



**zenon**  
by COPA-DATA

# Getting Started

BESS SCADA Application Set

Version: zenon 14

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# Getting Started:

## BESS SCADA Application Set

This document shall guide you through the essential steps to deploy and use the items contained within the BESS SCADA Application Set in zenon. You will find step-by-step instructions to install, explore and engineer using this Application Set. Moreover, some background hints are given about the main concepts of the solution.

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## Download & Installation

Download and install the Application Set. Once the setup has finalized, the BESS SCADA Application Demo project will be automatically set as the startup project. The demo project can be launched by starting the zenon Service Engine via the zenon startup tool.

### Automatic Setup

The file you have received with the download of this application set represents an automatic installation package. By double clicking the file in your File-Explorer, you can start the automatic deployment.

This setup will prepare your zenon Editor Workspace with all the necessary resources. After the setup has finished, you are ready to start using the projects in the workspace.

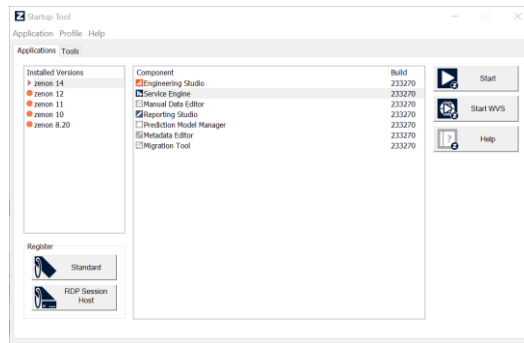


FIGURE: START ZENON RUNTIME FROM STARTUP TOOL

### Prerequisites

This Application Set requires you to use zenon Editor Version 14.

It is recommended to use a fully licensed zenon Editor or an evaluation license. Feel free to [contact your local COPA-DATA Sales branch](#) to provide an evaluation license for you.

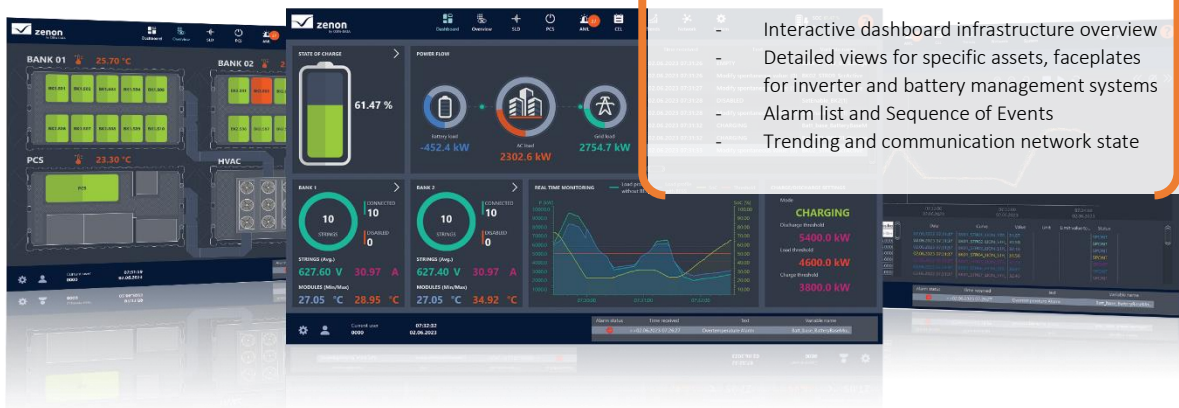
## Application Demo

The “BESS SCADA Application Demo” project provides a preview of a typical utility scale BESS O&M (Operations and Monitoring) application. The “Dashboard” screen is opened after launching the Runtime. It provides an overview of a simulated BESS infrastructure. The user can navigate through the project via the menu bar at the top of the screen.

An interactive dashboards screen provides a quick overview about the most important assets, such as battery management systems (BMS), power conversion systems (PCS) as well as real-time and historic generation values and alarms. Other screens contain examples of trending, event reporting, analysis and communication network monitoring.

The **Application Demo** gives you a quick overview of the functionality which you can easily reach by the use of this Application Set. Process functions in the sample plant are simulated. Take a tour in this simulated runtime environment, and check out features such as:

- Interactive dashboard infrastructure overview
- Detailed views for specific assets, faceplates for inverter and battery management systems
- Alarm list and Sequence of Events
- Trending and communication network state



# Creating a custom application

Begin creating your own custom solutions by activating the “BESS SCADA Template Project” in the zenon Editor. The Template project contains multiple preconfigured areas, which form the basis of a customizable application. A fully functional navigation bar, as well as screens for Alarming, Events and Trending are available.

*Note: Removing or modifying predefined components (Frames, Functions, Color Palettes, Fonts etc.) of the project could cause certain features to not behave as expected.*

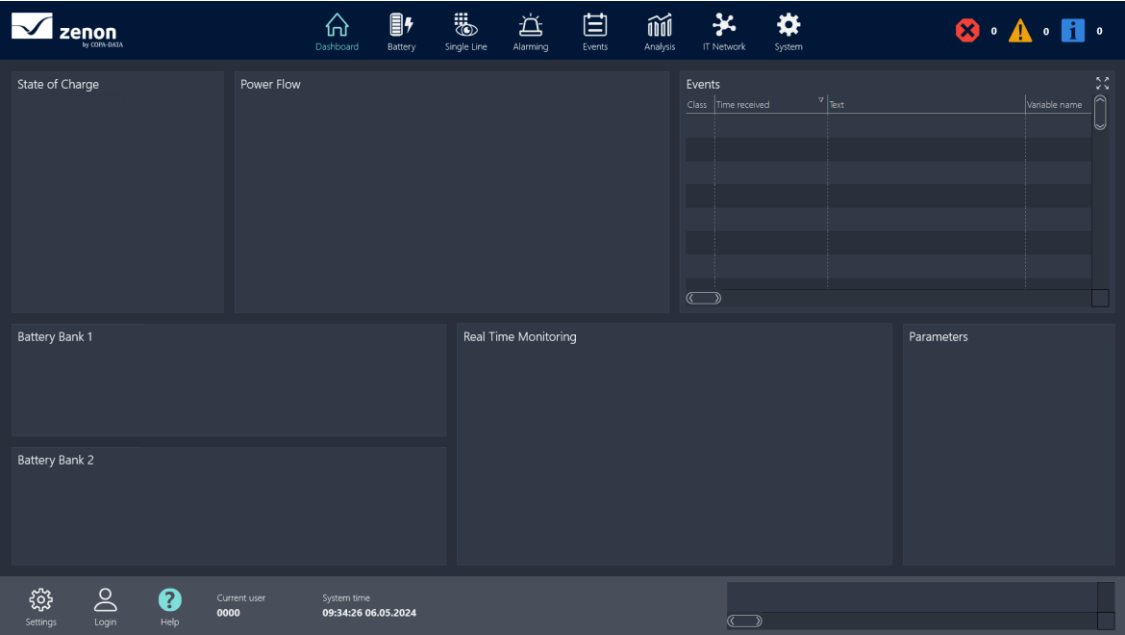


FIGURE: APPLICATION TEMPLATE – DASHBOARD SCREEN WITH PRE-ARRANGED SECTIONS

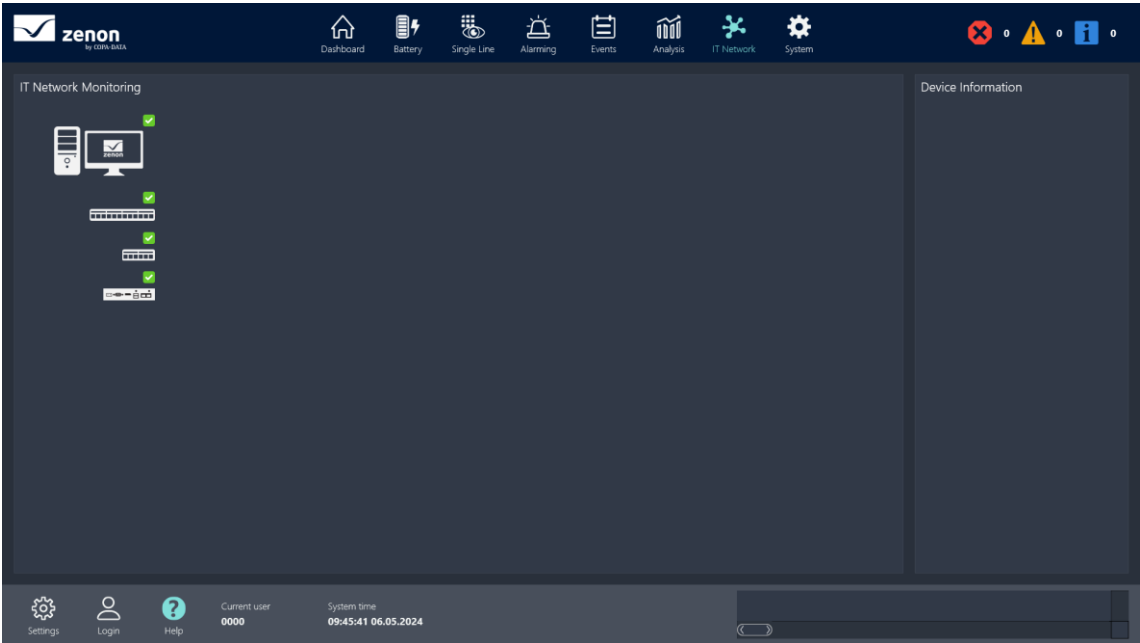


FIGURE: APPLICATION TEMPLATE – IT NETWORK OVERVIEW

## BESS components 'out of the box'

Battery Management Systems, Inverters and Switching Equipment ...out of the box, with Smart Objects!

The template project includes some predefined Smart Object Templates. To begin working with the Smart Objects, select "Create new instance" in the "Smart Objects" module in the project tree. A list of available Smart Object Templates is displayed. To assist with selecting the correct Smart Object Template, a description is available in the dialog. Select a specific Smart Object Template, define a name, and click "Create".

Creating an instance of a Smart Object Template, will create all associated functionality in the project automatically. (Variables, drivers, screens, functions etc.). The name defined in the Smart Object instance is used as a prefix for all created objects.

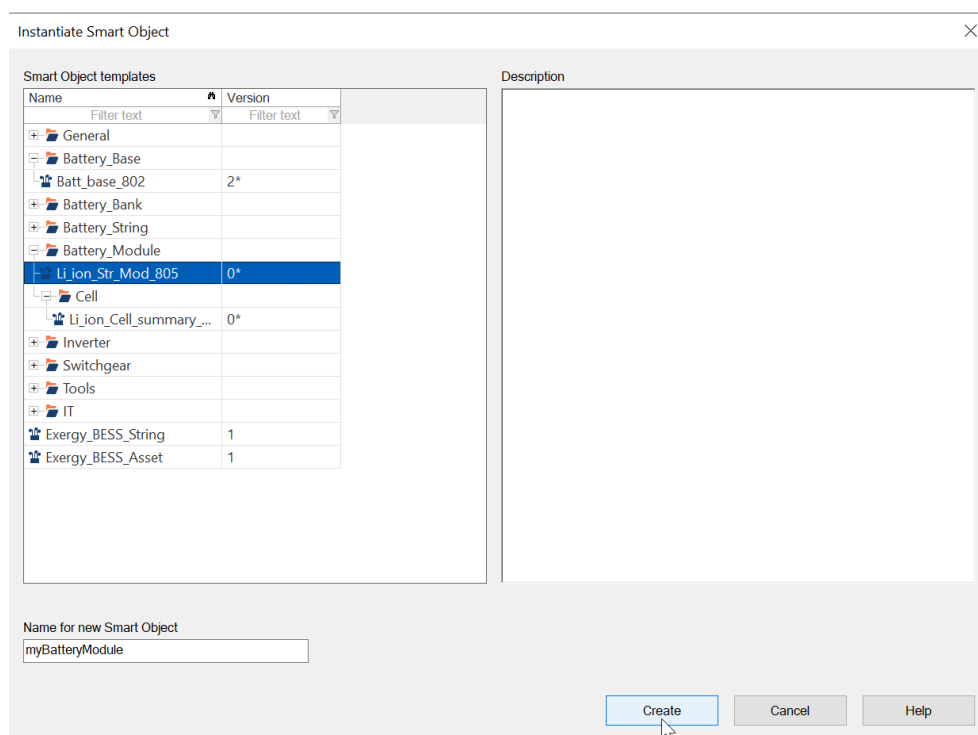


FIGURE: CREATE YOUR ASSET FROM A LIST OF SMART OBJECT TEMPLATES

Asset templates, such as battery management systems, inverters, string combiner boxes, metrology stations or pyranometers have been prepared in accordance with the SunSpec standard and based on the MODBUS protocol.



## Connecting to the right variables

Once instantiated, the predefined Smart Object variables can be mapped to specific project variables of your choice using the Variable mapping dialog which automatically opens.

### Variable Mapping Dialog

The screenshot shows the 'Variable mapping: Project -> Smart Object' dialog. It is divided into several sections:

- Project variables:** A list of variables from the project, such as 'CD\_132KV\_SSCOPA\_PEKING\_Breaker\_Position(S2B)'. An arrow labeled 'Drag and Drop' points from this list to the mapping table.
- Smart Object variable name:** A field for the variable name from the Smart Object template, with an example 'E.g. Tank1\*'. Below it is a 'Mapping rules' section with a text area containing 'All Smart Object variables starting with "Tank1\*" will be mapped to project variables which start with "Tank2\*"'. Buttons for 'Add rule' and 'Remove rule' are present.
- Mapping Table:** A table with columns 'Smart Object variable name', 'Mapped project variable', and 'Mapping Preview'. It shows mappings like 'PEKING\_FEEDER\_QC1\_ST' mapped to 'CD\_132KV\_SSCOPA\_PEKING\_Q8\_ST'. A callout box says 'allocate variables from the project' pointing to this table.
- Rules:** A section with 'Source' and 'Target' columns and 'Add rule'/'Remove rule' buttons.

Annotations with arrows point to various parts of the dialog:

- 'Variables which pre-exist in the project' points to the 'Project variables' list.
- 'Variables as defined in the Smart Object Template' points to the 'Smart Object variable name' field.
- 'Mapping Rules': Define generic rules for the allocation of variables (new with zenon 11)' points to the 'Mapping rules' text area.
- 'Variables from the project which are allocated by the respective Smart Object variables' points to the 'Mapped project variable' column in the mapping table.

FIGURE: OPTIONAL VARIABLE MAPPING, TO CONNECT YOUR SMART OBJECT (ASSET ) TO THE CORRECT DATA-SOURCES

## Parameterizing the asset

Any practical BMS, inverter or switching equipment will have specific parameters, which need individual parameterization. These parameters have been defined during the design and engineering of the respective Smart Object Template. This way, even though the asset is created from one single (centrally defined) Smart Object Template, the “released” parameters can be individually set for each object instance.

In this Application Set, various settings of Smart Object instances can be adapted in the “Released property” section. Select the main node of the Smart Object instance from the list, then select “Released Properties” node to display a list of properties which can be modified. A Smart Object Template engineer can specify which properties can be modified in a Smart Object instance. Changing these properties directly influences the behavior of certain aspects of the Smart Object instance.

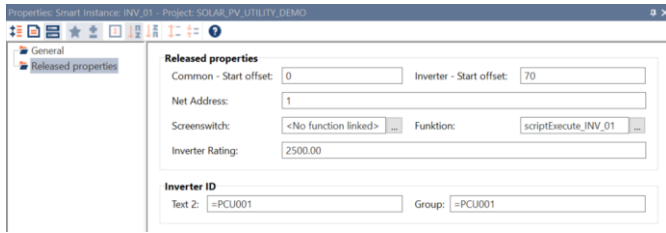


FIGURE: "RELEASED PROPERTIES" – THE PARAMETERIZATION INTERFACE FOR YOUR ASSET

### Parameterization: Clear and safe

The instantiation of a Smart Object leads to the creation of various items (variables, screens, functions etc.) in the project. These items can be used in the project – as value source, for display etc. - but cannot be directly changed or deleted in the project. Changes are only permitted centrally via the original Smart Object Template.

To make specific parameters of an asset adaptable (individually per instance), these parameters are "released" by the template engineer. The values which are set via this interface will propagate into the respective detailed properties.

This ensures a consistent usage of templates and instances, while keeping a good overall structure and great flexibility.

## Where to go from here ...

The creation of assets from Smart Object Templates can be repeated multiple times. In this way a plant overview can be created step-by-step. All templates can be used, while allowing the actual zenon project to remain "open" for regular engineering activities.

Smart Object instances remain connected to their original Smart Object Template. This allows project-wide updates of any object, to be easily performed in case there is a new version of the Smart Object Template available. Smart Object Templates can be shared between engineers.

### Want to create your own templates?

The Smart Objects engineering technology in zenon allows you to create your own templates. Various features will support you to build up a powerful library of Smart Objects, thus increasing your engineering efficiency in Energy projects.

[Contact your local COPA-DATA Support Office](#) for more information