

APPLICATION NOTE

Intelligent Distribution for 800VAC String inverter configuration in Photovoltaic plants

IEC Commercial & Industrial



Since much of our electrical energy production will be based on renewables, it will become increasingly crucial to ensure that systems are always available to prevent outages and minimize downtime for maintenance. Discover our Intelligent Distribution solutions for remotely monitoring solar plants and promptly detecting potential downtime risks.

What is remote monitoring?

Whenever something trips in the power collection infrastructure of a photovoltaic plant, the only way to assess the problem is to go directly on-site. Unfortunately, the locations are often difficult to reach and it might be too late to remedy the fault. By installing a remote monitoring system, a clear vision of consumption, electrical parameters and equipment status is always available through web-based applications, thereby helping you ensure power quality, optimized maintenance and reduced CO₂ emissions.

Why you need an Intelligent Distribution solution

ABB Intelligent Distribution technology helps you to ensure power quality, optimized maintenance, reduced CO₂ emissions and enhanced ROI assessment in just one solution.

By combining advanced ABB devices, you can easily set up a modular Modbus network open to any platform and scalable throughout the lifetime of the system, thus compliant with the customers' changing and evolving needs.

In addition, ABB product connectivity enables you to set up configuration and communication architectures ready to be interfaced with ABB or 3rd party monitoring platforms or a SCADA.

Main benefits



Flexibility

Modular and scalable solutions.



Energy efficiency

Maximizes energy efficiency, costs reduction and complies with ISO 50001 certification requirements



Reliability

Maximizes reliability and avoids downtime thanks to 24/7 real time monitoring, smart analytics, predictive maintenance and instantaneous alerts.



Multi-site Analysis

Monitors and analyzes multiple sites simultaneously with insights to benchmark sites performance and take action to improve critical rail ones.



3rd party aggregation

Minimized upgrading and replacement costs.

Typical architecture of 2MW photovoltaic plant



String inverters and Photovoltaic panels

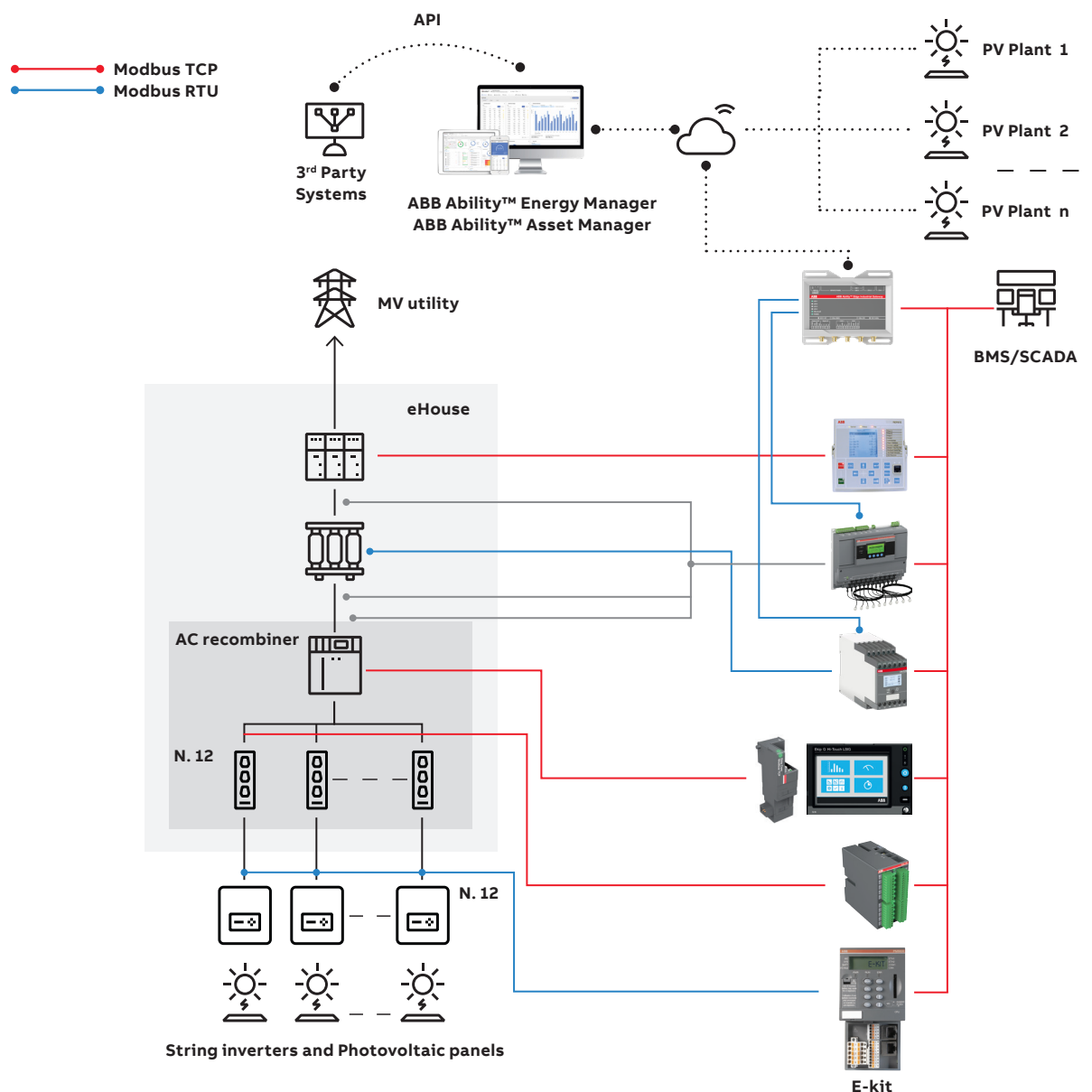
Intelligent Distribution solutions for 800VAC String inverter configuration in Photovoltaic plants

The state of all breakers, surge protection devices, isolation monitors and other auxiliary device installed in the plant to protect the solar string inverters or battery racks can be remotely monitored by connecting them to Ekip Signalling Modbus TCP/IP that collect state and trip signals from these devices.

High performance and protection is always guaranteed with Emax2 air circuit breakers, with up to 8 communication protocols, that features class 1 active energy measurement compliant with standard IEC61557-12 with embedded measurements, health analysis and predictive maintenance. REF615 medium voltage relay is dedicated for protection and measurement, with various communication protocols, enabling the broadest range of data and alarms to be collected as well as very accurate energy and power data.

Other key devices, such as the transformer temperature monitoring relays and TVOC-2 Arc Guard System, are connected through Modbus RTU. With E-kit, easily integrate 3rd party devices, including PV inverters and BESS systems.

The digital architecture shows a great measure of flexibility since it can be easily integrated with other BMS, SCADA or 3rd party systems via API. This is in addition to ABB Ability™ Energy Manager & ABB Ability™ Asset Manager, remotely monitoring one PV plant or multiple plants at the same time.



Bill of materials

Device description	Part number	Quantities
T5X-HA400 PR222DS-LSIG In320	1SDA107745R1	12
Auxiliary contacts AUX-C 3Q 1SY 24V DC	1SDA054915R1	12
Surge Protection Device OVR T1-T2 3P + Surge Protection Device OVR T1-T2 1P	2CTB815710R4700 + 2CTB815710R4100	1
CM-IWM.10 Insulation monitoring relay 2c/o	1SVR470670R1000	1
CP-S.1 24/20.0 Power supply In:100-240VAC/100-250VDC Out:DC 24V/20A	1SVR320761R1000	1
UPS POWERVALUE 11T G2 3 KVA	4NWP100162R0005	1
REF615 MV Relay	To be configured	1
E2.2H/E9 2500 Ekip Touch LSI 3P *	1SDA104361R1	1
Measuring Package	1SDA107525R1	1
Ekip Supply 24-48V DC	1SDA074173R1	1
Ekip Com Modbus TCP Module	1SDA074151R1	1
CM-TCN.012S Temperature Monitoring Relay	1SVR750740R0120	1
TVOC-2-48C Arc Monitor	1SFA664001R1004	1
Ekip Signalling Modbus TCP	1SDA082485R1	4
Ethernet switch 8 ports	2CDG120082R0011	2
ABB E-Kit	1SDA120717R1	1
ABB Ability Edge Industrial gateway 3G	1SDA116752R1	1
Energy Manager-Watching Edition – 5 Devices - 1 Yr		
Asset Manager – 1 Yr		
Energy Manager Multisite (Watching Edition - 5 Sites - 1 Year)	ABB Ability Marketplace™	
25 Extra Devices for ABB Ability		
LV CB Health Analysis Add On		

Note: [ABB Ability Marketplace™](#) one-stop online portal for ABB Ability™ solutions subscriptions and services.

* Always provided with external outlet: External VTs are needed to handle 800V

APPLICATION FINDER



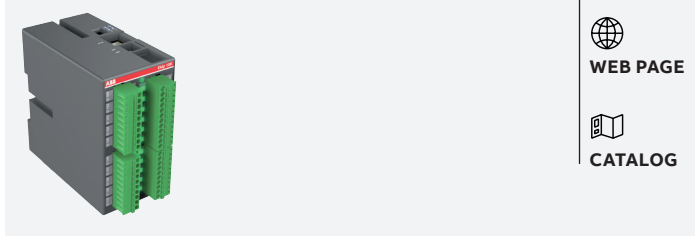
We've made it simpler for you to set up your project!

Click here to find the reference architecture that best fits your needs and download the Bill of Materials.



Product offering

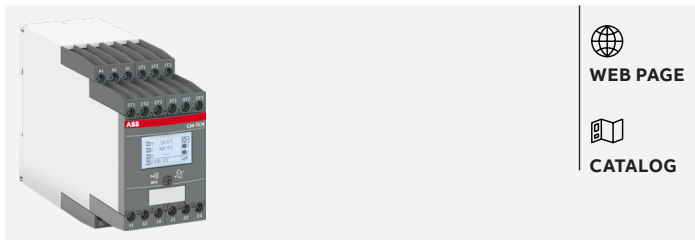
Ekip Signalling TCP:



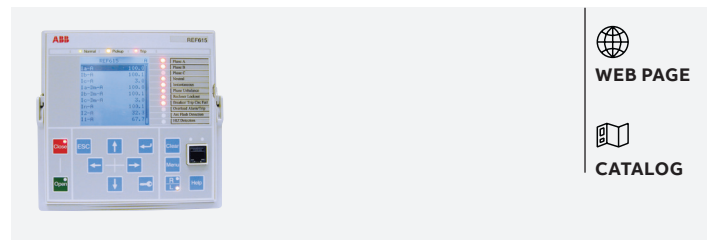
Ekip Touch⁺:



Temperature monitoring relays:



Ref 615 MV monitoring & protection relay:



TVOC-2 Arc Guard System:

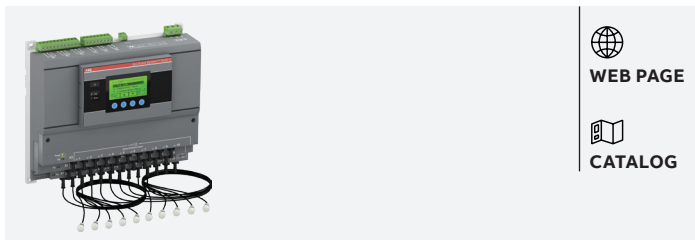


ABB Ability™ Edge Industrial Gateway:



E-kit:

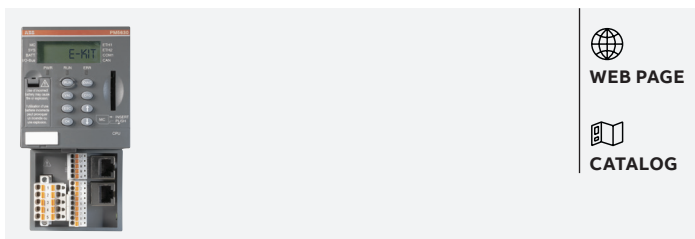
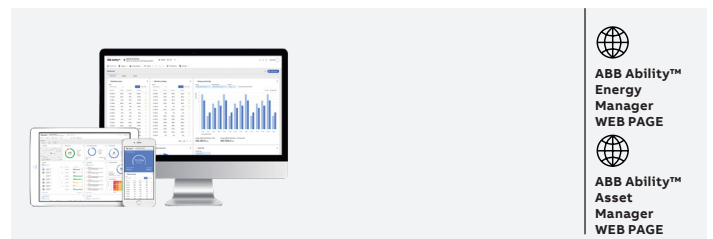


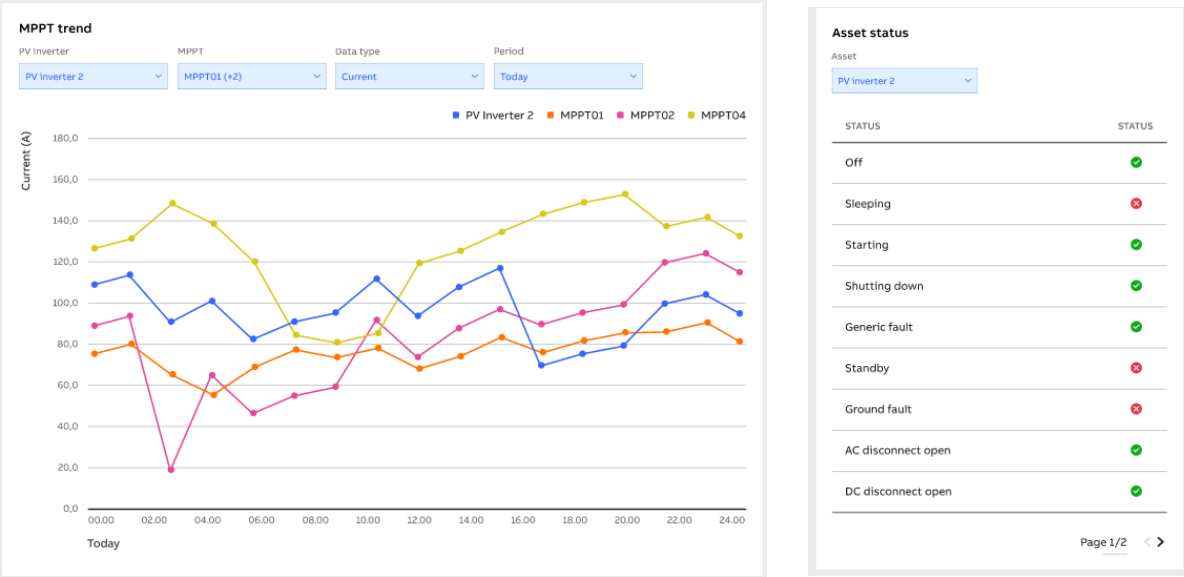
ABB Ability™ Energy and Asset Manager:



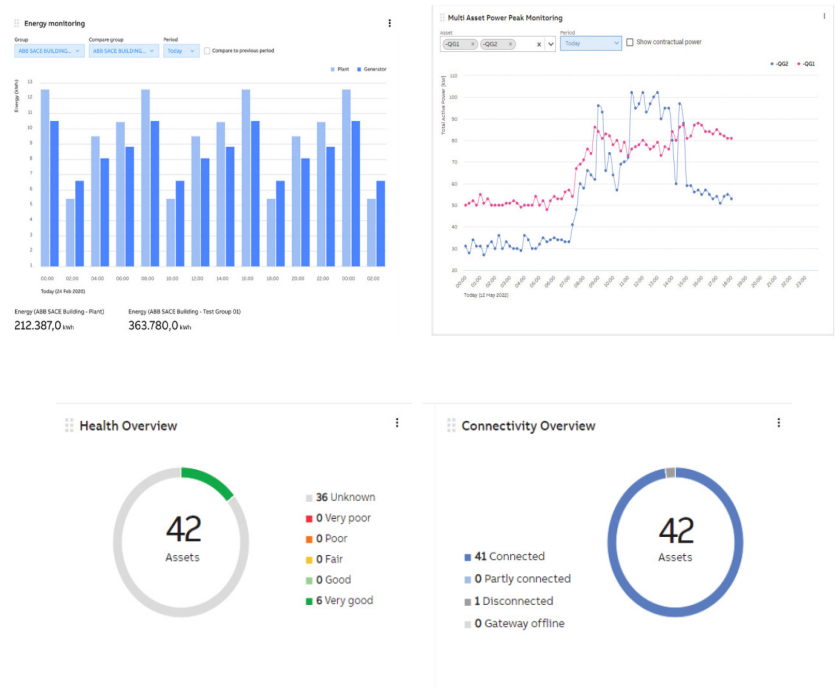
Annex

Comprehensive monitoring solutions for both single and multiple PV plants thanks to ABB Ability™ Energy Manager and ABB Ability™ Asset Manager.

Real-time measurements and trends of (DC current, DC voltage, DC power, DC energy) of MPPTS of your PV inverters. In addition to assets status



Easily monitoring energy consumption, asset power trends, health overviews and the connectivity status of the electrical devices.



Multi Asset Power Peak Monitoring

Asset

ABB SACE BUILDING...

Period

Today

Show contractual power

☐

Health Overview

42 Assets

36 Unknown

0 Very poor

0 Poor

0 Fair

0 Good

6 Very good

Connectivity Overview

42 Assets

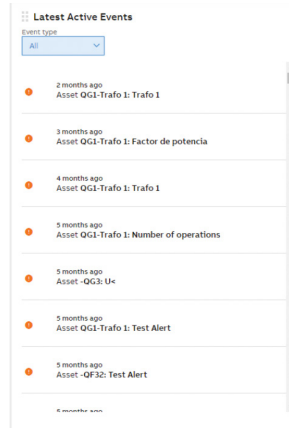
41 Connected

0 Partly connected

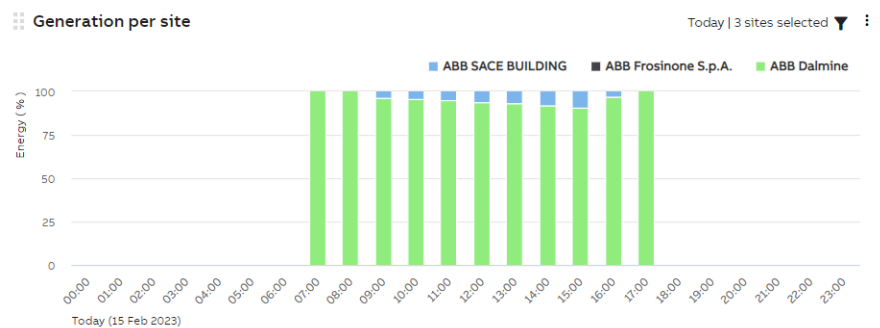
1 Disconnected

0 Gateway offline

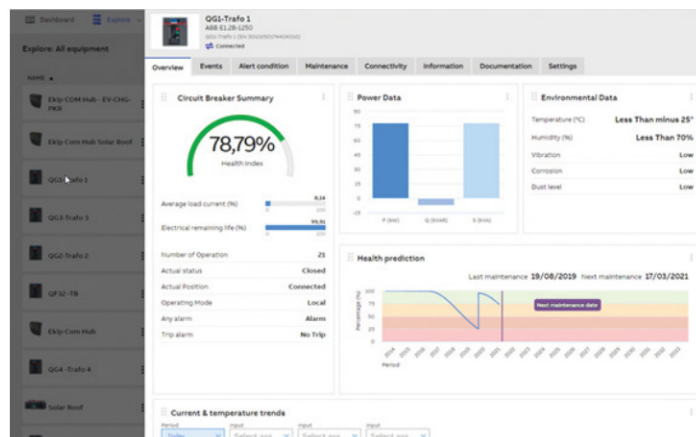
Receive instantaneous alerts about any abnormal event in the Plant on your mobile, tablet or PC via SMS or email.



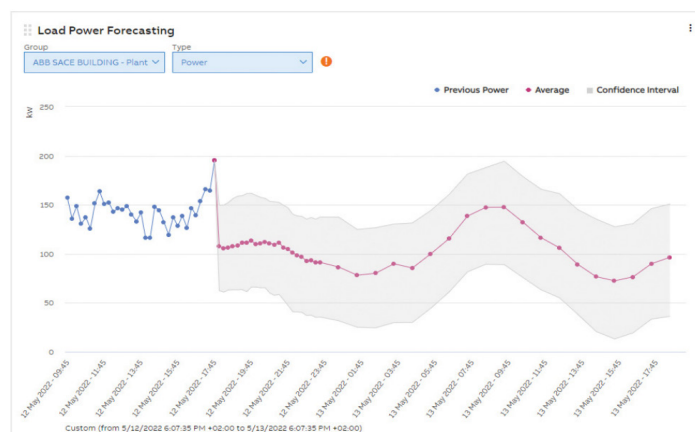
Monitor and compare the energy generation of multiple PV plants thanks to multisite feature.



Optimize asset management and avoid downtime with comprehensive overviews and actionable insights as well as predictive maintenance for 24/7 continuous operation.




More intelligence with load power forecasting thanks to smart analytics.




To discover more

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APPLICATION FINDER




Find the reference architecture tailored to your needs and speed up your project thanks to our new Application Finder Tool!




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CONTACT US




Do you have a similar project and are you searching for the right Application configuration? Contact us and talk to our experts!




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ABB S.p.A.
Electrification Business Area
Smart Power Division
5, Via Pescaria
I-24123 Bergamo - Italy
Phone: +39 035 395.111

new.abb.com/low-voltage

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