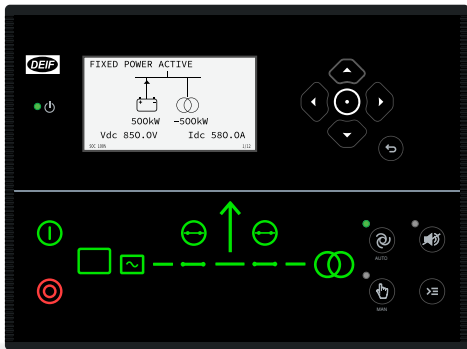


# iE 150 Battery



## About iE 150 Battery

Use the **iE 150 Battery** 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 battery 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.

Storage features	Premium
→ Energy storage breaker (ESB) control	●
→ Energy usage monitoring	●
→ Power management	●
→ Reactive power control	●

## Energy or power source

- **Energy source**  
The controller prioritises battery power over genset power. The system uses as much battery power as possible before starting any genset.
- **Power source**  
The 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.

## Single controller

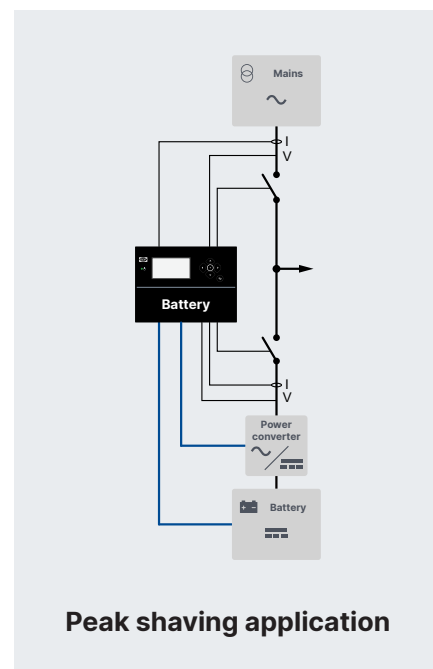
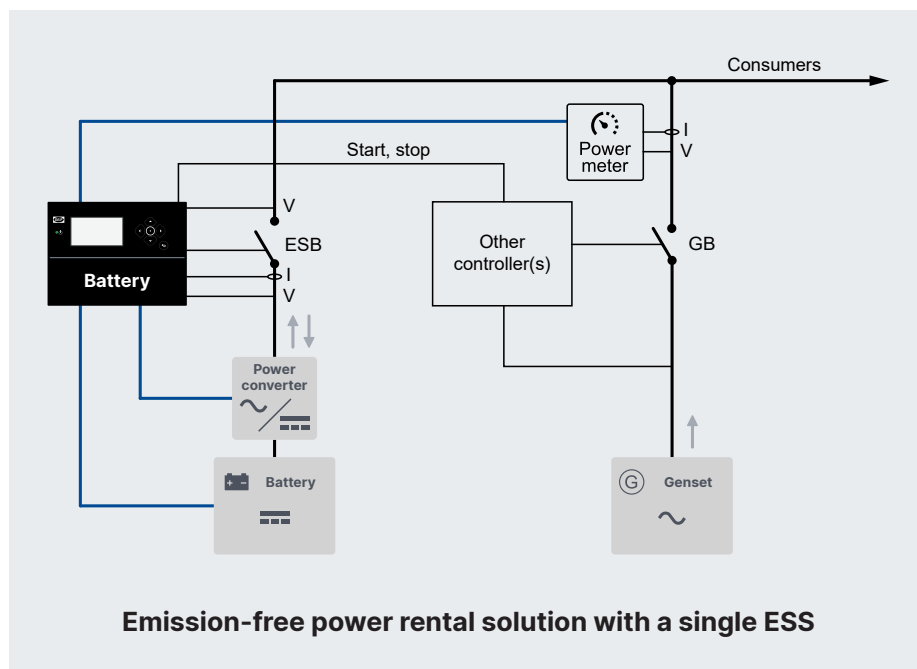
- Useful for **rental** and **brownfield** applications
- Automatically charges and discharges the ESS
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Requires **power measurement** and breaker feedback for other power sources
  - **Only one source:** Can use the controller's 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

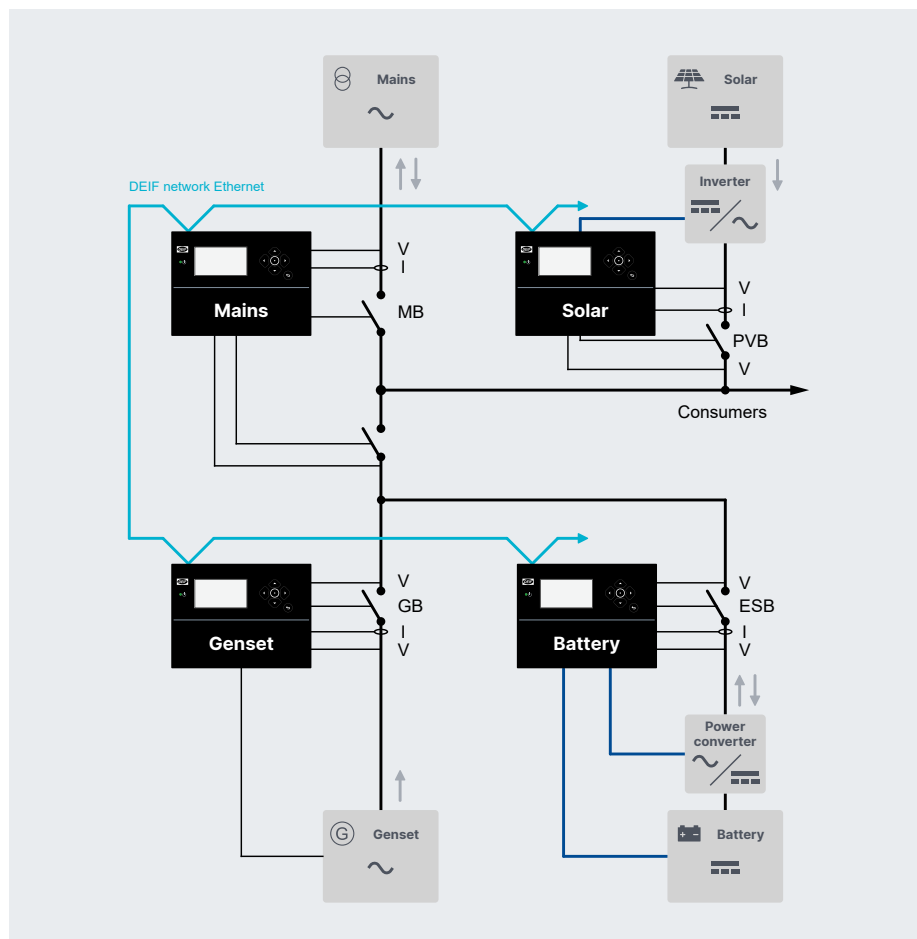
# Application examples

## Single controller



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

**NOTE** \* All controllers must use DEIF power management.

# Technical specifications

## Communication

### BCU control, BCU and PCS control, BMS control

- Modbus RTU (RS-485)
- Modbus TCP (Ethernet)
- CAN bus J1939

### Power meters

- Modbus RTU (RS-485)

### Other DEIF controllers

- CAN bus
- Ethernet

### Service port

- USB

## 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

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

## Approvals

- CE
- UL/cUL Listed to UL/ULC6200:2019, 1. ed. Controllers for Use in Power Production

**NOTE** Refer to [deif.com](http://deif.com) for the most recent approvals.

## AC measuring

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

## Power supply

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

## Environmental specifications

- 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 97 % RH
- Protection degree: IP65 in panel, IP20 on terminals
- Pollution degree 2
- Self-extinguishing plastic

## Protections

2 x Fast over-current.....	ANSI 50P
4 x Over-current .....	ANSI 50TD
1 x Voltage-dependent over-current .....	ANSI 50V
2 x Over-voltage .....	ANSI 59
3 x Under-voltage.....	ANSI 27P
3 x Over-frequency .....	ANSI 81O
3 x Under-frequency .....	ANSI 81U
1 x Unbalance voltage.....	ANSI 47
1 x Unbalance current .....	ANSI 46
1 x Under-excitation or reactive power import ...	ANSI 32RV
1 x Over-excitation or reactive power export .....	ANSI 32FV
5 x Overload* .....	ANSI 32F
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 Neutral current	
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	

**NOTE** \* You can configure these protections for overload or reverse power.

