

SIMATIC Energy Management

Integrated energy management from the field to the management level

siemens.com/simatic-energy-management

SIMATIC Energy-Managemen Incomer 2

Packaging

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Electricity

10 000 00

Nov 2016 - Month cu

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Why energy management?

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Why energy management?

Energy costs

Electricity prices 2000 - 2017 Germany, industry

Annual increase in electricity price (Ø '00 – '17)



... Energy costs are a significant cost factor in production



rise **worldwide** to

Laws and climate

UN climate summit 2015,

Limiting the temperature

protection

Paris

... to reach the goals, legal measures are taken

A green image is a deciding purchasing factor for the **majority** of those

... Energy-efficient

marketing instrument

production is an important

Opinion research

Image

2015

polled



Share of renewable energies: 2017 in power consumption in Germany

From **6.5%** in the year 2000. Should be to 80% by 2050

... Conversion of the energy supply affects every company

Source: Statista – The **Statistics Portal**

Source: E.ON survey 2015

Source: Siemens AG

Source: AGORA Energiewende

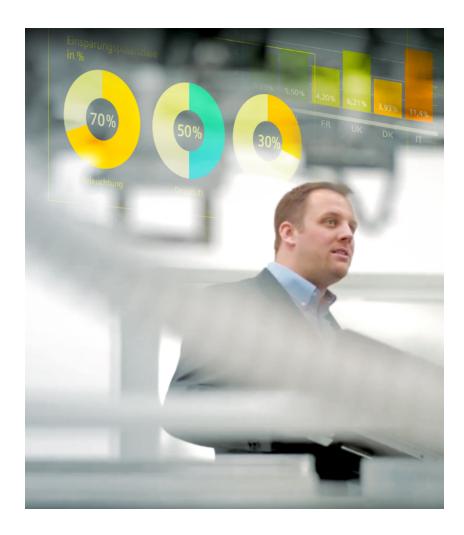
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Relevance of the energy management

Energy management is an essential lever in achieving efficiency gains, meeting statutory requirements, it contributes toward a sustainable and "green" corporate image, and enables businesses to seize upon the opportunity of the energy transition.

Energy management is more than just lowering energy costs!



Advantages with SIMATIC

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Advantages with SIMATIC

- Energy management as part of production
- Increasingly, energy management is being viewed as a holistic issue which does not solely concern building management systems and infrastructure. Linking of production data and energy data alone provides great potential to increase productivity and efficiency.
- It is important that energy is used practically and productively

 and in this regard companies require transparency as to
 how much energy is being used when and for what purpose.
- Energy transparency is prerequisite for energy efficiency and helps in the successful implementation of measures, to verify results, and to ensure their sustainability.

- Siemens have therefore developed a special solution within their TIA Portal framework for energy management, which can be seamlessly integrated in the automation environment.
- SIMATIC Energy Management provides support with a comprehensive and scalable product and solution portfolio certified by ISO 50001 – ranging from energy data collection and visualization at the field level to company-wide energy data analysis and reporting at the management level.
 - → Reference video RITTER SPORT – SIMATIC Energy Manager





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Portfolio overview

Scalable software solutions from individual machines to plant-wide solutions – SIMATIC allows you to realize an integrated and expandable energy management scalable to your needs as they grow. All of this combined with quick, easy engineering and comprehensive analysis functions. Open interfaces give you a free hand for data input and forwarding, where the energy measurement modules of SIMATIC Energy Meter provide an ideal basis for measured data collection/acquisition.

- Integrated energy measurement: Our energy measuring systems are ideal for integration into your automation environment and can also be retrofitted individually, depending on the respective application.
- Production-level energy monitoring: SIMATIC Energy Management provides you with a simple way of equipping your machinery and plants with a comprehensive solution for energy monitoring – from consumption measurement to detailed efficiency analysis depending on the condition of the machine or plant.
- **Company-wide energy analysis:** With our solutions for company-wide energy analysis, we support you with planning, implementation and evaluation of efficiency measures, cost allocation to source and compliance with the requirements of ISO 50001 in a scalable and future-proof way.

- Active energy management: SIMATIC powerrate enables you to prevent load peaks and avoid penalty fees: Automatic monitoring of your stipulated capacity limit will notify you of any potential exceedance of the limit potential and, if required, shuts down loads in accordance with the prescribed configuration.
- Making production lines more transparent and efficient: Monitor and optimize the performance and energy consumption of your production lines on a global scale in real time. SIMATIC MindApps prepare data managed by our IoT operating system, MindSphere, to bring you closer to your machines, plants and automation processes. As a machine manufacturer, this also means improved services and higher availability for your customers.

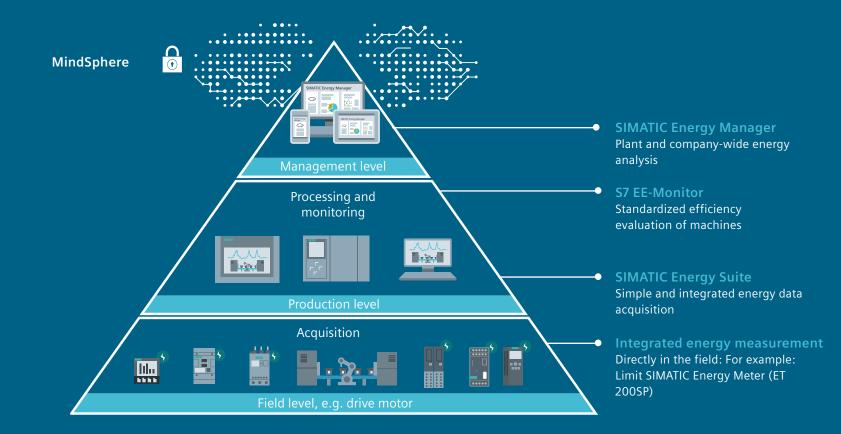


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SIMATIC Energy Management – Transparency and efficiency from the machine to the company as a whole



Production-level energy monitoring

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Production-level energy monitoring



SIMATIC Energy Suite: Energy data acquisition

SIMATIC Energy Suite as an option for the TIA Portal efficiently links energy management with automation, thus

creating energy transparency in the production system. It

allows different energy data to be grouped, buffered and

visualized in a standard way. The considerably simplified configuration and automatic generation of the energy management program significantly reduce configuration

costs. Due to the integrated interface to SIMATIC Energy Manager, the recorded energy data can be seamlessly

expanded into a cross-site energy management system

generated automatically

certified according to ISO 50001.

Intelligent energy management in production

Operators of industrial plants must manage their energy consumption efficiently to maintain their competitiveness in the market. Manufacturers of machinery and plants have to demonstrate the energy efficiency of their solutions in detail. You can do so by using an energy management solution integrated into the automation system: With S7 Energy Efficiency Monitor and SIMATIC Energy Suite.

You can only take targeted measures to save energy and subsequently costs in your production if you know how much energy is consumed as well as where and when it is consumed.



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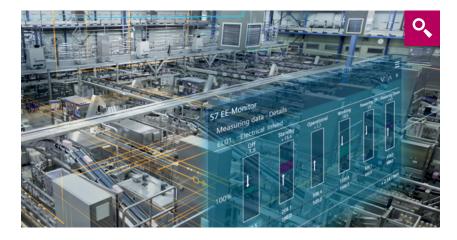
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S7 energy efficiency monitor: Standardized efficiency evaluation of machines

With the S7 Energy Efficiency Monitor, machine manufacturers can simply document the energy efficiency of your machines based on six defined machine conditions and thus comply with the requirements of the VDMA Measurement Instruction 34179. The S7 Energy Efficiency Monitor is part of TIA Portal* and enables integration of condition-based analysis of energy data into machines without great effort. The energy and media demand can automatically appear as an acceptance form on the SIMATIC operator panel and in Excel. Plant operators also benefit: The efficiency data are part of the automation and can be called up on the operator panel at any time and can optionally be transferred to the SIMATIC Energy Manager via the integrated interface and used for long-term evaluation across multiple machines. In this way, the operator can see the energy consumption over the plant life cycle at a glance, pick up any inefficient operating behavior and take suitable measures to correct it.

*TIA Portal V15 or higher





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Company-wide energy analysis

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Company-wide energy analysis

SIMATIC Energy Manager is the energy management system for industry, certified according to ISO 50001.

With SIMATIC Energy Manager, you can visualize energy flows and consumption values in your processes in detail, assign them to the relevant consumer or cost center and see why changes have occurred. Evaluate implemented efficiency measures, optimize your energy procurement and compare your energy efficiency across plants and locations – in a scalable, transparent and future-proof way.

Lower operating costs, optimize energy procurement and comply with legal requirements

SIMATIC Energy Manager not only helps you to save energy costs but also supports you with improving the productivity and efficiency of your processes overall.

With SIMATIC Energy Manager, you can do so much more than just saving energy costs. Our powerful, scalable energy management system links energy and production data, thus helping you to calculate the productivity of energy consumption: How much energy does it cost to produce a certain product? What line can most efficiently be used for this? Why do two comparable lines consume different amounts of energy? SIMATIC Energy Manager helps you to find the answer to these questions – with clear, user-specific dashboards, meaningful energy indicators and versatile interfaces for measuring energy data.



Our powerful energy management system is available in two versions for applications of varying complexity: Basic and PRO. That way, you benefit from tailored functionality and an optimum price-performance ratio.

The scalable, TÜV-certified SIMATIC Energy Manager energy management solution facilitates compliance with the statutory requirements according to ISO 50001/50003/50006 and an energy-efficient and cost-effective operation of your systems.

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Company-wide energy analysis

SIMATIC Energy Manager Basic

The SIMATIC Energy Manager Basic provides a simple way of getting started with energy management. It can be simply configured for the application in question by Web engineering – both in interaction with the automation system and for manual data acquisition. Predefined templates for reports and configurable dashboards support reporting. SIMATIC Energy Manager Basic can be upgraded simply at any time with a license key to SIMATIC Energy Manager PRO.

SIMATIC Energy Manager PRO

SIMATIC Energy Manager PRO provides additional functions for comprehensive, ISO-compliant energy management. The software supports the user with extensive reporting for acquisition and visualizing key data and consumption data, as well as with tools for ascertaining indicators for more complex correlations. In addition, Energy Manager PRO allows a batch-related or material-related consumption analysis and projections for energy consumption. Various systems on the automation level can be integrated via numerous interfaces.

→ Brochure SIMATIC Energy Manager PRO

SIMATIC Energy Manager App

The SIMATIC Energy Manager V1.0 App for IOS and Android rounds off the portfolio with a simple and intuitive solution for mobile acquisition of consumption data of measuring instruments that are not or cannot be networked with the energy management system. The employee can identify the energy meter simply using the QR code or barcode and enter the relevant numeric value. Company-wide energy analysis

 \rightarrow Find out more about SIMATIC to go





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Efficient lightweight construction – less energy for die casting

GF Automotive provides the automotive industry and automotive supply industry with high-quality die-cast products all over the world. The production of such molded parts requires considerable amounts of energy. A comprehensive energy management system was installed in the Altenmarkt factory in Austria.

The actuality of now being able to record, display and assess energy flows in a detailed manner reflects the basis for further increasing energy efficiency.

Assurance of the EN ISO 50001 standard – certified energy management process

Verification of energy efficiency potential for the plants

Savings attained with SIMATIC Energy Management:

4,500m³

Compressed air/weekend

10%

CO₂ emissions





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Functions, system requirements and setup – *Energy Suite*

SIMATIC Energy Suite

- Simple configuration direct in the TIA Portal
 - Option package for STEP 7 and WinCC (TIA Portal)
- Automatic program generation
 - Automatic generation of the S7 energy program; it can be downloaded to the controller (S7-1500) immediately after the compilation and immediately commences recording and preprocessing of the energy values.
- Energy data recording and preprocessing is already carried out in the automation environment, close to the consumers
 - Energy data is standardized and calculated according to the set archiving period, provided with a time stamp, and is ready for archiving.
- Free choice of archive location
 - on SIMATIC memory card
 - in WinCC Professional archive with buffered communication
- Export tool for simple reading out of energy data
 - Manual or fully-automatic export as an Excel file, including with individual export templates

• Display and monitoring of the energy data

- Centralized and uniform data provision in the S7-CPU with standardized data structures (configuration data, current and periodic energy values)
- Uniform visualization of energy data and energy indicators on HMI and SCADA screens

SIMATIC Energy Suite consists of the following components:

Engineering components (TIA Portal)

- Adds new, integrated editors for configuration of the energy measurement points to the TIA Portal
- Includes S7 program generator for the automatic generation of the complete S7 program

WinCC Runtime components (toolbox for WinCC Professional)

- Export tool: Export of the archived periodic energy data to Excel
- Transfer tool: Buffered communication of the energy values relevant to billing from S7-1500 CPU directly to the tag archive of WinCC Professional

S7 driver block library (Energy Support Library - EnSL)

- Includes S7 blocks for easier communication with Siemens measuring products of the SIMATIC, SENTRON, SINAMICS, SIRIUS and SIMOCODE product families. With the Energy Support Library (EnSL), the devices can be detected and easily configured by the Energy Suite.
- → You can find details about currently supported devices here

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Functions, system requirements and setup – *Energy Suite*

Technical data

	SIMATIC Energy Suite V15
PC hardware requirements	 According to the requirement of the TIA Portal components: SIMATIC STEP 7 (TIA Portal) SIMATIC WinCC Professional, Advanced, Comfort, Basic
Operating system requirements	 According to the requirement of the TIA Portal components: SIMATIC STEP 7 (TIA Portal) SIMATIC WinCC Professional, Advanced, Comfort, Basic
Supported STEP 7 version	• SIMATIC STEP 7 V15
Supported WinCC versions	• SIMATIC WinCC V15 Professional, Advanced, Comfort, Basic
Supported SIMATIC CPUs	• Runs on all S7-1500 CPUs (except S7-1500S) and ET 200SP CPU; with FW V2.0 and higher

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Ordering overview:

Engineering	Article No.:	Download	On DVD
SIMATIC Energy Suite V15 Engineering Engineering basic package		6AV2108-0AA05-0AH5	6AV2108-0AA05-0AA5
SIMATIC Energy Suite V15 Engineering, Upgrade V14 Engineering upgrade package	-> V15	6AV2108-3AA05-0AK5	6AV2108-3AA05-0AE5
SIMATIC Energy Suite Software Update Service (SUS) Engineering upgrade package)	6AV2108-0AA00-0AY5	6AV2108-0AA00-0AL5
SIMATIC Energy Suite V15 Engineering TRIAL (21 days)		Entry: 109752539	6AV2108-0AA05-0AA7

PLC Runtime Licenses	Article No.:	Download	On DVD
SIMATIC Energy Suite S7-1500, 5 energy objects (1x5	EnO)	6AV2108-0CF00-0BH0	6AV2108-0CF00-0BB0
SIMATIC Energy Suite S7-1500, 10 energy objects (1x	10 EnO)	6AV2108-0CH00-0BH0	6AV2108-0CH00-0BB0
SIMATIC Energy Suite S7-1500, 10 energy objects (2x	5 EnO)	6AV2108-0DF00-0BH0	6AV2108-0DF00-0BB0
SIMATIC Energy Suite S7-1500, 50 energy objects (5)	10 EnO)	6AV2108-0FH00-0BH0	6AV2108-0FH00-0BB0
SIMATIC Energy Suite S7-1500, 100 energy objects (1	0x10 EnO)	6AV2108-0HH00-0BH0	6AV2108-0HH00-0BB0

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Functions, system requirements and setup – *S7 energy efficiency monitor*

S7 energy efficiency monitor for machines

The S7 energy efficiency monitor for machines is in the TIA Portal. The S7 instruction offers the following functions: Fixed V15 for status-related analysis of energy data.

As part of the instruction library of STEP 7 (TIA Portal), the function can be integrated in the machine control system by the machine manufacturer. By linking the energy consumption, the production counter and the operating state, easy evaluation of the energy efficiency is possible based on energy performance indicators (EnPI). These can be automatically identified as an acceptance form in the SIMATIC HMI and in Excel.

The energy indicators can optionally be transmitted via the integrated interface to the Simatic Energy Manager PRO and used for long-term evaluation across all machines. This allows the plant operator an oversight of energy consumption during the procurement stage as well as throughout the life-cycle of the plant.

The S7 instruction offers the following functions:

- Production-related and standardized ascertainment of energy consumptions and efficiency indicators in machines pursuant to VDMA 34179 (e.g. kWh/unit, m³/unit)
- Up to 10 energy types for each machine (e.g. electric, compressed air, water)
- Up to 8 individually definable operating states (e.g. Production, Standby, Off)
- Simple integration in the machine control system (S7-1200/1500) and local visualization of the efficiency status
- Automatic long-term measurements (e.g. batch, layer)
- Creation of an efficiency log (.csv) for detailed evaluation and documentation

 \rightarrow Application example S7 EE monitor

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Operating system requirements	 According to the requirement of the TIA Portal components: SIMATIC STEP 7 (TIA Portal) SIMATIC WinCC Professional, Advanced, Comfort, Basic
Supported STEP 7 version	SIMATIC STEP 7 V15
Supported WinCC versions	• SIMATIC WinCC V15 Professional, Advanced, Comfort, Basic
Supported SIMATIC CPUs	• Runs on all S7-1500 CPUs and ET 200SP CPUs; with FW V2.1
	• Runs on all S7-1200 CPUs; with FW V4.2

Ordering overview

Runtime license	Article No.:	Download	On DVD
S7 EE-Monitor for Machines S7-1500/1200		6AV2108-1CF00-0BH0	6AV2108-1CF00-0BB0

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SIMATIC Energy Manager energy management system

The SIMATIC Energy Manager provides users with a modular, non-sector-specific energy management system for industrial operations. SIMATIC Energy Manager forms the basis for cost-effective energy management to reduce energy costs and increase energy efficiency.

Export of the data into the MindSphere

SIMATIC Energy Manager allows the MindSphere to be used for further analyses. The Energy Manager can be used as a data collector and data processor.

- Data points can be created automatically in the MindSphere.
- Data can be transferred cyclically into the MindSphere.

Simple introduction with the SIMATIC Energy Manager Basic V7.1

Energy Manager Basic can be configured completely in the web and provides you with a simple introduction to energy data management. You can upgrade from the Basic variant to the PRO variant at any time with the respective license key.

- Web-based system
- Simple configuration of dashboard, chart and report
- Configuration of data points and the interfaces OPC UA, OPC DA, OPC HDA, Energy Suite, WinCC/PCS7, Modbus/ TCP, as well as manual data acquisition
- Simple authorization concept
- The Web Client is available in the languages de, en, it, fr, es and cn
- Configuration of key data with a formula editor
- Configuration of parameters to display prices or factors
- Tabular overview and the possibility of structuring data sources, data points, key data and parameters
- Configuration of essential settings, e.g. email settings, backup, units, regional settings, account settings

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Functions, system requirements and setup – *Energy Manager*

Energy management system SIMATIC Energy Manager PRO V7.1

SIMATIC Energy Manager PRO forms the basis for costeffective energy management to reduce energy costs and increase energy efficiency.

Functions:

- Full client configuration
 - Comprehensive recording
 - 1. Global report templates
 - 2. Automatic printing/saving
 - Extended key data calculation functions (if-then, threshold values,...)
 - Batch and material analysis
 - Forecasting options (reference day principle, production plan-based forecasting, regression model)
 - Loop/prototype calculation stage 1 for preprocessing of the data for acquisition
 - Supports the data type String
 - Derived data points
 - S7 EE Monitor, EE@Transline interface including the template and instance concept
- Dashboard
 - Advanced widgets (map, multi-regression analysis
- File upload and download
 - Documents can be uploaded

- Energy efficiency measures
 - Definition and analysis of energy efficiency measures
- Expanded user management
 - Clients configuration, functional groups, user groups management
 - Active directory, single sign on
- Other interfaces
 - Use of the interfaces ASCII, OLE DB, S7
 - More acquisition components can be added
- Support of the S7 energy efficiency monitor
 - S7 energy efficiency monitor as an instruction in the TIA Portal allows a machine status-related energy data acquisition
 - The data is transferred to the Energy Manager PRO via a communication module.
 - Uniform and comparable display of efficiency indicators of machines / lines / PMU
 - Display of energy consumption and costs on machine level and cost center level
 - Energy consumption and costs per workpiece, or shift
 - Benchmarking of same machines/workpieces from different manufacturers

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Technical data

	SIMATIC Energy Manager PRO V7.0
Operating system	• Windows Server 2008 R2 (German/English)
	Windows Server 2012 R2 (German/English)
	 Windows Server 2016 (German/English)
	Windows 7 Professional/Ultimate SP1 (German/English)
	• Windows 8.1 Pro/Enterprise 64 Bit (German/English)
	 Windows 10 Pro/Enterprise 64 Bit (German/English)
	• mind. 4 GByte RAM
Connection	In addition to an interface to WinCC and S7 controllers, Energy Manager PRO also offers the latest interface standards such as OPC DA, OPC HDA, OPC UA, MODBUS TCP, ODBC, ASCII and XML.
WinCC versions ¹	 SIMATIC WinCCV7.2, V7.3 SE, V7.4
	• SIMATIC WinCC RT Professional V13, V14, V15
PCS 7 versions ²	 SIMATIC PCS 7 V8.1

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1. When installing a recording computer on a WinCC system, the relevant requirements stated must be complied with. 2. For a connection to PCS 7, the SIMATIC Energy Manager PRO system must always be installed on a separate PC

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SIMATIC Energy Manager V7.1	Article No.:	Download	Package
SIMATIC Energy Manager Basic incl. 50 Tags		6AV6372-1DF07-1AH0	6AV6372-1DF07-1AX0
IMATIC Energy Manager PRO incl. 50 Tags		6AV2108-0CH00-0BH0	6AV6372-2DF07-1AX0
SIMATIC Energy Manager PRO Powerpack Basic -> PRO		6AV6372-2DF07-1AH3	6AV6372-2DF07-1AX3
SIMATIC Energy Manager Basic/PRO Tag Package 50 1)		6AV6372-2DF07-0CH0	6AV6372-2DF07-0CX0
SIMATIC Energy Manager Basic/PRO Tag Package 100 1)		6AV6372-2DF07-0DH0	6AV6372-2DF07-0DX0
SIMATIC Energy Manager Basic/PRO Tag Package 250 1)		6AV6372-2DF07-0EH0	6AV6372-2DF07-0EX0
SIMATIC Energy Manager Basic/PRO Tag Package 500 1)		6AV6372-2DF07-0FH0	6AV6372-2DF07-0FX0
SIMATIC Energy Manager Basic/PRO Tag Package 1000 1))	6AV6372-2DF07-0GH0	6AV6372-2DF07-0GX0
SIMATIC Energy Manager Basic/PRO Tag Package 5000 1)	6AV6372-2DF07-0HH0	6AV6372-2DF07-0HX0
SIMATIC Energy Manager Basic/PRO Tag Package 30000	1)	6AV6372-2DF07-0JH0	6AV6372-2DF07-0JX0

SIMATIC Energy Manager expansions	Article No.:	Download	Package
SIMATIC Energy Manager Basic/PRO, 3 Web Clients		6AV6372-2DF27-0AH0	6AV6372-2DF27-0AX0
SIMATIC Energy Manager Basic/PRO, 20 Web Clients		6AV6372-2DF27-0BH0	6AV6372-2DF27-0BX0
SIMATIC Energy Manager Basic/PRO, 60 Web Clients		6AV6372-2DF27-0CH0	6AV6372-2DF27-0CX0
SIMATIC Energy Manager PRO Client		6AV6372-2DF37-0AH0	6AV6372-2DF37-0AX0
SIMATIC Energy Manager PRO Planning and Forecast		6AV6372-2DF47-0AH0	6AV6372-2DF47-0AX0
SIMATIC Energy Manager PRO acquisition component		6AV6372-2DF57-0AH0	6AV6372-2DF57-0AX0

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m	onitor	

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SIMATIC Energy Manager V7.1	Article No.:	Download	Package
SUS up to 50 tags and/or 1 consumer package		6AV6372-2DF00-0CY0	6AV6372-2DF00-0CL0
SUS up to 100 tags and/or 5 consumer packages		6AV6372-2DF00-0DY0	6AV6372-2DF00-0CL0
SUS up to 500 tags and/or 25 consumer packages		6AV6372-2DF00-0FY0	6AV6372-2DF00-0FL0
SUS up to 5000 tags and/or 100 consumer packages		6AV6372-2DF00-0HY0	6AV6372-2DF00-0HL0
SUS > 5000 tags and/or more than 100 consumer packa	iges	6AV6372-2DF70-0XY0	6AV6372-2DF70-0XL0

SIMATIC Energy Manager PRO Upgrades V7.0 \rightarrow V7.1 Article No.:	Download	Package
Upgrade from systems with up to 50 tags and 1 consumer package	6AV6372-2DF07-1CH4	6AV6372-2DF07-1CX4
Upgrade from systems with up to 100 tags and 5 consumer packages	6AV6372-2DF07-1DH4	6AV6372-2DF07-1DX4
Upgrade from systems with up to 500 tags and 25 consumers	6AV6372-2DF07-1FH4	6AV6372-2DF07-1FX4
Upgrade from systems with up to 5000 tags and 100 consumers	6AV6372-2DF07-1HH4	6AV6372-2DF07-1HX4
Upgrade from systems with > 5000 tags and > 100 consumers	6AV6372-2DF77-1XH4	6AV6372-2DF77-1XX4

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Energy Suite

S7 energy efficiency monitor

Energy Manager

07 More information

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Functions, system requirements and setup – Energy Manager

Ordering overview

SIMATIC Energy Manager SUS	Article No.:	Download	Package
Consumer Package 1 incl. S7 EE-Monitor		6AV6372-2DF67-1AH0	6AV6372-2DF67-1AX0
Consumer Package 5 incl. S7 EE-Monitor		6AV6372-2DF67-1BH0	6AV6372-2DF67-1BX0
Consumer Package 25 incl. S7 EE-Monitor		6AV6372-2DF67-1CH0	6AV6372-2DF67-1CX0
Consumer Package 1 excl. S7 EE-Monitor		6AV6372-2DF77-1AH0	6AV6372-2DF77-1AX0
Consumer Package 5 excl. S7 EE-Monitor		6AV6372-2DF77-1BH0	6AV6372-2DF77-1BX0
Consumer Package 25 excl. S7 EE-Monitor		6AV6372-2DF77-1CH0	6AV6372-2DF77-1CX0
SIMATIC Energy Manager PRO Upgrades V7.0 → V7.1	Article No.:	Download	Package
SIMATIC Energy Manager Basic/PRO TRIAL		Entry: 109759473	6AV6372-2DF17-1AX0



More information

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Find out more: siemens.com/simatic-energy-management

SIMATIC Energy Management – integrated and transparent

- Integrated energy management
- Reducing energy costs
- Fulfilling statutory requirements
- An overview of energy consumption for your entire company at all times



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SIMATIC Energy Management

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Further information under: siemens.com/simatic-energy-management