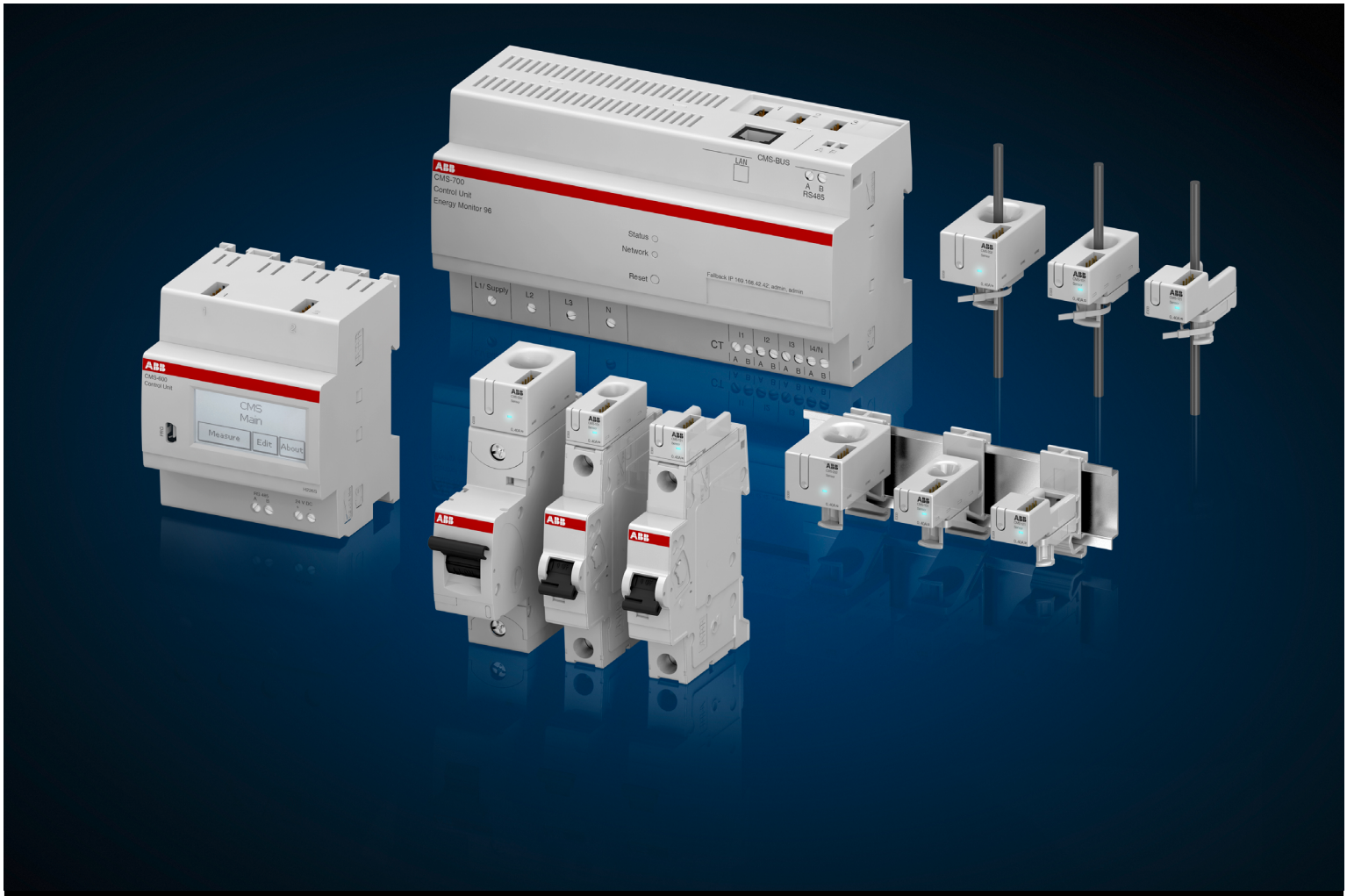


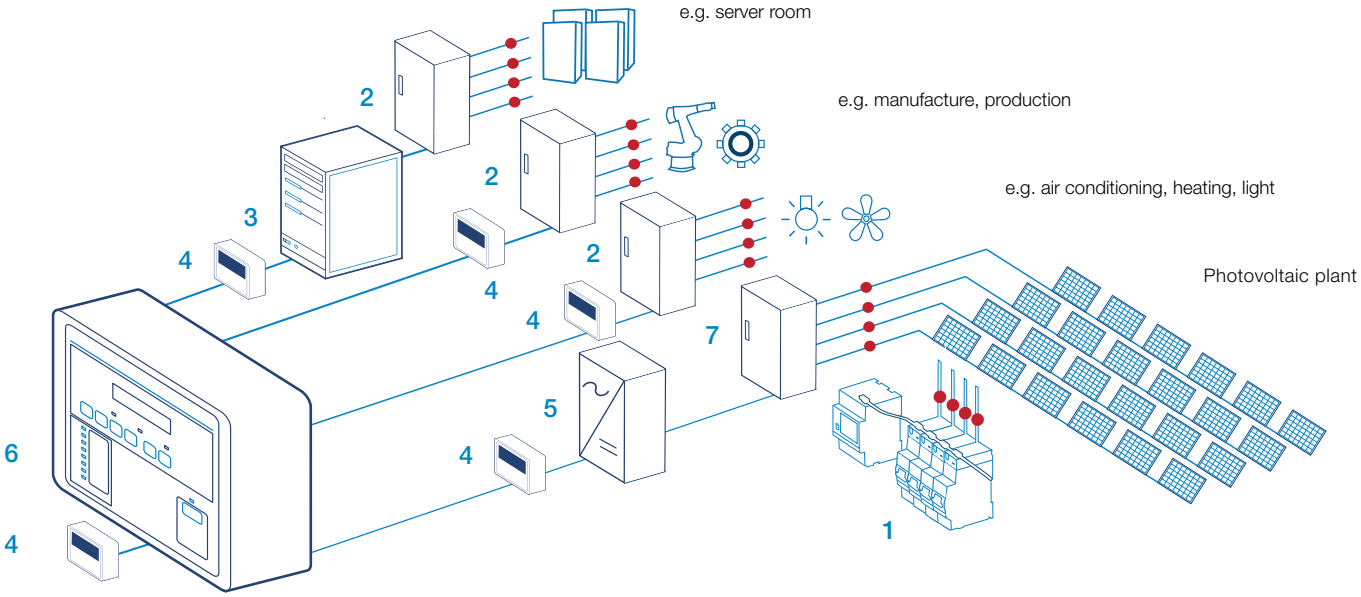
CMS Series
Circuit Monitoring System

Power and productivity
for a better world™

CMS – Circuit Monitoring System
A system packed with benefits

«The CMS is a compact AC and DC multichannel branch monitoring system.»

The measurement system consists of a Control Unit and sensors. The components can be installed quite simply and very clearly arranged inside control and distribution cabinets. During the system's development, special attention was paid to achieve the best possible user friendliness, a large measurement range (up to 160 A) and scalable solutions for every application. Thanks to its special design, the system is also ideal as a simple retrofit upgrade solution for existing installations. After all, no-one today wants to spend lots of time contemplating and installing the latest technology – all we want to do is make use of the technical benefits.



1 CMS system (● Measuring points) | **2** Sub-distribution | **3** UPS system
4 Energy meter | **5** Power inverter | **6** Main distribution | **7** Combiner box

This is the sign of success!

Minimum space requirement
Small, smaller, CMS – everything needed for effective measuring has been accommodated in the width of a sugar cube.

Very simple installation
The sensors are mounted in next to no time. No special tools are needed for the entire connection process – there is no need for the usual complicated wiring.

User-friendly commissioning
Configuring can be this smart: thanks to the intuitive operating concept the system can be set up and made ready for measuring in a matter of minutes.

One sensor for all types of current
Direct current, alternating current or mixed current – the CMS sensors measure everything. And in a huge measuring range of up to 160 A.

Always retrofittable and upgradeable
The system can be supplemented or modified at any time as it is extremely flexible and modular. Retrofitting is also possible sensor by sensor.

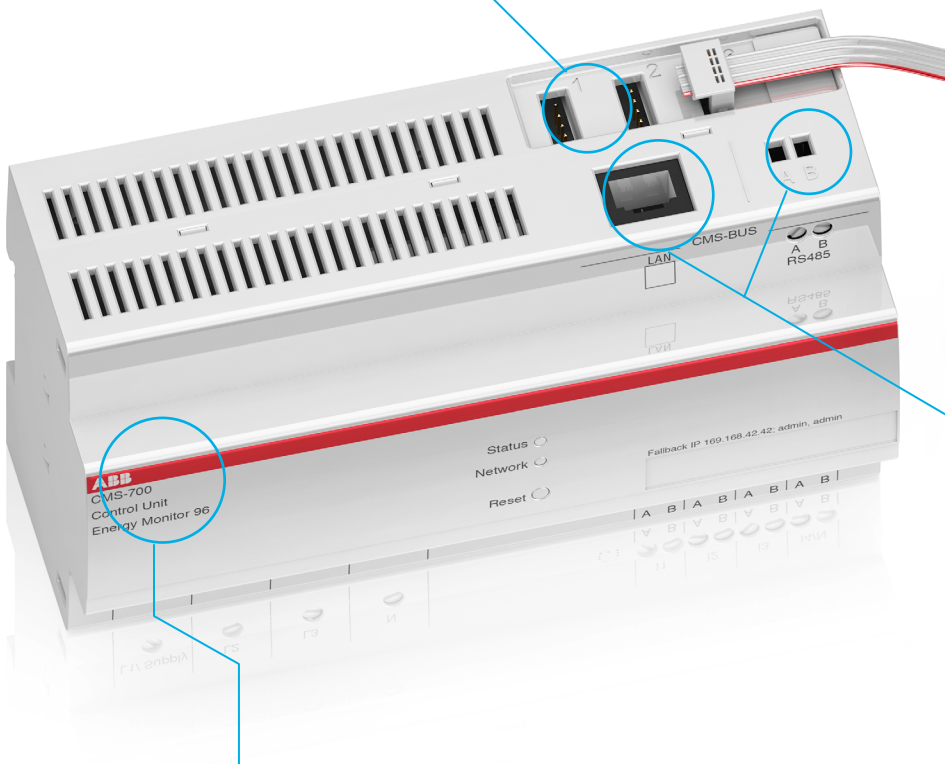
Maximum reliability
The contactless measuring process rules out potential sources of error right from the start. The negligible amount of wiring required ensures maximum system stability.

CMS – thought through right down to the last detail

System overview

The quality of a Circuit Monitoring System is dependent on the strengths of the individual components and how well they interact. ABB's CMS sets the bar particularly high. Regardless of whether we're talking compactness, technology, measurement results, user friendliness or flexibility, every component and every feature of this CMS has been fully optimized in terms of practicality and functionality.

CMS bus interface
A bus interface allows up to 32 sensors to be connected to the Control Unit.



Example illustration:
Control Unit CMS-700 in combination with CMS open-core sensors

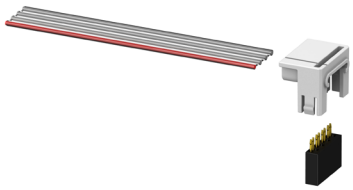
CMS-600 **CMS-700**

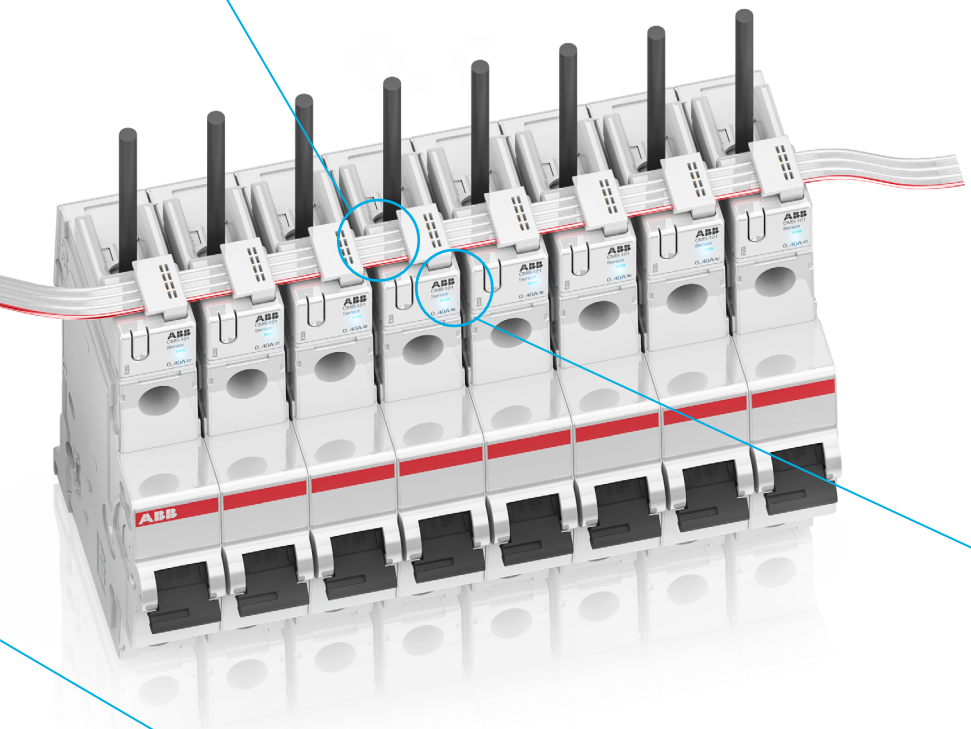
Control Units
The Control Unit is a kind of computing and communication center that, depending on the equipment connected to it, evaluates the different data picked up by the sensors and makes it available via the built-in interfaces.

You have a choice of two different units depending on your applications: CMS-600 and CMS-700.

Connection technology

Connecting the sensors to the Control Unit is extremely simple and requires no special tools. All sensors are connected to the Control Unit by means of a flexible flat cable and insulation displacement connectors. The positioning of sensors is fully customizable so that they sit exactly where a measurement is required.





Serial interfaces

Depending on the unit, numerous interfaces and protocols are available to ensure smooth network implementation: RS485 (Modbus RTU), LAN (TCP/IP and Modbus TCP)

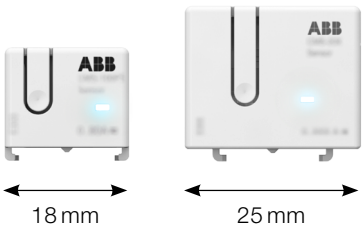
Thanks to the built-in web server, an internet browser or a free Android or iOS app can be used to visualize the values measured. What's more, the measured values can also be exported to CSV files.

Sensors

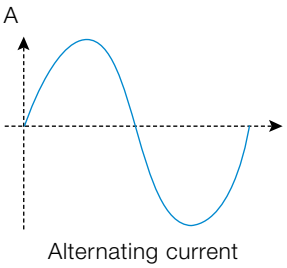
The CMS sensors form the heart of the system and they can be mounted anywhere without any problem. Initializing the sensors is also child's play, with the desired identifier being assigned to each individual sensor via the Control Unit in just a few simple steps. The entire configuration and commissioning procedure takes just a matter of minutes. All measurement functions are available immediately following initialization.

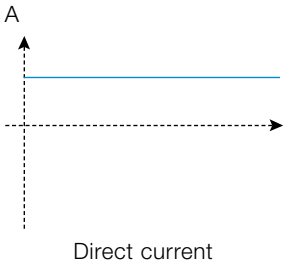
The sensors – the heart of the CMS
Top-level performance packed into a tiny space

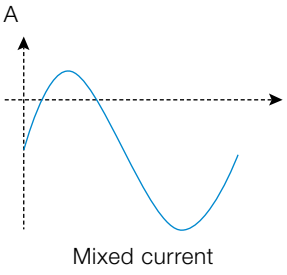
No space is wasted here! Everything is built into an 18 or 25 mm wide unit to enable precise and effective measurements. This makes these CMS sensors the most compact and most powerful on the market.



Small format, colossal performance: Alternating (AC), direct (DC) or mixed (TRMS) currents – the CMS sensors monitor and measure all types of current and that over a measurement range of up to 160 A (TRMS). They even measure harmonic components in the signal curve.
As each sensor is equipped with its own microprocessor for processing the signal, the measurement data is transmitted digitally to the Control Unit via the bus interface. This minimizes the amount of cabling required in the distribution cabinet and maximizes measured-value transmission reliability. Disturbances like those experienced with analog data now most definitely belong to the past.







Solid-core sensor **Open-core sensor**

Sensor designs

Our CMS sensors are available within a solid-core or open-core design. The solid-core units feature an enclosed structure and AC measurement accuracy* of ≤ ±0.5 %, and are therefore suitable for all applications in which maximum-precision measurement is crucial.

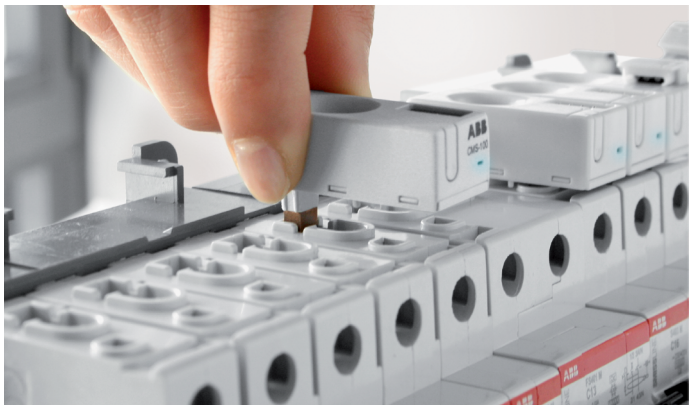
Thanks to their U shape, the open-core sensors can be retrofitted to existing installations with total ease without having to disconnect the cabling or shut down the equipment. With AC accuracy* of ≤ ±1.0 %, they can be used in a multitude of applications without any problem.

* All accuracy specifications refer to the relevant full scale value and apply to 25 °C.

Integrate however you want
Thanks to multiple mounting options

Depending on the application, choose between up to four different mounting options to make integrating the CMS sensors in your installation as simple and as uncomplicated as possible.

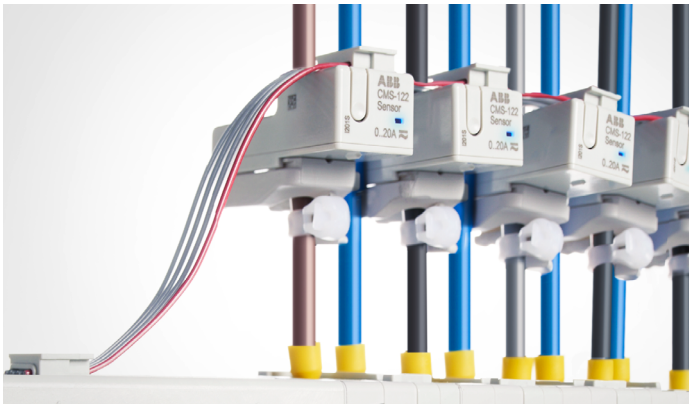
Special sensors for ABB installation devices



System pro M, SMISSLINE installation
CMS-120PS and CMS-100PS series sensors can be mounted on all ABB installation devices with twin terminals.

Installation on S800 installation devices
CMS-100S8 and CMS-200S8 series sensors can be mounted on all S800 high performance circuit breakers with cage terminals.

Universal use sensors design



Mounting on a DIN rail
CMS-120DR, CMS-100DR, and CMS-200DR series sensors can be mounted on all DIN rails with the aid of a DIN rail mounting.

Cable tie mounting
If space is at a real premium, CMS-120CA, CMS-100CA, and CMS-200CA series sensors can be secured directly to the cable(s) to be measured by means of cable ties.

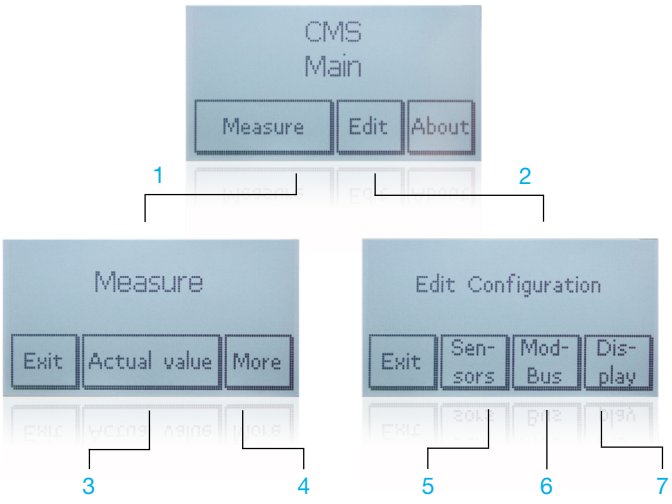
Control Unit CMS-600
Compact current monitoring for the Modbus architecture

The Control Unit CMS-600 is a compact Modbus variant for professional current monitoring.

The CMS-600 system enables you to measure AC and DC currents in up to 64 branches.
For simple and fast operation, the Control Unit is equipped with an illuminated touch display that makes not only initialization but also control of the sensors extremely simple. A 2-wire RS485 Modbus RTU interface enables users to remotely query and process the measurement data. As such, the CMS-600 Control Unit can be very easily integrated into an existing Modbus architecture. As an option, the measured values can also be visualized and processed by means of a programmable logic control (PLC).

Among other things, Control Units CMS-600 are put to use in the critical power systems of hospitals and in similar industrial applications, too. Furthermore, these devices can also be found in functional buildings such as airports, hotels, office buildings, universities/colleges and museums or in industrial photovoltaics.

Great care has been taken to ensure that the navigation concept of the CMS software is highly intuitive. All functions and menus can be called up with just a few clicks. There's as good as no need at all for extensive and costly user tutorials, neither for initialization nor for subsequent operation. This saves a lot of time, effort and, last but not least, money.



Crystal-clear menu navigation

1 Measurement | **2** Configuration | **3** Display of actual values
4 Display of Max., Min. and Hold values | **5** Initialization / parameterization of sensors
6 Modbus configuration | **7** Display settings

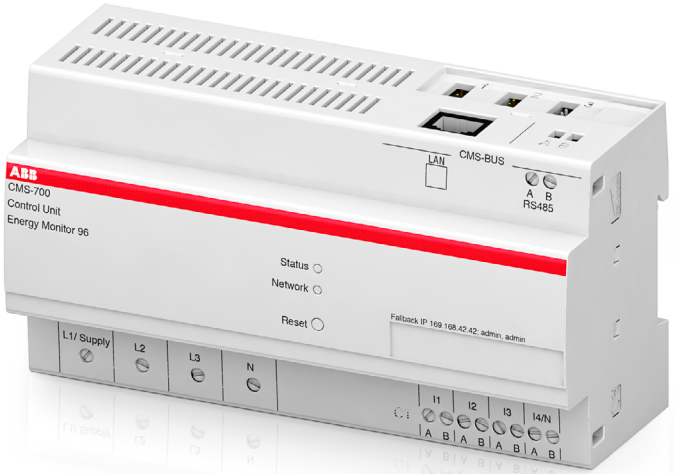
Control Unit CMS-700
Professional energy monitoring from open-plan offices to industrial plants

The Control Unit CMS-700 is the universal measuring instrument for metering performance and energy.

With the CMS-700, you can measure the AC and DC currents in the outgoing circuits via up to 3x32 sensors and in the process capture the energy and output data (line-side active and reactive power) of up to 96 sensors simultaneously.

Up to 246 different devices can be addressed when identifying the CMS-700 via Modbus RTU. If the CMS-700 is operated by means of Modbus TCP and SNMP, addressing is performed via an assigned IP address and is therefore open and independent of the operator of the LAN.

The Control Unit CMS-700 has been developed specifically to meet the requirements of critical power applications, such as those of computing centers. In addition, however, professional energy monitoring is becoming ever more important when it comes to identifying savings potentials in functional buildings such as office buildings.



Greater convenience during parameterization and visualization thanks to a built-in web server

The Control Unit CMS-700 stands out thanks to its built-in web server that offers easy access not only to the measured data but also to the system parameters. The two interfaces – LAN (TCP/IP or Modbus TCP) and RS485 (Modbus RTU) – guarantee straightforward integration into any IT infrastructure. What's more, the data can be read out by means of an SNMP protocol.

Energy monitoring using the CMS-700 web server interface

Tangible value added for you
ABB circuit monitoring pays off twofold

Early warning system (predictive maintenance) for increasing the availability of critical consumers

Continuous monitoring of the current flow at the circuit breaker makes it possible to detect overloaded lines before they lead to a service interruption. Apart from this, monitoring individual circuits indicates whether the loads are in the desired operating mode or not. In this way, system deviations can be ascertained instantaneously. What's more, the CMS can be used to detect unbalanced loads before they result in failure of the neutral conductor and consequently load failure.

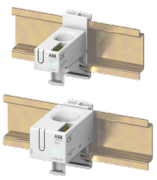
Cost analysis to reduce and assign energy costs

The cost of energy will rise continuously. In order to cut costs, you first have to know where they arise. The Control Unit helps illustrate and analyze the instantaneous energy consumption levels. Furthermore, the calculated active energy can be used to roughly allocate the costs at the output level.

CMS system components
At a glance

Find the right CMS sensor for your installation in next to no time.

Sensor mounting methods

				
	System pro *M*, SMISSLINE	**S800**	**DIN rail**	**Cable tie**
	for all LS, FI & FI-LS with twin terminals	for all S800 devices with cage terminals	universally usable	universally usable

Open-core sensors

AC accuracy* of ≤ ±1.0 %

The laying method influences the accuracy.



18-mm overall width

CMS-120xx (80 A)	CMS-120PS	CMS-120DR	CMS-120CA
CMS-121xx (40 A)	CMS-121PS	CMS-121DR	CMS-121CA
CMS-122xx (20 A)	CMS-122PS	CMS-122DR	CMS-122CA

Solid-core sensors

AC accuracy* ≤ ±0.5 %




18-mm overall width

CMS-100xx (80 A)	CMS-100PS	CMS-100S8	CMS-100DR	CMS-100CA
CMS-101xx (40 A)	CMS-101PS	CMS-101S8	CMS-101DR	CMS-101CA
CMS-102xx (20 A)	CMS-102PS	CMS-102S8	CMS-102DR	CMS-102CA

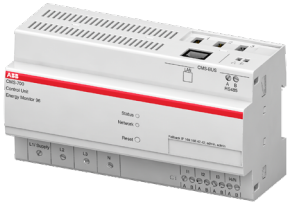


25-mm overall width

CMS-200xx (160 A)	CMS-200S8	CMS-200DR	CMS-200CA
CMS-201xx (80 A)	CMS-201S8	CMS-201DR	CMS-201CA
CMS-202xx (40 A)	CMS-202S8	CMS-202DR	CMS-202CA

* All accuracy specifications refer to the relevant full scale value and apply to 25 °C.

Comparison of the CMS Control Units. The right unit for every task.



Characteristics	Control Unit CMS-600	Control Unit CMS-700
CMS Sensors		
Sensors	64 (2x32)	96 (3x32)
Measured values		
Power supply		●
Current	●	●
Power		●
Energy		●
Built-in power pack		●
Power factor		●
Interfaces		
RS485	●	●
LAN		●
WiFi		
Protocols		
Modbus RTU	●	●
Modbus TCP		●
SNMP		●
Visualization		
Built-in web server		●
App		
Touch display	●	
CSV data export		●
Approvals		
IEC 61010-1	●	●
UL 508/ CSA C22.2 No. 14	●	●

CMS – Circuit Monitoring System
Technical Data

CMS-600

2CCC481070F0001

CMS-600
User Manual

Control Unit CMS-600 – «Modbus RTU»		
Supply voltage	[VDC]	24 (± 10 %)
Power input	[W]	4 – 24 (dep. on number of sensors)
Interface		RS485 2-wire
Protocol		Modbus RTU
Data rate	[Baud]	2400 ... 115200
Refresh time		≤1 sec with max. 64 sensors
Insulation strength	[VAC]	400
Screw-type terminals		0.5 ... 2.5 mm², max. 0.6 Nm
Mounting method		35 mm DIN rail (DIN 50022) or SMISSLINE TP plug base
Dimensions	[mm]	71.8 x 87.0 x 64.9 (4 WM)
Operating temperature	[°C]	–25 ... +70
Bearing temperature	[°C]	–40 ... +85
Standards		IEC 61010-1 UL 508/ CSA C22.2 No. 14

CMS-700

2CCC481194F0001

CMS-700
User Manual

Control Unit CMS-700		
Supply voltage	[VAC]	80 – 277 (L1-N, +5%)
Frequency	[Hz]	50/60
Power input (L1-N)	[W]	5 ... 40 (dep. on number of sensors)
Power input, current transformer, secondary side	[VA]	Current circuit <2 (per phase)
Voltage measurement range	[VAC]	80 – 277 (L1, L2, L3-N)
Measurement range, current transformer, secondary side	[A]	nominal: 5 max.: 6
Harmonic component	[Hz]	up to 2000
Data rate of Modbus RTU	[Baud]	RS485 2-wire, 2400 ... 115 200
Refresh time		≤1 sec with max. 96 sensors
LAN	[Mbit/s]	100
Conductor cross-section	[mm²]	0.5 ... 2.5
Mounting method		35 mm DIN rail (DIN 50022)
Degree of protection		IP20
Dimensions	[mm]	160.0 x 87.0 x 64.9 (9 WM)
Operating temperature	[°C]	–25 ... +60
Bearing temperature	[°C]	–40 ... +85
Standards		IEC61010-1 UL 508/ CSA C22.2 No. 14
Main circuit accuracy		
Voltage		± 1 %
Current		± 1 %
Harmonic component		1 %
Active power		± 2 %
Apparent power		± 2 %
Reactive power		± 2 %
Power factor		± 0.2 %

CMS website

Go to new.abb.com/circuit-monitoring-systems to find all available information and materials on the topic of CMS Circuit Monitoring Systems.

CMS – Circuit Monitoring System
Technical Data

CMS-120PS

2CCC481154F0001

CMS-120DR

2CCC481142R0001

CMS-120CA

2CCC481141F0001

CMS-100PS

2CCC481030F0001

CMS-100S8

2CCC481032F0001

CMS-100DR

2CCC481036F0001

CMS-100CA

2CCC481040F0001

CMS-200S8

2CCC481034F0001

CMS-200DR

2CCC481038F0001

CMS-200CA

2CCC481042F0001

Open-core sensors 18 mm

Sensor type			CMS-120xx	CMS-121xx	CMS-122xx
Measurement range		[A]	80	40	20
Measuring method			TRMS, AC 50/60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25 °C)*			≤ ±1 %		
AC temperature coefficient*			≤ ±0.04 %		
DC accuracy (TA = +25 °C)*			≤ ±1.2 %	≤ ±1.4 %	≤ ±1.8 %
DC temperature coefficient*			≤ ±0.14 %	≤ ±0.24 %	≤ ±0.44 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1 %)		[sec]	typ. 0.34		
Conductor penetration		[mm]	9,6		
Insulation strength			690 AC/1500 DC		
Operating/storage temperature		[°C]	–25 ... +70/–40 ... +85		
Dimensions	CMS-120PS Serie	[mm]	17.4 x 41.0 x 26.5		
	CMS-120CA Serie	[mm]	17.4 x 41.0 x 29.0		
	CMS-120DR Serie	[mm]	17.4 x 51.5 x 43.2		
Standards			IEC 61010-1 | UL508/CSA C22.2 No 14		

Solid-core sensors 18 mm

Sensor type			CMS-100xx	CMS-101xx	CMS-102xx
Measurement range		[A]	80	40	20
Measuring method			TRMS, AC 50/60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25 °C)*			≤ ±0.5 %		
AC temperature coefficient*			≤ ±0.036 %		
DC accuracy (TA = +25 °C)*			≤ ±0.7 %	≤ ±1.0 %	≤ ±1.7 %
DC temperature coefficient*			≤ ±0.047 %	≤ ±0.059 %	≤ ±0.084 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1 %)		[sec]	typ. 0.25		
Conductor penetration		[mm]	10		
Insulation strength		[V]	690 VAC/1500 VDC		
Operating/storage temperature		[°C]	–25 ... +70/–40 ... +85		
Dimensions	CMS-100PS Serie	[mm]	17.4 x 41.0 x 26.5		
	CMS-100S8 Serie	[mm]	26.5 x 45.5 x 31.8		
	CMS-100DR Serie	[mm]	17.4 x 51.5 x 43.2		
	CMS-100CA Serie	[mm]	17.4 x 41.0 x 29.0		
Standards			IEC 61010-1 | UL508/CSA C22.2 No 14		

Solid-core sensors 25 mm

Sensor type			CMS-200xx	CMS-201xx	CMS-202xx
Measurement range		[A]	160	80	40
Measuring method			TRMS, AC 50/60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25°C)*			≤ ±0.5 %		
AC temperature coefficient*			≤ ±0.036 %		
DC accuracy (TA = +25°C)*			≤ ±0.7 %	≤ ±1.0 %	≤ ±1.7 %
DC temperature coefficient*			≤ ±0.047 %	≤ ±0.059 %	≤ ±0.084 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1%)		[sec]	typ. 0.25		
Conductor penetration		[mm]	15		
Insulation strength		[V]	690 VA/1500 VDC		
Operating/storage temperature		[°C]	–25 ... +70/–40 ... +85		
Dimensions	CMS-200S8 Serie	[mm]	26.5 x 43.0 x 38.5		
	CMS-200DR Serie	[mm]	25.4 x 43.0 x 43.2		
	CMS-200CA Serie	[mm]	25.4 x 43.0 x 35.7		
Standards			IEC 61010-1 | UL508/CSA C22.2 No 14		

* All accuracy specifications refer to the relevant full scale value and apply to 25 °C. In the case of open-core sensors, the position of the cable influences the precision.

CMS – Circuit Monitoring System
Ordering Details

Description	Part number	Weight of 1 unit (kg)	Packaging unit (pce.)
Open-core sensors			
Open-core sensors 18 mm for pro *M* & SMISSLINE installation devices with twin terminals			
80 A	CMS-120PS	0.012	1
40 A	CMS-121PS	0.012	1
20 A	CMS-122PS	0.012	1
Open-core sensors 18 mm for DIN rail mounting (universally usable)			
80 A	CMS-120DR	0.015	1
40 A	CMS-121DR	0.015	1
20 A	CMS-122DR	0.015	1
Open-core sensors 18 mm for cable tie mounting (universally usable)			
80 A	CMS-120CA	0.011	1
40 A	CMS-121CA	0.011	1
20 A	CMS-122CA	0.011	1
Solid-core sensors			
Solid-core sensors 18 mm for pro *M* & SMISSLINE installation devices with twin terminals			
80 A	CMS-100PS	0.012	1
40 A	CMS-101PS	0.012	1
20 A	CMS-102PS	0.012	1
Solid-core sensors 18 mm for S800 installation devices with cage terminals			
80 A	CMS-100S8	0.014	1
40 A	CMS-101S8	0.014	1
20 A	CMS-102S8	0.014	1
Solid-core sensors 18 mm for DIN rail mounting (universally usable)			
80 A	CMS-100DR	0.015	1
40 A	CMS-101DR	0.015	1
20 A	CMS-102DR	0.015	1
Solid-core sensors 18 mm for cable tie mounting (universally usable)			
80 A	CMS-100CA	0.011	1
40 A	CMS-101CA	0.011	1
20 A	CMS-102CA	0.011	1
Solid-core sensors 25 mm for S800 installation devices with cage terminals			
160 A	CMS-200S8	0.028	1
80 A	CMS-201S8	0.028	1
40 A	CMS-202S8	0.028	1
Solid-core sensors 25 mm for DIN rail mounting (universally usable)			
160 A	CMS-200DR	0.030	1
80 A	CMS-201DR	0.030	1
40 A	CMS-202DR	0.030	1
Solid-core sensors 25 mm for cable tie mounting (universally usable)			
160 A	CMS-200CA	0.026	1
80 A	CMS-201CA	0.026	1
40 A	CMS-202CA	0.026	1
Control units			
Control Unit CMS-600	CMS-600	0.153	1
Control Unit CMS-700	CMS-700	0.329	1
Accessories			
Flat cable 2 m	CMS-800	0.017	1
Flat cable 3 m	CMS-801	0.025	1
Connector set (35 pcs.)	CMS-820	0.024	35

Contact us

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