.4K BPS (4.8 / 9.6 / 19.2 and 38.4 kB/sec) |
| Switched Ethernet Expansion Module (Supports PROFINET and Dual RJ45 Ethernet Ports) | Optional<br>• Parameterization via device front or with powerconfig software<br>• Transition of data via GSDML file                            | • Support of 10 and 100 Mbit/s baud rates   |

## Functional features (continued)

| Inputs / Outputs  |                                    |
|---|------------------------------------|
| Input voltage / at digital input  |                                    |
| • initial value for signal<1>-recognition   | 13 V                               |
| • at DC / rated value   | 24 V                               |
| • Full-scale value for signal <0> recognition   | 8 V                                |
| Number of digital outputs   | 1                                  |
| Number of digital inputs  | 1                                  |
| Digital output version  | Switching or pulse output function |
| Input current / at digital input  |                                    |
| • for signal <1>  | 7 mA                               |
| Output current  |                                    |
| • at digital output / with signal <0> / maximum                                       | 0.2 mA                             |
| • at digital output / for signal <1> / minimum  | 27 mA                              |
| • at digital output / for signal <1> / maximum  | 27 mA                              |
| • at the digital outputs / at DC / maximum  | 100 mA                             |
| Output delay / at digital output  |                                    |
| • for signal <0> to <1> / maximum   | 5 ms                               |
| • for signal <1> to <0> / maximum   | 5 ms                               |
| Operating voltage / as output voltage / at DC / maximum permissible                   | 30 V                               |
| Property of the output / Short-circuit proof  | Yes                                |
| Input delay time / at digital input   |                                    |
| • for signal <0> to <1> / maximum   | 5 ms                               |
| • for signal <1> to <0> / maximum   | 5 ms                               |
| Internal resistance / at the digital outputs  | 55 Ω                               |
| Measuring category / for digital signals  | CATII                              |
| Switching frequency / at digital output / maximum                                     | 17 Hz                              |
| Measuring inputs  |                                    |
| Outer conductors and neutral conductors internal resistance / for voltage measurement | 1.05 MΩ                            |
| Measurable supply voltage   |                                    |
| • between (PE)N and L / at AC / minimum   | 40 V                               |
| • between (PE)N and L / at AC / maximum   | 480 V                              |
| • between (PE)N and L / at AC / maximum rated value                                   | 400 V                              |
| • between the outer conductors / at AC / minimum                                      | 70 V                               |
| • between the outer conductors / at AC / maximum                                      | 831 V                              |
| • between the outer conductors / at AC / maximum rated value                          | 690 V                              |
| Voltage measuring range extension / with external voltage transformers                | Yes                                |
| Current measuring range extension / with external current transformers                | Yes                                |
| Measuring category / for voltage measurement  | CATIII                             |
| Supply voltage / between the outer conductors / at AC / maximum permissible           | 831 V                              |
| Consumed active power / for current measurement / per phase                           | 115 mW                             |
| Continuous current / at AC / maximum permissible                                      | 10A                                |
| Measuring category / for current measurement  | CATIII                             |
| Zero suppression / for current measurement  | 0.1...10 %                         |
| Relative measurable current / at AC   |                                    |
| • minimum   | 1 %                                |
| • maximum   | 120 %                              |
| Measuring procedure / for current measurement   | TRMS                               |
| Measurable current / 1 / at AC / Rated value  | 1 A                                |
| Short-time current resistance (I <sub>cw</sub> ) / limited to 1 s / rated value       | 100 A                              |

## Functional features (continued)

| Standard inputs / outputs   |  |  |
|---|--|--|
| Integrated digital input  | 24 Vdc / 7 mA  | 1, dry contact, requires external power    |
| Integrated digital output   | 30 Vdc max. / 10-27 mA; 100 mA max.                        | 1  |
| General   |  |  |
| Password protection   |  | ✓  |
| Technical data  |  |  |
| Two-quadrant (import) / four-quadrant (import and export) measuring |  | 4Q   |
| Measurement types   |  | 1 ph, 2 ph or 3 ph                         |
| Applicable for network type   |  | TN, TT, IT                                 |
| Sampling rate   | 64 samples / cycle at 60Hz                                 |  |
| Measured voltage  | Direct connection up to max. delta/wye without transformer | 690 V / 400 V (CAT III)                    |
| Current inputs  | Settable on device   | 1A or 5A nominal                           |
| Power supply  | AC/DC  | 95...240V AC (±10%) / 110...340V DC (±10%) |
|   | DC only  | 22...65V DC (±10%)                         |
| Degree of protection  | Front  | IP65, for UL IP54                          |
|   | Rear   | IP20, NEMA 1A                              |
| Operating temperature   | °C / °F  | -10...+55 / +14...+131                     |
| Display   | Type   | Background-illuminated graphic LCD         |
|   | Resolution (pixels)  | 128 x 96                                   |
| Text displays   |  | Multilingual                               |
| Optional ports  | 1  | One port is available for optional modules |
| MTBF  |  | 185.8 Years                                |
| Connections   |  |  |
| Type of electrical connection                                       |  |  |
| • at the measurement inputs for voltage                             |  | screw-type terminals                       |
| • of the fast Ethernet interface                                    |  | RJ45 (8P8C)                                |
| Mechanical Design   |  |  |
| Height  |  | 96 mm                                      |
| Height / of the display   |  | 54 mm                                      |
| Width   |  | 96 mm                                      |
| Width   |  |  |
| • of the display  |  | 72 mm                                      |
| Depth   |  | 56 mm                                      |
| Mounting position   |  | vertical                                   |
| Installation depth  |  | 51 mm                                      |
| Mounting type / panel mounting                                      |  | Yes  |
| Net weight  |  | 451 g                                      |
| Environmental conditions  |  |  |
| Installation altitude / at height above sea level / maximum         |  | 2 000 m                                    |

## Function features (continued)

| Standard   |  |
|--|--|
| • for EMC for industrial sector  | IEC 61000-6-2 respectively IEC 61326-1:2005, table 2   |
| • for EMC against unloading  | IEC 61000-4-2: 2001-04   |
| • for EMC against high frequency fields                                | IEC 61000-4-3: 2006-02   |
| • for EMC against conducted LF disturbance variables (industry)        | IEC 61000-6-4, Group 1 Klasse A / CISPR11 Gruppe 1 Klasse A FCC Part 15 Subpart B Class A                          |
| • for EMC against conducted disturbance variables via HF fields        | IEC 61000-4-6: 2001-12   |
| • for EMC against magnetic fields with power engineering frequencies   | IEC 61000-4-8: 2001-03   |
| • for EMC against quick, transient electrical disturbances             | IEC 61000-4-4: 2005-07   |
| • for EMC against voltage drops and interruptions                      | IEC 61000-4-11: 2004-03  |
| • for EMC against surge voltages                                       | IEC 61000-4-5: 2001-12   |
| • for free fall  | IEC 60068-2-32: 1975   |
| • for pulse emitter  | according to IEC62053-31   |
| • for cyclic, environmental damp heat check                            | IEC 60068-2-30   |
| • for environmental coldness check                                     | IEC 60068-2-1  |
| • for environmental dry heat check                                     | IEC 60068-2-2  |
| Relative humidity / at 25 °C / without condensation / during operation |  |
| • minimum  | 5 %  |
| • maximum  | 95 %   |
| Ambient temperature  |  |
| • during operation / minimum   | -10 °C   |
| • during operation / maximum   | 55 °C  |
| • during storage / minimum   | -25 °C   |
| • during storage / maximum   | 70 °C  |
| Certificates   |  |
| Certificate of suitability   |  |
| • as EC declaration of conformity                                      | IEC 61010-1: 2001 (2nd Ed.) with Corr. 1, EN 61010-1: 2001 (2nd Ed.) and DIN EN 61010-1:2002 with "Berichtigung 1" |
| • as approval for Canada   | UL 61010-1, 2nd Ed. CAN/CSA-C22.2 NO. 61010-1-04   |
| • as approval for USA  | UL 61010-1, 2nd Ed. CAN/CSA-C22.2 NO. 61010-1-04   |
| Reference identifier / acc. to DIN EN 61346-2                          | P  |

General Product Approval



Declaration of Conformity



## Order information

| Product   | Order Number <sup>1)</sup> |
|---|----------------------------|
| PAC3200 compression terminals not suitable for use with ring tongue terminals, AC/DC  | 7KM2112-0BA00-3AA0         |
| PAC3200 compression terminals not suitable for use with ring tongue terminals, DC only for 22-65V DC extra low voltage power supply | 7KM2111-1BA00-3AA0         |
| PAC PROFIBUS DP expansion module  | 7KM9300-0AB01-0AA0         |
| PAC MODBUS RTU expansion module   | 7KM9300-0AM00-0AA0         |
| Adapter Plate for 4700/4720 meter cutout  | 93-47ADAPTER               |
| SITOP Power Supply AC 99-264VAC, 24 VDC, 0.5A   | 6EP1331-5BA00              |
| PAC3200 In / Idiff, analog expansion module   | 7KM9200-0AD00-0AA0         |

1) Omit dashes from part numbers when ordering except on 93-47ADAPTER.

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