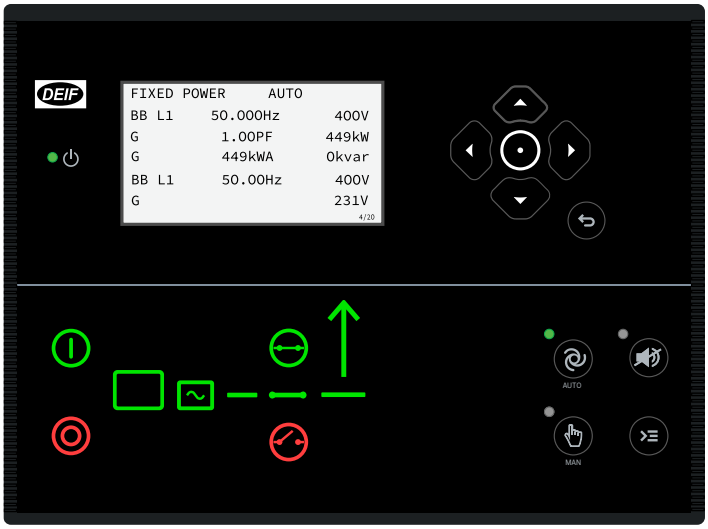


About the iE 150 Marine

The iE 150 Marine is an easy-to-use controller platform made for marine applications.

The iE 150 has a range of control, protection, and supervision functions. Each controller can protect and control a genset, an energy storage system (ESS), a shore connection, or a bus tie breaker.

With an iE 150 power management system you can control the system. The controller makes sure that the operation is stable and that the necessary power is always available.

You can also use iE 150 in power management systems with other DEIF controllers.

The iE 150 controllers work together in a multi-master system. Each iE 150 controller is a master controller. If there is a controller failure, the other controllers continue to operate.

Controller types

2 Genset controllers: Each controller controls and protects an engine, a generator, and the generator breaker.

2 Battery controllers: Each controller controls and protects an energy storage system.

1 Shore connection controller: Each controller controls and protects a system that includes a shore connection and a shore connection breaker.

2 Bus tie breaker controllers: Each controller controls a bus tie breaker.

Power management

Reliable power control with load management

- Power management system that can include up to 7 controllers (maximum two gensets and two batteries)
- Automatic start and stop for generators
- Automatic charge and discharge for the ESS
- Optimised fuel consumption
- Balanced load in the system
- Blackout prevention
- Configurable recovery after blackout

Load control and set point integration

- Load transfer
  - For synchronisation, de-loading, and load sharing
- Load-dependent start and stop
  - 2 sets of parameters available
- Calculation of control set points
- External analogue inputs as control set points

General functions

Easy to use

The controller has illuminated buttons that smoothly guide the operator and make it easy and intuitive to operate. Only buttons relevant for a function are visible to the user.

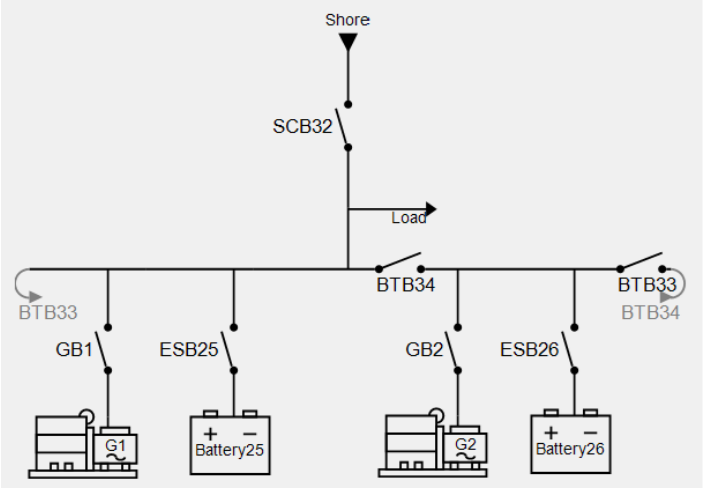
- Easy access to the most common functions with configurable shortcuts
- Parameters access from the display
- Pre-configured sensor curves

Settings and parameters

- Default parameters and fast input and output configuration
- Pre-programmed engine and inverter protocols
- Event and alarm log with real-time clock
- Programmed control settings
- Password-protected controller with configurable permission levels
- Alarm handling

Free utility software

- Draw-and-play single-line application drawing tool for design, configuration and broadcasting
- Settings and parameters to configure functions
- Emulation and supervision
- Logic configuration tool



Genset functions

Breaker control
- Automatic synchronisation and de-loading
- Breaker position detection
- Breaker alarms

Engine control
- Fuel optimisation
- Configurable start sequence
- Idle run start and stop
- Run coil/stop coil and crank configurable

Generator protection
- Current, power and protection alarms
- Synchroscope and sync check

Engine protection
- Oil pressure, oil level, water temperature and more
- Fuel usage monitoring

Load sharing
- Load sharing, kW (GOV)
- Reactive power sharing, kvar (AVR)
- Load sharing options for each busbar section:
  - Equal load sharing (symmetrical)
  - Asymmetric load sharing

Engine interface communication
- Extensive list of support engine protocols
- Generic J1939 protocol

Digital voltage regulator
- DVC 350 and DVC 550 support

Configurable controller
- 2 sets of nominal settings
- Configurable parameters for controller functions
- Customise the controller start sequence

General functions
- Maintenance logic
- Load adding and shedding control
- Blackout prevention and recovery
- Direct 3-phase AC measurement, max. 690 V AC, class 1

Battery functions

- Automatically uses the ESS as spinning reserve to support load deviations
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Each controller controls and protects an energy storage system with communication to a BMS, BCU, and/or a PCS
- Long list of compatible power inverters (PCS) and battery systems (BMS)

Grid-forming (island or V/f mode)

The battery acts as the only energy source. Gensets are 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 power management system can also use the battery to suppress genset start from spinning reserve requests.

Grid-following (parallel or P/Q mode)

The battery is always connected to another grid-forming source, like a genset. The battery is used as a power buffer, providing spinning reserve and peak shaving.

Droop mode (if the ESS supports this)

The controller manages the storage charge and discharge using V/f or P/Q set points from the configured droop curve. This setup functions like a virtual synchronous generator. Droop mode is available for both grid-forming and grid-following configurations.

Retrofit
- Adding battery to an existing power management system
- Useful for existing vessels
- Automatically charges and discharges the ESS
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Required power measurement and breaker feedback for other power sources
  Only one genset: Can use the battery controller's 4th current measurement

  Multiple gensets: Measurements from:
  - Genset controllers (DEIF or third parties)
  - Power meters
  - Transducers
- Power management communication is not required

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