PICUS

4189341362-J

PC Utility software

User's manual

Improve
Tomorrow

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1. About the PICUS manual

1.1 Intended users of the PICUS manual

The PICUS manual is intended for designers and operators who need to configure or supervise the system.

1.2 Need more information?

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

DEIF website
Official DEIF homepage.

Documentation
See all the related documentation.

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

Latest software
Download the latest software.

Product
PICUS page.

Give feedback
Let us have your feedback on our documentation.

1.3 Software version

The information in this document relates to software version 1.0.29.x.

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

1.4 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.

1.5 Safety during operation

PICUS is a tool used to design, emulate, commission, and service the controller system.

NOTICE

Change of configuration during operation

Configuration changes during operation may not be permitted by some Maritime classification societies. PICUS does not include all the safeguards required by the Maritime class societies.

It is possible to connect several PCs running PICUS to the system at the same time. Make sure that a controller does not receive conflicting information from PICUS and/or the display units at the same time, especially when you commission and service the system.

Concurrent configurations

If two concurrent configuration changes are made from PICUS and the display at the same time, only the **last** change the controller receives is implemented. The controller does not give a message about the change it ignores.

Concurrent commands

If two concurrent commands are sent from two different computers at the same time, only the **first** command the controller receives is effective. The controller gives a message about the command it does not execute.

1.6 Broadcast settings

Some settings can be broadcasted ( ) to other controllers in the system:

- Application
- Restore configuration

NOTICE

Broadcast with override status

The broadcast from PICUS can override the controller status if required by the user. In this case, PICUS will NOT check that they are ready for commissioning. It is the customer's responsibility to ensure that all of the controllers are not operating any connected equipment, such as a genset, when broadcasting information that could change the configuration.

1.7 Legal information

Disclaimer

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

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

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

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2. Getting started with PICUS

2.1 Introduction to PICUS

PICUS is the PC utility software to configure, commission, and supervise DEIF controllers.

More information
See https://www.deif.com/products/picus/ for the latest information and software downloads.

Regional settings

PICUS uses your computer's regional settings for both display and entry of numeric and character values. All default values are using the English (UK) regional setting.

Your local settings may be different. To avoid configuration errors, check your regional settings before configuring any values.

Some special characters may not be supported by PICUS.

Sleep mode

If your computer switches to **Sleep mode** while running PICUS, you might lose connection to the controllers.

2.2 System requirements

PICUS requirements

Component	Requirements	Notes
Operation system	Windows version 7, 8.1 Professional, 10 or 11	
Free disk space	• 2 GB or more of free disk space	
Memory	Minimum 2 GB RAM	On complex systems additionally memory is recommended
Network interface	Network adaptor with 1 free Ethernet port	To connect your computer to the controller
Screen resolution	Minimum 900 x 700 pixels	Window size resizeable
Browser	• Edge • Mozilla Firefox 10.x or later • Apple Safari 5 • Google Chrome 17.x	
PDF reader	Acrobat Reader 8.0 or higher	To read PDF report

NOTE Due to the way that Windows allows access to network files and folders, it may not be possible to access these with PICUS. Open the files and save them locally on your computer. This applies for firmware updates and backup files.

2.3 Download and install

Download

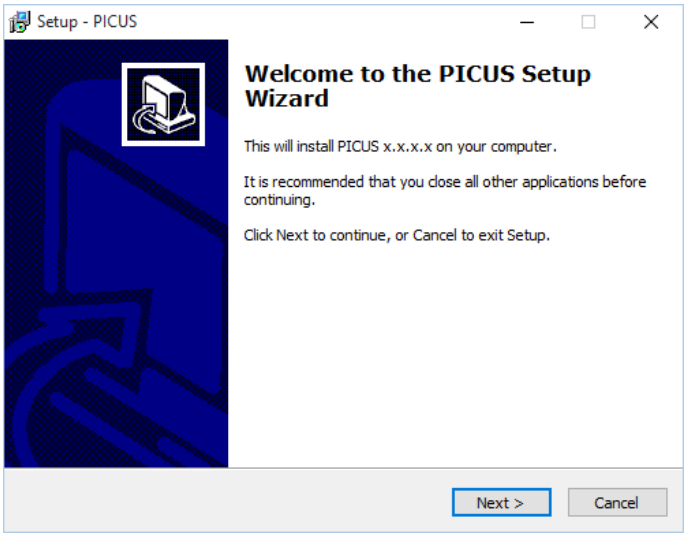
You can download PICUS for free directly from the DEIF homepage:

https://www.deif.com/software/?product=17615

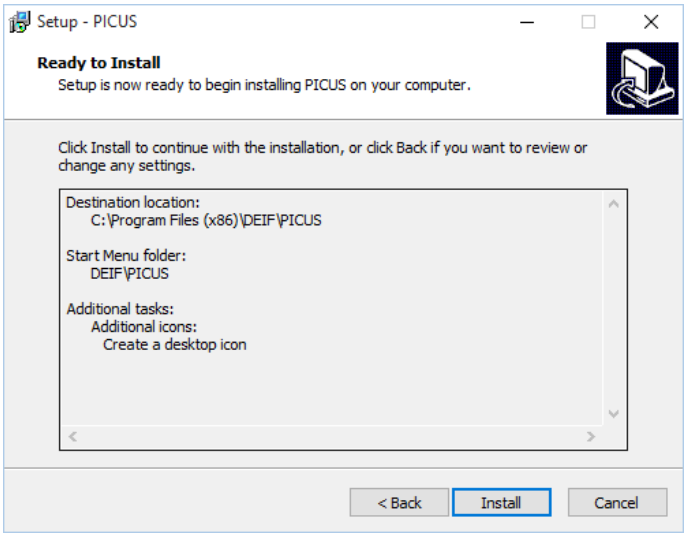
Install PICUS

Close all other applications before you install PICUS. Close any active version, before you reinstall PICUS.

1. Launch the PICUS installer from your computer:



2. To continue the installation, select `Next >` .
3. Confirm the installation location, select `Next >` .
   - You can change the default installed location if required.
4. Confirm the shortcut location, select `Next >` .
5. Confirm adding a desktop shortcut, select `Next >` .
6. To start the installation, select `Install`.



7. After PICUS is installed, select `Finish` to complete the installation.

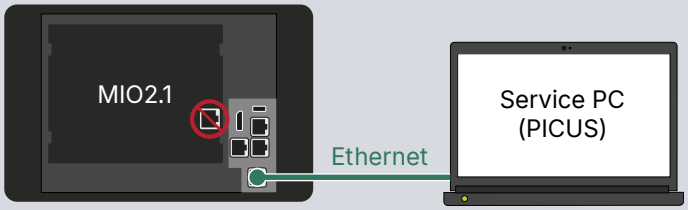
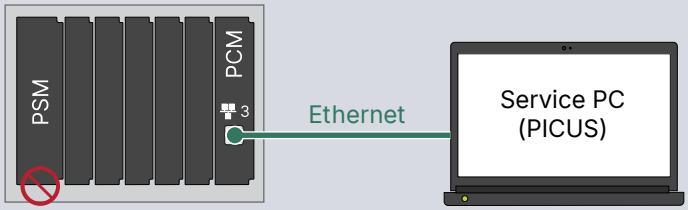
2.4 Ethernet connection

PICUS connects to the controllers with an Ethernet connection.

You can connect PICUS with either:

- A direct Ethernet cable to the controller port (recommended).
- An in-direct Ethernet connection over the same Ethernet network.

We recommend a direct connection from your computer to the controller service port. The port on the controller must be configured as either **Automatic** or **External network/PICUS**.

For iE 250	For iE 350
Controller  Connect an Ethernet cable to the service PC port on the controller. Do **not** use the EtherCAT port on the MIO2.1 module. This is for connection to expansion racks and is **not** to connect your computer.	Controller  Connect an Ethernet cable to the PCM module in the controller rack. We recommend that you use port 3, as this is easy to access. Do **not** use the red internal communication (EtherCAT) ports on the PSM module. These are for connection to expansion racks and are **not** to connect your computer. All controllers in the same system communicate with each other over the **DEIF Ethernet network**. You only need to connect your Ethernet cable to any one of the controllers, so that you can log on to any controller.

More information
See Communication for how to configure the communication settings in PICUS.

More information
If you cannot see any controllers on the Connect page, see Troubleshooting for assistance.

2.5 Supported DEIF products

PICUS is compatible with the following DEIF controllers:

- iE 250
- iE 250 Marine
- iE 350
- iE 350 Marine
- And the older Multi-line 300 controllers.

Not all features shown in this manual are supported on all products.

More information
See the PICUS for Multi-line 300 specific version of this document for PPM 300, PPU 300, GPU 300 or GPC 300.

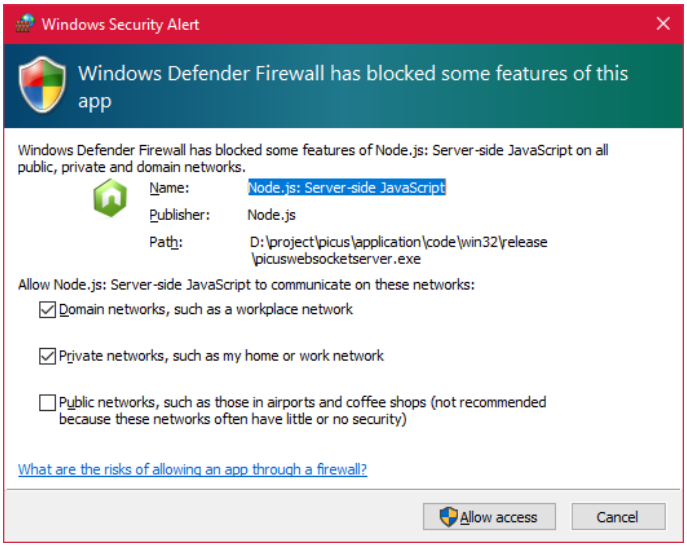
2.6 Launch PICUS

Launch PICUS from the installed folder or from the desktop icon .

You can launch one or more PICUS applications at the same time on the same computer, if you need to work or supervise different controllers at the same time.

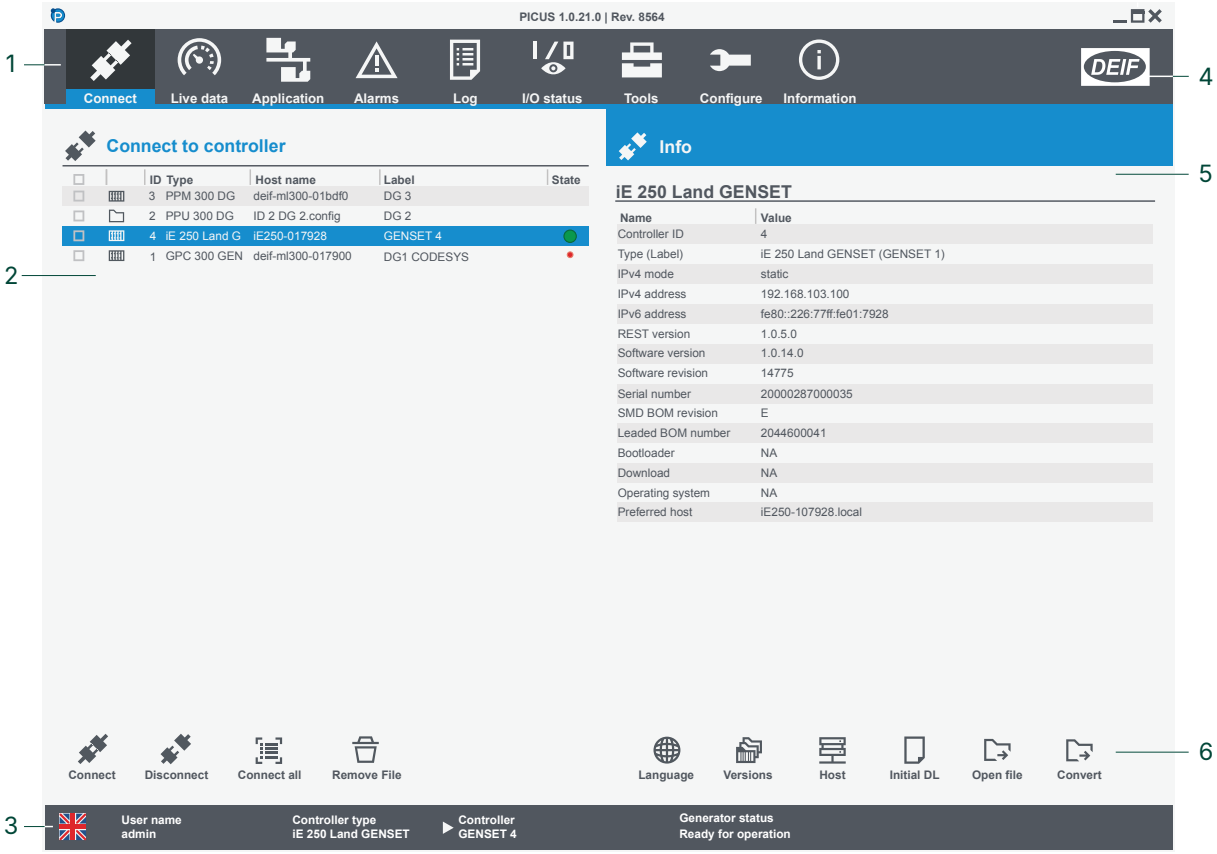
Windows security alert

You may need to confirm a Windows security alert, if your computer security level requires it. When you install PICUS for the first time, you may also need to confirm your access rights to the PICUS web socket server:



Select **Allow access**.

2.7 Screen layout



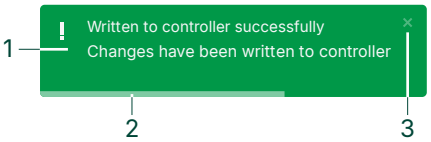
No.	Item	Notes
1	Page menu *	Selects a page to display.
2	Page content	Content for the selected page.
3	Status bar	System information for the connected controller and user.
4	DEIF About information	Information about PICUS and the controller software.
5	Additional page content	Additional information for the selected page.
6	Actions	Actions and additional features for the selected page.

NOTE * These pages can be restricted by User permissions.

2.7.1 Notifications

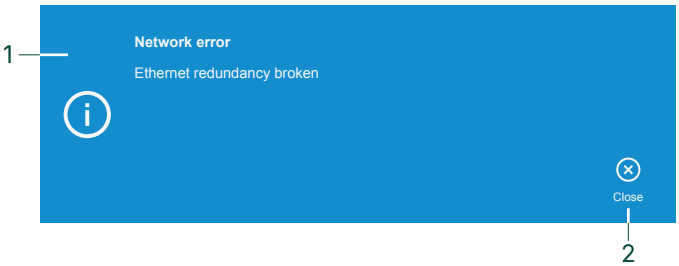
You are advised about events as they occur with notification windows.

Quick notifications



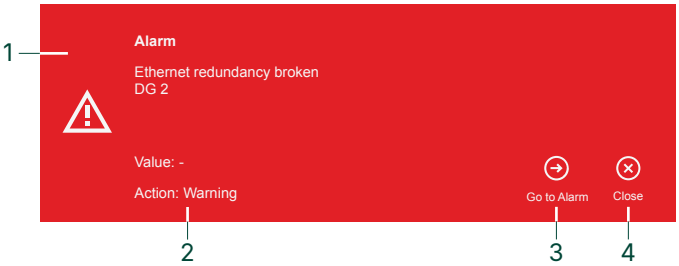
1. Quick notification details.
2. Delay timer before automatic closure.
3. Close the notification window.

Information notifications



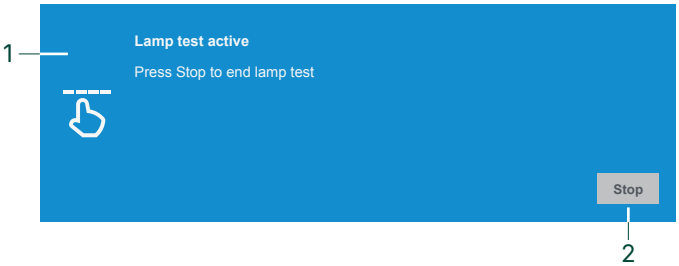
1. Information details.
2. Close ⊗ the notification window.

Alarm notifications



1. Description of the alarm.
2. Value and action for the alarm.
3. Go to alarm ⊖ page to view the alarm(s).
4. Close ⊗ the notification window.

Message notifications



1. Message details.
2. Example, press **Stop** to end the action and close the message window.

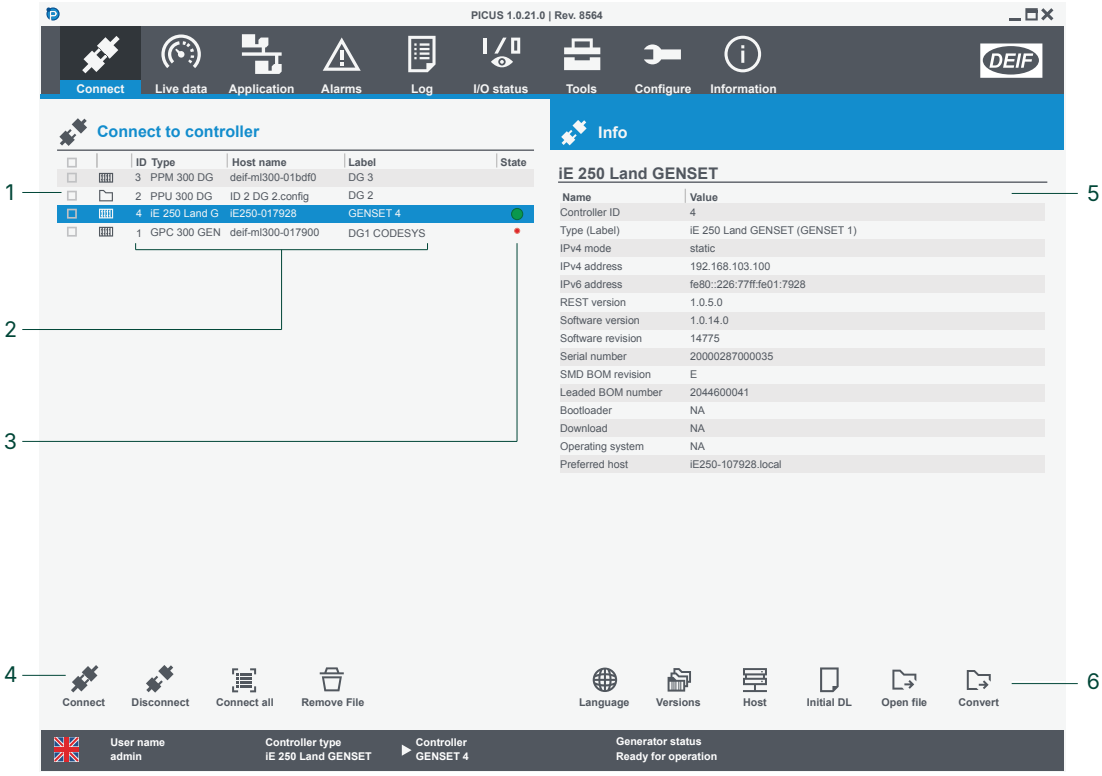
2.8 Command sources

Certain command sources can be restricted from use. For example, you could restrict the Supervision function for start/stop of the engine. Check with the designer of the system.

More information
See **Command sources** in the **Designer's handbook** for how to configure these settings.

3. Connect

3.1 Connect page



No.	Item	Notes	
1	Controller list	List of available controllers or previously opened local files.	
2	Controller information	Controller ID, Type, Host name, and Label	
3	Connection state	**Blank** Controller available, not connected.	**Small green dot** • Logged on.
		Large green dot • Logged on and connected.	**Red dot** • Not available or in Service mode.
4	Connection options	**Connect** to selected controllers.	**Disconnect** from selected controllers.
		Log on to **All** controllers.	**Remove file** from list.
5	Controller information	Summary information for the selected controller in the list.	
6	Actions	Change **Language**.	View Versions information.
		Connect directly to a known **Host**.	Start Initial DL of firmware to controllers.
		Open a backup or configuration, or folder.	Convert a file: • Backup file to configuration file or folder. • Folder to configuration file.

3.1.1 Open offline project file

Offline projects can be stored as a:

- backup file (.backup):
  - Read only access, information cannot be saved.
- configuration file (.config)
- folder

To open an offline project:

1. Select **Open** .
2. Locate where the file or folder is stored.
3. Highlight the file or folder and select **Open**.
   - The backup, configuration, or folder is added to the **Connect page** as a folder in the controller list.
   -

4. Highlight the folder from the list and select **Connect** .

More information
See Backup for more information about how to create a backup (.backup) file.

3.1.2 Convert

Use this option to convert project files.

- Convert Backup (.backup) files created with PICUS 1.0.8.x or later to Configuration (.config) files or new folders.
- Convert Backup folders created with PICUS 1.0.10.x or later to Configuration (.config) files. Older backup folders cannot be converted.

Multiple backup files can be converted to a selected format.

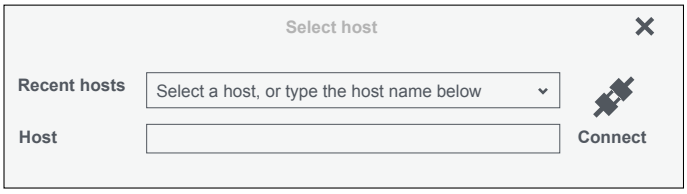
To convert a file:

1. Select **Convert** .
2. Locate where the file is stored.
3. Highlight the file and press **Open**.
4. Select the **Save as** type and location.

The file is now converted and added to the controller list.

3.1.3 Connect host

To connect to a known or previously connected host:

1. Select **Host** .
   - A prompt is shown on screen:
   - 

2. Enter the host name or IPv4 address, or you can select a previously connected host from the available list.
3. Select **Connect** to connect to the host.

- PICUS attempts to log on with the same user name and password.

3.1.4 Initial download (Initial DL)

Controllers supplied by DEIF are pre-installed with the necessary application software. **Initial DL** does not update on systems running in application mode.

NOTICE
Use for Initial download The Initial DL option is ONLY to be used where the firmware update has NOT been applied correctly. In all other situations the Firmware page should be used to apply new software.

For iE 350

If a firmware update has failed, the System status LED on the PCM3.3 and the Internal communication status LED on the PSM3.1 flash for more than one minute.

In this situation, use **Initial DL** to apply the software to the controller.

Apply an initial download to one controller at a time:

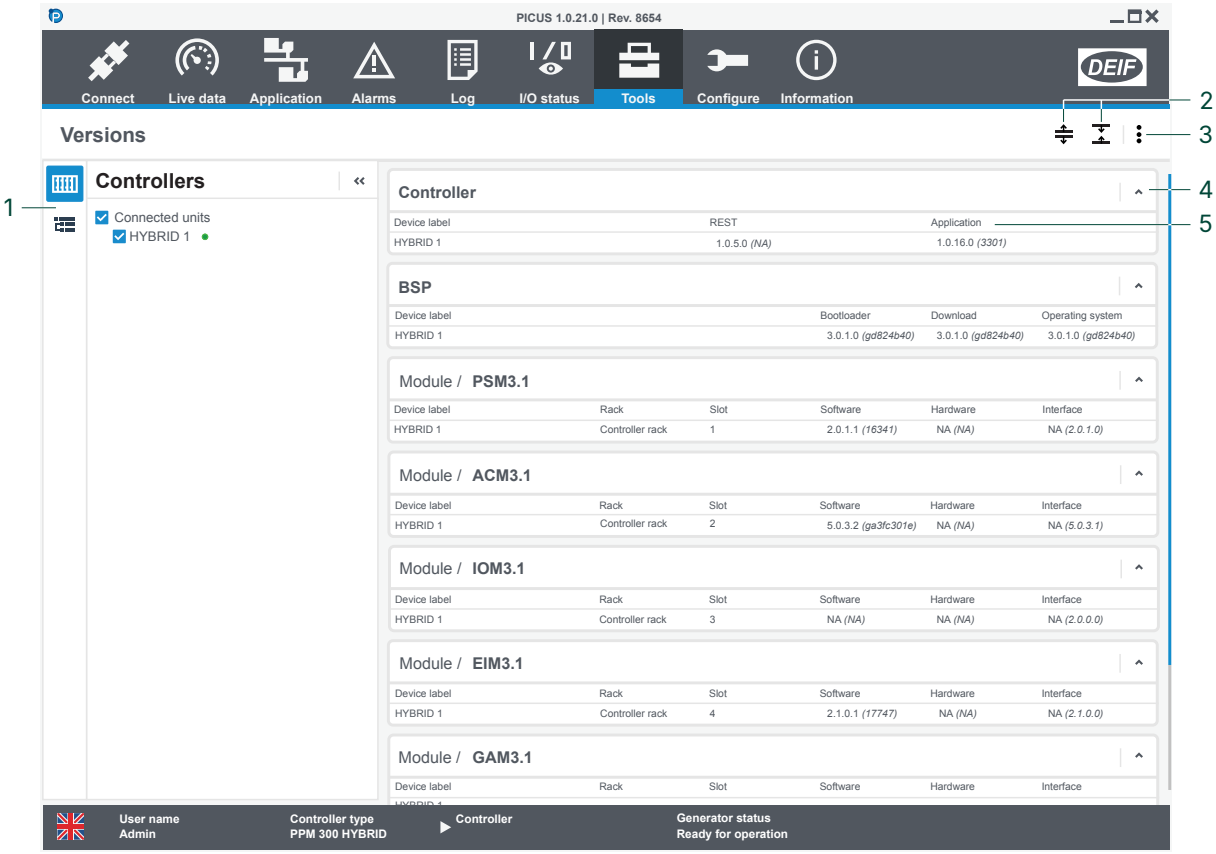
1. Select the required controller from the list.
2. Select **Initial DL** .
3. Select the required controller and the firmware package to apply.

More information
See Firmware for more information about how to apply a new software upgrade.

If you experience any problems with **Initial DL**, contact DEIF support.

3.2 Versions page

The versions page can be useful if you need to contact DEIF support for assistance.



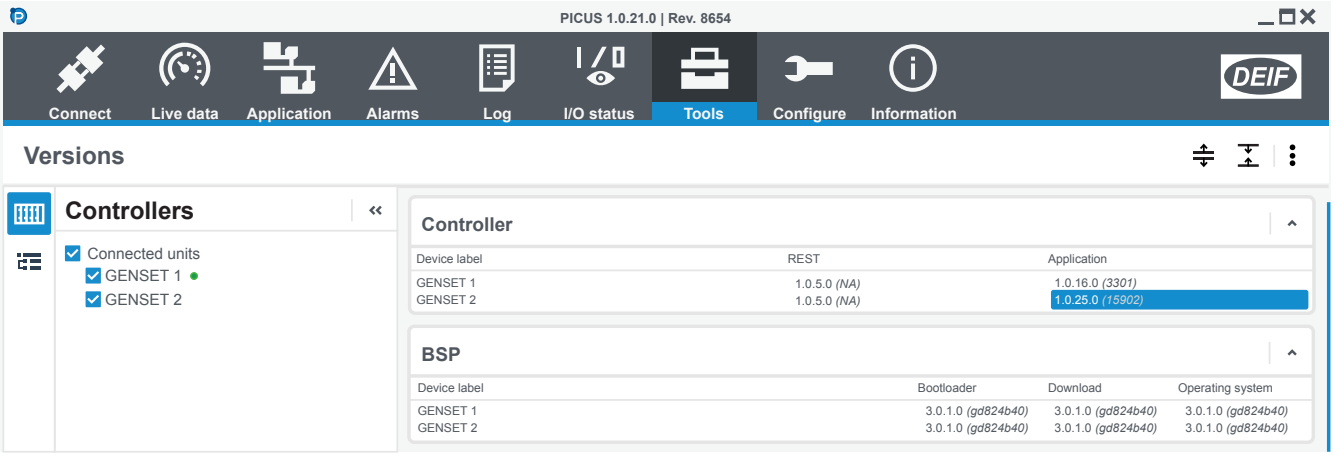
No.	Item	Notes	
1	Controller or filter	View by controllers or by filter:	
		Controllers : Shows version information based on connected units.	**Filter** : Shows version information based on filter selection.
2	List controls	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
3	**More options**	Include or exclude extra information: • Revision • Modules • Path • Differences	
4	Collapse item	Collapses the specific item box.	
5	Version information	Shows the version information for the item.	

3.2.1 Differences

You can highlight any differences between connected controllers. For example, the difference in controller software version.

Show differences

1. Connected and log on to the different controllers.
   - Example: GENSET 1 and GENSET 2.
2. Select **More options** and select **Show differences**.
3. Any differences are now shown highlighted:

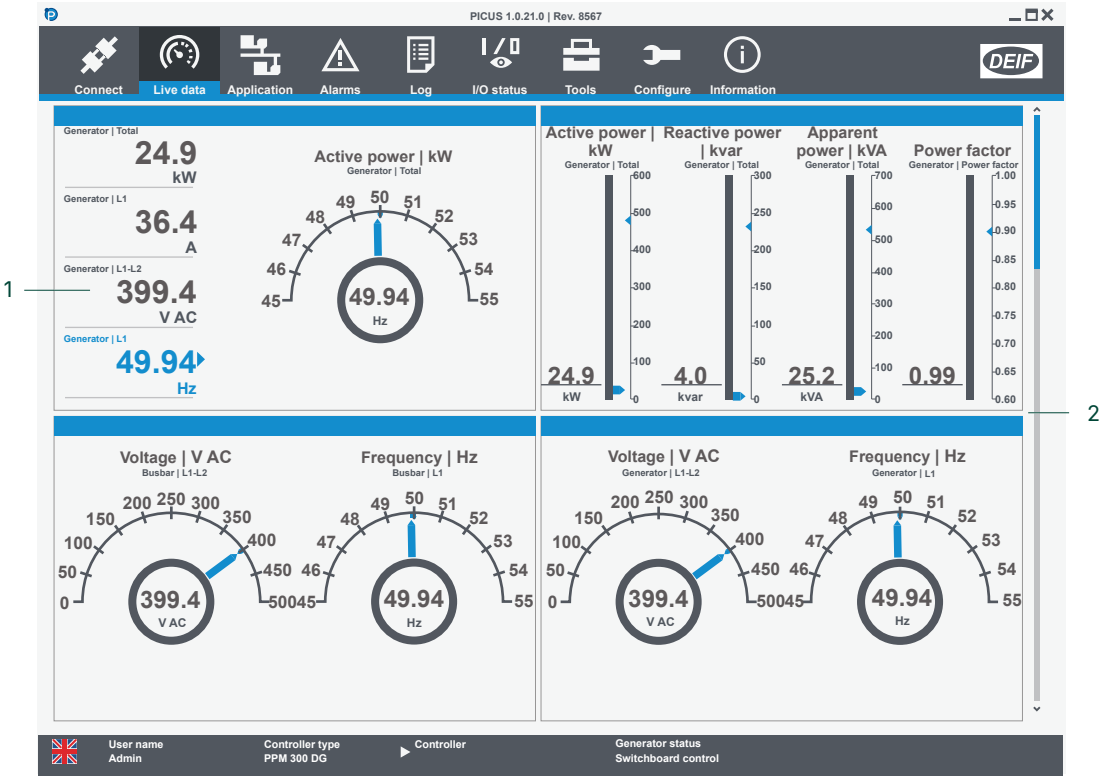
- 

- GENSET 1 is running application 1.0.16.0 and GENSET 2 is running 1.0.25.0.

4. Live data

4.1 Live data page

The information shown depends on the type of product and controller connected.



No.	Item	Notes
1.	Changeable display information	Some information displays can be changed.
2.	Scrollable list of live data information	Shows various operating information.

5. Application

5.1 About Application

Use Application to supervise or emulate the system, and also configure the Application drawing.

	Supervision	Allows you to supervise the asset or system. See the operational state and I/O status, and use operator commands.
	Emulation *	Allows you to emulate the operation of the asset and system. See the operational state and I/O status, and use operator commands. You can also simulate events or I/O channels, and apply emulated loads.
	Configuration	Allows you to configure the Application diagram. Drag and drop controllers and elements, and define how they are connected.

NOTE * Emulation must be enabled in Parameters to use this feature.

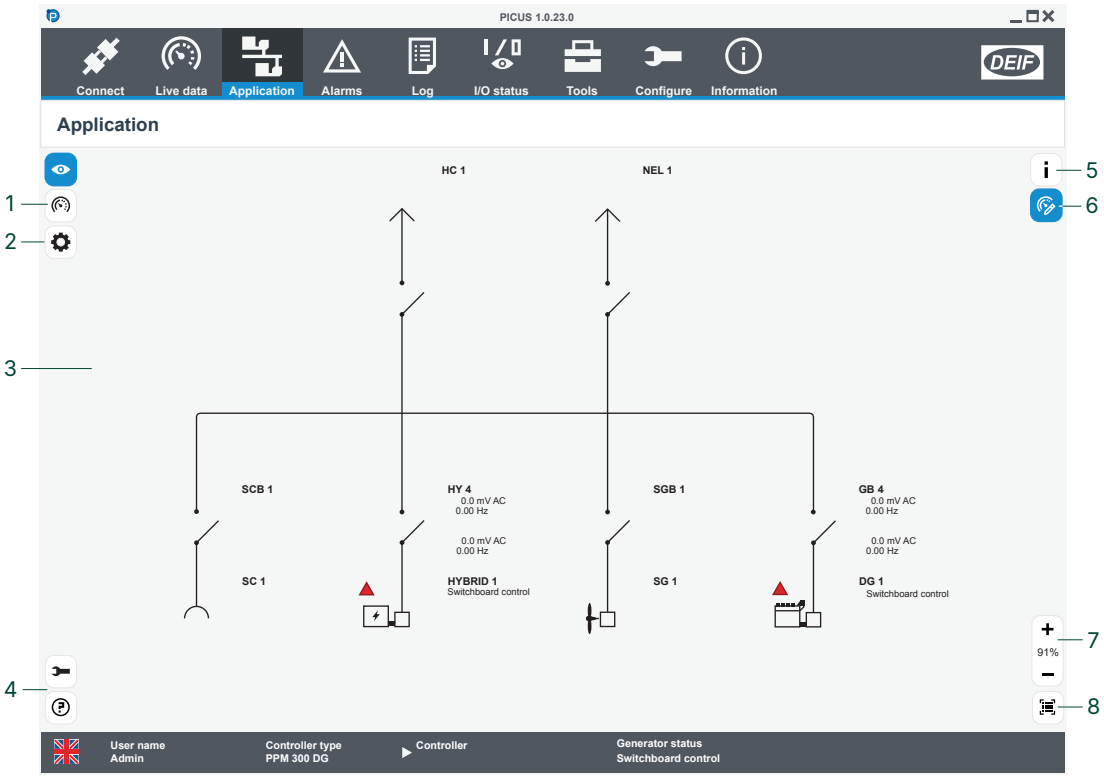
We would love to hear from you.

Help us improve our documentation by giving us feedback.

Click here

5.2 Supervision page

Select and zoom in on a controller to control it, or select and use the **Controls** option at the right.



No.	Item	Notes	
1	Emulation	Use Emulation to emulate and test operation.	
2	Configuration	Use Configuration to add equipment to the diagram.	
3	Single-line diagram	Shows the equipment, connections, and current operation state for the application.	
4	Application settings	**Settings** : Shows settings for this page.	**User guide** : Shows keyboard short-cuts.
5	Information	**Information** : Shows the information about the selected element.	
6	Controls	**Controls** : For a selected controller, controls the equipment and views input/output status.	
7	Zoom control	**Zoom in** : Increases magnification.	**Zoom out** : Decreases magnification.
8	Fit to page	**Zoom to fit** : Automatically zooms the diagram to fit the page.	

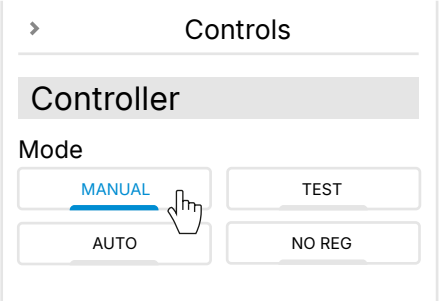
5.2.1 Default theme colours

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

5.2.2 Change mode

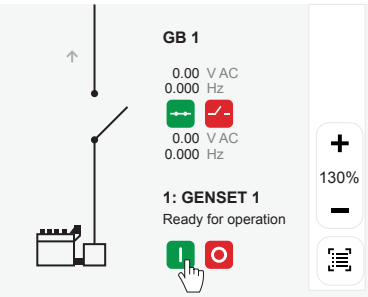
You can change controller mode similar to the display buttons.

1. Select the controller on the application.
2. The **Controls** opens automatically.
3. Change the controller mode as necessary:



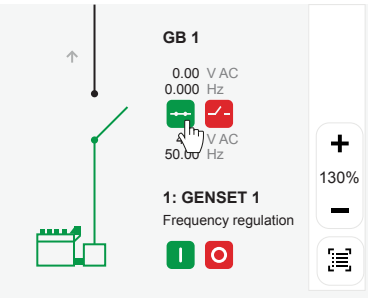
5.2.3 Start or stop equipment

1. Zoom in on the equipment to control.
2. Select **Start** or **Stop** as necessary:



5.2.4 Close or open the breaker

1. Use zoom controls to zoom in on the equipment to control.
2. Select **Close breaker** or **Open breaker** as necessary:

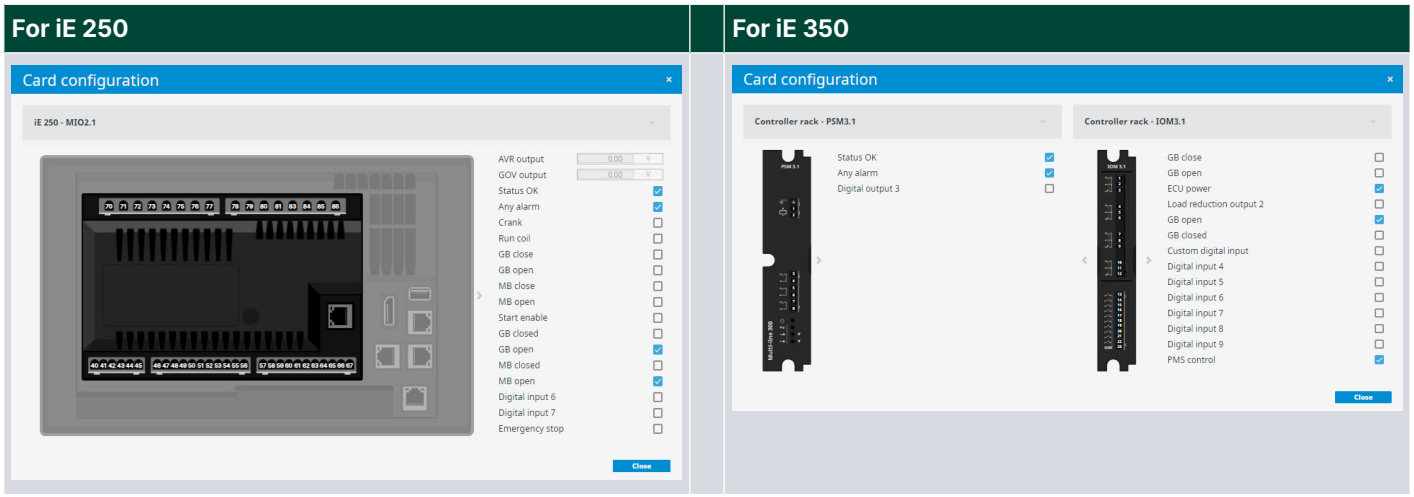


5.2.5 Input/output information

In Supervision you can view the input and output values.

1. Select the controller on the application.
2. The **Controls** opens automatically.
3. Select **I/O**:
   -

4. The *Card configuration* is shown.



The state of the digital inputs or outputs are shown:

- ☐ : Not activate
- ☑ : Active

The state of the analogue inputs or outputs are shown with their value:

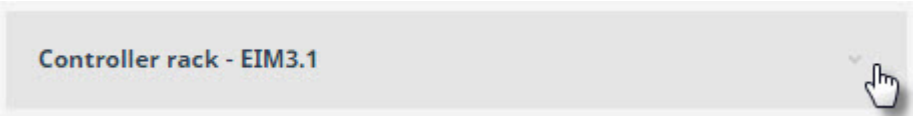
- 25.50

Use the navigation options, ‹ left or › right to change the hardware module:

-

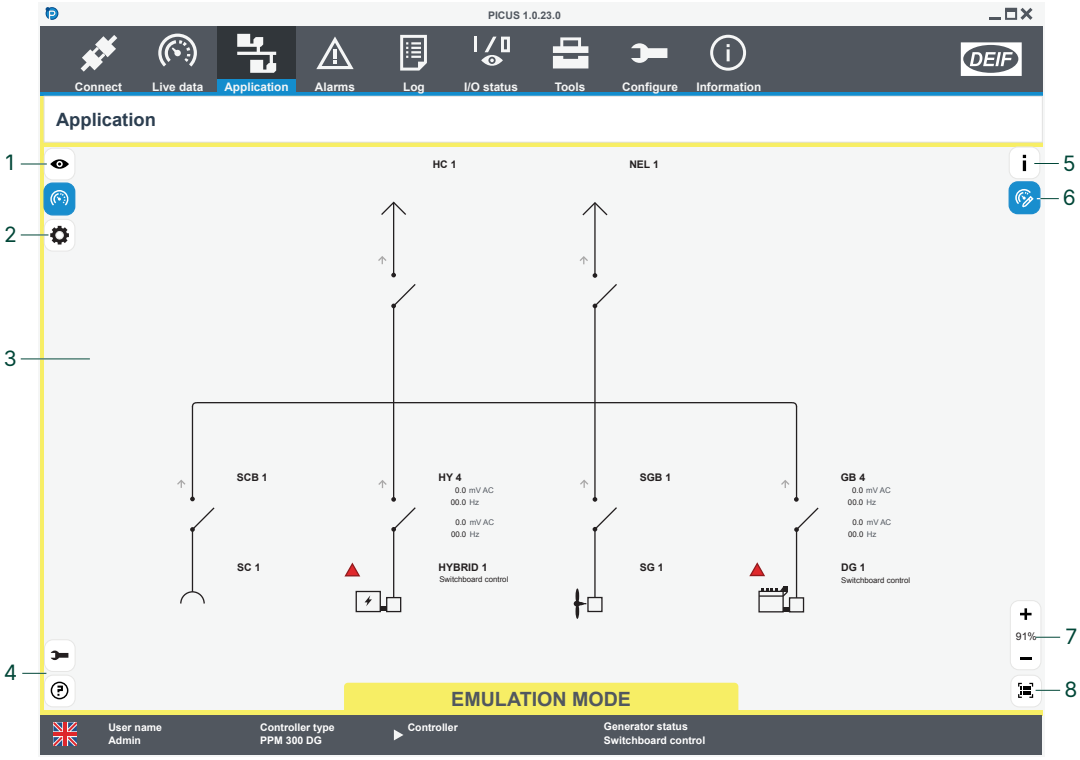
Select hardware

You can select the hardware or module by using ⌄ :

- 

5.3 Emulation page

Select and zoom in on a controller to control it, or select and use the **Controls** option at the right.



No.	Item	Notes	
1	Supervision	Use **Supervision** to change to the Supervision page.	
2	Configuration	Use **Configuration** to add equipment to the diagram.	
3	Single-line diagram	Shows the equipment, connections, and current operation state for the application.	
4	Application settings	**Settings** : Shows settings for this page.	**User guide** : Shows keyboard short-cuts.
5	Information	**Information** : Shows the information about the selected element.	
6	Controls	**Controls** : For a selected controller, controls the equipment and simulates input/output values.	
7	Zoom control	**Zoom in** : Increases magnification.	**Zoom out** : Decreases magnification.
8	Fit to page	**Zoom to fit** : Automatically zooms the diagram to fit the page.	

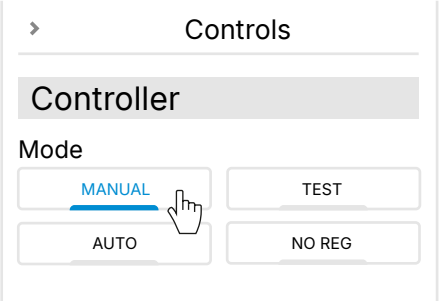
5.3.1 Default theme colours

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

5.3.2 Change mode

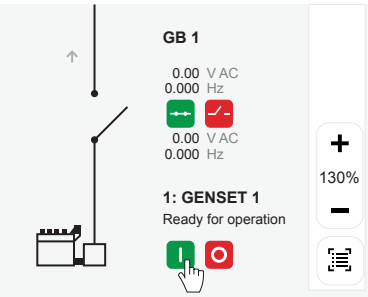
You can change controller mode similar to the display buttons.

1. Select the controller on the application.
2. The **Controls** opens automatically.
3. Change the controller mode as necessary:



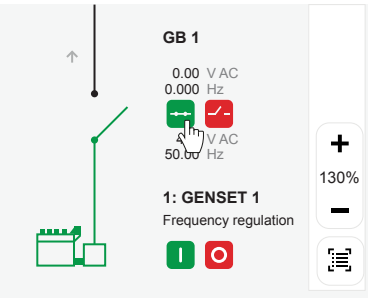
5.3.3 Start or stop equipment

1. Zoom in on the equipment to control.
2. Select **Start** or **Stop** as necessary:



5.3.4 Close or open the breaker

1. Use zoom controls to zoom in on the equipment to control.
2. Select **Close breaker** or **Open breaker** as necessary:

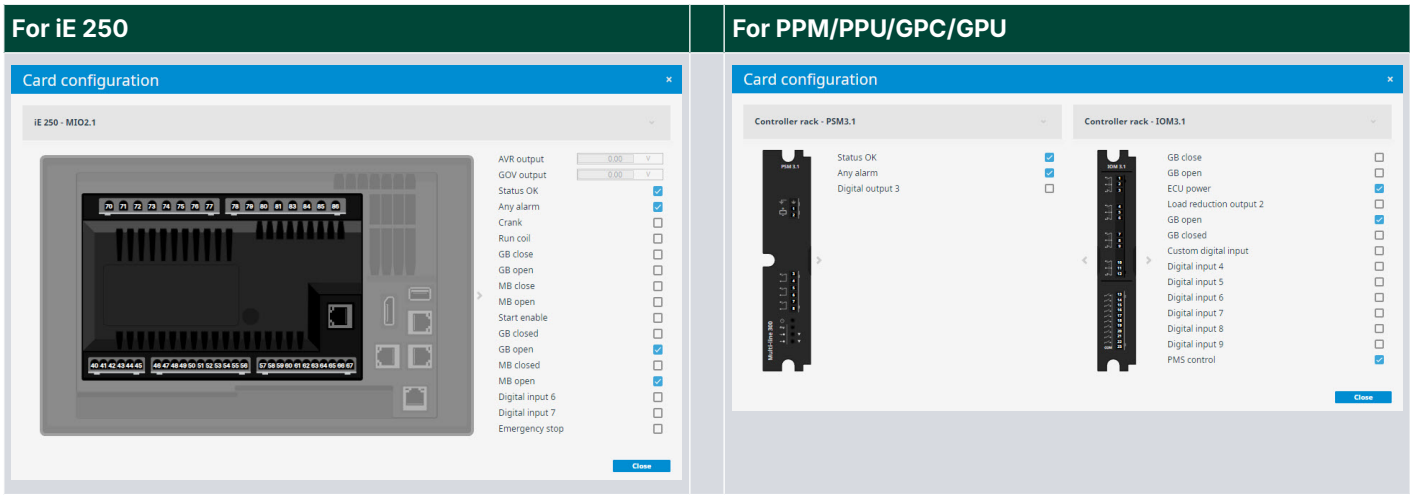


5.3.5 Input/output information

In Emulation you can both view and simulate the input and output values.

1. Select the controller on the application.
2. The **Controls** opens automatically.
3. Select **I/O**:
   -

4. The *Card configuration* is shown.



Change digital input or output state:

The state of the digital inputs or outputs can be simulated:

- ☐ : Not active
- ☑ : Active

Change analogue input or output state:

The state of the analogue inputs or outputs can be edited with a new value:

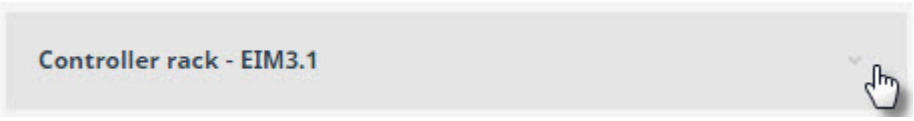
- 25.50

Use the navigation options, ‹ left or › right to change the hardware module:

-

Select hardware

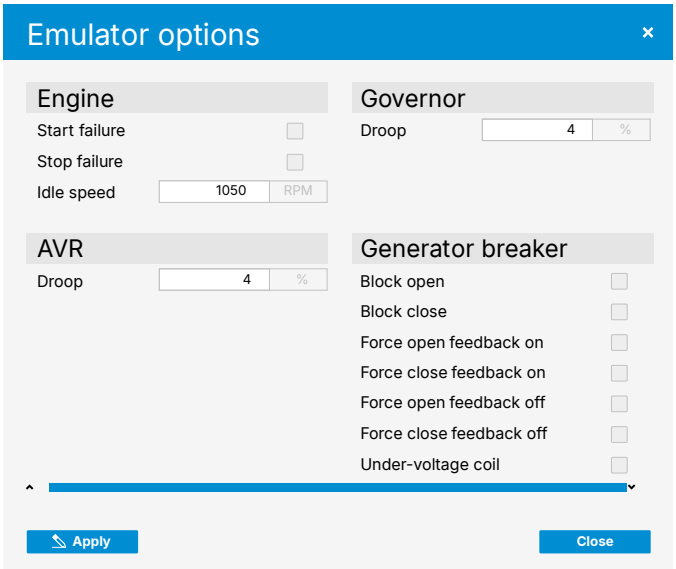
You can select the hardware or module by using ⌄:

- 

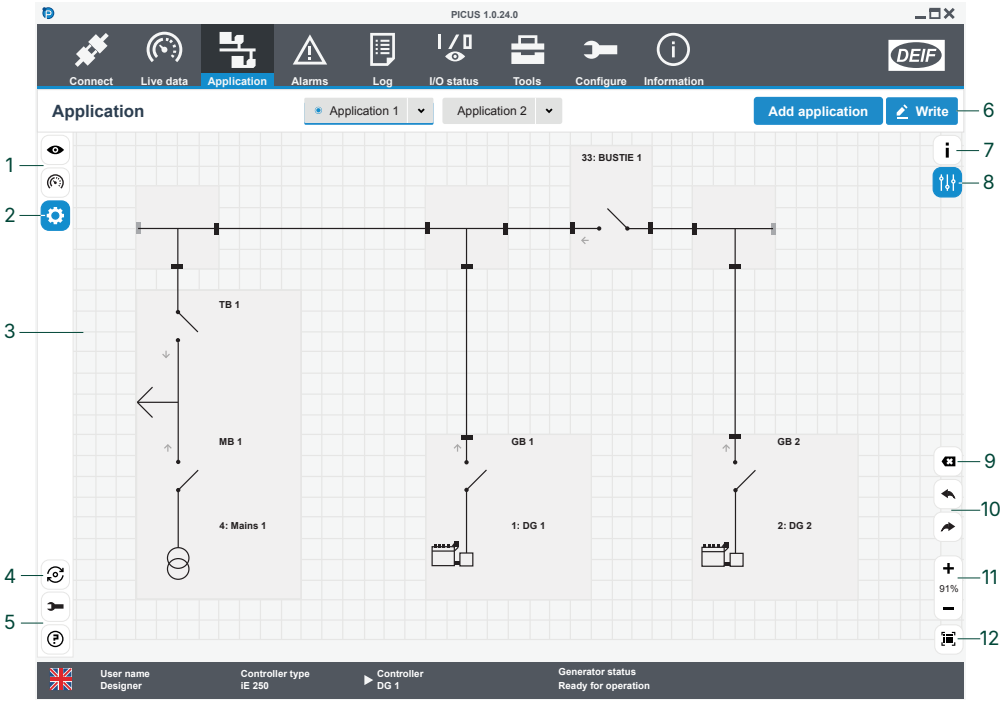
5.3.6 Simulate events

In Emulation you can simulate the occurrence of events, for example a Start failure.

1. Select the controller on the application.
2. The **Controls** opens automatically.
3. Select **Emulator**:
   -

4. You can simulate different events or values:
   - 

5.4 Configuration page

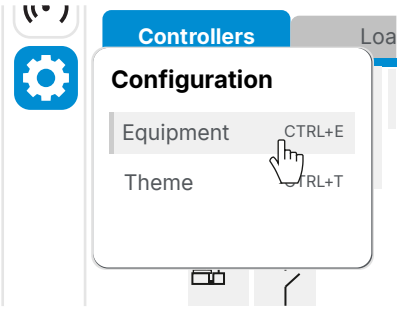


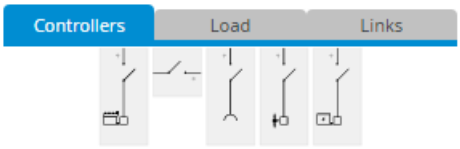
No.	Item	Notes	
1	Supervision or Emulation	**Supervision** : Change to Supervision .	**Emulation** : Change to Emulation.
2	Configuration	Use **Configuration** to add equipment.	
3	Canvas	Shows the equipment and connections for the application.	
4	Reload	**Reloads** the application from the controller.	
5	Application settings	**Settings** : Shows settings for this page.	**User guide** : Shows keyboard short-cuts.
6	Application	Add, remove or activate application.	Write the application and broadcast to other controllers.
7	Information	**Information** : Shows the information about the selected element.	
8	Element configuration	**Configuration** : Configures the selected element.	
9	Clear plant	**Clear plant** : Clears the application diagram.	
10	Undo and redo	**Undo** : Removes last action.	**Redo** : Restores last action.
11	Zoom control	**Zoom in** : Increases magnification.	**Zoom out** : Decreases magnification.
12	Zoom to fit	**Zoom to fit** : Automatically zooms the application to fit the page.	

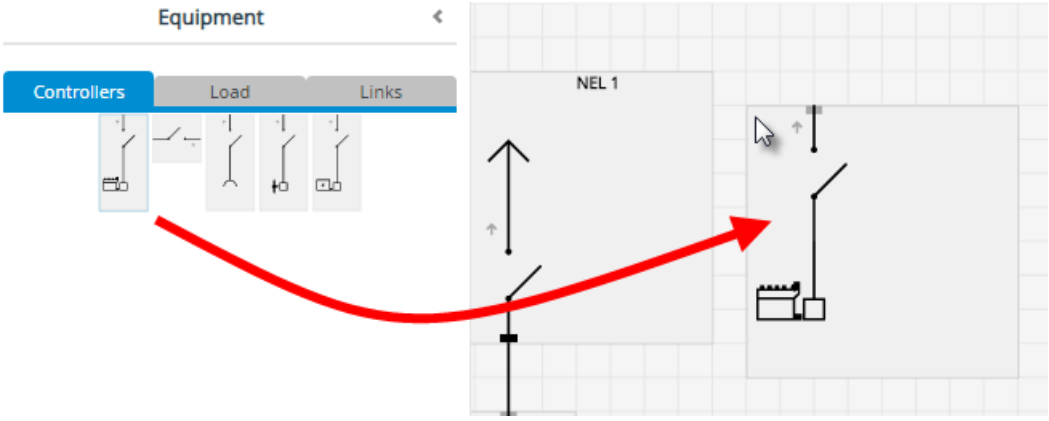
All controllers must have a controller ID assigned before you can configure an application diagram. An alarm occurs if the application does not match the connected equipment.

5.4.1 Add or remove equipment

Add equipment

1. Open **Configuration**.
2. Select **Equipment**.
   - 

3. Select the type of equipment you want to add:
   - 

4. Select and drag the equipment on to the canvas:
   - 

   - You can add multiple equipment of the same type at the same time by double-clicking in different places on the canvas.

NOTE You can also use the short-cut **CTRL+E** to open the equipment selection.

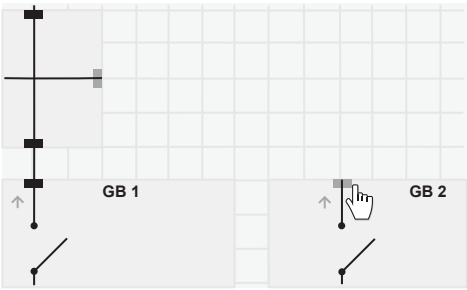
Remove equipment

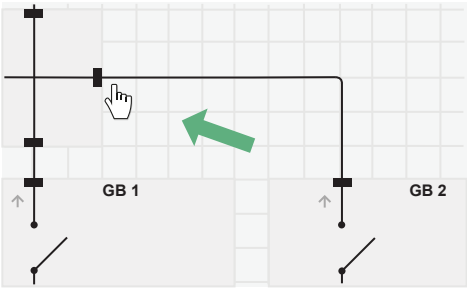
1. Select the equipment (or group) on the canvas.
   - Selection is shown as a blue box around the equipment or group.
2. Press delete.

5.4.2 Add or remove connections

Connect equipment

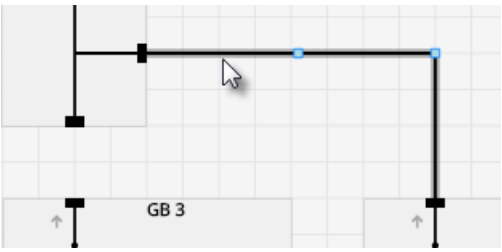
1. Select the grey connection point on the equipment:

- 

2. Drag to the connection point on the other equipment:
   - 

3. A connection is made between the equipment.
   - The connection point changes from grey to black to indicate it is connected.

Remove a connection

1. Select connection:
   - 

2. Press delete.

5.4.3 Configure equipment

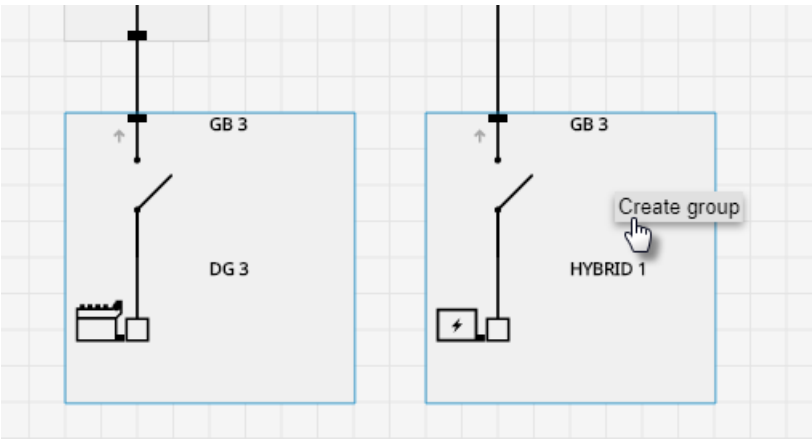
1. Select the equipment on the canvas which opens the **Equipment configuration**.
2. You can configure the settings for the equipment, including breaker and controller settings.
   - This includes the breaker feedback and breaker measurement settings.
3. You can rotate the equipment by selecting the direction option:
   -

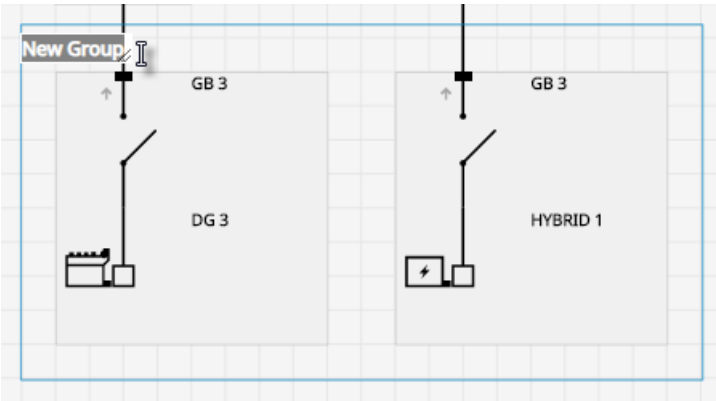
NOTE You can also use the short-cut `CTRL+C` to open the equipment configuration.

5.4.4 Group or ungroup equipment

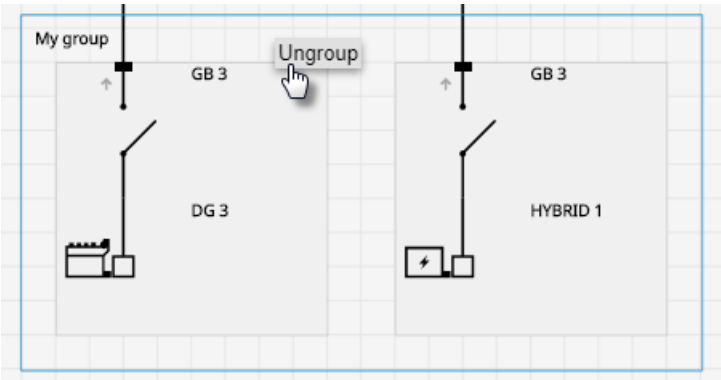
Group equipment

1. Select all the equipment on the application that you want to group together by using left click + shift.
2. Use right click and select **Create group**.

- 

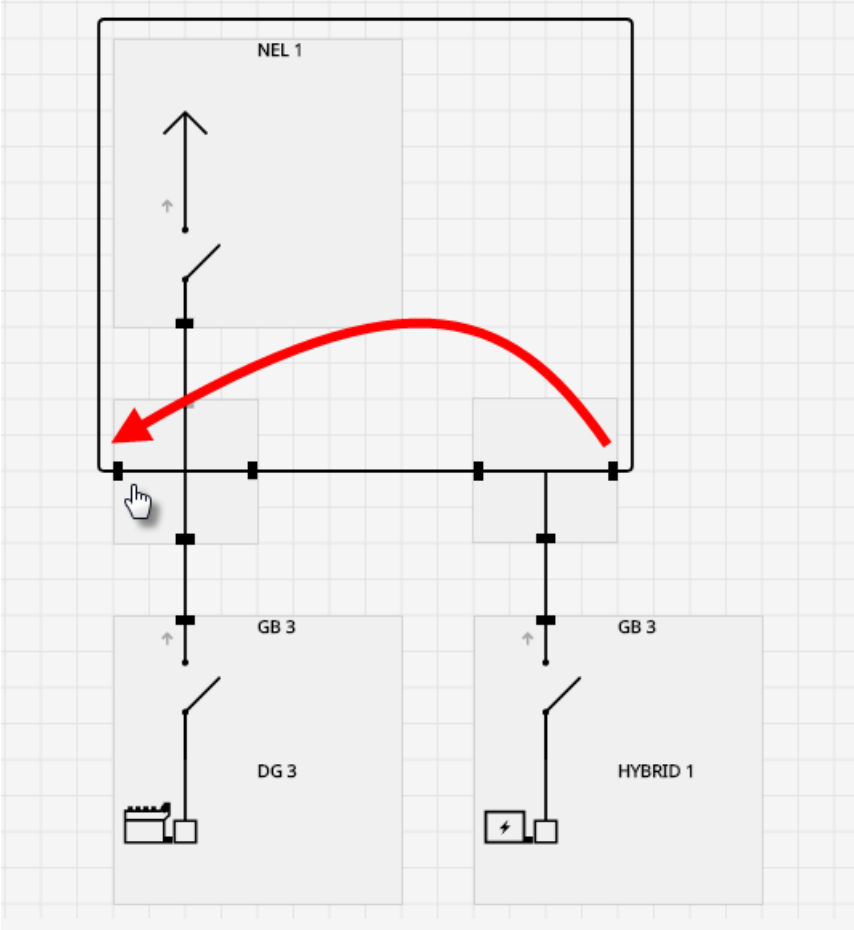
3. You can also give the group a name by double-clicking the group name:
- 

Ungroup equipment

1. Select the equipment group on the application that you want to ungroup.
2. Use right click and select **Ungroup**.
- 

5.4.5 Add a ring busbar connection

1. Make sure to have two free connection points on the application, add links if required.
2. Select one of the grey connection points and drag to the other end:

- 

- The connection point changes from grey to black to indicate it is connected.

5.4.6 Configure breaker under-voltage coil

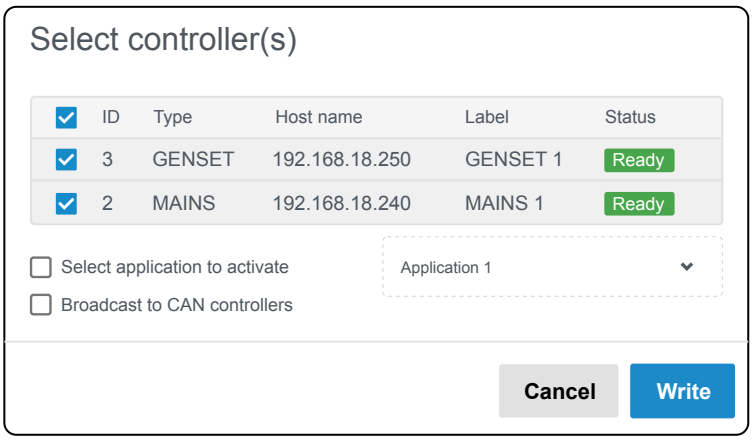
1. Open **Configuration**.
2. Select the controller which controls the breaker.
3. Under **Breaker** you can select **Under-voltage coil**.
   - The breaker shows the symbol:
     -

4. Use **Broadcast** the write settings to the controllers in the system.

5.4.7 Broadcast application to controllers

You must broadcast any changes to the application to the controllers to take effect. Only controllers connected and logged on are shown.

1. Select Write.
2. Select the controller(s):

- 

- If there is more than 1 application, you can select the application to activate.
- If there are CAN controllers you can also broadcast to these.
- Any controllers that are not ready, can be overridden with a confirmation.
  - **CAUTION**

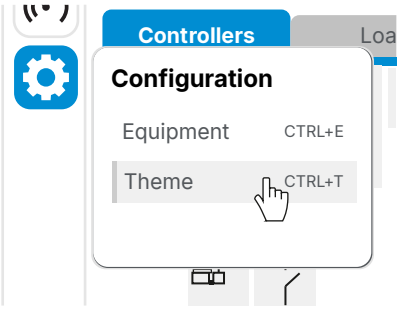
    Manual override action

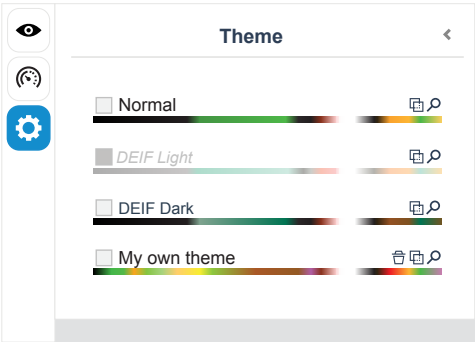
    PICUS allows you to broadcast to controllers, even if they are not safe for commissioning. You must confirm this override action manually.

3. Select Write to broadcast to the selected controllers.

5.4.8 Create or edit themes

You can configure the busbar colours shown on Supervision and Emulation. You can select between different themes or create a new theme with your own custom colours.

1. Open **Configuration**.
2. Select **Theme**.
   - 

3. The themes available are shown:
   - 

   - View or edit the theme colours. *
   - Copy and create a new theme.

- Deletes a custom theme.

4. Select a theme to make it the activate theme.

NOTE * You cannot edit the default DEIF themes.

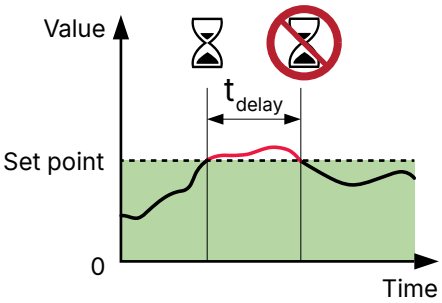
6. Alarms

6.1 About the alarms

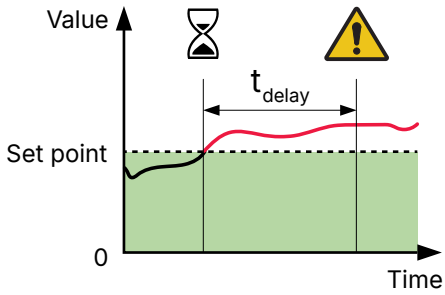
The controller alarms prevent unwanted, damaging, or dangerous situations from occurring. The Operator must review all activated alarms for cause and suitable action.

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:

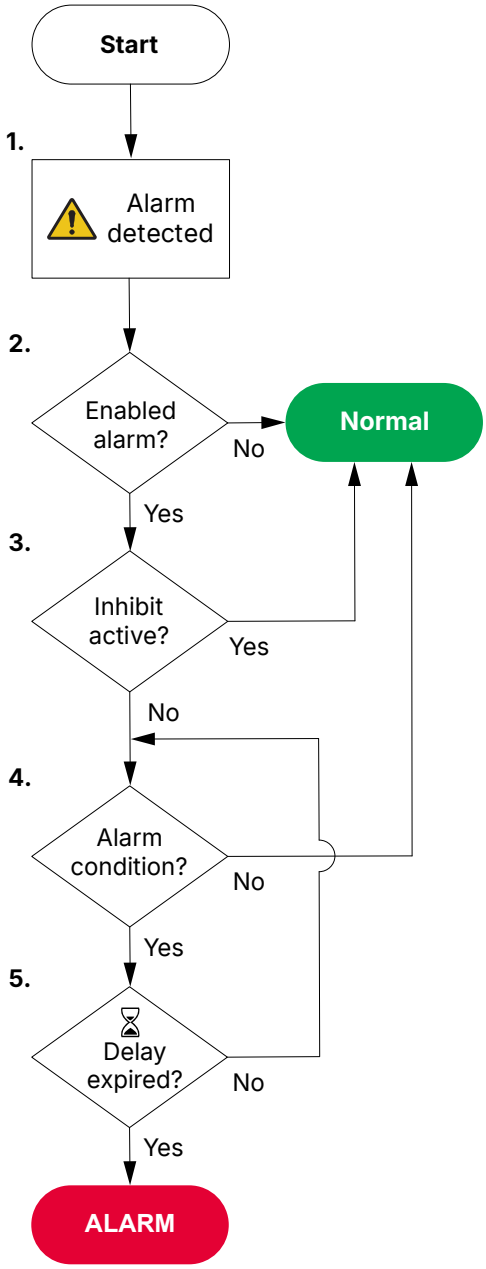
Alarms that are activated in a system must be reviewed for cause and action to resolve them.

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

6.1.1 Alarm flowchart



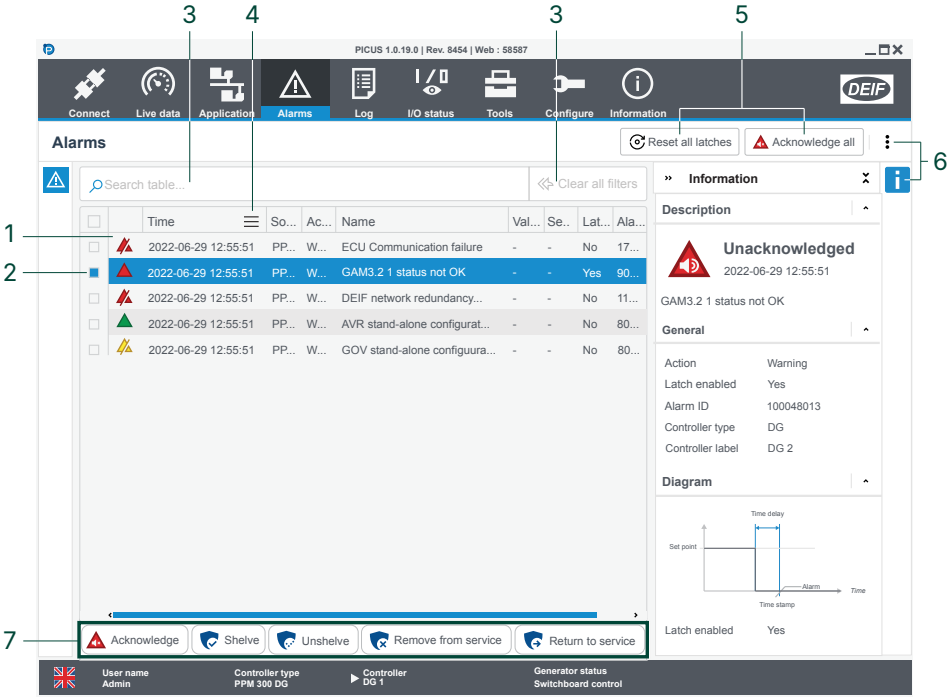
1. The controller detects an *Alarm condition*.
2. The controller checks if the alarm is enabled:
   - If the alarm is not enabled the controller ignores the alarm.
3. The controller checks if the alarm has an active inhibit.
   - If the alarm has an active inhibit the controller ignores the alarm.
4. 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*.

6.1.2 Alarm states

Symbol	Alarm condition *	Alarm action **	Acknowledge	Notes
or	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.
or	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.
or	Inactive	Active	Unacknowledged	• An alarm condition has cleared. • An alarm action is active. • An alarm requires acknowledgement. • An alarm latch requires reset.
or	Inactive	Active	Acknowledged	• An alarm condition has cleared. • An alarm action is active. • An alarm is acknowledged. • An alarm latch requires reset.
or	Inactive	Inactive	Unacknowledged	• An alarm condition occurred, but was cleared. • An alarm action is inactive. • An alarm requires acknowledgement.
or	Active or Inactive	Inactive	-	• An alarm is shelved for a period of time. • An alarm returns automatically after the period has expired.
or	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.
or	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.

6.2 Alarms page



No.	Item	Notes	
1	List of alarms	Unacknowledged alarm.	Acknowledged alarm.
		Unacknowledged latched alarm.	Acknowledged latched alarm.
		Unacknowledged cleared alarm.	Acknowledged cleared alarm.
		Shelved alarm.	Out of service alarm.
		Inhibited alarm.	
2	Alarm selection	Not selected.	Selected.
3	Search text	Enter a search term to filter the list.	Clear all filters.
4	Sort or filter	Use ≡ to sort or filter column values.	
5	Global actions	Reset all latches.	Acknowledge all alarms.
6	More options	Shows more actions.	Shows more information about the alarm.
7	Alarm actions	**Acknowledge** an unacknowledged alarm.	
		Shelve the alarm for the selected period.	**Unshelve** a previously shelved alarm.
		Remove from service the alarm.	**Return to service** the alarm.

6.2.1 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.

When alarms are activated in the system, they appear on the Alarms page.

Sort of filter for alarms

You can sort or filter the list of 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.

Alarm information

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

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`.

Select the alarm or alarms to reset the latch, and use `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.

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

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

You can also manually unshelve a shelved alarm, by using `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`.

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

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

6.2.2 Latched alarms

Alarms that have a latch enabled remain active even after they are acknowledged. This adds an additional layer of protection to the system.

How to reset latched alarms:

1. Acknowledge the alarm.
2. Clear the alarm condition.
3. Select **Reset all latches**.

All acknowledged and latched alarms are now reset, and the actions (protections) become inactive.

6.2.3 Alarm tests

CAUTION

Alarm tests activate alarm actions (protections)

Activating an alarm test also activates the alarm actions. Only test alarms if it is safe.

To start an alarm test:

1. Select **More options** at the top of the page.
2. Select either:
   - **Test enabled alarms**
   - **Test all alarms**
3. A confirmation message opens.
4. If it is safe to start the alarm test, select **Start test**.

The alarms remain active for as long as the alarm test is running. Stop the alarm test and acknowledge the alarms, to change the state of the alarms to inactive.

To stop an alarm test:

1. Select **More options** at the top of the page.

2. Select **Stop test**.
3. Select **Stop test** to stop all active alarm tests.
   - It can take a moment for PICUS to stop the alarm test.

6.2.4 Shelved alarms

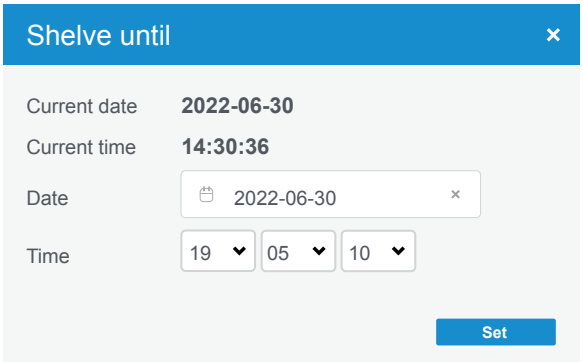
Only certain types of alarms can be shelved. Shelved alarms are not active, and become automatically unshelved after the shelve period expires. You can also unshelve alarms manually.

Shelve alarms

1. Mark the alarm or alarms to shelve.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

2. Select **Shelve** .
3. You must select the shelve period:



4. Enter the required shelve period.
5. Select **Set** to shelve the alarm or alarms.
   - The alarm is marked as shelved in the alarm list.
   - The alarm action (protection) is inactive until the alarm is unshelved.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

Unshelve an alarm

1. Mark the alarm or alarms to unshelve.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

2. Select **Unshelve** to unshelve the alarm or alarms.
   - The alarms are rechecked by the system.

- If the alarm condition is still present in the system, the alarm is activated again.
-

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

6.2.5 Remove from service

When alarms are removed from service, they are no longer active.

CAUTION

Inactive alarm action (protection)

The alarm action (protection) becomes inactive while the alarm is out of service.

Remove alarms from service

1. Mark the alarm or alarms to remove from service.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
■		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
■		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

2. Select **Remove from service** .
   - The alarm is marked as out of service in the alarm list.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

Return alarms to service

1. Mark the alarm or alarms to return to service.

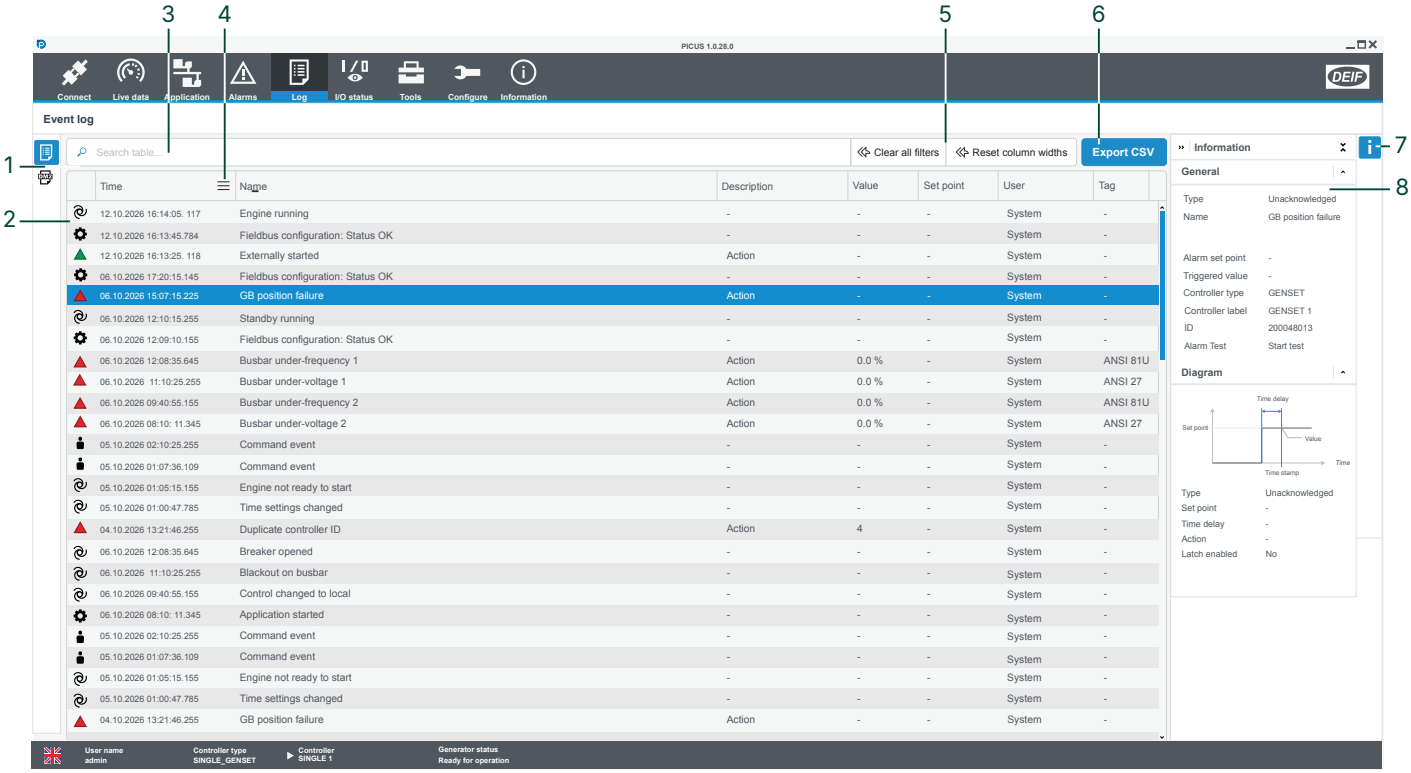
		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
■		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
■		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

2. Select **Return to service** .
   - The alarms are rechecked by the system.
   - If the alarm condition is still present in the system, the alarms activate again.

		Time	So...	Ac...	Name	Val...	Se..	Lat...	Ala...
		2022-06-29 12:55:51	PP...	W...	ECU Communication failure	-	-	No	17...
		2022-06-29 12:55:51	PP...	W...	GAM3.2 1 status not OK	-	-	Yes	90...
		2022-06-29 12:55:51	PP...	W...	DEIF network redundancy...	-	-	No	11...
		2022-06-29 12:55:51	PP...	W...	AVR stand-alone configurat...	-	-	No	80...
		2022-06-29 12:55:51	PP...	W...	GOV stand-alone configuura...	-	-	No	80...

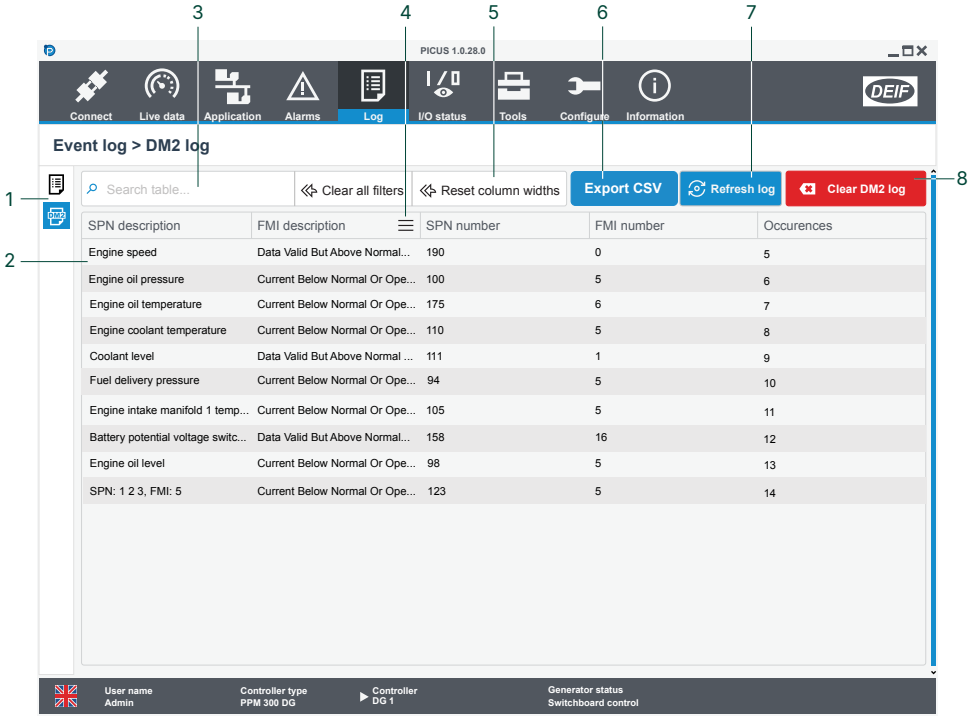
7. Log

7.1 Log page



No.	Item	Notes	
1	Change view	View Logs	View DM2 logs.
2	Log of events	AUTO event.	Manual event.
		System event.	Button action.
		Parameter changes.	Test.
		Unacknowledged alarm.	Acknowledged alarm.
		Unacknowledged latched alarm.	Acknowledged latched alarm.
		Unacknowledged cleared alarm.	Acknowledged cleared alarm.
		Shelved alarm.	Out of service alarm.
		Inhibited alarm.	
3	Search text	Enter a search term to filter the list.	
4	Sort or filter	Use ☰ to sort or filter column values.	
5	Clear or reset	Clear all filters.	Reset column widths.
6	Export log	Export log as CSV file.	
7	View information	Shows more information about the event.	

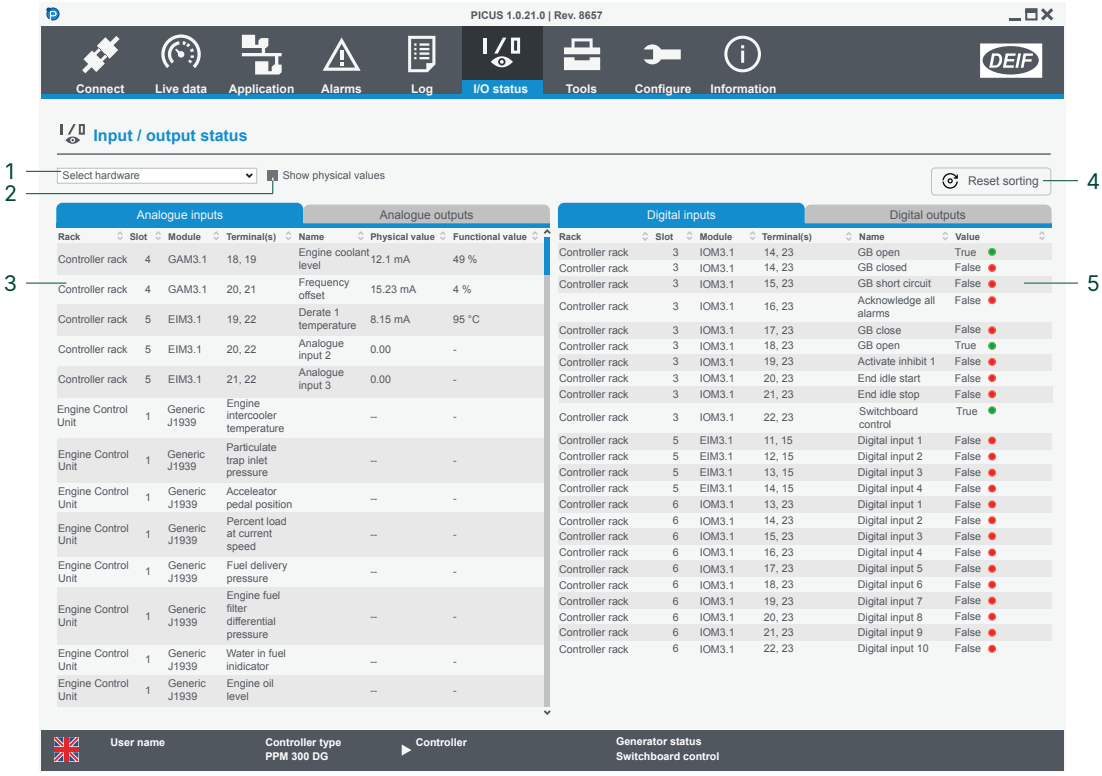
7.2 DM2 Log page



No.	Item	Notes	
1	Change view	View Logs	View DM2 logs.
2	Log of DM2 events	Shows the list of DM2 log events.	
3	Search text	Enter a search term to filter the list.	
4	Sort or filter	Use to sort or filter column values.	
5	Clear search/filters	Clear all filters.	
6	Export log	Export log as CSV file.	
7	Refresh log	**Refresh log** : Reloads the log list.	
8	Clear DM2	**Clear DM2 log** : Removes all log entries only if the ECU supports this feature.	

8. I/O status

8.1 I/O status page

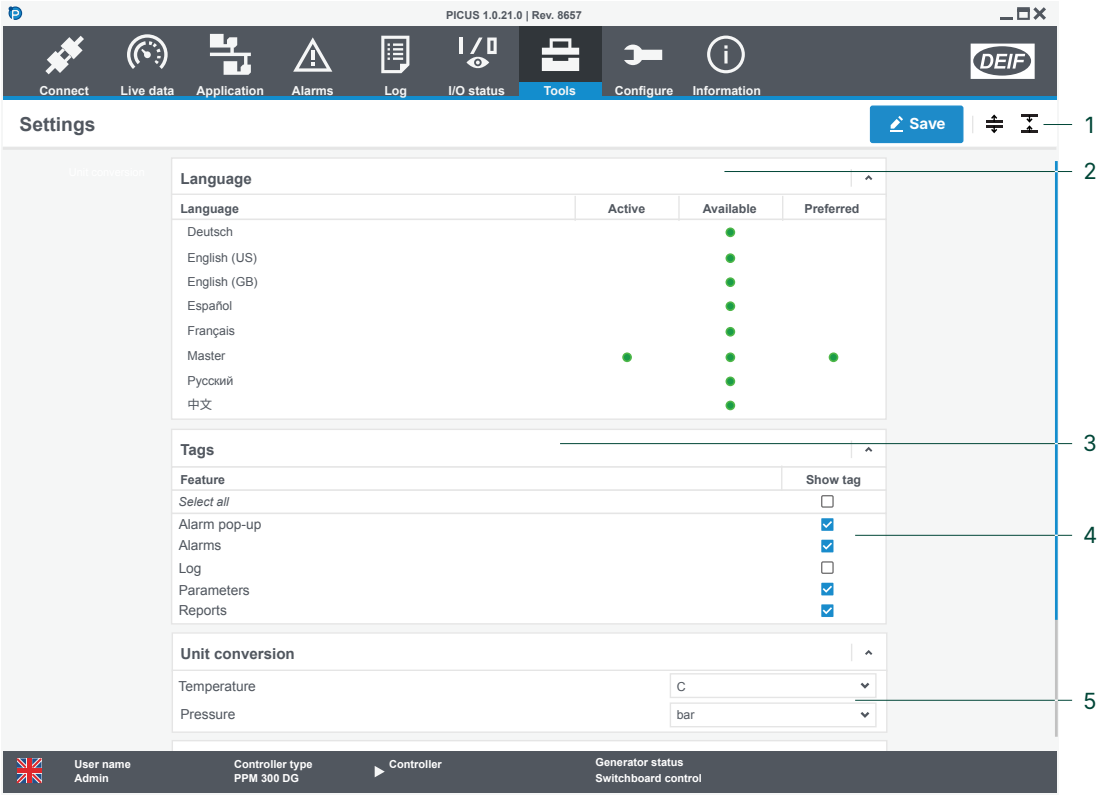


No.	Item	Notes	
1	Hardware selection	Select the hardware to include in the input / output status. • Controller • Extension rack • ECU • DAVR	
2	Physical values	Include or exclude showing physical values for the inputs or outputs.	
3	Analogue values	See the analogue inputs or analogue outputs values.	
4	Reset sorting	Returns to the default sorting view for all lists.	
5	Digital values	See digital inputs or digital outputs values.	
		True : input or output is active.	**False** : input or output is not active.

9. Tools

9.1 Settings

9.1.1 Settings page



No.	Item	Notes	
1	Controls	Save **Save** settings.	
		Expand all settings.	**Collapse all** settings.
2	PICUS language settings	Shows available languages for controller texts shown in PICUS.	
	Active	Shows the active language for the controller texts in PICUS.	
	Available	Shows the available languages.	
	Preferred *	Shows the preferred language for controller texts in PICUS.	
3	Tags settings	Shows where tags can be visible or hidden.	
4	Show or hide tags	**Hide** tag.	**Show** tag.
5	Unit conversion settings	Unit of measure for temperature or pressure.	

NOTE * If you are not logged on to a controller, you can only see the language PICUS prefers to read from controllers. If the text for the preferred language is not available, the text is displayed in the **Master** language.

The **Master** language for the controller is **UK English**. It is not possible to view or configure custom texts when the **Master** language is active.

9.2 Permissions

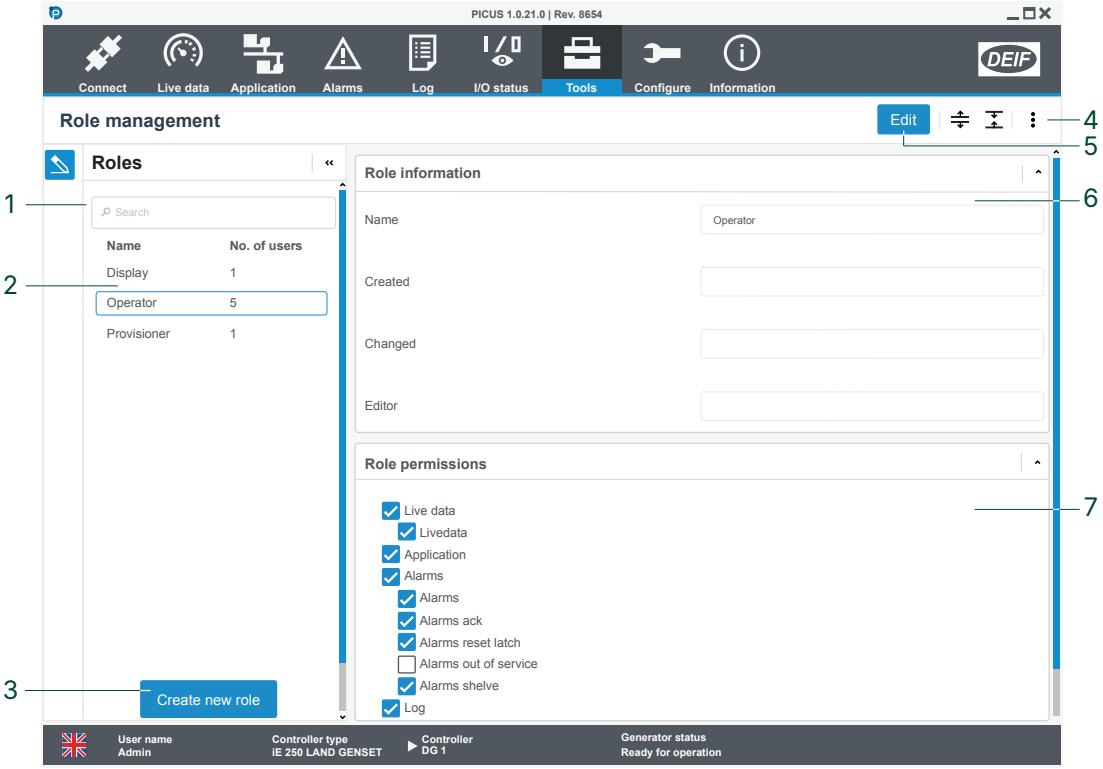
9.2.1 About permissions

Access to the controller's configuration and functionality is protected with user permissions. You can use PICUS to manage these permissions for your system.

More information
See **Permissions** in the **Designer's handbook** for how permissions work on the controller.

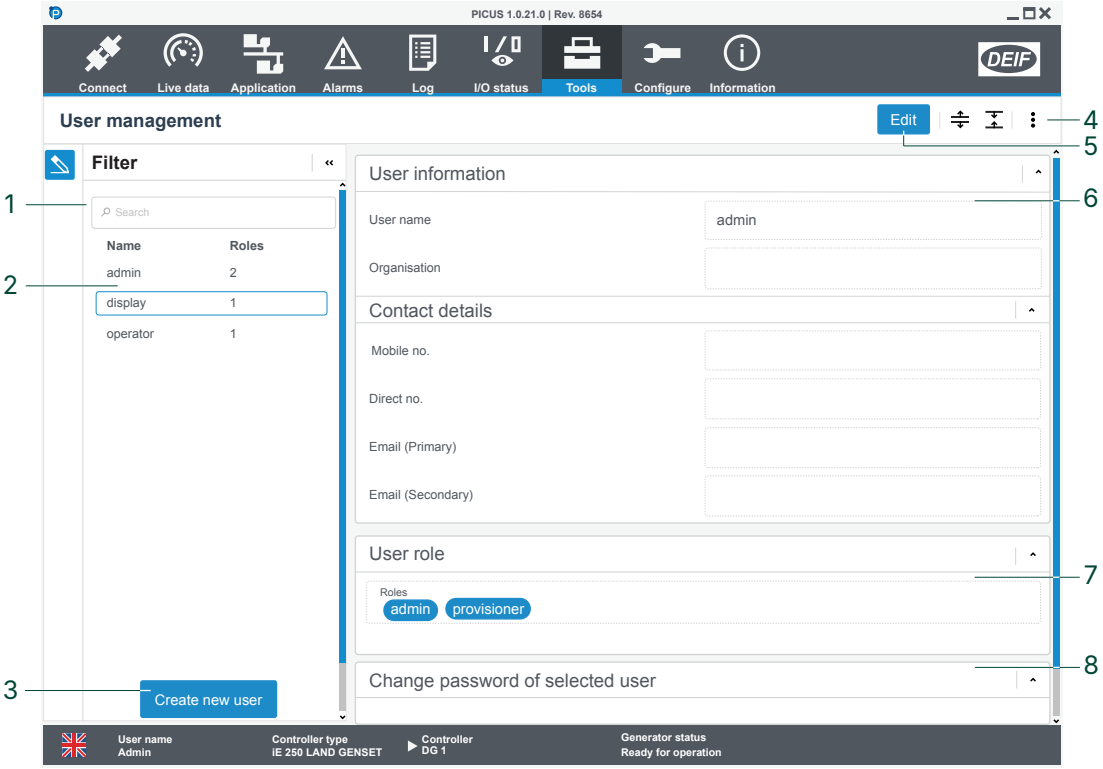
Always remember to use **Write** the update the controller.

9.2.2 Role management



No.	Item	Notes	
1	Search	Search the list of roles.	
2	Roles	List of roles and number of associated users.	
3	Create new role	Creates a new role.	
4	Actions	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
	More options	Only in **Edit** mode: • Duplicate role • Delete role	
5	Edit	Edits the selected role.	
6	Role information	Shows the selected role name and information.	
7	Role permissions	Shows the feature permissions for the selected role.	

9.2.3 Users page



No.	Item	Notes	
1	Search	Search the list of roles.	
2	Users	List of users and number of associated roles.	
3	Create new user	Create or duplicate a new user.	
4	Actions	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
	More : Additional settings.	Only in **Edit** mode: • Duplicate user • Delete user	
5	Edit	Edits the selected user.	
6	User information	Shows the selected user.	
7	Role permissions	Shows the permissions for the selected user.	
8	Password	Change password for selected user.	

9.3 Backup

9.3.1 About backup

You can create either a full or partial backup of the controller.

Full controller backup

Controller backups are saved as .backup files and contain all information from the controller.

- Backup files can be stored on the controller locally on your computer.
- Backup files can be restored to a controller, or opened as a local file (Offline project).

Partial controller backup

Partial backups, where you can select the features to include, are saved as either .config (Configuration) files or folders.

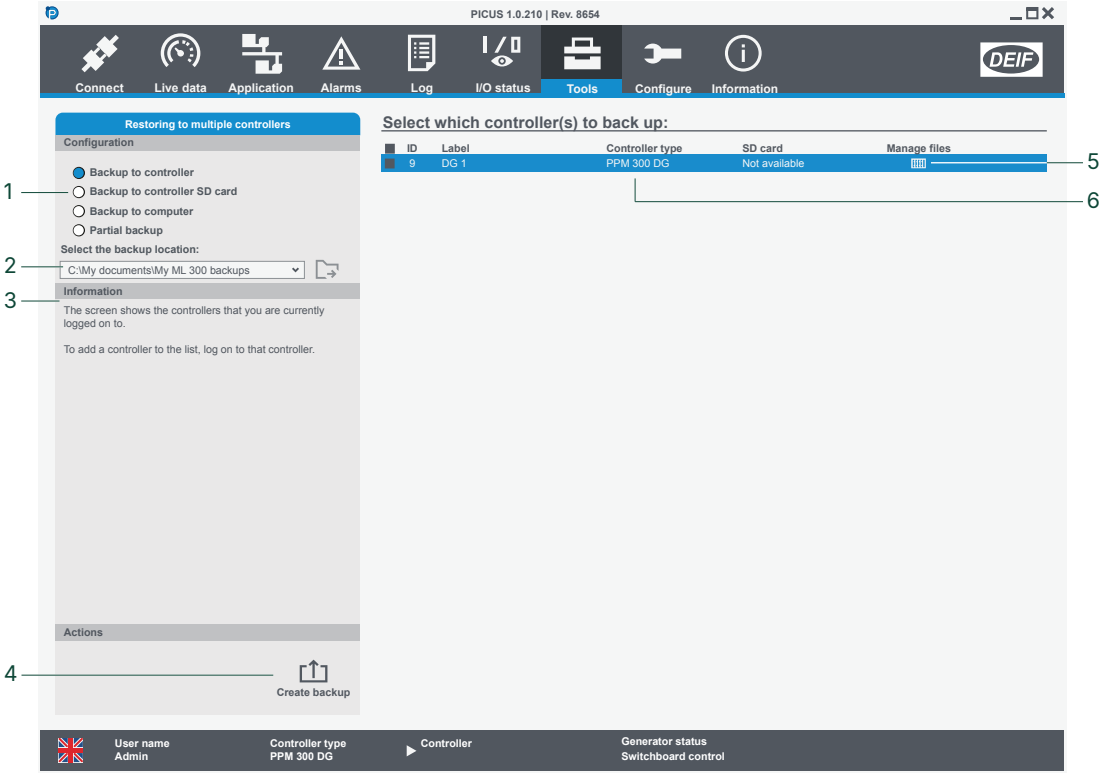
- Partial backup files are only stored on your computer and include only the features that you want to include.

You can view and delete backups from the **Manage backups** page.

Constraints

- You can store up to 20 backup files on the controller.
- Partial backup files are only .config or folders and not .backup files.
- Partial backup files or folders can only be stored locally on your computer.
- The default backup file name is *ID [Controller ID] [Controller label] (#)*, where # is a number starting at 1 from the first duplicate name.
- Deleted backup files cannot be recovered.
- The time it takes to create a backup depends on the location where the backup is saved.

9.3.2 Backup page

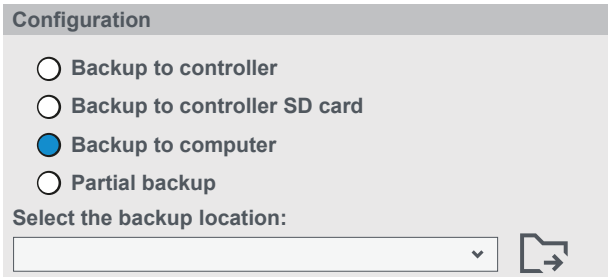


No.	Item	Notes
1	Backup location *	Select where to save a full backup. • Backup to controller • Backup to computer
		Or create a partial backup on your computer. *
2	Folder location	**Folder** location where to save the backup on your computer. Use the selection list to open a previously used location.
3	Information	Additional information about the page.
4	Actions	**Create backup** file in your selected location.
5	Manage files	**Manage backups** to open the Manage backups page. The page shows you all backups saved on the controller. You can delete backups from this page.
6	Controller list	Shows all connected and logged on controllers.

NOTE * For the partial backup option, see the Partial backup page.

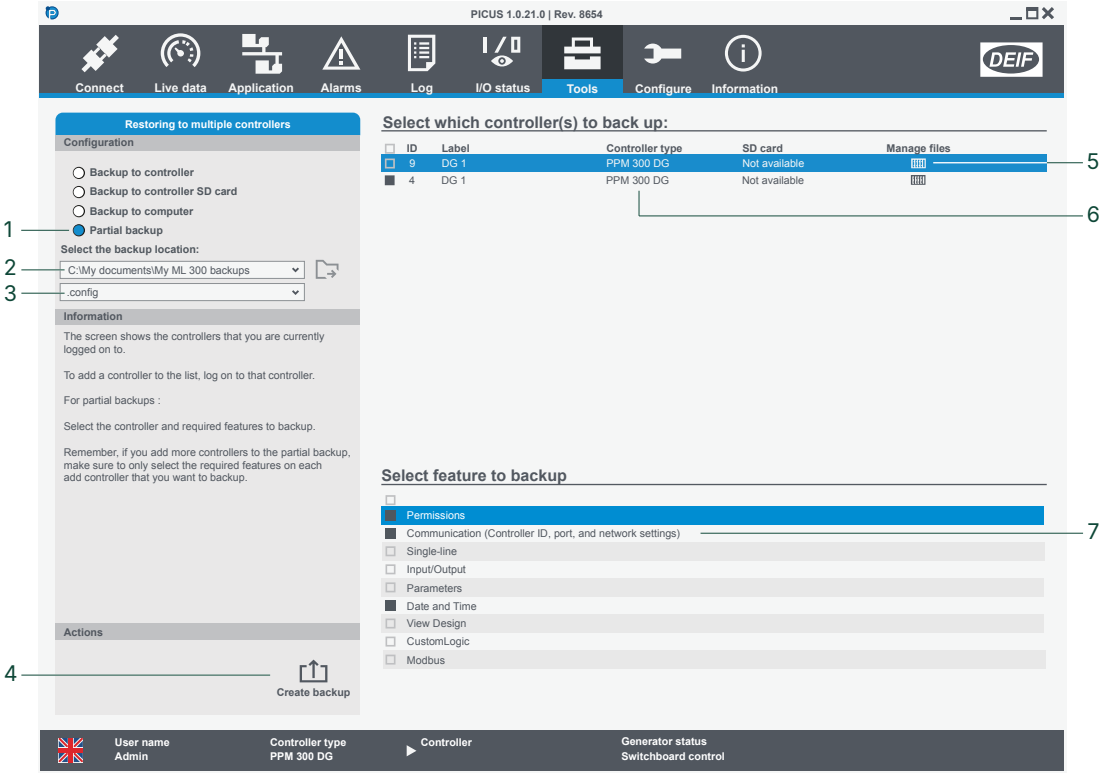
9.3.3 Create full backup

This information is only for creating a full backup to the controller or your computer. For partial backup, see Create partial backup.

1. Select a location to store the backup file:
   - 

   - If you select Backup to computer, then you must select a folder with either:
     - The selection list to open a previously used location.
     - **Folder** to select a location for the backup.
2. Select controllers from the controller list.
3. Select **Create backup** .
4. Enter the Backup filename.
5. The controller creates the backup file in the selected location.
6. If you create backups for multiple controllers, you can stop the backup process with **Cancel**. The ongoing backup file is finished, and the controller returns to the backup page.
7. A confirmation is shown after the backup has been created:
   -

9.3.4 Partial backup page

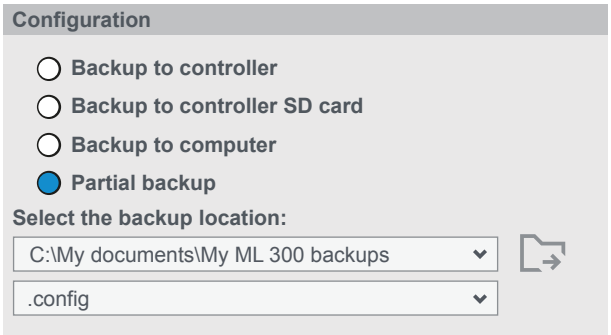


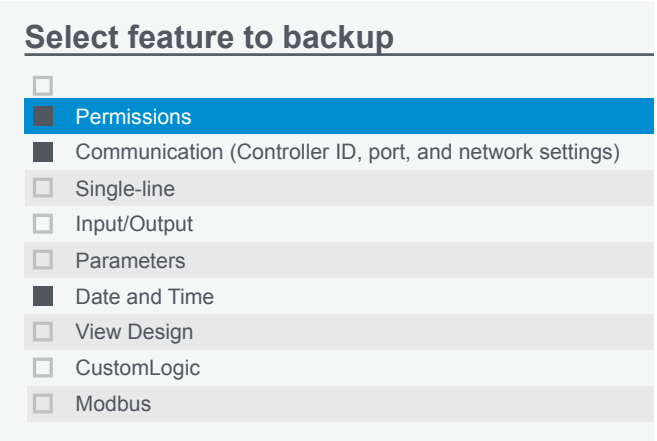
No.	Item	Notes
1	Partial backup	Select this for only a partial backup.
2	Folder location	**Folder** location where to save the backup on your computer. Use the selection list to open a previously used location.
3	Type of partial backup	Select either: • .config (Configuration file) • Folder
4	Actions	**Create backup** file in your selected location.
5	Manage files	**Manage backups** to open the Manage backups page. The page shows you all backups saved on the controller. You can delete backups from this page.
6	Controller list	Shows all connected and logged on controllers.
7	Partial backup features	Select the features you want to include in the partial backup. *

NOTE * If you add more controllers to the partial backup, make sure to only select the required features on each add controller that you want to backup. If you select some features on one controller and then add another controller without selecting features, the backup contains a combination of selected features and all features from the other controller.

9.3.5 Create partial backup

This information is only for creating a partial backup to your computer. For a full backup to the controller or your computer, see Create full backup.

1. Select partial backup:
   - 

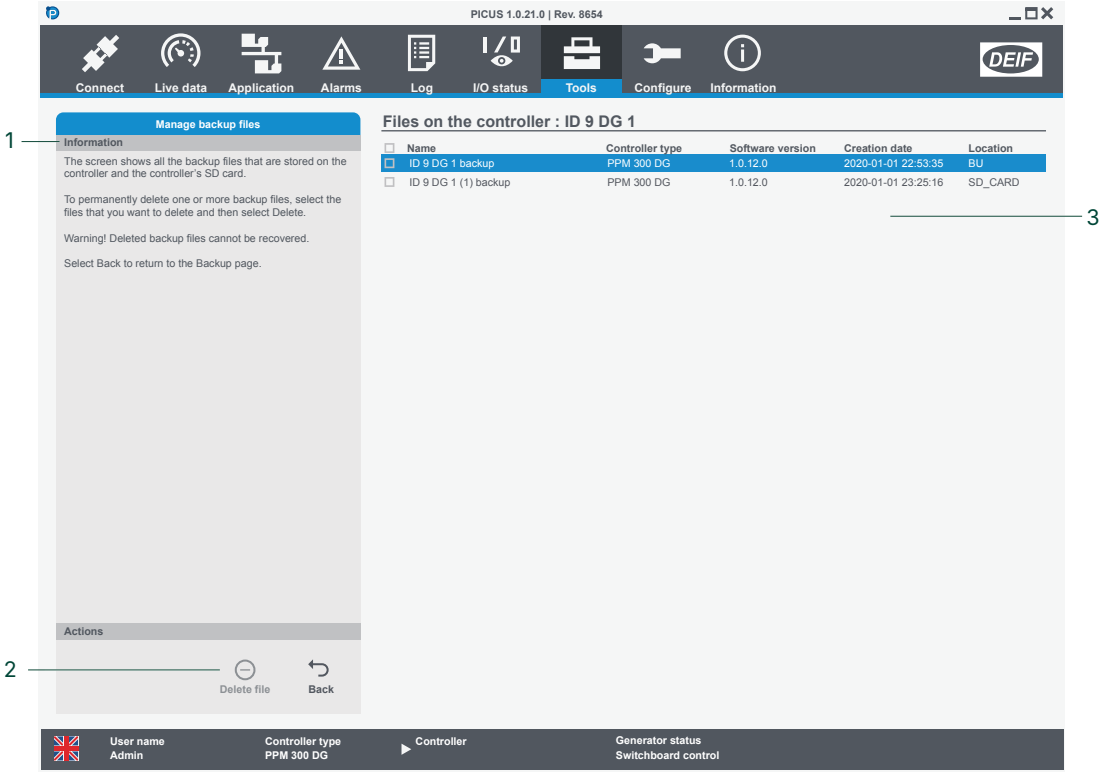
2. Select the backup location on your computer with either:
   - The selection list to open a previously used location.
   - **Folder** to select a location for the backup.
3. Select the type of partial backup:
   - .config for a configuration file
   - Folder for a folder
4. Select controllers from the controller list.
5. Select the features you want to include in the partial backup:
   - 

6. Select **Create backup** .

-

- The controller creates the partial backup file in the selected location.
- If you create backups for multiple controllers, you can stop the backup process with **Cancel**. The ongoing backup file is finished, and the controller returns to the backup page.

9.3.6 Manage backups page

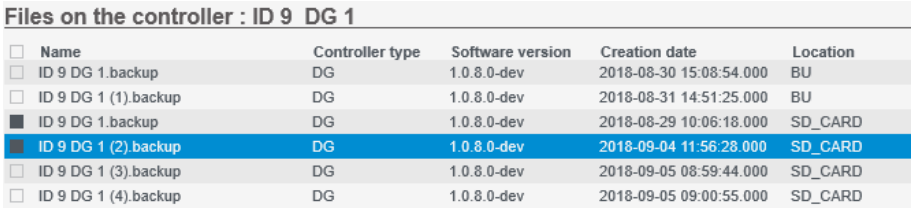


No.	Item	Notes	
1	Information	Additional information about the page.	
2	Actions	⊖ **Delete file** the selected files.	⮌ **Back** to the Backup page.
3	Backup list	Shows backups that are stored on the controller.	

9.3.7 Delete backup

Deleted backup files cannot be recovered.

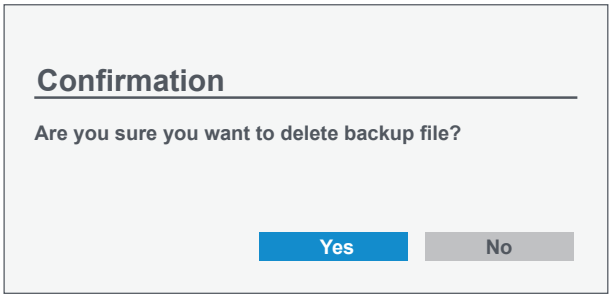
1. Select the backup files to delete.



Files on the controller : ID 9 DG 1

Name	Controller type	Software version	Creation date	Location
ID 9 DG 1.backup	DG	1.0.8.0-dev	2018-08-30 15:08:54.000	BU
ID 9 DG 1 (1).backup	DG	1.0.8.0-dev	2018-08-31 14:51:25.000	BU
ID 9 DG 1.backup	DG	1.0.8.0-dev	2018-08-29 10:06:18.000	SD_CARD
ID 9 DG 1 (2).backup	DG	1.0.8.0-dev	2018-09-04 11:56:28.000	SD_CARD
ID 9 DG 1 (3).backup	DG	1.0.8.0-dev	2018-09-05 08:59:44.000	SD_CARD
ID 9 DG 1 (4).backup	DG	1.0.8.0-dev	2018-09-05 09:00:55.000	SD_CARD

2. Select ⊖ **Delete file** .
   - You are prompted to confirm that you want to delete the selected files.



   - Select **Yes** to delete the files.
   - Select **No** to cancel.

9.4 Restore configuration

9.4.1 About restore configuration

You can restore configuration files (.config) or folders to one or more controllers.

When you restore or broadcast a configuration, the data on the controllers is replaced by the configuration data.

9.4.2 Restore configuration constraints

Controller prerequisites

Before you can restore or broadcast a configuration (file or folder), the controller must meet certain prerequisites. If the controller is in Emulation mode, these constraints do not apply.

Breaker constraint

All controlled breaker(s) must be opened.

Equipment constraint (if controlled)

The controlled equipment must be stopped.

Not compatible configuration files

Configuration files or folders might not compatible with the current controller configuration if:

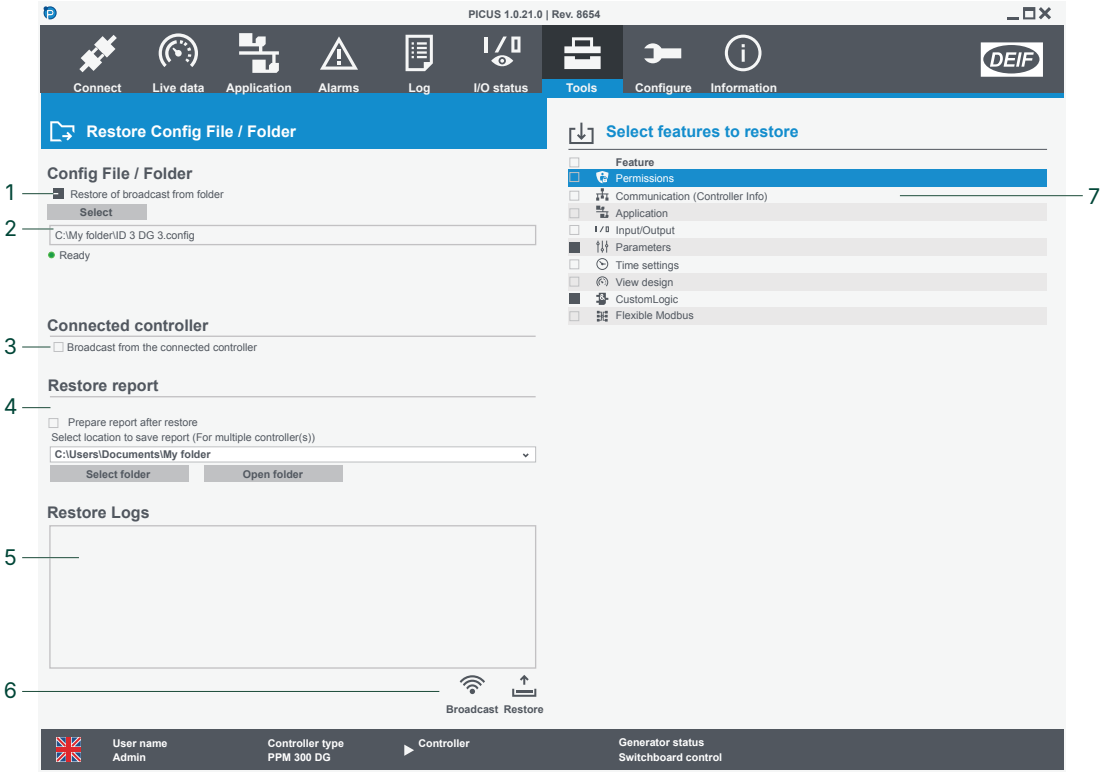
- The configuration is from a different product type.
- The configuration is from a different controller type.
- The configuration is from a different controller configuration.
- The configuration is from a controller with a different hardware configuration.
- The configuration is not supported by the current controller software.

NOTICE

Data not restored

When you restore a backup file or folder to a controller, the event log and alarms are **not** restored.

9.4.3 Restore configuration page



No.	Item	Notes	
1	Restore or broadcast from folder	Restore or broadcast from a file or folder.	
2	File or folder	The file or folder selected for restore or broadcast.	
3	Broadcast from connected controller	Broadcast features from the connected controller.	
4	Restore report	Select to create a restore report in the location selected.	
5	Restore log	Log of restore actions.	
6	Options	**Broadcast** the features.	**Restore** the features.
7	Feature selection	The features you can select to restore or broadcast. *	

NOTE * You cannot broadcast Flexible Modbus or CODESYS features.

9.4.4 Broadcast or restore a configuration

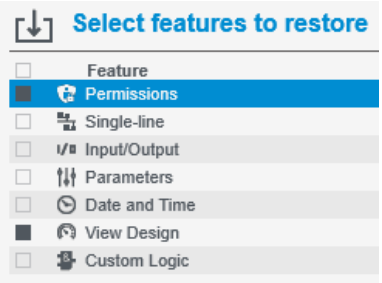
Before you restore or broadcast a configuration, make sure all the prerequisites are met.

Broadcast from controller

1. Select **Broadcast from the connected controller**:

   -

2. Select the features that you wish to restore: *

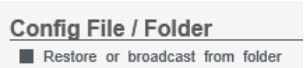
   - 

3. Select **Broadcast** and select the controllers you wish to broadcast to.

NOTE * You cannot broadcast Flexible modbus or CODESYS features.

Restore or broadcast from a configuration file or folder

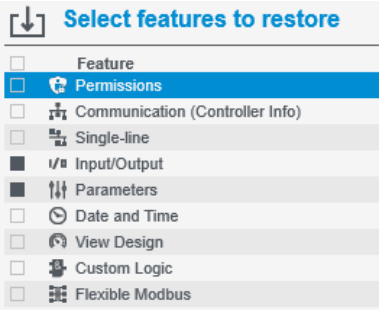
1. Select **Restore or broadcast from folder**:

   - 

2. Use **Select** to find the location of your configuration file or folder:

   -

3. Select the features that you wish to restore:

   - 

4. Select either:

   - **Broadcast** to broadcast the configuration file or folder and the selected features to the selected controllers.
   - **Restore** to restore the configuration file or folder and the selected features to the currently connected controller.

9.5 Restore

9.5.1 About restore

You can restore backup files or backup folders made before PICUS version 1.0.8.0. You can restore from the controller or from your computer.

Data restored

These backup data are always restored:

- Permissions
- Texts
- Date and time
- Parameters
- Input/Output
- CustomLogic
- Single-line
- Modbus

You can also select optional data to restore on the restore page.

9.5.2 Restore constraints

Controller prerequisites

Before you restore a backup to a controller, the controller must meet certain prerequisites. If the controller is in Emulation mode, these constraints do not apply.

Breaker constraint

All controlled breaker(s) must be opened.

Equipment constraint (if controlled)

The controlled equipment must be stopped.

Not compatible configuration files

Configuration files or folders might not compatible with the current controller configuration if:

- The configuration is from a different product type.
- The configuration is from a different controller type.
- The configuration is from a different controller configuration.
- The configuration is from a controller with a different hardware configuration.
- The configuration is not supported by the current controller software.

Restore network settings

If you use **Restore IP address (IPv4) and controller ID**, the controller **must** be powered off and powered on before the network settings are restored.

CAUTION

Controller part of network chain communication

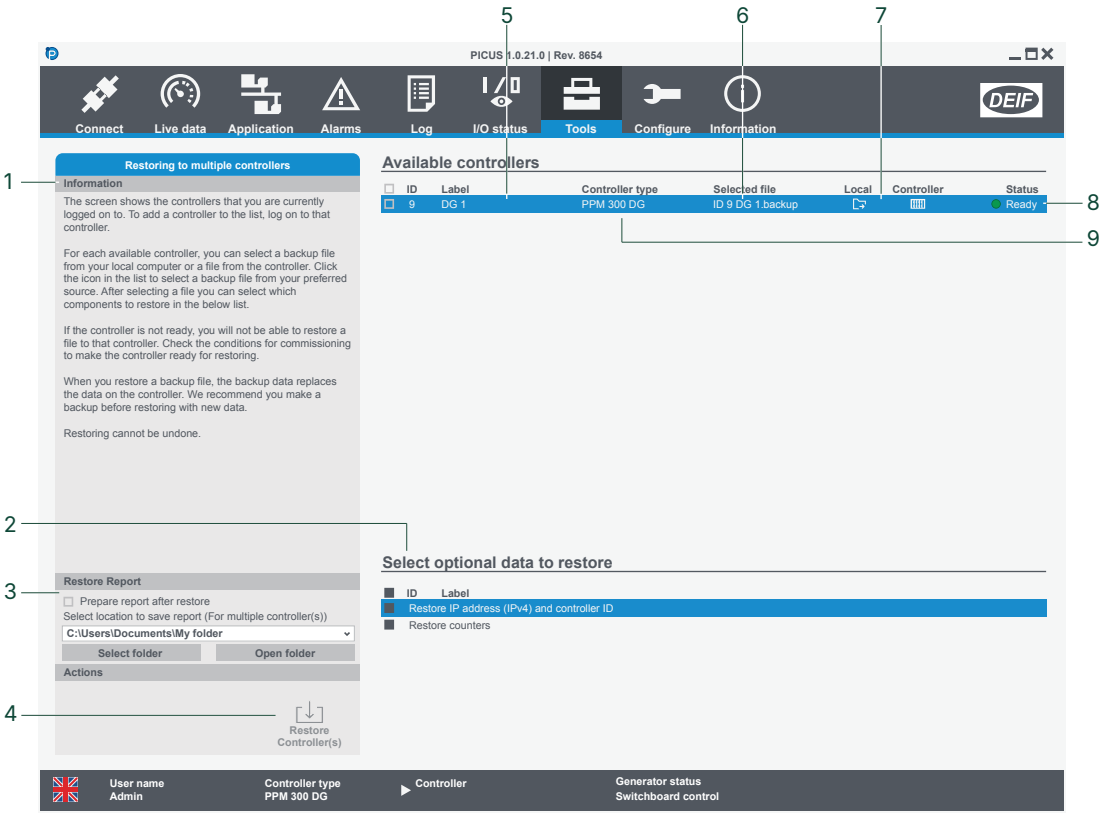
If the controller the only connection point between other controllers, when the controller is powered off, the connection through the controller will be disrupted. Check that this will not affect your system before you power off the controller. This does not affect a Star connection topology.

NOTICE

Data not restored

When you restore a backup file or folder to a controller, the event log and alarms are **not** restored.

9.5.3 Restore page



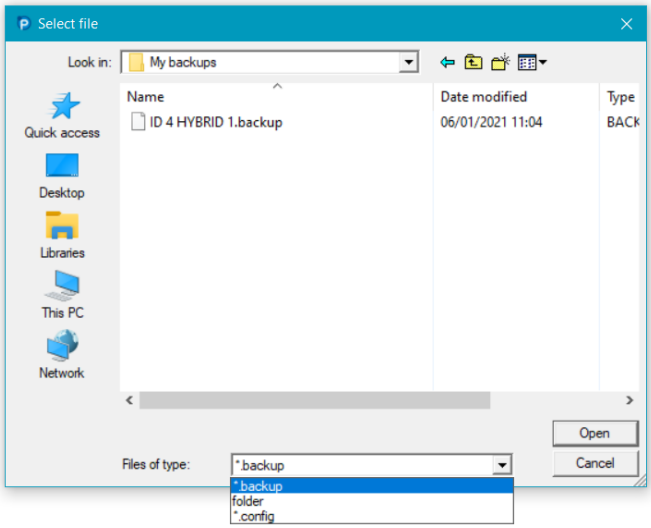
No.	Item	Notes	
1	Information	Additional information about the page.	
2	Data selection	Select additional data to restore (only shown after you select a backup file to restore).	
3	Restore report	Select to create a restore report in the location selected.	
4	Actions	**Restore controller(s)** to restore the data selection, to the selected controllers.	
5	Controller list	Shows all connected and logged on controllers.	
6	Selected file	Shows the backup that you selected to restore.	
7	Backup locations	**Local** to select a backup file from your computer.	**Controller** to select a backup file from the controller.
8	Status	Shows the ready status:	
		Ready for restore.	**Not ready** to restore. *
9	Controller list	Shows all connected and logged on controllers.	

NOTE * Not ready to restore because one or more prerequisites have not been met. For example, the breaker is not in the open state.

9.5.4 Restore a backup

Before you restore a backup, you must make sure all the prerequisites are met.

Restore from your computer

1. Select **Local** .
   - You are prompted to select the backup or backup folder:
     - 

   - Use the **Files of type** drop-down list to change the type of backup file you want to restore.
     - ***.config** files were converted from .backup files with PICUS version 1.0.9.0 and later.
     - ***.backup** backup files were created with PICUS version 1.0.8.0 and later.
     - **folder** backup folders were created with PICUS version 1.0.7.x and earlier.
2. Select the backup and select **Open**.
   - The controller checks if the selected backup file is valid.
   - If the backup file is not valid, you are informed why it is not valid and you can select a different backup file.
3. Select the optional data to restore.
4. Select the controllers you want to restore (you can only select controllers that already have a backup file selected).
5. Select **Restore controller(s)** .
   - The controller restarts.
   - You are logged out of the controller when the backup file or folder is restored.
   - If you selected optional data **Restore IP address (IPv4) and controller ID**, the controller must be powered off and powered on manually before the network settings are updated.

Restore from the controller

1. Select **Controller** to select a backup stored on the controller.
2. Select the backup you want to restore and select **Use selected backup** .
   - The controller checks if the selected backup file is valid.
   - If the backup file is not valid, you are informed why it is not valid and you can select a different backup file.
3. Select the optional data to restore.
4. Select the controllers you want to restore (you can only select controllers that already have a backup file selected).
5. Select **Restore controller(s)** .
   - The controller restarts.
   - You are logged out of the controller when the backup file or folder is restored.
   - If you selected **Restore IP address (IPv4) and controller ID**, then the controller must be powered off and powered on manually before the network settings are updated.

9.6 Firmware

9.6.1 About firmware

Use the firmware feature to update your controller and display.

Download firmware

Firmware for your product is available on www.deif.com.

iE 250 LAND: https://www.deif.com/software/?product=17655

iE 250 MARINE: https://www.deif.com/software/?product=20133

iE 350 MARINE: https://www.deif.com/software/?product=20135

1. Use the link for your product to download the controller firmware.
2. Follow the instructions for how to download.
3. Unzip the file to a location on your computer.

9.6.2 Firmware constraints

Controller prerequisites

Before you can apply a firmware update, the controller must meet certain prerequisites. If the controller is in Emulation mode, or has an ID of **0** (and not part of the system), these constraints do not apply.

Breaker constraint

All controlled breaker(s) must be opened.

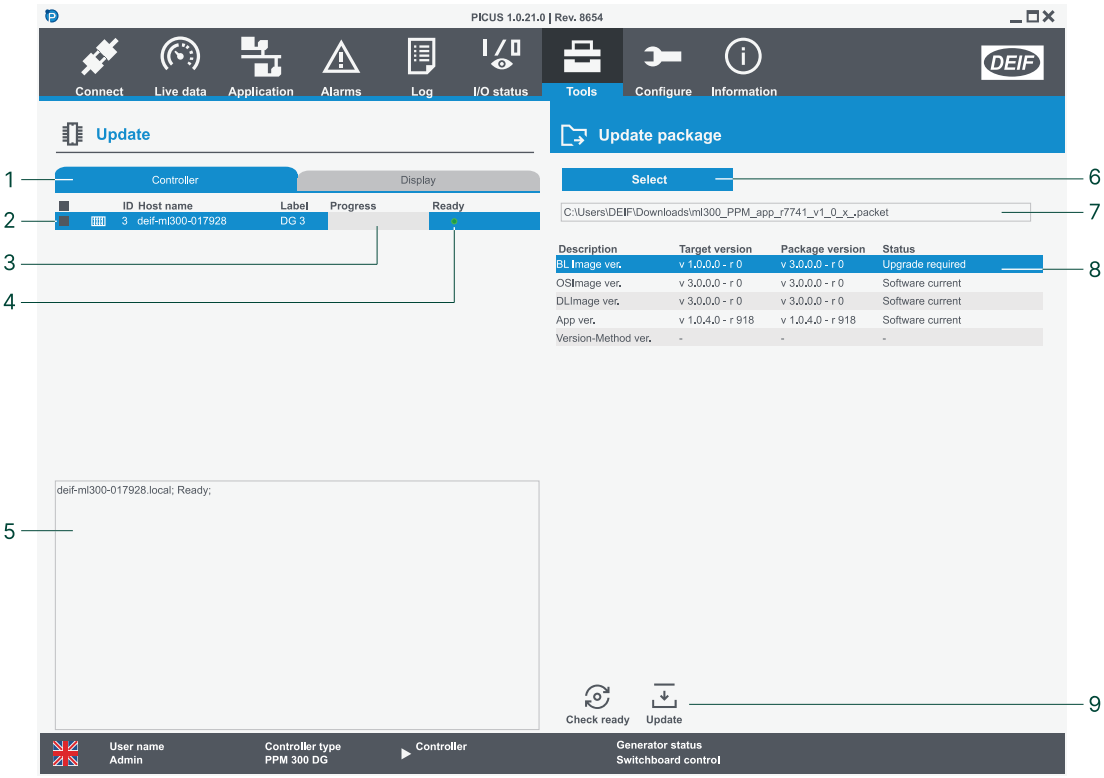
Equipment constraint (if controlled)

The controlled equipment must be stopped.

Mode constraint (Marine applications)

The controller must be in Switchboard control.

9.6.3 Update controller page



No.	Item	Notes	
1	Controller	Changes to the controller or display * update page.	
2	Controller list	Shows all the controllers available for update.	
3	Update progress	Progress bar shows how far the update has progressed.	
4	Connection state	Shows the ready status of the controller.	
		Ready to update.	**Not ready** to update.
5	Update information	Shows the progress of the update.	
6	Select firmware	Select the firmware package.	
7	Firmware location	Shows the location of the selected firmware package.	
8	Application versions	Shows the version information of the controller (target) and the selected firmware package.	
9	Actions	**Check ready** status of the controller.	**Update** the selected controllers.

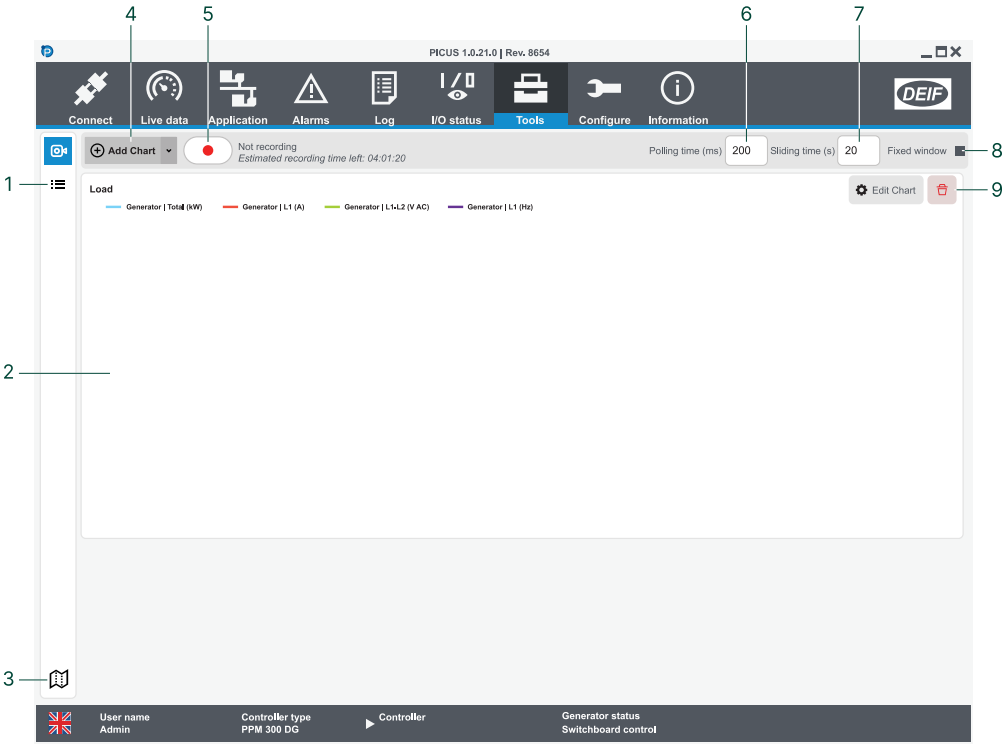
NOTE * Display is only for older ML 300 controllers.

9.6.4 Install firmware

1. Make sure you meet the Firmware update prerequisites.
2. Select the controllers that you wish to update.
3. Use **Select** to locate the downloaded firmware update **.packet** file.
   - PICUS automatically checks the status of the firmware package and selected controllers or displays.
4. To update a controller, use **Check ready** to check if the controller is ready to be updated:
   - = the controller is ready.
   - = the controller is not ready. Check if you have met the installation prerequisites.
5. Select **Update** to start.
   - During the update the progress status is shown and also by a progress bar.
6. When a controller update is complete, PICUS may restart.

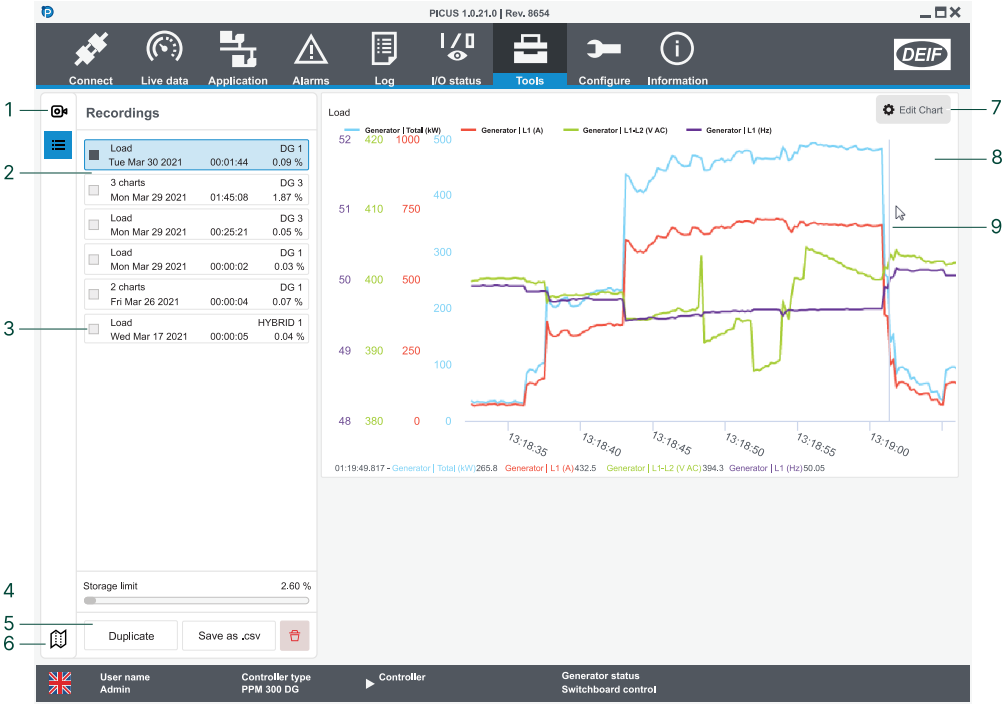
9.7 Trending

9.7.1 Record page



No.	Item	Notes	
1	View recordings	**Recordings** : Shows a list of saved recordings to duplicate, edit, delete or export.	
2	Charts	Shows the charts to use during the next recording.	
3	Map	**Map** : Shows the timeline for the entire recording and allows selection of a block to zoom in.	
4	Add or select chart	**Add chart** to select value traces for the recording. Or use to select a previously created chart.	
5	Record	**Record** starts the recording of all the charts.	
6	Polling time	The polling time to use between recording trace values.	
7	Sliding time	The time range to be displayed on the page.	
8	Fixed window	Whether to keep the chart within the area displayed and stored or allow the recording to scroll.	
9	Chart actions	**Edit chart** : To configure the trace values.	**Delete**: removes the chart from the recording.

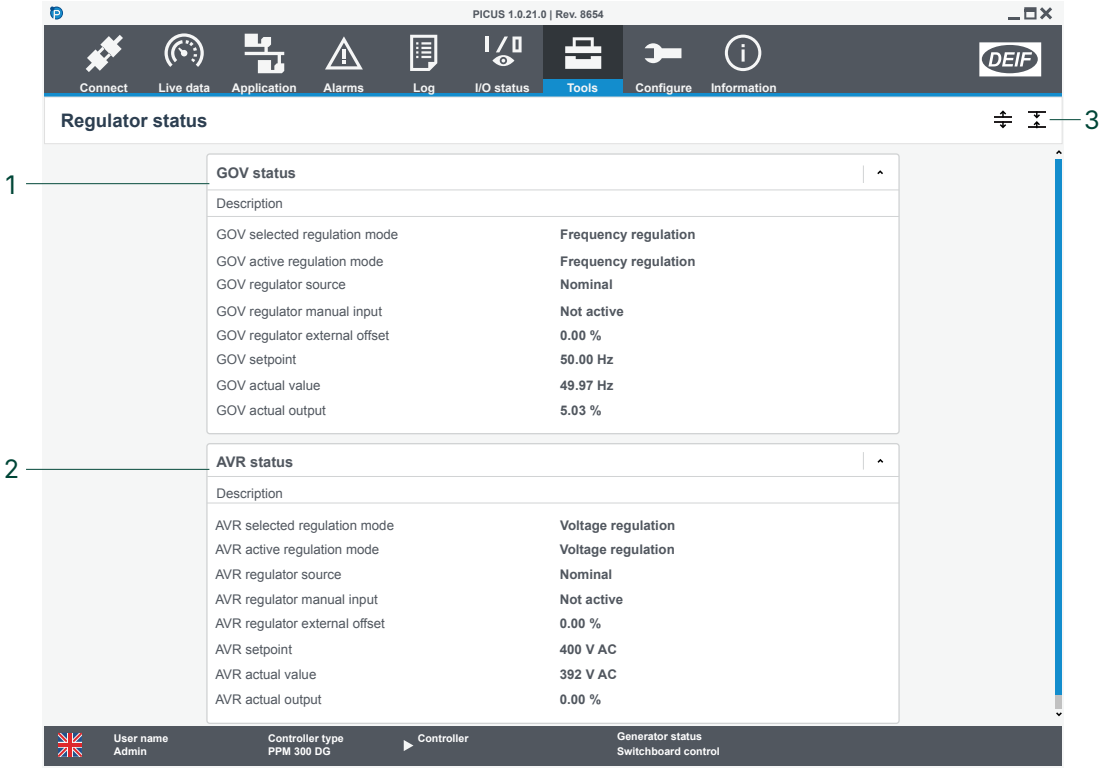
9.7.2 Recordings page



No.	Item	Notes	
1	Record	**Record** : Shows the recording page to create a recording of trace values.	
2	Previous recordings	Shows a list of previous recording sessions.	
3	Selection	Selects the recording session to use with actions below.	
4	Storage limit	Shows the storage amount used for all recordings.	
5	Recording actions	**Duplicate** : Uses the recording session for a new recording.	**Save as .csv** : Exports the recording values in a comma separated value file.
		Delete : Removes recording.	
6	Map	**Map** : Shows the timeline for the entire recording and allows selection of a block to zoom in.	
7	Edit chart	**Edit chart** : To configure the trace values.	
8	Recorded chart	Shows the recorded trace values for the chart.	
9	Selection line	A selection line to see the trace values for the specific point in the recording.	

9.8 Regulator status

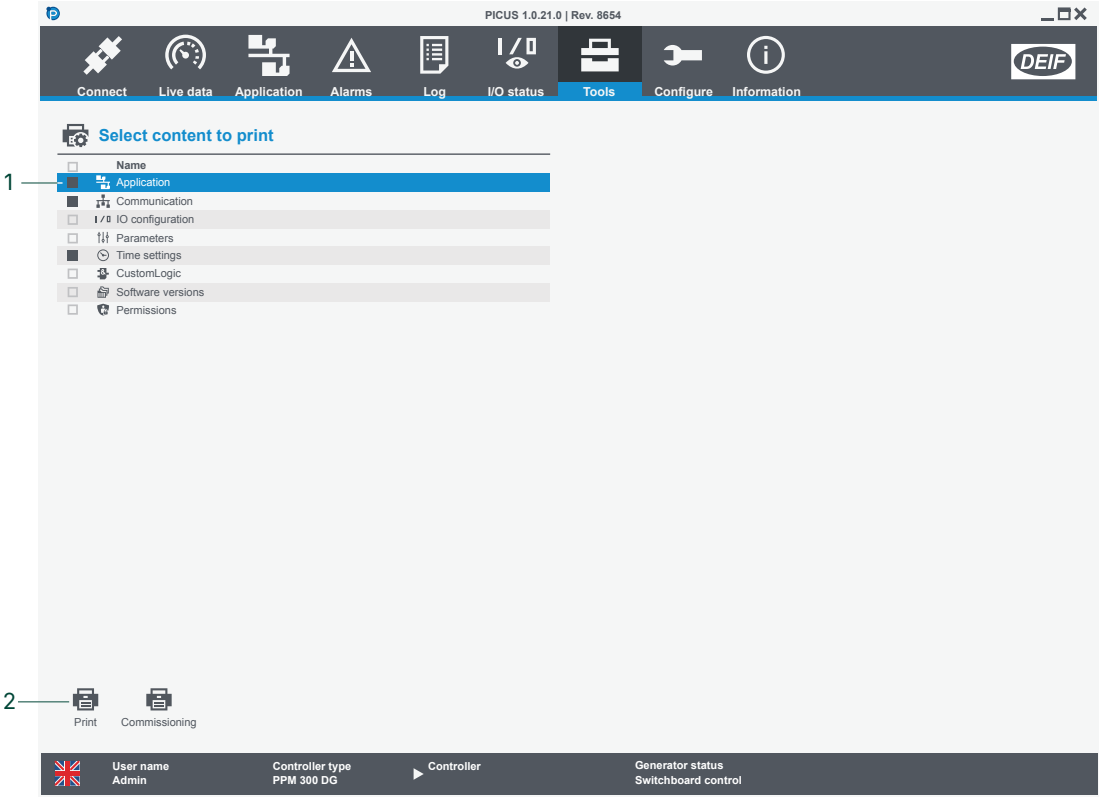
9.8.1 Regulator status page



No.	Item	Notes	
1	GOV status	Shows information on GOV regulation mode, set point, source, manual input, external offset, values, and output.	
2	AVR status	Shows information on AVR regulation mode, set point, source, manual input, external offset, values, and output.	
3	Actions	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.

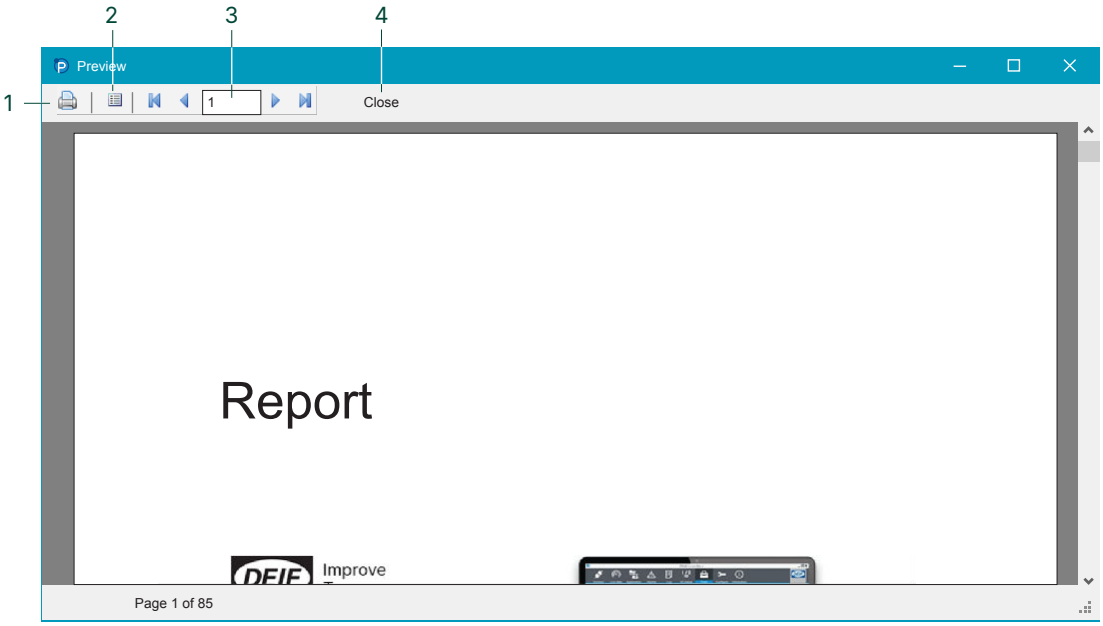
9.9 Report

9.9.1 Report page



No.	Item	Notes	
1	Content to print	■ **Selected** : includes content in report.	□ **Not selected** : excludes content in report.
2	Print	Produce and print a full report of the selected content.	
	Commissioning	Produce and print a commissioning report of the selected content. This report only includes information about enabled alarms.	

9.9.2 Report preview page

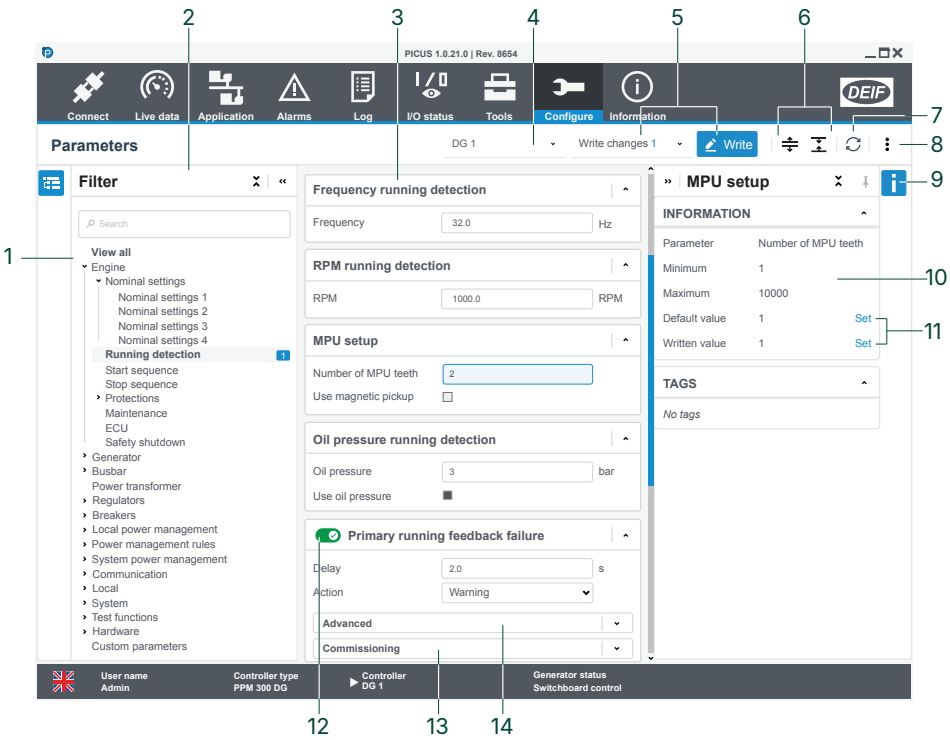


No.	Item	Notes
1	Print	Print the report.
2	Thumbnails	Toggle the view of thumbnail pages.
3	Page view	Page view options.
4	Close	Close the report preview.

10. Configure

10.1 Parameters

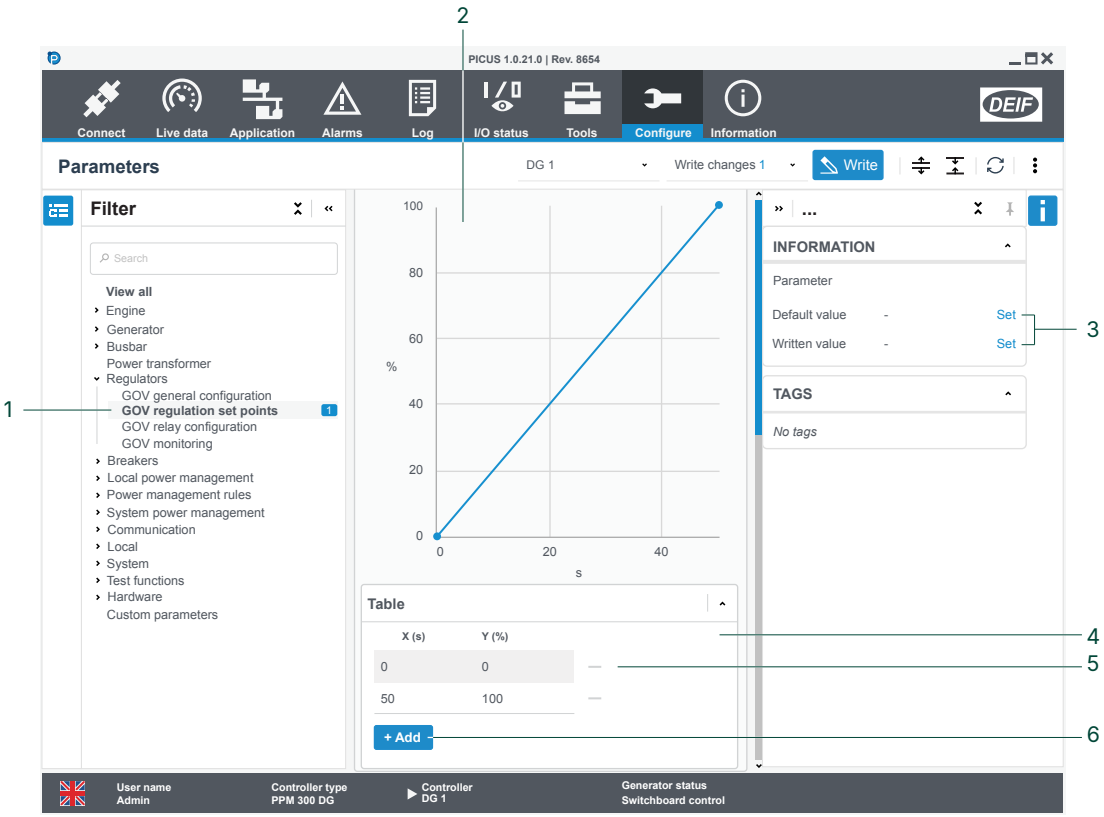
10.1.1 Parameters page



No.	Item	Notes
1	Parameter category list	Shows a list of the parameters organised by category. Highlight shows selected parameter and any unwritten changes.
2	Search filter	Keyword search on parameter name.
3	Parameter settings	The parameter settings in the category.
4	Selected controller(s)	Select one or more connected controllers. Any unsupported parameters are ignored.
5	Write	Write selected changes or Write all changes. You can also review changes to undo them if needed.
6	Expand/Collapse	**Expand all** : items in the list. **Collapse all** : items in the list.
7	Refresh	**Refresh** : parameter settings.
8	**More options**	• Auto refresh • Show path • Auto expand advanced • Expand none on load • Expand first on load
9		Show or hide the parameter information.
10	Parameter range	Shows Minimum, Maximum, default value, and written value.
11	Set value	Change value to either default value or last written value.
12	Enable	**Enable** or **Not enable** the parameter or alarm.

No.	Item	Notes
13	Commissioning	View value, alarm state, inhibit state, reset or view counter, and test alarm.
14	Advanced	Additional parameter configuration settings.

10.1.2 Parameter curve page

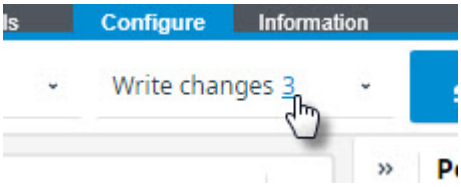


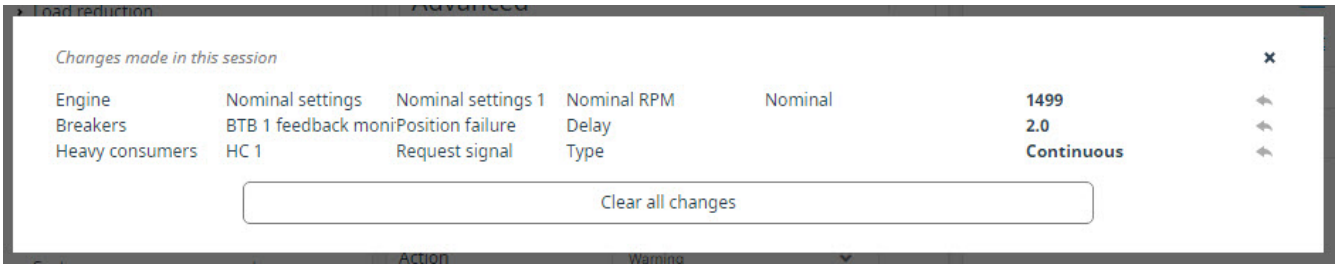
No.	Item	Notes
1	Selected parameter	Highlight shows selected parameter and any unwritten changes.
2	Curve	Shows curve settings as a graph.
3	Set value	Change value to either default value or last written value.
4	Table	Shows curve settings as a table.
5	Delete row	− **Delete** the table row.
6	Add row	Adds a row to the table.

NOTE Some parameter curves are only shown if the corresponding input/output function is configured. Some parameter curves must be enabled to be active.

10.1.3 Review changes

You can review all of the session changes before they are written to the controller(s). You can clear an individual change or all of the changes.

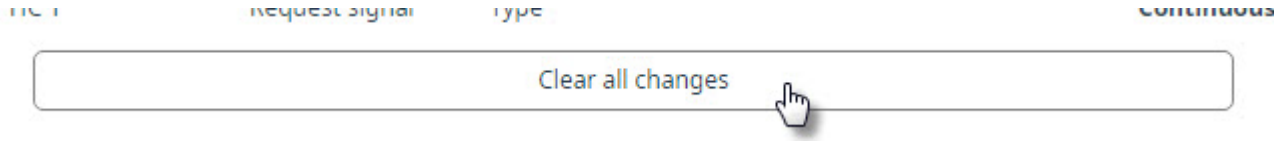
1. Select the changes number:
   - 

2. A summary of the changes is shown:
   - 

Clear an individual change

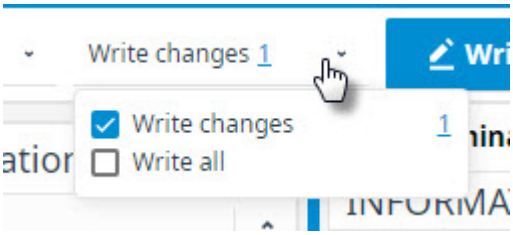
1. Select **Undo** against the parameter change to clear:
   -

Clear all changes

1. Select **Clear all changes** to clear all of the parameter changes:
   - 

10.1.4 Write changes or all

You can choose to either write either only the changed parameters, or all parameters to the controller(s).

1. Select **Write changes**:
   - 

2. Select either:
   - **Write changes** : to save only changed parameters.
   - **Write all** : to save all parameters.

3. Select Write **Write** to write the parameters to the controller(s).

10.1.5 Reset counter

1. Select the parameter from the list.
2. Open **Commissioning** in the parameter.
3. Enter the **Reset counter value**.
4. Select **Write** .

10.1.6 Alarm test

CAUTION

Active alarm actions (protections)

Activating an alarm test also activates the alarm actions. Only test alarms if it is safe.

The alarm remains active for as long as the alarm test is running. Stop the alarm test and acknowledge the alarm to change the state of the alarm to inactive.

1. Select the parameter from the list.
2. Open **Commissioning** in the parameter.
3. Under Alarm test, select **Start test**.
   - The **Alarm test** parameter changes to **Stop test** while an alarm test is running.
4. Select **Stop test** to stop the alarm test.

10.2 Input/output

10.2.1 About input or output channels

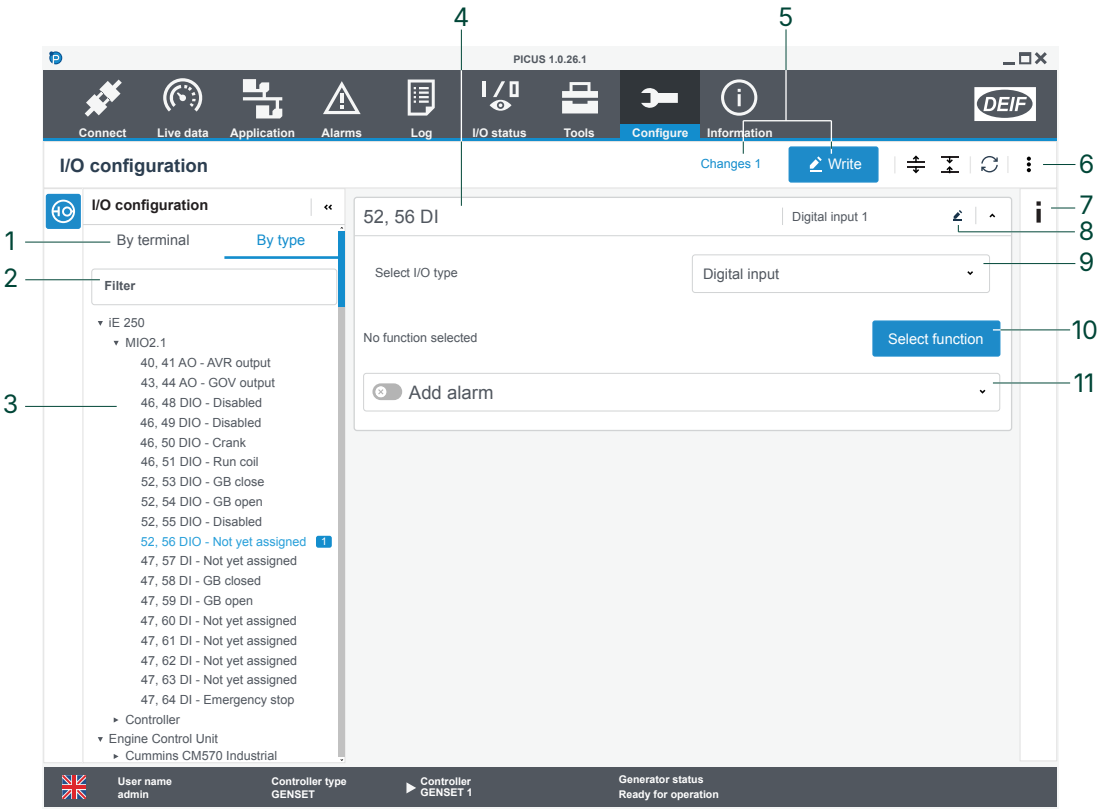
The controller channels are configurable but depend on the controller type, parameters, functions and alarms available. Some hardware types support bi-directional channels, where you can configure if the channel is input or output.

More information
See the **Technical specifications** in the Data sheet for the hardware specifications and terminal allocations for the controller.

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.

10.2.2 I/O configuration



No.	Item	Notes	
1	Terminal or type	Display list as by terminal or type.	
2	Filter	Filter the list by a search term.	
3	Hardware and list	List of channels for each hardware.	
4	Channel	Selected channel settings.	
5	Changes #	Shows number of changes.	
	Write	Write the configuration to the controller.	
6	Actions	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
		Refresh : Reload configuration.	**More** : Additional settings.
	More : Additional settings.	• Auto refresh • Show path • Auto expand advanced	
7	Information	**Information** : Details about the terminal type.	
8	Channel name	Edit the channel name.	
9	Channel direction	Select either input or output.	
10	Function selection	Select the function for the terminal.	
11	Custom alarm	Add or edit custom alarms.	

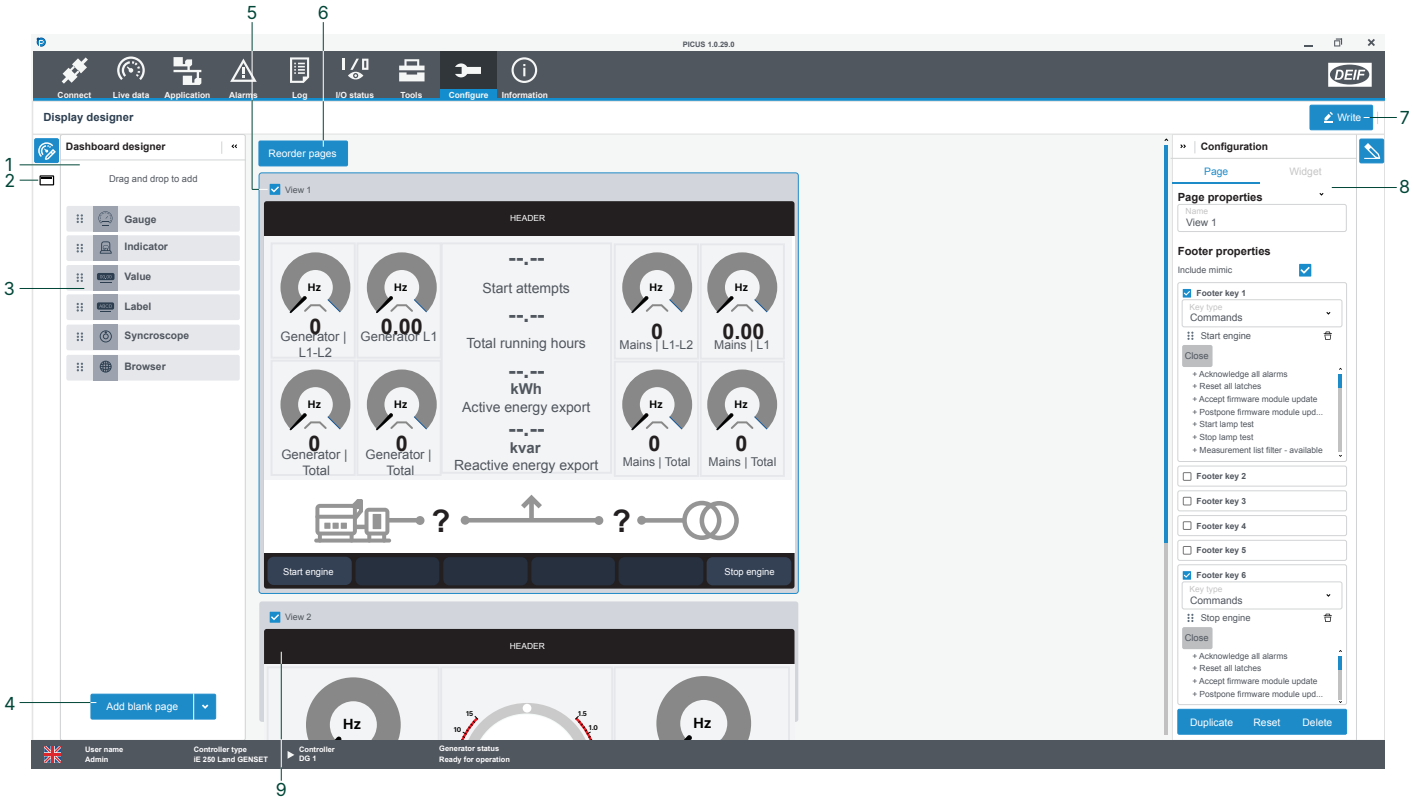
10.3 Display designer

10.3.1 About Display designer

Use the Display designer to create and edit both dashboards and the header shown on the controller display. Simply drag and drop the elements to the page.

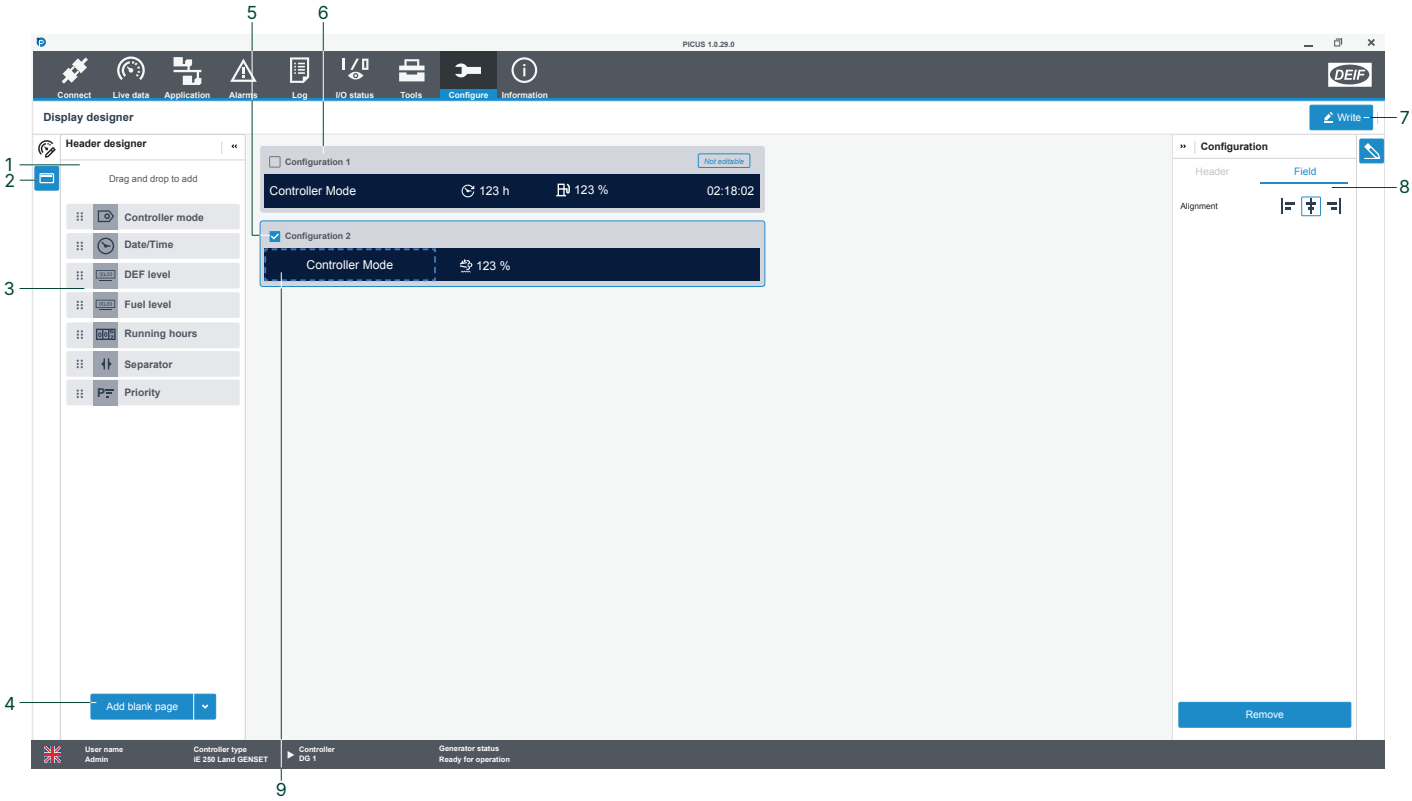
Example display dashboard

10.3.2 Display designer



No.	Item	Notes	
1	Dashboard designer	Configure the dashboard pages.	
2	Header designer	Configure the header on the display.	
3	Widgets	Drag and drop widgets to build your page.	
4	Add page	Add either a blank page or use a page template.	
5	Enable page	Enable the page on the display.	
6	Page actions	See a preview of the page.	Reorder the dashboard pages.
7	Write	Write the configuration to the controller.	
8	Configuration	Select a page or widget to configure it.	
9	Dashboard pages	Select a page to configure. You can also enable or not enable a page from being shown.	

10.3.3 Header designer



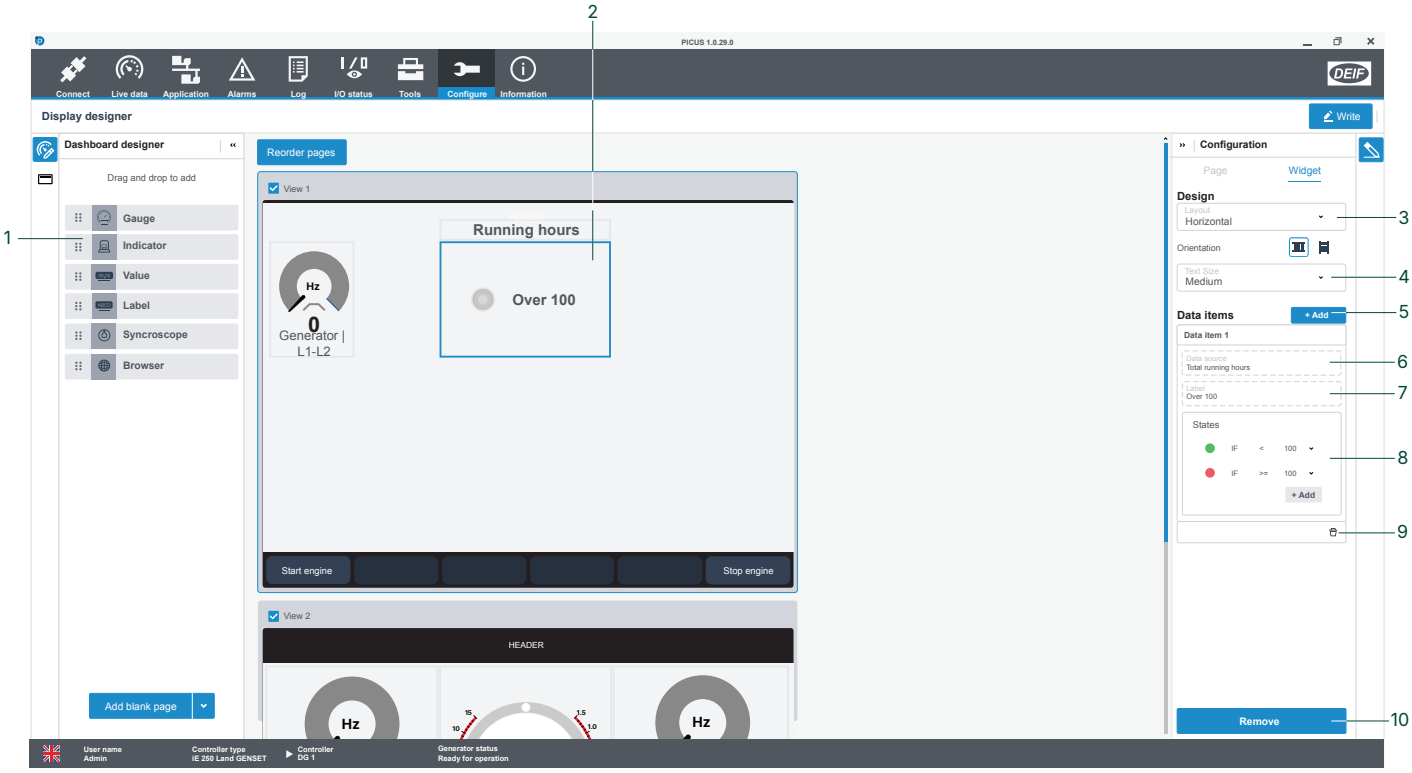
No.	Item	Notes
1	Dashboard designer	Configure the dashboard pages.
2	Header designer	Configure the header on the display.
3	Widgets	Drag and drop widgets to build your page.
4	Add header	Add a blank header.
5	Enable header	Enable the configuration as the active header.
6	Header configurations	Shows all the configurations available. Only one can be active.
7	Write	Write the configuration to the controller.
8	Configuration	Select a page or widget to configure it.
9	Selected widget	Select a page to configure. You can also resize the widget on the header.

10.3.4 Indicator widget

Use the Indicator widget to give visual indications from a data source. This can be Commands, Parameters, I/O functions *, Priorities, signals from other controllers, regulator status, controller text status, or Counters.

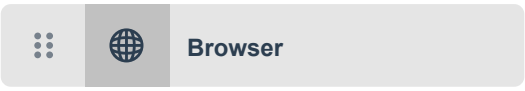
NOTE To use the I/O function as a source you must first configure the function in the Input/output configuration.

Simply drag and drop the Indicator widget to the page and configure the settings.



No.	Item	Notes
1	Indicator widget	Drag and drop widget to add to your page.
2	Indicator design	Shows how the indicator will be shown.
3	Layout	Configure if shown horizontal or vertical.
4	Text size	Configure the size of the text label.
5	Add data item	Adds additional data items.
6	Data source	Configure which data is used as the source.
7	Label	The label shown on the display.
8	Configuration	Assign the indication to specific data values.
9	Delete Data item	Delete the Data item, if there are several present.
10	Remove	Removes the Indicator widget from the page.

10.3.5 Browser widget

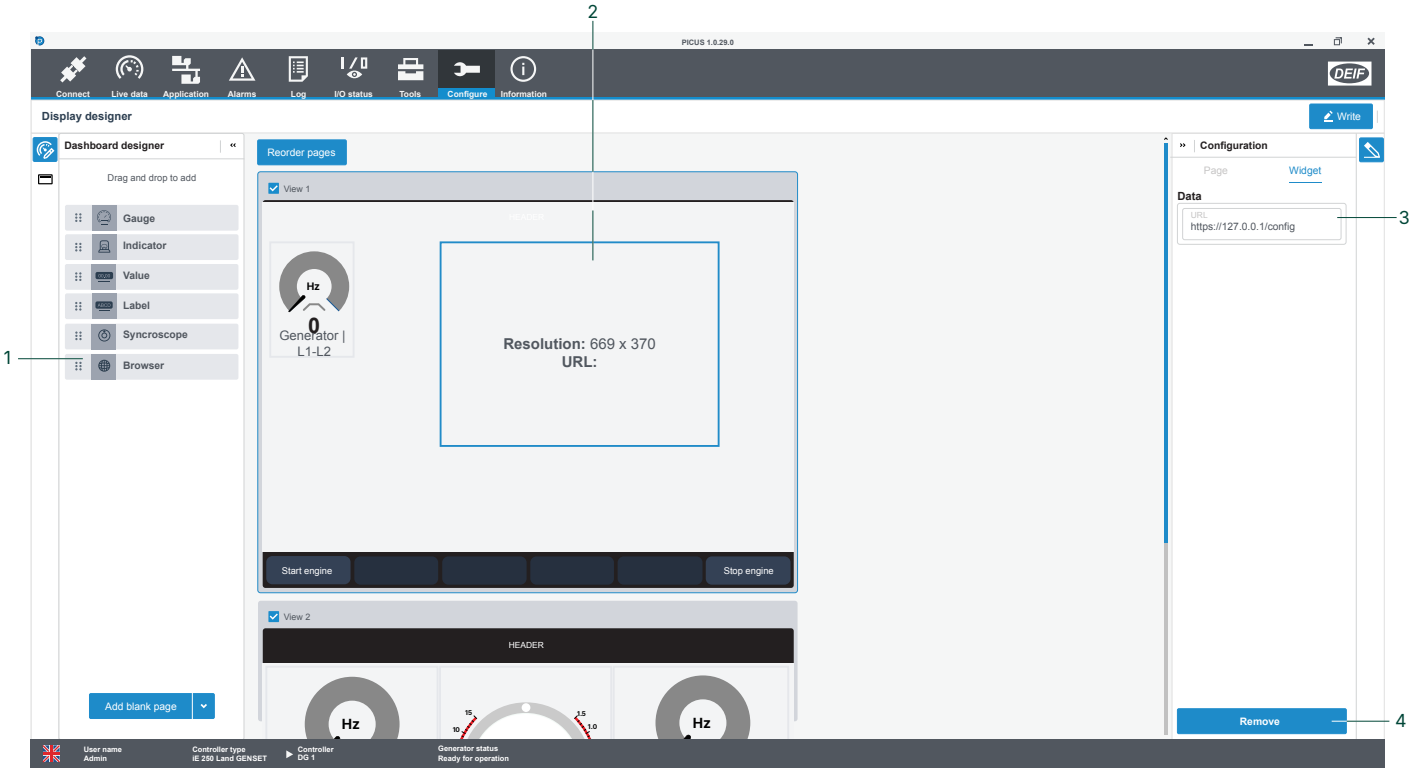


Use the Browser widget to display content from a URL. The URL must be hosted locally. External URLs are not supported.

In this example, CODESYS Webvisu page is renamed to *display.htm*.

Example URL: `http://127.0.0.1/webvisu/display.htm`

When the controller starts the splash screen is shown first, then loads the custom startup page. The custom service must be running on the URL.



No.	Item	Notes
1	Browser widget	Drag and drop widget to add to your page.
2	Browse pane	Shows the resizeable window for the URL.
3	URL	Configure the local URL.
4	Remove	Removes the Indicator widget from the page.

10.4 CustomLogic

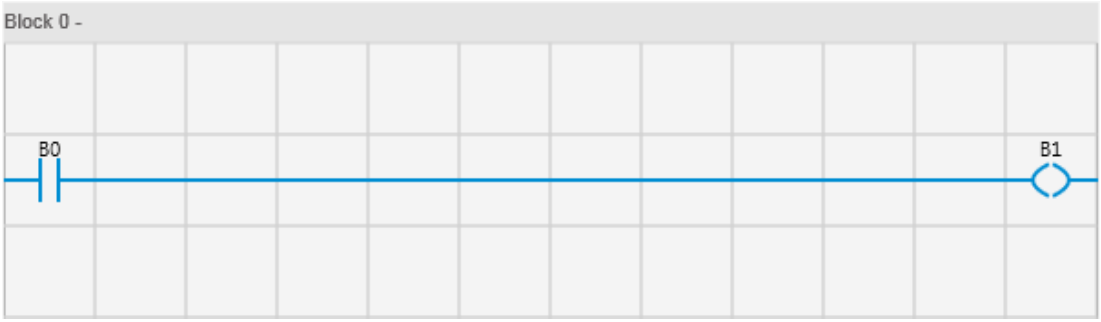
10.4.1 About CustomLogic

CustomLogic can be used to create customised logical functions for your system. CustomLogic must be enabled under:

```
Local > CustomLogic > Configuration > Enable
```

Projects built with logic

CustomLogic is created from left to right on the logic grid. The logic between left and right vertical rails are called lines. A line can consist of a single input and output, or multiple inputs and outputs connected directly to each other, or connected with connectors.



Logic can consist of several parallel lines.

A line is created of up to four element types:

- A contact (input)
- A function block (input)
- A connector
- A coil (output)

Lines are always read from the top of the block to the bottom of the block. Contacts (inputs) are always placed at the beginning of a line, and coils (outputs) always at the end. In some cases (for example, a counter block) the number of lines used as input does not match the amount of outputs.

When you build a line, it is not required to have an output. An example is a counter, since counter variables can be read directly by certain inputs and outputs.

Inputs and outputs for use in the logic

- Alarm state used as an input or used in the function COMPARE to check the actual state of the alarm.
- Controller function used as an input or set on an output.
- Digital inputs (DI) used as an input. *
- Digital outputs (DO) used as an input or set on an output. *
- Analogue inputs (AI) used in the function COMPARE to read measurement values. *
- Analogue outputs (AO) used in the functions COMPARE or OPERATE to read or change values. *
- Parameter value used in the functions COMPARE or OPERATE to read or change values.
- ICC (Inter-Controller Communication) used as an input or output. **
- Modbus used as an input.

NOTE * The input or output must be configured with a CustomLogic function before you can use it in your logic project.
** The controllers must be in the same single-line diagram, part of the same DEIF network, and have CustomLogic activated.

CustomLogic enabled state as an output (optional)

You can configure an output to use the CustomLogic state.

Function	IO	Type	Details
`Local > CustomLogic > State > Is enabled`	Digital output	Continuous	Activated when CustomLogic is enabled.

Variables

Variables can be used in CustomLogic instead of physical inputs and outputs to transfer the logic from one line to another. If you use variables, more of the controller's physical inputs and outputs are available for other functions. Variables are outputs that can be reused in more than one position or situation in the logic.

CustomLogic supports the use of Boolean variables. These are configured by setting the variable property to a pre-configured variable or a custom variable under:

```
Element setup > Functions
```

The value of the variable is equal to the output of the last coil in the project.

Custom variables are created by setting the variable property to "Bx" (where "x" is a number between 0 and 2147483647).

Project creation

Create your CustomLogic project in a three-step process:

1. Create a project with the required amount of sections and blocks.
2. Add the logic in the blocks with elements and functions.
3. Configure the elements and functions to represent the inputs, outputs, and variables.

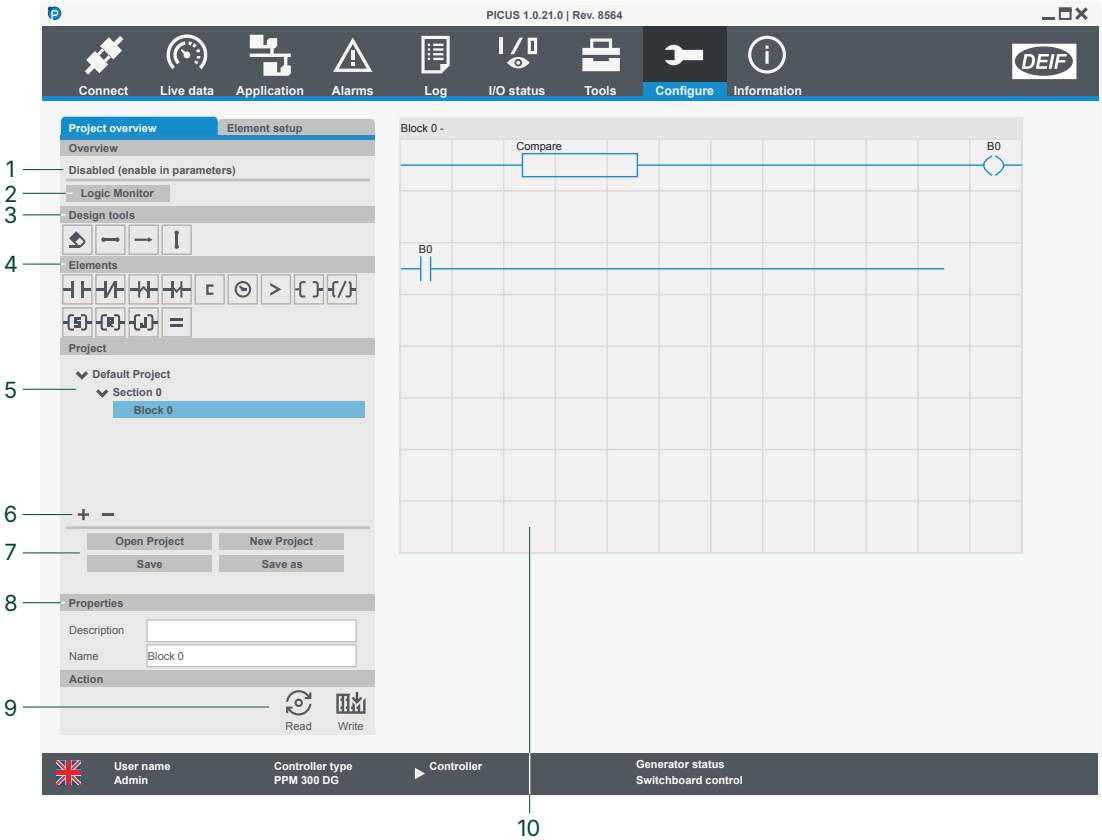
10.4.2 CustomLogic constraints

- A CustomLogic project can only have one section.
- A section has a maximum of 50 blocks.
- Each block has a maximum of 96 elements.
- A project has a maximum of 600 elements.
- Logic lines **must** be connected left to right on the logic grid.

NOTE Counter, compare, operate, and timer blocks take up more than one space on the logic grid, but are considered as one element.

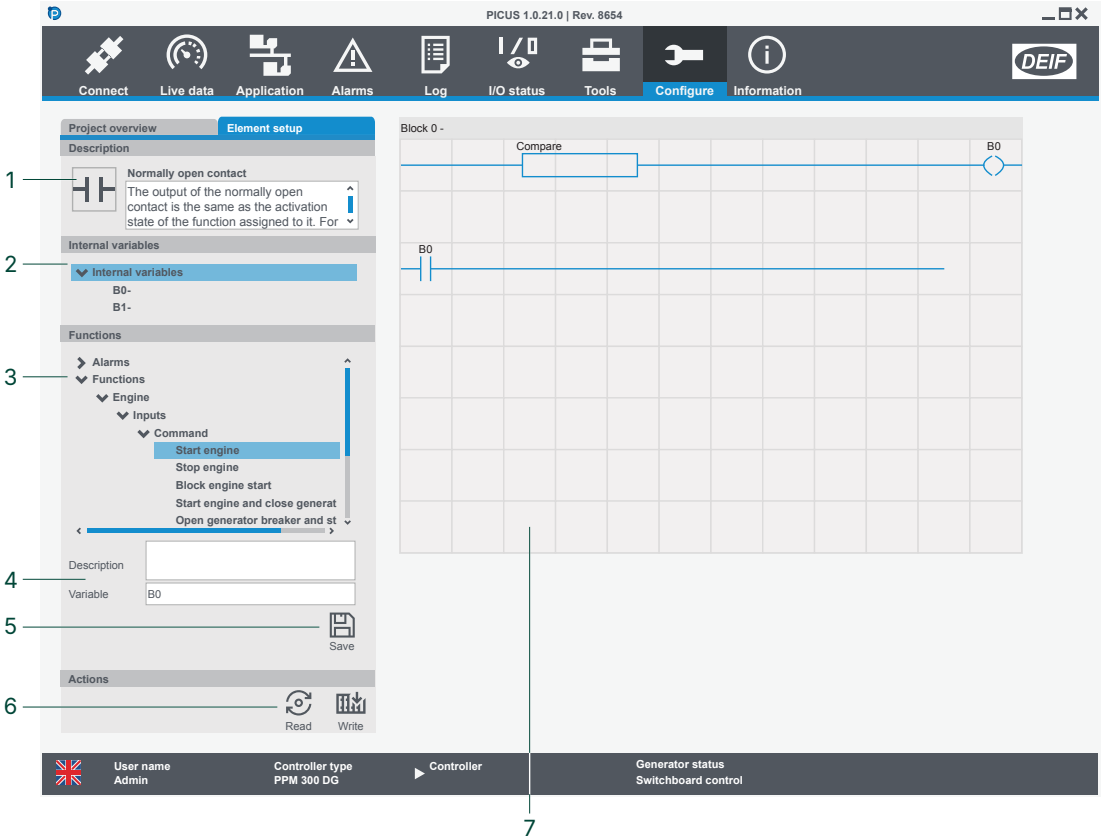
On PPU 300 or GPC 300 you cannot use CustomLogic if CODESYS is installed on the controller.

10.4.3 Project overview page



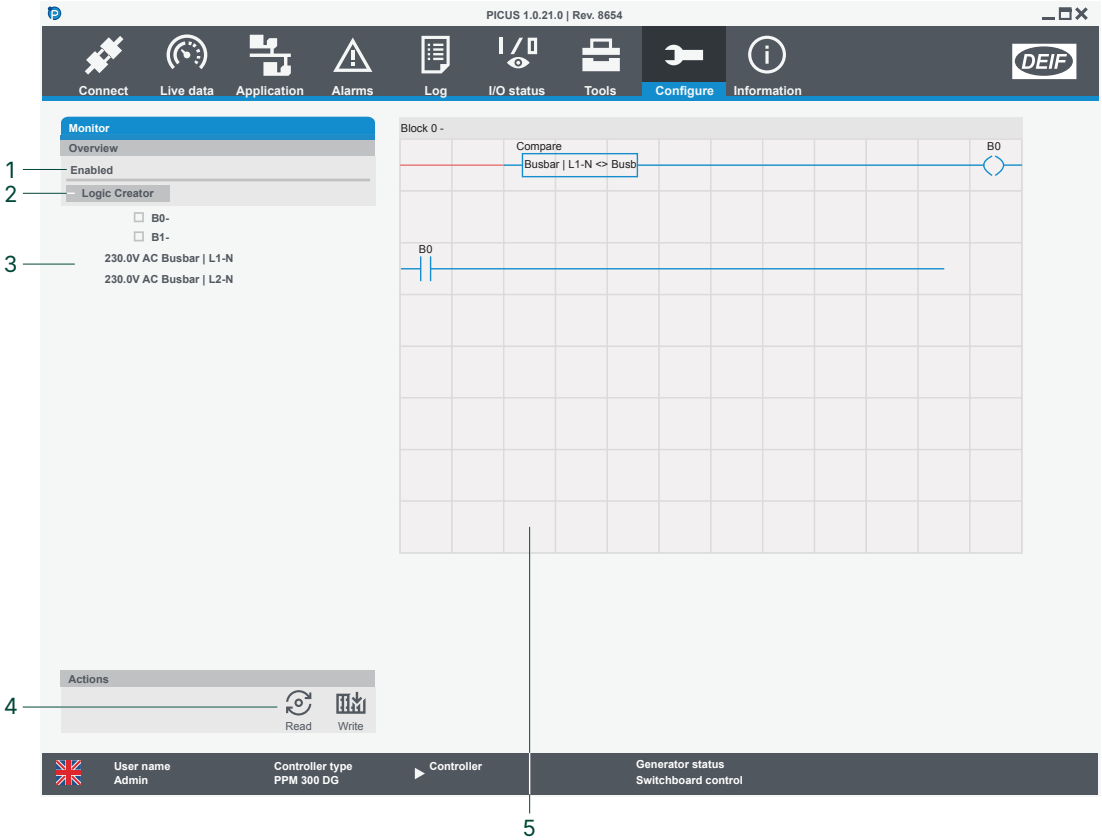
No.	Item	Notes	
1	CustomLogic state	Shows CustomLogic parameter is **Enabled** or **Not enabled**.	
2	Logic monitor	Changes to the Logic monitor page.	
3	Design tools	Drag and drop tool elements.	
4	Elements	Drag and drop function elements.	
5	Project	Sections and blocks within the project.	
6	Section or block	+ **Add** section or block.	- **Remove** section or block.
7	Project actions	**Open Project** to load a previous project.	**New Project** to create a blank project.
		Save project to your computer.	**Save as** to create a new project on your computer.
8	Properties	Information about the selected project, section or block.	
9	Actions	**Read** project from controller.	**Write** project to controller.
10	Logic block	The ladder logic blocks.	

10.4.4 Element setup page



No.	Item	Notes	
1	Description	Information about the selected element.	
2	Internal variables	List of all the internal variables in the project.	
3	Functions	Associated function to the element. Double click on a function to add it to the variable field of the selected element.	
4	Description and variable	Information for the element and the associated variable.	
5	Save element information	**Save** element description and variable.	
6	Actions	**Read** project from controller.	**Write** project to controller.
7	Logic block	Shows the ladder logic block.	

10.4.5 Monitor page



No.	Item	Notes	
1	CustomLogic state	Shows CustomLogic parameter is **Enabled** or **Not enabled**.	
2	Logic creator	Change to the Logic creation.	
3	Element state	Shows state of configured elements:	
		□ **FALSE**	■ **TRUE**
4	Actions	**Read** project from controller.	**Write** project to controller.
5	Logic block *	Shows the logic block and state:	
		TRUE	**FALSE**

NOTE * When CustomLogic is enabled, the logic monitor shows the state of the logic being processed in the controller. If CustomLogic is not enabled, the grid is faded and displays the state of the logic when CustomLogic was last enabled. The logic block has a refresh rate of 500 milliseconds.

10.4.6 Elements and functions

Connectors

Symbol	Name	Description
	Horizontal connector	A normal connector used to complete lines.
	Vertical connector	A connector used to connect parallel lines. This allows for parallel functions or multiple inputs. The connector is created in the upper left corner of the position where it is placed. The vertical connector can be placed over other elements if required. For example, it can be placed over a coil to create parallel outputs. If the element under the vertical connector is moved, the vertical connector is deleted.
	Long horizontal connector	Connects the position where the connector is placed horizontally with the next element to the right of the position or the end of the line.

Miscellaneous elements

Symbol	Name	Description
	Eraser	The eraser element can be dragged onto an existing element in the ladder diagram to delete that element from the ladder.

Contacts

Contacts (inputs) are normally on the left vertical rail. Contacts could be placed anywhere on the logic grid, except for the right-most position.

Symbol	Name	Description	Output for TRUE input
	Normally open contact	The output of the normally open contact is the same as the activation status.	TRUE
	Normally closed contact	The output of the normally closed contact is the opposite of the activation status.	FALSE
	Rising edge contact	The output of the rising edge contact is the same as the activation status for one scan of the contact. After the contact is scanned, the output changes to FALSE until it is activated again.	TRUE (one scan)
	Falling edge contact	The output of the falling edge contact is the opposite of the activation status for one scan of the contact. After the contact is scanned, the output changes to TRUE until it is activated again.	FALSE (one scan)

Coils

Coils (outputs) are always next to the right vertical rail. One exception is the Operate function block which also acts as an output.

Symbol	Name	Description	Output for TRUE input
	Normally open coil	The output of the normally open coil is the same as the input.	TRUE
	Normally closed coil	The output of the normally closed coil is the opposite of the input.	FALSE
	Set coil	The output of the set coil changes to TRUE when the input is TRUE. The output remains TRUE until a reset coil is activated (even if the input is no longer TRUE).	TRUE (continuously)
	Reset coil	The output of the reset coil changes to FALSE when the input is TRUE. The output remains FALSE until a reset coil is activated (even if the input is no longer TRUE).	FALSE (continuously)
	Jump coil	This type of coil jumps to another block in the ladder logic. The remainder of the vertically scanned rung block, in which the jump coil appears and all the rung blocks up until the destination rung block, are not executed.	TRUE
	Operate block *	This block is an internal output instruction in the ladder logic and can used to assign a value to a variable. Parameter values that are set with the Operate function MUST be within the accepted parameter range. See the accepted range for each parameter under `Configure > Parameters`.	TRUE

NOTE * All variables used in the OPERATE block must have the same unit of measure.

Functions

Symbol	Name	Description
	Timer block	When the input to a timer block goes to TRUE, the timer starts to count from zero to a pre-configured value. There are three different timer modes: 1. Timer on (TON) 2. Timer off (TOF) 3. Timer pulse (TP). See Function blocks for more information.
	Counter block	The counter block functions as a counter between 0 and 9999, and can store one preset value. A counter block consists of four inputs which operate the counter and three outputs which give the current status of the counter. See Function blocks for more information.
	Compare block	The compare element can be used to compare variables and/or expressions with each other. If the expression is true, the output of the compare block is also true. These comparisons can be used: • > "greater than" • >= "greater than or equal to" • < "less than" • <= "less than or equal to" • <> "different to" • = "equal to" See Function blocks for more information.

10.4.7 Function blocks

Timer block properties

Properties	Range	Default	Description
ID		TM0	The name of the timer. When specifying timer variables, the variable is preceded by the timer ID.
Mode	TON, TOF, TP	TON	When **TON** is selected: After the timer reaches the preset value, the timer output changes from FALSE to TRUE. When **TOF** is selected: After the timer reaches the preset value, the timer output changes from TRUE to FALSE. When **TP** is selected: After the timer reaches the preset value, the timer output will change from TRUE to FALSE. The timer starts counting when the input is TRUE (pulse or constant), and continues to count until it reaches the preset value.
Preset	0 to 9999	0	The preset value where the timer stops and the output is changed.
Unit	Minutes, seconds, 100 milliseconds	Minutes	The unit of time used for the count. If the timer is set to 200 ms or less, it will run out after one scan due to the CustomLogic scanning frequency.

After changing the *ID* or the *Preset* properties, select **Save** to apply the new value to the element.

Timer block variables

Variables	Range	Description
TMxx.Q *	TRUE, FALSE	The variable value is the same as the timer output.

NOTE * **TMxx** should be substituted by the timer ID when referring to the variable.

Counter properties

Properties	Range	Default	Description
ID		C0	The name of the counter. When specifying counter variables, the variable is preceded by the timer ID.
Preset	0 to 9999	0	The preset value is a target value to which the counter counts.

After changing the *ID* or the *Preset* properties, select **Save** to apply the new value to the element.

Counter inputs and outputs

Properties	Type	Description
R	Input	When this input is TRUE, the count is reset to 0.
P	Input	When this input is TRUE, the count is set to the preset value.
U	Input	When this input is TRUE, the count is increased by one.
D	Input	When this input is TRUE, the count is decreased by one.
E	Output	This output registers count under flow. The output will change from FALSE to TRUE when the counter rolls back from 0 to 9999.

Properties	Type	Description
D	Output	This output (*Done*) registers when the count has reached the preset value. When the count does not equal the preset value, the output is FALSE. When the count is equal to the preset value, the output is TRUE.
F	Output	This output registers count over flow. The output will change from FALSE to TRUE when the counter rolls over from 9999 to 0.

Counter variables

Variables	Range	Description
Cxx.D *	TRUE, FALSE	TRUE if the count equals the preset value. FALSE otherwise.
Cxx.E *	TRUE, FALSE	TRUE if the count changed from 0 to 9999. FALSE otherwise.
Cxx.F *	TRUE, FALSE	TRUE if the count changed from 9999 to 0. FALSE otherwise.

NOTE * **Cxx** should be substituted by the counter ID when referring to the variable.

Compare

The compare function block sets the output depending on the logical expression in the block.

When the input is FALSE, the output will always be FALSE.

When the input is TRUE, the block will check if the logical expression is true. If the logical expression is true, then the output is TRUE. If the logical expression is false, the output remains FALSE.

Compare logical operators

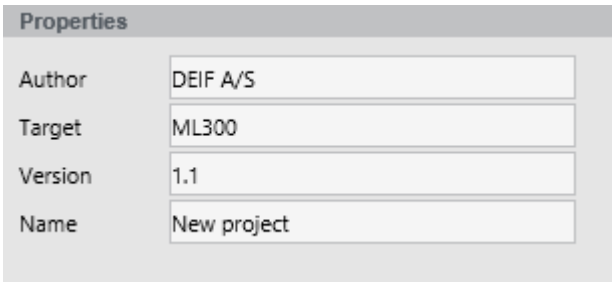
Operator	Output
X > Y	TRUE if X is greater than Y
X >= Y	TRUE if X is greater than or equal to Y
X < Y	TRUE if X is less than Y
X <= Y	TRUE if X is less than or equal to Y
X <> Y	TRUE if X is different from Y
X = Y	TRUE if X is equal to Y

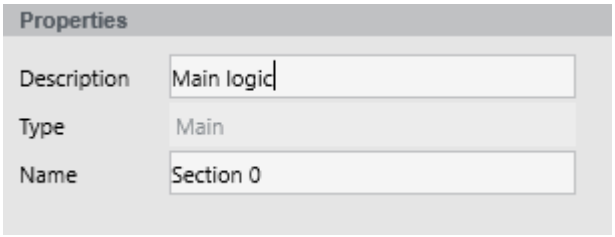
10.4.8 Configure a CustomLogic project

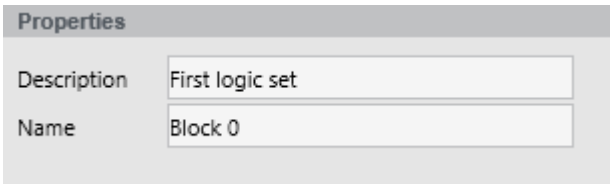
Create a project

1. Select **New**
   - If you create a new project it clears the logic shown, but the previous project remains on the controller until the new project is written to the controller.

   .
2. Select the project and configure the properties:

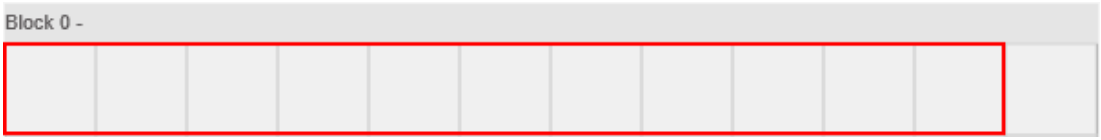
- 

3. Select + **Add** to add a section.
4. Select the section and configure the properties:
   - 

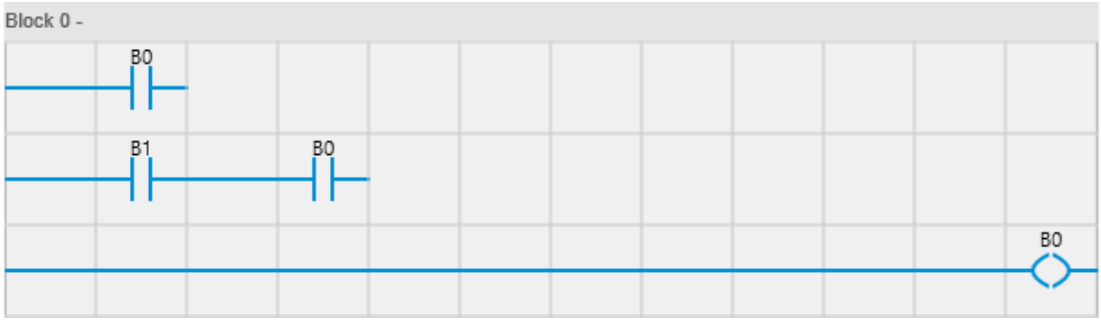
5. Select + **Add** to add a block to the section.
6. Select the block and configure the properties:
   - 

7. Add additional sections and blocks as required.
8. Select **Write** to save the project to the controller.

Add elements or functions

1. Drag and drop elements from the elements to a location on the logic grid:
   - Contacts and all function blocks can be placed in columns 1 to 11 of the logic grid:
     - 

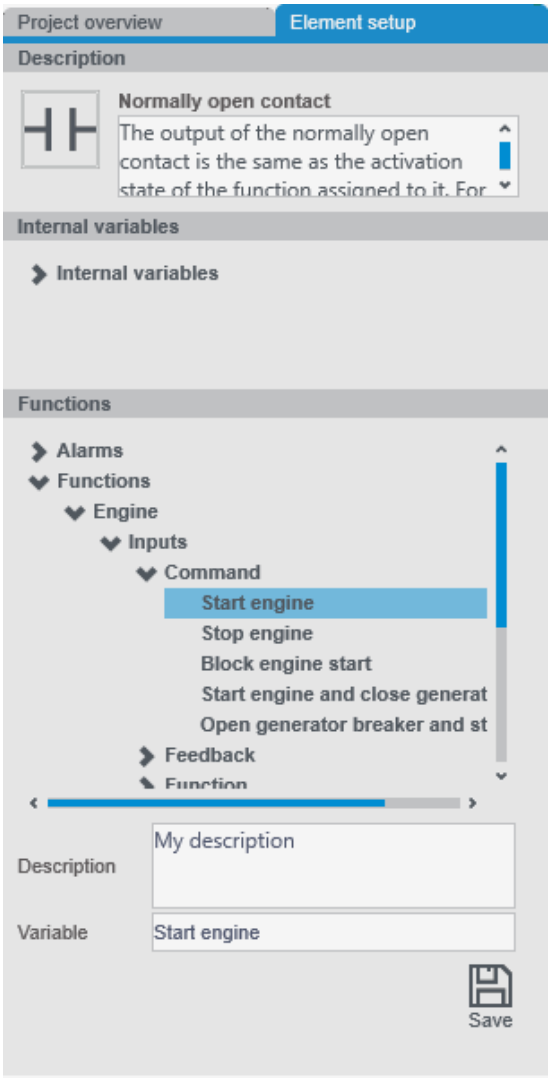
   - Coils can only be placed in column 12.
     -

2. Add and connect elements on the logic grid by drag-and-drop from the Design tools menu.
   - Elements can be moved around on the grid. It is not possible to move an element from one block to another block.
3. All elements on the logic grid must have a connection to the left vertical rail.
   - 

4. Select **Write** to save the project to the controller.

Configure element or function

1. Select an element on the logic grid.
2. Select Element setup.
3. Configure the properties:



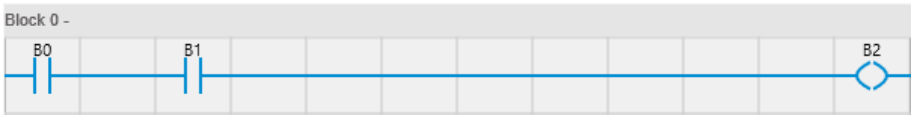
4. Select **Save** to update the configuration.
5. Select **Write** to save the project to the controller.

10.4.9 Logic gate examples

All outputs use a normally open coil, the output of which reflects the input. Element names are a letter and a number, for example "B1".

AND example

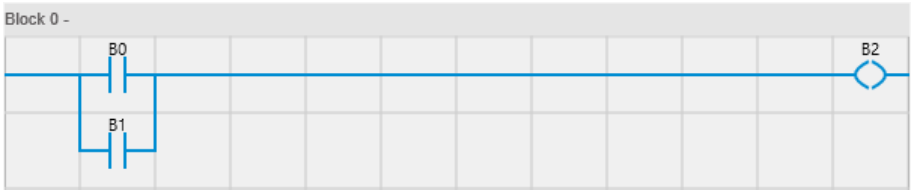
Two normally open contacts connected in series. For the output of a normally open coil to be TRUE, the inputs of both normally open contacts must be TRUE. This logic can be extended to be used with more than two normally open contacts connected in series.



B0	B1	B2
FALSE	FALSE	FALSE
FALSE	TRUE	FALSE
TRUE	FALSE	FALSE
TRUE	TRUE	TRUE

OR example

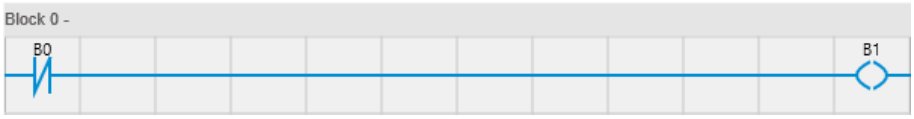
Two normally open contacts connected in parallel. For the output of the normally open coil to be TRUE, one, or both of the normally open inputs must be TRUE. This logic can be extended to be used with more than two normally open contacts connected in parallel.



B0	B1	B2
FALSE	FALSE	FALSE
FALSE	TRUE	TRUE
TRUE	FALSE	TRUE
TRUE	TRUE	TRUE

NOT example

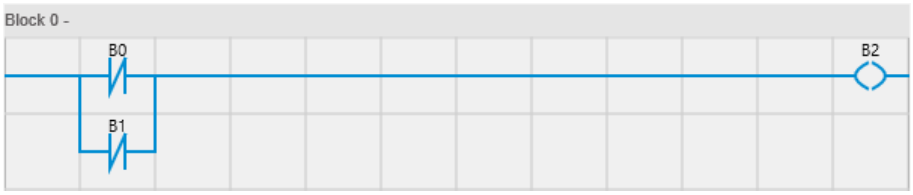
One normally closed contact. The output of a normally open coil will always be the opposite of the input of the contact.



B0	B1
FALSE	TRUE
TRUE	FALSE

NAND example

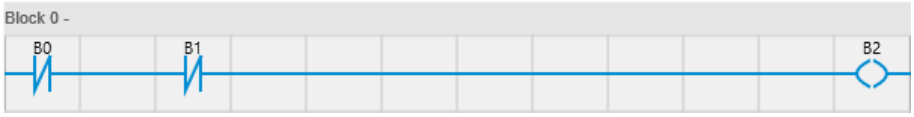
Two normally closed contacts connected in parallel. This operation is the opposite of the AND operation. The output of a normally open coil is TRUE, until the input of both normally closed contacts is TRUE. This logic can be extended to be used with more than two normally closed contacts in parallel.



B0	B1	B2
FALSE	FALSE	TRUE
FALSE	TRUE	TRUE
TRUE	FALSE	TRUE
TRUE	TRUE	FALSE

NOR example

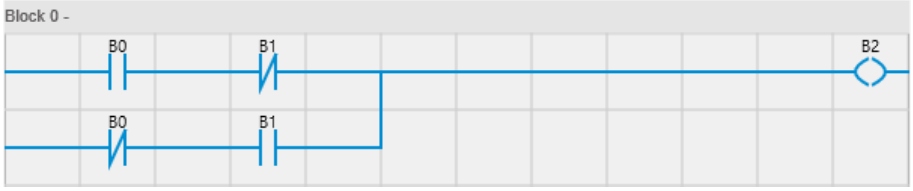
Two normally closed contacts connected in series. This operation is the opposite of the OR operation. The output of a normally open coil is TRUE, until the input of one or both normally closed contacts is TRUE.



B0	B1	B2
FALSE	FALSE	TRUE
FALSE	TRUE	FALSE
TRUE	FALSE	FALSE
TRUE	TRUE	FALSE

XOR example

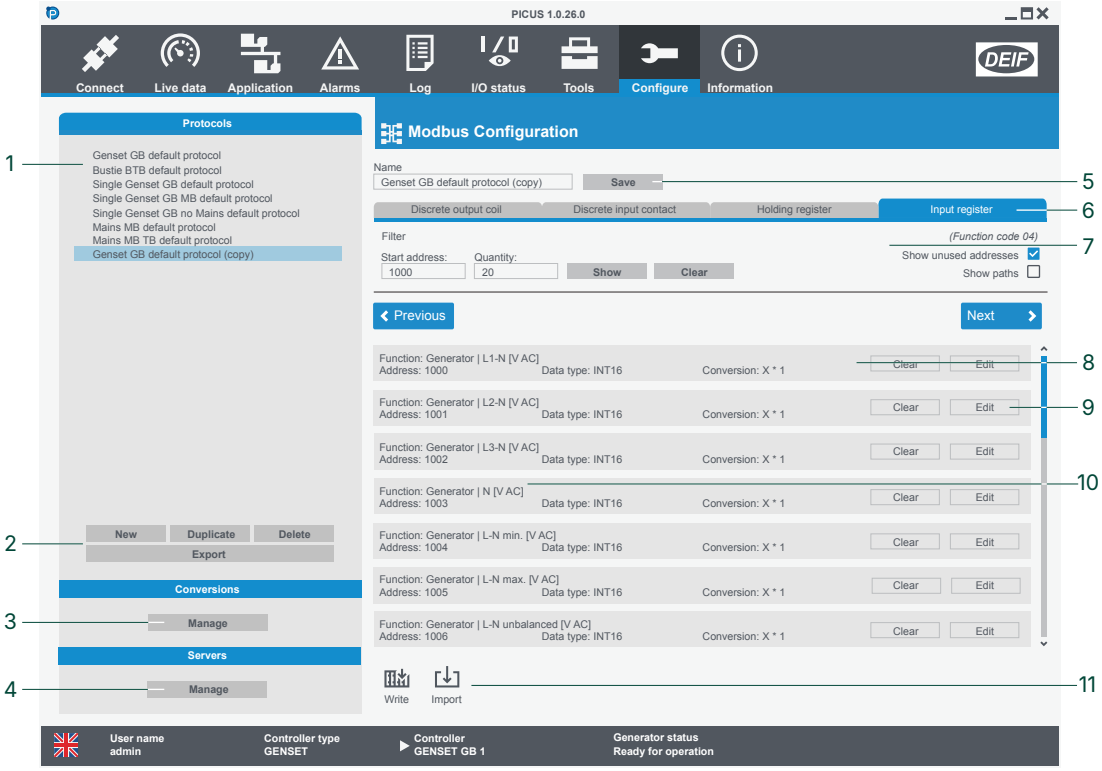
A normally open contact and normally closed contact connected in series, connected in parallel to a normally closed contact and normally open contact that are connected in series. For the output of the normally open coil to be TRUE, either B0 or B1 must be TRUE, but not at the same time.



B0	B1	B2
FALSE	FALSE	FALSE
FALSE	TRUE	TRUE
TRUE	FALSE	TRUE
TRUE	TRUE	FALSE

10.5 Modbus

10.5.1 Protocols page



No.	Item	Notes	
1	Protocol list	Shows the protocols on the controller.	
2	Commands	**New** protocol.	**Duplicate** the selected protocol.
		Delete the selected protocol.	**Export** the protocol.
3	Conversions page	Change to the Modbus conversion page.	
4	Servers page	Change to the Modbus servers page.	
5	Protocol name	Name of Modbus protocol.	
6	Supported Modbus functions	**Discrete output coil**: Read and write addresses in binary data.	**Discrete input contact**: Read only addresses in binary data.
		Holding register: Read and write addresses in boolean, 16 and 32-bit integer, float or bit map data.	**Input register**: Read only addresses in boolean, 16 and 32 bit integer, float or bit map data.
7	Address filter	Filter to display up to 1000 consecutive addresses for a Modbus function.	
8	Modbus address details	**Unused address**: A function can be assigned if a duplicated protocol.	**Reserved address**: Function assigned is not configurable. The function cannot be restored if it is cleared.
		Function: Controller path of the function assigned.	**Address**: Modbus address of the function.
		Data type: The data type associated. *	**Conversion**: Scaling or conversion associated. *
9	Address configuration commands (Default protocols cannot be edited)	**Set**: function to an unused address.	**Edit**: function assigned to the selected address.
		Clear: function assigned to the selected address.	

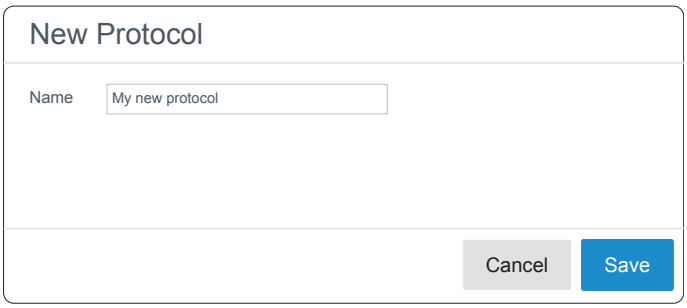
No.	Item	Notes	
10	Function path	Full function path displayed by default.	
		Collapse: the function name.	**...**: expand the function path.
11	Modbus function commands	**Write** changes to the selected function to the controller.	**Import** a Modbus function to replace the selected function.

NOTE * Only available in the Holding and Input registers. Scaling is not available for binary values.

10.5.2 Create, edit, or export a protocol

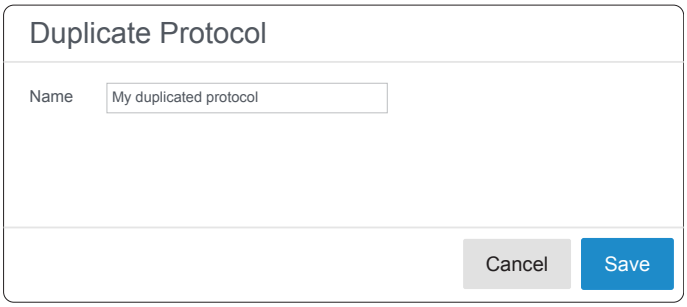
The controller default protocol cannot be edited or removed.

Create a new protocol

1. Select **New**.
2. Enter a name:
   - 

3. Select **Save**.
4. Select the new protocol to access the Modbus functions.
5. Select a Modbus function to configure.
6. Configure Modbus addresses individually with the filter and **Set** address configuration command, or import an existing Modbus function.

Duplicate an existing protocol

1. Select a Modbus protocol to duplicate.
2. Select **Duplicate**.
3. Enter a name:
   - 

4. Select **Save**.
5. Select the new protocol to access the Modbus functions.
6. Select a Modbus function to configure.
7. Configure Modbus addresses individually with the filter and **Set** address configuration command, or import an existing Modbus function.

Edit a protocol

Edit a used address

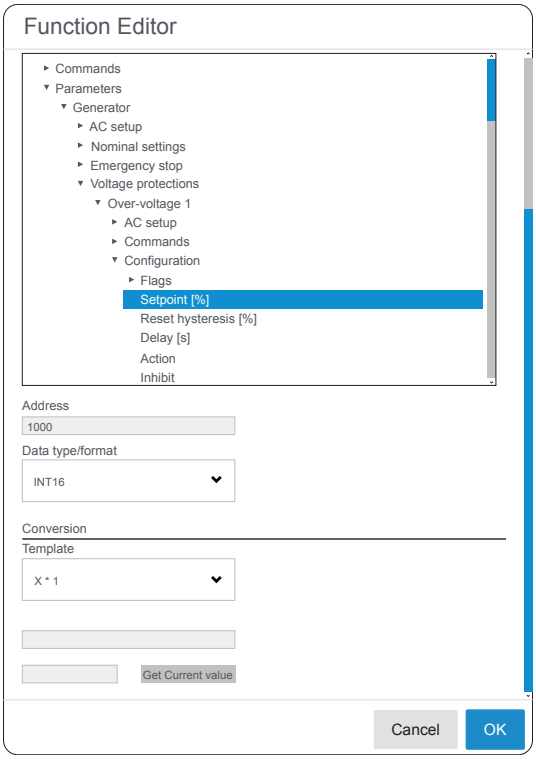
1. Select the protocol to configure from the protocol list.

2. Select the Modbus function to configure.
3. Use the filter to select the address range to configure.
   - Type in the start address and the number of addresses (including the Start address) to read from the controller.
   - If Show Unused Addresses is **not enabled**, then only configured addresses are shown.
   - The amount of addresses shown can be less then the value entered in Quantity.
4. Select **Edit** to configure the selected address.
5. Select **Write** to write the changes to the controller.

Clear a used address

1. Select the protocol to configure from the protocol list.
2. Select the Modbus function to configure.
3. Use the filter to select the address range to configure.
   - Type in the start address and the number of addresses (including the Start address) to read from the controller.
   - If Show Unused Addresses is **not enabled**, then only configured addresses are shown.
   - The amount of addresses shown can be less then the value entered in Quantity.
4. Select **Clear** to remove the function associated to the address.
5. Select **Write** to write the changes to the controller.

Set a function to an unused address

1. Select the protocol to configure from the protocol list.
2. Select the Modbus function to configure.
3. Use the filter to select the address range to configure.
   - Type in the start address and the number of addresses (including the Start address) to read from the controller.
   - Show Unused Addresses must be **enabled** to see empty addresses.
4. Select **Set** to open the Function Editor.
5. Select the function to associate to the Modbus address:
   - 

   - Functions that don't match the Data type/format for the address cannot be selected.
   - The Data type/format can be selected for register addresses.
   - A conversion formula must be selected for register addresses.
   - Test the selected conversion with **Get Current value**.

6. Select **OK**.
7. Select **Write** to write the changes to the controller.

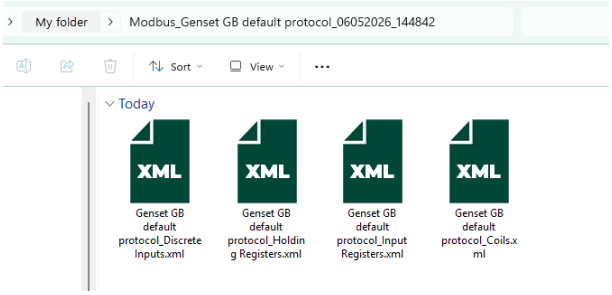
Import a protocol

If you import a function it overwrites existing data without a warning notification.

1. Select the protocol to import.
   - The controller only accepts Modbus functions that use the correct xml-format.
   - Only custom protocols or copies of default protocols can be imported.
2. Select the Modbus function to import data to.
3. Select **Import** .
4. Select the file to import and select **Open**.
5. Select **Dismiss** to close the confirmation window when the import is complete.

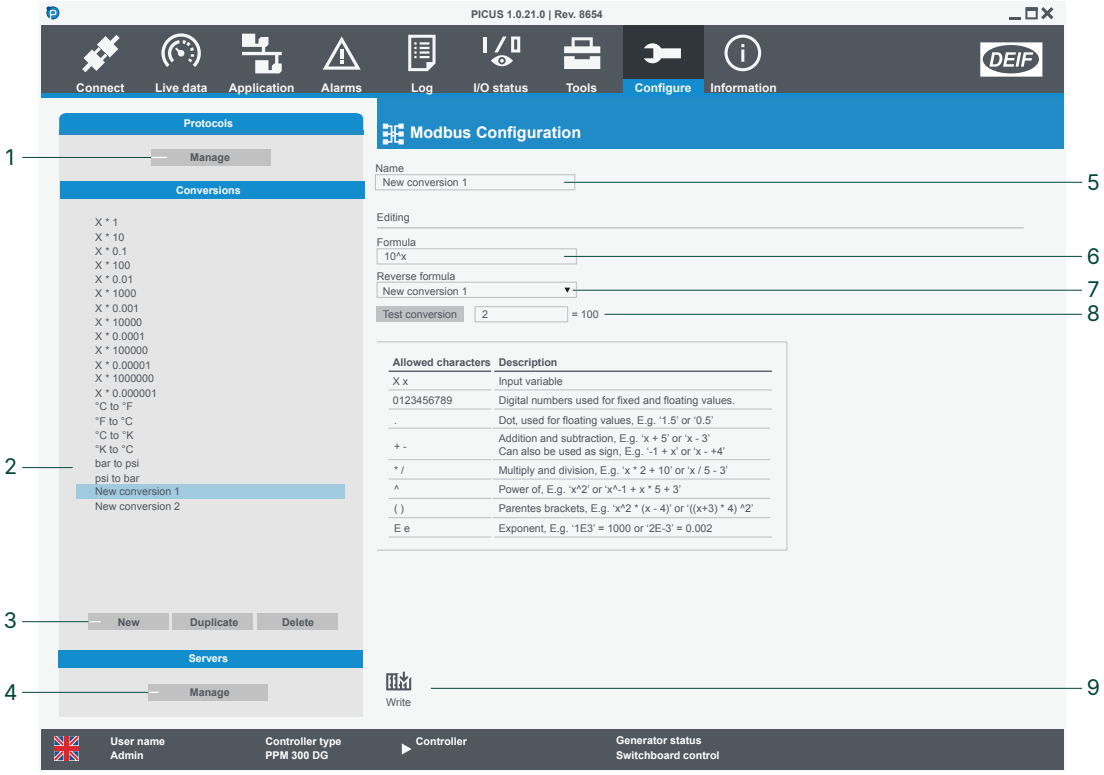
Export a protocol

Exported protocols are saved as four xml files (one for each function).

1. Select the protocol to export from the protocol list.
2. Select **Export** to open the location selection window.
3. Select a location to store the Modbus functions.
4. Select **Select folder**.
5. The protocol is exported to the folder you selected.
   - Example: *
   - 

NOTE * The XML files are named for your product, the above example is for iE 250.

10.5.3 Conversions page

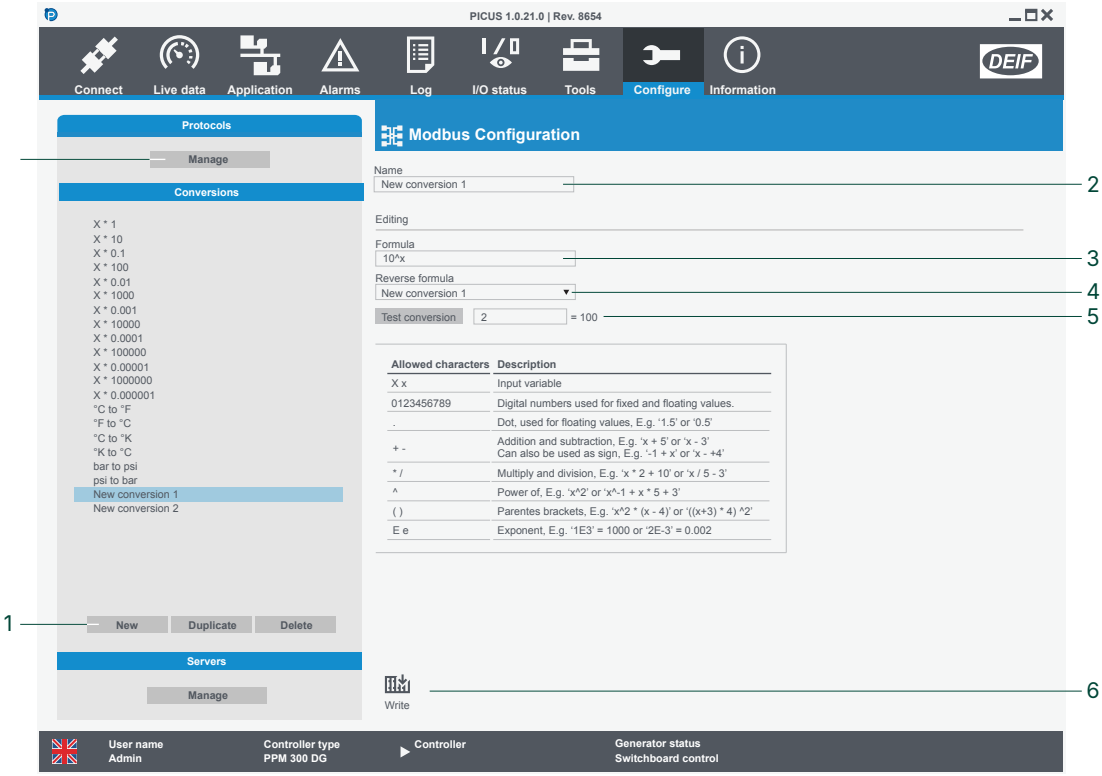


No.	Item	Notes
1	Protocol page	Change to the Modbus protocols page.
2	Conversions list *	Shows the conversions (scaling and unit) on the controller.
3	Commands	**New** conversion. **Duplicate** the selected conversion. **Delete** the selected conversion.
4	Servers page	Change to the Modbus servers page.
5	Conversion label	Name of a custom conversion.
6	Formula **	The conversion formula applied when you read a Modbus address.
7	Reverse formula	Conversion formula applied when you write a value to a Modbus address. The Reverse formula is always selected from the existing conversions.
8	Conversion test	Select a value for x to test the result of the Formula.
9	Modbus function commands	**Write** the conversion to the controller.

NOTE * The controller default conversions cannot be edited or removed.
** The Formula is a function of x, where x represents the raw value of the Modbus address.

10.5.4 Create or edit a conversion

Create a new conversion



1. Select **New**.
2. Enter a name for the conversion.
3. Type the formula for the conversion as a function of x.
   - The Formula is the conversion used when you read the data.
   - "x" is the value read by the controller for the function assigned to the address.
4. Select the Reverse formula from the list of existing formulae.
   - The Reverse formula is the conversion used when you write the data.
   - If the Reverse formula is not available, then a new conversion must be created where the Formula contains the desired Reverse formula.
5. Optional: Type a number in the Test conversion field and select **Test conversion** to see an example of the result of your new conversion (Formula).
6. Select **Write** to write the changes to the controller.

If there is an error with the Formula or Reverse formula, then the conversion defaults to x*1 for both the Formula and Reverse formula.

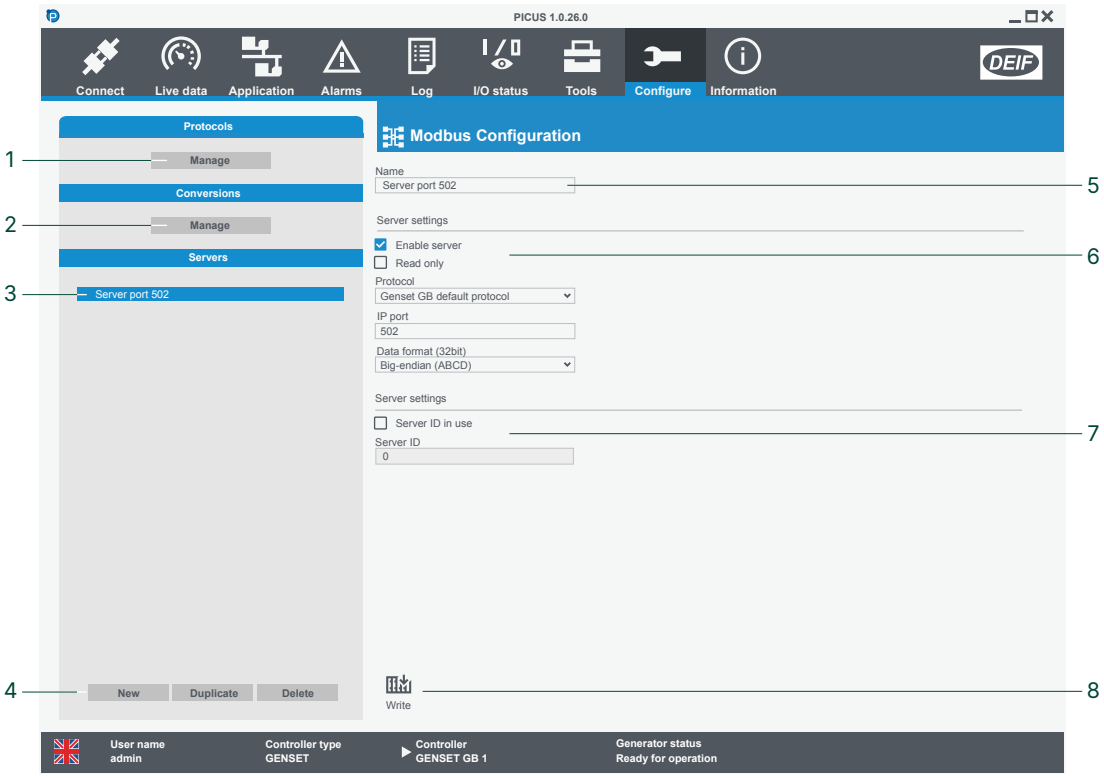
Duplicate a conversion

1. Select the conversion to duplicate and select **Duplicate**.
2. Optional: Enter a new name.
3. Select **Write** to write the changes to the controller.

Edit a conversion

1. Select the conversion to edit.
   - Default conversions cannot be edited.
2. Make the desired changes.
3. Select **Write** to write the changes to the controller.

10.5.5 Servers page

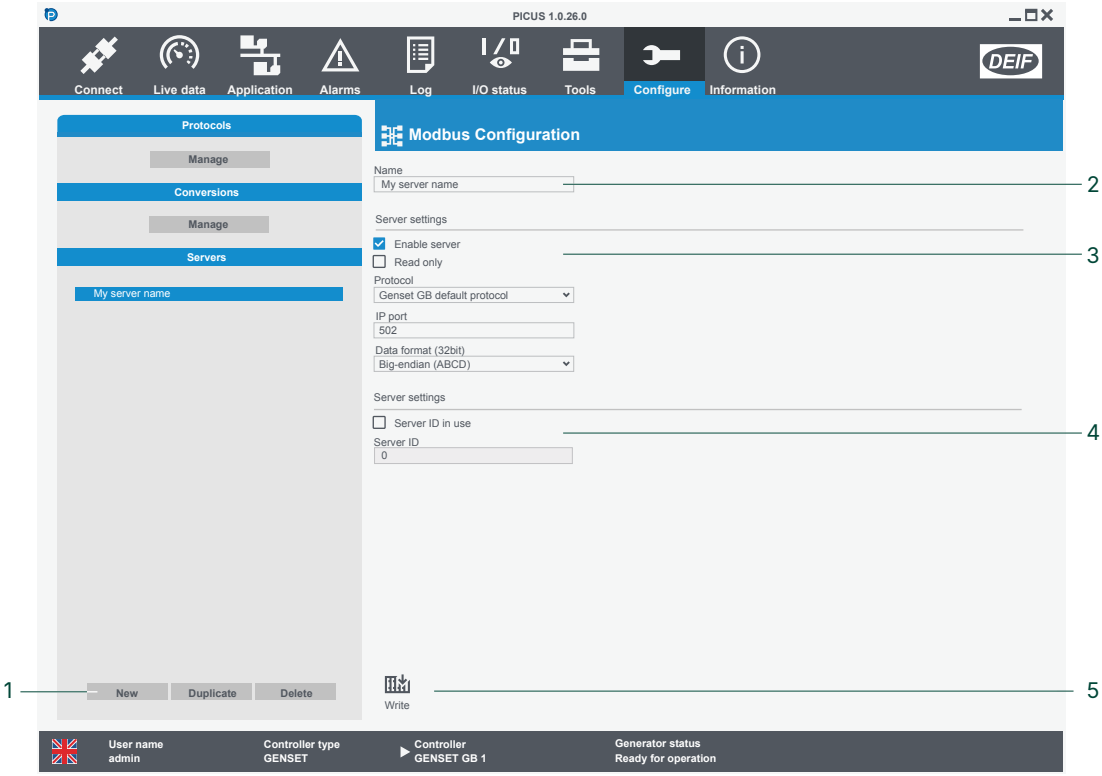


No.	Item	Notes	
1	Protocol page	Change to the Modbus protocols page.	
2	Conversions page	Change to the Modbus conversions page.	
3	Server list	Shows the servers on the controller.	
4	Commands	**New** server.	**Duplicate** the selected server.
		Delete the selected server.	
5	Server name	Name of selected server.	
6	Server settings	**Enable server**: Enable the selected server as active on the controller.	**Read only**: Enable all of the Modbus addresses as read only addresses and function codes 05, 06, 15 and 16 do not respond.
		Protocol: Select the Modbus protocol that is associated with the server.	**IP port**: The communication port for the server. *
		Data format (32bit): Byte order of the data sent with Modbus.	
7	Server settings	**Server ID in use**: Enabled the server uses the specified Server ID. If multiple servers are enabled and use the same IP port, then this parameter must be enabled.	
		Server ID: The unique Server ID associated with the Modbus server. If Server ID in use is not enabled, then the Server ID is 0.	
9	Server commands	**Write** the server to the controller.	

NOTE * The default Modbus port is port 502. If multiple servers are active and use the same port, then each server must have a unique Server ID.

10.5.6 Create or edit a server

Create a new server



1. Select **New**.
2. Enter a name for the server.
3. Configure the Server settings section:
   - **Enable server**: Activate or deactivate the server.
   - **Read only**: If **Enabled** then all of the Modbus addresses are read-only addresses.
   - **Protocol**: The Modbus protocol used on the server. Select from a list of existing protocols.
   - **IP port**: The communication port for Modbus communication. If more than one active server uses the same IP port, a Slave ID must be configured for all servers.
   - **Data format (32bit)**: Select the data format for 32-bit addresses (32-bit integer, float).
4. Optional: Configure the Slave settings section.
   - **Slave ID in use**: Only **Enable** this if you have multiple enabled servers that use the same communication port.
   - **Slave ID**: Select the ID number for the slave unit. ID number must be unique for every server that use the same communication port.
5. Select **Write** to write the changes to the controller.

Duplicate a server

1. Select the server to duplicate.
2. Select **Duplicate**.
3. Optional: Enter a new name.
4. Select **Write** to write the changes to the controller.

Edit a server

1. Select the server to edit.
2. Configure the settings.
3. Select **Write** to write the changes to the controller.

10.6 Counters

10.6.1 About Counters

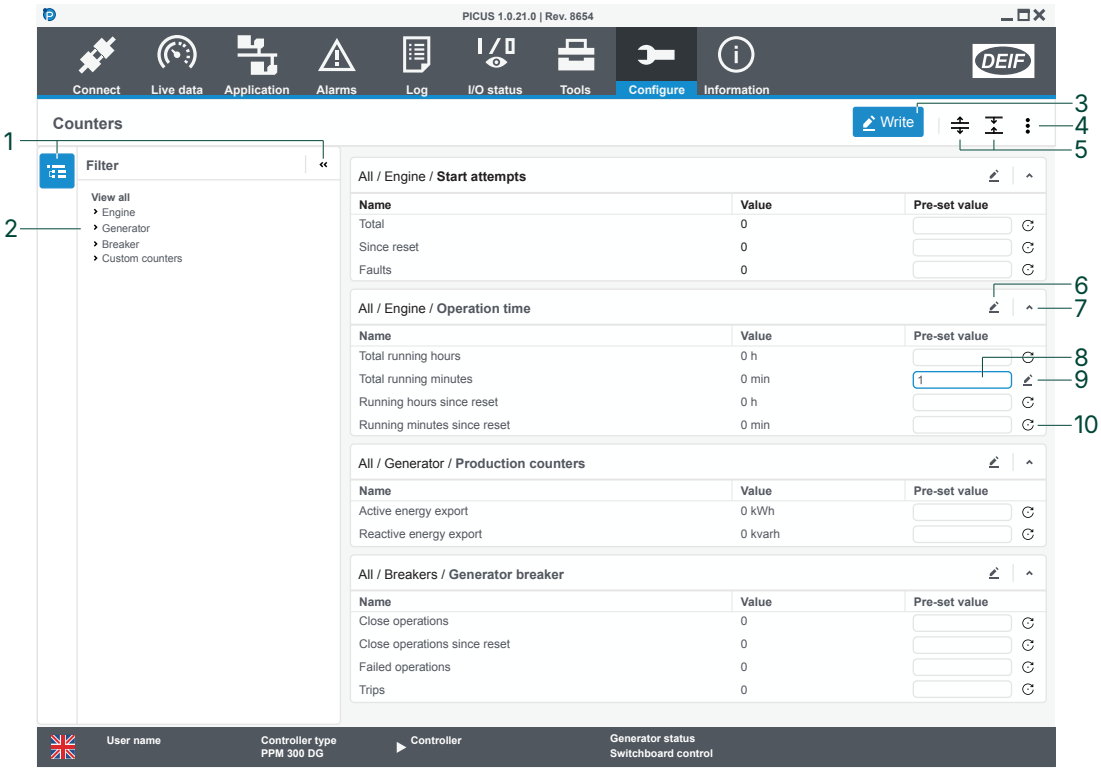
Specific events are recorded as counters. You can view or reset the counters recorded on the Counters page. The actual recorded counters can vary by product.

Examples include:

- Application counters
- Start attempts
- Total running hours and minutes
- Trip running hours and minutes
- Generator breaker operations and trips
- Energy export (active and reactive)
- Custom counters from CODESYS

More information
See **Counters** in the **Designer's handbook** for information about the counters available under each controller type.

10.6.2 Counters page



No.	Item	Notes
1	Collapse/expand menu	Open/close the Filter menu.
2	Filter select	Select all counters or a specific group of counters.
3	Write **Write**	Write all values to the controller.
4	**More options**	Show or hide paths for the counters.
5	Expand all/Collapse all	**Expand all** : Expands all items in the list. **Collapse all** : Collapses all items in the list.
6	Write	Write values for the current group to the controller.
7	Expand/collapse	Expand or collapse the group menu.
8	Value	Change a pre-set value for the counter.
9	Write	Write the new value to the controller.
10	Reset	Reset the value.

10.7 Custom data

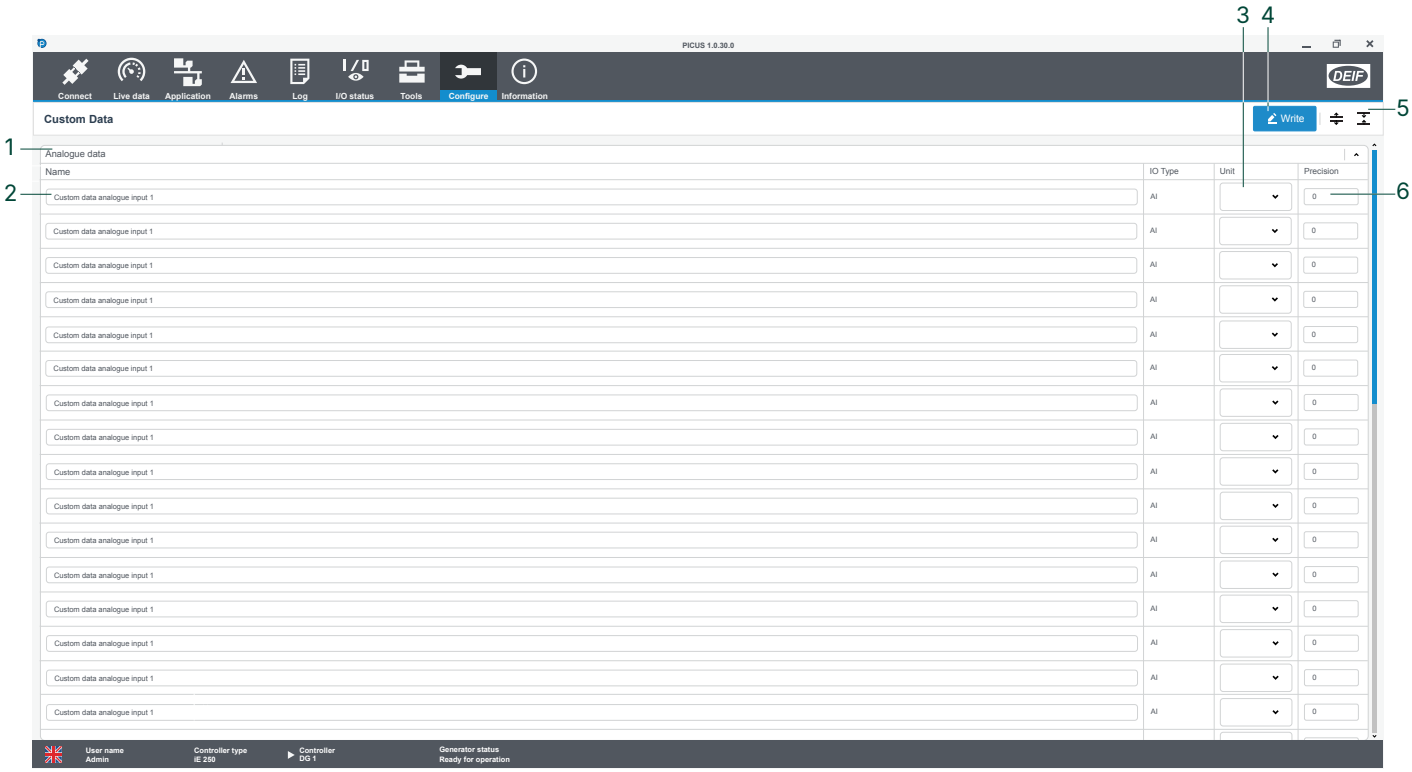
10.7.1 About custom data

You can configure *Custom data* inputs or outputs for use with CODESYS, I/O functions, Display designer, CustomLogic, or Modbus.

For example, these could be external data values that you wish to show on the *Display designer* to an operator.

- 40 Analogue inputs
- 40 Analogue outputs
- 60 Digital inputs
- 60 Digital outputs

10.7.2 Custom data page



No.	Item	Notes	
1	Custom data	Analogue or Digital custom data.	
2	Name	Configurable name for the custom data.	
3	Unit	Configurable unit of measure for the input or output.	
4	Write **Write**	Write all values to the controller.	
5	Expand all/Collapse all	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
6	Precision	Configure the number of decimal places used to represent and process the value.	

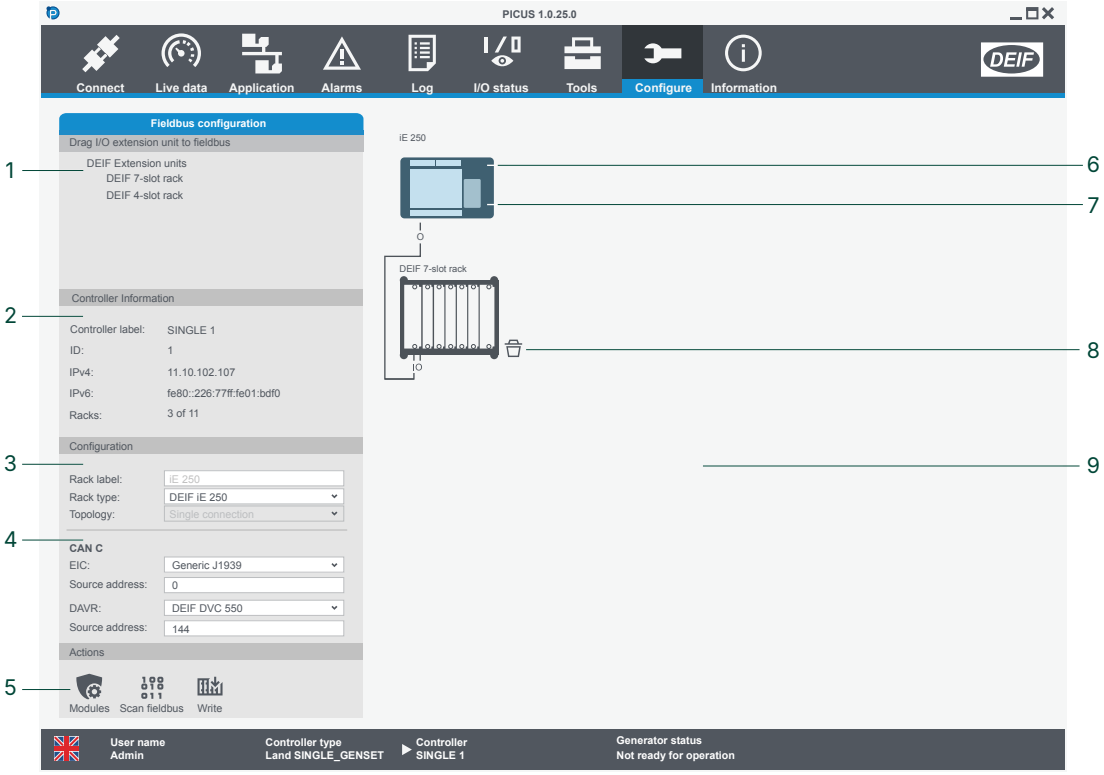
10.8 Fieldbus configuration

10.8.1 About Fieldbus

Use Fieldbus to supervise or configure Fieldbus connections to the controller. The hardware modules in the controller, extension racks, and ECU are handled as Fieldbus connections.

	Fieldbus configuration	Allows you to prepare the controller for hardware changes and confirm changes made.
	Fieldbus supervision	Allows you to troubleshoot the conflicts in the controller.

10.8.2 Fieldbus configuration page



No.	Item	Notes	
1	Fieldbus elements	Drag and drop elements to the diagram.	
2	Controller information	Shows the communication information of the controller, the number of extension units used and the information of the selected extension unit.	
3	Rack and topology configuration	Configuration information for the rack and topology.	
4	CAN bus configuration	Configure CAN protocol and source address for: • EIC (ECU) • DAVR (if supported)	
5	Actions	**Modules** to configure the modules in the selected rack.	**Scan fieldbus** to scan the configuration.
		Write changes to controller.	
6	Controller	Summary information for the connected and logged on controller.	
7	Selected fieldbus element	The rack that the Modules action and information are linked to.	
8	Delete	**Delete** the extension rack.	
9	Fieldbus diagram	Shows the Fieldbus configuration. *	

NOTE * When an ECU or DAVR is configured these are not shown on the diagram.

10.8.3 Detect setup

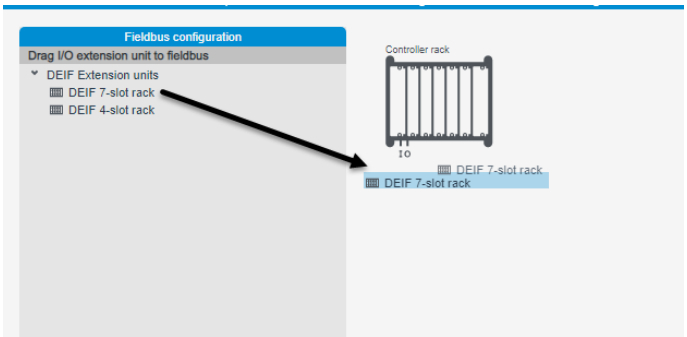
1. Select **Scan fieldbus**.
2. Select **Confirm**.
3. Select **Write** to write the changes to the controller.

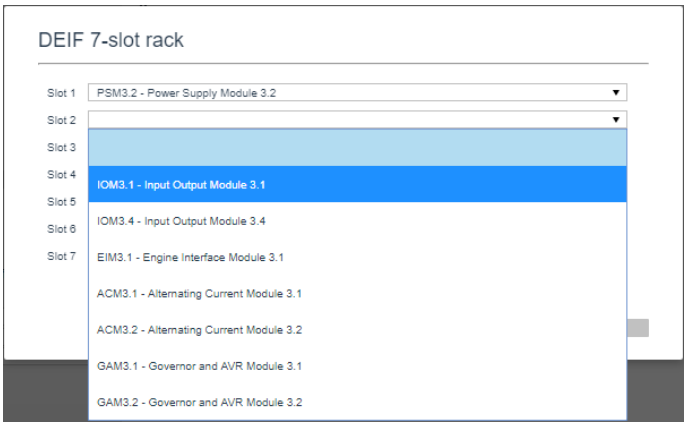
10.8.4 Add extension racks

Automatically add extension racks

1. Select **Scan fieldbus**.
2. Select **Confirm**.
3. Select **Write** to write the changes to the controller.

Manually add extension racks

1. Drag and drop the required extension rack to the fieldbus diagram.
   - 

2. Select the new rack.
3. Select **Modules**.
4. Select the modules in the rack from the selection box:
   - 

5. Select **Accept**.
6. Optional: Enter the Label with a unique name for the new rack.
7. Select **Write** to write the changes to the controller.

10.8.5 Add an ECU

1. Select the controller to configure.
2. Select the CAN protocol from the selection list.
3. Change the source address if needed, the default is address **0**.
4. Select **Write** to write the changes to the controller.

The controller can now connect to the ECU for control, reading information, assigning functions in input/output, I/O status, Live data, alarms, and logs.

More information
See the **Engine interface communication** manual for information about the supported engines and protocols.

10.8.6 Add a DVAR

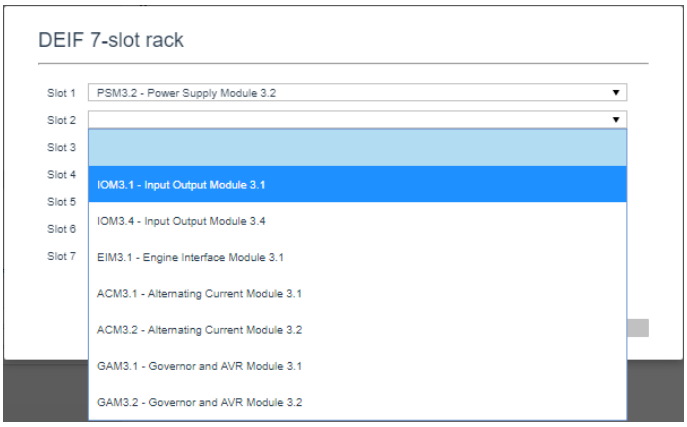
1. Select the controller to configure.
2. Select the DAVR from the selection list.
3. Change the source address if needed.
4. Select **Write** to write the changes to the controller.

10.8.7 Configure fieldbus

Change connection topology

1. Select the topology from the selection.
   - **Redundancy connection**
     - A network ring connection between the controller and extension racks.
     - The last rack in a network chain is connected back to the controller.
   - **Single connection**
     - A network chain connection between the controller and extension racks.
     - A single connection from one rack to the next.
2. Select **Write** to write the changes to the controller.

Change modules

1. Select the rack to configure.
2. Select **Modules**.
3. Select the modules in the rack from the selection box:
   - 

4. Select **Write** to write the changes to the controller.

Change rack name

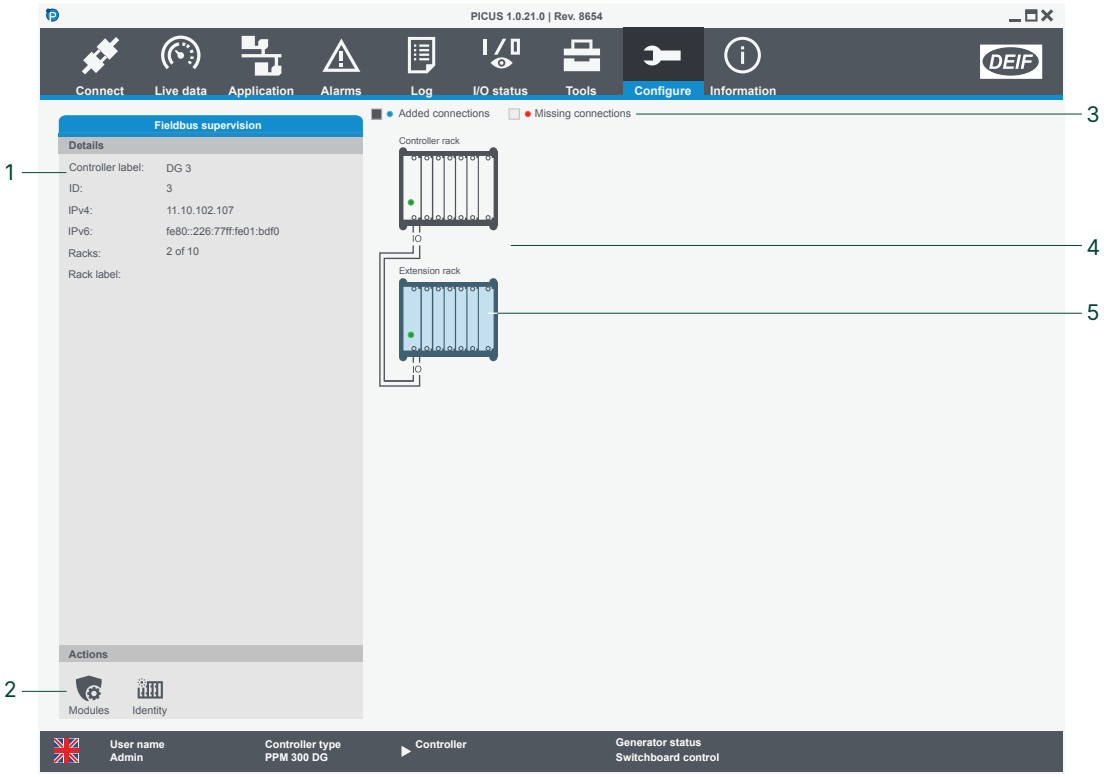
1. Select the rack to configure.
2. Select the Label field and enter the new name for the rack.
   - The default name for the rack is written in grey text if the rack does not have a custom name.
3. Select **Write** to write the changes to the controller.

Change rack type

1. Select the rack to configure.
2. Select the Rack type from the selection.
3. Select **Write** to write the changes to the controller.

10.9 Fieldbus supervision

10.9.1 Fieldbus supervision page



No.	Item	Notes	
1	Details	Shows the communication information of the controller, the number of extension units used and the information of the selected extension unit.	
2	Actions	**Modules** to show the modules in the selected rack.	**Identify** supported controller.
3	Show or hide connections	**Added connections:**	
		Hide added connections.	**Show** added connections.
		Missing connections:	
		Hide missing connections.	**Show** missing connections.
4	Fieldbus diagram	Shows the Fieldbus configuration.	
5	Selected fieldbus element	The rack that the Modules action and information are linked to.	

10.9.2 Identify hardware

1. Select the controller or extension rack that you want to identify.
2. Select **Identify**.
   - The controller or extension rack now performs an identification cycle.
   - The identification LED now flashes.
   - The LED repeats a cycle of fast, medium, and slow flashing.
   - The flashing ends after 30 seconds.

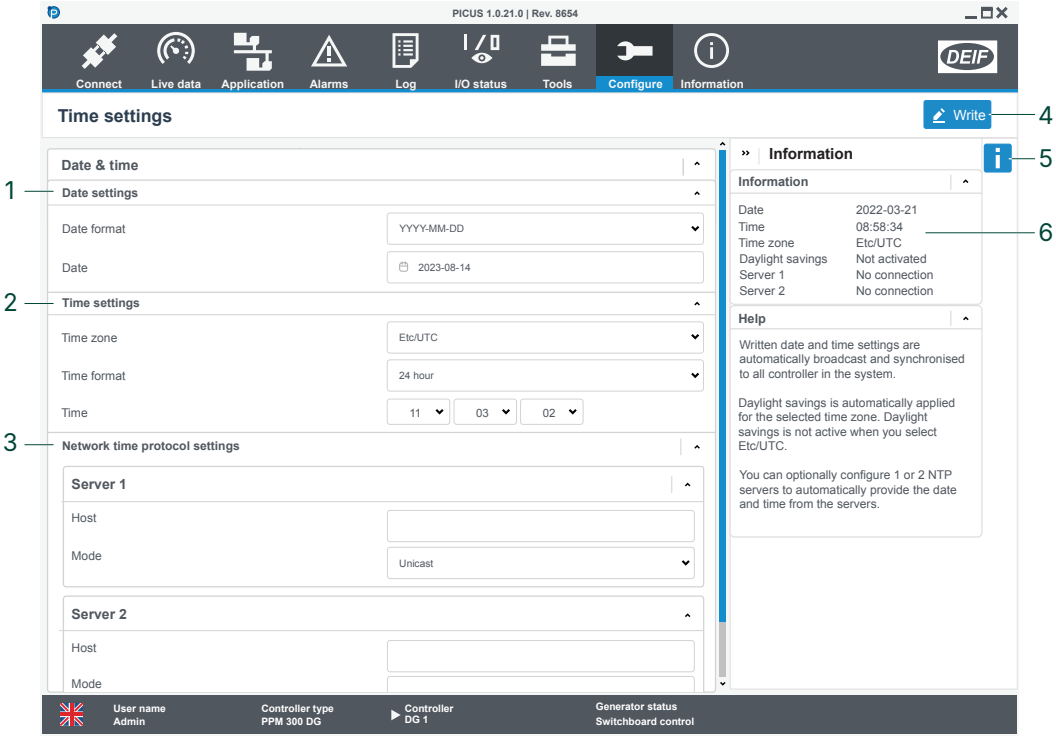
10.10 Time settings

10.10.1 About Time settings

The correct date and time settings are important for operation and for the recorded events. You can configure the date and time settings manually, or use a Network Time Protocol (NTP) server to synchronise the time settings.

More information
See **Date and time** in the **Designer's handbook** for how the time settings and NTP servers work.

10.10.2 Time settings page



No.	Item	Notes
1	Date settings	Settings to change date format and date.
2	Time settings	Settings to change time zone, time format, and time.
3	Network time protocol settings	Settings to change the network time protocol servers.
4	Write	Writes and broadcasts the settings to the controller(s).
5	Information	Show or hide the parameter information.
6	Controller date and time	Current date and time from the controller or offline project.

10.11 Communication

10.11.1 About communication

The controller can use either IPv6 or IPv4 addresses to communicate over the Ethernet connection. Some products can configure the Ethernet ports for specific types of connection. The network mode can also be configured for the network topology.

You can run an identification of the controller to help you identify the connected controller rack.

Configure settings for:

- Controller ID.
- IPv4 address.
- DNS servers.
- Network mode.
- Ethernet ports.

Changes to the communication settings require the controller to be powered off and on.

DANGER!

Controller power supply / Access to installation

The power to the controller must be powered off and on. Only authorised personnel who understand the risks with accessing the controller power supply or installation area should do this.

Take extreme care in the enclosure next to the AC terminals. Make sure the controller is not running and in operation. The controlled breaker must be open before you power off and on the controller.

NOTICE

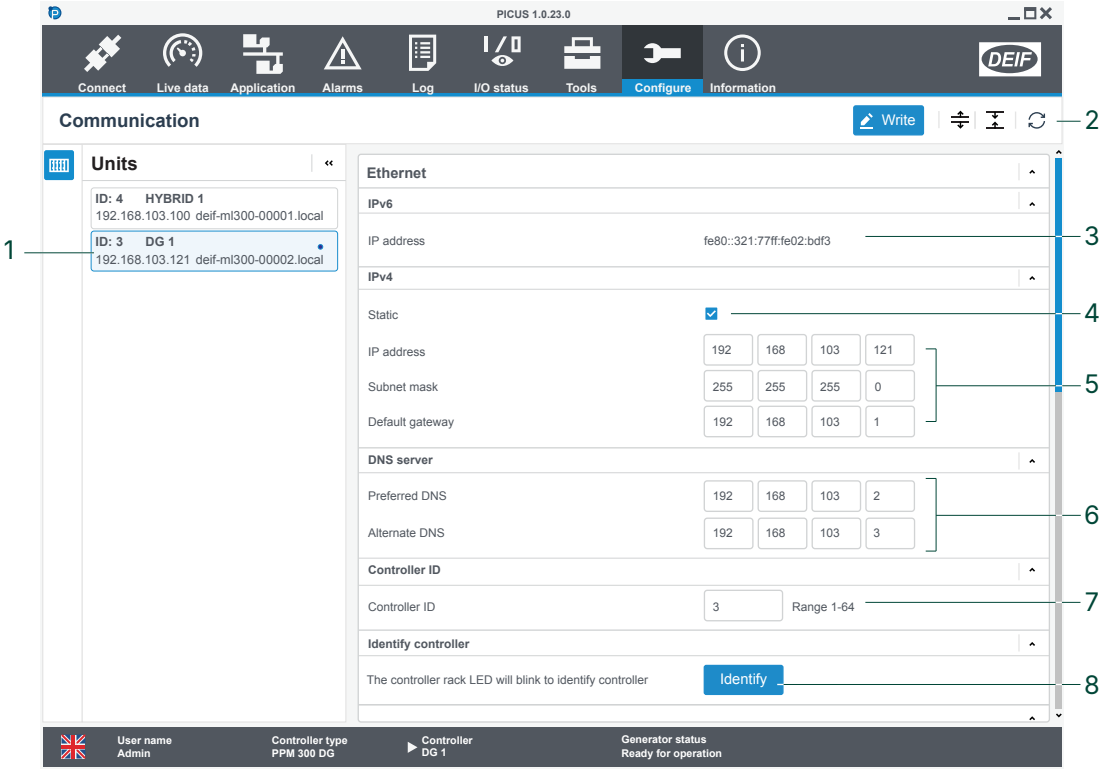
Cybersecurity

The DEIF controllers do not include a firewall or other Internet security measures.

It is the customer's own responsibility to protect the network. DEIF therefore recommends only connecting the controllers to local networks.

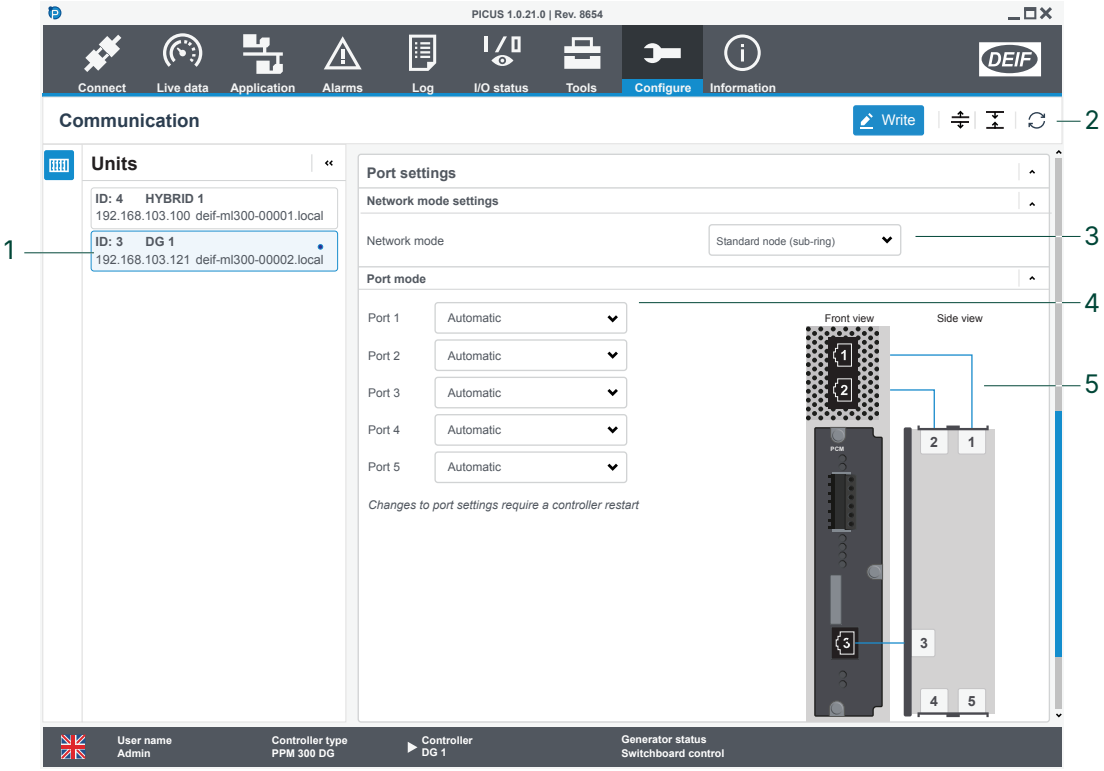
More information
See **DEIF Ethernet network** in the **Designer's handbook** for network .

10.11.2 Communication - Ethernet settings



No.	Item	Notes	
1	Controller list	List of all logged on and connected controllers.	
2	Actions	Write changes to the controller.	
		Expand all : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
		Refresh : Reload communication settings.	
3	IPv6	The IPv6 address of the selected controller.	
4	Static IPv4	**Enabled** uses IPv4 address settings.	**Not enabled** .
5	IPv4 settings	IPv4 address for the controller. Subnet mask address. Default gateway address.	
6	DNS server settings	Preferred DNS address (primary). Alternate DNS address (secondary).	
7	Controller ID	The controller ID of the selected controller.	
8	Additional actions	Use **Identify** to start the identification of the controller.	Use **Reset** to clear any unwritten changes.

10.11.3 Communication - Port settings



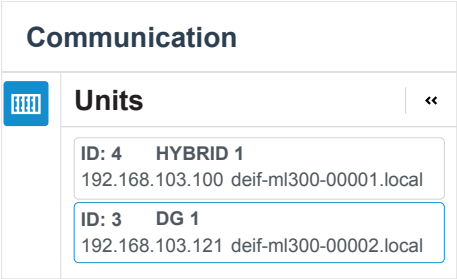
No.	Item	Notes	
1	Controller list	List of all logged on and connected controllers.	
2	Actions	Write changes to the controller.	
		Expand all : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
		Refresh : Reload communication settings.	
3	Network mode	Select the network mode for the connection in the network topology.	
4	Port mode	Select the port mode for each Ethernet port.	
5	Connections	Diagram shows where the Ethernet ports are located on the controller.	

10.11.4 Identify controller

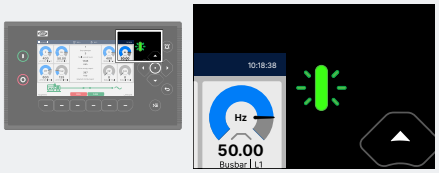
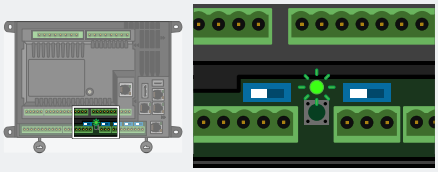
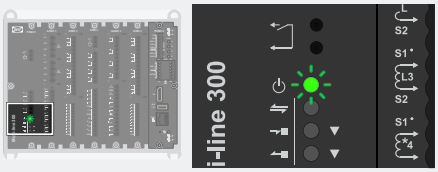
If you need to identify the controller rack that you are connected to, you can locate the controller rack by using **Identify**. This flashes either the Status or Power LED depending on the controller product.

To run the identification cycle

1. Select the controller from the controller list.



2. Select Identify.

For iE 250		For iE 350 or ML 300
Front-mounted	**Base-mounted**	**Base-mounted**
Status LED flashes 	Status LED flashes 	PSM Power LED flashes 
The LED repeats a cycle of fast, medium, and slow flashing. The cycle ends after 30 seconds.		

10.11.5 Configure communication settings

Configure IP address settings

Use **Static** for IPv4 address communication.

Configure **IPv4 address**, **Subnet mask**, and **Default gateway**.

You can configure a **Preferred DNS** or **Alternate DNS** server.

Configure controller ID

The controller must be configured with the same **Controller ID** as used on the application.

Configure the **Controller ID** from the range 1 to 64.

Configure network mode

You can select the necessary network mode:

- Standard node (sub-ring)

More information
See the **Designer's handbook** and **Installation instructions** for the supported network topologies.

Configure Ethernet port settings

For each Ethernet port you can assign the type of connection:

- Automatic
- External network/PICUS
- Stand-alone - External configured
- RSTP External
- Disabled *

NOTE * One port must always remain active.

Update communication settings

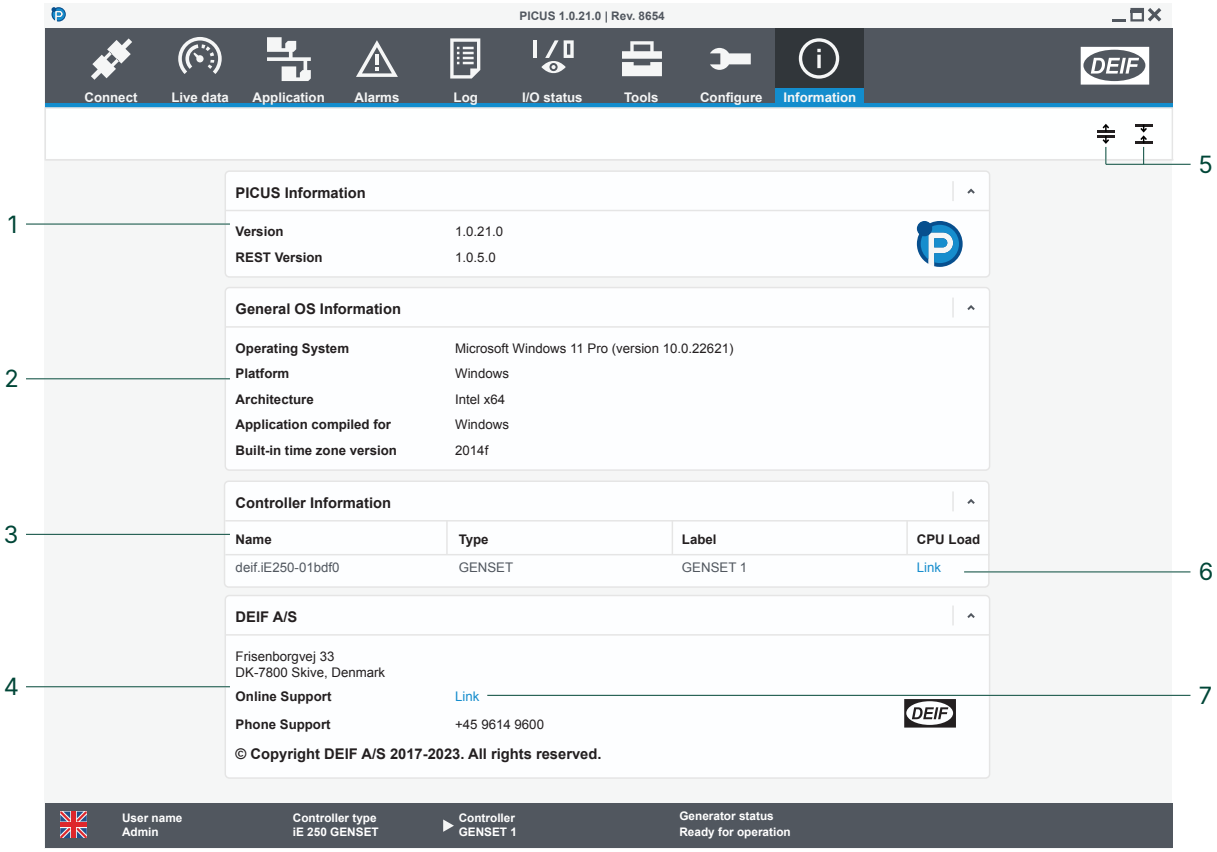
Use **Write** to update the controller's communication settings.

The controller rack must be powered off and on for the changes to take effect.

11. Information

11.1 About page

The About page provides information about PICUS, the operating system, and connected controllers. It can also be useful if you need to contact DEIF support for assistance.



No.	Item	Notes	
1	PICUS Information	PICUS version. Highest version of REST supported by PICUS.	
2	General OS information	Shows details of your computer's operating system.	
3	Controller information	Shows details for the connected and logged on controllers.	
4	Contact and support	Shows DEIF's contact and support information, with a direct link to the DEIF helpdesk.	
5	List controls	**Expand all** : Expands all items in the list.	**Collapse all** : Collapses all items in the list.
6	CPU Load Link	Links to a web page with an overview of the CPU load.	
7	Support Link	Links to the DEIF Online Helpdesk.	

12. Troubleshooting

12.1 Troubleshooting

General troubleshooting

Problem	Cause	Solution
PICUS cannot see any controllers on the **Connect** page.	Ethernet cable is not connected between PICUS and the controller.	Connect an Ethernet cable between your PC and the controller.
	Ethernet cable is damaged.	Replace the Ethernet cable.
	IPv6 not enabled on PC Ethernet adapter	Open Ethernet adapter settings and enable IPv6.
	IPv6 restricted	Make sure there are no restrictions on IPv6 on your connection/network.
	Incorrect controller port settings	Check the Ethernet port settings, see Communication settings.
PICUS cannot see some controllers on the **Connect** page.	Duplicate IPv4 address	1. Make sure there are no duplicate IPv4 addresses on other controllers or in your network. 2. Isolate the missing controller from all other Ethernet connections 3. Connect your PC directly to the controller. 4. Configure the Communication settings. 5. Power cycle the controller.
PICUS cannot connect to controllers listed on the Connect page.	Ethernet cables are not connected between PICUS and the controllers.	Connect an Ethernet cable between your PC and the controller.
	Ethernet cable is damaged.	Replace the Ethernet cable.
	IP address configured incorrectly.	Check the Ethernet port settings, see Communication settings.
	Old version of PICUS	Make sure you are running the latest version of PICUS, download the latest version from: https://www.deif.com/software/?product=17615 .
PICUS notifications are not shown on the display.	The computer has been locked and then unlocked.	• Press and hold **Alt**, then press **Tab** to cycle through open windows. • Press **Windows** + **D** to cycle through open windows.
Firmware update fails to complete.	Firmware update prerequisites are not met.	1. Power off and on the controller rack. 2. Make sure all prerequisites are met. 3. Update the firmware again.
	Firmware update failed or got stuck.	1. Power off and on the controller rack. 2. Launch PICUS, and with the controller selected, use the **Initial DL** option to update the firmware.
PICUS unable to locate previously saved files.	Files were saved on a network drive.	Move the files to a local drive.
A broadcast failed.	Ethernet cables are not connected between PICUS and the controllers.	Connect the Ethernet cables correctly.
	Ethernet cable is damaged.	Replace the Ethernet cable.

NOTE * DEIF is not responsible for external links or content.

Fieldbus troubleshooting

Problem	Cause	Solution
Fieldbus connection is missing	The cable between two racks is plugged into the same port type.	Change the *Topology* field to *Single connection*.
	Fieldbus *Topology* is set to *Redundancy connection*, but the wiring is a single connection.	Change the *Topology* field to *Single connection*.
	The cable for the highlighted missing connection is unplugged.	Connect the cable.
	The cable for the highlighted missing connection is damaged.	Replace the cable.
Fieldbus conflict	Fieldbus *Topology* is set to *Single connection*, but the wiring is a redundant connection.	Change the *Topology* field to *Redundant connection*.
	Hardware modules are removed from the unit.	Correct the fieldbus configuration.
	Hardware modules failed.	Correct the fieldbus configuration.
	Hardware modules added to the unit.	Correct the fieldbus configuration.
Fieldbus connection missing, and Fieldbus conflict	The module power supply is not connected.	Connect the power supply correctly.
	The module power supply is damaged.	Replace the power supply.
	Single connection topology: The cables are unplugged.	Connect the cables correctly.
	Single connection topology: The cables are damaged.	Replace the cables.
	The controller powered up before the extension unit powered up.	Remove the controller power, then restore the controller power.
Fieldbus config. changed.	A new extension unit was connected to the controller.	Update the fieldbus configuration to include all the connected extension units.
	The hardware modules were swapped and **I/O configuration - Module** parameter was set to *Locked to position*.	1. Place the hardware modules correctly in the rack. 2. Correct the fieldbus configuration.
Fieldbus configuration exceeded maximum I/O configuration	The number of inputs and outputs in the Fieldbus configuration exceeds the maximum for the unit.	Correct the fieldbus configuration.
AC protections not running, and System not OK	A new **EtherCAT** connection was plugged into the EtherCAT port while the controller did not have power.	Acknowledge the alarms and reset the latch on the *System not OK* alarm. The controller should now operate normally. Optional: To find the new EtherCAT connection for configuration, use **Configure > Fieldbus configuration > Scan fieldbus**.
	A new **Ethernet** connection was plugged into the EtherCAT port while the controller did not have power.	1. Remove the Ethernet connection from the EtherCAT port. 2. Wait about one minute. 3. Acknowledge the alarms and reset the latch on the *System not OK* alarm. The controller should now operate normally.