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ABB Group
ABB Electrification
Smart Buildings Division

new.abb.com/low-voltage

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Sensing. To manage power. M4M Network analyzers.

Enabling accurate energy efficiency evaluations and perfectly fitting the ABB solution for monitoring, optimization and control of electrical system.

- -50% Time for integration in the ABB turnkey solution
- -40% Time for installation and commissioning
- MID-certified and tamper-proof measurement for fiscal billing
- Improve reactivity and reduce uncoordinated maintenance

ABB’s M4M is the new fully-connected, state-of-the-art range of network analyzers, guaranteeing 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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Beyond connected
Scalable and connected solutions

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

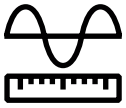
A fundamental aspect of this is that technology is making it easier to collect useful data and to use it for analysis.

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.

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.

InSite web server

Cloud ABB Ability™
Easily access real time data on the InSite web server or via the cloud using ABB Ability™ Energy and Asset Manager cloud platform to monitor, analyze and control your sub distribution remotely.



Energy & power meters
All the data from the ABB energy efficiency devices such as M4M network analyzers and Energy meters can be gathered by System pro M compact® InSite automatically, connecting it to their embedded communication protocols.

DIN rail protection devices & accessories
All the information coming from protection devices such as MCBs, RCDs, SPDs, AFDDs, 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 filed manually or through automated logics.

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 digital Input and Output modules.

Sub distribution board
System pro E® energy includes wall mounted and floor standing sheets steel cabinets offering protection degrees against dust and water up to IP43 and IP55 as well as a common interior fitting and busbars.

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.

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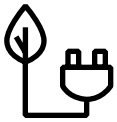
-50% Time for integration in the ABB turnkey solution

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.



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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.

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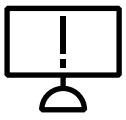
-40% Time for installation and commissioning

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.



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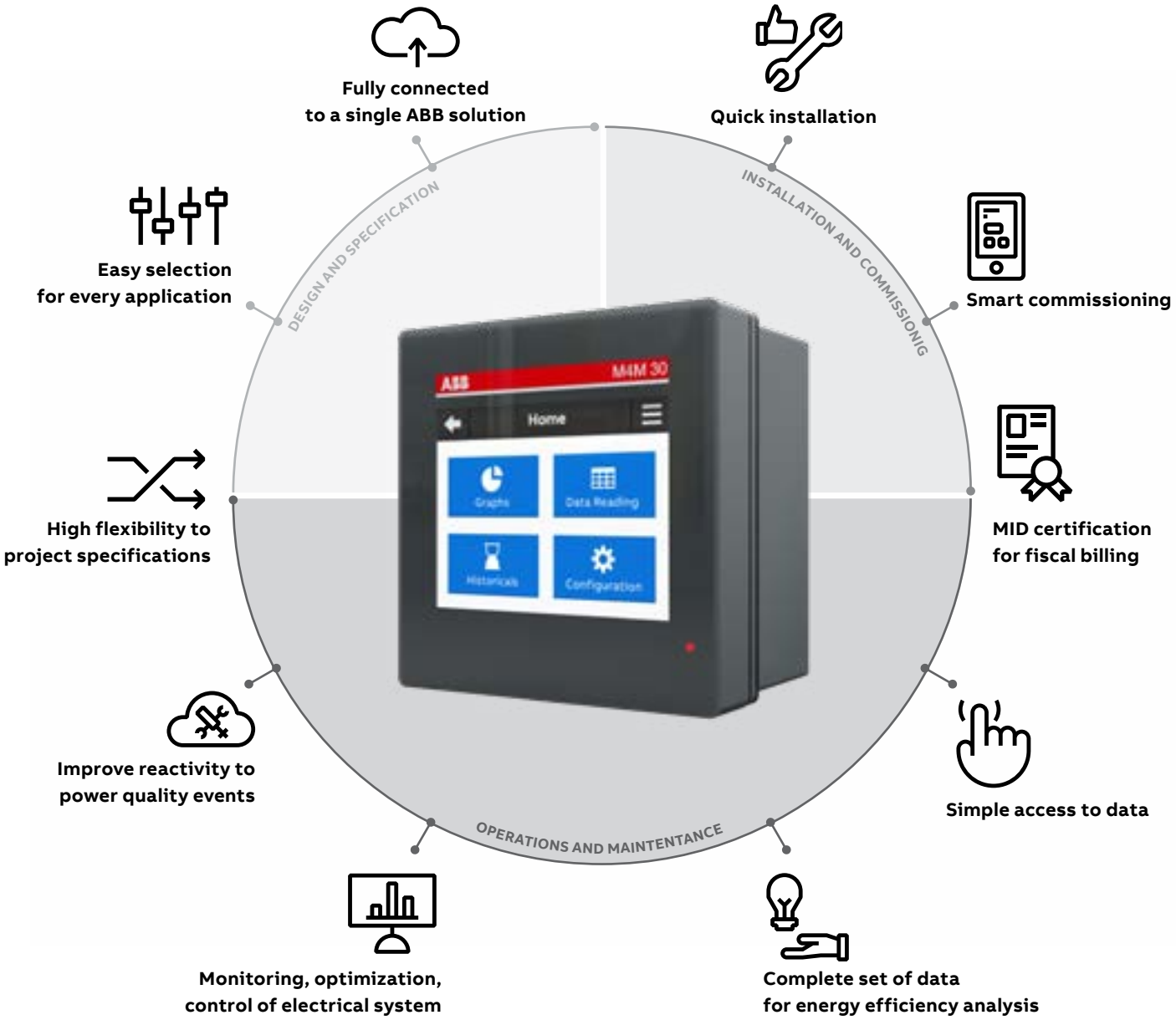
Improve reactivity and reduce uncoordinated maintenance

Realtime supervision
M4M netwoyk 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.


Fully connected
to a single ABB solution
Quick installation
Easy selection
for every application
Smart commissioning
DESIGN AND SPECIFICATION
INSTALLATION AND COMMISSIONIG
ABB
M4M 30
Home
Graphs
Data Reading
Historicals
Configuration
High flexibility to
project specifications
MID certification
for fiscal billing
Improve reactivity to
power quality events
Simple access to data
OPERATIONS AND MAINTENTANCE
Monitoring, optimization,
control of electrical system
Complete set of data
for energy efficiency analysis

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.

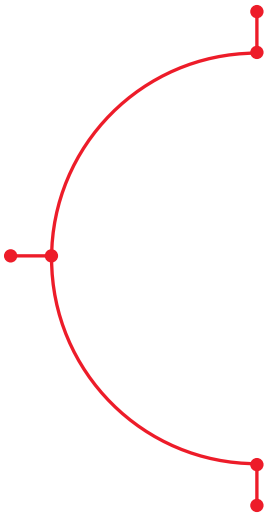
M4M exploits the scalability of the ABB solution, from stand-alone visualization and commissioning via HMI or EPiC mobile APP and desktop software, to monitoring, optimization and control of the complete electrical system via ABB Ability™.

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 measure-ment functionalities and power quality analysis in any existing installation, easily transmitted to the cloud also in brownfield projects.



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

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.

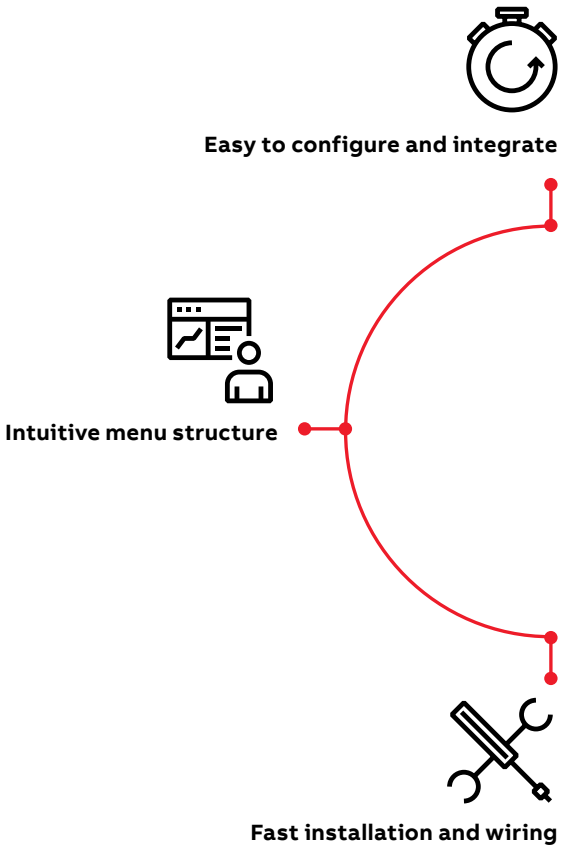
Easy installation and wiring are ensured by compact dimensions, all-removable terminals and Rogowski coils, while touchscreen color display and mobile APP integration increase the intuitiveness of use.

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.



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

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.

M4M can easily be integrated in the System pro M compact® InSite for sub-distribution managment 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.

Get a turnkey solution with System pro M compact® InSite for sub-distribution managment 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 standars. 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.

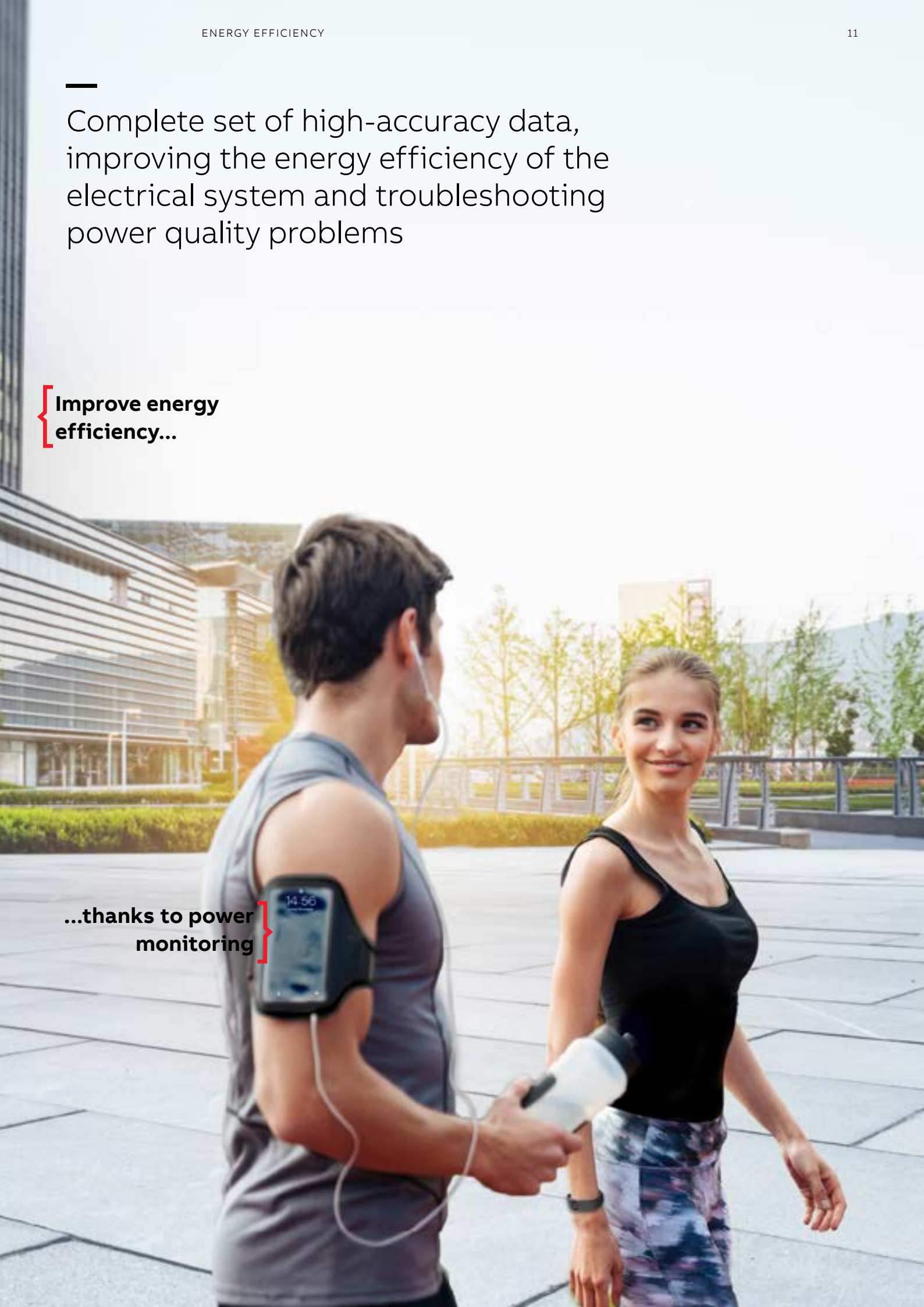
Monitor, optimize and control

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 rectivity 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.

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01 M4M Homepage

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02 Trending graphs of load profiles

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03 R4M Rogowski coils

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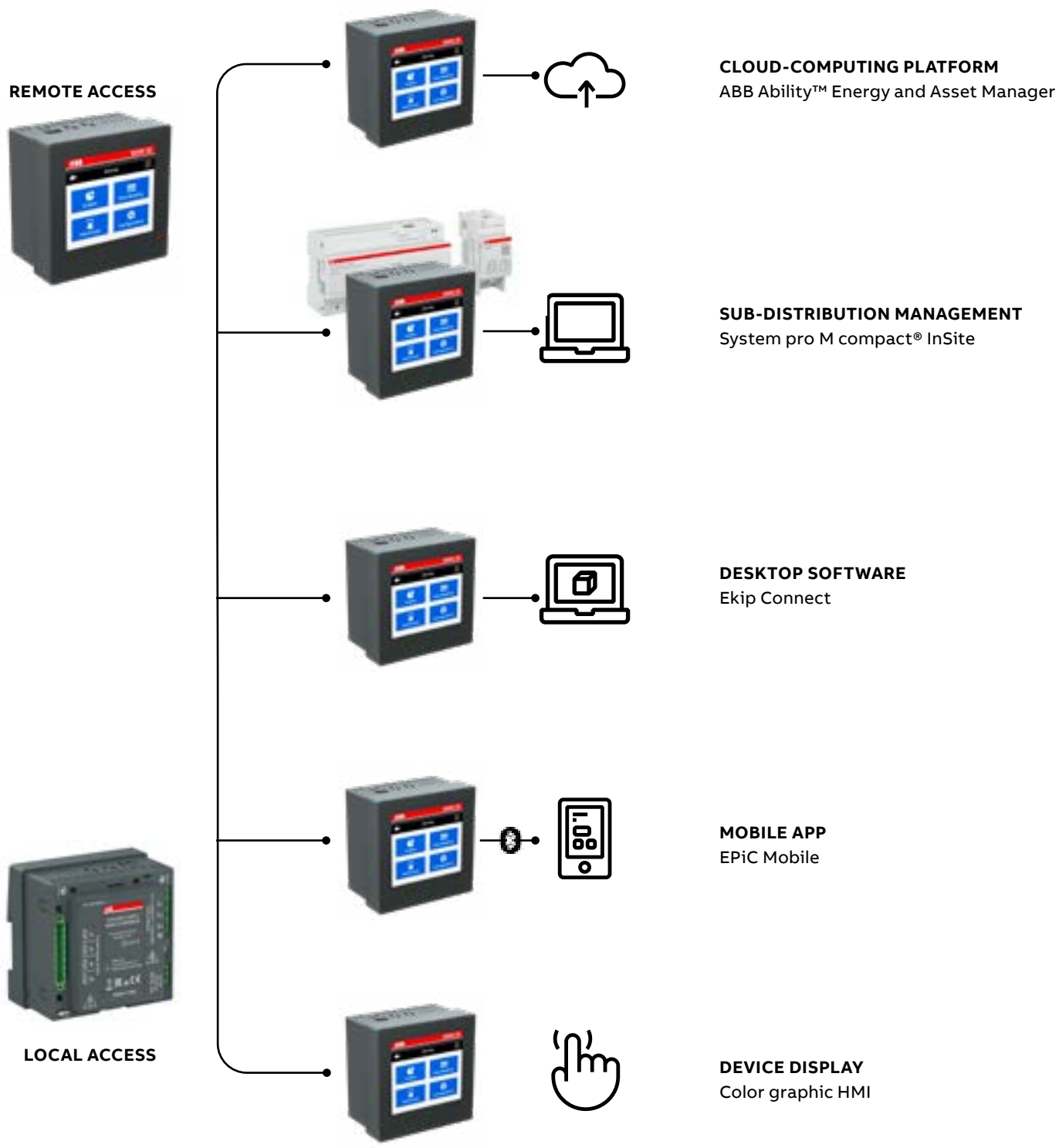
04 M4M with MID certification

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.



Compare the M4M versions
M4M 20 and M4M 30

Accuracy	**M4M 20** - Class 0,5S	**M4M 30** - Class 0,5S
MID certification	Option	Option
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	/	40th
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

Compare the M4M versions
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	25th
Unbalances	●
Historicals logs	Intermediate
RTC	●
+PQ2	
Individual Harmonics	40th
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

Connectivity tools
System pro M compact® InSite

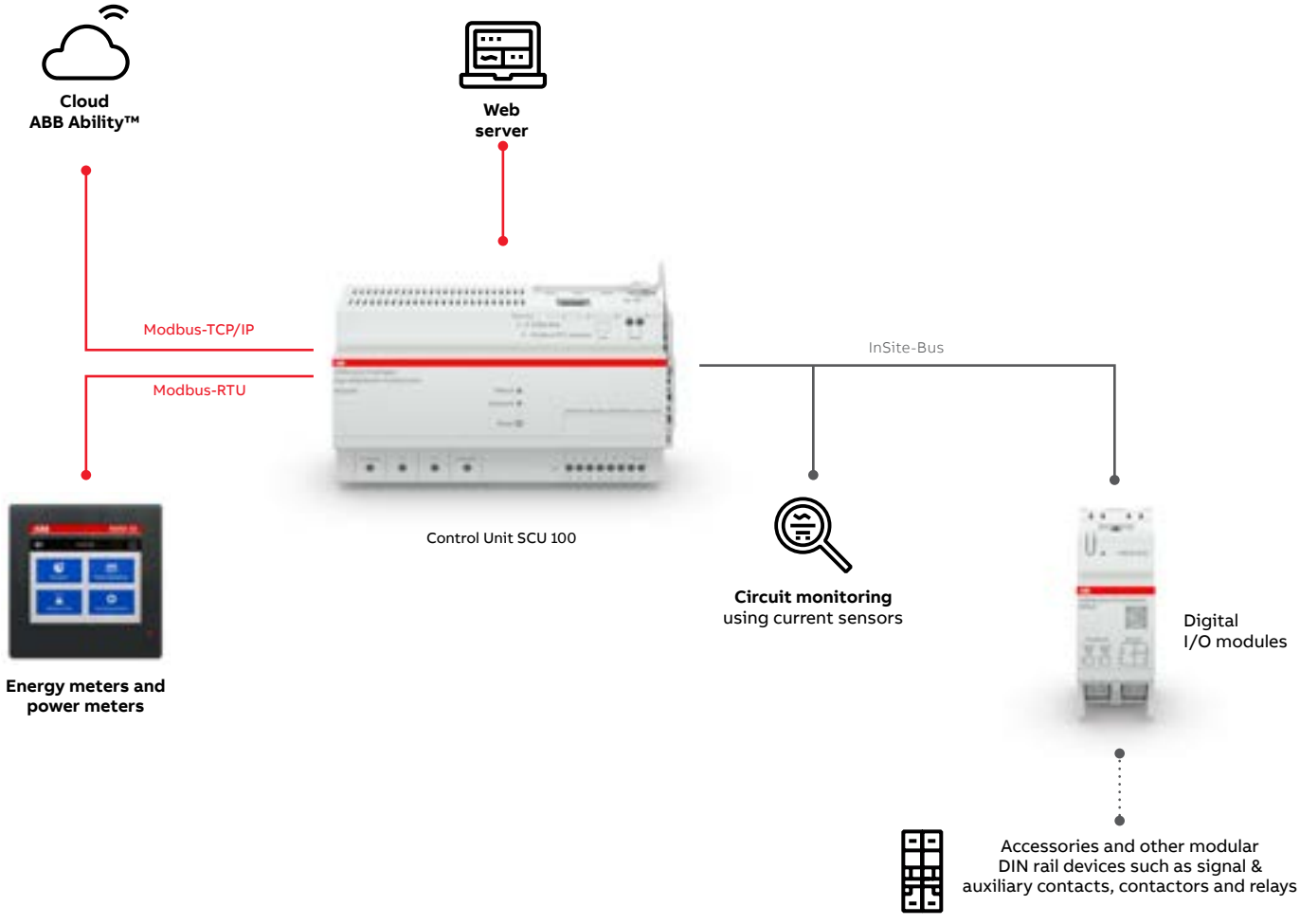
System pro M compact® InSite is a range of connected devices to support energy and asset management in electrical distribution.

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 M4M network analyzers and Energy 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.



Connectivity tools
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 from network analyzers like M4M can be accessed via the web server embedded in the control unit and shared with third party systems, locally or cloud based.

Access to all measurements coming from M4M network analyzers is provided automatically, including Power Quality KPIs such as single harmonics.

This allows to monitor, compare and structure real-time and historical data, either for a single netowork analyzer or for group of devices. Also, automatic actions and alarms can be set based on these data 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.)

Dashboard
All gathered values and info are displayed in a fully customizable single interface.

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

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

Connectivity tools
ABB Ability™ Energy and Asset Manager

Automatically integrated and recognized in the ABB Ability™ Energy Manager cloud solution, M4M is part of the ABB solution for monitoring, optimization, and control of the electrical system.

The ABB Ability™ Energy Manager cloud solution is designed to monitor, optimize, predict and control the electrical system. M4M meters are automatically integrated and recognized in the ABB Ability™ cloud: its data and functionalities are leveraged by the system to enhance operations and performances.

The cloud-computing platform collects data from protection and measuring devices within the electrical system, making it available anytime anywhere.

The user can supervise the electrical system and allocate costs but also implement an effective power management strategy to achieve energy savings.

ABB Ability™ Energy and Asset Manager also provides access on a multi-site level, simultaneously monitoring and comparing the performance of different facilities, as well as collecting and exporting data for historical trend analysis with on-demand queries or scheduled automatic reports.

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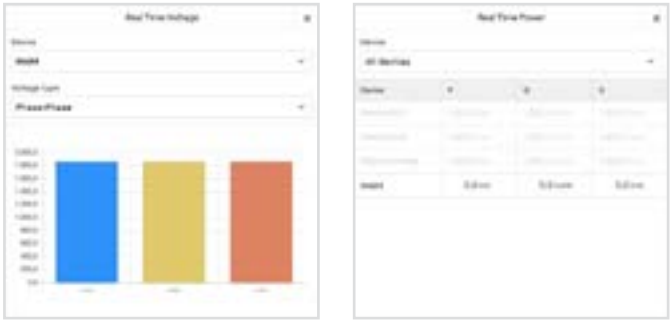
01 Widgets can be added and removed in the dashboard at any time, according to user's preferences.



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02 Overview of parameters from different devices, like M4M, can be displayed as graphs and exported at any time for further analysis.

Connectivity tools
Ekip Connect and EPiC commissioning tools

From commissioning to stand-alone device visualization, desktop software Ekip Connect and mobile app EPiC Mobile support the user in the management of M4M network analyzers throughout the whole product lifecycle.

The full set of configurations of M4M network analyzers can easily be carried out remotely thanks to Ekip Connect desktop software and EPiC Mobile app.

Ekip Connect also provides to the customers a complete tool for compelling device visualization on a dashboard. Every parameter can be visualized as instantaneous or historical value, with intuitive graphs that allow the user to quick analyze the measurement data and providing the option to fully download the flash memory of the M4M to your desktop computer.

Through EPiC software it is also possible to export and import the configuration from a M4M device to another.

Early notifications about unusual system status is ensured thanks to alarms and logs sent out over communications to EPiC, facilitating the identification and analysis of issues on the system.

Ekip Connect allows the connection to M4M network analyzers via Modbus RTU or Modbus TCP/IP, while connection to EPiC Mobile works over Bluetooth.

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01 Ekip Connect desktop software for stand-alone visualization, full commissioning and remote FW update of M4M network analyzers via Modbus RTU and Modbus TCP/IP
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02 EPiC mobile APP for quick visualization and smart commissioning of M4M network analyzers via Bluetooth

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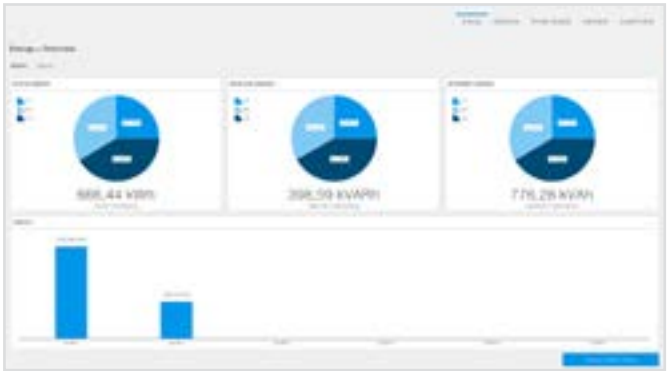

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Applications
Ensuring power monitoring in your building

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01 Comercial building
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02 Data Center
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03 Industrial building

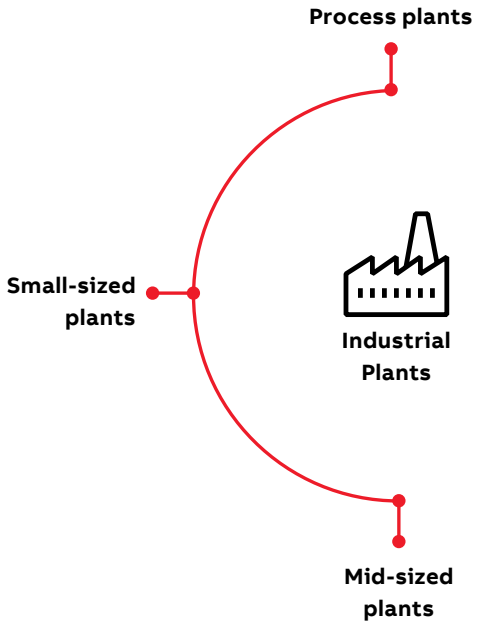
M4M network analyzers enable complete power quality analysis and accurate energy efficiency monitoring of all the energy assets: industrial and commercial buildings, facilities, data centers.

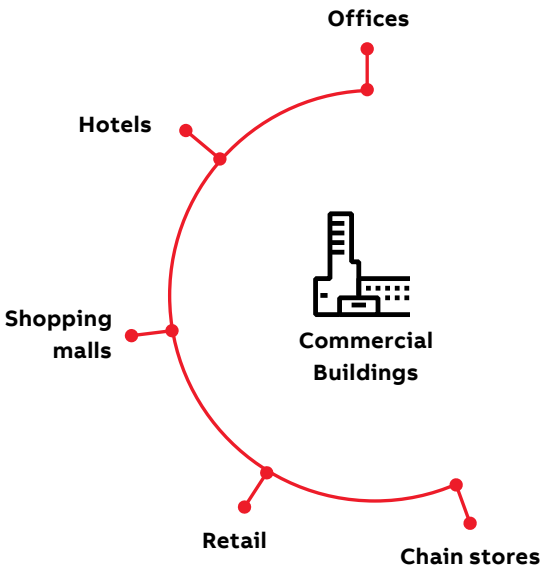
M4M range represents the perfect choice for sub-metering inside sub-distribution boards and power quality monitoring in main distribution boards and power centers.

In **industrial plants**, power network monitoring and control carried out by M4M allows to avoid outages, equipment damage, failures and interruption of any critical operation.
Furthermore, the improvement of the energy performance made possible by M4M reduces greenhouse gas emissions and operational energy costs for the facility.

Inside **commercial buildings**, M4M network analyzers support towards an efficient and rational use of energy, also ensuring accurate sub-billing of different individual departments or tenants. Moreover, avoiding fees and penalties from the utility is made easy thanks to demand power monitoring.

In **data centers**, M4M allows to fully monitor power quality and power reliability, and easily detect in which part of the data center harmonics are created. This allows to prevent damages to installed equipment and avoid any operational impact.





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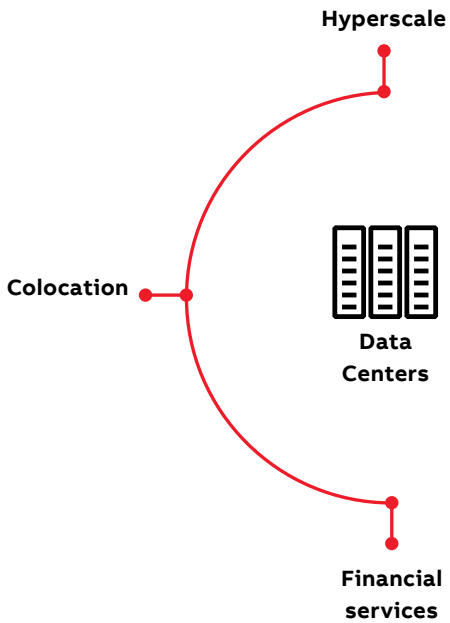

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