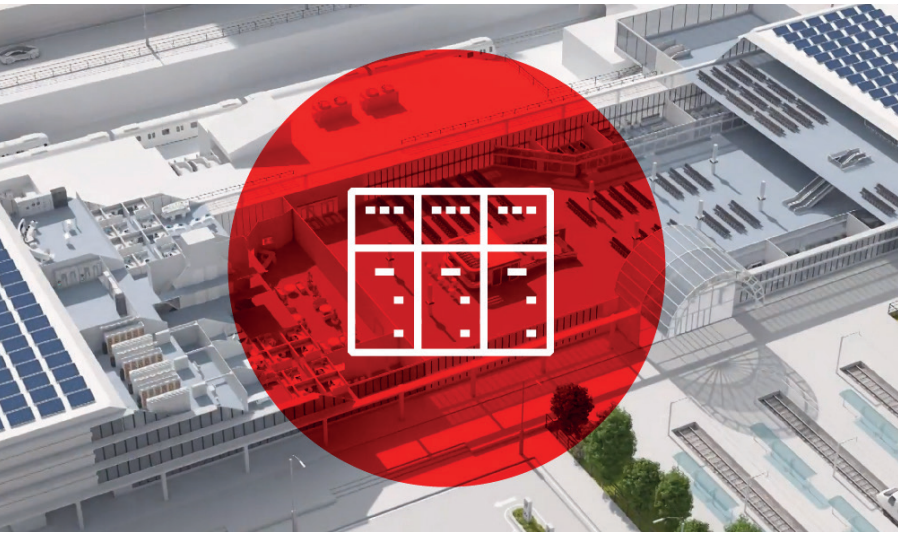
APPLICATION NOTE

Intelligent Distribution for Main Distribution Board in Passenger Station



With over 70 years' experience and global presence in more than 100 countries, ABB helps to keep the world moving with new, innovative and sustainable solutions targeted on creating a low-carbon rail industry able to operate with maximum efficiency, reliability and safety.

What is intelligent distribution?
Intelligent distribution means leveraging on new digital technologies to transform traditional electrical installations into smart connected architecture for 24/7 comprehensive monitoring, insights and analysis. The aim is to improve energy consumption and asset performance targeted on sustainability, energy efficiency, cost savings and continuous operation.

Why you need intelligent distribution
Reliability is a major concern in the rail industry. Last year, reliability issues increased by 64% causing delays amounting to 8612 hours in the UK alone. And as the demand is growing for rail as a sustainable form of transportation, ABB intelligent distribution applications offer solutions able to ensure safe, smooth rail operation, maximize energy efficiency, reduce carbon footprint, minimize running costs and downtime while ensuring 24/7 continuous service.

Main benefits

Energy Efficiency
Maximizes energy efficiency up to 30%, reduces carbon footprint and complies with LEED & ISO 50001 certification requirements.

Multi-site Analysis
Monitors and analyzes multiple passenger stations simultaneously with insights to benchmark station performance and take action to improve critical rail facilities.

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

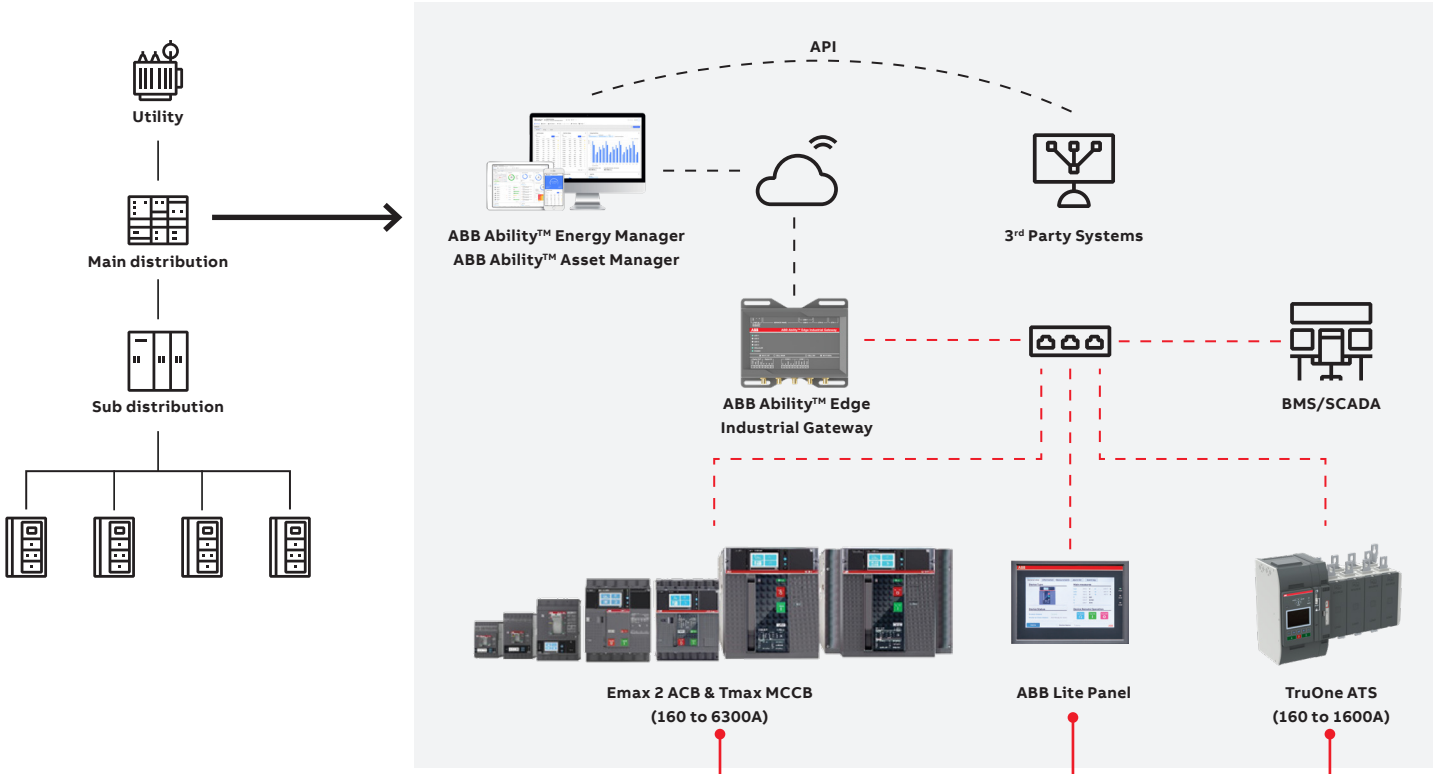
Flexibility
Modular, scalable solutions that can be applied to both greenfield and brownfield installations.

Integrable
Ready for complex integration, also when several systems are involved; BMS, SCADA or facility management with 3rd party integration.

Main distribution boards

Main distribution boards are typically installed downstream of the main power source, either provided by the utility or an emergency generator. High performance is always guaranteed by 160 to 6300A air circuit breakers and molded case circuit breakers with 8 communication protocols to easily integrate with BMS or SCADA, in addition to the ABB Ability™ Energy Manager and ABB Ability™ Asset Manager cloud solution, which integrates energy and asset management in a single intuitive dashboard.
The solution features class 1 active energy measurement compliant with standard IEC61557-12.

As well as the innovative embedded ATS, ABB also offers TruOne, the first true all-in-one automatic transfer switch engineered to incorporate switch and controller in one seamless unit. Performance-tested beyond standard requirements, TruONE stands ready to ensure steady delivery of critical power at all times. Moreover, up to 28 electrical assets can be monitored and controlled by the ABB Lite Panel switchboard HMI, which can be directly connected to the on-premises communication network.

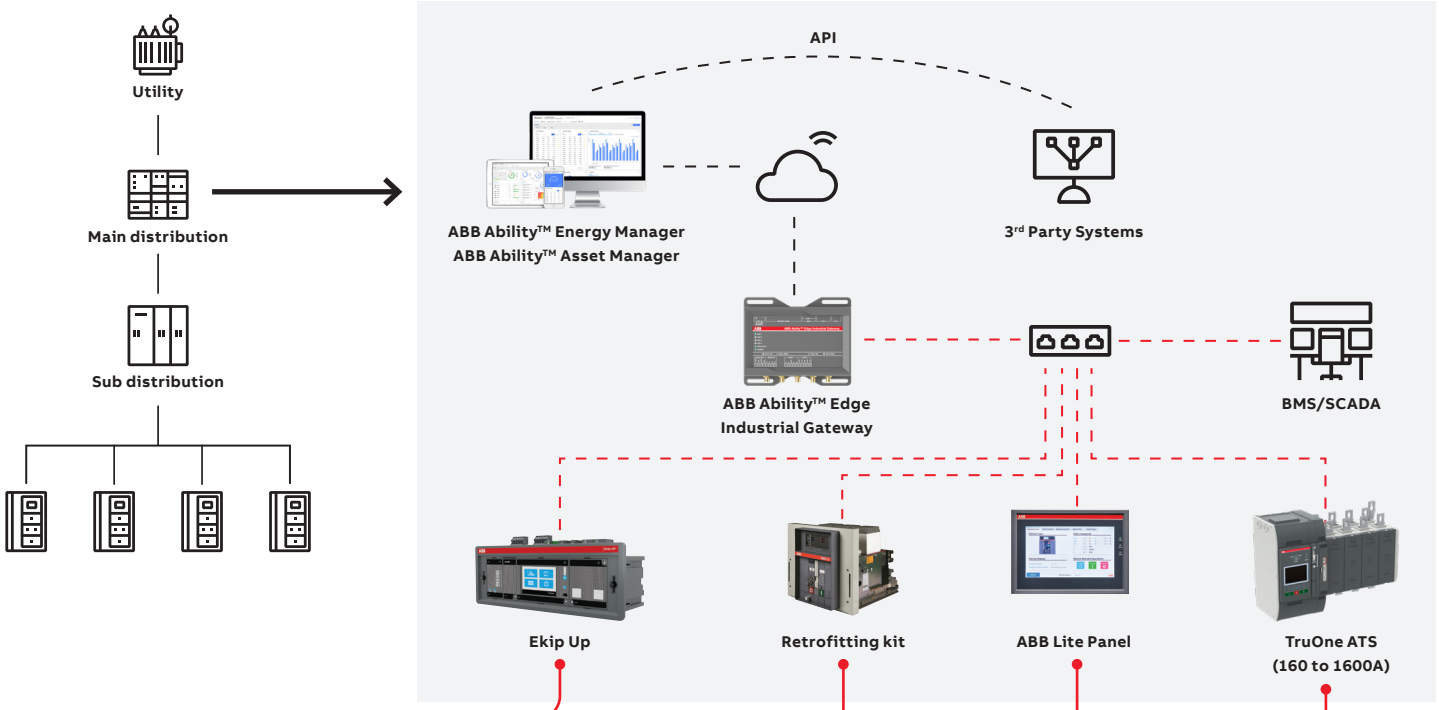


Unique user experience with 9 communication protocols supported:
- IEC 61850
- Modbus TCP/IP
- Modbus RTU
- Profibus-DP
- DeviceNet™
- Profinet
- EtherNet/IP™
- Hub
- Ekip Link

HMI for monitoring and controlling up to 28 ABB LV devices:
- Modbus TCP/IP (20 devices)
- Modbus RTU (8 devices)

The world's first true purpose-built ATS able to support 6 communication protocols:
- Modbus TCP/IP
- Modbus RTU
- Profibus-DP
- DeviceNet™
- Profinet
- EtherNet/IP™

With minimal impact on current installation switchgear, ABB Ekip Up digital units for old/3rd party devices or retrofitting kits (10) for legacy breakers are a cost effective, easy solution for upgrading your electrical system.



Digitalizes plant performance and supports 9 communication protocols:
- IEC 61850
- Modbus TCP/IP
- Modbus RTU
- Profibus-DP
- DeviceNet™
- Profinet
- EtherNet/IP™
- OpenADR
- Ekip Link

To upgrade old/legacy devices

HMI for monitoring and controlling up to 28 ABB LV devices:
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The world's first true purpose-built ATS able to support 6 communication protocols:
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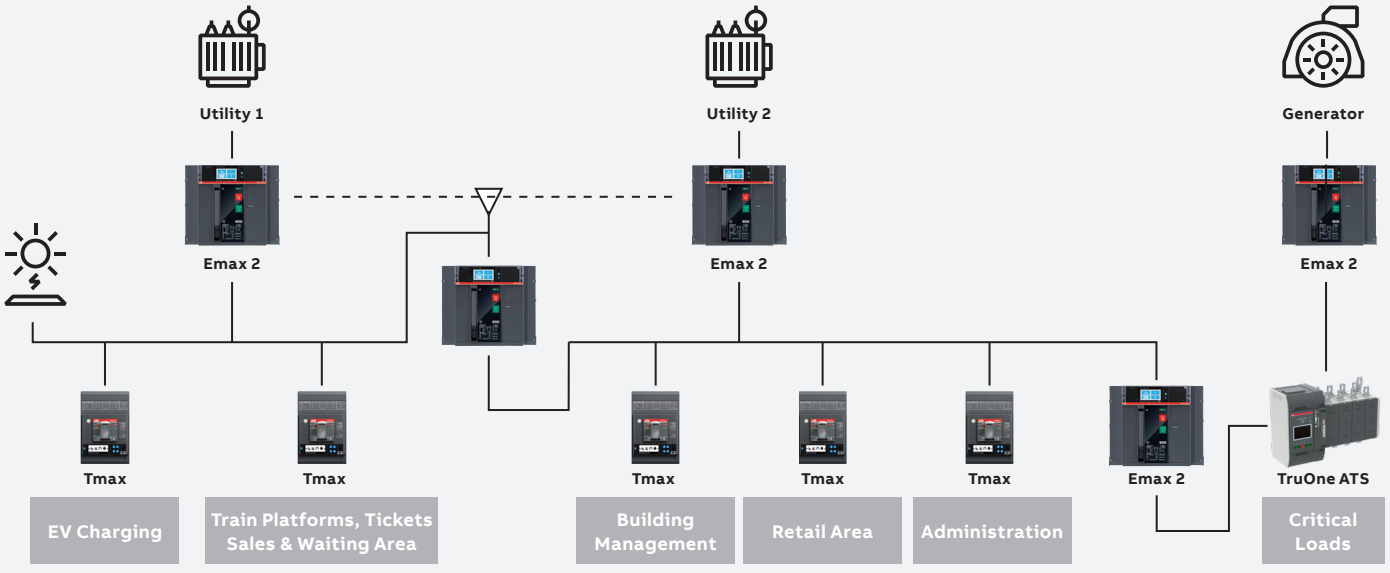
- DeviceNet™
- Profinet
- EtherNet/IP™

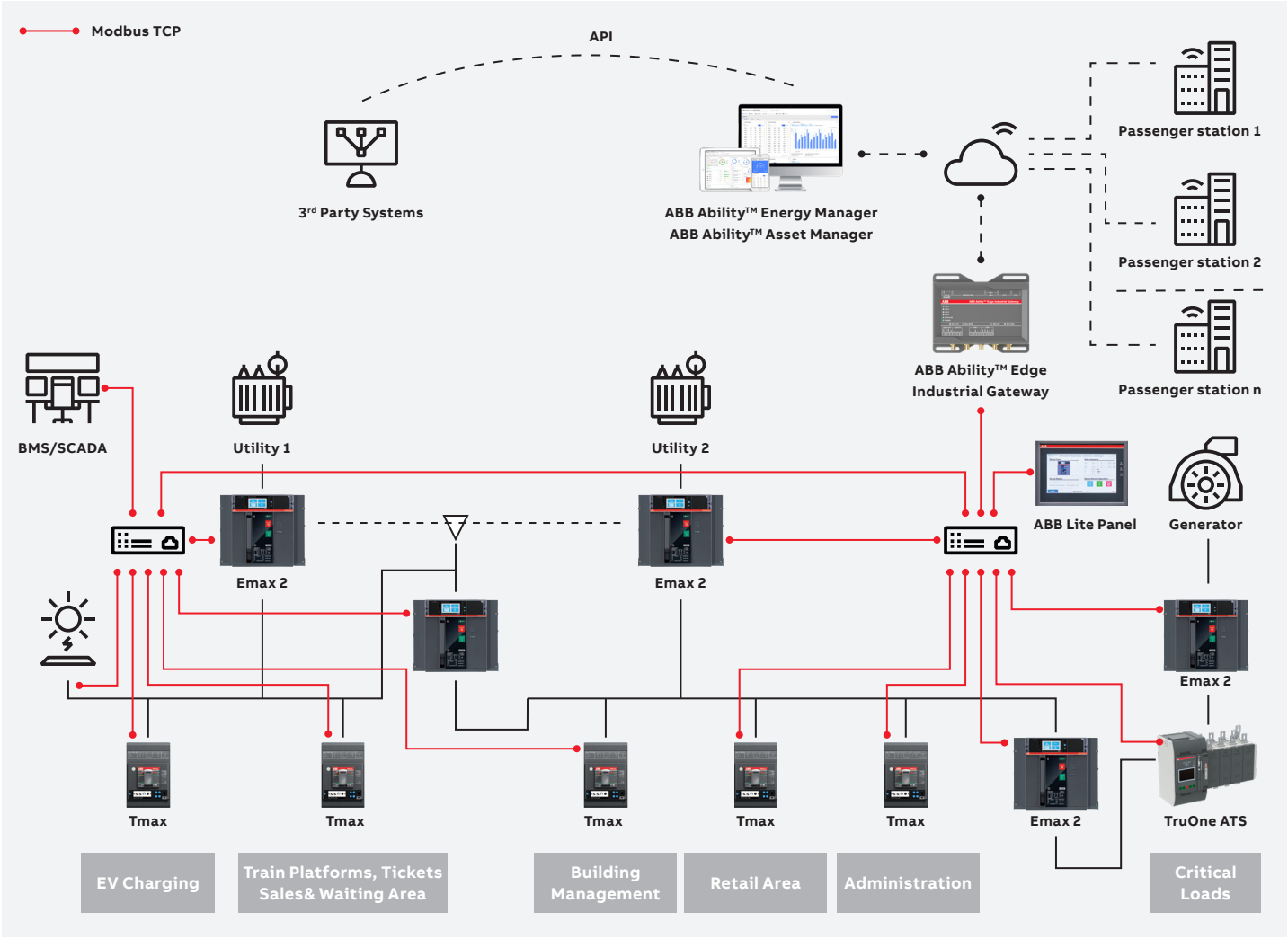
The single-line diagram, communication architecture and main components of a typical main distribution board are illustrated in the example below.



10. For more information about ABB Extensions, Upgrades and Retrofits

Thanks to their digital capabilities, ABB connected products can create smart architecture able to provide comprehensive monitoring solutions for single or multiple passenger stations, while ensuring continuous and reliable operation through ABB Ability™ Energy Manager & ABB Ability™ Asset Manager.

Solutions are available for monitoring the main incomings and outgoings while optimizing energy efficiency, cost savings, asset management and reducing carbon footprint thanks to smart analytics and predictive maintenance. All this plus higher flexibility and easy integration into BMS or SCADA systems, or even 3rd party systems via API.



Main Components

- Emax 2 Air Circuit Breaker
- Tmax XT Molded Case Circuit Breaker
- Ekip Up Digital Unit
- TruOne ATS
- ABB Lite Panel HMI
- ABB Ability™ Edge Industrial Gateway
- ABB Ability™ Energy Manager
- ABB Ability™ Asset Manager

Bill of Materials

Considered Parameters	
Standard	IEC
Power Supply Configuration	Main-Tie-Main configuration with independent backup generator for critical loads (415 V AC, 50 Hz)
Monitoring System	ABB Ability™ Energy Manager and ABB Ability™ Asset Manager
Communication Protocol	Modbus TCP
Measuring Points	12 Connected Devices
Network switch	Ethernet 8 Ports Switch requires 110 - 240V AC power supply
IoT Gateway	ABB Ability™ Edge industrial gateway requires power supply with nominal input 12 or 24 V DC and maximum current 2 A (15 W maximum consumption)

Product	Part Number	Quantity	Description
Emax2 ACB 1250 A 4P	1SDA072936R1	2	For Utility 1 and Utility 2 incomings E2.2N 1250 Ekip Touch LSIG (withdrawable circuit breaker)
	1SDA072936R1	1	Tie Breaker E2.2N 1250 Ekip Touch LSIG (withdrawable circuit breaker)
	1SDA073910R1	3	Fixed part for the withdrawable breakers
	1SDA074172R1	3	Ekip Supply 110-240V AC/DC
	1SDA074151R1	3	Ekip Com Modbus TCP communication module
	1SDA074163R1	3	Ekip Link communication module
	1SDA074183R1	3	Ekip Synchrocheck module
	1SDA074170R1	3	Ekip Signalling 4K
	1SDA074166R1	3	Ekip Com Actuator
	1SDA073724R1	3	Spring Charger Motor
	1SDA073672R1	3	Shunt Opening Release
	1SDA073685R1	3	Shunt Closing Release
	1SDA073882R1	1	Mechanical Interlock Group 1 (1 Cable for 3 breakers)
	1SDA073889R1	3	Mechanical Interlock Group 2 (1 Lever for mobile part for each breaker)
	1SDA073897R1	3	Mechanical Interlock Group 4 (1 Support for fixed part for each breaker)
	ABB Ability Marketplace™	3	Embedded ATS Main-Tie-Main Licence for Emax 2
		3	Measuring Package For Emax2
		3	Voltage Protection Package For Emax2
Emax2 ACB 630 A 4P	1SDA072706R1	1	Outgoing to emergency distribution board E1.2N 630 Ekip Touch LSIG (withdrawable circuit breaker)
	1SDA074151R1	1	Ekip Com Modbus TCP communication module
	1SDA072707R1	1	For generator E1.2N 630 Ekip G Touch LSIG (withdrawable circuit breaker)
	1SDA074151R1	1	Ekip Com Modbus TCP communication module
	1SDA073908R1	2	Fixed part for the withdrawable breakers
TruOne ATS 630 A 4P	1SCA151057R1001	1	Delayed transition I-O-II operation, Level 3 LCD controls. Includes handle for manual operation, 2 m RJ45 connection cable between detachable HMI and ATS frame
	1SCA148926R1001	1	Auxiliary power supply 12-24 V DC
	1SDA104052R1	1	Ekip Com Modbus TCP communication module
	1SCA150202R1001	1	Phase barriers
	1SCA126309R1001	2	Terminal connection kit with bolts, washers and nuts

Continue →

Product	Part Number	Quantity	Description
Tmax XT MCCB 4P	1SDA100552R1	1	Outgoing for EV charging (XT5N 400 breaking part)
	1SDA100685R1	1	Ekip Touch Measuring LSIG In=400
	1SDA105189R1	1	Ekip Com Modbus TCP communication module
	1SDA068294R1	1	Outgoing for retail shopping area (XT4N 160 breaking part)
	1SDA100328R1	1	Ekip Touch Measuring LSIG In=160A
	1SDA105177R1	1	Ekip Com Modbus TCP communication module
	1SDA100552R1	1	Outgoing for platforms, tickets .. (XT5N 400 breaking part)
	1SDA100685R1	1	Ekip Touch Measuring LSIG In=400
	1SDA105189R1	1	Ekip Com Modbus TCP communication module
	1SDA068178R1	1	Outgoing for building management(XT4N 250 breaking part)
	1SDA100329R1	1	Ekip Touch Measuring LSIG In=250A
	1SDA105177R1	1	Ekip Com Modbus TCP communication module
	1SDA068294R1	1	Outgoing for adminstration (XT4N 160 breaking part)
	1SDA100328R1	1	Ekip Touch Measuring LSIG In=160A
	1SDA105177R1	1	Ekip Com Modbus TCP communication module
	1SDA068294R1	1	Outgoing Spare (XT4N 160 breaking part)
	1SDA100328R1	1	Ekip Touch Measuring LSIG In=160A
	1SDA105177R1	1	Ekip Com Modbus TCP communication module
	1SDA100552R1	1	Outgoing Spare (XT5N 400 breaking part)
	1SDA100685R1	1	Ekip Touch Measuring LSIG In=400
	1SDA105189R1	1	Ekip Com Modbus TCP communication module
ABB Lite Panel	1SDA114809R1	1	Swtichboard HMI
ABB Ability™	1SDA116751R1	1	Edge Industrial Gateway (Cloud view)
	2CDG120082R0011	2	8 Ports Fast Ethernet Switch
	ABB Ability Marketplace™	1	Energy Manager (Watching Edition - 5 Devices - 1 Year)
		7	1 Extra Device For ABB Ability
		1	Load Power Forecasing Add-On (1 Site - 1 Year)
		1	Energy Manager Multsite (Watching Edition - 5 Sites - 1 Year)
		1	Asset Manager Subscription (1 Year)
		1	LV CB Health Analysis (Up to 25 LV Circuit Breakers)

Note : ABB Ability Marketplace™ one-stop online portal for ABB Ability™ solutions subscriptions and services.
For Tmax XT MCCB with communication modules, it should be supplied by means of a galvanically isolated 24V DC auxiliary voltage with the following characteristics (tolerance ±10%, maximum wave ±5%, maximum surge current 10A for 5ms and maximum rated power 4W @24V).

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

Emax 2:

WEB PAGE

CATALOG

Tmax XT:

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CATALOG

Ekip Up:

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CATALOG

TruOne ATS:

WEB PAGE

CATALOG

Lite Panel:

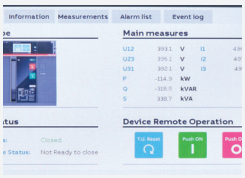

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ABB Ability™ Edge Industrial Gateway:

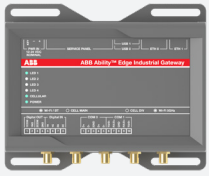

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ABB Ability™ Energy Manager:

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ABB Ability™ Asset Manager:

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To discover more

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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