

ABB ABILITY™ ELECTRIFICATION MONITORING AND CONTROL FOR DISTRIBUTION NETWORKS

ABB ZEE600

Product Guide



ABB ZEE600

Product version: 1.0

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1. Description

ABB zenon Electrification Edition 600 (ABB ZEE600 in short) is a specialized variant of ABB zenon (ABB Ability Operations Data Management zenon), which handles process visualization, control and distribution substation data management in electrification solutions for several customer segments.

- Utilities (such as power generation, sub-transmission, distribution, and renewables)
- Industries (such as food and beverage, oil and gas, chemicals, metals, electronics and semiconductors)
- Commercial and industrial buildings (such as data centers and hospitals)
- Transportation infrastructure (such as railways, e-mobility, and airports)

Based on zenon Energy Edition SCADA and ABB zenon, the ABB Ability Electrification Monitoring and Control for distribution networks ABB ZEE600 advantageously inherits all their features and versatility in visualization, data communication and control.

Following ABB's latest user experience guidelines, ABB ZEE600 seamlessly integrates ABB's electrification products and applications, the result being a state-of-the-art product with the advantages of a commercial off-the-shelf (COTS) product. The product also delivers next-generation on-premise digitalization solutions for state-of-the-art electrification systems.

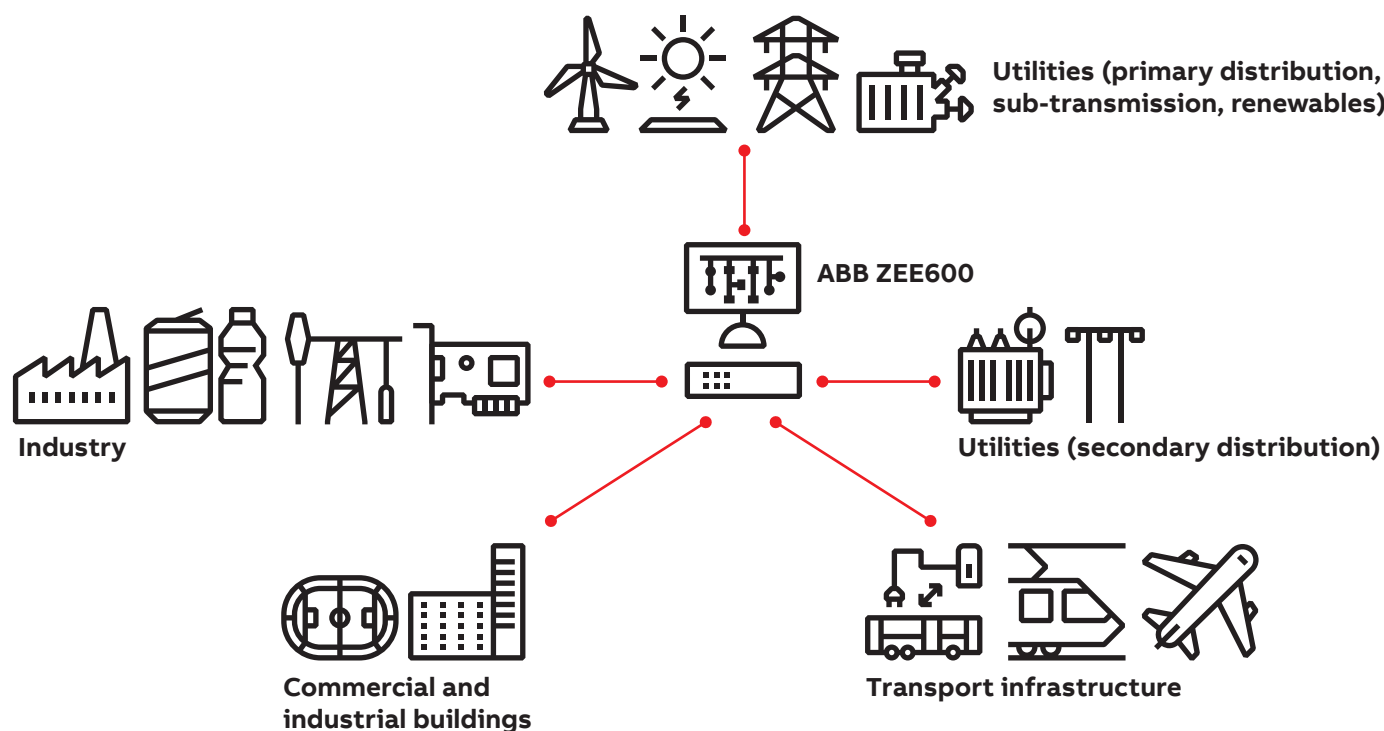


Figure 1. ABB ZEE600 in customer segments

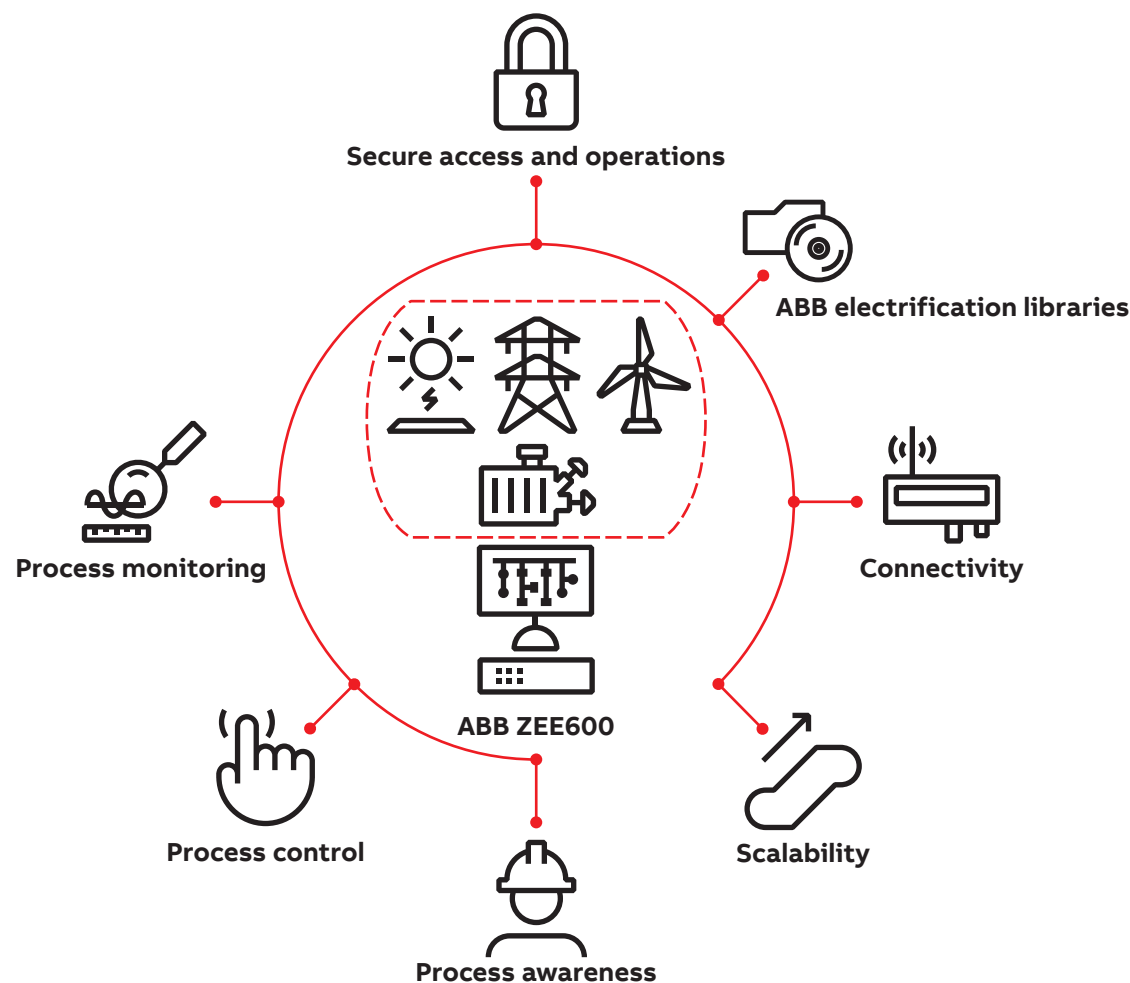


Figure 2. ABB ZEE600 overview

ABB ZEE600 handles several essential facets of substation and electrical process monitoring, control and data management.

- Process awareness
- Process control
- Process monitoring
- Connectivity to downstream and upstream devices or systems using standard protocols
- Secure access and operations

ABB ZEE600 also incorporates several electrification libraries.

- Standard display faceplates for common look and feel for ABB Relion medium-voltage relays and ABB Emax 2 intelligent low-voltage circuit breakers
- Standardized IEC and ANSI substation symbols for single-line diagram (SLD) displays
- Standardized pages displaying, for example, alarms, events and reports
- Signal engineering wizard for configuration automation

ABB ZEE600 supports system integration in segment electrification control system (ECS) solutions by handling

downstream process data acquired using Ethernet or serial communication-based protocols.

ABB ZEE600 offers versatile functionality in combination with the protection relays, meters, programmable logic controllers (PLC) and remote terminal units (RTU) deployed in digital electrification solutions.

ABB ZEE600 can be used in two installation scenarios.

- In a mix of new and existing installations in primary distribution substations, as a human-machine interface (HMI), communication gateway and a data handling unit.
- In new or existing secondary distribution substations as a communication gateway and a compact HMI.

ABB ZEE600 contributes towards the customers' generic KPIs through elucidated features and functionality by providing value for return on investment (ROI) and reduction of total cost of ownership (TCO).

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- Flexible architecture allowing remote control
- User-friendly ECS engineering environment
- Graphical and customizable user interface
- Multi-user project access and synchronization
- Openness and extensibility
- Real-time energy monitoring, reporting and optimization
- Capability to execute applications
- Hosted on rugged industrial computers
- Readiness for connectivity with external systems such as control systems and centers or cloud
- Secure operations, secure data communication and data security
- Real-time monitoring and control of plant electrification operations using contemporary, state-of-the-art user interfaces
- Comprehensive connectivity
- Scalability and modularity to suit the plant's present and future requirements
- High deployment efficiency through electrification device and application libraries

ABB ZEE600**Product version: 1.0****2. Inheritance from zenon Energy Edition**

ABB ZEE600 is based on ABB zenon (Energy Edition) and electrification libraries. However, some of its features or

functionality are inherited from ABB zenon. In addition to the default functionality of ABB zenon (Energy Edition), other optional features can be chosen as needed.

Table 1. Default ABB ZEE600 base server features

Feature	Category
Process awareness	Alarm areas
	Automatic line coloring
Process control	Command processing
	Interlocking
	zenon logic Runtime
Process monitoring	Historian with SQL export
	Extended trends
	Reporting (read-only)
Process connectivity (client drivers)	IEC 60870-5-101, IEC 60870-5-104
	IEC 60870-5-103
	IEC 61850, Edition 1 and Edition 2
	DNP3 serial/TCP
	Modbus serial/TCP
	IEC 61400-25 (wind power plant monitoring and control)
	IEC 62056-21 (power quality and revenue metering)
Connectivity from zenon logic SoftPLC (server or client)	IEC 61850 client, Edition 1
	IEC 61850 MMS server, GOOSE publisher and subscriber, Edition 1
	IEC 60870-5-101, IEC 60870-5-104 server
	IEC 60870-5-101, IEC 60870-5-104 client
Others	Programming interface VBA/C#/VB.NET ¹⁾
Electrification libraries	Wizards for automated engineering, disturbance records and energy reports

1) Use may require special skills and support; not covered in this document

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Table 2. Optional ABB ZEE600 features

Feature	Category ¹⁾
Process awareness	Message control
Process control	Command Sequencer
Process monitoring	Process recorder
	Reporting (write access)
	Historian SQL server interface
Process connectivity (client drivers)	<ul style="list-style-type: none"> • OPC (DA, UA) • Profibus (zenon logic/SoftPLC) • Profinet (zenon logic/SoftPLC)
	Everywhere server (process information on smart phones and tablets)
System connectivity (server) using the process gateway	<ul style="list-style-type: none"> • OPC (DA, UA) • IEC 60870-5-101, IEC 60870-5-104 • DNP3 serial, TCP • Modbus serial, TCP • SNMP
Others	Load management ²⁾

1) Including only the items relevant to electrification solutions

2) Use may require special skills and support; not covered in this document

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3. Application

ABB ZEE600 can function as a combined substation HMI, communication gateway and automation controller managing

real-time, non-real time and historical data in primary and secondary substations in various customer segments.

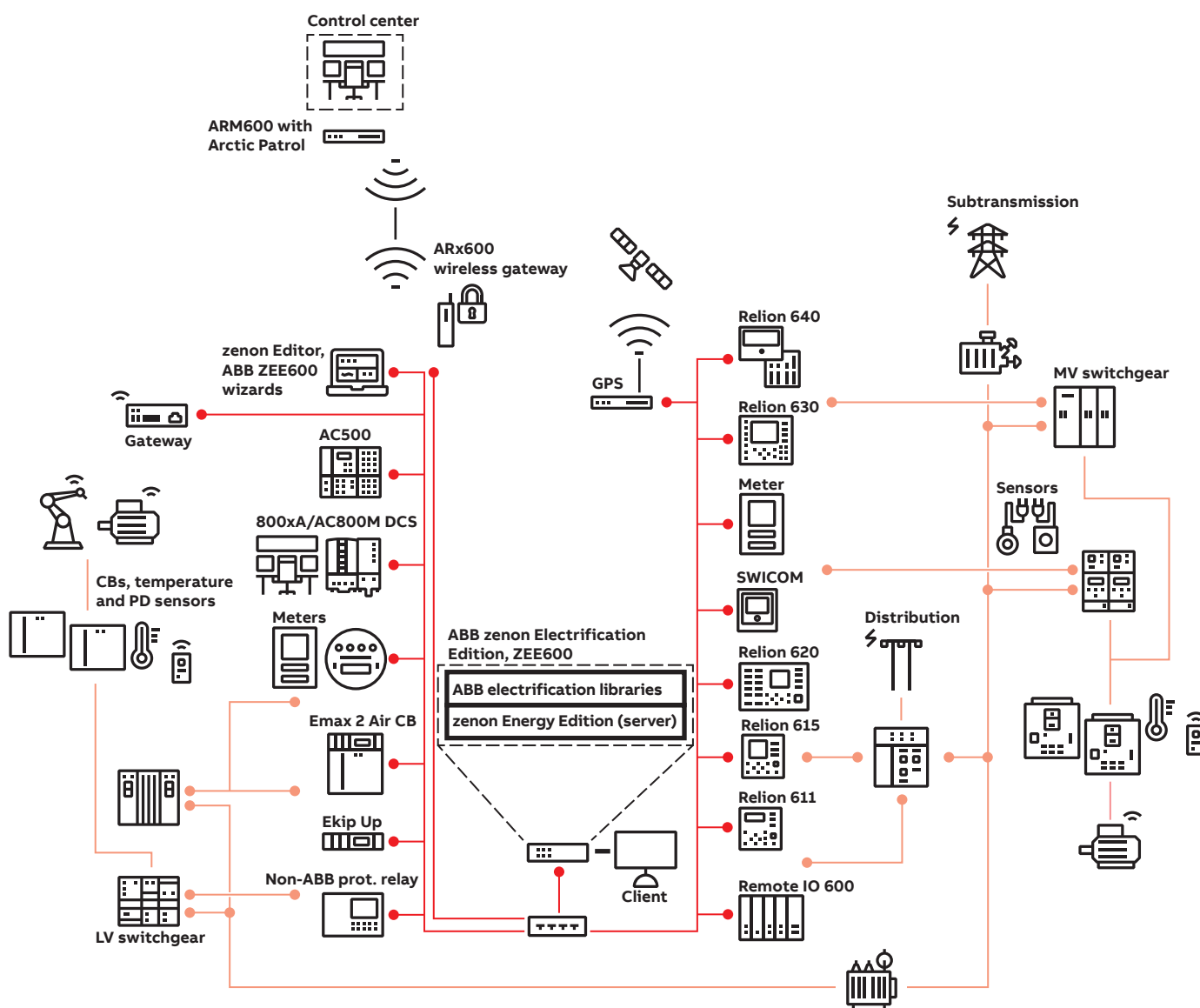


Figure 3. An integrated system with ABB ZEE600 comprising primary and secondary equipment

ABB ZEE600 can be used in several installations. For example, the applicable installation could be a combination of medium- and low-voltage networks spread across single or multiple substations (up to ten) with up to 100 feeders per substation.

ABB ZEE600 can be used as part of a system comprising several medium- and low-voltage ABB and non-ABB devices.

- Protection and control relays (ABB's Relion product family with 611, 615, 620 and 630 series and REX640, Ekip Up

series for monitoring, protection and control, third-party devices or legacy relays)

- PLC and IO devices (AC800M, AC500 or RIO600)
- Intelligent circuit breakers (Emax)
- Multifunction meters (M2M or third party, for example, SATEC)

The application can be based on switchgear or panel installations. The system communication can use Ethernet or serial interfaces and may require connectivity to higher-level systems such as control centers or distributed control systems (DCS) based on ABB and non-ABB systems using IEC protocols such as IEC 60870-5-101/104, DNP3, Modbus or OPC.

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When zenon Runtime is the server or client, the most commonly used communication protocols are IEC 61850 MMS (Edition 1, Edition 2), IEC 60870-5-101, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP or Modbus RTU and DNP3 TCP or DNP3 serial.

Communication with downstream devices can also be initiated from the SoftPLC engine within ABB ZEE600 using the protocols IEC 61850 MMS, IEC 60870-5-101 or IEC 60870-5-104.

As a client or server, zenon Runtime can communicate with other devices or systems based on OPC (DA, UA), DNP3 TCP client, IEC 60870-5-101, IEC 60870-5-104, Modbus TCP or Modbus RTU or SNMP.

Client or server communication can also be initiated from the SoftPLC engine using IEC 61850 GOOSE, IEC 60870-5-101 or IEC 60870-5-104.

ABB ZEE600 supports IEC 62349 parallel redundancy protocol (PRP) to handle and resolve identical communication messages from two separate LAN networks. To adapt to a high-availability seamless ring (HSR) network, an external redundancy box is required.

Additionally, ABB ZEE600 supports a scalable architecture comprising a single server and multiple clients or multiple servers with multiple clients.

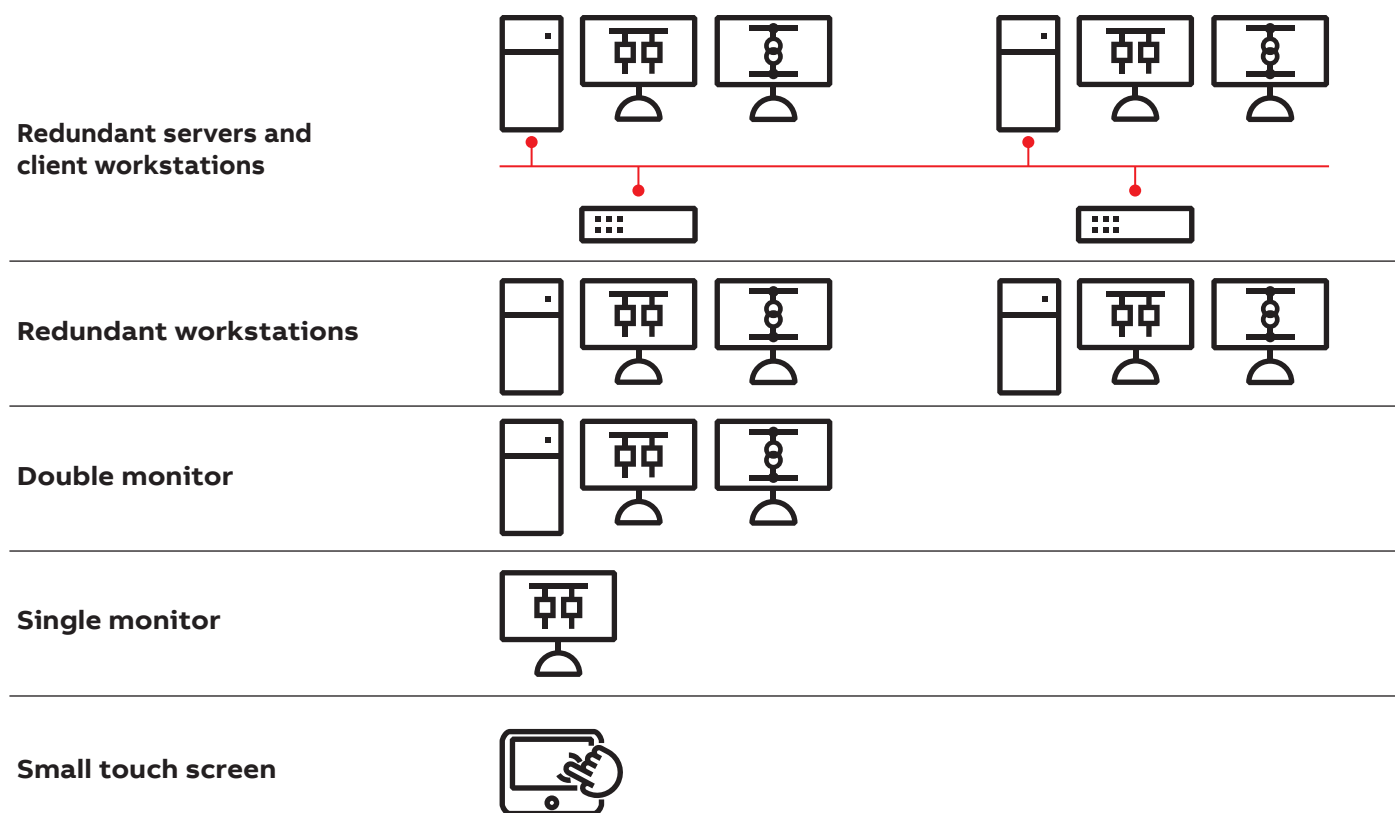


Figure 4. ABB ZEE600 scalable and flexible deployment architecture

4. Process awareness

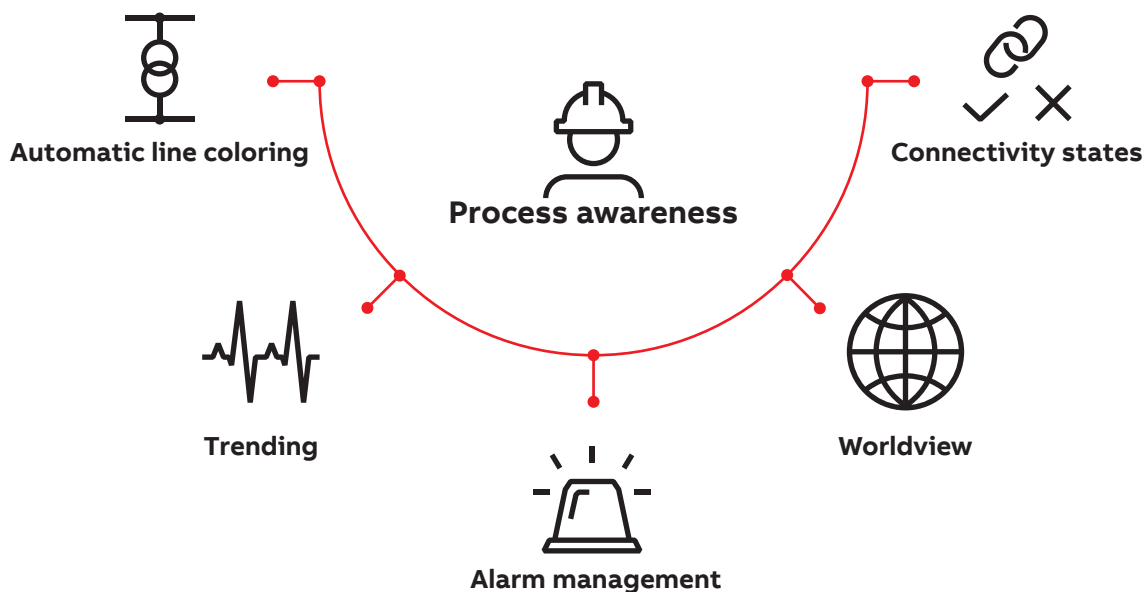


Figure 5. Process awareness with ABB ZEE600

Alarm management

Alarm administration informs the operator of abnormal situations or faults in the electrical power network or equipment, such as limit value violations and protection trips. A sophisticated alarm management is crucial to safe system operations. As alarm management is a native feature in ABB ZEE600, it can be set up quickly and it allows optimum handling and usability while being also fully integrated with ABB ZEE600's redundancy functions.

Alarms can be defined by setting value limits for variables, by using reaction matrices or by influencing the alarm properties.

ABB ZEE600's object-oriented approach ensures that alarms can be configured in a few minutes, even for large projects. The

limit values can be defined at the data variable or data type levels. Defining thresholds prevents a flood of alarms caused by oscillating values. The thresholds can be adjusted even during zenon Runtime and the changes are also recorded in the chronological event list. With a reaction matrix, there are many options to define global alarm conditions and then apply those to different variables.

Alarm areas allow the creation of applications that lead from a summarized alarm indication to the detailed screen of the alarm, thus providing visual alarm guidance. It is also possible to create an aggregated visualization of the number of active alarms, active/acknowledged alarms and inactive/unacknowledged alarms.

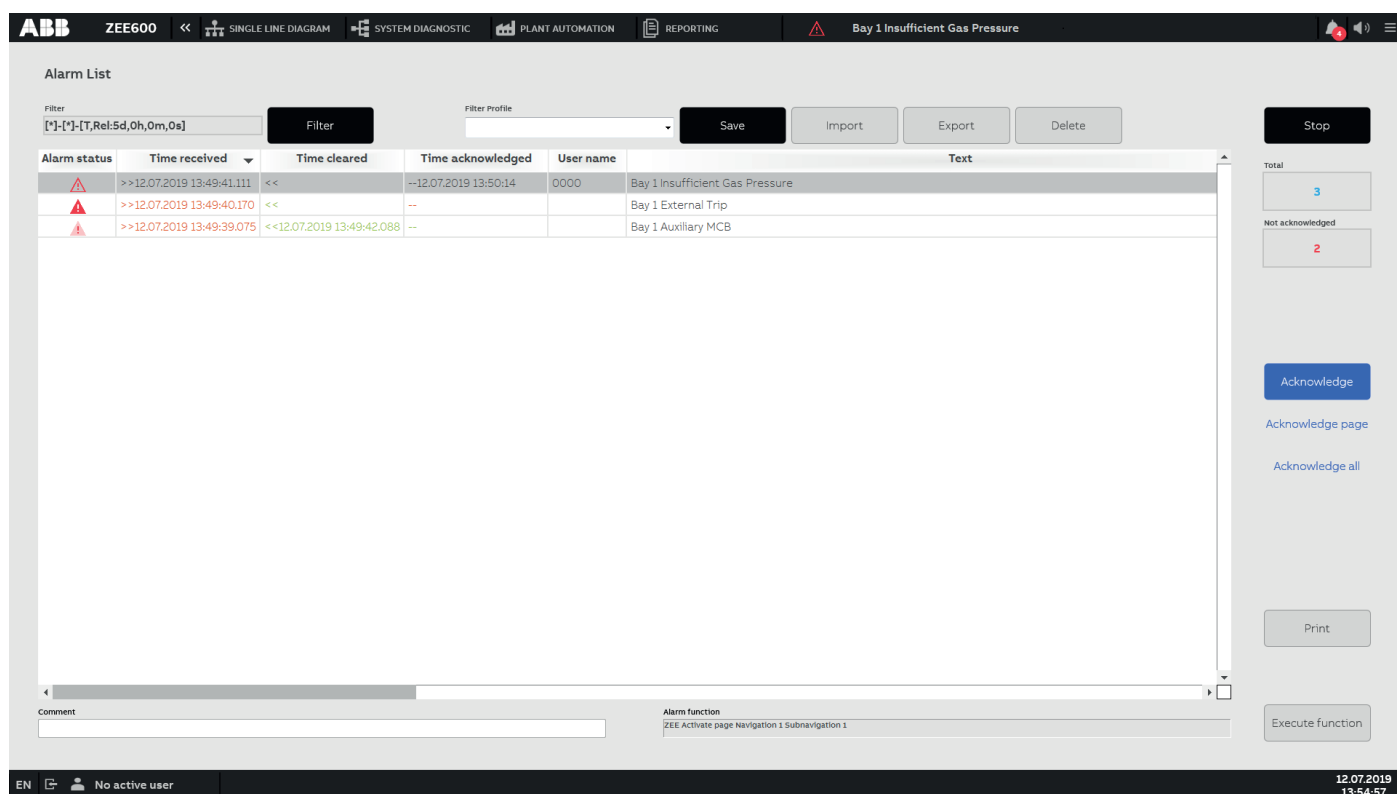


Figure 6. ABB ZEE600 alarm list

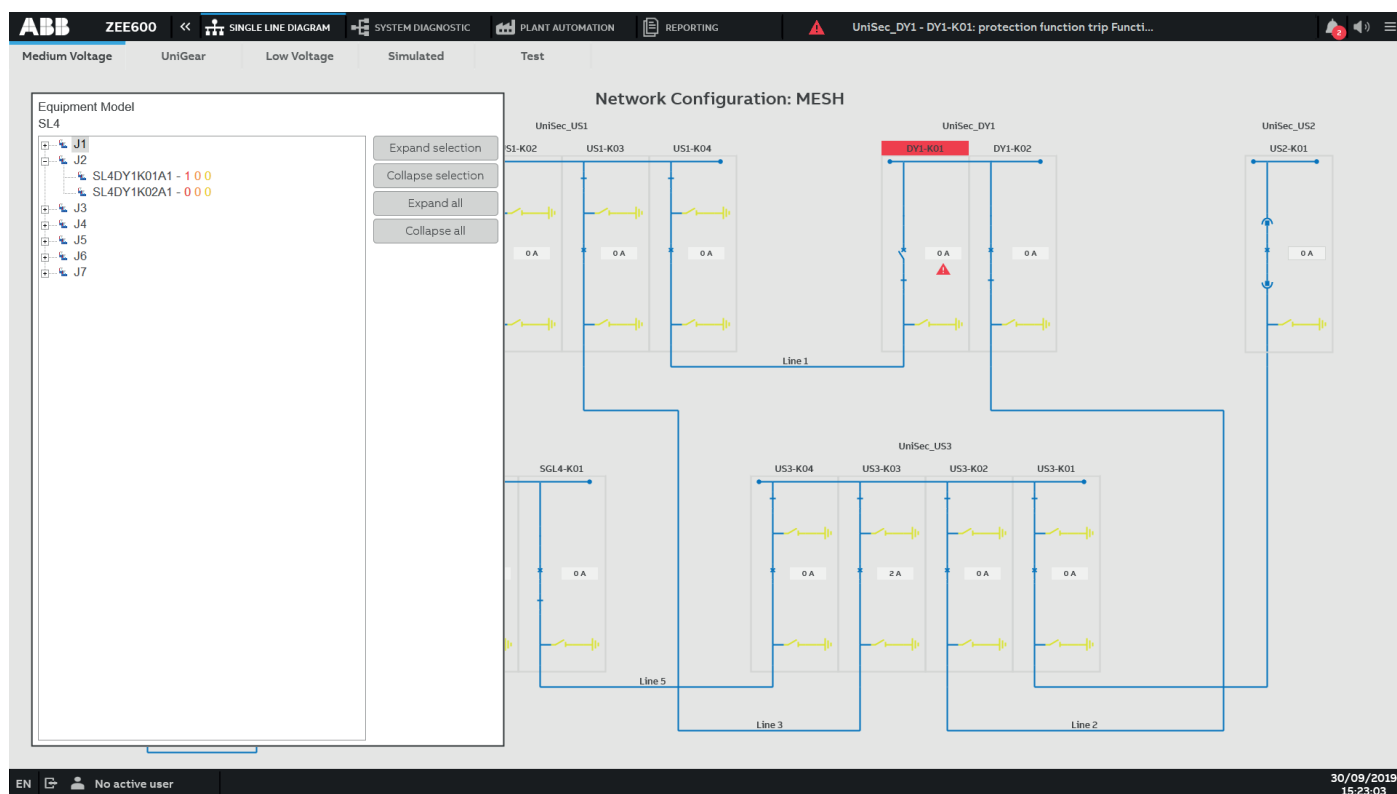


Figure 7. ABB ZEE600 aggregated alarming and equipment modeling

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The ABB ZEE600 equipment modeling recreates the equipment structure in zenon Editor. The upper levels enable details from the lower levels to be classified correctly and to be linked with each other. The lower levels refer to specific equipment and can be compiled for process control and process monitoring. Since the substation object hierarchy is defined according to the IEC 61850 standard and implemented by engineering tools such as PCM600, the ABB ZEE600 equipment modeling feature can be used to configure aggregated alarm handling without the need for alarm areas.

Automatic line coloring

The automatic line coloring or topology coloring feature allows the operator to have an immediate overview of the powered, unpowered, grounded and faulty parts of the electrical network depending on the power status of the lines. This feature increases awareness of critical operations and enables rapid error detection.

Different colors can be selected for representing different voltage levels being connected through a transformer. The statuses of the lines are influenced by the status of the circuit breakers. Undefined or faulty switches cause different line coloring.

The calculated topological model can also be used for command interlocking. The topology engineering is handled when constructing the SLD in zenon Editor.

To allow screen-overlapping models, the entire topology design and configuration are always project-wide. Therefore, a single topological model is defined per project, which is used for the calculation of the circuit breaker or disconnector switch statuses and ultimately for the coloring of the lines and transformers.

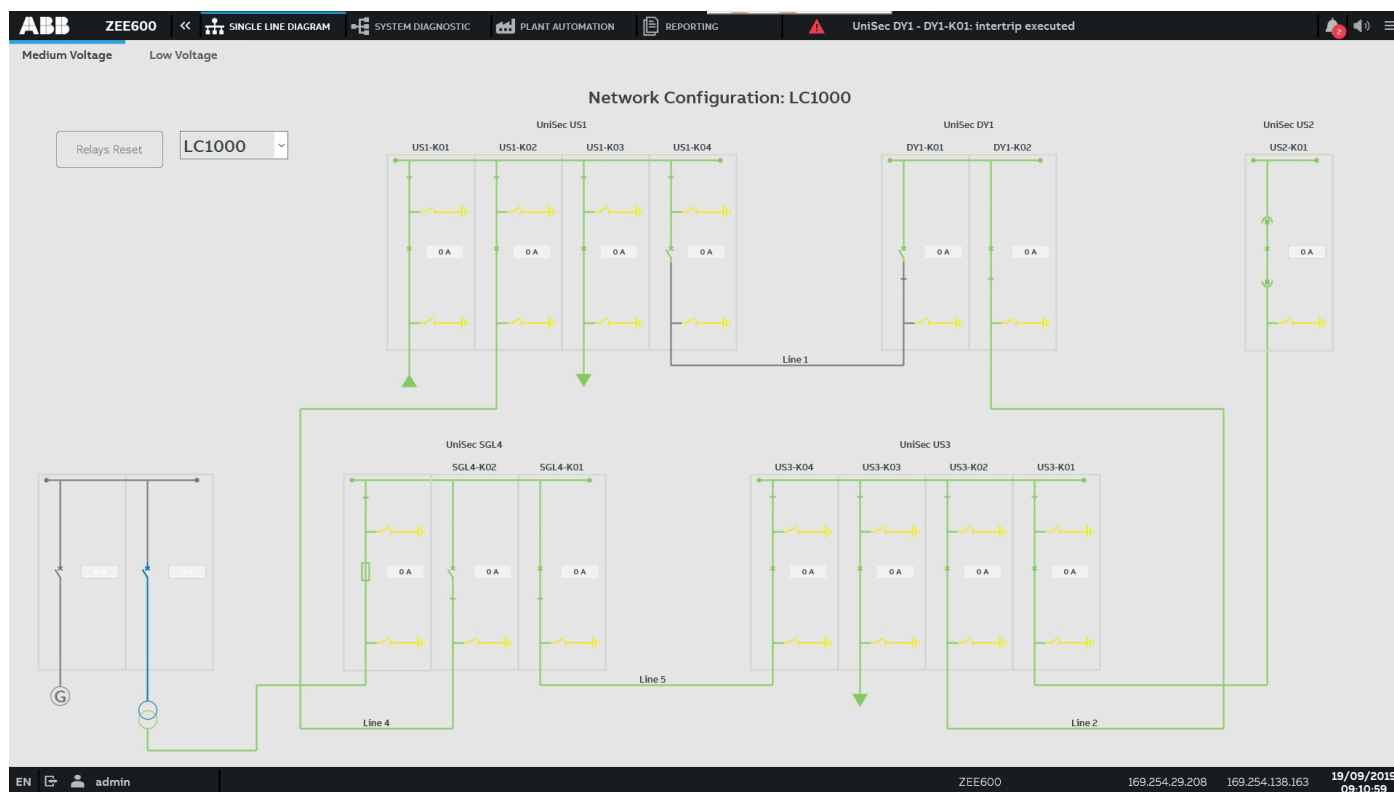


Figure 8. ABB ZEE600 single-line diagram

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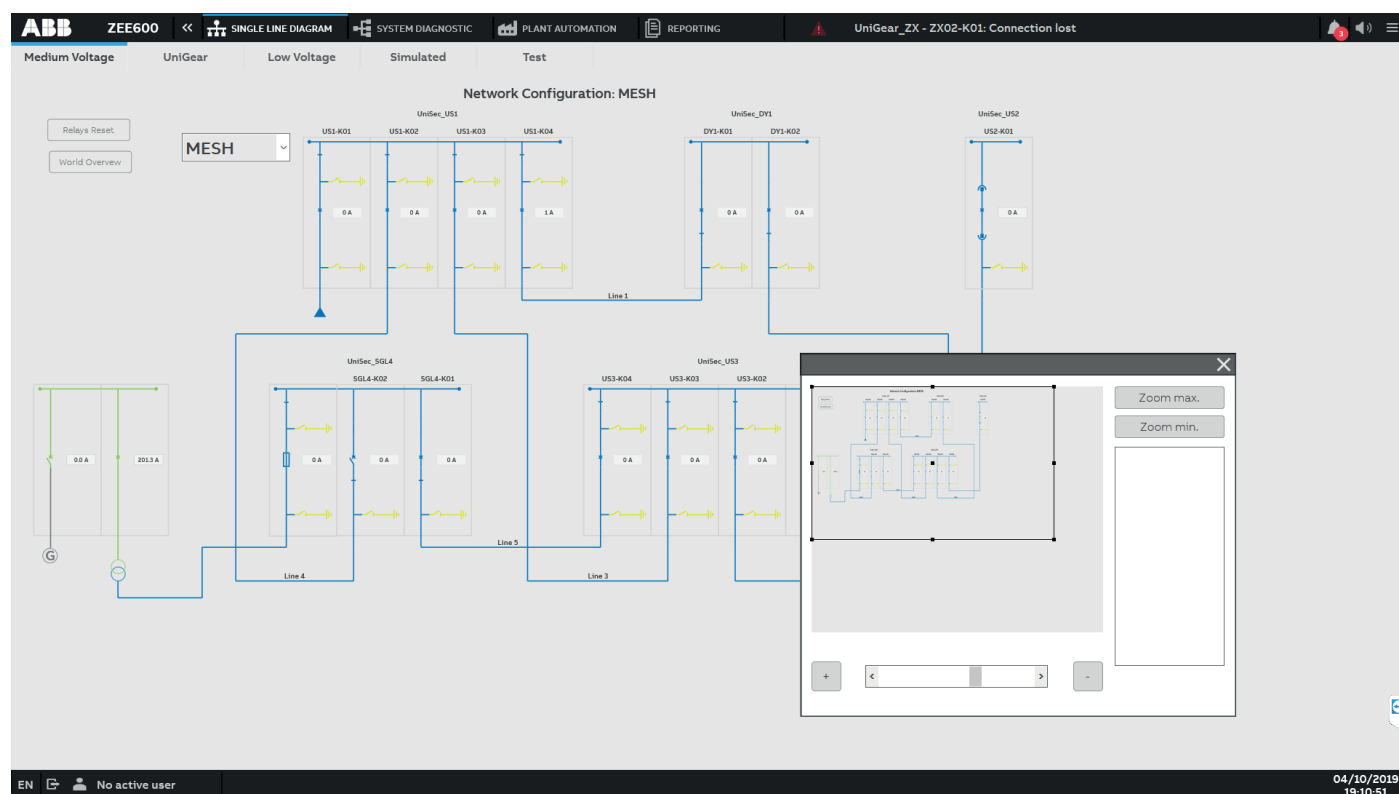


Figure 9. ABB ZEE600 worldview

Worldview

The worldview functionality displays the entire power network including, for example, power sources, switching equipment and cable or line feeders. It is possible to zoom in and out on the power network components at any level of details providing the

operator with system views and insights for an informed decision.

Functions such as zooming, scrolling, panning and decluttering of screen items are natively incorporated and can be activated with a mouse click.

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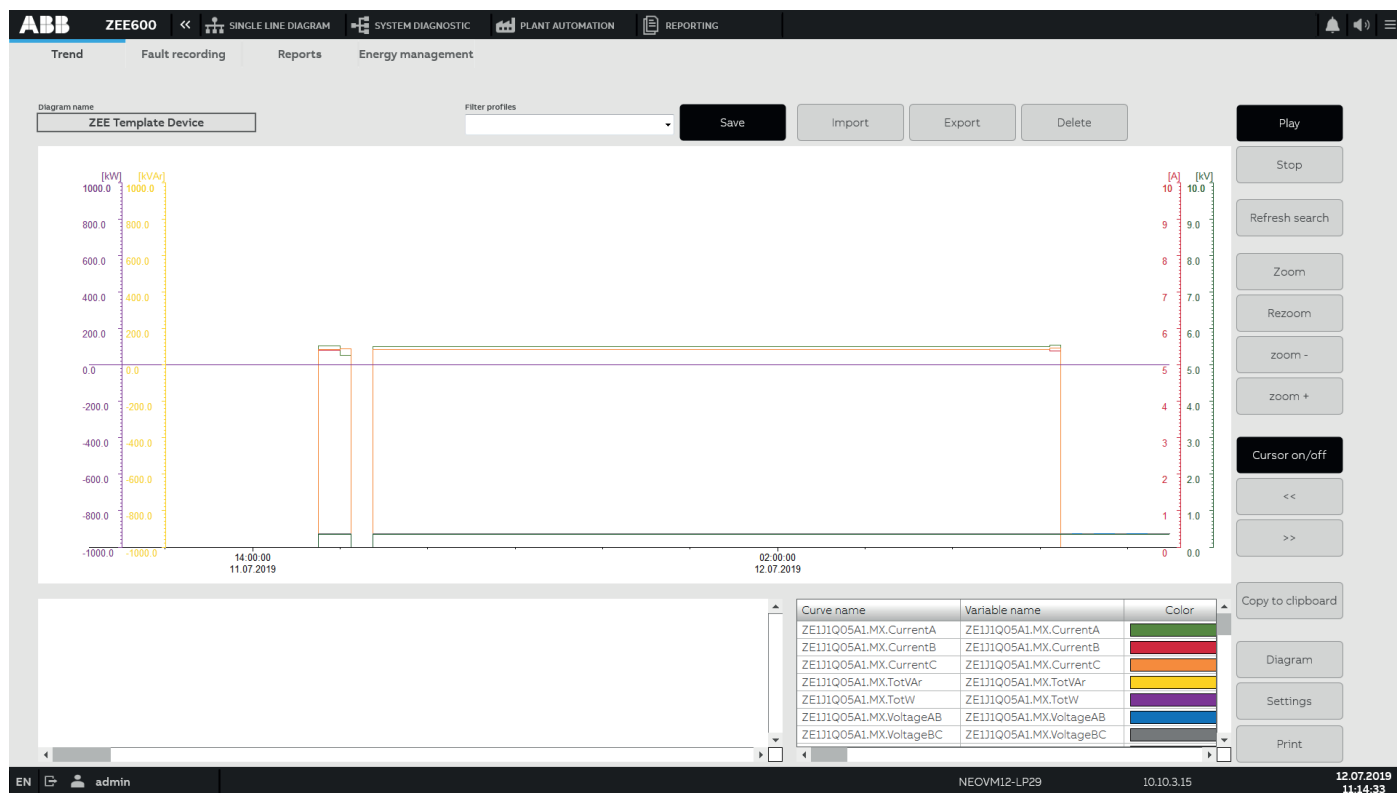


Figure 10. ABB ZEE600 trending

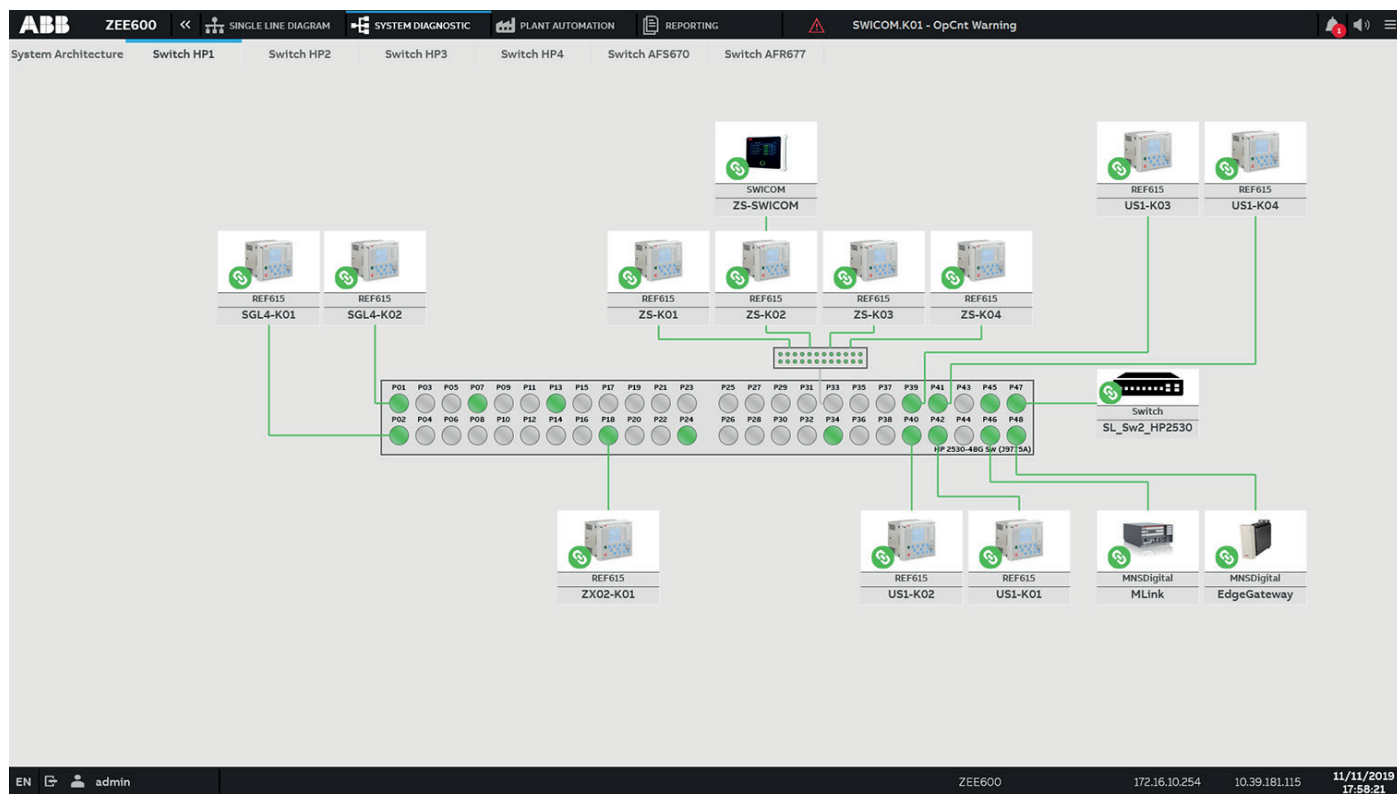


Figure 11. ABB ZEE600 connectivity states

ABB ZEE600**Product version: 1.0****Trending**

Extended Trend is used for representing process variables' online or historical values (from Historian) and calculated process variables in the form of curves. This makes it possible to read historical data at any point in time.

The scrolling feature provides a ruler and zoom function together with a trend analysis. It is also possible to zoom, browse, query and scale online values and values from archives.

Connectivity states

Using SNMP management in the Ethernet switch or the individual protocol's communication status feature, the communication network can be monitored on a real-time basis from ABB ZEE600.

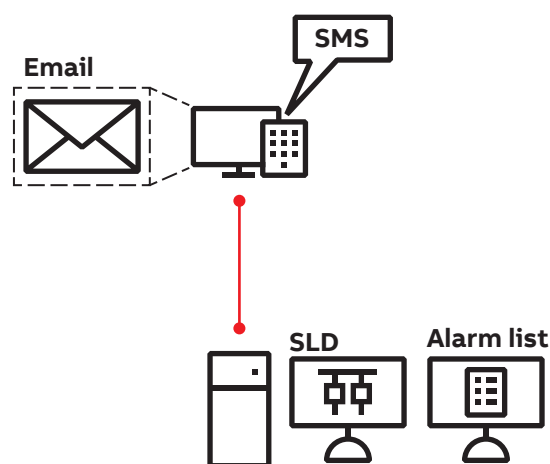


Figure 12. Message control

Message control (optional)

The message control feature ensures that alarms and messages can be automatically sent and acknowledged via email, SMS or voicemail, for example. The message sending is triggered with a function that can be linked to an event. The status of this transmission is logged in the chronological event list.

Message control also enables secure access to current power network data anytime and anywhere making it easier to respond quickly to faults or incidents. For more information, see [Selection and ordering data](#).

zenon Web Server (optional)

zenon Web Server offers another option to access the electrification or substation process or operations and it provides an optimal solution for Web-based desktop clients and mobile devices based on iOS, Android or Windows technologies (Web browsers).

zenon Web Server brings projects to the intranet or Internet. Without any additional engineering, the projects are available for visualization via zenon Web Client or as HTML5 applications for the Web engine. All screens, users, password administration and so on are available online with the same look and feel as well as functionality.

Any project changes made on zenon Web Server are instantly executed in zenon Runtime and available to all users (desktop and mobile or tablet-based Web clients) so that the project team can work on the project from anywhere.

The basic zenon Web Server only acts as a viewer, that is, no operations are possible except for screen switching and logging in or out. Several features are supported.

- Data packet forwarding from the primary server to zenon Web Client via zenon Web Server
- License handling
- Installation on a separate computer (than the project server), such as in a DMZ
- Network encryption
- HTTP tunneling
- Multi-client support, depending on the license

Note that projects that are operated using the web client may have certain limitations. All screen types are not supported with the HTML5 web engine. Functionalities such as command processing and project simulation are not supported using the web client. For more details, see the related documentation.

zenon Web Server Pro has the same functionality as the basic zenon Web Server except that it allows active user actions with zenon Supervisor and zenon Operator. For more information, see [Selection and ordering data](#).

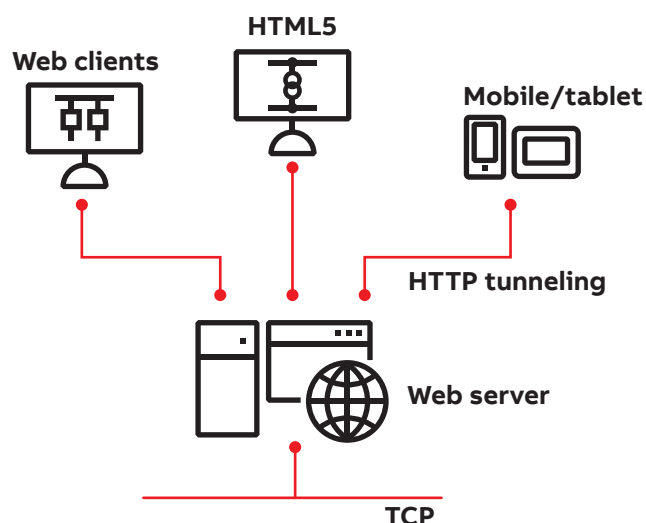


Figure 13. Web access

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5. Process control

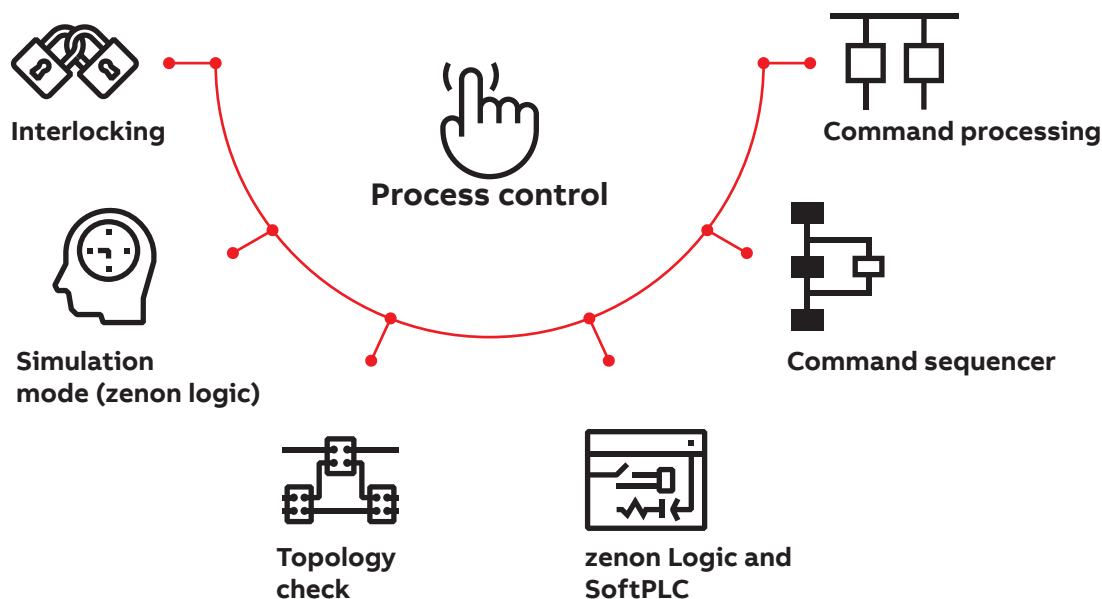


Figure 14. Process control with ABB ZEE600

Command processing

To ensure secure switching operations, ABB ZEE600 supports error-proof command processing (integrating select-before-operate for IEC 61850, DNP3 and IEC 60870), circuit breaker tripping detection, interlocking and switch locking (lockout-tagout).

In addition to single-stage commands, ABB ZEE600 also processes secure commands. A two-stage command as well

as two-hand commands are supported including the protocol-specific features such as select and execute (IEC 60870) or select-before-operate (IEC 61850). The two-hand operation or command requires the use of an additional button for unlocking commands when making safety critical actions. This operation ensures that accidental touches do not result in false switching operations or in value changes.

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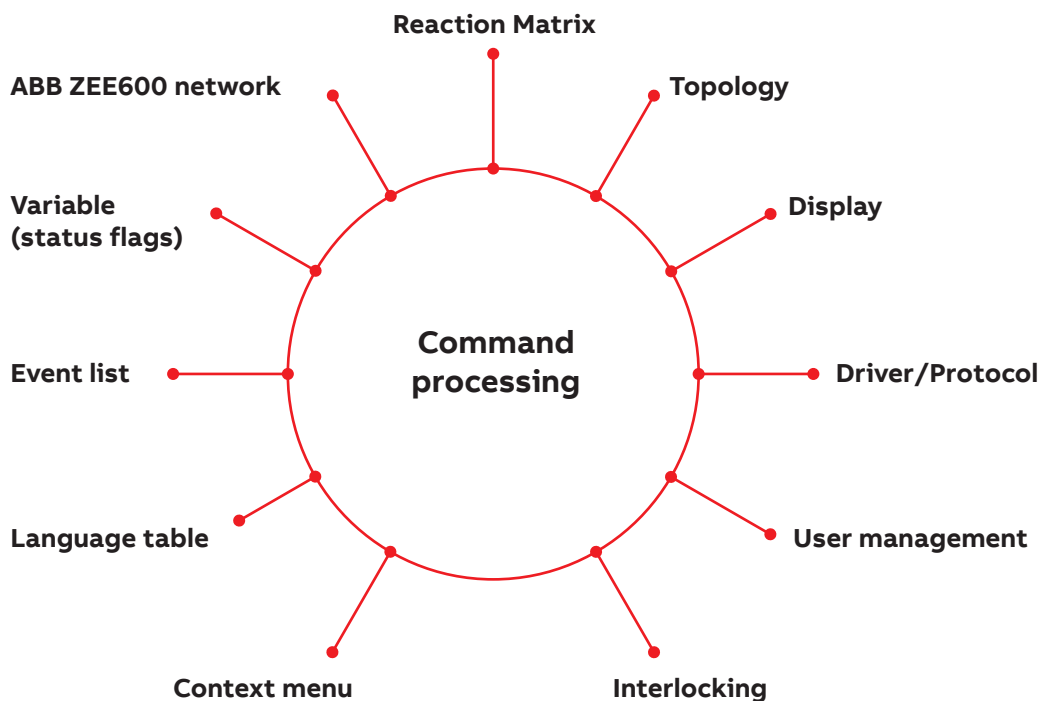


Figure 15. Command processing

Interlocking and topology check

To prevent operations from creating any hazardous conditions to the plant personnel or equipment, ABB ZEE600 allows the definition of interlockings for each command. The interlocking logic can be calculated using the switch status or by considering the topological status of the power network. The command processing function offers additional features such as circuit-breaker tripping detection, switch locking and tag management.

Interlockings control the access to certain zenon objects in zenon Runtime using variables. Operation can be blocked or released depending on the variables. Depending on process statuses, operations can be activated or deactivated. It is also possible to create and use various interlockings within one project. In each interlocking, several parallel interlocking conditions are possible.

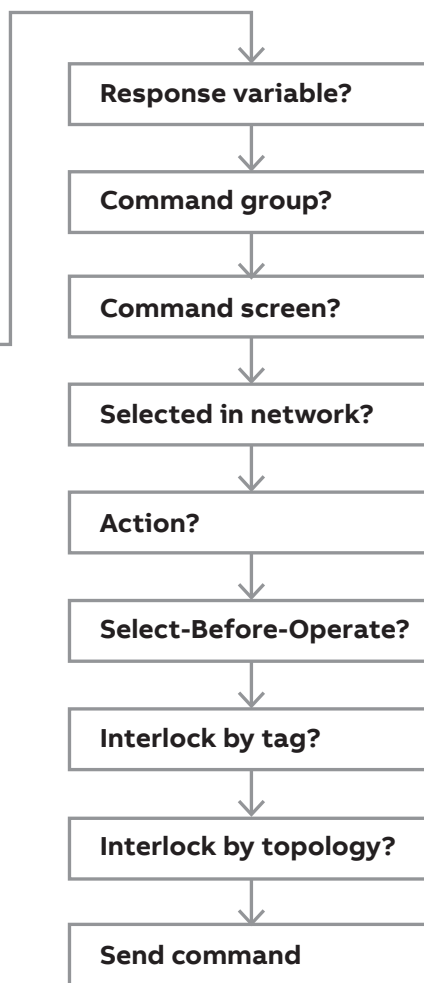
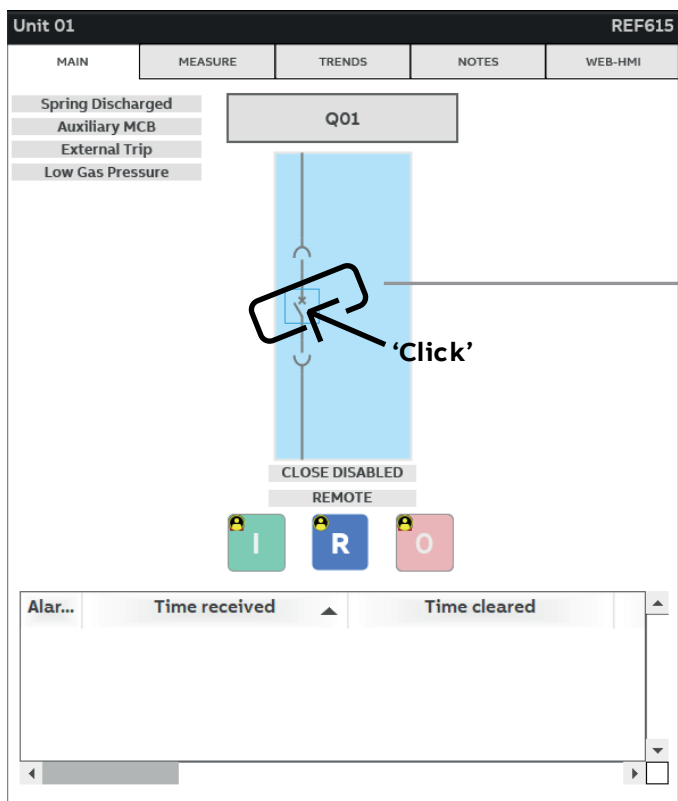


Figure 16. Secure command processing (interlocking and topology check)

zenon Logic and SoftPLC

ABB ZEE600 comes with a built-in IEC 61131-3 programming environment: standard zenon logic (workbench) and associated zenon Runtime (SoftPLC). zenon Editor, zenon Runtime and SoftPLC use a shared database and thereby have a consistent integration. Variables can be generated and maintained in zenon Editor and can be used in zenon logic.

With the zenon logic workbench, SoftPLC can be engineered and programmed in five defined programming languages as specified in the IEC 61131-3 standard.

zenon logic Runtime serves as SoftPLC for executing near-real time or non-real time applications, such as interlock checks or calculations, and communicating the calculated data with protection relays, IO devices and external systems using protocols such as IEC 61850 GOOSE and IEC 60870-5-101/104.

Visualization ↔ SoftPLC (IEC 61131-3 Runtime)

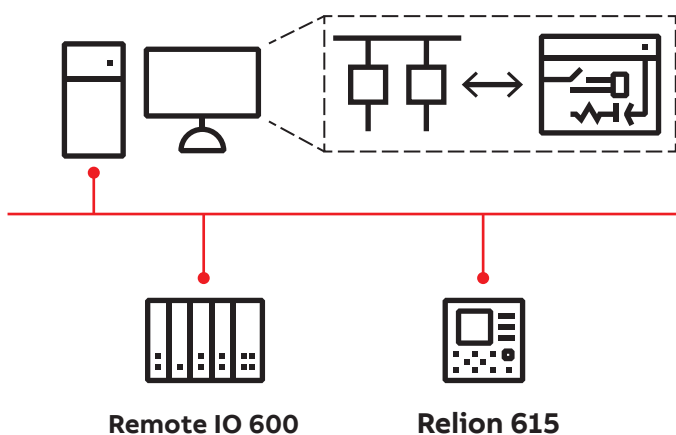


Figure 17. ABB ZEE600 SoftPLC

When working together with ABB ZEE600 process visualization, monitoring and control (HMI), the same variables

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associated with the main communication drivers are also used for zenon logic. This not only helps to prevent errors but also speeds and simplifies engineering and maintenance.

Note that although SoftPLC can work in a standalone mode (independent of ABB ZEE600 HMI/ECS main application) acquiring and delivering its data directly using its own native/direct drivers in real-time and supporting operational redundancy, it is recommended that for critical real-time applications, such as automatic bus transfer or sequence operations, the logic be implemented using protection relays or a dedicated PLC in electrification and substation solutions in projects deploying ABB ZEE600.

Simulation using zenon logic

All variables can be displayed and their values can be simulated on the screen even before they are connected to the process. Therefore, the test operations can be initiated without setting up the entire automation system.

When an operator or system engineer wants to test the power network behavior due to a change in the status of a switch (circuit breaker or disconnecter), they can take a process image and run a workstation in simulation mode enabling the handling of all switches without affecting the real process.

The simulation results can be seen by the coloring of the lines using the topological model calculation in the background. Additionally, it is possible to design a training simulator with a workstation.

To eliminate errors and risks, zenon logic can be used for simulation testing emulating SoftPLC Runtime before deployment in the field and in the process.

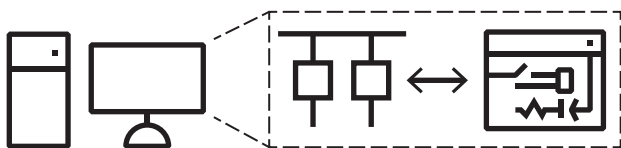
Visualization ↔ zenon logic (IEC 61131-3 Runtime)

Figure 18. ABB ZEE600 simulation based on zenon logic

The process behavior is defined by using zenon logic. The command sequences can be run in the simulation mode, the sequence can be recorded by performing the switching commands using the SLD and the results can be verified. After testing, the sequences can be passed on to the workstations for active use.

Command Sequencer (optional)

ABB ZEE600 offers a Command Sequencer tool for user-friendly command processing in a substation. The substation's operational command sequences can be configured, edited, tested and executed using a graphical editor where the steps of a command sequence can be arranged consecutively without the need of SoftPLC programming. Even complex sequences with parallel executions or conditional actions can be arranged by dragging the objects in zenon Editor. Visualization of these sequences and, if needed, user interventions are also supported. All common protocols, such as IEC 61850, DNP3 or Modbus, are supported for communication with the protection relays.

This functionality automates the command processing and helps to save time and costs, avoid errors, improve efficiency and flexibility. For more information, see [Selection and ordering data](#).

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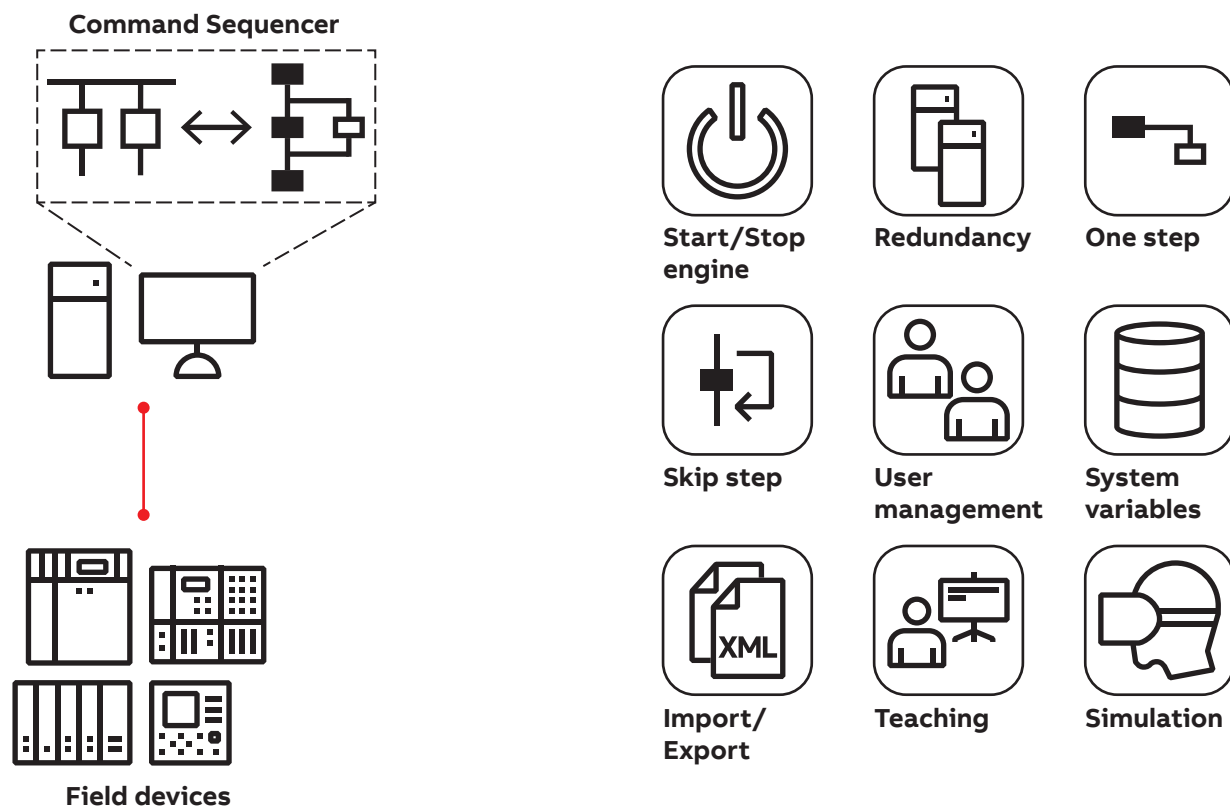


Figure 19. ABB ZEE600 Command Sequencer

Load management (optional)

This functionality is meant for energy supply management in small and medium-sized utility, industrial or infrastructure segments, whose energy supply is based on special contracts for power consumption.

This module provides support in two cases.

- Short-term forecast to avoid load peaks and automate load shedding through downstream devices such as Relion PML630 and Relion protection relays
- Optimization of energy consumption in a billing period

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6. Process monitoring

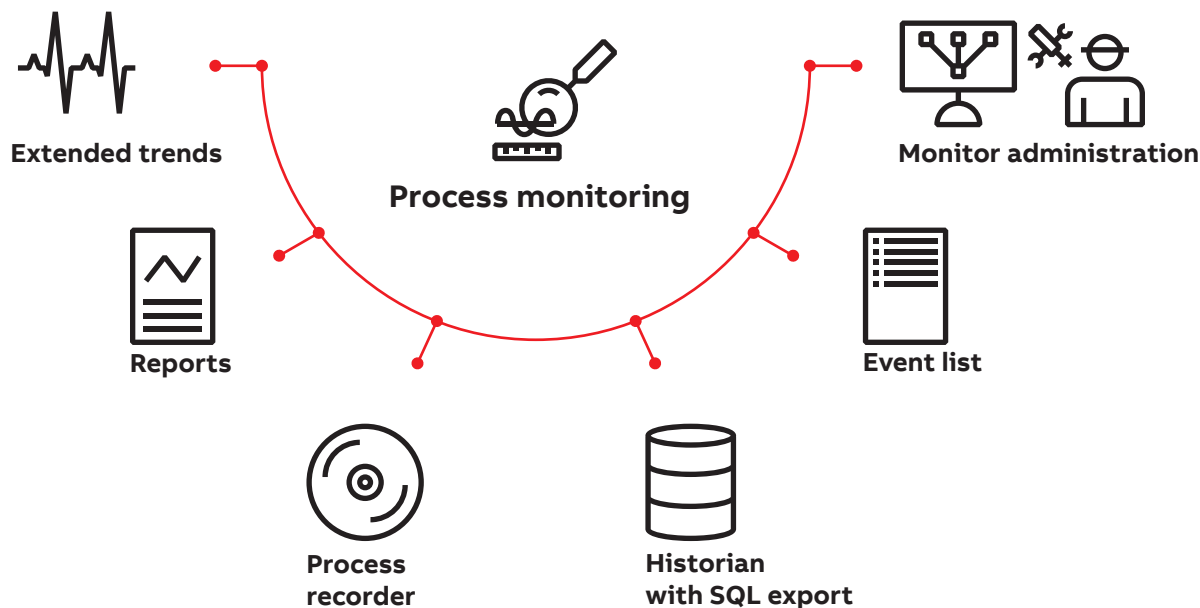


Figure 20. Process monitoring with ABB ZEE600

Event list

The chronological event list keeps an automatic and chronological account of all operations and displays all process, system and predefined messages. Both system events and user inputs can be logged in the chronological event list.

- alarm acknowledgment
- alarm deletion
- setting values
- data archival
- user or network actions and so on

All entries are made in the language in which zenon Runtime is executed. The event list display can be adapted or filtered for contextual (for example, bay or substation level) analysis and reports without additional programming.

The event list audit trail benefits from full redundancy compatibility and simple administration. The event list is stored in the system in a binary format to prevent content tampering. Further, the operator can add comments on the list entries for efficient traceability.

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Time received	Text	Variable name	Value	Meas...	User - full name	Comme
26.06.2019 11:34:24.364	Tag name: Bay 14 Status: Breaker closed	DEMO Device Configura...	1			
26.06.2019 12:59:32.991	System was stopped				SYSTEM	
28.06.2019 11:35:42.856	Scan frequency variable does not exists. DisturbanceRecordsScanFrequency				SYSTEM	
28.06.2019 11:35:43.228	AddIn ZEE_ IpAddressProvider started				SYSTEM	
28.06.2019 11:35:43.815	System was started				SYSTEM	
28.06.2019 11:35:44.799	Tag name: Bay 6 Status: Breaker closed	DEMO Device Configura...	1			
28.06.2019 11:35:44.799	Tag name: Bay 14 Status: Breaker closed	DEMO Device Configura...	1			
28.06.2019 14:37:26.454	Tag name: ZE111Q05A1 Status: Connection lost	ZE111Q05A1.Connectio...	8			
28.06.2019 14:37:32.270	Tag name: ZE111Q05A1 Status: Connection established	ZE111Q05A1.Connectio...	65538			
28.06.2019 15:21:45.433	System was stopped				SYSTEM	
12.07.2019 11:36:59.604	AddIn ZEE_ IpAddressProvider started				SYSTEM	
12.07.2019 11:37:00.411	Scan frequency variable does not exists. DisturbanceRecordsScanFrequency				SYSTEM	
12.07.2019 11:37:10.484	System was started				SYSTEM	
12.07.2019 11:37:11.143	Tag name: Bay 6 Status: Breaker closed	DEMO Device Configura...	1			
12.07.2019 11:37:11.143	Tag name: Bay 14 Status: Breaker closed	DEMO Device Configura...	1			
12.07.2019 11:44:39.216	System was stopped				SYSTEM	
12.07.2019 11:45:09.105	AddIn ZEE_ IpAddressProvider started				SYSTEM	
12.07.2019 11:45:09.902	Scan frequency variable does not exists. DisturbanceRecordsScanFrequency				SYSTEM	
12.07.2019 11:45:19.682	System was started				SYSTEM	
12.07.2019 11:45:20.801	Tag name: Bay 6 Status: Breaker closed	DEMO Device Configura...	1			
12.07.2019 11:45:20.803	Tag name: Bay 14 Status: Breaker closed	DEMO Device Configura...	1			
12.07.2019 13:49:39.075	Bay 1 Auxiliary MCB	EPDS DEMO Auxiliary M...	1			
12.07.2019 13:49:40.170	Bay 1 External Trip	EPDS DEMO External Trip	1			
12.07.2019 13:49:41.111	Bay 1 Insufficient Gas Pressure	EPDS DEMO Insuffic...	1			

Figure 21. ABB ZEE600 chronological event list

Historian with SQL export

Historian enables quick and easy archive engineering. It saves process data and supports archived data export. Therefore, data is available for subsequent processing and evaluation even externally to ABB ZEE600.

Historian has several features.

- Cascaded data aggregation
- Lot recording
- RDA archiving
- SQL evacuation
- User-defined start and stop of recording
- Function execution when starting and closing the archive
- Automatic data evacuation
- Automatic creation of substitute archives
- Data export via a function (for example, to XML)
- Manual revision of archive data

Historian allows easy data storage within a short time including up to several thousand changes per second. Three archiving or recording methods are available: cyclic, event-triggered or on-change data logging.

Process data is recorded on a lasting basis and archived without any numerical limitation. An archive can contain any

number of type-independent variables: binary variables, numerical variables or string variables. Each set of archived data has its value, status and time stamp in milliseconds through real-time data acquisition (RDA).

The archive files are saved in binary data format (ARX) to enable easy synchronization with redundant systems and to facilitate easy administration while preventing external manipulation of data. The data can be sorted at any time and exported into any other format for analysis such as CSV, dBase, XML or in an SQL database. When saving into an SQL database, the data is stored in clear text and is still readable from zenon Runtime.

The saving cycles for the created archives are user-defined. To prevent an archive from becoming very large, aggregated archives can also be created. The number of archive files that can be stored is limited to 65535. For example, for a storage duration of 5 hours (300 minutes) with a cycle of 15 minutes, 20 archive files can be stored.

Evacuation of the archived files can also be configured. The storage duration can be defined in hours, days, months or years. The archived data can be evaluated and further processed with Extended Trend, Report Generator or Report Viewer.

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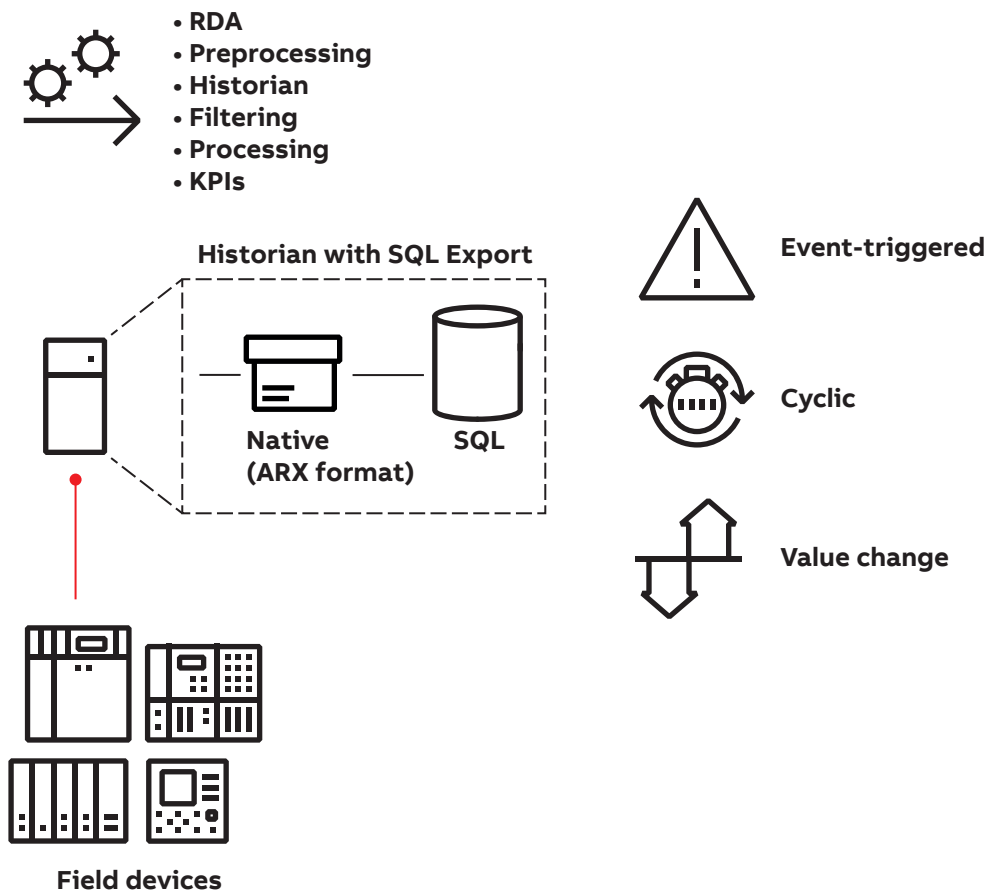


Figure 22. ABB ZEE600 SQL interface and export

ABB ZEE600

Product version: 1.0

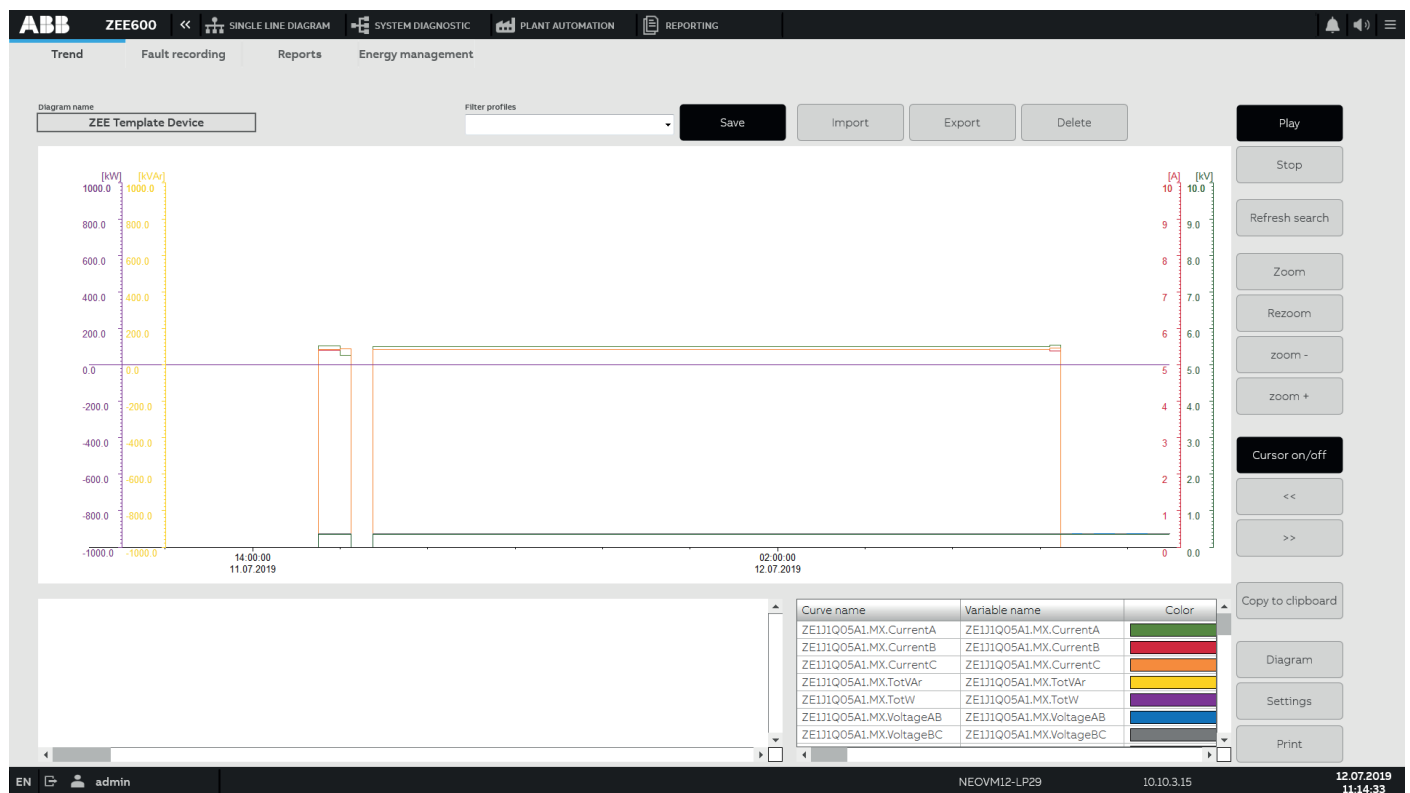


Figure 23. ABB ZEE600 extended trends

Extended trends

With extended trends, the electrification process data can be compared and analyzed in detail.

- Free curve settings
- Linear or logarithmic display
- Free zooming and scrolling
- Transparency levels for curve filling
- Configurable axes
- Grid display
- Interpolated display
- Surface display also for non-equidistant values

Extended Trend is used for the representation of online and archived values of process variables and derived process variables in the form of curves. It makes it possible to re-read historic data. Trends can be copied as a vector graphic and printed locally or in the network.

Reports

ABB ZEE600's integrated reporting functionality serves as documentation, evaluation and presentation (chart or tables) forms of the RDA process and archived data. The reporting feature offers various reporting options from simple KPIs and dashboards to complex calculations using archived data without the need of any additional software.

- Full graphical reporting based on Microsoft reporting technology and Report Definition Language (RDL) files
- Simple report displays and flexible usage
- Individual reports with graphic alarm statistics
- Real-time production analyses or KPIs
- Automatic reporting with individually compiled KPIs
- Reporting directly in zenon Runtime

The reporting functionality is implemented by Report Generator and Report Viewer. Report Generator documents, evaluates and presents process data based on the RDA process and archived data. It works on a cell-orientated (spreadsheet) basis where each cell can be assigned certain functions and formats. Report Viewer can be used to display RDL reports of archive, alarm message list and chronological event list data as well as online values. Two historical time ranges can be compared using two configurable time ranges.

With extended trends and the reporting feature, a relationship can be established between energy usage data and production output. When used in conjunction with energy tariffs, it is possible to analyze the data against KPIs such as energy costs per unit produced.

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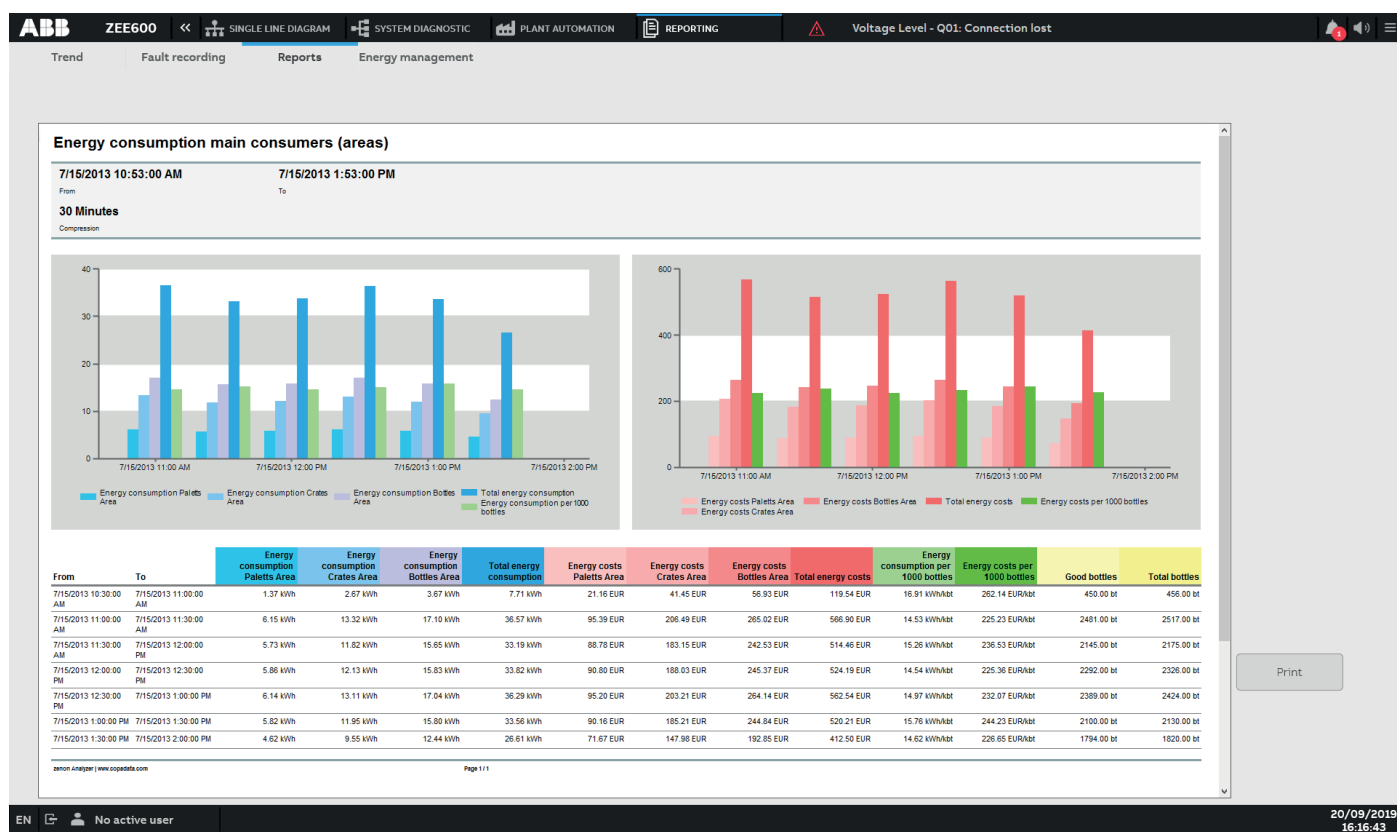


Figure 24. ABB ZEE600 reports

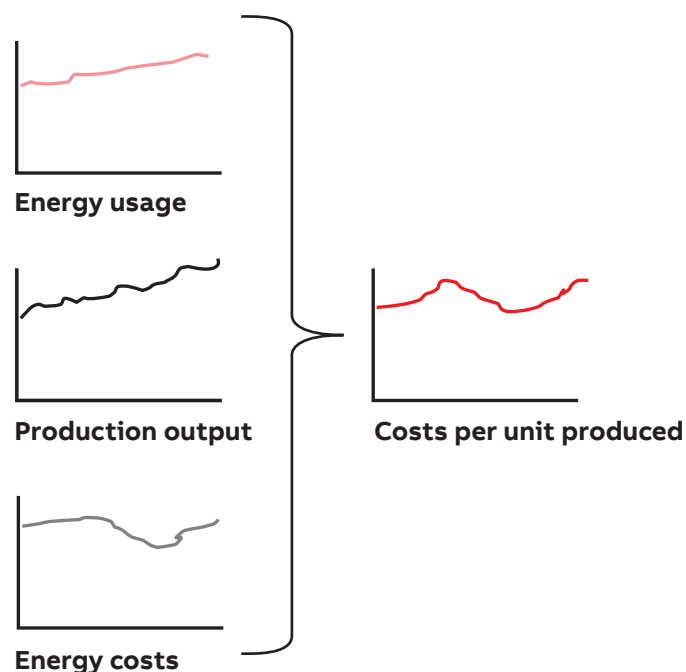


Figure 25. ABB ZEE600 reports coverage

Process recorder (optional)

The process recorder functionality offers the possibility to continuously record process data during productive zenon Runtime. The recorded data can be played back using a project simulation client to visualize and analyze the errors that may have occurred in the past. The time and time period of this playback can be configured.

Process recorder uses reporting and Historian. Recording is carried out in the event of value changes, limit violations and so on. The process recorder feature can be used together with the disturbance recorder files from multiple protection relays to study the power network's behavior after a fault condition and to perform a comprehensive post-fault analysis.

When combined with the alarm message list and the chronological event list, the process recorder increases the users' visibility and decreases the response time to errors. The process recorder functionality can also be used for training and simulation. It also supports redundancy configuration. For more information, see [Selection and ordering data](#).

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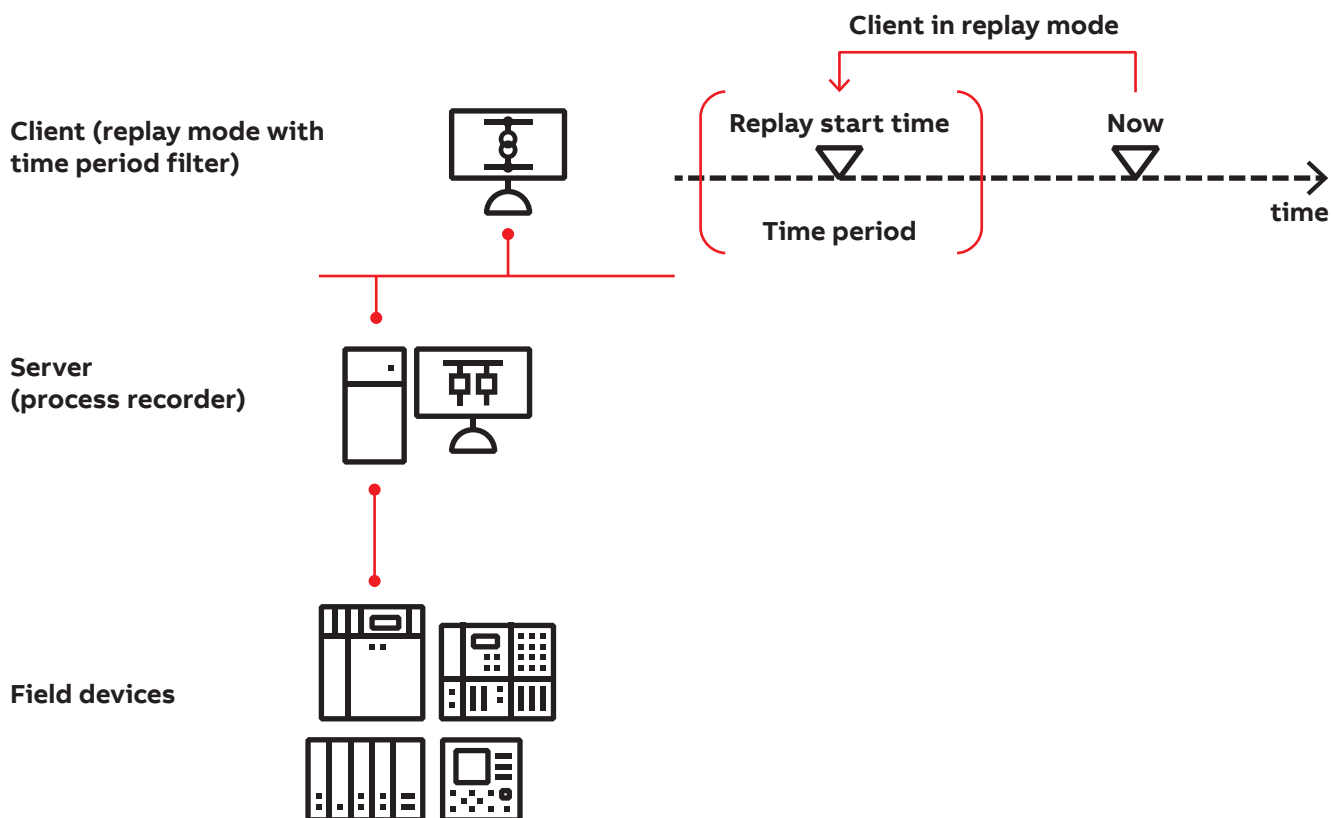


Figure 26. ABB ZEE600 process recorder

Monitor administration

Projects for single or multiple monitors can be easily configured with the monitor administration feature. The project screens can be allocated to match multiple monitors. Also, multi-monitor projects can be displayed on a single-monitor system without additional engineering. Monitor administration is configured and administered separately in zenon Editor for each project.

Monitor administration has three tasks.

- Mixed operation of single-monitor and multi-monitor systems. For example, in a project with three monitors, two can be used as clients in the substation control room and the third as the client on a maintenance engineer's laptop computer.
- Free assignment of a screen output on any monitor and changing of the assignment of a screen to a monitor in zenon Runtime.
- Resolution adjustment by inclusion of computers with different resolutions in one project.

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7. Secure access and operation

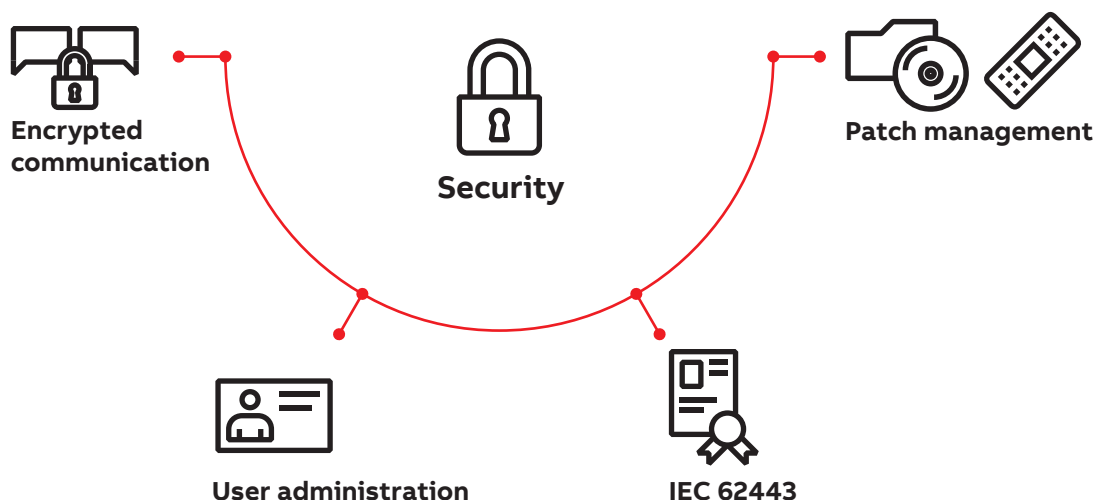


Figure 27. Operational security with ABB ZEE600

User administration

The role-based user administration feature protects against cybersecurity threats. Up to 128 different access levels can be defined in zenon Editor and zenon Runtime in Active Directory (optional) without any limit on the number of users. The access levels can be defined for each user depending on the role requirements. Changes to zenon Runtime can be synchronized with zenon Editor remotely in real time.

Different users have different operating rights (authorization levels and function authorizations) and the rights are issued regardless of user types (normal user, power user and administrator). Only an administrator can create new users, unblock users, or deactivate users.

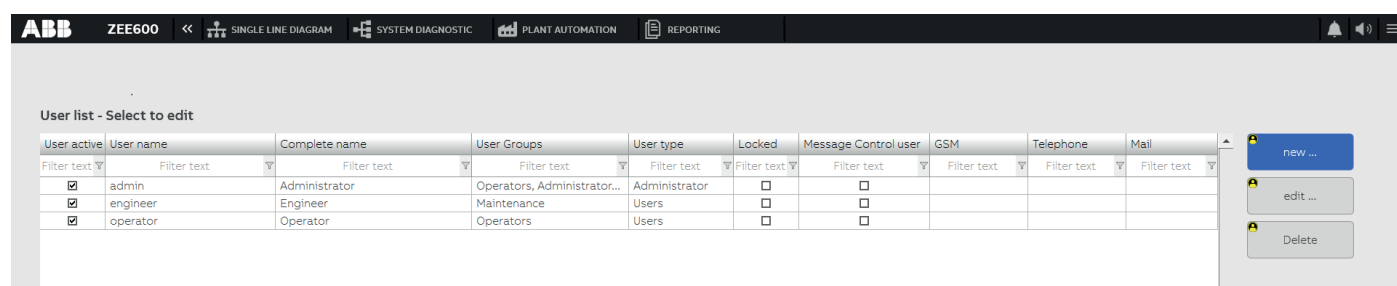


Figure 28. ABB ZEE600 user administration

Built-in security features

The core of ABB ZEE600 is developed in line with the IEC 62443 standard for Industrial Network and System Security. Windows OS compatibility testing and certification is a continuing process and consequently, ABB ZEE600 also complies with all the latest Microsoft® security standards such as the Active Directory services.

Combined with sophisticated security settings, ABB ZEE600 projects are protected from data loss or unauthorized access. Additionally, ABB ZEE600 is a compiled system, meaning only a few binary files reside on the panel or with zenon Runtime, so a

zenon Runtime database is not needed. Therefore, it is almost impossible to tamper with any of the zenon files.

Other security measures include configurable communication ports and a 128-bit encryption for network communication.

zenon Editor also comes with file signatures and a seamless change history, which enables complete documentation of the engineering phase. All changes to the project such as a change, deletion, creation and so on can be logged.

Because ABB ZEE600 can be connected to an enterprise system or IT infrastructure, cybersecurity threats need to be

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handled in a proactive manner. This implies that security gaps need to be detected and closed without impacting the electrification or substation operations.

Additionally, zenon Web Server supports HTTP tunneling and network encryption between itself and Web clients.

Patch management feature ensures that updates to the zenon core system can be done without a server system shutdown. It only needs a restart of zenon Runtime.

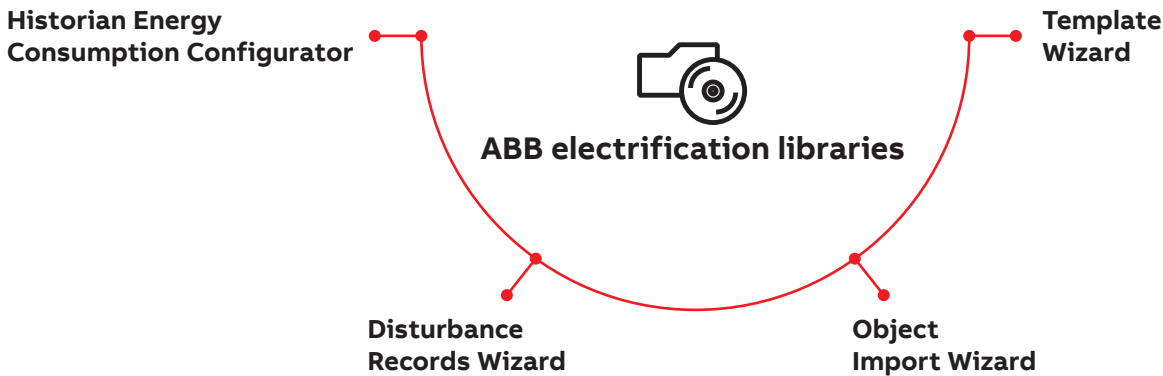
8. ABB electrification libraries

Figure 29. ABB electrification libraries

The ABB electrification libraries are built over the zenon Energy Edition to adapt it closely to the ABB standards. These adaptations influence ABB ZEE600 engineering and operational aspects.

Engineering using ABB ZEE600 wizards

As a part of the ABB ZEE600 setup wizard installation, four wizards are installed to increase engineering efficiency.

- ABB ZEE600 Template Wizard
- ABB ZEE600 Object Import Wizard
- ABB ZEE600 Historian Energy Consumption Configurator
- ABB ZEE600 Disturbance Records Wizard

With ABB ZEE600 Template Wizard all necessary settings are made to an empty project and all necessary elements are imported to create an ABB ZEE600-compatible project within zenon Editor. Template Wizard influences the selected project (and sub-libraries or packages, if applicable), language setting (CN, RU, PT, FR, IT, EN, DE), definition of number of SLDs, system diagnostic and plant automation pages (maximum 12 for each category) as well as customer logo and information.

Object Import Wizard is used to import devices which are supported by the ABB ZEE600 library (Relion RE_611, Relion RE_615, Relion RE_620, Relion RE_630, Relion REX640, Emax2 and the M2M meter). Except for the M2M device type (Modbus communication), all other device types are based on IEC 61850 communication.

Object Import Wizard is designed to maximize automation of engineering steps for IEC 61850 devices. For each system configuration (SCD), it is possible to select the device instance and type, the RCB data to be brought into the (ABB ZEE600) IEC 61850 client, object control enabling. It is also possible to make bay or feeder type and voltage level definitions, communication definitions, measurement window selection, alarm and event treatment and appearance settings, and define bay dialog box alarms, trends and measurement limits.

The selections can be stored as a template and reused for other instances of the same device type. Only a few steps, such as a new device name, bay description and communication settings, need to be defined for each new device. Once a device configuration is completed, all HMI engineering steps for that bay or feeder are completed automatically: driver settings (including RCBs), variable creation, equipment model configuration, Historian trends, functions for switching and set point command operations linked to bay displays, bay symbols and SLD, and switchboard wide SLD creation including automatic line coloring (ALC) configuration.

Historian Energy Consumption Configurator Wizard can be used to fill an existing archive with the energy consumption values of up to 100 devices with up to four measuring points per device.

Disturbance record files from the protection relays are automatically downloaded during the runtime of the visualization if this has been enabled by Disturbance Records

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Wizard in the specific project settings. The files can then be loaded into COMTRADE Viewer.

Operations using ABB ZEE600

The use and feel of zenon Energy Edition is completely transformed in accordance with ABB's latest user interface and experience guidelines.

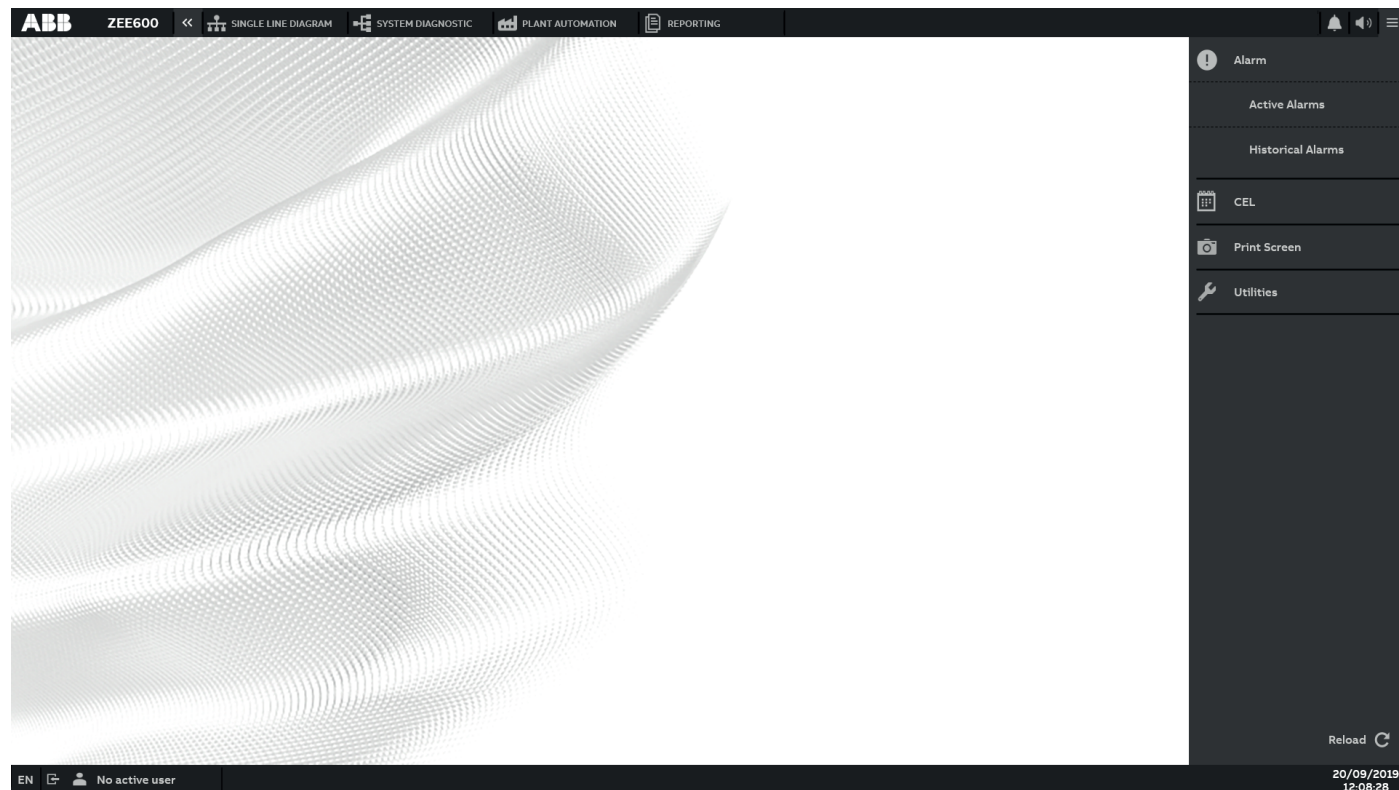


Figure 30. ABB ZEE600 libraries: operation screen overview

The main screen comprises the navigation bar, the vertical menu, the content window in which content is displayed based on the selections made on the navigation bar, and the task bar. The navigation bar offers access to the Single-Line Diagram, Diagnostic, Plant Automation (application display pages) and Reports pages and to the latest alarm messages. The vertical

menu is used to access the lists of active or historical alarms and chronological events. It also supports printing of the display screen contents. The task bar contains elements for language selection, active user login and logout, customer logo display, IP addresses and name of the ABB ZEE600 computer, time and date.

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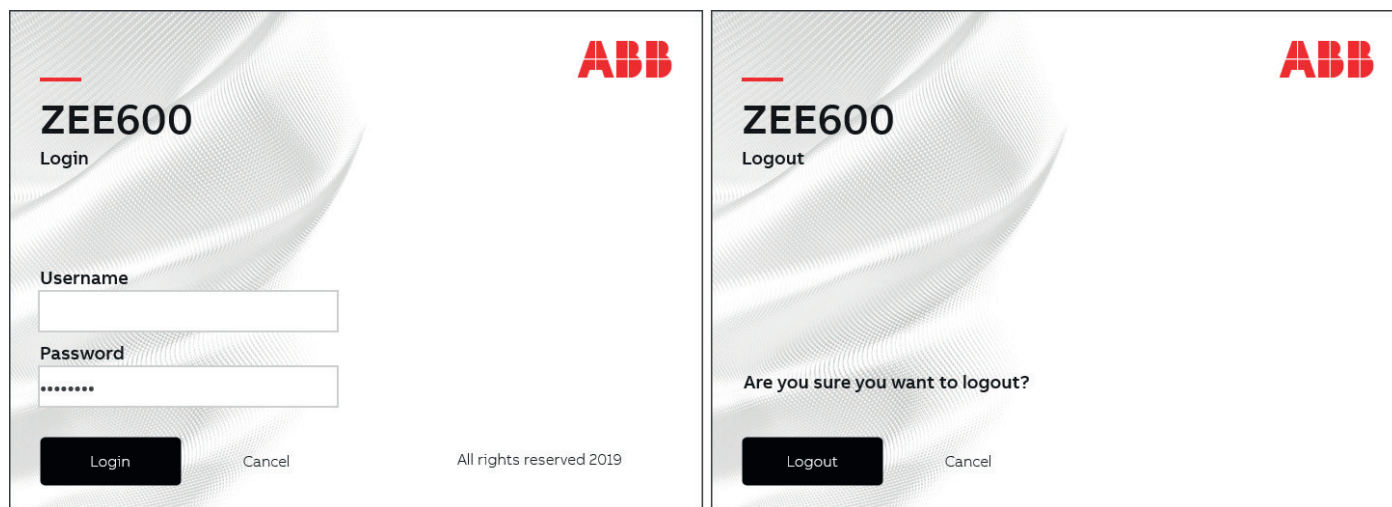


Figure 31. ABB ZEE600 libraries: login and logout

The automatically created SLD pages (maximum 12) include the plant-specific switchboards and bays. The content of the pages is plant specific and not part of the ABB electrification library. The automatic line coloring calculates the coloring depending on the position of the connected elements and according to their connected power supply. Thus, it is possible to follow circuit topologies and energy distribution. If different supplies are connected, the one with the highest priority is displayed.

If a bay has been integrated into the visualization, it is possible to open a device-specific dialog box by selecting the corresponding bay on an SLD page. The bay dialog box displays information on several tabs: Main, Measurement, Trends, Notes (notebook to record operation information which

is retained even after zenon Runtime restart) and Web HMI (access to the Relion protection relay's Web server).

- Description (for example, Unit 1)
- Device type (for example, REF615)
- List of predefined, device-specific alarm texts
- Bay name
- Bay control field with line coloring, controllable elements and selection status
- Control and status elements for selected elements, open and closing commands as well as local/remote indicator
- Alarm list with automatic filter for the selected bay

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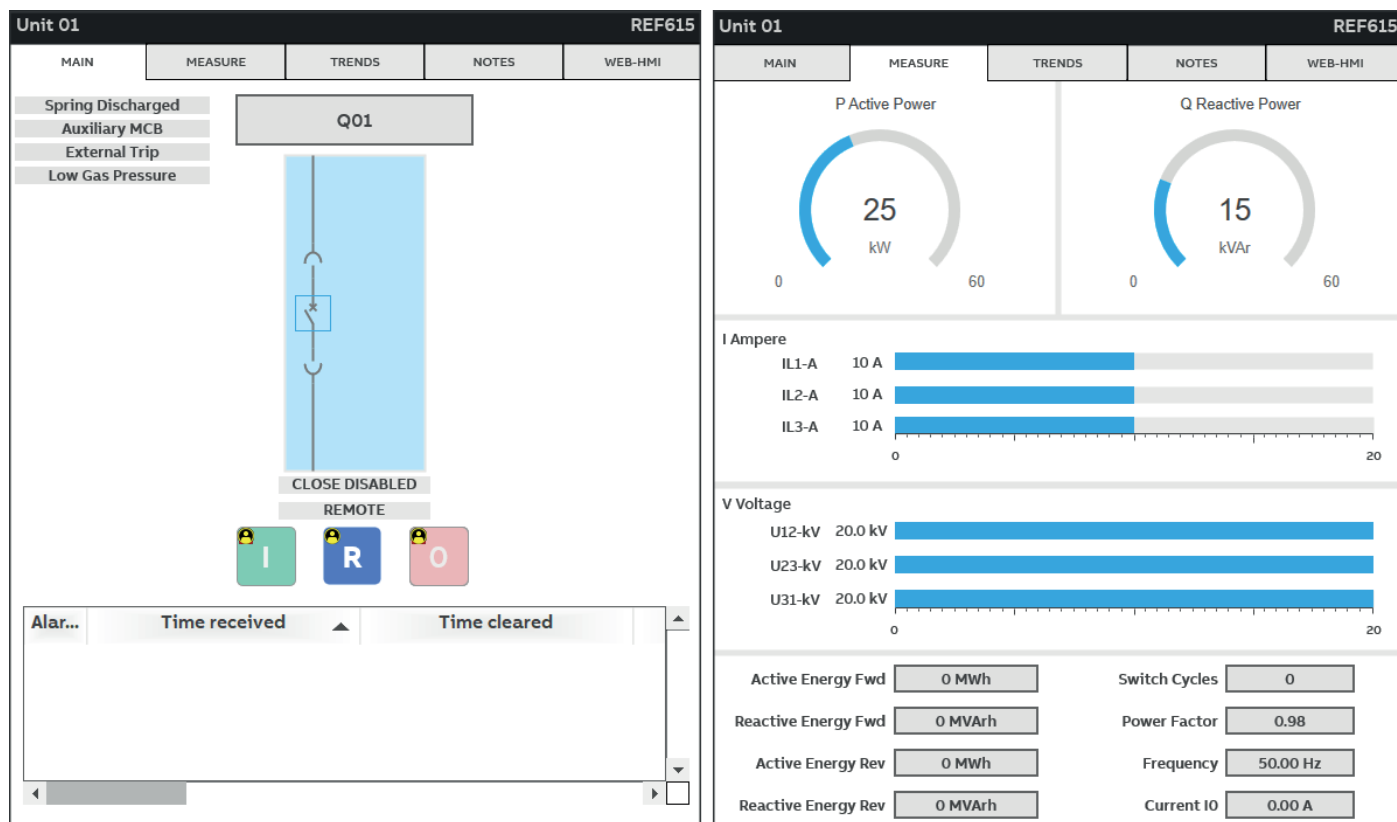


Figure 32. ABB ZEE600 libraries: bay operation screens overview

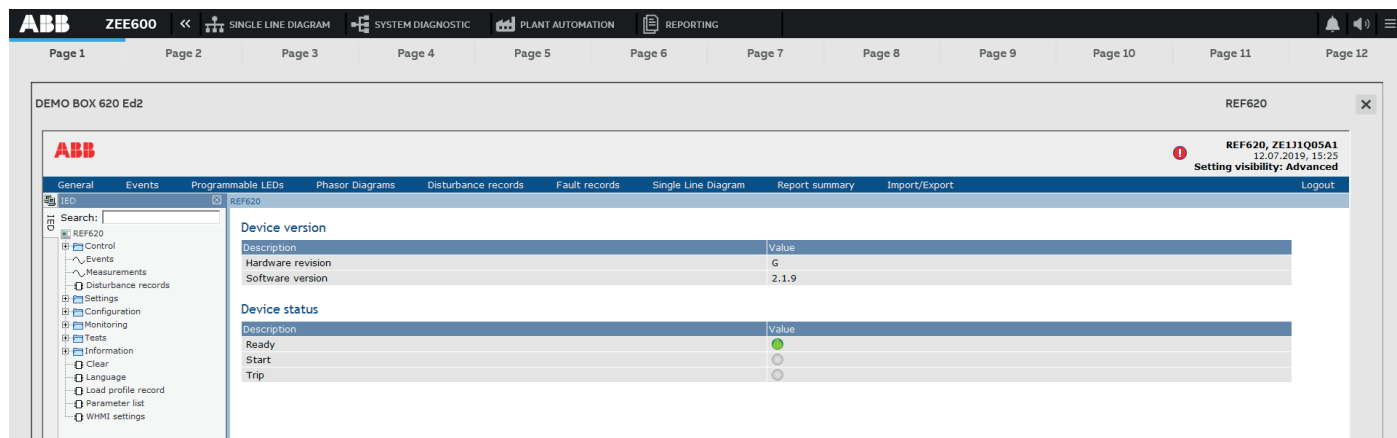


Figure 33. ABB ZEE600 libraries: Relion protection relay Web HMI access

The System Diagnostic page is not automatically created by wizards and therefore it needs to be handled using library faceplates to display various devices in a network. Along with the device instance object, the device details can also be accessed. The Plant Automation area is provisioned for the future for use with special automation library display pages.

Reporting covers real-time and historical trend across multiple bays, disturbance record viewing using uploaded COMTRADE files from downstream protection relays, report viewing for display of project-specific reports which can be printed or exported, and energy management that allows access to the historical data of up to 100 devices for up to four measurements per device.



Figure 34. ABB ZEE600 libraries: disturbance record overview

The ABB ZEE600 utilities feature facilitates siren management, user management (administration), printer setup, bay name management, system shutdown, background color (theme)

selection for display screens, selection of electrical symbol standard and system maintenance to view the status of selected project variables.

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Figure 35. ABB ZEE600 libraries: Energy management

9. Network handling

Server redundancy for reliable and high-availability process

ABB ZEE600's redundancy features enable users to significantly improve network reliability and have constant access to projects without interruptions, downtime or data loss. Depending on the project requirements, three types of redundancy modes are available for servers.

- The dominant mode establishes traditional primary standby roles for defined machines.
- Non-dominant mode provides full redundancy without traditional primary and standby definitions; either server machine can handle either role.
- Rated mode is based on connection status and other calculated data; the servers decide which machine is the

primary server. This mode involves analyzing and rating the quality of the data flow. If the defined criteria are not adhered to, the standby server that can ensure higher data quality immediately takes over.

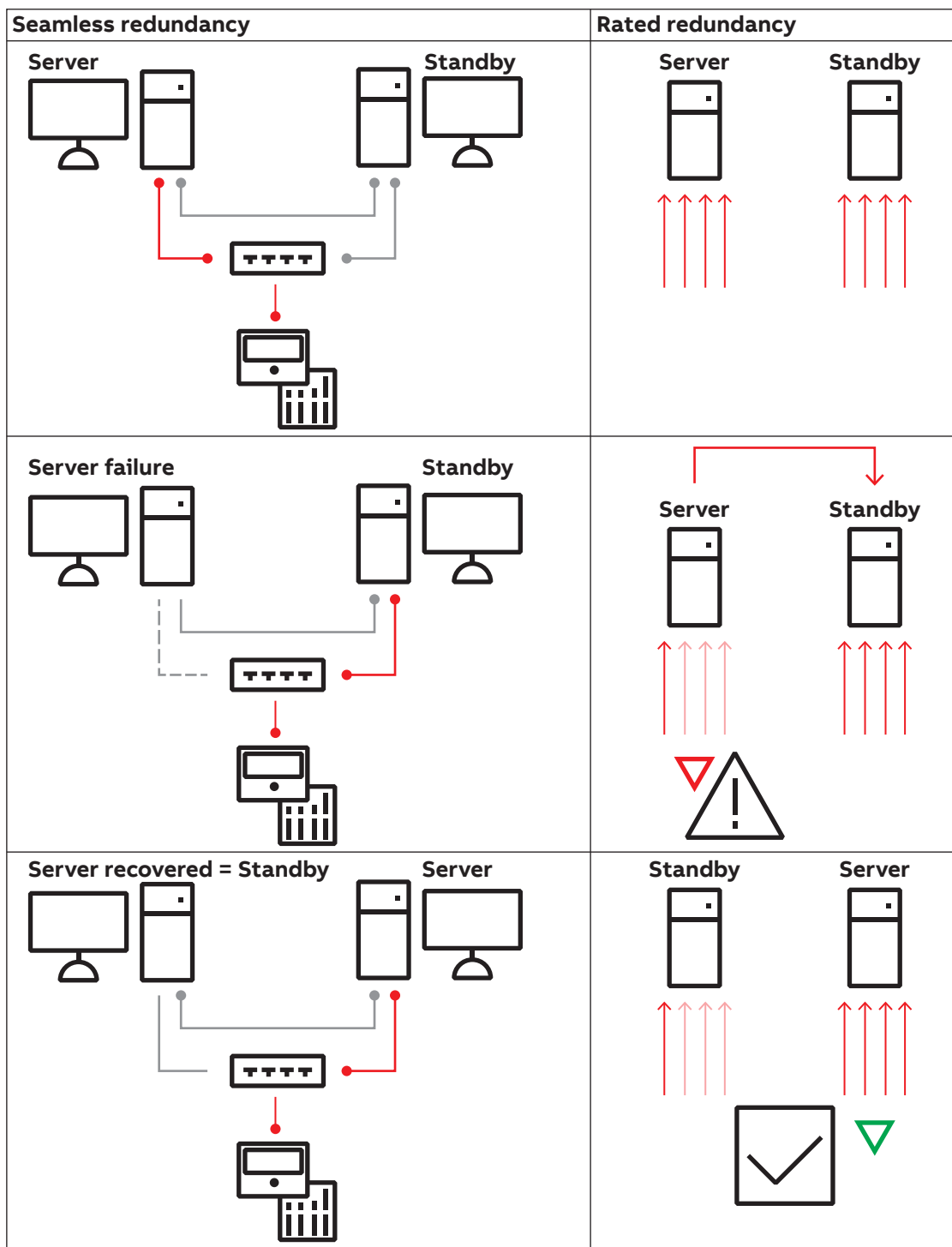


Figure 36. ABB ZEE600 server redundancy

The seamless redundancy in ABB ZEE600 guarantees continuous data recording, thus preventing data loss even in the time between a server outage and switchover to the

standby server. This functionality combines seamless redundancy and circular redundancy to form a highly fail-safe system.

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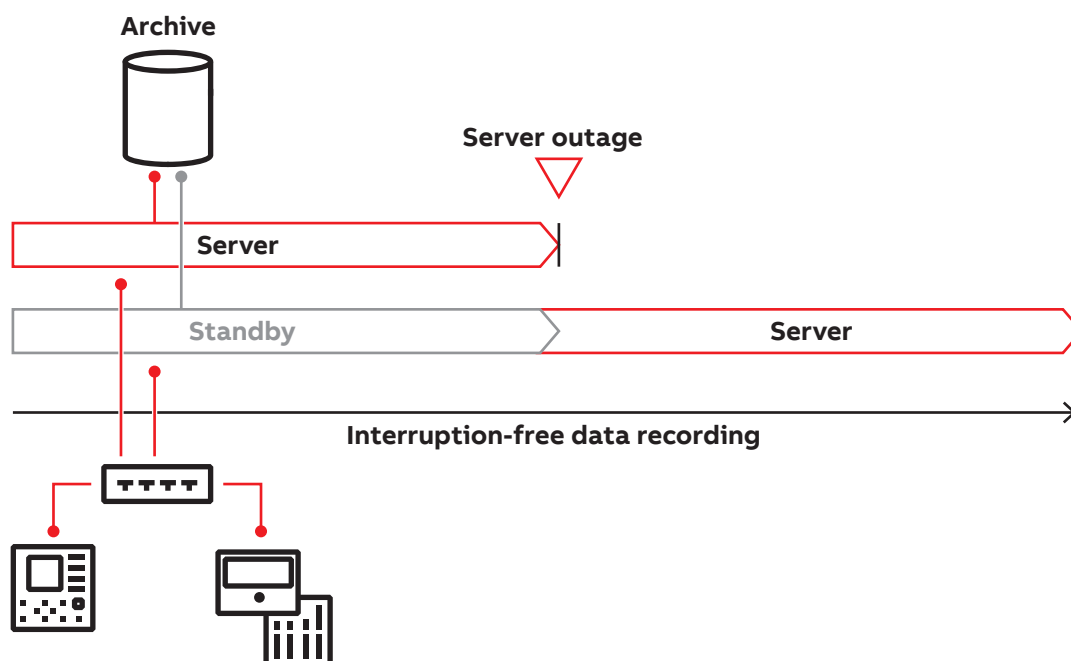


Figure 37. ABB ZEE600 hot-standby takeover operation

In the event of a server failure, seamless redundancy transfers all tasks and data to a standby server. This records all historical data in parallel when connected to the substation or electrification process and thus ensures that no data loss occurs between the server failure and switchover to the standby server.

The SoftPLC/zenon logic also supports redundancy.

Note that when using redundant ABB ZEE600 for HMI/ECS functionality with SoftPLC functionality (non-critical applications), it is recommended to fully synchronize the two redundancy functions using a watchdog function from the HMI/ECS application towards the SoftPLC/zenon logic.

Client and server

ABB ZEE600's client/server network technology provides a platform-independent solution that enables the user to improve network reliability and have constant access to projects without interruptions, downtime or data loss.

With ABB ZEE600, creating a network for projects is easy and secure. Even the most complex topologies can be clearly and effectively configured to create stable, secure and robust networks without any additional engineering.

Roles of server and standby server and client can be assigned to the computers, thus allowing the user to create both simple client-server structures and secure complex multi-hierarchical models.

ABB ZEE600 monitors all network conditions to guarantee effective performance and provide reliable protection against

data loss. High-quality encryption and client authentication in the network provide secure communication.

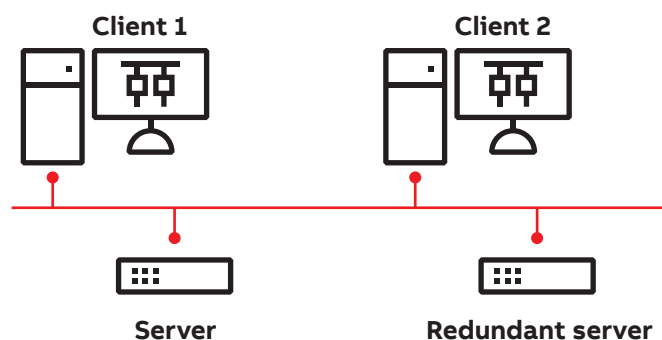


Figure 38. ABB ZEE600 client-server

zenon Runtime can start one or more projects on one computer depending on the project configuration. The computer on which zenon Runtime is started assumes the role of primary server, standby server or client for the respective projects.

With network projects, all computers in the network must be time-synchronized. In a topology with several Primary Servers, it is recommended that time synchronization be implemented using an external time server or Windows resources. In this case, the automatic time synchronization in ABB ZEE600 must be deactivated. By default, the zenon Runtime server has a built-in client.

10. Connectivity

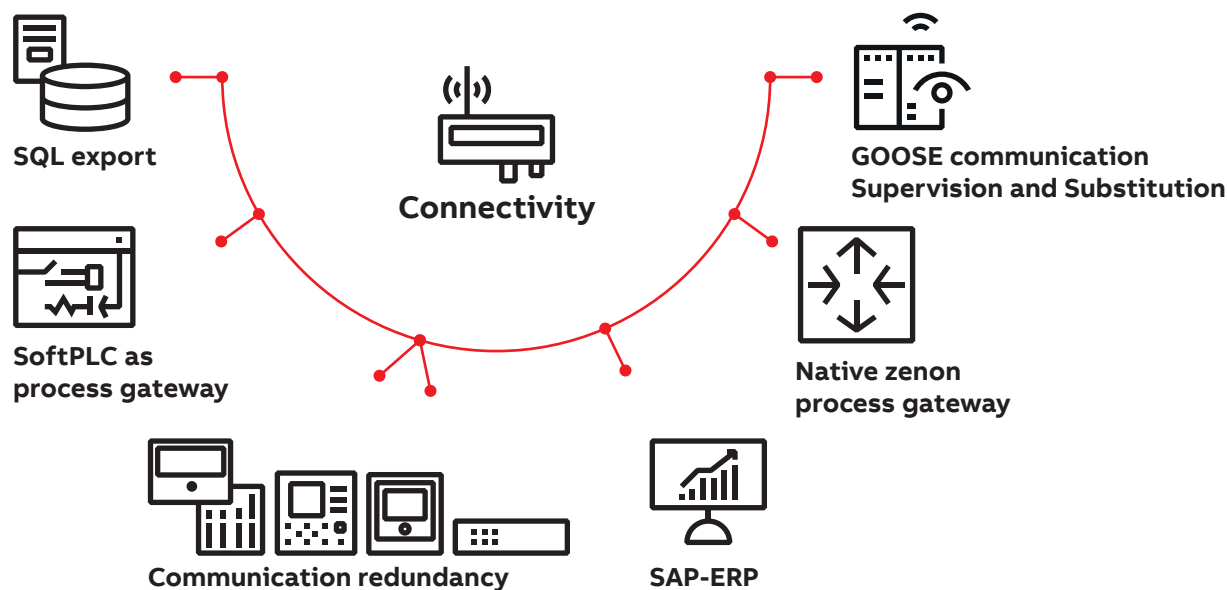


Figure 39. Connectivity with ABB ZEE600

Native zenon process gateway (optional)

With native drivers that support all common communication protocols, the ABB ZEE600 process gateway secures connectivity between field devices, such as protection relays, meters, PLCs and RTUs, and remote or higher-level systems.

The communication between ABB ZEE600 and higher-level systems such as a control center or a DCS is bidirectional. This means that process data from zenon Runtime can be forwarded to remote systems and they can write back values or commands to zenon Runtime.

The process gateway is an add-on to zenon Runtime and only works in combination with it. If zenon Runtime has not been started, the process gateway does not start. Several instances can be started on a single computer. The process gateway can be started on both a standalone computer and in the network (server/standby/client). All process gateway instances started in the network provide the same process image.

For more details, see [Selection and ordering data](#).

SoftPLC as process gateway

ABB ZEE600 through the base installation of zenon Energy Edition offers a number of protocol drivers.

- IEC 60870-5-101, IEC 60870-5-104 server
- IEC 60870-5-103 server
- IEC 61850 Edition 2 MMS client
- DNP3 serial, TCP server
- Modbus serial, TCP server

Additionally, the SoftPLC function can be used for direct communication with both downstream devices such as protection relays or meters and upper level systems. This aspect can be advantageously and flexibly used in combination with the pre-included drivers. For more details, see [Selection and ordering data](#).

Communication redundancy

ABB ZEE600 is designed for high-availability communication networks through support of PRP for redundant Ethernet networks. The PRP feature, as per IEC 62439-3, ensures seamless redundancy with zero switchover time for critical applications and operations, such as in electrification processes.

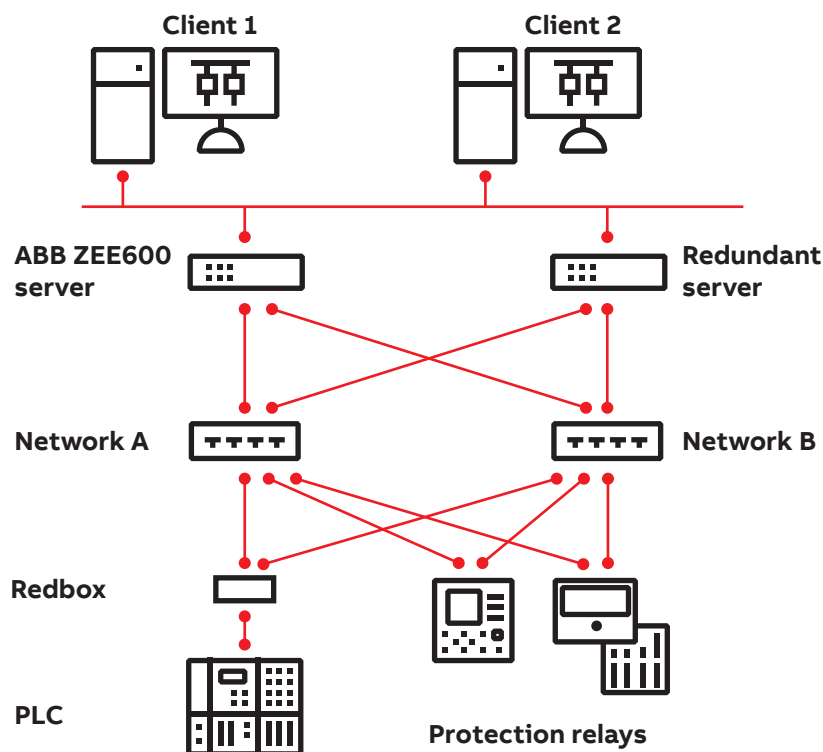


Figure 40. ABB ZEE600 communication redundancy

PRP is based on duplicated networks where each message is sent via both networks. The first of the received messages is accepted whereas the duplicate is discarded. In ABB ZEE600, message replication and discarding is done by the native PRP driver, which hides the two networks from upper-level applications.

Besides the protection relays and other substation devices supporting PRP, the ABB ZEE600 server machine needs to be equipped with a LAN card with two Ethernet ports and internally bridged network adapters. For devices which do not support PRP, an external redundancy box adaptation unit is needed.

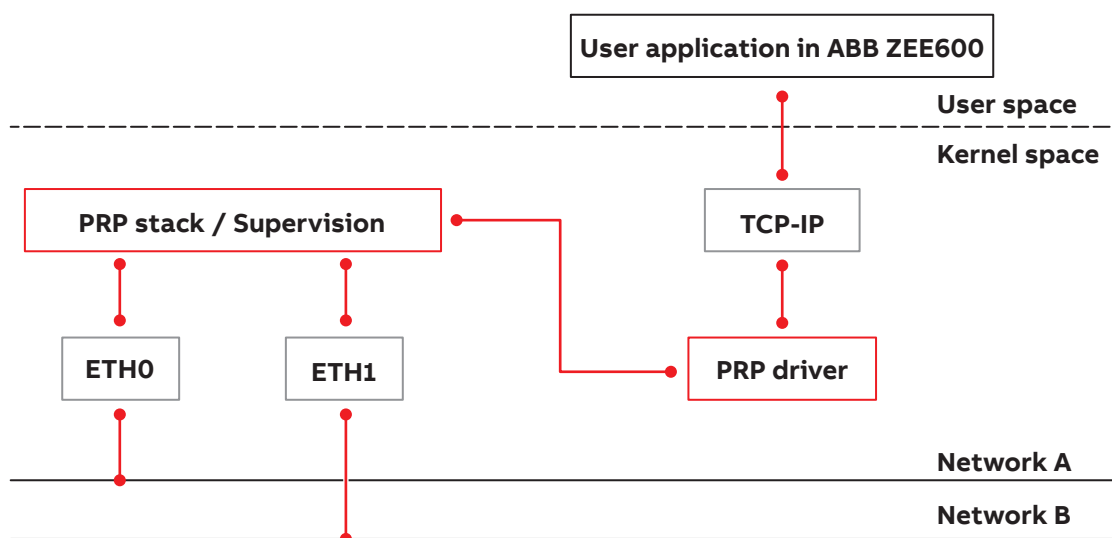


Figure 41. ABB ZEE600 PRP

SQL Export (optional)

SQL Export is an optional module of zenon Editor and zenon Runtime which allows archive data, alarm data and event data to be exported to an SQL database. This is a unidirectional

export, meaning that the exported data cannot be read back into ABB ZEE600. In this aspect, the SQL server export differs from the Historian SQL server interface.

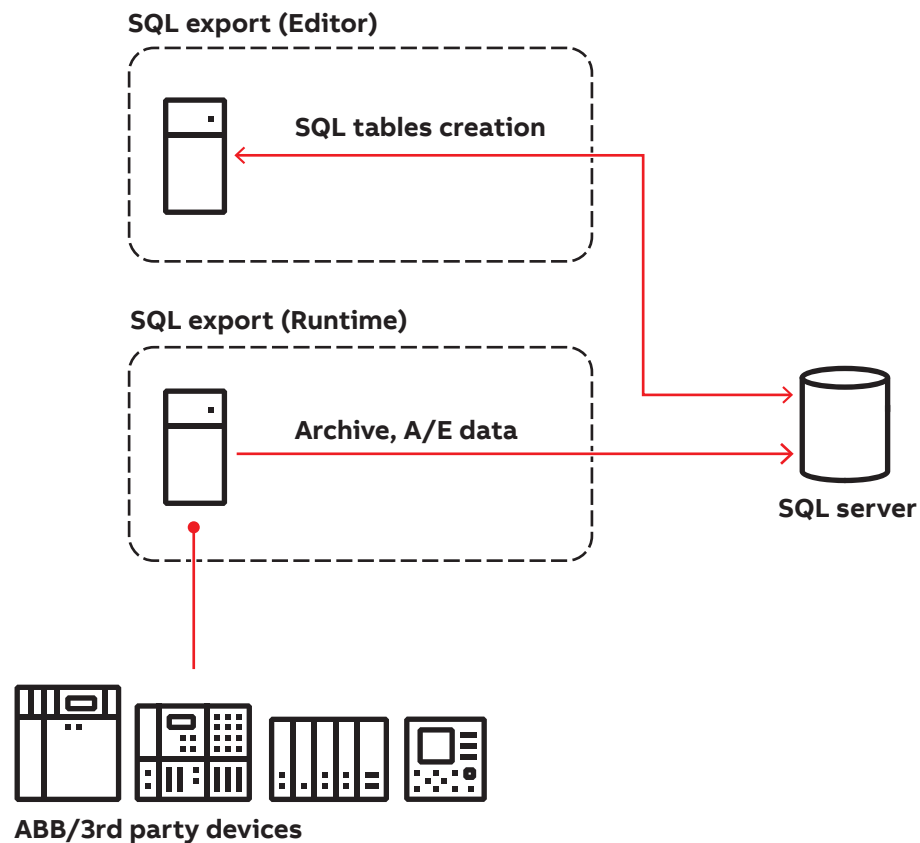


Figure 42. ABB ZEE600 SQL export

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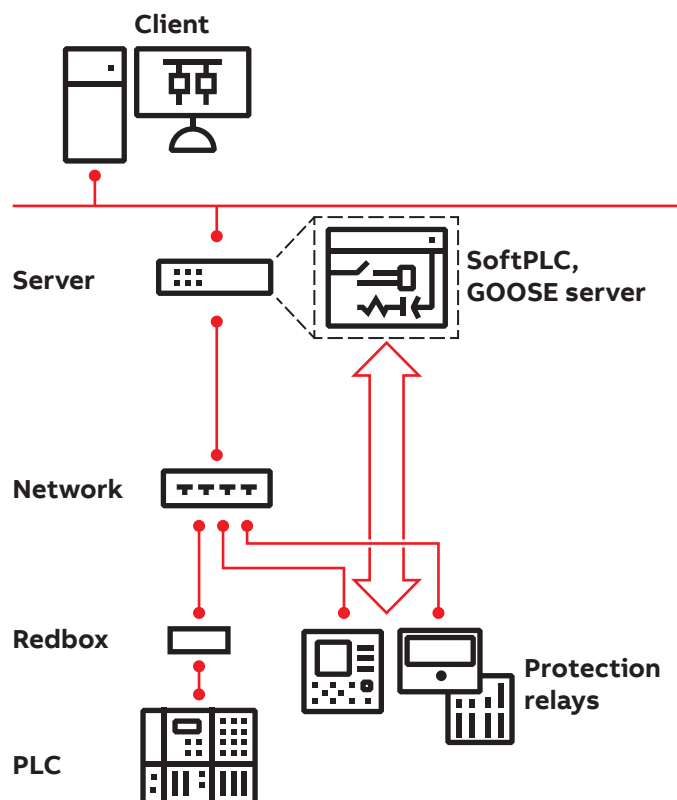


Figure 43. ABB ZEE600 IEC 61850 GOOSE supervision

IEC 61850 GOOSE supervision and substitution (optional)

The SoftPLC driver can be used to publish and subscribe IEC 61850 GOOSE messages and thereby exchange application information such as system-wide protection interlocking data with peer devices such as protection relays and other substation devices.

The GOOSE server driver supervises the GOOSE communication and performs certain diagnoses.

- Alarm generation on occurrence of GOOSE communication problems
- Detection of connection loss
- GOOSE subscriber detection

11. Scalability

ABB ZEE600 supports scalability by offering upgrading of server tags, client tags and Web server concurrent connections.

It is also possible to add functionality according to the project requirements.

- Missing GOOSE messages (gaps in sequence number)
- Delays in GOOSE messages
- If ABB ZEE600 as IEC 61850 subscriber has never received messages from another server/publisher, constantly gets messages from another server/publisher or does not receive messages anymore.

GOOSE-based applications, such as interlocking or bus transfer, involve exchange of circuit breaker or disconnector status information between the participating substation devices such as protection relays, PLCs and IO devices.

If a device falls offline (providing status information of the feeder), the entire application can become unavailable until a replacement device is available. To manage this situation, the values of switches can be substituted from the ABB ZEE600 operator station. The SoftPLC GOOSE server driver can be used to distribute the missing feeder switch status values to the other devices so that the applications in the healthy devices can continue to run.

SAP-ERP (enterprise resource planning) interface (optional)

As energy metering or consumption data or any type of events from the on-site ECS are often needed by an SAP application for billing purposes towards bulk and industrial or domestic consumers, ABB ZEE600 can be extended to include SAP-ERP connectivity.

The SAP-certified interface enables a simple, secure and rapid connection to the electrification process level with the ERP system. Process level information, such as metering and energy from various consumer feeders, can be quickly processed by billing applications in the ERP system.

ABB ZEE600 interacts with SAP-ERP applications via a two-way interface establishing a direct link between the process level and the ERP level via a closed loop and getting a complete overview of all processes. This provides important basic data for daily operations and for long-term planning.

- Communication protocols
- Process awareness
- Process control
- Special modules

For more information, see [Selection and ordering data](#).

12. Engineering

Object-oriented engineering

ABB ZEE600 has an object-orientated structure. Objects are created and maintained at a single point but they can be used in multiple places and across projects. A library of common symbols can be created and reused across projects. It is also easy to integrate components, processes and functions and include them in customized libraries.

The reusability of graphical objects, screens or entire projects enables rapid reuse of existing project configuration without re-engineering. Screens can be saved as templates in zenon Editor (engineering environment). Wizards perform multiple project engineering steps to help automate the project creation process and minimize the engineering time.

Distributed or collaborative engineering

To accelerate project development, ABB ZEE600 allows multiple engineers to check out portions of a project and

simultaneously work on specific areas where only they can make changes. These changes are then synchronized across all engineering machines. Also logging of changes in a project is enabled along with simplified version control.

This approach significantly reduces engineering time and increases efficiency in large projects. Amongst working teams, tasks can be split up according to the members' expertise. Teams can be added at any time and reorganized.

The projects are managed on a central SQL server which ensures that objects can only be modified by one user. The object under work is checked out and locked for everyone else which helps to eliminate overlapping or double configuration. Once the object has been checked back in, all other users have immediate access to the latest version of the project. Standalone projects can also be converted into multi-user projects at any time and vice versa.

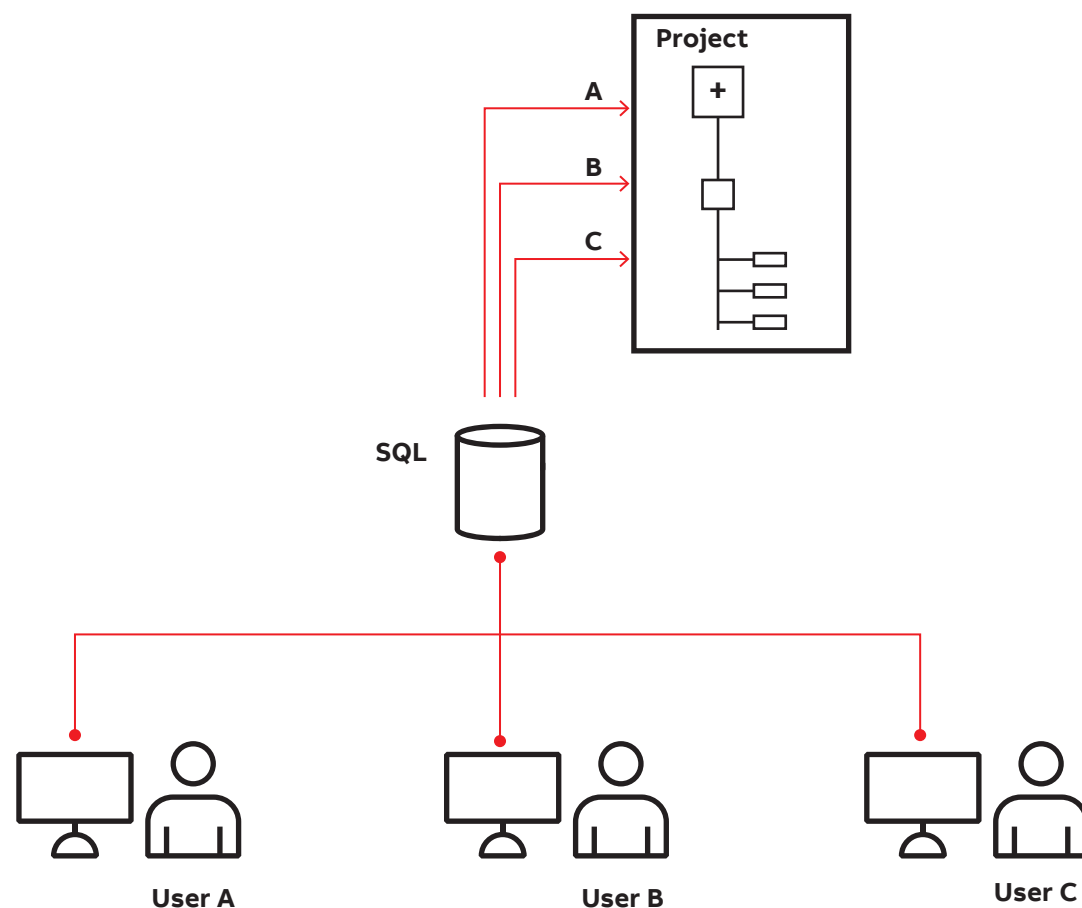


Figure 44. ABB ZEE600 distributed engineering

Multi-project administration and management (for large projects)

The ABB ZEE600 multi-project administration follows the principle of decentralization where a user can split large

projects into several smaller or logical projects under a single package and deploy them as required. The projects can be spread across several different computers which improves performance and increases flexibility. Combined with the

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object-oriented approach, this facilitates easy enhancements and project maintenance.

This feature enables editing individual parts of the project leaving unaffected parts unchanged. As this feature ensures efficient validation and revalidation, it is useful in user segments or installations with strict operational regulations. With this feature, it is possible to access information, for example alarms, from one machine on the display of another.

13. Hardware requirements

ABB ZEE600 can be hosted on any COTS business or industrial computer adhering to the minimal recommended hardware requirements. Advantech ECU 4784 and ABB B&R APC910 are typical examples of computer hardware that can host zenon Editor and Runtime on a single machine.

The Advantech ECU 4784 (D56SBE) industrial PC is suitable for a harsh substation environment and therefore, it can be used directly in substation switchgear (LV compartment).

- Intel® Core™ dual-core i7 4650U (1.7 GHz) processor
- 16 GB RAM
- 8 × LAN, 10 × COM, 2 × expansion slots
- Win10 IoT Ent
- 2 × 2.5" SATA HDD/SDD (optional)
- 4-port fiber-optic LAN (optional)

In ABB ZEE600, the server and client are not defined in relation to a computer but in relation to a project. This way multiple-project administration can be started for several visualization projects at the same time on one PC. A PC can be the server for one project and, at the same time, the client for another project. A PC can even be a multi-server (server for several projects) and a multi-client (client for several projects) simultaneously.

- 2-port SDP Gigabit Ethernet card with PRP/HSR (optional)
- Additional extra HV power supply (optional)
- LV power supply (optional)
- IEC 61850-3 compliant

ABB B&R APC910 can be considered if a server-grade substation computer is not required and if ABB ZEE600 is used for compact HMI and communication gateway requirements.

- Core i5 6440EQ 2.7 GHz quad-core processor
- 16 GB RAM (up to 32 GB)
- Win10 IoT Ent 64-bit
- 2 × Ethernet 10/100/1000 Gigabit
- 1 × RS-232, 4 × USB 3.0, 1 × USB 2.0
- 2 × 2.5" SATA HDD/SDD (optional)
- LV power supply 24 VDC

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14. Technical data

Table 3. zenon Editor

Description	Minimum requirement	Recommendation
CPU	Single core with SSE2 support	Quad core
RAM memory	From 4 GB	8 GB
Hard disk	At least 4 GB	
Monitor resolution	1920 x 1080 ¹⁾	Double monitor setup 2 x 1920 x 1080
Graphics adapter	64 MB dedicated memory	
Input devices	Standard keyboard or mouse	
USB interface or DVD drive	Not needed (software download using network connectivity)	
Parallel or USB interface	Needed for dongle licensing	
Network connection	10 Mbits/s with TCP/IP protocol for remote transport, network dongle, project backups on central file server and multi-user capable Editor	1 Gbits/s

1) Required for ABB ZEE600 standard templates

Table 4. zenon Runtime

Description	Minimum requirement	Recommendation
CPU	Single core with SSE2 support	Quad core
RAM memory	From 512 MB	4096 MB
Hard disk	At least 2 GB	
Monitor resolution	1920 x 1080 ¹⁾	
Graphics adapter	64 MB dedicated memory	
Input devices	Standard keyboard or mouse	
USB interface	Not needed for software installation: software download using network connectivity, network dongle also available for dongle	
Network connection	64 kbits/s for standard client/server projects, 100 Mbits/s full duplex for redundant communication	1000 kbits/s full duplex for standard client/server projects
Remote connection	Dial-up modem with 9600 bit/s	1 Mbits/s full duplex
WAN connection	Any interface through a router to an ISDN or DSL network	
Message control	Connectivity to SMTP server or to GSM network	
Serial interfaces	RS-232/RS-422/RS-485 as required	

1) Required for ABB ZEE600 standard templates

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Table 5. zenon Web Server

Description	Minimum requirement	Recommendation
CPU	Single core with SSE2 support	
RAM memory	From 1024 MB	
Hard disk	256 MB free space	1 GB free hard drive space
Network connection	10 Mbits/s full duplex	1000 Mbits/s full duplex
Remote connection	Dial-up modem with 9600 bit/s	1 Mbits/s full duplex

Table 6. zenon Web Client

Description	Minimum requirement	Recommendation
CPU	Single core with SSE2 support	Quad core
RAM memory	From 1024 MB	
Hard disk	64 MB free space	80 GB free hard drive space
Network connection	10 Mbits/s full duplex	1000 Mbits/s full duplex
Remote connection	Dial-up modem with 9600 bit/s	1 Mbits/s full duplex
Graphic adapter	64 MB dedicated memory	

Table 7. Operating system

Description	Energy Edition	Everywhere	Logic Runtime
Windows 10 Pro	x	x (PC)	x
Windows 10 Enterprise	x	x (PC)	x
Windows 10 IoT Enterprise	x	x (PC)	x

ABB ZEE600**Product version: 1.0****15. Selection and ordering data**

Discrete selection and ordering codes are applicable for the ABB ZEE600 server, the ABB ZEE600 client and for extensions involving Runtime server, Runtime client and Web server.

The ordering procedure for ABB ZEE600 1.0 is based on an Excel sheet. The ordering procedure does not include hardware or computers to host ABB ZEE600 servers or clients. The order code options corresponding to discrete ABB zenon licenses are usually required in electrification and substation ECS/HMI solutions. The requirements that are not included in the ordering code options must be ordered separately.

ABB ZEE600 server order code

The ABB base server comprises several ABB zenon product component licenses needed for a standard substation or power automation user interface, operations and communications. For a list of the default features, see [Table 1](#). The base server product comprises a combination of ABB zenon Energy Edition server tag license and electrification libraries.

To arrive at a tag count option, about 100 tags are needed for a device or a system that must be connected to the ABB ZEE600 server. The tag count refers to process tags only (not internal)

and is protocol independent. The SoftPLC Runtime works with the same tag count as the base product.

Process connectivity protocols towards downstream devices are not included in the base server product and must be ordered separately. All communication protocols associated with the process gateway functionality must be ordered separately as required. The optional HMI functionality related to process awareness, process control and process monitoring must be ordered separately.

The Web server is licensed by concurrent users (out of an unlimited group of users) who can access the server runtime simultaneously. It is anticipated that maximum ten concurrent Web clients connected to a Web server associated with an ABB ZEE600 server are needed in electrification automation solution projects. Web server (Pro) connectivity with concurrent clients must be ordered separately.

Both hardware dongle and software-based licensing methods are supported. Two server licenses are required for redundant operation. The zenon Editor license for engineering can be ordered either with runtime or as standalone.

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Digits Particulars	Description and Key allocation	1-2	3	4	5	6	7	8	9	10	11	12	13-14	15	16	17
		Z2	N	H	N	B	C	A	A	A	A	N	W3	A	A	A
1-2 Basic product																
	ABB ZEE600 server - 1500 tags (Z1)															
	ABB ZEE600 server - 4500 tags (Z2)	•														
	ABB ZEE600 server - 7000 tags (Z3)															
	ABB ZEE600 server - Unlimited tags (Z4)															
	No (ZN)															
3 Database connectivity																
	SQL Export driver (Write variable values in SQL) (A)															
	Historian SQL interface (B)															
	SQL Online (Process gateway) (C)															
	No (N)		•													
4 Process communication (client or master) from zenon Runtime																
	Modbus serial/TCP (A)															
	OPC DA (B)															
	OPC UA (C)															
	Profibus Master (D)															
	Modbus serial/TCP, OPC DA (E)															
	Modbus serial/TCP, OPC UA (F)															
	Modbus serial/TCP, Profibus master (G)															
	OPC DA, OPC UA (H)															
	OPC DA, Profibus Master (I)															
	OPC UA, Profibus Master (J)															
	Modbus serial/TCP, OPC DA, OPC UA (K)															
	Modbus serial/TCP, OPC DA, Profibus Master (L)															
	Modbus serial/TCP, OPC UA, Profibus Master (M)															
	Modbus serial/TCP, OPC DA, OPC UA, Profibus Master (O)															
	No (N)															
5 Process communication (client or master) from SoftPLC																
	Profinet (A)															
	No (N)															
6 Process gateway - Industrial (server or slave)																
	Modbus serial/TCP (A)															
	OPC DA (B)															
	OPC UA (C)															
	Modbus serial/TCP, OPC DA (D)															
	Modbus serial/TCP, OPC UA (E)															
	Modbus serial/TCP, OPC DA, OPC UA (F)															
	No (N)															
7 Process gateway - Power Utility (server or slave)																
	IEC 60870-5-101/104 (A)															
	DNP3 (B)															
	IEC 60870-5-101/104, DNP3 (C)															
	No (N)															
8 Process gateway - Communcation management																
	SNMP server (A)															
	No (N)															

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Digits Particulars	Description and Key allocation	1-2	3	4	5	6	7	8	9	10	11	12	13-14	15	16	17	
		Z2	N	H	N	B	C	A	A	A	A	N	W3	A	A	A	
9 Process awareness																	
	Message control (A)									•							
	Everywhere server (B)																
	Message control + Everywhere server (C)																
	No (N)																
10 Process control																	
	Command sequencer (A)									•							
	No (N)																
11 Process monitoring																	
	Process recorder (A)											•					
	Reporting (write access) (B)																
	Historian SQL server interface (C)																
	Process recorder, Reporting (write access) (D)																
	Process recorder, Historian SQL server interface (E)																
	Process recorder, Reporting (write access), Historian SQL server interface (F)																
	No (N)																
12 Special modules																	
	Load Management (A)																
	No (N)											•					
13-14 Web server																	
	Web server 1 client (W1)																
	Web server 3 clients (W2)																
	Web server 5 clients (W3)															•	
	Web server 10 clients (W4)																
	Web server Pro 1 client (W5)																
	Web server Pro 3 clients (W6)																
	Web server Pro 5 clients (W7)																
	Web server Pro 10 clients (W8)																
	No (W9)																
15 Editor license																	
	Energy Edition Editor option (A)															•	
	Energy Edition Editor standalone version (B)																
	No (N)																
16 License key																	
	zenon printed (software) license (A)																•
	zenon dongle license (B)																
17 Version																	
	1.0 (based on ABB zenon 8.0) (A)																•

Figure 45. ABB ZEE600 server order code

ABB ZEE600 client order code

The base server Runtime comprises an in-built client. The standalone/desktop Runtime client option is generally used for large projects that need separate servers for different processes and yet have the possibility of unified or selective access operator workplaces (clients).

One or several clients might need access from one or multiple servers. The associations between servers and clients could be:

- one server - one client
- one server - many clients
- many servers - one client
- many servers - many clients

The desktop client license comprises three features.

- Automatic Line Coloring
- Historian
- Extended Trends

ABB ZEE600

Product version: 1.0

Like the base server product tag options, the desktop client selection is based on tags and depends on the number of servers the client must be connected to. See [Multi-project](#)

[administration and management \(for large projects\)](#). Like the base server product, the desktop client has the option of a hardware or software-based dongle.

Digits Particulars	Description and Key allocation	1-2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		C1	A	A	N	N	N	N	N	N	N	N	N	N	N	N	N
1-2 ABB ZEE600 desktop Client																	
	ABB ZEE600 client - 1500 tags (C1)	•															
	ABB ZEE600 client - 4500 tags (C2)																
	ABB ZEE600 client - 7000 tags (C3)																
	ABB ZEE600 client - Unlimited tags (C4)																
3 License key																	
	zenon printed (software) license (A)		•														
	zenon dongle license (B)																
4 Version																	
	1.0 (based on ABB zenon 8.0) (A)																•

Figure 46. ABB ZEE600 client order code

Extension order code

In case of a tag upgrade for both the ABB ZEE600 server and the client, it is only possible to ‘jump’ from a lower tag count to a

higher tag count and always to the next step. The jump for Web server licenses is similar to the tag upgrade for the server and the client.

Digits Particulars	Description and Key allocation	1-2	3-4	5-6	7	8	9	10	11	12	13	14	15	16	17		
		E2	EN	EN	A	N	N	N	N	N	N	N	N	N	N		
1-2 ABB ZEE600 server tag extension																	
	ABB ZEE600 server extension - 1500 to 4500 tags (E1)																
	ABB ZEE600 server extension - 4500 to 7000 tags (E2)	•															
	ABB ZEE600 server extension -7000 to unlimited (E3)																
	No (EN)																
3-4 Client tag extension																	
	ABB ZEE600 client extension - 1500 to 4500 tags (E1)																
	ABB ZEE600 client extension - 4500 to 7000 tags (E2)																
	ABB ZEE600 client extension -7000 to unlimited (E3)																
	No (EN)														•		
5-6 Web server expansion																	
	Web server expansion from 1 to 3 clients (E1)																
	Web server expansion from 3 to 5 clients (E2)																
	Web server expansion from 5 to 10 clients (E3)																
	Web server Pro expansion from 1 to 3 clients (E4)																
	Web server Pro expansion from 3 to 5 clients (E5)																
	Web server Pro expansion from 5 to 10 clients (E6)																
	No (EN)														•		
7 Version																	
	1.0 (based on ABB zenon 8.0) (A)																•

Figure 47. Extension order code

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16. Documentation

Title	Document ID
ABB ZEE600 Operation Manual	2NGA000149
ABB ZEE600 Configuration Manual	2NGA000150
Process awareness	
Alarms administration	3AXD50000326730
Automatic Line Coloring (ALC) - Topology	3AXD50000326754
Equipment Modeling	3AXD50000326457
HTML Web Engine	3AXD50000326914
Message Control	3AXD50000327034
Status processing	3AXD50000327294
Worldview	3AXD50000327362
zenon Web Server	3AXD50000327430
Process control	
Command Sequencer	3AXD50000326785
Controls	3AXD50000326808
zenon Logic	3AXD50000327379
Driver simulation	3AXD50000326839
Project Simulation	3AXD50000327188
Time Control	3AXD50000327317
Interlockings	3AXD50000326969
Load Management	3AXD50000327003
Process monitoring	
Chronological Event List	3AXD50000326778
Historian	3AXD50000326495
Extended Trend	3AXD50000326464
Reporting	3AXD50000327218
Process Recorder	3AXD50000327126
Monitor administration	3AXD50000327058
Measuring unit switch	3AXD50000327010
System operation, access and security	
User Administration	3AXD50000327331
zenon Security Guide	3AXD50000327423
Shift Management	3AXD50000327270
zenon Operator	3AXD50000327386
Runtime	3AXD50000327225
Keyboards	3AXD50000326976
Mobile applications for zenon	3AXD50000327041
Scheduler	3AXD50000327256
Network handling	

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Title	Document ID
zenon Remote Desktop	3AXD50000327409
Network	3AXD50000327089
Remote Transport	3AXD50000327201
Connectivity and data handling	
communication driver: DNP3_TG	3AXD50000325047
communication driver: IEC62056	3AXD50000325252
communication driver: IEC850	3AXD50000325269
communication driver: IEC870	3AXD50000325276
communication driver: IEC870_10332	3AXD50000325283
communication driver: MODRTU32	3AXD50000325757
communication driver: MODBUS ENERGY	3AXD50000325658
communication driver: DPUNI32	3AXD50000325061
communication driver: Opc2CLI32	3AXD50000325818
communication driver: OPCUA32	3AXD50000325825
communication driver: SNMP32	3AXD50000326181
communication driver: SNMPNG32	3AXD50000326198
communication driver: SqlDrv	3AXD50000326280
internal driver: MATHDR32	3AXD50000325573
internal driver: SIMUL32	3AXD50000326167
internal driver: straton32	3AXD50000326617
internal driver: straton NG	3AXD50000326624
internal driver: Trend32	3AXD50000326693
internal driver: TrendNG (trend driver)	3AXD50000326709
Protocol handling for zenon logic (softPLC) v.8.00	3AXD50000505906
Process Gateway; zenon as communication gateway	3AXD50000327119
OPC Server	3AXD50000327096
SAP Interface	3AXD50000327249
internal driver: ArchDrv	3AXD50000324637
internal driver: Internal	3AXD50000325429
internal driver: SYSDRV	3AXD50000326655
Usability	
zenon WPF Element	3AXD50000327447
Multi-Touch	3AXD50000327072
Styles	3AXD50000327300
ABB zenon template- zenon Add-ons Manual	3AXD50000338115
Object Integration zenon Add-ons Manual	3AXD50000338979
Screens	3AXD50000327263
Runtime help	3AXD50000327232

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Title	Document ID
Language switch	3AXD50000326983
Configuration and engineering	
Allocations	3AXD50000326747
Wizards	3AXD50000327355
Tools	3AXD50000327324
History of Changes	3AXD50000326501
Menus	3AXD50000327027
Programming Interfaces	3AXD50000327140
Project Backup	3AXD50000327157
Distributed engineering	3AXD50000326822
Configuration files	3AXD50000326792
Editor	3AXD50000326846
Efficient engineering	3AXD50000326853
Functions and scripts	3AXD50000326471
Cross-reference list	3AXD50000326815
Import – Export	3AXD50000326921
Installation and updates	3AXD50000326952
Project conversion	3AXD50000327164
PLC Diagnosis	3AXD50000327102
Project Management and Workspace	3AXD50000327171
Licensing	3AXD50000326990
Variables	3AXD50000327348
Product awareness	
Energy Edition	3AXD50000326440
Golden thread across the help	3AXD50000326488
zenon Product Family	3AXD50000327393

17. References

The www.abb.com/mediumvoltage portal provides information on the entire range of distribution automation products and services.

The latest relevant information on ABB ZEE600 is found on the product page. Scroll down the page to find and download the related documentation.

ABB ZEE600

Product version: 1.0

18. Document revision history

Document revision/date	Product version	History
A/2019-10-28	1.0	First release
B/2019-12-17	1.0	Content updated

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ABB Distribution Solutions

www.abb.com/mediumvoltage

