



Measuring Devices for your Energy Management

EMpro

Measurement – Monitoring –
Communication

EMpro – Measuring Devices for your Energy Management

EMpro energy measuring devices detect and monitor the characteristic electrical data of your machines and systems. Using network-capable devices ensures that all measuring data is available centrally and on site.

With EMpro, you can be confident you have the right measuring device solution for your energy management.



Ethernet



RS 485



The communication expert

EMpro MA600

- performs measuring tasks in the power supply up to 700 V AC
- can be extended with communication modules and special function modules
- remote access via web server

What advantages does energy management offer?

Reduced energy costs

by identifying energy-saving potentials

Optimized system capacity

by intelligent switching of system parts, constant supply system loading and reduction of harmonic disturbances

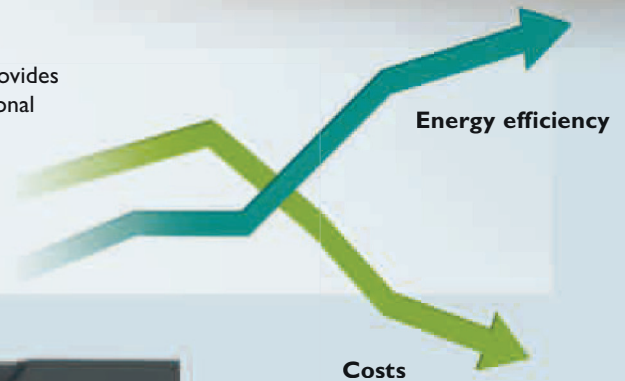
Decreased peak loads

by intelligent trend calculation and load management

Secured production processes

by continuously monitoring the system parameters, system downtimes can be minimized

Continuously recorded energy flow provides the basis for a target-oriented operational energy management system.



The universal solution on the front panel

EMpro MA400

- performs standard measuring tasks up to 500 V AC
- can be extended with an RS485 module

The compact DIN rail solution

EMpro MA250

- performs measuring tasks in small control cabinets directly on the machine
- integrated RS485 interface

The complete EMpro measuring device program

Advantages for you at a glance:

1 Direct access to measured value

At the touch of a button you can obtain the desired measured values in a target-oriented manner. This enables a fast, on-site analysis of the system parameters. The user-friendly web server function can be used to directly request measured values from the control center.

2 Easy device configuration

The choice is yours: configure the EMpro measuring devices in an operator-controlled manner on site or for Ethernet communication, this can also be done via the integrated web server on the PC.

3 Flexible network connection

Using the communication modules, EMpro measuring devices can be flexibly integrated into network structures and field bus systems. In this way, the measured values are also available for further processing in the control center.

4 High investment security

Using the function and communication modules, the EMpro measuring devices can be expanded at any time to include new functions. In this way, the measuring devices grow in line with your requirements, meaning high planning and investment security for you.



Ethernet
 Modbus
 RS 485
 PROFIBUS®

Order No.	Type
Measurements	
Currents	I1, I2, I3, ΣI
	I1, I2, I3, IN (Calculation)
	Maximum values
	Average values
Voltages	U12, U23, U31, V1, V2, V3
	Maximum values
	Average values
	Voltage measurement via voltage transducer
	Voltage measurement direct (AC)
Frequency	F
Power	ΣP, ΣQ, ΣS (+/-)
	P, Q, S per phase (+/-)
	Maximum values P, Q, S
	Average values P, Q, S
	Trend power
Power factor	ΣPF
	PF per phase
Harmonics (TDH)	3I, 3V, 3U
	I1, I2, I3, U12, U23, U31, V1, V2, V3
Temperature	Temperature measurement
Counting	Real energy/reactive energy
	2 tariff meter
	Operating hours
Analysis	Harmonics analysis
Outputs	1 configurable pulse output
Inputs	1 configurable input

Communication modules (optional)

RS485 JBUS/MODBUS

PROFIBUS 1.5 Mbps

PROFIBUS 12 Mbps

Ethernet with integrated web server

RS485/Ethernet gateway with integrated web server

Special function modules (optional)

Memory (512 kbyte)

2 digital inputs/outputs

2 analog outputs

Temperature module



EMpro MA600

2901366

EEM-MA600

EMpro MA400

2901364

EEM-MA400

EMpro MA250

2901363

EEM-MA250

EMpro MA200

2901362

EEM-MA200

-
-
-
-

direct/via current transformer

-
-
-
-

up to 700 V

-
-
-
-
-
-
-
-
-

up to the 63rd harmonic
up to the 63rd harmonic
with special function module

kWh +/- / kvarh +/-

-

up to the 63rd harmonic

-
-

via current transformer

-

up to 500 V

-
-
-
-
-

up to the 51st harmonic
up to the 51st harmonic

kWh+ / kvarh+

-

-
-

via current transformer

-

up to 500 V

-
-
-
-
-

up to the 51st harmonic

• (internal)
kWh+ / kvarh+

-
-
-
-

-
-

via current transformer

-

up to 500 V

-
-
-
-
-

up to the 51st harmonic

• (internal)
kWh+ / kvarh+

-
-
-
-

EEM-RS485-MA600 (2901367)
EEM-PB-MA600 (2901368)
EEM-PB12-MA600 (2901418)
EEM-ETH-MA600 (2901373)
EEM-ETH-RS485-MA600 (2901374)

EEM-RS485-MA400 (2901365)

integrated RS485 interface

EEM-MEMO-MA600 (2901370)
EEM-2DIO-MA600 (2901371)
EEM-2AO-MA600 (2901475)
EEM-TEMP-MA600 (2901949)

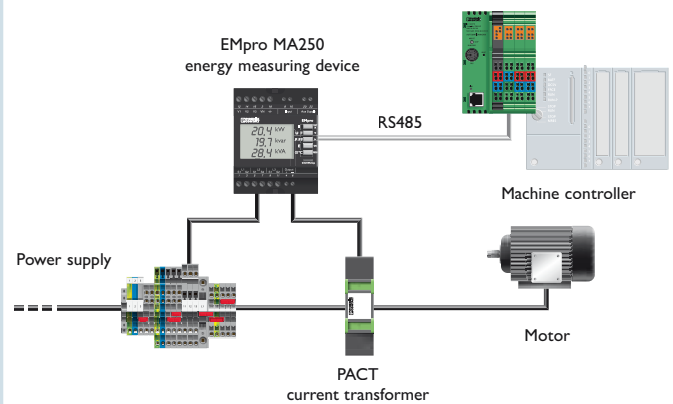
Measure, monitor and communicate energy data

With the EMpro device range, you are well positioned to perform any measuring task:

- Easy detection of local loads
- Logging of measured values in databases
- Communication of measured data across extensive network structures

Measuring energy flow

In machines and systems, energy characteristics are recorded in the control cabinet, displayed and then transferred to the PLC using EMpro measuring devices.



Current transformer

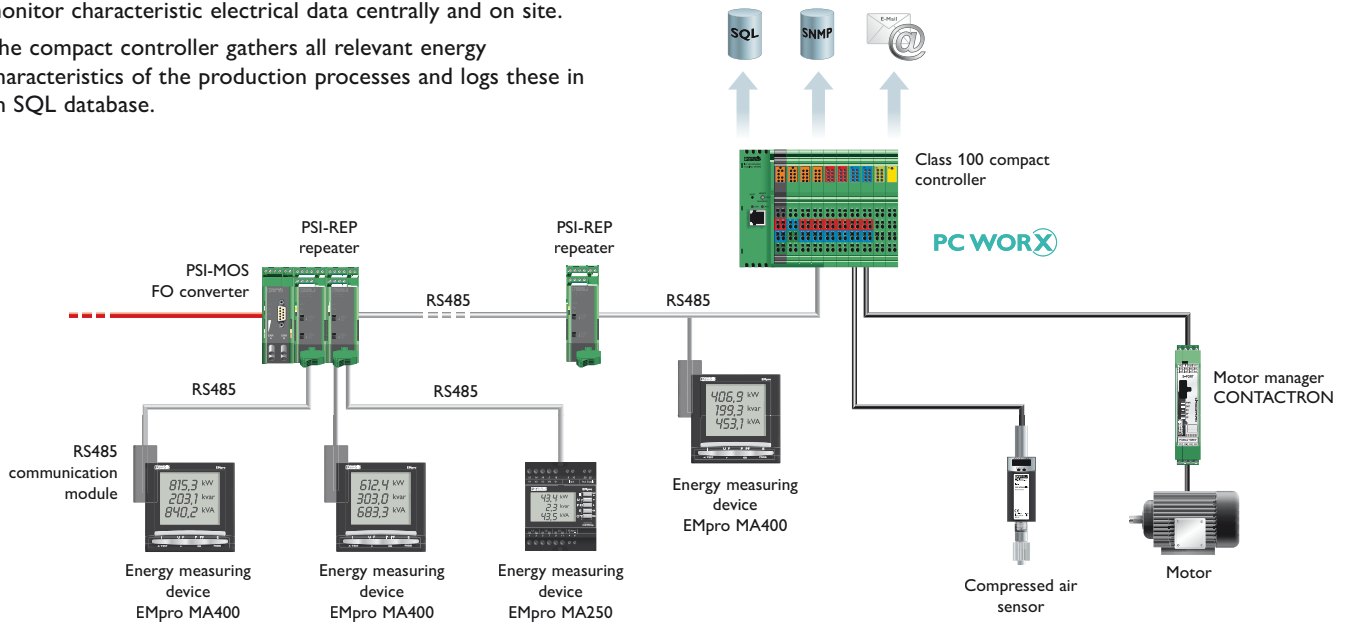
PACT current transformers convert currents of up to 4000 A into secondary currents of one to five amps.

- Space-saving mounting
- Can be used in any mounting position
- Tested safety

Monitoring energy flow and logging energy data

Network-capable EMpro measuring devices can be used to monitor characteristic electrical data centrally and on site.

The compact controller gathers all relevant energy characteristics of the production processes and logs these in an SQL database.



Repeater

PSI repeaters increase the high performance and availability of bus systems.

- Increased ranges and devices
- Individual network structures
- 4-way electrical isolation
- Can be combined with PSI-MOS FO converters



Compact controller

The modularly expandable Class 100 compact controllers are able to log operating states and energy data.

- Freely programmable application in PC Worx
 - Comprehensive function libraries for direct SQL communication
- Finished data logger kits on page 11.



Motor manager

The CONTACTRON EMM motor manager protects the motor and system against critical overload and underload states.

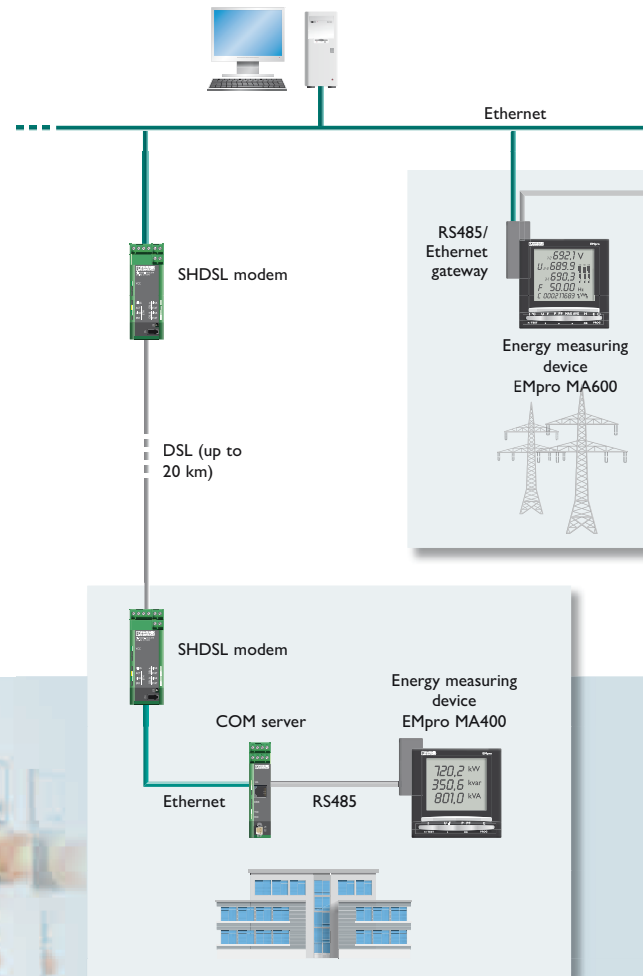
- Integrated full motor protection
- Saves the cost of sensors
- Protects high-grade system parts

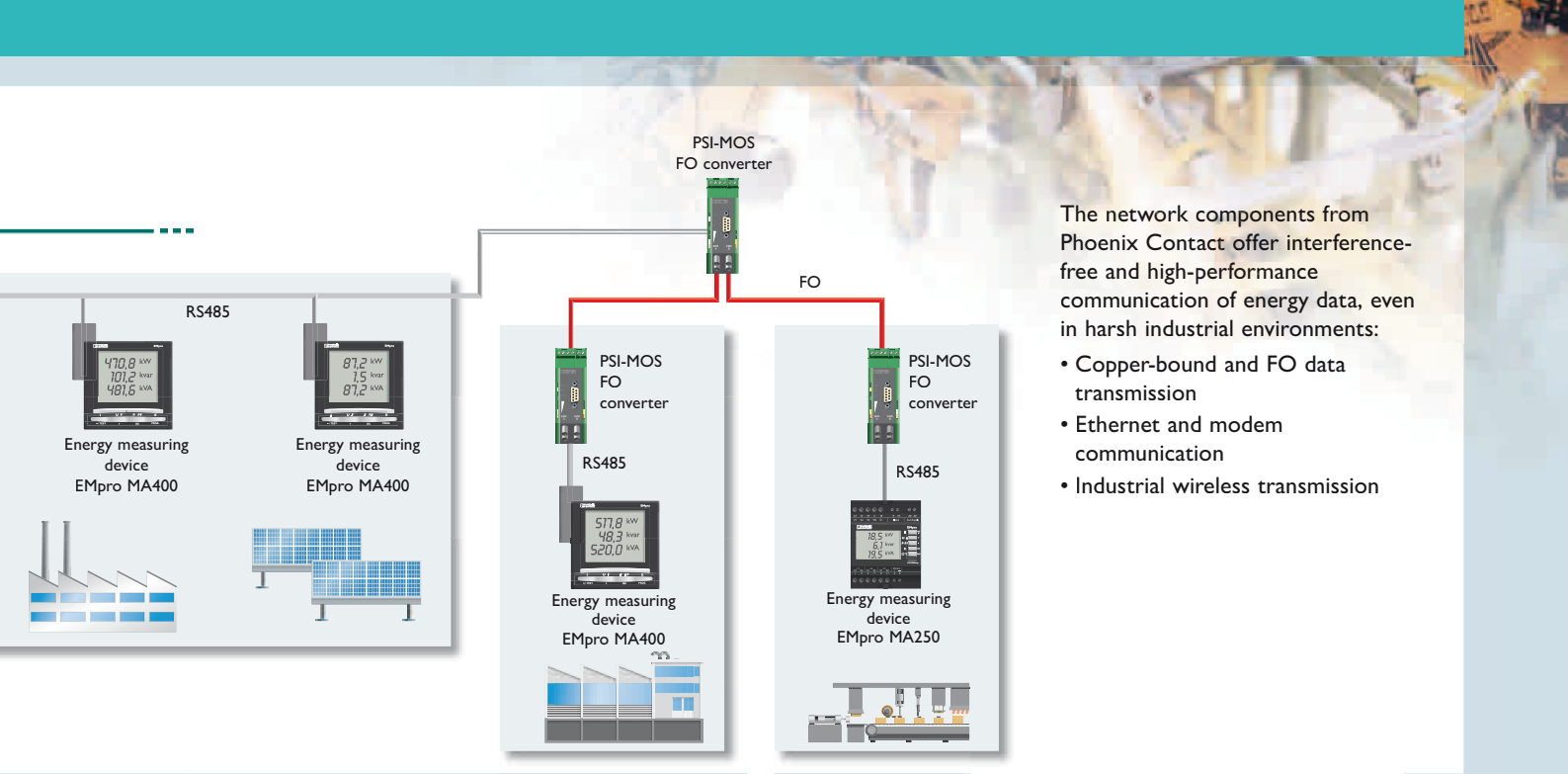
Measure, monitor and communicate energy data

In order to achieve efficient energy management, all energy data that has been determined is gathered and analyzed centrally in the control center.

For data transmission of the EMpro measuring devices to the control center, the most varied network structures can be implemented.

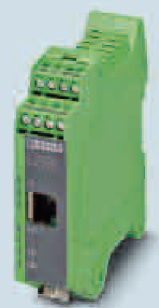
Central energy data acquisition





The network components from Phoenix Contact offer interference-free and high-performance communication of energy data, even in harsh industrial environments:

- Copper-bound and FO data transmission
- Ethernet and modem communication
- Industrial wireless transmission



Industrial modem

Industrial Modem Line provides universal data links with remote machines and system parts.

- DSL connections of up to 20 km
- Mobile communications connections up to 7.2 Mbps
- Automatic alarm generation via SMS and e-mail

COM server

FL COM device servers enable easy integration of serial data into Ethernet networks.

- Configuration using web-based management
- Cable replacement, virtual COM ports
- MODBUS gateway from RTU to MODBUS TCP
- Supports RS232/422/485

FO converter

PSI-MOS FO converters contribute to interference-free data transmission in serial, Ethernet and fieldbus applications.

- FO connections of up to 45 km
- Individual network structures
- High-grade electrical isolation
- Can be combined with PSI-MOS repeaters

Further products for reliable energy data acquisition and communication

Industrial wireless communication



RAD line serial

The RAD line wireless modules with Trusted Wireless Technology can transmit analog, digital and serial data safely and reliably within the kilometer range.

PSI line Bluetooth

The PSI line Bluetooth converters provide interference-free cable replacement for serial data transmissions in close range of up to 150 meters.

FL COMSERVER WLAN

The FL COMSERVER WLAN integrates serial data easily and conveniently in wireless Ethernet networks.

Power supply units



MINI POWER for Measuring and Control Technology (MCR)

Easy maintenance connection method with coded COMBICON connectors and active function monitoring for output powers of up to 100 Watt.

STEP POWER for installation distributors

Energy-saving through maximum energy efficiency and flexible mounting on the DIN rail or for screwing on level surfaces for output powers of up to 100 Watt.

Uninterruptible power supply

Uninterruptible solutions suited to the MINI POWER and STEP POWER series are available.

Surge protection



Surge protective devices secure and increase the availability of systems or installations in the following areas:

- Power supply
- MCR technology
- Information technology

Log data using data logger kits

BASIC data logger solution kit



- The PSK DL BASIC basic version excels with the following features:
- Parameterization and startup via web browser
 - 16 digital inputs and 4 digital outputs onboard
 - Sending of status messages via e-mail, SMS and via Ethernet
 - Acquisition of machine data, operating data and consumption data
 - Fields of application e.g. measuring compressed air consumption or water mass flow, as well as temperature recording

Order No. 2700726

FLEX data logger solution kit



- In addition to all properties of the basic version, the PSK DL FLEX expandable version also offers the following:
- A parameterizable communication interface for MS SQL and My SQL database connection
 - Expandability to include 96 digital inputs, 24 analog inputs
 - Fields of application e.g. measuring compressed air consumption or water mass flow, as well as temperature recording

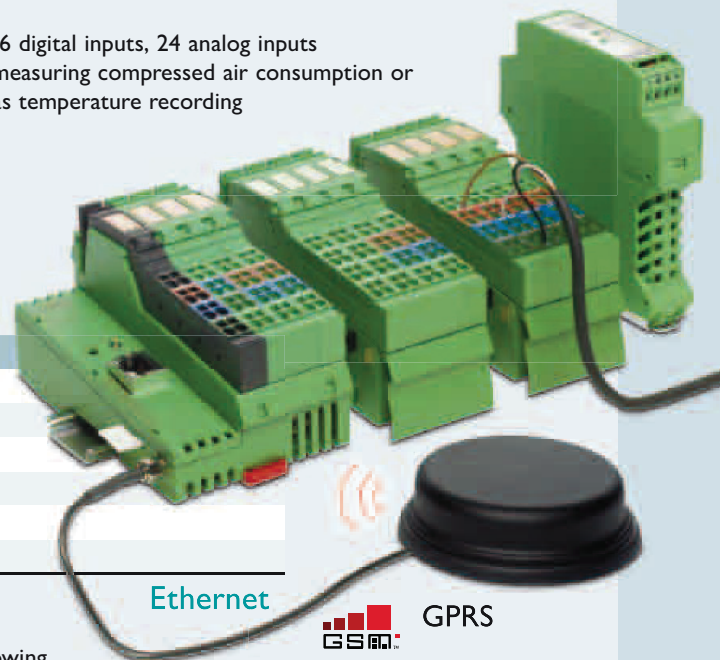
Order No. 2700727

A maximum of three Inline **Modular Digital Input Terminals** from the following table are possible on the PSK FLEX:

Order No.:	Type	Description
2861221	IB IL DI2-PAC	2 digital inputs, 24 V DC, 4-wire connection method
2861234	IB IL DI4-PAC	4 digital inputs, 24 V DC, 4-wire connection method
2861247	IB IL DI8-PAC	8 digital inputs, 24 V DC, 4-wire connection method
2861250	IB IL DI16-PAC	16 digital inputs, 24 V DC, 4-wire connection method
2862835	IB IL DI32-PAC	32 digital inputs, 24 V DC, 4-wire connection method
2891289	IB IL DI8/S0-PAC	8 digital inputs, 24 V DC, SØ counter

A maximum of four Inline **Modular Analog Input Terminals** from the following table are possible on the PSK FLEX:

Order No.:	Type	Description
2861302	IB IL AI2 /SF-PAC	2 analog inputs, 0–20 mA, ±20 mA, 0–10 V, ±10 V, 2-wire connection method
2861412	IB IL AI8/SF-PAC	8 analog inputs, 0–20 mA, ±20 mA, 0–10 V, ±10 V, 2-wire connection method
2861661	IB IL AI8/IS-PAC	8 analog inputs, 0–20 mA, 4–20 mA, 0–40 mA, ±20 mA, ±40 mA, 2-wire connection method



All data logger solution kits are supplied as a package. Startup does not require programming knowledge.

Further information on the products presented here and on the world of the solutions from Phoenix Contact can be found at www.phoenixcontact.net/catalog



Or contact us directly.



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