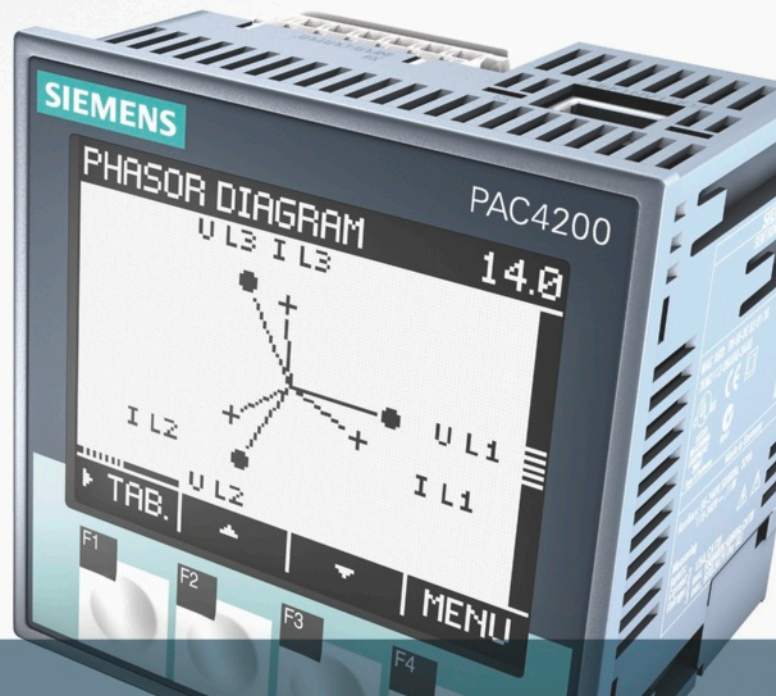


# SIEMENS



SENTRON



## 7KT/7KM PAC measuring devices

A device to suit every requirement

### Fully informed at all times thanks to intelligent measuring technology

The 7KT/7KM PAC measuring devices ensure precise, reproducible and reliable measurement of energy values for infeed, outgoing feeders or individual loads. For further processing of the measurement data, the devices are equipped with a wide range of communication options for easy integration in higher-level automation and power monitoring systems.

### Universal in use – worldwide

The portfolio includes measuring devices for every requirement: from simple energy measurement through to the monitoring of system status and power quality. Fast commissioning of the devices is ensured by the intuitive menu. They can be used worldwide thanks to international approvals.

### Highlights

- Fast commissioning thanks to intuitive menu
- Easy system connection to higher-level automation and power monitoring systems
- Global application in accordance with IEC/EN and UL standards



Answers for infrastructure and cities.

# Measuring Devices and Power Monitoring

## Power Monitoring

### Hardware and software components

#### Overview

| 7KT/7KM PAC measuring devices                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                             | 7KT PAC1500                                                                       | 7KM PAC3100                                                                        | 7KM PAC3200                                                                         | 7KM PAC4200                                                                         |
|                                                             |  |  |  |  |
|                                                             | The entry-level solution when it comes to energy measurement                      | The cost-effective solution for digital measurement                                | The specialist solution for precise energy measurement                              | The professional solution for communication and monitoring                          |
| <b>Measuring range/connection</b>                           |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Max. input voltage L-L/L-N                                | 400 V/230 V                                                                       | 480 V/276V                                                                         | 690 V/400 V <sup>1)</sup>                                                           | 690 V/400 V <sup>1)</sup>                                                           |
| • Transformer connection version                            | x/5A                                                                              | x/5A                                                                               | x/1A/x/5A                                                                           | x/1A/x/5A                                                                           |
| • Direct connection version                                 | 80 A/125 A                                                                        | –                                                                                  | –                                                                                   | –                                                                                   |
| • DC power supply unit with extra-low voltage version       | –                                                                                 | –                                                                                  | 22 ... 65 V                                                                         | 22 ... 65 V                                                                         |
| • Single-phase counter version                              | ✓                                                                                 | –                                                                                  | –                                                                                   | –                                                                                   |
| <b>Basic measured quantities</b>                            |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Voltage, current, power, frequency, power factor          | ✓ <sup>2)</sup>                                                                   | ✓                                                                                  | ✓                                                                                   | ✓                                                                                   |
| <b>Energy measurement</b>                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Apparent, active, reactive energy                         | –   ✓   ✓                                                                         | –   ✓   ✓                                                                          | ✓   ✓   ✓                                                                           | ✓   ✓   ✓                                                                           |
| <b>Extended measured quantities</b>                         |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Load profile recording with time stamp and min/max values | –                                                                                 | –                                                                                  | –                                                                                   | ✓                                                                                   |
| • Distortion factor THD (voltage, current)                  | –                                                                                 | –                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • Harmonics (voltage, current)                              | –                                                                                 | –                                                                                  | –                                                                                   | 3. - 31.                                                                            |
| • Phase angle/phase chart                                   | –                                                                                 | –                                                                                  | –                                                                                   | ✓                                                                                   |
| <b>Monitoring functions</b>                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Operating hours counter                                   | –                                                                                 | –                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • Limit monitoring                                          | –                                                                                 | –                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • Logic functions                                           | –                                                                                 | –                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • Event log                                                 | –                                                                                 | –                                                                                  | –                                                                                   | > 4000 events                                                                       |
| • Gateway function                                          | –                                                                                 | –                                                                                  | –                                                                                   | ✓                                                                                   |
| <b>System integration and communication</b>                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Digital inputs (DI)/digital outputs (DO)                  | –                                                                                 | 2/2                                                                                | 1/1                                                                                 | 2/2                                                                                 |
| • S0 interface                                              | ✓                                                                                 | ✓                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • 4DI/2DO expansion module                                  | –                                                                                 | –                                                                                  | –                                                                                   | Optional                                                                            |
| • M-Bus                                                     | Optional                                                                          | –                                                                                  | –                                                                                   | –                                                                                   |
| • Instabus KNX                                              | Optional                                                                          | –                                                                                  | –                                                                                   | –                                                                                   |
| • Modbus RTU                                                | Optional                                                                          | ✓                                                                                  | Optional                                                                            | Optional                                                                            |
| • Ethernet with Modbus TCP                                  | –                                                                                 | –                                                                                  | ✓                                                                                   | ✓                                                                                   |
| • PROFIBUS DPV1                                             | –                                                                                 | –                                                                                  | Optional                                                                            | Optional                                                                            |
| • PROFINET IO/ PROFINergy                                   | –                                                                                 | –                                                                                  | Optional                                                                            | Optional                                                                            |
| • Parameterization software                                 | ✓                                                                                 | powerconfig                                                                        | powerconfig                                                                         | powerconfig                                                                         |
| • Integration in power monitoring system                    | powermanager                                                                      | powermanager                                                                       | powermanager, powerrate                                                             | powermanager, powerrate                                                             |
| <b>General data</b>                                         |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| • Measuring accuracy, active energy, reactive energy        | 1   2                                                                             | 1   2                                                                              | 0.5 S   2                                                                           | 0.2 S   2                                                                           |
| • MID version                                               | ✓                                                                                 | –                                                                                  | –                                                                                   | –                                                                                   |
| • Installation                                              | Standard mounting rail                                                            | Front mounting                                                                     | Front mounting                                                                      | Front mounting                                                                      |
| • Dimensions (1 MW = 18 mm)                                 | 2 MW/4 MW/6 MW                                                                    | 96 x 96 x 56 mm                                                                    | 96 x 96 x 56 mm                                                                     | 96 x 96 x 82 mm                                                                     |

<sup>1)</sup> With the exception of devices with power supply units with extra-low voltage

<sup>2)</sup> On the display - energy values only. Additional measured quantities are transmitted via the optional expansion modules 7KT Modbus and 7KT M-Bus

✓ Available/possible

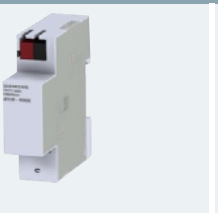
– Not available/not possible

# Measuring Devices and Power Monitoring

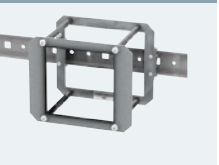
## Power Monitoring

### Hardware and software components

#### Accessories for 7KT PAC measuring devices

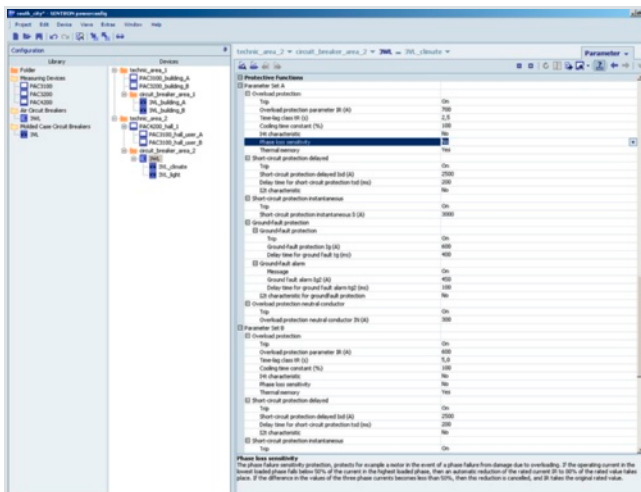
|               |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|---------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|               |  |  |  |  |  |
|               | <b>7KT PAC expansion modules</b>                                                  |                                                                                   |                                                                                    |                                                                                     | <b>7KT LAN couplers</b>                                                             |
|               | M-Bus                                                                             | Modbus RTU                                                                        | RS485                                                                              | KNX                                                                                 | Web servers                                                                         |
| Specification | Up to 9,600 bit/s                                                                 | Up to 115,200 bit/s                                                               | For connection to the 7KT LAN coupler                                              | Up to 19,200 bit/s                                                                  | For up to 30 7KT PAC1500 measuring devices                                          |

#### Accessories for 7KM PAC measuring devices

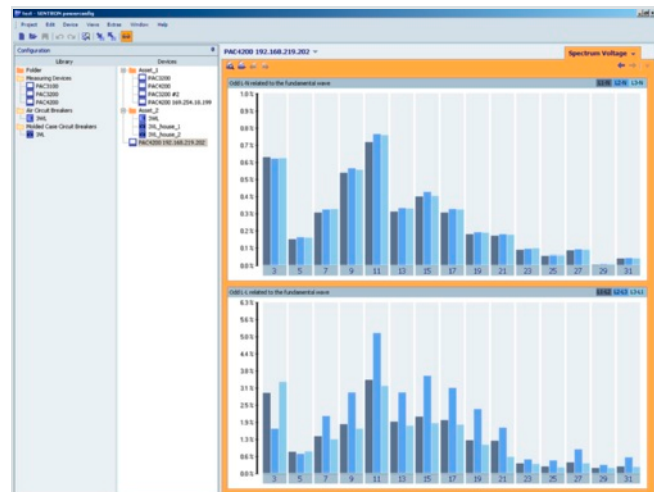
|                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                           |
|-------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                 |  |  |  |  |        |
|                                                 | <b>7KM PAC expansion modules</b>                                                  |                                                                                   |                                                                                    |                                                                                     | <b>Standard mounting rail adapter</b>                                                     |
|                                                 | Switched Ethernet<br>For 7KM PAC3200,<br>7KM PAC4200                              | PROFIBUS DP<br>For 7KM PAC3200,<br>7KM PAC4200                                    | RS485<br>For 7KM PAC3200,<br>7KM PAC4200                                           | 4DI/2DO<br>For 7KM PAC4200<br>(number of digital inputs/<br>outputs per module 4/2) | 7KM PAC TMP2<br>For 7KM PAC3100/3200/<br>4200 for mounting on a<br>standard mounting rail |
| Maximum number of modules that can be connected | 1                                                                                 | 1                                                                                 | 1                                                                                  | 2                                                                                   |                                                                                           |
| Protocol                                        | PROFINET IO<br>PROFenergy<br>Modbus TCP                                           | DPV1                                                                              | Modbus RTU                                                                         | S0 interface                                                                        |                                                                                           |

#### The powerconfig software for commissioning

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Software tool for the efficient commissioning and diagnosis of communication-capable SENTRON components                                                                                                                                                                                                                                                                                                                                   |
| License                             | Free use                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Supported devices                   | 7KM PAC3100/3200/4200 measuring devices, incl. expansion modules<br>3WL/3VL circuit breakers                                                                                                                                                                                                                                                                                                                                              |
| General range of functions          | The PC-based tool facilitates parameterization of the devices, resulting in substantial time savings, particularly when several devices have to be set up.<br>The device settings can be stored in the PC and printed out.<br>The tool enables monitoring of instantaneous measured quantities, which can be printed out if required. Execution of specific device functions, such as resetting of devices and setting of energy counters |
| Supported languages                 | English, German                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Service functions                   | Firmware updates and switching of language packs for 7KM PAC measuring devices                                                                                                                                                                                                                                                                                                                                                            |
| Range of functions with 7KM PAC4200 | Readout of data stored in the device (events; load profile history; daily energy counters), which are saved in csv format                                                                                                                                                                                                                                                                                                                 |



Setting the parameters of a SENTRON device



Display of current measured quantities (harmonics)

Download for powerconfig go to  
<http://support.automation.siemens.com/WW/view/en/22951684/133100>

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### Introduction

#### Overview

| Devices                                                                             | Page                                                                                                                                                                                                                                                                                                | Application | Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Used in                                                                |                       |          |   |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------|----------|---|
|                                                                                     |                                                                                                                                                                                                                                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Non-residential buildings                                              | Residential buildings | Industry |   |
| 7KM PAC measuring devices                                                           |                                                                                                                                                                                                                                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                        |                       |          |   |
|    | <b>7KM PAC3100 measuring device</b><br>AC/DC wide-range power supply unit, screw connection                                                                                                                                                                                                         | 5           | Control panel instrument with graphics display, integrated digital inputs and outputs and an RS485 interface for the transmission of measured values and configurations.<br><br>Display of 30 electrical measured values and consumption values in switchgear assemblies, infeeds, or outgoing feeders.<br><br>International standards and multilingual displays for worldwide use.                                                                                                                                                                                                                                                                                                                 | IEC 61557-12                                                           | ✓                     | --       | ✓ |
|    | <b>7KM PAC3200 measuring device</b><br>3 versions: <ul style="list-style-type: none"><li>AC/DC wide-range power supply unit, screw connection</li><li>DC power supply unit with extra-low voltage, screw connection</li><li>AC/DC wide-range power supply unit, ring cable lug connection</li></ul> | 6           | Control panel instrument with graphics display, integrated digital inputs and outputs and an integrated Ethernet interface for the transmission of measured values and configurations.<br><br>Display of over 50 electrical measured values for switchgear assemblies, infeeds, or outgoing feeders. Dual-tariff measuring devices for precise energy measurement for power import and feedback.<br><br>The following components are available: <ul style="list-style-type: none"><li>7KM PAC Switched Ethernet PROFINET</li><li>7KM PAC RS485</li><li>7KM PAC PROFIBUS DP</li></ul>                                                                                                                | Measuring accuracy for energy acc. to IEC 62053-22/23 and IEC 61557-12 | ✓                     | --       | ✓ |
|  | <b>7KM PAC4200 measuring device</b><br>3 versions: <ul style="list-style-type: none"><li>AC/DC wide-range power supply unit, screw connection</li><li>DC power supply unit with extra-low voltage, screw connection</li><li>AC/DC wide-range power supply unit, ring cable lug connection</li></ul> | 8           | Control panel instrument with graphics display, user-defined displays, memory, clock and calendar function, digital inputs and outputs and an integrated Ethernet interface with gateway function to transfer measured values and configurations.<br><br>Display of over 200 electrical measured values for switchgear assemblies, infeeds, or outgoing feeders. Extensive functions for precise energy measurement for power import and feedback and assessment of the system quality.<br><br>The following components are available: <ul style="list-style-type: none"><li>7KM PAC Switched Ethernet PROFINET</li><li>7KM PAC RS485</li><li>7KM PAC PROFIBUS DP</li><li>7KM PAC 4DI/2DO</li></ul> | Measuring accuracy for energy acc. to IEC 62053-22/23 and IEC 61557-12 | ✓                     | --       | ✓ |
|  | <b>Expansion modules for 7KM PAC measuring devices</b>                                                                                                                                                                                                                                              | 11          | <ul style="list-style-type: none"><li>The 7KM PAC Switched Ethernet PROFINET expansion module serves to connect the 7KM PAC3200 and 7KM PAC4200 measuring devices to Switched Ethernet PROFINET (PROFInergy).</li><li>The 7KM PAC PROFIBUS DP expansion module is used to connect the 7KM PAC3200 and 7KM PAC4200 measuring devices to the PROFIBUS DPV1</li><li>The 7KM PAC RS485 expansion module is used for connecting simple devices with RS485 interface, such as the 7KM PAC3100, and supports the Modbus RTU protocol.</li><li>The 7KM PAC 4DI/2DO expansion module is used to expand the 7KM PAC4200 measuring device to up to 10 digital inputs and 6 digital outputs.</li></ul>          | IEC 62053-31                                                           | ✓                     | --       | ✓ |

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### 7KM PAC3100 measuring devices

#### Overview



The 7KM PAC measuring devices are used to measure and display all relevant system parameters in low-voltage power distribution. They can be used for both single-phase and multi-phase measurements in 3 and 4-conductor power supply systems (TN, TT, IT).

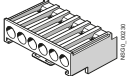
They record energy values for main distribution boards, electrical branches or individual loads precisely and reliably, and supply key measured values for assessment of the state of the plant and the quality of the power supply.

The 7KM PAC3100 measuring device is fitted with an integrated Modbus RTU interface via RS485, so no expansion module is required.

#### Benefits

- Simple mounting and commissioning
- High IP65 degree of protection (front side, when installed) permits usage in extremely dusty and wet environments
- Intuitive operation using 4 function buttons and multilingual plain text displays
- Easy adaptation to different systems using integrated and optional
  - Digital inputs and outputs
  - Communication interfaces
- Worldwide use
  - At least 8 languages
  - International approvals
  - Developed and tested to European and international standards
- Low mounting depth
- Free, intuitive configuration software powerconfig

#### Selection and ordering data

| Version                                                                                                                                                                                           | DT | Order No.                                                                                                                                                                                                                                                                                                 | Price per PU                                                                                                  | PU (UNIT, SET, M) | PS* / P. unit | PG  | Weight per PU approx. kg |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------|---------------|-----|--------------------------|
| <br><br>7KM3 133-0BA00-3AA0 |    | <b>7KM PAC3100 measuring device</b>                                                                                                                                                                                                                                                                       | <b>Screw connection</b>  |                   |               |     |                          |
|                                                                                                                                                                                                   |    | Control panel instrument 96 mm x 96 mm<br>Screw connections for current and voltage connection<br>AC/DC wide-range power supply unit<br>$U_{AUX}$ :<br>100 ... 240 V AC $\pm 10\%$ , 50/60 Hz<br>110 ... 250 V DC $\pm 10\%$<br>Measuring inputs<br>$U_e$ : max. 3 AC 480/277 V, 50/60 Hz<br>$I_e$ : /5 A | <b>7KM3 133-0BA00-3AA0</b>                                                                                    | 1                 | 1 unit        | 133 | 0.456                    |



# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### 7KM PAC3200 measuring devices

#### Overview



The 7KM PAC measuring devices are used to measure and display all relevant system parameters in low-voltage power distribution. They can be used for both single-phase and multi-phase measurements in 3 and 4-conductor power supply systems (TN, TT, IT).

They record energy values for main distribution boards, electrical branches or individual loads precisely and reliably, and supply key measured values for assessment of the state of the plant and the quality of the power supply.

#### Benefits

- Simple mounting and commissioning
- High IP65 degree of protection (front side, when installed) permits usage in extremely dusty and wet environments
- Intuitive operation using 4 function buttons and multilingual plain text displays
- Easy adaptation to different systems using integrated and optional
  - Digital inputs and outputs
  - Communication interfaces
- Worldwide use
  - At least 8 languages
  - International approvals
  - Developed and tested to European and international standards
- Low mounting depth

Additional performance characteristics of the 7KM PAC3200

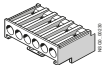
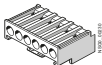
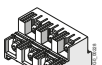
- Precise energy measurement
- Versatile system integration
  - Integrated Ethernet interface
  - Optional communication modules available
  - Multifunctional digital inputs and outputs
  - Limit monitoring
- Can be connected directly to power supply systems up to 690 V AC (UL-L) and CATIII without voltage transformers (with the exception of devices with power supply units with extra-low voltage)
- Intuitive configuration software powerconfig included in the scope of delivery

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### 7KM PAC3200 measuring devices

#### Selection and ordering data

| Version                                                                                                                                                                                                          | DT                                                                                                                                                                                                                                                                                                                                                                                                                                    | Order No.                                                                                                                                              | Price per PU | PU (UNIT, SET, M) | PS*/ P. unit | PG  | Weight per PU approx. kg |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|--------------|-----|--------------------------|
| <div></div> <div>7KM2 112-0BA00-3AA0</div>     | <b>7KM PAC3200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Screw connections for current and voltage connection</p> <p>AC/DC wide-range power supply unit<br/><math>U_{AUX}</math>:<br/>95 ... 240 V AC <math>\pm 10\%</math>, 50/60 Hz<br/>110 ... 340 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 690/400 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p>          | <b>Screw connection</b><br><br><b>7KM2 112-0BA00-3AA0</b>           |              | 1                 | 1 unit       | 133 | 0.476                    |
| <div></div> <div>7KM2 111-1BA00-3AA0</div>     | <b>7KM PAC3200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Screw connections for current and voltage connection</p> <p>DC power supply unit with extra-low voltage<br/><math>U_{AUX}</math>: 22 ... 65 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 500/289 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p>                                                           | <b>Screw connection</b><br><br><b>7KM2 111-1BA00-3AA0</b>           |              | 1                 | 1 unit       | 133 | 0.466                    |
| <div></div> <div>7KM2 112-0BA00-2AA0</div> | <b>7KM PAC3200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Ring cable lug connections for current and voltage connection</p> <p>AC/DC wide-range power supply unit<br/><math>U_{AUX}</math>:<br/>95 ... 240 V AC <math>\pm 10\%</math>, 50/60 Hz<br/>110 ... 340 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 690/400 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p> | <b>Ring cable lug connection</b><br><br><b>7KM2 112-0BA00-2AA0</b> |              | 1                 | 1 unit       | 133 | 0.494                    |

#### More information

For accessories and information about software components  
see [page 10](#).

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### 7KM PAC4200 measuring devices

#### Overview



The 7KM PAC measuring devices are used to measure and display all relevant system parameters in low-voltage power distribution. They can be used for both single-phase and multi-phase measurements in 3 and 4-conductor power supply systems (TN, TT, IT).

They record energy values for main distribution boards, electrical branches or individual loads precisely and reliably, and supply key measured values for assessment of the state of the plant and the quality of the power supply.

#### Benefits

- Simple mounting and commissioning
- High IP65 degree of protection (front side, when installed) permits usage in extremely dusty and wet environments
- Intuitive operation using 4 function buttons and multilingual plain text displays
- Easy adaptation to different systems using integrated and optional
  - Digital inputs and outputs
  - Communication interfaces
- Worldwide use
  - At least 8 languages
  - International approvals
  - Developed and tested to European and international standards
- Low mounting depth

Additional performance characteristics of the 7KM PAC4200:

- Precise energy measurement
- Versatile system integration
  - Integrated Ethernet interface
  - Optional communication modules available
  - Multifunctional digital inputs and outputs
  - Limit monitoring
- Can be connected directly to power supply systems up to 690 V AC (UL-L) and CATIII without voltage transformers (with the exception of devices with power supply units with extra-low voltage)
- Intuitive configuration software powerconfig included in the scope of delivery
- Monitoring of the state of the plant and the power supply quality
  - Basic information for evaluating the power supply quality
  - Logging of plant history in the form of operation, control and system-related events
- Recording of the power range through power averaging (load profile)
- Daily energy meters for apparent, active and reactive energy over 365 days for cut-off date assessment
- Detection of gas, water, compressed air or other energy sources via pulse counter to the digital inputs
- Can be expanded using modules to up to 10 digital inputs and 6 digital outputs
- Counters for apparent, active and reactive energy for the precise detection of the power consumption of a partial process or manufacturing process
- 10/100 Mbit/s Ethernet interface with gateway function for the easy connection of devices with serial RS485 interface via expansion module 7KM PAC RS485 to an Ethernet network
- Comprehensive user-friendly indicators, such as user-defined displays, bar and status indicators, phase diagram and list and histogram graphics
- Satisfies the accuracy requirements of class 0.2S high-precision meters used by power supply companies according to IEC 62053-22, which are normally reserved for exacting industrial applications

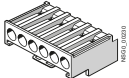
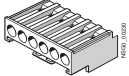
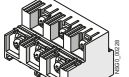


# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### 7KM PAC4200 measuring devices

#### Selection and ordering data

| Version                                                                                                                                                                                                          | DT                                                                                                                                                                                                                                                                                                                                                                                                                                | Order No.                                                                                                                                               | Price<br>per PU | PU<br>(UNIT,<br>SET, M) | PS*/<br>P. unit | PG  | Weight<br>per PU<br>approx.<br><br>kg |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------|-----------------|-----|---------------------------------------|
| <div></div> <div>7KM4 212-0BA00-3AA0</div>     | <b>7KM PAC4200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Screw connections for current and voltage connection</p> <p>AC/DC wide-range power supply unit<br/><math>U_{AUX}</math>:<br/>95 ... 240 V AC <math>\pm 10\%</math>, 50/60 Hz<br/>110 ... 340 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 690/400 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p>      | <b>Screw connection</b><br><br><b>7KM4 212-0BA00-3AA0</b>            |                 | 1                       | 1 unit          | 133 | 0.547                                 |
| <div></div> <div>7KM4 211-1BA00-3AA0</div>     | <b>7KM PAC4200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Screw connections for current and voltage connection</p> <p>DC power supply unit with extra-low voltage<br/><math>U_{AUX}</math>:<br/>22 ... 65 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 500/289 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p>                                                   | <b>Screw connection</b><br><br><b>7KM4 211-1BA00-3AA0</b>            |                 | 1                       | 1 unit          | 133 | 0.537                                 |
| <div></div> <div>7KM4 212-0BA00-2AA0</div> | <b>7KM PAC4200 measuring device</b> <p>Control panel instrument 96 mm x 96 mm<br/>Ring cable lug connections for current and voltage connection</p> <p>AC/DC wide-range power supply unit<br/><math>U_{AUX}</math>:<br/>95...240 V AC <math>\pm 10\%</math>, 50/60 Hz<br/>110...340 V DC <math>\pm 10\%</math></p> <p>Measuring inputs<br/><math>U_e</math>: max. 3 AC 690/400 V, 50/60 Hz<br/><math>I_e</math>: /1 A or /5 A</p> | <b>Ring cable lug connection</b><br><br><b>7KM4 212-0BA00-2AA0</b> |                 | 1                       | 1 unit          | 133 | 0.544                                 |

#### More information

For accessories and information about software components  
see [page 10](#).

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### Accessories for 7KM PAC

#### Selection and ordering data

| Version                                                                                                                                                                                                                                                                                                                                                                                                                      | DT | Order No.                  | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|--------------|-------------------|-------------|-----|-------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                              |    |                            |              |                   |             |     | per PU approx. kg |
|  <p><b>7KM9 900-0XA00-0AA0</b></p> <p><b>7KM PAC TMP2 standard mounting rail adapter</b></p> <p>Two-tier adapter for mounting a measuring device on a standard mounting rail</p> <ul style="list-style-type: none"> <li>• Front display</li> <li>• For manual intervention</li> </ul>                                                       |    | <b>7KM9 900-0XA00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.401             |
|  <p><b>7KM9 900-0YA00-0AA0</b></p> <p><b>7KM PAC TMP mounting plate</b></p> <p>Adapter for mounting a measuring device on standard mounting rail</p> <ul style="list-style-type: none"> <li>• Display faces backwards toward standard mounting rail</li> <li>• Readout and evaluation of measurements solely via mains operation</li> </ul> |    | <b>7KM9 900-0YA00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.140             |

#### More information

##### Software components

For more information about the software components go to [www.siemens.com/lowvoltage/powermonitoring](http://www.siemens.com/lowvoltage/powermonitoring)

##### More information

More information is available on the Internet at: [www.siemens.com/lowvoltage/powermonitoring](http://www.siemens.com/lowvoltage/powermonitoring)

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### Expansion modules for 7KM PAC

#### Overview



Expansion modules are used as communication interfaces and for expanding the digital inputs/outputs for 7KM PAC measuring devices.

The expansion modules are plugged in at the back of the measuring device. The device identifies the module automatically and presents the relevant parameters for this module for selection in the parameterization menu.

The following expansion modules are available (shown from left to right in the figure on the left):

- 7KM PAC Switched Ethernet PROFINET expansion module
- 7KM PAC PROFIBUS DP expansion module
- 7KM PAC RS485 expansion module
- 7KM PAC 4DI/2DO expansion module

#### More information

For more information about the software components go to [www.siemens.com/lowvoltage/powermonitoring](http://www.siemens.com/lowvoltage/powermonitoring)

#### Expansion module

#### Use in 7KM

PAC3100

PAC3200

PAC4200

#### Expansion modules for 7KM PAC measuring devices



##### 7KM PAC Switched Ethernet PROFINET expansion module

The 7KM PAC Switched Ethernet PROFINET expansion module is a plug-in communication module for the 7KM PAC3200 and 7KM PAC4200 measuring devices.

It provides the following features:

- Standardized PROFinergy interface to the measured quantities.
- The measured quantities can be individually selected using a GSDML file. This permits use of cost-effective S7 CPUs.
- Easy parameter assignment using the device display and STEP 7.
- Integrated Ethernet switching allows networking with short cables without additional switches.
- Direct integration in production machine networks using IRT (IRT = Isochronous Real Time)
- Full support of PROFINET IO (DHC, DNS, SNMP, SNTIP)
- Device replacement without PG in the PROFINET network using LLDP
- Deterministic reversing time through ring redundancy (MRP)
- Modbus TCP communication
- Communication with powermanager or powerconfig
- 2 x Ethernet (RJ45) sockets
- Baud rates 10 and 100 Mbit/s
- Protocols PROFINET IO, PROFinergy and Modbus TCP
- No external auxiliary power necessary
- Additional display via the device display and via LEDs on the module

All measured quantities from 7KM PAC3200 and 7KM PAC4200 can be individually selected and cyclically transmitted by means of the GSDML file. This enables optimum use of the process image of the PROFINET controller, e.g. CPU 315-2 PN/DP of SIMATIC S7.

The measured quantities can be read out in acyclic mode using PROFinergy, a PNO protocol profile. Thanks to PROFinergy, it is possible to assemble a power monitoring system with devices from various manufacturers using PROFINET.

|    |   |   |
|----|---|---|
| -- | ✓ | ✓ |
|----|---|---|



##### 7KM PAC PROFIBUS DP expansion module

The 7KM PAC PROFIBUS DP expansion module has the following features:

- Plug-in communication module for measuring devices for connection to PROFIBUS DPV1
- 7KM PAC3200 and 7KM PAC4200
- Configurable from the front of the device or using parameterization software
- Using PROFIBUS DPV1, data can be transferred in both cyclic and acyclic modes
- Easy engineering thanks to integration in SIMATIC STEP 7 and/or simple integration via GSD file for other programming systems
- Optimum use of process image of a control system for selection of individual measured quantities for cyclical transfer
- All baud rates from 9.6 kbit/s up to 12 Mbit/s are supported
- Connection through 9-pole D-sub connector according to IEC 61158
- No external auxiliary power necessary
- Additional display via the device display and via LEDs on the module

|    |   |   |
|----|---|---|
| -- | ✓ | ✓ |
|----|---|---|

# Measuring Devices and Power Monitoring

## 7KM PAC Measuring Devices

### Expansion modules for 7KM PAC

| Expansion module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Use in 7KM |         |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|---------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PAC3100    | PAC3200 | PAC4200 |
|  <b>7KM PAC RS485 expansion module</b><br>The 7KM PAC RS485 expansion module has the following features: <ul style="list-style-type: none"> <li>• Plug-in 7KM PAC RS485 communication module for 7KM PAC3200 and 7KM PAC4200 measuring devices</li> <li>• Configurable from the front of the device or using parameterization software.</li> <li>• Support for the Modbus RTU protocol</li> <li>• Plug and play</li> <li>• Baud rates 4.8/9.6/19.2 and 38.4 kbit/s are supported</li> <li>• Connection by means of 6-pole screw terminals</li> <li>• No external auxiliary power necessary</li> <li>• Status indication by LED on the module</li> <li>• The 7KM PAC RS485 expansion module is required for the gateway function of the 7KM PAC4200 for communication with simple devices with RS485 interface, such as the 7KM PAC3100, via Ethernet (Modbus TCP).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                            | --         | ✓       | ✓       |
|  <b>7KM PAC 4DI/2DO expansion module</b><br>The 7KM PAC 4DI/2DO expansion module is used to expand the 7KM PAC4200 measuring device to up to 10 digital inputs and 6 digital outputs and offers the following features: <ul style="list-style-type: none"> <li>• Up to two 7KM PAC 4DI/2DO modules can be plugged onto a 7KM PAC4200.</li> <li>• The 7KM PAC 4DI/2DO expansion modules mean that the internal digital inputs and outputs can be expanded by up to 8 inputs and 4 outputs.</li> <li>• The 7KM PAC 4DI/2DO expansion modules can be configured locally at the front of the device or via the power-config parameterization software.</li> <li>• The digital inputs can be used without the need for an external power supply as they are self-powered. This is particularly useful for the integration of non-electric measuring devices, such as water or compressed-air counters.</li> <li>• All functions of the integrated multifunctional inputs/outputs on the 7KM PAC4200 are also available in the 7KM PAC 4DI/2DO expansion module.</li> <li>• Inputs and outputs can be used as an S0 interface conforming to IEC 62053-31.</li> <li>• The connection is made via a 9-pole screw terminal.</li> <li>• No external auxiliary power supply is required.</li> </ul> | --         | --      | ✓       |

### Selection and ordering data

| Version                                                                                                                                                                                                         | DT | Order No.                  | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. kg |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|--------------|-------------------|-------------|-----|--------------------------|
|  <b>7KM PAC Switched Ethernet PROFINET expansion module</b><br>Expansion module for 7KM PAC3200 and 7KM PAC4200 (PROFInergy) |    | <b>7KM9 300-0AE00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.077                    |
|  <b>7KM PAC PROFIBUS DP expansion module</b><br>Expansion module for 7KM PAC3200 and 7KM PAC4200 (PROFIBUS DPV1)             |    | <b>7KM9 300-0AB00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.078                    |
|  <b>7KM PAC RS485 expansion module</b><br>Expansion module for 7KM PAC3200 and 7KM PAC4200 (Modbus RTU)                      |    | <b>7KM9 300-0AM00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.074                    |
|  <b>7KM PAC 4DI/2DO expansion module</b><br>Expansion module for 7KM PAC4200                                                 |    | <b>7KM9 200-0AB00-0AA0</b> |              | 1                 | 1 unit      | 133 | 0.074                    |

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### Introduction

#### Overview

| Devices                                                                                                                                                  | Page | Application                                                                                                                                                                                                                                                                                   | Standards                                           | Used in                   |                       |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------|-----------------------|----------|
|                                                                                                                                                          |      |                                                                                                                                                                                                                                                                                               |                                                     | Non-residential buildings | Residential buildings | Industry |
| 7KT PAC measuring devices                                                                                                                                |      |                                                                                                                                                                                                                                                                                               |                                                     |                           |                       |          |
|  <b>7KT PAC1500 measuring device, three-phase</b><br>7KT1 54            | 14   | Measurement of consumption data in three-phase systems of plant sections, offices, or holiday apartments.                                                                                                                                                                                     | EN 50470-1, EN 50470-3<br>EN 62052-23, EN 62053-31  | ✓                         | ✓                     | ✓        |
|  <b>7KT PAC1500 measuring device, single-phase</b><br>7KT1 53           | 16   | For the measurement of consumption data in single-phase systems, e.g. in industrial plants, offices, and apartments in apartment blocks.                                                                                                                                                      | EN 50740-1, EN 50470-3, EN 62053-31                 | ✓                         | ✓                     | ✓        |
|  <b>Expansion modules for 7KT PAC1500 measuring devices</b><br>7KT1 9 | 17   | Communication interfaces with IrDA infrared interface for 7KT PAC1500 measuring devices. Modules are available for the following bus systems: <ul style="list-style-type: none"><li>• M-Bus</li><li>• Modbus RTU</li><li>• RS485 (7KT1391 LAN coupler connection)</li><li>• KNX/EIB</li></ul> | EN 13757<br>ISO/IEC 14543-3<br>EN 50090, EN 13321-1 | ✓                         | ✓                     | ✓        |
|  <b>7KT1 391 LAN couplers</b>                                         | 18   | Web server with 2 GB internal storage, for up to 30 7KT15.., 7KT13.. measuring devices<br><br>Global view and Excel export of current consumption data via LAN or Internet using a Web browser, such as Firefox                                                                               | IEEE 802                                            | ✓                         | --                    | ✓        |



# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### 7KT PAC1500 measuring devices, three-phase

#### Overview



7KT PAC1500 measuring devices, three-phase, for direct connection up to 80 A / 125 A

The measuring devices (power meters) are used to record the amount of electrical energy exported or imported. Siemens compact measuring devices are designed as modular installation devices for alternating current and can be mounted on standard mounting rails. They comply with the metering equipment standard EN 50470 (Part 1 and 3) and come with an LCD display.

The three-phase measuring devices for direct connection are available up to 125 A and in versions with transformer connections (.../5 A to 10000/5 A).

The measuring devices store active and reactive energy and all comply with accuracy class 1 (for active energy).

All measuring devices have a pulse output (S0) and are designed for 2-tariff measurements. The calibrated versions comply with the new Measuring Instruments Directive 2004/22/EC (MID).

The measuring devices also have an integrated optical interface (IrDA) for connecting communication modules, which enables their integration in a range of other systems, such as power monitoring systems.

#### Technical specifications

| 7KT PAC1500 measuring device, three-phase                                                                   |                                |                      | 7KT1 540<br>7KT1 542                             | 7KT1 543<br>7KT1 545 | 7KT1 546<br>7KT1 548 |
|-------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------|--------------------------------------------------|----------------------|----------------------|
| <b>Standards</b>                                                                                            |                                |                      | EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31 |                      |                      |
| <b>Connection</b>                                                                                           |                                |                      |                                                  |                      |                      |
| <ul style="list-style-type: none"> <li>Direct connection</li> <li>Transformer current connection</li> </ul> |                                |                      | --<br>.../5 A                                    | 80 A<br>--           | 125 A<br>--          |
| <b>General data</b>                                                                                         |                                |                      |                                                  |                      |                      |
| Enclosures                                                                                                  | Acc. to DIN 43880              | MW (1 MW = 18 mm)    | 4                                                | 4                    | 6                    |
| Mounting                                                                                                    | Acc. to EN 60715               |                      | 35 mm                                            |                      |                      |
| Mounting height                                                                                             |                                | mm                   | 70                                               |                      |                      |
| <b>Function</b>                                                                                             |                                |                      |                                                  |                      |                      |
| Connection                                                                                                  | Single-phase or three-phase    | Number of conductors | 4                                                | 2 ... 4              | 2 ... 4              |
| Saving of setting and counter reading                                                                       | Via (EEPROM)                   |                      | Yes                                              | Yes                  | Yes                  |
| Tariffs                                                                                                     | For active and reactive energy |                      | T1/T2                                            | T1/T2                | T1/T2                |
| <b>Supply (through measuring terminals)</b>                                                                 |                                |                      |                                                  |                      |                      |
| Rated control supply voltage $U_n$                                                                          |                                | V AC                 | 230                                              |                      |                      |
| Voltage range                                                                                               |                                | V                    | 184 ... 276                                      |                      |                      |
| Rated frequency $f_n$                                                                                       |                                | Hz                   | 50                                               |                      |                      |
| <b>Measuring accuracy at (at 23 ± 1 °C)</b>                                                                 |                                |                      |                                                  |                      |                      |
| Active energy and active power                                                                              | Based on nominal value         |                      | Class B                                          |                      |                      |
| Reactive energy and reactive power                                                                          | Acc. to EN 50470-3             |                      | Class 2                                          |                      |                      |
| <b>Measuring inputs</b>                                                                                     |                                |                      |                                                  |                      |                      |
| Connection type                                                                                             |                                |                      | Transformer<br>TA-TC .../5 A                     | Direct               | Direct               |
| Terminal capacitance, operational and main current paths                                                    |                                |                      | 1.5 (6)<br>1.5 (6)                               | 1.5 (35)<br>1.5 (35) | 5 (50)<br>5 (50)     |
| Voltage $U_n$                                                                                               |                                |                      | 400<br>230                                       |                      |                      |
| Operating range voltage                                                                                     |                                |                      | 319 ... 480<br>184 ... 276                       |                      |                      |
| Current $I_{ref}$                                                                                           |                                |                      | --                                               | 5                    | 5                    |
| Current $I_n$                                                                                               |                                |                      | 5                                                | --                   | --                   |
| Current $I_{min}$                                                                                           |                                |                      | 0.05                                             | 0.25                 | 0.25                 |
| Operating range current ( $I_{st} ... I_{max}$ )                                                            |                                |                      | --                                               | 0.015 ... 80         | 0.020 ... 125        |
| Transformer current                                                                                         |                                |                      | 0.003 ... 6                                      | --                   | --                   |
| Primary current of the transformer                                                                          |                                |                      | 5 ... 10000                                      | --                   | --                   |
| Smallest input step                                                                                         |                                |                      | 5                                                | --                   | --                   |
| Input ripple form                                                                                           |                                |                      | Sinusoidal                                       |                      |                      |
| Operational starting current $I_{st}$                                                                       |                                |                      | 3                                                | 15                   | 20                   |
| <b>S0 interface</b>                                                                                         |                                |                      |                                                  |                      |                      |
| Acc. to EN 62053-31                                                                                         |                                |                      |                                                  |                      |                      |
| Pulse outputs for absorbed active and reactive energy T1 + T2                                               |                                |                      | Yes                                              |                      |                      |
| Pulse count                                                                                                 |                                |                      | --                                               | 500                  | 500                  |
| For input current $I_{max}$                                                                                 |                                |                      | 100 - 10 - 1                                     | --                   | --                   |
| Automatic for transformers                                                                                  |                                |                      |                                                  |                      |                      |
| <b>IR interface</b>                                                                                         |                                |                      |                                                  |                      |                      |
| At the side for connecting communication modules                                                            |                                |                      | M-Bus/Modbus RTU/RS485/KNX                       |                      |                      |

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### 7KT PAC1500 measuring devices, three-phase

#### Selection and ordering data

|                                                                                   | $U_n$                                            | $I_{\max}$ | Mounting width | DT | Order No. | Price per PU     | PU (UNIT, SET, M) | PS*/P. unit     | PG     | Weight per PU approx. |
|-----------------------------------------------------------------------------------|--------------------------------------------------|------------|----------------|----|-----------|------------------|-------------------|-----------------|--------|-----------------------|
|                                                                                   | V AC                                             | A AC       | MW             |    |           |                  |                   |                 |        | kg                    |
|  | <b>7KT PAC1500 measuring device, three-phase</b> |            |                |    |           |                  |                   |                 |        |                       |
|                                                                                   | Digital measuring device                         |            |                |    |           |                  |                   |                 |        |                       |
|                                                                                   | • For transformer connection, double tariff      |            |                |    | 230       | Transformer /5 4 | <b>7KT1 540</b>   | 1               | 1 unit | 047 0.289             |
|                                                                                   | • For transformer connection, double tariff, MID |            |                |    | 230       | Transformer /5 4 | <b>7KT1 542</b>   | 1               | 1 unit | 047 0.293             |
|                                                                                   | • For direct connection, double tariff           |            |                |    | 230       | 80               | 4                 | <b>7KT1 543</b> | 1      | 1 unit 047 0.419      |
|                                                                                   | • For direct connection, double tariff, MID      |            |                |    | 230       | 80               | 4                 | <b>7KT1 545</b> | 1      | 1 unit 047 0.419      |
|                                                                                   | • For direct connection, double tariff           |            |                |    | 230       | 125              | 4                 | <b>7KT1 546</b> | 1      | 1 unit 047 0.678      |
|                                                                                   | • For direct connection, double tariff, MID      |            |                |    | 230       | 125              | 4                 | <b>7KT1 548</b> | 1      | 1 unit 047 0.690      |

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### 7KT PAC1500 measuring devices, single-phase

#### Overview



The 7KT PAC1500 single-phase measuring devices (power meters) are used to record the amount of electrical energy exported or imported. They comply with the metering equipment standard EN 50470 (Part 1 and 3) and come with an LCD display.

The 7KT PAC1500 single-phase measuring devices for direct connection are available up to 80 A. They store active and reactive energy, and all comply with accuracy class 1 (for active energy).

All measuring devices have a pulse output (S0) and are designed for 1-tariff or 2-tariff measurements, depending on the version.

The calibrated versions comply with the new Measuring Instruments Directive 2004/22/EC (MID). The measuring devices (with the exception of 7KT1 530) also have an integrated optical interface (IrDA) for connecting communication modules.

#### Technical specifications

| 7KT PAC1500 measuring device, single-phase<br>direct connection up to 80 A      |                                              |                 | 7KT1 530                                         | 7KT1 531<br>7KT1 533 |
|---------------------------------------------------------------------------------|----------------------------------------------|-----------------|--------------------------------------------------|----------------------|
| <b>Standards</b>                                                                |                                              |                 | EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31 |                      |
| <b>General data</b>                                                             |                                              |                 |                                                  |                      |
| • Enclosures                                                                    | Acc. to DIN 43880                            | MW              | 2                                                |                      |
| • Mounting                                                                      | Acc. to EN 60715                             |                 | 35 mm                                            |                      |
| • Mounting height                                                               |                                              | mm              | 70                                               |                      |
| <b>Function</b>                                                                 |                                              |                 |                                                  |                      |
| • Operating mode                                                                | Single-phase loads                           | Conductors      | 2                                                |                      |
| • Saving of setting and counter reading                                         | Via (EEPROM)                                 |                 | Yes                                              |                      |
| • Tariff                                                                        | For active energy<br>For reactive energy     |                 | T1<br>T1                                         | T1 + T2<br>T1 + T2   |
| <b>Supply (through measuring terminals)</b>                                     |                                              |                 |                                                  |                      |
| • Rated control supply voltage $U_n$                                            |                                              | V AC            | 230                                              |                      |
| • Voltage range                                                                 |                                              | V               | 184 ... 276                                      |                      |
| • Rated frequency $f_n$                                                         |                                              | Hz              | 50                                               |                      |
| <b>Measuring accuracy at</b> (at $23 \pm 1^\circ\text{C}$ )                     |                                              |                 |                                                  |                      |
| • Active energy and active power                                                | Based on nominal value<br>Acc. to EN 50470-3 |                 | Class B                                          |                      |
| • Reactive energy and reactive power                                            | Acc. to EN 62053-23                          |                 | Class 2                                          |                      |
| <b>Measuring inputs</b>                                                         |                                              |                 |                                                  |                      |
| • Connection type                                                               | Phase/N                                      |                 | Direct                                           |                      |
| • Terminal capacitance, operational and main current paths                      | Rigid, min. (max.)                           | mm <sup>2</sup> | 1.5 (35)                                         | 1.5 (35)             |
|                                                                                 | Flexible min. (max.)                         | mm <sup>2</sup> | 1.5 (35)                                         | 1.5 (35)             |
| • Operating range voltage                                                       | Phase/N                                      | V AC            | 184 ... 276                                      |                      |
| • Current $I_{\text{ref}}$                                                      |                                              | A               | 15                                               |                      |
| • Current $I_{\text{min}}$                                                      |                                              | A               | 0.75                                             |                      |
| • Operating range current ( $I_{\text{st}}$ ... $I_{\text{max}}$ )              | Direct connection                            | A               | 0.025 ... 80                                     |                      |
| • Current waveform                                                              |                                              |                 | Sinusoidal                                       |                      |
| • Operational starting current $I_{\text{st}}$                                  |                                              | mA              | 25                                               |                      |
| <b>S0 interface</b>                                                             |                                              |                 |                                                  |                      |
| • Pulse outputs for absorbed active and reactive energy                         | Acc. to EN 62053-31                          |                 | Yes                                              |                      |
| • Pulse count                                                                   |                                              | Pulses/kWh      | 1000                                             |                      |
| <b>IR interface</b>                                                             |                                              |                 |                                                  |                      |
| • At the side for connecting communication modules (M-Bus/Modbus RTU/RS485/KNX) |                                              |                 | --                                               | Yes                  |

#### Selection and ordering data

|                                                                                                                                                                    | $U_n$ | $I_{\text{max}}$ | Mounting width | DT | Order No.       | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. kg |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------|----------------|----|-----------------|--------------|-------------------|-------------|-----|--------------------------|
|                                                                                                                                                                    | V AC  | A AC             | MW             |    |                 |              |                   |             |     |                          |
|  <b>7KT PAC1500 measuring devices, single-phase</b><br>Digital measuring device |       |                  |                |    |                 |              |                   |             |     |                          |
|                                                                                                                                                                    |       |                  |                |    |                 |              |                   |             |     |                          |
|                                                                                                                                                                    |       |                  |                |    |                 |              |                   |             |     |                          |
|                                                                                                                                                                    |       |                  |                |    |                 |              |                   |             |     |                          |
| • For direct connection, single tariff                                                                                                                             | 230   | 80               | 2              |    | <b>7KT1 530</b> |              | 1                 | 1 unit      | 047 | 0.164                    |
| • For direct connection, double tariff                                                                                                                             | 230   | 80               | 2              |    | <b>7KT1 531</b> |              | 1                 | 1 unit      | 047 | 0.164                    |
| • For direct connection, double tariff, MID                                                                                                                        | 230   | 80               | 2              |    | <b>7KT1 533</b> |              | 1                 | 1 unit      | 047 | 0.190                    |

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### Expansion modules for 7KT PAC

#### Overview



Expansion modules for 7KT PAC1500 measuring devices, from left to right: Expansion modules for M-Bus, Modbus RTU, RS485, Instabus KNX

Expansion modules are used as communication interfaces for 7KT PAC1500 measuring devices. They have the following features:

- The expansion modules can be selected independently of the measuring device. This means they can also be retrofitted in already installed measuring devices.
- Data transmission between the measuring devices and expansion modules is executed via the IrDA infrared interface.
- The expansion modules are placed alongside the measuring devices in the installation direction so that their IrDA interfaces are exactly opposite each other.

#### 7KT PAC M-Bus (7KT1 908) expansion module

- Power supply through bus cable
- Baud rates: 300 to 9600 kbit/s
- Status indication by LED on the module
- Can be parameterized using M-Bus Master software

#### 7KT PAC Modbus RTU (7KT1 907) expansion module

- Power supply: 230 V AC
- Baud rates: 4.8 / 9.6 / 19.2 and 38.4 kbit/s are supported.
- Status indication by LED on the module
- Configurable via RS485 master software

#### 7KT PAC RS485 (7KT1 903) expansion module

- Power supply: 230 V AC
- Status indication by LED on the module

#### 7KT PAC 7KNX (7KT1 900) expansion module

- Power supply through the KNX/EIB bus cable
- Status indication by LED on the module

#### Selection and ordering data

| Version                                                                                         | Mounting width | DT | Order No.       | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. kg |
|-------------------------------------------------------------------------------------------------|----------------|----|-----------------|--------------|-------------------|-------------|-----|--------------------------|
|                                                                                                 | MW             |    |                 |              |                   |             |     |                          |
| <br>7KT1 908 |                | 1  | <b>7KT1 908</b> |              | 1                 | 1 unit      | 047 | 0.050                    |
| for connecting 7KT PAC1500 measuring devices to M-Bus                                           |                |    |                 |              |                   |             |     |                          |
| <br>7KT1 907 |                | 1  | <b>7KT1 907</b> |              | 1                 | 1 unit      | 047 | 0.085                    |
| for connecting 7KT PAC1500 measuring devices to Modbus RTU                                      |                |    |                 |              |                   |             |     |                          |
| <br>7KT1 903 |                | 1  | <b>7KT1 903</b> |              | 1                 | 1 unit      | 047 | 0.080                    |
| for connecting 7KT PAC1500 measuring devices via RS485 to 7KT1 391 LAN couplers                 |                |    |                 |              |                   |             |     |                          |
| <br>7KT1 900 |                | 1  | <b>7KT1 900</b> |              | 1                 | 1 unit      | 047 | 0.064                    |
| for connecting 7KT PAC1500 measuring devices to Instabus KNX                                    |                |    |                 |              |                   |             |     |                          |

\* You can order this quantity or a multiple thereof.

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### LAN couplers

#### Overview



7KT 391 LAN couplers

A LAN coupler supports worldwide data retrieval from 7KT PAC measuring devices, as long as there is a LAN link to the Internet.

Up to 30 devices can be linked to a LAN coupler via a Web browser, such as Firefox. In turn, the LAN coupler is connected to a LAN.

Data communication between the LAN coupler and the PC takes place using the TCP/IP protocol.

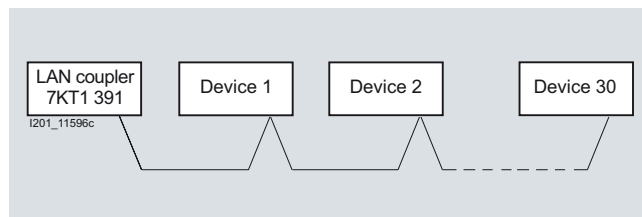
#### Application

##### Suitable 7KT PAC measuring devices

The following measuring devices can be connected to the LAN coupler:

|                                                                         | Order No. |
|-------------------------------------------------------------------------|-----------|
| <b>Energy measuring devices</b>                                         |           |
| 7KT PAC1500 measuring device, three-phase                               |           |
| • For direct connection 80 A, double tariff                             | 7KT1 543  |
| • For direct connection 80 A, double tariff, calibrated version         | 7KT1 545  |
| • For transformer connection .../5 A, double tariff                     | 7KT1 540  |
| • For transformer connection .../5 A, double tariff, calibrated version | 7KT1 542  |
| • For direct connection 125 A, double tariff                            | 7KT1 546  |
| • For direct connection 125 A, double tariff, calibrated version        | 7KT1 548  |
| • For direct connection 63 A, double tariff                             | 7KT1 520  |
| • For transformer connection .../5 A, double tariff                     | 7KT1 521  |
| • 7KT PAC1500 measuring device, single-phase                            |           |
| • For direct connection 80 A, double tariff                             | 7KT1 531  |
| • For direct connection 80 A, double tariff, calibrated version         | 7KT1 533  |
| <b>7KT PAC3000 measuring devices</b>                                    |           |
| • 7KT PAC3000, for direct connection                                    | 7KT1 340  |
| • 7KT PAC3000, for transformer connection .../5 A                       | 7KT1 341  |

##### Connecting several devices to a 7KT 391 LAN coupler



#### Technical specifications

|                                      |  |                   |  | 7KT1 391 LAN couplers                                                                                               |  |
|--------------------------------------|--|-------------------|--|---------------------------------------------------------------------------------------------------------------------|--|
| Standards                            |  |                   |  | IEEE 802.3 AS, IEC 60950, EN 61000-6-2, EN 61000-6-3                                                                |  |
| General data                         |  |                   |  |                                                                                                                     |  |
| • Enclosures                         |  | Acc. to DIN 43880 |  | 4 modules                                                                                                           |  |
| • Mounting                           |  | Acc. to EN 60715  |  | Mounting onto standard mounting rail (35 mm)                                                                        |  |
| • Mounting height                    |  | mm                |  | 70                                                                                                                  |  |
| Supply                               |  |                   |  |                                                                                                                     |  |
| • Rated power dissipation $P_v$      |  | VA                |  | ≤ 10                                                                                                                |  |
| • Rated control supply voltage $U_c$ |  | V AC              |  | 230                                                                                                                 |  |
| • Primary operating range            |  | $\times U_c$      |  | 0.9 ... 1.10                                                                                                        |  |
| • Rated frequency                    |  | Hz                |  | 50                                                                                                                  |  |
| • Frequency ranges                   |  | Hz                |  | 45 ... 65                                                                                                           |  |
| Function                             |  |                   |  |                                                                                                                     |  |
| • System start                       |  |                   |  | Automatic upon switching on                                                                                         |  |
| • LAN server identification          |  |                   |  | Over the IP address of the PC                                                                                       |  |
| • Transmission rate                  |  | Limitation by LAN |  | Mbit/s 100                                                                                                          |  |
| • Operating system                   |  |                   |  | Windows XP/Vista/7                                                                                                  |  |
| • Operating system                   |  |                   |  | IE 7,8; Mozilla Firefox 3.09 / 3.5.3 / 3.6; Opera 9.64 / 10 / 10.5; Safari 3.2.2 / 4.0.5; Google Chrome 3.0.195.27. |  |

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### LAN couplers

|                                                  |  |                                         |                 | 7KT1 391 LAN couplers         |  |
|--------------------------------------------------|--|-----------------------------------------|-----------------|-------------------------------|--|
| <b>LAN interface</b>                             |  |                                         |                 |                               |  |
| • HW interface                                   |  |                                         |                 | Connection RJ 45              |  |
| • SW interface                                   |  |                                         |                 | TCP/IP                        |  |
| <b>Interface to measuring devices</b>            |  |                                         |                 |                               |  |
| • HW interface                                   |  | RS485 terminals                         | Number          | 3 (+/-/shielded twisted pair) |  |
| • Line                                           |  | Version                                 |                 | STP (shielded twisted pair)   |  |
|                                                  |  | Minimum cross-section                   | mm <sup>2</sup> | 2 × 0.2 or 2 x AWG 24         |  |
|                                                  |  | Maximum line capacitance                | pF/m            | < 50                          |  |
|                                                  |  | Impedance                               | W               | 100                           |  |
|                                                  |  | Maximum overall cable length            | m               | ≤ 1200                        |  |
|                                                  |  | Type of installation                    |                 | Serial                        |  |
| Measuring devices that can be connected directly |  |                                         | Number          | 30                            |  |
| <b>Environmental conditions</b>                  |  |                                         |                 |                               |  |
| • Temperatures                                   |  | In operation                            | °C              | -10 ... +55                   |  |
|                                                  |  | Storage and transport                   | °C              | -25 ... +70                   |  |
| • Relative humidity                              |  | In operation                            | %               | ≤ 80                          |  |
| • Vibrations                                     |  | Sine amplitude at 50 Hz                 | mm              | ± 0.25                        |  |
| • Safety class                                   |  | Acc. to IEC 60950                       |                 | III                           |  |
| • Degree of protection                           |  | Installed device front side (terminals) |                 | IP20                          |  |

### Selection and ordering data

| Version                                                              | U <sub>c</sub> | Mounting width | DT | Order No.       | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. |
|----------------------------------------------------------------------|----------------|----------------|----|-----------------|--------------|-------------------|-------------|-----|-----------------------|
|                                                                      | V AC           | MW             |    |                 |              |                   |             |     | kg                    |
| <b>LAN couplers</b><br>For connection of up to 30 devices over RS485 |                |                |    | <b>7KT1 391</b> |              | 1                 | 1 unit      | 047 | 0.212                 |





# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### PC-based power monitoring system

#### Overview



Components of the PC-based power monitoring system

#### **Power monitoring system with the SENTRON product family**

The SENTRON product family offers the user not only power monitoring software in the form of the powermanager, but also the corresponding hardware in the form of 7KT/7KM PAC measuring devices and 3WL/3VL circuit breakers for implementing a plant power monitoring system.

The components are optimally coordinated with each other. These include special SENTRON device drivers integrated in powermanager, which enable energy data acquisition with very little additional configuration required, as well as the indication of key measured values or states on predefined displays.

This reduces the engineering work for the customer and gives the user the assurance of knowing that the device functions are optimally supported in the software.



User interface of powermanager

#### **Features of powermanager**

The power monitoring software powermanager is the central feature of the PC-based power monitoring system and

- is an independent power monitoring software.
- can be operated using a PC and measuring devices with Ethernet connection.
- is expandable from the simple standard application to a fully flexible customer solution.
- is fully scalable with regard to the number of devices and the software's functions.
- ensures optimum integration of measuring devices from the 7KT/7KM PAC range, as well as 3WL/3VL circuit breakers and other Modbus devices.

#### **Benefits**

- Transparency of power flows
- Exact knowledge of the consumption profile
- Increased power efficiency
- Optimization of power supply contracts
- Compliance with contractual terms
- Allocation of power costs to cost centers
- Optimization of plant maintenance
- Identification of critical plant conditions
- Available languages:  
German, English, Spanish, Portuguese
- Support of the various device communication interfaces (Modbus RTU, Modbus TCP)
- Status display of devices

Download for powermanager V 3.0 trial license at

<http://support.automation.siemens.com/WW/view/en/64850998>

#### **Application**

##### **Applications**

The product offers a standard power monitoring solution which provides the user with the following basic functions:

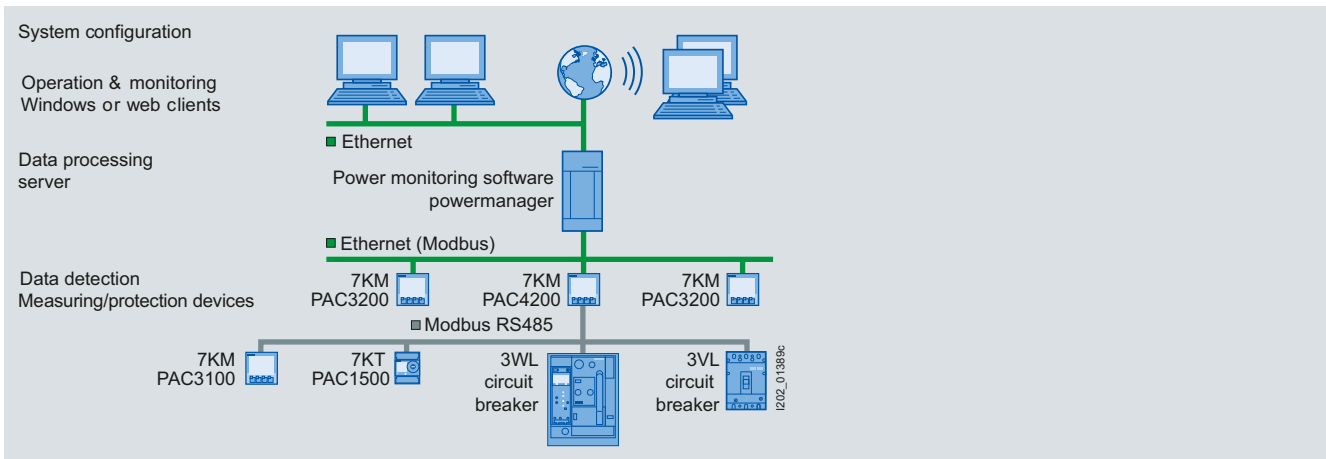
- Collection of measured quantities from the devices
- Presentation of the measured quantities from the devices in a predefined standard view for the 7KT PAC1500, 7KM PAC3100, 7KM PAC3200, 7KM PAC4200 measuring devices and 3WL/3VL circuit breakers
- Free presentation of measured quantities possible, including those from non-Siemens devices using generic Modbus drivers
- Archiving of measured quantities
- Monitoring of status and limits, with generation of corresponding signals
- Load curve display for visualizing the archived data and on-line data
- Cost center reports based on predefined tariffs and archived consumption data
- OPC server
- Configuration of the system including user management
- Load monitoring for complying with power limits
- Virtual computation

This standard solution is designed with cost-efficiency and simple system commissioning in mind.

# Measuring Devices and Power Monitoring

## 7KT PAC Measuring Devices

### PC-based power monitoring system



System overview

### Selection and ordering data

| Version                                                                                                                                                  | DT | Order No.                  | Price<br>per PU | PU<br>(UNIT,<br>SET,<br>M) | PS*/<br>P. unit | PG  | Weight<br>per PU<br>approx.<br>kg |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|-----------------|----------------------------|-----------------|-----|-----------------------------------|
| <b>powermanager V 3.0</b>                                                                                                                                |    |                            |                 |                            |                 |     |                                   |
| • <b>Trial license</b><br>up to 10 devices, inc. "Expert" and "Web" option packs<br>full product license limited to 30 days                              |    | <b>3ZS2 711-0CC30-0YA7</b> |                 | 1                          | 1 unit          | 133 | 0.217                             |
| • <b>Basic package</b><br>full product license up to 10 devices, installation for client/server                                                          |    | <b>3ZS2 711-0CC30-0YA0</b> |                 | 1                          | 1 unit          | 133 | 0.230                             |
| • <b>Device Pack (20)</b><br>Device expansion license for 20 devices                                                                                     |    | <b>3ZS2 711-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.230                             |
| • <b>Device Pack (50)</b><br>Device expansion license for 50 devices                                                                                     |    | <b>3ZS2 712-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.147                             |
| • <b>Device Pack (100)</b><br>Device expansion license for 100 devices                                                                                   |    | <b>3ZS2 713-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.147                             |
| • <b>Device Pack (200)</b><br>Device expansion license for 200 devices                                                                                   |    | <b>3ZS2 714-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.147                             |
| • <b>Device Pack (500)</b><br>Device expansion license for 500 devices                                                                                   |    | <b>3ZS2 715-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.148                             |
| • <b>Device Pack (1000)</b><br>Device expansion license for 1000 devices                                                                                 |    | <b>3ZS2 716-0CC30-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.147                             |
| • <b>Update license</b><br>from V2.0 Lean to V3.0 (10)                                                                                                   |    | <b>3ZS2 711-0CC30-0YE0</b> |                 | 1                          | 1 unit          | 133 | 0.229                             |
| • <b>Update license</b><br>from V2.0 Standard to V3.0 (50)                                                                                               |    | <b>3ZS2 712-0CC30-0YE0</b> |                 | 1                          | 1 unit          | 133 | 0.235                             |
| • <b>Update license</b><br>from V2.0 Advanced to V3.0 (100)                                                                                              |    | <b>3ZS2 713-0CC30-0YE0</b> |                 | 1                          | 1 unit          | 133 | 0.229                             |
| • <b>Update license</b><br>from V2.0 Maximum to V3.0 (200)                                                                                               |    | <b>3ZS2 714-0CC30-0YE0</b> |                 | 1                          | 1 unit          | 133 | 0.231                             |
| <b>powermanager V 2.0</b>                                                                                                                                |    |                            |                 |                            |                 |     |                                   |
| • <b>Upgrade license</b><br>from Lean to Standard                                                                                                        |    | <b>3ZS2 712-0CC20-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.144                             |
| • <b>Upgrade license</b><br>from Standard to Advanced                                                                                                    |    | <b>3ZS2 713-0CC20-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.143                             |
| • <b>Upgrade license</b><br>from Advanced to Maximum                                                                                                     |    | <b>3ZS2 714-0CC20-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.141                             |
| <b>Option packs</b>                                                                                                                                      |    |                            |                 |                            |                 |     |                                   |
| • <b>"Expert" option pack</b><br>Option for creating/displaying any number of freely configurable images                                                 |    | <b>3ZS2 710-2CC20-0YH0</b> |                 | 1                          | 1 unit          | 133 | 0.142                             |
| • <b>"Web" option pack</b><br>Option for access via the Web (e.g. Internet Explorer) for up to 10 clients                                                |    | <b>3ZS2 710-1CC20-0YH0</b> |                 | 1                          | 1 unit          | 133 | 0.142                             |
| • <b>"Client (5)" option pack</b><br>Expansion by up to 5 clients                                                                                        |    | <b>3ZS2 710-3CC00-0YD0</b> |                 | 1                          | 1 unit          | 133 | 0.139                             |
| • <b>"Distributed Systems (2)" option pack</b><br>Option for connecting 2 autonomous powermanager systems<br>for exchanging measured values and alarms   |    | <b>3ZS2 718-1CC00-0YH0</b> |                 | 1                          | 1 unit          | 133 | 0.145                             |
| • <b>"Distributed Systems (5)" option pack</b><br>Option for connecting 5 autonomous powermanager systems<br>for exchanging measured values and alarms   |    | <b>3ZS2 718-2CC00-0YH0</b> |                 | 1                          | 1 unit          | 133 | 0.140                             |
| • <b>"Distributed Systems (10)" option pack</b><br>Option for connecting 10 autonomous powermanager systems<br>for exchanging measured values and alarms |    | <b>3ZS2 718-3CC00-0YH0</b> |                 | 1                          | 1 unit          | 133 | 0.145                             |

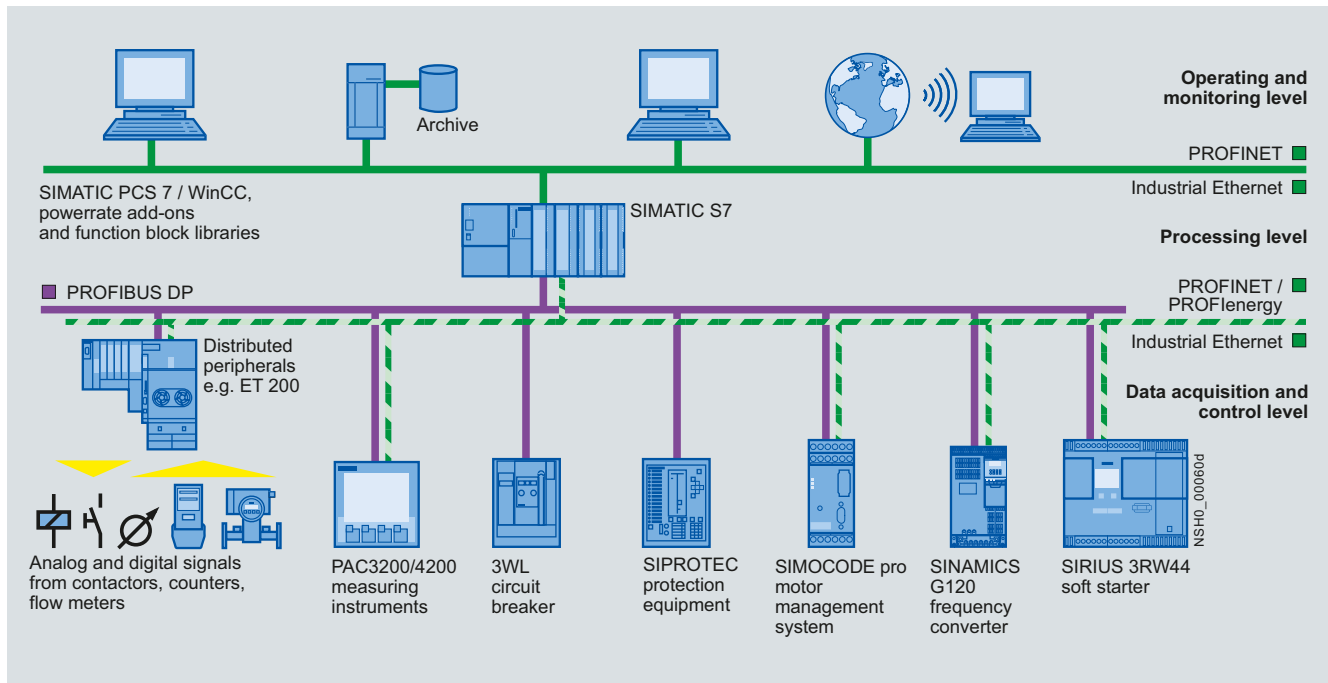
\* You can order this quantity or a multiple thereof.

# Measuring Devices and Power Monitoring

## Power Monitoring

### SIMATIC-based power data management system

#### Overview



#### SIMATIC-based solutions for the process and manufacturing industry

A key feature of the process and manufacturing industry is its very high power consumption. It therefore makes sense to integrate a power data management system in existing systems.

##### Communication through PROFIBUS DP

PROFIBUS DP enables integration of a wide range of devices:

- For the protection of distribution boards and loads: protective devices, such as circuit breakers
- For open-loop and closed-loop control: frequency converters, motor management systems and soft starters
- For detection
  - electrical measured quantities: via the 7KM PAC3200/4200 measuring devices
  - non-electrical measured quantities: via analog/digital converters

##### PROFINET and PROFlenergy

An increasing number of devices in automation technology offer PROFINET. An expansion module is also available for the 7KM PAC3200 und 7KM PAC4200 measuring devices 7KM PAC Switched Ethernet PROFINET.

PROFlenergy is a "Common Application Profile" from Profibus International. Thanks to PROFlenergy, it is possible to create a power data management system with standardized device interfaces.

##### Function block libraries for SIMATIC PCS 7 and WinCC

The function block library for SIMATIC PCS 7 and WinCC ensures device integration as follows:

- Measured quantities and states can be connected via CFC.
- Structured display of measured quantities and protection parameters for the 3WL/3VL circuit breakers.
- Limit value violations are displayed, archived and acknowledged in the relevant communications system in the usual way
- Circuit breakers can be program-controlled or manually operated with the appropriate user authorization.

#### SIMATIC powerrate

SIMATIC powerrate forms the core of the SIMATIC-based power data management system in the form of a PCS 7 / WinCC option and

- ensures power consumption transparency
- continuously collects, archives and processes power data
- enables the evaluation of power consumption per batch
- prevents load peaks through active load management together with SIMATIC S7
- collects archived data, which can be exported to Excel and presented in various reports

#### Benefits

- Increased energy efficiency due to precise knowledge of the load profile
- Optimization of power supply contracts
- Allocation of power costs to cost centers
- Optimization of plant maintenance
- Identification of critical plant conditions
- Reliable monitoring of the power limit through automatic load management

#### Application

The SIMATIC PCS 7 and WinCC library function blocks and powerrate are used in all industries where PCS 7 and WinCC are used and where the transparency and monitoring of power flows is crucial.

# Measuring Devices and Power Monitoring

## Power Monitoring

### SIMATIC-based power data management system

#### More information

##### Hardware components

The hardware components of the SIMATIC-based power data management system are

- 7KM PAC measuring devices
- 3WL air circuit breakers
- 3VL molded case circuit breakers (MCCBs)

##### Software components

The software components of the SIMATIC-based power data management system are

- SIMATIC powerrate for WinCC/PCS 7
- Library 7KM PAC3200 for SIMATIC PCS 7
- Library 3WL/3VL for SIMATIC PCS 7
- Library 7KM PAC3200 for SIMATIC WinCC

You can find more information on the Internet at:  
[www.siemens.com/lowvoltage/powermonitoring](http://www.siemens.com/lowvoltage/powermonitoring)

#### Selection and ordering data

| Version                                                                                                                                                                                                                                                      | DT | Order No.                  | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. kg |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|--------------|-------------------|-------------|-----|--------------------------|
| <b>SIMATIC powerrate V4.0 SP1</b>                                                                                                                                                                                                                            |    |                            |              |                   |             |     |                          |
| <b>Trial license</b>                                                                                                                                                                                                                                         |    | <b>6AV6 372-1DE04-0AX7</b> |              | 1                 | 1 unit      | 276 | 0.100                    |
| Engineering/Runtime license limited to 30 days                                                                                                                                                                                                               |    |                            |              |                   |             |     |                          |
| <b>Engineering and AS Runtime license unlimited<sup>1)</sup></b>                                                                                                                                                                                             |    | <b>6AV6 372-1DE04-0AX0</b> |              | 1                 | 1 unit      | 276 | 0.100                    |
| Also contains                                                                                                                                                                                                                                                |    |                            |              |                   |             |     |                          |
| <ul style="list-style-type: none"> <li>• License for user/archives</li> <li>• Library 7KM PAC3200 for SIMATIC WinCC / PCS7 (can also be used for 7KM PAC4200)</li> <li>• Library 3WL/3VL for SIMATIC PCS 7</li> </ul>                                        |    |                            |              |                   |             |     |                          |
| <b>SIMATIC powerrate V4.0 SP1 Upgrade from V3.0 to V4.0 SP1</b>                                                                                                                                                                                              |    |                            |              |                   |             |     |                          |
| <b>Engineering and AS Runtime license unlimited<sup>1)</sup></b>                                                                                                                                                                                             |    | <b>6AV6 372-1DE04-0AX4</b> |              | 1                 | 1 unit      | 276 | 0.100                    |
| Also contains:                                                                                                                                                                                                                                               |    |                            |              |                   |             |     |                          |
| <ul style="list-style-type: none"> <li>• License for user/archives</li> <li>• Library 7KM PAC3200 for SIMATIC WinCC / PCS7 (can also be used for 7KM PAC4200)</li> <li>• Library 3WL/3VL for SIMATIC PCS 7</li> </ul>                                        |    |                            |              |                   |             |     |                          |
| <sup>1)</sup> For operation on one WinCC/PCS 7 OS (single-user system or server) and any number of automation systems (AS).<br>When using further WinCC single-user systems/servers, one license is required for each WinCC/PCS 7 single-user system/server. |    |                            |              |                   |             |     |                          |

##### SIMATIC PCS 7 V 8.0

##### SIMATIC PCS 7 V 7.0 and V7.1

| Version                                                                                                                                                                                                                                         | DT | Order No.                  | Price per PU | PU (UNIT, SET, M) | PS*/P. unit | PG  | Weight per PU approx. kg |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|--------------|-------------------|-------------|-----|--------------------------|
| <b>Library 7KM PAC3200 for SIMATIC PCS 7<sup>1)</sup></b>                                                                                                                                                                                       |    |                            |              |                   |             |     |                          |
| <b>Engineering license</b>                                                                                                                                                                                                                      |    | <b>3ZS2 781-1CC11-0YG0</b> |              | 1                 | 1 unit      | 133 | 0.210                    |
| <ul style="list-style-type: none"> <li>• For operation on one PCS 7 OS (single-user system or server) and one automation system (AS).</li> <li>• When using further PCS 7 OS, one engineering license is required for each PCS 7 OS.</li> </ul> |    |                            |              |                   |             |     |                          |
| <b>Runtime License</b>                                                                                                                                                                                                                          |    | <b>3ZS2 781-1CC10-6YH0</b> |              | 1                 | 1 unit      | 133 | 0.011                    |
| • For operation on a further AS                                                                                                                                                                                                                 |    |                            |              |                   |             |     |                          |
| <b>Library 3WL/3VL for SIMATIC PCS 7<sup>1)</sup></b>                                                                                                                                                                                           |    |                            |              |                   |             |     |                          |
| <b>Engineering license</b>                                                                                                                                                                                                                      |    | <b>3ZS2 782-1CC10-0YG0</b> |              | 1                 | 1 unit      | 133 | 0.208                    |
| <ul style="list-style-type: none"> <li>• For operation on one PCS 7 OS (single-user system or server) and one automation system (AS).</li> <li>• When using further PCS 7 OS, one engineering license is required for each PCS 7 OS.</li> </ul> |    |                            |              |                   |             |     |                          |
| <b>Runtime License</b>                                                                                                                                                                                                                          |    | <b>3ZS2 782-1CC10-6YH0</b> |              | 1                 | 1 unit      | 133 | 0.010                    |
| • For operation on a further AS                                                                                                                                                                                                                 |    |                            |              |                   |             |     |                          |

<sup>1)</sup> Can also be used for 7KM PAC4200  
 For the currently supported SIMATIC PCS 7 versions, go to  
<http://support.automation.siemens.com>

## Order No. index including Export markings

### Overview

| Order No.      | Page           | Export markings* |    |
|----------------|----------------|------------------|----|
|                |                | ECCN             | AL |
| 3Z             |                |                  |    |
| 3ZS2 71        | 21             | EAR99S           | N  |
| 3ZS2 781-1CC10 | 23             | N                | N  |
| 3ZS2 781-1CC11 | 23             | 5D992            | N  |
| 3ZS2 782-1CC10 | 23             | 5D992            | N  |
| 6A             |                |                  |    |
| 6AV            | 23             | N                | N  |
| 7K             |                |                  |    |
| 7KM2           | 7              | 5D992            | N  |
| 7KM3           | 5              | EAR99APP         | N  |
| 7KM4           | 9              | 5D992            | N  |
| 7KM9 2         | 12             | EAR99H           | N  |
| 7KM9 300-0AB   | 12             | N                | N  |
| 7KM9 300-0AE   | 12             | EAR99H           | N  |
| 7KM9 300-0AM   | 12             | EAR99            | N  |
| 7KM9 9         | 10             | N                | N  |
| 7KT1           | 15, 16, 17, 19 | N                | N  |

## Conditions of sale and delivery

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- an exact explanation of the metal factor
- the text of the Comprehensive Terms and Conditions of Sale and Delivery of Siemens AG

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|      |                                                                                                                                                                                                                                                                                                                                                                                       |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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GERMANY

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