ABB Ability™ Data Center Automation

The next generation of building automation and electrical controls: industrial strength, mission critical converged solutions for data centers.

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Building a data center with control and monitoring systems from multiple vendors wastes time, introduces risk and compromises performance. ABB's single platform approach brings improved reliability, energy efficiency, asset utilization and personnel productivity.

Why choose ABB
Serving mission critical industries for over 100 years

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An industrial heritage that brings new and innovative solutions to data centers.

ABB is the largest enterprise asset management and distributed control system supplier in the world. The company's flagship process automation system, ABB Ability™ System 800xA has an installed base of more than 10,000 systems worldwide.

It is System 800xA that provides the core technology within ABB Ability™ Data Center Automation. It allows ABB to deliver industrial-strength, mission critical converged solutions for mechanical controls (BMS), electrical monitoring (EPMS), electrical controls (ECS) and DCIM to the data center.

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A worldwide service organization that stands ready to support your data center, wherever it is.

ABB's global service network is strategically positioned to provide support, logistics and service operations using standard processes and tools, to ensure our services are delivered quickly and reliably anywhere in the world.

Tailored **service agreements** enable us to provide the exact mix of lifecycle services needed for mission critical 24/7 operations including spare parts, technical support, training, emergency on-site support, preventive maintenance and more.

A wide variety of **optimization services** and analytics are available to ensure efficient operations and maximum uptime.

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01 ABB Formula E

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02 ABB motors and drives factory

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03 ABB production robot in action

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04 ABB renewable power at sea

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Why take a new approach?
Because the old way is holding you back

Traditionally, data centers have been designed and delivered with "silos of automation" that not only increase risk and cost, but create significant construction and operational inefficiencies.

During construction, this means one controls team bidding on, designing, installing and commissioning your electrical controls with another, from a separate vendor handling mechanical controls, and yet another implementing the DCIM system. This results in duplicated effort, increased cost and lengthy delays.
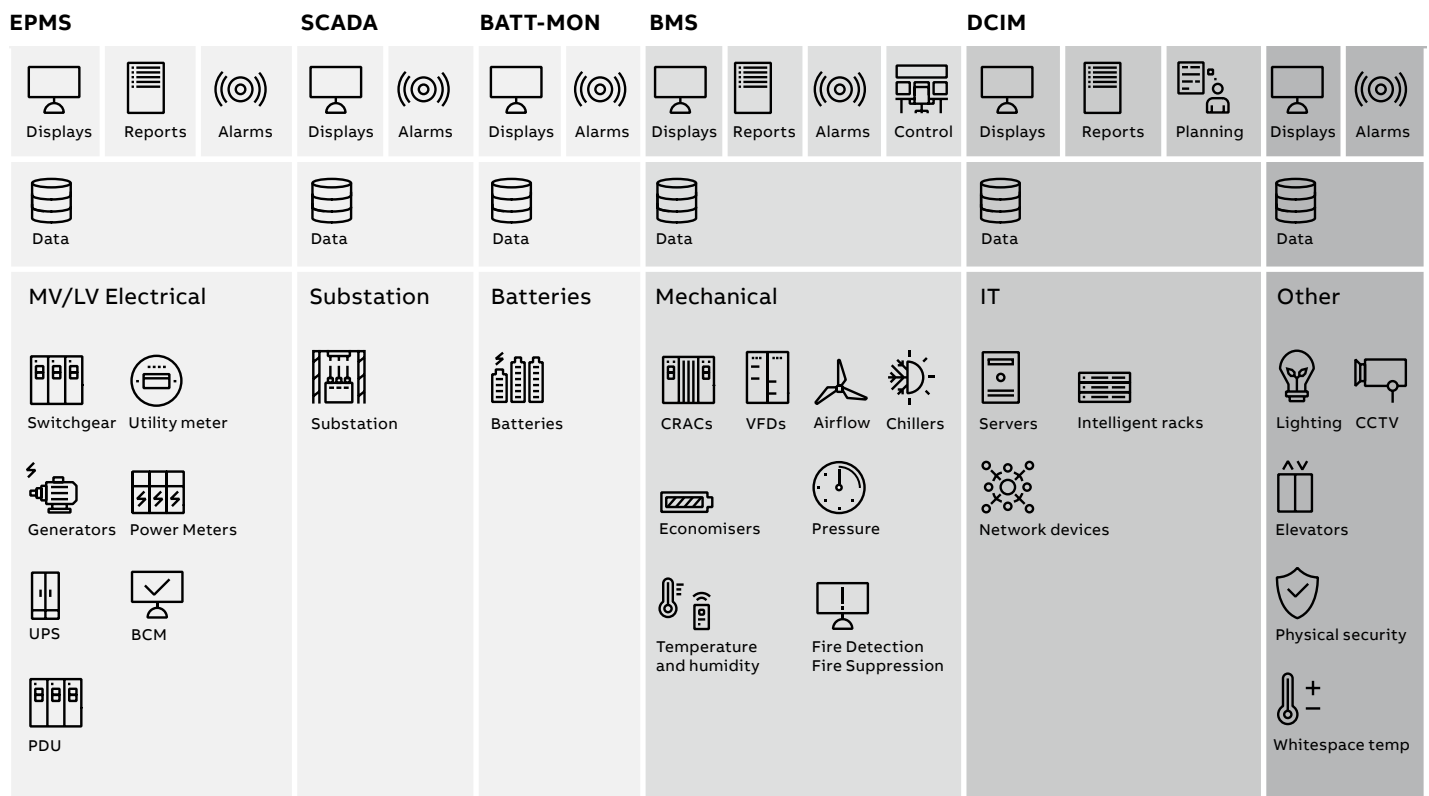
For operations, the result is multiple systems to deal with, none of which are integrated. To make matters worse, new systems get added to this mix as the data center grows. The end result is lack of insight into the behavior of your data center, and a lack of ability to optimize it.

The industrial world recognized this lack of system collaboration as a problem years ago, and has developed robust and flexible solutions that are proven-in-use.

Collaborative automation systems - where people, systems and equipment work together seamlessly - are now the industry norm. The payback is improved reliability, energy efficiency, asset utilization and personnel productivity.

ABB has led the way in developing collaborative solutions for automating all kinds of mission critical facilities, and is number one in the world for distributed control systems.

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Facilities engineering, operations & planning

EPMS			SCADA		BATT-MON		BMS				DCIM				
Displays	Reports	Alarms	Displays	Alarms	Displays	Alarms	Displays	Reports	Alarms	Control	Displays	Reports	Planning	Displays	Alarms
Data			Data		Data		Data				Data			Data	

MV/LV Electrical		Substation	Batteries	Mechanical				IT		Other	
Switchgear	Utility meter	Substation	Batteries	CRACs	VFDs	Airflow	Chillers	Servers	Intelligent racks	Lighting	CCTV
Generators	Power Meters			Economisers		Pressure		Network devices		Elevators	
UPS	BCM			Temperature and humidity		Fire Detection Fire Suppression				Physical security	
PDU										Whitespace temp	

ABB Ability™ Data Center Automation
ABB's converged solution for the data center

ABB Ability™ Data Center Automation has all the functionality of every necessary control and monitoring tool required to run a data center in a single, industrial platform. Based on the ABB Ability™ System 800xA platform, this data center solution is built to exacting standards of reliability and performance, and is highly secure, expandable, open, modular and maintainable.

It's proven-in-use capabilities make building and operating a data center more efficient, through:
- Common tools for engineering and configuration
- Single consistent data model for all systems
- "Single pane of glass" view
- Role-based visualization of data and analytics
- Standards-based communication protocols to enable easy integration of applications.

With the right converged solution, it's easy to add new equipment and capabilities at any time.

There is no need to add new separate systems in order to integrate in-row cooling, additional environmental sensors, physical security systems, server monitoring or dashboards and analytics.

New equipment can be added to the system at any time, meaning the system can continue to be expanded and enhanced long after construction is complete.

Since ABB Ability™ Data Center Automation has a standards-based integration platform at its core, it is completely technology and vendor neutral, and adding new mechanical or electrical equipment or software packages is a matter of configuration, not custom programming. In addition to a full range of hardwired I/O options, it supports all common protocols (Modbus, BACnet, SNMP) as well as advanced protocols such as IEC61850.

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Data Center Automation

| Displays | Reports | Alarms | Control | Planning | Operations Management | Performance KPIS | Data Analytics | Energy Optimization | Maintenance Management | Additional third-party or end-user created modules can be added later... |

Data

| Switchgear | Utility meter | Generators | PMS | Substation | CMS | CRACs | VFDs | Airflow | Servers | Intelligent racks | Lighting | CCTV |

| Power Meters | UPS | BCM | EMS | | BMS | Chillers | Economisers | Pressure | Network devices | | Elevators | Physical security |

| PDU | | | | | | | | | | | | Whitespace temp |

Advantages of a converged solution
ABB Ability™ Data Center Automation

A converged system, implemented with hardened and proven components and delivered by a trusted and experienced partner, delivers benefits during all phases of a data center's lifecycle.
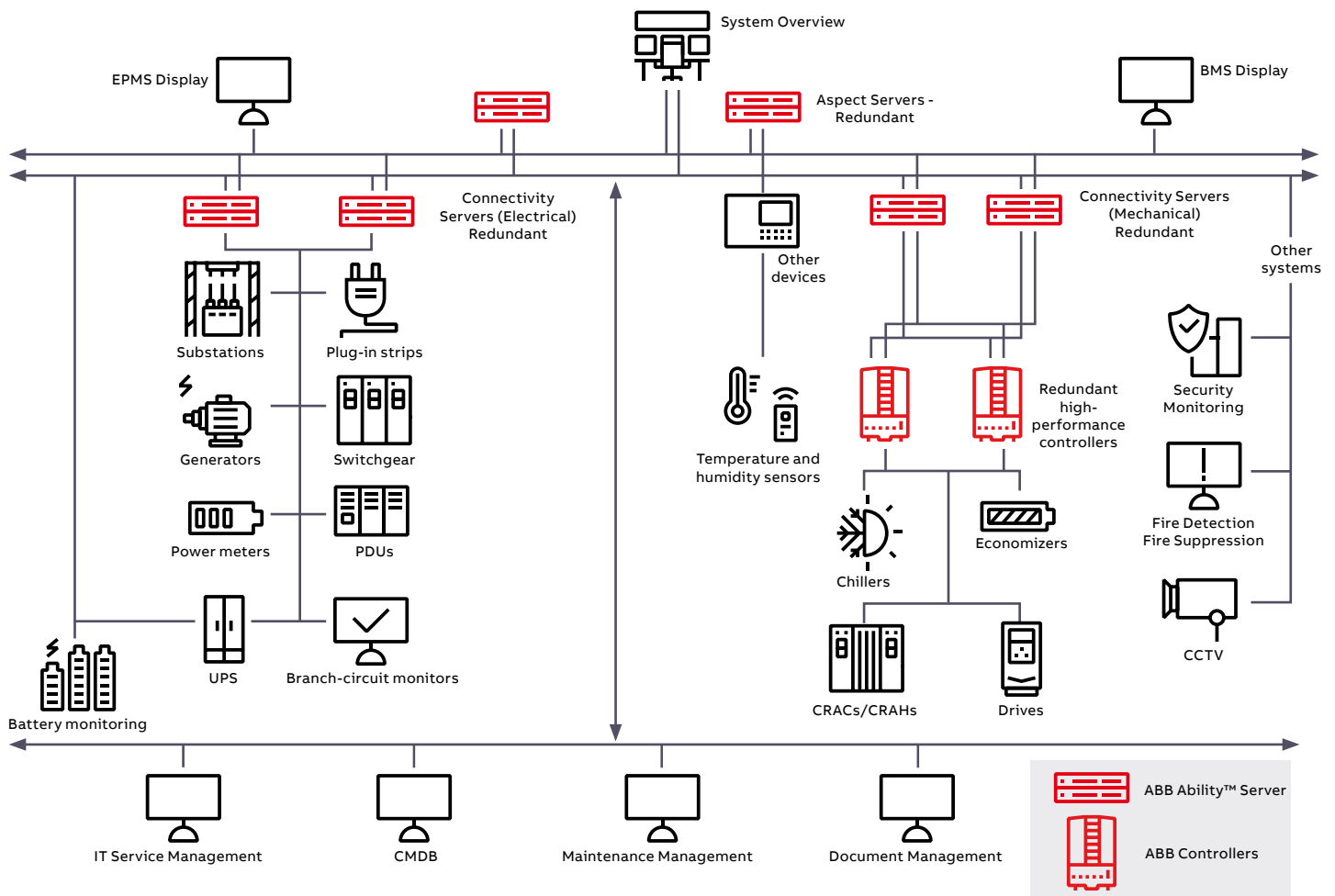
ABB approach	Traditional approach
Single platform technology: • Provides easy integration between EPMS, ECS and BMS	Different technologies and systems for mechanical and electrical: • Adds cost, risk and inefficiencies
Vendor agnostic with configurable integration of data and software applications: • Faster installation, commissioning and fault finding	Multiple suppliers: • Tied to demands from individual equipment suppliers
Converged solution means new equipment and capabilities can be added at any time: • No need for custom system integrations	Silos of automation: • Adding a new system means adding another silo
Solution based totally on ABB products: • Tested and field-proven, significantly reducing risk • Reduced troubleshooting and rework delays	System integrators deliver solutions using third party products: • Bespoke system integration adding risk and cost • Limited responsibility for the entire solution
Sole supplier: • One site team with expertise on all systems • One project manager for increased accountability • Avoid conflict and blame between vendors	Multi-team commissioning: • One vendor and installation crew per system • Multiple teams for the builder to manage

Collaborative control for data centers
Single window collaboration and efficiency

**A single window on the world**

Whether ABB's industrial workstation - the Extended Operator Workplace (EOW) - or a single display on a handheld device is selected, the ABB Ability™ Data Center Automation system gives operators:

- Intelligent navigation capabilities
- Alarm management functionality
- Integrated video and communications features
- Integrated information from all data center systems through one interface
- Dynamic and configurable views based on user role

In addition, ABB provides control room design services to help minimize footprint while optimizing the operator experience with a focus on human factors such as ergonomics and operator well-being.

Features	Benefits
Integration for legacy solutions	Consolidated view of all data center systems
Collaboration platform for operations	Improved asset performance
Integrated control environment for EPMS, ECS and BMS	Consolidated data for optimum decision making
Ready for remote connectivity	Enterprise view and/or remote access to expertise

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Extended Operator Workplace (EOW) user interface for the converged Data Center Automation System
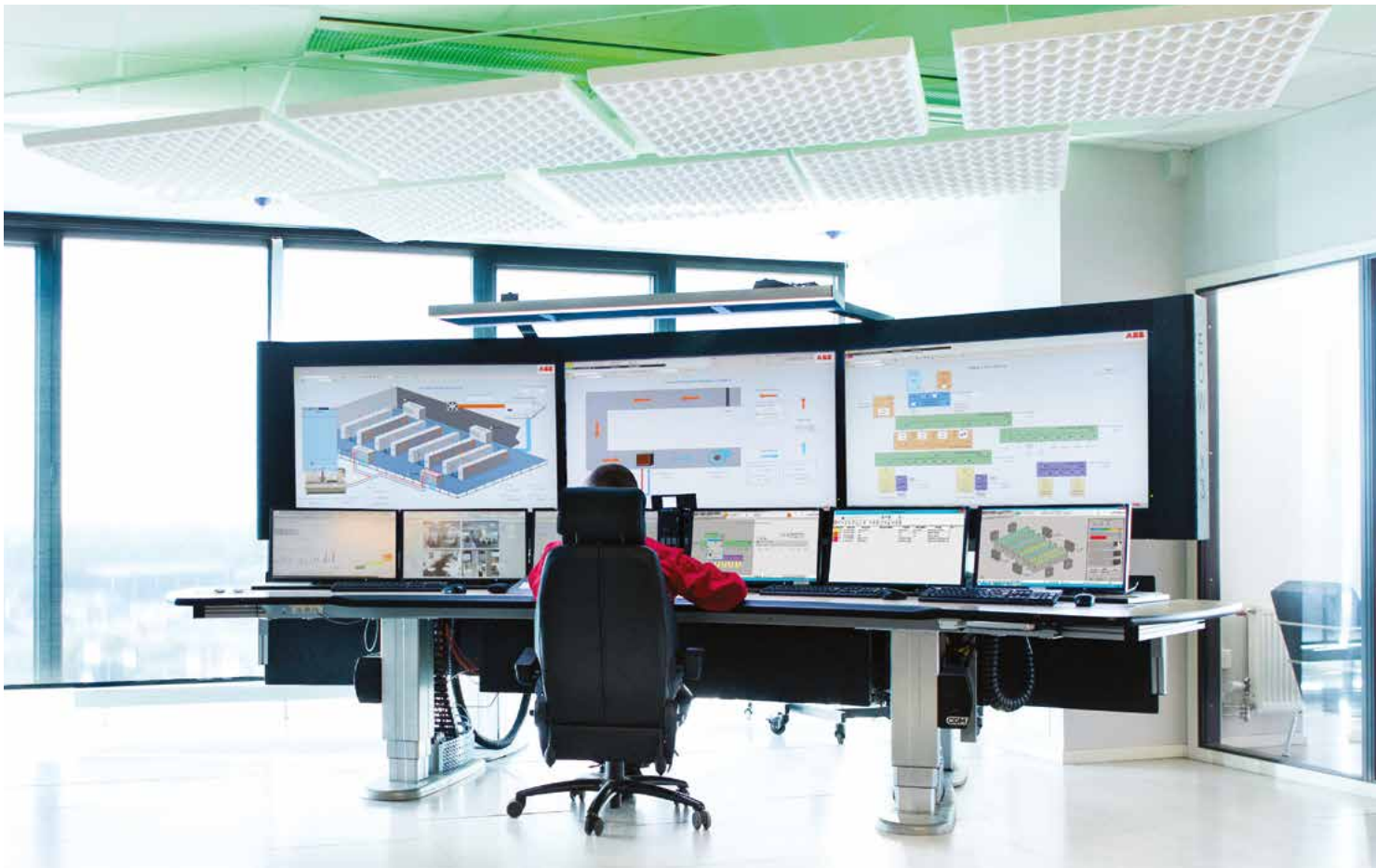
Building Management System (BMS)
Automatic control and scheduling

In today's data centers, an efficiently managed building isn't enough. An integrated building management solution is required in order to provide real-time information to multiple decision makers to maintain 24x7 operations, ensure safety and security as well as to protect and manage the data center assets.

Industrially proven and reliable controllers
Highly scalable, fault tolerant and modular controllers and I/O provide control of the mechanical infrastructure of a data center. This industrially proven control hardware ensures you can achieve the level of availabililty and maintainability that is required in a mission critical data center.

Features	Benefits
Solutions based on industrial controls technology	Powerful 24x7x365 operations
PLC to fully hot-swappable controllers	A full range of control options
"Everything redundant" architecture (optional)	System can survive failure of any component
Vendor neutral hardware integration	Flexibility of choice for hardware
Built-in tools to review and monitor control logic	100 percent user maintainable throughout the lifecycle

ABB controllers are:
• Reliable, fault tolerant and resilient
• Redundant controllers / CPU
• Redundant I/O interfaces
• Redundant network
• Redundant power supplies
• Hot swappable modules

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Automatic control
and scheduling of all
mechanical infrastructure
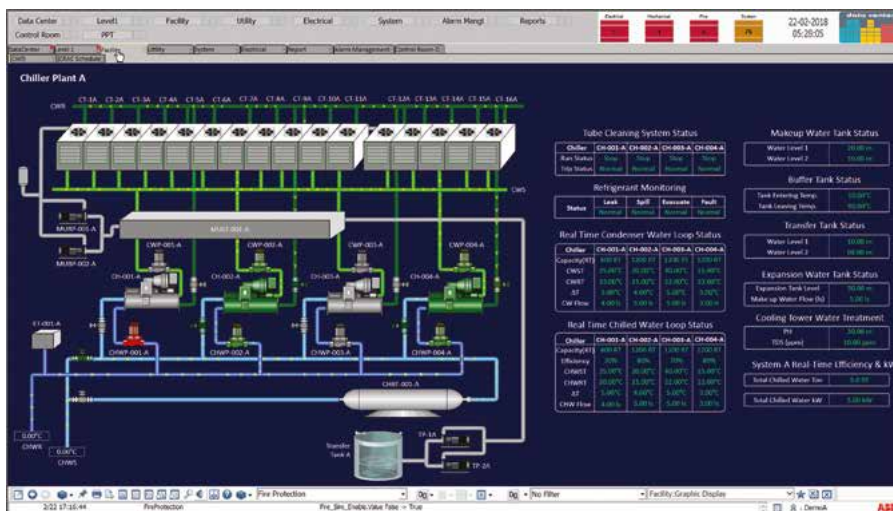
Electrical Power Management System (EPMS)
Electrical monitoring from substation to chip

Monitoring every electrical sub-system

Whether it's deployed as a stand alone EPMS or part of a converged system, ABB Ability™ Data Center Automation provides superior electrical monitoring, reporting and analytics. This ensures that the electrical system performance is optimized, while identifying issues before they escalate.

With this product, you can:
- Manage electricity capacity
- Analyze the quality of power in the data center
- Visualize how energy is used
- View performance trends
- Identify potential problems

Features	Benefits
Supports all common protocols	Seamless access to data from all common meter vendors
High speed communication and data storage	All data is collected and presented in real time
Extensive power quality analysis tools	Intuitive troubleshooting and baseline data capture capabilities
Live single-line diagrams	Maintenance support
Drill down into equipment details	Single source for system information
Sophisticated alarm management tools	Fast-fault detection
Vendor-neutral power quality meter (PQM) interface	Harmonics and disturbance data can be read from any third-party meter

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EPMS visualization of the electrical system with deep dive analytics
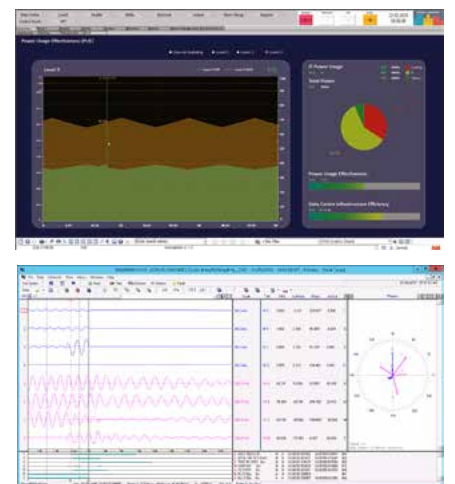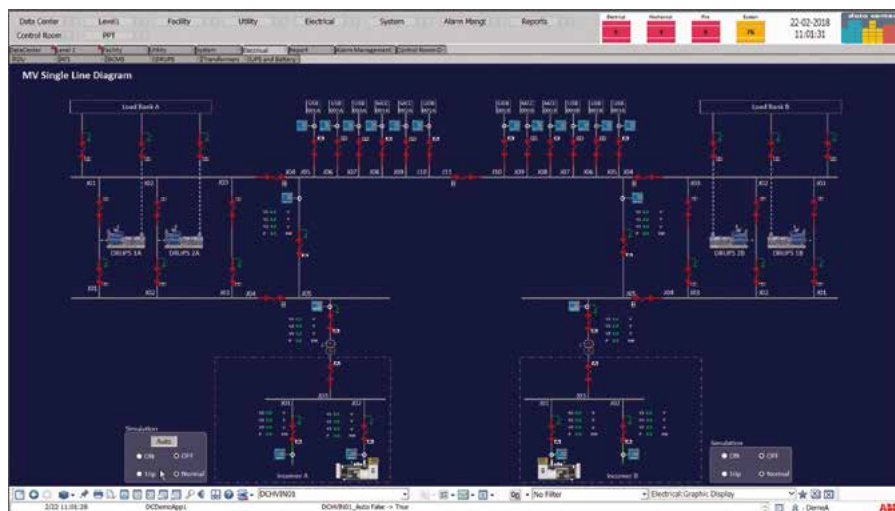
Electrical Control System (ECS)
Take control of your power

Managing electrical loads
Today's data centers need to minimize energy costs and maximize capacity. This can be achieved through:

- Integrating onsite solar or wind generation to minimize grid demand
- Using a Battery Electrical Storage System (BESS) to avoid peak demand charges or shift load to lower rate periods
- Implementing a load management system to offload non-critical systems during peak demand periods, or for scheduling load shedding or restoration after a grid failure.

The ECS built within the ABB Ability™ Data Center Automation provides the ability to flexibly and reliably manage and control electrical infrastructure.

Features	Benefits
Solutions based on industrial controls technology	Powerful 24x7x365 operations
Controller-based implementation	All control logic is running in hot-redundant controllers designed for data center applications
Built-in to the ABB Ability™ Data Center Automation system	ECS is fully integrated with the rest of the automation system, giving full system visibility to operations, complete with overrides and system alarms

Using high-speed, redundant controllers and state-of-the-art communications protocols such as IEC61850, ABB delivers robust, standardized solutions, configured to meet the specific needs of any data center.

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Controlling your electrical infrastructure, including microgrids, substations, renewables and load management
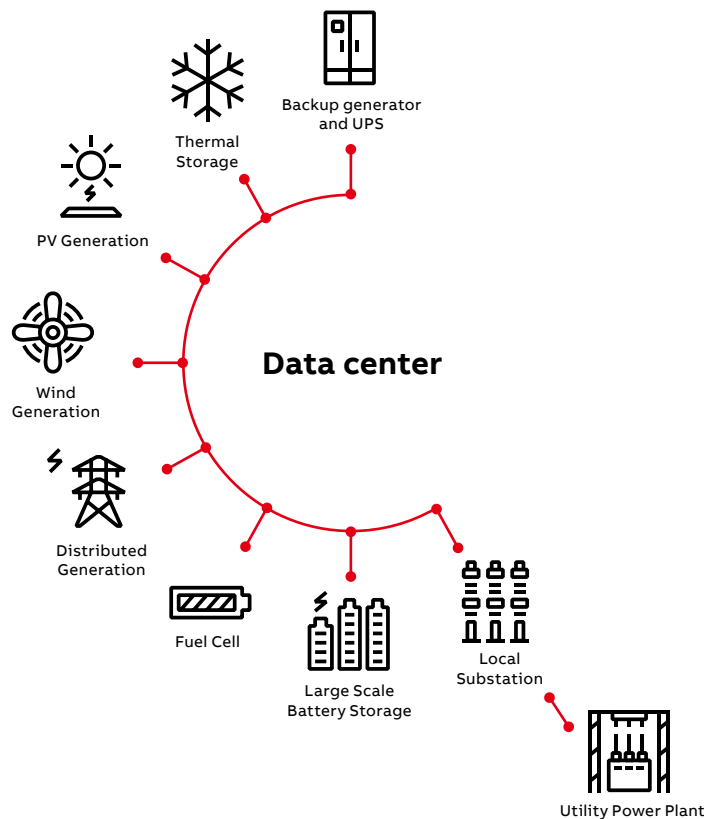
ABB in the Data Center Industry
Empowering integrated operations

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ABB's converged solution drives operational savings with integrated functions for both operations and maintenance.

Perhaps the greatest benefit of ABB Ability™ Data Center Automation is the wide range of integrated applications and functions that can be applied across the entire converged system. Using a common data model, functions such as advanced navigation, alarm management, history, condition-based maintenance, CMMS integration and operations management can be implemented with a few clicks. These functions will make both operations and maintenance more efficient:

Predictive Maintenance
A shift towards more predictive maintenance is crucial for driving down the cost of maintaining data centers. With ABB's built in condition monitoring and reporting features, information is collected, aggregated, analyzed, and compared to historical data to provide advanced warning of degrading equipment performance or impending failure.

CMMS Integration
ABB Ability Data Center Automation integrates to third party Computerized Maintenance Management Systems (CMMS) such as Maximo and SAP PM. Through this integration, maintenance data such as active work orders and work order history can be shared seamlessly between the ABB Ability™ Data Center Automation system and the CMMS. Work orders can be automatically generated based on triggers determined by the condition monitoring module, saving time and eliminating errors.

Operations Management
ABB's integrated operations management functionality ensures complete tracking of processes that are typically handled with paper, spreadsheets and emails. Features like the electronic logbook and operator rounds tracking allow operations teams to eliminate paperwork and ensure seamless communication over shift changes.

These unique operational features are part of the ABB Ability™ Data Center Automation solutions suite and deliver significant benefits for operations and maintenance.

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Operations Management

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ABB Industrial Automation

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