ENcombi

ECsync

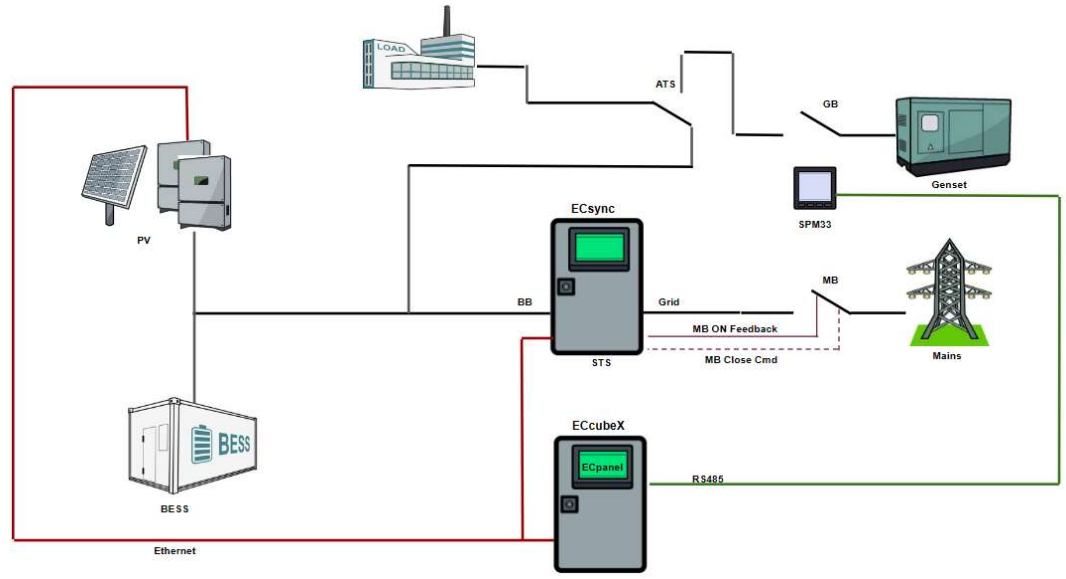
User Manual

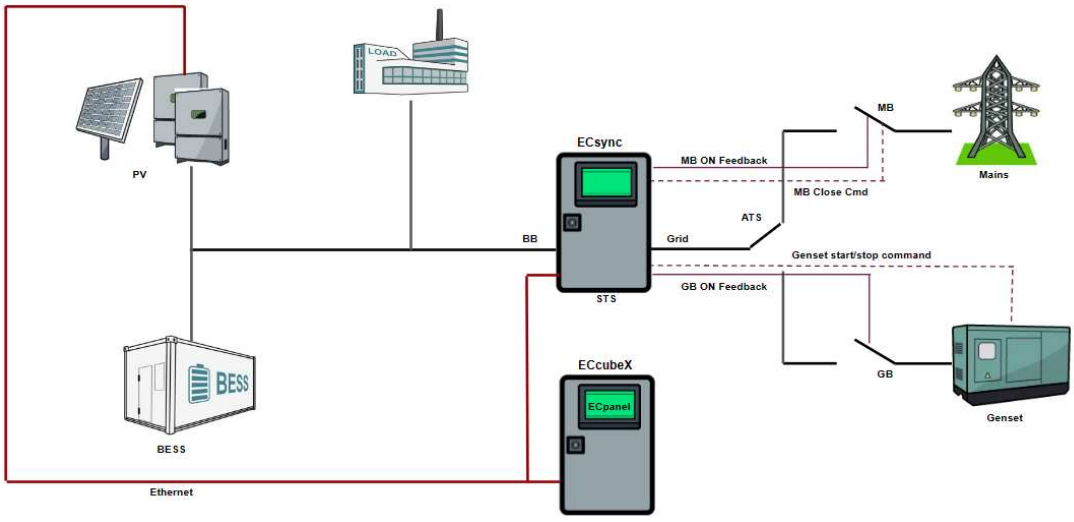
Document change log

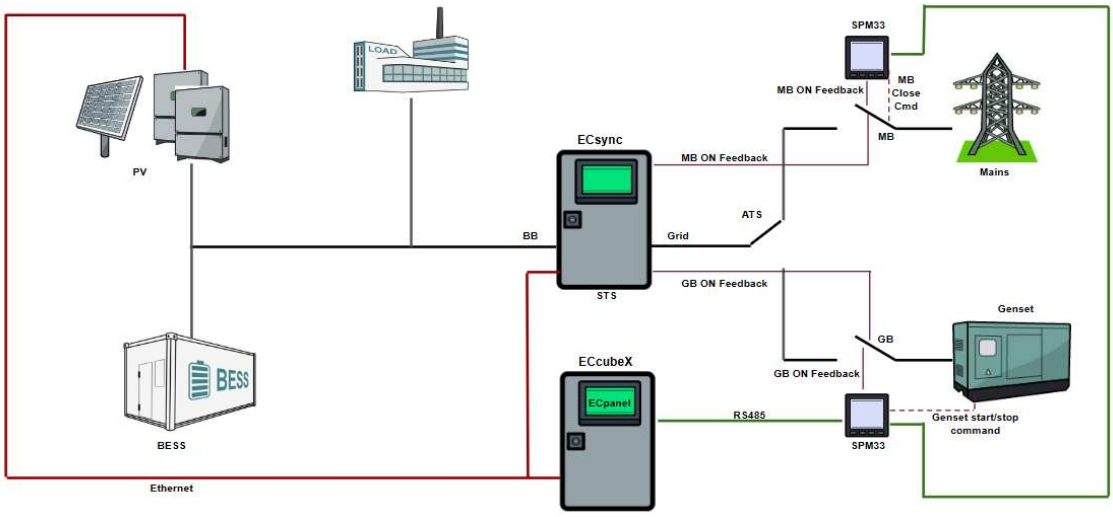
2024-02-18	First version

Overview

ECsync is the **EN**combi plug and play cabinet for providing seamless transfer between on-grid and off-grid operation in BESS applications where the BESS itself does not feature seamless transfer by means of STS or otherwise. The grid can in this context be the public utility grid or a grid provided by genset(s).







The ECsync cabinet's main components are a mechanical breaker and a synchronization relay. The ENcombi EMS ,ECpvX/ECcubeX, can communicate with and control the synchronization relay.

The ECsync cabinet can be operated in Manual mode and in Automatic mode. In Manual mode the mechanical breaker can be operated directly on the synchronization relay's display. The ECpvX/ECcubeX will acknowledge the manual commands made and control the plant accordingly. In Auto mode, the ECsync cabinet is commanded to work in either on-grid mode or in off-grid mode by the user from the ECpvX/ECcubeX. This is easily done both via the ECpvX built-in webserver, ECweb, or via the ECpanel HMI.

In on-grid mode, the ECsync cabinet will always reconnect the grid with the BESS when the grid is available. In off-grid mode, the ECsync cabinet will unload the mechanical breaker by adjusting the BESS and PV output before opening it.

Variants

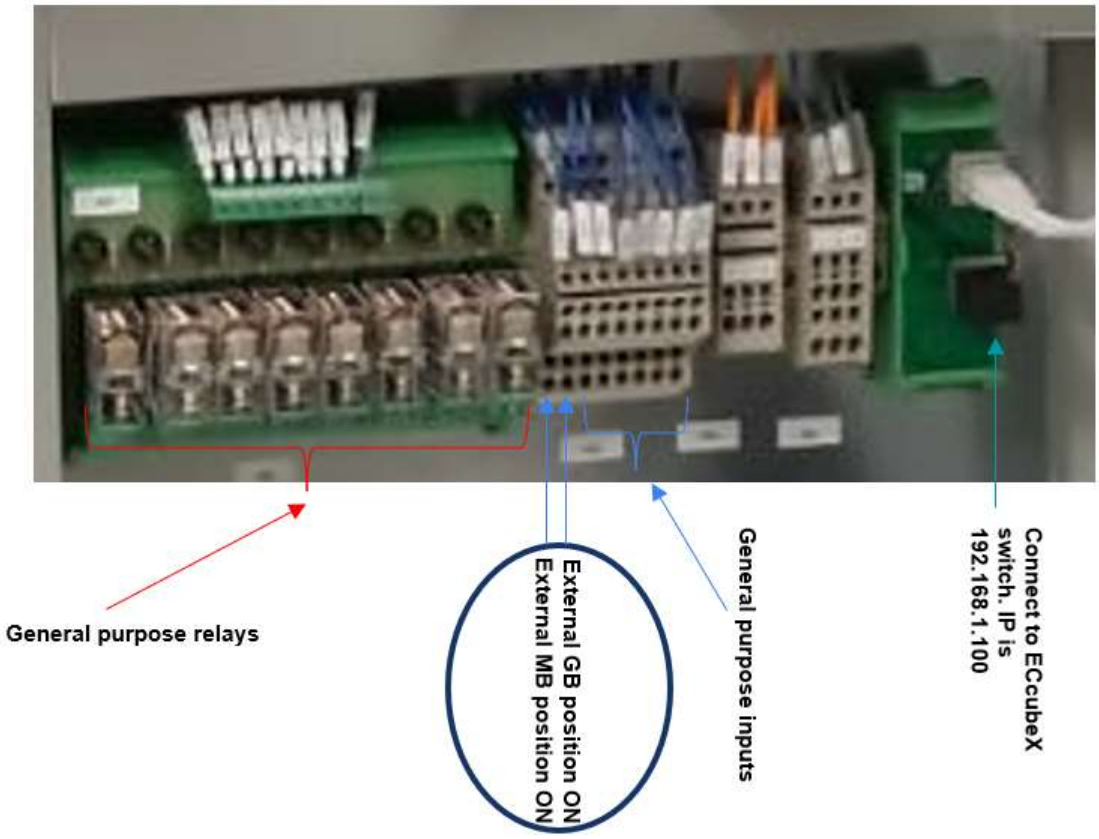
The ECsync comes in numerous ratings and with various options. Consult the ECsync datasheet for the details.

Installation & Maintenance

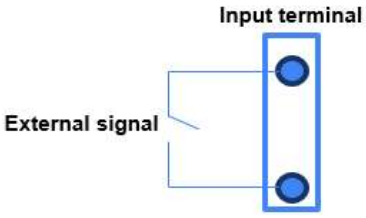
Consult the ECsync Installation & Maintenance Instruction for the information on how to install and do maintenance of the ECsync. Installing and operating the ECsync may require work with currents and voltages. The installation must only be carried out by authorized personnel who understand the risks involved in working with electrical equipment.

External MB & GB position feedbacks

The ECsync needs to know the position of the external MB and/or GB that can connect to the grid side of the ECsync. Dedicated inputs are reserved for these position feedbacks in the ECsync.



Note that an input is activated with potential free signal by shortening the two respective input terminals.



Note that in case of an ATS is used on the grid side for switching between grid and genset supply the transition time must be long enough for the ECsync to see a state

where neither the external MB or GB is active so that it manages to disconnect its breaker and isolate the BESS before the new supply source is connected to its grid side.

Functionality

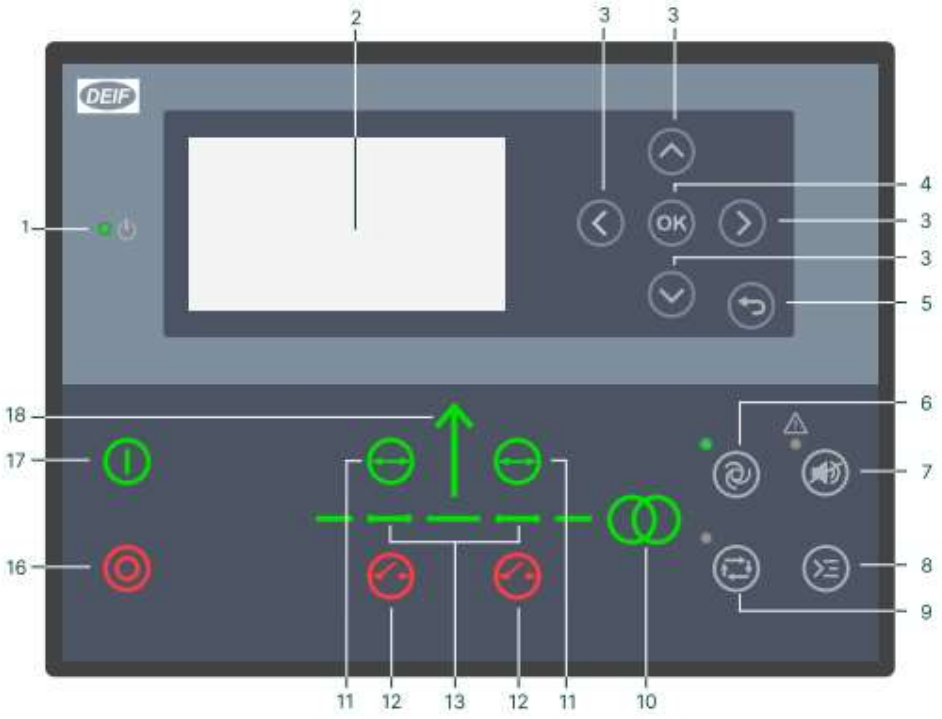
ECsync has a breaker inside that parallels the BB side with the Grid side. The synchronization of the breaker is handled by a synchronization relay. CTs are included in the ECsync cabinet for current readings. The ECpvX/ECcubeX reads the AC measurements, breaker position, configurable input status and controls the configurable relay outputs via either Modbus TCP or Modbus RTU.

- The ECsync breaker will close when BB is dead and either feedback from MB or GB is active.
- The ECsync will sync and close its breaker when in on-grid mode, BB voltage is present and the grid voltage is present and either feedback from MB or GB is active.
- The ECsync will unload and open its breaker when in off-grid mode, BESS is in operation and the either feedback from MB or GB is active.
- The ECsync will open its breaker when neither feedback from MB or GB is active.
- The ECsync will open its breaker when feedback from MB is active and a grid code protection activates.
- The external MB and GB can be controlled by the ECpvX/ECcubeX via a configurable output in the ECsync cabinet.
- There is dual supply to the synchronization relay so that it is alive when voltage is present on either the BB side or the grid side.

Synchronization relay

A DEIF AGC150 Mains is used as the synchronization relay in the ECsync. The ECsync is delivered with a pre-programmed synchronization relay from the factory that matches the rating of the ECsync and the integration with the ECpvX. Changing the factory configuration of the synchronization relay may cause the operation to fail. Only the protection scheme should be adjusted as per the project requirements. You must therefore check the protection parameters before using the ECsync.

Display



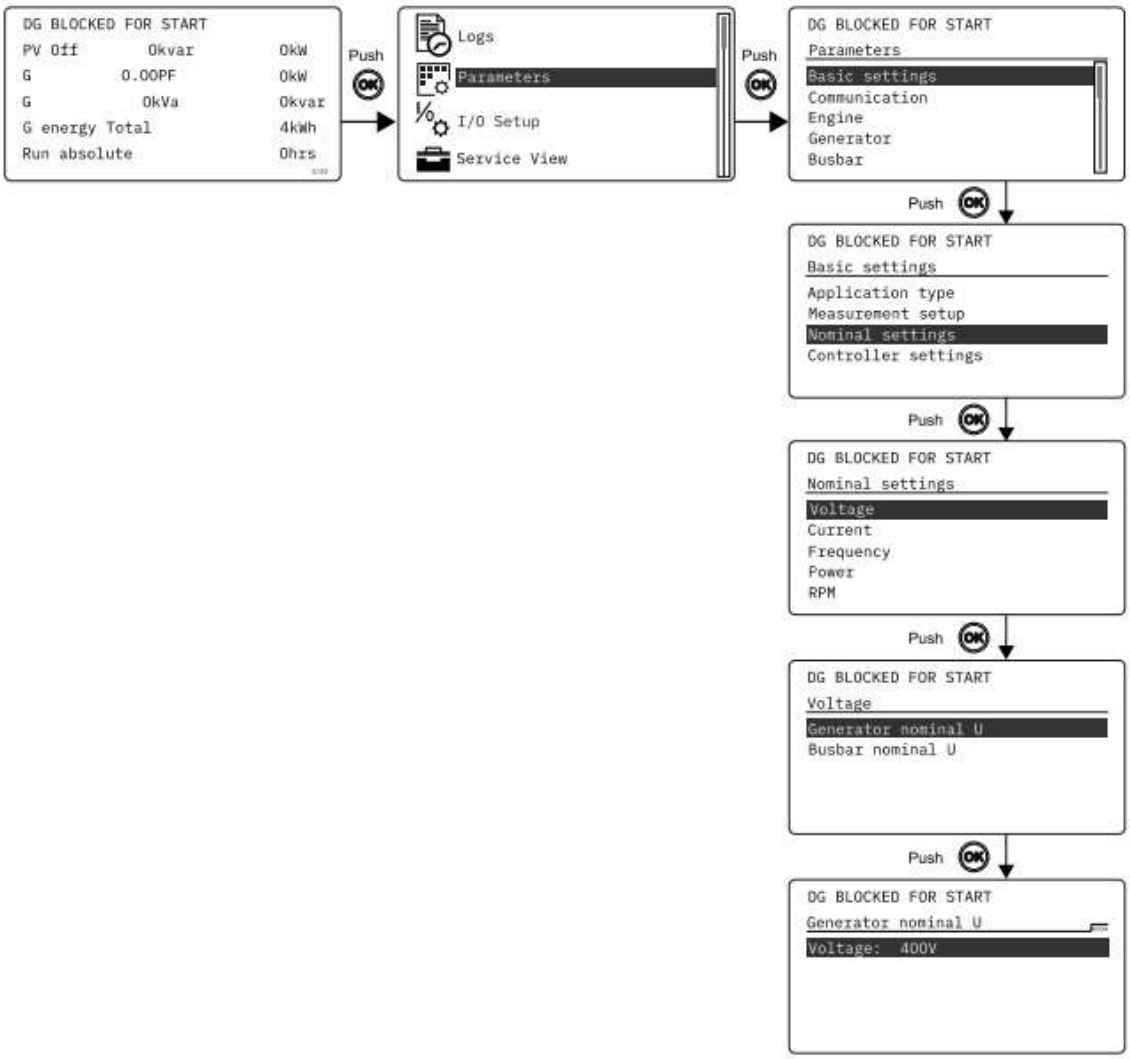
Nbr.	Name	Function
1	Power	Green: The sync. relay power is ON. Off: The sync. relay power is OFF.
2	Display screen	Resolution: 240 x 128 px. Viewing area: 88.50 x 51.40 mm. Six lines, each with 25 characters.
3	Navigation	Move the selector up, down, left and right on the screen.
4	OK	Go to the Menu system. Confirm the selection on the screen.

5	Back	Go to the previous page.
6	AUTO mode	The operator can't connect or disconnect the ECsync breaker using the breaker buttons on the sync. relay display. The ECpvX can connect and disconnect the ECsync breaker via ECweb or the ECpanel. The sync. relay automatically synchronises before closing the breaker. The breaker is deloaded by the ECpvX before the sync. relay is commanded to open it.
7	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu
8	Shortcut menu	Access the Jump menu, Mode selection, Test, Lamp test.
9	Manual mode	The operator can connect or disconnect the ECsync breaker using the breaker buttons on the sync. relay display. The ECpvX cannot connect or disconnect the ECsync breaker from ECweb or the ECpanel. The sync. relay automatically synchronises before closing a breaker.
10	Grid symbol	Green: Mains voltage and frequency are OK. The sync. relay can synchronise and close the breaker. Red: Grid failure.
11	Close breaker	Push to close the breaker (only active in Manual mode).
12	Open breaker	Push to open the breaker (only active in Manual mode).
13	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising. Red: Breaker failure
16	Stop	Not used
17	Start	Not used
18	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

Parameters editing

You can configure the sync. relay parameters via the display. From the View menu, push the OK button to reach the parameter menu. Use the navigation buttons to find the various parameters and select with the OK button. Below is an example of how to reach

and navigate the parameter menu. A password is required for editing the parameters. The factory default password is 2002.



ECpvX setup

The ECpvX controls and reads data from the ECsync via Modbus TCP or Modbus RTU. Consult the ECpvX User Manual for information on how to set up the communication and parameters for synchronization as well as on the data visualization and how to apply the control commands.