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 and reliable measurement of power values for infeed, outgoing feeders and individual loads. For further processing of measurement data, the devices are equipped with a wide range of communication options for easy integration in higher-level automation and power management systems.

Universal – worldwide

The portfolio covers measuring devices for every requirement: from simple power measurement through to the monitoring of system status and power quality. A user-friendly and intuitive menu ensures easy commissioning of the device. Universally and globally applicable – thanks to international approvals.

Highlights

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

Answers for infrastructure.

PC-based power management system

Overview

Components of the PC-based power management system

User interface of powermanager

Power management system with the SENTRON product family

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

The components are optimally coordinated with each other. For example, special drivers for the SENTRON devices are integrated in the powermanager software so that on the one hand the power data acquisition can take place without any great configuration effort and, on the other hand, the most important measured values or states are indicated by 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.

Power management software powermanager

The power management software powermanager is at the heart of the PC-based power management system and

- is independent power management 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 to the software's functions
- ensures the optimum integration of measuring devices from the 7KM PAC range, 3WL/3VL circuit breakers and other devices

The powermanager energy management software includes a client/server installation for recording, preparing, displaying and archiving power data. These power data are supplied primarily by 7KM PAC measuring devices or 3WL/3VL circuit breakers, which are connected to the system through Ethernet.

The powermanager software is available in the "Expert", "Web" and "Distributed Systems" option packs.

Benefits

- Transparency of power flows
- Exact knowledge of the consumption profile
- Increase of power efficiency
- Optimization of power supply contracts
- Compliance with contractual terms
- Assignment of power costs to cost centers
- Optimization of plant maintenance
- Identification of critical plant conditions

Field of application

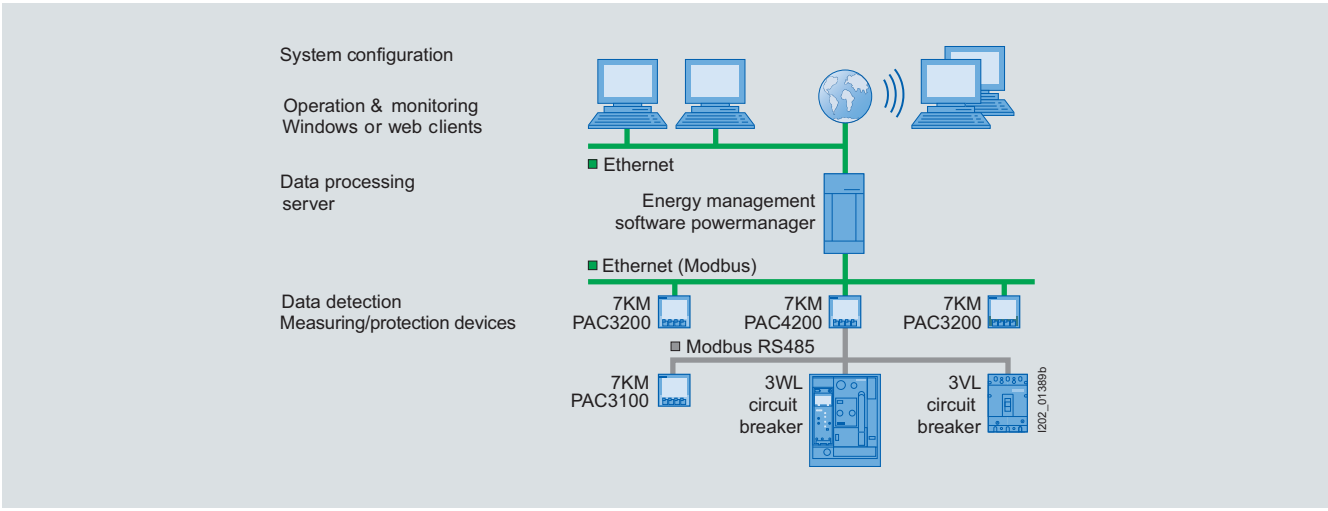
The PC-based energy management system is used wherever power flows need to be transparently displayed and monitored.

Industries

Energy efficiency thanks to power management with consistent monitoring and the resulting optimization measures is important for all industries, e. g. in the manufacturing industry, in non-residential buildings, in the field of services, and in infrastructure projects. This has a particular impact on competitiveness, particularly in view of rising energy prices.

System configuration with powermanager

- Integration of measuring devices by means of predefined device templates for the 7KM PAC family and the 3WL/3VL circuit breakers
- Easy integration of existing modbus-capable detecting devices
- Communication through Standard Ethernet
- Integration of devices with RS 485 interface (ModbusRTU) through Modbus gateway, e. g. the 7KM PAC4200 measuring device can be used as gateway



System overview

More information

Hardware components

The hardware components of the PC-based energy management system are

- the 7KM PAC measuring devices in this chapter
- the open 3WL circuit breakers in Catalog LV 10.1 · 2012, Chapter 1
- the 3VL molded case circuit breakers in Catalog LV 10.1 · 2012, Chapter 2

Software

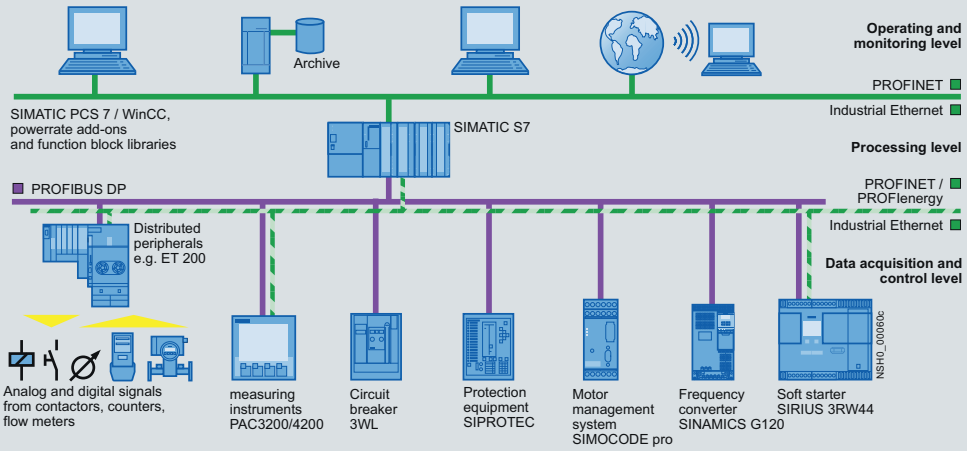
The software for the PC-based power management system is powermanager, see Catalog LV 10.1 · 2012, Chapter 13, "Configuring, visualizing and controlling with SENTRON".

Internet

You can find more information on the Internet at:
www.siemens.com/lowvoltage/energymanagement

SIMATIC-based power management system

Overview



SIMATIC-based solutions for the process and manufacturing industry

Besides the high level of automation, a key feature of the process and manufacturing industry is a very high power consumption. It is only natural, therefore, to integrate an energy management system in the existing systems. The add-on SIMATIC powerrate for WinCC and PCS 7 makes it possible to provide transparency and control in power distribution and energy costs.

Integration of switching, safety and measuring devices

For complete integration of low-voltage power distribution components in process and SCADA systems, PROFIBUS DP interfaces and function block libraries are available, e. g. the PAC3200 function block library for SIMATIC WinCC and PCS 7. The software add-ons can therefore be used to display all the data supplied from the devices without major engineering work.

PROFINET and PROFIenergy

An increasing number of devices in automation technology offer PROFINET. There is also a Switched Ethernet PROFINET module for the 7KM PAC3200 and PAC4200 measuring device.

PROFIenergy is a "Common Application Profile" from the PNO. Thanks to PROFIenergy it is possible to assemble an energy management system with standardized device interfaces.

SIMATIC powerrate

The SIMATIC powerrate software is at the heart of the SIMATIC-based power management system and

- is an add-on to PCS 7 and WinCC which throws light on power consumption from the infeed to the load
- continuously collects, archives and processes power data
- creates a load profile and works out potential savings based on exact knowledge of the load profile
- monitors the contractually agreed power limit
- enables the exact recording and evaluation of power consumption per batch through batch-related consumption recording
- enables the monitoring or indication of switch status and, with suitable authorization, remote switching
- shows selected measurements online and messages from the 7KM PAC3200 and PAC4200 measuring devices
- collects archived data, which can be exported to Excel and presented in various reports

Benefits

- Increased energy efficiency due to exact knowledge of the load profile
- Optimization of power supply contracts
- Assignment 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

Field of application

The SIMATIC-based energy management system is used wherever power flows need to be transparently displayed and monitored, and also where it is necessary to effectively intervene above the process control level.

Industries

SIMATIC powerrate is used in all areas in which PCS 7 or WinCC is used and energy efficiency considerations play a major role.

More information

Hardware components

- the 7KM PAC measuring devices in this chapter
- the open 3WL circuit breakers in Catalog LV 10.1 · 2012, Chapter 1
- the 3VL molded case circuit breakers in Catalog LV 10.1 · 2012, Chapter 2

Software components

- SIMATIC powerrate
- PCS 7 function block library PAC3200
- WinCC function block library PAC3200

All software components can be found in Catalog LV 10.1 · 2012, Chapter13.

You can find more information on the Internet at:
www.siemens.com/lowvoltage/energymanagement

Overview

Precise measuring with 7KM PAC3100, PAC3200 and PAC4200

The 7KM PAC measuring devices:
PAC3200 (left), PAC3100 (center) and PAC4200 (right)

The 7KM PAC measuring devices are used to measure and indicate all relevant network parameters in low-voltage power distribution. They can be used for single-phase measurements as well as for multiphase measurements in 3 and 4-conductor networks (TN, TT, IT).

Power values for main distribution boards, electrical feeders or individual loads are recorded precisely and reliably, and important measured values are supplied in addition for assessing the state of the plant and the quality of the network.

More information

More information is available on the Internet at:
www.siemens.com/lowvoltage/energymanagement

Benefits

7KM PAC measuring device, general

The common features of all measuring devices in the 7KM PAC series:

- 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
  - min. 8 languages
  - international approvals
  - developed and tested to European and international standards
- Low mounting depth

7KM PAC3200 and 7KM PAC4200 measuring device

Additional performance characteristics of the 7KM PAC3200 and 7KM PAC4200:

- Precise energy recording
- Versatile system integration
  - integrated Ethernet interface
  - optional communication modules available
  - multifunctional digital inputs and outputs
  - limit value monitoring
- Can be directly connected to power supply networks up to 690 V AC (UL-L), CATIII without voltage transformer
- Easy-to-use configuration software included as standard

7KM PAC4200 measuring device

Additional performance characteristics of the 7KM PAC4200:

- Monitoring the plant status and the system quality
  - basic information for evaluating network 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 across 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
- Meters 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 RS 485 interface via 7KM PAC RS485 expansion module to an Ethernet network
- Comprehensive convenience 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.

Technical specifications



Device versions		7KM PAC3100	7KM PAC3200	7KM PAC4200
Basic measurement variables				
Voltage, current		✓	✓	✓
Neutral conductor current		✓	--	✓
Apparent power, active power, reactive power, power factor		✓	✓	✓
Power factor of the fundamental wave		--	--	✓
Frequency	Of the reference phase	✓	✓	✓
Min/max values	Slave pointer function | with date & time	✓ | --	✓ | --	✓ | ✓
Power measurement				
Apparent energy		--	✓	✓
Active energy, reactive energy	Input | Output | Balance	✓ | ✓ | ✓	✓ | ✓ | --	✓ | ✓ | --
Number of tariffs	Apparent, active and reactive energy	1	2	2
Daily energy values for 365 days	Apparent, active and reactive energy	--	--	✓
Consumption recording of a sub-process or manufacturing process	Apparent, active and reactive energy	--	--	✓
Power averages of the last integration period	Active and reactive power average with min / max value	✓	✓	✓
Load profile record		--	--	✓ max. 3840 entries[1]
Power measuring devices for S_0 signal at a digital input	Electrical energy | any energy	-- | --	✓ | --	✓ | ✓
Accuracy class for active energy	According to IEC 62053-21 / 62053-22	Class 1	Class 0.5S	Class 0.2S
Accuracy class for reactive energy	According to IEC 62053-23	Class 3	Class 2	Class 2
Monitoring of state of the plant and quality of the network				
Configurable displays	For presenting up to 4 measured quantities	--	--	4
Operating hours meter	Operating hours of loads	--	✓	✓
Sliding mean values	*U, I, S, P, Q, LF*	--	--	✓
THD voltage, current		--	THD-R	THD
Distortion current strength		--	--	✓
Phase angle, phase displacement angle		--	--	✓
Unbalance	Voltage | current	--	U_{nba} | I_{nba}[2]	U_{nb} | I_{nb}[3]
Harmonics in voltage, current		--	--	3. to 31st
Limit value monitoring	Max. number of limit values	--	6	12
Boolean logic	For limit values | inputs	--| --	✓ | --	✓ | ✓
Event memory for operation, control and system-related events	Including time stamp	--	--	✓ (> 4000 events)
Battery backup for min / max values		--	--	✓
System integration and communication				
Ethernet (integrated)		--	10 Mbit/s	10/100 Mbit/s
• Protocol	Modbus TCP	--	✓	✓
• Gateway	Ethernet <--> RS 485 (Modbus)	--	--	✓[4]
PROFINET incl. PROFIenergy		--	Expansion module optional	
PROFIBUS DPV1		--	Expansion module optional	
RS 485		Integrated	Expansion module optional	
• Protocol	Modbus RTU	✓	✓	✓
4DI/2DO expansion module	Expansion to max. 10 DI / 6 DO	--	--	✓ (max. 2 modules)
Number of expansion modules	Max.	--	1	2
Integrated digital inputs (DI)	Number | multifunctional	2 | --	1 | ✓	2 | ✓
Integrated digital outputs (DO)	Number | multifunctional	2 | ✓	1 | ✓	2 | ✓
Installation plan				
Dimensions (L x W x D)	In mm	96 x 96 x 56	96 x 96 x 56	96 x 96 x 82
Mounting depth	PAC | PAC with expansion module (in mm)	51 | --	51 | 73	77 | 99
Panel cutout (L x W)	In mm	92 x 92	92 x 92	92 x 92
Standards and approvals				
CE / cULus / C-Tick / GOST		✓	✓	✓
IEC 61557-12		✓	--	✓

1) This corresponds for example to a duration of 40 days with a measurement period length of 15 minutes.

2) U_{nba}, I_{nba} - Unbalance with regard to amplitude.

3) U_{nba}, I_{nba} - Unbalance with regard to amplitude and phase.

4) In conjunction with 7KM PAC RS 485 expansion module

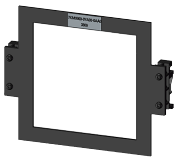
✓ = Available, -- = Not available.

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
 7KM3 133-0BA00-3AA0	**7KM PAC3100 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Screw terminals for connecting current and voltage AC/DC power supply unit with wide voltage range U_{AUX}: 100 … 240 V AC ±10 %, 50/60 Hz 110 … 250 V DC ±10 % Measuring inputs U_e: max. 3 AC 480/277 V, 50/60 Hz I_e: /5 A	A	**Screw terminals** **7KM3 133-0BA00-3AA0**		1	1 unit	133	0.325

Accessories

Accessories for 7KM PAC3100/3200/4200

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
 7KM9 900-0XA00-0AA0	**7KM PAC TMP2 mounting rail adapter** Double-tiered adapter for mounting a measuring device on standard mounting rail • Display faces forward • For manual intervention	A	**7KM9 900-0XA00-0AA0**		1	1 unit	133	0.380
 7KM9 900-0YA00-0AA0	**7KM PAC TMP mounting plate** Adapter for mounting a measuring device on standard mounting rail • Display faces backwards towards standard mounting rail • Read-out and evaluation of measurements solely via mains operation	A	**7KM9 900-0YA00-0AA0**		1	1 unit	133	0.105

More information

Current transformers

Suitable current transformers can be found
- in the Catalog LV 10.1 · 2012, Chapter 2, "Molded case circuit breakers"
- in the Industry Mall, Section: "Industry Automation and Drive Technologies"
  - "Low-Voltage Power Distribution and Electrical Installation Technology"
  - "Protection Equipment"
  - "Molded Case Circuit Breakers"
  - "3VL Molded Case Circuit Breakers"
  - "3VL Molded Case Circuit Breakers up to 1600 A"
  - "Accessories and Spare Parts"

Software components

For more information about the software components see Catalog LV 10.1 · 2012, Chapter 13 and on the Internet at: www.siemens.com/lowvoltage/energymanagement

* You can order this quantity or a multiple thereof.

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
  7KM2 112-0BA00-3AA0	**7KM PAC3200 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Screw terminals for connecting current and voltage AC/DC power supply unit with wide voltage range U_{AUX}: 95 … 240 V AC ±10 %, 50/60 Hz 110 … 340 V DC ±10 % Measuring inputs U_e: max. 3 AC 690/400 V, 50/60 Hz I_e: /1 A or /5 A	A	**Screw terminals** **7KM2 112-0BA00-3AA0**		1	1 unit	133	0.325
  7KM2 111-1BA00-3AA0	**7KM PAC3200 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Screw terminals for connecting current and voltage DC power supply unit with extra-low voltage U_{AUX}: 22 … 65 V DC ± 10 % Measuring inputs U_e: max. 3 AC 500/289 V, 50/60 Hz I_e: /1 A or /5 A	A	**Screw terminals** **7KM2 111-1BA00-3AA0**		1	1 unit	133	0.325
  7KM2 112-0BA00-2AA0	**7KM PAC3200 measuring device** Control panel flush-mounting instrument 9 6 mm x 96 mm Cable lug terminals for connecting current and voltage AC/DC power supply unit with wide voltage range: U_{AUX}: 95…240 V AC ±10 %, 50/60 Hz 110…340 V DC ±10 % Measuring inputs U_e: max. 3 AC 690/400 V, 50/60 Hz I_e: /1 A or /5 A	A	**Ring terminal lug connection** **7KM2 112-0BA00-2AA0**		1	1 unit	133	0.325

More information

For accessories and information about current transformers and software components see Page 7.

* You can order this quantity or a multiple thereof.

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
 7KM4 212-0BA00-3AA0	**7KM PAC4200 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Screw terminals for connecting current and voltage AC/DC power supply unit with wide voltage range U_{AUX}: 95 … 240 V AC ±10 %, 50/60 Hz 110 … 340 V DC ±10 % Measuring inputs U_e: max. 3 AC 690/400 V, 50/60 Hz I_e: /1 A or /5 A	A	**Screw terminals** **7KM4 212-0BA00-3AA0**		1	1 unit	133	0.450
 7KM4 211-1BA00-3AA0	**7KM PAC4200 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Screw terminals for connecting current and voltage DC power supply unit with extra-low voltage U_{AUX}: 22 … 65 V DC ± 10 % Measuring inputs U_e: max. 3 AC 500/289 V, 50/60 Hz I_e: /1 A or /5 A	A	**Screw terminals** **7KM4 211-1BA00-3AA0**		1	1 unit	133	0.450
 7KM4 212-0BA00-2AA0	**7KM PAC4200 measuring device** Control panel flush-mounting instrument 96 mm x 96 mm Cable lug terminals for connecting current and voltage AC/DC power supply unit with wide voltage range: U_{AUX}: 95…240 V AC ±10 %, 50/60 Hz 110…340 V DC ±10 % Measuring inputs U_e: max. 3 AC 690/400 V, 50/60 Hz I_e: /1 A or /5 A	A	**Ring terminal lug connection** **7KM4 212-0BA00-2AA0**		1	1 unit	133	0.450

More information

For accessories and information about current transformers and software components see Page 7.

* You can order this quantity or a multiple thereof.

Expansion modules for 7KM PAC measuring devices

Overview

From left to right:
Expansion module 7KM PAC Switched Ethernet PROFINET
Expansion module 7KM PAC PROFIBUS DP
Expansion module 7KM PAC RS485
Expansion module 7KM PAC 4DI/2DO

Expansion modules act as communication interfaces for 7KM measuring devices.

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

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 PAC4200 measuring devices.

- Standardized PROFIenergy interface to the measured variables
- The measured variables can be individually selected using a GSDML file. This enables the use of cost-effective S7-CPUs
- Easy parameter assignment using the device display and STEP 7
- Integrated Ethernet Switching permits 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, SNTP)
- Device replacement without PG in the PROFINET network using LLDP
- Deterministic reversing time through ring redundancy (MRP)
- Modbus TCP for communication with 7KM powermanager or powerconfig
- 2 x Ethernet (RJ45) sockets
- Baud rates 10 and 100 Mbit/s
- Protocols PROFINET IO, PROFIenergy and Modbus TCP
- No external auxiliary power necessary
- Additional display via the device display and via LEDs on the module

All measurement variables from 7KM PAC3200 and PAC4200 are 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 variables can be read out in acyclic mode using PROFIenergy, a PNO protocol profile. Thanks to PROFIenergy it is possible to assemble an energy management 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:

- Pluggable communication modules for 7KM PAC3200 and PAC4200 measuring devices
- Parameterizable 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 into SIMATIC STEP 7 and/or simple integration via GSD file for other programming systems
- Optimum use of process image of a control for selection of individual measurement values for cyclical transfer
- All baud rates from 9.6 kbit/s up to 12 Mbit/s are supported
- Connection through 9-pole Sub-D connector according to IEC 61158
- No external auxiliary power necessary
- Additional display via the device display and via LEDs on the module

7KM PAC RS485 expansion module

The 7KM PAC RS485 expansion module has the following features:

- Pluggable 7KM PAC RS485 communication module for 7KM PAC3200 and PAC4200 measuring devices
- Parameterizable from the front of the device or using parameterization software
- Support for the Modbus RTU protocol
- Plug and play
- Baud rates 4.8 / 9.6 / 19.2 and 38.4 kbit/s are supported.
- Connection by means of 6-pole screw terminals
- No external auxiliary power necessary
- Status indication by LED on the module

The 7KM PAC RS 485 expansion module is required for the gateway function of the 7KM PAC4200 to achieve simple devices with RS 485 interface, such as the 7KM PAC3100, via Ethernet (Modbus TCP).

7KM PAC 4DI/2DO expansion module

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.
It offers the following features:

- Up to two 7KM 4DI/2DO modules can be plugged onto a PAC4200
- The 7KM PAC 4DI/2DO modules mean that the internal digital inputs and outputs can be expanded by up to 8 inputs and 4 outputs
- The 4DI/2DO expansion modules can be parameterized via the front of the device or via the powerconfig configuration software
- The digital inputs can be used without external voltage sources. They are self-powered
- All functions of the integrated multifunctional inputs/outputs on the 7KM PAC4200 are also available in the 7KM PAC 4DI/2DO expansion module
- Inputs and outputs can be used as an S0 interface conforming to IEC 62053-31
- The connection is made via a 9-pole screw terminal
- No external auxiliary power supply is required

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx. kg
 7KM9 300-0AE00-0AA0	**7KM PAC Switched Ethernet PROFINET expansion module** Expansion module for 7KM PAC3200 and PAC4200(PROFIenergy)	A	**7KM9 300-0AE00-0AA0**		1	1 unit	133	0.045
 7KM9 300-0AB00-0AA0	**7KM PAC PROFIBUS DP expansion module** Expansion module for 7KM PAC3200 and PAC4200 (PROFIBUS DPV1)	A	**7KM9 300-0AB00-0AA0**		1	1 unit	133	0.045
 7KM9 300-0AM00-0AA0	**7KM PAC RS485 expansion module** Expansion module for 7KM PAC3200 and PAC4200 (Modbus RTU)	A	**7KM9 300-0AM00-0AA0**		1	1 unit	133	0.041
 7KM9 200-0AB00-0AA0	**7KM PAC 4DI/2DO expansion module** Expansion module for 7KM PAC4200	A	**7KM9 200-0AB00-0AA0**		1	1 unit	133	0.041

More information

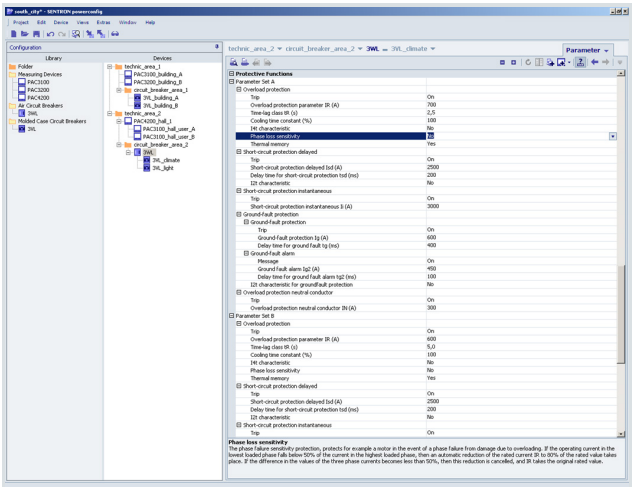
Software components

For more information about the software components see Catalog LV 10.1 · 2012, Chapter 13 and on the Internet at: www.siemens.com/lowvoltage/energymanagement

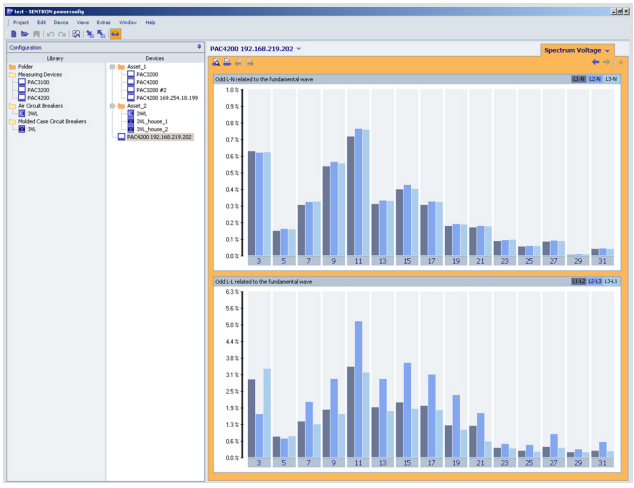
* You can order this quantity or a multiple thereof.

powerconfig

Overview



Setting the parameters of a SENTRON device



Display of current measured variables (harmonic)

The powerconfig software is the new combined commissioning and service tool for communication-capable SENTRON measuring devices and circuit breakers.

The PC-based tool makes the parameterization of the devices easier, which gives rise to a considerable time saving, particularly when several devices have to be set up.

With powerconfig the 3WL and 3VL circuit breakers and the 7KM PAC measuring devices with expansion modules can be parameterized, documented, operated and monitored using various communication interfaces.

Benefits

- Parameterization, documentation, operation and monitoring in one software
- Documentation of measured values and settings
- Clear presentation of the available parameters including plausibility testing of the inputs
- Display of the available device statuses and measured values in standardized views
- Project-oriented storage of device data
- Consistent operation and usability
- Support of the various device communication interfaces (Modbus RTU, Modbus TCP)
- Supported languages: English and German
- Read-out and saving of device recordings (device-dependent)
- Update of the device firmware and loading of language packs (device-dependent)
- No programming knowledge required for operation
- Communication via PROFIBUS and PROFINET and connection to STEP7 (available soon)

Field of application

System requirements

Hardware requirements

- Processor: Intel Pentium III, 1 GHz (or better)
- RAM: at least 512 MB
- Hard disk: at least 1 GB free
- Color monitor with a minimum resolution of 1024 x 768 pixels

Supported operating systems

- Microsoft Windows XP Prof. 32Bit SP3. MUL OS
- Microsoft Windows 7 Professional (32Bit)
- Microsoft Windows 7 Ultimate (32Bit)
- Microsoft Windows 7 Home Basic (32Bit)

Required framework:

- Microsoft .NET V3.5 SP1

More information

powerconfig is available free of charge at
http://support.automation.siemens.com/WW/view/com/50241697
You can find more information on the Internet at:
www.siemens.com/sentron

Overview

7KT PAC 1500 (7KT1 543) 3-phase counters for direct connection up to 80 A

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

Three-phases counters are available up to 125 A and in versions with transformer connections (…/5 A to 10000/5 A).

Counters store active and reactive energy, and comply with accuracy class 1 (for active energy).

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

At the same time the counters have an integrated optical interface (IrDA) for connecting communication modules, which enables their integration in a range of other systems, such as power management systems.

Technical specifications

7KT PAC1500 three-phase counters			**7KT1 540 7KT1 542**	**7KT1 543 7KT1 545**	**7KT1 546 7KT1 548**
Standards			EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31		
Connection					
• Direct connection			--	80 A	125 A
• Transformer current connection			.../5 A	--	--
General data					
• Enclosures	Acc. to DIN 43880	MW	4	4	6
• Mounting	Acc. to EN 60715	mm	35		
• Mounting height		mm	70		
Function					
• Connection	Single-phase or three-phase	Number of conductors	4	2 ... 4	2 ... 4
• Storage of setting and counter reading	Through (EEPROM)		Yes	Yes	Yes
• Rate	for active and reactive energy		T1/T2	T1/T2	T1/T2
Supply (through measuring terminals)					
• Rated control supply voltage U_n		V AC	230		
• Voltage range		V	184 ... 276		
• Rated frequency f_n		Hz	50		
• Rated power dissipation P_v		VA (W)	≤ 8 (0.6)		
Measuring accuracy (at 23 ±1 °C)	Based on nominal value				
• Active energy and active power	Acc. to EN 50470-3		Class B		
• Reactive energy and reactive power	Acc. to EN 62053-23		Class 2		
Measuring inputs					
• Connection type			Transformer TA-TC .../5 A	Direct	Direct
• Voltage U_n	Phase/phase Phase/N	V V	400 230		
• Operating range voltage	Phase/phase Phase/N	V V	319 ... 480 184 ... 276		
• Current I_{ref}		A	--	5	5
• Current I_n		A	5	--	--
• Current I_{min}		A	0.05	0.25	0.25
• Operating range current (I_{st} … I_{max})	Direct connection Transformer connection	A A	-- 0.003 ... 6	0.015 ... 80 --	0.020 ... 125 --
• Transformer current	Primary current of the transformer Smallest input step	A A	5 ... 10000 5	-- --	-- --
• Frequency		Hz	50		
• Input ripple form			Sinusoidal		
• Operational starting current I_{st}		mA	3	15	20
S0 interface	Acc. to EN 62053-31				
• Pulse outputs for absorbed for active and reactive energy T1 + T2			Yes		
• Pulse count	for input current I_{max} Can be set on transformer	Pulses/kWh Pulses/kWh	-- 100 - 10 - 1	500 --	500 --
IR interface					
• At the side for connecting communication modules			M-Bus / Modbus RTU / RS 485 / KNX		

7KT PAC1500 three-phase counters

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
	**7KT PAC1500 three-phase counters**										
	Digital measuring devices										
	• For transformer connection, double rate	230	transformer /5	4	B	**7KT1 540**		1	1 unit	047	0.289
	• For transformer connection, double rate, calibrated version (MID)	230	transformer /5	4	B	**7KT1 542**		1	1 unit	047	0.293
	• For direct connection, double rate	230	80	4	B	**7KT1 543**		1	1 unit	047	0.419
	• For direct connection, double rate, calibrated version (MID)	230	80	4	B	**7KT1 545**		1	1 unit	047	0.419
	• For direct connection, double rate	230	125	4	B	**7KT1 546**		1	1 unit	047	0.678
	• For direct connection, double rate, calibrated version (MID)	230	125	4	B	**7KT1 548**		1	1 unit	047	0.690

* You can order this quantity or a multiple thereof.

Overview

7KT1 53 digital counters

The 7KT PAC1500 counters (power meters) are used to record the amount of electrical energy exported or imported. They comply with the counter standard EN 50470 (Part 1 and 3) and come with an LCD display.

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

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

The calibrated versions are in accordance with the new Measuring Instruments Directive 2004/22/EC (MID). At the same time the counters – except version 7KT1 530 – have an integrated optical interface (IrDA) for connecting communication modules.

Technical specifications

7KT PAC1500 single-phase counters, Direct connection up to 80 A			**7KT1 530**	**7KT1 531 7KT1 533**
Standards			EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31	
General data				
• Enclosures	Acc. to DIN 43880	MW	2	
• Mounting	Acc. to EN 60715	mm	35	
• Mounting height		mm	70	
Function				
• Operating mode	Single-phase loads	Conductors	2	
• Storage of setting and counter reading	Through (EEPROM)		Yes	
• Rate	for active energy For reactive energy		T1 T1	T1 + T2 T1 + T2
Supply (through measuring terminals)				
• Rated control supply voltage U_n		V AC	230	
• Voltage range		V	184 ... 276	
• Rated frequency f_n		Hz	50	
Measuring accuracy (at 23 ±1 °C)	Based on nominal value			
• Active energy and active power	Acc. to EN 50470-3		Class B	
• Reactive energy and reactive power	Acc. to EN 62053-23		Class 2	
Measuring inputs				
• Connection type	Phase/N		Direct	
• Operating range voltage	Phase/N	V AC	184 ... 276	
• Current I_{ref}		A	15	
• Current I_{min}		A	0.75	
• Operating range current (I_{st} ... I_{max})	Direct connection	A	0.025 ... 80	
• Frequency		Hz	50	
• Current waveform			Sinusoidal	
• Operational starting current I_{st}		mA	25	
S0 interface	Acc. to EN 62053-31			
• Pulse outputs for absorbed active and reactive energy			Yes	
• Pulse count		Pulses/kWh	1000	
IR interface				
• At the side for connecting communication modules (M-Bus / Modbus RTU / RS 485 / KNX)			--	Yes

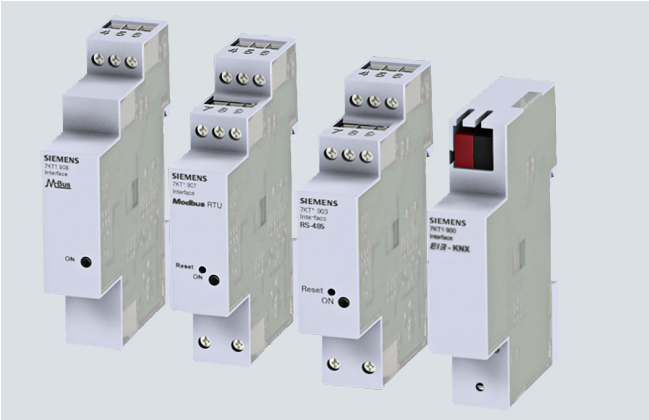
Selection and ordering data

		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
	**7KT PAC1500 single-phase counters**										
	Digital counters										
	• For direct connection, single rate	230	80	2	B	**7KT1 530**		1	1 unit	047	0.164
	• For direct connection, double rate	230	80	2	B	**7KT1 531**		1	1 unit	047	0.164
	• For direct connection, double rate, calibrated version	230	80	2	B	**7KT1 533**		1	1 unit	047	0.190

* You can order this quantity or a multiple thereof.

Expansion modules for 7KM PAC counters

Overview



Expansion modules for 7KT PAC1500 counters, from left to right:
Expansion modules for M-Bus, Modbus RTU, RS 485 and Instabus KNX

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

- The expansion modules can be selected independently of the counter. Retrofitting of already installed counters is therefore possible if required
- Data transmission between the counters and the expansion modules takes place through the IrDA infrared interface
- The expansion modules are placed alongside the counters in the installation direction so that their IrDA interfaces lie exactly opposite

M-Bus communication modules (7KT1 908)

- 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

Modbus expansion modules (7KT1 907)

- 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
- Can be parameterized using RS 485 Master software

RS 485 expansion modules (7KT1 903)

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

7KNX/EIB expansion modules (7KT1 900)

- 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.
		MW							kg
 7KT1 908	**Expansion module M-Bus** For connecting 7KT PAC1500 counters to M-Bus	1	B	**7KT1 908**		1	1 unit	047	0.050
 7KT1 907	**Expansion module Modbus RTU** For connecting 7KT PAC1500 counters to Modbus RTU	1	B	**7KT1 907**		1	1 unit	047	0.085
 7KT1 903	**Expansion module RS 485** For connecting 7KT PAC1500 counters via RS 485 to 7KT1 391 LAN couplers	1	B	**7KT1 903**		1	1 unit	047	0.080
 7KT1 900	**Expansion module KNX** For connecting 7KT PAC1500 counters to Instabus KNX	1	B	**7KT1 900**		1	1 unit	047	0.064

* You can order this quantity or a multiple thereof.

Overview

7KT PAC3000 measuring devices

Features

- Measuring devices with LED display
- For direct (80A) and transformer connection (/5A)
- Display of 38 measured values
- 9 display levels, each with 6 display units (one level freely configurable)
- Password-protected menu setting
- S0 pulse output
- Integrated RS485 interface (for connecting to the 7KT1391 LAN coupler or communication using Modbus RTU)

Technical specifications

7KT PAC3000 measuring devices without communication **7KT PAC3000 multicounters with RS 485 interface (Modbus RTU / LAN couplers)**			**7KT1 310** **7KT1 340**	**7KT1 311** **7KT1 341**
Standards			EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31, IEC 61010-1	
General data				
• Enclosures	Acc. to DIN 43880		6 modules	
• Mounting	Acc. to EN 60715	mm	35	
• Mounting height		mm	70	
Supply				
• Rated control supply voltage U_n		V AC	230	
• Operating range		× U_n	0.8 ... 1,2	
• Rated frequency		Hz	50	
• Rated power dissipation P_V		VA	< 5	
Measuring accuracy				
• Voltage		%	± 1	
• Current		%	± 2	
• Power outputs		%	± 1	
• Active energy	According to IEC 50470-3		Class B	
• Reactive energy	Acc. to IEC 62053-23		Class 2	
• p.f.		%	± 2	
• Frequency		%	± 0.2	
Measuring inputs				
• Connection type			Direct	Transformers /5 A
• Voltage U_n	Phase/phase Phase/N	V V	400 230	
• Operating range voltage	Phase/phase Phase/N	V V	87 ... 480 50 ... 276	
• Current I_n / I_{ref}		A	5	1 or 5
• Operating range current		A	0.0015 ... 80	0.003 ... 6
• Transformer current	Primary current of the transformer Smallest input step	A A	-- --	5 ... 10000 1 or 5
• Frequency		Hz	50	
S0 interface	Acc. to IEC 62053-31		Class A	
• Pulse outputs	For active and reactive energy T1 and T2		Yes	Yes
• Pulse count	At 80 A, max.	Pulses/kWh	500	--
	Depending on the transformer factor, adjustable, max.	Pulses/kWh	--	10000

7KT PAC3000 measuring devices

7KT PAC3000 measuring devices without communication 7KT PAC3000 multicounters with RS 485 interface (Modbus RTU / LAN couplers)			7KT1 310 7KT1 340	7KT1 311 7KT1 341
Modbus RTU interface (only for 7KT1 340 - 7KT1 341)				
• Transmission rate		kbit/s	9.6-19.2	9.6-19.2
Ambient conditions				
• Mechanical environment			M1	
• Electromagnetic environment			E2	
• Operating temperature		°C	-10 ... +55	
• Temperature limits for storage and transport		°C	-25 ... +70	
• Relative humidity (without condensation)		%	< 80	
• Vibrations	Sinus amplitude at 50 Hz	mm	± 0.075	
• Degree of protection	Installed device, front side/terminals		IP51[1]/PI20	

[1] For installation in a distribution board with at least IP51 degree of protection.

Selection and ordering data

	U_e	I_e	U_c	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx.
	V AC	A AC	V AC	MW							kg
7KT PAC3000 measuring devices											
For the display of 35 electrical values, of which 5 or 6 values can be continuously displayed. For three-phase, 3/4 conductor connection, with S0 interface											
Without communication interface											
Standard rail mounting											
• For direct connection											
	3 × 230/400	80	230	6	B	**7KT1 310**		1	1 unit	047	0.478
• For transformer connection 5 ... 5000 A, adjustable in 5 A steps, secondary current 5 A											
	3 × 230/400	transformer /5	230	6	B	**7KT1 311**		1	1 unit	047	0.421
With RS 485 interface and RTU Modbus protocol or for connection to LAN networks via 7KT1 391 LAN coupler											
Standard rail mounting											
• For direct connection											
	3 × 230/400	80	230	6	B	**7KT1 340**		1	1 unit	047	0.430
• For transformer connection 5 ... 5000 A, adjustable in 5 A steps, secondary current 5 A											
	3 × 230/400	transformer /5	230	6	B	**7KT1 341**		1	1 unit	047	0.430

7KT1 310

* You can order this quantity or a multiple thereof.

Overview

7KT 391 LAN couplers

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

Up to 30 devices can be linked with 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.

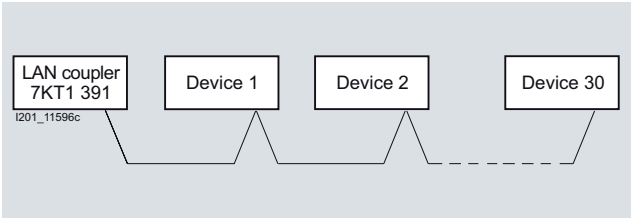
Field of application

Suitable 7KT PAC measuring devices and counters

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

	Order No.
Energy counters	
7KT PAC1500 digital three-phase counters	
• For direct connection 80 A, double rate	7KT1 543
• For direct connection 80 A, double rate, calibrated version	7KT1 545
• For transformer connection .../5 A, double rate	7KT1 540
• For transformer connection .../5 A, double rate, calibrated version	7KT1 542
• For direct connection 125 A, double rate	7KT1 546
• For direct connection 125 A, double rate, calibrated version	7KT1 548
• For direct connection 63 A, double rate	7KT1 520
• For transformer connection .../5 A, double rate	7KT1 521
• Digital 1-phase counters	
• 7KT PAC1500, for direct connection 80 A, double rate	7KT1 531
• 7KT PAC1500, for direct connection 80 A, double rate, calibrated version	7KT1 533
7KT PAC3000 measuring devices	
• 7KT PAC3000, for direct connection	7KT1 340
• 7KT PAC3000, for transformer connection .../5 A	7KT1 341

Connecting the devices to a 7KT 391 LAN coupler



Technical specifications

			7KT1 391 LAN couplers
Standards			IEE 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
• Operating range		× 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.

7KT1 391 LAN couplers

			7KT1 391 LAN couplers
LAN interface			
• HW interface			Connection RJ 45
• SW interface			TCP/IP
Interface to the measuring devices			
• HW interface	RS 485 terminals	Number	3 (+/-/shielded twisted pair)
• Line	Version		STP (shielded twisted pair)
	Minimum cross-section	mm^2	2 × 0.2 or 2 x AWG 24
	Maximum line capacity	pF/m	< 50
	Impedance	W	100
	Maximum overall cable length	m	≤ 1200
	Type of installation		Serial
Measuring devices can be connected directly		Number	30
Environmental conditions			
• Temperature	During operation	°C	-10 ... +55
	Storage and transport	°C	-25 ... +70
• Relative humidity	During operation	%	≤ 80
• Vibrations	Sinus 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_c	Mounting width	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx.
		V AC	MW							kg
	**LAN couplers** For connection of up to 30 devices over RS 485	230	4	B	**7KT1 391**		1	1 unit	047	0.212

* You can order this quantity or a multiple thereof.

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