iE Display

4189341416C

Intelligent energy controllers

Operator's manual

DEIF Improve Tomorrow

1. About the Operator's manual

2. Getting started

3. Control and operation

1. About the Operator's manual

1.1 Symbols and notation

Symbols for general notes

NOTE This shows general information.

More information
This shows where you can find more information.

Example

This shows an example.

How to ...
This shows a link to a video for help and guidance.

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.

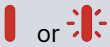
NOTICE

This shows an important notice

Make sure to read this information.

Symbols for LEDs

LEDs in this document are noted by the following symbols:

Symbol	Colour	State		Notes
	Grey	Off	Static	• The LED is not active. • The feature or indication is not active.
 or	Any	On	Any colour static or flashing	The feature or indication is active.

1.2 Previous document numbers

This document replaces the following document numbers:

- iE 250 Operator's manual - 4189341349 - Revision D
- iE 250 Marine Operator's manual - 4189341380 - Revision B
- iE 250 Marine Power management Operator's manual - 4189341394 - Revision B
- iE 350 Marine Operator's manual - 4189341382 - Revision B
- iE 350 Marine Power management Operator's manual - 4189341395 - Revision B

1.3 Intended users of the Operator's manual

CAUTION

Read this manual

Read this manual before you operate the system. Failure to do this may result in personal injury and damage to the equipment.

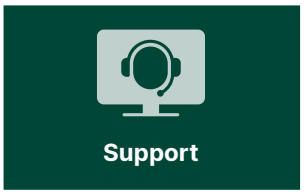
The Operator's manual is for the operator that completes daily operations with the controller. The manual includes information about the LEDs, buttons and screens, and general operator tasks, alarms, and logs.

1.4 Need more information?

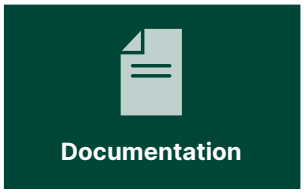
Get direct access to the resources that you need by using the links below.

Official DEIF homepage.

Help improve our documentation with your feedback.

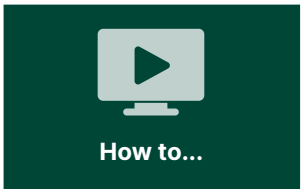


Self-help resources and how to contact DEIF for assistance.

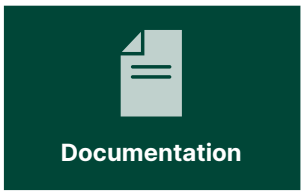


iE 250 documentation.

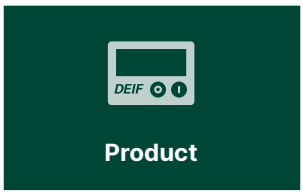
iE 250 product page.



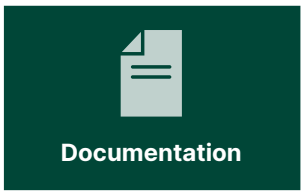
Learn how to use this product.



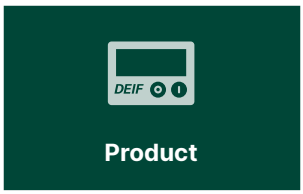
iE 250 Marine documentation.



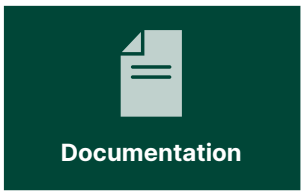
iE 250 Marine product page.



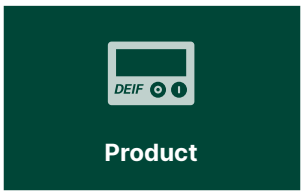
iE 350 documentation.



iE 350 product page.



iE 350 Marine documentation.



iE 350 Marine product page.

1.5 Software versions

The information in this document relates to software versions:

Software	Details	Version
iE 250	Controller application	2.0.8.x
iE 250 Marine	Controller application	2.0.8.x
iE 350	Controller application	2.0.8.x
iE 350 Marine	Controller application	2.0.8.x
iE x50 CODESYS libraries	CODESYS	2.0.2.x
PICUS	PC software	1.0.24.x

1.6 Features in this document

Not all features shown in this document are supported on all licences.

More information
For details about the different licences, see the Data sheet:

- iE 250 Data sheet
- iE 250 Marine Data sheet
- iE 350 Marine Data sheet

1.7 Warnings and safety

Safety during operation

When you operate the equipment, you may have to work with dangerous currents and voltages.

DANGER!

Hazardous live currents and voltages

Do not touch any terminals, especially the AC measurement inputs, as this could lead to injury or death.

Automatic and remote-controlled starts

CAUTION

Automatic genset start

The power management system automatically starts gensets when more power is needed. It can be difficult for an inexperienced operator to predict which gensets will start. In addition, gensets can be started remotely (for example, via an Ethernet connection, or a digital input).

To avoid personal injury, the genset design, the layout, and maintenance procedures must take this into account.

Switchboard control

In MARINE applications, the operator can operate the equipment from the switchboard.

When *Switchboard control* is activate:

- The controller trips the breaker and/or shuts down the engine, if an alarm situation arises that requires a trip and/or shutdown.
- The controller **does not** accept operator commands.
- The controller cannot and **does not** prevent manual operator actions.
- In Power management applications:
  - The controller **does not** respond to a blackout.
  - The controller **does not** provide power management.

The switchboard design must protect the system when the controller is in *Switchboard control*.

DANGER!

Manual override of alarm action

Do not use switchboard or manual control to override the alarm action of an active alarm.

An alarm may be active because it is latched, or because the alarm condition is still active. If the alarm action is manually overridden, the latched alarm provides no protection.

Do not circumvent active alarm actions

DANGER!

Circumventing a latched alarm action

If the alarm action is circumvented, a latched alarm does NOT provide any protection.

Do not circumvent the alarm action of an active alarm. An alarm may be active because it is latched, or because the alarm condition is still present.

Latched *Over-current* alarm example

The controller trips a breaker because of over-current. The operator then manually (that is, not using the controller) closes the breaker while the *Over-current* alarm is still latched.

If another over-current situation arises, the controller **does not trip the breaker again**. The controller regards the original *Over-current* latched alarm as still active.

1.8 Legal information

Warranty

NOTICE

Warranty

The warranty will be lost if the warranty seals are broken.

Open source software

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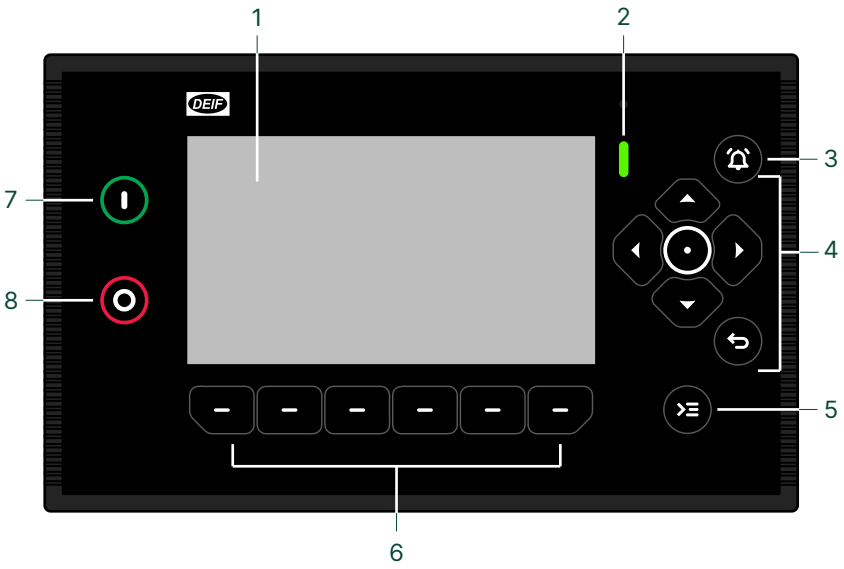
2. Getting started

2.1 About the display

2.1.1 Display layout

The base-mounted controller can run with or without a display, but we recommend that you use a display. The display is the operator's interface to the controller.



No.	Item	Notes
1	Display screen	7" colour touch screen.
2	Status LED	Multi-colour LED for status indication.
3	Notification centre button	Silences the alarm horn (deactivates the output), and opens the **Notification centre**, which shows alarms and events.
4	Navigation buttons	Up, down, left, and right arrows.
	Enter button	Confirms the selection.
	Back button	• Returns to the previous page • Shows the menu. • Hold: Change to Dashboard
5	Control centre button	Opens the **Control centre**.
6	Configurable buttons	Buttons are can be activated either by pressing the physical button or the soft key on the screen. *
7	Start button	In manual or local operation, it starts the asset. In a Power management system and in AUTO mode, it starts the Power management.
8	Stop button **	In manual or local operation, it stops the asset. In a Power management system and in AUTO mode, it stops the Power management.

NOTE * Dashboard pages can be created, copied and modified, to assign different functions to the buttons (with PICUS and the Display designer).

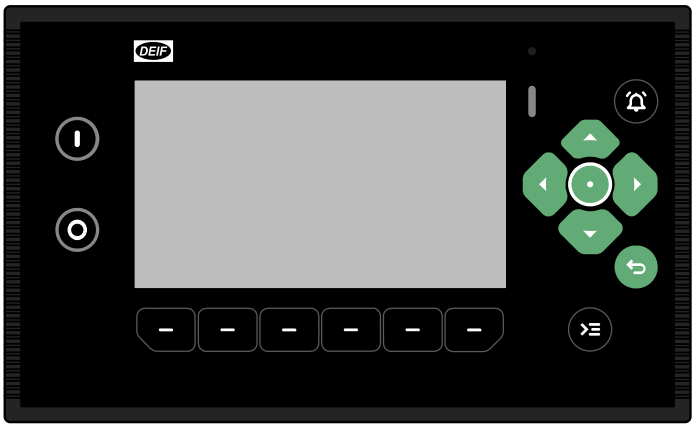
** Double press to override cooldown process. Press again to cancel **Idle run**, if configured. Idle run may not be permitted or approved by certain maritime classification societies.

2.1.2 Controls

You can operate the controller with flexible controls.

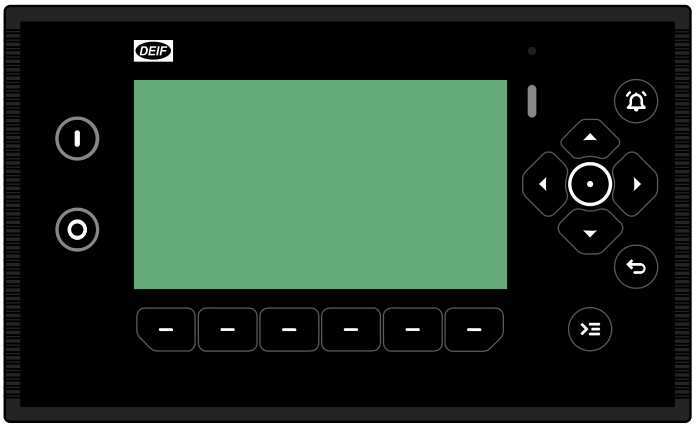
6-way navigation

Button navigation for control, selection, and entering information.



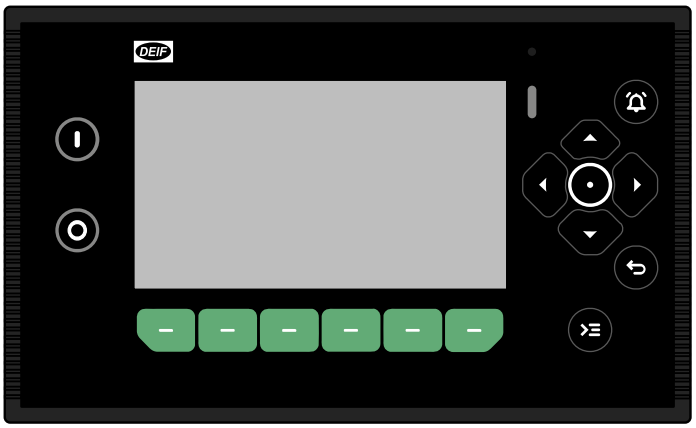
Touch screen

Easy to use touch interface for most functions.
This feature can also be disabled.



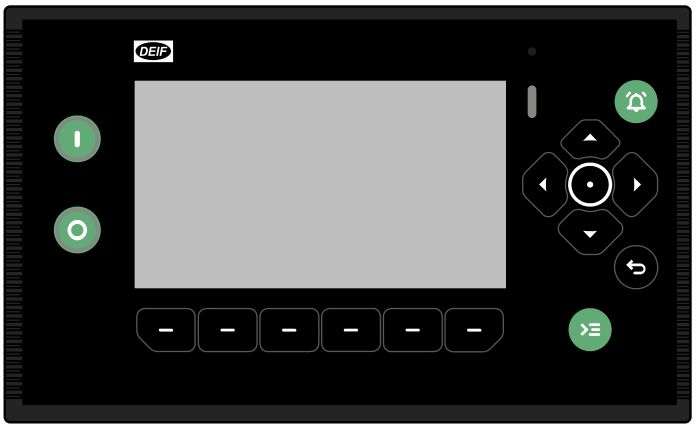
Configurable buttons

Six configurable buttons, allow direct functions from pages.

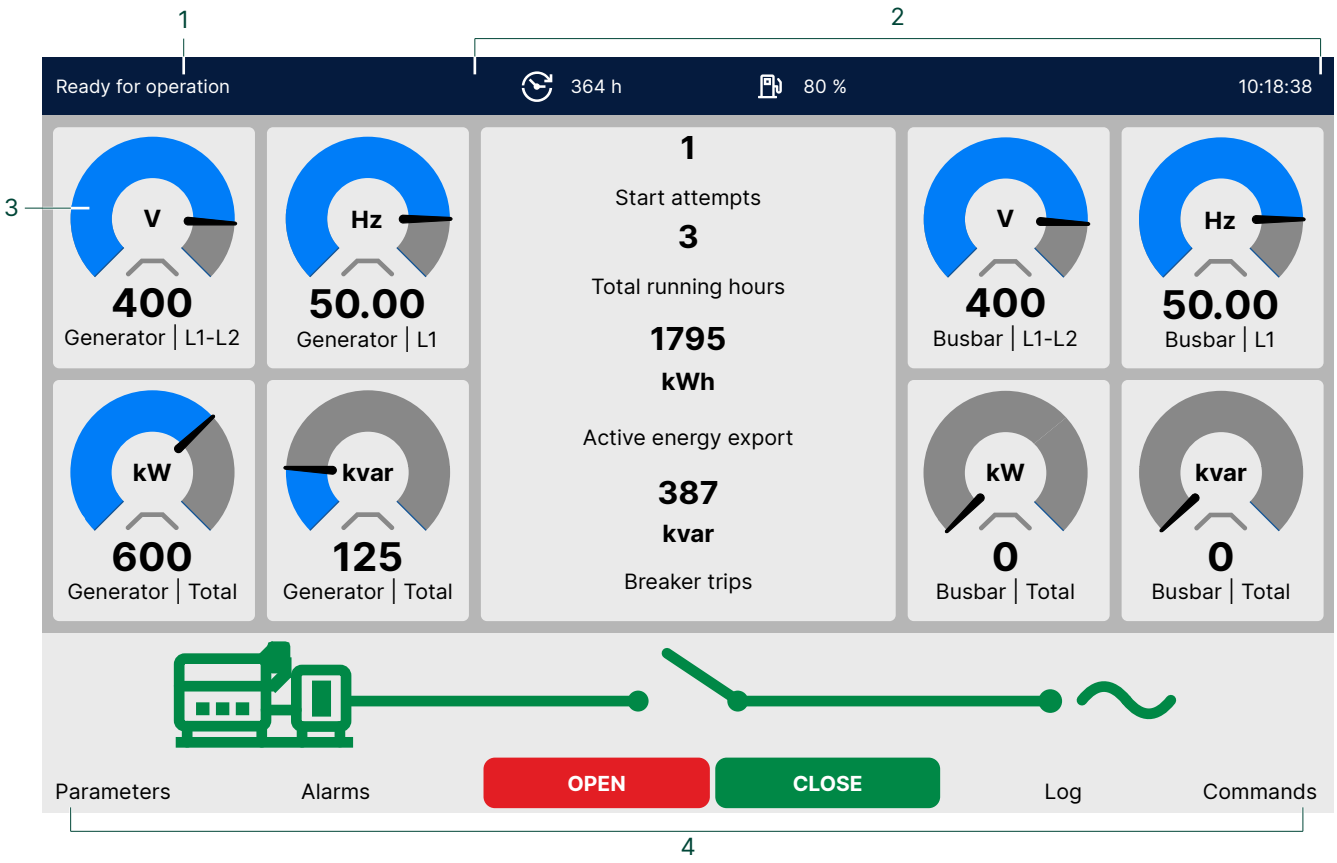


Dedicated buttons

Dedicated buttons for start and stop of the asset, Notification centre and Control centre.



2.1.3 Screen layout



No.	Item	Notes
1	Status text	Shows the status of the controller.
2	Information	Shows status information:
		Run hours total. / **Fuel** level. *
3	Page	Example page shown is a dashboard. Dashboards and display headers are configured from PICUS with the Display designer.
4	Soft keys	Shows the soft keys if applicable for the page viewed. Example shown includes a mimic.

NOTE * **Fuel** level is only shown if the data is available.

We would love to hear from you.

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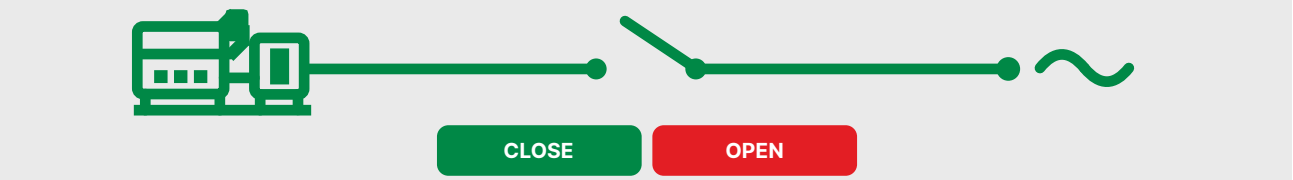
Click here

2.1.4 Mimics

The controller features the latest generation of adaptive mimic for the controller type.

SINGLE genset controller

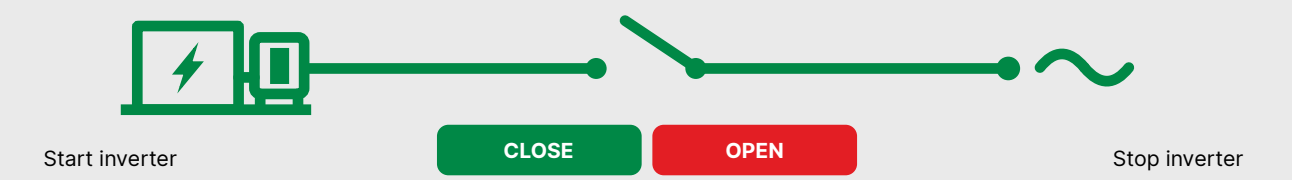
GENSET controller



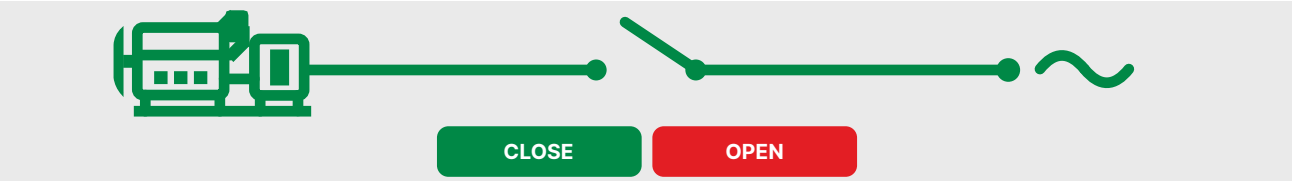
EMERGENCY genset controller

MAINS controller

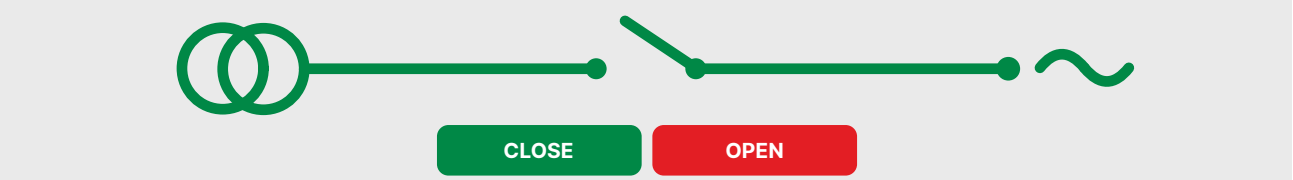
HYBRID controller



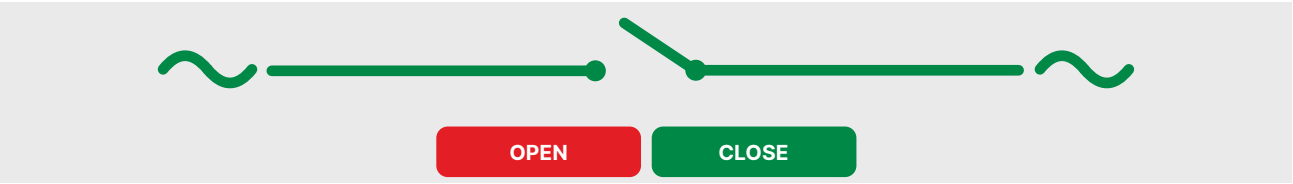
SHAFT generator controller



SHORE connection controller



BUS TIE breaker controller

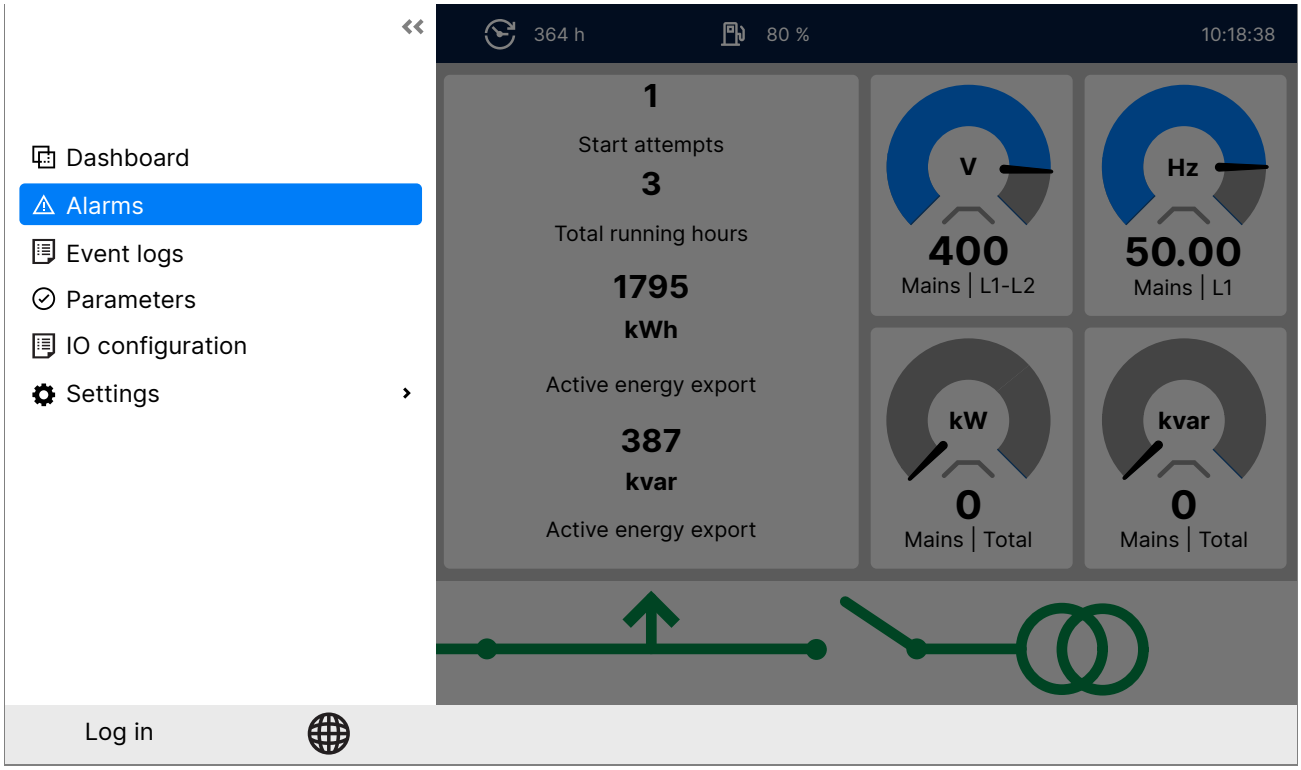


2.1.5 Default theme colours

Line	Colour	Notes
	Black	Dead busbar (voltage < 10 % of nominal voltage).
	Green	Live busbar.
	Amber	Unknown state.
	Red	Voltage present but is not within acceptable range.

2.1.6 Navigation menu

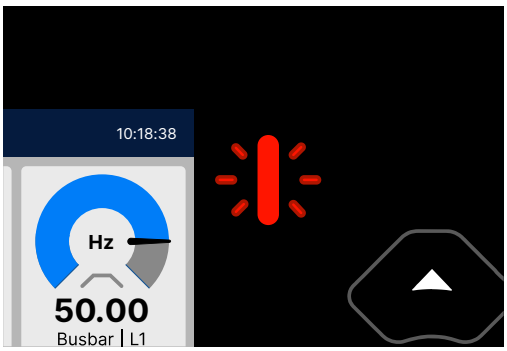
To access the navigation menu, push the **Back** :



Use either the touch screen or the navigation buttons to highlight and select a feature to view. Some features have further selections, for example **Settings**.

You can also log in or change the language shown on the display.

2.1.7 Status LED



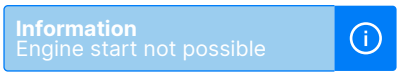
The status LED shows operation and alarm status.

	Off	The controller has no power or during boot before application start.			
	Green	Power on, normal operation.		**Green flash**	Unacknowledged alarm(s) where all alarm conditions have returned to normal operation.
	Red	All high severity active alarm(s) acknowledged.		**Red flash**	Unacknowledged high severity active alarm(s).
	Orange	All medium severity active alarm(s) acknowledged.		**Orange flash**	Unacknowledged medium severity active alarm(s).
	Yellow	All low severity active alarm(s) acknowledged.		**Yellow flash**	Unacknowledged low severity active alarm(s).

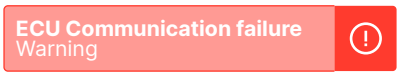
2.1.8 Notifications

You are advised about events as they occur with notifications. These automatically close after a delay, or you can press to close.

Information



Alarm



High severity

Medium severity

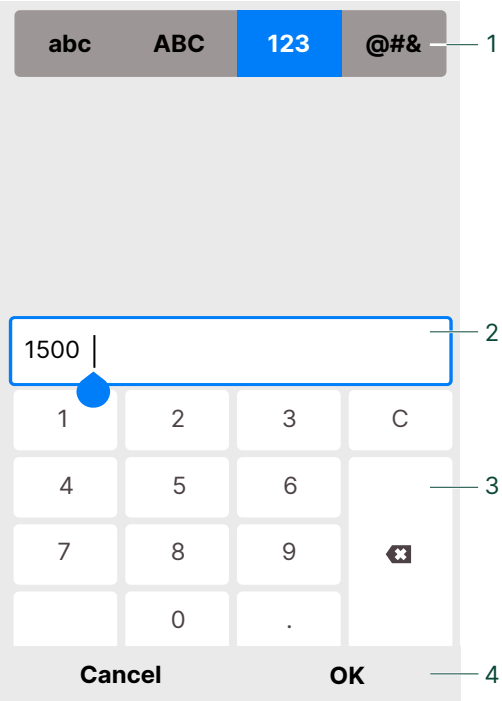
Low severity

Notification

2.1.9 Virtual keyboards

The display has different virtual keyboards to enter information or settings. Some keyboards have unique features for the information that you are entering. The keyboards are designed for use by either button navigation or touch screen.

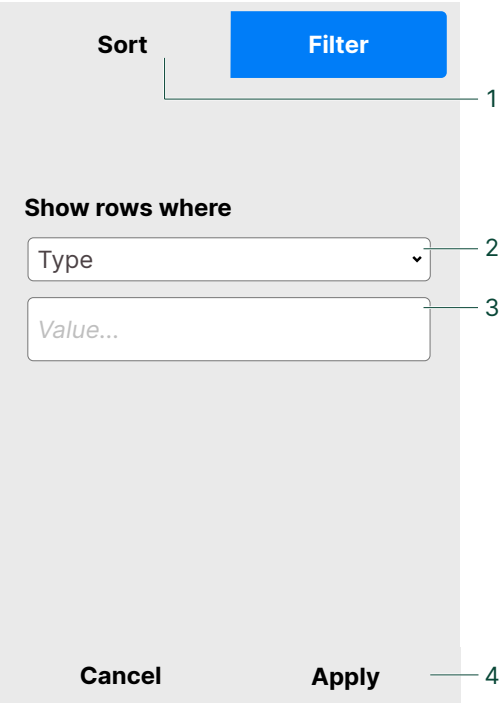
Use either the touch screen or the navigation buttons to highlight, edit, and select information.



No.	Item	Notes
1	Keyboard type	Displays the different keyboards.
2	Text or value	The information to be edited.
3	Keyboard	Enter the information using the keys. **C** : Clears all information : Deletes last character
4	Actions	Cancel or confirm the changes.

2.1.10 Filter

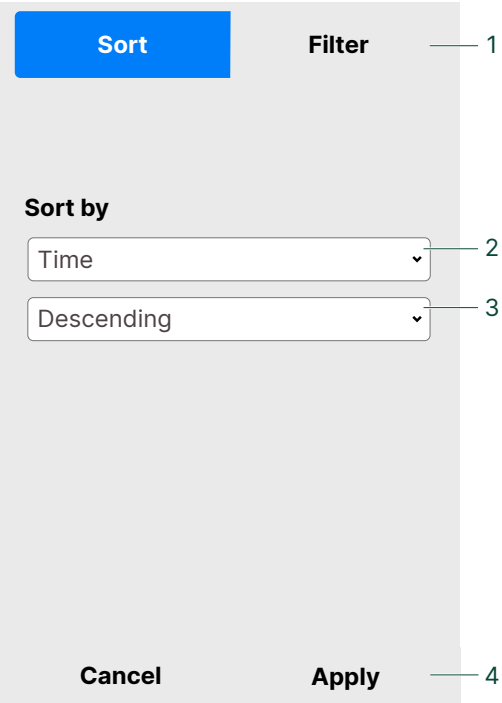
On selected pages you can use a **Filter** on the list shown by a type of condition. For example, filter the list where it contains a specific word.



No.	Item	Notes
1	Sort	Change to Sort.
2	Condition	Show items based on this condition.
3	Value	The value to filter by condition.
4	Actions	**Cancel** or **Apply** the filter.

2.1.11 Sort

On some pages you can use a Filter on the list shown by a sort type. For example, sort the list in descending order of time.



No.	Item	Notes
1	Filter	Change to Filter.
2	Sort by	Select a category to sort the list.
3	Order	Select **Ascending** or **Descending** order.
4	Actions	**Cancel** or **Apply** the filter.

2.2 About the controller operation

2.2.1 Display operation/feature restrictions

The available features on the display can be restricted by both role management (permissions) and Command sources. These restrictions are subject to the design of your system. Check with the designer of your system.

Command sources

Certain commands from the display can be allowed or restricted from use.

More information
See **Command sources** in the Designer's handbook.

2.2.2 Power management control

Power management is only available if the appropriate licence is installed on each controller.

With power management, the iE controllers make sure that required power is available and that the system is protected for typical applications. All controllers have the ability to operate in Power management control.

To take full benefit of the power management, the controllers must be set to AUTO (Automatic) mode. In AUTO mode, the power management automatically starts and stops assets for the power requirements. The power management automatically starts and stops assets that are not connected.

2.2.3 Utility software

PICUS

PICUS is the utility software used to configure and monitor the system. You can connect a computer running PICUS to the controller (direct connection) to configure, supervise, send commands and more.

Dashboards and display headers are configured from PICUS with the Display designer.

More information
See https://www.deif.com/products/picus/ for the latest software download and information.
See https://www.deif.com/rtd/picus for the latest PICUS manual.

3. Control and operation

3.1 About the equipment control and operation

The iE controllers contain all the functions needed to protect and control different types of equipment and their breaker(s).

Controllers	Notes
SINGLE genset controllers	The **SINGLE genset** controllers protect and control a genset, and the genset breaker. **SINGLE genset** controllers can optionally include a mains connection with or without a mains breaker.
GENSET controllers	The **GENSET** controllers protect and control a genset, and the genset breaker. Can be used with other controllers in a Power management system.
EMERGENCY genset controllers	The **EMERGENCY genset** controllers protect and control an emergency genset, the genset breaker, and the tie breaker. Can be used with other controllers in a Power management system. By default, the **EMERGENCY genset** controller automatically starts the emergency generator when there is no voltage on the busbar. The **EMERGENCY genset** controller includes a test function, to make regular testing of the emergency generator easier. The **EMERGENCY genset** controller allows harbour operation, so that the genset can be used as the ship generator when in harbour. Apart from this, the emergency genset does not normally supply power to the system.
MAINS controllers	The **MAINS** controller protects and controls a mains breaker, with or without a tie breaker. Can be used with other controllers in a Power management system.
SHORE connection controllers	The **SHORE connection** controller protects and controls a shore connection breaker. Can be used with other controllers in a Power management system. When the shore connection is in use, it is normally the ship's only power source. However, the gensets may run in parallel with the shore connection for a limited time.
SHAFT generator controllers	The **SHAFT generator** controller protects the system when a shaft generator is connected, and the shaft generator breaker. Can be used with other controllers in a Power management system. When the shaft generator is connected, it is normally the ship's only power source. However, it is possible for the shaft generator to run in parallel with the gensets and supply a base load for an extended period (long-time parallel).
HYBRID controllers	The **HYBRID** controller controls an inverter with power source, and the inverter breaker. Can be used with other controllers in a Power management system. The **HYBRID** controllers can work together to ensure effective power management. Power Take Off (PTO) mode, running only on the power source if needed and available, asymmetric load sharing with configurable constant discharge and genset start if required. The **HYBRID** controller accepts Power Take In (PTI) and but does not control it. The **HYBRID** controller only directly controls an inverter and the inverter breaker. It does not control or provide any management of the actual power source, for example a Battery Management System (BMS). The customer must ensure that the necessary management

Controllers	Notes
	system for the power source is installed and approved, according to the applicable Maritime classification societies.
BUS TIE breaker controllers	The **BUS TIE breaker** controller protects and controls a bus tie breaker. The power management system manages the busbar sections. Can be used with other controllers in a Power management system.

3.2 Controller modes

3.2.1 About the controller mode

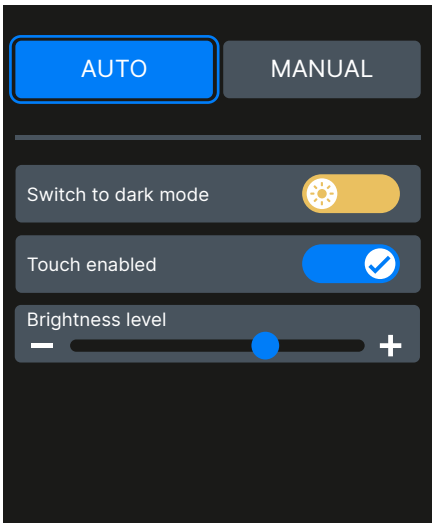
The iE controllers operate in a controller mode. This mode decides which actions may be taken or how the controller reacts to operational situations.

Controller modes:

- **AUTO - Automatic mode**
  - The controller can automatically start, stop, connect, and disconnect the asset. The operator cannot start a sequence manually, unless the local control setting is enabled for the controller or section. The controllers use the power management configuration to automatically select the power management action.
- **MANUAL - Manual mode**
  - The operator can start, stop, connect and disconnect the asset. The controller automatically synchronises before closing a breaker, and automatically de-loads before opening a breaker.
- **LOCAL mode**
  - The operator can start, stop, connect and disconnect the asset. The controller automatically synchronises before closing a breaker, and automatically de-loads before opening a breaker. Remote commands for sequences are ignored.
- **REMOTE mode**
  - REMOTE mode uses command start sequences from digital inputs, PICUS, Modbus, and/or CustomLogic or CODESYS. Display push-buttons for sequences are ignored.
- **NO REG - No regulation mode**
  - Regulation is not controlled by the controller and must be done manually or externally.
- **Switchboard mode (Marine applications only)**
  - Each controller can operate in switchboard control. You can manually operate the genset speed and open and close the breakers. Use Switchboard control for troubleshooting, or to manually override the system.
  - In Switchboard control, all the controller functions are not available, but the controller protections stay active. The controller can trip breaker(s) and/or shut down the engine, if an alarm situation occurs. The controller does not accept operator commands. The controller cannot and does not prevent manual operator actions.
  - The controller does not respond to a blackout. The controller does not provide Power management.
  - The switchboard design must protect the system when the controller is in Switchboard mode.
- **TEST - Test mode**
  - The test sequence starts when an operator selects the test mode.

3.2.2 Change mode

You change modes with the Control centre:

1. Push the Control centre button.
   - The Control centre pop-up is shown on the screen.
   - 

2. Select the mode required.

3.3 Asset control

3.3.1 Start the asset

Mode	Procedure
AUTO (Automatic)	The asset start is typically controlled automatically and the display control is not available. In a Power management system, if it calculates that more power is required, the controller automatically starts the asset, with the priority order.
MANUAL	To start the asset: 1. Push  once. 2. The controller runs the start sequence. • If everything is OK, the asset starts. • If the asset does not start, the display shows an info message. 3. If **Idle run start** is configured: • The controller runs the **Idle run start** sequence. ◦ If needed, to override the **Idle run start** push  again.
LOCAL	To start the asset: 1. Push  once. 2. The controller runs the start sequence. • If everything is OK, the asset starts. • If the asset does not start, the display shows an info message. 3. If **Idle run start*** is configured: • The controller runs the **Idle run start** sequence. ◦ If needed, to override the **Idle run start** push  again.
REMOTE	When the controller is in REMOTE mode, the asset start is based on a remote signal, for example a PLC or Modbus.
Switchboard	When the controller is in Switchboard control, the display push-buttons are not available. The asset can only be started locally and/or from the switchboard.

NOTE * Idle run may not be permitted or approved by certain classification societies.

3.3.2 Stop the asset

Mode	Procedure
AUTO (Automatic)	The asset stop is controlled automatically and the display control is not available. In a Power management system, if it calculates that power is not required, the controller automatically stops the asset, with the priority order.
MANUAL	To stop the asset: 1. Push  once. 2. The controller activates the cooldown period. • If necessary, to override the cooldown period, push  again. ◦ **Note:** A stop without cooldown time increases possible mechanical wear subject to the type of asset controlled. The asset may also have problems if it needs to restart immediately. The asset should only be stopped without cooldown time in emergencies. Contact the asset manufacturer for more information. 3. If **Idle run stop** is configured: • The controller runs the **Idle run stop** sequence. ◦ If needed, to override the **Idle run stop** push  again. 4. If the asset does not stop, the controller activates an alarm.
LOCAL	To stop the asset: 1. Push  once. 2. The controller activates the cooldown period. • If necessary, to override the cooldown period, push  again. ◦ **Note:** A stop without cooldown time increases possible mechanical wear subject to the type of asset controlled. The asset may also have problems if it needs to restart immediately. The asset should only be stopped without cooldown time in emergencies. Contact the asset manufacturer for more information. 3. If **Idle run stop*** is configured: • The controller runs the **Idle run stop** sequence. ◦ If needed, to override the **Idle run stop** push  again. 4. If the asset does not stop, the controller activates an alarm.
REMOTE	When the controller is in REMOTE mode, the asset stop is based on a remote signal, for example a PLC or Modbus.
Switchboard	When the controller is in Switchboard control, the display push-buttons are not available. The asset can only be stopped locally and/or from the switchboard.

NOTE * Idle run may not be permitted or approved by certain classification societies.

3.4 Breaker control

3.4.1 Close the breaker

Mode	Procedure
AUTO (Automatic)	The breaker close is controlled automatically and the display control is not available. In a Power management system, if it calculates that more power is required, the controller automatically starts the asset and closes the breaker, with the priority order.
MANUAL	The asset must be running to close the breaker. See Start the asset for how to start the asset. To close the breaker: 1. Push CLOSE once. • The Power management synchronises the asset with the busbar. • When the asset and busbar synchronise, the controller closes the breaker. • If the asset and busbar do not synchronise before the synchronisation timer expires, the breaker does not close. The synchronisation failure alarm is activated.
LOCAL	The asset must be running to close the breaker. See Start the asset for how to start the asset. To close the breaker: 1. Push CLOSE once. • The controller synchronises the asset with the busbar. • When the asset and busbar synchronise, the controller closes the breaker. • If the asset and busbar do not synchronise before the synchronisation timer expires, the breaker does not close. The synchronisation failure alarm is activated.
REMOTE	When the controller is in REMOTE mode, the breaker close is based on a remote signal, for example a PLC or Modbus.
Switchboard	When the controller is in Switchboard control, the display push-buttons are not available. The breaker can only be closed from the switchboard.

3.4.2 Open the breaker

Mode	Procedure
AUTO (Automatic)	The breaker open is controlled automatically and the display control is not available. In a Power management system, if it calculates that power is not required, the controller automatically opens the breaker as part of the asset stop sequence.
MANUAL	To open the breaker: 1. Push OPEN once.
LOCAL	To open the breaker: 1. Push OPEN once. • If load sharing is present, the controller de-loads the breaker until the load is less than the de-load open point. • If load sharing is not present or not possible, the controller immediately opens the breaker.
REMOTE	When the controller is in REMOTE mode, the breaker open is based on a remote signal, for example a PLC or Modbus.
Switchboard	When the controller is in Switchboard control, the display push-buttons are not available. The breaker can only be opened from the switchboard.

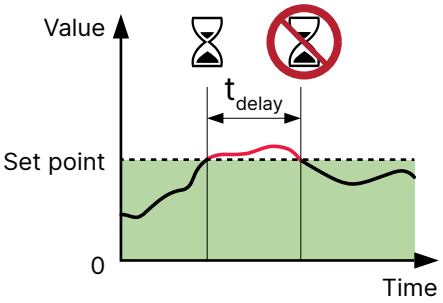
3.5 Alarms

3.5.1 About the alarms

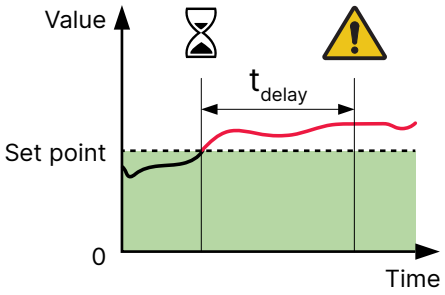
The controller alarms prevent unwanted, damaging, or dangerous situations from occurring. The Operator must review all activated alarms for cause and suitable action.

Each alarm has an *Alarm condition* which determines if the alarm is activated. When the *Alarm condition* is detected (typically, the operating value reaches the *Set point*), the controller starts the *Time delay* (t_{delay}).

During the *Time delay* the controller checks whether the *Alarm condition* remains active:



If the *Alarm condition* is no longer active, the *Time delay* is reset and the alarm is not activated.



If the *Alarm condition* continues and the *Time delay* expires, then the *Alarm action* is activated.

Some alarms do not have a *Time delay* (t_{delay}) and these activate immediately.

The alarm results in both a visual, and an optional acoustic (or audible) indication. Some alarms can be configured to be automatically acknowledged. *Auto acknowledge* can be useful during commissioning and troubleshooting.

During operation the system continues to monitor for *Alarm condition(s)* and moves alarms between different Alarm states as necessary. Operators can also move the alarm(s) to other states:

Alarms that are activated in a system must be reviewed for cause and action to resolve them.

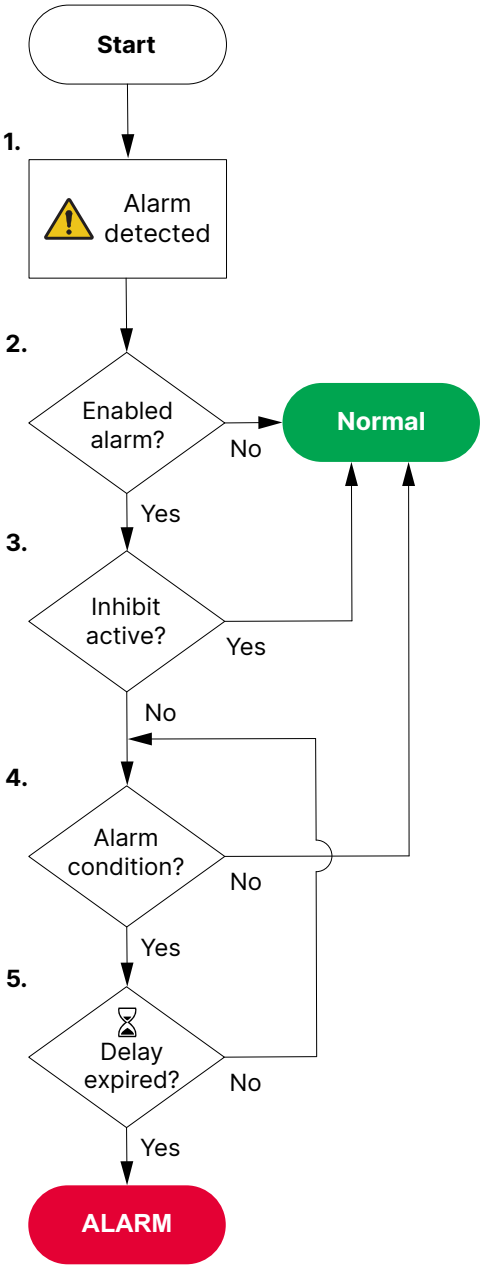
You can review and action alarms from either the Alarms page or the Notification centre.

Activated alarms require Acknowledgement and then action to resolve the *Alarm condition*. For most alarms, once the *Alarm condition* has been resolved, the *Alarm action* is no longer active. Some alarms may be configured with an additional step before the *Alarm action* can be removed. This step requires the operator to clear the *Alarm latch* before the *Alarm action* becomes inactive.

Operators can also move the alarm(s) to other states:

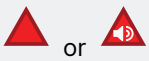
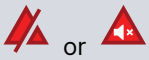
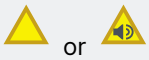
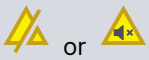
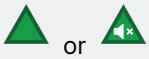
- Out of service
- Shelved

3.5.2 Alarm flowchart



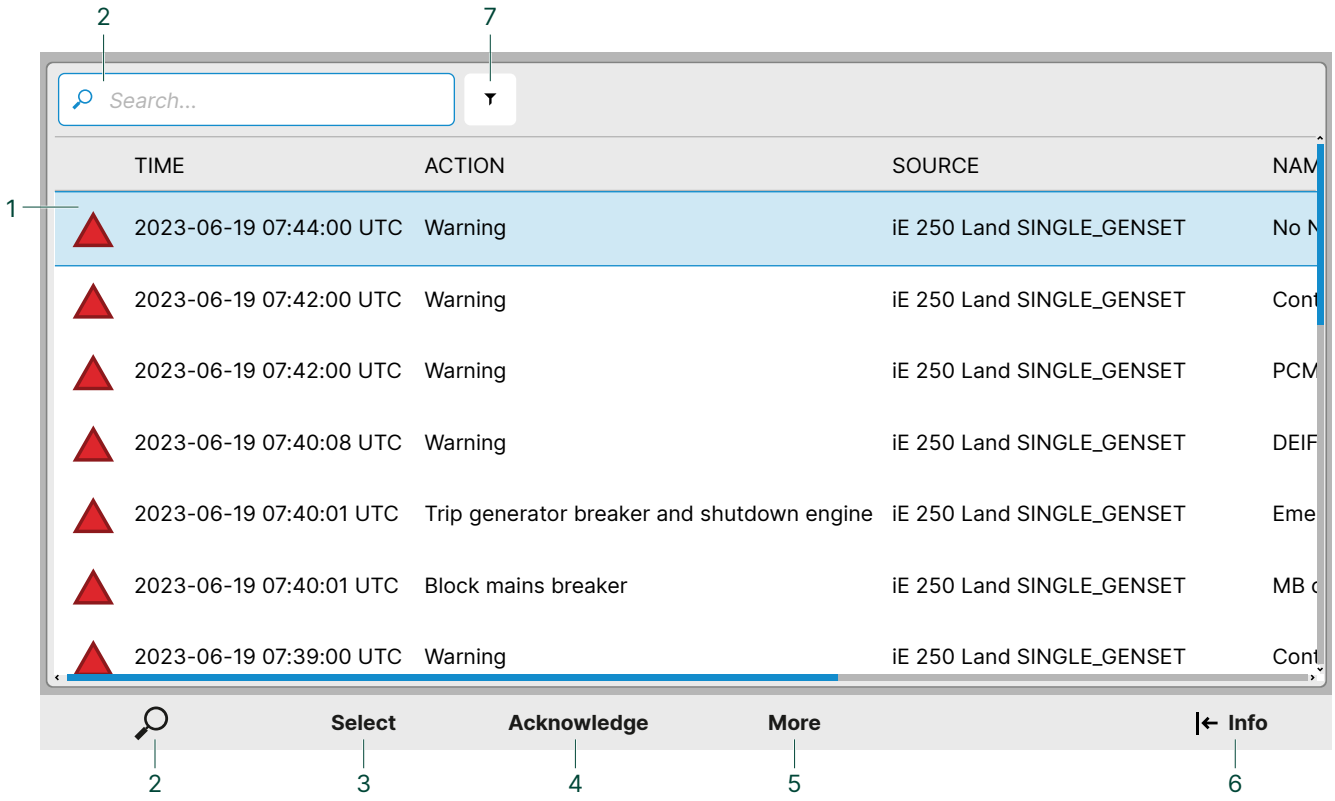
1. The controller detects an *Alarm condition*.
2. The controller checks if the alarm is enabled:
   - If the alarm is not enabled the controller ignores the alarm.
3. The controller checks if the alarm has an active inhibit.
   - If the alarm has an active inhibit the controller ignores the alarm.
4. The controller checks if the *Alarm condition* is still active:
   - If the *Alarm condition* is no longer active the controller ignores the alarm.
5. While the *Alarm condition* is active, the controller checks if the *Time delay* has expired:
   - If the *Alarm condition* is no longer active before the *Time delay* expires, the controller ignores the alarm.
   - If the *Alarm condition* continues and the *Time delay* expires, the controller activates the alarm and the *Alarm action*.

3.5.3 Alarm states

Symbol	Alarm condition *	Alarm action **	Acknowledge	Notes
	Active	Active	Unacknowledged	• An alarm condition occurred. • An alarm action is active. • An alarm requires acknowledgement. • An alarm requires action to clear the alarm condition.
	Active	Active	Acknowledged	• An alarm condition occurred. • An alarm action is active. • An alarm is acknowledged. • An alarm requires action to clear the alarm condition.
	Inactive	Active	Unacknowledged	• An alarm condition has cleared. • An alarm action is active. • An alarm requires acknowledgement. • An alarm latch requires reset.
	Inactive	Active	Acknowledged	• An alarm condition has cleared. • An alarm action is active. • An alarm is acknowledged. • An alarm latch requires reset.
	Inactive	Inactive	Unacknowledged	• An alarm condition occurred, but was cleared. • An alarm action is inactive. • An alarm requires acknowledgement.
	Active or Inactive	Inactive	-	• An alarm is shelved for a period of time. • An alarm returns automatically after the period has expired.
	Active or Inactive	Inactive	-	• An alarm is marked *out of service* for an indefinite period. • An alarm does not return automatically and must be returned to service manually.
	Active or inactive	Inactive	-	An alarm is inhibited to occur.

NOTE * *Alarm condition* is usually where the *Set point* is exceeded.
** *Alarm action* (the protection) is the configured action taken to protect the situation. When active, the controller activates the action.

3.5.4 Alarms page



No.	Item	Notes
1	Alarms list	The symbol shows the Alarm state for the alarm.
2	Focus search	Enter a text search. Jumps to the Search box.
3	Select	Allows selection for multiple alarms at the same time. You can also, **Select all**, or **Deselect all**.
4	Acknowledge	Acknowledges the alarm or selection of alarms.
5	More	Additional actions for selected alarm(s): * • Reset all latches • Remove from service • Return to service • Unshelve • Shelve • Clear ECU alarms
6	Info (Information)	**Info** shows more information for the selected alarm.
7	Filter	Sort or filter the list.

NOTE * Actual actions shown depend on alarm type. For example, the Clear ECU alarms is only if an ECU has been configured and connected.

3.5.5 Alarm handling and actions

When alarms are activated in the system, they appear on the Alarms page and the Notification centre. The Notification centre provides quick access for some alarm handling. For more comprehensive alarm actions use the Alarms page.

Sort or filter of alarms list

You can sort or filter the list shown of the alarms by using the Filter.

Alarm information

Further information about each alarm can be displayed by using **Info**.

This includes further details on the alarm, the controller, and on some alarms how the alarm was triggered.

Acknowledge

You must acknowledge alarms that are activated in the system.

Select the alarm (or alarms) to acknowledge and use **Acknowledge**.

Reset latches

Latched alarms can only be reset if the alarm is both acknowledged and the *Alarm condition* has cleared.

Select the alarm or alarms to reset the latch, and use **`More > Reset all latches`**.

NOTICE

Shelve or Out of service alarms

Shelved or Out of service alarms are not recommended for normal operation and could cause dangerous situations.

Only use Shelve or Out of service during commissioning or troubleshooting situations.

Shelve

Some types of alarm can be shelved, that is, they can be temporarily suspended. When an alarm is shelved, a period of time must be given for how long the alarm remains in the shelve state. While shelved the *Alarm action* is not active. When the period of time has expired, the system automatically rechecks the *Alarm condition*, and if it is still active, the alarm triggers.

Shelving alarms is only recommended during commissioning or troubleshooting, and not during normal operation.

Select the alarm or alarms to shelve, and use **`More > Shelve`**. Enter the period of time for the shelve and confirm.

You can also manually unshelve a shelved alarm, by using **`More > Unshelve`**.

Remove from service

Some types of alarm can be removed from service, that is, they can be suspended. When an alarm is out of service, the *Alarm action* is not active. The Operator must return the alarm back to service. It does not automatically reinstate.

Select the alarm or alarms to mark as *Out of service*, and use **`More > Remove from service`**.

Return to service

Out of service alarms do not automatically reinstate. The Operator must return the alarm back to service.

Select the alarm or alarms to return to service, and use **`More > Return to service`**.

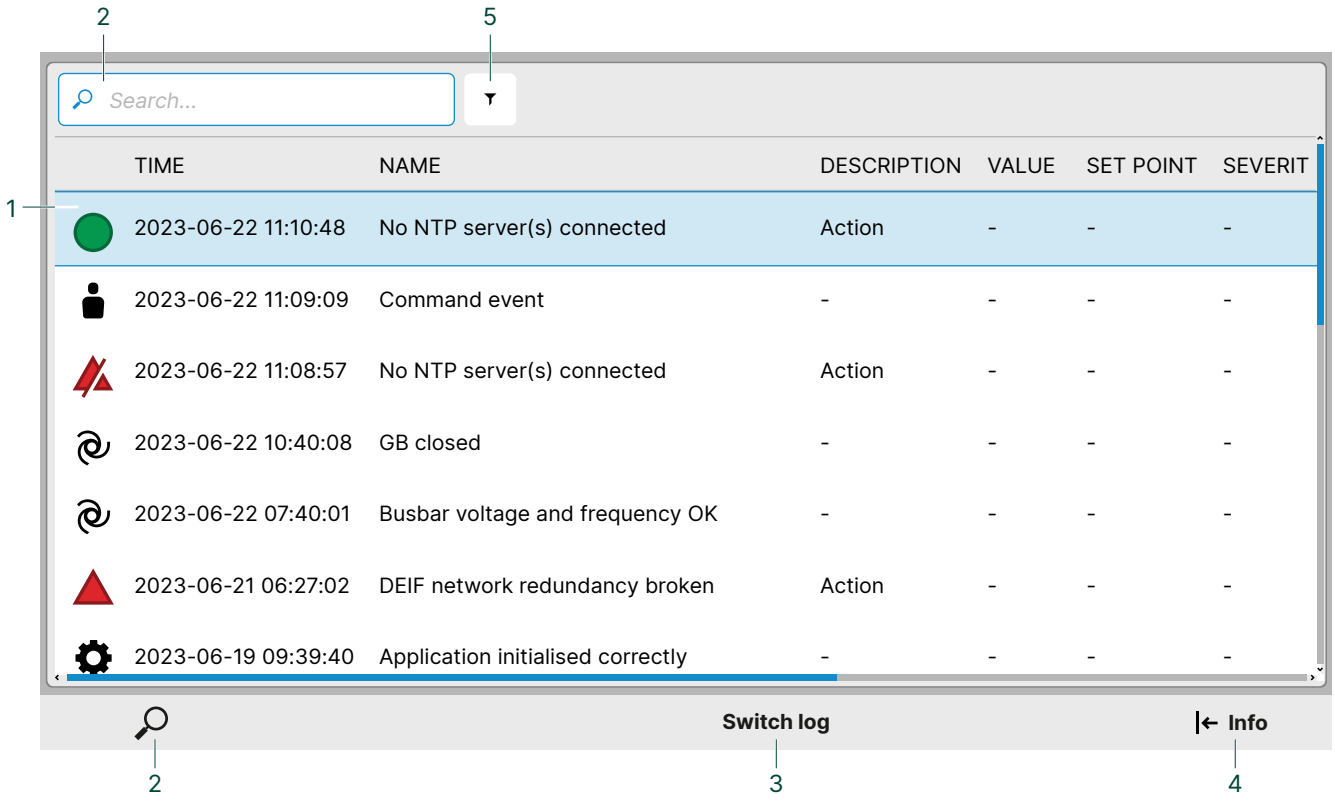
3.6 Logs

3.6.1 About event logs

The event log is a historical recorded list of all system and operator events. For example, the acknowledgement of an alarm, or connection of an asset.

If an ECU has been configured with Fieldbus, you can additionally view the DM2 event log. The DM2 event logs are retrieved from the engine and the ECU must be powered up to get the information.

3.6.2 Event logs page



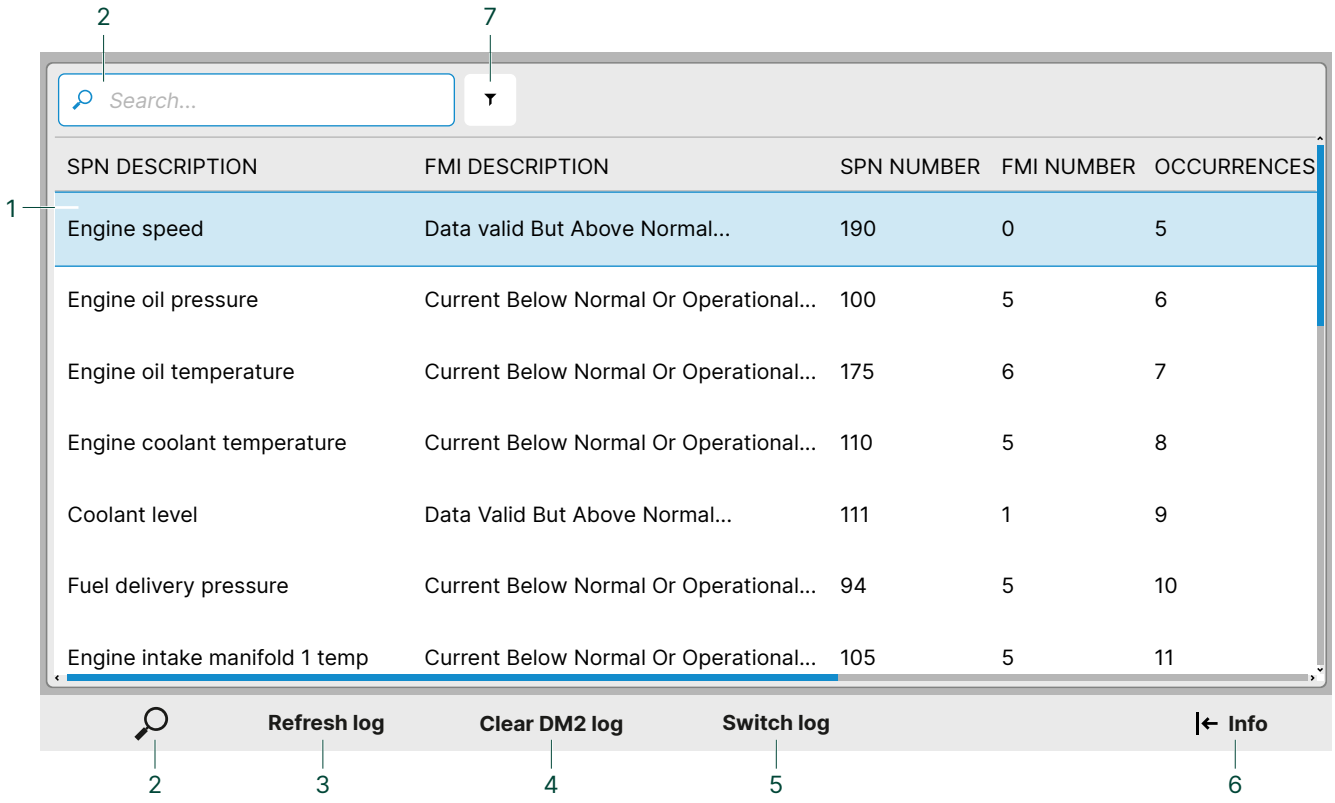
No.	Item	Notes
1	Event list	The symbol shows recorded event.
2	Search	Enter a text search. Jumps to the Search box.
3	Switch log	Change to DM2 logs. *
4	Info (Information)	**Info** shows more information for the selected alarm.
5	Filter	Sort or filter the list.

NOTE * DM2 logs are only available if an ECU is configured.

Symbol	Event	Examples
	Automatic	Asset & breaker commands Other commands
	System	Power up Download firmware
	Command	Direct user commands
	Information	Parameter changes Configuration changes
	Alarms	Acknowledgement of alarms Change to alarm state
	Test	Alarm test Test mode

3.6.3 DM2 logs page

This shows the engine ECU J1939 historical diagnostic messages (DM2).



No.	Item	Notes
1	DM2 event list	List of recorded DM2 events.
2	Search	Enter a text search. Jumps to the Search box.
3	Refresh	Reload the events from the ECU.
4	Clear DM2 log	Removes all the log entries.
5	Switch log	Change to Event log.
6	Info (Information)	**Info** shows more information for the selected alarm.
7	Filter	Sort or filter the list.

3.7 Notification centre

3.7.1 About notifications

The Notification centre provides you with fast access to both alarms and events in the system.

Press to open the Notification centre.

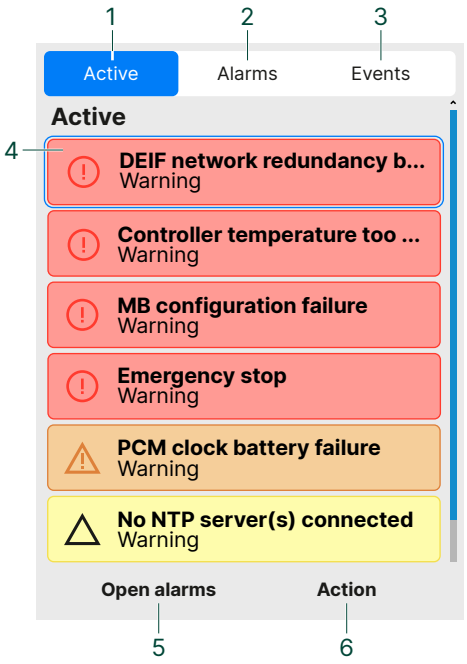
You can directly action the alarms listed here or open them on the Alarms page.

Alarms can be either **Active** or **Historical**. Active alarms are unacknowledged and Historical alarms are acknowledged.

Alarms have an *Alarm severity* which is configured in the Advanced section of the Parameters configuration. The *Alarm severity* is shown colour-coded:

High	**DEIF network redundancy b...** Warning
Medium	**PCM clock battery failure** Warning
Low	**No NTP server(s) connected** Warning

3.7.2 Notification centre



No.	Item	Notes
1	Active list	Shows only active notifications.
2	Alarms list	Shows only alarms.
3	Events list	Shows events,
4	Notification list	Selectable notification.
5	Open [Notification]	Opens either Alarms or Events page.
6	Alarm action	For a selected alarm, allows an action to be used.

3.8 Operator messages

3.8.1 Controller status texts

The controller status texts are shown at the top of the display. The status text shown depends on the type of controller and software package. Not all texts apply for all controller types.

Status text *	Description	LAND		MARINE	
		Core	Premium	Core	Power management
-	Cannot read controller status. For example, slow communication or a loss of communication.	●	●	●	●
Alarm testing	*Enable alarm test* parameter is enabled.	●	●	●	●
Blackout handling in # s	The remaining time (in seconds) before the emergency genset begins the start procedure to solve a blackout.				●
Blackout start blocked	“Block blackout start” function is activated, or there is an active short circuit alarm in the section.				●
BTB in operation	The bus tie breaker is closed.	●	●	●	●
Busbar OK in # s	The remaining time (in seconds) before the emergency genset begins the stop procedure after a blackout is solved.				●
Cooldown - # s	The remaining time (in seconds) for the genset cooldown.	●	●	●	●
Crank off	The crank is turned off if there is no running detection of the genset during start.	●	●	●	●
Crank on	The crank is activated in order to start the genset.	●	●	●	●
De-loading GB / TB / SGB / SCB	The controller is de-loading the breaker.	●	●	●	●
De-loading MAINS	The controller is broadcasting a set point for de-loading the mains breaker.	●	●		
De-loading TB	The controller is broadcasting a set point for de-loading the tie breaker.	●	●		
Dividing section	The controller is broadcasting set points for de-loading the bus tie breaker.	●	●	●	●
Emergency supply	The emergency genset without regulation is running, and the generator breaker and tie breaker are closed.				●
Engine running	The emergency genset without regulation is running, and the generator breaker is open.				●
Engine stopping	The genset is being stopped.	●	●		
Engine test # s	The remaining time (in seconds) that the EMERGENCY genset controller engine test is still active.				●
Fixed power	The genset is running and is being regulated to a fixed power.	●	●	●	●

Status text *	Description	LAND		MARINE	
		Core	Premium	Core	Power management
Fixed frequency	The genset is running and is being regulated using fixed frequency regulation.	●	●	●	
Frequency droop	The genset is running and is being regulated using frequency droop regulation.	●	●	●	
Frequency regulation	The genset is running and is regulated using frequency regulation.				●
Frequency too high	The frequency is too high and should be adjusted to a lower value. The adjustment happens automatically if the controller is under PMS control.			●	●
Frequency too low	The frequency is too low and should be adjusted to a higher value. The adjustment happens automatically if the controller is under PMS control.			●	●
Harbour operation	The emergency genset is operating in harbour operation and supplies power to the busbar as the first priority genset.				●
Load-dependent stop blocked	Shown when the "Block load-dependent stop" function is activated.				●
Load sharing	The gensets that are connected to the busbar are sharing the load symmetrically with each other.	●	●	●	
Load sharing (asymmetric)	The genset shares the load with another genset as per asymmetric load sharing parameters.				●
LTO test # s	The remaining time (in seconds) that the EMERGENCY genset controller load take over test is still active.				●
Non-connected stop in # s	The remaining time (in seconds) before a genset no longer connected to the busbar starts the genset stop procedure.				●
Not ready for operation	The controller is not ready for operation. For gensets *Start enable* might not activated, or there are alarms (latched or unacknowledged) blocking the ready status.	●	●	●	●
Parallel test # s	The remaining time (in seconds) that the EMERGENCY genset controller parallel test is still active.				●
Precautionary standby	A precautionary genset start alarm or input started the genset.				●
Ready for operation	All operation conditions are met. Gensets are ready to start and/or breakers are ready to close.	●	●	●	●
MAINS in operation	MAINS supply is available, and mains breaker is closed.	●	●		
MAINS not ready	MAINS is not ready to provide power to the busbar. There may be alarms blocking the mains breaker from closing.	●	●		

Status text *	Description	LAND		MARINE	
		Core	Premium	Core	Power management
MAINS ready	MAINS supply is available, and mains breaker is open.	●	●		
Manual regulation	The genset is running and is under manual regulation.	●	●	●	
SC in operation	A power supply from the shore connection is available, and the shore connection breaker is closed.			●	●
SC not ready	The shore connection is not ready to provide power to the busbar. There may be alarms blocking the shore connection breaker from closing.			●	●
SC ready	A power supply from the shore connection is available, and the shore connection breaker is open.			●	●
Secured mode active	Secured mode is activated to ensure there is enough power if the largest generator fails.				●
SG in operation	The shaft generator is producing power, and the shaft generator breaker is closed.			●	●
SG in operation (base load)	The shaft generator is producing power, and the shaft generator breaker is closed. The base load parameter is activated.				●
SG in PTH operation	Power take home is activated, and the shaft generator breaker is closed.				●
SG not ready	The shaft generator is not ready to provide power to the busbar. There may be alarms blocking the shaft generator breaker from closing.			●	●
SG ready for PTH operation	Power take home has been activated, and the shaft generator breaker is open.				●
SG ready	A power supply from the shaft generator is available, and shaft generator breaker is open.			●	●
SG running	The shaft generator is producing power, and the shaft generator breaker is open.			●	●
Ship-to-ship active	Ship-to-ship operation is active and the shore connection breaker is closed.				●
Starting genset in # s	The remaining time (in seconds) before the genset starts.				●
Start prepare - # s	The remaining time (in seconds) for the genset to prepare to start.	●	●	●	●
Stop coil activated - # s	The remaining time (in seconds) before the genset shuts down.	●	●	●	
Stopping genset in # s	The remaining time (in seconds) before the genset stops.				●
Switchboard control	The controller is in Switchboard control and can only receive commands from the switchboard. Power management is not active.			●	●

Status text *	Description	LAND		MARINE	
		Core	Premium	Core	Power management
Synchronising SGB / SCB	The controller is busy synchronising the busbar frequency and voltage to close the breaker.			●	●
Synchronising GB	The controller is synchronising the genset to the busbar frequency and voltage to close the generator breaker.	●	●	●	●
Synchronising sections	The controller is broadcasting the set points for synchronisation.	●	●	●	●
Synchronising MB	The controller is broadcasting a set point for synchronisation.	●	●		
Synchronising TB	The controller is broadcasting a set point for synchronisation.	●	●	●	●
Waiting for software	A software update is in progress.	●	●	●	●

NOTE * "# s" represents a timer countdown.

3.8.2 Operator information messages

During operation some operator information messages may be shown. The information shown depends on the type of controller. Not all texts apply for all controller types.

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
1st priority not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.				●
Alarm blocking engine start	A block alarm is active. Clear the alarm before attempting to start the genset.	●	●		●
Alarm blocking GB / MB / TB / BTB close	A block alarm is active. Clear the alarm before attempting to close the breaker.	●	●		
Alarm blocking GB / BTB close	A block alarm is active. Clear the alarm before attempting to close the breaker.			●	●
Alarm blocking SCB or SGB close	A block alarm is active. Clear the alarm before attempting to close the breaker.			●	●
Already first priority	The controller is already the first priority controller.				●
Already selected	The command is already received.				●
Available power too low	The power source cannot be disconnected, because this overloads the busbar.				●
Blackout start block activated	The *Block blackout start* function is active.				●
Blackout start block deactivated	The *Block blackout start* function is not active.				●
Breaker already closed	The breaker is already closed and cannot be closed again.	●	●	●	●

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
Breaker already opened	The breaker is already open and cannot be opened again.	●	●	●	●
BTB block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
BTB close blocked	The *Block BTB close* function is active. An open breaker cannot be closed.	●	●	●	●
BTB close cancelled	The *BTB close* was cancelled by a *BTB open* command.	●	●	●	●
BTB close not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
BTB close unblocked	The *Block BTB close* function is not active.	●	●	●	●
BTB open cancelled	The *BTB open* was cancelled by a *BTB close* command.	●	●	●	●
BTB open not possible in SWBD	In switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Busbar A voltage/ frequency not OK	The bus tie breaker cannot connect to a dead or unknown state busbar. The bus tie breaker will not close until the busbar state is OK and known.				●
Busbar B voltage/ frequency not OK	The bus tie breaker cannot connect to a dead or unknown state busbar. The bus tie breaker will not close until the busbar state is OK and known.				●
Busbar V/Hz not OK	The shaft generator cannot be connected to a dead or unknown state busbar while it is in power take home mode. The shaft generator breaker will not close until the busbar state is OK and known.				●
Change of synchronisation settings not possible in SWBD	The input from the static synchronisation or dynamic synchronisation digital input is ignored when the controller is in switchboard control.			●	●
Confirmation	You can use the display to confirm an action.			●	●
Dynamic synchronisation activated	The digital input is activated. The controller will use dynamic synchronisation.	●	●		
Dynamic synchronisation deactivated	The digital input is deactivated. The controller will use the synchronisation type configured in the parameter.	●	●		
Engine already running	The prime mover is already running and cannot be started again.	●	●	●	●
Engine already stopped	The prime mover has already stopped and cannot be stopped again.	●	●	●	●

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
Engine block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Engine is stopping	The command has already been received. The controller is executing the engine stop procedure.	●	●	●	●
Engine not ready	The engine cannot start. There might be alarms blocking the ready status.	●	●	●	●
Engine start and breaker close not possible in SWBD	In switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Engine start blocked	The *Block engine start* function is active. A stopped engine cannot be started.	●	●	●	●
Engine start not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Engine start unblocked	The *Block engine start* function is not active.	●	●	●	●
Engine stop not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Force all in section to AUTO mode activated	The *Force all controllers in section to AUTO mode* function is active.				●
Force all in section to MANUAL mode activated	The *Force all controllers in section to MANUAL mode* function is active.				●
Force all in section to SWBD control activated	The *Force all controllers in section to SWBD control* function is active.				●
Force all in section to SWBD control deactivated	The *Force all controllers in section to SWBD mode* function is not active.				●
GB block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
GB close blocked	The *Block GB close* or *Trip* function is active. An open breaker cannot be closed.	●	●	●	●
GB close cancelled	The *GB close* was cancelled by a *GB open* command.	●	●	●	●
GB close not possible in SWBD	In switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
GB close unblocked	The *Block GB close* function is not active.	●	●	●	●
GB is closed	The *Generator breaker* is closed.	●	●	●	●
GB is de-loading	The *Generator breaker* is currently de-loading.	●	●	●	●
GB is open	The *Generator breaker* is open.	●	●	●	●
GB is synchronising	The *Generator breaker* is synchronising.	●	●	●	●

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
GB open and stop not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
GB open cancelled	The *GB open* was cancelled by a *GB close* command.	●	●	●	●
GB open not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Genset starting - SG f [Hz]	The PMS starts the first priority genset, due to a shaft generator frequency variation.				●
Genset synchronising - SG f [Hz]	The PMS synchronises gensets to connect and take over the load, due to a shaft generator frequency variation.				●
Harbour operation activated	Harbour operation is activated.				●
Harbour operation deactivated	Harbour operation is deactivated.				●
Harbour operation not possible in SWBD	Harbour operation is not possible when the EMERGENCY genset controller is in switchboard control.				●
Harbour operation requested	The *Harbour operation* digital input function is activated. You can use the display unit to allow or reject harbour operation.				●
Lamp test active	The display lamp test is active.	●	●	●	●
Load-dependent stop block activated	The *Block load-dependent stop* function is active.				●
Load-dependent stop block deactivated	The *Block load-dependent stop* function is not active.				●
Load on busbar too high	The section cannot change to DG supply, or stay on SG/SC supply, because the load on the busbar is too high for the selected supply.				●
Load on SC too high (Ship-to-ship)	The shore connection breaker does not open because the load consumed by the receiving ship is too high.				●
Load on SG too high (PTH)	The shaft generator breaker does not open because the load to drive the propeller is too high.				●
You can remove latches	There are acknowledged latched alarms in the alarm list that can be reset.	●	●	●	●
MB close blocked	The *Block MB close* function is active. An open breaker cannot be closed.	●	●		
MB close cancelled	The *MB close* was cancelled by a *MB open* command.	●	●		
MB close unblocked	The *Block MB close* function is not active.	●	●		
MB open cancelled	The *MB open* was cancelled by a *MB close* command.	●	●		

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
Mode change locked	It is not possible to change to MANUAL or AUTO mode while the controller is in Switchboard control.			●	●
No genset ready to start	There is no genset in AUTO and Ready for operation to take over the load after the breaker is opened.			●	●
Not in MANUAL mode	The action cannot be performed unless the controller is in MANUAL mode.			●	●
Not possible as stand-alone EDG	Harbour operation is not possible for a stand-alone EDG.				●
Not under local control	The action cannot be performed unless the controller is in LOCAL mode.			●	●
Only one genset connected	There is only one genset connected to the busbar. Opening the generator breaker will cause a blackout.				●
Pitch not zero	The shaft generator breaker cannot open because the *Zero pitch* parameter is set but not activated. Activate *Zero pitch* before you try to open the breaker.				●
Possible to remove latches	There are acknowledged latched alarms in the alarm list that can be reset.	●	●	●	●
PTH mode activated	The *Power take home* parameter is activated.				●
PTH mode activates when breaker is opened	The *Power take home* parameter is activated while the shaft generator breaker is closed. Open the shaft generator breaker to start power take home mode.				●
PTH mode deactivated	The *Power take home* parameter is deactivated.				●
PTH mode deactivates when breaker is opened	The *Power take home* parameter is deactivated while the shaft generator breaker is closed. Open the shaft generator breaker to stop power take home mode.				●
SC Overlap power too high	The power currently handled by the overlap breaker is too high for the DG in first priority. The breaker cannot open.				●
SCB block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
SCB close blocked	The *Block shore connection breaker close* function is active. An open breaker cannot be closed.			●	●
SCB close cancelled	The *SCB close* was cancelled by an *SCB open* command.			●	●
SCB close not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●

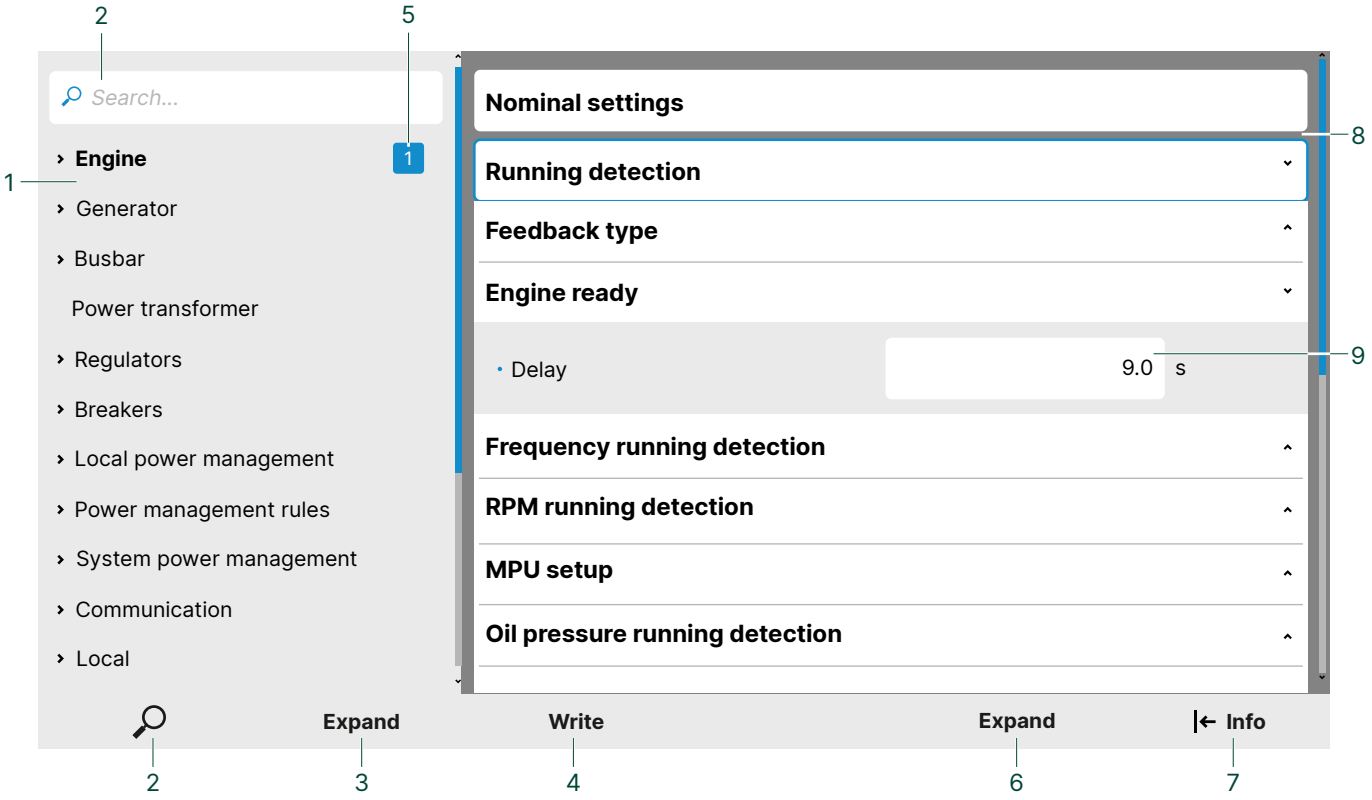
Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
SCB close unblocked	The *Block shore connection breaker close* function is not active.			●	●
SCB open cancelled	The *SCB open* was cancelled by an *SCB close* command.			●	●
SCB open not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Section cannot divide	No power source is available for one of the busbar sections after the bus tie breaker opens. Opening the bus tie breaker will cause a blackout on one of the busbars.				●
Sections cannot synchronise	The bus tie breaker cannot close while two sections about to be connected are powered by a shaft generator and/or shore connection.				●
Secured mode activated	The *Secured mode* parameter is enabled, and the *Activate secured mode* function is active.				●
Secured mode deactivated	The *Secured mode* parameter is not enabled, or the *Activate secured mode* function is not active.				●
SGB block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
SGB close blocked	The *Block shaft generator breaker close* function is active. An open breaker cannot be closed.			●	●
SGB close cancelled	The *SGB close* was cancelled by an *SGB open* command.			●	●
SGB close not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
SGB close unblocked	The *Block shaft generator breaker close* function is not active.			●	●
SGB is closed	The *Shaft generator breaker* is closed.			●	●
SGB is de-loading	The *Shaft generator breaker* is de-loading.			●	●
SGB is open	The *Shaft generator breaker* is open.			●	●
SGB is synchronising	The *Shaft generator breaker* is synchronising.			●	●
SGB open cancelled	The *SGB open* was cancelled by an *SGB close* command.			●	●
SGB open not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
SG fixed speed activated	The shaft generator *Fixed speed* parameter is configured and enabled.				●

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
SG fixed speed deactivated	The shaft generator *Fixed speed* parameter is configured, but not enabled. The shaft generator breaker does not close until it is enabled. Or the *Fixed speed* parameter is not enabled.				●
SG fixed speed not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.				●
SG genset start request	The PMS is starting the first priority genset, due to a shaft generator frequency variation.				●
SG connect genset(s) request	The PMS is synchronising gensets to connect and take over the load, due to a shaft generator frequency variation.				●
Start enable not activated	The genset cannot start, because *Start enable* is not activated.	●	●	●	●
Static synchronisation activated	The digital input is activated. The controller will use static synchronisation.	●	●	●	
Static synchronisation deactivated	The digital input is deactivated. The controller will use the synchronisation type configured in the parameter.	●	●	●	
Synchronisation cancelled	The controller has cancelled the synchronisation (for example, if there is a blackout during synchronisation).	●	●	●	●
TB block not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
TB cannot open, GB is open.	The emergency genset supplies power to the emergency busbar. Opening the tie breaker with the generator breaker open will cause a blackout.			●	●
TB close blocked	The *Block TB close* function is active. An open breaker cannot be closed.	●	●	●	●
TB close cancelled	The *TB close* was cancelled by a *TB open* command.	●	●	●	●
TB close not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
TB close unblocked	The *Block TB close* function is not active.	●	●	●	●
TB open cancelled	The *TB open* was cancelled by a *TB close* command.	●	●	●	●
TB open not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.			●	●
Zero pitch activated	The *Zero pitch* function is active.				●

Operator info	Additional information	LAND		MARINE	
		Core	Premium	Core	Power management
Zero pitch deactivated	The *Zero pitch* function is not active.				●
Zero pitch not possible in SWBD	In Switchboard control, operator actions cannot be performed from the controller interfaces.				●

4. Configuration

4.1 Parameters page



No.	Item	Notes
1	Category/parameter list	Browse the categories and parameters.
2	Focus search	Jumps to the Search box.
3	Expand/Collapse	Toggles between expand or collapse of all categories/parameters listed.
4	Write	Opens the changelog to confirm the changes to the controller.
5	Changes	Shows if there are changes.
6	Expand/Collapse	Toggles between expand or collapse of all parameter settings.
7	Info (Information)	**Info** shows more information for the selected parameter.
8	Parameters	Parameters for the category selected.
9	Setting	Configure the parameter setting.

4.2 Input/output configuration

4.2.1 About input or output channels

The controller channels are configurable but depend on the controller type, parameters, functions and alarms available. Some hardware types support bi-directional channels, where you can configure if the channel is input or output.

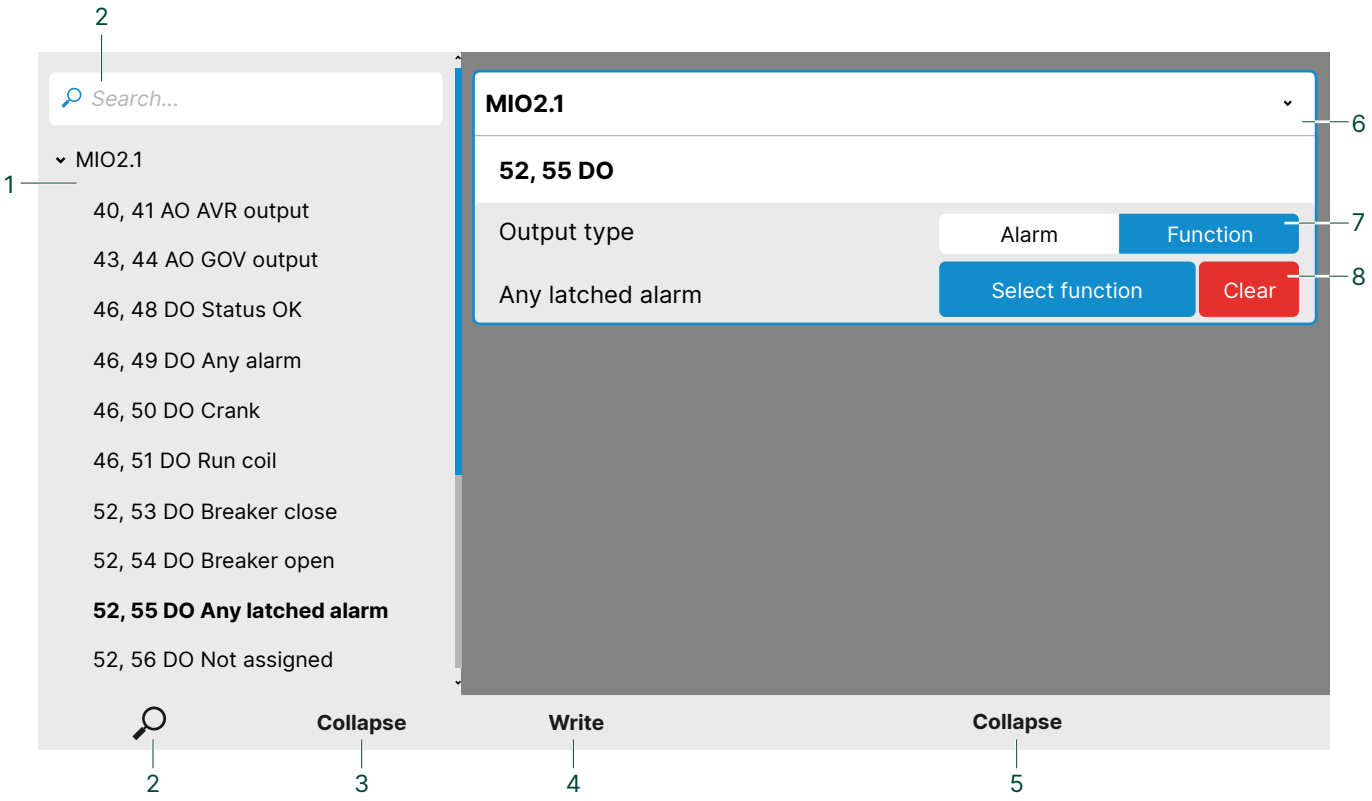
More information
For the hardware specifications and terminal allocations, see the **Technical specifications** in the Data sheet:

- iE 250 Data sheet
- iE 250 MARINE Data sheet
- iE 350 MARINE Data sheet

Input/output constraints

Channel	Function and/or alarm	Constraints
Digital input	1 or more function 1 or more custom alarm	• You cannot use a function already assigned to another digital input (DI). • You cannot use a function assigned and used in CustomLogic.
Digital output	1 function or 1 or more custom alarm(s)	• Only one function or multiple alarms are allowed to be configured. • You cannot use a function assigned and used in CustomLogic. • The same function can be assigned to other digital output (DO) terminals.
Analogue input	1 function 1 Above range alarm 1 Below range alarm 1 or more custom alarm(s)	• Functions must use the same unit of measure. • You cannot use a function already assigned to another analogue input (AI). • The selected functions type can either be: ◦ Analogue input (**Analogue functions**). ◦ or ◦ Digital input (**Supervised binary input**). • You cannot use both analogue AND digital functions on the same terminal.
Analogue output or PWM	1 function	• The function must be selected before the Output setup can be configured. • The same function can be assigned to other Pulse width modulation (PWM) terminals.

4.2.2 I/O configuration page



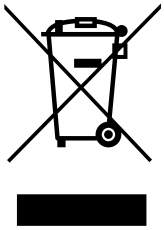
No.	Item	Notes
1	Input/Output list	Browse the input/output channels on available hardware. This can include an ECU if configured.
2	Focus search	Jumps to the Search box.
3	Expand/Collapse	Toggles between expand or collapse of all inputs/outputs listed.
4	Write	Writes the changes to the controller.
5	Expand/Collapse	Toggles between expand or collapse of the channel settings.
6	Channel	Channel settings.
7	Output type	Alarm or function. *
8	Function or alarm	The configured function or alarm associated to the channel. *

NOTE * Supported functions or alarms are dependent on the type of channel selected. See About input or output channels.

5. End-of-life

5.1 Disposal of waste electrical and electronic equipment

WEEE symbol



All products that are marked with the crossed-out wheeled bin (the WEEE symbol) are electrical and electronic equipment (EEE). EEE contains materials, components and substances that can be dangerous and harmful to people's health and to the environment. Waste electrical and electronic equipment (WEEE) must therefore be disposed of properly. In the EU, the disposal of WEEE is governed by the WEEE directive issued by the European Parliament. DEIF complies with this directive.

You must not dispose of WEEE as unsorted municipal waste. Instead, WEEE must be collected separately, to minimise the load on the environment, and to improve the opportunities to recycle, reuse and/or recover the WEEE. In the EU, local governments are responsible for facilities to receive WEEE. If you need more information on how to dispose of DEIF WEEE, please contact DEIF.