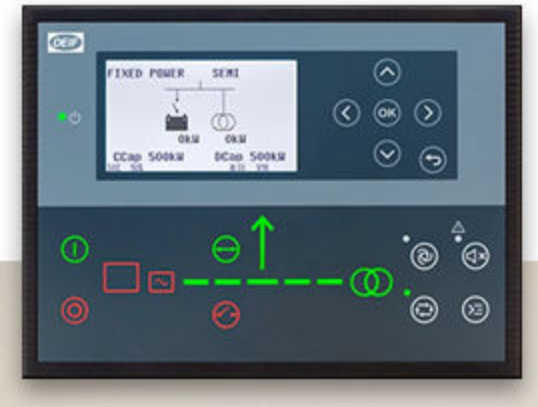
ASC 150 Storage

4189341343C

Operator's manual

Improve
Tomorrow



1. Introduction

1.1 Symbols for hazard statements

DANGER!

This shows dangerous situations.

If the guidelines are not followed, these situations will result in death, serious personal injury, and equipment damage or destruction.

WARNING

This shows potentially dangerous situations.

If the guidelines are not followed, these situations could result in death, serious personal injury, and equipment damage or destruction.

CAUTION

This shows low level risk situation.

If the guidelines are not followed, these situations could result in minor or moderate injury.

NOTICE

This shows an important notice

Make sure to read this information.

1.2 About the operator's manual

This document gives the necessary information to operate the controller.

CAUTION

Installation errors

Read this document before working with the controller. Failure to do this may result in human injury or damage to the equipment.

Intended users of the operator's manual

The operator's manual is for the operator that uses the controller regularly.

The manual describes the LEDs, buttons and screens on the controller, alarm handling, and the logs menu.

1.3 Warnings and safety

Factory settings

The controller is delivered pre-programmed from the factory with a set of default settings. These settings are based on typical values and may not be correct for your system. You must therefore check all parameters before using the controller.

Data security

To minimise the risk of data security breaches:

- As far as possible, avoid exposing controllers and controller networks to public networks and the Internet.
- Use additional security layers like a VPN for remote access, and install firewall mechanisms.
- Restrict access to authorised persons.

1.4 Legal information

Third party equipment

DEIF takes no responsibility for the installation or operation of any third party equipment, including the **genset**. Contact the **genset company** if you have any doubt about how to install or operate the genset.

Warranty

NOTICE

Warranty

The controller is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

Copyright

Software version

This document is based on the AGC 150 software version 1.14.0.

2. About ASC 150 Storage

2.1 About controller operation

The ASC 150 Storage controller provides effective control for an energy storage system (ESS). You can add the controller to an existing plant, or use it with other DEIF controllers in a power/energy management system.

You can easily control the system from the display. The display can show your configured application with a simple diagram that gives you information about power sources, breaker feedback, and state of charge.

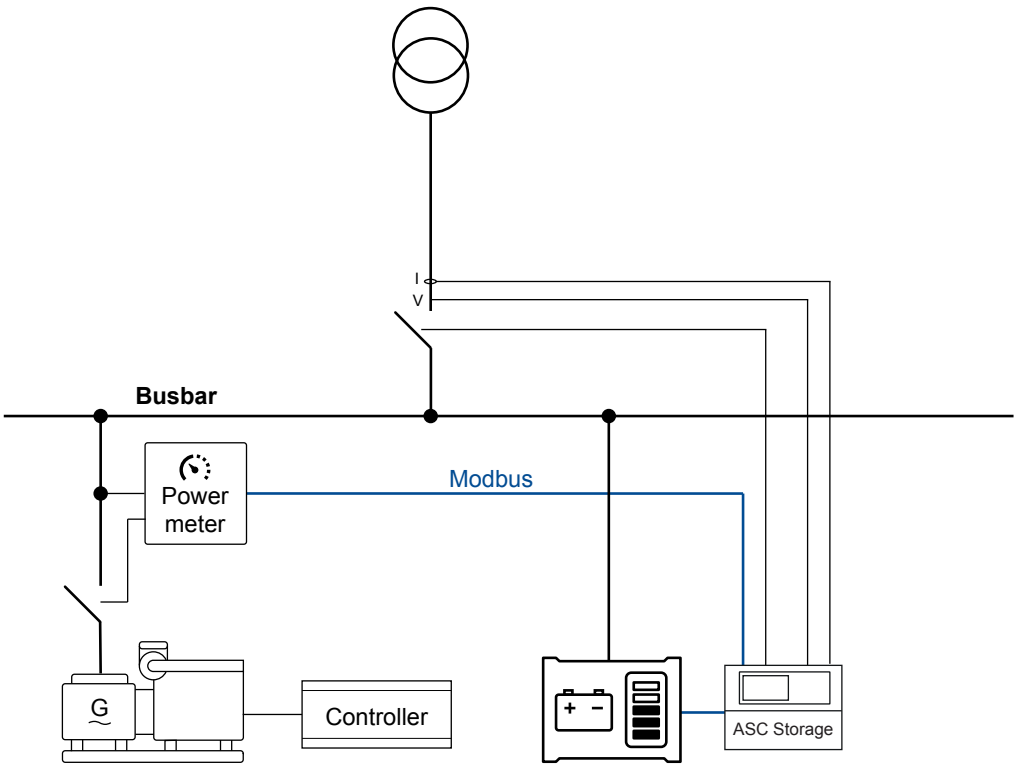
2.2 Typical application examples

2.2.1 Without power management (single controller)

In applications without power management, one ASC 150 Storage controller can control one energy storage system (ESS), one ESS breaker, and one mains breaker. It can also start and stop gensets.

Application for one ASC 150 Storage controller without power management

This example shows one ASC 150 Storage controller in a grid-tied application. The ASC controls the ESS and the mains breaker. The ASC controller gets power measurements and breaker positions from the mains and the genset.



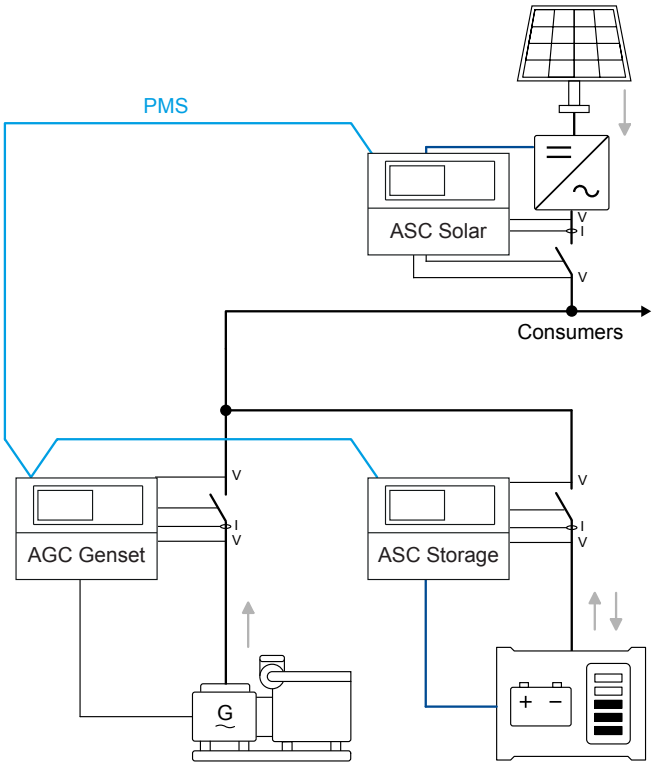
More information
See **Single-controller applications** in the **ASC 150 Storage Designer's handbook** for variations on this controller arrangement.

2.2.2 With power management

The ASC 150 Storage controller also works in DEIF power management applications, where the controller communicates with other DEIF controllers. The ASC 150 Storage controller can control the ESS and the ESS breaker in these applications.

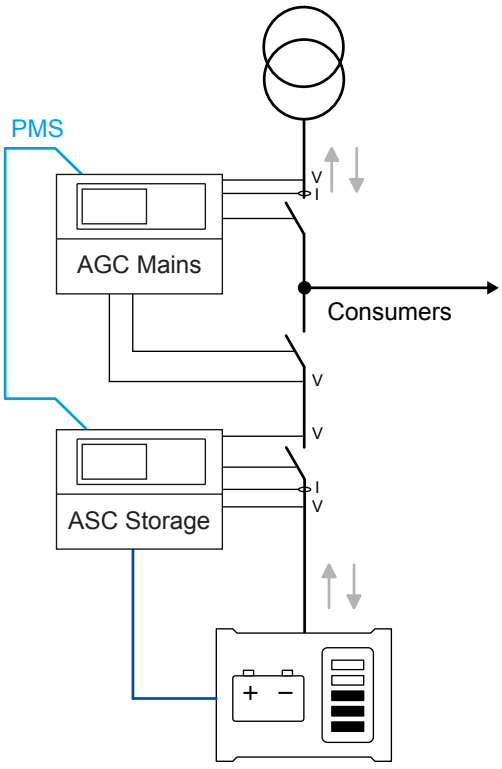
Application for an ASC controller in a power management system with AGC Genset and ASC Solar

This is an example of an off-grid application, where the controllers are in a power management system together. The ASC 150 Storage controller controls the ESS, and the ESS breaker.



Application for an ASC 150 Storage controller in a power management system with AGC Mains controller

This is an example of a grid-tied application, where the controllers are in a power management system together. The ASC 150 Storage controller controls the ESS, and the ESS breaker.



More information
See the **ASC 150 Storage data sheet** for the variations on the grid-tied and off-grid arrangement.

You can select the plant mode for the AGC Mains controller when you have a power management system.

ASC Storage configuration

`Basic settings > Application type > Plant type > Plant mode`

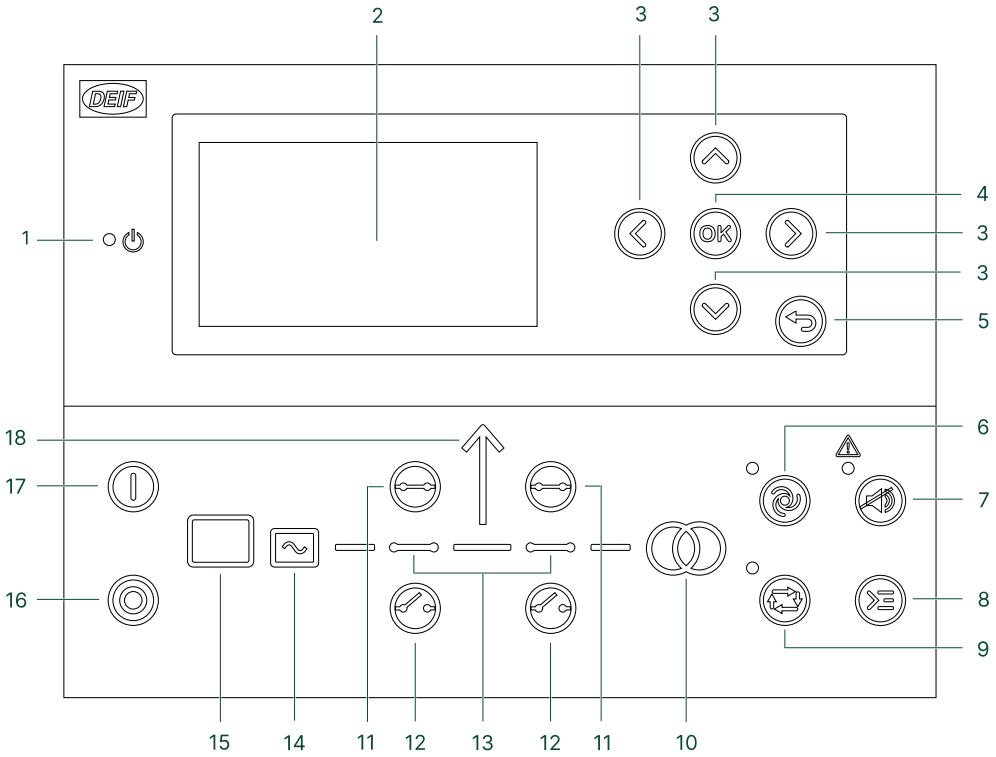
Parameter	Name	Setting
6071	Operating mode	Power management

AGC Mains configuration

`Basic settings > Application type > Plant type > Plant mode`

Parameter	Name	Setting
6070	Plant mode	Select a plant mode (in the AGC mains controller). For example, Mains Power Export.

2.3 Display, buttons and LEDs



No.	Name	Function
1	Power	Green: The controller power is ON. OFF: The controller 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	Enter the Menu system. Confirm the selection on the screen.

No.	Name	Function
5	Back	Go to the previous page.
6	AUTO mode	The controller automatically starts and stops (and connects and disconnects) the storage system. The controller automatically controls the power to and from the storage system. No operator actions are needed.
7	Silence horn	Turns off an alarm horn (if configured) and enters the Alarm menu.
8	Shortcut menu	Access the Jump menu, Mode selection, Test, Lamp test, and Storage.
9	SEMI-AUTO mode	The operator or an external signal can also start or stop, and open and close the storage breaker. Automatic controller actions are not possible. The controller automatically synchronises before closing a breaker, and automatically de-loads before opening a breaker.
10	Mains symbol	Green: Mains/busbar voltage and frequency are OK. The controller can synchronise and close the breaker. Red: Mains/busbar voltage failure.
11	Close breaker	Push to close the breaker.
12	Open breaker	Push to open the breaker.
13	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising or de-loading. Red: Breaker failure.
14	Power converter	Green: Power converter voltage and frequency are OK. The controller can synchronise and close the breaker. Green flashing: The power converter voltage and frequency are OK, but the V&Hz OK timer is still running. The controller cannot close the breaker. Red: The power converter voltage is too low to measure.
15	Battery management system	Green: There is storage system available feedback. Green flashing: The storage system is getting ready. Red: The storage system is not running, or there is no availability feedback.
16	Stop	Stops the power converter if SEMI-AUTO is selected.
17	Start	Starts the power converter if SEMI-AUTO is selected.
18	Load symbol	OFF: Power management application Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

NOTE * You can use the display to monitor the storage operation.

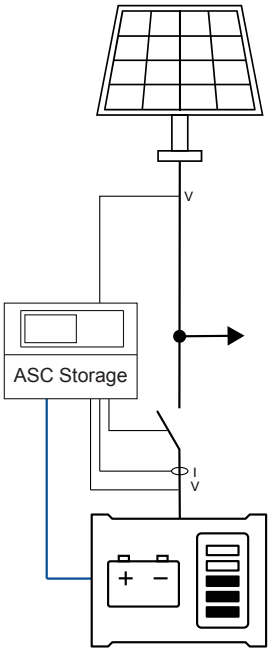
2.4 Controller functions

2.4.1 Grid-forming or grid-following

Grid-forming

Grid-forming is also called island, V/f mode, or off-grid. In grid-forming, the battery can act as the only energy source. The battery can provide the grid-forming power in island operation, and work together with non-grid-forming sources, like solar and wind.

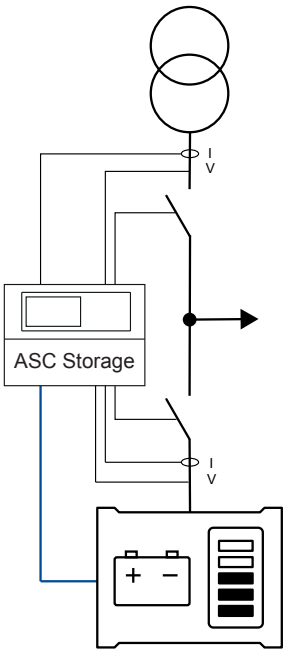
Island operation with PV



Grid-following

Grid-following is also called parallel, or P/Q mode. For grid-following, the battery is always connected to another grid-forming source, like a mains or genset. You can use the battery to achieve optimal genset load, or maintain a minimum genset load.

Parallel operation with Mains



Droop mode/VSG (virtual synchronous generator) mode

If the ESS supports this, the ASC Storage controller can operate the ESS in droop mode for island operations (grid-forming) and parallel operations (grid-following).

2.4.2 Energy source or power source

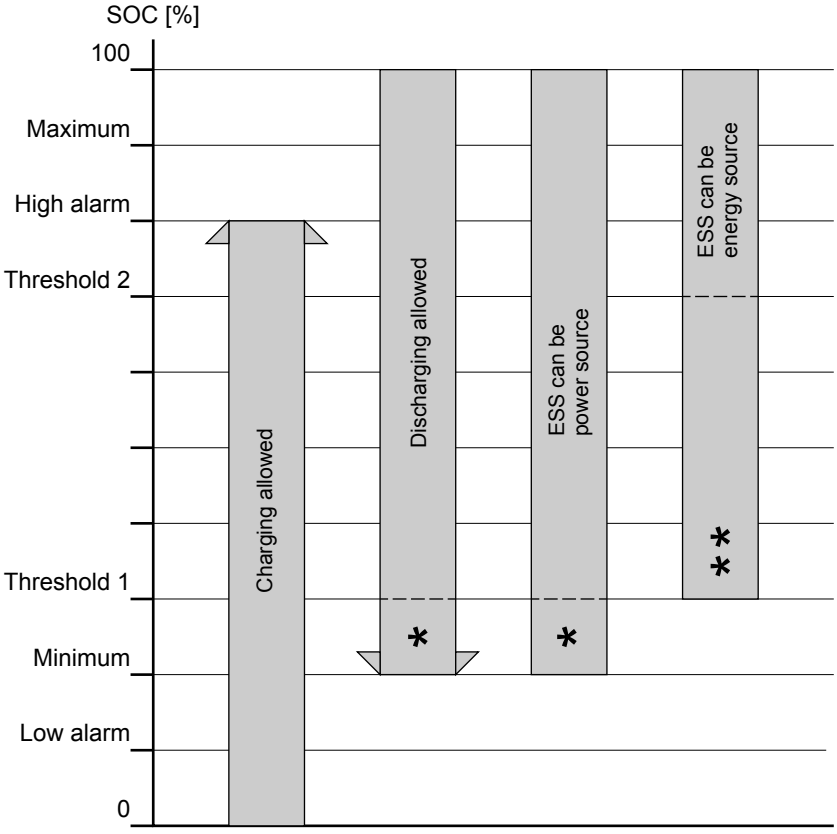
The energy and power source functions determine the source priority.

- **Energy source**
  The ASC 150 Storage controller prioritises battery power over genset power. This means that the system uses as much battery power as possible before starting a genset. If the genset is in operation, the ASC 150 Storage controller tries to decrease the genset load to minimum (P DG minimum). When the generator is operating, the ESS works as a power source with spinning reserve functionality.
- **Power source**
  The ASC 150 Storage controller operates parallel to other sources. Genset power is prioritised over battery power. Use this mode when you want to make sure that spinning reserve requirements are met.

2.4.3 Charging and discharging

The energy management system controls when the ESS charges and discharges. This is based on the state of charge conditions. The ASC controller reads the state of charge from the ESS.

State of charge (SOC) conditions



Charging: If the SOC is less than maximum, the ESS can charge.

Discharging: If the SOC is more than minimum, the ESS can discharge. * Less than threshold 1: The ESS can discharge until the SOC reaches the minimum. The ESS must then recharge to threshold 1 before it can discharge again.

Power source operation: The ESS can be a power source if the SOC is above threshold 1. *Below threshold 1: The ESS can discharge as a power source until the SOC reaches the minimum. The ESS must then recharge to threshold 1 before it can discharge again.

Energy source operation: The ESS can be an energy source if the SOC is above threshold 2. **Below threshold 2: The ESS can discharge as an energy source until the SOC reaches threshold 1. The ESS must recharge to threshold 2 before it can be an energy source again.

Between threshold 1 and maximum, you can use M-Logic or external inputs to change between power source operation and energy source operation.

Charging and discharging parameters

The ESS can recharge from gensets or mains. You can configure which source to use for charging with parameters 17025 and 17033. Parameter 17025 is the *Mains charge mode*, and parameter 17033 is the *DG Charge mode*.

For the *Mains charge mode* function, you can select these options:

- SOC-based charging only
- SOC + plant assist charging

The default is SOC + plant assist charging. For this option, the battery can discharge to help achieve the plant set point (if the state of charge (SOC) lets the battery do this).

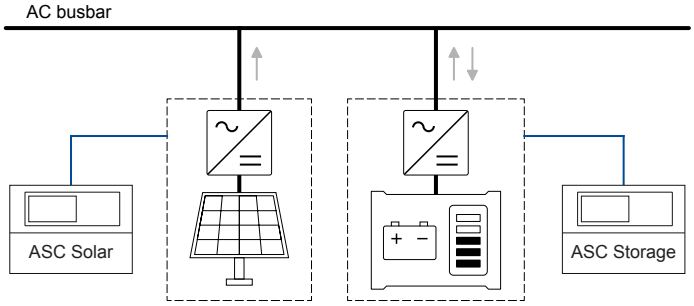
These settings are usually configured during plant commissioning.

2.4.4 AC- or DC-coupled connections

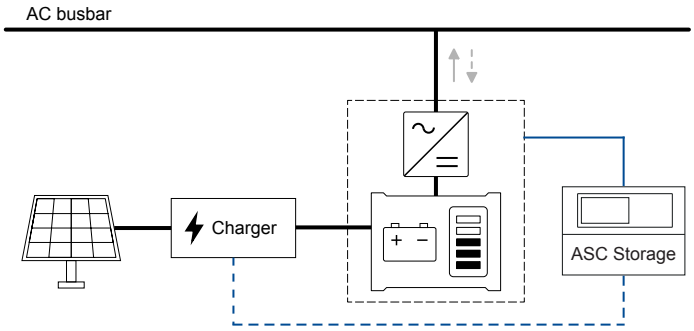
In AC-coupled connections, the system can include an ASC Solar that controls PV, and an ASC Storage that controls the ESS. You can configure which source charges the ESS, for example mains or gensets.

In DC-coupled connections, a DC source (for example, a separate charger or PV) charges the battery directly. In AC-coupled connections, the power sources have separate connections to the AC busbar.

AC-coupled connections



DC-coupled connections



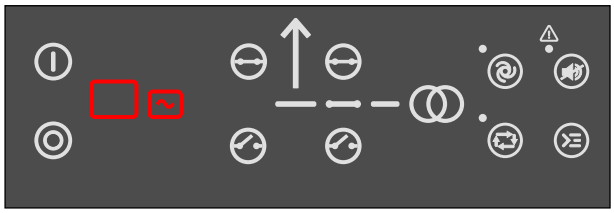
3. Operating the system

3.1 Mimic function

Settings > Basic settings > Controller settings > Display > LED mimic

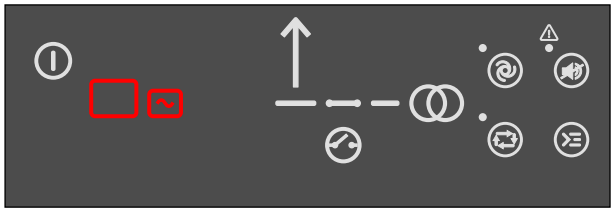
Parameter no.	Item	Range
6082	LED mimic	Standard Guided

Standard
The control buttons and LEDs are shown.
If you the stop the energy storage system (ESS), the ESS symbols are shown in red.



Guided
Active control buttons, LEDs, and the ESS symbols are shown, inactive are not shown.

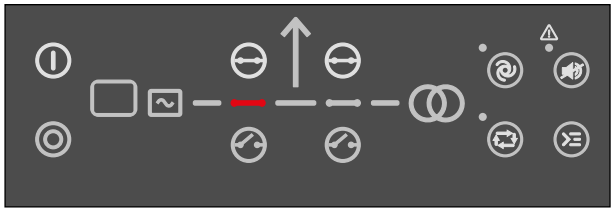
Example: The controller is in SEMI-AUTO mode, and the ESS is not operating. The only possible action is to start the ESS, or open the mains breaker. Therefore, only the start button, the red ESS symbols, and the button to open the mains breaker are shown.



All Mimic settings

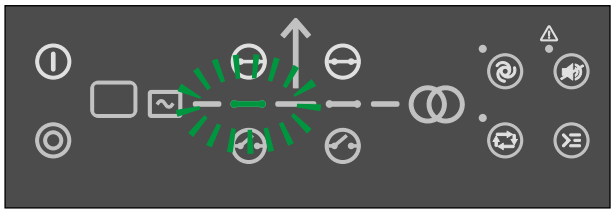
The breaker symbol is shown in red:

- Breaker position failure
- Breaker close failure



The breaker symbol flashes green:

- The controller is synchronising
- The controller is de-loading



3.2 Running modes

The controller has four running modes:

- **AUTO (remote)**: The controller operates automatically, and the operator cannot start sequences manually.
- **SEMI-AUTO (local)**: The operator must start all sequences. You can do this with the buttons, Modbus commands, or digital inputs. When you start the ESS, it operates at the nominal values.

SEMI-AUTO mode

Use external signals to operate the controller in SEMI-AUTO mode.

Give an external signal with:

1. Buttons on the display
2. Digital inputs*

NOTE * The controller has a limited number of digital inputs. See **Digital inputs** in the **ASC 150 Storage Designer's handbook** for availability.

Commands in SEMI-AUTO mode

Command	Description
Start	The ESS start sequence is started
Stop	The ESS is stopped.
Close the Energy Storage Breaker (ESB)	The controller closes the energy storage system breaker if the mains breaker is open, or synchronise and close the energy storage system breaker if the mains breaker is closed.
Open the Energy Storage Breaker (ESB)	The controller ramps down and opens the energy storage system breaker at the breaker open point if the mains breaker is closed. The controller opens the energy storage system breaker instantly if the mains breaker is open or the ASC is in island mode.
Close the mains breaker	The controller closes the mains breaker if the energy storage system breaker is open, or synchronises and closes the mains breaker if the energy storage system breaker is closed.
Open the mains breaker	The controller opens the mains breaker instantly.

3.3 Display settings

To adjust for ambient lighting, configure the display settings.

`Settings > Basic settings > Controller settings > Display > Display control`

Parameter	Text	Range	Default
9151	Backlight dimmer	0 to 15 *	12
9152	Green LEDs dimmer	1 to 15 *	15
9153	Red LEDs dimmer	1 to 15 *	15
9154	Contrast level	-20 to +20	0
9155	Sleep mode timer	1 to 1800 s	60 s
9156	Enable (Sleep mode timer)	OFF ON	ON
9157	Alarm Jump	OFF ON	ON
9158	Engineering units	Bar/Celcius PSI/Fahrenheit	Bar/Celcius

NOTE * Low numbers are minimum brightness and high numbers are maximum brightness.

3.4 Easy connect

You can use Easy connect in your energy management system if the application consists of only genset or energy storage system (ESS) controllers. Easy connect is a fast and easy way to add more controllers to a new or existing application. Easy connect commands normally come from the display, but they can also be sent from M-Logic and Modbus.

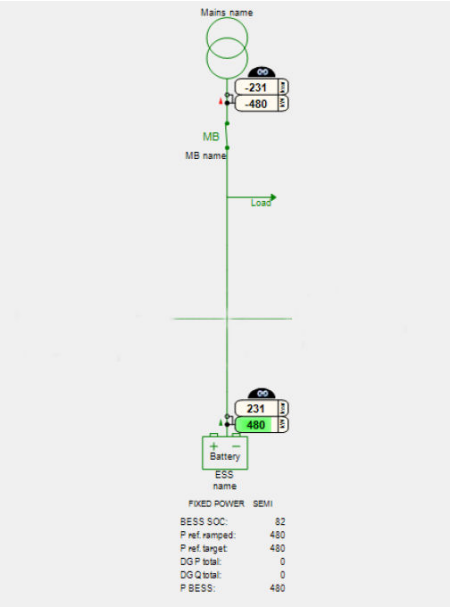
More information
See **Easy connect** in the **ASC 150 Storage Designer's handbook** for how to activate and use Easy connect.

3.5 Utility software

3.5.1 Application supervision

Use the application supervision function in the utility software to see the plant operation. This includes how much power each power source is producing.

You can find *Application supervision* in the vertical menu in the utility software.



3.5.2 Data monitoring and counters

Power meter monitoring

Go to *Application supervision* and select *Power meter Data* to open the *Power meter Data* window.

Electrical data monitoring

Go to *Application supervision* and select *Electrical Data* to open the *Electrical Data* window.

ESS data

Go to *Application supervision* and select *Inverter data* to open the *Inverter data* window.

USW counters

You can view and adjust a number of counters using the USW. Click the Σ icon in the upper horizontal menu to open the counters window.

More information
See **General functions** in the **ASC 150 Storage Designer's handbook** for more information about the functions in the utility software.

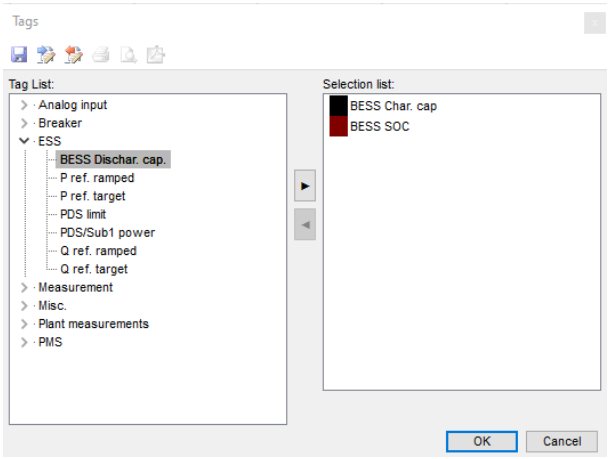
3.5.3 Trending

Use the trending function in the utility software to see real-time operation. Trending is possible when a PC is connected to the controller and the trending window is open. It is not possible for the controller to save the data.

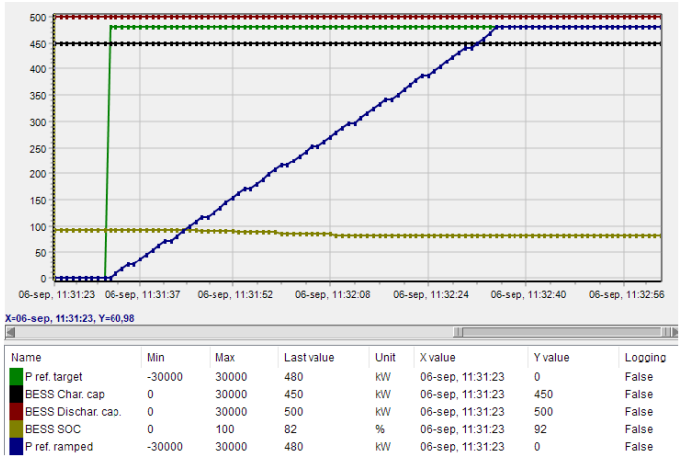
How to configure trending

1. Click on *Trending* in the vertical menu on the left to see the trending page.

2. Click on *Edit the trending tags* .
3. In the pop-up window, select the data you want to trend.



4. Click *OK* to confirm your selection.
5. Click on the *save* button if you want to save the trending data to a .trend file.
6. The trending begins automatically when you have selected the data to trend.
7. You can see the trending data at the bottom of the page. The numerical values are also shown here.



8. Click on the pause button to pause the update of the trending window. The trending continues in the background.
9. When the trending is paused, you can use the zoom buttons and the scroll buttons to navigate the trending graph.

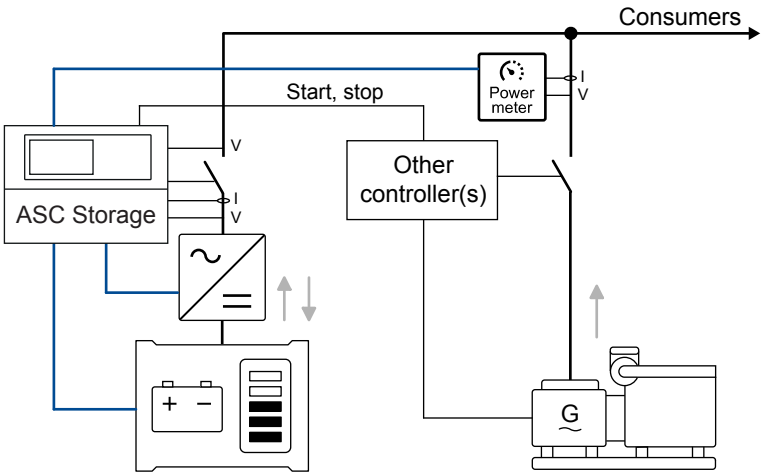
4. Modes of operation

Operate the ASC in AUTO mode (remote) or SEMI-AUTO mode (local). In AUTO mode, the system closes the ESS breaker (if there is one) and starts ESS charging or discharging if the plant has a start signal.

To keep it simple, the following examples show one ASC controller without power management. However, the modes of operation also apply to power management systems.

4.1 Island operation

The ESS supplies the load in island mode. The ESS can provide the grid-forming power in island mode. It can also work together with non-grid forming sources.



AUTO mode

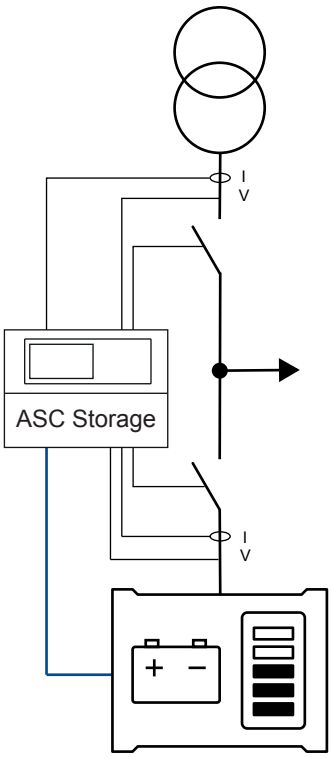
1. Activate a start signal.
   - Use a digital input or
   - Use a time-dependent start command.
2. The ESS starts and the ESS breaker (optional) closes.
3. The ESS supplies the load.
4. To stop the ESS, activate a stop signal.
   - Use a digital input or
   - Use a time-dependent stop command.
5. The ESS breaker opens and the ESS stops.

SEMI-AUTO mode

1. Push the *Start* button on the controller to start the ESS.
2. Push the *Close breaker* button to close the ESS breaker.
3. To stop the ESS, push the *Open breaker* button to open the breaker, and then push the *Stop* button.

4.2 Automatic mains failure (AMF)

If there is a mains failure, the ESS can automatically supply the load. This also applies if Mode shift is ON (automatic switch from other plant modes to AMF mode). During normal operation, the mains supplies the load.



Start sequence

Make sure you have set parameter 6071 to *Auto. Mains Failure*. You do not have to do this If Mode shift is ON.

1. Select AUTO mode.
2. The mains supplies the load.

If a mains failure occurs

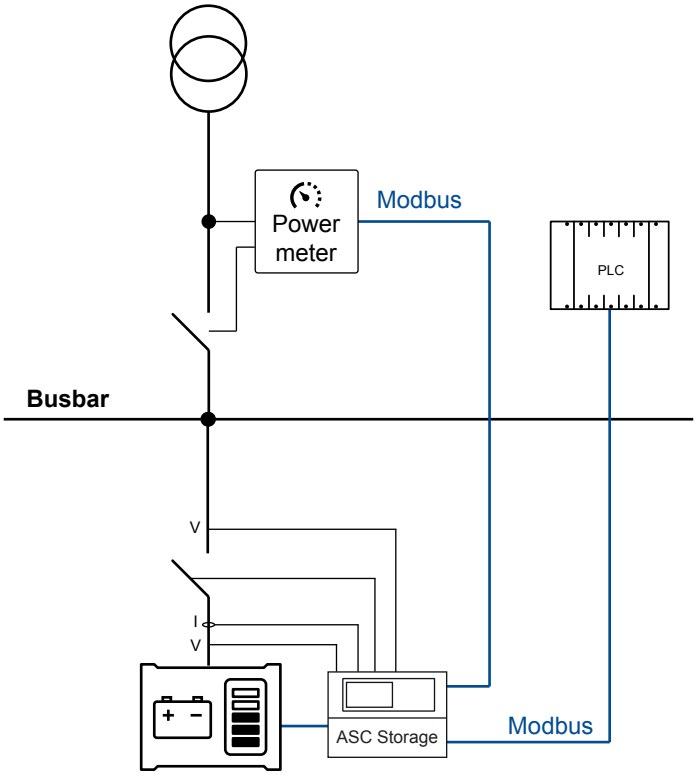
1. The mains breaker opens.
2. The ESS starts and the ESS breaker closes.
3. The ESS supplies the load.

More information
See **Automatic mains failure** in the **ASC 150 Storage Designer's handbook** for the AMF parameters.

4.3 Fixed power

In AUTO and SEMI-AUTO mode, the ESS supplies the amount of power configured in the set point for fixed power.

The ASC can operate as a server to an external PLC/EMS controller. The ASC receives the fixed power set point from the PLC/EMS controller using, for example, Modbus or analogue signals.



NOTE The ASC can also use the current measurement from the 4th CT to calculate the mains power.

Start sequence

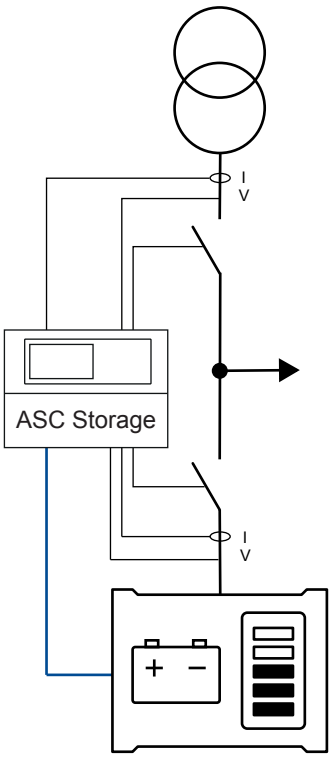
1. Activate a start signal.
   - AUTO mode: The ESS starts automatically when you select AUTO mode.
   - SEMI-AUTO mode: Push the *Start* button on the controller and then push the *Close breaker* button to close the ESS breaker.
2. The ESS supplies the load configured in the set point for PV fixed power (parameter 7051).
3. If the load increases to more than the set point, the mains supplies the extra load.

`Settings > Power set points > Fixed Power > Set point`

Parameter	Text	Range	Default
7051	Set point	-20000 to 2000 kW	500 kW

4.4 Mains power export (MPE)

In this mode a constant level of power through the mains breaker is maintained. The power can be exported to the mains or imported from the mains, but always at a constant level. The set point can be 0 kW. This is to make sure that the load is supplied from the ESS and that there is no import or export of power from the mains.



Start sequence

1. Activate a start signal.
   - AUTO mode: The ESS starts automatically.
   - SEMI-AUTO mode: Push the *Start* button on the controller and then push the *Close breaker* button to close the ESS breaker.
2. The ESS ramps up to reach the MPE kW set point (parameters 7001 and 7002).
3. If the ESS cannot supply this load, the mains supplies the remaining load.

Settings > Power set point > Mains power export and peak shaving > Day/night power set point

Parameter	Text	Range	Default
7001	Mains power, Day	-20000 to 20000 kW	750 kW
7002	Mains power, Night	-20000 to 20000kW	1000 kW
7006	MPE/PS scale	1kW:1kW 1kW:10kW 1kW:100kW 1kW:1000kW	1kW:1kW

Settings > Power set point > Mains power export and peak shaving > Day/night settings

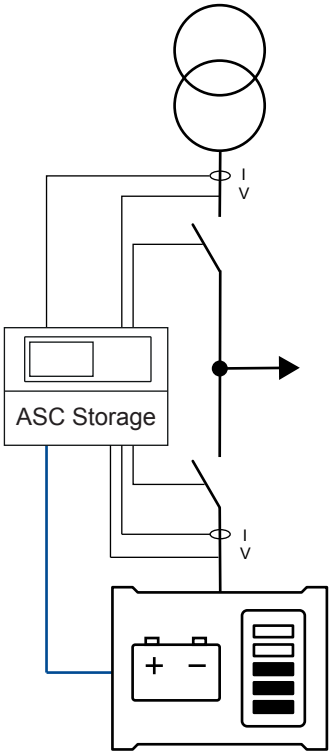
Parameter	Text	Range	Default
7011	Daytime period, start hour	0 to 23	8
7012	Daytime period, start min.	0 to 59	0

Parameter	Text	Range	Default
7013	Daytime period, stop hour	0 to 23	16
7014	Daytime period, stop min.	0 to 59	0

4.5 Peak shaving

The ESS supplies the extra load when the mains import increases to more than the maximum import set point. When the load is less than the maximum import set point, the ESS recharges.

You can enable the peak shaving charging limit with parameter 10724. When you have enabled this parameter, the ASC uses the peak shaving set point as the mains charging limit. The ESS can charge from the mains, but if the power from the mains is more than the peak shaving set point, then the ESS cannot charge from the mains. Use this parameter in peak shaving operations to optimally load the mains feeder.



AUTO mode

1. Activate a start signal.
   - Use a digital input or
   - Use a time-dependent start command.
2. The ESS supplies the extra load when the mains import is more than the maximum set point for mains import.
3. The ESS recharges when the load is less than the set point.

SEMI-AUTO mode

1. Push the *Start* button on the controller, and then push the *Close breaker* button to close the ESS breaker.
2. When the ESS is parallel to the mains, the ESS is controlled by the peak shaving set point.

`Settings > Power set point > Mains power export and peak shaving > Day/night power set point`

Parameter	Text	Range	Default
7001	Mains power, Day	-20000 to 20000 kW	750 kW
7002	Mains power, Night	-20000 to 20000kW	1000 kW
7006	MPE/PS scale	1kW:1kW 1kW:10kW 1kW:100kW 1kW:1000kW	1kW:1kW

Settings > Power set point > Mains power export and peak shaving > Day/night settings

Parameter	Text	Range	Default
7011	Daytime period, start hour	0 to 23	8
7012	Daytime period, start min.	0 to 59	0
7013	Daytime period, stop hour	0 to 23	16
7014	Daytime period, stop min.	0 to 59	0

5. Menus

5.1 Menu structure

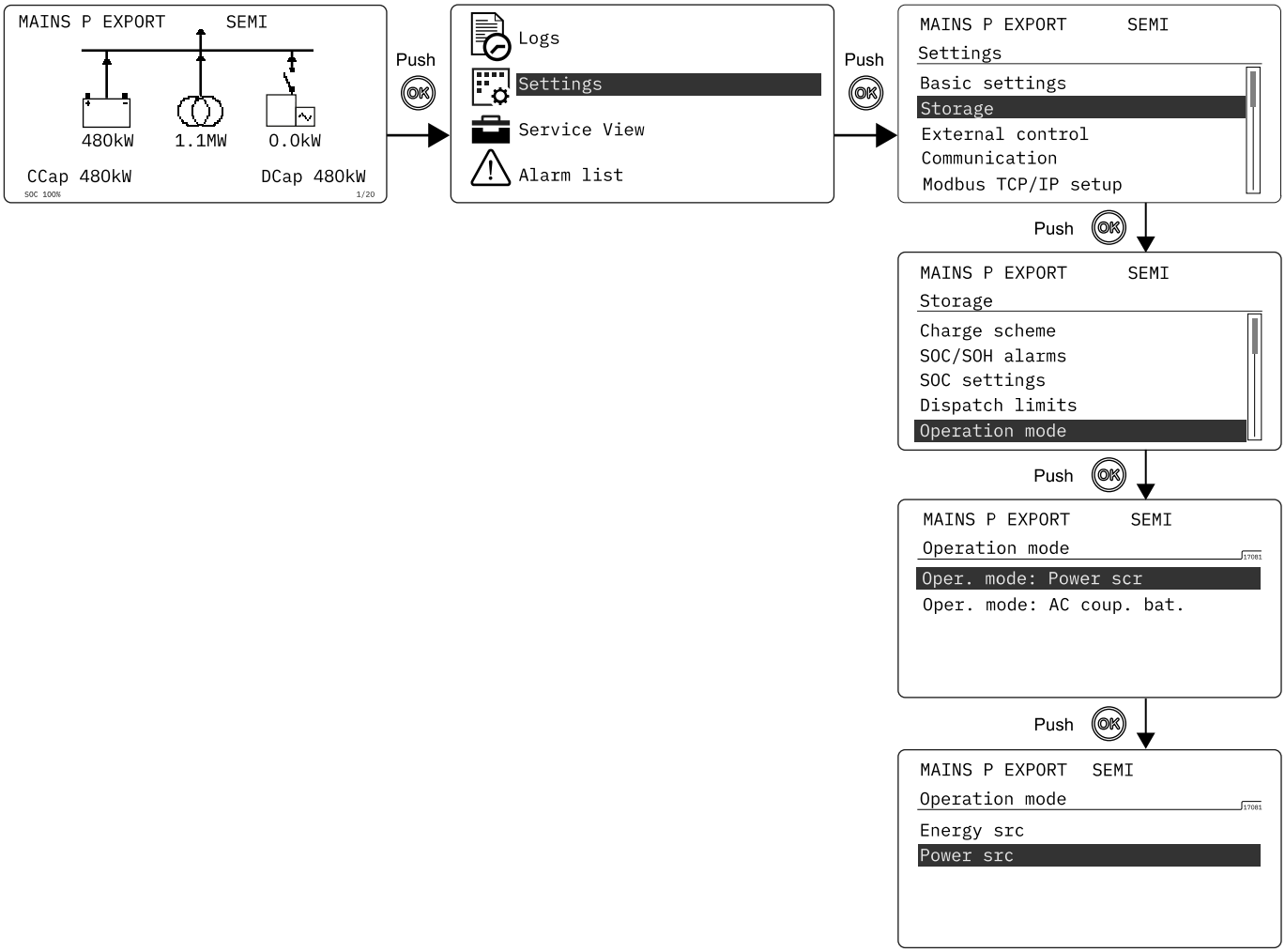
The controller has two menu systems, which can be used without password entry:

- **The View menu system**: Shows the operating status and values. The system has 20 configurable windows, that can be entered with the arrow buttons.
- **The Settings menu system**: The operator can see the controller's parameters. A password is necessary to change the parameter settings.

5.2 Settings menu

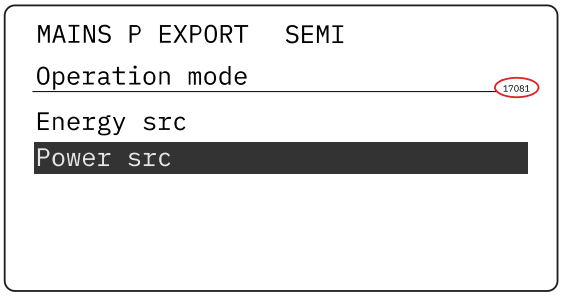
You can configure the controller in the settings menu and you can also find information, which is not available in the view menu. From the view menu, push the OK button to find the settings menu. Use the ⌄ and ⌃ buttons to find the different settings parameter and select with the OK button.

Settings menu example



5.2.1 Menu numbers

Each parameter has a menu number. You can find the number in the upper right corner on the display screen.



You can also find the menu number with the utility software:

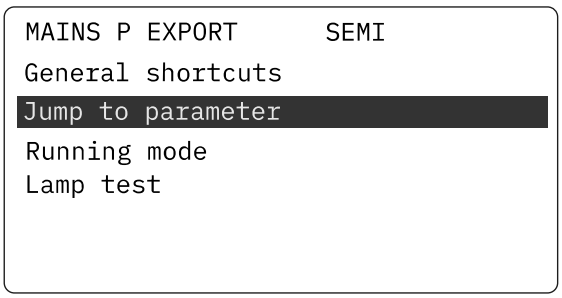
1. Select *Parameters* from the vertical toolbar on the left.
2. Set the view mode to list. The view mode can be found in the left corner of the screen.
3. The menu numbers are in the *Channel* column.

5.2.2 The jump to parameter function

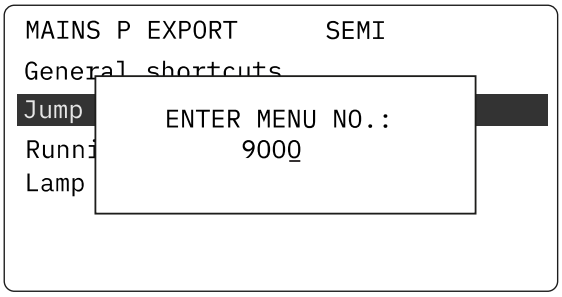
If you know the menu number for a parameter, you can use the jump to parameter function to go directly to the parameter.

On the controller

1. From the view menu, push the *Shortcut* button to see the jump to parameter function:



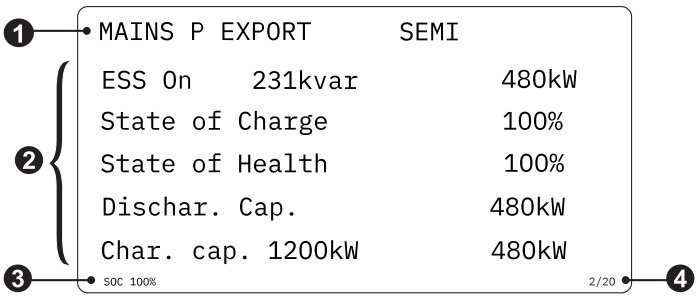
2. Use the and buttons to go to *Jump to parameter* and push the button.



3. Use the and buttons to change the numbers, and push the button to save. Use the and buttons to move to the next number.

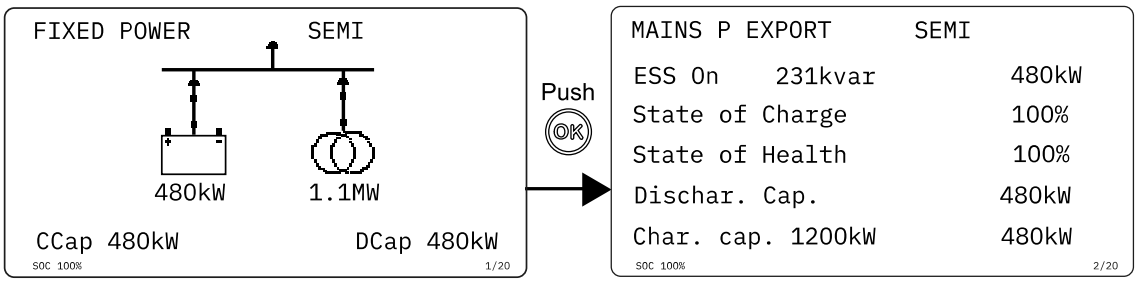
5.3 View menu

The view menu is shown when the controller is turned on, and you can see the operating status and values. The event and alarms list will also be shown if an alarm is on.



1. Operating status
2. Values and information
3. State of charge (SOC) value. This value is always shown.
4. Page number

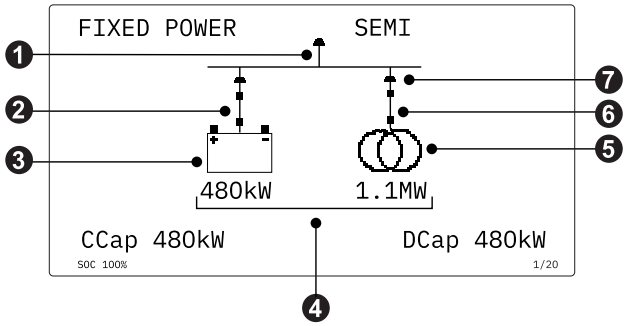
The view menu has 20 display views. Use the and buttons to select a view.

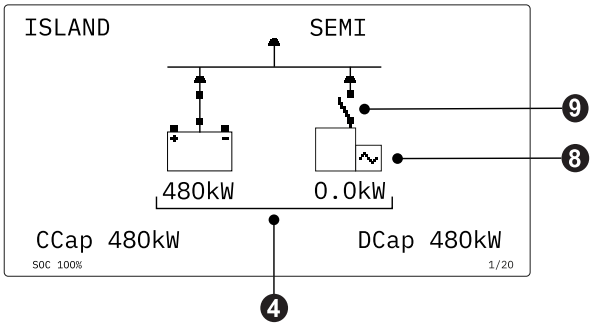


5.3.1 Supervision

Display view 1 shows an active image and is therefore different from the other views. The view gives an overview of all the sources the controller is connected to and is useful for supervising the application.

The image shows the power values, the direction of the power flow, and the image also provides breaker feedback.





1. Load
2. Energy storage breaker
3. Energy storage symbol.
   - If the symbol has no fill, then the ESS is operating.
   - If the symbol has a dark fill, then the ESS is not operating.

4. Power values
5. Mains symbol
6. Mains breaker
7. The arrows show the direction of the power flow
8. Generator symbol
9. Generator breaker

You can select three different options for the bottom view line on the supervision page:

- Option 1: Battery voltage (V) and Battery current (A)
  - The battery voltage is set to N/A if this is not supported by the selected protocol.
  - Both values are DC.
- Option 2: State of the Power Conversion System (PCS) and state of the Battery Management System (BMS)
  - Both are decimal values. Each value corresponds to a different state of the PCS and BMS *.
- Option 3: Charging capacity (kW) and discharging capacity (kW)
  - If there is no active communication or if there is a communication failure with BMS or BCU then both values are set to N/A.

It is possible to move the supervision page and the values to another view page.

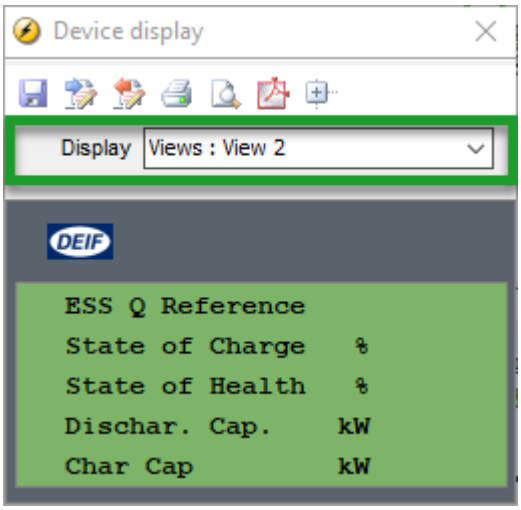
NOTE * Refer to the PCS and BMS manufacturer's documentation for information about the different states.

5.3.2 Display text

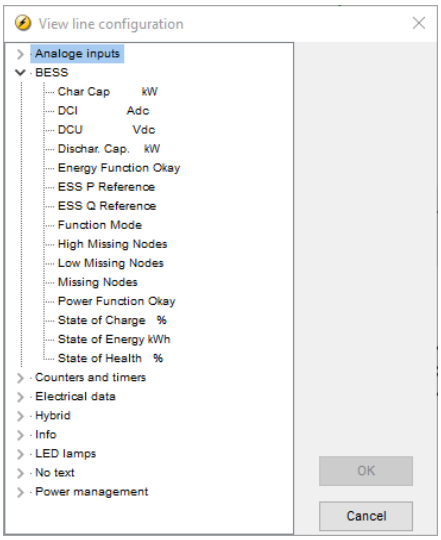
Configure the display views

You can configure the display views with the utility software:

1. Select the *Configuration of the user views* button in the toolbar.
2. In the pop-up window, select the display view to be changed.



3. Select the display line you want to change.
4. In the pop-up window, select the text you want and click OK.



Display text

You can select five of the display texts for each display view.

5.3.3 Display views

The controller has 20 display views, and 18 of the views are pre-configured. You can configure the views with the utility software.

Line	View 1	View 2	View 3	View 4	View 5
1	Supervision Drawing	ESS PkW QkVAR	Synchroniser	ES P 0kW	P 0kW 0%
2	-	State of Charge %	-	ES Q 0kvar	Q 0kVAR 0%
3	-	State of Health %	-	ES PF 0.00	ES f-L1 0.00Hz
4	-	Dischar. Cap. kW	-	ES 0 0 0V	ES f-L2 0.00Hz
5	Supervision	Char. Cap. kW	-	BB 0 0 0V	ES f-L3 0.00Hz

Line	View 6	View 7	View 8	View 9	View 10
1	ES P 0kW	ES UL1N 0V	Angle BB-ES 0deg	BB U-Max 0V	Date and Time
2	ES Q 0kvar	ES U-L2N 0V	ES U-L1L2 0V	BB U-Min 0V	BB U-L1L2 0V
3	ES I-L1 0A	ES U-L3N 0V	ES U-L2L3 0V	BB U-L1N 0V	BB UL2L3 0V
4	ES I-L2 0A	PF %	ES U-L3L1	BB U-L2N	BB U-L3L1 0V
5	ES I-L3	State of Energy kWh	Energy Day 0kWh	BB U-L3N 0V	BB f-L1 0.00Hz

Line	View 11	View 12	View 13	View 14	View 15
1	Multi Input 20 0	ESS P Reference	DCU Vdc	ES P L1 0kW	ES Q L1 0kvar
2	Multi Input 21 0	ESS Q Reference	DCI Adc	ES P L2 0kW	ES Q L2 0kvar
3	Multi Input 22 0	Energy Week 0kWh	Energy Function Okay	ES P L3 0kW	ES Q L3 0kvar
4	Multi Input 23 0	Energy Month 0kWh	Power Function Okay	Low Missing Nodes	Function Mode
5	P Mains	Missing nodes	MB Operations	High Missing Nodes	Ext. DG Pkw Qkvar

Line	View 16	View 17	View 18	View 19	View 20
1	ES S L1 0kVA	Energy Day 0kvarh	Import Week 0kWh	-	-
2	ES S L2 0kVA	Energy Week 0kvarh	Import Month 0kWh	-	-
3	ES S L3 0kVA	Energy Month 0kvarh	Import Total 0kvarh	-	-
4	-	Import Total 0kWh	Import Day 0kvarh	-	-
5	-	Import Day 0kWh	Import Week 0kvarh	-	-

5.4 Status texts

Status text	Condition
ACCESS LOCK	The configurable input is activated, and the operator tries to activate one of the blocked keys.
ADAPT IN PROGRESS	The controller is receiving the application that it has just connected to.
ADD ESS TO CAN PMS?	Easy connect: Add ESS to PMS plant.
AMF ACTIVE	The controller is in auto mode during a mains failure.
AMF AUTO	The controller is in auto mode and ready to respond.
AMF SEMI	The controller is in semi-auto mode and waiting for operator input.
Aux. test ##.#V ####s	The controller power supply test is activated.
AUX TEST ST. SEQ.	Genset battery test.
AUX TEST START SEQ.	Genset battery test.
AWAITING ESS RUN OK	The ESS must be operating before attempting to close the breaker.
AWAITING MODE INFO	The selected mode is not supported by the configured application. Select another application mode.
BATTERY BOOST ACTIVE	The battery is boosting the DC voltage to increase the state of charge (SOC).
BB BLOCKED BY GB	Power management: GB has a position failure.
BB BLOCKED BY MB	Power management: MB has a position failure.
BB BLOCKED BY TB	Power management: TB has a position failure.
BB V/Hz OK IN	The voltage and frequency will be okay in ###s.
BB VOLTAGE DETECTED	Voltage detected on the busbar.
BESS INITIALIZING	The controller is establishing communication to the BESS.
BLACKOUT ENABLE	Blackout close when there is a CAN failure.
BLOCKED FOR CLOSING	The breaker is unable to close.
BLOCKED FOR START	There are active alarms.
BROADCAST ABORTED	Power management: Broadcast terminated.
BROADCAST COMPLETED	Power management: Successful broadcast of application.
BROADCASTING APPL.	Power management: Broadcast one of the four applications from one controller to the other controllers in the power management system, through the CAN line.
CHECKING CAN PMS	Easy connect: Checking for other units on the PMS CAN line.
CLOSE DELAY	ES breaker close delay.
COMPENSATION FREQ.	Compensation is active. The frequency is not at the nominal setting.
DELAY REG.	Regulation is delayed until after start.

Status text	Condition
DELOAD	The controller is decreasing the load of the genset in order to open the breaker.
DELOAD ERROR	There is an error when deloading.
DELOADING MB	The ESS controller (without power management application) is increasing the load to de-load MB XX.
DERATED TO	Displays the ramp-down set point.
EASY CONNECT ERROR	Easy connect failure.
ESB OPEN BLOCKED	The ES breaker is blocked from opening.
ESS NOT READY	The ESS is not ready for operation.
EXT. MB OPEN FAILURE	External MB open failure.
EXT. STOP TIMER	Extended stop timer.
EXTERNAL START ORDER	A planned AMF sequence is activated (without a mains failure).
FIXED POWER ACTIVE	The controller is in auto mode and supplying fixed power.
FIXED POWER AUTO	The controller is in auto mode and ready to respond.
FIXED POWER SEMI	The controller is in semi-auto mode and waiting for operator input.
FULL TEST	Test mode is activated.
ID 1-16 SUPPORT ONLY	Only IDs 1 to 16 are supported.
ISLAND ACTIVE	The controller is in auto mode and supplying power while not connected to a mains supply.
ISLAND AUTO	The controller is in auto mode and ready to respond.
ISLAND SEMI	The controller is in semi-auto mode and waiting for operator input.
LOAD TAKE OVER AUTO	The controller is in auto mode and ready to respond.
LOAD TAKE OVER SEMI	The controller is in semi-auto mode and waiting for operator input.
LOAD TEST	Test mode is activated.
LTO ACTIVE	The controller is in auto mode and taking over the load.
MAIN BB FAILURE	Phase is missing.
MAIN BB U OK IN	The mains BB voltage is OK after mains failure. The timer shown is the mains OK delay.
MAIN BB F OK IN	The mains BB frequency is OK after mains failure. The timer shown is the mains OK delay.
MAIN BUSBAR OK	The mains busbar is OK after mains failure. The timer shown is the mains OK delay.
MAINS FAILURE	Mains failure and mains failure timer expired.
MAINS FAILURE IN ###s	The frequency or voltage measurement is outside the limits. The timer shown is the mains failure delay.
MAINS FAILURE TIMER	Mains failure present timer.
MAINS f OK DEL ####s	Mains frequency is OK after a mains failure. The timer shown is the mains OK delay.
MAINS P EXPORT AUTO	The controller is in auto mode and ready to respond.
MAINS P EXPORT SEMI	The controller is in semi-auto mode and waiting for operator input.
MAINS U OK DEL ####s	The mains voltage is OK after a mains failure. The timer shown is the mains OK delay.
MB CLOSED INHIBITED	MB closing inhibited.
MB EXT. TRIPPED	The mains breaker is tripped externally.
MB IS CLOSED	The mains breaker is already closed.
MB IS OPEN	The mains breaker is already open.
MB SYNCHRONISING	Synchronising the mains breaker.

Status text	Condition
MB RACKED OUT	The *Breaker racked out* digital input is activated. Position failure and external trip alarms from the racked out breaker will not interfere with the rest of the system.
MIN DG LOAD CHARGING	The battery is charging to make sure the gensets are operating at the minimum genset load.
MOUNT CAN CONNECTOR	Quick setup.
MPE ACTIVE	The controller is in auto mode and exporting power to the mains.
NOT IN MAN OR SEMI	The controller tried to open or close the mains breaker in auto mode.
NOT POSSIBLE	Unable to do the requested command.
PEAK SHAVING ACTIVE	The controller is in auto mode and doing peak shaving.
PEAK SHAVING AUTO	The controller is in auto mode and ready to respond.
PEAK SHAVING SEMI	The controller is in semi-auto mode and waiting for operator input.
POWER DERATE	Power derate is active.
PROGRAMMING LANGUAGE	Downloading the language file, using the PC utility software.
QUICK SETUP ERROR	Quick setup of the application failed.
RAMP FREEZED	Stopped ramping (ramping frozen).
RAMP TO #####kW	The power ramp is ramping in steps. The next step that is reached after the timer has expired is displayed.
RAMPING	Ramping up to the set point.
READY AMF AUTO	The controller is in auto mode and the ESS is stopped.
READY AUTO OPERATION	The controller in auto mode and ready for breaker operation (no active BTB trip alarm).
READY FIXED P AUTO	The controller is in auto mode and the ESS is stopped.
READY ISLAND AUTO	The controller is in auto mode and the ESS is stopped.
READY LTO AUTO	The controller is in auto mode and the ESS is stopped.
READY MPE AUTO	The controller is in auto mode and the ESS is stopped.
READY PEAKSHAV AUTO	The controller is in auto mode and the ESS is stopped.
READY TO BE ADDED	Easy connect: Controller is ready to be added.
RECEIVE COMPLETED	The broadcast application has been received.
RECEIVE ERROR	There was an error receiving the broadcast application.
RECEIVING APPL.	Receiving the broadcast application on the CAN line.
REM. FROM PMS ESS	Easy connect: Remove ESS from PMS plant.
REMOVE CAN CONNECTOR	Remove the power management CAN lines.
SELECT OPERATION MO	An operation mode has not been selected.
SELECT PLANT MODE	A plant mode has not been selected.
SETUP COMPLETED	Successful update of the application in all the controllers.
SETUP IN PROGRESS	A new controller is being added to the existing application.
SETUP STAND ALONE?	Easy connect: Configure the controller in a stand-alone application.
SIMPLE TEST	Test mode is activated.
SOC STOP LIM > THR2	Warning: The SOC genset stop limit is more than the SOC threshold 2.
START DG(s) IN ###s	Genset start timer: Load dependent start/stop.
START NEW PLANT	Easy connect: Configure a new PMS plant.

Status text	Condition
START PREPARE	The start prepare relay is activated.
START RELAY OFF	The start relay is deactivated during the start sequence.
START RELAY ON	The start relay is activated.
STOP DG(s) IN ###s	Genset stop timer: Load dependent start/stop.
SYNCRHONIZING MB	MB is synchronising.
TOO SLOW 00←----------|	ESS frequency is less than the BB frequency.
--------⟶ 00 TOO F	ESS frequency is more than the BB frequency.
UNEXPECTED GB ON BB	A stopped genset has a closed GB.
VOLT/FREQ OK IN	BB Hz/V OK timer.
VOLTAGE/FREQUENCY OK	The voltage and frequency are okay, and the timer has run out.
WARM UP RAMP	Warm up ramp is active. The available power is limited until the pre-defined temperature is reached, or when the input that activated warm up ramp is deactivated.
---xx-------- >00< ----------	Generator is synchronising. The "xx" marks the actual generator phase angle position in the synchronisation. When the "xx" is aligned over the 00 centre, the generator is synchronised.

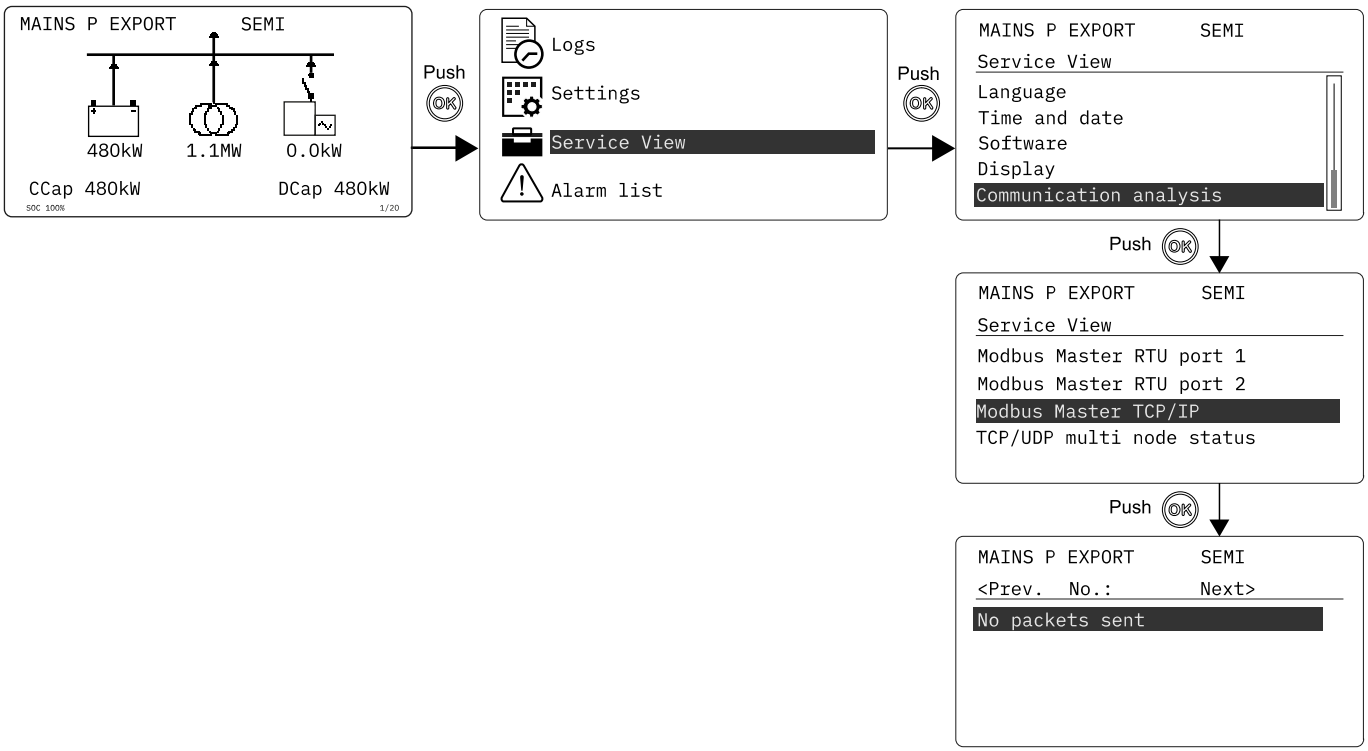
5.5 Service view

You can use the service view to see the status of the controller. You can change the passwords in the service menu, but not the other controller settings.

From the view menu, push the OK button and select *Service View* . Use the ⌄ and ⌃ buttons to go through the parameters in the service view, and use the OK button to select the parameters.

Service view example

This is an example of how to find the configuration and operating details for *Modbus Master TCP/IP* in `Communication analysis`.



5.5.1 Communication troubleshooting

In `Service View > Communication analysis` you can see:

- Modbus Master RTU port 1
- Modbus Master RTU port 2
- Modbus Master TCP/IP
- TCP/UDP multi mode status

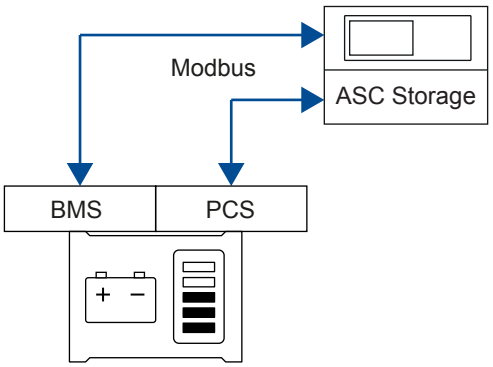
For each selection, you can see configuration and operating details. For example, for Modbus Master TCP/IP you can see:

- Details for each connected device (use <Prev. and Next> to navigate)
- IDs, Rx and Tx info, IP address, connected (true or false), and so on.

The ASC 150 Storage controller controls the ESS with communication to a battery management system (BMS), a battery control unit (BCU), or a power conversion system (PCS).

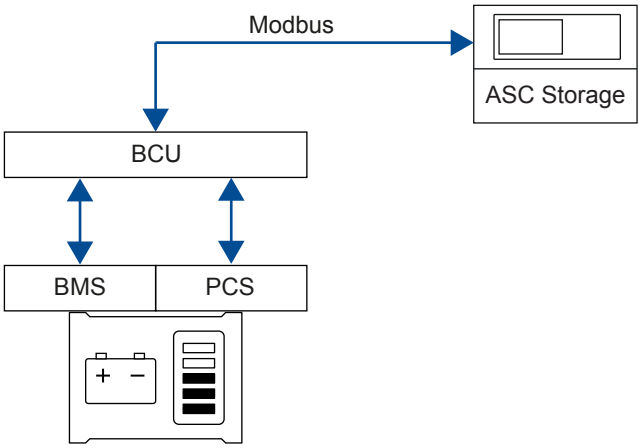
Communication with the battery management system (BMS) and power conversion system (PCS)

If the ESS does not have a BCU, the ASC 150 Storage controller communicates with the BMS over Modbus. The ASC also communicates with the PCS over Modbus. This examples shows a simplified version of this type of communication.



Communication with the battery control unit (BCU)

If the ESS does have a battery control unit (BCU), the ASC communicates with the BCU over Modbus. This is a simplified example of how this type of communication works. Troubleshooting is only for communication between the BCU and the ASC controller since communication between the BCU and BMS, and the BCU and PCS is proprietary.



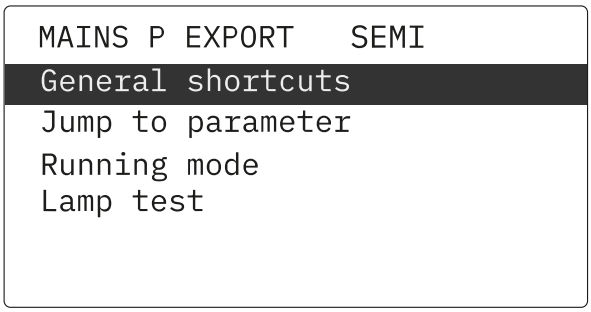
5.6 General shortcuts

You can see your configured shortcuts in the General shortcuts menu. If you have not configured a shortcut, then the menu is empty. Use the shortcuts when the controller is in SEMI-AUTO mode.

More information
See **General shortcuts** in the **ASC 150 Storage Designer's handbook** for how to configure the general shortcuts.

On the controller

1. From the view menu, push the *Shortcut* button to see the menu.



2. Use the *Up* and *Down* buttons to go to *General shortcuts* , and push the button.

3. Use the *Up* and *Down* buttons to go to select a shortcut.

6. Alarm handling and log list

6.1 Alarm handling

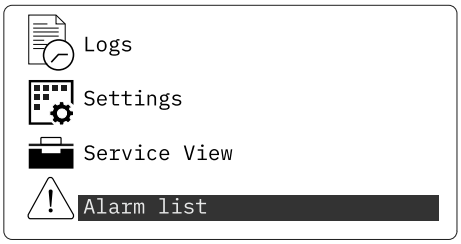
If the function *Alarm Jump* is on, the controller will automatically show the alarm list on the display screen when an alarm occurs.

`Service View > Display > Alarm Jump`

Parameter	Text	Range	Default
9157	Alarm Jump	OFF ON	ON

Access the alarm list from the display unit

1. From the view menu, push the OK button.
2. Use the ^ and v buttons to go to the *Alarm list*.

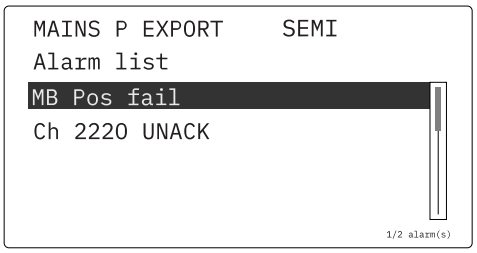


3. Push the OK button to view the *Alarm list*.

The alarm list contains both acknowledged and unacknowledged alarms that are active. An alarm is active, if you have not cleared the alarm condition, which started the alarm. Once an alarm is acknowledged and you have cleared the alarm condition, the alarm is removed from the alarm list. If there are no alarms, then the alarm list will show *No alarms*.

The display screen can show only one alarm at a time. The number of alarms is shown on the right at the bottom of the screen.

Example of an unacknowledged alarm



To see the other alarms, use the ^ and v buttons to go through the list. To acknowledge an alarm, select the alarm and push the OK button.

Access the alarm list with the utility software

Select *Alarms* on the vertical panel on the left.

CAUTION

Caution

If an alarm is blocking the ESS in AUTO mode from starting, the ESS starts automatically if the condition that triggered the alarm has gone and the alarm has been acknowledged.

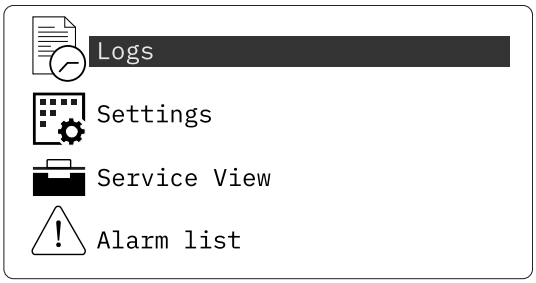
6.2 Logs menu

These are the log sub-menus:

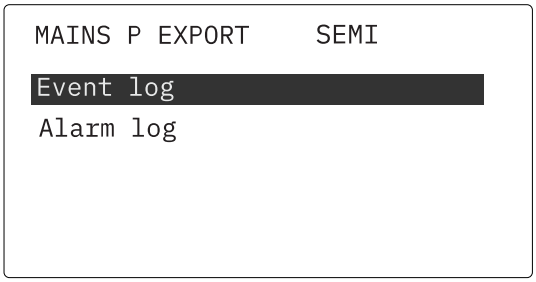
1. Event log: Shows up to 500 events.
2. Alarm log: Shows up to 500 alarms. Only the latest 100 alarms are shown on the display unit, while the remaining alarms are shown in the utility software.

Access the log menu from the controller

1. From the view menu, push the OK button.
2. Use the ^ and v buttons to go to *Logs*.



3. Push the OK button to select *Logs*.
4. Select the log you want to see and push the OK button.



5. To leave the *Log* , push the ← button.

Access the log list with the utility software

1. In the vertical panel on the left, select *Logs*.
2. In the task bar, select *Get logs* .
3. Select the *Log list* you want to see.