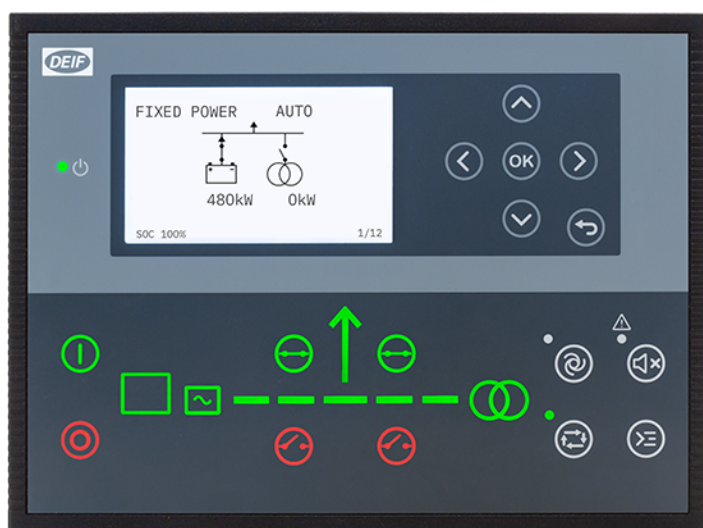




About ASC 150 Storage

Use the **ASC 150 Storage** as a **single** controller to add a storage system to an existing site, or with other DEIF controllers in a **power/energy management system**. The controller optimises the battery power, to **save fuel** and maximise green penetration.

Each controller controls and protects an energy storage system (ESS) with communication to a BMS, BCU, and/or a PCS. The controller is **plug-and-play**, and **easy to customise** (with the user-friendly M-Logic tool). You can **easily scale up** from a single controller, to a PMS with a variety of controllers and up to 16 storage controllers.

Grid-forming or -following

The controller uses the PCS and BCU:

- **Grid-forming** (island or V/f mode)
The battery acts as the only energy source.
The battery provides the grid-forming power in island operation. It works with non-grid-forming sources, like solar and wind.
Gensets: Stopped if the load level, battery capacity, and state of charge conditions are fulfilled. When the battery is discharged or more power is needed, the gensets are reconnected. The controller can also suppress genset starts from spinning reserve requests.
- **Grid-following** (parallel or P/Q mode)
The battery is always connected to another grid-forming source, like a mains or genset.
The battery is used as a power buffer, providing spinning reserve and peak shaving.
- **Droop mode** (if the ESS supports this)
The controller controls the storage charge and discharge using V/f or P/Q set points from the configured droop curve (that is, like a virtual synchronous generator (VSG)).

Droop mode is possible for both grid-forming and grid-following.

Energy or power source

- **Energy source**
The ASC 150 Storage controller prioritises battery power over genset power.
The system uses as much battery power as possible before starting any genset.
- **Power source**
The ASC 150 Storage controller operates in parallel to other sources.
Genset power is prioritised over battery power. This mode is used to ensure that spinning reserve requirements are met.

Storage features

	Extended	Premium
Energy storage breaker (ESB) control	●	●
Energy usage monitoring	●	●
Power management	●	●
Reactive power control		●

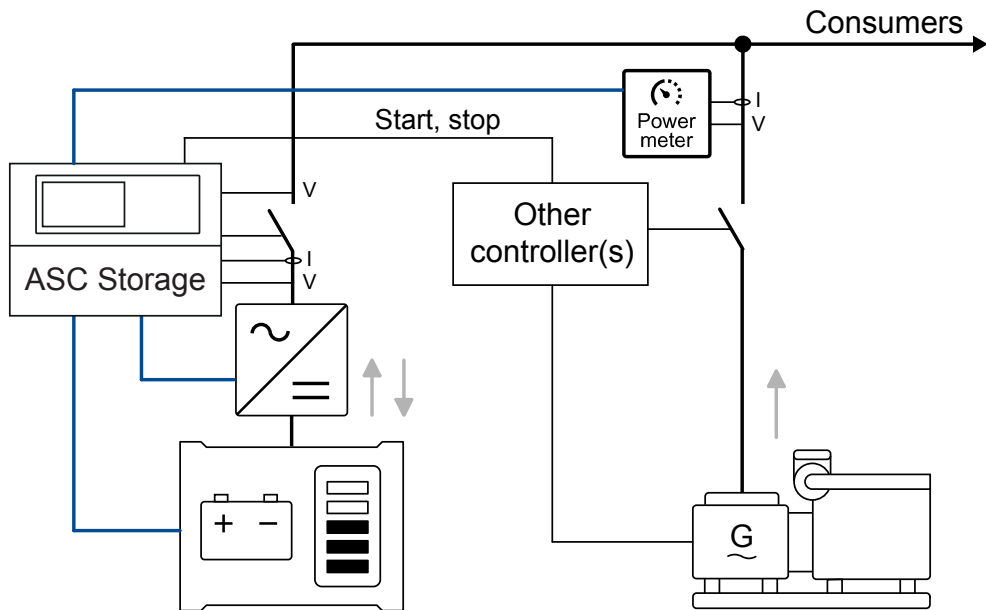
Single controller

- Useful for **rental** and **brownfield** applications
- Automatically charges and discharges the ESS
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Requires **power measurement** and breaker feedback for other power sources
 - **Only one source:** Can use the controller's 4th current measurement.
 - **Multiple power sources:** Measurements from:
 - Genset controllers (DEIF or third parties)
 - Power meters
 - Transducers
- Power management communication is not required

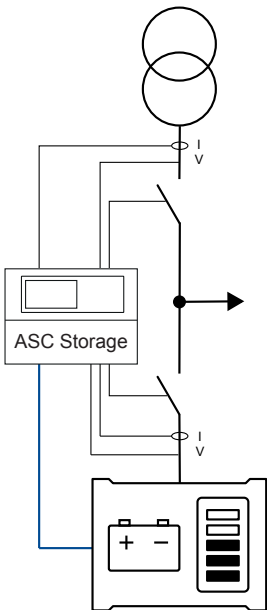
Power management

- Automatically charges and discharges the ESS
- Automatically uses the ESS as spinning reserve for PV and microgrids
- Automatically starts and stops generators
- Automatically closes and opens breakers
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Optimises the fuel consumption
- Balances the loads in the system
- Uses the plant logic
- Makes sure that the system is safe

Single controller



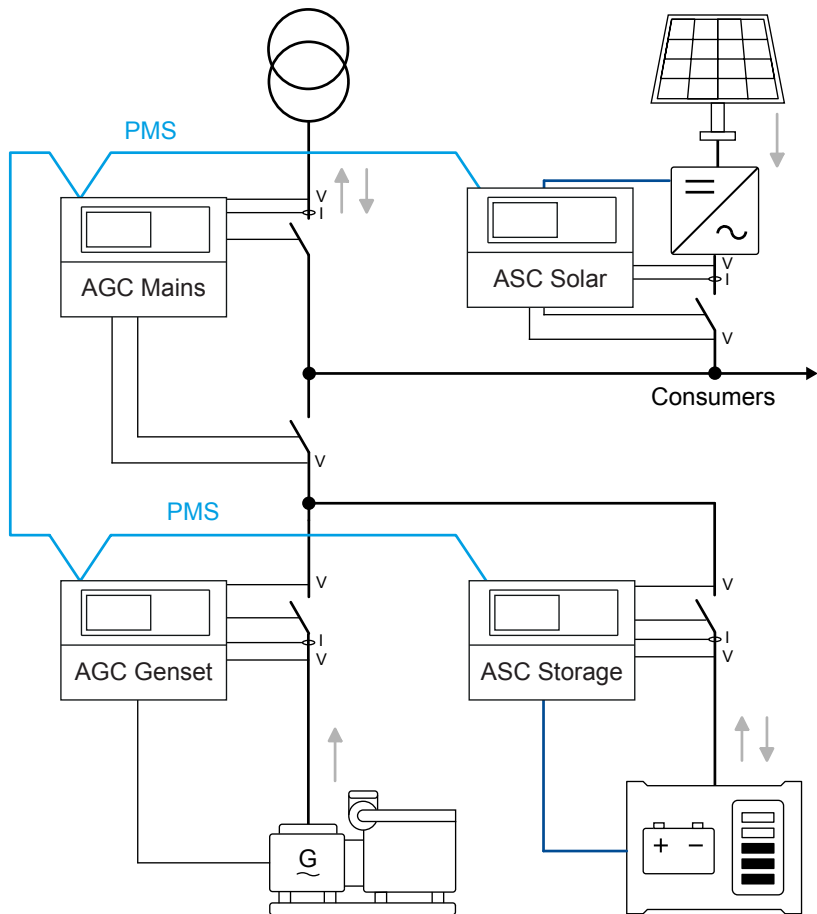
Emission-free power rental solution with a single ESS



Peak shaving application

Maximum number of gensets for a single controller: 4 (Extended) or 16 (Premium)

Power management

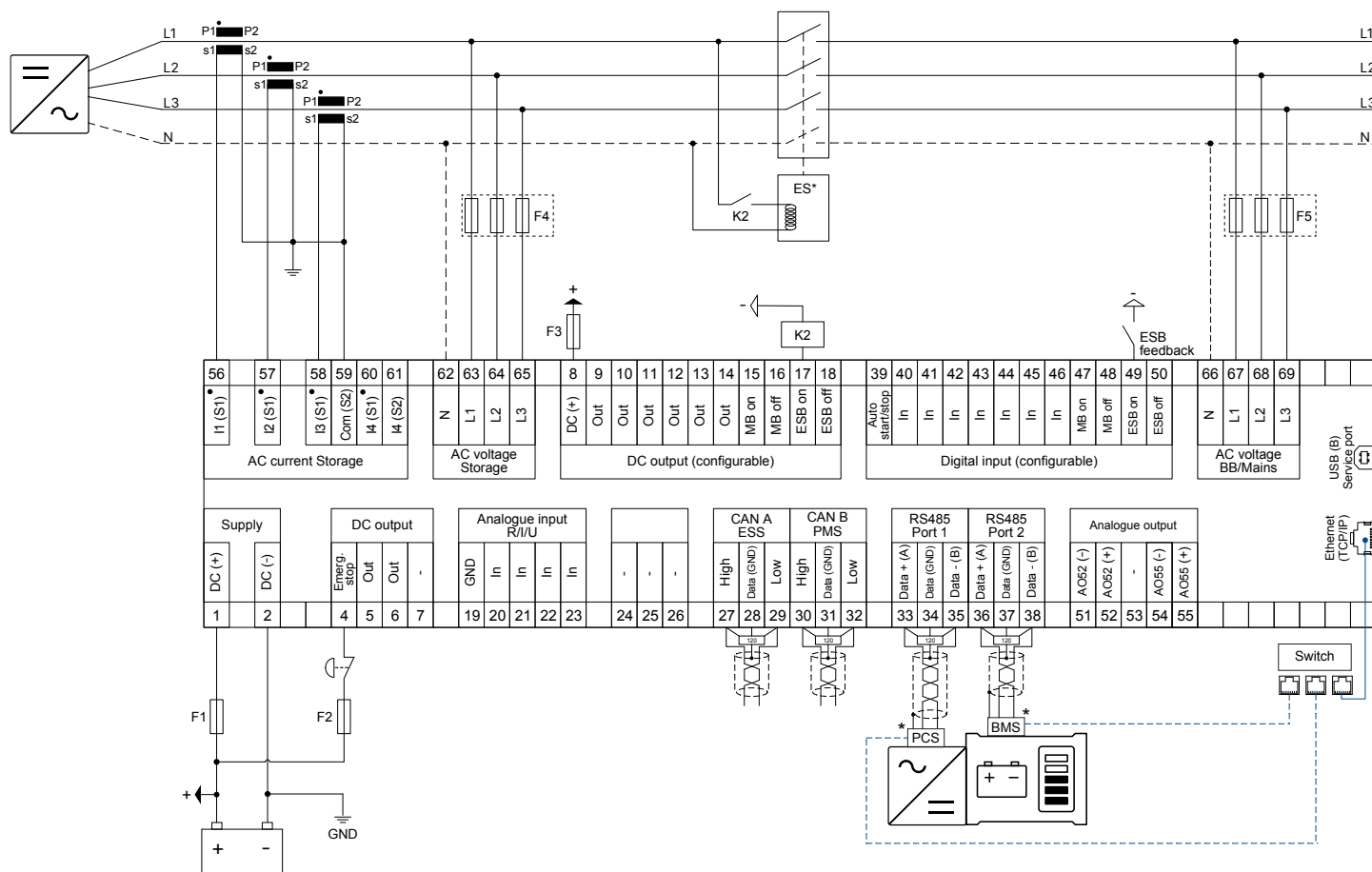


Maximum number of compatible controllers*

Generator controllers.....	32
Mains controllers.....	32
BTB controllers.....	8
Solar controllers.....	16
Storage (BESS) controllers.....	16
Load controllers.....	8

* All controllers must use DEIF power management.

Typical wiring



Communication

BCU control, BCU and PCS control, BMS control

- Modbus RTU (RS-485)
- Modbus TCP (Ethernet)

Power meters

- Modbus RTU (RS-485)

Other DEIF controllers

- CAN bus
- Ethernet

Compatibility

BCU control/BCU and PCS control/BMS control

- Supports more than 20 different systems
- Supports a wide range of manufacturers

Power meters

- Genset controllers (DEIF or third parties)
- Power meters
- Transducers



More information

See **DEIF hybrid controller compatibility** for all the compatible BCU, PCS, BMS and power meters.

AC measuring

- Voltage: 100 to 690 V phase-to-phase (10 to 135 %), ± 1 %
- Current: -/1 A or -/5 A (2 to 300 %), ± 1 %
- Frequency: 3.5 to 75 Hz
- Power: ± 1 %

Power supply

- Nominal voltage: 12/24 V DC
- Operating range: 6.5 to 36 V DC
- Load dump protection: ISO16750-2
- Measuring range: 0 to 36 V DC

Inputs and outputs

- Digital inputs: 12 x (max. +36 V, min. -24 V)
- Digital outputs:
 - 2 x (15 A inrush, 3 A continuously)
 - 10 x (2 A inrush, 0.5 A continuously)
 - Common: 12/24 V DC
- 4 x analogue inputs
- 2 x analogue outputs
- CAN bus A and B
- RS-485 1 and 2
- RJ-45 Ethernet
- USB (service port)

Environment

- Operating temperature: -40 to +70 °C (-40 to +158 °F)
- Storage temperature: -40 to +85 °C (-40 to +185 °F)
- Altitude: 0 to 4000 m
- Humidity: 20/55 °C at 95 % RH
- Protection degree: IP65 in panel, IP20 on terminals
- Pollution degree 2
- Self-extinguishing plastic

Approvals

- CE



More information

See www.deif.com for the most recent approvals.

Protections

2 x Fast over-current.....	ANSI 50P
4 x Over-current.....	ANSI 51
1 x Voltage-dependent over-current.....	ANSI 50V
2 x Over-voltage.....	ANSI 59P
3 x Under-voltage.....	ANSI 27P
3 x Over-frequency.....	ANSI 81O
3 x Under-frequency.....	ANSI 81U
1 x Unbalanced voltage.....	ANSI 47
1 x Unbalanced current.....	ANSI 46
1 x Under-excitation or var import.....	ANSI 32RV
1 x Over-excitation or var import.....	ANSI 32FV
5 x Overload.....	ANSI 32F
1 x Neutral current.....	ANSI 51N
3 x Busbar over-voltage.....	ANSI 59P
4 x Busbar under-voltage.....	ANSI 27P
3 x Busbar over-frequency.....	ANSI 81O
3 x Busbar under-frequency.....	ANSI 81U
1 x Low auxiliary supply.....	ANSI 27DC
1 x High auxiliary supply.....	ANSI 59DC
Breaker open failure.....	ANSI 52BF
Breaker close failure.....	ANSI 52BF
Breaker position failure.....	ANSI 52BF
1 x Phase sequence error.....	ANSI 47
1 x Emergency stop	
1 x De-load error	
1 x Hz/V failure	
1 x Not in Auto	
1 x ES breaker external trip	
Synchronisation failure alarms	

For more information:

DEIF A/S
Frisenborgvej 33, 7800 Skive, Denmark
Tel.: +45 9614 9614, info@deif.com
www.deif.com

