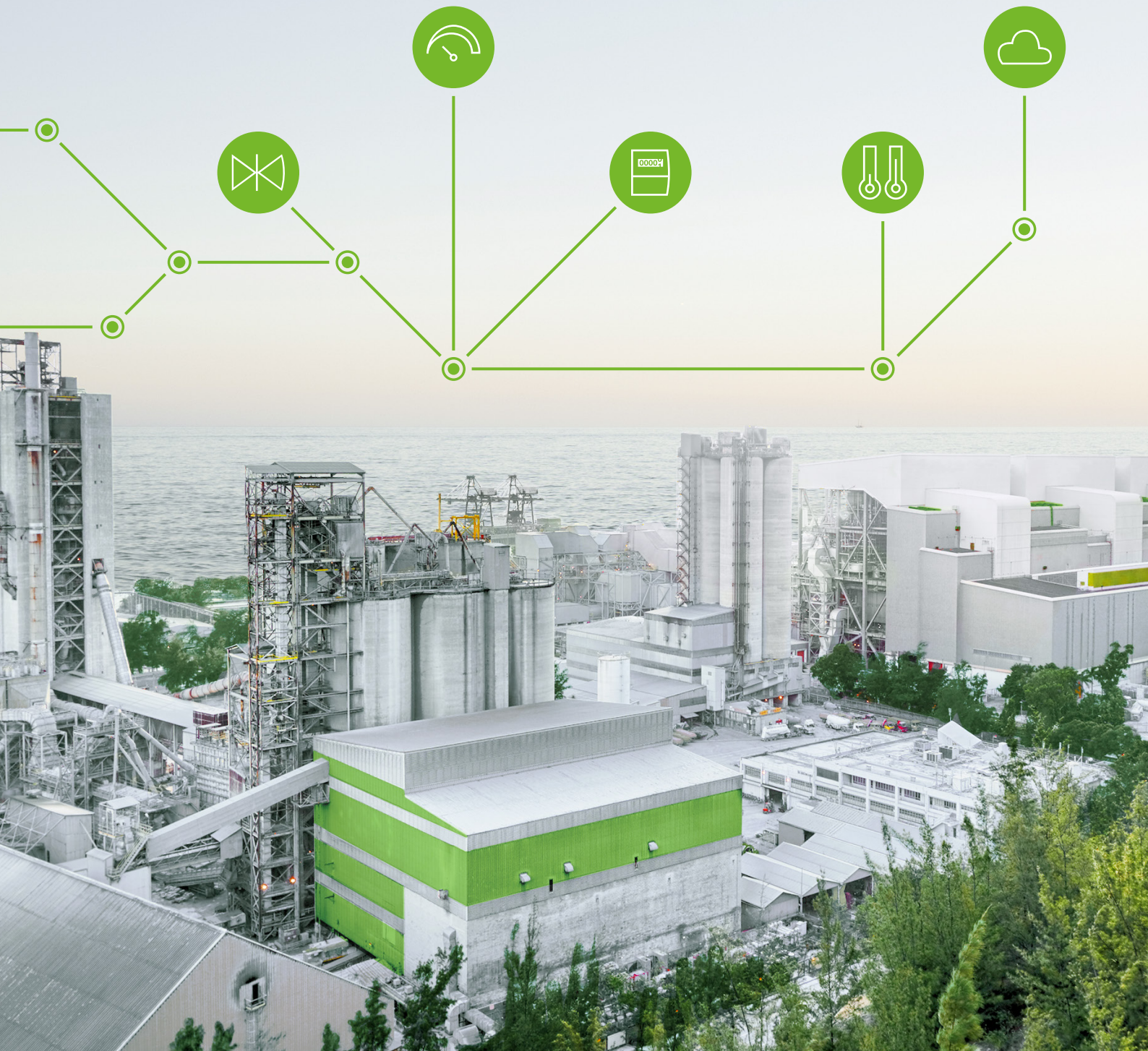




WAGO Energy Data Management

Efficiency is That Easy!



Measurement System with Added Value

Easily Record, Visualize and Analyze Energy Data

With our energy data management solution, you can record and visualize your measurement data for different media and influencing variables, as well as the key figures calculated from them, in no time. Continuous acquisition and monitoring provide the basis for resource-efficient energy usage – the environment will thank you, and your operating costs will be minimized. As an added bonus, conformity with DIN EN 50001 for the energy evaluation is part of the package. WAGO Energy Data Management consists of Web-

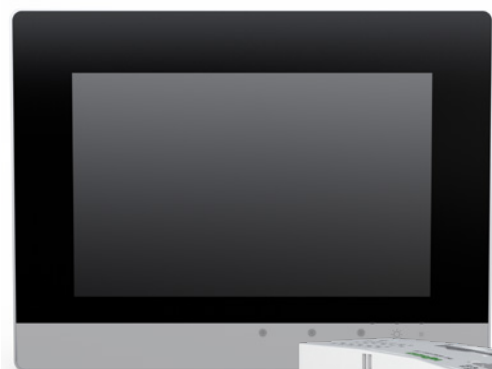
based application software combined with a modular control system. It records measurement data for different media and influencing variables for energy monitoring and processes it for further analysis, archiving and reporting. The software automatically detects different signals from the connected meters and sensors, and they can be made available to additional energy analysis tools via simple parameter settings. This allows you to optimize energy consumption in your building or production facility – either locally or across the globe.

Your Benefits:

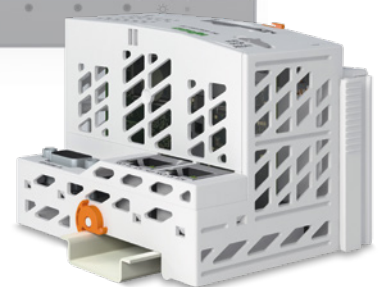
- Ready to go in a few easy steps
- No programming experience required
- Integrated cloud connectivity



Touch Panel 600



Easy Parameter Setting –
Not Programming



PFC200 Controller

Find out more:

www.wago.com/energy-management

Applications

Industry-Independent Basic Functions at a Glance

Record Energy Data

Capture energy and environmental data from multiple sources, such as:

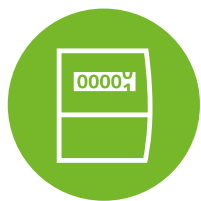
- Power consumption
- Gas volumes
- Heat/flow rates
- Volume flow
- Temperature

Furthermore, key energy figures can be calculated from the acquired data (NEW!).

Save and Archive Energy Data

Sie bestimmen Dateiformat und Ablageort Ihrer Energiedaten individuell. Save it as needed:

- In a database
- In the cloud (new!)
- Format as CSV files for data exchange with the control system



Visualize Energy Data

Monitor your energy data and key energy figures anywhere:

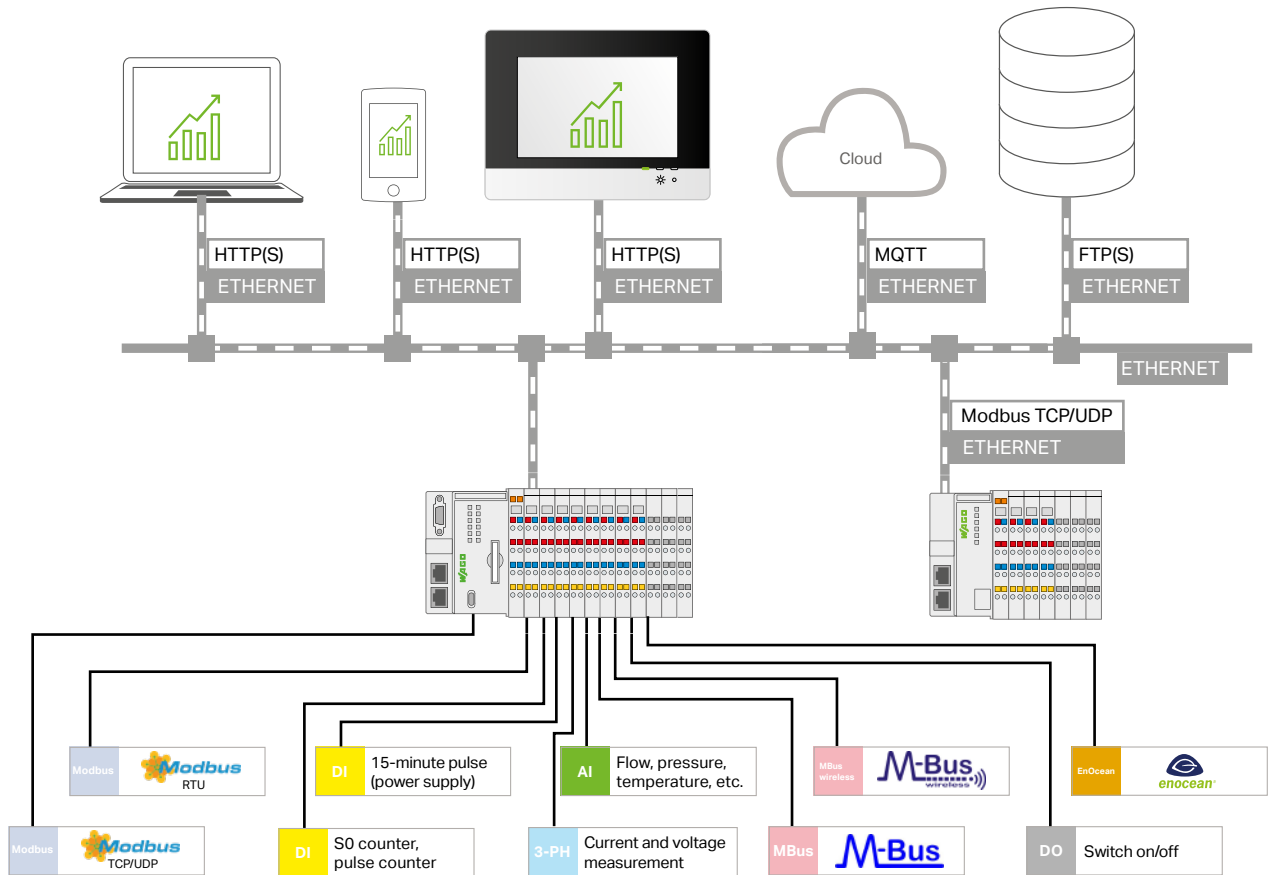
- On a PC
- Or on mobile devices

Alarms for Off-Limit Conditions

Transfer your defined thresholds to the system:

- Be notified immediately via email if your defined limits are surpassed (e.g., if specified absolute values or key energy figures calculated online are exceeded)
- In off-limit conditions, immediately take technical countermeasures remotely (e.g., switch off outputs)

System Scope at a Glance



Precisely Tailored Hardware

Modular energy and process data collection, management and visualization

Evaluation

Evaluating energy data and deriving efficiency plans is convenient

Parameter Setting – Not Programming

Easy input parameterization via Web visualization – no programming experience required

Retrofitting Existing Systems

Connect existing sensors to the WAGO I/O-System – integration into existing systems maximizes both flexibility and your return on investment

Cybersecurity






Functions integrated into the controller, such as OpenVPN, IPsec or a firewall, secure the transmission path for securely storing your data in the cloud

Connectivity

Comprehensive Connectivity to Other Systems

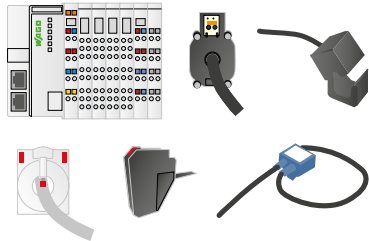
WAGO Energy Data Management offers the possibility of collecting data locally at the controller. This capability is joined by connectivity to various devices through a range of different fieldbuses and

protocols for capturing data. In addition to data collection, it is also possible to save it on different media and to trigger an alarm and email it when configured criteria are met.

Signal/Protocol	Description
	The meter bus serves as a communication system for meter data and transmits the values from the meter in accordance with the standard. Up to 40 devices can be connected per I/O module.
	Meter data can also be transferred wirelessly via a gateway.
	An EnOcean gateway connects a wide variety of sensor types commonly used in buildings, e.g., for measuring temperature, humidity, brightness, CO ₂ etc.
	Standardized fieldbus protocol via ETHERNET for: <ul style="list-style-type: none"> • Communication between several EDM systems • Communication with light management systems • Reading energy meters • Communication with any other controllers
	Standardized fieldbus protocol via serial interface for the integration of up to 32 devices, e.g., 3-phase power measurement modules or energy meters
FTP(S)	The measurement series saved on the controller can be transmitted to a previously selected server via FTP or FTPS. This transmission can be actuated either manually or automatically at a user-specified time interval.
MQTT	Protocol to transfer data to the cloud, e.g., WAGO Cloud, Microsoft Azure, SAP Cloud, IBM Cloud, Amazon Web Services
HTTP(S)	Protocol for transmitting Web pages, e.g., based on the description language HTML5, for displaying the energy data application in any Web browser on any device

Five Easy Steps

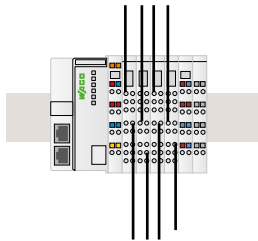
to WAGO Energy Data Management



1. Select the hardware needed; information about the I/O modules and voltage transformers to be used is available at:
www.wago.com/en/energy-management/modular-data-acquisition



2. Download the "WAGO Energy Data Management" software from:
www.wago.com/application-edm
and transfer the "WAGO Energy Data Management" software to the application controller



3. Install the hardware



4. Set the energy data management parameters



5. Direct connection via Modbus TPC/UDP; sending CSV files via FTP or FTPS; sending the data to the cloud via MQTT

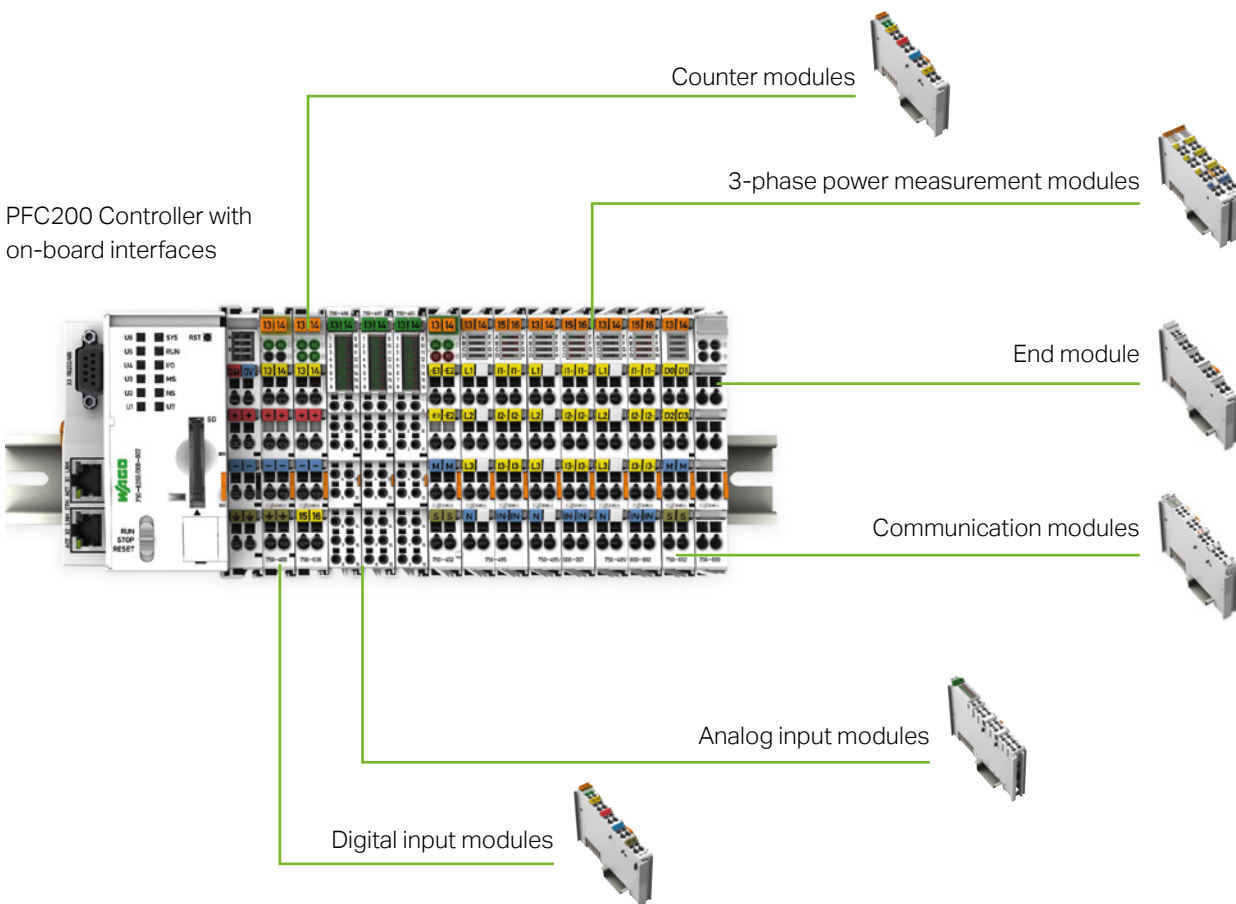
Modular Station Setup

Connect Signals Directly to the Controller

The PFC200 Controller lies at the core of energy data management. It represents the head station of a standard DIN-rail mount device with a modular structure. Depending on the requirements, different I/O modules can be connected to optimally combine equipment that has different inputs and outputs.

Your Benefits:

- The connected I/O modules are automatically detected by the controller
- Intuitive configuration interfaces allow easy parameterization of the I/O modules



Digital input modules

- E.g., for detecting the effective power pulse from the power provider

Analog input modules

- E.g., for recording temperature, pressure and flow meters

3-phase power measurement modules

- E.g., for connecting current signal conditioning modules

Alternatively, the Energy Data Management application can run on a touch panel, and the results can be visualized directly. Depending on the version, it can be possible to record three digital input signals

Communication modules

- E.g., for reading in measured values of a counter via a bus system

Counter modules

- E.g., for recording S0 counters

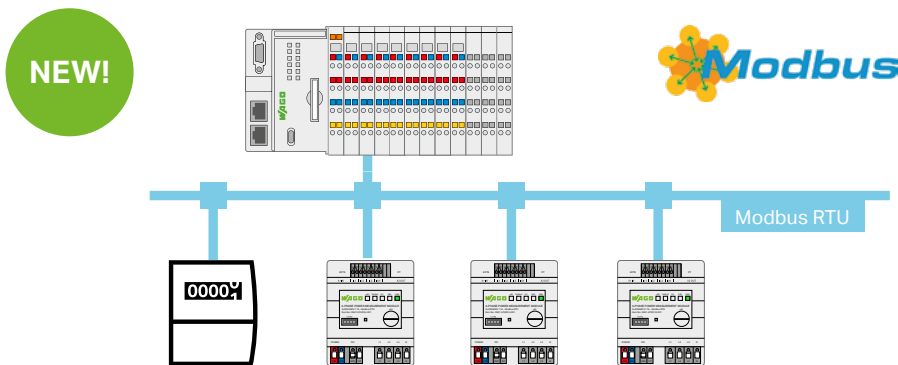
here directly and control one digital output. For recording other signals, communication via Modbus® TCP/UDP/RTU is available, as well as data acquisition via EnOcean with the help of a gateway.

Integrate Devices in Detail

If measured values are recorded by separate counters, they can be read in via bus system in select instances.

The required components and the connections to be used differ according to the bus system.

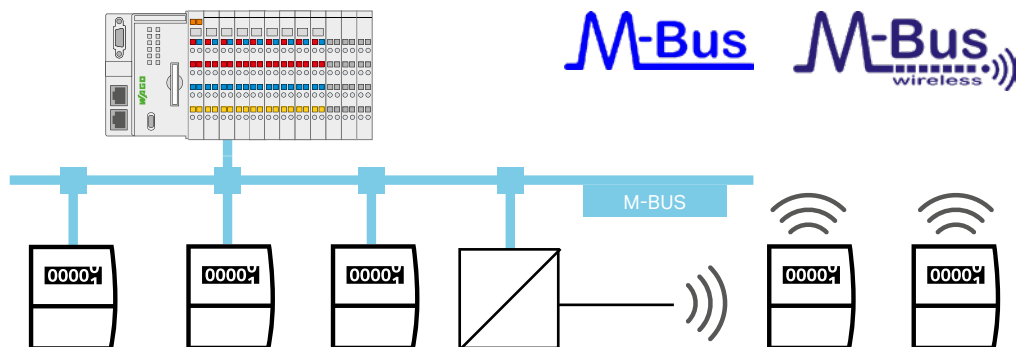
Energy Data Collection with Remote Devices via Modbus RTU



If the current measurement points are far away from the controller, it is possible to decentralize current data acquisition via power measurement modules and to transfer the data to the controller via Modbus RTU bus system. Even products from other manu-

facturers can be integrated. The controller's serial onboard interface can be used as connection. If several Modbus RTU bus lines are required, an additional connection can be created using a communication module.

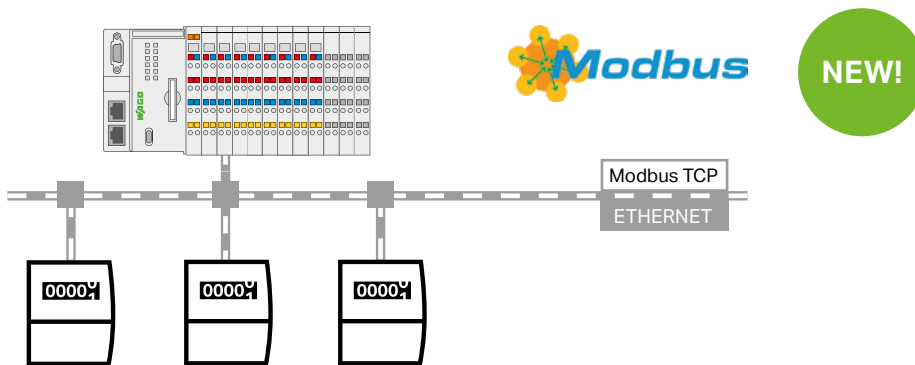
Measured Value Acquisition via M-Bus



Separate counters with an M-Bus interface can be read in by the controller if it is equipped with the M-Bus master communication module.

Meters connected wirelessly can also be queried. This requires a wireless M-Bus gateway in addition.

Energy Data Collection with Remote Devices via Modbus TCP



Separate counters with a Modbus TCP/UDP interface can be read directly from the controller. The on-board ETHERNET interface serves as a connection.

Data Acquisition via EnOcean



In building automation, the EnOcean wireless standard is widespread. It allows wireless communication with sensors and permits the recording of temperature, humidity, brightness, CO₂ etc.

To capture the wireless signals, an EnOcean gateway is required, which is connected to the controller via a serial interface (on-board or communication module).



Operation in Detail

Energy data management is operated entirely via the Web-based engineering interface (HTML5) integrated into the controller. It can be viewed on any

device that has a Web browser, eliminating the need to install any additional software.



Configuring Inputs and Outputs

- Automatic detection of connected I/O modules
- Simple connection of Modbus® devices by importing a CSV file
- Clear representation of all configured inputs

Process Summary	Digital Inputs	Analog Inputs	750-494 3-Phase POM	750-495 3-Phase POM	Fieldbus/External Inputs	Counter		
Name	Description	QOS	Type	Value	Unit	Logger	Logger Id	
1 MyM_BusConnection ID:1 Job ID:2	Value ID:6, TYPE:0	0	mbus		Hz		1	
2 MyM_BusConnection ID:1 Job ID:2	Value ID:1, TYPE:0	0	mbus		Wh		1	
3 Office Temperature	Floor 1	192	analog	23.578	°C	✓	1	
4 Wast water pump	Operating hours	192	digital	12.5927777777778	h		1	
5 Window Temperature	Eastside	192	erocan	16.6245	°C		1	
6 Modbus connection	Temperature 1	192	modbusAnalog	5.87747E-39	°C		1	
7 Temperature difference		192	modbusAnalog	0.0	K		1	
8 Outside Temperature	3rd party sensor	192	modbusAnalog	0.0	°F		1	
9 Current N		192	modbusAnalog	0.0	mA		1	
10 Voltage Input Plant	Phase 1	192	modbusAnalog	0.0	MV		1	
11 Electronic scale	measurement	192	modbusAnalog	0.0	mg		1	
12 Wast water tank	level	192	modbusAnalog	5.87747E-39	mm		1	
13 Capacity		192	modbusAnalog	0.0	mC		1	
14 Electrical conductivity		192	modbusAnalog	0.0	mSi		1	
15 Fault current	Phase 3	192	modbusAnalog	0.0	A		1	
16 Pre heater pump	Operating time	192	modbusAnalog	0.0	h		1	
17 Presence detector	Floor 7	192	modbusBinary	0			1	
18 Wast water pump	Feedback on/off	192	modbusBinary	0	Status		1	
19 RPM Counter		192	counter	0.0	1/min		1	
20 Current phase 1		192	495analog	0.0035	A		1	



Configuration of the Logger Function/ Data Storage

- Cyclical data logging and storage on an SD card
- Easy export of a logged channel overview as CSV data for measurement point documentation
- Provision of logged data to higher level systems via Modbus TCP/UDP communication or MQTT



Alarms

Alarms triggering in case of:

- Limiting value overrun
- Value change
- Feedback monitoring

Consequences of alarms:

- Alarm logged
- Email notification
- Output switched

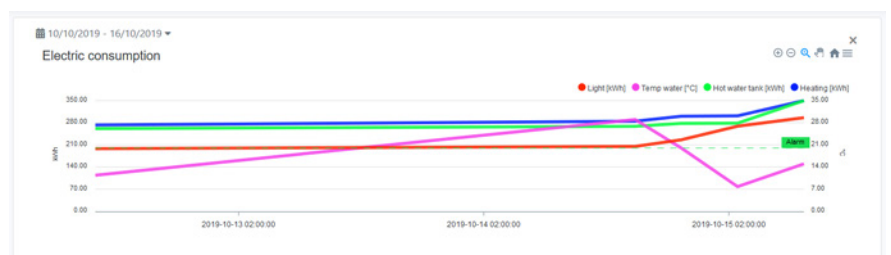
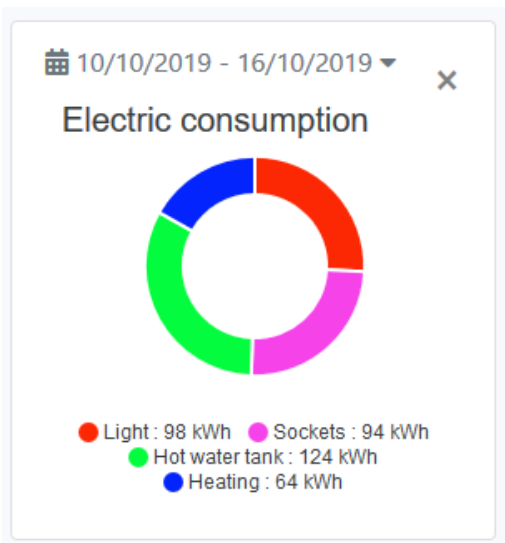
File	Inputs	Logger	Alarms	2019-02-26 09:35							
Select	Name	Description	Value	QOS	Type	1st-Feed	E-Index	Delay	High Level	Low Level	Deadband
<input type="checkbox"/>	Alarm universal		0	0	alarm:Universal	3	0	0	100.0	0.0	1.0
<input type="checkbox"/>	Wast water pump	feedback failure	0	0	alarm:FeedbackFailure	5	0	0			
<input type="checkbox"/>	Waterflow monitoring		0	0	alarm:ChangeOfValue	10	0	0			
<input type="checkbox"/>	Water level monitoring		0	0	alarm:OnOffChange	1	0	0	100.0	0.0	1.0
<input type="checkbox"/>	Evaluation of 2 general alarms		0	0	alarm:KAlarms		0	0			

Visualization of Current Data

- Visualize configured data points as line or bar charts via data plotter
- Simultaneously visualize multiple data points over the same time interval



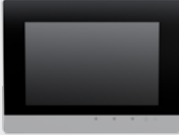




Optional: Creating dashboards as a separate form of visualization optimized for mobile devices (requires an additional license)






Supported Hardware

Controllers/Touch Panels

	Description
	750-821x PFC200 Controller; 2nd generation
	750-821x/000-040 PFC200 XTR Controller; 2nd generation
	762-4xxx Touch Panel 600; Standard Line*
	762-5xxx Touch Panel 600; Advanced Line*
	762-6xxx Touch Panel 600; Marine Line*

* Depending on the factory license, an additional e#RUNTIME PLC 600 license may be required.

Accessories for Controllers

	Description
	758-879/000-001 SD Memory Card; 2 GB; industrial design Application: storage of measurement values
	759-923 USB Communication Cable; 2.5 m long Connects a PC to the service interface of the controllers and 857 Series Signal Conditioners
	758-879/000-3102 microSD Memory Card; 2 GB; industrial design Application: storage of measurement values in the Touch Panel 600

Software Licenses

Item Number	Description
2759-206/260-1000	Energy Data Management Application License for use of the "Energy Data Management" application on a standard controller/touch panel
2759-207/270-1000	Energy Data Management Visualization License for use of advanced visualization functions
2759-216/210-1000	e!RUNTIME PLC License to upgrade a touch panel to a control panel*



I/O Modules

Function Group	Module
Digital I/O Modules	
	750-402 4-Channel Digital Input; 24 VDC; 3.0 ms
	750-504 4-Channel Digital Output; 24 VDC; 0.5 A
	750-530 8-Channel Digital Output; 24 VDC; 0.5 A
Analog Input Modules	
	750-496 8-Channel Analog Input; 0 ... 20 mA/4 ... 20 mA; single-ended
	750-497 8-Channel Analog Input; 0 ... 10 VDC/±10 V; single-ended
	750-451 8-Channel Analog Input; for resistance sensors
	750-452 2-Channel Analog Input; 0 ... 20 mA/4 ... 20 mA; differential input
	750-471 4-Channel Analog Input; voltage/current; differential input; electrically isolated channels
Power Measurement Modules	
	750-494 3-Phase Power Measurement; 480 VAC; 1 A
	750-495 3-Phase Power Measurement; 690 V; 1 A
	750-495/000-001 3-Phase Power Measurement; 690 V; 5 A
	750-495/000-002 3-Phase Power Measurement; 690 V; RTC
Communication and Technology Modules	
	753-649 M-Bus Master
	750-652 RS-232/RS-485 Serial Interface
	750-638 2-Channel Up/Down Counter; 24 VDC; 500 Hz

Additional variants of the above-mentioned I/O modules, as well as associated segment and supply modules, can be found in our Full Line Catalog, Volume 3.




Supported Hardware

Power Supplies

	Description
	<p>787-1012</p> <p>Compact Power Supply; primary switched-mode power supply; 1-phase; Output voltage: 24 VDC; output current: 2.5 A</p>
	<p>2787-2xxx</p> <p>Pro 2 Power Supply; 1- or 3-phase; output voltage: 24 VDC; nominal output currents from 5 to 40 A; up to 96 % efficiency; -40°C to +70°C</p>








Additional power supplies, as well as corresponding accessories, can be found in our Full Line Catalog, Volume 4.

Signal Conditioners and Gateways

	Description
	3-Phase Power Measurement Module
	<p>2857 - 570/024 - 001</p> <p>Input: Current Transformer, 1 A (3x400/690 V/1 A - Modbus RTU)</p>
	<p>2857 - 570/024 - 005</p> <p>Input: Current Transformer, 5 A (3x400/690 V/5 A - Modbus RTU)</p>
	<p>2857 - 570/024 - 000</p> <p>Input: Rogowski Coils, RC 70, RC 125, RC 175 (3x400/690 V/RC - Modbus RTU)</p>
	<p>2852-7101</p> <p>STC65-RS-485 EVC EnOcean Receiver/Transmitter with RS-485 EVC interface</p>
	<p>758-916</p> <p>WLAN Ethernet Gateway; 2.4 GHz</p>

Additional variants of the above devices, as well as suitable accessories, can be found in our Full Line Catalog, Volume 3.

Components for Electrical Energy Measurement

	Description
	Split-Core Current Transformers; Retrofits; Primary rated current: 60 ... 1000 A; Secondary rated current: 1A/5A
	Plug-In Current Transformers with a <i>picoMAX</i> ® Pluggable Connector; New installations; Primary rated current: 32 A; Secondary rated current: 320 mA
	Rogowski Coils; Retrofits; 1.5 m ... 4.5 m cable length; Primary rated current: 4000 AAC
	Current and Voltage Tap; Compatible with 2-conductor through terminal block; Primary rated current: 150 A ... 350 A; Secondary rated current: 1 A
	Plug-In Current Transformers with CAGE CLAMP® Connection Technology; New installations; Primary rated current: 50 ... 2500 A; Secondary rated current: 1 A/5 A
	Power Taps for Insulated Conductors; New installations and retrofits
	Power Taps for Busbars; New installations and retrofits

A detailed overview of the available components and accessories for current measurement can be found in our "Power and Energy Measurement Technology" brochure.

Cloud Functions Overview

The WAGO Cloud is a universal, industrial-strength data logger with data visualization. It allows customizable dashboards and analyses to be created quickly and easily in the cloud. Use interfaces via

REST and CSV data export for further processing of data, or use them as a data supplier in order to perform detailed analyses in other systems, for example.

	Function	
Data Management	Data Package	<ul style="list-style-type: none"> Connect WAGO PFC Controller to the cloud Transfer data from the controller to the cloud Mount devices and data Visualize data
	Restful API	<ul style="list-style-type: none"> Provide data for other cloud services and customer systems
Device Management	Firmware & Application Update	<ul style="list-style-type: none"> Select/download firmware catalog Manage your own firmware application catalog Replace firmware on the device Install application updates
	Remote Visu Access	<ul style="list-style-type: none"> Access local configurations and visualizations remotely (diagnostics, monitoring, remote maintenance)
	User Management	<ul style="list-style-type: none"> In a customer area, up to 10 users have free access; more can be booked upon request
Item Description		Item Number
WAGO Cloud; 100 license points		2759-1061/651-010
WAGO Cloud; 500 license points		2759-1061/651-050
WAGO Cloud; 1000 license points		2759-1061/651-100

Details can be found at www.wago.com/cloud

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