



Energy efficiency portfolio

Accurate electrical measuring and power monitoring



- Complete portfolio
- Simple and compact design
- Digital turnkey solution for monitoring, optimization and control
- Improve reactivity and reduce uncoordinated maintenance

ABB's energy efficiency product portfolio is the new, complete assortment of product range comprising of single function, multifunction, dual source, power metering and fully connected, state-of-the-art range of network analyzers, guaranteeing basic to complete power quality analysis and accurate energy efficiency monitoring of all the energy assets: industrial and commercial buildings, facilities, data centers.

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Technical and ordering details

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ABB Energy Efficiency Portfolio - Overview

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ABB Energy Efficiency Portfolio

Metering solutions from basic to advanced

Single function and multi function Metering solutions

ABB digital VAF Meters, KWh meters, Ammeters and Voltmeters are optimal to replace analogue devices. With these models all entry-level measuring requirements are covered.

Basic Metering solutions

On top of the simplest measurements, ABB basic multi-function meters also monitor Energy and Power. They are available with option for Modbus communication.



Modular analog instruments



Modular digital instruments



Front panel analog instruments



Front panel digital instruments



M1A



M1V



M1M 10



M1M 11



EQ meters C series



EQ meters B series



M1M 12



M1M DS

Intermediate Metering solutions

Intermediate level solutions offer a wider range of measurements - including THD, Individual Harmonics and Unbalances - and functionalities - such as 1 DO, Timers, RTC and Alarms.

Advanced Metering solutions

M4M suits all power monitoring needs: from high-accuracy energy efficiency monitoring of electrical parameters to complete power quality analysis through advanced KPIs via cloud.



M1M 15



M4M 2X



M1M 20B



M1M 30B



M4M 20



EQ meters B series



M1M 20



M1M 30



M4M 30



EQ meters A series



CMS-700 Circuit Monitoring System



CMS-600/660 Circuit Monitoring System



SCU-100 InSite Pro



Digital I/O modules

Measurement made simple

Explore the new single function, multi function and dual source meters range for basic monitoring applications inside both commercial buildings and industries.

M1A M1V and M1M 11

The M1 series is a single phase and three-phase digital panel meter for reliable and accurate true-RMS measurement of electrical parameters voltage, current and energy for building, commercial and industrial applications.



M1A

M1A is a digital ammeter for current measurement, providing the measurement of the single-phase or three-phase electrical parameters and allowing easy replacement of different analogue meters.

M1V

M1V is a digital voltmeter for voltage (and Frequency) measurement, providing the measurement of the single-phase or three-phase Voltage as well as Frequency (for 3Ph Voltmeter) and allowing easy replacement of different analogue meters.



M1M 11

M1M11 is a digital kWh meter for energy measurement, providing the measurement of the single-phase or three-phase energy consumption. Enabled with Modbus RTU RS485 communication for remote monitoring.



Measurement made simple

Easily replace the different analogue meters in sub-distribution switchboards using a single M1M; making stand-alone metering simple.

M1M 10, M1M 12 and M1M DS

M1M 10, M1M 12 and M1M DS offer exactly what is basically needed to monitor in an electrical system. Thanks to True RMS measurement of the main parameters, both average and per phase measurement suitable for Star, Delta or 1-phase systems can be easily measured. M1M allow quick stand-alone metering of the 3 different phases, as well as statistical metering of active energy consumptions along with dual source monitoring.

M1M 10

M1M 10 is a VAF meter for basic electrical system monitoring, providing the measurement of Voltage, Current, Frequency and On Hours.



M1M 12

M1M 12 is a multi-function meter for complete electrical system monitoring, providing the measurement of: Active Energy, Active Power, Power Factor, Voltage, Current, Frequency, On Hours and Load Hours. Enabled with Modbus RTU RS485 communication for remote monitoring.

M1M DS

M1M DS is a Dual Source multi-function meter for complete electrical system monitoring, providing the measurement of: Active Energy, Active Power, Apparent Power, Power Factor, Voltage, Current, Frequency. Enabled with Modbus RTU RS485 communication for remote monitoring.



Measurement made simple

Making difference with M1M range of meters in sub-distribution switchboards.



Commercial Buildings



Industrial Plants



Public Buildings

Measurement made simple

Value proposition

Simple to use

- Intuitive visualization of the 3 phase parameters on the bright LED display
- Enhanced clarity in data reading and device configuration

Easy choice

- Only 6 product codes to cover the main measurement requirements
- Maximum 2 steps to select the correct product for your application

Easy to install and stock

- Compact product design and optimized volumetric weight of packaging
- No tools required for product mounting thanks to mounting clips

System integration

- Remote monitoring in any Modbus RTU supervision system thanks to the optional RS485 port for M1M 12
- Quick system integration thanks to basic communication protocol map



M1M DS

Your benefits



For distributors

- Save space needed for internal stock
- Fast selection of the correct product for your orders
- Handle a minimum set of order codes



For panel builders

- Reduce the time needed for meter installation on the panel
- Fast selection of the correct product for your application
- Increase the number of projects covered with the same product



M1M Power Meters

Introducing the new ABB power meters ranges M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 an easy solution for any standard application in buildings and industry.

M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 are the new ABB ranges of power meters, offering exactly what is needed to monitor the electrical system and analyze the power quality in a single device.

The new M1M power meters offer allows to easily and cost-effectively cover the main submetering and power quality monitoring requirements in commercial and industrial buildings, either small or mid/large-sized, e.g. inside power factor correction boards, motor control center or sub-distribution switchboards.

ABB's complete multifunction meters product line, now including. M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 ranges, are capable to cover all needs, from basic electrical parameters measurement to advanced power quality analysis.

ABB's power meters are simple to use, with a common and intuitive user experience from installation to operations, allowing to fully exploit the reliable, IEC-compliant measurements.

Thanks to their connectivity capabilities, M1M can get leverage on the integration in ABB scalable energy and asset management solutions to monitor, optimize and control the complete electrical system, such as System pro M compact® InSite and ABB Ability™ Energy and Asset Manager cloud-computing platform.



Commercial Buildings



Industrial Plants



Public Buildings



M1M 15



M1M 20B



M1M 30B



M1M 20



M1M 30



Explore the new ranges

Five new different M1M product families M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30, have been commonly designed in order to perfectly fit in a scalable way any monitoring need, with high focus on intuitiveness, quality and common user experience. All M1M power meters are compliant to IEC 61557-12 power metering and monitoring devices (PMD) standard, ensuring reliability of all electrical parameters and power quality KPIs measurements.

M1M 15

M1M 15 is a LED display complete multifunction meter for electrical system monitoring, mainly targeting measurement of basic electrical parameters and applications for cost allocation of energy consumptions.



M1M 15

M1M 20B

M1M 20B is a LED display power meter including THD and import/export (4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.



M1M 20B



M1M 30B

M1M 30B is a LED display power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.



M1M 30B

M1M 20

M1M 20 is a LCD display power meter including THD and import/export (4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.



M1M 20

M1M 30

M1M 30 is a LCD display power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.



M1M 30

Measurement made simple

The complete M1M range, offering all the measurement features required for basic power quality monitoring and submetering in a single power meter; making measurement simple.



—
Complete offer

ABB meters to cover all needs

Select in maximum 2 steps the right and most competitive power meter to cover all basic electrical system measurement needs. Thanks to integrated functionalities and communication protocols, the same product version fits an increased number of projects and wide applications range.



—
Easy to use

Common user experience

Common and intuitive menu structure all over the different ranges on clear and large backlit LCD/LED displays, helping to reduce the time needed to operate the power meters. Feedback on correct operations and quick reactivity on the system events are ensured by alarms icons and frontal LEDs on all product versions.





—
Easy to install

Optimized installation process

Compact power meters, ensuring a very limited footprint inside the panel, provide a common, vertical disposition of the terminals for easy wiring of cables directly from the sides. No special tool is required for product mounting thanks to mounting clips.



—
Energy Efficiency

Reliable and accurate measurement

Complete set of measurement functionalities, from multi-function meters to intermediate power meters, compliant with accuracy standard IEC 61557-12 to allow improving energy efficiency of the electrical system. Remote communication on main communication protocol, Modbus RTU and Modbus TCP/IP.

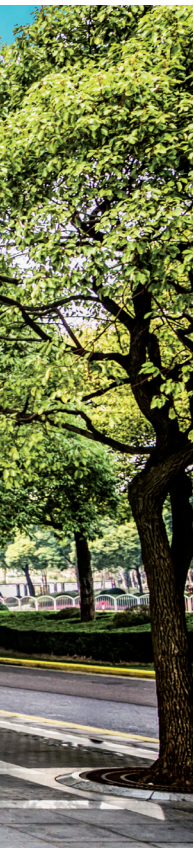
— **Your benefits**

For distributors

- Reduce selection time of the correct product thanks to reduced range complexity
- Manage a limited number of order codes from a single supplier
- Save space needed for internal stock
- Have the product on stock when needed and reduce delivery time

For panel builders

- 1 supplier only for all measurement products covering wide range of projects
- Increase competitiveness in projects
- Reduce time needed for product selection thanks to simple range composition
- Reduce time for installation and operations
- Minimum space requirements in the panel



M4M Network Analyzers

Discover the benefits

M4M as a stand-alone network analyzer guarantees all power monitoring needs in the energy distribution system: from high-accuracy energy efficiency monitoring of electrical parameters to complete power quality analysis.

Thanks to its connectivity capabilities, M4M can get leverage on the integration in ABB scalable energy and asset management solutions.

Thanks to MID certification, M4M allows now to fulfill all legal requirements for accounting and energy acquisition.



—
-50% Time for integration
in the ABB turnkey solution

Full connectivity

Natively integrated in sub-distribution management System pro M compact® InSite and ABB Ability™ Energy and Asset Manager cloud-solution, M4M benefits from the scalability of the ABB digital solutions: from stand-alone visualization and commissioning to monitoring, optimization and control of the complete electrical system.



—
Reliable and accurate power
monitoring

Energy Efficiency

ABB's M4M range of network analyzers gathers data from the electrical system and provides a complete power quality analysis and high accuracy energy monitoring. MID certification available to ensure certified and tamper-proof measurement for billing applications and fulfilment of legal requirements for accounting and energy acquisition.



—
-40% Time for installation
and commissioning

Simple and Intuitive

M4M makes configuration and operations simple and fast, from easy installation and wiring thanks to compact dimensions, all-removable terminals and Rogowski coils, to intuitive use and data access thanks to touchscreen color display, mobile APP and desktop software.



—
Improve reactivity and reduce
uncoordinated maintenance

Realtime supervision

M4M network analyzers make information easy to access from any area of the system, providing a comprehensive range of accurate data and notifications that enhance reactivity to the events on the electrical system and allowing to avoid overloads, outages and uncoordinated maintenance.



Full Connectivity

Cloud-based power monitoring

Connectivity-based solutions increase awareness of resources and process behaviors: asset management can then be optimized through the control and monitoring of operations and costs.

M4M network analyzers ranges allow full connectivity and easy integration of submetering and power quality monitoring features, thanks to a complete set of communication protocols, matching high-accuracy standard requirements.

M4M exploits the scalability of the ABB solution, from stand-alone visualization and commissioning via HMI or EPiC mobile APP and desktop software, to monitoring, optimization and control of the complete electrical system via ABB Ability™.

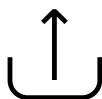
At ABB we leverage internet of things' devices to drive digital transformation of buildings, by providing a scalable portfolio for energy and asset management.



Propose a single solution to optimize costs and energy needs thanks to M4M which is automatically integrated in System pro M compact® InSite and ABB Ability™ Energy and Asset Manager cloud-solution, enabling real-time monitoring widgets, historical trend analysis and power quality reporting.



Propose projects compliant with energy efficiency regulations. High-accuracy network analyzers class 0,5 according to IEC 61557-12, connecting to the cloud complete set of electrical parameters and power quality KPIs: from THD to individual harmonics.



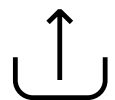
Rogowski coil acceptance to integrate measurement functionalities and power quality analysis in any existing installation, easily transmitted to the cloud also in brownfield projects.



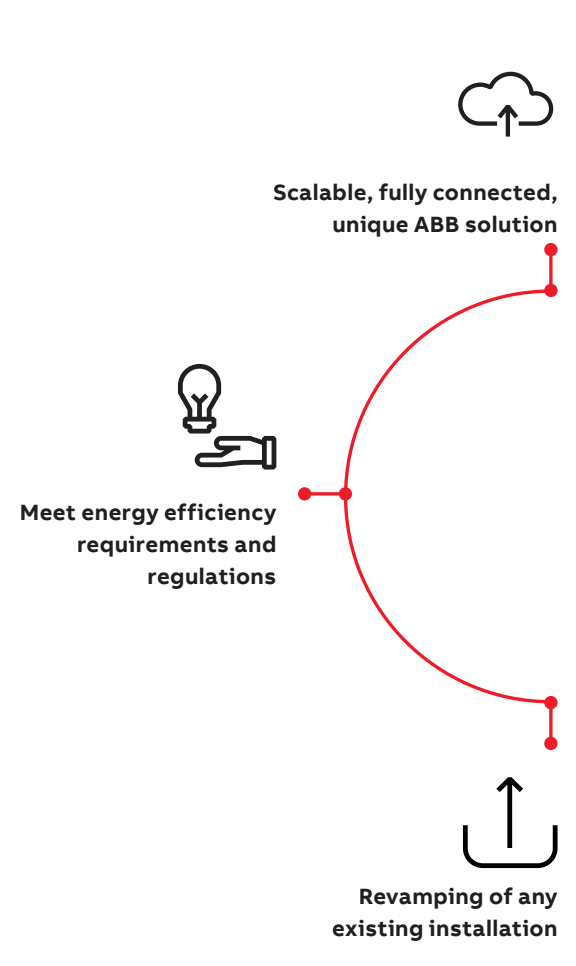
Scalable, fully connected, unique ABB solution



Meet energy efficiency requirements and regulations



Revamping of any existing installation



—
Complete integration in the ABB's
scalable solutions for energy and asset
management, to protect assets and
optimize costs and energy needs



**Full
connectivity...**

**...for integration with
ABB Ability™ system**

Simple and intuitive

Setting up a new benchmark

Thanks to its great user experience design, every user can become familiar with and competent in using the device at the very first contact.

M4M network analyzers reduce installation and commissioning time by up to 40%, thanks to easier configuration and simpler operations.

Easy installation and wiring are ensured by compact dimensions, all-removable terminals and Rogowski coils, while touchscreen color display and mobile APP integration increase the intuitiveness of use.

M4M network analyzers represent the new benchmark in terms of easiness of use and intuitiveness, throughout the whole device lifecycle.



Smart commissioning both locally and remotely, via mobile App and desktop software thanks to Bluetooth and embedded communication protocols, allowing to copy-paste the configuration of several devices and to simply integrate products in the system.



Touchscreen color graphic display and easy-to access App-structured menu make network analyzers' configuration and operation simple and quick, with interactive pop-ups and complete notifications.



All-removable terminals with vertical disposition allow fast installation and wiring of the compact 57mm-wide M4M, suitable for installation in any panel. Rogowski coils enable faster CT cabling with zero downtime.



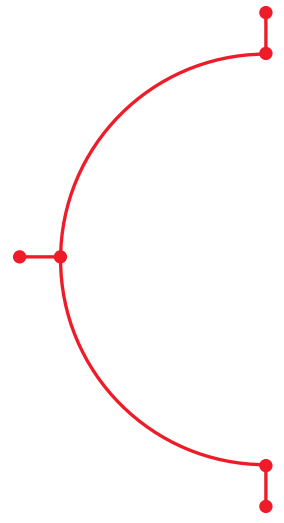
Easy to configure and integrate



Intuitive menu structure



Fast installation and wiring



—
Smart commissioning and intuitive visualization and data access, making configuration and operations simple and fast.

...to make
it work }

{ Just a few
touches...



Energy efficiency

Power from data

Buildings are responsible for 36% of global final energy consumption and nearly 40% of total direct and indirect CO2 emissions, as reported by International Energy Agency.

Building owners and engineers need to re-design electrical network of their facilities and buildings in order to considerably reduce unnecessary energy use and achieve better efficiency.



Get a turnkey solution with System pro M compact® InSite for sub-distribution management and ABB Ability™ Energy and Asset Manager cloud-solution, enabling access to data collected from electrical distribution system, including power metering data from M4M, for straightforward benchmark analysis.



Increase efficiency by avoiding penalties from utility thanks to the high reliability of measurement, compliant with main IEC accuracy standards. Datalogging of 1-year historical data, including max demand, load profiles and energy.



MID certification, allowing fiscal billing and ensuring certified and tamper-proof measurement for fulfilment of legal requirements for accounting and energy acquisition. Reduce time needed to understand data, from intuitive stand-alone product interface to the complete energy management system.

M4M can easily be integrated in the System pro M compact® InSite for sub-distribution management and ABB Ability™ Energy and Asset Manager cloud-solution, providing a unique, turnkey solution for monitoring, optimization and control of the electrical system, from protection to measurement, from field measurements to services.

M4M network analyzers provide a complete set of measurements and KPIs needed to set up a high-quality and effective energy management strategy.



Monitor, optimize and control



Quick access to energy efficiency data



Reduce energy wastage



—
Complete set of high-accuracy data,
improving the energy efficiency of the
electrical system and troubleshooting
power quality problems

**{ Improve energy
efficiency...**

**...thanks to power
monitoring }**



Real-time supervision

Taking informed actions

From 5 to 20% of production inefficiency is caused by downtime. A research conducted by [Aberdeen](#) reported the cost per hour of an unplanned downtime can cost up to \$8,600.

M4M allow you to improve reactivity to any event on the electrical system in order to avoid overloads, outages and uncoordinated maintenance.

Collected data and user-defined alarms can flow into a remote system via embedded communication protocols (Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP), making them easy to access from any area of the system.

M4M network analyzers support facility managers and building owners to keep under control the electrical system performances.



Alarms can be linked with user-defined logics to a complete set of power quality KPIs, acting on the system via embedded programmable I/O. Measurement of neutral line and calculation of ground current to avoid overloads and outages.



Remote and quick access to measured parameters, notifications and user-defined alarms from any area of the system through a smartphone, a tablet or a PC thanks to Bluetooth and embedded communication protocols, making maintenance faster.



Remote FW upgrade of M4M can be easily done via Ekip Connect software without any impact on operations, guaranteeing to have the most updated and the most secure device, at any time.



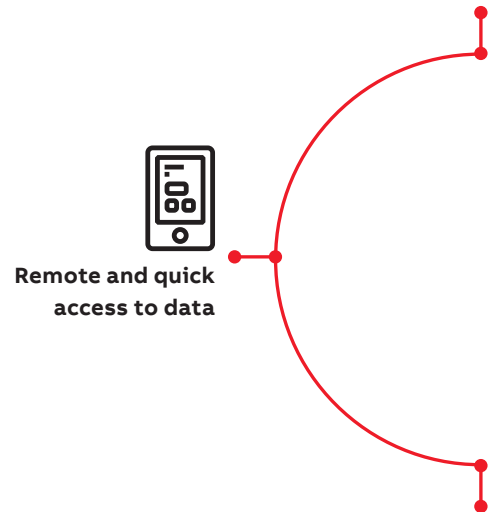
Improve reactivity to power quality events



Remote and quick access to data



Have the most updated and secure product



—
Enhanced reactivity to the events
on the electrical system,
improving operations and allowing
faster maintenance, at any time

Realtime
supervision... }

{ ...to improve
operations



Explore the M4M ranges

M4M network analyzers are available in different versions which ensure all power monitoring needs, from basic to more complete power quality analysis.



EQUIPPED WITH GRAPHIC COLOR DISPLAY AND 5 PUSHBUTTONS KEYBOARD, M4M 20 RANGE ALLOWS COMPLETE MONITORING AND BASIC POWER QUALITY ANALYSIS.



EQUIPPED WITH TOUCHSCREEN COLOR DISPLAY, M4M 30 RANGE ALLOWS COMPLETE POWER QUALITY ANALYSIS AND ENERGY EFFICIENCY EVALUATIONS.



M4M 2X ON DIN-RAIL WITHOUT DISPLAY, ENSURING HIGH FLEXIBILITY TO PROJECT SPECIFICATIONS COMPARED TO STANDARD NETWORK ANALYZERS.

MID-certification

Availability of MID approval to ensure certified and tamper-proof measurement for billing applications.

Graphic color display

M4M 20 and M4M 30 are equipped with a graphic color display and common app-based menu for an intuitive visualization.

Bluetooth-enabled

All M4M network analyzers are equipped with Bluetooth module for smart commissioning via mobile app.

Full communication

A complete set of embedded communication protocols, including Modbus RTU, Modbus TCP/IP, Profibus DP-V0 and BACnet/IP

Input/Output

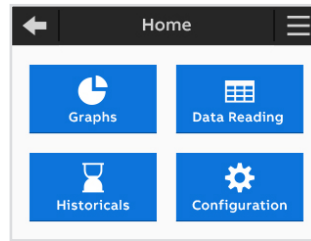
Control on the system thanks to I/O options including digital outputs, programmable I/O or programmable analogue outputs.

Datalogger

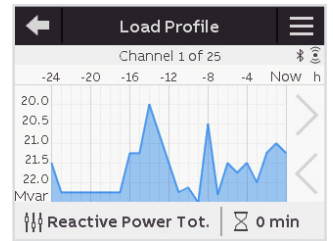
Data logging features are available, from complete notification logs to flash memory and RTC for 1-year data logging of trends.

Rogowski version

M4M Rogowski versions are compatible with ABB's R4M Rogowski coils for easy retrofit in existing installations.



01



02



03



04

01 M4M Homepage

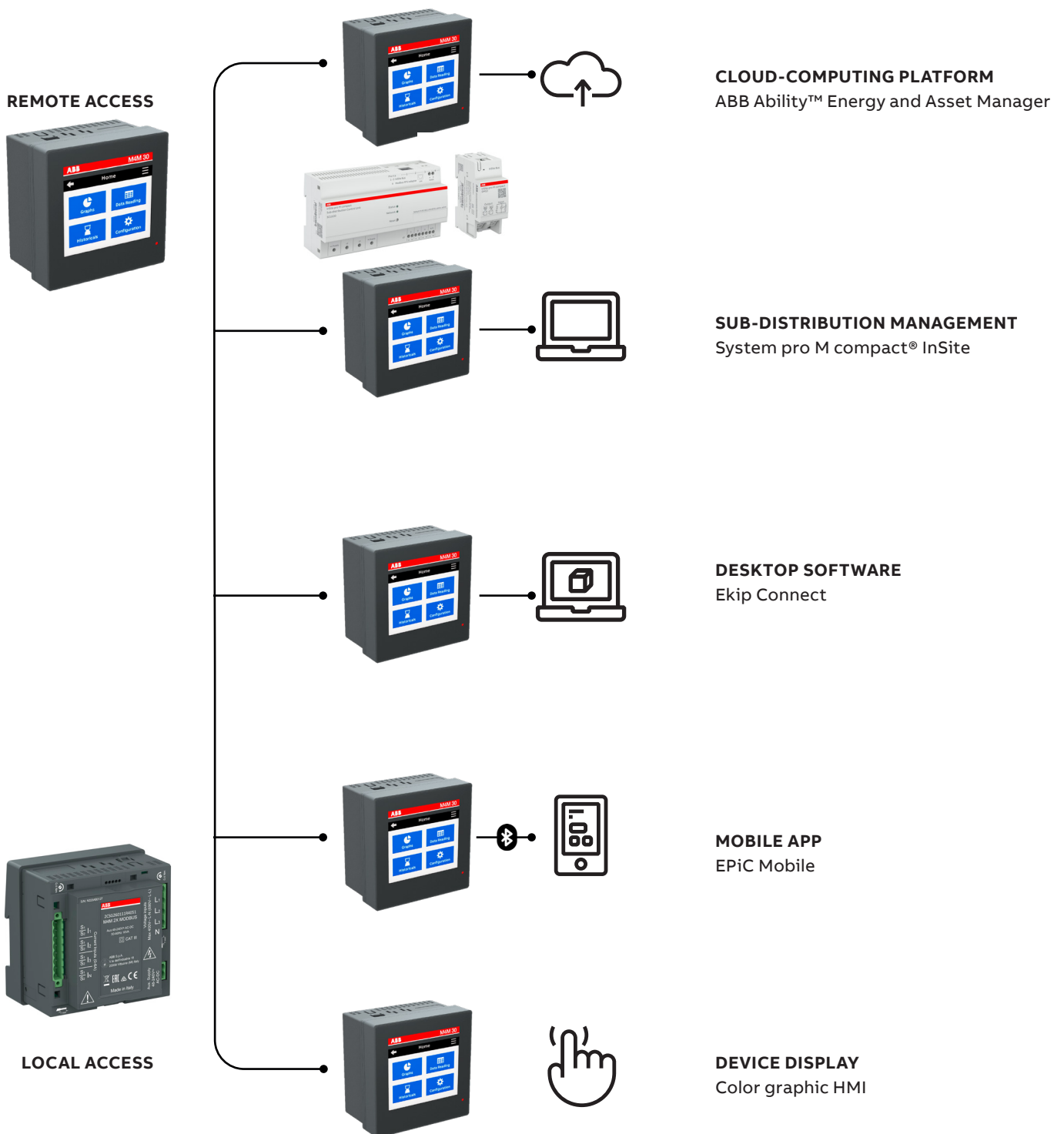
02 Trending graphs of load profiles

03 R4M Rogowski coils

04 M4M with MID certification

Access to M4M network analyzers

M4M network analyzers offer the strongest scalability to access the measurement data, from color graphic display to smartphone app and desktop software, up to webserver and cloud-platform when integrated in the ABB digital solutions.



Explore the EQ meters

Information is the key

Energy consumption awareness is key to reduce energy costs and improve energy efficiency on your machines and electrical assets. Energy meters allow to identify areas for improvement and to generate benefits for owners, facility managers and users. They enable to run smarter buildings in a more energy and cost efficient manner.

With Energy Meters you can also split the bill received from the utility within different household thanks to the MID certification.

Sub-metering provides a detailed picture of the energy consumption and the specific areas where energy is used.

EQ meters have the following instrumentation values as a minimum:

- Active power
- Voltage
- Current
- Power factor

Discover the full range of ABB products designed to monitor energy consumption and energy costs in residential, commercial and industrial buildings.



The A series

Is an advanced meter product range for installations up to 80 A direct connected or transformer connected both for current and voltage (CT/VT).



The B series

Is a basic meter product range for installations up to 65 A direct connected or transformer connected (CT).



The C series

Are products, without communication, intended for stand-alone energy measurement up to 40 A direct connected.

Explore the EQ meters

Information is the key

STEEL	BRONZE	SILVER	GOLD	PLATINUM
<p>STEEL +</p> <ul style="list-style-type: none"> • Active energy • Class 1 • Pulse Output • Alarm 	<p>STEEL +</p> <ul style="list-style-type: none"> • Reactive energy • Apparent energy • Import/Export energy • Alarm 	<p>BRONZE +</p> <ul style="list-style-type: none"> • Class 0.5 or 1 • Resettable energy register • Tariffs • Fixed I/O 	<p>SILVER +</p> <ul style="list-style-type: none"> • Clock Functions <ul style="list-style-type: none"> - Tariff Control - Previous Value - Max/min demand - Event log 	<p>GOLD +</p> <ul style="list-style-type: none"> • Harmonics • Configurable I/O • Advanced clock functions (load profiles)

—
Functionalities



Reliable in harsh conditions

Wide operating conditions:

- -25° and +70° for C series
- -40° and +70° for B and A Series
- B21/B23 112-100 can work without derating at 4.000 meter altitude (AC Voltage test)

Environmental

Classification to MID:

- M2 for Mechanical environment
- E2 for Electromagnetic environment



Optimum Interface

New versions can be integrated into ABB Ability EDCS thanks to plug & play technology.

Mbus and Modbus communication protocols are available



Complete Offer

A vast offer of functionalities, such as:

- Apparent Energy Measurement
- Tariff Control, Import / Export energy...and many more!



Global Availability

EQ meters meet different international standards :

- MID Approval
- IEC Approval for Worldwide
- GOST standards for Russia
- METAS certification on Reactive energy for Switzerland

Beyond connected

Scalable and connected solutions

—
01
Connected sub
distribution board
installed in an office

Digitalization is changing the world of energy distribution making it safer, smarter and more sustainable.

Thanks to its flexibility, also existing installations can be easily revamped within a day and without replacing any existing components, reducing installation and configuration time nearly to zero, and in turn, minimizing operational downtime costs.

—
02
Sub distribution
solutions architecture
scheme

A fundamental aspect of this is that technology is making it easier to collect useful data and to use it for analysis.

Connectivity based solutions increase awareness of resources and process behaviors: asset management can then be optimized through the control and monitoring of operations and costs.

Once the system is installed and connected, the data collected on the intuitive web user interface can be used for a variety of needs, from reducing energy consumption to identifying potential risks for operational continuity.

Receiving customized alerts and configuring automatic actions are just some of the functionalities to optimize the management of energy and assets. Constant diagnostics and real time notifications ensure total transparency over how the electrical system is performing.

It fosters a more conscious utilization of resources that improves energy efficiency and aligns with challenging sustainability targets.

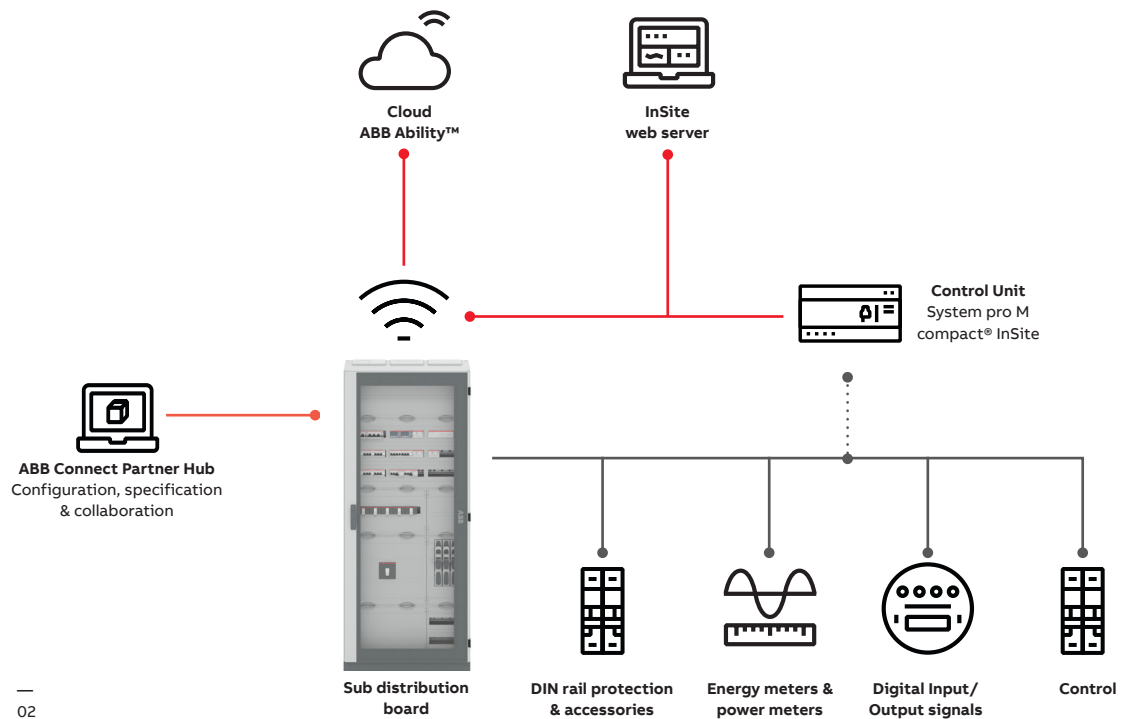
ABB's solutions for sub distribution protect, monitor, measure and eventually make your installation smart and fully connected.

Compliance with highest energy efficiency standards and complete control over the total facility consumptions to save up to 20% of energy and reduce CO2 emissions by 15%. All that is guaranteed with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.

With our scalable solutions any size of public, commercial or industrial building can easily be connected to the cloud or data can be accessed via the web server.



01



02

Beyond connected

System overview

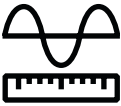


InSite web server



Cloud ABB Ability™

Easily access real time data on the InSite web server or via the cloud using ABB Ability™ Energy Manager cloud solution. Monitor and analyze data gathered from the electrical system in the applications or even on multiple sites. Control your sub distribution remotely, for instance by creating automated actions.



Energy & power meters

To perform full energy management in the electrical distribution, knowing the energy flow in the system is key. ABB's extensive portfolio of energy efficiency devices, including energy meters & network analyzers, is designed for every type of residential, commercial and industrial application. All the data can be gathered by System pro M compact InSite® automatically, connecting it to their embedded communication protocols.

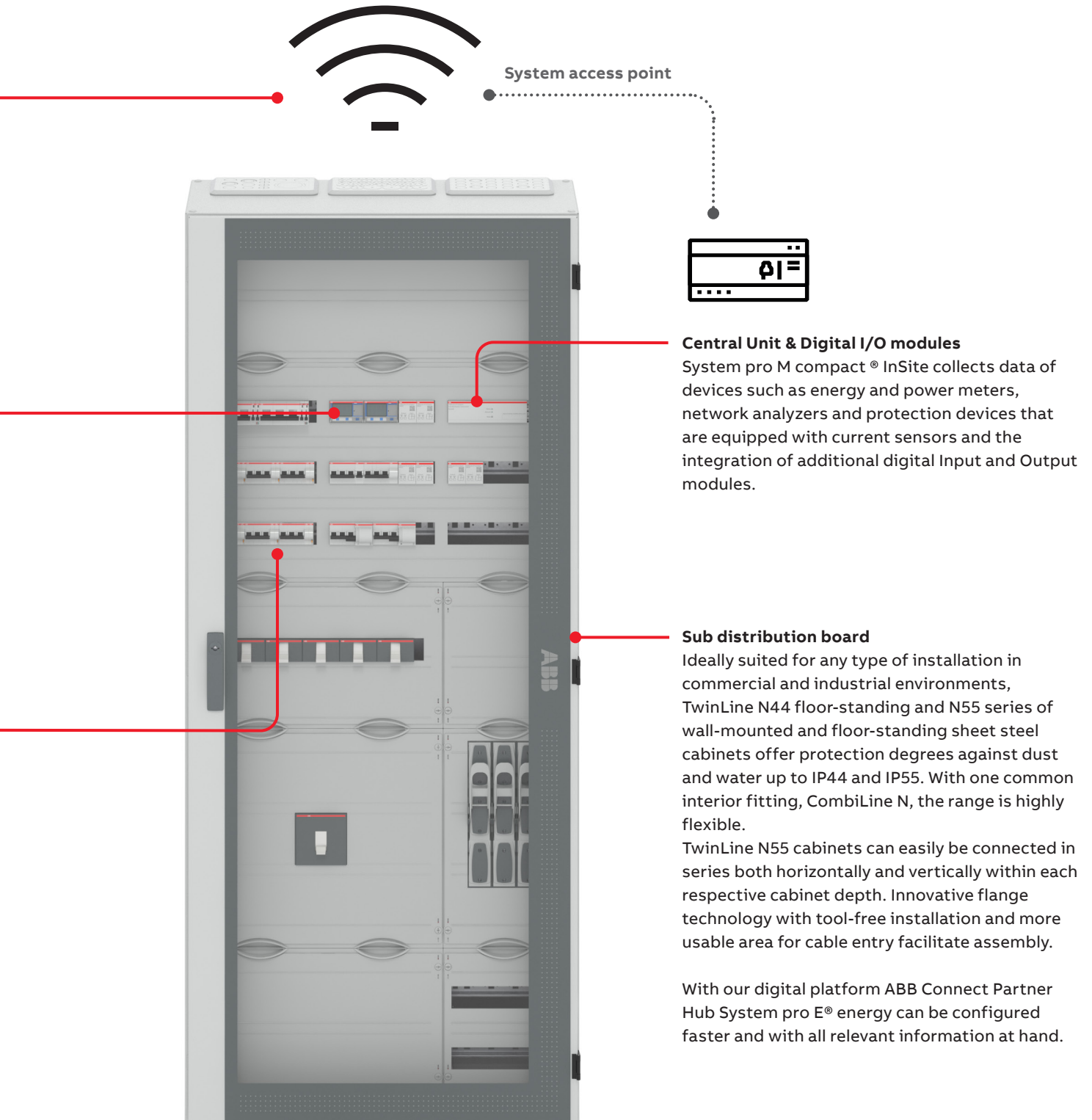


DIN rail protection devices & accessories

Complete protection can be achieved by the comprehensive ABB DIN rail protection portfolio including MCBs, RCDs, SPDs, AFDDs.

The offer is completed with a wide range of accessories: auxiliary and signal contacts, shunt trips, motor operating devices, and many more.

All the information coming from protection devices can be gathered in System Pro M compact® InSite through the digital input module, while through the digital output module it is possible to control the devices on the field manually or through automated logics



System access point

Central Unit & Digital I/O modules

System pro M compact[®] InSite collects data of devices such as energy and power meters, network analyzers and protection devices that are equipped with current sensors and the integration of additional digital Input and Output modules.

Sub distribution board

Ideally suited for any type of installation in commercial and industrial environments, TwinLine N44 floor-standing and N55 series of wall-mounted and floor-standing sheet steel cabinets offer protection degrees against dust and water up to IP44 and IP55. With one common interior fitting, CombiLine N, the range is highly flexible.

TwinLine N55 cabinets can easily be connected in series both horizontally and vertically within each respective cabinet depth. Innovative flange technology with tool-free installation and more usable area for cable entry facilitate assembly.

With our digital platform ABB Connect Partner Hub System pro E[®] energy can be configured faster and with all relevant information at hand.

Safe and reliable energy distribution

Find the perfect fit for every application

ABB's safe, smart and sustainable solutions for sub distribution are designed to improve energy and facility management in all types and sizes of commercial and industrial buildings.

Thanks to their scalability, our flexible and connected solutions can be tailored to businesses' specific requirements.

- **Small commercial buildings**

Existing installations of small shops, hotels, offices and restaurants with few panels can be easily upgraded with plug and play assembly.

Total transparency over the complete energy distribution system and utility consumption like gas and water improves energy management and reduces operational costs significantly.

- **Large commercial buildings**

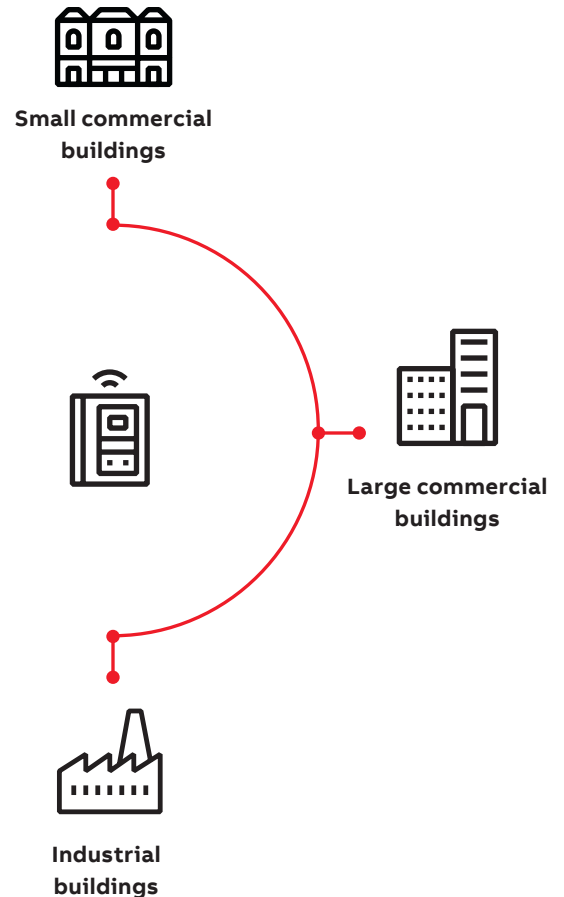
Office towers, mixed use commercial buildings, airports, shopping malls, hospitals or large hotels can be managed more efficiently.

Sub-metering and energy costs allocation of different occupiers, for instance single stores in a shopping mall, can be integrated with the collected sub distribution data into the local webserver or cloud platform that manages the overall site.

- **Industrial Buildings**

Our scalable solutions ensure service continuity and predictive maintenance for forecasts developments, particularly in industrial areas where it is important to reduce or prevent unplanned outages and related costs, for example in food and beverage production lines.

Supervision systems or more complex installations that are already in place such as SCADA or BMS can easily be complemented.





Beyond connected, no matter the project stage

Whether you're retrofitting an old building, adding a new installation or any stage in between – we offer flexible and scalable solutions to save time in all stages of the design process.

Meet your needs for improving energy impact, reducing supervision costs and adding value to the structure.

Using safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- **Scalable, fully connected solutions** that can be implemented across all project stages
- **Increased efficiency** of electrical systems and compliance to highest energy efficiency standards to save up to 20% of energy and to cut CO2 emissions by 15%
- **Replicable and easy configuration** to save time comparing product features and select the right solution
- **Updated and secured system** thanks to FW update to ensure data security guaranteed by encrypted SNMP V3 and SSL certificate





Category	Value 1	Value 2	Value 3	Value 4
Item 1	93,2	651	108	0
Item 2				
Item 3				
Item 4				
Item 5				
Item 6				
Item 7				
Item 8				
Item 9				
Item 10				

Beyond connected, with simple and intuitive commissioning

Flexible assembly of sub distribution boards, optimized wiring and smooth coupling of devices to speed up the installation process.

Whether you're installing new systems, integrating electrical plants, or revamping pre-existing electrical systems - we offer scalable solutions that improve installation efficiency and save on time and costs without impacting the existing design configuration.

Discover how easy and effortless installation can be with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- **Retrofit existing installations within one day** with zero component replacement
- **Quick assembly** and easy installation
- **Fast and error-free configuration** thanks automatic recognition of installed devices , directly communicated to the system access pointc
- **Connect** the system **to the cloud** in only 10 minutes
- **Configurations** of similar systems **can be transferred** between one another



Beyond connected, always one step ahead of maintenance

Easily access data from wherever you are and effectively manage the consumption of your facility.

Whether it's an old building, a new building or at any stage in between – we offer simple solutions to save on time and costs through configurable automatic control to optimize facility and energy management.

Improve energy efficiency and increase the value of the facility by up to 5% while lowering maintenance and operational costs with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- **Monitor and check real-time** or historical data from both protection and measurement devices online
- **Customized alerts**, automatic actions and **easy access to data** enabling early detection of potential issues and allowing fast reactions
- Guarantee **continuous operations** by proactively planning maintenance interventions to avoid unexpected downtime costs and improve the facility value by up to 5%
- **Configure and program automatic actions** to promptly react to selected events with no need of manual interventions and hence, optimize facility management
- **Manage the consumption** of the facility to **reduce operational costs** save up to 20% of energy





ABB Connect Partner Hub

Far more than a conventional website, with ABB Connect Partner Hub you can interact with ABB, improve your knowledge and collaborate with other professionals.

It helps to find product information, connects you directly to an online network of expert contacts and a range of digital services such as online training, project and plant management.



Create, design and collaborate in real time

Build a project to bring your designs to life with your partners and clients. Share documents with fellow collaborators, import BOM, view activities in real time and fast track your plans to implementation.



Share your feedback and ideas with us

We are curious to know your ideas. Leave your feedback and suggestions and help us improve our products and solutions.



Design and develop your solution, in one place

Create your own applications for the platform by making the development process simpler, produce tailored apps for each customer and integrate new features and provide added value for your clients.



→ [HTTPS://PARTNERHUB.CONNECT.ABB.COM/](https://partnerhub.connect.abb.com/)

InSite web server

Once you made your sub distribution board smart by installing System pro M compact® InSite you can connect it to the local network so data gathered by its control unit, digital I/O modules and current sensors can be accessed via the web server. Access to several pre-configured pages is provided automatically.

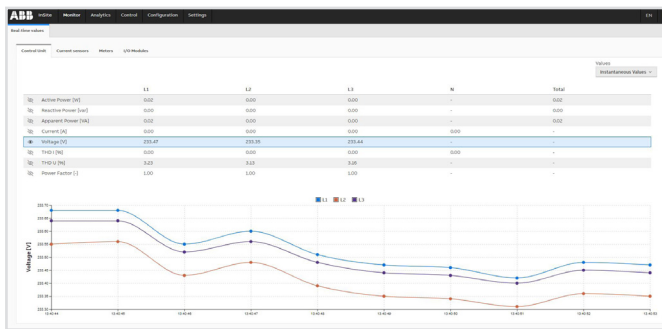
These allow you to monitor, compare and structure your real-time and historical data. Also, automatic actions can be set to react promptly to selected events.

In the InSite web server you will find the following structure:



Monitor

Access real-time data of all the devices available in the system (Control Unit, I/O modules, meters, etc.)



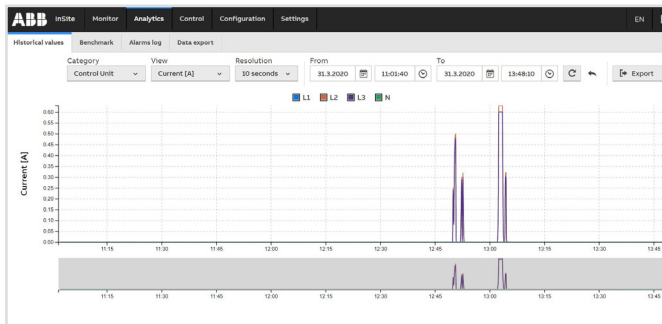
Control

Rename channels or switch them on or off remotely.

ID	Channel tag name	Channel type	Device type	Status	Action
98.1	Module 2 Port 1	-	-	Open	[Icon]
98.2	Module 2 Port 2	-	-	Open	[Icon]
98.3	Module 2 Port 3	-	-	Open	[Icon]
98.4	Module 2 Port 4	-	-	Open	[Icon]

Analytics

Analyze data, access historical values, access alarms, export data of selected periods and compare products.



Configuration

Change the hierarchy of the devices, set alarms, create automated actions using if-then logics and thresholds.

Edit selected automation

- Name: Avoid current peak
- Category: Control unit
- Device: L1
- Type: Crossing
- Measure: I
- Threshold [A]: 300
- Time delay [s]: 0
- Send alarm: [Icon]

THEN:

- Device: Output module 1
- Channel: Short trip SOC A2
- Action: Open

ABB Energy Management

ABB Ability™ Energy Manager

ABB Ability™ Energy and Asset Manager is the state-of-the-art cloud solution for monitoring, supervising and analyzing site equipment, as well as the site’s electrical distribution system, resulting in improved performance, efficiency and safety. Through its scalable and flexible approach, ABB Ability™ Energy and Asset Manager ensures full-range integration of main electrical low- and medium-voltage equipment installed in the distribution and sub-distribution switchboards. With a single easy-to-use interface, ABB Ability™ Energy and Asset Manager assists the user by means of a cloud computing or hybrid platform, enabling analysis of relevant data and optimization of installation.

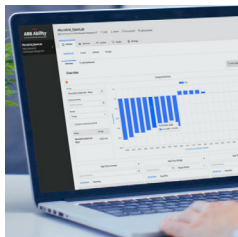


ABB Ability™ Energy and Asset Manager also provides access on a multi-site level, allowing you to monitor and compare the performance of different facilities at the same time. It allows profiling of users according to the level of access they require.

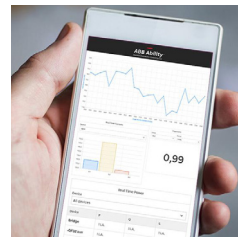
A new approach to energy and asset management

With an intuitive web app interface accessible via smartphone, tablet or PC, ABB Ability™ Energy and Asset Manager makes it simple to:

In addition, upgrades and changes can be organized at any time via the ABB Ability™ Marketplace. With just a click, the customer can customize their solution according to their needs anytime, anywhere.



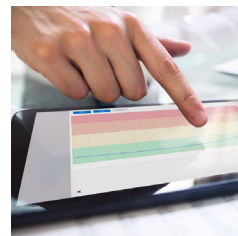
Monitor
Oversee site performance, supervise the electrical system and allocate costs.



Explore
Visualize the system structure, verify assets health and get actionable insights following predictions and prescriptions.



Analyze
Schedule and analyze automatic data exports, improve the use of assets and make the right business decision.



Act
Set up alerts to notify key personnel while remotely implementing an effective efficiency strategy, managing maintenance activities and scheduling next actions.



→ NEW.ABB.COM/LOW-VOLTAGE/LAUNCHES/ABB-ABILITY-EDCS

CMS System overview

Designed down to the finest detail

The quality of a measurement and monitoring system depends on the strengths of the individual components and how well they interact. ABB's new CMS sets new and high standards.

Compactness, technology, measurement results, user friendliness and flexibility - every component and every feature of the CMS has been fully optimized in terms of practicality and functionality.

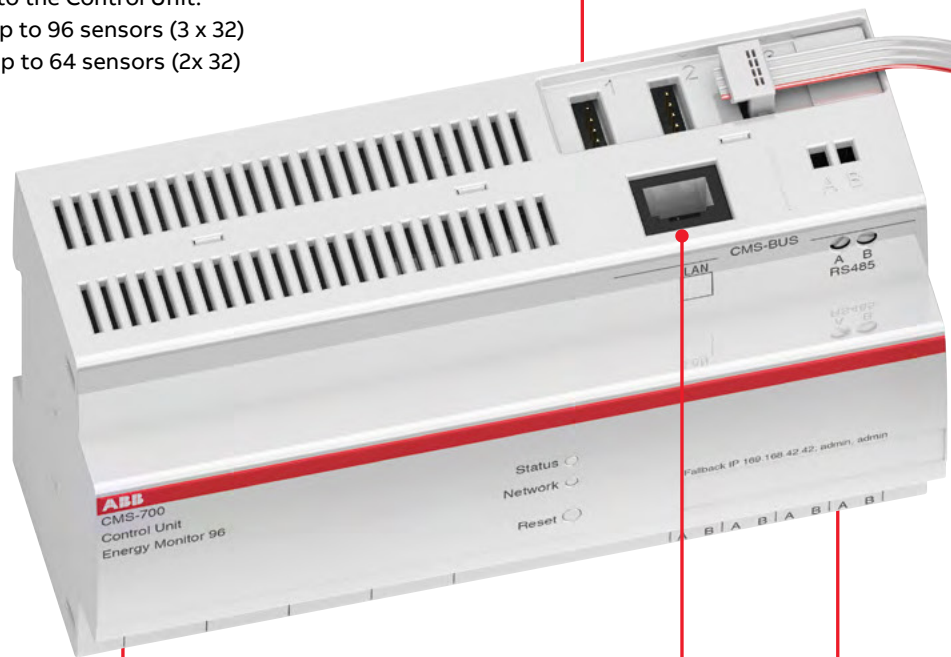
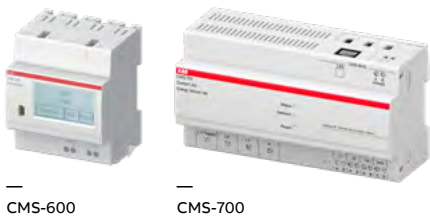
CMS-700 control unit in combination with open core CMS sensors.

CMS bus interface

Each bus interface allows up to 32 sensors connected to the Control Unit:

CMS-700: up to 96 sensors (3 x 32)

CMS-600: up to 64 sensors (2x 32)



Control Unit

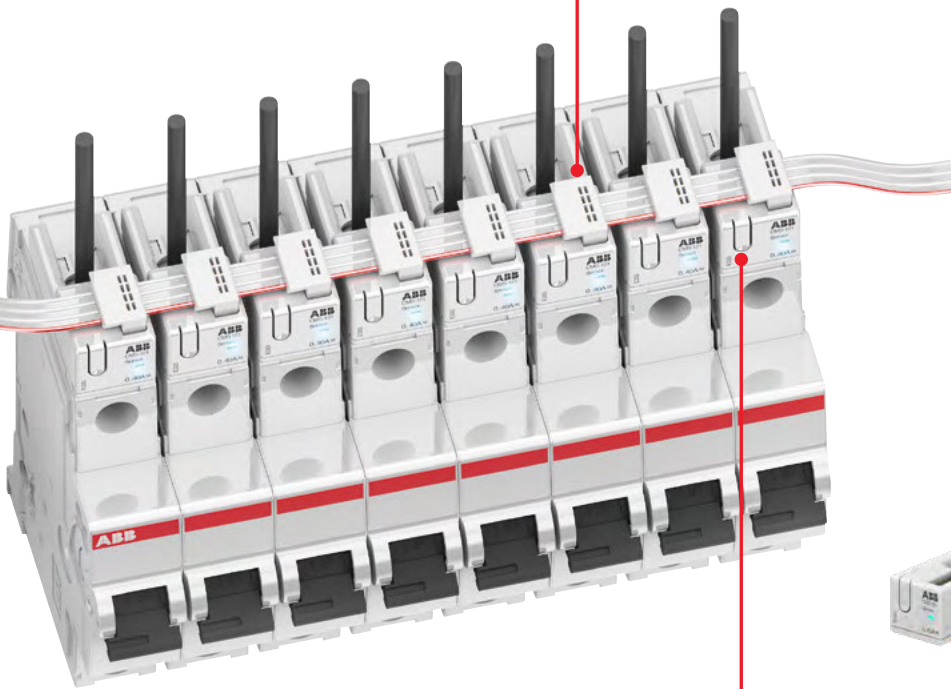
The control unit evaluates the measurement data picked up by the sensors, and makes it available via the provided interfaces.

Two different units are available depending on the application: CMS-600 and CMS-700.



Connection technology

Connecting the sensors to the control unit is extremely easy and requires no special tools. All sensors are connected to the control unit via a flexible flat cable and insulation piercing connectors. The positioning of sensors can be fully customized and placed where measurement is required.



Sensors

CMS sensors can be placed anywhere in the system, without any limitation. Easy initializing is guaranteed by the unique ID assigned to each sensors via Control Unit in just a few simple steps. All measurement functions are available right after commissioning.



Serial interfaces

Depending on the selected control unit, the following communication interfaces are available: RS485 (Modbus RTU), LAN (TCP/IP and Modbus TCP) , SNMP v1/v2 and v3 encrypted.

The web server integrated in the CMS-700 makes it possible to display the values via any Internet browser and to automatically export the files (via e-mail or FTP server).

CMS-700 Control Unit

Plug & Play energy monitoring

The CMS-700 control unit is the reliable solution for maximum transparency of energy consumption.

Using CMS-700 it is possible to measure and calculate electrical parameters from both the mains and the branches, in order to provide the most comprehensive set of information on the system.

A maximum of 3x32 sensors can be connected to the CMS-700, allowing to simultaneously obtain AC and DC current as well as active energy from up to 96 branches.

At the mains side, the control unit allows to access the complete set of measurement data.

Complete set of embedded communication protocols is available to ensure smooth network

implementation: Modbus RTU, Modbus TCP/IP and SNMP, including encrypted SNMP v3 for utmost data security.

As well as helping in the identification of potential savings related to energy consumption, CMS-700 allows to detect risky situations before they lead to service interruptions or load failures, improving system reliability and supporting continuous operations.

Smart commissioning of the system is guaranteed thanks to the CMS-700 integrated webserver, with no need of any external software to put into operation the CMS system.

Energy monitoring using the CMS-700 web server interface





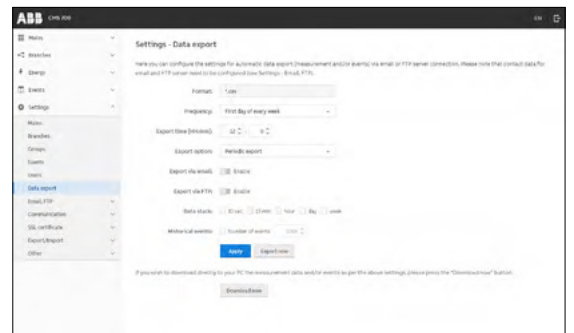
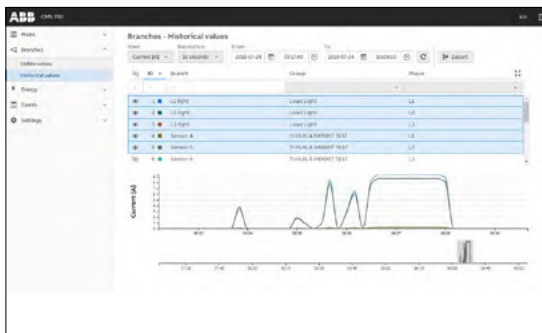
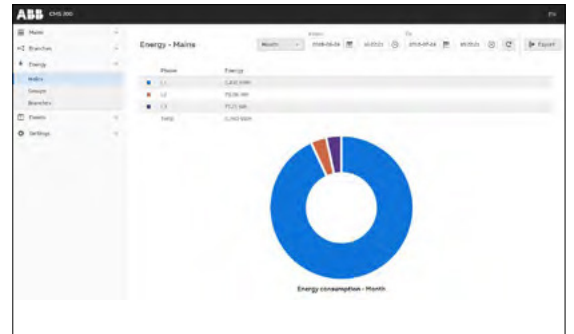
Access to CMS-700

Integrated web server

Thanks to the CMS-700 built-in web server, any web browser can be used to carry out the smart commissioning of the system, as well as easy visualization of online and historical measurement data.

Every parameter from both mains and branches can be visualized as instantaneous or historical value, with intuitive graphs that allow the user to quickly analyze the measurement data. Data export to CSV files, mail or FTP is possible, according to user requirements.

The integrated alarm function can be fully managed via the webserver ensuring quick notification, via email or FTP, to unusual system status. This improves reactivity to potential issues and supports continuous operations. The whole commissioning phase of the CMS system can be carried out via the CMS-700 WebUI, from the sensor identification to the automatic data export settings. Moreover, the WebUI enables the FW update of the control unit at any time, ensuring to have the most advanced functionalities and the most secure device.



Access to CMS-700

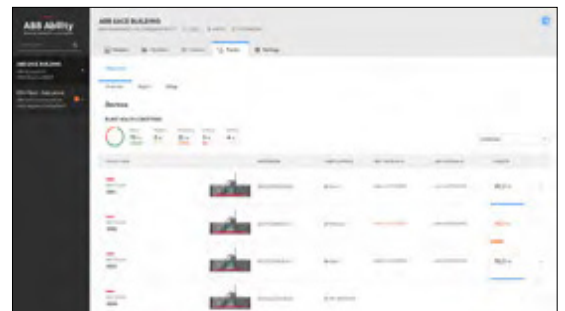
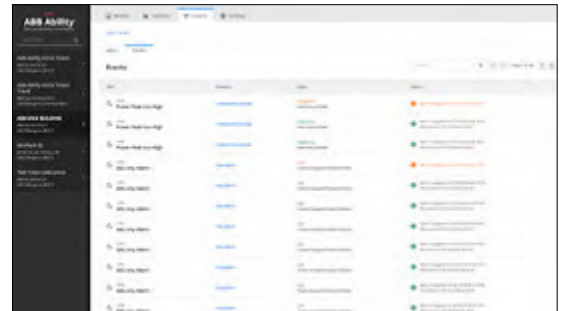
ABB Ability™ Electrical Distribution Control System

CMS-700 is automatically recognized in the ABB Ability™ Electrical Distribution Control System, allowing the easy integration of its functionalities via the ABB Ability™ cloud.

To set up the network and cloud connectivity in a new installation – or to upgrade existing facilities – just “plug & play” modules or devices are needed. The cloud connection for the whole switchboard can be established via Emax 2 or Ekip UP equipped with Ekip Com Hub, or through Ekip E-Hub DIN-rail mounting module.

The ABB Ability™ Electrical Distribution Control System is an innovative cloud-computing platform designed to make asset monitoring, control and optimization simple, gathering data from the devices installed in the power distribution system, including CMS-700.

The cloud-based platform also provides access on a multi-site level, simultaneously monitoring and comparing the performance of different facilities, as well as collecting and exporting data and historical trend analysis with on-demand queries or scheduled automatic reports.



CMS-600 Control Unit

Compact current monitoring

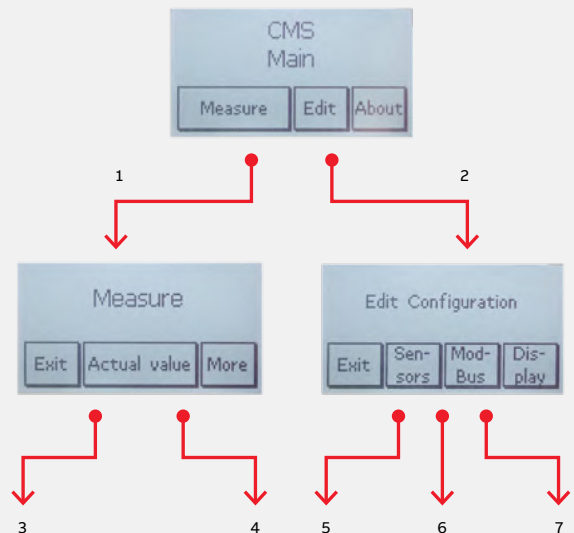
The CMS-600 control unit is the compact solution for professional monitoring of the currents of each individual line.

The CMS-600 is able to measure AC and DC currents of up to 64 branches. Up to 64 sensors can be installed on 2 independent lines to each control unit.

For quick and easy use, the control unit is equipped with an illuminated touch display that simplifies the parameterization and control of the sensors. RS485 Modbus RTU interface allows users to remotely query and process measurement data, making the CMS-600 control unit easy to be integrated into an existing Modbus architecture.

Easy navigation of CMS-600 is ensured by the highly intuitive touch screen display. It takes just a few clicks to access all the desired functions and menus. User does not require any special training neither for system commissioning nor for operation.

Ideal in simple monitoring applications, CMS-600 can be used to monitor current level of individual lines in order to easily detect load level and overload conditions.



Transparent navigation menu
 1 Measurement | 2 Configuration | 3 Display of current measurement values |
 4 Display of max./min. values and threshold | 5 Initialization/parameterization
 of the sensors | 6 Modbus configuration | 7 Display settings

CMS sensors

High-level performance in a tiny space

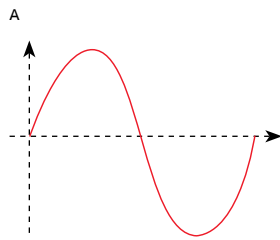
Available in 18 or 25mm versions, CMS sensors guarantee maximum performance with ultimate compactness.

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

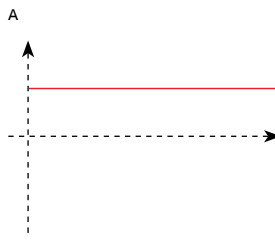
Reduced size, high performance: alternating (AC), continuous (DC) or mixed (TRMS) currents - CMS sensors detect and measure all types of currents up to 160A (TRMS).

measurement data is transmitted in digital format to the control unit via the bus interface. This minimizes the amount of cables required in the switchboards and maximizes the reliability of the measured value transmission.

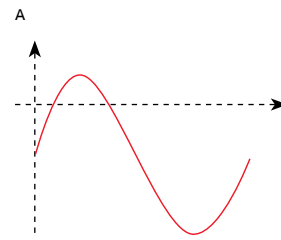
Since each sensor is equipped with its own microprocessor for signal processing, the



Alternate Current (AC)



Direct Current (DC)



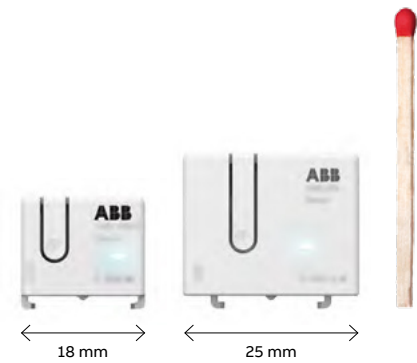
Mixed current



Open- core sensor



Solid-core sensor



Open-core sensors

The special U-shape form of the open-core sensors allows the retrofitting of existing installation, making sensors easy to adapt to different applications while keeping continuity of service. AC accuracy* of $\leq \pm 1,0 \%$ allows open-core sensors to be used in various monitoring applications.

Solid-core sensors

Available in 18mm and 25mm types, solid-core sensors offer AC measurement accuracy* of $\leq \pm 0,5 \%$. This accuracy makes solid-core sensors suitable for all applications where high measurement precision is needed.

Maximum compatibility

Mounting flexibility for simple integration

Depending on the application, you can choose between two sets of sensors - one specifically designed for ABB installation devices, the other with an universal design to be installed on cables or DIN-rail.

Sensors for ABB devices



System pro M installation, SMISLINE

The sensors of the CMS-120LA and CMS-120FH series can be used for easy retrofit installation on S200 MCBs, SMISLINE devices and E90 fuseholders (1000VDC).



Mounting on S800 devices

The sensors of the CMS-100S8 and CMS-200S8 series can be mounted on all S800 high-performance switches with cage terminals.

Universal sensors



Mounting on DIN-Rail

The sensors of the CMS-120DR, CMS-100DR and CMS-200DR series are installed directly on a DIN rail using an enclosed adapter.



Clamp mounting on the cable

If space is a problem, the sensors of the CMS-120CA series, CMS-CMS-100CA and 200CA can be fixed directly on the cable to be measured using clamps (not supplied).

System pro M compact® InSite

Connected solution for sub distribution

System pro M compact® InSite is a range of connected devices to support energy and asset management in electrical distribution.

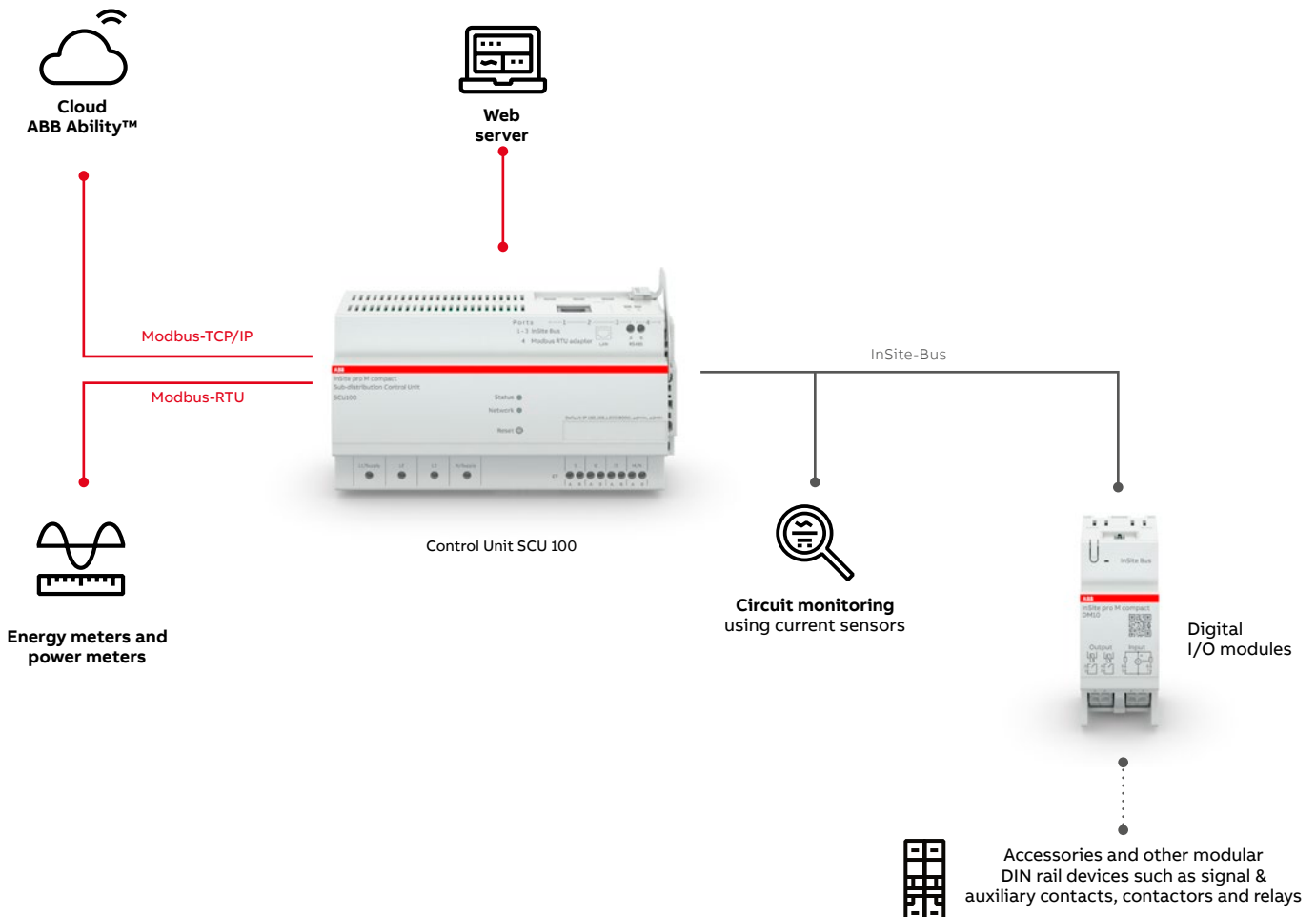
The solution delivers highest data security standards (encrypted SNMP V3 and SSL certificate) as well as continuous upgrades thanks to regular firmware updates. Central to the System pro M® InSite range is the SCU100 control unit, that has been specifically developed to allow users to better manage energy and assets in sub distribution boards. It can gather data from up to 16 energy and power meters, as well current sensors for branch measurement.

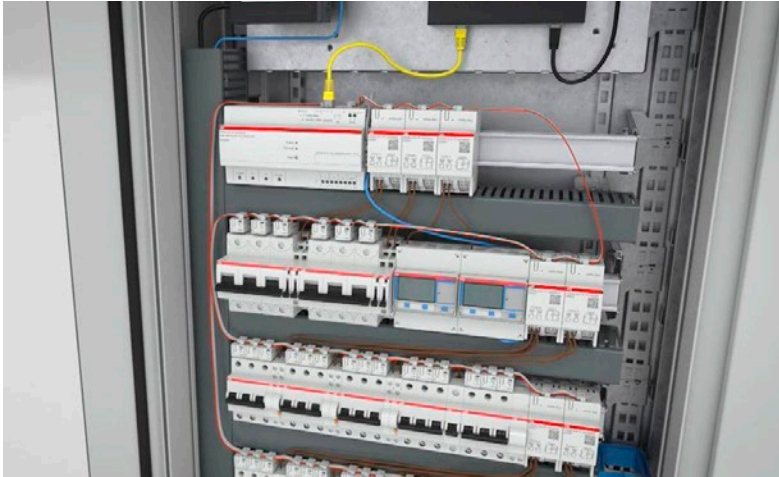
ABB's ready-made, pre-assembled InSite kit packages are designed to make sub and final electrical distribution smarter with minimal effort. Any size of installation in commercial or industrial application can easily be upgraded,

reducing installation and configuration time to nearly zero, and in turn, minimize costly operational downtime.

To enable monitoring and control of the complete energy distribution system, the range is completed with a flexible choice of input and output modules, which can be easily connected to ABB's System pro M compact® accessories of MCBs and RCDs, as well as other DIN-Rail products with digital inputs or outputs. They can also be connected to pulse meters – such as gas or water – to collect utilities consumption.

Based on a wide set of data, available functionalities range from simple monitoring of the installation to analysis of historical data, customized alarms and implementation of automated actions to reduce energy consumption, identify potential risks and ensure operational continuity.





What to include in the panel:

- 1 Control Unit
- 2 Digital I/O modules
- 3 Current sensors
- 4 Flat cable

1 Control Unit SCU 100

Single access point in the sub distribution board, data aggregator and collector from field devices

4th port for Modbus RTU to enable connection of meters

Firmware upgrade to communicate with:

- Classic accessories connected through I/O modules
- Sensors, energy and power meters in Modbus RTU
- Current sensors

Modbus TCP/IP and RTU to communicate to supervision system, enabling remote availability of collected data

LEDs for visual understanding of correct /incorrect installation and functioning

Internal power supply to enable communication and correct functioning of sensors and I/O modules

2 Digital Input/Output modules DM00, DM10, DM11

Connect in the connectivity system classic accessories from existing and future ABB ranges and 3rd party ranges.

Compatibility with water/gas/heat meters with pulse outputs

Input to receive data from hard wired connecte devices (accessories, meters)

Output to act on connected accessories

Connection to InSite bus via same type of connectors as existing sensors

Assignment of ID address via dedicated button and analogous procedure as for sensors

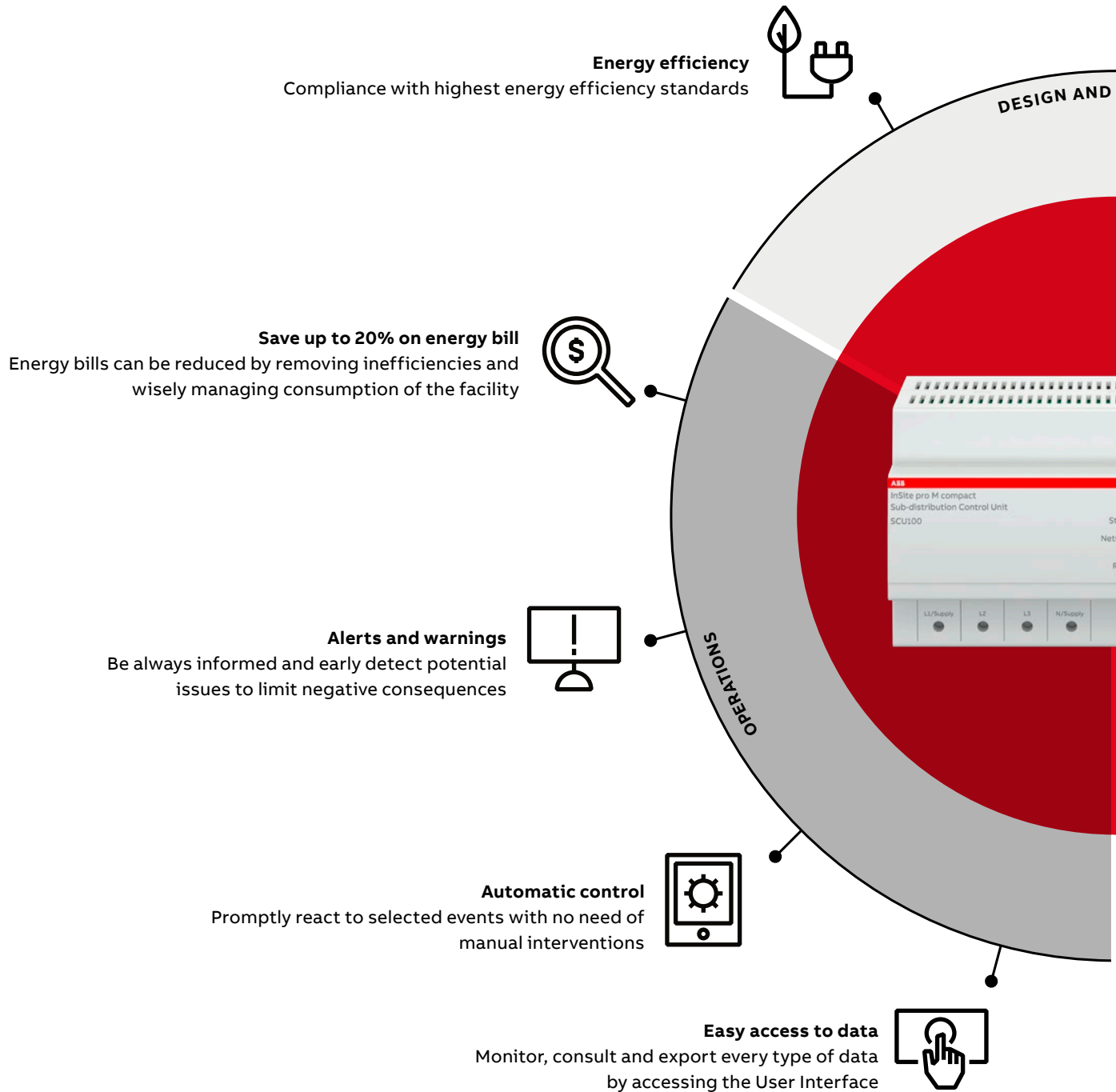
No external power supply to enable communication and correct functioning

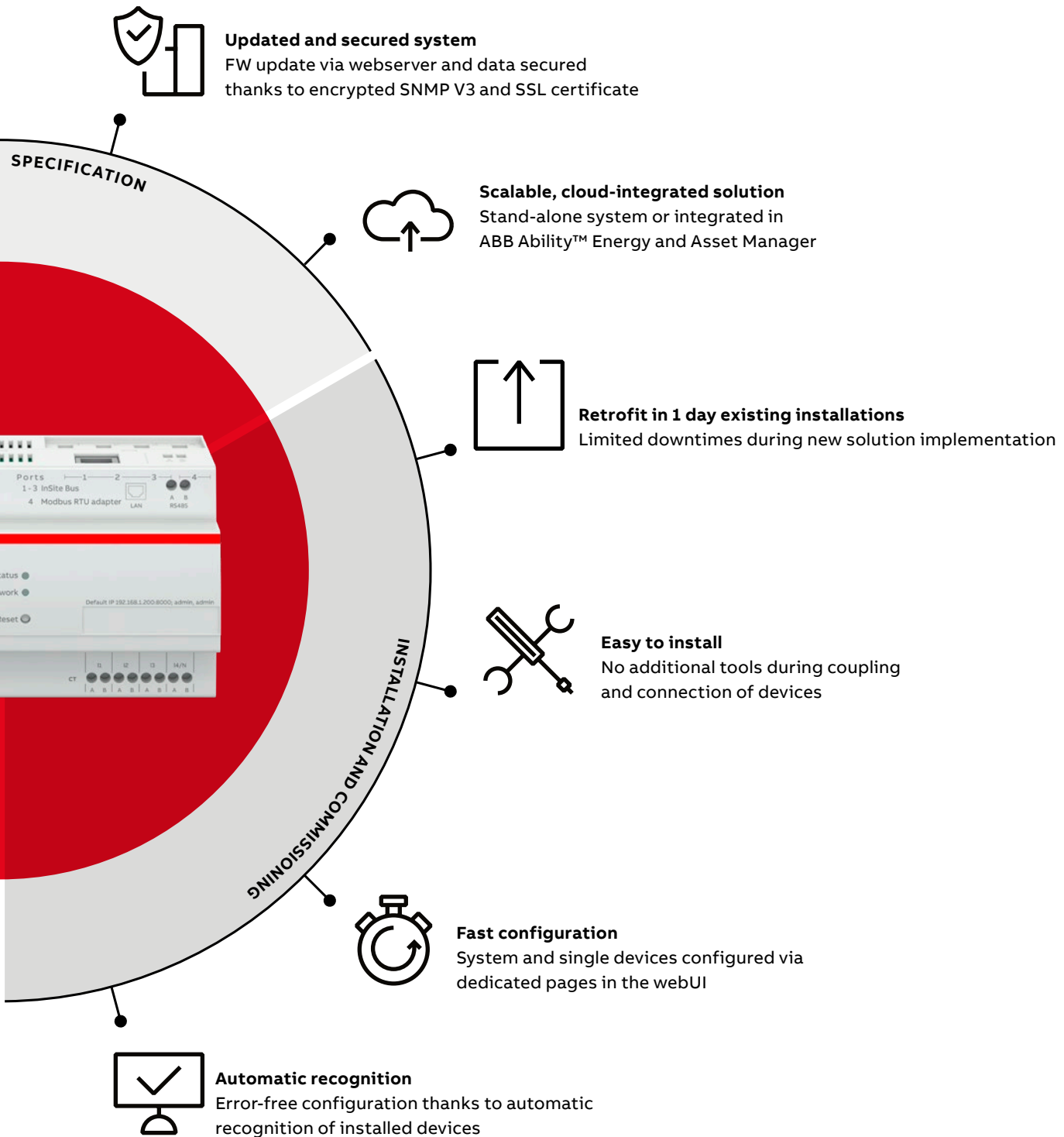
Visual indication of correct installation and functioning

Screwless terminals to ease installation procedure

System pro M compact® InSite

Main benefits for customers





Applications

Flexibility and modularity

The CMS range offers users a simple and compact solution to guarantee energy efficiency and up-to-date system status, responding to the specific needs of different customers.

The design of the CMS system is based on extreme flexibility and modularity, making it suitable for applications in different sectors.

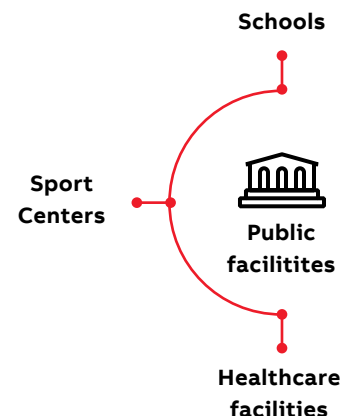
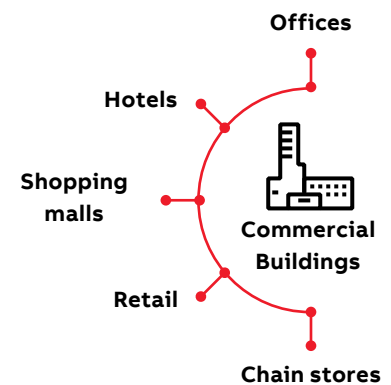
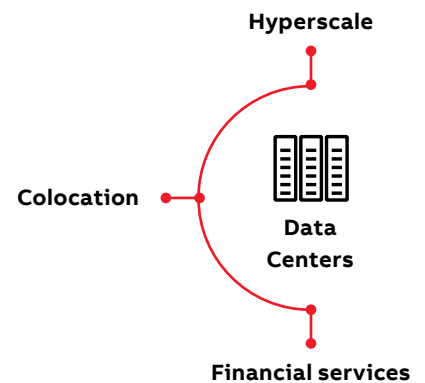
In **data centers**, CMS system can be installed to get clear visibility of energy consumption and detect risky situations before they lead to service interruptions or load failures.

Retrofitting at single branch level allows to carry out brownfield extension in existing installations at any time.

Commercial and public buildings can also leverage the CMS system to achieve higher energy efficiency and to have more detailed monitoring of their facility.

Offices, shopping malls, hotels, retail or chain stores can increase their awareness of energy consumption to improve performance.

Public facilities, such as schools, sport centers and healthcare facilities, can secure service continuity and develop predictive maintenance forecasts.





Applications

Current and power monitoring in data centers

Within critical power applications such as data centers, CMS-700 provides a reliable solution for measuring individual branch load circuits and presenting energy and power dashboards. In addition, it protects data centers against current-related system outages with an integrated alarm function.

In this example the busbar trunking system, mounted overhead or under the raised floor of the server racks, is equipped with master and slave plug-in tap-off units. The proposed solution, suitable for new and existing installations, includes CMS-700 control unit in the

master tap-off unit to measure the incoming side. Open-core CMS sensors are integrated into daisy-chained slave tap-off units to carry out energy monitoring of every single phase to the rack PDU.

The integrated webserver ensures an easy configuration and allows you to remotely check realtime online values as well as historical data without any additional external software. On the other hand, Modbus and SNMP communication protocols allow the easy integration into higher level systems like DCIM or SCADA.



Design and Specification

Through this solution, the customer can simply and easily ensure optimal load distribution and efficient energy consumption



Installation

I can easily extend the solution when expanding the busbar trunking system, as well as retrofit into existing installations.

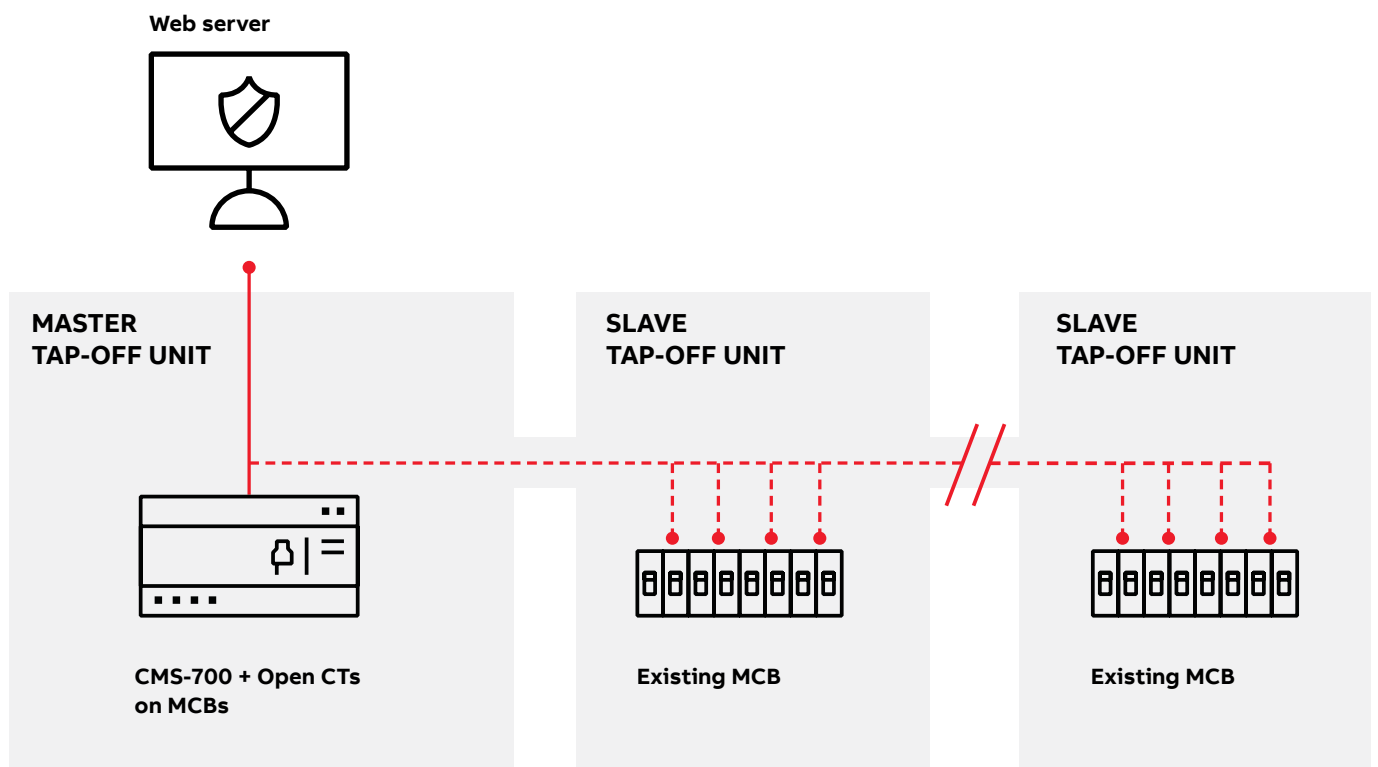


Operation

I can reduce downtime and improve system reliability by early detecting potential issues.



- RJ45 Ethernet cable
- - - CMS bus



Applications

Multi-site supervision for chain stores

Stores can be situated as single locations or as a shop in a shopping mall.

Current solutions gather data from all the different stores in order to analyze energy management, monitor energy consumption and improve energy efficiency. To aggregate and compare data from multiple locations, a cloud-based solution is essential.

Monitoring any store requires only an analogue installation. Water and gas consumption data

are gathered from dedicated meters and sent digitally to the E-Hub.

Electrical data and measurements are collected from energy meters, breakers and CMS-700 devices and transmitted to the E-Hub via Modbus RTU. At the core of the solution, the Ekip E-Hub mounted on the DIN rail gathers all the incoming data.

Data from all the stores then goes to the cloud via Ethernet or wireless connections for further analysis.



Design and Specification

While guaranteeing fast payback, this solution can ensure compliance or higher class on efficiency standards.



Installation

Deploying a multi-site monitoring solution, I can reduce installation time and components.

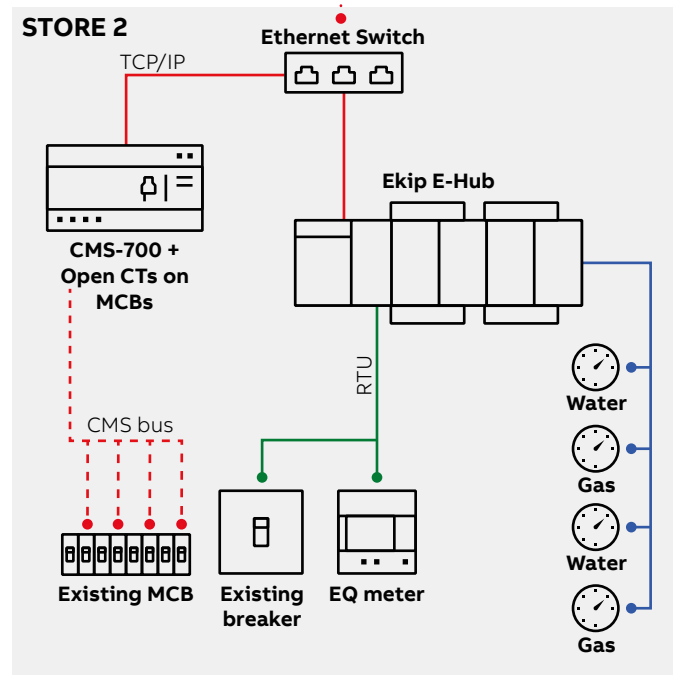
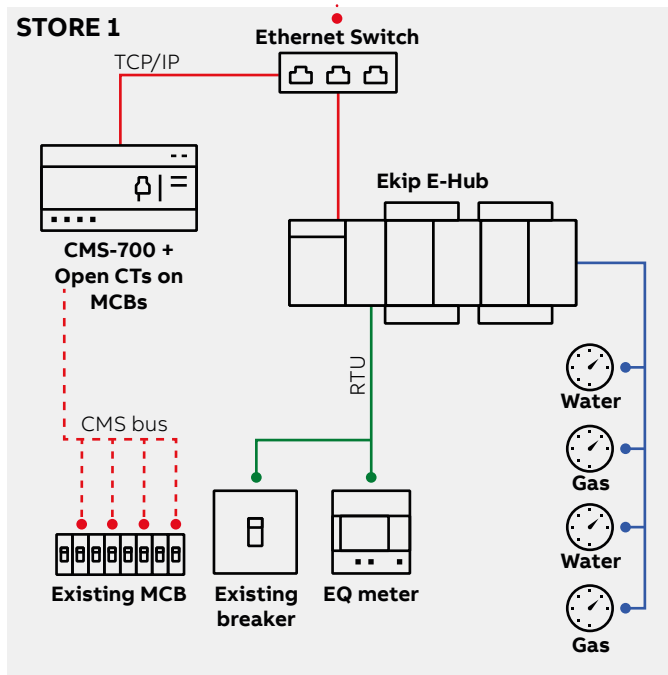
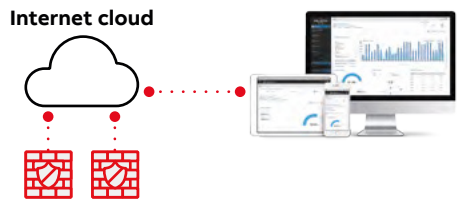


Operation

Introducing a single intuitive digital solution, I can guarantee continuous operation and allocate effectively energy consumptions.



- Power
- RJ45 Ethernet cable
- Digital Inputs
- Modbus RTU
- - - CMS bus



Applications

Retrofitting and upgrading public buildings

For public buildings such as schools, a retrofit solution can bring rapid benefits without replacing existing components.

With accurate performance monitoring of the installation, devices can be managed more efficiently, producing savings in maintenance and energy costs.

In this scenario, the Ekip UP and the Ekip E-Hub collect data from field devices.

The Ekip UP is connected to the breakers and, via an Ethernet switch, to the Ekip Signalling.

The breakers measure energy and power quality, while Ekip Signalling modules send information about status, alarms and the number of operations.

The CMS-700 in the panel is responsible for branch monitoring and is connected to the Ekip UP via Modbus TCP/IP. In order to monitor consumption, another panel is provided with the Ekip E-Hub to gather data from gas, water and energy meters and from breakers.

This data, together with information collected by the Ekip UP, then goes to the cloud and is made available on ABB Ability EDCS for further analysis.



Design and Specification

I will easily upgrade the existing facilities, ensuring a very fast payback.



Installation

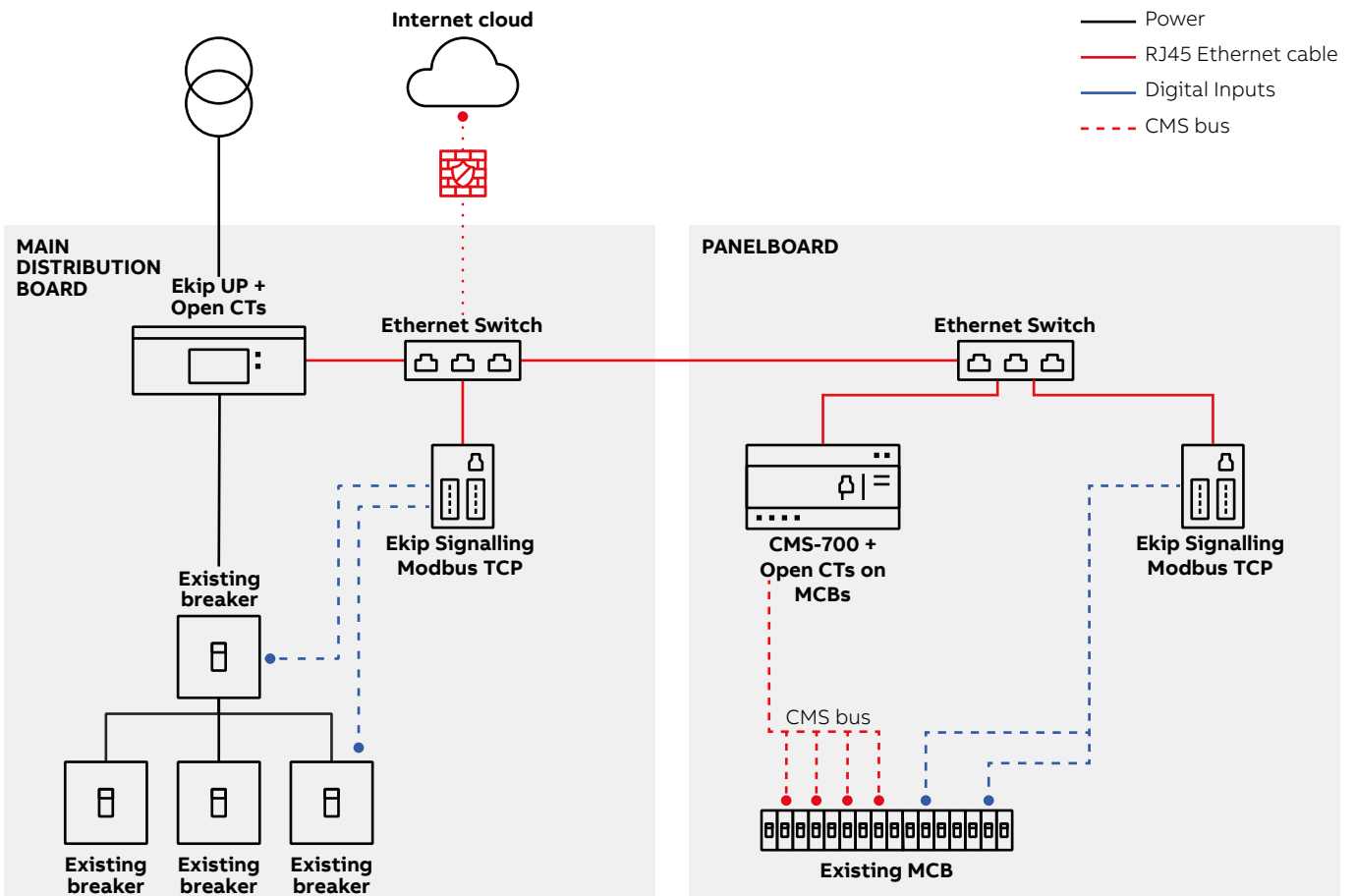
Through plug&play components and commissioning, I can upgrade the existing distribution and panel boards. I don't have to replace anything.



Operation

With this solution I can start saving on operating costs, also on multi-site, through an intuitive and simple solution while catching up with efficiency standards and regulations.





Current transformers and Shunts

ABB offers a wide range of current transformers for alternating current and Shunts for direct current.

If current in a circuit is too high to be applied directly to a measuring instrument, a current transformer is used to reduce the current accurately proportional to the current in the circuit, which can be conveniently connected to measuring and recording instruments.

Explore the full range and discover the most suitable Current Transformers or Shunts for your needs.



CT and CTA

- Used to transform primary currents into .../5 A low secondary currents
- Available both with wound (CTA) and through primary (CT)
- CT PRO XT and CT MAX guarantee maximum safety against overvoltage and overheating
- From 20A to 100A primary

CTO split core

- Split core measurement CT with through primary.
- Easy installation, time and space saving avoiding bar disconnection
- Terminal caps and fastening accessories, both on bar and on wall
- From 20A to 6,000A

Current transformers and Shunts

Performance and flexibility.

The new CT PRO XT and CT MAX range of current transformers has been specially designed for easy and safe switchboard installation, testing and maintenance operations thanks to the compact size of the products and their flexible assembly system. Moreover, the integrated electronic protection circuit in the CT PRO XT SELV and CT MAX SELV versions guarantees protection against risks deriving from no-load operation of the secondary.



TRF M modular

- Modular current transformers with \varnothing 29 mm through primary, secondary .../5A
- Easy installation and quick DIN rail plug thanks to the compact size
- From 20A to 600A



Rogowski Coils

- Retrofit in existing installations, with 0 downtime, ideal for critical power applications
- Save up to 70% time for current transformers cabling compared to standard CTs
- Minimum space requirements: 8mm diameter coil
- Measurement up to 10,000A with same product code, ensuring optimized logistics



Shunts

- Shunts have 60 mV voltage and must be used with a maximum load of 0.25 Ω in combination with measuring instruments in d.c.
- Both horizontal and vertical mounting are possible
- From 10A to 1,000A

Technical and ordering details

76	M1 Single Function and Multi Function meters
86	M1M Power Meters
88	M4M Network Analyzers
99	EQ meters
126	System pro M compact® InSite
130	Circuit Monitoring System
142	Analogue and digital instruments
154	Current transformers and shunts

M1 Single Function Measurement Devices

Features : M1A, M1V and M1M 11



1

Intuitive visualization

Clear and simple reading of the measurement data for all 3 phases on the wide LED displays.

2

Compact design

Only 52mm inside the switchboard to ensure optimized logistics and reduced footprint in the panel

3

Electrical system monitoring

Complete electrical parameters measurement, from simple VAF (voltage, current, frequency) to power and energy monitoring

M1 Multi Function and Dual Source Measurement Devices

Features : M1M 10, M1M 12 and M1M DS



4

Easy to use

Simple front keypad to navigate in setup and menus.

5

Remote measurement

Availability of RS485 interface with the support of communication protocol Modbus RTU facilitating the communication and connection of the device with remote locations.

Technical features



Product type		Single Function and Multi Function meters M1M			
Product range		M1A 1-1 Ameter	M1A 3-1 Ameter	M1A 3-05 Ameter	M1V 1-1 Vmeter
Mounting		Front Panel	Front Panel	Front Panel	Front Panel
HMI	Display	LED	LED	LED	LED
	Accuracy Class (active energy)	Class 1	Class 1	Class 0.5	Class 1
	IEC 61557-12 PMD	-	-	-	-
Measurement	Voltage measurement range	80-515 VAC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)
	Measurement via CT	1A or 5A	1A or 5A	1A or 5A	1A or 5A
	Measurement via Rogowski coils	-	-	-	-
	Sample per cycle	32	32	32	32
Real-time	Current (I), Voltage (U, V), f	I	I	I	V
	Active Power (P), PF	-	-	-	-
	Reactive (Q), Apparent (S) Power	-	-	-	-
	Timers	-	-	-	-
Energy	Active energy	-	-	-	-
	Reactive, apparent energy	-	-	-	-
	4 quadrants energy (import/export)	-	-	-	-
Power Quality	THD	-	-	-	-
	Harmonics	-	-	-	-
	Unbalances	-	-	-	-
	Neutral current	-	-	-	-
Logging	Alarms	-	-	-	-
	Complex alarms with logics	-	-	-	-
	Min/max/demand	-	-	-	-
	Flash memory for historicals	-	-	-	-
	RTC	-	-	-	-
	Graphs visualization	-	-	-	-
	Homepage and favourite page	-	-	-	-
HMI	Password protection	■	■	■	■
	Standard I/O	-	-	-	-
	Additional I/O	-	-	-	-
	M-bus	-	-	-	-
	Modbus RTU	-	-	-	-
	Modbus TCP/IP	-	-	-	-
Communication	Profibus DP-V0	-	-	-	-
	BACnet/IP	-	-	-	-
	Bluetooth	-	-	-	-
	Automatic integration in System pro M compact® InSite	-	-	-	-
	Automatic integration in ABB Ability™ Energy and Asset Manager	-	-	-	-
	InSite-bus flat cable	-	-	-	-

* Available starting from 2022 Q2



M1V 3-1- Vmeter	M1V 3-05 Vmeter	M1M 11-1 KWh	M1M 11-05 KWh	M1M 10	M1M 12	M1M DS Dual source
Front Panel	Front Panel	Front panel	Front panel	Front panel	Front panel	Front panel
LED	LED	LED	LED	LED	LED	LED
Class 1	Class 0.5	Class 1	Class 0.5	-	1%	Class 0.5
-	-	-	-	-	-	-
80-515 VAC (L-L)	80-515 VAC (L-L)	80-515 V AC (L-L)	80-515 V AC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)
1A or 5A	1A or 5A	1A or 5A	1A or 5A	.../1A or .../5A	1A or 5A	■
-	-	-	-	-	-	-
32	32	64	64	64	64	64
V, f	V, f	-	-	■	■	■
-	-	-	-	-	■	■
-	-	Apparent	Apparent	-	Apparent	Apparent
-	-	-	-	■	■	-
-	-	■	■	-	■	■
-	-	Apparent	Apparent	-	Apparent	-
-	-	-	-	-	-	-
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-	-	*	*	-	*	*
-	-	*	*	-	*	*
-	-	-	-	-	-	-

M1 Single Function Measurement Devices

M1A, M1V and M1M 11

Ordering codes



M1A

M1A

M1A is a digital ammeter for current measurement, providing the measurement of the single-phase or three-phase electrical parameters and allowing easy replacement of different analogue meters.

Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	-	M1A 1-1 Ammeter 1Ph (CI 1.0)	1SYG235145R4051	0.19	1
-	-	M1A 3-1 Ammeter 3Ph (CI 1.0)	1SYG235135R4051	0.19	1
-	-	M1A 3-05 Ammeter 3Ph (CI 0.5)	1SYG234905R4051	0.19	1



M1A

M1V

M1V is a digital voltmeter for voltage (and Frequency) measurement, providing the measurement of the single-phase or three-phase Voltage as well as Frequency (for 3Ph Voltmeter) and allowing easy replacement of different analogue meters.

Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	-	M1V 1-1 Volt Meter 1Ph	1SYG233965R4051	0.19	1
-	-	M1V 3-1 Volt Meter 3Ph	1SYG233955R4051	0.19	1
-	-	M1V 3-05 Volt Meter 3Ph	1SYG233695R4051	0.19	1

M1M 11

M1M11 is a digital kWh meter for energy measurement, providing the measurement of the single-phase or three-phase energy consumption.



M1M 11

Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
Modbus RTU RS485	-	M1M 11-1 Modbus kWh meter 1%	1SYG233685R4051	0.22	1
Modbus RTU RS485	-	M1M 11-05 Modbus kWh meter 0.5%	1SYG232395R4051	0.22	1

M1 Multi Function Measurement Devices

M1M 10, M1M 12 and M1M DS

Ordering codes



M1M 10

M1M 10

M1M 10 is a VAF meter for basic electrical system monitoring, providing the measurement of the main single-phase and three-phase electrical parameters and allowing easy replacement of different analogue meters.

Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	350811	M1M 10	1SYG235081R4051	0.3	1



M1M 12

M1M 12

M1M 12 is a multi-function meter, providing what is needed to monitor the electrical system and allowing statistical metering of active energy consumption.

M1M 12 product range includes option with built-in communication protocol (Modbus RTU) through RS485 communication port, allowing easy integration with Modbus supervision systems.

Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	075912	M1M 12	1SYG207591R4051	0.3	1
Modbus RTU RS485	075813	M1M 12 Modbus	1SYG207581R4051	0.3	1



M1M DS

M1M DS

M1M DS is a digital dual source meter along with power parameters for two source measurement for example EB/DG.

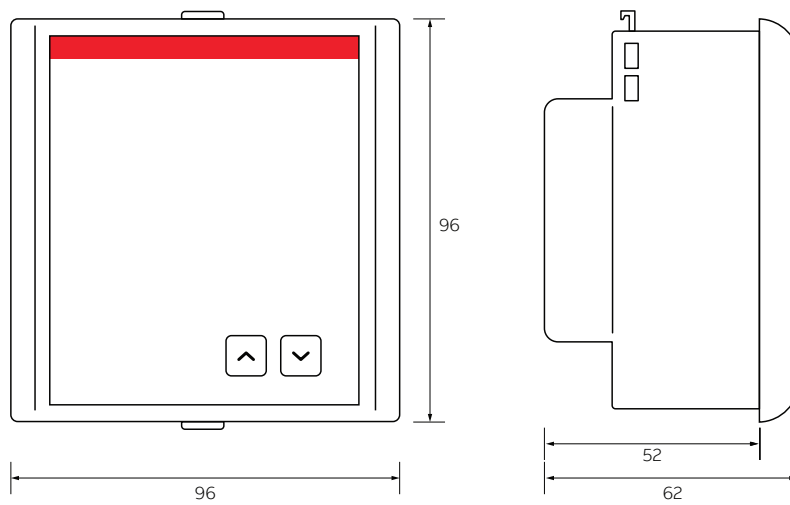
Communication protocol and interface	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	-	M1M DS Dual source meter	1SYG232385R4051	0.21	1
Modbus RTU RS485	-	M1M DS Modbus Dual source meter	1SYG232375R4051	0.21	1

Dimension details

M1A, M1V and M1M 11

Overall dimensions

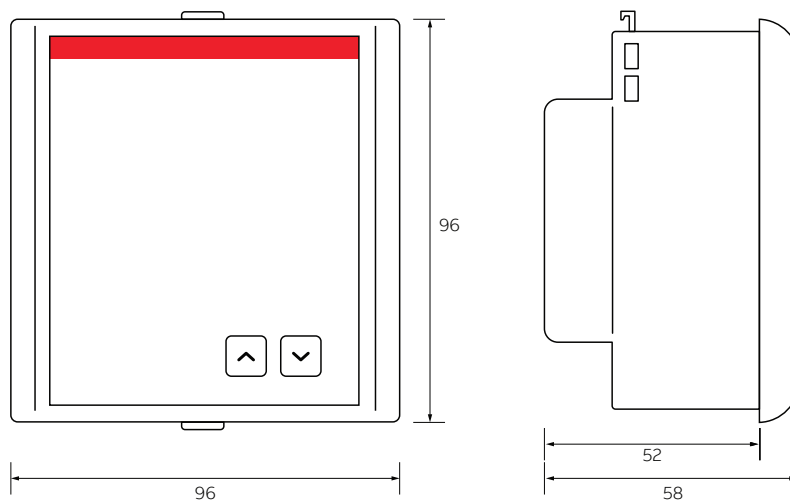
All measurements in mm



M1M 10 and M1M 12

Overall dimensions

All measurements in mm





Dimension details

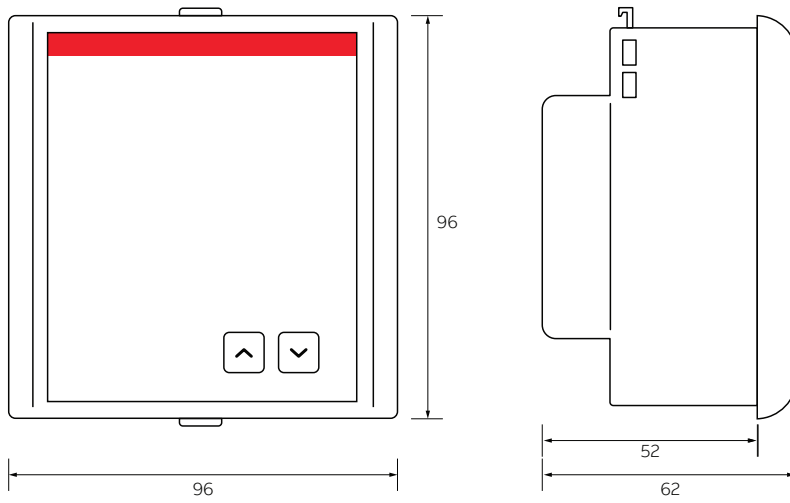


M1M DS



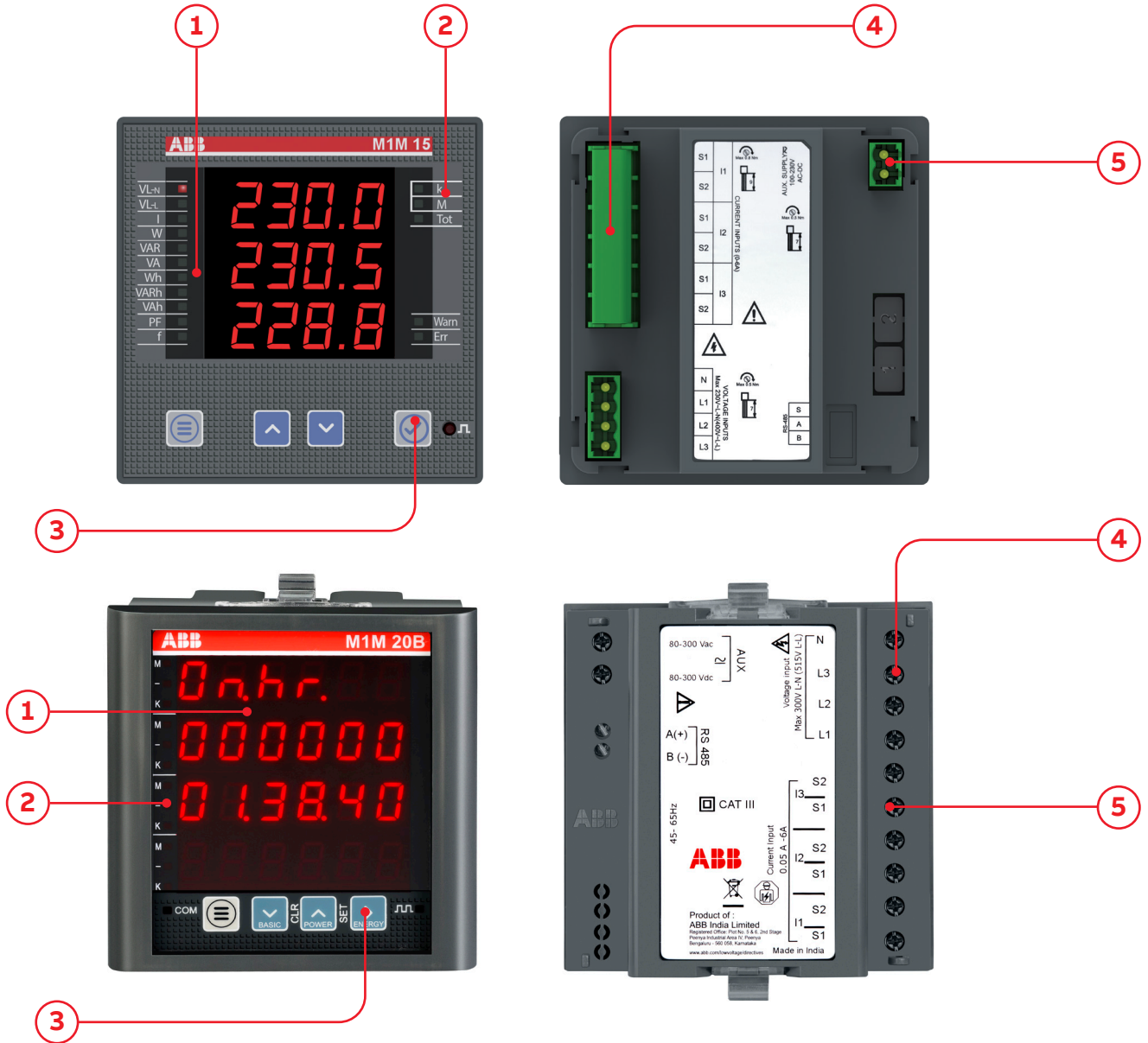
Overall dimensions

All measurements in mm



M1M Power Meters - features

M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30



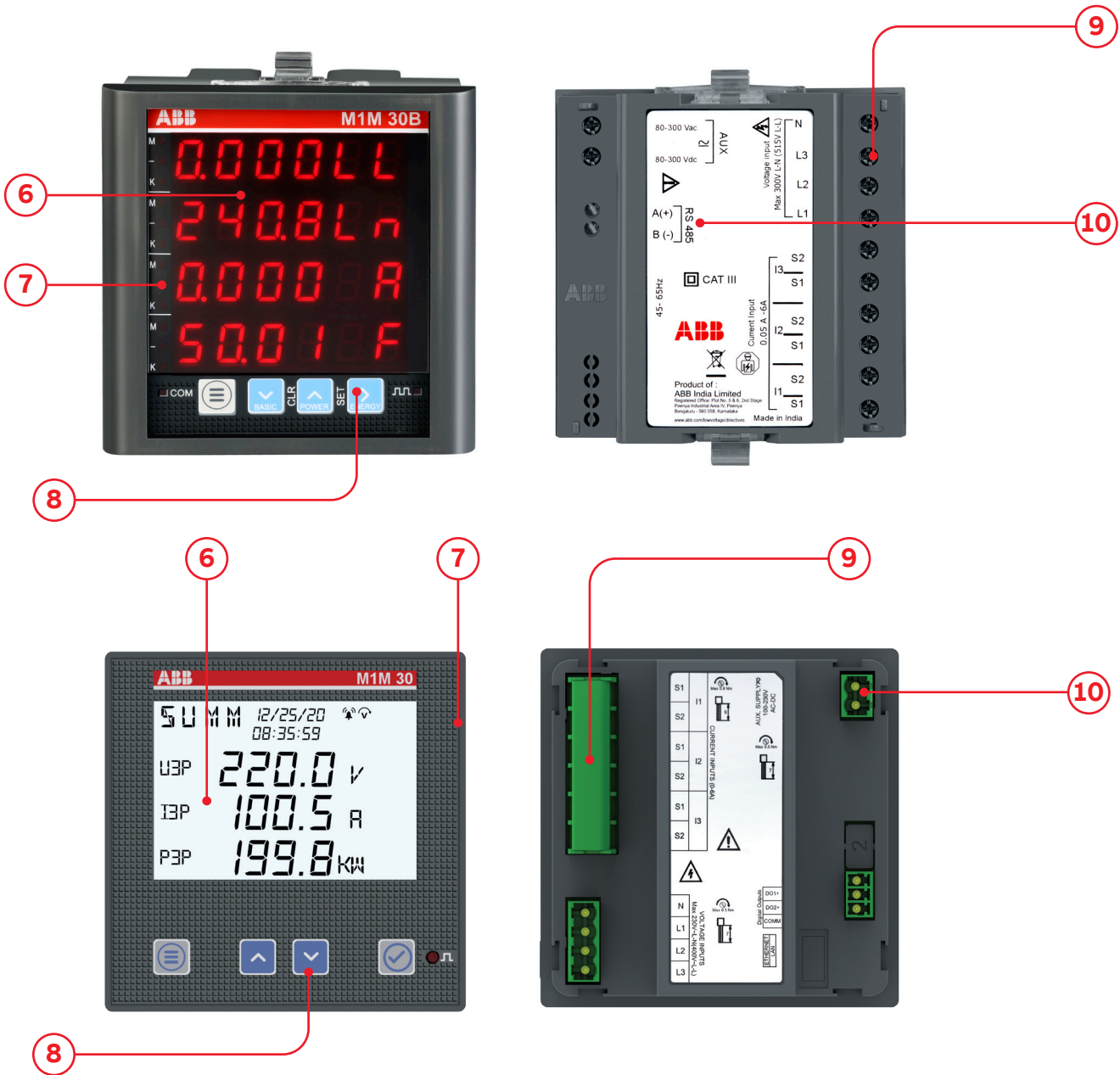
1 **Bright display**
Simple reading of the measurement data for all 3 phases on the wide LED display.

2 **Easy navigation**
LEDs on the sides to help during the navigation in the menu pages.

3 **Common experience**
Same intuitive menu structure all over the different M1M meters, with 4 pushbuttons keyboard for simplified access to the device.

4 **Electrical system monitoring**
Reliable electrical parameters measurement for basic applications compliant with IEC 61557-12, including voltage, current, frequency, power, energy.

5 **Comfortable wiring**
Vertical disposition of the removable parameters terminals all over M1M range makes the cabling inside the switchboard easy to be completed.



6
Intuitive visualization
 Clear visualization of the measurements with self-guided menus on the bright backlit LCD displays.

7
Compact design
 Only 65mm inside the switchboard to ensure optimized logistics and reduced footprint in the panel.

8
Manual-less configuration
 Guided wizard for first commissioning helping to save time for the basic configuration.

9
Power quality measurement
 Complete set of power quality features according to IEC 61557-12, including main KPIs and datalogger functionality on flash memory.

10
Remote measurement
 Availability of Modbus RTU and Modbus TCP/IP communication protocols and I/O options for easy integration in any system.

Technical features



Product type		Power meters M1M		
Product range		M1M 15	M1M 20B-1	M1M 20B-05
Mounting		Front panel	Front panel	Front panel
HMI	Display	LED	LED	LED
	Accuracy Class (active energy)	Class 1	Class 1	Class 0.5
	IEC 61557-12 PMD	–	–	–
Measurement	Voltage measurement range	80-550 VAC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)
	Measurement via CT (.../1A or .../5A)	■	■	■
	Measurement via Rogowski coils	–	–	–
	Sample per cycle	128	128	128
Real-time	Current (I), Voltage (U, V), f	■	■	■
	Active Power (P), PF	■	■	■
	Reactive (Q), Apparent (S) Power	■	■	■
	Timers	■	–	–
Energy	Active energy	■	■	■
	Reactive, Apparent energy	■	■	■
	4 quadrants energy (import/export)	–	Delivered, Received	Delivered, Received
	Multi-tariffs	–	–	–
Power Quality	THD	–	■	■
	Individual Harmonics	–	–	–
	Unbalances	–	■	■
	Neutral current	–	Calculated	Calculated
	Phasors, waveforms	–	–	–
Logging	Alarms	–	–	–
	Complex alarms with logics	–	–	–
	Min/max/demand	–	■	■
	Flash memory for historicals	–	–	–
	RTC	–	–	–
	Graphs visualization	–	–	–
	Homepage and favourite page	–	–	–
HMI	Password protection	■	■	■
	Standard I/O	–	1 Digital Output	1 Digital Output
	Additional I/O	–	–	–
Communication	M-bus	–	–	–
	Modbus RTU	■	■	■
	Modbus TCP/IP	–	–	–
	Profibus DP-V0	–	–	–
	BACnet/IP	–	–	–
	Bluetooth	–	–	–
	Automatic integration in System pro M compact® InSite	*	*	*
	Automatic integration in ABB Ability™ Energy and Asset Manager	*	*	*
	InSite-bus flat cable	–	–	–

* Available starting from 2022 Q2



M1M 20B-02	M1M 30B-05	M1M 30B-02	M1M 20	M1M 30
Front panel	Front panel	Front panel	Front panel	Front panel
LED	LED	LED	LCD	LCD
Class 0.2	Class 0.5	Class 0.2	Class 1/Class 0.5 (IO Version)	Class 1/Class 0.5 (IO Version)
-	-	-	-	-
80-515 VAC (L-L)	80-515 VAC (L-L)	80-515 VAC (L-L)	80-550 VAC (L-L)	80-550 VAC (L-L)
■	■	■	■	■
-	-	-	-	-
128	128	128	128	128
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
-	■	■	■	■
■	■	■	■	■
■	■	■	■	■
Delivered, Received	Delivered, Received, Total, Net, Last cleared	Delivered, Received, Total, Net, Last cleared	■	■
-	-	-	-	-
■	■	■	■	■
-	31st	31st	-	40th
■	■	■	-	■
Calculated	Calculated	Calculated	Calculated	Calculated
-	-	-	-	-
-	-	-	15	15
-	-	-	■	■
■	■	■	-	Basic
-	■	■	-	■
-	■	■	-	■
-	-	-	-	-
-	-	-	-	-
■	■	■	■	■
1 Digital Output	1 Digital Output	1 Digital Output	-	2 Digital Outputs
-	-	-	2 Digital Inputs. 2 Digital Outputs	2 Digital Inputs. 2 Digital Outputs
-	-	-	-	-
■	■	■	■	■
-	-	-	■	■
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
*	*	*	*	*
*	*	*	*	*
-	-	-	-	-

M1M Power Meters

M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 Ordering codes



M1M 15

M1M 15

M1M 15 is a complete multifunction meter for electrical system monitoring, mainly targeting measurement of basic electrical parameters and applications for cost allocation of energy consumptions.

Communication Protocol	I/O	Bbn EAN 6941593	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	-	406982	M1M 15	2TAZ661010R2000	0.31	1
Modbus RTU	-	406999	M1M 15 Modbus	2TAZ661012R2000	0.31	1



M1M 20B

M1M 20B

M1M 20 is a power meter including THD and import/export (4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.

Communication protocol and interface	I/O	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
Modbus RTU RS485	1 Digital Out	-	M1M 20B-1 Modbus 1%	1SYG231445R4051	0.26	1
Modbus RTU RS485	1 Digital Out	-	M1M 20B-05 Modbus 0,5%	1SYG230355R4051	0.26	1
Modbus RTU RS485	1 Digital Out	-	M1M 20B-02 Modbus 0,2%	1SYG230295R4051	0.26	1



M1M 30B

M1M 30B

M1M 30 is a power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.

Communication protocol and interface	I/O	Bbn EAN 8012542	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
Modbus RTU RS485	1 Digital Out	-	M1M 30B-05 Modbus	1SYG230185R4051	0.27	1
Modbus RTU RS485	1 Digital Out	-	M1M 30B-02 Modbus	1SYG229775R4051	0.27	1



M1M 20

M1M 20

M1M 20 is a power meter including THD and import/export (4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.

Communication Protocol	I/O	Bbn EAN 6941593	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
-	-	407002	M1M 20	2TAZ662010R2000	0.31	1
Modbus RTU	-	407019	M1M 20 Modbus	2TAZ662012R2000	0.32	1
Modbus TCP/IP	-	407026	M1M 20 Ethernet	2TAZ662014R2000	0.33	1
Modbus RTU	2 Digital Out. 2 Digital In.	407033	M1M 20 I/O	2TAZ662012R2001	0.33	1



M1M 30

M1M 30

M1M 30 is a power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.

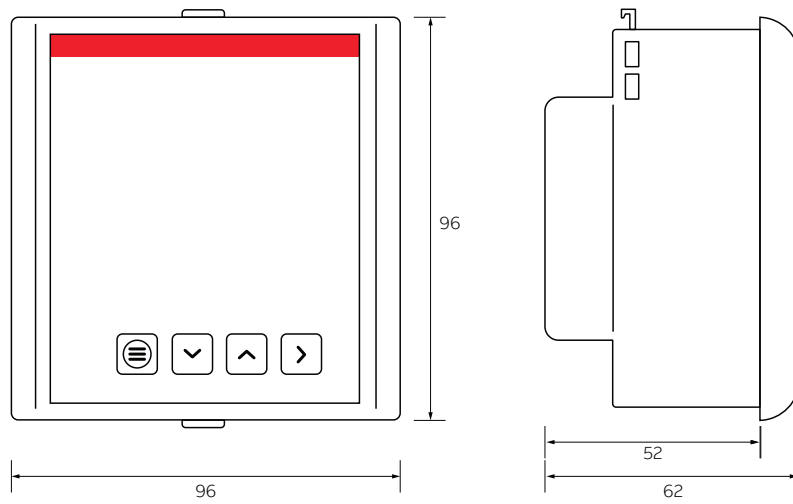
Communication Protocol	I/O	Bbn EAN 6941593	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
Modbus RTU	2 Digital Out.	407040	M1M 30 Modbus	2TAZ663012R2000	0.32	1
Modbus TCP/IP	2 Digital Out.	407057	M1M 30 Ethernet	2TAZ663014R2000	0.34	1
Modbus RTU	2 Digital Out. 2 Digital In.	407064	M1M 30 I/O	2TAZ663012R2001	0.33	1

Dimension details

M1M 20B and M1M 30B

Overall dimensions

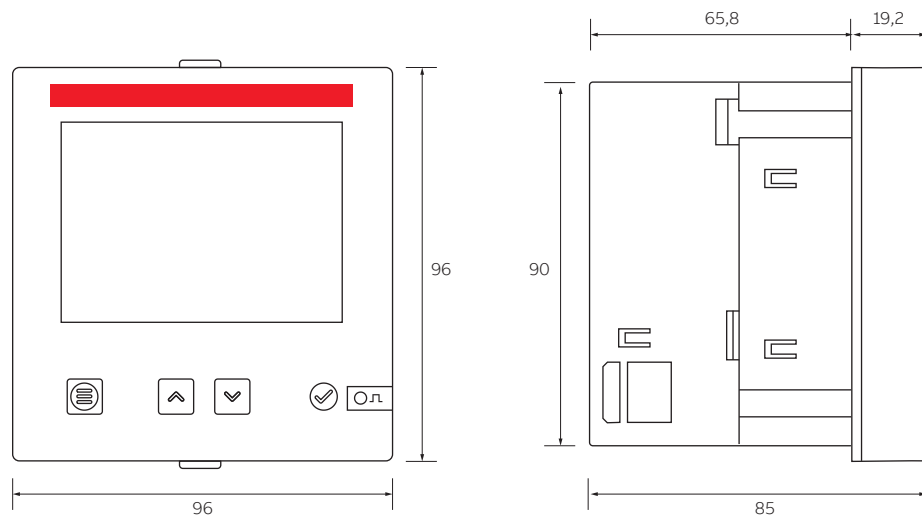
All measurements in mm



M1M 15, M1M 20 and M1M 30

Overall dimensions

All measurements in mm



M4M Network analyzers

Accurate electrical measuring and power monitoring.

Simple in every aspect, M4M enables accurate energy efficiency evaluations and perfectly fits the ABB solution for monitoring, optimization and control of electrical system.

Accurate measurement
Class 0,5 measurement according to IEC 61557-12 and advanced power quality functionalities, including historical measurements.

Option for MID Approval
Class C accuracy in accordance with 2014/32/EU for billing applications

Clear visualization
Color display and App-structured menu for advanced graphic visualization.

Smart commissioning
Bluetooth module for easy configuration through EPiC Mobile App unique commissioning tool.

Intuitive access
Simplified access to the device via touch screen display or 5 pushbuttons keypad.

Easy to install
Fast one-hand mounting and comfortable installation with clips in only 57 mm depth inside the panel.

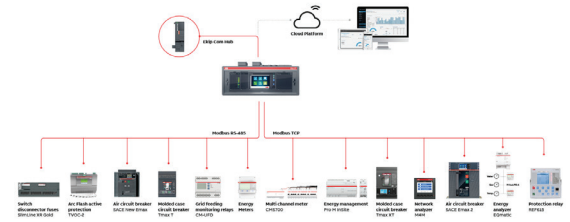
Fast wiring
All-removable terminals and one tool process to speed up the wiring activities.

Full communication
ABB Ability™ native network analyzers with complete communication protocols and I/O options for integration in any system.



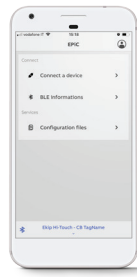
Intuitive interface

Touchscreen display and easy-to-access App-structured menu make network analyzers' configuration and operation simple and quick. Graphic color display for advanced visualization of the Class 0,5S accurate parameters, interactive pop-ups and complete notifications. Quick navigation is ensured by Homepage and favorite page setting.



Full integration

Natively integrated in sub-distribution management System pro M compact InSite and ABB Ability™ Energy and Asset Manager cloud-solution. To allow monitoring, optimization and control of the complete electrical system. Wide integration in all main applications through embedded communication protocols (Modbus RTU, Modbus TCP/IP, BACnet/IP, Profibus DP V0).



Smart commissioning

All M4M network analyzers are equipped with Bluetooth BLE module, ensuring smart configuration and quick visualization via unique EpiC commissioning tool, both available as mobile App and desktop software. Availability of remote firmware update regularly at any time guarantees the latest and the most secure version of the device with no impact on operations.

Installation in any panel

Comfortable installation and secure fix on the panel is ensured by the easy-to-use clips, with different thickness setup for compatibility with any panel. One-hand mounting of the device thanks to the hooks on the housing. The reduced depth of only 57 mm inside the panel makes M4M suitable even in small-size switchboards.



Fast installation and wiring

All terminals on M4M are removable, including the current transformers (CTs) inputs for current measurement, allowing to carry out the wiring directly on the terminals and speeding up the process. Moreover, the vertical disposition of the terminals makes the cabling inside the switchboard more comfortable.



Rogowski coils compatibility

Specific M4M versions compatible with ABB's R4M Rogowski coils allow to retrofit in existing installations, integrating power quality metering with 0 downtime. The pre-wired terminals of R4M coils allow to save up to 70% time for current transformers cabling compared to standard CTs.

Technical features



M4M 20



M4M 30



M4M 2X

Auxiliary power supply

Voltage range	[V]	48 - 240 V AC/VDC $\pm 15\%$	
Frequency	[Hz]	50 - 60	
Power consumption	[VA]	10 VA max	
Installation category		CAT III 300V class per IEC 61010-1 edition 3	
Protection fuse		T1 A - 277 VAC	

Measurement accuracy

Measurement type		True RMS up to the 40 th harmonic 128 samples per cycle, zero blind		
IEC 61557-12		IEC 61557-12 PMD/S/K70/0,5		
Active energy		Class 0,5 acc. to IEC 61557-12 [*] Class 0,5S acc. to IEC 62053-22		
Reactive energy		Class 2 acc. to IEC 61557-12 Class 2S acc. to IEC 62053-23		
Active power		Class 0,5 acc. to IEC 61557-12		
Reactive power	Class 2 acc. to IEC 61557-12	Class 1 acc. to IEC 61557-12	Class 1 acc. to IEC 61557-12	
Apparent power		Class 0,5 acc. to IEC 61557-12		
Voltage		Class 0,2 acc. to IEC 61557-12		
Current		Class 0,2 acc. to IEC 61557-12		
Neutral current	Calculated	Class 0,2 acc. to IEC 61557-12	Calculated (2X, 2X PQ1, 2X RTS) Class 0,2 acc. to IEC 61557-12 (2X PQ2)	
Frequency		Class 0,1 acc. to IEC 61557-12		
Unbalances (Current, Voltage)		Class 0,2 acc. to IEC 61557-12		
Harmonics, THD (Current, voltage)		Class 1 acc. to IEC 61557-12		

Voltage measurement inputs

Measurement range	[V]	50 - 400 V AC (L-N) 87 - 690 V AC (L-L)	
Measurement category		400V~ (CAT III)	
Rated frequency	[Hz]	50/60 Hz	
Max. VT Primary (indirect connection)	[V]	500 kV AC (L-N)	
Max over voltage	[V]	800 V AC (L-L)	
Protection fuse	[V]	T1 A - 277 V AC	

Insulation characteristics

Test Voltage impulse @230V to accessible parts		6,4 kV 1,2/50 μ S	
Test Voltage impulse @400V to accessible parts		9 kV 1,2/50 μ S	
Test Voltage @230V to accessible parts		3 kV 60s @2000m	
Test Voltage @400V to accessible parts		3,6 kV 60s @2000m	

Current measurement inputs

Number of current inputs	3 (L1, L2, L3)	4 (L1, L2, L3, N)	3 (2X, 2X PQ1, 2X RTS), 4 (2X PQ2)
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M4M 20



M4M 30



M4M 2X

Indirect insertion with CT

CT rated secondary current	5 A (Class 0,5S) 1 A (Class 0,5S)
Max primary CT	50kA
Measurement range without accuracy derating	10 mA - 6 A
Starting current	1 mA
Burden	0,024 VA at 6 A

Indirect insertion with Rogowski coils	M4M 20 Rogowski	M4M 30 Rogowski	-
Rated current	10.000 A	-	-
Measurement range without accuracy derating	100 A - 12 kA	-	-
Length of coils connections cable to M4M	3m	-	-
Starting current [A]	10 A	-	-

I/O

Digital Output

Voltage (min - max)	5 - 240 V AC/DC
Current (min - max)	2 - 100 mA
Max ON state drop voltage	1,5 V
Max R value at Min voltage conditions (5 V)	1750 Ohm
Min R value at Max voltage conditions (240 V)	2400 Ohm
Pulse duration [ms]	20 ms ON, 20 ms OFF
Pulse frequency	25 Hz
Alarm activation delay [s]	1 - 900 s (programmable)
Alarm return hysteresis	0 - 40 % (programmable)

Digital Input

Maximum voltage	240 V AC/DC
Max voltage for OFF state on input	20 V AC/DC
Min voltage for ON state on input	45 V AC/DC

Analogue Output

Programmable electrical span	Span [0 - 20 mA or 4 - 20 mA]	-
Load	Typical 250 Ohm, max 500 Ohm	-

Technical data for MID version	M4M 20-M	M4M 30-M	-
MID standards	EN 50470-1, EN 50470-3		
Voltage measurement (type of network and rated voltage)	3Ph/4W - 3Ph/3W - 1Ph/2W, 3x230/400...3x400/690V		
Current rating (I min- I ref(I _{max}))	0,01-1(6) A		
Rated frequencies	50 Hz and 60 Hz		
Active Energy accuracy class	Class C		
Pulse value S0 (pulse constant)	200000 imp/kWh		
Electromagnetic ambient conditions	Class E2		
Mechanical ambient conditions	Class M1		
LED indicator pulse frequency [s]	200000 imp/kWh		
LED indicator pulse length	1ms		

Technical features



M4M 20



M4M 30



M4M 2X

Mechanical characteristics

Overall dimensions	96 mm x 96 mm x 77 mm (Depth inside the switchboard: 57 mm)	96 mm x 96 mm x 77 mm (DIN-rail mounting)
IP degree of protection (acc. to IEC 60529)	Front: IP54	-
Weight	[g]	400

Terminal characteristics

Voltage inputs	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 7,62 mm Poles: 4		
Current inputs	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 6 Screw flanges for fixing	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 8 Screw flanges for fixing	
RS-485 Serial port	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 3		
I/O	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 3 (Programmable I/O, only on M4M 20 I/O) Poles: 3 (Digital outputs) Poles: 3 (Analogue outputs, only on M4M 20 I/O)	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 5 (Programmable I/O) Poles: 3 (Programmable I/O only on M4M 30 I/O) Poles: 3 (Analogue outputs, only on M4M 30 I/O)	Nominal cross section: 2,5 mm ² Solid/stranded wire: 0,2 - 2,5 mm ² (AWG 24 - 12) Pitch: 5,08 mm Poles: 5 (Programmable I/O)
Rogowski current probes	Only with ABB Rogowski probes: - R4M-200 2CSG202150R1101 (200 mm diameter) - R4M-80 2CSG202160R1101 (80 mm diameter)		

Climatic conditions

Operating temperature	-25 to 70 °C (K70 acc. to IEC 61557-12)
Storage temperature	-40 to 85 °C (K70 acc. to IEC 61557-12)
Relative humidity	Max 93 % (non-condensing) at 40 °C
Pollution degree	2
Altitude	< 2.000 m

User Interface

Access to device	5 pushbuttons	Touchscreen	-
Display type	Graphic color display		-
Display dimensions	70 x 52 mm (3.5")		-



M4M 20



M4M 30



M4M 2X

Communication protocol			
Modbus RTU	M4M 20 Modbus, M4M 20 I/O, M4M 20 Rogowski, M4M 20-M Modbus	M4M 30 Modbus, M4M 30 I/O, M4M 30 Rogowski, M4M 30-M Modbus	M4M 2X Modbus
Communication interface	RS485 with optical isolation		
Baud rate	9600, 19200, 38400, 57600, 115200 bps		
Parity number	Odd, Even, None		
Stop bit	1, 2		
Address	1-247		
Connector	3 pole terminal		
Profibus DP-V0	M4M 20 Profibus	M4M 30 Profibus	-
Protocol	Profibus with slave DP-V0 function in compliance with IEC 61158 regulations		
Communication interface	RS485 with optical isolation		
Baud rate	Automatic detection [9,6 kpbs - 12 Mbps]		
Address	0-126		
Connector	DB 9 female connector (do not use connectors with 90° cable outlet)		
LED indicators	Green for communication status Red for communication error		
Modbus TCP/IP	M4M 20 Ethernet, M4M 20-M Ethernet	M4M 30 Ethernet, M4M 30-M Ethernet	M4M 2X Ethernet
Protocol	Modbus TCP/IP		
Communication interface	RJ45	RJ45 (2 ports for daisy-chain)*	
BACnet	M4M 20 Bacnet	M4M 30 Bacnet	-
Protocol	BACnet/IP		
Communication interface	RJ45		
Bluetooth			
Type	BLE (Bluetooth Low Energy)		
Real-time clock	Available on 2X PQ1, 2X PQ2, 2X RTS		
Clock drift	-	~ 0,4 seconds per day	
Battery backup time	-	~ 3 days without aux supply	
Standards			
Power metering and monitoring devices (PMD)	IEC 61557-12 (IEC 62053-22, IEC 62053-23)		
Electrical safety	IEC 61010-1		
EMC	IEC 61326-1 (IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)		

* 1x RJ45 port available on M4M 30-M

M4M 20 and M4M 30

Comparing the two versions



	M4M 20 - Class 0,5S	M4M 30 - Class 0,5S
Accuracy		
MID approval	Optional	Optional
Real-time		
TRMS current	•	•
TRMS voltage	•	•
Frequency	•	•
Active, Reactive and Apparent power	•	•
Power factor	•	•
Operating timer, countdown timer	•	•
Energy		
Active, Reactive and Apparent energy	•	•
4 quadrants Energy (Import/Export)	•	•
Tariffs	/	•
Power Quality		
THD (I, VLN, VLL)	•	•
Individual Harmonics	/	40 th
Unbalances (I, VLN, VLL)	/	•
Neutral current	Calculated	Measured
Phasors (I, VLN)	/	•
Waveforms (I, VLN, VLL)	/	•
Data recording and logs		
Single alarms	25	25
Warnings, alarms and errors logs	•	•
Complex alarms with logics	/	4
Demand values (average)	Basic	Advanced
Min/Max Demand values	Basic	Advanced
Energy Trending logs	/	•
RTC	/	•
HMI	Graphic color	Graphic color touchscreen
Graphs visualization	Basic	Advanced
Notifications	•	•
Homepage and favourite page	•	•
Password protection	•	•
Connectivity		
Automatic integration in ABB Ability™ Energy and Asset Manager	•	•
Automatic integration in System pro M compact InSite	•	•
Bluetooth Low Energy	•	•
Communication Protocols	Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP	Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP
RJ45 Daisy Chain (Ethernet version)	/	•*

* daisy chain not available on M4M 30-M

M4M 2X

Functionality packages



Accuracy

M4M 2X - Class 0,5S

TRMS current	●
TRMS voltage	●
Frequency	●
Active, Reactive and Apparent power	●
Power factor	●
Operating timer, countdown timer	●
Active, Reactive and Apparent energy	●
4 quadrants Energy (Import/Export)	●
THD (I, VLN, VLL)	●
Neutral current	Calculated
Single alarms	25
Demand values (average)	Basic
Max/min values	Basic
Warnings, alarms and errors logs	●
Digital Outputs	2
+PQ1	
Individual Harmonics	25 th
Unbalances	●
Historicals logs	Intermediate
RTC	●
+PQ2	
Individual Harmonics	40 th
Unbalances	●
Historicals logs	Advanced
RTC	●
Neutral current	Measured
+RTS	
Tariffs	6
Complex alarms with logics	4
RTC	●
Programmable I/O ¹	4
Connectivity	
Automatic integration in ABB Ability™ Energy and Asset Manager	●
Automatic integration in System pro M compact InSite	●
Bluetooth Low Energy	●
Communication Protocols	Modbus RTU, Modbus TCP/IP
RJ45 Daisy Chain (Ethernet version)	●

¹ instead of 2 Digital Outputs



Ordering codes



M4M 20

M4M 20 is ABB's network analyzer range that provides complete and accurate electrical parameters monitoring and basic power quality analysis.

Equipped with graphic color display for advanced visualization of the measured parameters and Bluetooth module for smart commissioning.

Communication protocol	I/O	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
BLE	2 Digital out.	511519	M4M 20	2CSG251151R4051	0,400	1
BLE, Modbus RTU	2 Digital out.	511410	M4M 20 Modbus	2CSG251141R4051	0,400	1
BLE, Modbus TCP/IP	2 Digital out.	044710	M4M 20 Ethernet	2CSG204471R4051	0,400	1
BLE, Profibus DP-V0	2 Digital out.	511311	M4M 20 Profibus	2CSG251131R4051	0,400	1
BLE, BACnet/IP	2 Digital out.	368311	M4M 20 Bacnet	2CSG236831R4051	0,400	1
BLE, Modbus RTU	2 Progr. I/O, 2 Digital out., 2 Analogue out.	511618	M4M 20 I/O	2CSG251161R4051	0,400	1
 BLE, Modbus RTU	2 Digital Out.	390558	M4M 20-M MODBUS	2CSG239055R4051	0,400	1
 BLE, Modbus TCP/IP	2 Digital Out.	390657	M4M 20-M ETHERNET	2CSG239065R4051	0,400	1



M4M 20 - ROGOWSKI VERSION

M4M 20 is also available as compatible with ABB's R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers offer and allowing retrofit in any existing installations.

M4M 20 Rogowski together with R4M Rogowski coils ensures the integration of basic power quality metering in any existing system with 0 downtime.

Communication protocol	I/O	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
BLE, Modbus RTU	2 Digital Outputs	070818	M4M 20 Rogowski	2CSG207081R4051	0,400	1



Ordering codes



M4M 30

M4M 30 is ABB's network analyzer range that allows complete power quality analysis and energy efficiency evaluations.

Equipped with touchscreen color display for simplified access to the device and with Bluetooth module for smart commissioning.

Communication protocol	I/O	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
BLE, Modbus RTU	4 Progr. I/O	747611	M4M 30 Modbus	2CSG274761R4051	0,400	1
BLE, Modbus TCP/IP	4 Progr. I/O	746812	M4M 30 Ethernet	2CSG274681R4051	0,400	1
BLE, Profibus DP-V0	4 Progr. I/O	367918	M4M 30 Profibus	2CSG236791R4051	0,400	1
BLE, BACnet/IP	4 Progr. I/O	024514	M4M 30 Bacnet	2CSG202451R4051	0,400	1
BLE, Modbus RTU	6 Progr. I/O, 2 Analogue out.	024712	M4M 30 I/O	2CSG202471R4051	0,400	1
 BLE, Modbus RTU	4 programmable I/O	390350	M4M 30-M MODBUS	2CSG239035R4051	0,400	1
 BLE, Modbus TCP/IP	4 programmable I/O	390459	M4M 30-M ETHERNET	2CSG239045R4051	0,400	1



M4M 30 - ROGOWSKI VERSION

M4M 30 is also available as compatible with ABB's R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers and allowing retrofit in any existing installations. M4M 30 Rogowski together with R4M coils ensure integration of complete PQ analysis in any existing system with 0 downtime.

Communication protocol	I/O	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
			Type code	Order code		
BLE, Modbus RTU	4 Prog. I/O	024613	M4M 30 Rogowski	2CSG202461R4051	0,400	1

R4M ROGOWSKI COILS

R4M Rogowski coils are flexible current transformer based on Rogowski technology, ideal to retrofit existing installations up to 12kA. Available in two different sizes (80mm or 200mm diameters), R4M coils are directly equipped with pre-wired removable terminals that perfectly fit M4M 20 Rogowski (3 Rogowski coil inputs) and M4M 30 Rogowski (4 Rogowski coil inputs), with no need for external integrators.



Diameter (mm)	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
		Type code	Order code		
80	021605	R4M-80	2CSG202160R1101	0,150	1
200	021506	R4M-200	2CSG202150R1101	0,250	1

Ordering codes



M4M 2X

M4M 2X is ABB's network analyzer range that ensuring higher flexibility to project specifications compared to standard network analyzers. M4M 2X is available without display, only communicating via protocols and Bluetooth module for smart remote commissioning.

Communication protocol	I/O	Functionality package	Bbn 8012542 EAN	Order details		Weight 1 piece kg	Pack unit pc.
				Type code	Order code		
BLE, Modbus RTU	2 Digital out.	2X	601111	M4M 2X Modbus	2CSG260111R4051		
BLE, Modbus TCP/IP	2 Digital out.	2X	600619	M4M 2X Ethernet	2CSG260061R4051		
BLE, Modbus RTU	2 Digital out.	2X+PQ1	390756	M4M 2X Modbus PQ1	2CSG239075R4051		
BLE, Modbus TCP/IP	2 Digital out.	2X+PQ1	391258	M4M 2X Ethernet PQ1	2CSG239125R4051		
BLE, Modbus RTU	2 Digital out.	2X+PQ2	390855	M4M 2X Modbus PQ2	2CSG239085R4051		
BLE, Modbus TCP/IP	2 Digital out.	2X+PQ2	391357	M4M 2X Ethernet PQ2	2CSG239135R4051		
BLE, Modbus RTU	4 Progr. I/O	2X+RTS	390954	M4M 2X Modbus RTS	2CSG239095R4051		
BLE, Modbus TCP/IP	4 Progr. I/O	2X+RTS	391456	M4M 2X Ethernet RTS	2CSG239145R4051		
BLE, Modbus RTU	4 Progr. I/O	2X+PQ1+RTS	391050	M4M 2X Modbus PQ1+RTS	2CSG239105R4051		
BLE, Modbus TCP/IP	4 Progr. I/O	2X+PQ1+RTS	391555	M4M 2X Ethernet PQ1+RTS	2CSG239155R4051		
BLE, Modbus RTU	4 Progr. I/O	2X+PQ2+RTS	391159	M4M 2X Modbus PQ2+RTS	2CSG239115R4051		
BLE, Modbus TCP/IP	4 Progr. I/O	2X+PQ2+RTS	391654	M4M 2X Ethernet PQ2+RTS	2CSG239165R4051		

Overall dimensions

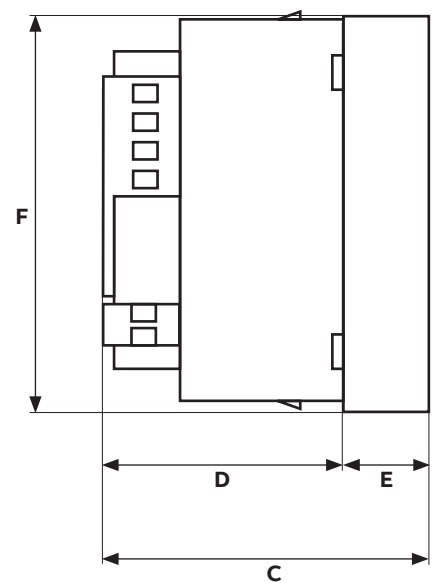
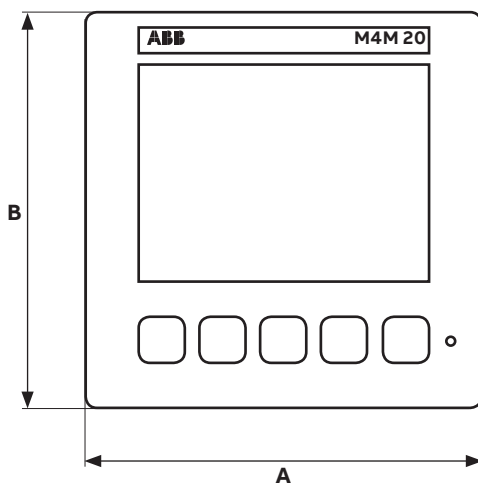
M4M 20 and M4M 30

Overall dimensions

All measurements in mm

Dimensions

- A: 96 mm
- B: 96 mm
- C: 77,5 mm
- D: 57 mm
- E: 20,5 mm
- F: 92 mm



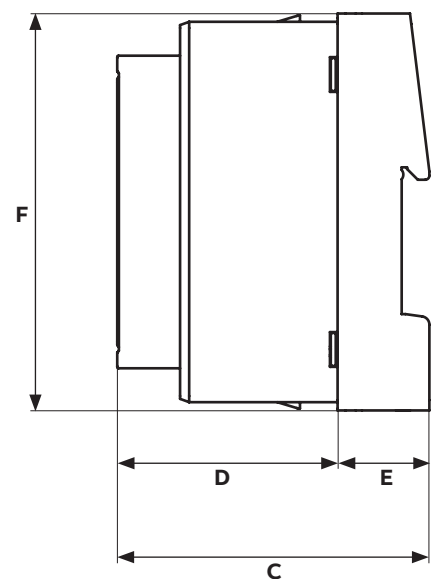
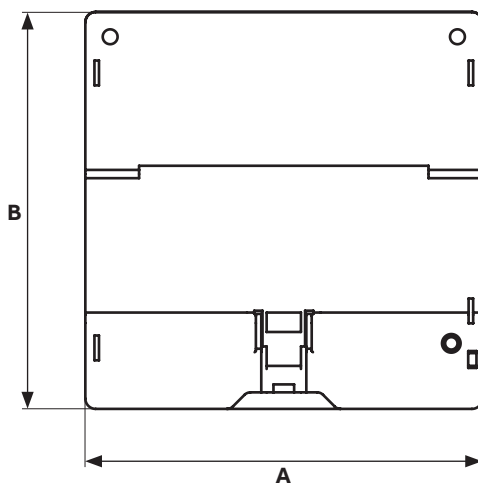
M4M 2X

Overall dimensions

All measurements in mm

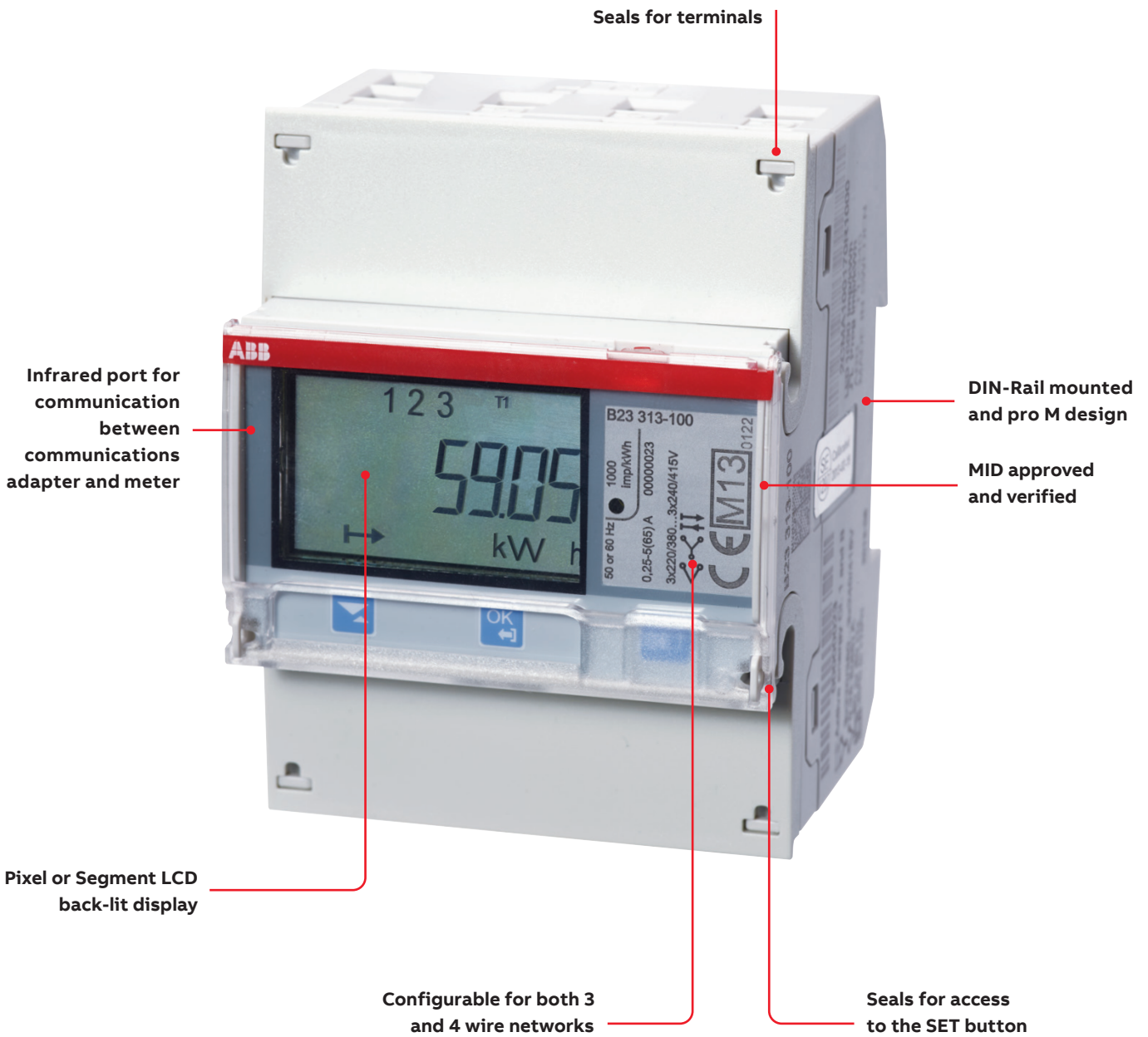
Dimensions

- A: 96 mm
- B: 96 mm
- C: 77.5 mm
- D: 53.5 mm
- E: 22 mm
- F: 92 mm



EQ meters

The details make the difference



Energy efficiency

Energy meters. The details make the difference.

A series

Key applications

- Facility management installations
- Critical power
- Production lines
- System solutions
- Power quality
- Etc.

Key performance

Single phase or three phase

Direct connected up to 80 A or transformer current- and/or voltage transformers (CTVT)

Active energy measurement

- Class B (Cl. 1) or
- Class C (Cl. 0,5 S) on CTVT connected meters

Wide voltage range

- 100 - 690 V phase to phase
- 57,7 - 400 V phase to neutral

Alarm functions

MID (Module B and D)

Reactive energy measurement

Import/export measurement of energy

Optional communication

- via M-Bus or
- RS-485 (For Modbus RTU or EQ bus)

4 tariffs controlled by inputs,

- communication or
- built-in clock

Previous values by

- day or
- week or
- month

Demand measurement (per period)

- 3 maximum
- 1 minimum

Load profiles

- 8 channels independently configurable
- 40 000 values total

Harmonics measurement up to 16th harmonic

- Current
- Voltage
- and evaluation of THD

Pulse outputs (S0 compatible)

Instrumentation

The A series meters support reading of instrument values. A large number of electrical properties can be read.

Depending on version of the meter the following data is available:

- Active power
- Apparent power
- Reactive power
- Current
- Voltage
- Frequency
- Power factor
- Harmonics (Current and Voltage)
- Total harmonic distortion

B series

Key applications

- Cost transfer/billing
- Solar power
- EV chargers
- Elevators/escalators
- Lighting
- Installation beside machines
- Etc.

Key performance

Single phase or three phase

Direct connected up to 65 A or CT connected (three phase types)

Active energy measurement

- Class B (Cl. 1) or
- Class C (Cl. 0,5 S) on CT connected meters

Alarm functions

MID (Module B and D)

Reactive energy measurement

Import/export measurement of energy

- Optional communication via via M-Bus or
- RS-485 (For Modbus RTU or EQ bus)

4 tariffs controlled by

- input or
- communication

Pulse outputs (S0 compatible)

Instrumentation

The B series meters support reading of instrument values.

A large number of electrical properties can be read. Depending on version of the meter the following data is available:

- Active power
- Apparent power
- Reactive power
- Current
- Voltage
- Frequency
- Power factor

C series

Key applications

- HVAC applications
- Stand-alone applications
- Domestic applications
- Camping and Marinas
- Etc.

Key performance

Single phase or three phase

Very compact

- 1 & 3 modules.

Direct connected up to 40 A

Active energy measurement

Accuracy class 1

Alarm functions

MID (Module B and F) as option

Pulse output (S0 compatible)

Instrumentation

The C series meters support reading of instrument values. A number of electrical properties can be read:

- Power factor
- Active power
- Current
- Voltage

Energy efficiency

Selection guide EQ meters.

How do I select the best meter for my application?

There are many versions of EQ meters in order to meet your requests. The EQ program comprises meters with different functionalities such as tariffs, communication interfaces or advanced clock functions. Spend a little time to evaluate the functions and imagine how they could add extra value to your metering. For example, the input counter (from Silver level) on an EQ meter can be used to count products produced by a machine and be read out together with the energy consumption of the same machine. In one easy go you can allocate energy to any produced product from one source. Another useful function is previous values (from Gold level). If you charge users in intervals the meter can secure the data even in the event of a broken communication link. You can collect the correct interval data later and also make it visible for your counterpart immediately on the meters display in case of any discussions.

STEEL	BRONZE	SILVER	GOLD	PLATINUM
<ul style="list-style-type: none"> Active energy Class 1 Pulse Output Alarm 	STEEL + <ul style="list-style-type: none"> Reactive energy Apparent energy Import/Export energy Alarm 	BRONZE + <ul style="list-style-type: none"> Class 0.5 or 1 Resettable energy register Tariffs Fixed I/O 	SILVER + <ul style="list-style-type: none"> Clock Functions Tariff Control Previous Value Max/min demand Event log 	GOLD + <ul style="list-style-type: none"> Harmonics Configurable I/O Advanced clock functions (load profiles)

Function	Single phase				Three phase				
	C11	B21	A41	A42	C13	B23	B24	A43	A44
Direct connected	1	1 3	1 3 4		1	1 2 3		1 2 3	5
Transformer connected				1 3 5			1 2 3		1 2 3 4 5
2 element metering						1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
3 element metering					1	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Accuracy 1 %, Class 1, Class B	1	1 3	1 3 4	1 3	1	1 2 3	1 2	1 2 3	5 1 2 3
Accuracy 0.5 %, Class 0,5 S, Class C					5		3		3 4 5
Active energy	1	1 3	1 3 4	1 3 5	1	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Reactive energy		3	3 4	3 5		2 3	2 3	2 3	5 2 3 4 5
Apparent energy		3	3 4	3 5		2 3	2 3	2 3	5 2 3 4 5
Import/Export energy		3	3 4	3 5		2 3	2 3	2 3	5 2 3 4 5
Tariff registers, 1-4		3	3 4	3 5		3	3	3	5 3 4 5
Instrument values	1	1 3	1 3 4	1 3 5	1	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Alarm function	1	1 3	1 3 4	1 3 5	1	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Harmonics, 2th-16th and THD				5					5 5
Previous values - day, week, month			4		5				5 4 5
Max and min demand			4		5				5 4 5
Load profiles - 8 channels					5				5 5
Pulse output	1	1	1	1	1	1 2	1 2	1 2	1 2
I/O board - 2 in, 2 out		3	3 4	3		3	3	3	3 4
Configurable I/O - 4 I/O channels					5				5 5
Tariffs controlled by input		3	3 4	3 5		3	3	3	5 3 4 5
Tariffs controlled by communication		3	3 4	3 5		3	3	3	5 3 4 5
Tariffs controlled by clock			4	5					5 4 5
MID approved, verified	optional	1 3	1 3 4	1 3 5	optional	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
IEC approved	1	1 3	1 3 4	1 3 5	1	1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Communication - Infrared (M-Bus)		1 3	1 3 4	1 3 5		1 2 3	1 2 3	1 2 3	5 1 2 3 4 5
Communication - M-Bus		optional	optional	optional		optional	optional	optional	optional
Communication - RS-485 Modbus		optional	optional	optional		optional	optional	optional	optional
Communication - RS-485 EQ bus		optional	optional	optional		optional	optional	optional	optional

1 = Steel
 3 = Silver
 5 = Platinum
 Optional = Available on some order codes
2 = Bronze
 4 = Gold
 = Not available

Energy efficiency

Energy meters selection table



	EQ meters C11	EQ meters C13	EQ meters B21	EQ meters B23	EQ meters B24
Overall dimensions	1 DIN module	3 DIN modules	2 DIN modules	4 DIN modules	
Display	LCD			Backlit LCD	
Operating voltage	230 V AC	3x230/400 V AC	220...240 V AC	3x220/380...240/415 V AC	
Frequency	50 / 60 Hz				
Max current	40 A		65 A		6 A
CTVT connection	Direct	Direct	Direct	Direct	CT
Active energy	Standard feature				
Reactive energy	-	-	Optional		
Apparent energy	-	-			
Accuracy	Cl. 1 (B)			Cl. 1 (B), Cl. 0,5 S (C)	
Up to 4 tariffs	-	-	Optional		
Max/min demand	-	-	-	-	-
Previous values	-	-	-	-	-
Load profiles	-	-	-	-	-
Alarm function	Standard feature				
Harmonic analysis	-	-	-	-	-
Event log	-	-	Standard feature		
Active power	Instrumentation parameters (standard)				
Voltage					
Current					
Power factor					
Frequency	-	-	Instrumentation parameters		
Pulse output	Standard feature				
I/O	1 Output*		1 Output* or 2 outputs/2 inputs (optional)		
Built-in serial communication	-	-	IR / M-Bus (optional) / RS-485 (optional)		
Protocols	-	-	M-Bus, Modbus RTU, EQ bus		

*) The pulse output can be assigned as an output if it is not used for pulses

**) For 16,7 Hz meters



EQ meters A41

EQ meters A42

EQ meters A43

EQ meters A44

4 DIN modules

7 DIN modules

Backlit Pixel (LCD)

57.7...288 V AC

57.7...288 V AC or 100...288** V AC

3x57.7/100 ... 288/500

3x57.7/100 ... 288/500 or
3x57.7/100 ... 400/690

50 / 60 Hz

50 / 60 Hz
(or 16,7 / 50 / 60 Hz)

50 / 60 Hz

80 A

6 A

80 A

6 A

Direct

CTVT

Direct

CTVT

Standard feature

optional

Cl. 1 (B)

Cl. 1 (B), Cl. 0,5 S (C)

Cl. 1 (B)

Cl.1 (B), Cl. 0,5 S (C)

Optional

Optional

Standard feature

Power quality (optional)

Standard feature

Instrumentation parameters (standard)

Instrumentation parameters (optional)

Standard feature

1 output or 2 outputs/2 inputs (optional) or 4 configurable inputs and outputs (optional)

IR / M-Bus (optional) / RS-485 (optional)

M-Bus, Modbus, EQ bus

Energy efficiency

EQ meters A series



A-series

Technical features	
A41	
Voltage/current inputs	
Nominal voltage	230 V AC
Voltage range	57.7 - 288 V AC (-20% - +15%)
Power dissipation voltage circuits	1.5 VA (0.6 W) total at 230 V AC
Power dissipation current circuits	0.006 VA (0.006 W) at I_{ref} and I_b
Base current I_b	5 A
Rated current I_n	-
Reference current I_{ref}	5 A
Transitional current I_{tr}	0.5 A
Maximum current I_{max}	80 A
Minimum current I_{min}	0.25 A
Starting current I_{st}	< 20 mA
Terminal wire area	1 - 25 mm ²
Recommended tightening torque	2 Nm
Communication	
Terminal wire area	0.5 - 1 mm ²
Recommended tightening torque	0.25 Nm
Transformer ratios	
Configurable current ratio (CT)	-
Configurable voltage ratio (VT)	-
Pulse indicator (LED)	
Pulse frequency	1000 imp/kWh
Pulse length	40 ms
Frequency	
Accuracy Class	B (Cl.1) and Reactive Cl. 2
Active energy	1%
Display of energy	Pixel oriented display (LCD)
Environmental	
Operating temperature	-40°C - +70°C
Storage temperature	-40°C - +85°C
Humidity	75% yearly average, 95% on 30 days/year
Resistance to fire and heat	Terminal 960°C, cover 650°C (IEC 60695-2-1)
Resistance to water and dust	IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.
Mechanical environment	Class M2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).
Electromagnetic environment	Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).

*) For 690 V AC meters:

Power dissipation voltage circuits 2.2 VA (1.0 W) total at 230 V AC

Power dissipation current circuits 0.001 VA (0.001 W) per phase at I_{ref} and I_n

A42	A43	A44
	3x230/400 V AC	
57.7 - 288 or 100 ... 288 V AC (-20% - +15%)	3x57.7/100 ... 288/500 V AC (-20% - +15%)	3x57.7/100 ... 288/500 or 3x100/173 ... 400/690 V AC (-20% - +15%)
	1.8 VA (0.8 W) total at 230 V AC	
0.001 VA (0.001 W) at I_{ref} and I_n	0.006 VA (0.006 W) per phase at I_{ref}	0.001 VA (0.001 W) at I_{ref} and I_n^*
-	5 A	-
1 A	-	1 A
1 A	5 A	1 A
0.05 A	0.5 A	0.05 A
6 A	80 A	6 A
0.02 A	0.25 A	0.01 A
< 1 mA	< 20 mA	< 1 mA
0.5 - 10 mm ²	1 - 25 mm ²	0.5 - 10 mm ²
1.2 Nm	2 Nm	1.2 Nm
		0.5 - 1 mm ²
		0.25 Nm
1/9 - 9999/1	-	1/9 - 9999/1
1/999 - 999999/1	-	1/999 - 999999/1
5000 imp/kWh	1000 imp/kWh	5000 imp/kWh
40 ms		
50 or 60 Hz ± 5 % (or 16.7 Hz optional)	50 or 60 Hz ± 5 %	
B (Cl.1), C (Cl. 0,5 S) and Reactive Cl. 2	A (Cl.2), B (Cl.1) and Reactive Cl. 2	B (Cl.1), C (Cl. 0,5 S) and Reactive Cl. 2
0.5%, 1%	1%	0.5%, 1%
-40°C - +70°C		
-40°C - +85°C		
75% yearly average, 95% on 30 days/year		
Terminal 960°C, cover 650°C (IEC 60695-2-1)		
IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.		
Class M2 in accordance with the Measuring Instrument Directive (MID). (2014/32/EU).		
Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).		

Energy efficiency

EQ meters A series

The A series meters ranges from single phase to three phase meters and from basic up to advanced functionality without any comparison.

The A series meters are mounted on a DIN rail and are suitable for installation in distribution boards and small enclosures such as consumer units.

With the main terminals in accordance with DIN 43857 and accessible from the below the meters, the A series is suitable for many applications.

The low rated or base currents of these products ensures high dynamic performance with superior accuracy even at low currents. The meters support a wide voltage range as well as a wide temperature range. The display is pixel-oriented and can display up to four quantities at the same time. Navigating the meter is easily done via the push-buttons below the display. To configure the meter settings, the set button must be accessed and this

button is protected against unauthorized use when the “glass lid” on the front of the meter is closed and sealed. The exceptional low power consumption of the meters makes them economical in the long run - an important feature specially for large meter populations.

Data from the A series meters can be collected via pulse output or serial communication. The pulse output is a solid state relay that generates pulses proportionally to the measured energy. The meters can also be equipped with built-in serial communication interfaces for M-Bus or Modbus RTU (RS-485). Meters with RS-485 interface can also be set to communicate over the new EQ bus with the gateway G13. All meters in the A series come with an infrared port for communication with an external Serial Communication Adapter (SCA) such as the KNX adapter.

A series supports following instrumentation values dependent on version of meter:

- Active energy
- Current
- Voltage
- Power factor
- Reactive power
- Total harmonic distortion
- Apparent power
- Frequency
- Harmonics

A series meters with a functionality level of Gold or Platinum have an internal clock for advanced functionality:

- Event log
- Previous values
- Load profile
- Maximum and minimum demand

The tariffs are controlled via inputs, via communication or via an internal clock in Gold and Platinum versions.

The A series support up to four I/O's. It can be two inputs and two outputs in a fixed configuration or four I/O points that are freely configured to input or output. Inputs can be used for counting pulses from e.g. a water meter, or reading status from external devices. Outputs can be used as pulse outputs or controlling external apparatus like a contactor or an alarm (connected via an external relay). The I/O's need an external voltage supply. The A series meters are type approved according to IEC and they are both type approved and verified according to MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

Energy efficiency

EQ meters A series



A series

Technical features		
A series		
Outputs		
Type	Transistor or MOSFET	
Current	2 - 100 mA	
Voltage	5 - 240 V AC/DC. For meters with only 1 output, 5 - 40 V DC.	
Pulse output frequency	Programmable: 1 - 999999 imp/kWh	
Pulse length	Programmable: 10 - 990 ms	
Terminal wire area	0.5 - 1 mm ²	
Recommended tightening torque	0.25 Nm	
Inputs		
Voltage	0 - 240 V AC/DC	
OFF	0 - 5 V AC/DC	
ON	57 - 240 V AC/24 - 240 V DC	
Min. pulse length	30 ms	
Terminal wire area	0.5 - 1 mm ²	
Recommended tightening torque	0.25 Nm	
EMC compatibility		
Impulse voltage test	6 kV 1.2/50 μs (IEC 60060-1)	
Surge voltage test	4 kV 1.2/50 μs (IEC 61000-4-5)	
Fast transient burn test	4 kV (IEC 61000-4-4)	
Immunity to electromagnetic HF-fields	80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)	
Immunity to conducted disturbance	150 kHz - 80 MHz, (IEC 61000-4-6)	
Immunity to disturbance with harmonics	2kHz - 150kHz	
Radio frequency emission	EN 55022, class B (CISPR22)	
Electrostatic discharge	15 kV (IEC 61000-4-2)	
Standards	EC 62052-11, IEC 62053-21 class 1 & 2, IEC 62053-22 class 0,5 S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GB/T 17215.321-2008 class 1 & 2, GB/T 17215.322-2008 class 0,5 S, GB 4208-2008, EN 50470-1, EN 50470-3 category A, B & C EQ meters.	
Mechanical		
Material	Polycarbonate in transparent front glass, bottom case, upper case and terminal cover, Glass reinforced polycarbonate in terminal block.	
Dimensions		
	A41 / A42	A43 / A44
Width	70 mm	123 mm
Height	97 mm	97 mm
Depth	65 mm	65 mm
DIN modules	4	7

Energy efficiency

EQ meters A series



A41

Direct connected electricity meter up to 80 A. Verified and approved according to MID. IEC approval. Instrument values. Alarm function. Communication - Infrared (M-Bus).
Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters single phase electricity meter, 4 DIN with IR port, 80 A

Class B (Cl. 1) with functionality level Steel. Active energy

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696					
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, Pulse output	705547	A41 111 - 100	2CMA170554R1000		0.230	1
57.7...288 V AC, Pulse output, RS-485	705004	A41 112 - 100	2CMA170500R1000		0.230	1
57.7...288 V AC, Pulse output, M-Bus	002400	A41 113 - 100	2CMA100240R1000		0.230	1

Class 1 (Reactive Class 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff control via inputs and communication.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696					
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, 2 output, 2 input, RS-485	705035	A41 312 - 100	2CMA170503R1000		0.230	1
57.7...288 V AC, 2 output, 2 input. M-Bus	705042	A41 313 - 100	2CMA170504R1000		0.230	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Gold. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696					
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, 2 output, 2 input, RS-485	705059	A41 412 - 100	2CMA170505R1000		0.230	1

Energy efficiency

EQ meters A series



A42

Transformer CTVT connected electricity meter up to 6 A. Verified and approved according to MID. IEC approval. Voltage V - 57...288 V AC. Instrument values. Alarm function. Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters single phase electricity meter, 4 DIN with IR port, 6 A

Class B (Cl. 1) with functionality level Steel. Active energy						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, Pulse output	705554	A42 111 - 100	2CMA170555R1000		0.200	1
57.7...288 V AC, Pulse output, RS-485	705103	A42 112 - 100	2CMA170510R1000		0.200	1
57.7...288 V AC, Pulse output, M-Bus	002424	A42 113 - 100	2CMA100242R1000		0.200	1
Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, 2 output, 2 input, RS-485	705127	A42 312 - 100	2CMA170512R1000		0.200	1
Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD. Versions for 16.7, 50 or 60 Hz.						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
57.7...288 V AC, Configurable 4 I/O channels, RS-485	002387	A42 552 - 100	2CMA100238R1000		0.200	1
100...288 V AC, Configurable 4 I/O channels, RS-485 16.7*, 50 or 60 Hz	705189	A42 552 - 120	2CMA100518R1000		0.200	1
100...288 V AC, Configurable 4 I/O channels, M-Bus 16.7*, 50 or 60 Hz	705196	A42 553 - 120	2CMA100519R1000		0.200	1

*) The meters are not tested and approved for placement on rolling stock.

Energy efficiency

EQ meters A series



A43

Direct connected electricity meter up to 80 A. Verified and approved according to MID. IEC approval. 2- and 3-element metering. Instrument values. Alarm function. Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters three phase electricity meter, 7 DIN with IR port, 80 A

Class B (Cl. 1) with functionality level Steel. Active energy						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 57.7/100...288/500 V AC, Pulse output	705202	A43 111 - 100	2CMA170520R1000		0.440	1
3 x 57.7/100...288/500 V AC, Pulse output, RS-485	002448	A43 112 - 100	2CMA100244R1000		0.440	1
3 x 57.7/100...288/500 V AC, Pulse output, M-Bus	002455	A43 113 - 100	2CMA100245R1000		0.440	1
Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 57.7/100...288/500 V AC, Pulse output, RS-485	705226	A43 212 - 100	2CMA170522R1000		0.440	1
3 x 57.7/100...288/500 V AC, Pulse output, M-Bus	705233	A43 213 - 100	2CMA170523R1000		0.440	1
Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 57.7/100...288/500 V AC, 2 output, 2 input, RS-485	705257	A43 312 - 100	2CMA170525R1000		0.440	1
3 x 57.7/100...288/500 V AC, 2 output, 2 input, M-Bus	705264	A43 313 - 100	2CMA170526R1000		0.440	1
Class B (Cl. 1) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, RS-485	705318	A43 512 - 100	2CMA170531R1000		0.440	1
3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, M-Bus	705325	A43 513 - 100	2CMA170532R1000		0.440	1

Energy efficiency

EQ meters A series



A44

Transformer CTVT connected electricity meter up to 6 A. Verified and approved according to MID. IEC approval. 2- and 3-element metering. Instrument values. Alarm function. Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters three phase electricity meter, 7 DIN with IR port, 6 A

Class B (Cl. 1) with functionality level Steel. Active energy

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, Pulse output	705332	A44 111 - 100	2CMA170533R1000		0.350	1
3 x 57.7/100...288/500 V AC, Pulse output, RS-485	002486	A44 112 - 100	2CMA100248R1000		0.350	1
3 x 57.7/100...288/500 V AC, Pulse output, M-Bus	002493	A44 113 - 100	2CMA100249R1000		0.350	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, Pulse output	000130	A44 211 - 100	2CMA100013R1000		0.350	1
3 x 57.7/100...288/500 V AC, Pulse output, RS-485	705349	A44 212 - 100	2CMA170534R1000		0.350	1
3 x 57.7/100...288/500 V AC, Pulse output, M-Bus	705356	A44 213 - 100	2CMA170535R1000		0.350	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, 2 output, 2 input	705363	A44 311 - 100	2CMA170536R1000		0.350	1

Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, 2 output, 2 input, RS-485	705370	A44 352 - 100	2CMA170537R1000		0.350	1
3 x 57.7/100...288/500 V AC, 2 output, 2 input, M-Bus	705387	A44 353 - 100	2CMA170538R1000		0.350	1

Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Gold. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, 2 output, 2 input, RS-485	705400	A44 452 - 100	2CMA170540R1000		0.350	1

Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.

Description	Bbn	Order details		Price 1 piece	Weight 1 piece	Pack unit
	7392696	EAN	Type code			
3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, RS-485	705455	A44 552 - 100	2CMA170545R1000		0.350	1
3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, M-Bus	705462	A44 553 - 100	2CMA170546R1000		0.350	1
3 x 57.7/100...400/690 V AC, 1 input + 1 output, RS-485	705493	A44 552 - 110	2CMA170549R1000		0.350	1
3 x 57.7/100...400/690 V AC, 1 input + 1 output, M-Bus	705486	A44 553 - 110	2CMA170548R1000		0.350	1

Energy efficiency

EQ meters B series



B series

Technical features	
	B21
Voltage/current inputs	
Nominal voltage	230 V AC
Voltage range	220...240 VAC (-20% - +15%)
Power dissipation voltage circuits	1.1 VA (0.5 W) total at 230 V AC
Power dissipation current circuits	0.012 VA (0.012 W) at I_{ref} and I_b
Base current I_b	5 A
Rated current I_n	-
Reference current I_{ref}	5 A
Transitional current I_{tr}	0.5 A
Maximum current I_{max}	65 A
Minimum current I_{min}	0.25 A
Starting current I_{st}	< 20 mA
Terminal wire area	1 - 25 mm ²
Recommended tightening torque	2 Nm
Communication	
Terminal wire area	0.5 - 1 mm ²
Recommended tightening torque	0.25 Nm
Transformer ratios	
Configurable current ratio (CT)	-
Pulse indicator (LED)	
Pulse frequency	1000 imp/kWh
Pulse length	40 ms
General data	
Frequency	50 or 60 Hz ± 5%
Accuracy Class	B (Cl. 1) and Reactive Cl. 2
Active energy	1%
Display of energy	6 digit LCD
Environmental	
Operating temperature	-40°C - +70°C
Storage temperature	-40°C - +85°C
Humidity	75% yearly average, 95% on 30 days/year
Resistance to fire and heat	Terminal 960 °C, cover 650°C (IEC 60695-2-1)
Resistance to water and dust	IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.
Mechanical environment	Class M2 in accordance with the Measuring Instrument Directive (MID). (2014/32/EU).
Electromagnetic environment	Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).

B23	B24
3x230/400 V AC	
3x220/380...240/415 VAC (-20% - +15%)	
1.7 VA (0.8 W) total at 230 V AC	
0.007 VA (0.007 W) per phase at I_{ref} and I_b	0.0007 VA (0.0005 W) per phase at I_{ref} and I_n
	-
	1 A
	-
	0.05 A
	6 A
	0.02 A
	< 1 mA
	0.5 - 10 mm ²
	1.2 Nm
	1/9 - 9999/1
	5000 imp/kWh
B (Cl. 1) or C (Cl. 0.5 S) and Reactive Cl. 2	
	0.5%, 1%
7 digit LCD	
IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.	
Class M2 in accordance with the Measuring Instrument Directive (MID). (2014/32/EU).	
Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).	

Energy efficiency

EQ meters B series

The EQ meters, B series is a range of meters for single phase and three phase metering. The B series meters are mounted on a DIN rail and are suitable for installation in distribution boards and small enclosures such as consumer units. The B series are suitable in applications where there is a need for reliable energy measurements and where space is limited.

The low rated or base currents of these products ensures high dynamic performance with superior accuracy even at low currents. The B series meters are meters for many applications and installations. Navigating the meter is easily done via the push-buttons below the display. To configure the meter settings, the set button must be accessed and this button is protected against unauthorized use when the "glass lid" on the front of the meter is closed and sealed. The exceptional low power consumption of the meters, less than 0.9 VA and 1.6 VA, makes them economical in the long run - an important feature specially for large meter populations.

Data from the B series meters can be collected via pulse output or serial communication. The pulse output is a solid state relay that generates pulses proportionally to the measured energy. The meters can also be equipped with built-in serial communication interfaces for M-Bus or Modbus RTU (RS-485). Meters with RS-485 interface can also be set to communicate over the new EQ bus with the new gateway G13. All meters in the B series come with an infrared port for communication with an external Serial Communication Adapter (SCA) such as the KNX adapter.

The B series meters support reading of instrument values. A large number of electrical properties can be read. Depending on version of the meter the following data is available:

- Active power
- Apparent power
- Reactive power
- Current
- Voltage
- Frequency
- Power factor

Up to 4 tariffs are controlled via inputs or communication.

The B series support two inputs and two outputs in a fixed configuration. Inputs can be used for counting pulses from e.g. a water meter, or reading status from external devices. Outputs can be used as pulse outputs or controlling external apparatus like a contactor or an alarm (connected via an external relay).

The B series meters are type approved according to IEC and they are both type approved and verified according to MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

Energy efficiency

EQ meters B series



B series

Technical features		
B series		
Outputs		
Type	Transistor or MOSFET	
Current	2 - 100 mA	
Voltage	5 - 240 V AC/DC. For meters with only 1 output 5 - 40 VDC.	
Pulse output frequency	Programmable 1 - 999999 imp/kWh	
Pulse length	Programmable 10 - 990 ms	
Terminal wire area	0.5 - 1 mm ²	
Recommended tightening torque	0.25 Nm	
Inputs		
Voltage	0 - 240 V AC/DC	
OFF	0 - 5 V AC/DC	
ON	57 - 240 V AC/24 - 240 V DC	
Min. pulse length	30 ms	
Terminal wire area	0.5 - 1 mm ²	
Recommended tightening torque	0.25 Nm	
EMC compatibility		
Impulse voltage test	6 kV 1.2/50µs (IEC 60060-1)	
Surge voltage test	4 kV 1.2/50µs (IEC 61000-4-5)	
Fast transient burn test	4kV (IEC 61000-4-4)	
Immunity to electromagnetic HF-fields	80 MHz - 2 GHz (IEC 61000-4-6)	
Immunity to conducted disturbance	150kHz - 80MHz (IEC 61000-4-6)	
Immunity to disturbance with harmonics	2kHz - 150kHz	
Radio frequency emission	EN 55022, class B (CISPR22)	
Electrostatic discharge	15 kV (IEC 61000-4-2)	
Standards	IEC 62052-11, IEC 62053-21 class 1 & 2, IEC 62053-22 class 0,5 S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GB/T 17215.312-2008 class 1 & 2, GB/T 17215.322-2008 class 0,5 S, GB 4208-2008, EN 50470-1, EN 50470-3 category A, B & C	
Mechanical		
Material	Polycarbonate in transparent front glass. Glass reinforced polycarbonate in bottom case and upper case. Polycarbonate in terminal cover.	
Dimensions		
	B21	B23/B24
Width	35 mm	70 mm
Height	97 mm	97 mm
Depth	65 mm	65 mm
DIN modules	2	4

Energy efficiency

EQ meters B series



B21

Direct connected electricity meter up to 65 A. Verified and approved according to MID. IEC approval. Instrument values. Alarm function. - Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters single phase electricity meter, 2 DIN with IR port, 65 A

For direct connection up to 65 A. Class B (Cl. 1) with functionality level Steel.

Active energy

Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
1 x 230 V AC, Pulse output	001496	B21 111 - 100	2CMA100149R1000		0.140	1
1 x 230 V AC, Pulse output, RS-485	001502	B21 112 - 100	2CMA100150R1000		0.150	1
1 x 230 V AC, Pulse output, M-Bus	001519	B21 113 - 100	2CMA100151R1000		0.150	1

For direct connection up to 65 A. Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver.

Active and reactive energy, import/export, tariffs 1-4, tariff control via inputs and communication.

Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
1 x 230 V AC, 2 output, 2 input	001540	B21 311 - 100	2CMA100154R1000		0.140	1
1 x 230 V AC, 2 output, 2 input, RS-485	001557	B21 312 - 100	2CMA100155R1000		0.150	1
1 x 230 V AC, 2 output, 2 input, M-Bus	001564	B21 313 - 100	2CMA100156R1000		0.150	1

Energy efficiency

EQ meters B series



B23

Direct connected electricity meter up to 65 A. Verified and approved according to MID. IEC approval. 2- and 3-element metering. Instrument values. Alarm function. Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters three phase electricity meter, 4 DIN with IR port, 65 A

Class B (Cl. 1) with functionality level Steel.

Active energy

Description	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
3 x 230/400 V AC, Pulse output	001632	B23 111 - 100	2CMA100163R1000		0.310	1
3 x 230/400 V AC, Pulse output, RS-485	001649	B23 112 - 100	2CMA100164R1000		0.320	1
3 x 230/400 V AC, Pulse output, M-Bus	001656	B23 113 - 100	2CMA100165R1000		0.330	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze.

Active and reactive energy, import/export.

Description	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
3 x 230/400 V AC, Pulse output, RS-485	001663	B23 212 - 100	2CMA100166R1000		0.320	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver.

Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.

Description	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
3 x 230/400 V AC, 2 output, 2 input	001687	B23 311 - 100	2CMA100168R1000		0.330	1
3 x 230/400 V AC, 2 output, 2 input, RS-485	001694	B23 312 - 100	2CMA100169R1000		0.340	1
3 x 230/400 V AC, 2 output, 2 input, M-Bus	001700	B23 313 - 100	2CMA100170R1000		0.350	1

Energy efficiency

EQ meters B series



B24

Transformer CT connected electricity meter up to 6 A. Verified and approved according to MID. IEC approval. 2- and 3-element metering. Instrument values. Alarm function. Communication - Infrared (M-Bus). Optional - Communication with M-Bus, RS-485 Modbus, RS-485 EQ bus.

EQ meters three phase electricity meter, 4 DIN with IR port, 6 A

Class B (Cl. 1) with functionality level Steel. Active energy

Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 230/400 V AC, Pulse output	001779	B24 111 - 100	2CMA100177R1000		0.250	1
3 x 230/400 V AC, Pulse output, RS-485	001786	B24 112 - 100	2CMA100178R1000		0.250	1
3 x 230/400 V AC, Pulse output, M-Bus	001793	B24 113 - 100	2CMA100179R1000		0.270	1

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.

Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 230/400 V AC, Pulse output, RS-485	001809	B24 212 - 100	2CMA100180R1000		0.250	1

Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Silver.

Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.

Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 230/400 V AC, 2 output, 2 input, RS-485	001830	B24 352 - 100	2CMA100183R1000		0.270	1
3 x 230/400 V AC, 2 output, 2 input, M-Bus	001847	B24 353 - 100	2CMA100184R1000		0.290	1

Energy efficiency

EQ meters C series

The EQ meters, C series are truly compact meters for single phase and three phase metering. The C series is mounted on a DIN rail and is suitable for installation in distribution boards and small consumer units.

Only one or three module wide, the C series is a very compact meter for single phase and three phase applications. The meters have an LCD with large digits showing energy register and instrumentation values. The meters have a wide temperature range which makes it possible to install the meters in many locations. Navigating the meters are easily done via the push-button below the display. The exceptional low power consumption of the meters, less than 0,3 W and 0,6 W at 230 V AC, makes them economical in the long run - an important feature specially for large meter populations.

The C series meters support reading of instrument values. A number of electrical properties can be read:

- Power factor
- Active power
- Current
- Voltage

The C series meters have an output that can be used as pulse output or alarm output. The alarm quantity and levels is easily configured on the meter with the push button. The output can be used for controlling external apparatus like a contactor or an alarm indicator (connected via an external relay).

The C series meters are type approved according to IEC and MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

MID versions have initial verification according to annex F of the Measuring Instruments Directive.

Energy efficiency

EQ meters C series



C series

Technical features		
	C11	C13
Voltage/current inputs		
Nominal voltage	230 V AC	3x230/400 V AC
Voltage range	230 V AC (-20% - +15%)	3x230/400 V AC (-20% - +15%)
Power dissipation voltage circuits	7.4 VA (0.3 W) at 230 V	1.5 VA (0.6 W) total at 230 V
Power dissipation current circuits	0.04 VA (0.04 W) at I_b and I_{ref}	0.04 VA (0.04 W) per phase at I_b and I_{ref}
Base current I_b	5 A	
Rated current I_n	-	
Reference current I_{ref}	5 A	
Transitional current I_{tr}	0.5 A	
Maximum current I_{max}	40 A	
Minimum current I_{min}	0.25 A	
Starting current I_{st}	< 20 mA	
Terminal wire area	0.5 - 10 mm ²	0.5 - 10 mm ²
Recommended tightening torque	0.8 Nm	
General data		
Frequency	50 or 60 Hz ± 5%	
Accuracy Class	B (Cl.1)	
Active energy	1%	
Display of energy	6 digit LCD	7 digits LCD
Communication		
Terminal wire area	-	
Recommended tightening torque	-	
Pulse indicator (LED)		
Pulse frequency	1000 (imp/kWh)	
Pulse length	40 ms	
Environmental		
Operating temperature	- 25°C - +70°C	
Storage temperature	- 25°C - +85°C	
Humidity	75% yearly average, 95% on 30 days/year	
Resistance to fire and heat	Terminal 960°C, cover 650°C (IEC 60695-2-1)	
Resistance to water and dust	IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.	
Mechanical environment	Class M2 in accordance with the Measuring Instrument Directive (MID). (2014/32/EU).	
Electromagnetic environment	Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).	

Energy efficiency

EQ meters C series

Technical features		
	C11	C13
Outputs		
Type	Transistor	
Current	2 - 100 mA	
Voltage	5 - 40 V DC	
Pulse output frequency	100 or 1000 (imp/kWh)	
Pulse length	100 ms	
Terminal wire area	0.5 - 10 mm ²	0.5 - 6 mm ²
Recommended tightening torque	0.8 Nm	0.25 Nm
EMC compatibility		
Impulse voltage test	6 kV 1.2/50 μ s (IEC 60060-1)	
Surge voltage test	4 kV 1.2/50 μ s (IEC 61000-4-5)	
Fast transient burn test	4 kV (IEC 61000-4-4)	
Immunity to electromagnetic HF-fields	80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)	
Immunity to conducted disturbance	150 kHz - 80 MHz, (IEC 61000-4-6)	
Immunity to disturbance with harmonics	2kHz - 150kHz	
Radio frequency emission	EN 55022, class B (CISPR22)	
Electrostatic discharge	15 kV (IEC 61000-4-2)	
Standards	IEC 62052-11, IEC 62053-21 class 1, GB/T 17215.211-2006, GBT 17215.321-2008 class 1, GB 4208-2008, EN 50470-1, EN 50470-3 category B	
Mechanical		
Material	Glass reinforced polycarbonate	
Dimensions		
Width	17,5 mm	54 mm
Height	111 mm	122 mm
Depth	65 mm	65 mm
DIN modules	1	3

Energy efficiency

EQ meters C series



C11

Direct connected electricity meter up to 40 A. IEC approval. Instrument values. Alarm function. Optional - Verified and approved according to MID.

EQ meters single phase electricity meter, 1 DIN, 40 A

Class B (Cl.1) with functionality level Steel. Active energy						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
1 x 230 V AC, Pulse output 1000 imp/kWh + MID	035712	C11 110 - 101	2CMA103571R1000		0.070	1
Class 1 with functionality level Steel. Active energy						
1 x 230 V AC, Pulse output 1000 imp/kWh	035729	C11 110 - 301	2CMA103572R1000		0.070	1



C13

Direct connected electricity meter. IEC approval. 3 element metering. Instrument values. Alarm function. Optional - Verified and approved according to MID.

EQ meters three phase electricity meter, 3 DIN, 40 A

For direct connection up to 40 A. Class B (Cl.1) with functionality level Steel. Active energy						
Description	Bbn	Order details		Price	Weight	Pack
	7392696			1 piece	1 piece	unit
	EAN	Type code	Order code		kg	pc.
3 x 230/400 V AC, Pulse output 1000 imp/kWh + MID	035743	C13 110 - 101	2CMA103574R1000		0.170	1
For direct connection up to 40 A. Class 1 with functionality level Steel. Active energy						
3 x 230/400 V AC, Pulse output 1000 imp/kWh	035750	C13 110 - 301	2CMA103575R1000		0.170	1

Energy efficiency

Interfaces for EQ meters



ZS/S 1.1

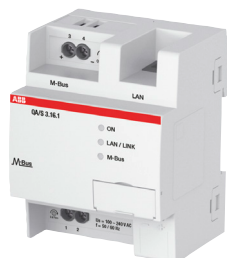
Meter Interface Module, KNX

It records consumption and measured values of the electrical energy consumption meters. Using an infra-red interface, the ABB energy meter types of the A- and B-series are incorporated. The information and data which is read can be used, for example, for cost centre accounting, energy optimisation, monitoring of installations and visualisation.

Description	EAN	Order details		Price 1 piece	Weight 1 piece	Pack unit
		Type code	Order code			
KNX meter module	4016779662079	ZS/S 1.1	2CDG110083R0011		0.100	1

Energy efficiency

EQmatic



QA/S 3.xx.1

Energy Analyzer, M-Bus, MDRC

Compact and web-based stand-alone devices for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 or 64 electricity, gas, water or heat meters via M-Bus. Automatic detection for ABB EQ meters (A/B-Series). Access to the device via web browser. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more.

Description	Bbn 4016779	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
16 Devices	997751	QA/S 3.16.1	2CDG110226R0011		0.15	1
64 Devices	997768	QA/S 3.64.1	2CDG110227R0011		0.15	1



QA/S 4.xx.1

Energy Analyzer, Modbus RTU, MDRC

Compact and web-based stand-alone devices for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 or 64 electricity, gas, water or heat meters via Modbus RTU. Automatic detection for ABB EQ meters (A/B-Series). Access to the device via web browser. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more.

Description	Bbn 4016779	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
16 Devices	997775	QA/S 4.16.1	2CDG110228R0011		0.15	1
64 Devices	997782	QA/S 4.64.1	2CDG110229R0011		0.15	1



QA/S 1.16.1

Energy Analyzer, KNX, MDRC

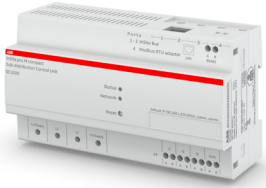
NEW

Compact and web-based stand-alone device for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 electricity, gas, water or heat meters via KNX TP. In addition measured values such as temperature, humidity, etc. can be processed and displayed. The alarm function allows early warning via E-mail if any value exceeds defined limits. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more. In order to increase energy efficiency, defined loads can be selectively switched off with the load control function if they exceed a load limit. For further processing data can be exported via E-mail or upload to FTP server. Several data sharing options allow communication with other systems.

Description	Bbn 4016779	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code			
16 Devices	997713	QA/S 1.16.1	2CDG110224R0011		0.15	1


Technical data

System pro M compact® InSite



Sub distribution control unit	Technical feature	Unit	Description
	Supply voltage	[VAC]	80-277 (L1-N, +5%)
	Frequency	[Hz]	50/60
	Power input (L1-N)	[W]	5...45 depending on number of sensors and I/O modules
	Power input , current trtransformer, 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
	Hramonic component	[Hz]	up to 2000
	Data rate of Modbus RTU	[Baud]	RS485 2- wire, 2400...115200
	Refresh time		1sec / 30 sec (depending on type of data)
	Data storage and export		Integrated 1-year data storage Automatic CSV data export
	Communication		LAN: Modbus TCP/IP, SNMP v1, v2, encrypted v3 RS485: Modbus RTU
	Connected devices		Up to 96 sensors/digital channels Up to 16 meters
	LAN	[Mbit/s]	100
	Conductor cross-section	[mm ²]	0.5...2.5
	Mounting method		35mm DIN rail (DIN 5022)
	Degree of protection		IP20
	Dimensions	[mm]	161.5x87.0x64.9 (9WM)
	Oparting temperature	[°C]	-25... +60
	Stirage temperature	[°C]	-40... +85
	Standards		IEC61010-1

Main circuit accuracy	Description
Voltage	± 1%
Current	± 1%
Harmonic component (up to 2500Hz)	± 1%
Active power	± 2%
Apparent power	± 2%
Reactive power	± 2%
Power factor	± 2%

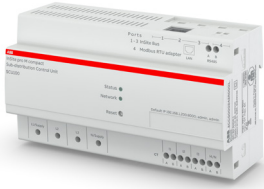
Input and Output modules	Technical feature	Unit	Input module DM11	Output module DM00	Input and Output module DM10
	Number of digital channels		4 Input	4 Output	2 Input + 2 Output
	Voltage (min - max)*		active input: 22-26 Vdc	relay output: 5Vdc-240Vac	active input: 22-26Vdc relay output: 5Vdc-240Vac
	Current (min - max)*		active input: 4mA	relay output: 5mA-2.5A Max 4,5A (<5sec)	active input: 4mA relay output: mA-2.5A Max 4,5A (<5sec)
	Pulse minimum duration**	[ms]	5	n/a	5
	Pulse frequency**	[Hz]	100	n/a	100
	Terminals cross section	[mm ²]	2,5	2,5	2,5
	Mounting method		35 mm DIN rail (DIN 50022) or SMISLINE TP plug base		
	Degree of protection		IP20	IP20	IP20
	Dimensions	[mm]	36x88x65	36x88x65	36x88x65
	Operating temperature	[°C]	-25...+60	-25...+60	-25...+60
Storage temperature	[°C]	-40...+85	-40...+85	-40...+85	
Standards		IEC 61010	IEC 61010	IEC 61010	

*relay output values reported are applicable to resistive load

**Applicable only to active inputs

Ordering data

System pro M compact® InSite



SCU100

The SCU100 is capable of collecting measurements and information from up to 16 energy and power meters, in addition to 96 current sensors and digital channels, all simultaneously. It calculates the energy and number of operations at single line level and compares stored values by period or by device.

Remotely monitoring of the system is made possible by a digital communication that supports different protocols: Modbus RTU, TCP or SNMP v1 and v2 and the encrypted v3.

Its built-in web server offers intuitive access to the measured data, the configuration settings and the system parameters, providing one unique interface for both operations and commissioning process. 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 encrypted SNMP protocol.

The Sub-distribution Control Unit SCU100 has been specifically develop to meet requirements of energy and asset monitoring and control in sub-distribution panelboards. In a framework where energy efficiency and operations continuity are becoming crucial, SCU100 offers the possibility to reduce wastes and identify risky situations promptly.



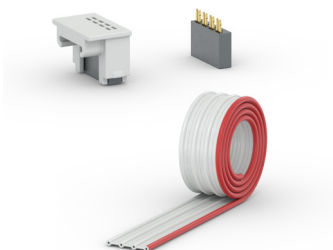
Digital Input and Output modules – DM11, DM00, DM10

The range of digital Input and Output Modules consists of 3 devices to adapt to quantity and type of installed products: Input Module DM11, Output Module DM00 and Input/Output Module DM10.

They can be connected to System pro M compact® accessories of MCBs and RCDs, but also to other DIN-Rail products with a digital input or output and to pulse meters (e.g. water, gas meters). They can read contact status, activate or deactivate lines and collect utilities consumptions.

ABB ranges compatible with I/O Modules are:

Molded Case Circuit Breaker	
Tmax XT	
Molded Case Circuit Breaker	Residual Current Devices
S 200	RCCBs – F 200
SN 201	RCD-blocks – DDA 200, DDA 800
S200 80-100A	RCBOs – DS 201, DS 202, DS 203, DS 200, DS800
S 750 DR	eRCBOs – DSE, DSN
S 700	
S 800	



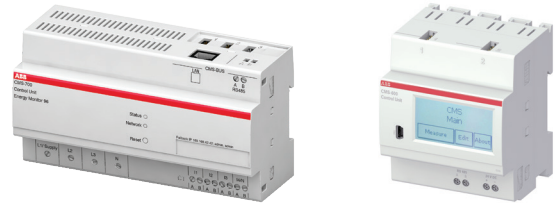
Accessories

The Sub-distribution Control Unit needs a flat cable to gather information from current sensors and digital I/O modules. The flat cable should be a 4-pin cable, flexible in length. Devices can be placed at customizable distances required by the specific application.

Description	GTIN 7612271	Ordering details		Unit price	Weight of 1 unit (kg)	Packaging unit (pce.)
	EAN	Brief description	Product no.			
Sub-distribution Control Unit	508104	SCU100	2CCG000242R0001		0.329	1
Digital Input Module	508135	DM11	2CCG000245R0001		0.075	1
Digital Output Module	508142	DM00	2CCG000246R0001		0.085	1
Digital Input and Output Module	508159	DM10	2CCG000247R0001		0.080	1
Flat cable 5m	508111	INS105	2CCG000243R0001		0.046	1
Connector set (35pcs)	508128	INS135	2CCG000244R0001		0.024	35

Energy efficiency

Circuit Monitoring System



Control units		
Characteristics	Control Unit CMS-700	Control Unit CMS-600
CMS Sensors		
Sensors	96 (3x32)	64 (2x32)
Control Unit		
Integrated power supply	•	
Voltage measurement	•	
Current (External CTs are required) measurement	•	
Active, reactive and apparent power (External CTs are required) measurement	•	
Calculated values for the branches		
Energy (Using branch currents, mains voltage and power factor over time)	•	
Power (Using branch currents, mains voltage and power factor)	•	
Interfaces		
RS485	•	•
LAN	•	
Protocols		
Modbus RTU	•	•
Modbus TCP	•	
SNMP (v1, v2 and encrypted v3)	•	
Visualization		
Built-in web server	•	
Touch display		•
CSV data export	•	
Approvals		
IEC 61010-1	•	•
UL 508 / CSA C22.2 No. 14	•	•

Energy efficiency

Control units



CMS-700

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	[mm ²]	0.5... 2.5
Mounting method		35 mm DIN rail (DIN 50022)
Degree of protection		IP20
Dimensions	[mm]	161.5 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-600

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 mm ² , max. 0.6 Nm
Mounting method		35 mm DIN rail (DIN 50022) or SMISLINE 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

Energy efficiency

Control units

CMS-700



CMS-700
User Manual

CMS-700

The CMS-700 measures the AC and DC currents in the outgoing circuits via up to 3 x 32 sensors and calculates the energy and output data (line-side active and reactive power) of up to 96 sensors simultaneously.

Remotely monitoring of the system is made possible by a digital communication that supports different protocols: Modbus RTU, TCP or SNMP v1 and v2 and the encrypted v3. 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 straight-forward integration into any IT infrastructure. What’s more, the data can be read out by means of an encrypted SNMP protocol.

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.

CMS-600



CMS-600
User Manual

CMS-600

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).

CMS-600 is equipped with an integrated CMS software for which great care has been taken to ensure that the navigation concept is highly intuitive





The Control Unit 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.

Description	GTIN	Order details		Price	Weight	Pack
	7612271	Type code	Order code	1 piece	1 piece	unit
	EAN				kg	pc.
Control units						
Control Unit CMS-700	453138	CMS-700	2CCA880700R0001		0.329	1
Control Unit CMS-600	418700	CMS-600	2CCA880000R0001		0.153	1






Energy efficiency

Circuit Monitoring System







Sensors overview

		System Pro M, SMISLINE		S800	DIN rail	Cable tie
						
Mounting method	for all MCBs, RCDs, RCBOs with twin terminals	for MCBs (S200, SMISLINE) and RCBOs (SMISLINE)	for fuse holders E90	for all S800 devices with cage terminals	universally usable	universally usable

Open-core sensors

AC accuracy* of $\leq \pm 1.0\%$					
The laying method influences the accuracy.					
18-mm overall width					
CMS-120xx (80 A)	CMS-120PS	CMS-120LA	-	CMS-120DR	CMS-120CA
CMS-121xx (40 A)	CMS-121PS	CMS-121LA	CMS-121FH	CMS-121DR	CMS-121CA
CMS-122xx (20 A)	CMS-122PS	CMS-122LA	CMS-122FH	CMS-122DR	CMS-122CA

Solid-core sensors

AC accuracy* of $\leq \pm 0.5\%$				
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

Energy efficiency

Sensors and Accessories



CMS-120LA



CMS-120FH



CMS-120PS



CMS-120DR



CMS-120CA

Open core sensors 18 mm

Sensor type		CMS-120xx	CMS-121xx	CMS-122xx
Measurement range	[A]	80	40	20
Measurement method		TRMS, AC 50 / 60 Hz, DC		
Peak value of the distorted wave-form		≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = 25 °C)*		≤ ± 1 %		
AC* temperature coefficient		≤ ± 0.04 %		
AC accuracy (TA = 25 °C)*		≤ ± 1.2 %	≤ ± 1.4 %	≤ ± 1.8 %
DC* temperature coefficient		≤ ± 0.14 %	≤ ± 0.24 %	≤ ± 0.44 %
Resolution	[A]	0.01		
Internal sampling rate	[Hz]	5000		
Respond time (±1 %)	[sec]	Type 0.34		
Max. diameter of the cable	[mm]	9.6		
Insulation		690 V AC / 1500 V DC		
Operating temperature	[°C]	- 25 ... +70 / - 40 ... +85		
Size	CMS-120PS series	[mm]	17.4 x 41.0 x 26.5	
	CMS-120CA series	[mm]	17.4 x 41.0 x 29.0	
	CMS-120DR series	[mm]	17.4 x 51.5 x 43.2	
	CMS-120LA series	[mm]	17.4 x 41.0 x 38.9	
	CMS-120FH series	[mm]	17.4 x 41.0 x 38.9	
Reference standard		IEC 61010-1 UL508 / CSA C22.2 No 14		

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

Solid-core sensors 18 mm



CMS-120PS



CMS-120PS



CMS-120DR



CMS-120CA

Sensor type		CMS-100xx	CMS-101xx	CMS-102xx
Measurement range	[A]	80	40	20
Measurement method		TRMS, AC 50 / 60 Hz, DC		
Peak value of the distorted wave-form		≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = 25 °C)*		≤ ± 0.5 %		
AC* temperature coefficient		≤ ± 0.036 %		
AC accuracy (TA = 25 °C)*		≤ ± 0.7 %	≤ ± 1.0 %	≤ ± 1.7 %
DC* temperature coefficient		≤ ± 0.047 %	≤ ± 0.059 %	≤ ± 0.084 %
Resolution	[A]	0.01		
Internal sampling rate	[Hz]	5000		
Respond time (±1 %)	[sec]	Type 0.25		
Max. diameter of the cable	[mm]	10		
Insulation	[V]	690 V AC / 1500 V DC		
Operating temperature	[°C]	- 25 ... +70 / - 40 ... +85		
Size	CMS-100PS series	[mm]	17.4 x 41.0 x 26.5	
	CMS-100S8 series	[mm]	26.5 x 45.5 x 31.8	
	CMS-100DR series	[mm]	17.4 x 51.5 x 43.2	
	CMS-100CA series	[mm]	17.4 x 41.0 x 29.0	
Reference standard		IEC 61010-1 UL508 / CSA C22.2 No 14		

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



CMS-120PS



CMS-120DR



CMS-120CA

Solid-core sensors 25 mm

Sensor type		CMS-200xx	CMS-201xx	CMS-202xx
Measurement range	[A]	160	80	40
Measurement method		TRMS, AC 50 / 60 Hz, DC		
Peak value of the distorted wave-form		≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25°C)*		≤ ± 0.5%		
AC* temperature coefficient		≤ ± 0.036%		
AC accuracy (TA = +25°C)*		≤ ± 0.7%	≤ ± 1.0%	≤ ± 1.7%
DC* temperature coefficient		≤ ± 0.047%	≤ ± 0.059%	≤ ± 0.084%
Resolution	[A]	0.01		
Internal sampling rate	[Hz]	5000		
Respond time (±1%)	[sec]	Type 0.25		
Max. diameter of the cable	[mm]	15		
Insulation	[V]	690 V AC / 1500 V DC		
Operating temperature	[°C]	- 25 ... +70 / - 40 ... +85		
Size	CMS-200S8 series	[mm]	26.5 x 43.0 x 38.5	
	CMS-200DR series	[mm]	25.4 x 43.0 x 43.2	
	CMS-200CA series	[mm]	25.4 x 43.0 x 35.7	
Reference standard		IEC 61010-1 UL508 / CSA C22.2 No 14		

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

Energy efficiency

Sensors and Accessories



Open-core sensors
Installation manual

Open-core sensors

The open-core sensors are able to measure all types of current, whether AC, DC or mixed, up to 80 A in TRMS, enabling exact and effective measurements. As each sensor is equipped with its own microprocessor for processing the signal, the measurement data is transmitted digitally to the Control Unit via bus interface, maximizing data reliability. Disturbances like those experienced with analog data now most definitely belong to the past.

With this solution a faster cabling is guaranteed, since wiring cables are directly inserted in the sensors without the aid of a screwdriver. No special tools are needed for the entire connection process.

With AC accuracy* of $\leq \pm 1.0\%$, they can be used in a multitude of applications without any problem: System pro M, DIN rail and Cable tie.

Thanks to their U shape, the open-core sensors can be retrofitted to existing installations, without the need to disconnect the cabling or shut down the equipment, being the key for brownfield extension.

Solid-core sensors

Alternating (AC), direct (DC) or mixed (TRMS) currents – the CMS sensors monitor and measure all types of current over a measurement range of up to 160 A (TRMS). They even measure harmonic components in the signal curve. The measurements are digitally transmitted through bus interface, enabling reliability of data and removing disturbance effects.

Maximum secure insertion of wiring cables is guaranteed by this sensors solution.

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.

Depending on the application, solid-core sensors are chosen between up to four different mounting options to making this solution as flexible as possible.

The solid-core units feature an enclosed structure and AC measurement accuracy* of $\leq \pm 0.5\%$, and are therefore suitable for all applications in which maximum-precision measurement is crucial.

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

Accessories

The Control Unit of the circuit monitoring system need a flat cable for receive branches measurements from sensors. The flat cable should be a 4-pin cable, flexible in length. Flat cable are available in several lengths in order to cover the most kind of application. Cables with the greater length are designed with the purpose of being adapted, through cutting, to the various lengths required by the applications.



Solid-core sensors
Installation manual

Energy efficiency

Sensors and Accessories

Open-core sensors

Description				
Type	ABB code	Weight of 1 unit (kg)	Unit conf. (Pcs)	
Open-core sensors 18 mm for retrofit of MCBs (S200, SMISLINE) and RCBOs (SMISLINE)				
80 A	CMS-120LA	2CCA880225R0001	0.012	1
40 A	CMS-121LA	2CCA880226R0001	0.012	1
20 A	CMS-122LA	2CCA880227R0001	0.012	1
Open-core sensors 18 mm for retrofit of E90 fuseholders 1000VDC				
40 A	CMS-121FH	2CCA880216R0001	0.012	1
20 A	CMS-122FH	2CCA880217R0001	0.012	1
Open-core sensors 18 mm for pro M and SMISLINE devices with twin terminals				
80 A	CMS-120PS	2CCA880210R0001	0.012	1
40 A	CMS-121PS	2CCA880211R0001	0.012	1
20 A	CMS-122PS	2CCA880212R0001	0.012	1
Open-core sensors 18 mm for DIN-rail (universal use)				
80 A	CMS-120DR	2CCA880240R0001	0.015	1
40 A	CMS-121DR	2CCA880241R0001	0.015	1
20 A	CMS-122DR	2CCA880242R0001	0.015	1
Open-core sensors 18 mm for cable tie mounting (universal use)				
80 A	CMS-120CA	2CCA880220R0001	0.011	1
40 A	CMS-121CA	2CCA880221R0001	0.011	1
20 A	CMS-122CA	2CCA880222R0001	0.011	1

Solid-core sensors

Description				
Type	ABB code	Weight of 1 unit (kg)	Unit conf. (Pcs)	
Solid-core sensors 18 mm for S800 devices with cage terminals				
80 A	CMS-100S8	2CCA880124R0001	0.014	1
40 A	CMS-101S8	2CCA880125R0001	0.014	1
20 A	CMS-102S8	2CCA880126R0001	0.014	1
Solid-core sensors 18 mm for pro M & SMISLINE installation devices with twin terminals				
80 A	CMS-100PS	2CCA880100R0001	0.012	1
40 A	CMS-101PS	2CCA880101R0001	0.012	1
20 A	CMS-102PS	2CCA880102R0001	0.012	1
Solid-core sensors 18 mm for DIN rail mounting (universally usable)				
80 A	CMS-100DR	2CCA880128R0001	0.015	1
40 A	CMS-101DR	2CCA880129R0001	0.015	1
20 A	CMS-102DR	2CCA880130R0001	0.015	1
Solid-core sensors 18 mm for cable tie mounting (universally usable)				
80 A	CMS-100CA	2CCA880107R0001	0.011	1
40 A	CMS-101CA	2CCA880108R0001	0.011	1
20 A	CMS-102CA	2CCA880109R0001	0.011	1
Solid-core sensors 25 mm for S800 devices with cage terminals				
160 A	CMS-200S8	2CCA880136R0001	0.028	1
80 A	CMS-201S8	2CCA880137R0001	0.028	1
40 A	CMS-202S8	2CCA880138R0001	0.028	1

Energy efficiency

Sensors and Accessories

Solid-core sensors

Description				
	Type	ABB code	Weight of 1 unit (kg)	Unit conf. (Pcs)
Solid-core sensors 25 mm for DIN-rail mounting (universal use)				
160 A	CMS-200DR	2CCA880132R0001	0.030	1
80 A	CMS-201DR	2CCA880133R0001	0.030	1
40 A	CMS-202DR	2CCA880134R0001	0.030	1
Solid-core sensors 25 mm for cable tie mounting (universal use)				
160 A	CMS-200CA	2CCA880117R0001	0.026	1
80 A	CMS-201CA	2CCA880118R0001	0.026	1
40 A	CMS-202CA	2CCA880119R0001	0.026	1

Control Unit

Description				
	Type	ABB code	Weight of 1 unit (kg)	Unit conf. (Pcs)
CMS-600 Control Unit	CMS-600	2CCA880000R0001	0.153	1
CMS-700 Control Unit	CMS-700	2CCA880700R0001	0.329	1

Accessories

Description				
	Type	ABB code	Weight of 1 unit (kg)	Unit conf. (Pcs)
2 m flat cable	CMS-800	2CCA880148R0001	0.017	1
5 m flat cable	CMS-802	2CCA880331R0001	0.045	1
10 m Flat cable	CMS-803	2CCA880332R0001	0.090	1
30 m Flat cable	CMS-805	2CCA880333R0001	0.270	1
Connector set (35 pcs)	CMS-820	2CCA880145R0001	0.024	35

String monitoring

CMS-660 circuit monitoring system

Extreme flexibility

The number (up to 32) and positioning of the sensors is fully customizable, ensuring the highest flexibility in integration to different system conditions

Up-to-date system status

CMS-660 immediately detects unusual system status (e.g. solar shading, over-voltages, breaker trip, high temperature), facilitating maintenance of the system



User friendliness

Local information, thanks to the LEDs, about network and device status. Reset button to easily set the device.

Compatibility

RS485 port to guarantee easy integration with the plant / inverter monitoring systems.

Smart commissioning

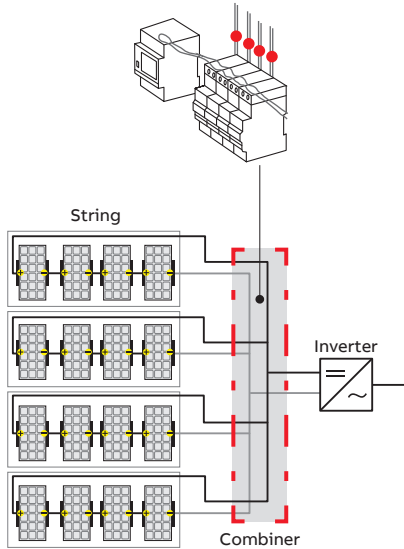
Thanks to the intelligent, intuitive configuration, the CMS system can be configured and put into operation in just a few minutes.

One sensor for all currents and strings

Direct, alternating or mixed – in a wide measuring range up to 80A, allowing the combination of two strings into one solid-core sensor.

Energy efficiency

String monitoring CMS-660



Circuit monitoring system for PV applications

The CMS string monitoring increases the efficiency of photovoltaic systems by detecting failures on PV strings. With the easy-to-integrate system you can immediately detect unusual system status, e.g. defective strings, over-voltages, breaker trips or high temperatures, enabling you to quickly implement appropriate countermeasures.

Key features:

- Current and temperature measurement directly from the sensors
- Monitoring of two strings can be combined into one single CMS solid-core sensor
- Integration of SPD and Switch disconnecter status via 2 digital inputs
- Up to 32 flexible monitoring points, placed where measurement is required
- LEDs provide local information about network and device status.
- Modbus RTU protocol guarantees easy integration into plant or inverter monitoring systems
- Connection technology is extremely simple and requires no special tools

Control unit – CMS-660










Main technical specification		CMS-660
General data		
Degree of protection		IP20
Operating temperature	[°C]	- 25 .. +70 °C
Storage temperature	[°C]	- 40 .. +85 °C
Dimensions W / H / D	[mm]	71.8 x 87.0 x 64.9 (4 modules)
Screw-type terminals		0.5...2.5 mm ² , max 0.6 Nm
Altitude	[m]	≤ 2000 m
Insulation strength	[VAC]	400
Installation on DIN-rail		35 mm (DIN EN 50022)
Reference standards		IEC 61010-1 UL 508/CSA C22.2 No. 14
Supply		
Supply voltage	[VDC]	24 (±10%)
Power Input	[W]	0.5 - 11 (dep. on n. of sensors)
Serial interface (RS-485)		
Serial transmission speed		2.4 ... 115.2 kbps
Cable type		Twisted, shielded
Communication protocol		Modbus RTU
Measuring inputs		
Max. number of sensors		32
Refresh time		≤1 sec with max 32 sensors
Digital inputs		
Connection method		Push-in spring connection
Cable diameter		max. 0.5mm ²
Electrical characteristics		for potential-free contact
Micro USB port		
		1

Control Unit

	Description		Weight of 1 unit (kg)	Unit conf. (Pcs)
	Type	ABB code		
CMS-660 control unit	CMS-660	2CCA880020R0001	0.153	1

Energy efficiency

Analogue and digital instruments selection table

Measure	Technology	Mounting	Insertion	Characteristics	Accessories	Type	
Voltage	Analogue	3 modules	Direct	a.c.	MCV voltage switches	VLM page 8/45	
		72x72, 96x96	Direct		MCV voltage switches	VLM-1 page 8/50	
	Digital	3 modules	Direct	a.c. and d.c. Auxiliary supply 230 V a.c.	MCV voltage switches	VLMD page 8/42	
		36x72	Direct		MCV voltage switches	VLMD P page 8/43	
Current	Analogue	3 modules	Direct		MCA current switches	AMT page 8/45	
			Indirect	a.c. and d.c.	CT a.c. current transformer SNT shunt for d.c. SCL interchangeable scale MCA current switches	AMT1/A AMT2 page 8/46	
		72x72, 96x96	Direct		MCA current switches	AMT1-A1 AMT2-A2 page 8/52	
	Digital	3 modules	Indirect	a.c. and Auxiliary supply 230 V a.c.	CT a.c. current transformer SNT shunt for d.c. MCA current switches	AMT1-A1 AMT1-A5 AMT2-A2 page 8/52	
			36x72	Indirect		CT a.c. current transformer SNT shunt for d.c. MCA current switches	AMTD page 8/42
							AMTD P page 8/43
Frequency	Analogue	72x72, 96x96	Direct	a.c.		FRZ page 8/54	

Energy efficiency

Modular digital instruments



Digital instruments

Technical features		
Power supply	[V]	230 V a.c.
Rated frequency	[Hz]	50±60
Ammeter full scale value	[A]	5, 20, 25, 40, 60, 100, 150, 200, 250, 400, 600, 999
Voltmeter full scale value	[V]	600
Frequency meter range	[Hz]	35...400
Tripping delay	[s]	1, 5, 10, 20, 30
Hysteresis	[%]	5, 10, 20, 30 set threshold
Output pins		3-4
Output relay		NO
Rated voltage relay	[V]	230 V a.c.
Rated current relay	[A]	AC1 16, AC15 3
Relay configuration		NO relay closes in alarm status NC relay opens in alarm status, positive safety
Overload	[In/Vn]	1, 2
Accuracy class	[%]	±0,5 full scale ±1digit at 25 °C
Max. signal input value for ammeters		5 A a.c./60 mV d.c.
Display		3 digit LED display
Operating temperature	[°C]	-10...+55
Storage temperature	[°C]	-40...+70
Protection degree		IP20
Power consumption	[VA]	4
Modules		3
Overall dimensions front panel devices	[mm]	36x72x61.5 (51.5 depth inside the switchboard)
Standard		IEC EN 61010

Energy efficiency

Modular digital instruments



VLMD

Modular digital instruments

The wide range of modular digital instruments starts with single-phase mono-function measurement devices for measuring voltage, current.

The range is composed by a voltmeter for a.c./d.c. voltage monitoring, one ammeter for a.c. current. Ammeters measure in indirect insertion thanks to measuring accessories, like current transformer for a.c. and shunt for d.c.

The full-scale value is programmable by the user, according to the current flow on the primary windings.

Version	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
a.c./d.c. digital voltmeter	620402	VLMD-1-2	2CSM110000R1011		0,300	1
a.c. digital ammeter	620501	AMTD-1	2CSM320000R1011		0,300	1



AMTD

Modular digital instruments with alarm relay

The range is widened by two additional devices with extended features: two ammeters, trip the internal relay to signal an alarm condition if the measured parameter exceeds or falls below a programmable threshold. The measured maximum and minimum peak values are stored in the non-volatile instrument's memory.

The contact type is NO, so that the contact is open when the instrument is powered off, but it is possible to obtain positive safety operation setting, directly on the instrument, the NC relay contact type.

The instrument with relay can be used to signal the exceeding or the fall below a certain threshold, but not for both functions simultaneously.

Version	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
a.c. digital ammeter with alarm relay	747734	AMTD-1-R	2CSM274773R1011		0,300	1
d.c. digital ammeter with alarm relay	610731	AMTD-2-R			0,300	1



FRZ

Energy efficiency

Front panel digital instruments



VLMD P

Front-panel digital instruments

The wide range of front-panel digital instruments starts with single-phase mono-function measurement devices for measuring voltage and current.

The range is composed by a voltmeter for a.c./d.c. voltage monitoring, and one ammeter for a.c. Ammeters measure in indirect insertion thanks to measuring accessories, like current transformer for a.c.

The full-scale value is programmable by the user, according to the current flow on the primary windings.

Version	Bbn	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
	8012542	EAN	Type code			
a.c./d.c. digital voltmeter	136057	VLMD P	2CSG213605R4011		0,300	1
a.c. digital ammeter	136156	AMTD-1 P	2CSG213615R4011		0,300	1



AMTD-_ P

Front-panel digital instruments with alarm relay

The range is widened by one additional devices with extended features: one ammeters that trip the internal relay to signal an alarm condition if the measured parameter exceeds or falls below a programmable threshold. The measured maximum and minimum peak values are stored in the non-volatile instrument's memory.













The contact type is NO, so that the contact is open when the instrument is powered off, but it is possible to obtain positive safety operation setting, directly on the instrument, the NC relay contact type.

The instrument with relay can be used to signal the exceeding or the fall below a certain threshold, but not for both functions simultaneously.

Version	Bbn	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
	8012542	EAN	Type code			
a.c. digital ammeter with alarm relay	136453	AMTD-1-R P	2CSG213645R4011		0,300	1

Energy efficiency

Analogue instruments selection table

Instrument mounting	a.c. / d.c.	Size	Full-scale value Visualization	Instrument type	Scale type
Modular	a.c.	-	90°	AMT1/A1	 SCL 1 
Front-panel	a.c.	72x72 mm	90°	AMT1-A1/72	 SCL-A1 ... /72 
			78°	AMT1-A5/72	 SCL-A5 ... /72 
	d.c.	96x96 mm	90°	AMT1-A1/96	 SCL-A1 ... /96 
			78°	AMT1-A5/96	 SCL-A5 ... /96 
	d.c.	96x96 mm	90°	AMT2-A2/96	 SCL-A2 ... /96 

Analogue instruments with scales

The range of mono-function analogue instruments, employable in single-phase networks, is composed of measurement devices performing the measure and visualization of one electrical parameter: voltage, current and frequency.

The range of voltmeters, both in modular and front-panel versions, is composed by devices fully equipped with the proper scale, even when the use of a voltage transformer is required. The connection, whether it's direct, allows the immediate visualization of the measures on the display.

The range of ammeters is composed of devices for direct and indirect connection to the network. The devices directly connected to the network are fully equipped with proper scale, while the devices that require a current transformer or a shunt, need to be combined with a separate scale to be mounted on the front of the instrument.

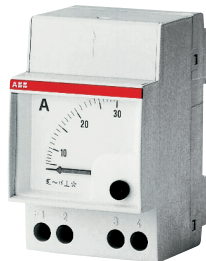
The wide range of scales for ammeters allows the employability of the latter even in application with high nominal current, up to 10000 A a.c.

Energy efficiency

Modular analogue instruments



VLM1



AMT1

Technical features			
Rated voltage U_n	[V]	a.c. 300, 500; d.c. 100, 300	
Rated currents in a.c.	Direct reading	[A]	full scale values 5...30
	Indirect reading		full scale values 5...2500
Rated currents in d.c.	Direct reading	[A]	full scale values 0.1...30
	Indirect reading		full scale values 5...500
Frequency	[Hz]	50/60	
Overload capacity	[%]	20 compared to the voltage or to the rated current	
Accuracy class	[%]	1.5 (0.5 for frequency meters)	
Ammeters power consumption	[VA]	5 A: 0.3 VA; 10 A: 0.6 VA; 25 A: 1 VA; 30 A: 1.2 VA	
Voltmeters power consumption	[VA]	300 V: 1.5 VA; 500 V: 4 VA	
Frequency meters power consumption	[VA]	<1.5 VA	
Modules	[No.]	3	
Protection degree		IP20	
Standards		EN 60051	

The range of modular analogue instruments is composed by mono-function measurement devices employable in single-phase networks. It includes voltmeters, ammeters and frequency meters. In particular, the range of ammeters is composed of devices fully equipped with the appropriate scale in the range between 5 A and 30 A. In case of greater current values, the range features devices to be used together with the proper scale and CT according to the application.

Modular analogue instruments for alternating current

Suitable for direct or indirect measurement through the appropriate accessories.

Voltmeters: direct connection						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
300 V	007906	VLM1/300	2CSM110190R1001	0.200	1	
500 V	000006	VLM1/500	2CSM110220R1001	0.200	1	

Ammeters: direct connection						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
5 A	000709	AMT1/5	2CSM310030R1001	0.200	1	
10 A	000105	AMT1/10	2CSM310040R1001	0.200	1	
15 A	000204	AMT1/15	2CSM310050R1001	0.200	1	
20 A	000303	AMT1/20	2CSM310060R1001	0.200	1	
25 A	000402	AMT1/25	2CSM310070R1001	0.200	1	
30 A	000501	AMT1/30	2CSM310080R1001	0.200	1	

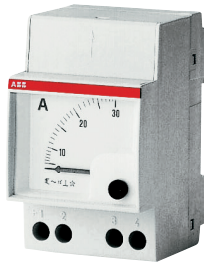
Energy efficiency

Modular analogue instruments



VLM2

Ammeters without scale: connection using CT.../5						
Scale	Bbn	Order details		Price	Weight	Pack
	8012542			1	1 piece	unit
	EAN	Type code	Order code		kg	pc.
A1	000600	AMT1/A1	2CSM320250R1001		0.200	1

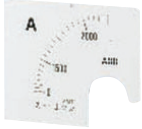


AMT2

Ammeters: direct connection						
Scale	Bbn	Order details		Price	Weight	Pack
	8012542			1	1 piece	unit
	EAN	Type code	Order code		kg	pc.
10 mA	028307	AMT2/0.01	2CSM410330R1001		0.200	1

Energy efficiency

Scales for modular analogue ammeters



SCL

Scales for modular analogue ammeters

Scales SCL 1/A1 for AMT1						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
	EAN	Type code	Order code			
A1-5A	001201	SCL 1/5	2CSM110021R1041		0.010	10
A1-10A	001300	SCL 1/10	2CSM110032R1041		0.010	10
A1-20A	001409	SCL 1/20	2CSM110075R1041		0.010	10
A1-25A	030706	SCL 1/25	2CSM110096R1041		0.010	10
A1-30A	001508	SCL 1/30	2CSM110107R1041		0.010	10
A1-40A	030805	SCL 1/40	2CSM110128R1041		0.010	10
A1-50A	001607	SCL 1/50	2CSM110149R1041		0.010	10
A1-60A	030904	SCL 1/60	2CSM110159R1041		0.010	10
A1-75A	031000	SCL 1/75	2CSM110169R1041		0.010	10
A1-80A	001706	SCL 1/80	2CSM110179R1041		0.010	10
A1-100A	001805	SCL 1/100	2CSM110189R1041		0.010	10
A1-150A	001904	SCL 1/150	2CSM110209R1041		0.010	10
A1-200A	002000	SCL 1/200	2CSM110229R1041		0.010	10
A1-250A	031109	SCL 1/250	2CSM110249R1041		0.010	10
A1-300A	002109	SCL 1/300	2CSM110259R1041		0.010	10
A1-400A	002208	SCL 1/400	2CSM110279R1041		0.010	10
A1-500A	002307	SCL 1/500	2CSM110299R1041		0.010	10
A1-600A	031208	SCL 1/600	2CSM110309R1041		0.010	10
A1-800A	002406	SCL 1/800	2CSM110329R1041		0.010	10
A1-1000A	002505	SCL 1/1000	2CSM110339R1041		0.010	10
A1-1500A	274704	SCL 1/1500	2CSM110359R1041		0.010	10
A1-2000A	274803	SCL 1/2000	2CSM110379R1041		0.010	10
A1-2500A	274902	SCL 1/2500	2CSM110389R1041		0.010	10

Energy efficiency

Front-panel analogue instruments



Front panel analogue instruments

Technical features		
Rated max. reference voltage for insulation	[V]	600 (a.c. meters), 300 (d.c. meters)
Test voltage	[V]	2000 eff. (50 Hz/1 min)
Accuracy class		1.5 (0.5 for frequency meters)
Overload capacity ①		
- ammetric windings		up to $I_n \times 10 / < \text{sec.}$ up to $I_n \times 2 / \text{permanent}$
- voltmetric windings		up to $U_n \times 2 / < 5 \text{ sec.}$ up to $U_n \times 1.2 / \text{permanent}$
Operating temperature	[°C]	-10...+55
Storage temperature	[°C]	-40...+70
Average and max. relative humidity (DIN 40040) ②		65% (yearly average) 85% (+35 °C/60 days a year)
Vibration resistance (IEC 50-1)	[g (9.81 m/s)]	0.08-1.8 (0.35 mm/10-55 Hz; 3 axis/6 h)
Degree of protection		
		IP52 indoors
		IP00 on the terminals (IEC 144. DIN 40050)
		IP20 with suitable terminal covers
Materials		
- cases and front edge		self-extinguishing thermosetting material in accordance with UL94 V-0, fungus and termite resistant
- pointers (DIN 43802) ③		molded aluminium
- terminals		brass
Assembly		
Dimensions W x H x D (DIN 43700/43718)	[mm]	48 x 48 X 53 72 x 72 x 53 96 x 96 X 53
Applicable standards		
		IEC EN 61010-1

① The overload can be greater for instruments enabled by a CT because the transformer generally keeps secondary current peaks to within 10 In.

② Tropicalization enables the instruments to withstand up to 95% max. relative humidity (+35 °C/60 days). In accordance with DIN standard 40040, they must be protected against any penetration of humidity inside the device. Terminals, screws, washers, bolts and magnets are galvanically protected against rust, while the electrical circuits are painted with the special Multicolor PC52 varnish.

③ The pointer damping time is 1 second. The recorded values are cleared by pressing the control provided.

④ With 0.5 mm -19 mm thick panels, the screws must be attached in the fixing position nearest to the front edge of the measuring device, whereas the 20 mm - 39 mm thick panels require the screws to be fixed in the position furthest away from the front edge.

Energy efficiency

Front-panel analogue instruments



VLM

Available in both alternating current and direct current versions, the front-panel mono-function measurement devices come in two standard sizes, 72 mm x 72 mm and 96 mm x 96 mm (special versions available on request), employable in single-phase networks. The range is composed ammeters for a.c. and d.c. applications, and voltmeters and frequency meters for a.c. applications. Ammeters without scale for indirect connection must be completed with the appropriate scale, chosen according to the full-scale value.

Front-panel analogue voltmeters for alternating current

Size mm	Insertion	Scale V a.c.	VT type	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
					Type code	Order code			
72	D	50		544104	VLM-1-50/72	2CSG112100R4001			1
72	D	60		544203	VLM-1-60/72	2CSG112110R4001			1
72	D	80		544302	VLM-1-80/72	2CSG112120R4001			1
72	D	100		544401	VLM-1-100/72	2CSG112130R4001			1
72	D	150		544500	VLM-1-150/72	2CSG112150R4001			1
72	D	200		544609	VLM-1-200/72	2CSG112160R4001			1
72	D	250		544708	VLM-1-250/72	2CSG112180R4001			1
72	D	300		544807	VLM-1-300/72	2CSG112190R4001			1
72	D	400		544906	VLM-1-400/72	2CSG112210R4001			1
72	D	500		545002	VLM-1-500/72	2CSG112220R4001			1
72	D	600		545101	VLM-1-600/72	2CSG112230R4001			1

Energy efficiency

Front-panel analogue instruments



VLM

Size	Insertion	Scale	VT type	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc
mm		V a.c.		EAN	Type code	Order code			
96	D	50		546702	VLM-1-50/96	2CSG113100R4001			1
96	D	60		546801	VLM-1-60/96	2CSG113110R4001			1
96	D	80		546900	VLM-1-80/96	2CSG113120R4001			1
96	D	100		547006	VLM-1-100/96	2CSG113130R4001			1
96	D	150		547105	VLM-1-150/96	2CSG113150R4001			1
96	D	200		547204	VLM-1-200/96	2CSG113160R4001			1
96	D	250		547303	VLM-1-250/96	2CSG113180R4001			1
96	D	300		547402	VLM-1-300/96	2CSG113190R4001			1
96	D	400		547501	VLM-1-400/96	2CSG113210R4001			1
96	D	500		547600	VLM-1-500/96	2CSG113220R4001			1
96	D	600		547709	VLM-1-600/96	2CSG113230R4001			1

D: direct connection

Energy efficiency

Front-panel analogue ammeters for alternating current



AMT1-A1 72



AMT1-A1 96

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		A a.c.	EAN	Type code	Order code		kg	pc.
72	D	1	545507	AMT1-A1-1/72	2CSG312020R4001			1
72	D	5	545606	AMT1-A1-5/72	2CSG312030R4001			1
72	D	10	545705	AMT1-A1-10/72	2CSG312040R4001			1
72	D	15	545804	AMT1-A1-15/72	2CSG312050R4001			1
72	D	20	545903	AMT1-A1-20/72	2CSG312060R4001			1
72	D	25	546009	AMT1-A1-25/72	2CSG312070R4001			1
72	D	30	546108	AMT1-A1-30/72	2CSG312080R4001			1
72	D	40	546207	AMT1-A1-40/72	2CSG312090R4001			1
72	D	50	546306	AMT1-A1-50/72	2CSG312100R4001			1
72	D	60	546405	AMT1-A1-60/72	2CSG312110R4001			1
72	I	SCL-A1	546504	AMT1-A1/72	2CSG322250R4001			1
72	I	SCL-A5	546603	AMT1-A5/72	2CSG322260R4001			1

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		A a.c.	EAN	Type code	Order code		kg	pc.
96	D	1	548102	AMT1-A1-1/96	2CSG313020R4001			1
96	D	5	548201	AMT1-A1-5/96	2CSG313030R4001			1
96	D	10	548300	AMT1-A1-10/96	2CSG313040R4001			1
96	D	15	548409	AMT1-A1-15/96	2CSG313050R4001			1
96	D	20	548508	AMT1-A1-20/96	2CSG313060R4001			1
96	D	25	548607	AMT1-A1-25/96	2CSG313070R4001			1
96	D	30	548706	AMT1-A1-30/96	2CSG313080R4001			1
96	D	40	548805	AMT1-A1-40/96	2CSG313090R4001			1
96	D	50	548904	AMT1-A1-50/96	2CSG313100R4001			1
96	D	60	549000	AMT1-A1-60/96	2CSG313110R4001			1
96	I	SCL-A1	549109	AMT1-A1/96	2CSG323250R4001			1
96	I	SCL-A5	549208	AMT1-A5/96	2CSG323260R4001			1

D: direct connection

I: indirect connection with VT, CT and shunt, according to the type

Energy efficiency

Front-panel analogue instruments



FRZ 72



FRZ 96

Front-panel analogue frequency meters

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
mm			EAN	Type code	Order code			
72	D	90°	555704	FRZ-90/72	2CSG812310R4001			1
72	D	240°	555902	FRZ-240/72	2CSG812320R4001			1

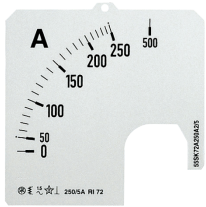
Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
mm			EAN	Type code	Order code			
96	D	90°	555803	FRZ-90/96	2CSG813310R4001			1
96	D	240°	556008	FRZ-240/96	2CSG813320R4001			1

D: direct connection

I: indirect connection with VT, CT and shunt, according to the type

Energy efficiency

Scales for front-panel analogue instrument

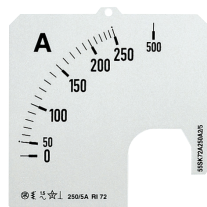


SCL

Scales 72 x 72 mm: SCL-A1 for AMT1-A1/72 a.c. ammeters						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
A a.c.	EAN	Type code	Order code			
1	771609	SCL-A1-1/72	2CSG112010R5011		0.010	10
5	771708	SCL-A1-5/72	2CSG112021R5011		0.010	10
10	771807	SCL-A1-10/72	2CSG112032R5011		0.010	10
15	771906	SCL-A1-15/72	2CSG112054R5011		0.010	10
20	772002	SCL-A1-20/72	2CSG112075R5011		0.010	10
25	772101	SCL-A1-25/72	2CSG112096R5011		0.010	10
30	772200	SCL-A1-30/72	2CSG112107R5011		0.010	10
40	772309	SCL-A1-40/72	2CSG112128R5011		0.010	10
50	772408	SCL-A1-50/72	2CSG112149R5011		0.010	10
60	772507	SCL-A1-60/72	2CSG112159R5011		0.010	10
80	772606	SCL-A1-80/72	2CSG112179R5011		0.010	10
100	572305	SCL-A1-100/72	2CSG112189R5011		0.010	10
150	572404	SCL-A1-150/72	2CSG112209R5011		0.010	10
200	572503	SCL-A1-200/72	2CSG112229R5011		0.010	10
250	572602	SCL-A1-250/72	2CSG112249R5011		0.010	10
300	572701	SCL-A1-300/72	2CSG112259R5011		0.010	10
400	572800	SCL-A1-400/72	2CSG112279R5011		0.010	10
500	572909	SCL-A1-500/72	2CSG112299R5011		0.010	10
600	573005	SCL-A1-600/72	2CSG112309R5011		0.010	10
800	573104	SCL-A1-800/72	2CSG112329R5011		0.010	10
1000	573203	SCL-A1-1000/72	2CSG112339R5011		0.010	10
1500	573302	SCL-A1-1500/72	2CSG112359R5011		0.010	10
2000	573401	SCL-A1-2000/72	2CSG112379R5011		0.010	10
2500	573500	SCL-A1-2500/72	2CSG112389R5011		0.010	10
3000	573609	SCL-A1-3000/72	2CSG112399R5011		0.010	10
4000	573708	SCL-A1-4000/72	2CSG112409R5011		0.010	10
5000	573807	SCL-A1-5000/72	2CSG112419R5011		0.010	10
6000	573906	SCL-A1-6000/72	2CSG112429R5011		0.010	10
8000	574002	SCL-A1-8000/72	2CSG112439R5011		0.010	10
10000	574101	SCL-A1-10000/72	2CSG112449R5011		0.010	10

Energy efficiency

Scales for front-panel analogue instrument

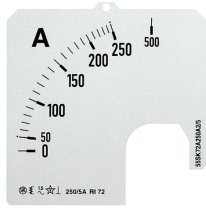


SCL

Scales 72 x 72 mm: SCL-A5 for AMT1-A5/72 a.c. ammeters						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
A a.c.	EAN	Type code	Order code		kg	pc.
1	772705	SCL-A5-1/72	2CSG122010R5011		0.010	10
5	772804	SCL-A5-5/72	2CSG122021R5011		0.010	10
10	772903	SCL-A5-10/72	2CSG122032R5011		0.010	10
15	773009	SCL-A5-15/72	2CSG122054R5011		0.010	10
20	773108	SCL-A5-20/72	2CSG122075R5011		0.010	10
25	773207	SCL-A5-25/72	2CSG122096R5011		0.010	10
30	773306	SCL-A5-30/72	2CSG122107R5011		0.010	10
40	773405	SCL-A5-40/72	2CSG122128R5011		0.010	10
50	773504	SCL-A5-50/72	2CSG122149R5011		0.010	10
60	773603	SCL-A5-60/72	2CSG122159R5011		0.010	10
80	773702	SCL-A5-80/72	2CSG122179R5011		0.010	10
100	574200	SCL-A5-100/72	2CSG122189R5011		0.010	10
150	574309	SCL-A5-150/72	2CSG122209R5011		0.010	10
200	574408	SCL-A5-200/72	2CSG122229R5011		0.010	10
250	574507	SCL-A5-250/72	2CSG122249R5011		0.010	10
300	574606	SCL-A5-300/72	2CSG122259R5011		0.010	10
400	574705	SCL-A5-400/72	2CSG122279R5011		0.010	10
500	574804	SCL-A5-500/72	2CSG122299R5011		0.010	10
600	574903	SCL-A5-600/72	2CSG122309R5011		0.010	10
800	575009	SCL-A5-800/72	2CSG122329R5011		0.010	10
1000	575108	SCL-A5-1000/72	2CSG122339R5011		0.010	10
1500	575207	SCL-A5-1500/72	2CSG122359R5011		0.010	10
2000	575306	SCL-A5-2000/72	2CSG122379R5011		0.010	10
2500	575405	SCL-A5-2500/72	2CSG122389R5011		0.010	10
3000	575504	SCL-A5-3000/72	2CSG122399R5011		0.010	10
4000	575603	SCL-A5-4000/72	2CSG122409R5011		0.010	10
5000	575702	SCL-A5-5000/72	2CSG122419R5011		0.010	10
6000	575801	SCL-A5-6000/72	2CSG122429R5011		0.010	10
8000	575900	SCL-A5-8000/72	2CSG122439R5011		0.010	10
10000	576006	SCL-A5-10000/72	2CSG122449R5011		0.010	10

Energy efficiency

Scales for front-panel analogue instrument

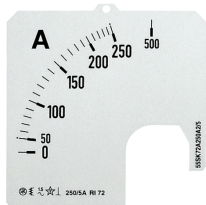


SCL

Scales 96 x 96 mm: SCL-A1 for AMT1-A1/96 a.c. ammeters						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
A a.c.	EAN	Type code	Order code		kg	pc.
1	773801	SCL-A1-1/96	2CSG113010R5011		0.010	10
5	773900	SCL-A1-5/96	2CSG113021R5011		0.010	10
10	774006	SCL-A1-10/96	2CSG113032R5011		0.010	10
15	774105	SCL-A1-15/96	2CSG113054R5011		0.010	10
20	774204	SCL-A1-20/96	2CSG113075R5011		0.010	10
25	774303	SCL-A1-25/96	2CSG113096R5011		0.010	10
30	774402	SCL-A1-30/96	2CSG113107R5011		0.010	10
40	774501	SCL-A1-40/96	2CSG113128R5011		0.010	10
50	774600	SCL-A1-50/96	2CSG113149R5011		0.010	10
60	774709	SCL-A1-60/96	2CSG113159R5011		0.010	10
80	774808	SCL-A1-80/96	2CSG113179R5011		0.010	10
100	584100	SCL-A1-100/96	2CSG113189R5011		0.010	10
150	584209	SCL-A1-150/96	2CSG113209R5011		0.010	10
200	584308	SCL-A1-200/96	2CSG113229R5011		0.010	10
250	584407	SCL-A1-250/96	2CSG113249R5011		0.010	10
300	584506	SCL-A1-300/96	2CSG113259R5011		0.010	10
400	584605	SCL-A1-400/96	2CSG113279R5011		0.010	10
500	584704	SCL-A1-500/96	2CSG113299R5011		0.010	10
600	584803	SCL-A1-600/96	2CSG113309R5011		0.010	10
800	584902	SCL-A1-800/96	2CSG113329R5011		0.010	10
1000	585008	SCL-A1-1000/96	2CSG113339R5011		0.010	10
1500	585107	SCL-A1-1500/96	2CSG113359R5011		0.010	10
2000	585206	SCL-A1-2000/96	2CSG113379R5011		0.010	10
2500	585305	SCL-A1-2500/96	2CSG113389R5011		0.010	10
3000	585404	SCL-A1-3000/96	2CSG113399R5011		0.010	10
4000	585503	SCL-A1-4000/96	2CSG113409R5011		0.010	10
5000	585602	SCL-A1-5000/96	2CSG113419R5011		0.010	10
6000	585701	SCL-A1-6000/96	2CSG113429R5011		0.010	10
8000	585800	SCL-A1-8000/96	2CSG113439R5011		0.010	10
10000	585909	SCL-A1-10000/96	2CSG113449R5011		0.010	10

Energy efficiency

Scales for front-panel analogue instrument

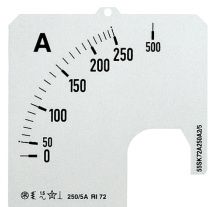


SCL

Scales 96 x 96 mm: SCL-A5 for AMT1-A5/96 a.c. ammeters						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
A a.c.	EAN	Type code	Order code		kg	pc.
1	774907	SCL-A5-1/96	2CSG123010R5011		0.010	10
5	775003	SCL-A5-5/96	2CSG123021R5011		0.010	10
10	775102	SCL-A5-10/96	2CSG123032R5011		0.010	10
15	775201	SCL-A5-15/96	2CSG123054R5011		0.010	10
20	775300	SCL-A5-20/96	2CSG123075R5011		0.010	10
25	775409	SCL-A5-25/96	2CSG123096R5011		0.010	10
30	775508	SCL-A5-30/96	2CSG123107R5011		0.010	10
40	775607	SCL-A5-40/96	2CSG123128R5011		0.010	10
50	775706	SCL-A5-50/96	2CSG123149R5011		0.010	10
60	775805	SCL-A5-60/96	2CSG123159R5011		0.010	10
80	775904	SCL-A5-80/96	2CSG123179R5011		0.010	10
100	586005	SCL-A5-100/96	2CSG123189R5011		0.010	10
150	586104	SCL-A5-150/96	2CSG123209R5011		0.010	10
200	586203	SCL-A5-200/96	2CSG123229R5011		0.010	10
250	586302	SCL-A5-250/96	2CSG123249R5011		0.010	10
300	586401	SCL-A5-300/96	2CSG123259R5011		0.010	10
400	586500	SCL-A5-400/96	2CSG123279R5011		0.010	10
500	586609	SCL-A5-500/96	2CSG123299R5011		0.010	10
600	586708	SCL-A5-600/96	2CSG123309R5011		0.010	10
800	586807	SCL-A5-800/96	2CSG123329R5011		0.010	10
1000	586906	SCL-A5-1000/96	2CSG123339R5011		0.010	10
1500	587002	SCL-A5-1500/96	2CSG123359R5011		0.010	10
2000	587101	SCL-A5-2000/96	2CSG123379R5011		0.010	10
2500	587200	SCL-A5-2500/96	2CSG123389R5011		0.010	10
3000	587309	SCL-A5-3000/96	2CSG123399R5011		0.010	10
4000	587408	SCL-A5-4000/96	2CSG123409R5011		0.010	10
5000	587507	SCL-A5-5000/96	2CSG123419R5011		0.010	10
6000	587606	SCL-A5-6000/96	2CSG123429R5011		0.010	10
8000	587705	SCL-A5-8000/96	2CSG123439R5011		0.010	10
10000	587804	SCL-A5-10000/96	2CSG123449R5011		0.010	10

Energy efficiency

Scales for front-panel analogue instrument



SCL

Scales 96 x 96 mm: SCL-A2 for AMT2-A2/96 d.c. ammeters						
Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
A a.c.	EAN	Type code	Order code		kg	pc.
20	598107	SCL-A2-20/96	2CSG233075R5011		0.010	10
100	598206	SCL-A2-100/96	2CSG233189R5011		0.010	10
150	598305	SCL-A2-150/96	2CSG233209R5011		0.010	10
200	598404	SCL-A2-200/96	2CSG233229R5011		0.010	10
250	598503	SCL-A2-250/96	2CSG233249R5011		0.010	10
300	598602	SCL-A2-300/96	2CSG233259R5011		0.010	10
400	598701	SCL-A2-400/96	2CSG233279R5011		0.010	10
500	598800	SCL-A2-500/96	2CSG233299R5011		0.010	10
600	598909	SCL-A2-600/96	2CSG233309R5011		0.010	10
800	599005	SCL-A2-800/96	2CSG233329R5011		0.010	10
1000	599104	SCL-A2-1000/96	2CSG233339R5011		0.010	10

Energy efficiency

Voltmetric and current switches



MCV

Technical features

Insulation voltage	[V]	600
Rated thermal current	[A]	12
Mechanic operations	[No.]	1000000
Power consumption	[VA]	0.23
Modules	[No.]	3

MCV - MCA voltmetric and current switches

Cam rotary switches are suitable for mounting on EN 50022 rail. In three-phase systems they enable the use of a single measurement instrument (single-phase) for viewing the current or voltage value set through the switch itself.



MCA

Voltmeter switches

Range	Power loss	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
	W	EAN	Type code	Order code		kg	pc.
L1, L2, L3	0.5	52246 9	MCV 4	1SCA022404R4740		0.095	1
L1, L2, L3, N	0.5	52243 8	MCV 7	1SCA022647R7840		0.110	1

Current switches

Range	Power loss	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
	W	EAN	Type code	Order code		kg	pc.
0-1-2-3	0.5	52245 2	MCA 4	1SCA022404R4821		0.110	1



QCA 48

Front panel QCV - QCA voltage and current switches

For use in three-phase systems, to allow a single device to measure the voltage and current settings adjusted by the switches.

Measure	Position	Bbn 7392696	Order details		Price 1 piece	Weight 1 piece	Pack unit
		EAN	Type code	Order code		kg	pc.
Voltage	4	527990	QCV-4/48	1SCA022780R0770		0.150	1
Current	4	528003	QCA-4/48	1SCA022780R0690		0.150	1
Voltage	7	527983	QCV-7/48	1SCA022780R0850		0.150	1



QCV 48

Energy efficiency

E 233 hour counters



E 233

Technical features		
	AC equipment	DC equipment
Rated voltage	50 Hz: 24 V, 230 V 60 Hz: 24 V, 120 V, 240 V	DC 12 V ... 48 V
Voltage tolerance	±15 %	±10 %
Power consumption	1.5 VA	ca. 20 mW (at 12 V DC)
Ambient temperature	-15 °C/5 °F... +50 °C/122 °F	-10 °C/14 °F ... +50 °C/122 °F
Counting capacity	99.999 h	99.999 h
Reading accuracy	0.01 h	0.1 h
Operation display	fast running	LED blinking
Protection against electric shock	according to DIN VDE 0106 Part 100 (BGV A2)	according to DIN VDE 0106 Part 100 (BGV A2)
Terminal size	up to 10 mm ²	up to 10 mm ²

E 233 electro-mechanical hour counters

Hour counters are used to record operating times as well as to determine idle times and off times of industrial machinery and plant, for commercial purposes or in domestic installations. No reset functionality.

Rated voltage	Bbn 4012233	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
AC 230 V/50 Hz	63000 4	E 233-230	2CDE100000R1601		0.05	10
AC 24 V/50 Hz	63010 3	E 233-24	2CDE400000R1601		0.05	10
DC 12 V ... 48 V	63020 2	E 233-12/48	2CDE300010R1601		0.05	10
AC 240 V/60 Hz	36590 1 ①	E 233-240/60 Hz	2CDE100021R1601		0.05	10
AC 120 V/60 Hz	36600 7 ①	E 233-120/60 Hz	2CDE600021R1601		0.05	10
AC 24 V/60 Hz	36610 6 ①	E 233- 24/60 Hz	2CDE400021R1601		0.05	10

① Bbn No. 4016779

Energy efficiency

HMT hour counters



HMT

Technical features		
Rated voltage Un	[V]	a.c. 24 a.c. 110 a.c. 230
Displayed digits (in hours)	[n°]	99,999.9 (for HMT1 and HMT11)
Accuracy class	[%]	0.5
Frequency	[Hz]	50
Power consumption	[W]	1.1...2.2
Modules	[No.]	2

HMT electro-mechanical hour counters

Equipped with 7-digit indicator (99.999,99) and available in two modules. They cannot be reset.

Rated voltage	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
V AC						
24	030300	HMT 1/24	2CSM111000R1601		0.200	6
110	030409	HMT 1/110	2CSM121000R1601		0.200	6
230	030508	HMT 1/220	2CSM131000R1601		0.200	6
230	030607	HMT 11	2CSM133000R1601		0.200	1

Energy efficiency

TMD temperature control units



TMD

Technical features			
Auxiliary supply	Alternating current	[V]	20÷250 ±15%
	Direct current	[Hz]	115-230-400 50-60
Power consumption		[VA]	4 max
Input	Sensor		PT100 RTD (not included)
	Type		3 wires (2 and 4 wires types are also supported)
	Error		1 degree every 0,39 Ω
	Measure range	[°C]	0...220 ± 2
	Compensation	[Ω]	20 max
	Trip delay/hysteresis	[s/°C]	5/2
Output	Number		4
	Type		NO-CO-NC
	Vmax	[V]	12 d.c.
	I _{maxww}	[A]	8 (resistive load)
	Functions		Alarm, trip, cooling, auto-test
	Programmable functions		Alarm, tip, hold, fan, temp. max
Display			7 segments LED
Connections	Terminals		removable screw
	Max section	[mm ²]	2.5
Insulation voltage		[V]	2500/50 Hz - 1 min
Protection degree	Front		IP52
	Rear		IP20
Operation temperature		[°C]	-10...+55, relative humidity max 90%
Storage temperature		[°C]	-25...+80
Reference			IEC EN 50081-2, IEC EN 50082-2, IEC EN 60255

Temperature control units

TMD are used measure and control the temperature levels and efficiency of electric machines, power transformers, motors, etc.






The temperature is measured by four PT100 type sensors. Each measuring channel has two programmable alarm thresholds which trip two output relays to remotely signal that a critical temperature has been reached.




The measured values and any alarm conditions are shown on the dual 3-digit display on the front of the device, which also has five programming keys for configuring its operation. The control unit is also able to store in memory maximum values and a log of all trip-events.

Temperature measured	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		EAN	Type code			
4	560203	TMD-4/96	2CSG524000R2021		0.8	1

Energy efficiency






Current transformers selection table

Breaker choice							
Modular	S200, S280, S290, S700, S750DR, S800						
Tmax	XT1, XT2, XT3, XT4, T4320						T5
Emax							
Installation choice							
Fixing system	DIN rail	DIN rail	DIN rail, cable or bus bar		Bus bar	DIN rail, cable or bus bar, base mounted with feet	
							
Rated current (A)	CTA	TRFM	CT PRO XT		CT30	CT MAX	
			Standard	SELV version		Standard	SELV version
20	2CS-G111050R1141 CTA/20						
25	2CS-G111060R1141 CTA/25						
40	2CS-G111080R1141 CTA/40 (cl. 0.5)	2CS-M100050R1111 TRFM/40	2CSG225745R1101 CT PRO XT 40	2CSG225845R1101 CT PRO XT 40 SELV			
50	2CS-G111090R1141 CTA/50 (cl. 0.5)		2CSG225755R1101 CT PRO XT 50	2CSG225855R1101 CT PRO XT 50 SELV			
60	2CSG111100R1141 CTA/60 (cl. 0.5)	2CS-M100070R1111 TRFM/60 (cl. 1)	2CSG225765R1101 CT PRO XT 60	2CSG225865R1101 CT PRO XT 60 SELV			
80	2CSG111110R1141 CTA/80 (cl. 0.5)		2CSG225775R1101 CT PRO XT 80	2CSG225875R1101 CT PRO XT 80 SELV			
100	2CSG111120R1141 CTA/100 (cl. 0.5)	2CS-M100090R1111 TRFM/100	2CSG225785R1101 CT PRO XT 100	2CSG225885R1101 CT PRO XT 100 SELV	2CS-G101100R1101 CT30/100 (cl. 3)		
150		2CSM100100R1111 TRFM/150	2CSG225795R1101 CT PRO XT 150	2CSG225895R1101 CT PRO XT 150 SELV	2CS-G101110R1101 CT30/150 (cl. 3)		
200			2CSG225805R1101 CT PRO XT 200	2CSG225905R1101 CT PRO XT 200 SELV			
250		2CSM100120R1111 TRFM/250	2CSG225815R1101 CT PRO XT 250	2CSG225915R1101 CT PRO XT 250 SELV	2CS-G101130R1101 CT30/250		
300			2CSG225825R1101 CT PRO XT 300	2CSG225925R1101 CT PRO XT 300 SELV		2CSG225945R1101 CT MAX 300	2CSG226005R1101 CT MAX 300 SELV

T6,T7		T6,T7						
E1.2, E2.2, E4.2		E2, E3, E4, E6		E2.2, E4.2, E6.2		E2.2, E4.2		E1.2
Cable or bus bar, base mounted with feet			Bus bar	Cable or bus bar, base mounted with feet			Bus bar	
								
CT6	CT8	CT8V	CT80	CT12	CT12V	CT120		Class
								0,5
								0,5
								3
								3
								3
								3
								1
								0,5
								0,5
2CSG421130R1101 CT6/250		2CSG201130R1101 CT80/250						0,5
2CSG421140R1101 CT6/300								0,5

Energy efficiency

Current transformers selection table

Breaker choice							
Modular	S200, S280, S290, S700, S750DR, S800						
Tmax	XT1, XT2, XT3, XT4, T4320						T5
Emax							
Installation choice							
Fixing system	DIN rail	DIN rail	DIN rail, cable or bus bar		Bus bar	DIN rail, cable or bus bar, base mounted with feet	
							
Rated current (A)	CTA	TRF M	CT PRO XT		CT30	CT MAX	
			Standard	SELV version		Standard	SELV version
400		2CSM100140R1111 TRFM/400	2CSG225835R1101 CT PRO XT 400	2CSG225935R1101 CT PRO XT 400 SELV	2CS-G101150R1101 CT30/400	2CSG225955R1101 CT MAX 400	2CSG226015R1101 CT MAX 400 SELV
500						2CSG225965R1101 CT MAX 500	2CSG226025R1101 CT MAX 500 SELV
600		2CSM100160R1111 TRFM/600				2CSG225975R1101 CT MAX 600	2CSG226035R1101 CT MAX 600 SELV
800						2CSG225985R1101 CT MAX 800	2CSG226045R1101 CT MAX 800 SELV
1000						2CSG225995R1101 CT MAX 1000	2CSG226055R1101 CT MAX 1000 SELV
1200							
1250							
1500							
2000							
2500							
3000							
4000							
5000							
6000							
Primary choice							
	CTA	TRF M	CT PRO XT		CT30	CT MAX	
	Wound primary	Through primary			Split core trough primary	Through primary	
Through	8	29	18	18	-	30	30
primary max section [mm]	-	-	20x10	20x10	-	30x15; 40x10	30x15; 40x10
	-	-	-	-	3x80x10	-	-

T6,T7		T6,T7		E2, E3, E4, E6		E2.2, E4.2, E6.2		E2.2, E4.2		E1.2			
Cable or bus bar, base mounted with feet				Bus bar		Cable or bus bar, base mounted with feet				Bus bar			
CT6		CT8		CT8V		CT80		CT12		CT12V		CT120	
CT6		CT8		CT8V		CT80		CT12		CT12V		CT120	
Class													
2CSG421150R1101 CT6/400						2CSG201150R1101 CT80/400						0,5	
2CSG421160R1101 CT6/500						2CSG201160R1101 CT80/500						0,5	
2CSG421170R1101 CT6/600		2CSG521170R1101 CT8/600		2CSG631170R1101 CT8-V/600		2CSG201170R1101 CT80/600		2CSG721170R1101 CT12/600				0,5	
2CSG421180R1101 CT6/800		2CSG521180R1101 CT8/800		2CSG631180R1101 CT8-V/800				2CSG721180R1101 CT12/800		2CSG831180R1101 CT12-V/800		2CSG401180R1101 CT120/800	
2CSG421190R1101 CT6/1000		2CSG521190R1101 CT8/1000		2CSG631190R1101 CT8-V/1000		2CSG201190R1101 CT80/1000		2CSG721190R1101 CT12/1000		2CSG831190R1101 CT12-V/1000		0,5	
2CSG421200R1101 CT6/1200		2CSG521200R1101 CT8/1200		2CSG631200R1101 CT8-V/1200				2CSG721200R1101 CT12/1200		2CSG831200R1101 CT12-V/1200		2CSG401200R1101 CT120/1200	
										2CSG831210R1101 CT12-V/1250		0,5	
2CSG421220R1101 CT6/1500		2CSG521220R1101 CT8/1500		2CSG631220R1101 CT8-V/1500				2CSG721220R1101 CT12/1500		2CSG831220R1101 CT12-V/1500		2CSG401220R1101 CT120/1500	
2CSG421230R1101 CT6/2000		2CSG521230R1101 CT8/2000		2CSG631230R1101 CT8-V/2000				2CSG721230R1101 CT12/2000		2CSG831230R1101 CT12-V/2000		0,5	
2CSG421240R1101 CT6/2500		2CSG521240R1101 CT8/2500		2CSG631240R1101 CT8-V/2500				2CSG721240R1101 CT12/2500		2CSG831240R1101 CT12-V/2500		0,5	
		2CSG521250R1101 CT8/3000						2CSG721250R1101 CT12/3000		2CSG831250R1101 CT12-V/3000		0,5	
								2CSG721260R1101 CT12/4000		2CSG831260R1101 CT12-V/4000		0,5	
								2CSG721270R1101 CT12/5000				0,5	
								2CSG721280R1101 CT12/6000				0,5	
CT6		CT8		CT8V		CT80		CT12		CT12V		CT120	
Through primary						Split core trough primary		Through primary				Split core trough primary	
50		2x30		2x35		-		2x50		3x35		-	
60x20		80x30		-		-		80x50; 100x50; 125x50		-		-	
-		-		80x30; 3x80x5		2x30x10		-		125x30, 3x100x10, 4x100x5, 4x125x5		4x120x10	

Energy efficiency

CT measurement current transformers with through primary



CT

Technical features		CT...	CTO	TRFM
Standard secondary current	[A]	5 A		
Max. voltage for operation	[kV]	1,2		
Test voltage	[kV]	3 a 50 Hz/1min		
Residual current voltage at secondary terminals when security circuit intervenes (only SELV versions)		< 25 V rms		
Short circuit rated thermal current	[IpN]	40 per 1 sec.	60 per 1 sec.	40 per 1 sec.
Short circuit rated dynamic current	[Ith]	2,5 per 1 sec.		
Permanent overload	[IpN]	1,2		
Safety factor	[Fs]	from ≤ 2 to ≤ 10 depending on the type and capacity		
Frequency	[Hz]	50-60		
Air insulation class		Class E	B	E
Terminals		primary P1 - P2 (K - L); secondary s1 - s2 (k - l) P1 (K) primary winding input s1 (k) secondary winding input P2 (L) primary winding output s2 (l) secondary winding output		
Housing		Self-extinguishing thermoplastic resin V0		
Protection degree		IP30	IP20	IP20
Operating temperature	[°C]	-5...+50	-5...+50	-25...+50
Max. temperature on bars	[°C]	70°C		
Storage temperature	[°C]	-20...+80	-20...+80	-40...+80
Relative humidity		80%		
Reference standard		IEC EN 60044-1, IEC EN 61010-1		
Secondary protection circuit reference standards (only SELV versions)		IEC60364; IEC473.1.4; IEC556.3; CEI64-8-4; CEI411.1.4.3; CEI411.5.2; CEI411.2; CEI473.1.4; CEI473.2.3		

CT and CTA current transformers

Used to transform primary currents (max. 6000 A) into .../5 A low secondary currents indirectly supplying power to analogue and digital measurement devices. They are available both with wound and through primary. In the first case they are provided along with the bar or the primary terminal; in the second case they have a hole to insert in the bar or the cable which forms the primary.

The rated current to the secondary windings is 5 A, in line with the offer of measuring devices. CT .. /1 are not employable with ABB mono-function and multifunction measuring devices. The use of CT .. /1 is needed in case of long wirings from CT secondary windings to the measuring device; nowadays, the wide use of communication protocols doesn't require the instrument to be installed far from the line to measure.

The new SELV versions of the CT PRO XT and CT MAX guarantee maximum safety against overvoltage and switchboard internal overheating thanks to the innovative electronic protection circuit which automatically short-circuit the CT secondary winding in case of accidental disconnection of its secondary terminals.

Energy efficiency

CT measurement current transformers with through primary



CT PRO XT

Standard type current transformers .../5 A with through primary

CT PRO XT .../5 A series, through primary								
Primary rated current I_{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
40	3	2	257455	CT PRO XT 40	2CSG225745R1101	0.32	0.32	1
50	3	2	257554	CT PRO XT 50	2CSG225755R1101	0.32	0.32	1
60	3	2	257653	CT PRO XT 60	2CSG225765R1101	0.32	0.32	1
80	3	2	257752	CT PRO XT 80	2CSG225775R1101	0.32	0.32	1
100	1	3	257851	CT PRO XT 100	2CSG225785R1101	0.32	0.32	1
150	1	5	257950	CT PRO XT 150	2CSG225795R1101	0.32	0.32	1
200	1	5	258056	CT PRO XT 200	2CSG225805R1101	0.32	0.32	1
250	0.5	5	258155	CT PRO XT 250	2CSG225815R1101	0.32	0.32	1
300	0.5	5	258155	CT PRO XT 300	2CSG225825R1101	0.32	0.32	1
400	0.5	5	258353	CT PRO XT 400	2CSG225835R1101	0.32	0.32	1

CT PRO XT SELV .../5 A series, through primary								
Primary rated current I_{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
40	3	2	258452	CT PRO XT 40 SELV	2CSG225845R1101	0.37	0.37	1
50	3	2	258551	CT PRO XT 50 SELV	2CSG225855R1101	0.37	0.37	1
60	3	2	258650	CT PRO XT 60 SELV	2CSG225865R1101	0.37	0.37	1
80	3	2	258650	CT PRO XT 80 SELV	2CSG225875R1101	0.37	0.37	1
100	1	3	258858	CT PRO XT 100 SELV	2CSG225885R1101	0.37	0.37	1
150	1	5	258957	CT PRO XT 150 SELV	2CSG225895R1101	0.37	0.37	1
200	1	5	259053	CT PRO XT 200 SELV	2CSG225905R1101	0.37	0.37	1
250	0.5	5	259152	CT PRO XT 250 SELV	2CSG225915R1101	0.37	0.37	1
300	0.5	5	259251	CT PRO XT 300 SELV	2CSG225925R1101	0.37	0.37	1
400	0.5	5	259350	CT PRO XT 400 SELV	2CSG225935R1101	0.37	0.37	1

CT PRO XT series

Through primary		max section [mm]
cable	○	18
horizontal bar	▬	20x10
vertical bar	▮	-

Energy efficiency

CT measurement current transformers with through primary



CT MAX

CT MAX .../5 A series, through primary								
Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
				Type code	Order code			
300	0,5	4	259459	CT MAX 300	2CSG225945R1101	0,32	kg	pc.
400	0,5	5	259558	CT MAX 400	2CSG225955R1101	0,32	kg	pc.
500	0,5	6	259558	CT MAX 500	2CSG225965R1101	0,32	kg	pc.
600	0,5	10	259657	CT MAX 600	2CSG225975R1101	0,32	kg	pc.
800	0,5	10	259657	CT MAX 800	2CSG225985R1101	0,32	kg	pc.
1000	0,5	10	259954	CT MAX 1000	2CSG225995R1101	0,32	kg	pc.

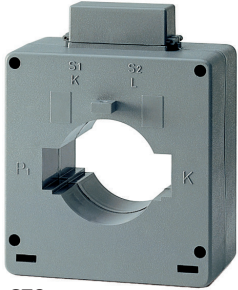
CT MAX SELV .../5 A series, through primary								
Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
				Type code	Order code			
300	0,5	4	260059	CT MAX 300 SELV	2CSG226005R1101	0,37	kg	pc.
400	0,5	5	260158	CT MAX 400 SELV	2CSG226015R1101	0,37	kg	pc.
500	0,5	6	260257	CT MAX 500 SELV	2CSG226025R1101	0,37	kg	pc.
600	0,5	10	260356	CT MAX 600 SELV	2CSG226035R1101	0,37	kg	pc.
800	0,5	10	260455	CT MAX 800 SELV	2CSG226045R1101	0,37	kg	pc.
1000	0,5	10	260554	CT MAX 1000 SELV	2CSG226055R1101	0,37	kg	pc.

CT MAX series

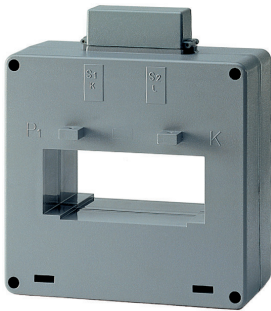
Through primary		max section [mm]
cable	○	30
horizontal bar	▭	30x15, 40x10
vertical bar	▭	-

Energy efficiency

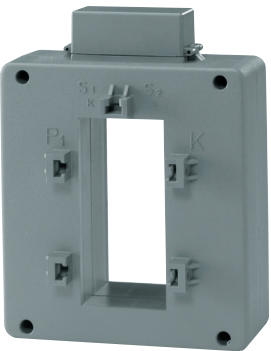
CT measurement current transformers with through primary



CT6



CT8



CT8/V

CT6 .../5 A series, through primary

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
250	0.5	5	605508	CT6/250	2CSG421130R1101		1.000	1
300	0.5	5	605607	CT6/300	2CSG421140R1101		1.000	1
400	0.5	6	605706	CT6/400	2CSG421150R1101		1.000	1
500	0.5	6	605805	CT6/500	2CSG421160R1101		1.000	1
600	0.5	10	605904	CT6/600	2CSG421170R1101		1.000	1
800	0.5	10	606000	CT6/800	2CSG421180R1101		1.000	1
1000	0.5	20	606109	CT6/1000	2CSG421190R1101		1.000	1
1200	0.5	20	606208	CT6/1200	2CSG421200R1101		1.000	1
1500	0.5	30	606307	CT6/1500	2CSG421220R1101		1.000	1
2000	0.5	30	606406	CT6/2000	2CSG421230R1101		1.000	1
2500	0.5	30	606505	CT6/2500	2CSG421240R1101		1.000	1

CT8 .../5 A series, through primary

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
600	0.5	10	606901	CT8/600	2CSG521170R1101		1.000	1
800	0.5	10	607007	CT8/800	2CSG521180R1101		1.000	1
1000	0.5	10	607106	CT8/1000	2CSG521190R1101		1.000	1
1200	0.5	15	607205	CT8/1200	2CSG521200R1101		1.000	1
1500	0.5	20	607304	CT8/1500	2CSG521220R1101		1.000	1
2000	0.5	20	607403	CT8/2000	2CSG521230R1101		1.000	1
2500	0.5	20	607502	CT8/2500	2CSG521240R1101		1.000	1
3000	0.5	20	607601	CT8/3000	2CSG521250R1101		1.000	1

CT8-V .../5 A series, through primary

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
600	0.5	10	608905	CT8-V/600	2CSG631170R1101		0.800	1
800	0.5	10	609001	CT8-V/800	2CSG631180R1101		0.800	1
1000	0.5	10	609100	CT8-V/1000	2CSG631190R1101		0.800	1
1200	0.5	10	609209	CT8-V/1200	2CSG631200R1101		0.800	1
1500	0.5	10	609308	CT8-V/1500	2CSG631220R1101		0.800	1
2000	0.5	20	609407	CT8-V/2000	2CSG631230R1101		0.800	1
2500	0.5	20	609506	CT8-V/2500	2CSG631240R1101		0.800	1

CT6 series

Through primary		max section [mm]
cable	○	50
horizontal bar	▬	60x20
vertical bar	▮	-

CT8 series

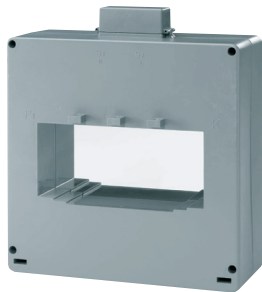
Through primary		max section [mm]
cable	○	2x30
horizontal bar	▬	80x30
vertical bar	▮	-

CT8-V series

Through primary		max section [mm]
cable	○	2x35
horizontal bar	▬	-
vertical bar	▮	80x30 3x80x5

Energy efficiency

CT measurement current transformers with through primary



CT12



CT12/V

CT12 .../5 A series, through primary

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
600	0.5	10	607809	CT12/600	2CSG721170R1101		1.600	1
800	0.5	15	607908	CT12/800	2CSG721180R1101		1.600	1
1000	0.5	20	608004	CT12/1000	2CSG721190R1101		1.600	1
1200	0.5	20	608103	CT12/1200	2CSG721200R1101		1.600	1
1500	0.5	20	608202	CT12/1500	2CSG721220R1101		1.600	1
2000	0.5	30	608301	CT12/2000	2CSG721230R1101		1.600	1
2500	0.5	40	608400	CT12/2500	2CSG721240R1101		1.600	1
3000	0.5	40	608509	CT12/3000	2CSG721250R1101		1.600	1
4000	0.5	50	608608	CT12/4000	2CSG721260R1101		2.000	1
5000	0.5	50	745600	CT12/5000	2CSG721270R1101		3.000	1
6000	0.5	50	745709	CT12/6000	2CSG721280R1101		3.000	1

CT12-V .../5 A series, through primary

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
800	0.5	10	609605	CT12-V/800	2CSG831180R1101		0.700	1
1000	0.5	10	609704	CT12-V/1000	2CSG831190R1101		0.700	1
1200	0.5	10	609803	CT12-V/1200	2CSG831200R1101		0.700	1
1250	0.5	10	609902	CT12-V/1250	2CSG831210R1101		0.700	1
1500	0.5	12	610007	CT12-V/1500	2CSG831220R1101		0.700	1
2000	0.5	15	610106	CT12-V/2000	2CSG831230R1101		1.000	1
2500	0.5	20	610205	CT12-V/2500	2CSG831240R1101		1.000	1
3000	0.5	20	610304	CT12-V/3000	2CSG831250R1101		1.000	1
4000	0.5	20	745808	CT12-V/4000*	2CSG831260R1101		1.000	1

* Air insulation class: Class B

CT12 series

Through primary		max section [mm] up to 4000A	max section [mm] 5000 and 6000 A
cable	○	2x50	-
horizontal bar	▭	125x50	120x10, 2x120x10, 3x120x10
vertical bar	▭	-	200x10, 2x200x10, 3x200x10

CT12-V series

Through primary		max section [mm]
cable	○	3x35
horizontal bar	▭	-
vertical bar	▭	125x30, 3x100x10, 4x125x5

Energy efficiency

CTA measurement current transformers with wound primary



CTA/25

Standard type current transformers .../5 A with wound primary

CTA .../5 A series, wound primary with insertion on Ø8 MA bolt								
Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1	Weight 1 piece kg	Pack unit pc.
				Type code	Order code	piece	kg	pc.
10	0.5	5	661405	CTA/10	2CSG111030R1141		0.290	1
20	0.5	5	661603	CTA/20	2CSG111050R1141		0.290	1
25	0.5	5	661702	CTA/25	2CSG111060R1141		0.290	1
40	0.5	5	661801	CTA/40	2CSG111080R1141		0.290	1
50	0.5	5	661900	CTA/50	2CSG111090R1141		0.290	1
60	0.5	5	662006	CTA/60	2CSG111100R1141		0.290	1
80	0.5	5	662105	CTA/80	2CSG111110R1141		0.290	1
100	0.5	5	662204	CTA/100	2CSG111120R1141		0.290	1

CTA series

Wound primary		max section [mm]
cable	○	8
horizontal bar	▭	-
vertical bar	▮	-

Energy efficiency

CTO split core measurement current transformers



CT30



CT80



CT120

Split core measurement current transformers with through primary

Split core measurement current transformers are used in distribution panels or power centers for maintenance or system expansion. They can be installed easily and they allow to save a lot of time, avoiding bar disconnection. All transformers are complete with terminal caps and fastening accessories, both on bar and on wall.

CT30/...5 A Split core current transformers

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn EAN	Order details Type code	Price 1 piece	Weight 1 piece kg	Pack unit pc.
100	3	1.5	887805	CT30/100	2CSG101100R1101	0.85	1
150	3	2	887904	CT30/150	2CSG101110R1101	0.85	1
250	0.5	1.5	888109	CT30/250	2CSG101130R1101	0.85	1
400	0.5	2.5	888000	CT30/400	2CSG101150R1101	0.85	1

CT80/...5 A Split core current transformers

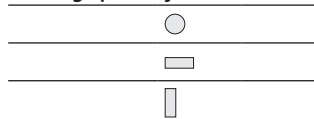
Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn EAN	Order details Type code	Price 1 piece	Weight 1 piece kg	Pack unit pc.
250	0.5	1	888208	CT80/250	2CSG201130R1101	1.1	1
400	0.5	1.5	888307	CT80/400	2CSG201150R1101	1.1	1
500	0.5	2.5	888406	CT80/500	2CSG201160R1101	1.1	1
600	0.5	2.5	888505	CT80/600	2CSG201170R1101	1.1	1
1000	0.5	5	888703	CT80/1000	2CSG201190R1101	1.1	1

CT120/...5 A Split core current transformers

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn EAN	Order details Type code	Price 1 piece	Weight 1 piece kg	Pack unit pc.
800	0.5	3	889304	CT120/800	2CSG401180R1101	1.3	1
1200	0.5	6	889502	CT120/1200	2CSG401200R1101	1.3	1
1500	0.5	8	889601	CT120/1500	2CSG401220R1101	1.3	1

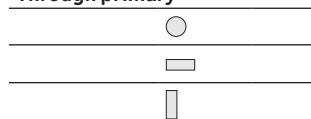
CT30 series

Through primary



CT80 series

Through primary



CT120 series

Through primary max section [mm]

cable	○	
horizontal bar	▬	
vertical bar	▮	4x120x10

Energy efficiency

TRF M measurement modular current transformers



TRF M

Modular current transformers with Ø 29 mm through primary, secondary .../5A

TRF M are modular current transformers with through primary for measuring instruments. Their compact size and quick DIN rail plug allow easy installation along with great measurement precision.

Primary rated current I _{prim} A	Accuracy class	Rated power VA	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
				Type code	Order code			
40	3	1	046912	TRFM/40	2CSM100050R1111		0.250	1
60	1	2	047018	TRFM/60	2CSM100070R1111		0.250	1
100	0.5	2	047117	TRFM/100	2CSM100090R1111		0.250	1
150	0.5	3	047216	TRFM/150	2CSM100100R1111		0.250	1
250	0.5	4	047315	TRFM/250	2CSM100120R1111		0.250	1
400	0.5	6	047407	TRFM/400	2CSM100140R1111		0.250	1
600	0.5	8	047506	TRFM/600	2CSM100160R1111		0.250	1

SNT current transformer for d.c. applications



SNT

Technical features		
Voltage	[mV]	60
Current rating	[A]	from 5 to 1000
Accuracy class		0.5 (from 10 to 30 °C)
Max. load	[Ω]	0.25
Overload for 5 sec.		from 10 to 500 A: 1xI _n from 600 to 1000 A: 5xI _n

Shunts

Shunts have 60 mV voltage and must be used with a maximum load of 0.25 Ω in combination with measurement instruments in d.c.

For an appropriate operation:

- both horizontal and vertical mounting are possible (the horizontal position enables a greater heat consumption)
- the faying surface must be completely used and clean; cover with specific grease after the connection
- screws and bolts must be perfectly tight
- shunts must be sufficiently ventilated; as they are not insulated, it is a good rule to protect them against accidental contacts.

60 mV shunts						
Rated current A	Bbn 8012542 EAN	Order details		Price 1 piece	Weight 1 piece kg	Pack unit pc.
		Type code	Order code			
10	047803	SNT 1/10	2CSM100030R1121		1.800	1
50	048404	SNT 1/50	2CSM100090R1121		2.200	1
100	048701	SNT 1/100	2CSM100120R1121		1.300	1
150	048800	SNT 1/150	2CSM100130R1121		1.300	1
400	049104	SNT 1/400	2CSM100160R1121		1.900	1
800	049401	SNT 1/800	2CSM100190R1121		2.200	1
1000	049500	SNT 1/1000	2CSM100200R1121		2.200	1

Quick reference links

Scan for more details

M1 Single Fuction Meters



Catalogue



User manual

M1M 15 Power Meter



Catalogue



Installation Manual



Communication Manual



User manual

M1M 10 Multi Fuction Meters



Catalogue



User manual

M1M 20 Power Meter



Catalogue



Installation Manual



Communication Manual



User manual

M1M 12 Multi Fuction Meters



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User manual

M1M 30 Power Meter



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Installation Manual



Communication Manual



User manual

M1M DS Dual Source Meters



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User manual

M4M 20



Catalogue



Installation Manual
M4M 20 and
M4M 20-M



Installation Manual
M4M 20
Rogowski



Installation Manual
M4M 2X

M1M 20B Power Meter



Catalogue



User manual



Communication Manual
Modbus
communication manual (valid for
M4M Modbus and
M4M Ethernet)



Communication Manual
Profibus
communication manual



Communication Manual
BACnet
communication manual



Communication Manual
M4M Modbus map



User Manual

M1M 30B Power Meter



Catalogue



User manual

Quick reference links

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M4M 30



Catalogue



Installation Manual
M4M 30 and
M4M 30-M



Installation Manual
M4M 30 Rogowski



Communication Manual
Modbus
communication manual (valid for
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User Manual

EQ Meters



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