Copyright

This document and parts thereof must not be reproduced or copied without written permission from ABB, and the contents thereof must not be imparted to a third party, nor used for any unauthorized purpose.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license.

Trademarks

ABB Ability is a trademark of the ABB Group. ABB and Relion are registered trademarks of the ABB Group. All other brand or product names mentioned in this document may be trademarks or registered trademarks of their respective holders.

Warranty

Please inquire about the terms of warranty from your nearest ABB representative.

www.abb.com/mediumvoltage
Disclaimer

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guaranteed properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This product has been designed to be connected and communicate data and information via a network interface which should be connected to a secure network. It is the sole responsibility of the person or entity responsible for network administration to ensure a secure connection to the network and to take the necessary measures (such as, but not limited to, installation of firewalls, application of authentication measures, encryption of data, installation of anti virus programs, etc.) to protect the product and the network, its system and interface included, against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB is not liable for any such damages and/or losses.

This document has been carefully checked by ABB but deviations cannot be completely ruled out. In case any errors are detected, the reader is kindly requested to notify the manufacturer. Other than under explicit contractual commitments, in no event shall ABB be responsible or liable for any loss or damage resulting from the use of this manual or the application of the equipment. In case of discrepancies between the English and any other language version, the wording of the English version shall prevail.
# Table of contents

## Section 1  Introduction

- This manual
- Intended audience
- Product documentation
  - Product documentation set
  - Document revision history
  - Related documentation
- Symbols and conventions
  - Symbols
  - Document conventions

## Section 2  ABB ZEE600 overview

- Overview
- Main screen
  - Single-line diagram pages
  - System diagnostic pages
  - Plant automation pages
  - Reporting pages
  - Real-time trend
    - COMTRADE Viewer
    - Report Viewer
    - Energy management
- Bay dialog box
- Secure access and operation

## Section 3  Operating the system

- Starting up system
- Logging in and out
  - Logging in
  - Logging out
- Switching users
- Changing language
- Controlling objects
- Controlling tap changer
- Viewing measurements
- Opening trends
- Opening notes
- Accessing Web HMI
- Alarm and event handling
  - Acknowledging alarms via navigation bar
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledging alarms via vertical menu</td>
<td>39</td>
</tr>
<tr>
<td>Defining new alarm filters</td>
<td>40</td>
</tr>
<tr>
<td>Opening chronological event list</td>
<td>43</td>
</tr>
<tr>
<td>Defining new event filters</td>
<td>45</td>
</tr>
<tr>
<td>Printing screen contents</td>
<td>47</td>
</tr>
<tr>
<td>Activating siren</td>
<td>48</td>
</tr>
<tr>
<td>Managing users</td>
<td>48</td>
</tr>
<tr>
<td>Editing users</td>
<td>48</td>
</tr>
<tr>
<td>Editing groups</td>
<td>51</td>
</tr>
<tr>
<td>Viewing user list</td>
<td>52</td>
</tr>
<tr>
<td>Configuring printers</td>
<td>53</td>
</tr>
<tr>
<td>Configuring bay properties</td>
<td>54</td>
</tr>
<tr>
<td>Changing theme</td>
<td>55</td>
</tr>
<tr>
<td>Selecting electrical symbol standard</td>
<td>55</td>
</tr>
<tr>
<td>Selecting electrical symbol alarms and text</td>
<td>57</td>
</tr>
<tr>
<td>Managing variables</td>
<td>57</td>
</tr>
<tr>
<td>Creating backups</td>
<td>62</td>
</tr>
<tr>
<td>Restoring backups</td>
<td>62</td>
</tr>
<tr>
<td>Shutting down system</td>
<td>63</td>
</tr>
<tr>
<td>Section 4 Glossary</td>
<td>65</td>
</tr>
</tbody>
</table>
### Section 1 Introduction

#### 1.1 This manual

The operation manual contains information about the features of ABB ZEE600. The manual provides instructions for monitoring and controlling.

#### 1.2 Intended audience

This manual addresses the operator who operates the system frequently.

The operator must be trained in and have a basic knowledge of how to operate the system. The manual contains terms and expressions commonly used to describe this kind of system.

#### 1.3 Product documentation

##### 1.3.1 Product documentation set

<table>
<thead>
<tr>
<th>Planning &amp; purchase</th>
<th>Engineering</th>
<th>Installation</th>
<th>Commissioning</th>
<th>Operation</th>
<th>Maintenance</th>
<th>Decommissioning, deinstallation &amp; disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brochure</td>
<td>Product guide</td>
<td>Operation manual</td>
<td>Configuration manual</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1: The intended use of documents during the product life cycle*

##### 1.3.2 Document revision history

<table>
<thead>
<tr>
<th>Document revision/date</th>
<th>Product version</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/2019-12-17</td>
<td>1.0</td>
<td>First release</td>
</tr>
</tbody>
</table>
1.3.3 Related documentation

Product manuals can be downloaded from the ABB Web site www.abb.com/mediumvoltage.

1.4 Symbols and conventions

1.4.1 Symbols

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader of important facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to information or property loss. Therefore, comply fully with all notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Menu paths are presented in bold.
  Select Main menu/Settings.
- WHMI menu names are presented in bold.
  Click Information in the WHMI menu structure.
- Parameter names are shown in italics.
  The function can be enabled and disabled with the Operation setting.
- Parameter values are indicated with quotation marks.
  The corresponding parameter values are "On" and "Off".
- Shortcut keys are presented in uppercase letters.
  A page can also be added pressing the shortcut keys CTRL+SHIFT+P.
2.1 Overview

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 2: ABB ZEE600 in customer segments]
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.

## 2.2 Main screen

The main screen comprises the navigation bar, the vertical menu, the content window and the task bar.
Figure 4: Main screen

1. Main pages
2. Navigation bar
3. Content window
4. Task bar
5. Language selection
6. Login/Logout
7. Active user (also used to switch users)
8. Alarm message indication and shortcut to the active alarms list
9. Siren management
10. Vertical menu
11. Active and historical alarm lists
12. Chronological event list
13. Print screen
14. Utility pages
15. Reload

The navigation bar is used to access four main pages and it also indicates the status of pending messages. If one of the main pages is selected, an additional navigation bar is displayed. The number of subordinate pages depends on the project settings that are made in Template Wizard.

The vertical menu is used to access the Utilities pages and the lists of pending alarms, historical alarms and events. In addition, a screenshot of the visualization can be sent to a preconfigured printer. The Reload option can be used if the project configuration...
is changed in zenon Editor. Runtime can reload the changed files in the ongoing operation, but system-related changes are excluded as they generally require Runtime to be restarted.

The task bar has a button for selecting the display language, and shows the logged in user and the current time and date. By clicking the Login/Logout button, it is possible to change the currently registered user of the visualization. Depending on the project settings, a customized logo can be displayed in the middle of the task bar. If a user with administrator rights is logged in, the name of the computer on which the visualization runs as well as the corresponding IP addresses of up to two Ethernet adapters are displayed.

2.2.1 Single-line diagram pages

Depending on the project settings, up to 12 SLD pages can be created, containing the plant-specific switchboards and bays. The pages' content is plant specific.

The automatic line coloring or topology coloring feature presents an immediate overview of powered, unpowered, grounded and faulty parts of the electrical network depending on the power status of the lines. Different colors can be selected for representing the different voltage levels connected through a transformer. The statuses of the lines are influenced by the status of the circuit breakers. Undefined or faulty switches cause different coloring of the lines.

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

To allow screen-overlapping models, the entire topology design and configuration is 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.

2.2.2 System diagnostic pages

Depending on the project settings, up to 12 system diagnostic pages are available displaying the plant-specific network representations.
To ensure a uniform representation, standard symbols from the library are used to represent the network plans. Most symbols have an identifier that symbolizes the device accessibility. For example, the chain symbols can be highlighted in green, red or gray symbolizing the device states.

- Green: Communication link is established.
- Red: Communication link is down or the report control block activation failed.

The symbols also have information fields indicating the device name or its type. In addition, all elements are buttons which, when clicked, display a dialog box showing more information about the selected device.
Figure 6: System diagnostic dialog box

Table 1: System diagnostic symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Personal computer</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Server</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Network switch</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>AC500 PLC</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Emax 2 circuit breaker</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>611 series protection and control relay</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>615 series protection and control relay</td>
</tr>
</tbody>
</table>

Table continues on next page
### Symbol Table

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol]</td>
<td>620 series protection and control relay</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>630 series protection and control relay</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>REX640 protection and control relay</td>
</tr>
</tbody>
</table>

### 2.2.3 Plant automation pages

The plant automation page subset hosts the management of the automations available in the plant, for example, automatic network reconfigurations or load shedding but these page contents are not created by the wizard. The design of the plant automation pages is the responsibility of the system integrator. This area is more individual than system diagnostics and, therefore, the library does not contain predefined symbols for this purpose.

### 2.2.4 Reporting pages

#### 2.2.4.1 Real-time trend

The trend page displays current and historical variable data and is permanently updated automatically. If the Trend tab on a bay dialog box is selected, this page is activated with a corresponding filter, which filters and displays the variables of the bay.

When the page is opened via the navigation bar, the trend graph does not have a default filter, but the data to be displayed can be manually selected.
Figure 7: Trend tab

1. Filter buttons
2. Diagram control buttons
3. Diagram
4. Cursor output list
5. Variable information

Table 2: Trend diagram filter buttons

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter profiles</td>
<td>Selects profile from list</td>
</tr>
<tr>
<td>Save</td>
<td>Saves the current setting as a profile</td>
</tr>
<tr>
<td></td>
<td>The name can be a maximum of 31 characters long and must only contain valid</td>
</tr>
<tr>
<td></td>
<td>characters. Prohibited are: ! / : * ? &lt; &gt;</td>
</tr>
<tr>
<td>Import</td>
<td>Imports filter profiles from the export file</td>
</tr>
<tr>
<td>Export</td>
<td>Exports filter profiles in the file</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes the selected profile</td>
</tr>
</tbody>
</table>
Table 3: Trend diagram control buttons

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play</td>
<td>Updates screen</td>
</tr>
<tr>
<td>Stop</td>
<td>Stops screen refreshing</td>
</tr>
<tr>
<td>Refresh search</td>
<td>Refreshes the display</td>
</tr>
<tr>
<td>Zoom</td>
<td>Zooms the display</td>
</tr>
<tr>
<td>Rezoom</td>
<td>Reduces the display</td>
</tr>
<tr>
<td>Zoom -</td>
<td>Reduces the display's time intervals</td>
</tr>
<tr>
<td>Zoom +</td>
<td>Increases the display's time intervals</td>
</tr>
<tr>
<td>Cursor on/off</td>
<td>Queries values</td>
</tr>
<tr>
<td>&lt;&lt;</td>
<td>Scrolls backward on the time axis (history)</td>
</tr>
<tr>
<td>&gt;&gt;</td>
<td>Scrolls forward on the time axis (current)</td>
</tr>
<tr>
<td>Copy to clipboard</td>
<td>Copies representation into the intermediate store</td>
</tr>
<tr>
<td>Diagram</td>
<td>Display of set filter</td>
</tr>
<tr>
<td>Settings</td>
<td>Opens the dialog box for diagram settings and cursor output</td>
</tr>
<tr>
<td>Print</td>
<td>Prints diagram</td>
</tr>
</tbody>
</table>

The diagram pane displays the trend curve and the cursor output list shows the cursor position in the diagram window, the values set in the diagram settings and the cursor output.

Variable information is given as a list of curves that can be edited in Runtime.

- Active
- Color
- Area display
- Fill color
- Curve name
- Sorting order
- Title
- Transparency fill color
- Variable name
- Variable identification
- Y-axis

The extended trend functionality supports free curve settings, linear or logarithmic display, free zooming and scrolling, transparency levels for curve filling, configurable axes, grid display, interpolated display and surface display also for non-equidistant values. Trends can be copied as a vector graphic and printed locally or in the network by means of the print function.

Scrolling in the extended trend provides a ruler and zoom function together with a trend analysis. To analyze important sections very precisely, the trend needs to be stopped and the desired area must be highlighted with two cursors. The values are
automatically calculated in real-time and the results are displayed. Unlike the trend dynamic element, it is possible to zoom, browse, query and scale online and archived values. In addition to a time-controlled display (yt), the extended trend can also support a locus display (xy). As the extended trend can display two-time axes at the same time in a diagram, it is easy to compare different time periods.

### 2.2.4.2 COMTRADE Viewer

The fault recording page offers the possibility to evaluate COMTRADE files in ABB ZEE600.

The control supports IEEE C37.111 IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems standard-compliant files. ASCII or binary files in accordance with the 1999 or 2013 edition can be visualized. Older files or files without a year identification are not supported. A warning dialog box opens when an invalid or unsupported file is selected.

![COMTRADE Viewer WPF control](image)

**Figure 8: Fault recording**

The COMTRADE Viewer WPF control has several possibilities in zenon Runtime.

- Selection of a file in the COMTRADE file format
- Visualization of the selected COMTRADE file
  - Current (sinus wave display)
  - Voltage (sinus wave display)
  - Digital signals (binary bar chart display)
  - Display of values at a selected cursor position
  - If an element that represents neither current nor voltage (such as frequency) is selected, it is visualized in both analog areas again (current and voltage).
- Navigation
• Zooming in and out using the mouse wheel, the scroll bar and multi-touch gestures
• Enlargement and selection of the area by clicking the mouse
• Moving the display area using the right mouse button, the scroll bar or multi-touch gestures
• Export of selected objects as a CSV file

COMTRADE Viewer can be configured in zenon Editor only with a valid Energy Edition license. If there is no valid license, WPF is displayed as unavailable in zenon Editor. A valid Energy Edition license is also required for display in zenon Runtime.

The system supports the operator with automatic disturbance recording files upload from protection relays via IEC 61850 MMS file transfer protocol. An embedded logic in ZEE600 cyclically scans all connected IEDs searching for new available data.

The uploaded files are stored in a specific folder on the local runtime PC. A sub-folder is created automatically for each device. The configuration setup is done via Disturbance Records Wizard in the specific project settings. These files can then be loaded into COMTRADE Viewer.

**2.2.4.3 Report Viewer**

The Reports page displays a project-specific report which can be printed or exported using a configured printer.
2.2.4.4 Energy management

Energy management allows access to the historical data of up to 100 devices with a maximum of four individually configurable measured values. This configuration is done outside the visualization using Historian Energy Consumption Configurator Wizard.

If energy management is called up at runtime via the navigation bar, a dialog box opens in which the device to be displayed must first be selected. After that, another dialog box opens, displaying the available measured values of this device.

Using the selected information, a trend diagram with a corresponding filter is activated. The current day’s display opens by default. Therefore, the day to display must be selected.

The trend diagram support three different time filters: Day, Month and Year. The time filters can be selected using the control bar above the diagram.

Figure 10: Energy management dialog boxes
Figure 11: Energy management diagram

1 General buttons
2 Diagram control buttons
3 Diagram
4 Cursor output list
5 Variable information

Table 4: General energy management diagram buttons

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Only visible in the day view. A parameter dialog box opens in which the upper and lower limits of the Y-axis can be set.</td>
</tr>
<tr>
<td>Export</td>
<td>Exports the displayed values to the zenon export folder in dBase format</td>
</tr>
<tr>
<td>Select device</td>
<td>Opens the dialog box for selecting a new device to be displayed</td>
</tr>
<tr>
<td>Select curve</td>
<td>Opens the dialog box for selecting a new measure value to be displayed</td>
</tr>
<tr>
<td>Day</td>
<td>Scales the diagram axis to show the values of a selected day</td>
</tr>
<tr>
<td>Month</td>
<td>Scales the diagram axis to show the values of a selected month</td>
</tr>
<tr>
<td>Year</td>
<td>Scales the diagram axis to show the values of a selected year</td>
</tr>
</tbody>
</table>
### Table 5: Energy management diagram control buttons

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play</td>
<td>Updates the screen</td>
</tr>
<tr>
<td>Stop</td>
<td>Stops screen refreshing</td>
</tr>
<tr>
<td>Refresh search</td>
<td>Refreshes the screen</td>
</tr>
<tr>
<td>Zoom</td>
<td>Zooms the screen</td>
</tr>
<tr>
<td>Rezoom</td>
<td>Reduces the screen</td>
</tr>
<tr>
<td>Zoom -</td>
<td>Reduces the screen time intervals</td>
</tr>
<tr>
<td>Zoom +</td>
<td>Increases the screen time intervals</td>
</tr>
<tr>
<td>Cursor on/off</td>
<td>Queries values</td>
</tr>
<tr>
<td>&lt;&lt;</td>
<td>Scrolls backward on the time axis (history)</td>
</tr>
<tr>
<td>&gt;&gt;</td>
<td>Scrolls forward on the time axis (current)</td>
</tr>
<tr>
<td>Copy to clipboard</td>
<td>Copies representation into the intermediate store</td>
</tr>
<tr>
<td>Diagram</td>
<td>Displays the set filter</td>
</tr>
<tr>
<td>Settings</td>
<td>Opens the dialog box for diagram settings and cursor output</td>
</tr>
<tr>
<td>Print</td>
<td>Prints the diagram</td>
</tr>
</tbody>
</table>

The diagram pane displays the trend curve and the cursor output list shows the cursor position in the diagram pane, the values set in the diagram settings and the cursor output.

Variable information is given as a list of curves that can be edited in Runtime.

- Active
- Color
- Area display
- Fill color
- Curve name
- Sorting order
- Title
- Transparency fill color
- Variable name
- Variable identification
- Y-axis

### 2.3 Bay dialog box

If a bay has been integrated into the visualization using Object Import Wizard, it is possible to open the device-specific dialog box by selecting the corresponding bay on an SLD page.
This dialog box usually consists of five tabs, which switch on different status and control areas.

Figure 12: Bay dialog box

1. Tabbed pages
2. Description
3. Predefined device-specific alarm texts
4. Alarm list
5. Device type
6. Bay name
7. Bay control field
8. Control permission flags
9. Control buttons
The bay control field shows the status by the line coloring. Controllable elements can be selected if remote control is active. The selected elements are marked by a blue square. The control buttons and the control permission flags are used for issuing opening and closing commands as well as for indicating local/remote use.

The alarm list is bay-specific and has an automatic filter.

2.4 Secure access and operation

![Diagram showing secure access and operation features: Encrypted communication, Security, Patch management, User administration, IEC 62443]

*Figure 13: 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.

![Lightbulb icon] Only an administrator can create new users and unblock or deactivate existing users.
Table 6: User types and rights

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Can carry out actions according to the authorization levels they have been assigned</td>
</tr>
<tr>
<td>Power</td>
<td>Has the same rights as User and can also create and edit users</td>
</tr>
<tr>
<td>Administrator</td>
<td>Has the same rights as Power user and can also carry out other administration tasks such as canceling blocks and resetting passwords</td>
</tr>
</tbody>
</table>

It is possible to configure an automatic time-triggered logout. If there is no user activity for the set timeout duration, the user is logged out.

Audit trail

The audit trail function is used by the chronological event list (CEL). The system logs different actions or events.

- User login and logout
- Commands to, for example, circuit breakers, disconnectors and IEDs
- Automation logic settings and parametrization

To help the operator, specific events can be filtered on a separate dialog box.

Figure 14: ABB ZEE600 audit trail

Antivirus

An antivirus policy is demanded by end customer requirements, according to the project.
Patch management and system updates

Using a specific license contract, software patch management, system updates and system maintenance can be accessed.
Section 3  Operating the system

3.1  Starting up system

1. In Startup Tool, select the zenon version.
   The visualization can also be started in other ways.
   • Open Editor and press F5.
   • Open Editor and click the Start Runtime symbol in the toolbarRuntime files.
   • Click the Start menu in Windows.
   • Use Windows Autostart.
   • Use the service zenStartupMgr.

2. Click the Runtime button.
   Another Runtime start button for the 64-bit version may also be visible.
Figure 15: Starting up the system

1. Version selection
2. Runtime start button

For information on manually stopping the visualization, see Shutting down system.

3.2 Logging in and out

3.2.1 Logging in

1. On the task bar, click the icon.
   This icon is available only if no user is logged in, which is indicated by the message No active user.
2. In the **Login** dialog box, enter the username and password and click **Login**.

![Login symbol in task bar](image1)

*Figure 16: Login symbol in task bar*

After successful login, the username is displayed on the task bar. If the login password is incorrect, a dialog box opens. After entering a wrong password three times or if a non-existing user tries to log in, the user gets locked and can only be unlocked by an administrator.

![Logging in](image2)

*Figure 17: Logging in*

![Notification of incorrect password](image3)

*Figure 18: Notification of incorrect password*
It is possible to operate a large part of the visualization without a registered user. However, some operations require special rights associated with the user account. If the rights of the currently logged in user are not sufficient to perform an action, this is indicated by a yellow symbol of a human silhouette.

**Figure 19: Indication of insufficient user rights**

When the button is clicked, a dialog box opens where a user can log in temporarily. After the action has been completed, the user is automatically logged out. If the rights of the temporarily logged in user are insufficient to perform the action, a dialog box opens.

**Figure 20: Notification of insufficient user rights**

### 3.2.2 Logging out

1. On the task bar, click the ![icon](admin.png) icon.

   **Figure 21: Logout symbol in task bar**

2. In the confirmation window, click **Logout**.
It is possible to configure an automatic time-triggered logout. If there is no user activity for the set timeout duration, the user is logged out.

### 3.2.3 Switching users

It is possible to switch between users directly without logging out the registered user.

1. On the task bar, click the username field.
2. In the **Login** dialog box, enter the username and password and click **Login**.
3.3 Changing language

ABB ZEE600 includes the zenon feature for multi-language support and is developed in the English language.

1. On the task bar, click the language selection button.
2. Select a language code.
   The number of languages in the list depends on the settings made in Template Wizard.
   • English EN
   • Italian IT
   • German DE
   • French FR
   • Russian RU
   • Portuguese PT
   • Chinese ZH

To support IEC, ANSI and IEC 61850 naming, three different language tables are stored for each language. Thus, three different translation texts can be created for each entry in one language.
3.4 Controlling objects

1. On the bay dialog box, select the **MAIN** tab.
2. Select a device in the bay control field.
3. Click `1` or `0` to close or open the device.
4. In the confirmation window, click **Confirm**.

*Figure 24: Confirming the command*

Insufficient user rights are indicated by a yellow symbol in the form of a human silhouette.
3.5 Controlling tap changer

1. On the bay dialog box, select the MAIN tab.
2. Select the tap changer in the bay control field.
3. Click \textdownarrow or \textup to move the tap changer up or down.
4. Confirm the operation in the confirmation window.

3.6 Viewing measurements

- On the bay dialog box, select the MEASURE tab. The appearance of the MEASURE tab can vary from bay to bay, depending on the base configuration selected in Object Import Wizard as well as the imported variables. Only status displays matching the device are displayed.
3.7 Opening trends

- On the bay dialog box, select the TRENDS tab. The bay-specific chart values page opens. The values to be set here have to be defined in Object Import Wizard.
Figure 29: Opening bay-specific trends

For more information, see the Energy management chapter in this manual.

3.8 Opening notes

Each bay dialog box has a notebook, which can be edited during runtime.

1. On the bay dialog box, click the NOTES tab.
2. Edit the notes.
3. Click Save.
3.9 Accessing Web HMI

The WHMI window is the Web-based user interface integrated in the device. The design is the responsibility of the device manufacturer and is not part of the library presented here.

- On the bay dialog box, click the **WEB-HMI** tab.
3.10 Alarm and event handling

Alarm administration informs the operator of abnormal situations or faults, such as limit value violations and protection trips, in the electrical power network or equipment.

- The alarm status line is always shown in the foreground in zenon Runtime and typically it can be used to display the most recent or oldest unacknowledged alarm.
- Alarm message list administers alarms in a list in zenon Runtime.
  - Displays alarms and their causes in an unfiltered or filtered list
  - Enables localization of the alarm cause
  - Enables alarm acknowledgement
  - Enables alarm deletion
  - Enables alarm printing and saving

For quick error diagnosis and traceability, there are three different operating areas in the visualization.

- Navigation alarm list
- Active and historical alarm lists
- Chronological event list
3.10.1 Acknowledging alarms via navigation bar

On the navigation bar, there is an indicator for the last error that occurred and a bell symbol indicating the number of existing error messages in a red circle. There is also a volume symbol on the bar if the siren management is active in the project.

1. On the navigation bar, click the button to deactivate the possible alarm sound triggered by the new alarm and click the button to open the alarm list. The alarm list contains several alarm texts depending on how many active alarms are pending and the length of each alarm text. The different icons by each message represent the status of the alarm.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔄</td>
<td>Alarm received</td>
</tr>
<tr>
<td>🔄</td>
<td>Alarm cleared</td>
</tr>
<tr>
<td>🔄</td>
<td>Alarm acknowledged</td>
</tr>
</tbody>
</table>

Table 7: Alarm status icons

Figure 32: Opening the alarm list

2. In the alarm list, click **Acknowledge all** to clear all alarms or **Open** to open the active alarms list, which provides more information about each fault.

The active alarms list can also be accessed via the vertical menu.

Figure 33: Clearing alarms or opening the active alarms list
3.10.2 Acknowledging alarms via vertical menu

The active alarm page contains detailed information on all pending errors. The appearance of the alarm list is configurable. It is possible to filter the alarms and also print the filtered alarm list.

![Image: Viewing active alarms]

Click **Historical Alarms** on the vertical menu to access historical faults.

1. On the vertical menu, click **Active Alarms** to open the alarm list.

![Table: Alarm status colors]

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#DD4814 (red)</td>
<td>Alarm received</td>
</tr>
<tr>
<td>#96BD33 (green)</td>
<td>Alarm cleared</td>
</tr>
<tr>
<td>#3D6894 (blue)</td>
<td>Alarm acknowledged</td>
</tr>
</tbody>
</table>

Figure 34: Viewing active alarms

The total number of alarms and the number of unacknowledged alarms are displayed on the right side of the alarm list. The alarm states in the list are symbolized by icons and different colors on the columns Time received, Time cleared and Time acknowledged.

2. Filter the alarms, if necessary.
   - Click **Filter** to open the filter dialog box to define new filter settings (variables, time, text, alarm/event groups/classes, alarm areas and minimum time active).
   - In the **Filter Profile** list, select a filter to be applied.
   - In the **Filter Profile** text box, type a name and click **Save** to save the current settings as a filter profile.
The filter profile name can be a maximum of 31 characters long and must only contain valid characters. The prohibited characters are: ! \ : * ? < > | "

- Click Import to import filter profiles from export file.
- Click Export to export filter profiles in the file.
- Click Delete to delete the selected filter profile.

3. Acknowledge the alarms in one of the alternative ways.
   - Select alarm rows and click Acknowledge to acknowledge the alarm messages in Runtime.
   - Click Acknowledge page to acknowledge all alarms displayed on the current page.
   - Click Acknowledge all to acknowledge all alarms fulfilling the current filter criteria.

A comment about the selected alarm can be typed in the Comment field. The maximum length of the text is 79 characters.

The Alarm function field displays the function allocated to the alarm message in the output field. The functions configured for the alarm in Runtime are executed by clicking Execute function.

Click Stop to prevent new elements from being automatically added to the alarm list.

3.10.2.1 Defining new alarm filters

The filter dialog box has several settings that allow the alarm list to be filtered.

1. In the Alarm List, click Filter to open the filter dialog box.
Figure 35: Opening the filter dialog box

2. Under **Variable filter**, define filter settings on the variable level.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable name</td>
<td>Filters by variable name</td>
</tr>
<tr>
<td>Identification</td>
<td>Filters by variable identification</td>
</tr>
<tr>
<td>Case sensitivity</td>
<td>Capitalization must be noted</td>
</tr>
<tr>
<td>Show list without refresh</td>
<td>Alarm list does not refresh</td>
</tr>
<tr>
<td>Non-acknowledged alarms only</td>
<td>Displays only unacknowledged alarms</td>
</tr>
<tr>
<td>Current alarms only</td>
<td>Displays current alarms only</td>
</tr>
<tr>
<td>Only cleared alarms</td>
<td>Displays cleared alarms only</td>
</tr>
<tr>
<td>Comment required</td>
<td>Displays only alarms that require a comment when acknowledged</td>
</tr>
<tr>
<td>Ring buffer</td>
<td>Data comes from the ring buffer</td>
</tr>
<tr>
<td>Historic data</td>
<td>Data comes from an archive</td>
</tr>
<tr>
<td>Maximum number</td>
<td>Maximum number of historical alarms to be displayed 0: displays all</td>
</tr>
</tbody>
</table>

3. Under **Text filter**, define the text filter properties.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No text filter</td>
<td>Does not select text filter</td>
</tr>
<tr>
<td>Search for (word separated by space)</td>
<td>Activates the search</td>
</tr>
<tr>
<td>Search text</td>
<td>Field for input of search term</td>
</tr>
</tbody>
</table>

Table continues on next page
### Table 11: Time filter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case sensitivity</td>
<td>Capitalization must be noted.</td>
</tr>
<tr>
<td>Words do not need to appear in full within the text</td>
<td>Fragments can also be searched for.</td>
</tr>
<tr>
<td>At least one word has to appear in the text</td>
<td>At least one search term from several must be in the result.</td>
</tr>
<tr>
<td>All words must be in the text</td>
<td>All search terms must be included in the result.</td>
</tr>
<tr>
<td>Filter string must exactly be in the text</td>
<td>Exact text from the input field must be contained in the result.</td>
</tr>
</tbody>
</table>

4. Under **Time filter**, define the time filter properties.

### Table 12: Alarm/event groups/classes, alarm areas

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm/Event Groups</td>
<td>Displays alarms or events of the same group</td>
</tr>
<tr>
<td>Alarm/event classes</td>
<td>Displays alarms or events of the same class</td>
</tr>
<tr>
<td>Alarm areas</td>
<td>List field for grouped display: Alarm areas</td>
</tr>
<tr>
<td></td>
<td>If the property Use hierarchical alarming of the Equipment Model is activated, the Alarm area column is empty. The check box is in the alarm handling item of the variable properties.</td>
</tr>
</tbody>
</table>

5. Under **alarm/event groups/classes, alarms areas**, define how alarms are grouped and classified.

### Table 13: Minimum time active filter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Displays only alarms that have been current for at least the given number of days</td>
</tr>
<tr>
<td>Hour</td>
<td>Displays only alarms that have been current for at least the given number of hours</td>
</tr>
<tr>
<td>Minute</td>
<td>Displays only alarms that have been current for at least the given number of minutes</td>
</tr>
<tr>
<td>Second</td>
<td>Displays only alarms that have been current for at least the given number of seconds</td>
</tr>
<tr>
<td>Millisecond</td>
<td>Displays only alarms that have been current for at least the given number of milliseconds</td>
</tr>
</tbody>
</table>

6. Under **Minimum time active**, define how recent alarms are displayed.

7. Use the control buttons to manage the selected settings.
3.10.3 Opening chronological event list

The chronological event list keeps an automatic 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 in the language in which zenon Runtime runs.

- Alarm acknowledgments
- Alarm deletion
- Setting values
- Recipe sending
- Recipe change
- Data archival
- User actions
- Network actions

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.

The event list display can be adapted or filtered for contextual analysis and reports (for example, bay or substation level) without the need for additional programming. It is possible to filter the events and also print the filtered event list.

1. On the vertical menu, click CEL to open the chronological event list.
Figure 36: Viewing events

The total number of alarms is displayed on the right side of the chronological event list.

2. Filter the events, if necessary.
   - Click **Filter** to open the filter dialog box to define new filter settings (variables, time, text, alarm/event groups/classes, alarm areas and minimum time active).
   - In the **Filter Profile** list, select a filter to be applied.
   - In **Filter Profile** text box, type a name and click **Save** to save the current settings as a filter profile.

The filter profile name can be a maximum of 31 characters long and must only contain valid characters. The prohibited characters are: ! / : * ? < > | "

- Click **Import** to import filter profiles from an export file.
- Click **Export** to export filter profiles in a file.
- Click **Delete** to delete the selected filter profile.

A comment about the selected event can be typed in the Comment field. The maximum length of the text is 79 characters.

Click **Stop** to prevent new elements from being automatically added to the event list.

Click **Custom record** to create an event without text to be used for inserting an empty record for custom user comments.
3.10.3.1 Defining new event filters

The filter dialog box has several settings that allow the event list to be filtered.

1. In **Chronological Event List**, click **Filter** to open the filter dialog box.

   ![Opening the filter dialog box](Figure 37)

2. Under **Variable filter**, define filter settings on the variable level.

   **Table 14: Variable filter**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable name</td>
<td>Filters by variable name</td>
</tr>
<tr>
<td>Identification</td>
<td>Filters by variable identification</td>
</tr>
<tr>
<td>Case sensitivity</td>
<td>Capitalization must be noted.</td>
</tr>
<tr>
<td>Show list without refresh</td>
<td>Event list does not refresh.</td>
</tr>
<tr>
<td>Non-acknowledged alarms only</td>
<td>Displays only unacknowledged alarms</td>
</tr>
<tr>
<td>Current alarms only</td>
<td>Displays current alarms</td>
</tr>
<tr>
<td>Only cleared alarms</td>
<td>Displays cleared alarms only</td>
</tr>
<tr>
<td>Comment required</td>
<td>Displays only alarms that require a comment when acknowledged</td>
</tr>
<tr>
<td>Ring buffer</td>
<td>Data comes from the ring buffer</td>
</tr>
<tr>
<td>Historic data</td>
<td>Data comes from an archive</td>
</tr>
<tr>
<td>Maximum number</td>
<td>Maximum number of historical alarms to be displayed</td>
</tr>
</tbody>
</table>

3. Under **Text filter**, define the text filter properties.
Table 15: Text filter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No text filter</td>
<td>Does not select text filter</td>
</tr>
<tr>
<td>Search for (word separated by space)</td>
<td>Activates the search</td>
</tr>
<tr>
<td>Search text</td>
<td>Field for input of search term</td>
</tr>
<tr>
<td>Case sensitivity</td>
<td>Capitalization must be noted.</td>
</tr>
<tr>
<td>Words do not need to appear in full within the text</td>
<td>Fragments can also be searched for.</td>
</tr>
<tr>
<td>At least one word has to appear in the text</td>
<td>At least one search term from several must be in the result.</td>
</tr>
<tr>
<td>All words must be in the text</td>
<td>All search terms must be included in the result.</td>
</tr>
<tr>
<td>Filter string must exactly be in the text</td>
<td>Exact text from the input field must be contained in the result.</td>
</tr>
</tbody>
</table>

4. Under **Time filter**, define the time filter properties.

Table 16: Time filter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter type</td>
<td>Dynamic text element for the display of the set filter type</td>
</tr>
<tr>
<td>Current time</td>
<td>Shows the current system time</td>
</tr>
<tr>
<td>From day/ hour/minute/second</td>
<td>Fields and labeling for stating &quot;from&quot; time</td>
</tr>
<tr>
<td>Until day/ hour/minute/second</td>
<td>Fields and labeling for stating &quot;to&quot; time</td>
</tr>
</tbody>
</table>

5. Under **alarm/event groups/classes, alarm areas**, define how alarms are grouped and classified.

Table 17: Alarm/event groups/classes, alarm areas

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm/Event Groups</td>
<td>Displays alarms or events of the same group</td>
</tr>
<tr>
<td>Alarm/event classes</td>
<td>Displays alarms or events of the same class</td>
</tr>
<tr>
<td>Alarm areas</td>
<td>List field for grouped display: Alarm areas If the property Use hierarchical alarming of the Equipment Model is activated, the Alarm area column is empty. The check box is in the alarm handling item of the variable properties.</td>
</tr>
</tbody>
</table>

6. Under **Minimum time active**, define how recent events are displayed.
Table 18: Minimum time active filter

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Displays only alarms that have been current for at least the given number of days</td>
</tr>
<tr>
<td>Hour</td>
<td>Displays only alarms that have been current for at least the given number of hours</td>
</tr>
<tr>
<td>Minute</td>
<td>Displays only alarms that have been current for at least the given number of minutes</td>
</tr>
<tr>
<td>Second</td>
<td>Displays only alarms that have been current for at least the given number of seconds</td>
</tr>
<tr>
<td>Millisecond</td>
<td>Displays only alarms that have been current for at least the given number of milliseconds</td>
</tr>
</tbody>
</table>

7. Use the control buttons to manage the selected settings.
   - Click **Ok** to apply the filter settings and close the dialog box.
   - Click **Apply** to accept the filter settings.
   - Click **Cancel** to cancel the configuration of the filter settings.
   - Click **Refresh** to update the filtered display.

### 3.11 Printing screen contents

1. In the vertical menu, click **Print Screen**.
   The vertical menu closes and a screenshot of the visualization is sent to the preconfigured printer.
2. Click **Ok**.

![Print Screen dialog box](Figure 38: Print Screen dialog box)
3.12 Activating siren

If siren management is activated, each new incoming alarm is indicated with a warning sound that must be muted using the volume symbol on the task bar. If the warning sound is not required, siren management can be deactivated.

1. On the main screen, select Utilities from the vertical menu.
2. Under Siren management, click Active.

3.13 Managing users

3.13.1 Editing users

An administrator can edit or delete existing users and create new users.

Exercise caution when deleting users. If all users with rights to operate the visualization are deleted, it is no longer possible to fully operate the system.

1. On the main screen, select Utilities from the vertical menu.
2. Under User management, click Edit user.
   A list of all users is shown.

3. Edit, create or delete users.
4. Under User, define the user details.

4.1. In the User name box, use a maximum of 20 characters to enter a unique user name that is used for logging in to the system. If the user already exists, an error message appears.

4.2. In the Complete name box, enter the user's full name.

4.3. In the User type list, define the user right level.

- User
- Power user
- Administrator

4.4. Select the Active check box if the user should be active and able to log in to the system.

4.5. Clear the Locked check box if the user has been locked in Runtime and is unable to log in to the system, for example, after three failed login attempts.

4.6. In the Login profile list, select the login profile for the filter settings.

5. Under Change password, manage the passwords.

5.1. In the Old password box, enter the old password to be able to change the existing password. This is only used if the user wants to change the password. If an administrator changes this password, the user needs to change the password at first login.

5.2. In the New password box, enter the new password for the user.

5.3. In the Confirm password box, enter the new password again.

6. Under User Groups, click or to select or remove the user's user groups.
The user level can be edited for each group.

7. Under **Message Control**, activate the user for message control services. With message control, alarms and information messages can be automatically sent and acknowledged via selected means. 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 enables secure access to current power network data anytime and anywhere making it easier to respond quickly to faults or incidents.

7.1. Select the **User** check box if the user is used by the module Message Control.

7.2. In the **Telephone** box, enter the number of the user's voice-compatible telephone device. This number is used for text to speech.

Use numbers only in addition to the permitted characters. The prefix + can be used as an abbreviation for 00 of the international area code and the following separators are permitted in AD user administration: minus (-), slash (/) and space. In the communication between AD and Message Control, separators are ignored as soon as the data from the AD is mapped to a zenon object.

7.3. In the **Cell phone** box, enter the user's cell phone number. This number is used for messages via GSM and SMS (text messages).

Use numbers only in addition to the permitted characters. The prefix + can be used as an abbreviation for 00 of the international area code and the following separators are permitted in AD user administration: minus (-), slash (/) and space. In the communication between AD and Message Control, separators are ignored as soon as the data from the AD is mapped to a zenon object.

7.4. In the **Mail** box, enter the user's e-mail address.

7.5. Click ![ ] by the **Substitute person** box, to select a substitute person if the user is not reached or they do not accept the message. Only users who have been activated as Message Control users are available for selection.

7.6. In the **PIN code** box, enter a four-digit PIN code (0000...9999) that the user must use to confirm the receipt of the message.

7.7. In the **NA code** box, enter a four-digit PIN code (0000...9999) that the user must use to reject the receipt of the message (not available). After rejection, the message is sent to the next user in the list. If there is no other user entered in the list, the message is entered as "not successfully acknowledged". The function assigned to this is executed. In addition, a "rejected by" CEL entry is created in each case.

8. Click **Ok**.
### Table 19: Predefined users

<table>
<thead>
<tr>
<th>Full name</th>
<th>Login name</th>
<th>Default password</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>admin</td>
<td>abadmin</td>
<td>Administrators</td>
</tr>
<tr>
<td>Engineer</td>
<td>engineer</td>
<td>engineer</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Operator</td>
<td>operator</td>
<td>operator</td>
<td>Operators</td>
</tr>
</tbody>
</table>

#### 3.13.2 Editing groups

Existing user groups can be edited or deleted. It is also possible to create new user groups with their own authorization levels. All user groups automatically have the authorization level “0”.

Exercise caution when deleting user groups. The visualization may no longer be fully operated if user groups are deleted.

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **User management**, click **Edit groups**. The **Edit Groups** dialog box opens.
3. Edit, create or delete user groups.
   - Under **User Groups**, select a user group. Under **Authorization levels**, click ⬆️ or ⬇️ to grant or remove the selected authorization levels.
   - Under **Properties**, click **New group** to create a new user group, enter the user name and click **Ok**.
   - Under **User Groups**, select a user group and click **Delete group** to delete it.
Table 20: Authorization levels for predefined user groups

<table>
<thead>
<tr>
<th>Authorization level</th>
<th>Administrators</th>
<th>Maintenance</th>
<th>Operators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page navigation</td>
<td>No login</td>
<td>No login</td>
<td>No login</td>
<td></td>
</tr>
<tr>
<td>Alarm Acknowledge</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>Allowed to acknowledge alarms</td>
</tr>
<tr>
<td>CB commands</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>Allowed to send commands to the IEC device, open and close circuit breakers and send remote reset</td>
</tr>
<tr>
<td>Logic or Parameter settings</td>
<td>x</td>
<td>x</td>
<td>-</td>
<td>Authorization depends on the specific project settings.</td>
</tr>
<tr>
<td>System shutdown</td>
<td>x</td>
<td>-</td>
<td>-</td>
<td>Allowed to deactivate Runtime</td>
</tr>
</tbody>
</table>

3.13.3 Viewing user list

The user list provides an overview of all existing users in the current system. Unlike the list under Edit user, there are no user controls available under User list.

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **User management**, click **User list**.
3.14 Configuring printers

The printer setup can be used to configure different printers for each category.

Always monitor the printing process because ABB zenon does not notify if a print job has started successfully or if a printer has been configured.

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **Printer setup**, click **Select printer**.
3. In the **Printer** dialog box, select the printer option from the drop-down list or click ![Printer icon] to locate the printer.
   - for online printing AML or CEL
   - for offline printing AML or CEL
   - Values and protocols for output
   - for screen shots
   - for notepad

![Printer dialog box]

*Figure 42: Selecting the printers*

4. Click **OK**.
3.15 Configuring bay properties

The selected properties of the devices created in the project can be changed dynamically in bay management.

1. On the main screen, select Utilities from the vertical menu.
2. Under Bay management, make the selection based on the bay’s voltage level.
   - up to 45 kV
   - over 45 kV
3. In the Bay list, select the device.
   Bays are presorted according to their electrical voltages.
4. Edit the bay properties.
   - Tag
   - Description
   - Switchboard

![Editing the bay properties](image)

Figure 43: Editing the bay properties

### Table 21: Voltage levels

<table>
<thead>
<tr>
<th>Voltage level</th>
<th>Letter</th>
<th>ZEE bay management index</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;420 kV</td>
<td>B</td>
<td>12</td>
</tr>
<tr>
<td>380...420 kV</td>
<td>C</td>
<td>11</td>
</tr>
<tr>
<td>220...380 kV</td>
<td>D</td>
<td>10</td>
</tr>
<tr>
<td>110...220 kV</td>
<td>E</td>
<td>9</td>
</tr>
<tr>
<td>60...110 kV</td>
<td>F</td>
<td>8</td>
</tr>
<tr>
<td>45...60 kV</td>
<td>G</td>
<td>7</td>
</tr>
<tr>
<td>30...45 kV</td>
<td>H</td>
<td>6</td>
</tr>
</tbody>
</table>

Table continues on next page
### 3.16 Changing theme

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **Theme**, select the internal color palette.
   - **Dark**
   - **Light**

![Figure 44: Selecting the dark theme](image)

The selected theme affects all screens.

### 3.17 Selecting electrical symbol standard

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **Electrical Symbol Standard**, select the electrical symbol standard that defines the appearance of the bay configurations.
   - **IEC**
   - **ANSI**
Figure 45: Selecting the ANSI standard
3.18 Selecting electrical symbol alarms and text

1. On the main screen, select Utilities from the vertical menu.
2. Under Electrical alarms/text Standard, select the norm that applies to the special device messages which have to follow a specific sentence structure.
   - IEC61850
   - IEC
   - ANSI

3.19 Managing variables

In variable diagnosis, variables created in the project can be added to the displayed table to view their actual values. The actual values of these variables can also be manipulated.

⚠️ The manipulation of variables can lead to unpredictable malfunction of the connected devices and affect the usability and functionality of
the visualization. Only experienced users should use the variable
diagnosis option.

The display of counter values of the variable list can be controlled. Switching of the
value display resets the column width back to the default. For example, manually
widened columns become wider as a result. In the variable lists, the following content
is visualized in counter values and can be switched using the value display.

- Actual value
- Set value
- Minimum
- Maximum
- Actual value (raw data)

Figure 47: Variable diagnosis with selected variables

1. On the main screen, select Utilities from the vertical menu.
2. Under Variable diagnosis, click open screen.
3. Manage the variable list.
- Sort and filter the cells in Runtime.
- Save the filtering and sorting in the filter profiles.
- Hold down the right mouse button to change the column width.
- Drag columns to rearrange them.

4. Manage filters.
   - In the **Filter Profile** list, select a filter to be applied.
   - In the **Filter Profile** text box, type a name and click **Save** to save the current settings as a filter profile.

   The filter profile name can be a maximum of 31 characters long and must only contain valid characters. The prohibited characters are: ! / : * ? < > |

   - Click **Import** to import filter profiles from export file.
   - Click **Export** to export filter profiles in the file.
   - Click **Delete** to delete the selected filter profile.

5. Under **Variables**, add or remove variables.
   - Click **Add** to add a variable to the variable list in Runtime.
   - Click **Release** to remove a variable from the variable list in Runtime.

6. Under **Actual value**, manage the updating of current variable values.
   - Click **Refresh on** to switch on automatic updating of current variable values.
   - Click **Refresh off** to switch off automatic updating of current variable values.
   - Click **Refresh now** to update the current values of the variables.

7. Under **Write set value**, select which set values are written to the hardware.
   - **All variables**
   - **Selected variables**

8. Under **View**, select the variable list value format.
   - **Decimal**
   - **Hexadecimal**
   - **Binary**
   - **Octal**
   - **Exponential**
### Table 22: Variable list columns

<table>
<thead>
<tr>
<th>Column</th>
<th>Visibility in Runtime</th>
<th>Unit</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Name of the variable</td>
<td>This corresponds to the Name property in zenon Editor.</td>
</tr>
<tr>
<td>Identification&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Identification of the variable</td>
<td>This corresponds to the Identification property in zenon Editor.</td>
</tr>
<tr>
<td>Actual value&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Current value of the variable</td>
<td>Updated with the Updating on or Update now buttons.</td>
</tr>
<tr>
<td>Set value</td>
<td>Yes</td>
<td></td>
<td>Set value of the variable</td>
<td></td>
</tr>
<tr>
<td>Measuring unit&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Measuring unit of the variables</td>
<td>This corresponds to the Measuring unit property in zenon Editor.</td>
</tr>
<tr>
<td>Minimum&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Minimum signal range of the variables in the PLC</td>
<td>This corresponds to the Signal range min. property in zenon Editor.</td>
</tr>
<tr>
<td>Maximum&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Maximum signal range of the variables in the PLC</td>
<td>This corresponds to the Signal range max. property in zenon Editor.</td>
</tr>
<tr>
<td>Status&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Yes</td>
<td></td>
<td>Current status of the variable in plain text display</td>
<td></td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>Column</th>
<th>Visibility in Runtime</th>
<th>Unit</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td></td>
<td></td>
<td>Current time stamp of the variable</td>
<td>If a value has the status T_EXTERN and not T_INVAL, the value of the external time stamp is used as the time stamp. The external time stamp is the time value that the controller has provided together with the value at the driver. If a value has the status T_INTERN or has T_EXTERN and T_INVAL, the value of the internal time stamp is used as the time stamp. The internal time stamp is the time point at which the driver has received the value from the controller.</td>
</tr>
<tr>
<td>Display with precision in seconds(^1)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timestamp internal (UTC)(^1)</td>
<td>Yes</td>
<td>ms</td>
<td>Current internal time stamp of the variable in UTC time</td>
<td></td>
</tr>
<tr>
<td>Timestamp external (UTC)(^1)</td>
<td>Yes</td>
<td>ms</td>
<td>Current external time stamp of the variable in UTC time</td>
<td></td>
</tr>
<tr>
<td>Symbolic address(^1)</td>
<td>Yes</td>
<td></td>
<td>Symbolic address of the variable</td>
<td>This corresponds to the Symbolic address property in zenon Editor. Empty, if not present</td>
</tr>
<tr>
<td>Address(^1)</td>
<td>Yes</td>
<td></td>
<td>Address of the variable</td>
<td>This corresponds to the Addressing property group in zenon Editor.</td>
</tr>
<tr>
<td>Actual value (raw data)(^1)</td>
<td>No</td>
<td></td>
<td>Raw data of the variable's actual value</td>
<td>This value corresponds to the actual value of the variable before the value adjustment.</td>
</tr>
</tbody>
</table>

Table continues on next page
### Column Visibility in Runtime Unit Description Note

<table>
<thead>
<tr>
<th>Status (binary) 1)</th>
<th>No</th>
<th></th>
<th>Status of variable</th>
<th>Display format: shows the complete 64-bit status register in binary form. This display is always binary, regardless of the selected value display in the display options.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp external (local) 1)</td>
<td>No</td>
<td>ms</td>
<td>Current external time stamp of the variable in local time</td>
<td>Unavailable if there is no external time stamp</td>
</tr>
<tr>
<td>Timestamp internal (local) 1)</td>
<td>No</td>
<td>ms</td>
<td>Internal time stamp of the variable in local time</td>
<td></td>
</tr>
</tbody>
</table>

1) Cannot be changed in Runtime

### 3.20 Creating backups

ABB zenon Editor has its own node in the project tree for making project backups. These can be found at the bottom of the project tree.

1. In the project manager, right-click the **Project backups** node and select **Create backup**.
2. In the backup dialog box, enter the name and the description. The saved project backups are displayed and administered in the detail view.

### 3.21 Restoring backups

1. In the project manager, click the **Project backups** node.
2. In the detail list, select the backup.
3. Restore the backup in one of the alternative ways.
   - Right-click the backup and select **Restore backup**.
   - Click the **Restore backup as new project** icon.
3.22 Shutting down system

1. On the main screen, select **Utilities** from the vertical menu.
2. Under **Shutdown**, click **Shutdown zenon** to manually stop the visualization.
3. On the **System shutdown** dialog box, click **Ok** to confirm the action.

![System shutdown dialog box](Image)

*Figure 48: Confirming the system shutdown*
Section 4  Glossary

611 series  Series of numerical protection and control relays for low-end protection and supervision applications of utility substations, and industrial switchgear and equipment

615 series  Series of numerical protection and control relays for protection and supervision applications of utility substations, and industrial switchgear and equipment

620 series  Series of numerical protection and control relays for high-end protection and supervision applications of utility substations, and industrial switchgear and equipment

AD  Active directory

AML  Alarm message list

ANSI  American National Standards Institute

CEL  Chronological event list

COMTRADE  Common format for transient data exchange for power systems. Defined by the IEEE Standard.

COTS  Commercial off-the-shelf

CSV  Comma-separated values

ECS  Electrification control system

Ethernet  A standard for connecting a family of frame-based computer networking technologies into a LAN

HMI  Human-machine interface

IEC  International Electrotechnical Commission

IEC 61850  International standard for substation communication and modeling

IEEE  Institute of Electrical and Electronics Engineers, Inc.

PLC  Programmable logic controller

RTU  Remote terminal unit

SCADA  Supervision, control and data acquisition

SLD  Single-line diagram

UTC  Coordinated universal time

WHMI  Web human-machine interface