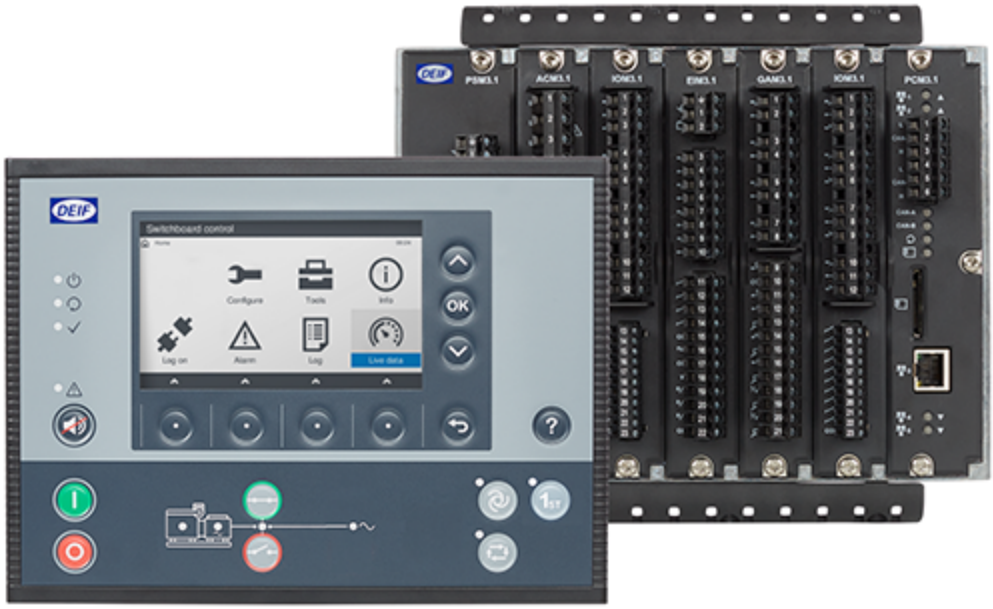
PICUS MANUAL

PPM 300

Protection and Power Management



8. I/O status

9. Tools

10. Tools - Advanced

11. Configure

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 PPM 300 system.

You can find other technical documentation for PPM 300 on deif.com.

1.2 Software versions

The information in this document corresponds to the following software versions.

PPM 300 Software versions

Software	Details	Version
PCM APPL	Controller application	1.0.15.x
DU APPL	Display unit application	1.0.15.x
PICUS	PC software	1.0.15.x

1.3 Symbols for general notes

NOTE This highlights general information.

More information
This highlights where you can find more information.

Example

This shows an example.

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

1.4 Technical support

If you need technical support:

1. Help:
   - The display unit includes context-sensitive help.
2. Technical documentation:
   - Download relevant technical documentation from www.deif.com/documentation.
3. Support:
   - DEIF offers 24-hour support.
   - See www.deif.com for contact details, there may be a DEIF subsidiary located near you.
   - You can also e-mail support@deif.com.
4. Service:
   - DEIF engineers can help with design, commissioning, operating and optimisation.
5. Training:
   - DEIF regularly offers training courses at the DEIF offices worldwide.

You can read more about service and support options on www.deif.com.

1.5 Safety during operation

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

DANGER!
Do not use PICUS to change the controller configuration during operation. PICUS does not include all the safeguards required by 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.

- **Conflicting configurations**: If two conflicting configuration changes are made from PICUS and the display unit 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.
- **Conflicting commands**: If two conflicting 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 information

Settings can be **Broadcast** different pages in PICUS:

- Permissions
- Single-line
- Parameters
- Restore configuration

NOTICE
Broadcast with PICUS Broadcasting in PICUS to selected controllers can be overridden 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.

NOTICE
Warranty The DEIF equipment must not be opened by unauthorised personnel. If opened, the warranty is void. You may remove, replace, or add a hardware module to the controller rack without losing the warranty. However, you must follow DEIF's procedure.

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

Power **I**n **C**ontrol **U**tility **S**oftware
PICUS for short.

PICUS is the PC software utility interface to configure, commission, and supervise PPM 300 controllers.

PICUS features:

- Create and maintain users and permissions.
- Configure and commission.
- CustomLogic.
- Create and maintain the application single-line diagrams.
- Send commands.
- Supervision (read out) of data and information.
- Live data information.
- Alarm handling.
- Emulation of the system.
- Fieldbus configuration and supervision.
- I/O status for all hardware.
- Record and view trending based on values.
- Update and apply firmware.
- Create and restore backup files.
- Open and configure settings with an offline project.

Some special characters may not be supported by PICUS.

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.

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

2.2 System requirements

Table 2.1 PICUS requirements

Component	Requirements	Notes
Operation system	Windows version 7, 8.1 Professional or 10	Service pack 1 or above
Free disk space	• 300 MB for PICUS installation • 5 MB for *Bonjour* installation • 2 GB or more of free disk space	*Bonjour* is not installed as part of the PICUS installation
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 1024 x 768 pixels	

Component	Requirements	Notes
Display	Graphics hardware acceleration requires a DirectX10 graphics card	
Browser	• Internet Explorer 8, 9, 10, or 11 • Mozilla Firefox 10.x or later • Apple Safari 5 • Google Chrome 17.x	
PDF save	PDF document software	Creates PDF document from the report data
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

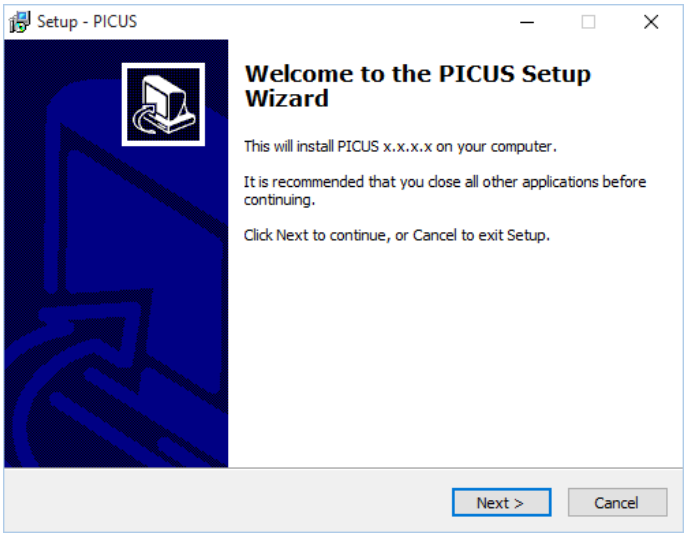
Download PICUS from https://www.deif.com/software/multi-line-300-picus-ver-1-x-x.

PICUS uses *Bonjour* to see the device on the DEIF network. Refer to Apple's support page for *Bonjour*, for information and downloading: https://support.apple.com/.

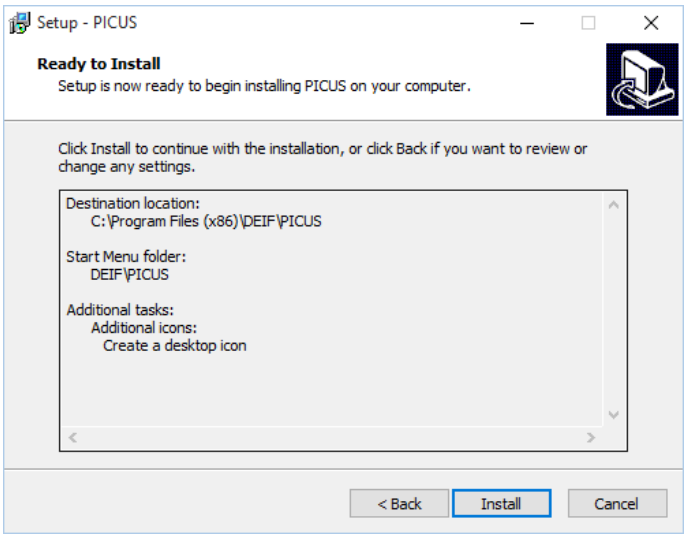
Install

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. To start the installation, select **Install**.



4. After PICUS is installed, select **Finish** to complete the installation.

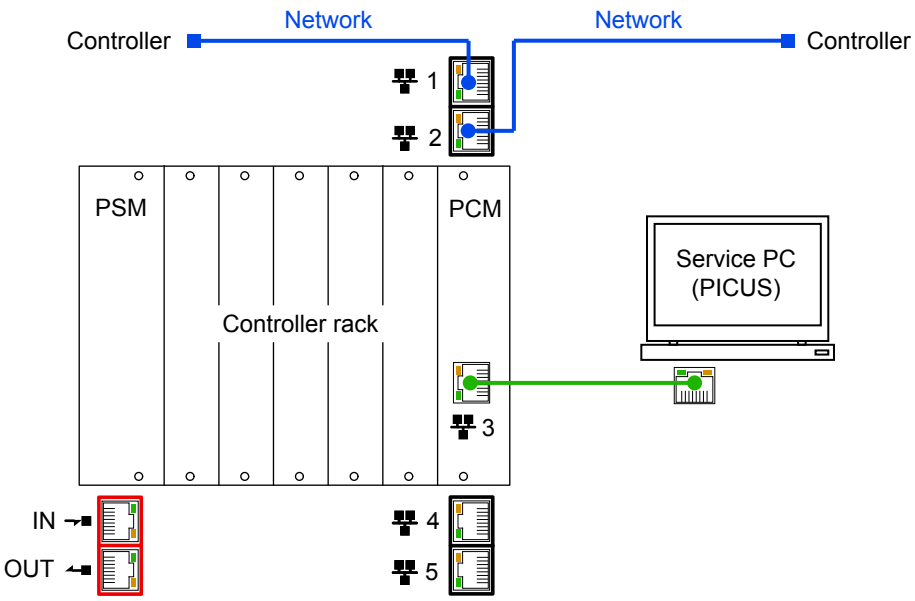
2.4 Connect

Connect your computer with an Ethernet cable directly to a controller rack port configured as **Automatic** or **External network/ PICUS**. Do **not** connect via a network or USB adapter, as this may cause loss of communication.

The connected controllers communicate with each other over the Ethernet network. You can connect to any controller in a network by plugging into any other controller on the same network.

Do **not** use any of the red internal communication ports on the PSM module. These can **not** connect to a computer.

We recommend to use PCM port 3, as this is easy to access when the rack is installed in a switchboard.



NOTE 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 to connect the controllers to local networks.

More information
See **Hardware characteristics and configuration**, **DEIF Ethernet network** in the **Designer's handbook** for more information about communication possibilities and Ethernet cable requirements.

More information
See **Communication** in this document for more information about how to configure the communication settings.

More information
If you are unable to see any controllers on the Connect page, see **Troubleshooting**, **Connections** for more information and assistance.

2.5 Launch

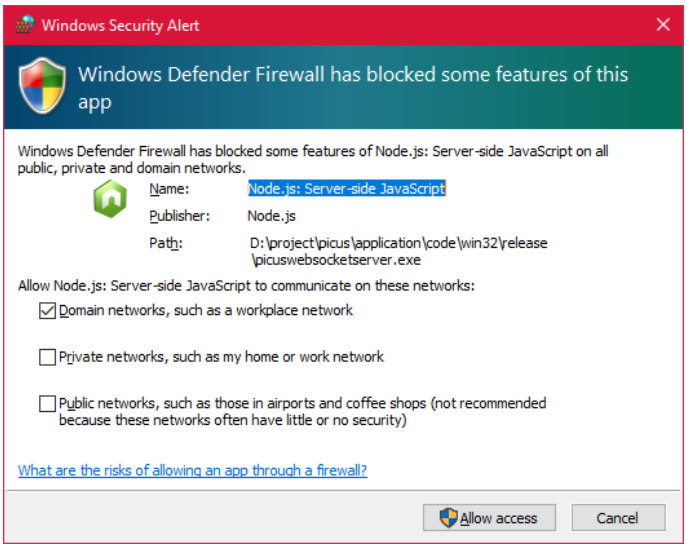
Launch PICUS from the installed folder or from the desktop icon .

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.

Security notification

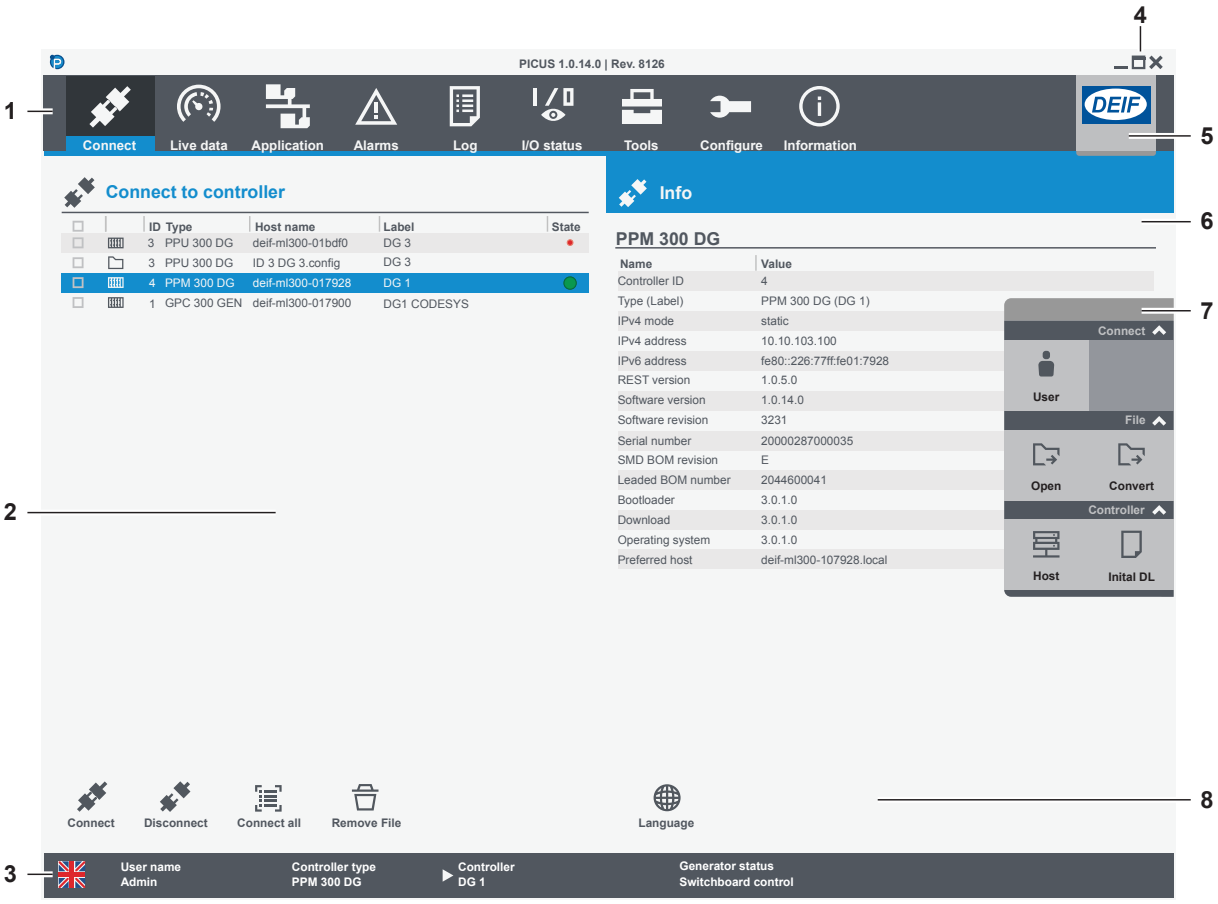
If a *Windows User Account Control* (UAC) notification shield is shown, select *Yes* to launch PICUS.

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**.

2.6 Screen layout

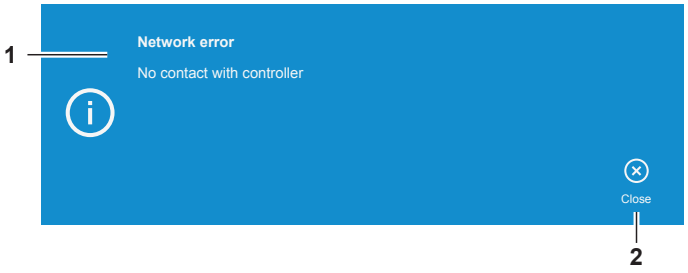


No.	Item	Notes	
1	Page menu *	Selects a page:	
		Connect or disconnect controllers.	**Live data** information.
		Application to access Configuration, Supervision, or Emulation. *	**Alarms** list. * • Box [number] indicates active alarms must be acknowledged.
		Log information during operation. *	**I/O status**.
		Tools. *	**Configure** or view settings. *
		Views about information.	
2	Page content	Content for the selected page.	
3	Status bar	Shows language, user name, controller type, connected controller label, and generator status.	
4	Window controls	Minimise, maximise, or close PICUS.	
5	About information	Views about information.	
6	Additional page content	Additional information for the selected page.	
7	Right side panel	Additional menus or actions for the selected page.	
8	Page actions	Shows the page actions.	

NOTE * These pages can be restricted by user permissions.

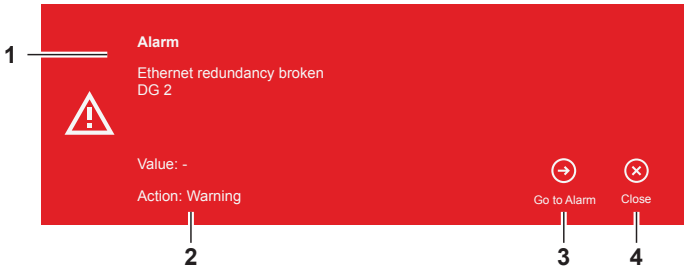
2.6.1 Notifications

You can be advised about events that occur with a blue notification window.



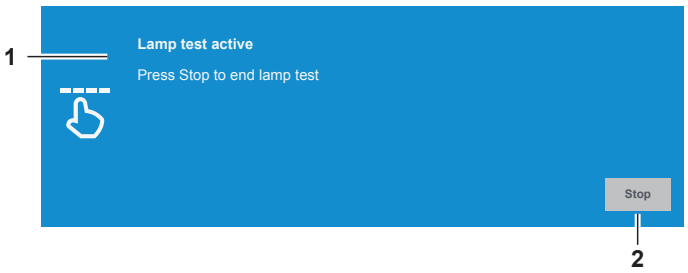
No.	Item	Notes
1	Information details	Description of the information.
2	Close	Close ⊗ the notification window.

If an alarm is activated in the system, you are advised with a red notification window.



No.	Item	Notes
1	Alarm details	Description of the alarm that occurs.
2	Value	Value and action for the alarm.
3	Go to alarm	Go to alarm ⊙ page to view the alarm(s).
4	Close	Close ⊗ the notification window.

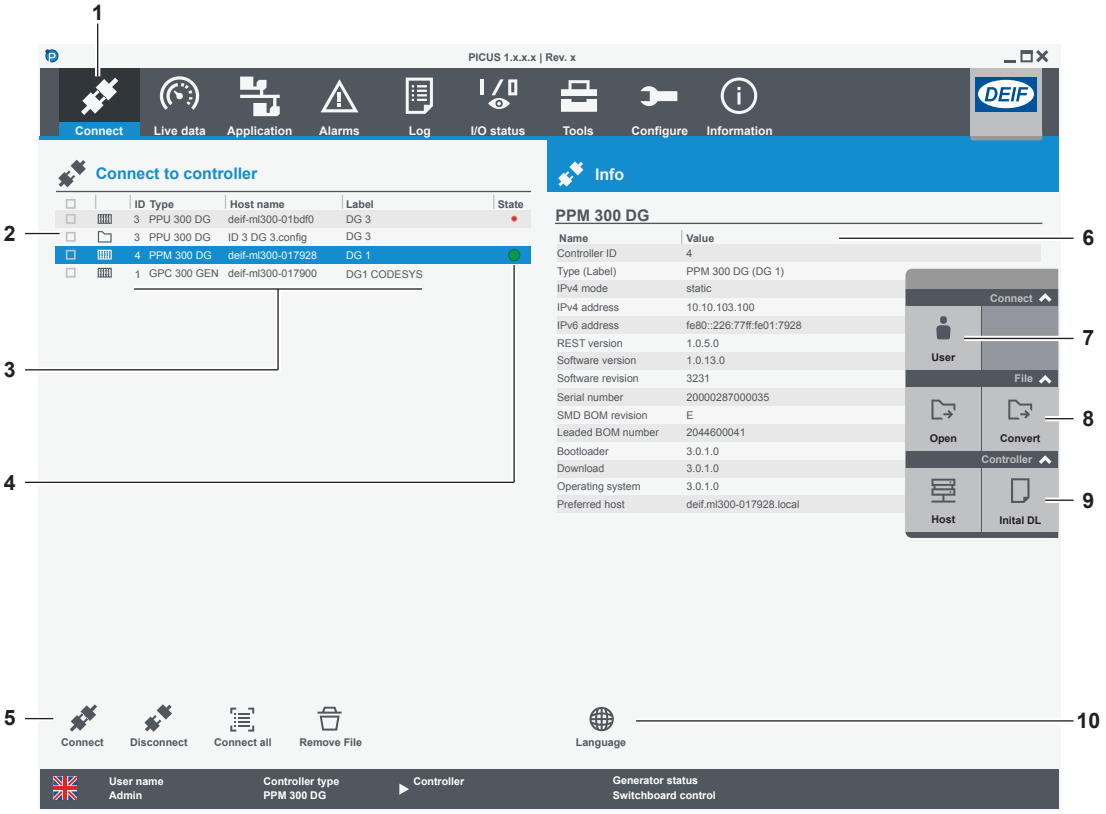
Messages can be shown on the display.



No.	Item	Notes
1	Message	Description of the message.
2	Soft key	Example, press **Stop** to end the action and close the message window.

3. Connect

3.1 Connect page



No.	Item	Notes	
1	Connect page	Connect/disconnect controllers, open/convert files, connect host, or initial firmware download.	
2	Controller list	List of available controllers or previously opened local files.	
3	Controller information	Controller ID, Type, Host name, and Label	
4	Connection state	**Blank** Controller available, but not connected.	**Small green dot** • Logged on.
		Large green dot • Logged on and connected.	**Red dot** • Not available or in Service mode.
5	Connection options	**Connect** to selected controller.	**Disconnect** from all controllers.
		Log on to **All** controllers.	**Remove file** from list.
7	Connection options	Change **User** logged on.	
8	File options	**Open** a backup or configuration, or folder.	**Convert** a file: • Backup file to configuration file or folder. • Folder to configuration file.
9	Actions	Connect directly to a known **Host**.	Start **Initial DL** of firmware to controllers. *
10	Language option	Change **Language**.	

NOTE * Initial download is only for controllers stuck in Service mode. For all other upgrades use the Firmware page.

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** from the right side panel.
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.

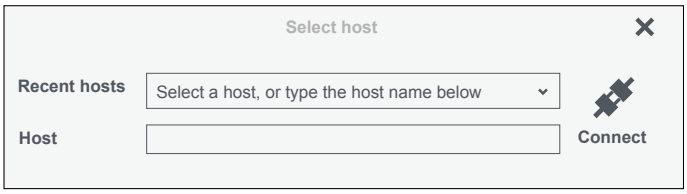
To convert a file:

1. Select **Convert** from the right side panel.
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 directly to a known or previously connected host:

1. Select **Host** from the right side panel.
   - A prompt is shown on screen:
   - 

2. Enter the host name or 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.

If a firmware update has failed, the System status LED on the PCM3.1 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.

NOTE **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.

Apply an initial download to one controller at a time:

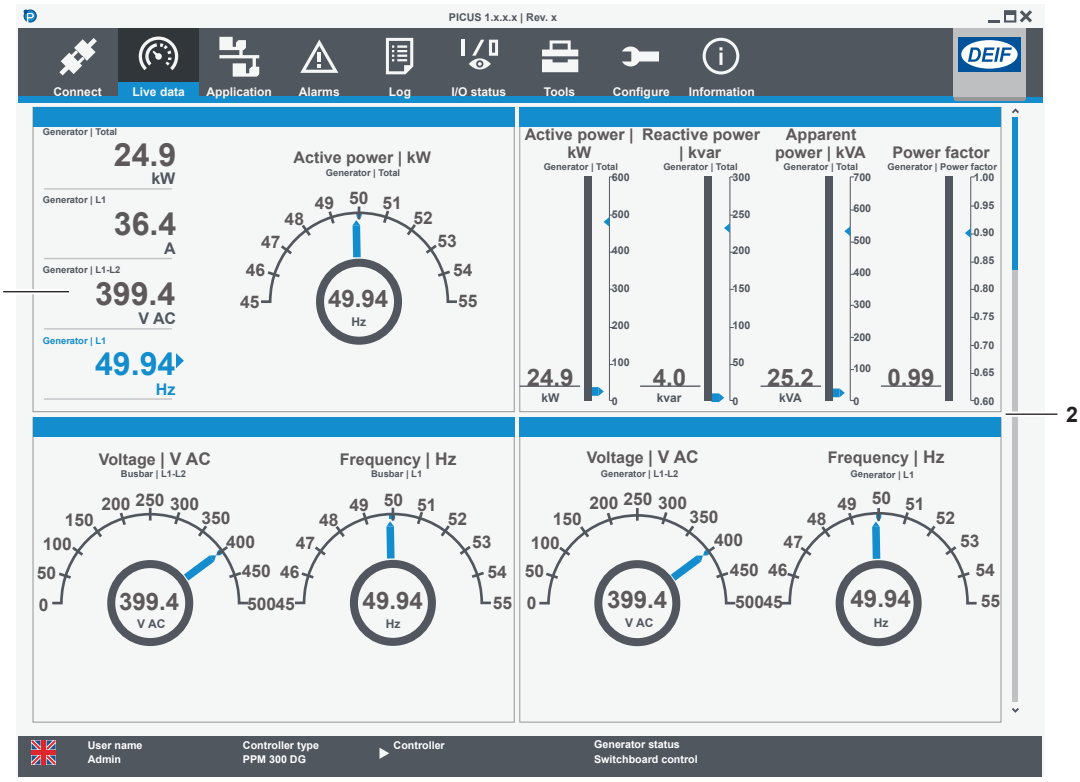
1. Select the required controller from the list.
2. Select **Initial DL** from the right side panel.
   - The firmware page is displayed.
3. Select again the required controller and the firmware package to apply.

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 (see **Technical support**).

4. Live data

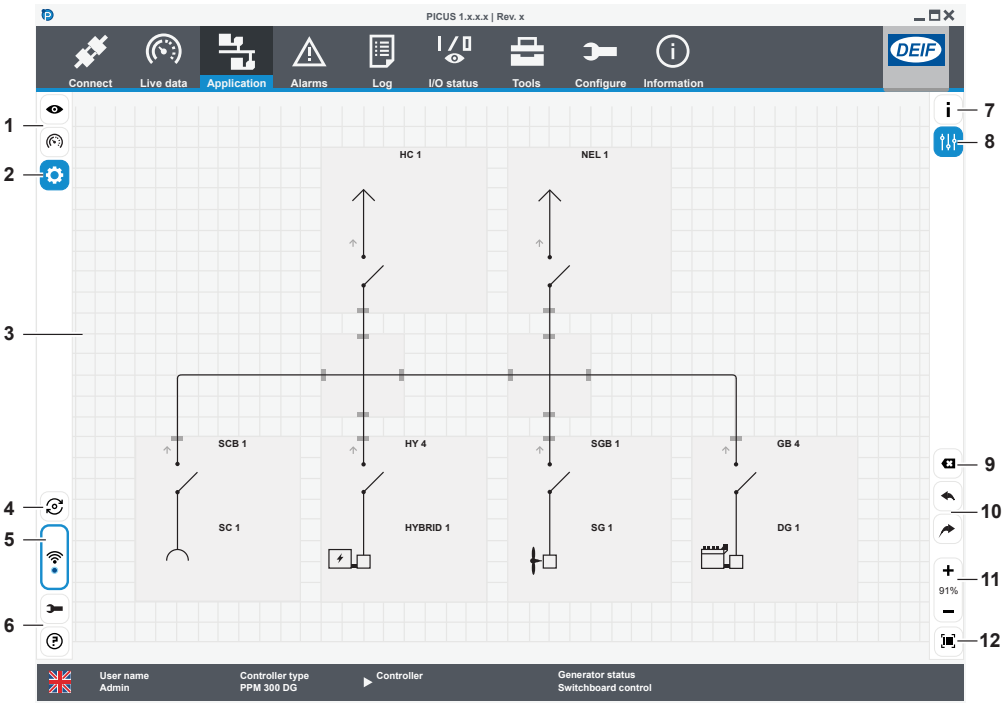
4.1 Live data page



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 Application configuration page



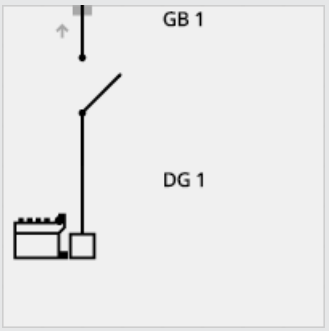
No.	Item	Notes	
1	Supervision or Emulation	**Supervision** : Changes to supervision page.	**Emulation** : Changes to emulation page.
2	Configuration	Use **Configuration** to add equipment to the diagram.	
3	Single-line diagram	Shows the equipment and connections for the application.	
4	Reload	**Reloads** the diagram from the controller.	
5	Broadcast	**Broadcasts** the application to the selected controllers.	
6	Application settings	**Settings** : Shows settings for this page.	**User guide** : Shows keyboard short-cuts.
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 single-line 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 diagram to fit the page.	

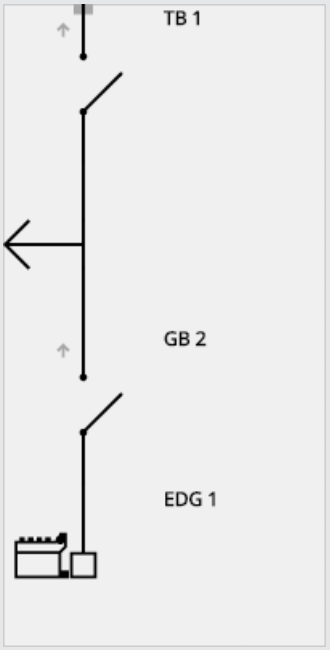
All controllers must have a controller ID assigned before you can configure a single-line diagram. Alarms occur if the single-line diagram does not match the connected equipment.

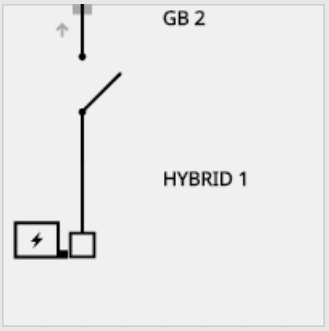
5.1.1 Equipment

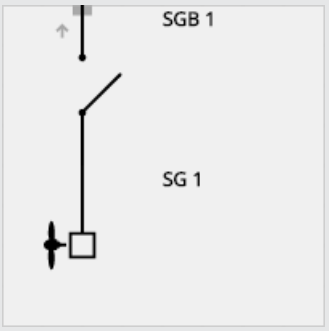
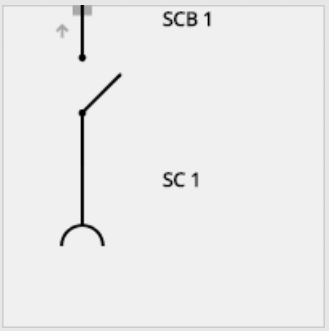
Controllers

GENSET controller (DG)		Controls the genset and its generator breaker.
EMERGENCY genset controller (EDG)		Controls the emergency genset, generator breaker and tie breaker.
HYBRID controller		Controls the hybrid inverter and breaker.

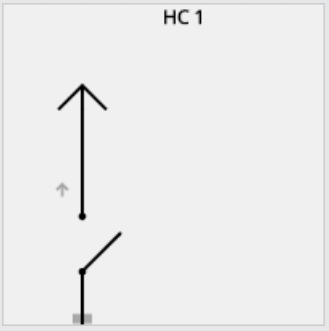


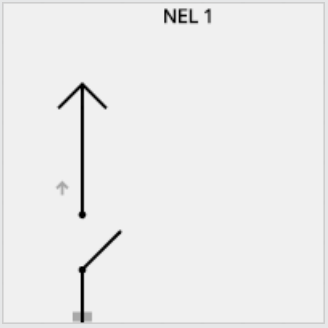




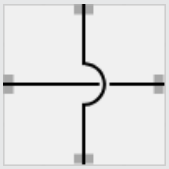
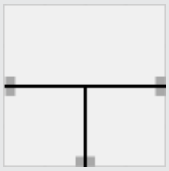
SHAFT generator controller (SG)		Controls the shaft generator breaker. Can also be externally controlled.	
SHORE connection controller (SC)		Controls the shore connection breaker. Can also be externally controlled.	
BUS TIE breaker controller (BTB)		Controls the bus tie breaker. Can also be externally controlled. If two BUS TIE breaker controllers are present in the system, you can also configure the ring busbar option.	

Load

Heavy consumer (HC)		A load that requests power reservation before it is connected. The power management system ensures that there is enough available power for the heavy load.	

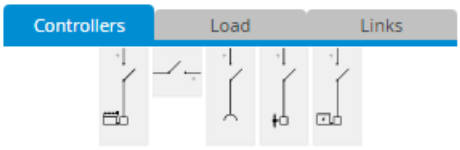
Non-essential load (NEL)		A load that is disconnected to protect the busbar against imminent blackout.	

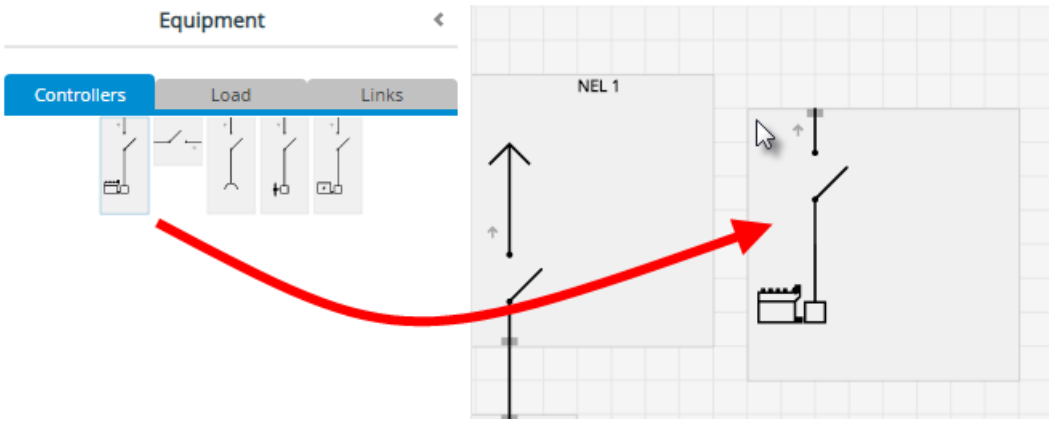
Links

Intersection jumpover		Connects two pieces of equipment without joining them all together.	
Intersection cross		Connects four pieces of equipment together.	
Intersection T-cross		Connects three pieces of equipment together.	

5.1.2 Configure application diagram

Add equipment

1. Open the **Configuration panel** .
2. Select **Equipment**.
3. You can select the type of equipment you want to add:
   - 
4. Select and drag the equipment on to the single-line diagram:



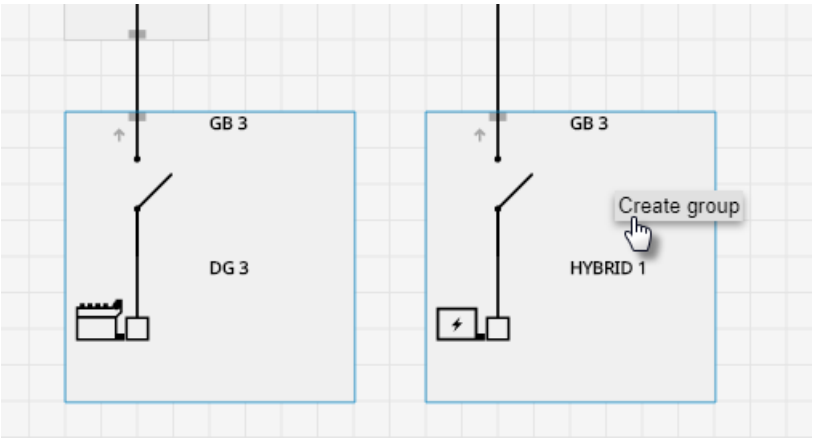
- You can add multiple equipment of the same type at the same time by double-clicking in different places on the diagram.

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

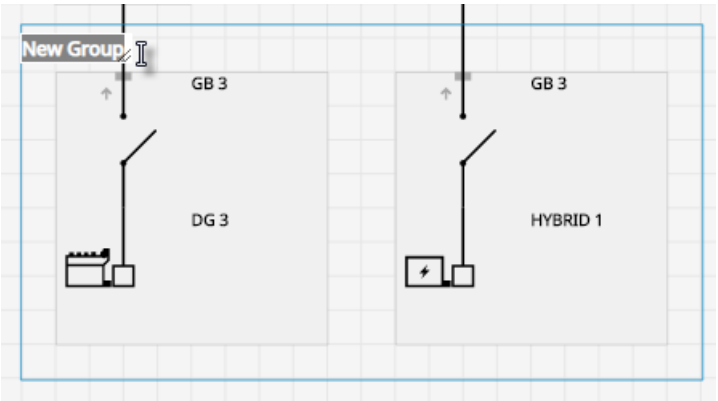
Group or ungroup equipment

Group equipment:

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

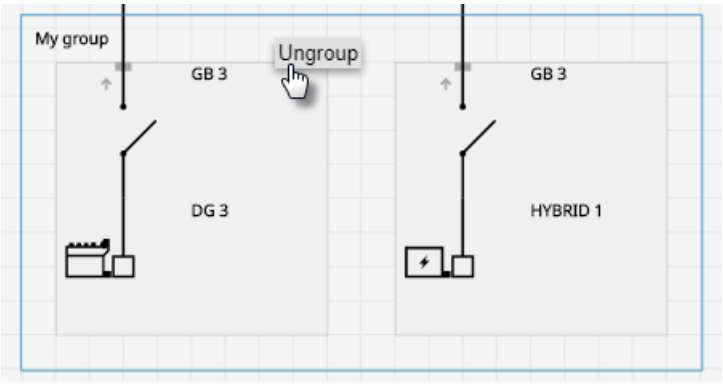


3. You can also give the group a name by double-clicking the group name:



Ungroup equipment:

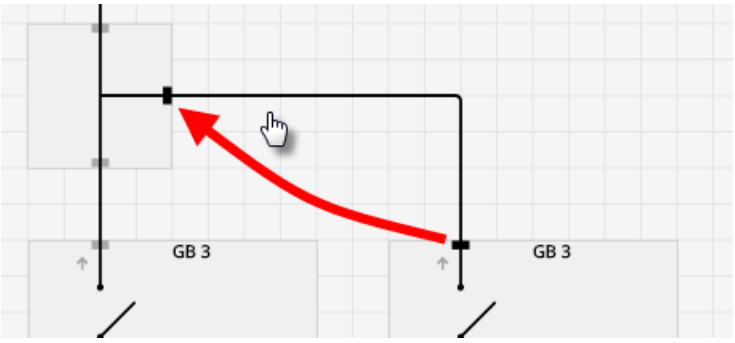
1. Select the equipment group on the single-line diagram that you want to ungroup.
2. Use right click and select **Ungroup**.

- 

Remove equipment

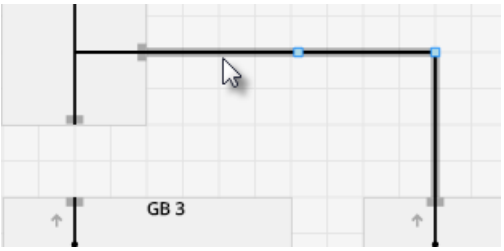
1. Select the equipment or group on the single-line diagram.
   - Selection is shown as a blue box around the equipment or group.
2. Press delete.

Connect equipment

1. Select the grey connection point on the equipment and drag to the connection point on the other equipment:
   - 

2. A connection is made between the equipment.

Remove a connection

1. Select connection:
   - 

2. Press delete.

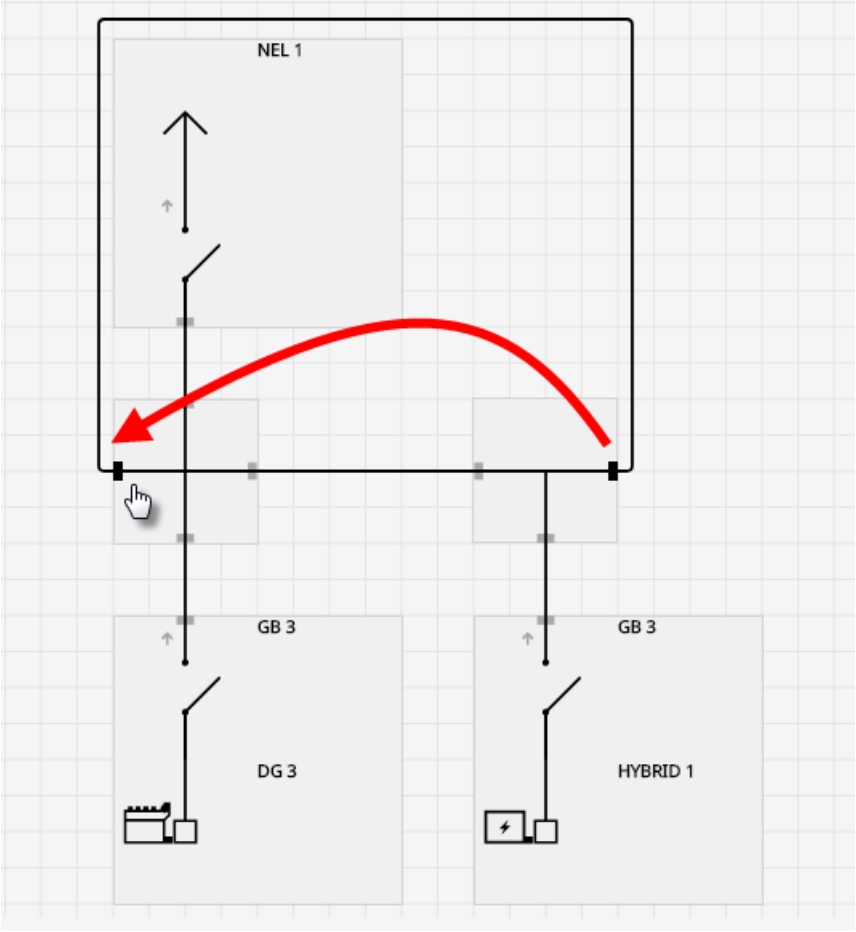
Configure equipment

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

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

Add a ring busbar

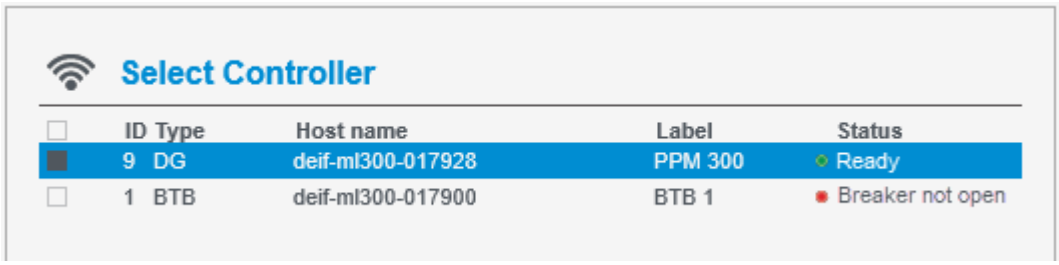
1. Make sure to have two free connection points on the diagram, add links if required.
2. Select one of the grey connection points and drag to the other end:



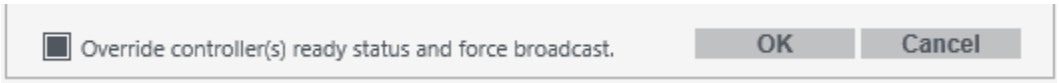
5.1.3 Broadcast to controllers

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

1. Select **Broadcast** .
   - Only controllers connected and logged on are shown.
2. Select the controllers:



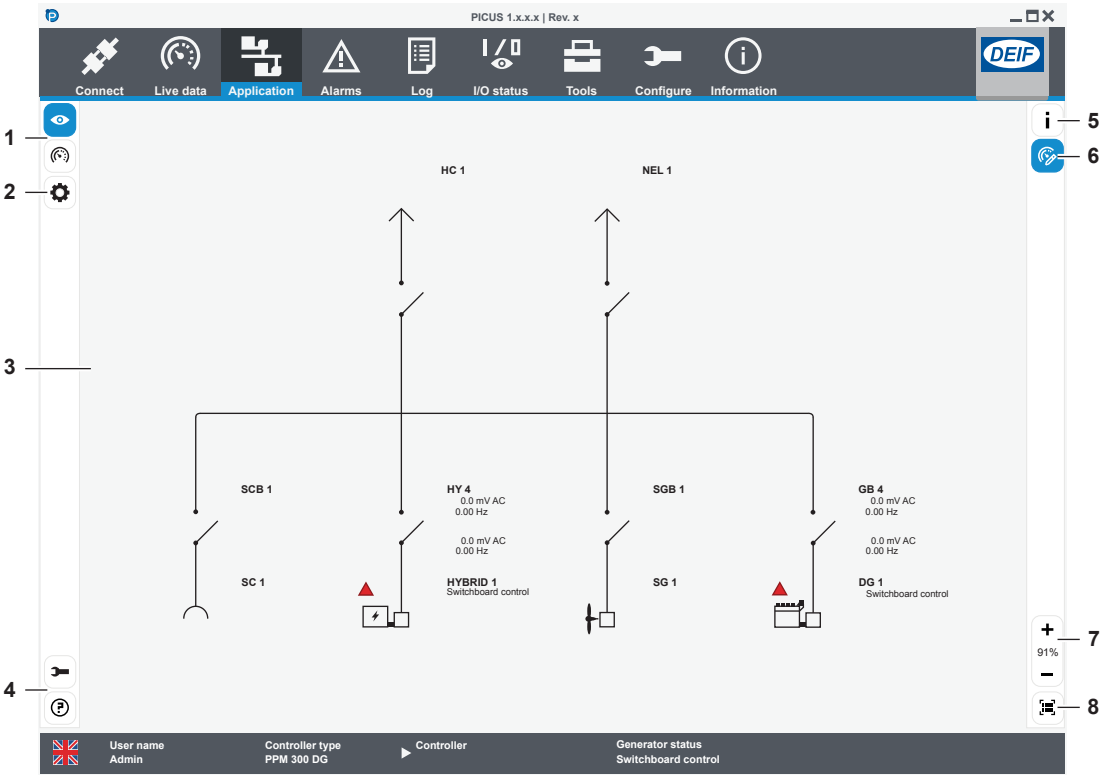
   - ● indicates the controller is ready.
   - ● indicates the controller is not ready, but can be overridden.
3. For controllers that are not ready, you can force a broadcast and override action at the bottom of the window:



4. Select **OK** to broadcast to the selected controllers.

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 change to emulation 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 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.	

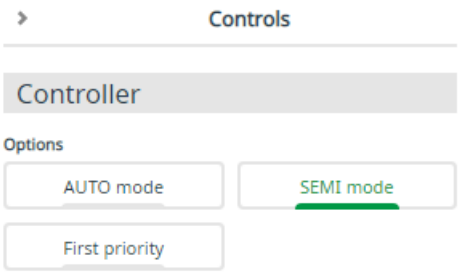
5.2.1 Busbar colours

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

5.2.2 Control and view operation

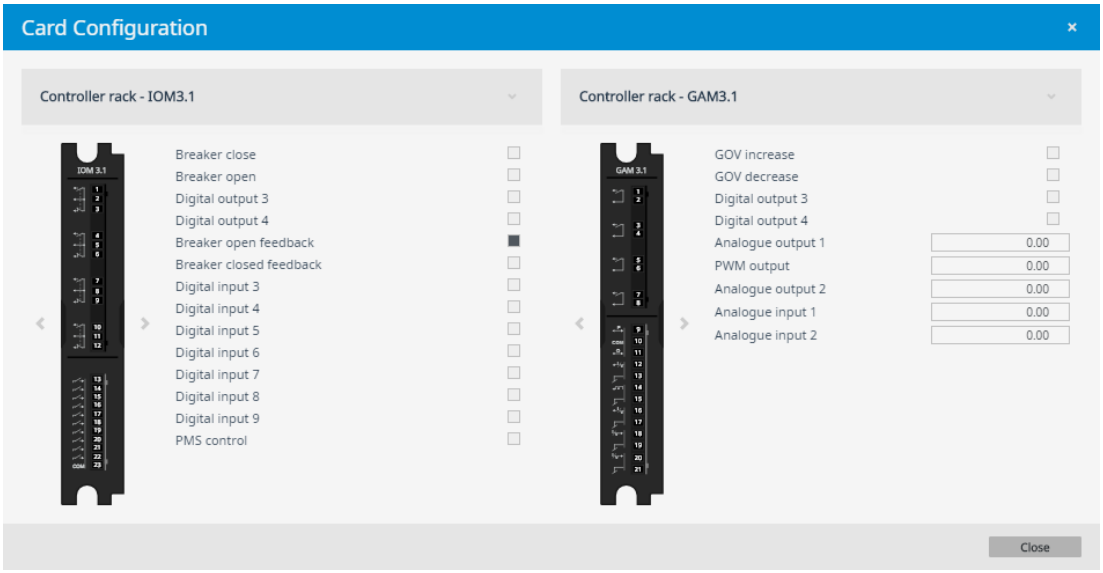
Control equipment

1. Select the **Equipment** on the diagram.
2. Open **Control** .
3. You can control the controller actions, similar to the display push-buttons.



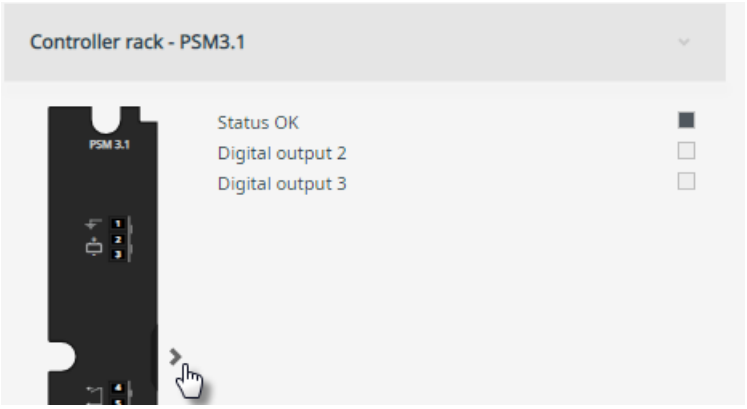
View operation information

1. Select the **Equipment** on the diagram.
2. Open **Control** .
3. Select the **I/O** I/O option.
4. You can view two different modules at the same time:

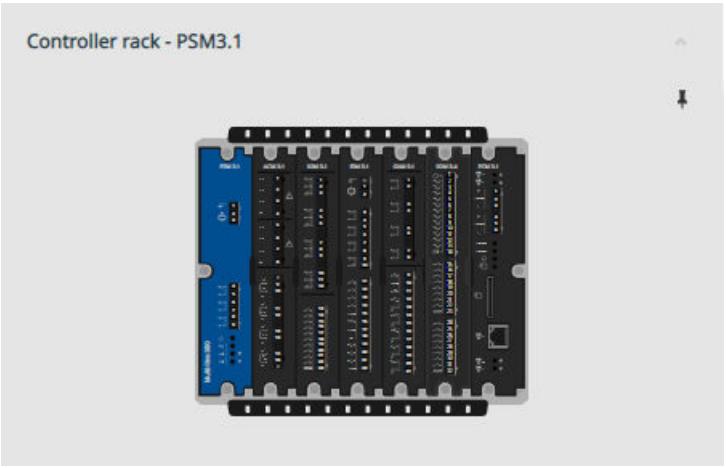


- The state of the digital inputs or outputs are shown with:
  - ☐ : Not activate
  - ■ : Active
- The state of the analogue inputs or outputs are shown with their value:
  - 25.50

5. Use the navigation options, left or right to change the hardware module:

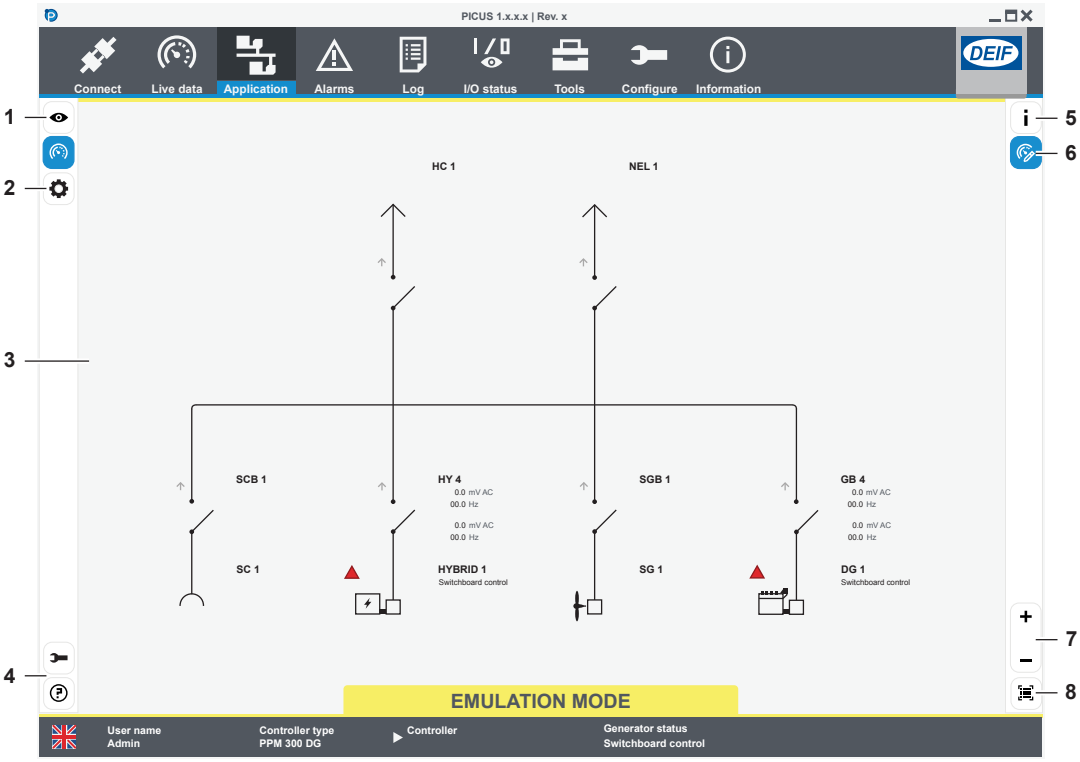
- 

6. You can also open the controller rack by using ⌄ and select a hardware module:

- 

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.

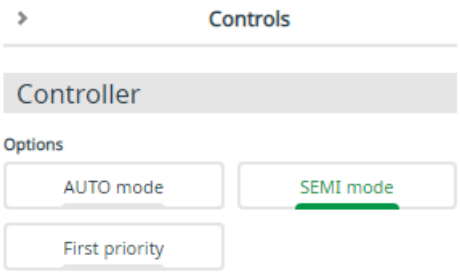
5.3.1 Busbar colours

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

5.3.2 Control and simulate operation

Control equipment

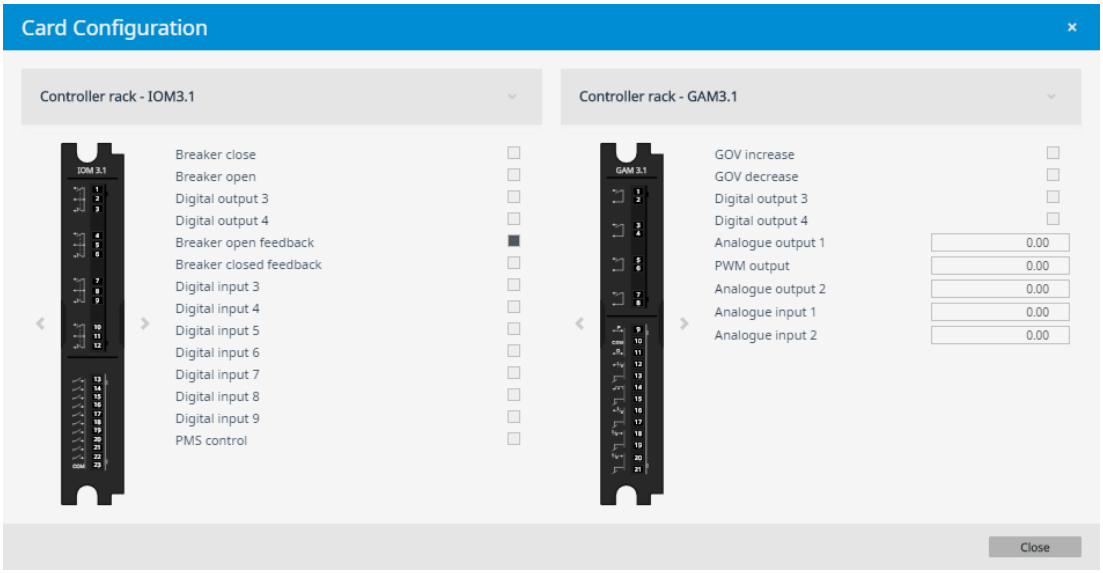
1. Select the **Equipment** on the diagram.
2. Open **Control** .
3. You can control the controller actions, similar to the display push-buttons.



Simulate operation

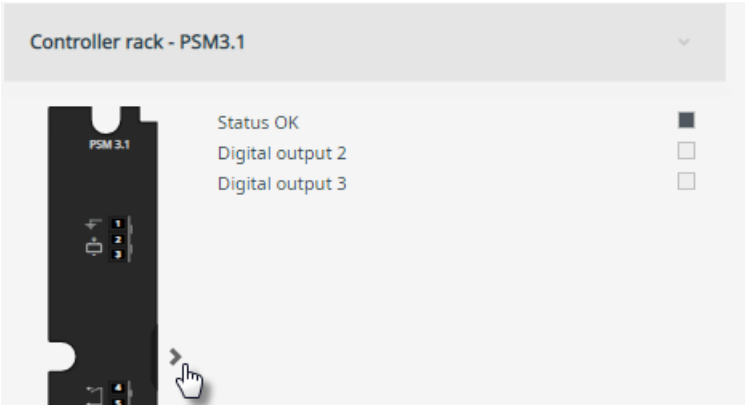
1. Select the **Equipment** on the diagram.
2. Open **Control** .
3. Select the **I/O**

option.
4. You can view two different modules at the same time:

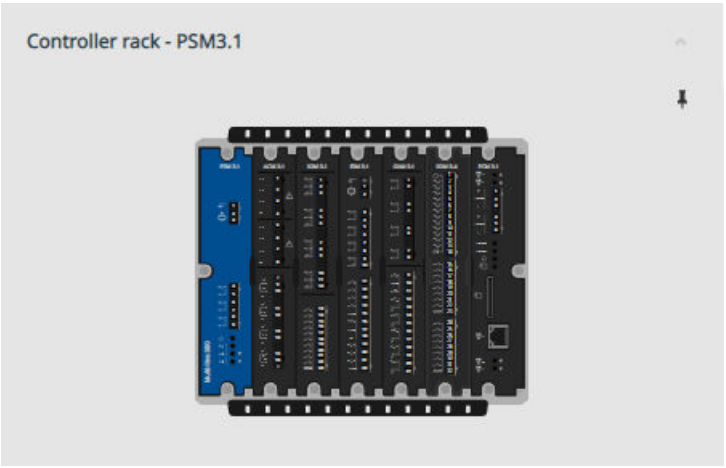


   - The state of the digital inputs or outputs are shown with:
     - ☐ : Not activate
     - ■ : Active
     - You can simulate the input or output and change the state by clicking on the state.
   - The state of the analogue inputs or outputs are shown with their value:
     - 

     - You can simulate the input or output and change the value by clicking on the value and entering the new value.
5. Use the navigation options, left or right to change the hardware module:

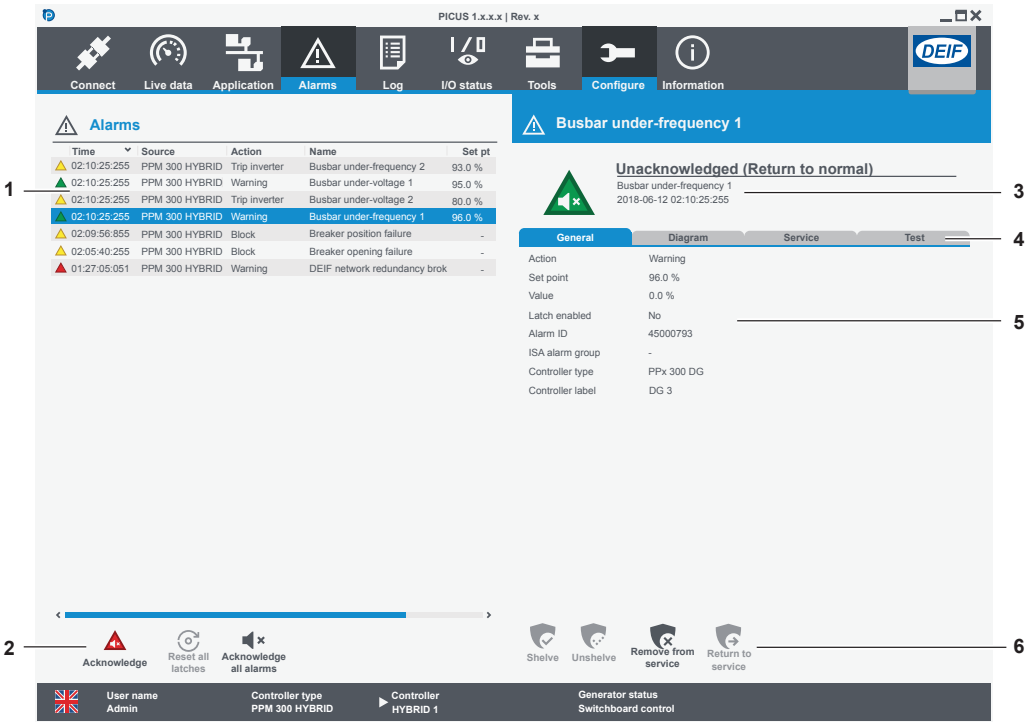
- 

6. You can also open the controller rack by using ⌄ and select a hardware module:

- 

6. Alarms

6.1 Alarms page



No.	Item	Notes	
1	List of alarms	Shows the alarm, state, source of alarm (controller or ECU).	
		To the right of the list, the alarm is marked with a grey dot ○ if any of these are **Enabled**:	
		L = Latched.	**A** = Auto acknowledged.
		T = Test running.	
2	General alarm actions	**Acknowledge** ** an unacknowledged alarm.	**Reset all latches** for acknowledged latched alarms.
		Acknowledge all alarms ** for all unacknowledged alarms.	
3	Selected alarm	Details for the selected alarm.	
4	Alarm information pages	**General** - basic information about the alarm.	
		Diagram - how the alarm occurred.	
		Service - selection of shelve period.	
		Test - perform and stop alarm tests.	
5	Alarm information	For the selected information page.	
6	Service actions	**Shelve** the alarm for the selected period. *	**Unshelve** a previously shelved alarm.
		Remove from service the alarm.	**Return to service** the alarm.

NOTE * Shelved alarms are automatically rechecked after the selected shelve period has expired.
** Acknowledging an alarm does not stop the alarm action (protection) if the alarm condition remains active or the alarm has a latch enabled.

6.1.1 Remove from service

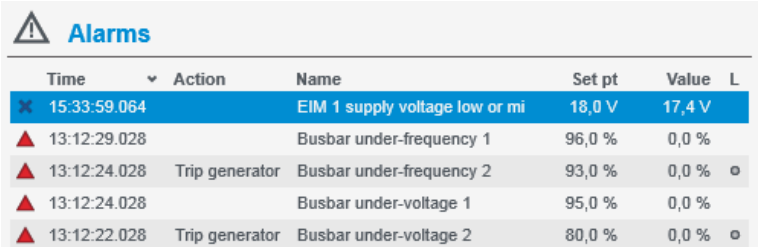
When alarms are removed from service, they are no longer active.

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

Remove an alarm from service

You can only remove certain types of alarms from service:

1. Select the alarm to remove from service.
2. Select **Remove from service** .
   - The alarm is marked as out of service (or) in the alarm list.



Return an alarm to service

1. Select the alarm to return to service.
2. Select **Return to service** .
   - The alarm is rechecked by the system.
   - If the alarm condition is still present in the system, the alarm is activated again.

6.1.2 Alarm state

Symbol	Alarm condition *	Alarm action **	Acknowledge	Notes
or	Active	Active	Unacknowledged	• An alarm condition has 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 has 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 has cleared. • An alarm action is inactive.

Symbol	Alarm condition *	Alarm action **	Acknowledge	Notes
				• An alarm requires acknowledgement.
	Active or Inactive	Inactive	-	• An alarm is shelved for a period of time. • An alarm returns automatically after the period has expired.
	Active or Inactive	Inactive	-	• An alarm is marked *out of service* for an indefinite period. • An alarm does not return automatically and must be returned to service manually.
	Active or inactive	Inactive	-	An alarm is inhibited to occur.

NOTE * Alarm condition is typically where the set point is exceeded.
** Alarm action (protection) is the configured action taken to protect the situation. When active, this action occurs in the controller.

More information
See **Alarms** in the **Designer's handbook** for more information about how to handle alarms in the system.

6.1.3 Latched alarms

Until a latched alarm is reset, the alarm action (protection) remains active. To reset a latched alarm:

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.

6.1.4 Alarm test

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

1. Select **Test** from the alarm details on the right.
2. Select **Start test**.
   - A confirmation message opens.
3. If it is safe to start the alarm test, select **Yes**.
4. Select **Stop test** to stop all active alarm tests.
   - **Stop test** also stops all active individual alarm tests.
   - It can take a moment for PICUS to stop the alarm test.

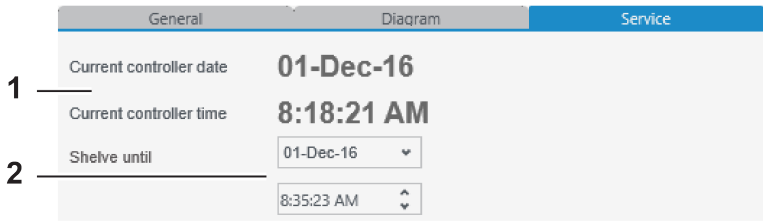
The alarms remain active for as long as the alarm test is running. Stop the alarm test and acknowledge the alarms, to change the state of the alarms to inactive.

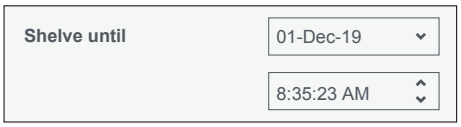
6.1.5 Shelved alarms

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

Shelve an alarm

You can only shelve certain types of alarms.

1. Select the alarm to shelve.
2. Select **Service** from the alarm details to the right.
   - The **Service** page now shows this information:
   - 

   - 1. Current controller date and time.
   - 2. Shelve until date and time.
3. Enter the required shelve period:
   - 

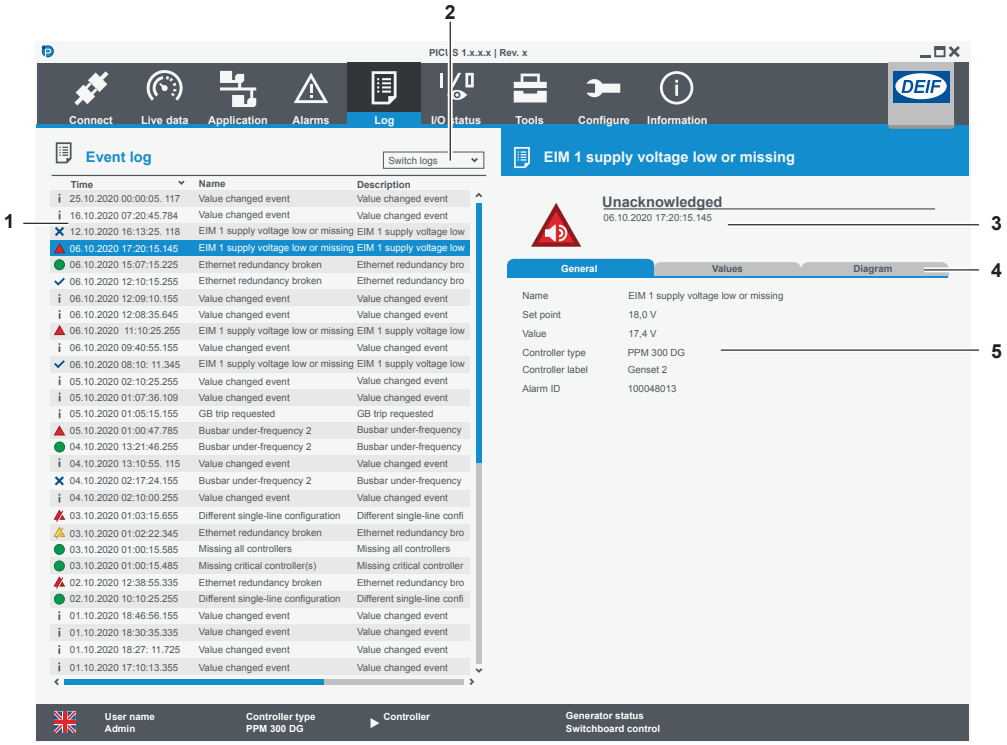
4. Select **Shelve** to shelve the alarm.
   - The alarm is marked as shelved (or) in the alarm list.
   - The alarm action (protection) is inactive until the alarm is unshelved.

Unshelve an alarm

1. Select the shelved alarm to unshelve.
2. Select **Unshelve** to unshelve the alarm.
   - The alarm is rechecked by the system.
   - If the alarm condition is still present in the system, the alarm is activated again.

7. Log

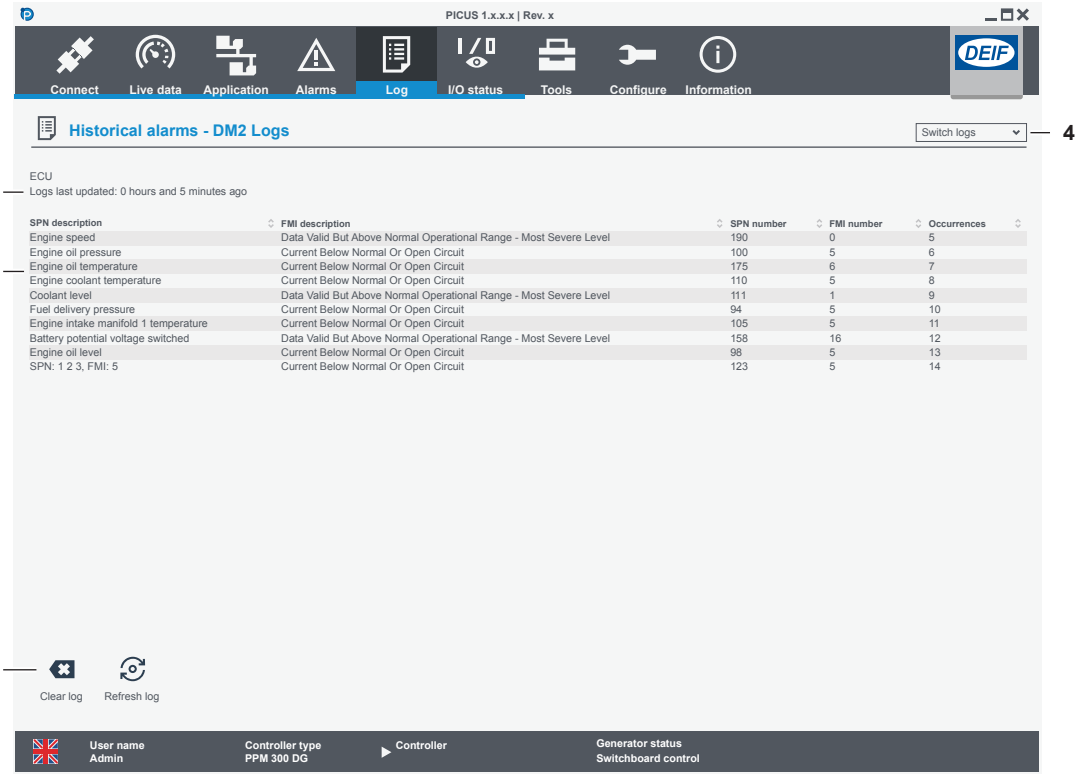
7.1 Log page



No.	Item	Notes	
1	Log of events *	Historical list of events in the system:	
		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.	
2	Switch list of log entries	Change between the system log entries or if configured the DM2 historical alarms log.	
3	Selected log entry	Details for the log entry selected from the list.	
4	Log information pages	**General**: Information about the event. **Values**: For the event, if applicable. **Diagram**: For the event, if applicable.	
5	Selected alarm	Details for the selected alarm.	

NOTE * Test alarms are marked with grey dot.

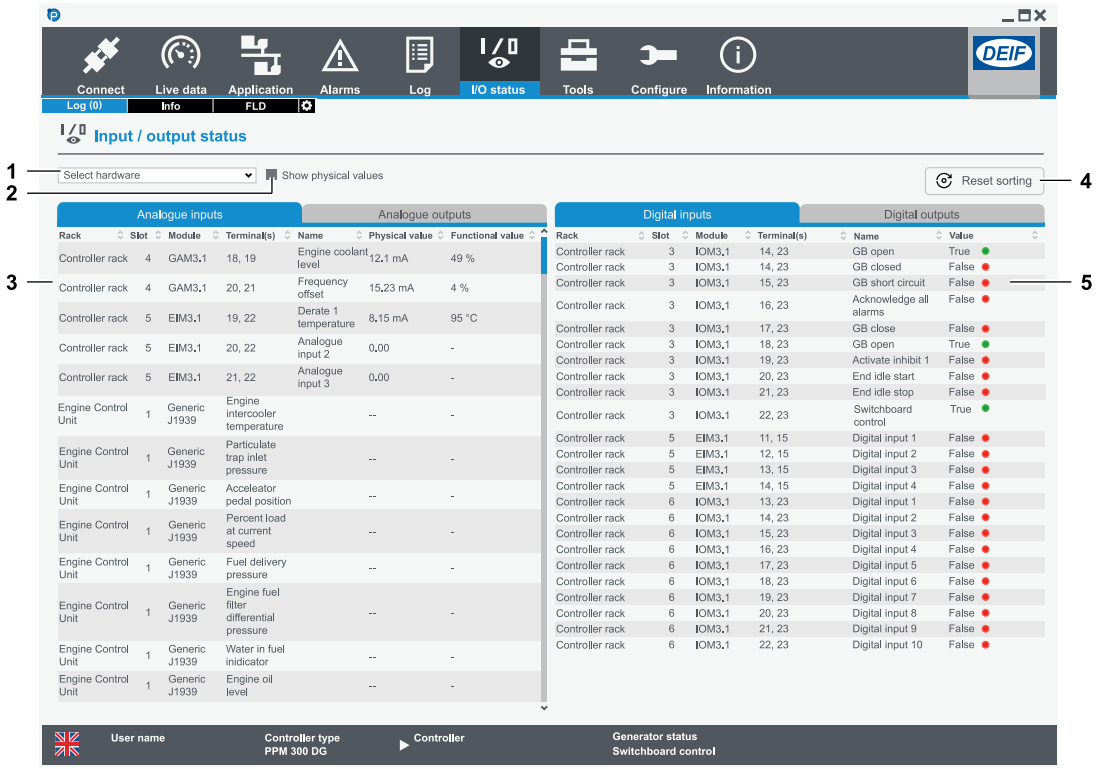
7.2 DM2 Log page



No.	Item	Notes	
1	Last update	Shows when the list was last updated.	
2	DM2 log list	Shows the list of DM2 log events.	
3	Actions	**Clear log** : Removes all log entries.	**Refresh log** : Reloads the log list.
4	Switch list of log entries	Change between the system log entries or if an ECU is configured, the DM2 historical alarms log.	

8. I/O status

8.1 I/O status page



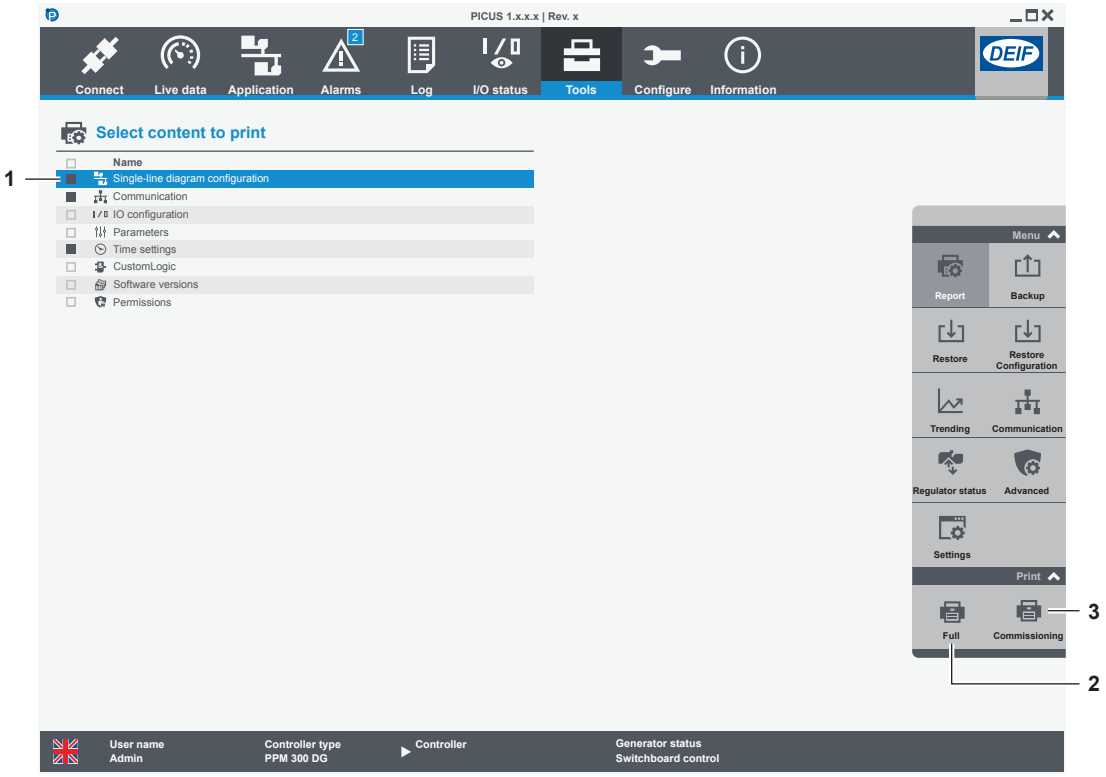
No.	Item	Notes	
1	Hardware selection	Select the hardware to include in the input / output status. *	
2	Physical values	Include or exclude showing physical values for the inputs or outputs.	
3	Analogue values	See the analogue inputs or analogue outputs values.	
4	Reset sorting	Returns to the default sorting 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.

NOTE * This can be the controller rack, extension rack, or ECU.

9. Tools

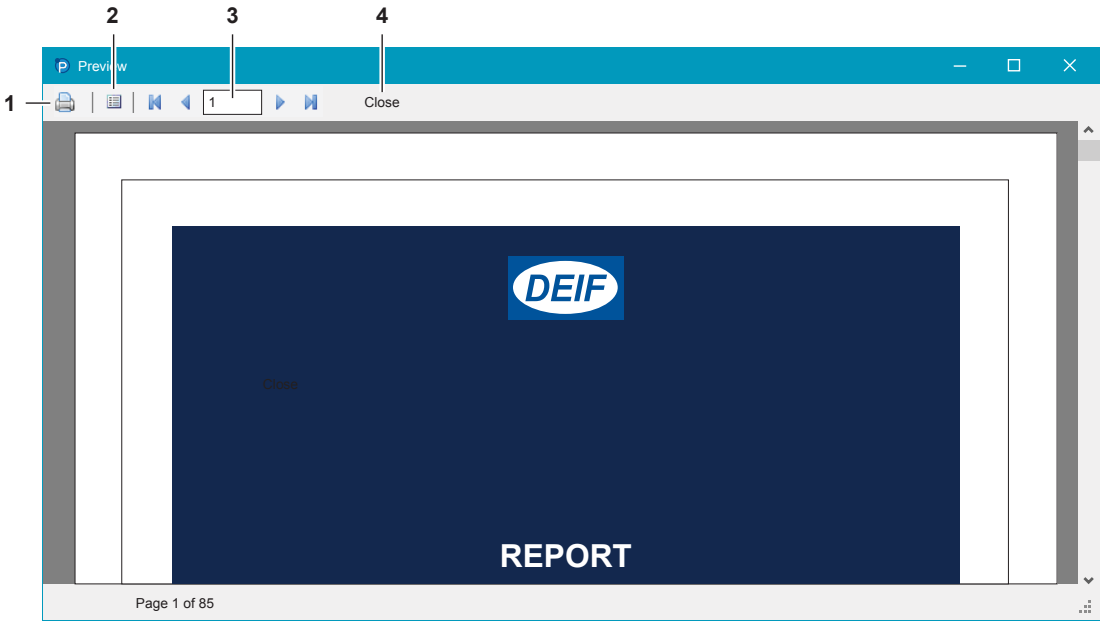
9.1 Report

9.1.1 Report page



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

9.1.2 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.

9.2 Backup

9.2.1 About backup

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

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, an SD card or 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.

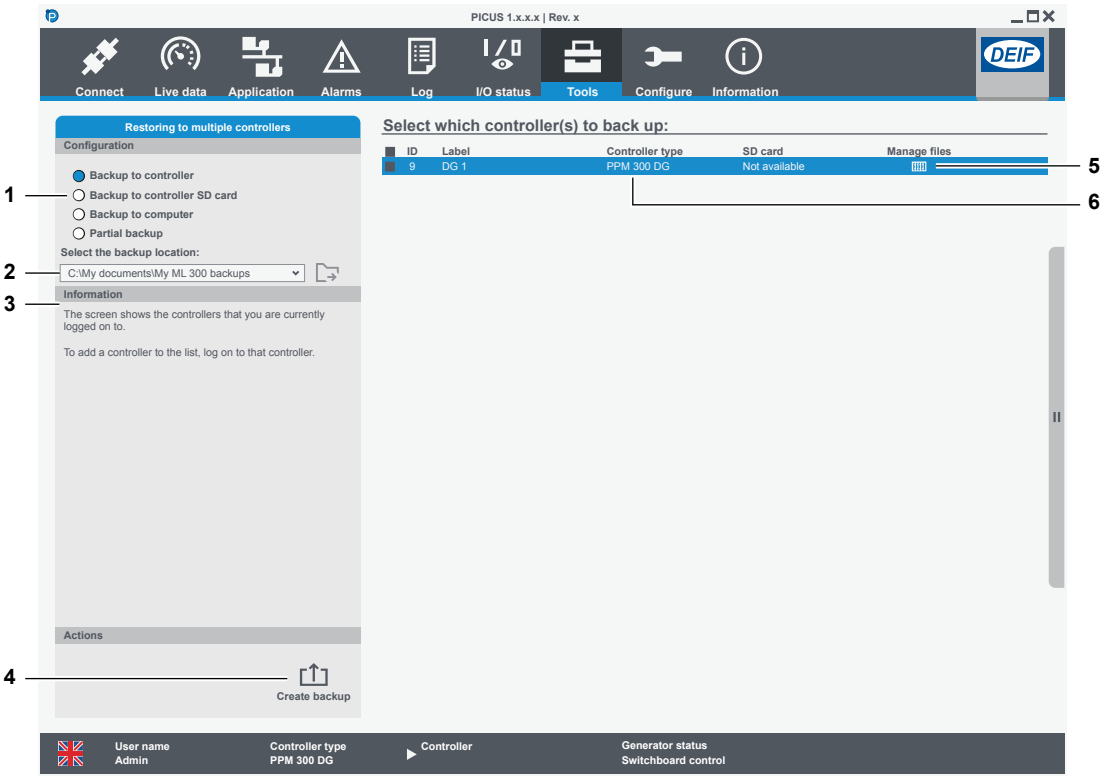
- Partial backup files are only stored on your computer and include only the features that you want to include.

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

Restrictions

- 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 SD card must be formatted as a FAT32 file system.
- 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.

9.2.2 Backup page



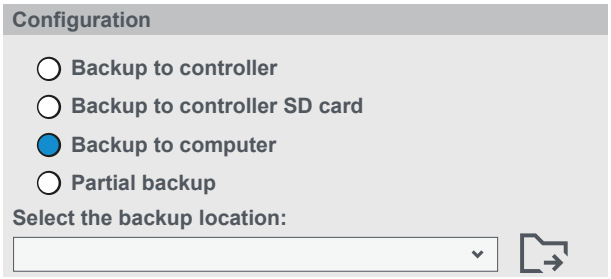
No.	Item	Notes
1	Backup location *	Select where to save a full backup. • Backup to controller • Backup to controller SD card • Backup to computer
		Or create a partial backup on your computer. *
2	Folder location	**Folder** location where to save the backup on your computer. Use the selection list to 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 or SD card. 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.

9.2.3 Create full backup

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

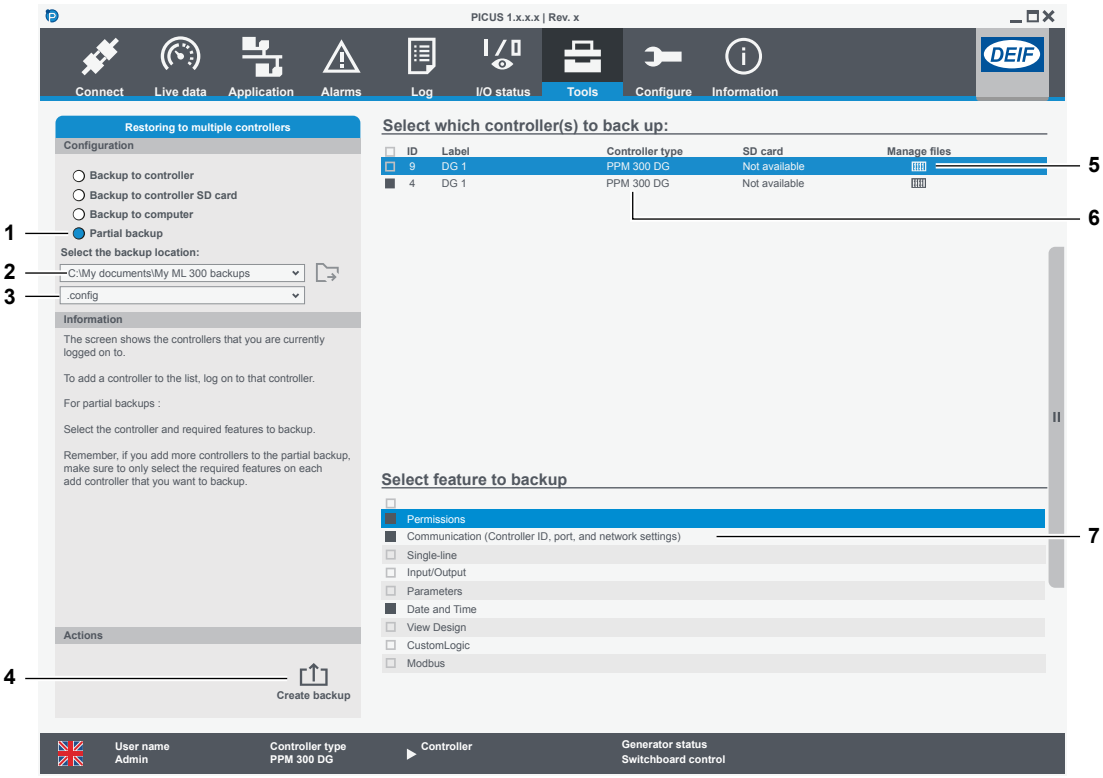
1. Select a location to store the backup file:



   - 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.

   - If you select Backup to SD card, the list only shows controllers with an available SD card.
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:

9.2.4 Partial backup page



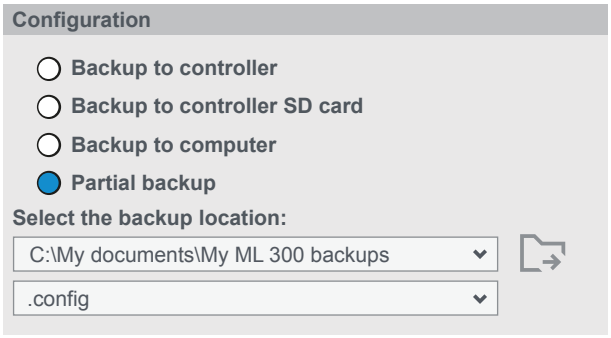
No.	Item	Notes
1	Partial backup	Select this for only a partial backup.
2	Folder location	**Folder** location where to save the backup on your computer. Use the selection list to open a previously used location.
3	Type of partial backup	Select either: • .config (Configuration file) • Folder
4	Actions	**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 or SD card. 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.

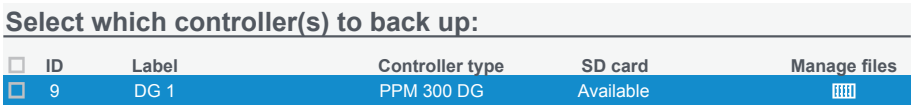
9.2.5 Create partial backup

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

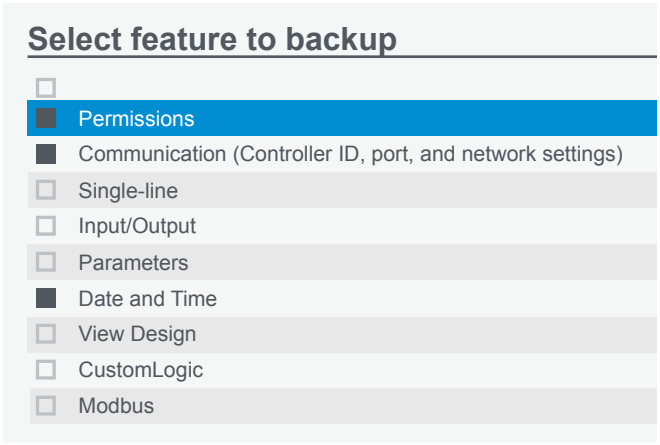
1. Select partial backup:



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.



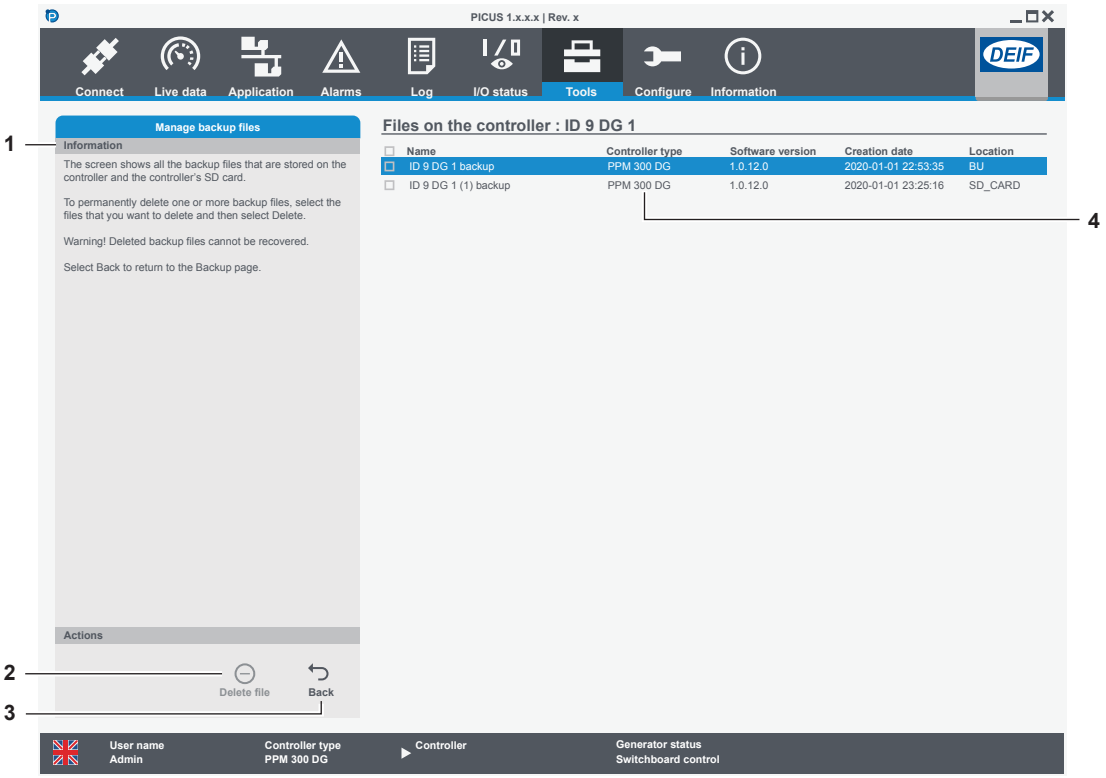
5. Select the features you want to include in the partial backup:



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.

9.2.6 Manage backups page

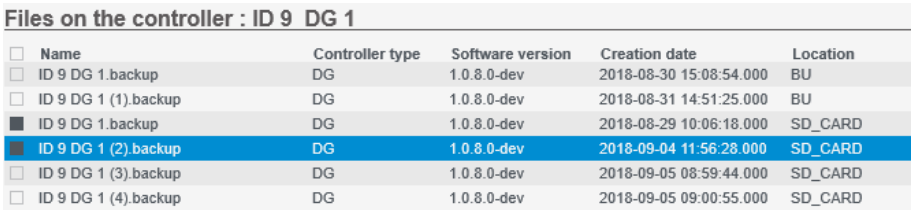


No.	Item	Notes	
1	Information	Additional information about the page.	
2	Actions	⊖ **Delete file** the selected files.	⮌ **Back** to the Backup page.
3	Backup list	Shows backups that are stored on the controller or SD card.	
4	Controller list	Shows all connected and logged on controllers.	

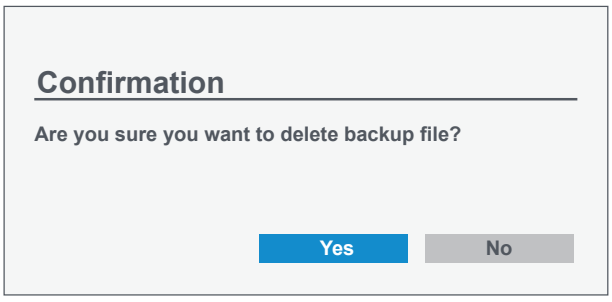
9.2.7 Delete backup

Deleted backup files cannot be recovered.

1. Select the backup files to delete.



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.

9.3 Restore

9.3.1 About restore

You can restore backup files or backup folders made before PICUS version 1.0.8.0. You can restore from the controller, an SD card, 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.

9.3.2 Restore restrictions

Controller prerequisites

Before you restore a backup to a controller, the controller must meet these prerequisites:

Controller type	Prerequisites
GENSET controller	1. The breaker must be opened. 2. The engine must be stopped. 3. The controller must be under switchboard control.
EMERGENCY genset controller	
HYBRID controller	1. The inverter breaker must be opened. 2. The inverter must be stopped. 3. The controller must be under switchboard control.
SHAFT generator controller	1. The breaker must be opened. 2. The controller must be under switchboard control.
SHORE connection controller	
BUS TIE breaker controller	

NOTE When a controller is in Emulation mode, these restrictions do not apply.

Not compatible backup files

Backup files or folders are not compatible with the current controller configuration if:

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

Restore network settings

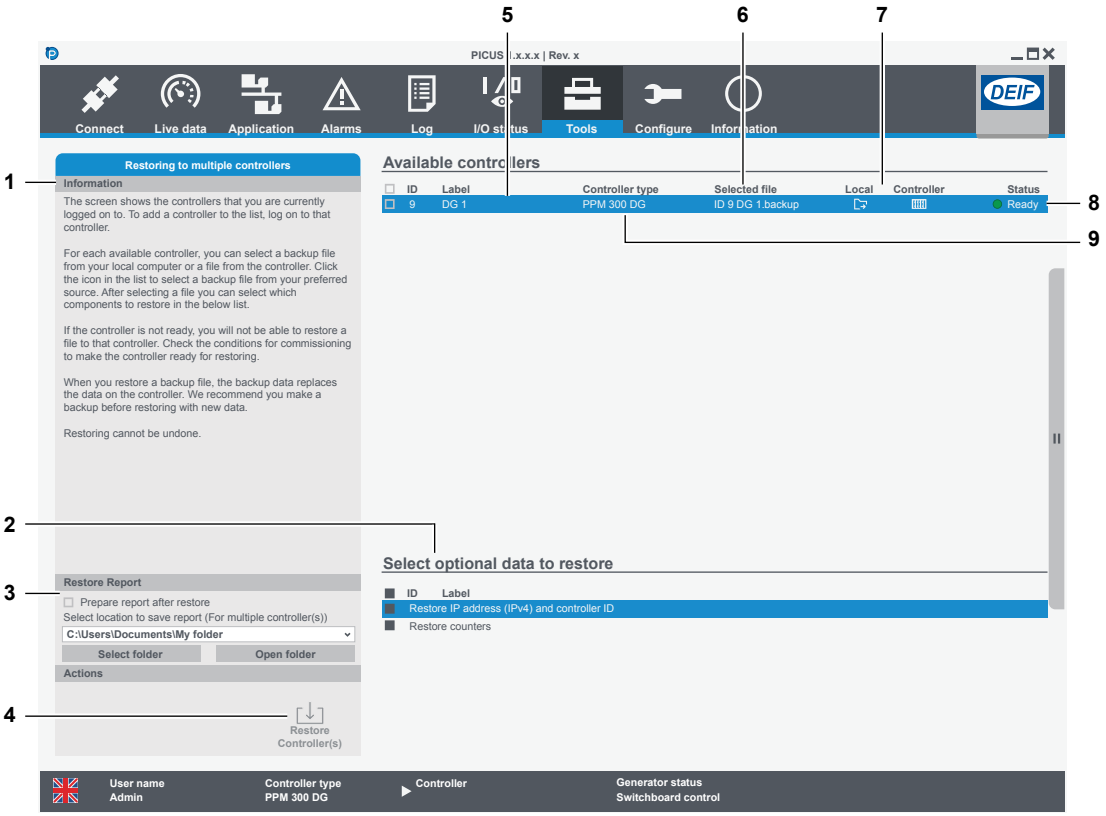
If you use **Restore IP address (IPv4) and controller ID**, the controller **must** be powered off and powered on before the network settings are restored.

CAUTION
If this controller is part of the network communication between units, when the controller is powered off, the processor and communication module (PCM) is also powered off. Check this will not affect your system before you power the controller off.

Data not restored

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

9.3.3 Restore page



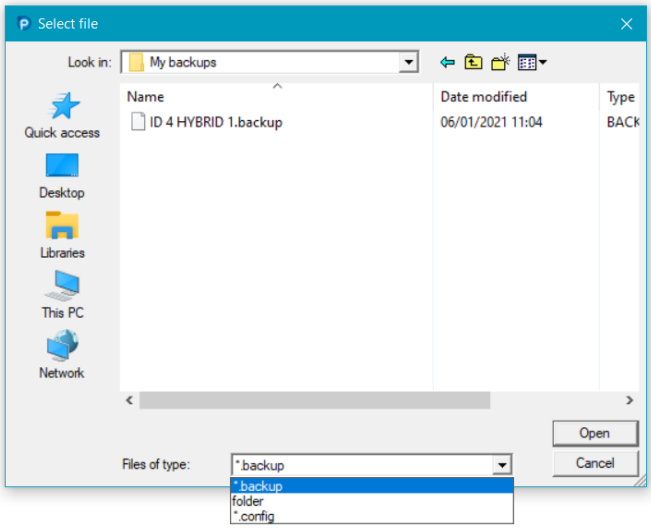
No.	Item	Notes	
1	Information	Additional information about the page.	
2	Data selection	Select additional data to restore (only shown after you select a backup file to restore).	
3	Restore report	Select to create a restore report in the location selected.	
4	Actions	**Restore controller(s)** to restore 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 or SD card.
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.

9.3.4 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 or SD card.
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.

9.4 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 restrictions

Controller prerequisites

Before you restore or broadcast a configuration file or folder, the controller must meet these prerequisites:

Controller type	Prerequisites
GENSET controller	1. The breaker must be opened. 2. The engine must be stopped. 3. The controller must be under switchboard control.
EMERGENCY genset controller	
HYBRID controller	1. The inverter breaker must be opened. 2. The inverter must be stopped. 3. The controller must be under switchboard control.
SHAFT generator controller	1. The breaker must be opened. 2. The controller must be under switchboard control.
SHORE connection controller	
BUS TIE breaker controller	

NOTE When a controller is in Emulation mode, these restrictions do not apply.

Not compatible configuration files

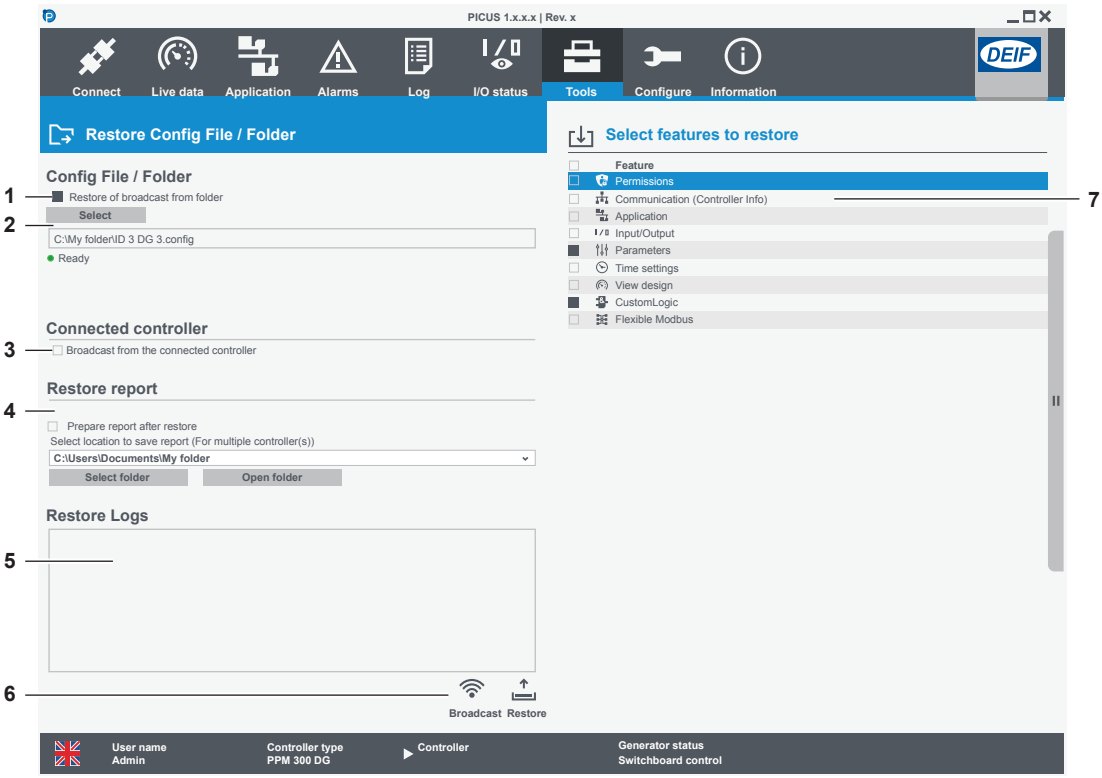
Configuration files or folders could be not compatible with the current controller configuration if:

- 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.

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. *	

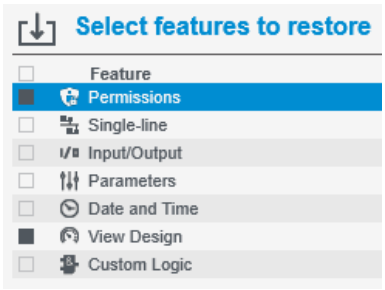
NOTE * You cannot broadcast Flexible Modbus or CODESYS features.

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

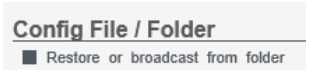
1. Select **Broadcast from the connected controller**:
   - 

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

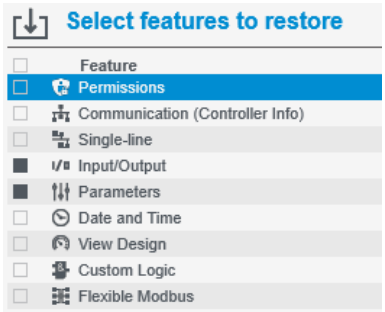
3. Select **Broadcast** and select the controllers you wish to broadcast to.

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**:
   - 

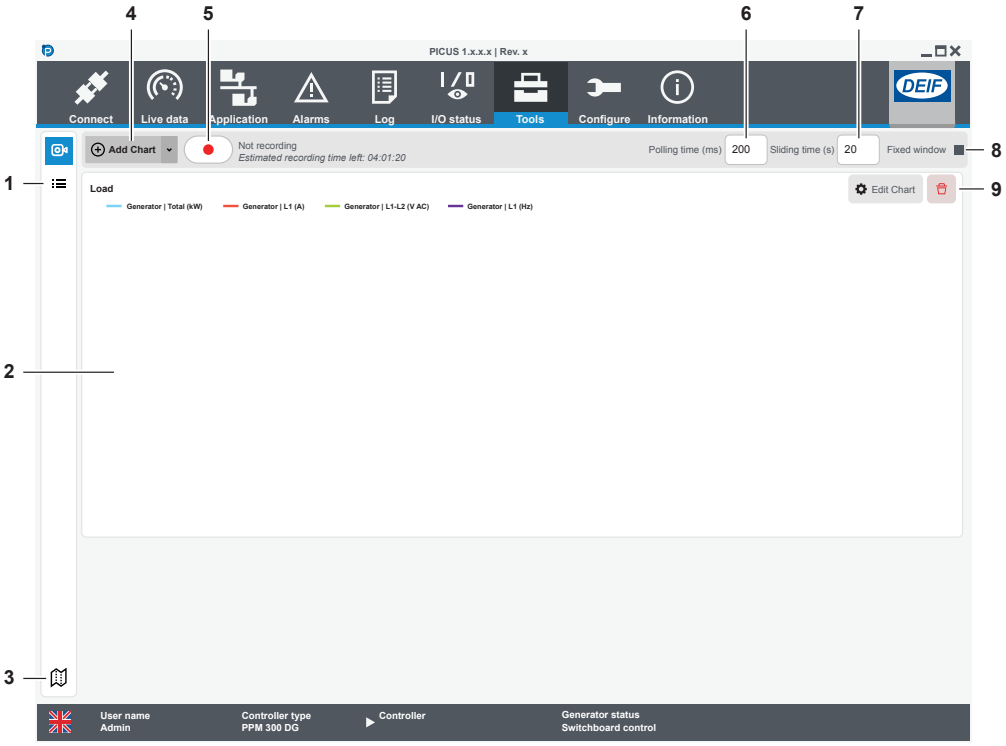
2. Use **Select** to find the location of your configuration file or folder:
   - 

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.

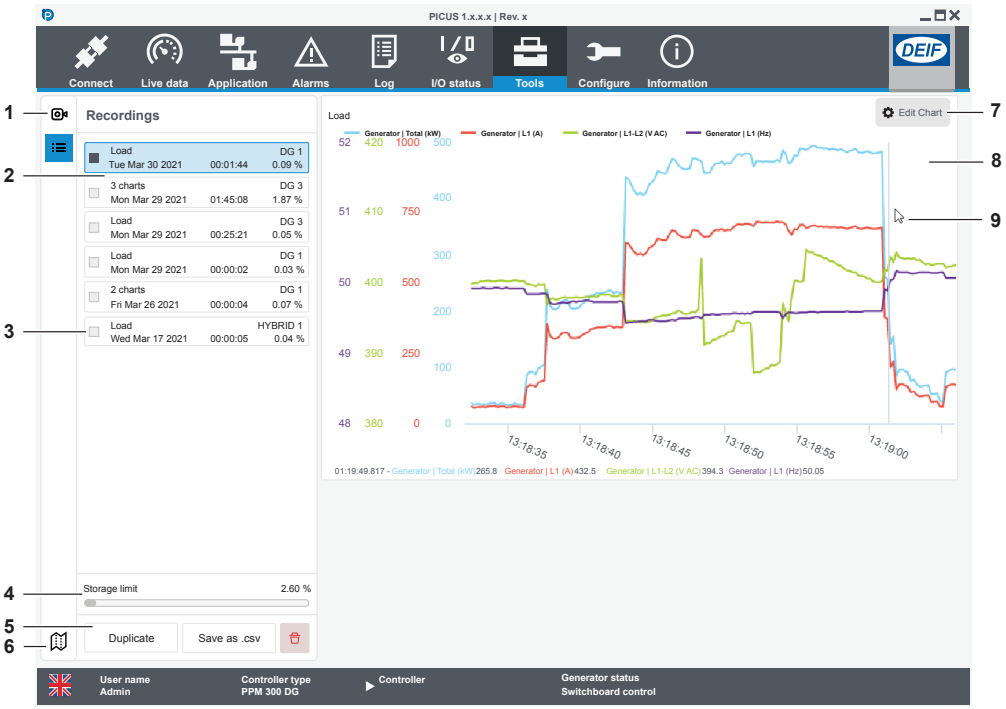
9.5 Trending

9.5.1 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.

9.5.2 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.	

9.6 Communication

9.6.1 About communication

Configure settings for:

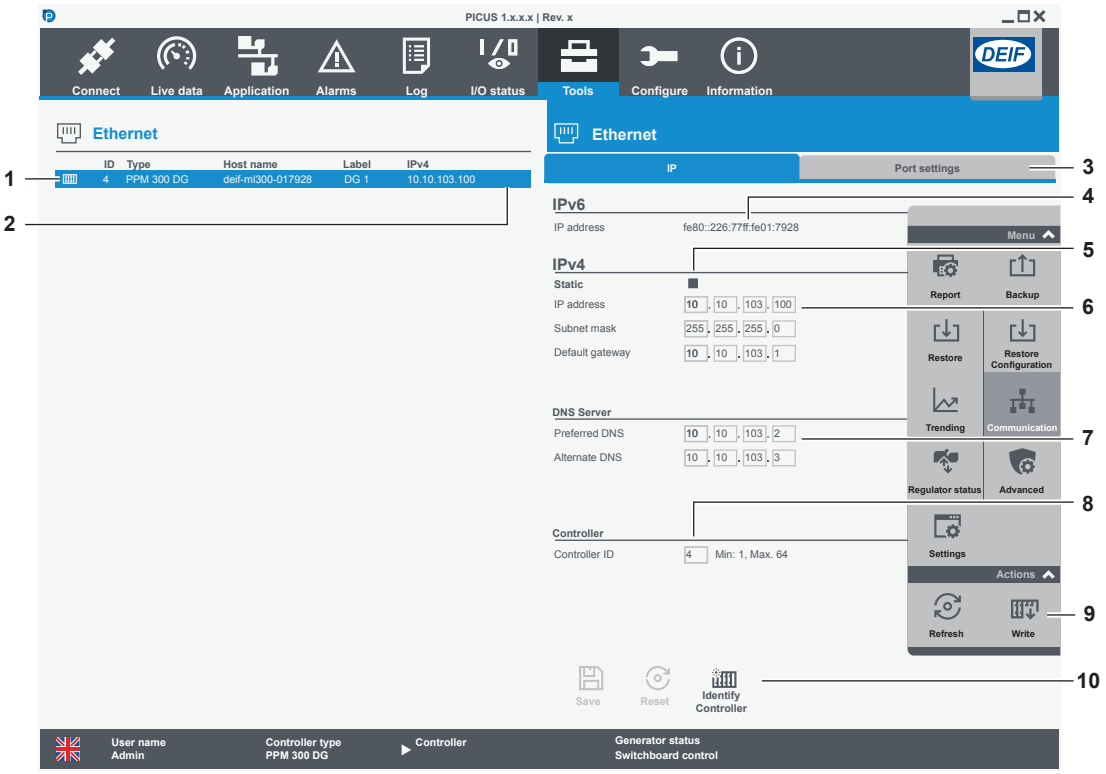
- IP address.
- Ethernet port and network mode.

You can also run the Identify controller option to help identify the connected controller.

NOTE 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.

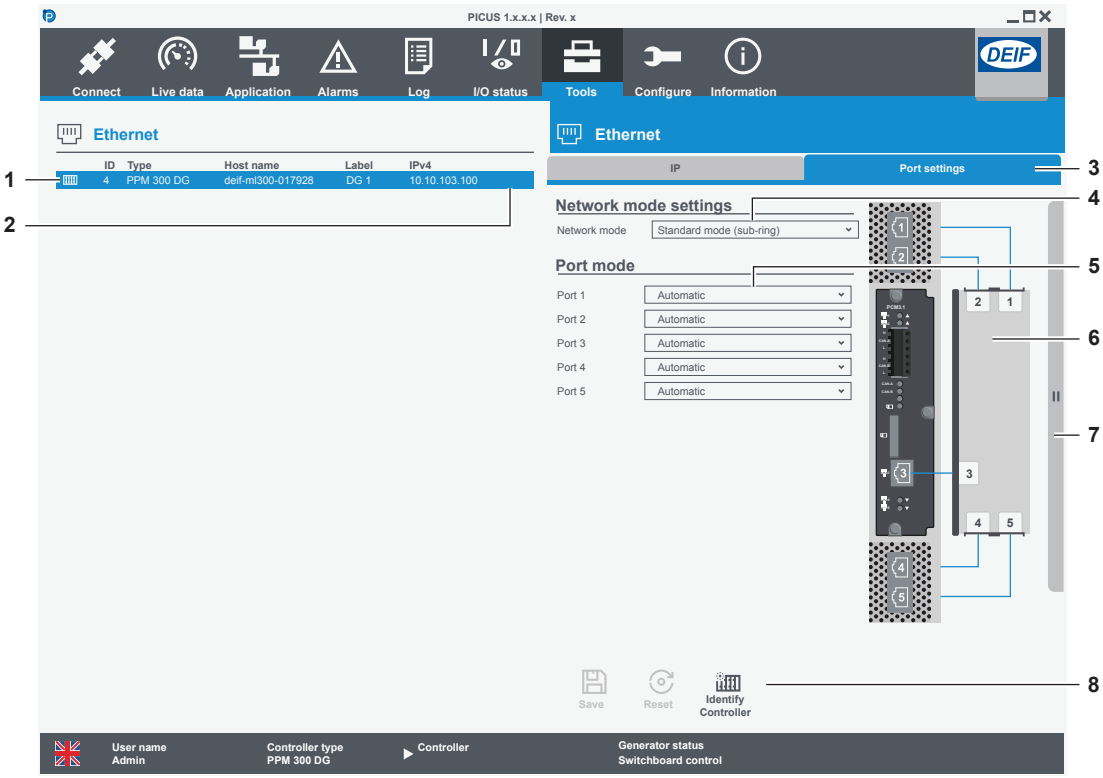
More information
See **Hardware characteristics, DEIF Ethernet network** in the **Designer's handbook** for more information about how to configure a network.

9.6.2 Communication: IP settings page



No.	Item	Notes	
1	Controller list	List of all logged on and connected controllers.	
2	Identify state	**Green dot** shows the controller runs the Identify controller option.	
3	IP or port settings	Change between IP settings or Ethernet port settings.	
4	Controller IPv6	The IPv6 address of the selected controller.	
5	Controller IPv4 state	■ **Enabled** shows controller uses IPv4.	□ **Not enabled** shows controller uses IPv6.
6	Controller IPv4 settings	IPv4 address for the controller. Subnet mask address. Default gateway address.	
7	DNS server settings	Preferred DNS address (primary). Alternate DNS address (secondary).	
8	Controller ID	The controller ID of the selected controller.	
9	Actions	**Refresh** the controller settings.	**Write** the settings to the controller.
10	Options	**Save** the settings temporarily.	**Reset** to previous settings.
		Identify to start the identification of the controller.	

9.6.3 Communication: Port settings page



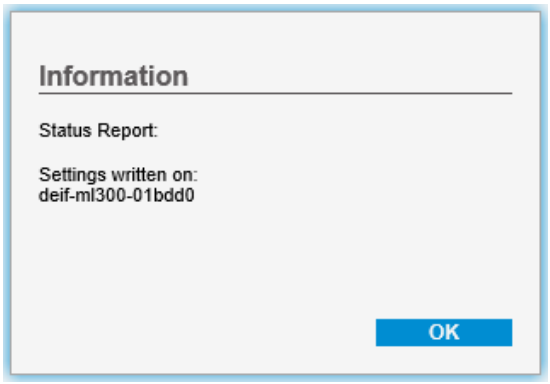
No.	Item	Notes	
1	Controller list	List of all logged on and connected controllers.	
2	Identify state	**Green dot** shows the controller runs the Identify controller option.	
3	IP or port settings	Change between IP settings or Ethernet port settings.	
4	Network mode	Select the network mode for the connection of this PCM3.1 in the network topology.	
5	Port mode	Select the port mode for each Ethernet port: • Automatic • Interconnection (major ring) • External network/PICUS • Standard (sub-ring)	
6	Connections	Diagram shows how the Ethernet ports are numbered on the PCM3.1 module.	
7	Actions	**Refresh** the controller settings.	**Write** the settings to the controller.
8	Options	**Save** the settings temporarily.	**Reset** to previous settings.
		Identify to start the identification of the controller.	

9.6.4 Identify controller

1. Select a controller from the controller list.
2. Select **Identify controller** .
   - **Green dot** shows the controller runs the identification option.
   - The controller performs an identification cycle.
   - Power LED on the PSM flashes on the controller rack.
   - The LED repeats a cycle of fast, medium, and slow flashing.
   - The flashing ends after 30 seconds.

9.6.5 Configure port settings

The controller Ethernet ports on the PCM3.1 can be configured for a specific type of connection. The network mode can be configured for the controller in the network topology.

1. Select the network mode:
   - Standard node (sub-ring)
   - Interconnection node (major ring)
2. Each port [1 to 5] can be configured:
   - Automatic
   - Standard (sub-ring)
   - Interconnection (major ring)
   - External network/PICUS
3. Select **Save** to save the setting.
4. You are prompted to confirm the save, select **Yes**.
5. Select **Write** to write the settings to the controller.
   - A confirmation is displayed after writing the settings:
     ◦ 

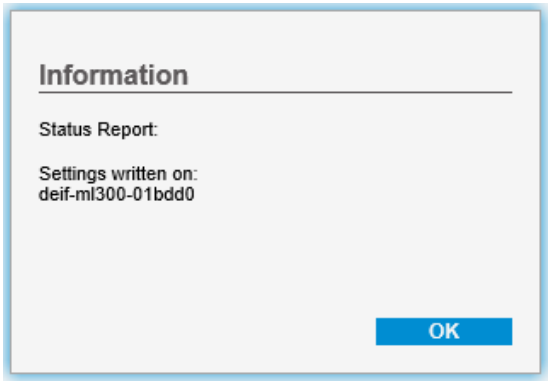
6. An alarm is activated that requires the controller rack to be powered off and on for the change to take effect.

DANGER!
The controller **must** only be powered off and powered on by authorised personnel who understand the risks involved in accessing the controller power supply or installation design. Take extreme care in the enclosure next to the ACM terminals. Ensure the controller is not running and in operation, and that the controlled breaker is open before you power off and on the controller.

9.6.6 Configure IP, DNS and controller ID settings

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 to connect the controllers to local networks.

The controller can use either automatic IPv6 or static IPv4 addresses to communicate via Ethernet.

1. Select **Static** to use IPv4 addresses.
2. Configure *IP address*, *Subnet mask*, and *Default gateway*.
3. Configure *Controller ID* (range 1 to 64).
   - Configure the Single-line diagram to match your selected controller ID.
4. Configure *Preferred DNS* and *Alternate DNS*.
5. Select **Save** .
   - When prompted to confirm the save, select **Yes** to save the settings.
6. Select **Write** to write the settings to the controller.
   - A confirmation is displayed after writing the settings:
     ◦ 

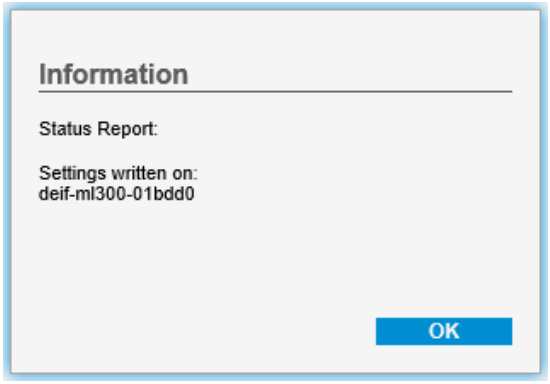
7. For changes to the IP settings to take effect, power off and power on the controller rack.

DANGER!
The controller **must** only be powered off and powered on by authorised personnel who understand the risks involved in accessing the controller power supply or installation design. Take extreme care in the enclosure next to the ACM terminals. Ensure the controller is not running and in operation, and that the controlled breaker is open before you power off and on the controller.

9.6.7 Configure port settings

The controller Ethernet ports on the PCM3.1 can be configured for a specific type of connection. The network mode can be configured for the controller in the network topology.

1. Select the network mode:
   - Standard node (sub-ring)
   - Interconnection node (major ring)
2. Each port [1 to 5] can be configured:
   - Automatic
   - Standard (sub-ring)
   - Interconnection (major ring)
   - External network/PICUS
3. Select **Save** to save the setting.
4. You are prompted to confirm the save, select **Yes**.
5. Select **Write** to write the settings to the controller.
   - A confirmation is displayed after writing the settings:

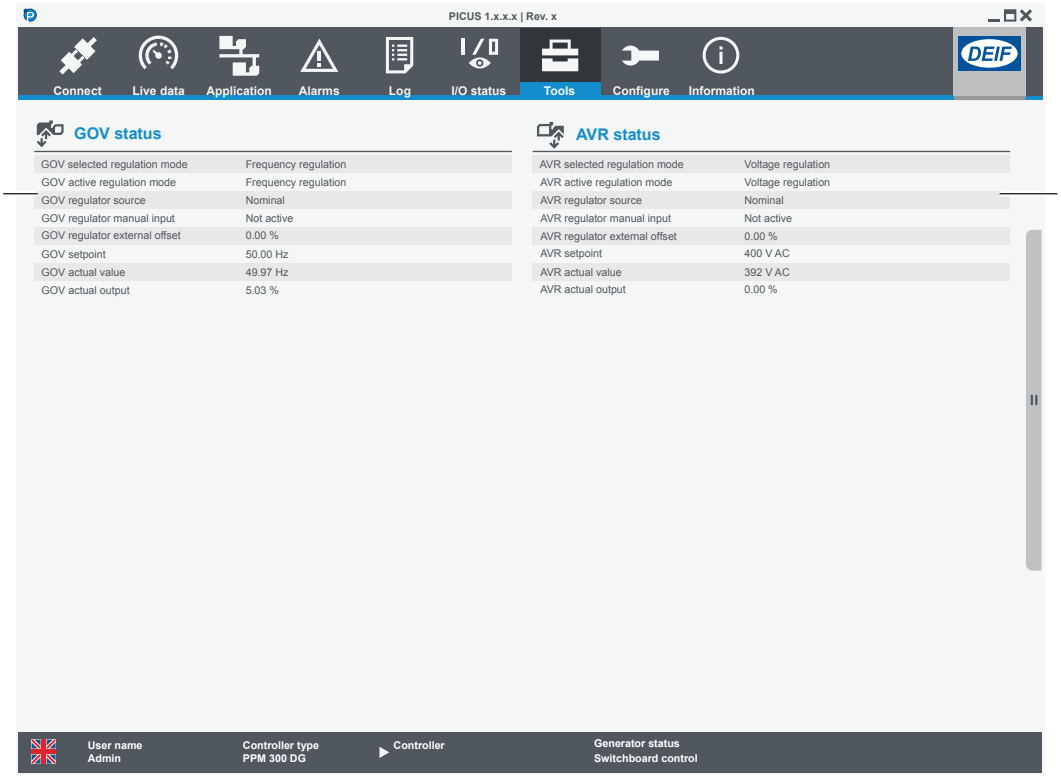


6. An alarm is activated that requires the controller rack to be powered off and on for the change to take effect.

DANGER!
The controller **must** only be powered off and powered on by authorised personnel who understand the risks involved in accessing the controller power supply or installation design. Take extreme care in the enclosure next to the ACM terminals. Ensure the controller is not running and in operation, and that the controlled breaker is open before you power off and on the controller.

9.7 Regulator status

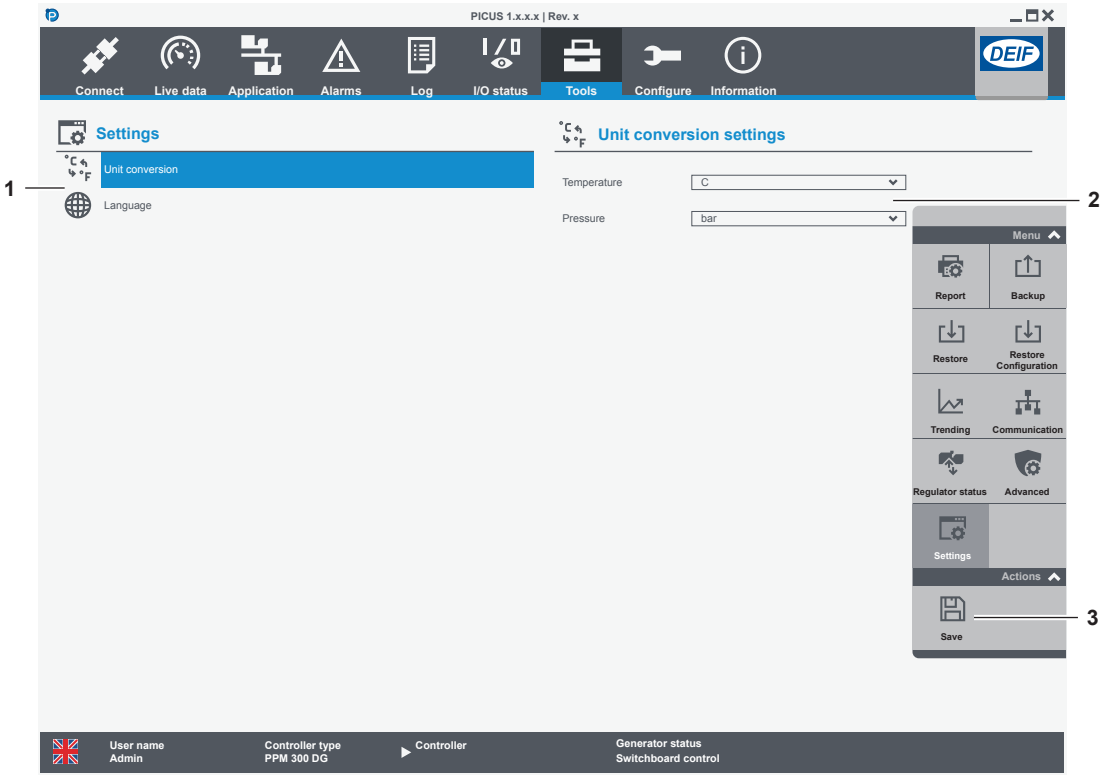
9.7.1 Regulator status page



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.

9.8 Settings

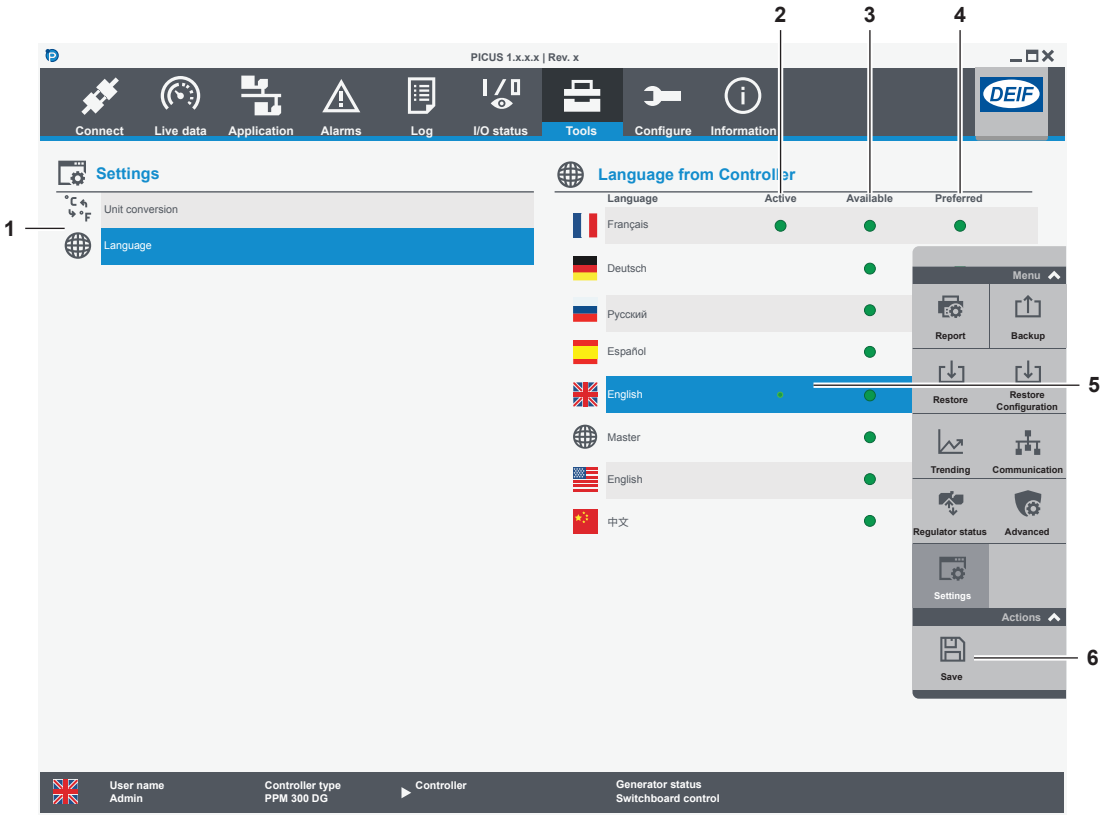
9.8.1 Unit conversion page



No.	Item	Notes	
1	Setting	Change selected setting	
		Unit conversion settings.	**Language** settings.
2	Unit of measure *	Unit of measure for certain operation information: • Temperature • Pressure	
3	Actions	**Save** the settings.	

NOTE * This does **not** change the unit of measure shown on each display.

9.8.2 Language page



No.	Item	Notes	
1	Setting	Change selected setting	
		Unit conversion settings.	**Language** settings.
2	Active	Shows the language that the controller texts are displayed in.	
3	Available	Shows the available languages for controller texts on the controller you are logged on to.	
4	Preferred *	Shows the preferred language for controller texts in PICUS.	
5	Selection **	Shows the language that PICUS uses to display controller text after the settings are saved.	
6	Actions	**Save** the settings.	

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.

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

10. Tools - Advanced

10.1 Firmware

10.1.1 About firmware

Updates of firmware and service packages for controller or display are available from http://www.deif.com.

Installation prerequisites

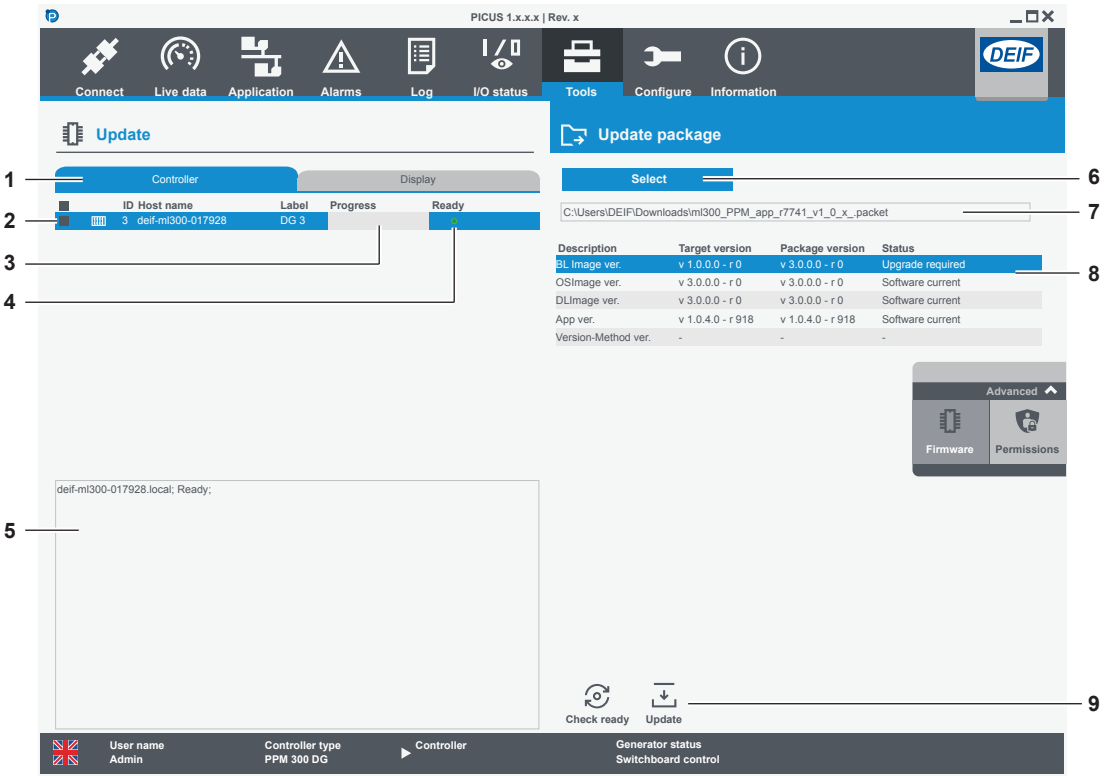
Controllers with ID 0 that are not part of a system can be updated without any prerequisites.

Controllers in a system must meet these prerequisites:

Controller type	Prerequisites
GENSET controller	1. The breaker must be opened. 2. The engine must be stopped. 3. The controller must be under switchboard control.
EMERGENCY genset controller	
HYBRID controller	1. The inverter breaker must be opened. 2. The inverter must be stopped. 3. The controller must be under switchboard control.
SHAFT generator controller	1. The breaker must be opened. 2. The controller must be under switchboard control.
SHORE connection controller	
BUS TIE breaker controller	

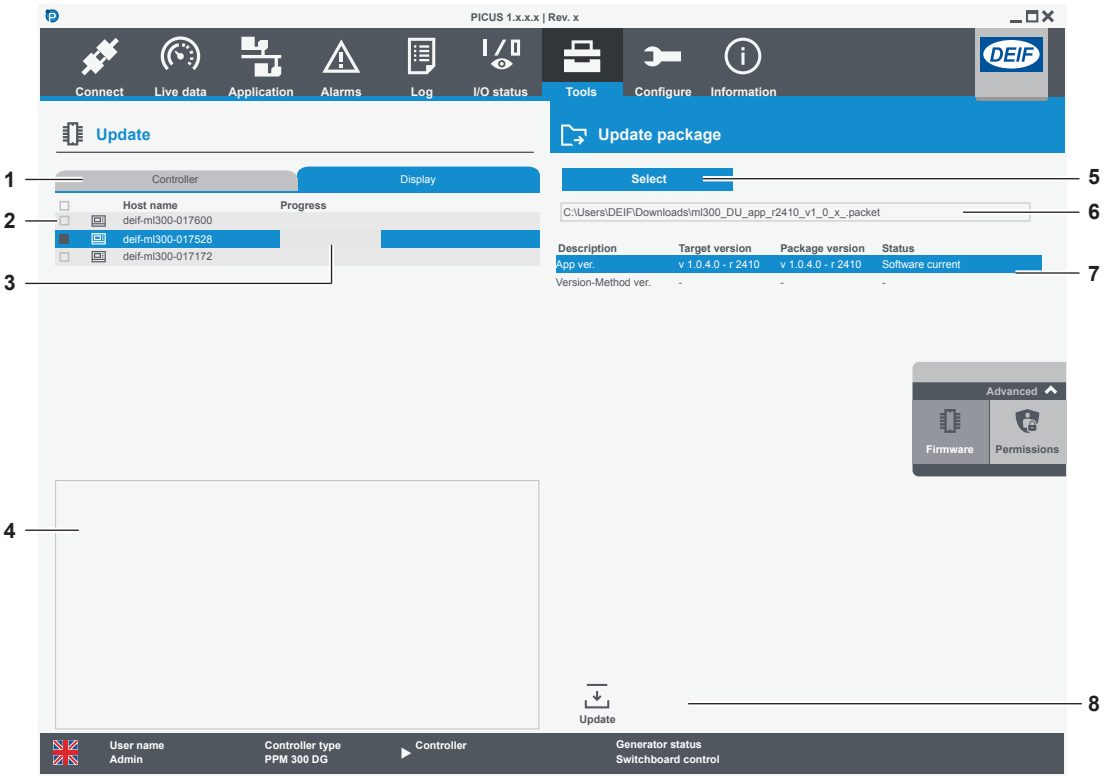
NOTE When a controller is in Emulation mode, these restrictions do not apply.

10.1.2 Update controller page



No.	Item	Notes	
1	Controller or display	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, when you use **Check ready** .	
		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.

10.1.3 Update display page



No.	Item	Notes
1	Controller or display	Changes to the controller or display update page.
2	Display list	Shows all the displays available for update.
3	Update progress	Progress bar shows how far the update has progressed.
4	Update information	Shows the progress of the update.
5	Select firmware	Select the firmware package.
6	Firmware location	Shows the location of the selected firmware package.
7	Application versions	Shows the version information of the display (target) and the selected firmware package.
8	Actions	**Update** the selected displays.

10.1.4 Download and install firmware

Download firmware

1. Use these links to download the controller firmware for your product:
   - GPU 300 - https://www.deif.com/products/gpu-300#software
   - PPM 300 - https://www.deif.com/products/ppm-300#software
   - PPU 300 - https://www.deif.com/products/ppu-300#software
2. Follow the given instructions for download.
3. Unzip the file to a location on your computer.

Install firmware

1. Make sure you meet the installation prerequisites.
2. Select Controller or Display unit page.
3. Select the controllers or display units you wish to update.
4. Use **Select** to locate the downloaded firmware update **.packet** file.

- PICUS automatically checks the status of the firmware package and selected controllers or displays.

5. 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.
6. Select **Update** to start.
   - During the update the progress status is shown and also by a progress bar.
7. When a controller update is complete, PICUS may restart.

10.2 Permissions

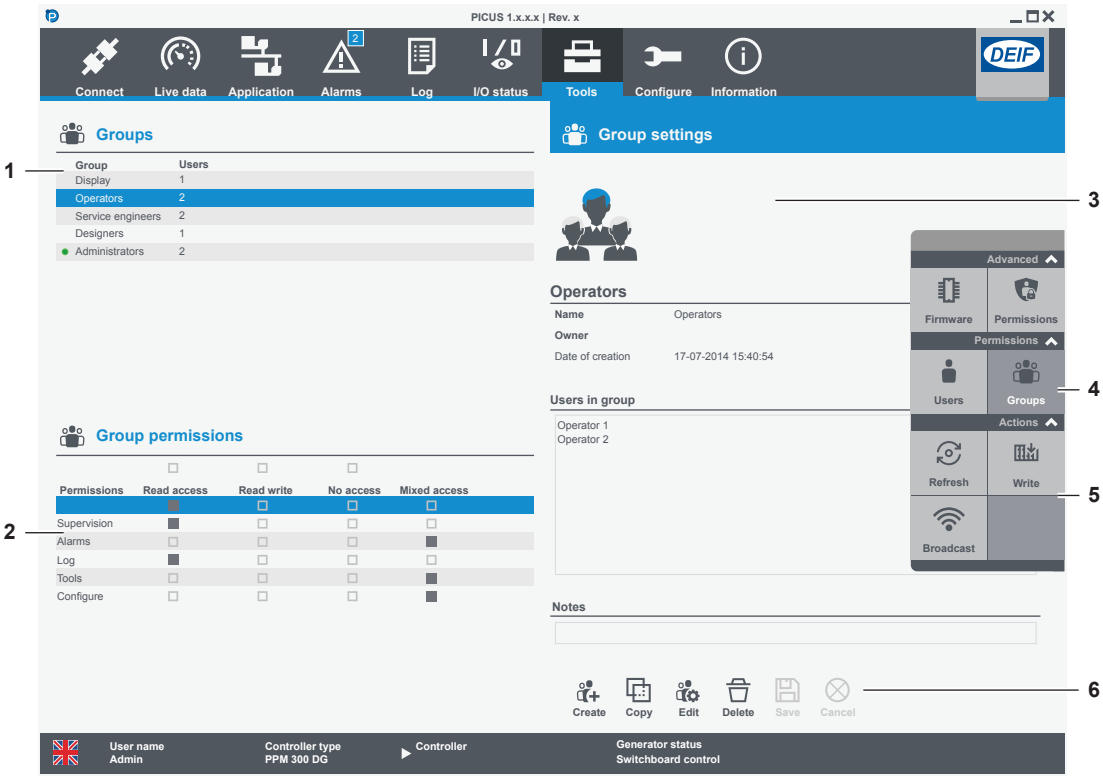
10.2.1 About permissions

Access to the controllers configuration and functionality is protected with user permissions. You can use PICUS to manage the group and user permissions for your system.

Always remember to **Write** the group settings to the controller, once you have made all of your configuration changes. You can optionally use **Broadcast** to duplicate the groups to the selected controllers.

More information
See **Other functions**, **Permissions** in the **Designer's handbook** for more information about how permissions work on the controller.

10.2.2 Groups page



No.	Item	Notes	
1	Group list and selection	Shows a list of permission groups and number of users assigned to that group.	
		Green dot shows the group for the currently logged on user.	
2	Group permissions	Permissions access for the different areas of the controller software and/or PICUS features.	
3	Group information	Details about the selected group.	
4	Users page	**Users** to change to the Users page.	
5	Actions	**Refresh** the permissions.	**Write** the permissions to the controller.
		Broadcast the permissions to controllers.	
6	Options	**Create** a new group.	**Copy** a group to a new group.
		Edit the selected group.	**Delete** the selected group.
		Save the changes locally.	**Cancel** the edit of a group.

10.2.3 Manage groups

Create a group

1. Select **Create** for a new group, or use **Copy** to duplicate a group.
2. Enter the Name and optional Owner and Notes for the group.
3. Select **Save** to save the new group settings locally.
4. Select **Write** to write the permissions to the controller.

The new group is created with read access permissions by default.

Edit a group

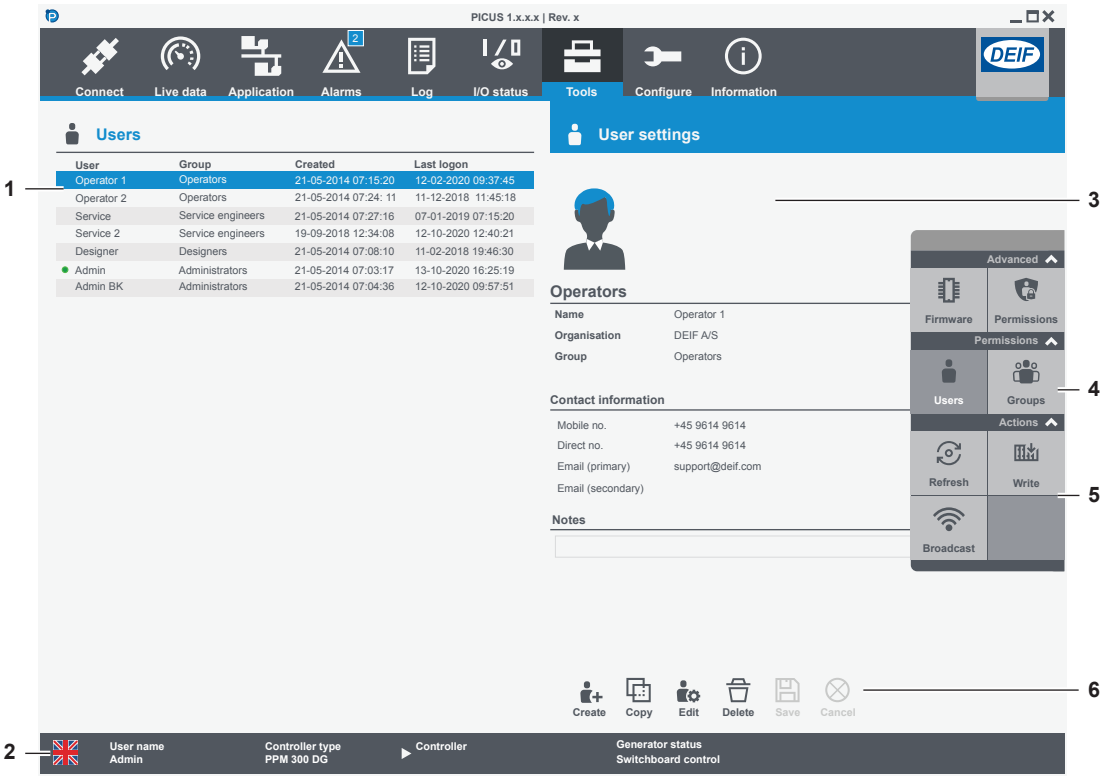
1. Select the group.
2. Select **Edit**.
3. Edit the Name and optional Owner and Notes for the group.
4. To change the group permissions, select the permission from the list (details are shown on the right).
5. Select the Access permission.
6. Select **Save** to save the new group settings locally.
7. Select **Write** to write the permissions to the controller.

Delete a group

If you delete a group you also delete all the assigned users of that group. The groups Administrators and Display cannot be deleted.

1. Select the group to delete from the list.
2. Select **Delete** . You are prompted to confirm the deletion.
   - Any users assigned to the group are listed.
3. Select **Yes** to delete the group with any assigned users.

10.2.4 Users page



No.	Item	Notes	
1	User list and selection	Shows a list of permission users and last log on date and time.	
		Green dot shows the user is currently logged on.	
2	User name	Currently logged on user.	
3	User information	Details about the selected user.	
4	Users page	**Groups** to change to the Groups page.	
5	Actions	**Refresh** the permissions.	**Write** the permissions to the controller.
		Broadcast the permissions to controllers.	
6	Options	**Create** a new user.	**Copy** a user to a new user.
		Edit the selected user.	**Delete** the selected user.
		Save the changes locally. *	**Cancel** the edit of a user.

NOTE * **Save** does not write the configuration to the controller, but gives you the opportunity to configure several users. Use **Write** to write the saved permissions to the controller.

10.2.5 Manage users

Create a user

1. Select **Create** for a new user, or use **Copy** to duplicate a user.
2. Enter the Name and optional Organisation for the user.
3. Select the group to assign to this user from the available list.
4. Enter the optional Mobile number, Direct number, Email (primary), Email (secondary) and Notes for the user.
5. Enter and confirm the Password for the user (minimum eight characters).
6. Select **Save** to save the new user settings locally.
7. Select **Write** to write the permissions to the controller.

Edit a user

1. Select the user.
2. Select **Edit**.
3. Enter the user Password under Old password.
   - Use the **TAB** key on the keyboard or select outside of the password entry.
   - Enter a new password to edit the user information or change the password.
4. Select **Save** to save the new group settings locally.
5. Select **Write** to write the permissions to the controller.

Delete a user

A user who is a member of the Administrators group cannot be deleted.

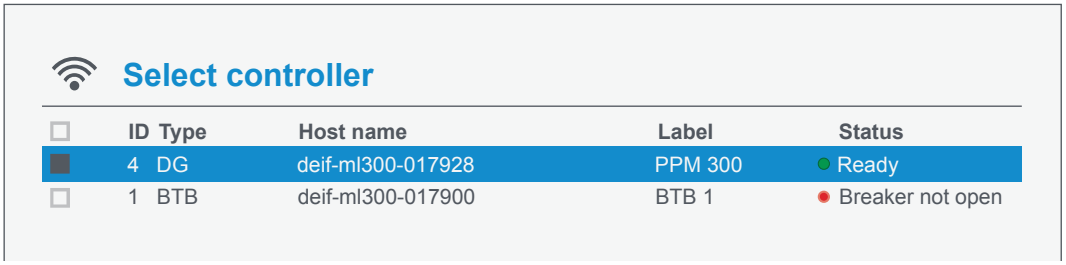
1. Select the user to delete from the list.
2. Select **Delete** . You are prompted to confirm the deletion.
3. Select **Yes** to delete the user.

10.2.6 Broadcast to controllers

Only controllers connected and logged on are shown. Selected controllers must include the controller you are directly connected and logged on to.

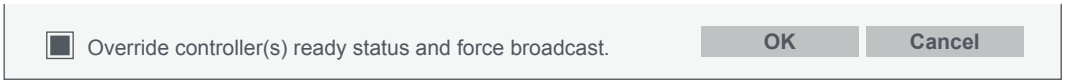
CAUTION
PICUS allows you to broadcast to controllers, even if they are not safe for commissioning. You must confirm this override action manually.

1. Select **Broadcast** .
2. Select the controllers:

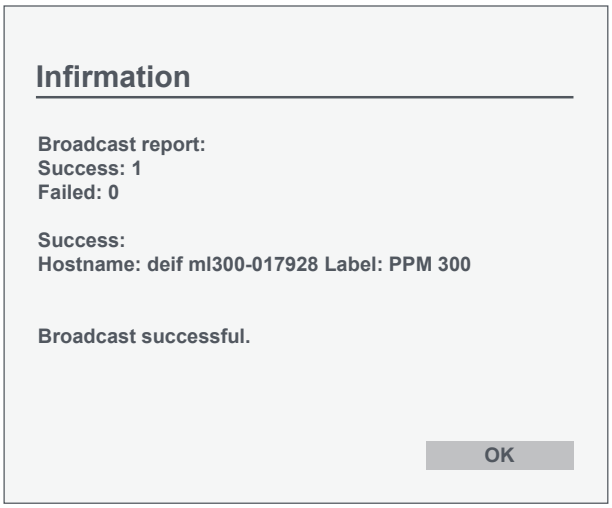


- indicates the controller is ready.
- indicates the controller is not ready, but can be overridden.

3. For controllers that are not ready, you can force a broadcast and override action at the bottom of the window:



4. Select **OK** to broadcast to the selected controllers.
   - A summary report is shown:



11. Configure

11.1 Time settings

11.1.1 About Time settings

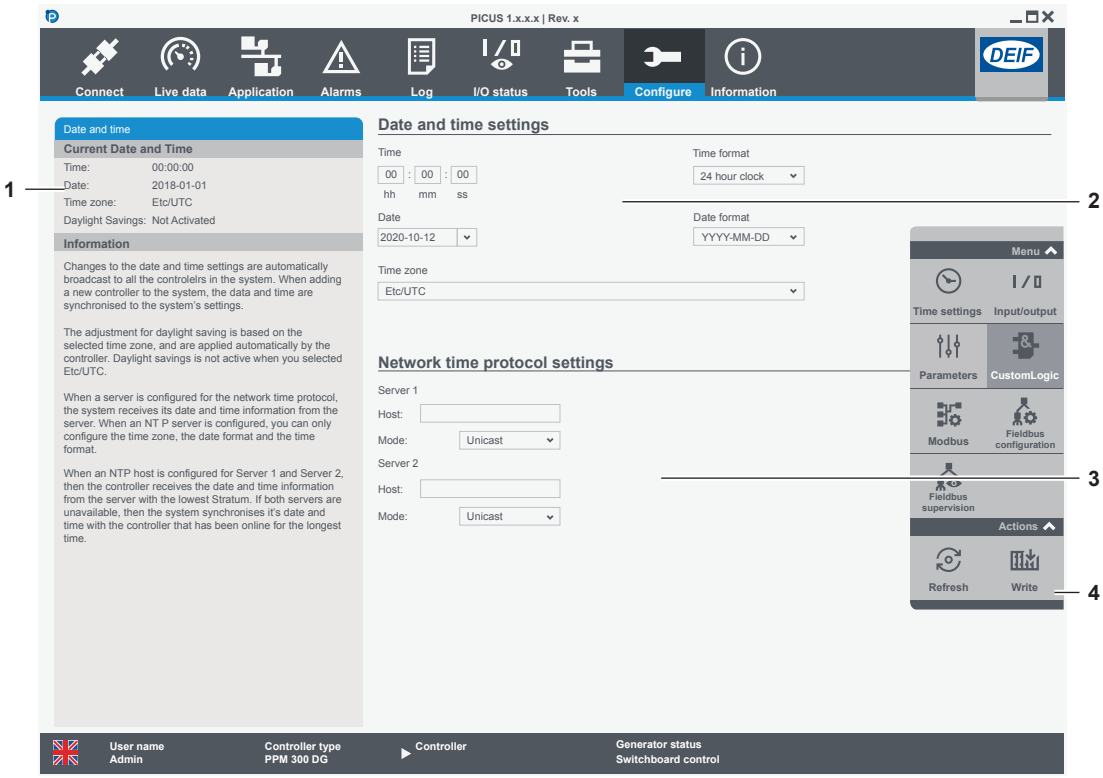
Date and time are used for operation and for logs. Configure date and time manually, or use a network time protocol (NTP) server to synchronise to a server.

Date and time settings are shared with all controllers on the network. If you manually change the time on one controller it updates the time on all the controllers on the network.

Daylight saving adjustment is based on the time zone, and is automatically applied by the controller.

More information
See **Other functions**, **Date and time** in the **Designer's handbook** for more information about the date settings and NTP server.

11.1.2 Time settings page

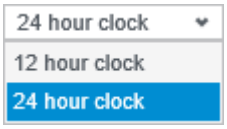


No.	Item	Notes	
1	Controller date and time	Current date and time from the controller or offline project.	
		If an NTP server is configured, the server status is shown here.	
2	Date and time settings	Settings to change the date and time.	
3	Network time protocol settings	Settings to change the network time protocol servers.	
4	Actions	**Refresh** to reload the settings.	**Write** the settings to the controller.

11.1.3 Configure date and time

1. Select the correct time zone before you change the time:
   - 

   - Daylight savings is not applied to the controller when you select the *Etc/UTC* time zone.
2. Enter the time:
   - 

3. Select the time format:
   - 

4. Enter or select the date.
5. Select the date format:
   - 

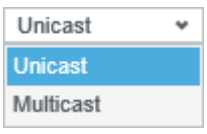
6. Select **Write** to save the settings to the controller.

11.1.4 Configure network time protocol

A host address and NTP mode must be configured for Server 1 and/or Server 2.

The NTP server must be configured on every controller in the network:

- **Unicast** mode: The controller sends requests for date and time to the specified host. The controller updates the date and time when the host responds to the request.
- **Multicast** mode: The controller waits for date and time to be broadcast from a server on the host location. The controller updates the date and time when a broadcast is received.

1. Enter the NTP host IPv4 address.
2. Select the synchronisation mode to the server:
   - 

3. Select **Write** to save the settings to the controller.

11.2 Input/output

11.2.1 About input/output

The controller inputs and outputs are configurable but depend on the single-line diagram, parameters, functions and alarms. You can configure digital or analogue inputs and outputs, custom alarms, and use functions.

More information
See the **Data sheet**, or **Hardware characteristics and configuration** in the **Designer's handbook** for more information about the hardware modules and terminals.

Input/output restrictions

Digital input (DI)	
Functions allowed	One or more different functions on same input terminal.
Restrictions	• You cannot use a function already assigned to another digital input (DI). • You cannot use a function assigned and used in CustomLogic.

Digital output (DO)	
Functions allowed	One function on the same terminal.
Restrictions	• Only one function or multiple alarms are allowed to be configured. • You cannot use a function assigned and used in CustomLogic.
Notes	The same function can be assigned to other digital output (DO) terminals.

Analogue input (AI)	
Functions allowed	One or more different functions on the same input terminal.
Restrictions	• 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 functions (**Analogue functions**). ◦ or ◦ Digital input functions (**Supervised binary input**). • You cannot use both analogue AND digital functions on the same terminal.

Analogue output (AO)	
Functions allowed	One function on the same input terminal.
Restrictions	The function must be selected before the Output setup can be configured.
Notes	The same function can be assigned to other analogue output (AO) terminals.

Pulse width modulation (PWM)	
Functions allowed	One function on the same input terminal.
Restrictions	The function must be selected before the Output setup can be configured.
Notes	The same function can be assigned to other Pulse width modulation (PWM) terminals.

About Analogue inputs

You can use an analogue input for:

- As an input for one or more controller **analogue functions**.
- As a supervised input for one or more controller **digital functions**.

- To detect **sensor failure**.
- As the basis for one or more **alarms**.

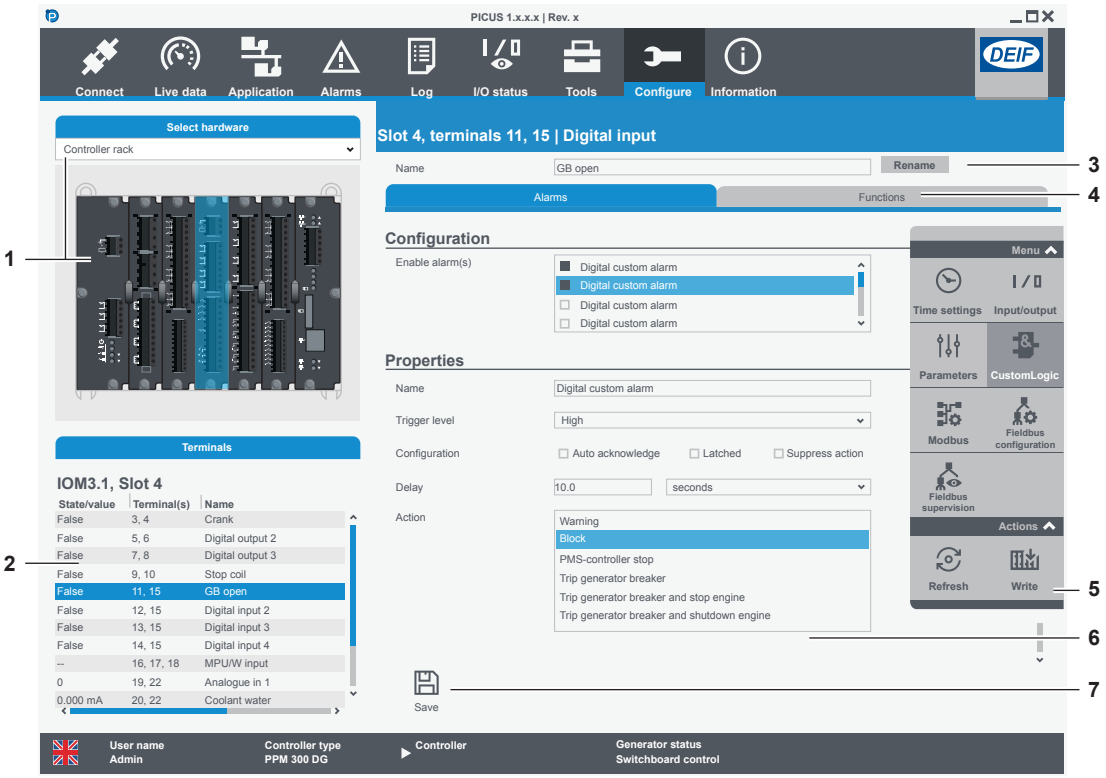
For each analogue input use, the table below shows which **pages** in the analogue input view you must configure.

Table 11.1 Configuration for the uses of an analogue input

Use	Functions	Sensor setup	Alarms
Analogue functions	Required	Required	Optional
Digital functions	Required	Required	Optional
Sensor failure	Optional	Required	Optional
Alarms	Optional	Required	Required

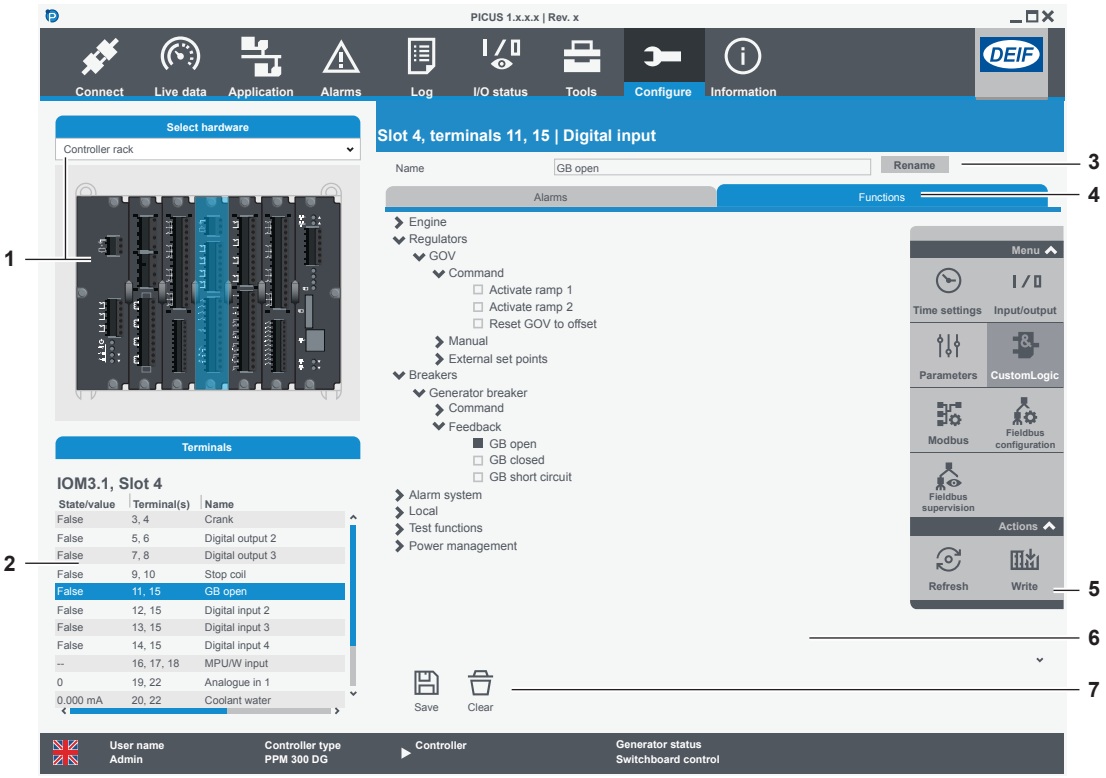
More information
See the **Designer's handbook** for more information on specific functions and hardware characteristics.

11.2.2 Digital input: Alarms page



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Functions page	Change to Functions page.	
5	Actions	**Refresh** settings.	**Write** settings to the controller.
6	Alarm settings	Settings for the alarm.	
7	Options	**Save** the changes locally.	

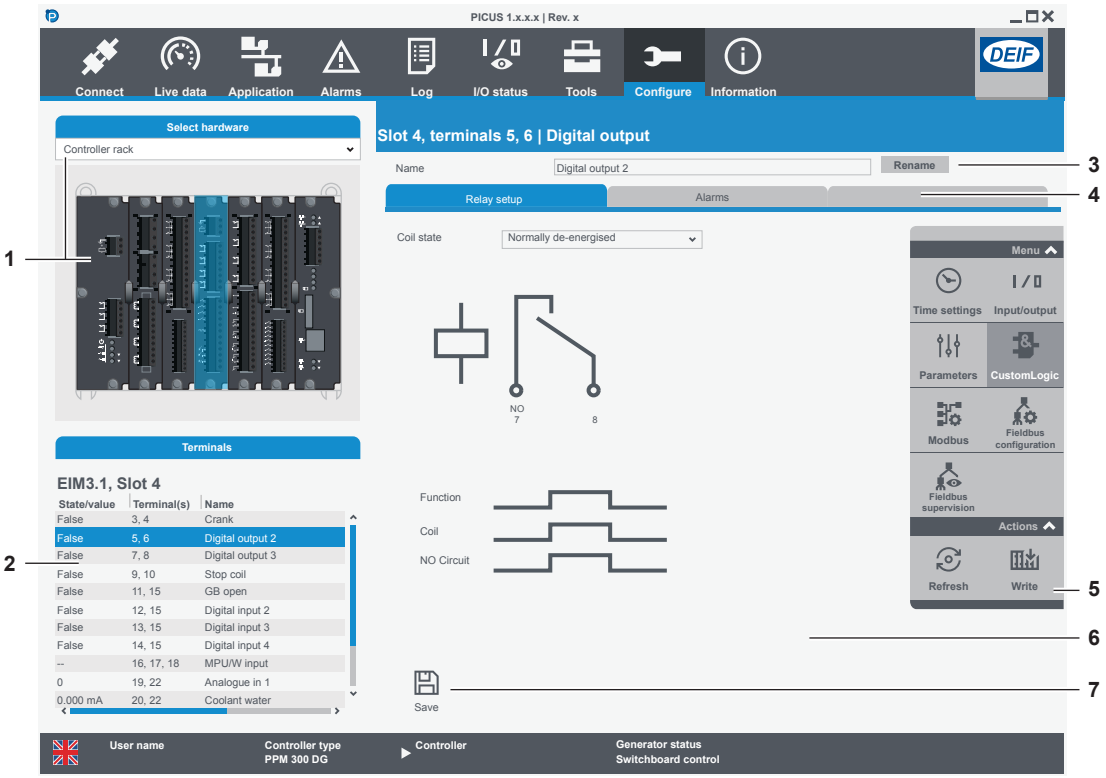
11.2.3 Digital input: Functions page



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Alarms page	Change to Alarms page.	
5	Actions	**Refresh** settings.	**Write** settings to the controller.
6	Functions	List of selectable digital input functions. *	
7	Options	**Save** the changes locally.	**Clear** all selected functions.

NOTE * You can assign multiple functions to the same digital input but not functions already assigned to a different terminal.

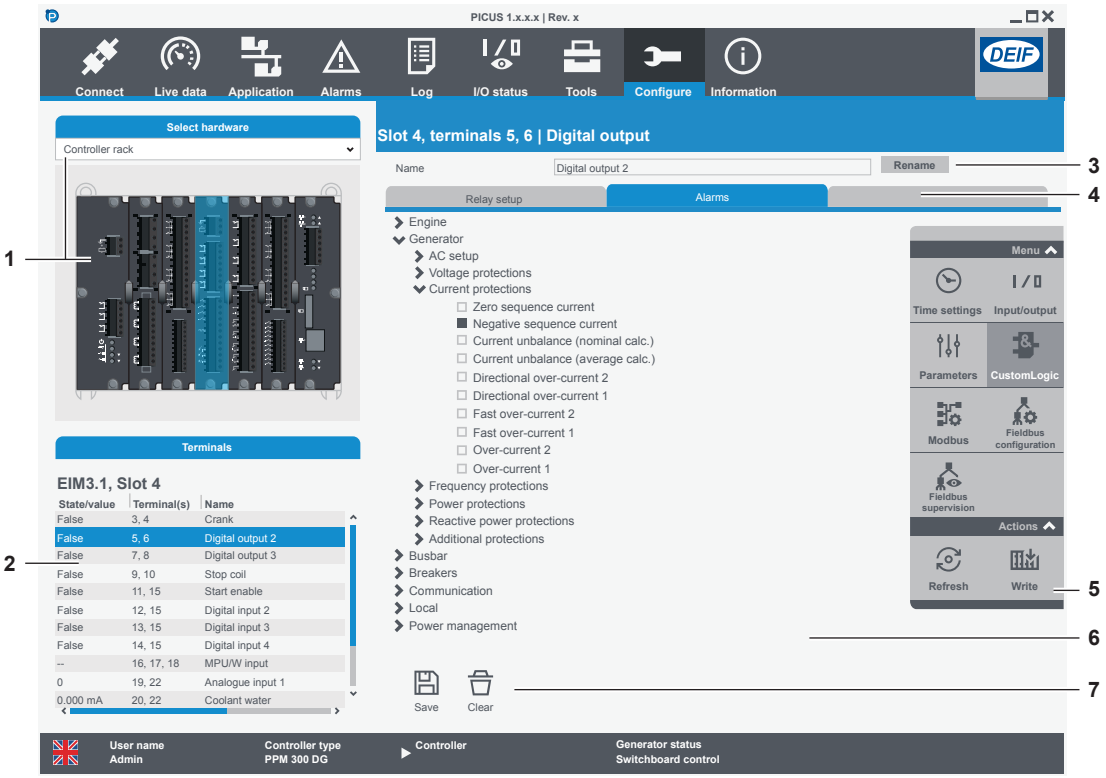
11.2.4 Digital output: Relay setup page



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Alarms or functions page *	Change to Alarms or Functions page.	
5	Actions	**Refresh** settings.	**Write** settings to the controller.
6	Relay setting	Select Coil state.	
7	Options	**Save** the changes locally.	

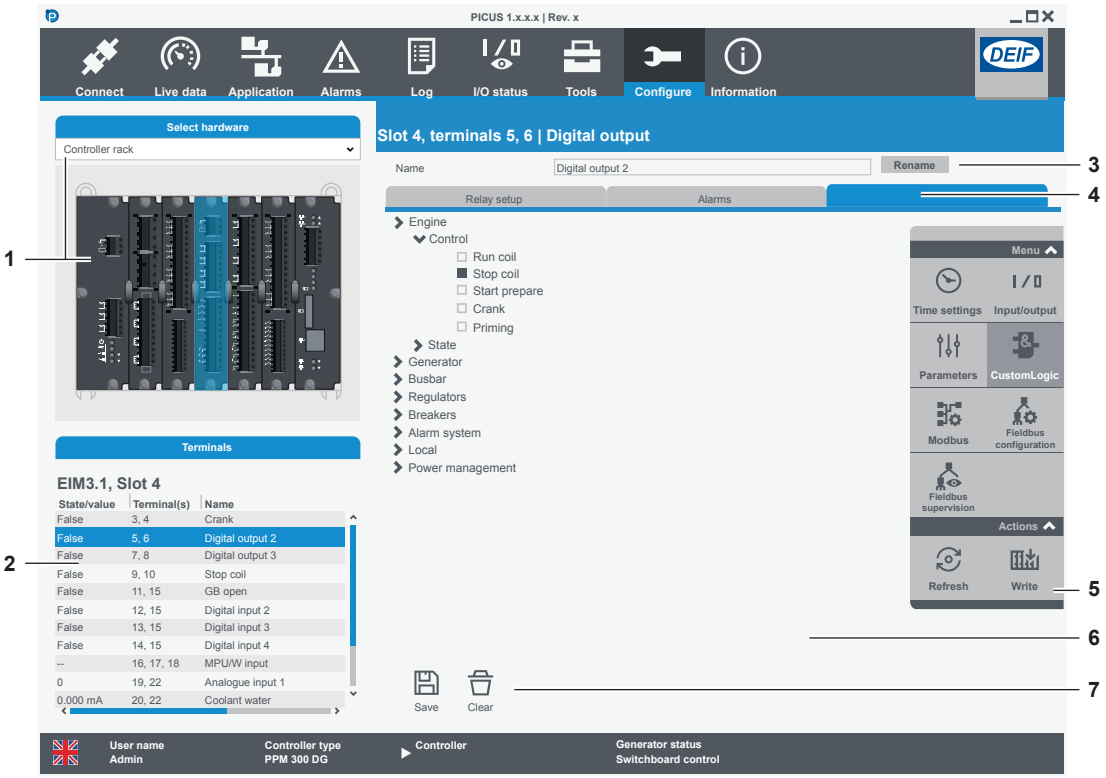
NOTE * A digital output can only be assigned to one function, or to one or more alarms. You cannot assign both a function and an alarm. The same function can be assigned to different digital outputs.

11.2.5 Digital output: Alarms page



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Relay setup or functions page	Change to Relay setup or Functions page.	
5	Actions	**Refresh** settings.	**Write** settings to the controller.
6	Alarms	List of selectable alarms.	
7	Options	**Save** the changes locally.	**Clear** all selected alarms.

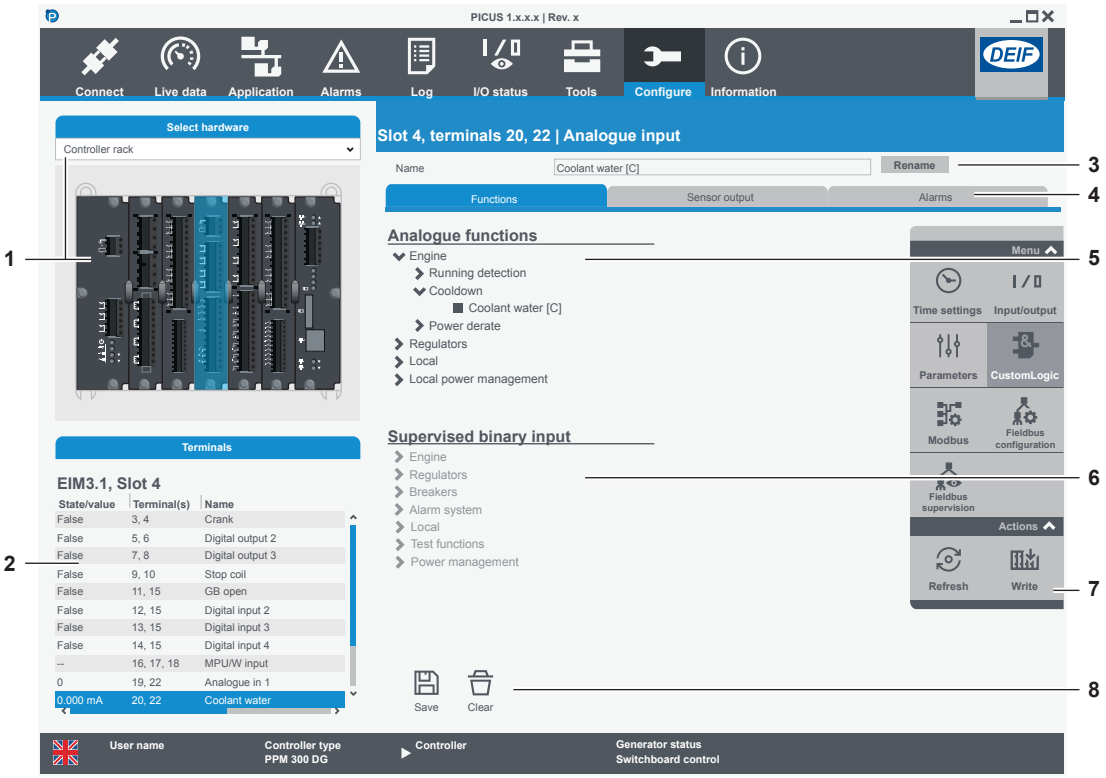
11.2.6 Digital output: Functions page



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Relay setup or alarms page	Change to Relay setup or Alarms page.	
5	Actions	**Refresh** settings.	**Write** settings to the controller.
6	Functions *	List of selectable functions.	
7	Options	**Save** the changes locally.	**Clear** the selected function.

NOTE * You can assign one function to the digital output and not functions already assigned to a different terminal.

11.2.7 Analogue input: Functions page

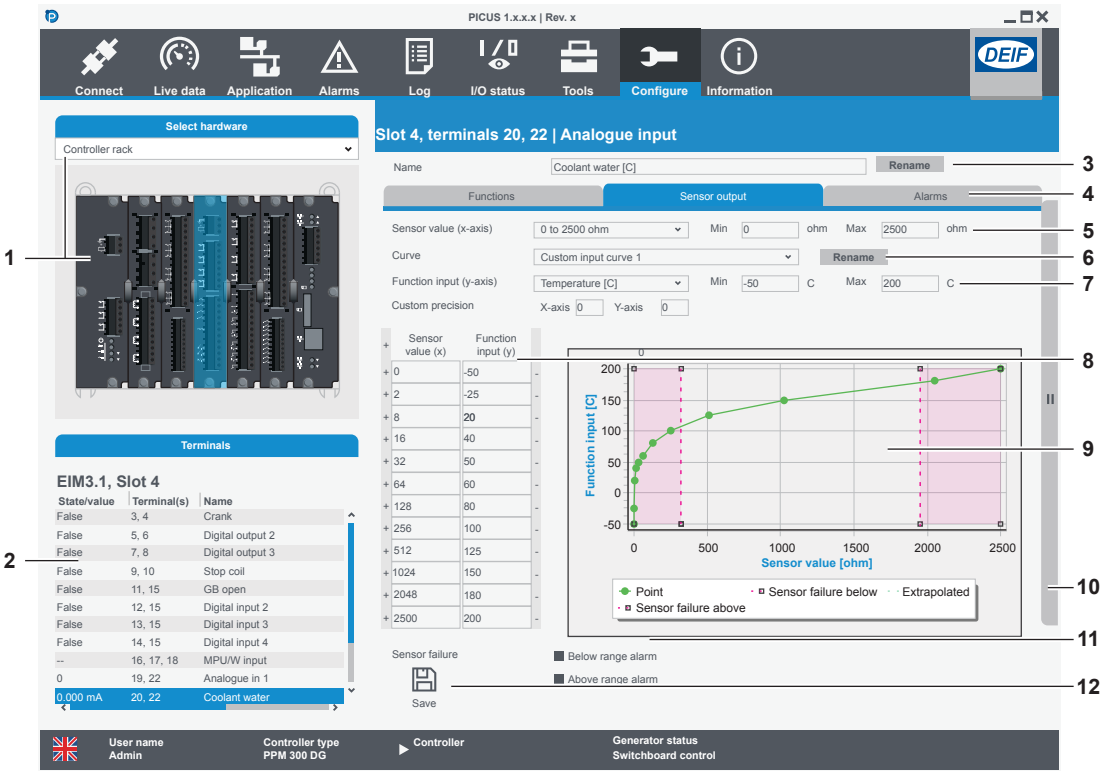


No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Sensor setup or alarms page	Change to Sensor setup or Alarms page.	
5	Analogue input functions *	Select analogue input functions. **	
6	Digital input functions *	Select digital input functions.	
7	Actions	**Refresh** settings.	**Write** settings to the controller.
8	Options	**Save** the changes locally.	**Clear** the selected functions.

NOTE * You cannot select both analogue input functions and digital input functions.
** You cannot select a function that is already assigned to another terminal. All selected functions must have the same unit of measure.

11.2.8 Analogue input: Sensor setup page

Hardware characteristics of the sensor wired to the terminals determines the analogue input configuration.

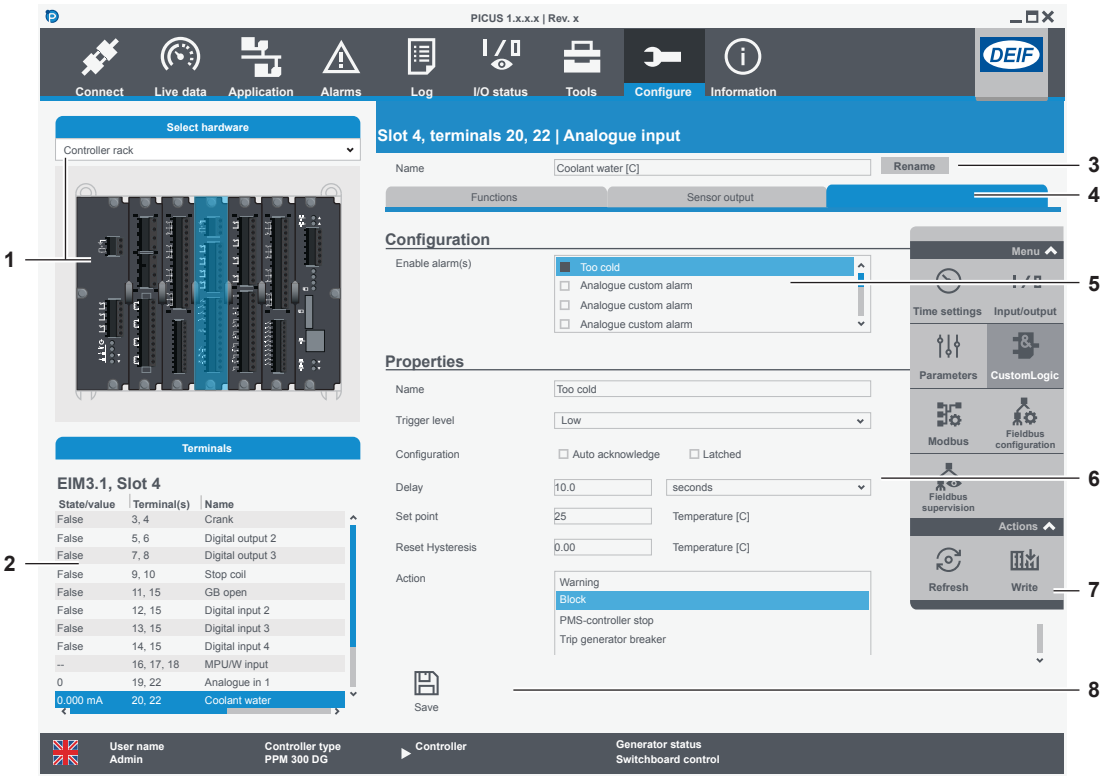


No.	Item	Notes
1	Controller rack and module selection	Select controller rack and hardware module.
2	Terminal selection	Select the terminal to configure.
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.
4	Functions or alarms page	Change to Functions or Alarms page.
5	x-axis values	**x-axis**: Units selectable, range from the analogue input.
6	Curve	Create a new curve or select a compatible curve from the list. *
7	y-axis values	**y-axis**: Units and range from the analogue input function initially.
8	Curve points **	Create points for the curve to convert the analogue input to the value used by the controller. + **Add** a coordinate. | - **Remove** a coordinate.
9	Graph	A graphic representation of the curve points and sensor failure alarms.
10	Actions	**Refresh** settings. | **Write** settings to the controller.
11	Sensor failure alarms	Enable **Below range alarm** and/or **Above range alarm**.
12	Options	**Save** the changes locally.

NOTE * Pre-configured curves cannot be modified.
** The minimum and maximum sensor output and function input do not create a straight line graph. You must supply all the points required for the active area of the curve.

11.2.9 Analogue input: Alarms page

This page is only available after you have configured the Sensor setup.



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Sensor setup or functions page	Change to Sensor setup or Functions page.	
5	Enable alarms	Enable alarms here. The parameters for the highlighted alarm are shown under Properties.	
6	Properties	The parameters for the highlighted alarm.	
7	Actions	**Refresh** settings.	**Write** settings to the controller.
8	Options	**Save** the changes locally.	

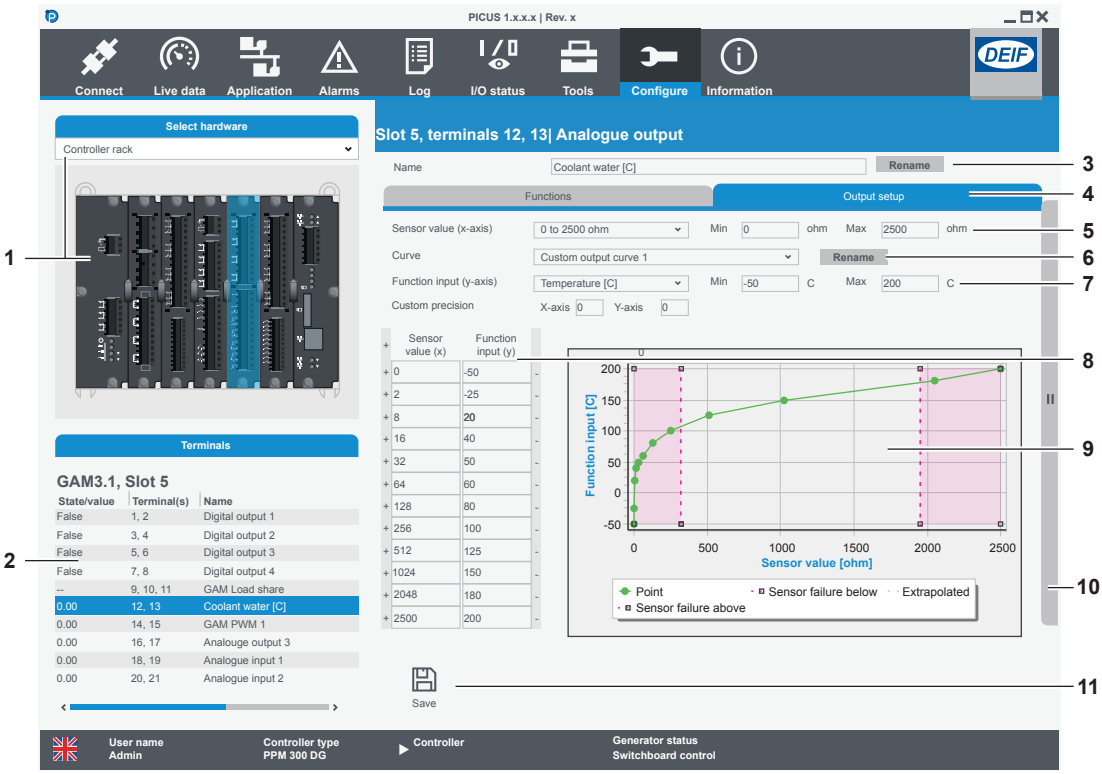
11.2.10 Analogue output: Function page

No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Output setup page	Change to Output setup page.	
5	Functions	Select analogue output function. *	
6	Actions	**Refresh** settings.	**Write** settings to the controller.
7	Options	**Save** the changes locally.	**Clear** the selected functions.

NOTE * You can only assign one function to the analogue output. You cannot select a function that is already assigned to another terminal.

11.2.11 Analogue output: Output setup

Hardware characteristics of the sensor wired to the terminals determines the analogue output configuration.



No.	Item	Notes	
1	Controller rack and module selection	Select controller rack and hardware module.	
2	Terminal selection	Select the terminal to configure.	
3	Terminal name	Automatically updates the name when a function is selected. Use **Rename** to enter another name.	
4	Function page	Change to Function page.	
5	x-axis values	**x-axis**: Units selectable, range from the analogue input.	
6	Curve	Create a new curve or select a compatible curve from the list. *	
7	y-axis values	**y-axis**: Units and range from the analogue input function initially.	
8	Curve points **	Create points for the curve to convert the analogue input to the value used by the controller.	
		+ **Add** a coordinate.	- **Remove** a coordinate.
9	Graph	A graphic representation of the curve points and sensor failure alarms.	
10	Actions	**Refresh** settings.	**Write** settings to the controller.
11	Options	**Save** the changes locally.	

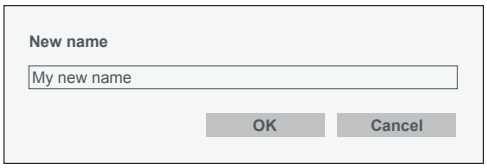
NOTE * Pre-configured curves cannot be modified.
** The minimum and maximum sensor output and function input do not create a straight line graph. You must supply all the points required for the active area of the curve.

11.2.12 Configure input/output

Configure a terminal name

	DI	DO	AI	AO	PWM
Configurable for:	●	●	●	●	●

PICUS automatically assigns a name when a function is selected. You can also rename the terminal:

1. Select **Rename**.
   - Enter the new name:
   - 

2. Select **Save** .
3. Select **Write** to write the settings to the controller.

Assign a function

	DI	DO	AI	AO	PWM
Configurable for:	●	●	●	●	●

1. Select the required functions from the available list.
2. Select either:
   - **Save** to store the functions.
   - **Clear** to clear all selected functions.
3. Select **Write** to write the settings to the controller.

Configure a custom alarm

	DI	DO	AI	AO	PWM
Configurable for:	●		●		

Analogue input (AI) custom alarms

The sensor settings must be configured before you configure any custom alarms.

You can create up to 200 analogue custom alarms.

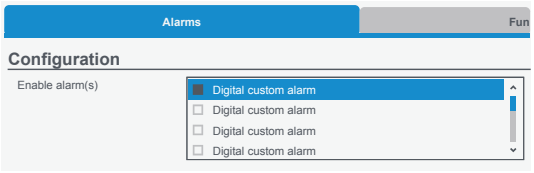
You can configure an analogue custom alarm with a Set point related to the y-axis (function input) for the sensor settings.

You can also configure analogue custom alarms for sensor failure as part of the sensor setup page.

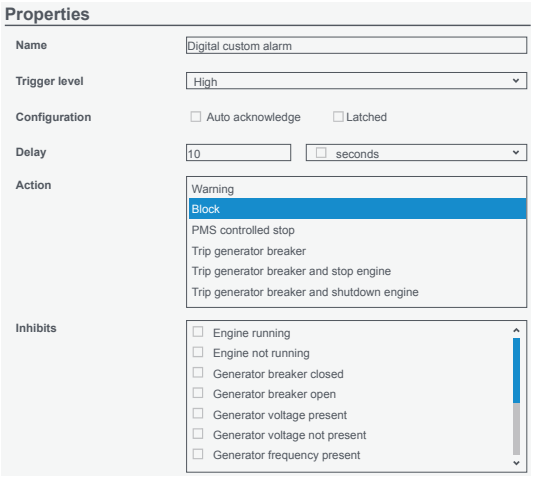
Digital input (DI) custom alarms

Configure a digital input (DI) custom alarm for a **Low** or **High** *Trigger level*. The alarm is activated when the input is inactive or active, respectively.

1. Select Enable with an unused alarm from the list.

- 

2. Configure the alarm settings under properties:

- 

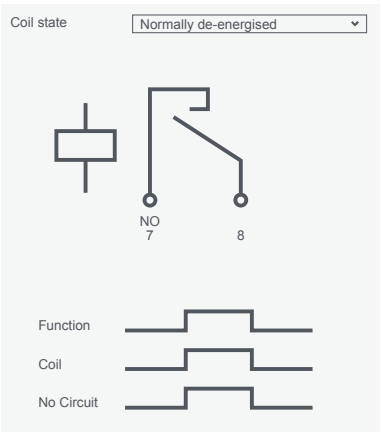
3. Select **Save** to store the alarm.
4. Select **Write** to write the settings to the controller.

Configure a relay setup

	DI	DO	AI	AO	PWM
Configurable for:		●			

A digital output (DO) can be either a standard relay or a changeover relay. The type of relay depends upon the hardware.

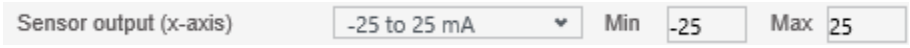
1. Select the Coil state from the list.

- 

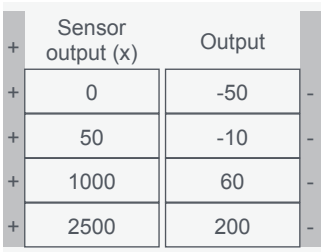
2. Select **Save** to store the setting.
3. Select **Write** to write the settings to the controller.

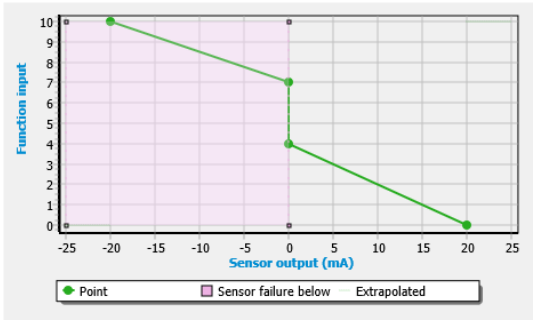
Configure a sensor setup

	DI	DO	AI	AO	PWM
Configurable for:			●		

1. If applicable select the analogue input function on the Functions page.
2. Change the **Sensor output (x-axis)** units and range if necessary:
   - 

3. Change the **Function input (y-axis)** units and range if necessary:
   - 

   - All the functions are deselected if you change the function input units.
4. Configure the coordinate points:
   - 

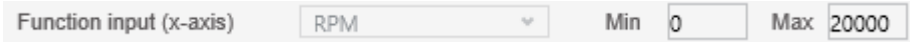
   - Select **Add** to add a point.
   - Select **Remove** to remove a point.
   - The Sensor output (x) values must be in ascending order.
5. As you edit the points, the graph is updated:
   - 

6. Optionally create sensor failure alarms. These are also shown on the graph.
7. Select **Save** to store the setting.
8. Select **Write** to write the settings to the controller.

Configure an output setup

	DI	DO	AI	AO	PWM
Configurable for:				•	•

The function previously selected determines the x-axis for the output setup.

1. Select the analogue output function on the Function page.
2. Change the **Function input (x-axis)** range if necessary.
   - 

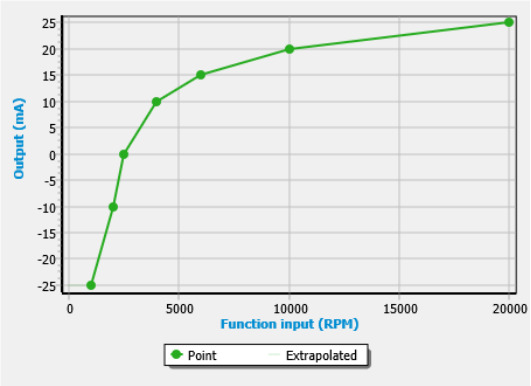
3. Change the **Output type (y-axis)** units and range if necessary.
   - 

4. Configure the coordinate points:

	Function input (x)	Output (y)	
+	1000	-25	-
+	2000	-10	-
+	2500	0	-
+	4000	10	-
+	6000	15	-
+	10000	20	-
+	20000	25	-

- Select + **Add** to add a point.
- Select - **Remove** to remove a point.
- The Function input (x) values must be in ascending order.

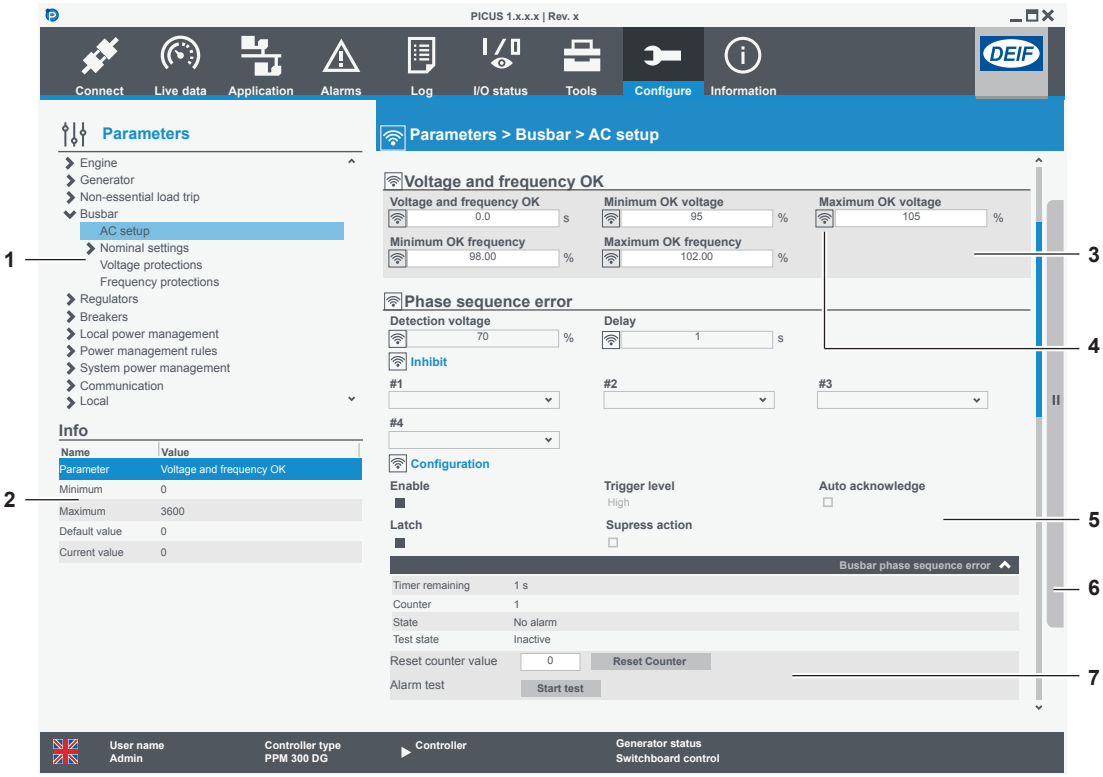
5. As you edit the points, the graph is updated:



6. Select **Save** to store the setting.
7. Select **Write** to write the settings to the controller.

11.3 Parameters

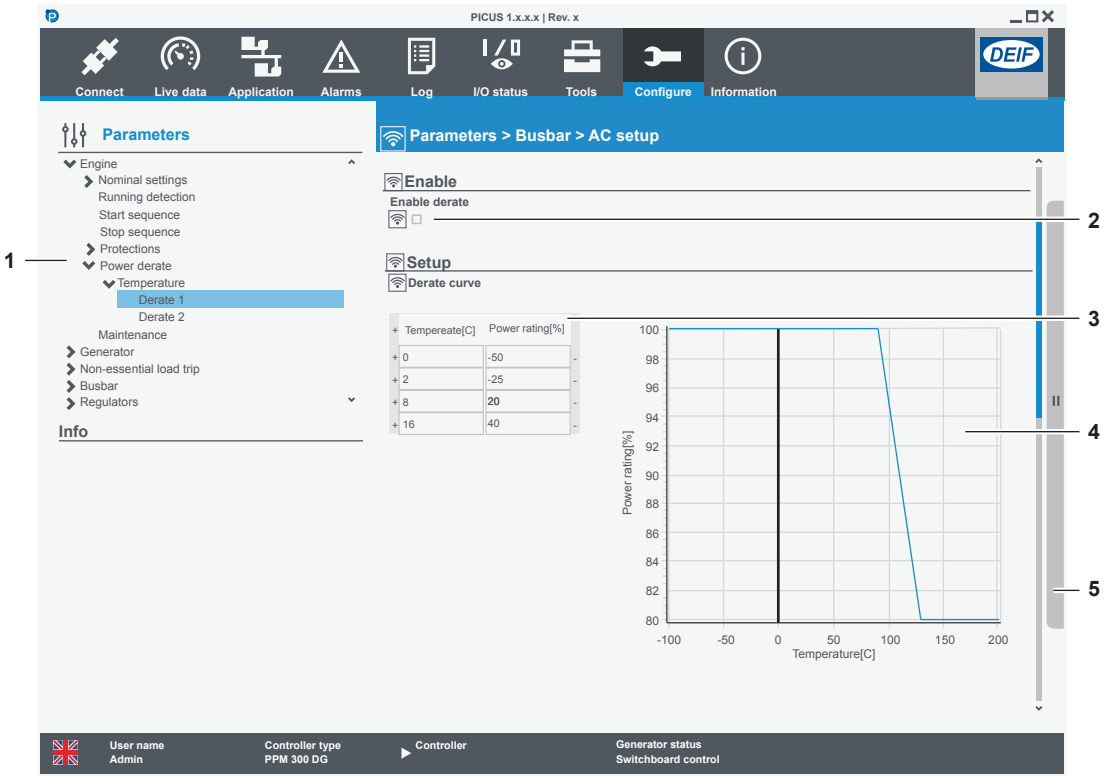
11.3.1 Parameters page



No.	Item	Notes	
1	Parameter category list	Shows a list of the parameters organised by category.	
2	Parameter info	Information for the selected parameter.	
3	Controller setting	Controller parameter setting.	
4	Setting broadcast	**Broadcast** the setting to controllers.	
5	Alarm setting	Alarm setting	
6	Actions	**Refresh** the parameters.	**Write** the parameters to the controller.
7	Additional information	Further information or actions.	

NOTE Some parameters are only visible in the parameter list if the corresponding input/output or function is enabled.

11.3.2 Parameter curve page



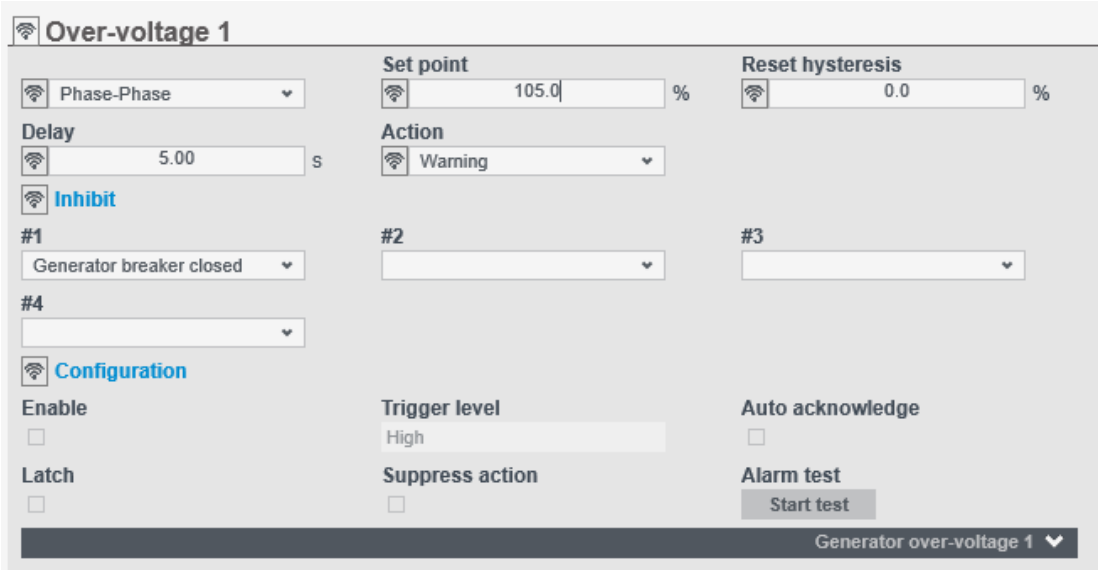
No.	Item	Notes	
1	Parameter category list	Shows a list of the parameters organised by category.	
2	Curve enable	☐ **Not enabled** .	■ **Enabled** .
3	Curve settings	Curve requires a minimum of four sets of coordinates (x, y), and a maximum of up to 10 sets of coordinates.	
		+ **Add** a set of coordinates.	- **Remove** a set of coordinates.
4	Curve	Shows curve settings as a graph.	
5	Actions	**Refresh** the parameters.	**Write** the parameters to the controller.

NOTE Some parameter curves are only shown if the corresponding input/output function is configured.

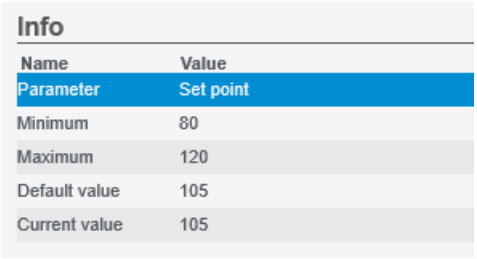
11.3.3 Configure parameter settings

Configure a parameter

1. Select the parameter from the category list.
2. Select the parameter setting or alarm setting to edit.



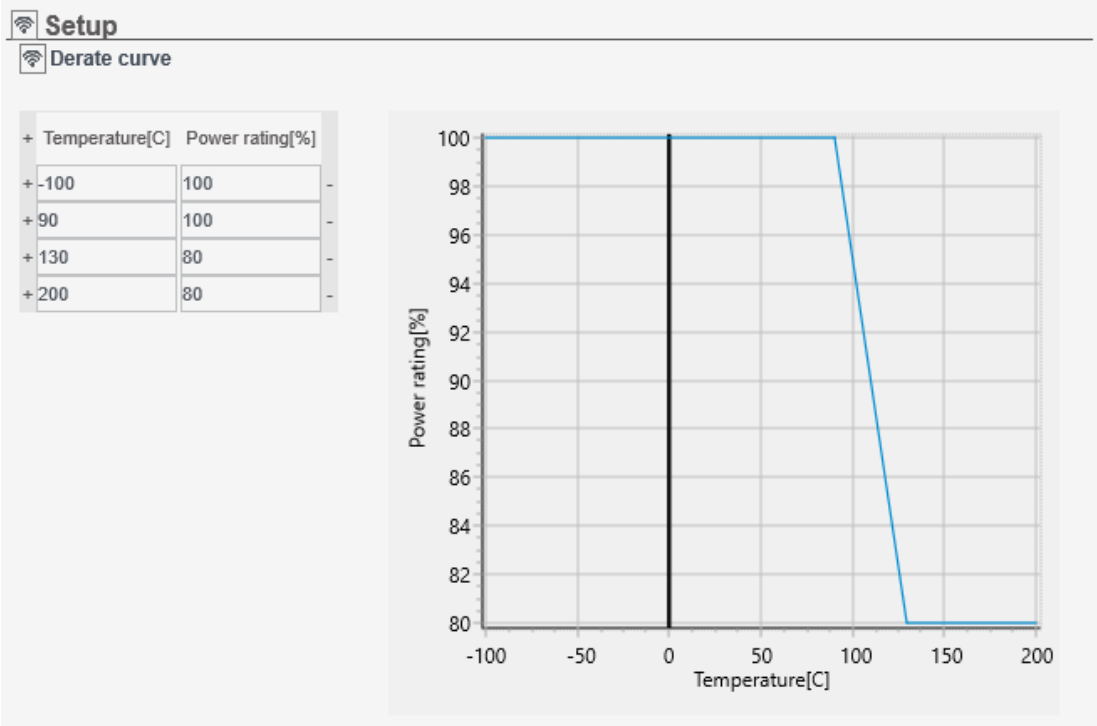
- The current and default values are shown under Info.



3. Edit the settings within the allowed range.
4. You can change as many parameters as necessary, before you write the settings to the controller.
5. Select **Write** to write the parameters to the controller.

Configure a parameter curve

1. Select the parameter from the category list.
2. Configure the parameter curve:

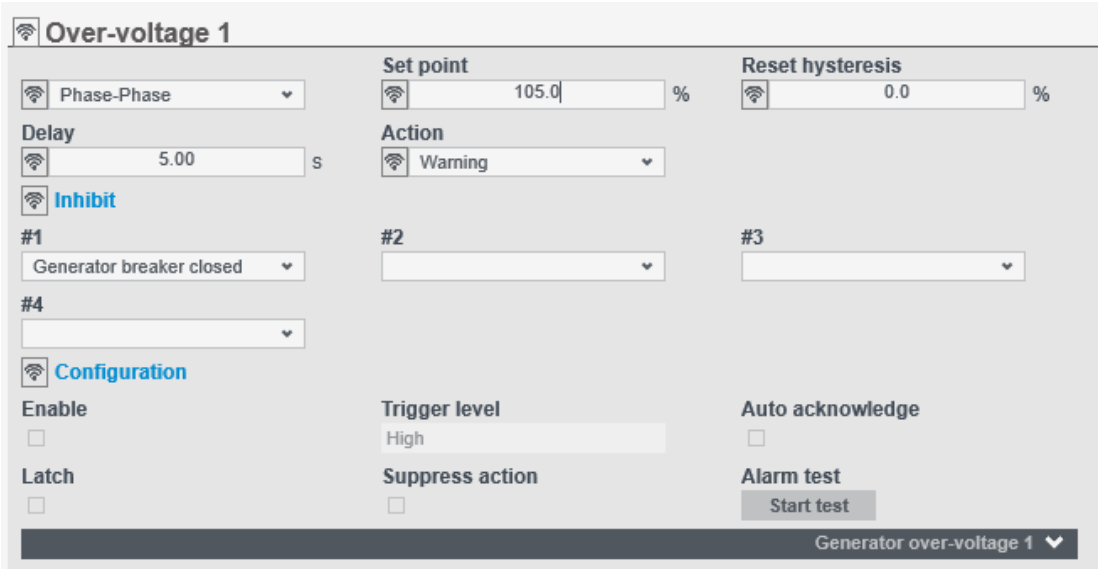


- Select + **Add** to add a new set of coordinates.
- Select - **Remove** to remove a set of coordinates.

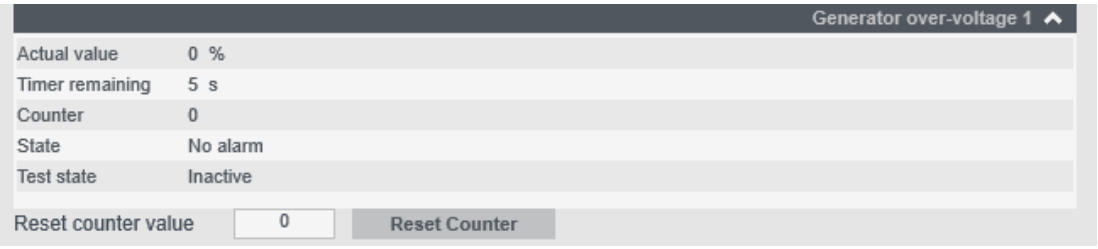
3. You can change as many parameters as necessary, before writing the settings to the controller.
4. Select **Write** to write the parameters to the controller.

11.3.4 Additional alarm information or counter reset

1. Select the parameter from the category list.
2. Select the arrow next to the alarm name to expand the additional information.



3. Additional information about the alarm is shown.



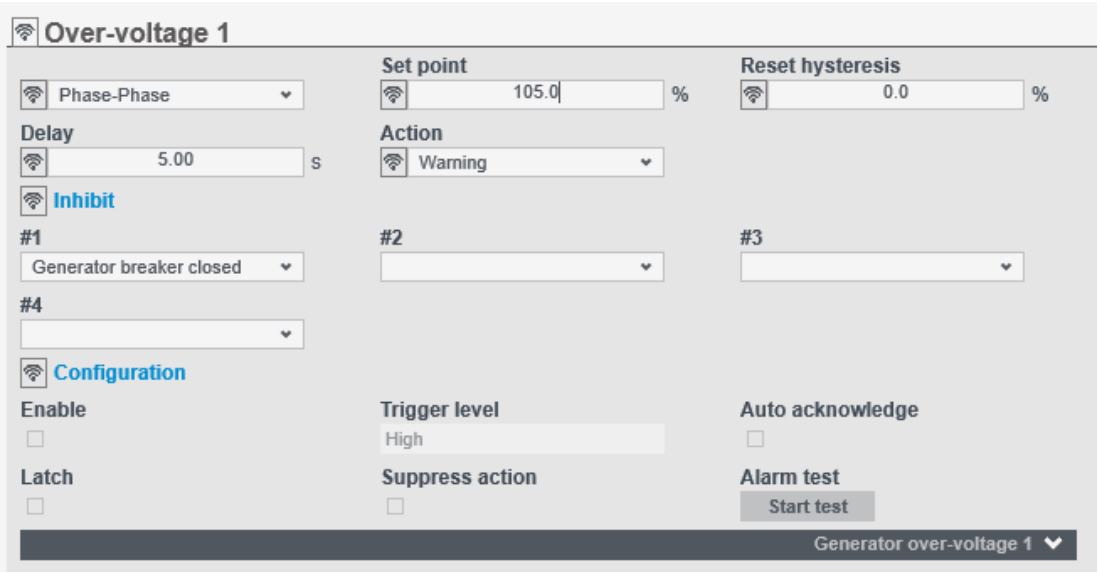
4. Reset counter value with 0 or a value, and select Reset Counter to write the new value to the controller.

11.3.5 Alarm test

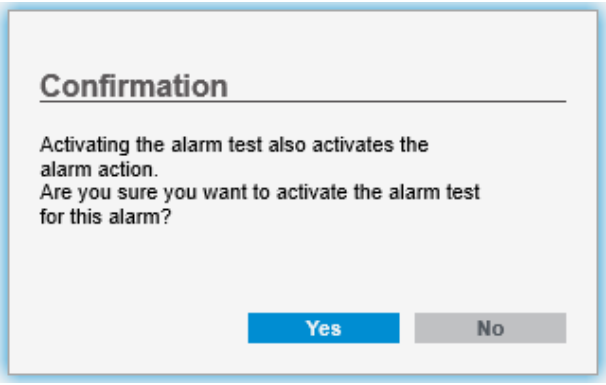
If you activate an alarm test, you also activates the alarm action (protection). You must only test alarms if it is safe to do so.

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 category list.
2. Select **Start test** under the alarm to test.



3. Select **Yes** to confirm:



- The **Alarm test** parameter changes to **Stop test** while an alarm test is running.

4. Select **Stop test** to stop the alarm test.

11.4 Counters

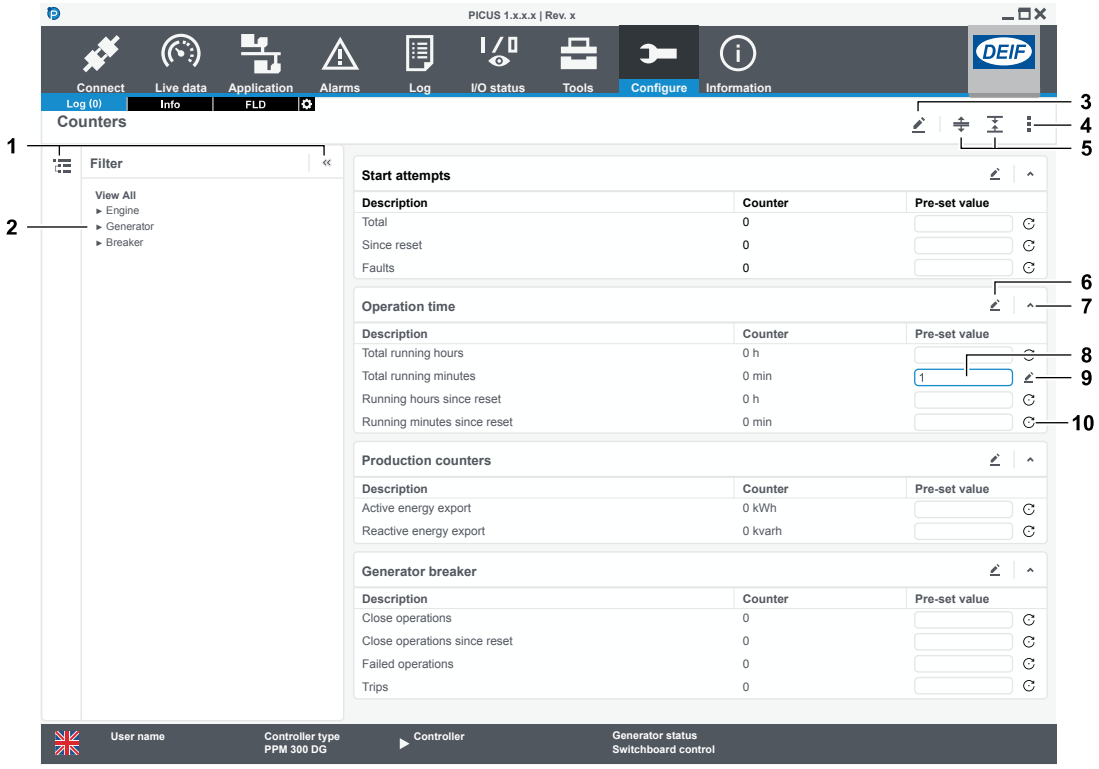
11.4.1 About Counters

The counters include:

- Start attempts
- Total running hours and minutes
- Trip running hours and minutes
- Generator breaker operations and trips
- Energy export (active and reactive)

More information
See **Other [controller] functions**, **Counters** in the **Designer's handbook** for more information about the use of counters.

11.4.2 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 all	Write all values to the controller.
4	More options	Open to see more options.
5	Expand all/Collapse all	Expand or collapse all in the view pane.
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.

No.	Item	Notes
9	Write	Write the new value to the controller.
10	Reset	Reset the value.

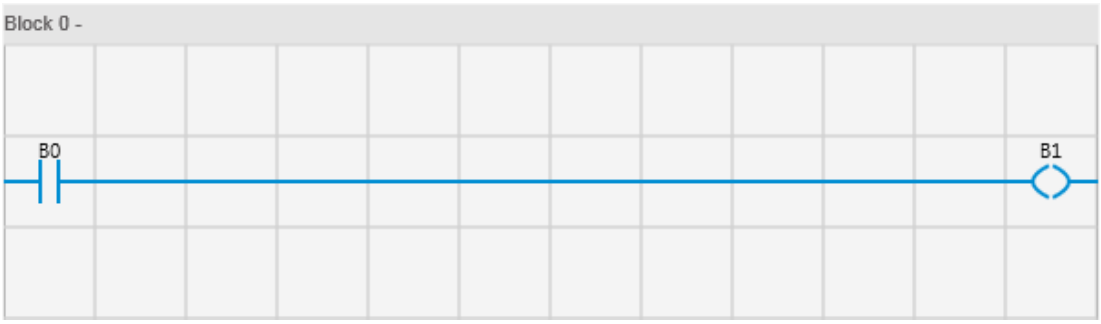
11.5 CustomLogic

11.5.1 About CustomLogic

CustomLogic can be used to create customised logic functions for your system. CustomLogic must be enabled under **Local > CustomLogic > Configuration > Enable**.

Projects built with ladder 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 state as an output

You can configure an output to use the CustomLogic state.

Assign the CustomLogic state output under **Configure > Input/output**. Select the hardware module, then select the output to configure.

The output is not part of the CustomLogic configuration and is optional.

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

CustomLogic is created with 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.

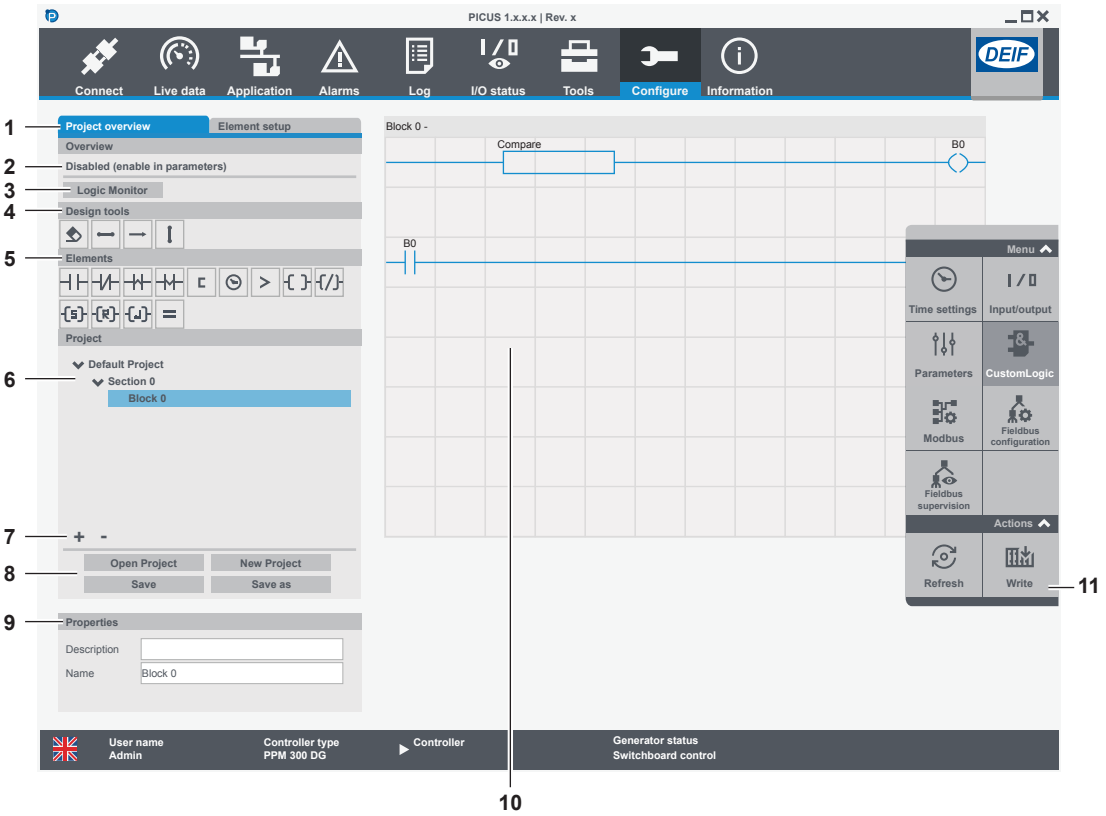
11.5.2 CustomLogic restrictions

- You cannot use CustomLogic if CODESYS is installed on the controller.
- 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. If these elements are used, they reduce the maximum number of elements that can be used in a project.

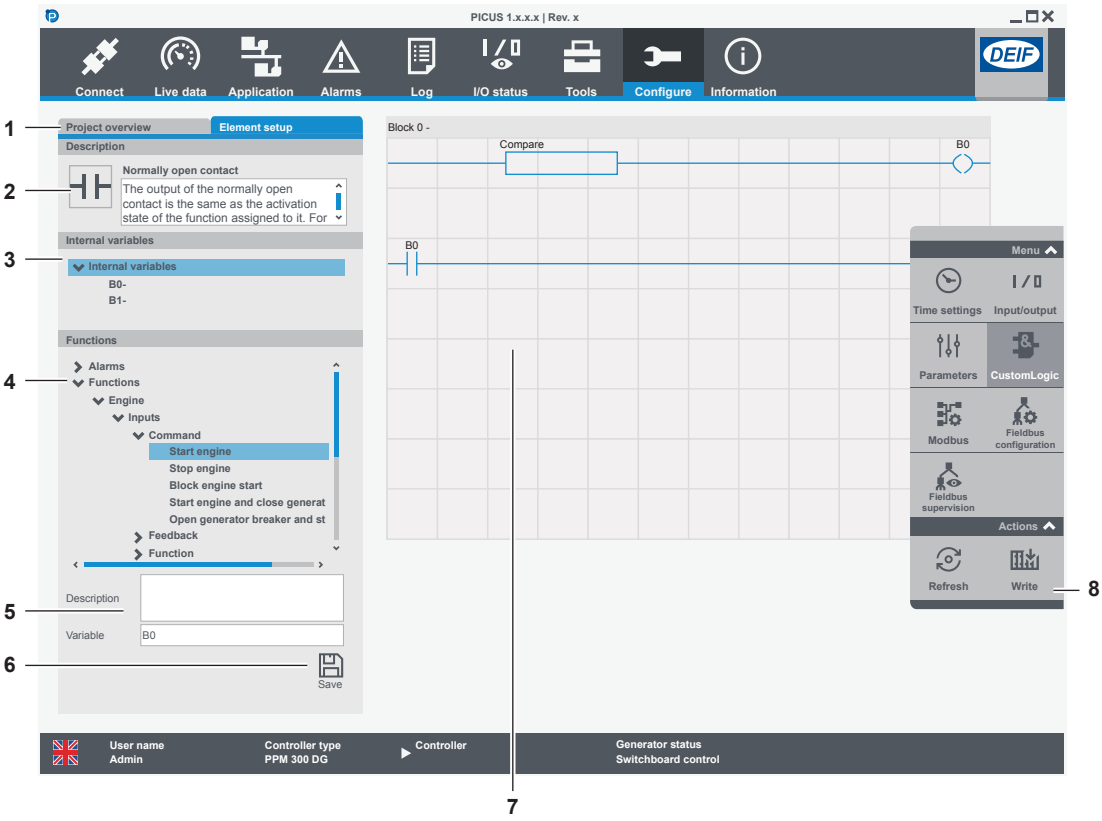
The controller runs the CustomLogic project once every 200 milliseconds. If an input signal is not available for at least 200 milliseconds, the input signal might not be detected by the controller.

11.5.3 Project overview page



No.	Item	Notes	
1	Element setup	Change to Element setup page.	
2	CustomLogic state	Shows if CustomLogic parameter is **Enabled** or **Disabled**.	
3	Logic monitor	Changes to the Logic monitor page.	
4	Design tools	Drag and drop tool elements.	
5	Elements	Drag and drop function elements.	
6	Project	Sections and blocks within the project.	
7	Section or block	+ **Add** section or block.	- **Remove** section or block.
8	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.
9	Properties	Shows information about the selected project, section or block.	
10	Logic block	Shows the logic block.	
11	Actions	**Refresh** reload project from controller.	**Write** project to controller.

11.5.4 Element setup page



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

11.5.5 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.

Symbol	Name	Description
		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)

Symbol	Name	Description	Output for TRUE input
	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

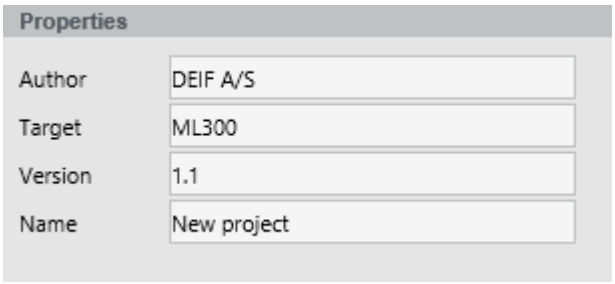
Symbol	Name	Description
	Timer block	When the input to a timer block goes to TRUE, the timer starts to count from zero to a pre-configured value. There are three different timer modes: 1. Timer on (TON) 2. Timer off (TOF) 3. Timer pulse (TP). More details about these modes can be found in the sections below.
	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. More details about the counter block can be found in the sections below.
	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"

11.5.6 Configure a CustomLogic project

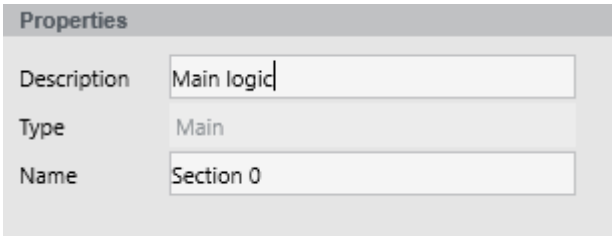
Create a project

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.

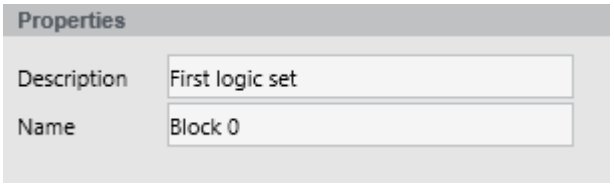
   .
2. Select the project and configure the properties:



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



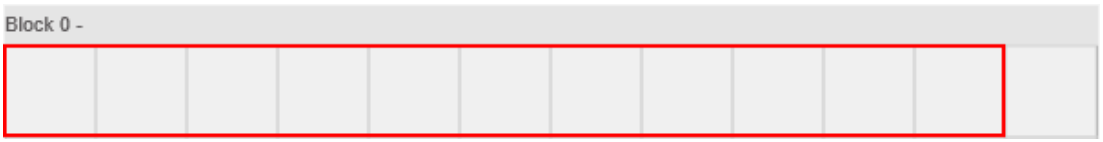
5. Select + **Add** to add a block to the section.
6. Select the block and configure the properties:



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

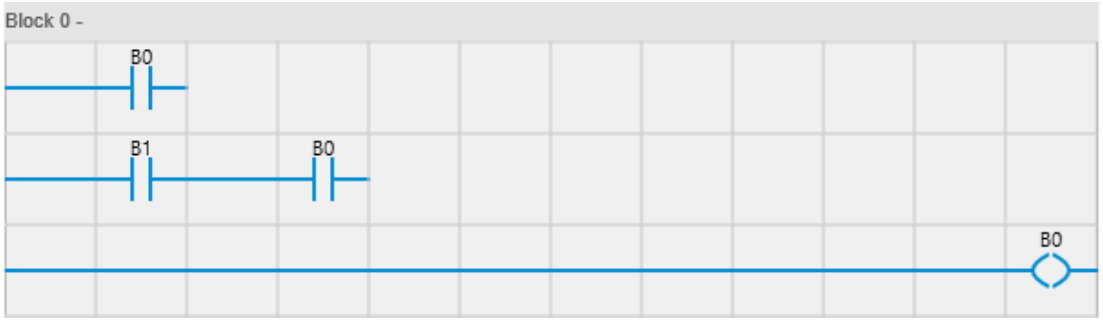
Add elements or functions

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.

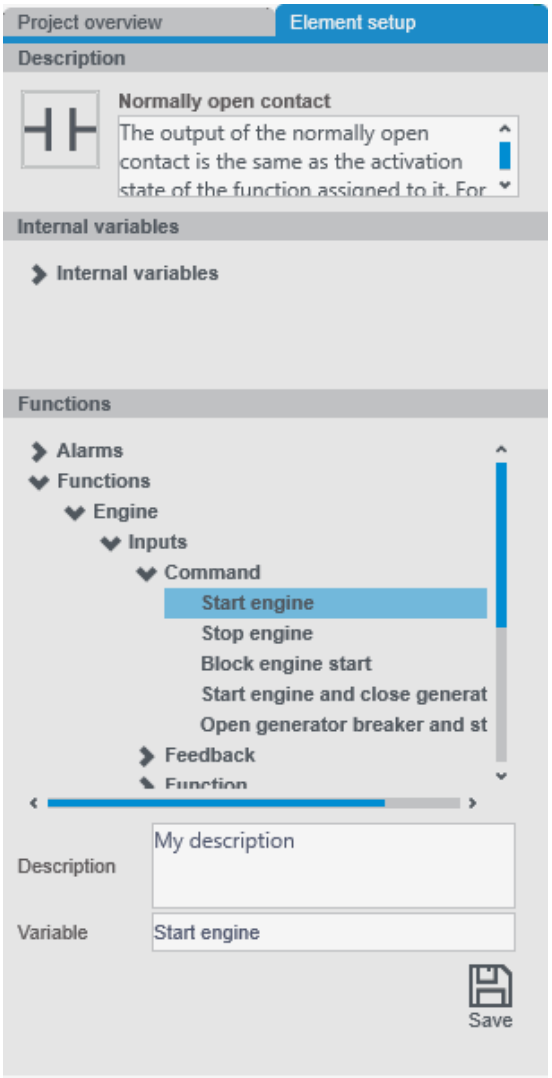
2. Add and connect elements on the logic grid by drag-and-drop from the Design tools menu.
   - Elements can be moved around on the grid. It is not possible to move an element from one block to another block.
3. All elements on the logic grid must have a connection to the left vertical rail.



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:



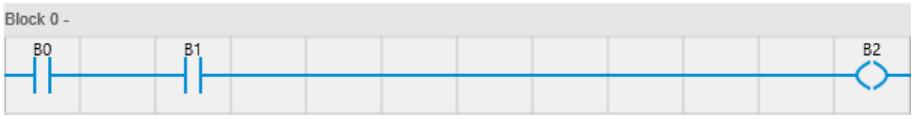
4. Select **Save** to update the configuration.
5. Select **Write** to save the project to the controller.

11.5.7 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

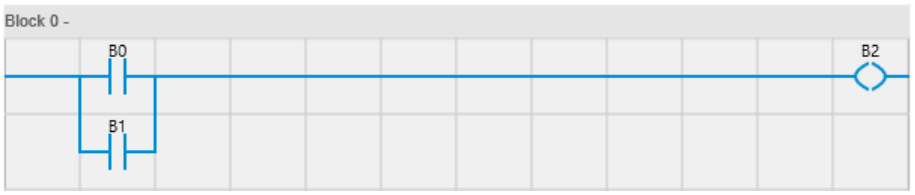
Two normally open contacts connected in series. For the output of a normally open coil to be TRUE, the inputs of both normally open contacts must be TRUE. This logic can be extended to be used with more than two normally open contacts connected in series.



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

OR example

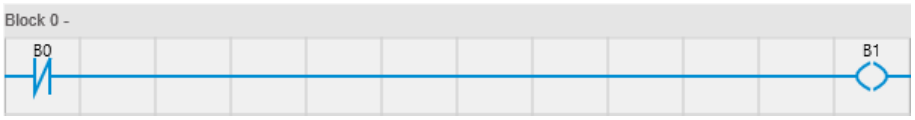
Two normally open contacts connected in parallel. For the output of the normally open coil to be TRUE, one, or both of the normally open inputs must be TRUE. This logic can be extended to be used with more than two normally open contacts connected in parallel.



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

NOT example

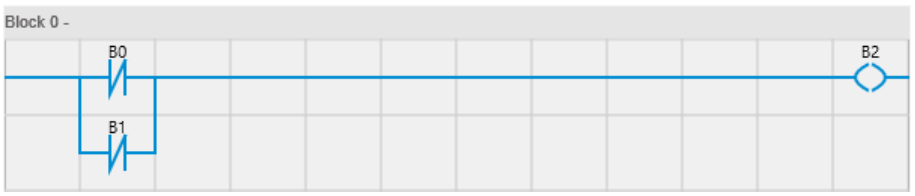
One normally closed contact. The output of a normally open coil will always be the opposite of the input of the contact.



B0	B1
FALSE	TRUE
TRUE	FALSE

NAND example

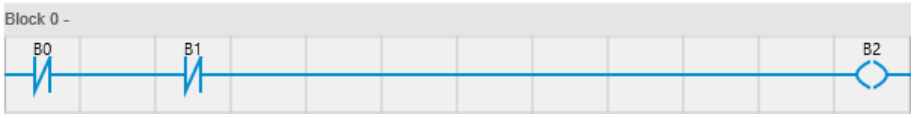
Two normally closed contacts connected in parallel. This operation is the opposite of the AND operation. The output of a normally open coil is TRUE, until the input of both normally closed contacts is TRUE. This logic can be extended to be used with more than two normally open contacts in parallel.



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

NOR example

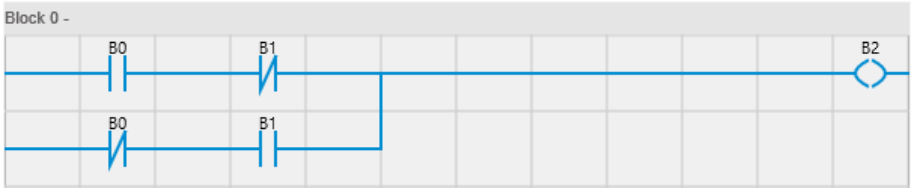
Two normally closed contacts connected in series. This operation is the opposite of the OR operation. The output of a normally open coil is TRUE, until the input of one or both normally closed contacts is TRUE.



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

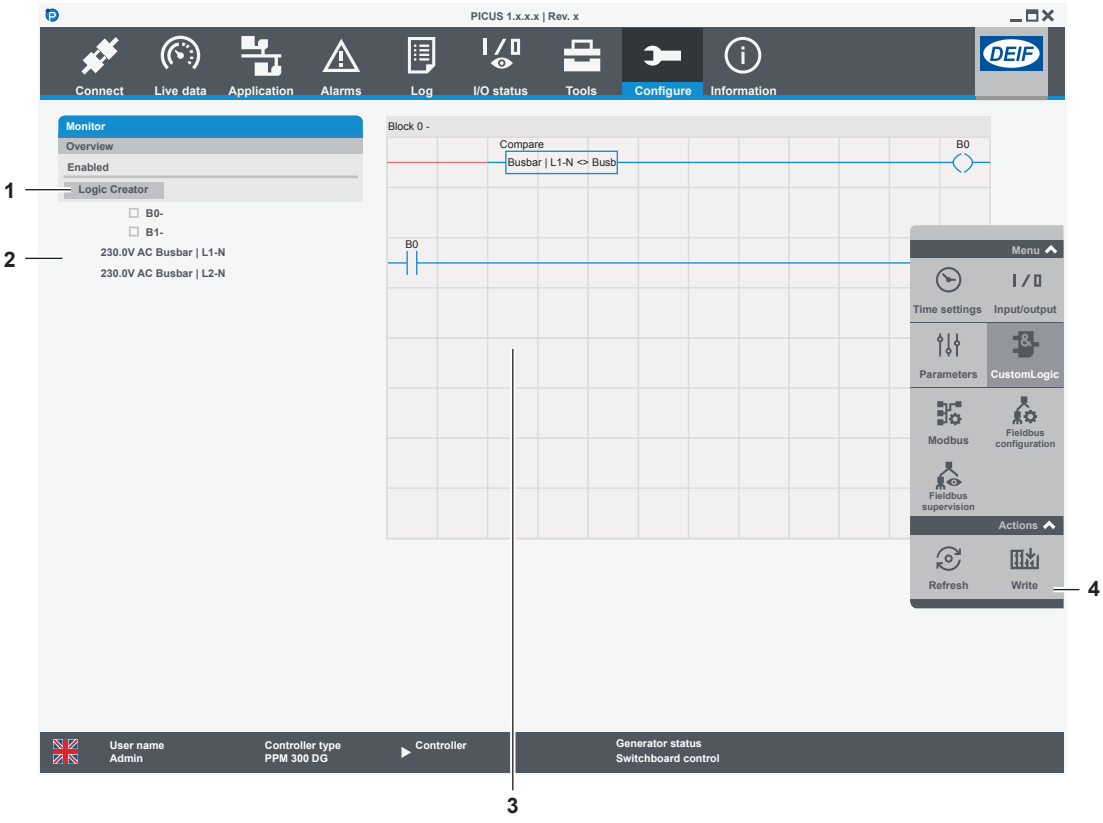
XOR example

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

11.5.8 Monitor page

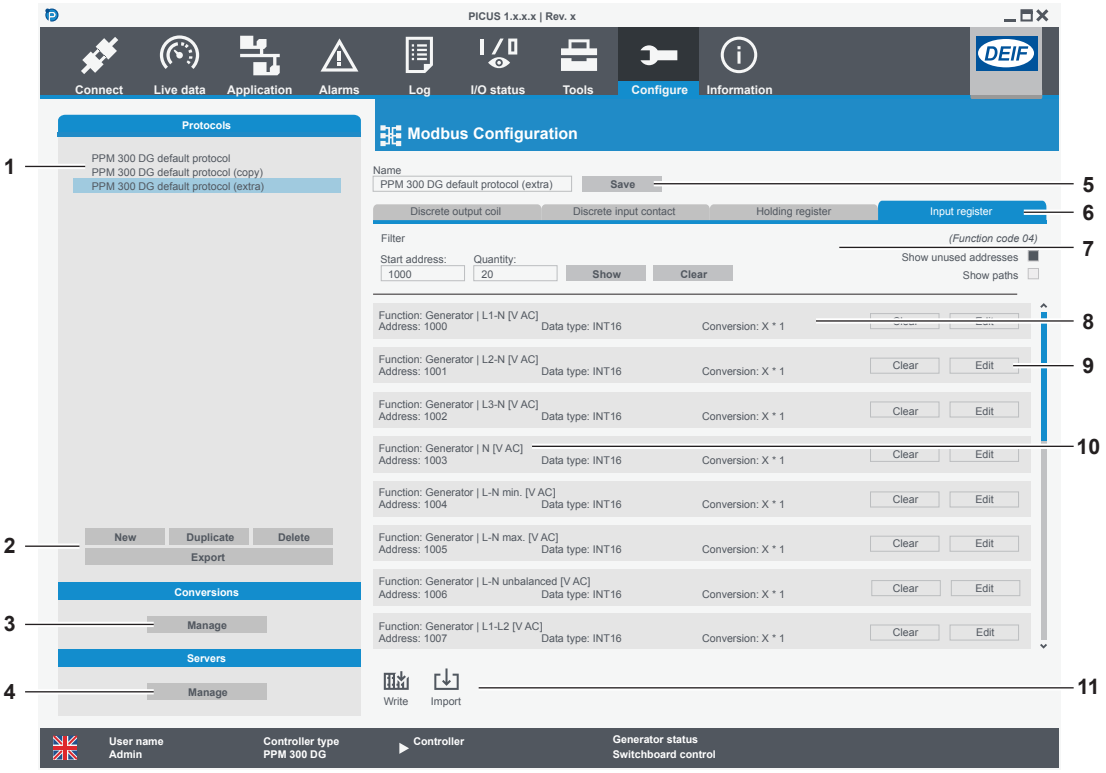


No.	Item	Notes	
1	CustomLogic state	Shows if CustomLogic parameter is **Enabled** or **Disabled**.	
2	Element state	Shows state of configured elements:	
		□ **FALSE** .	■ **TRUE** .
3	Logic block *	Shows the logic block and state:	
		TRUE	**FALSE**
4	Logic creator	Change to **Logic creator** page.	

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 disabled. The logic block has a refresh rate of 500 milliseconds.

11.6 Modbus

11.6.1 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	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.	**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	**Set**: function to an unused address.	**Edit**: function assigned to the selected address.
		Clear: function assigned to the selected address.	

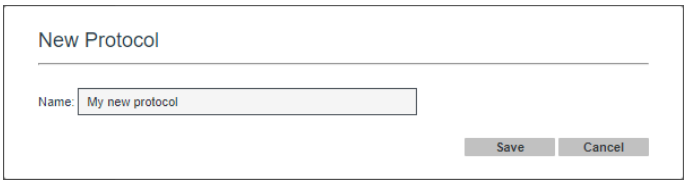
No.	Item	Notes	
10	Function path	Full function path displayed by default.	
		Collapse: the function name.	**...**: expand the function path.
11	Modbus function commands	**Write** changes to the selected function to the controller.	**Import** a Modbus function to replace the selected function.

NOTE * 32-bit integer and float data types use two Modbus addresses.
** Only available in the Holding and Input registers.

11.6.2 Create, edit, or export a protocol

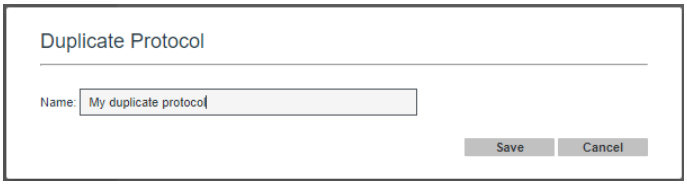
The controller default protocol cannot be edited or removed.

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.

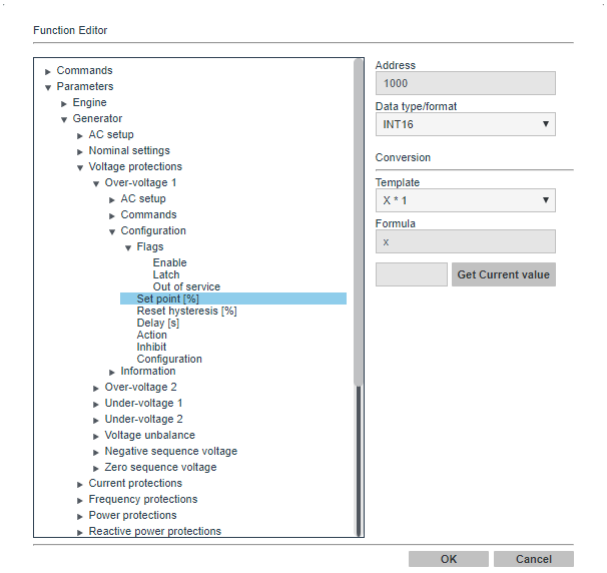
4. Select **Edit** to configure the selected address.
5. Select **Write** to write the changes to the controller.

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.

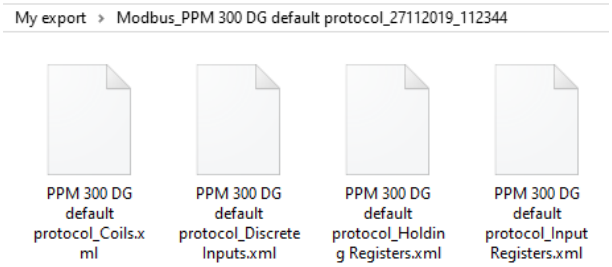
1. Select the protocol to import.
   - The controller only accepts Modbus functions that use the correct xml-format.
   - Only custom protocols or copies of default protocols can be imported.
2. Select the Modbus function to import data to.

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

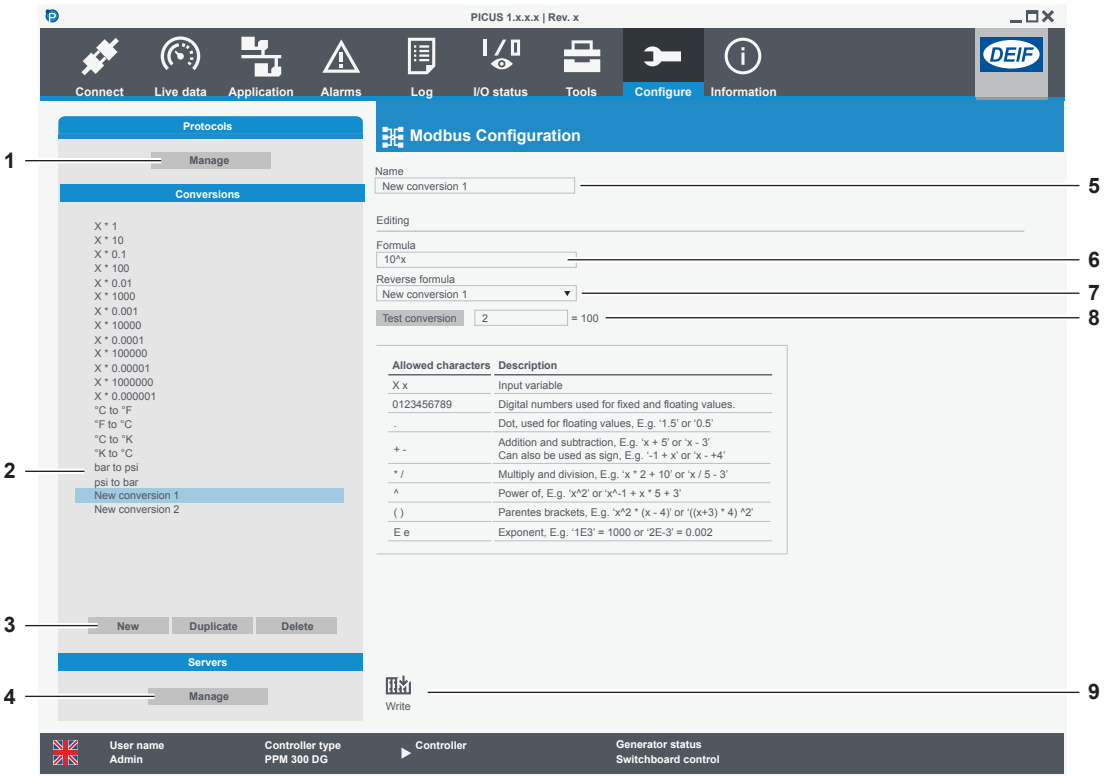
Exported protocols are saved as four xml files (one for each function).

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 PPM 300.

11.6.3 Conversions page

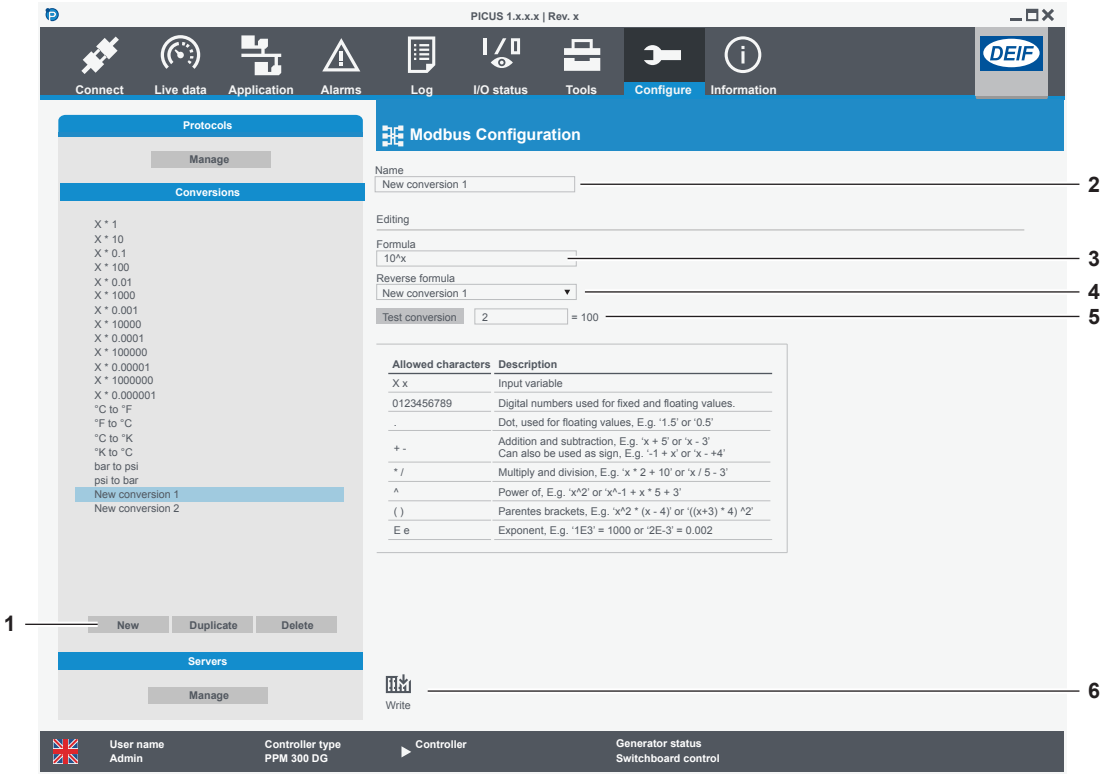


No.	Item	Notes
1	Protocol page	Change to the Modbus protocols page.
2	Conversions list *	Shows the conversions (scaling and unit) on the controller.
3	Commands	**New** conversion. **Duplicate** the selected conversion. **Delete** the selected conversion.
4	Servers page	Change to the Modbus servers page.
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.

11.6.4 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.

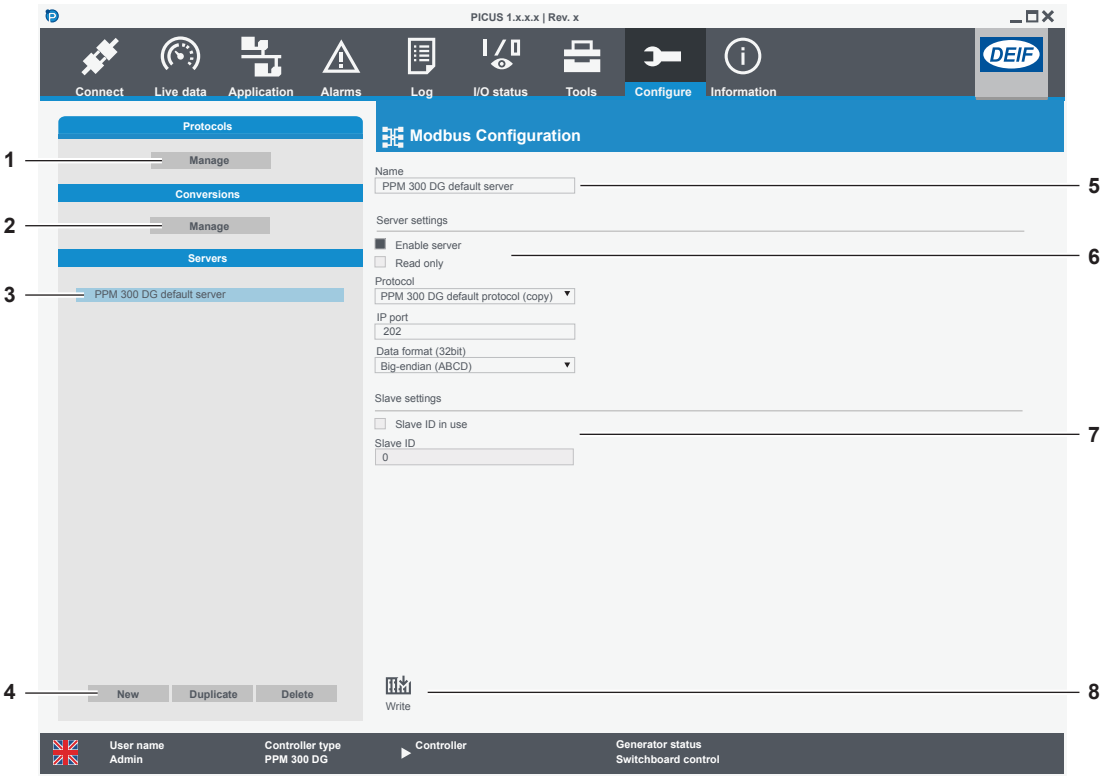
Duplicate a conversion

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.

11.6.5 Servers page

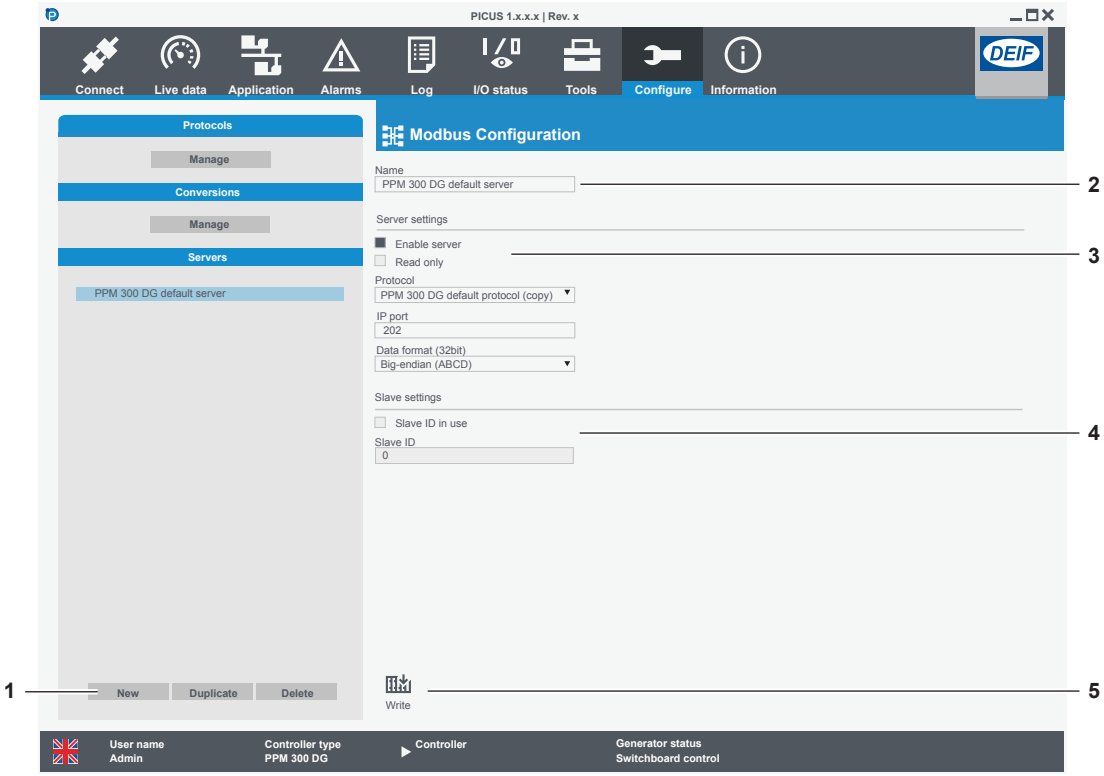


No.	Item	Notes	
1	Protocol page	Change to the Modbus protocols page.	
2	Conversions page	Change to the Modbus conversions page.	
3	Server list	Shows the servers on the controller.	
4	Commands	**New** server.	**Duplicate** the selected server.
		Delete the selected server.	
5	Server name	Name of selected 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	Slave settings	**Slave ID in use**: Enabled the server uses the specified slave ID. If multiple servers are enabled and use the same IP port, then this parameter must be enabled.	
		Slave ID: The unique slave ID associated with the Modbus server. If Slave ID in use is not enabled, then the Slave 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 Slave ID.

11.6.6 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.

11.7 Fieldbus configuration

11.7.1 About Fieldbus

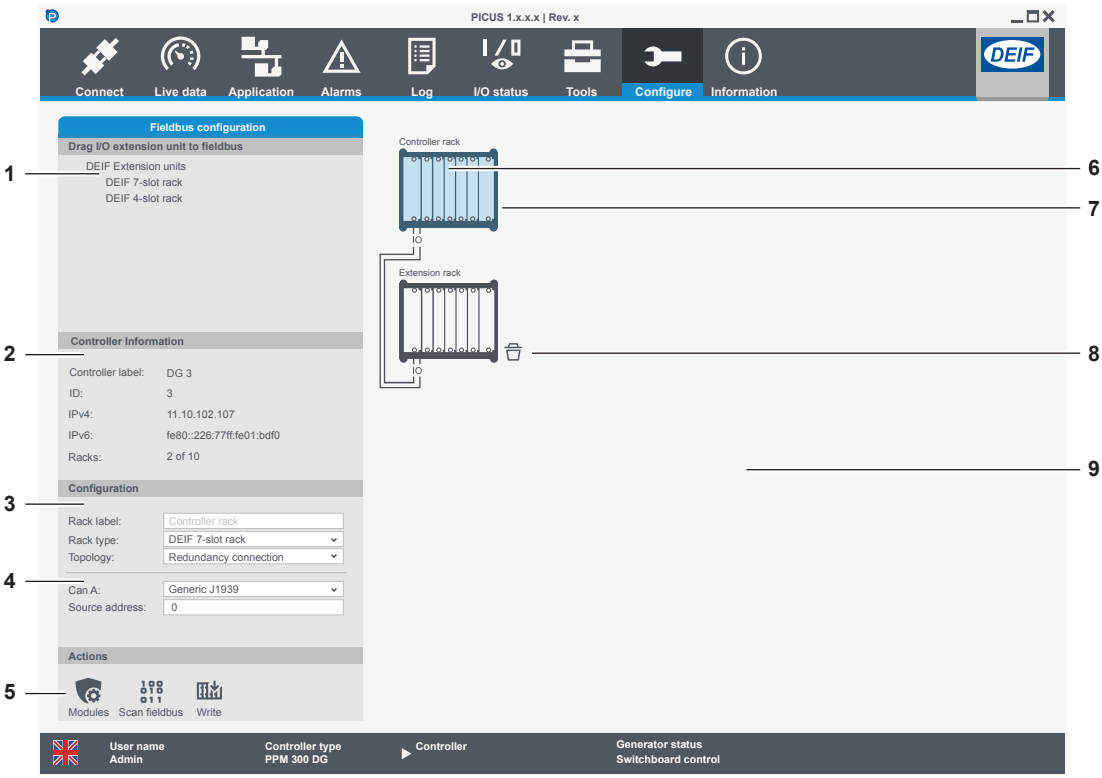
You can configure and monitor the Fieldbus connections to the controller. The hardware modules in the controller, extension racks, and ECU are handled as Fieldbus connections.

Fieldbus configuration to solve conflicts, or to prepare the controller for hardware changes and confirm changes made.

Fieldbus supervision to troubleshoot the conflicts in the controller.

NOTE Extension racks must be powered off when you exchange or re-connect to another controller. If an extension rack is not powered off, there could be unintended actions from the rack modules.

11.7.2 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 A configuration	Configure CAN A protocol and source address for an ECU.	
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 is configured this is not shown on the diagram.

11.7.3 Detect setup

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

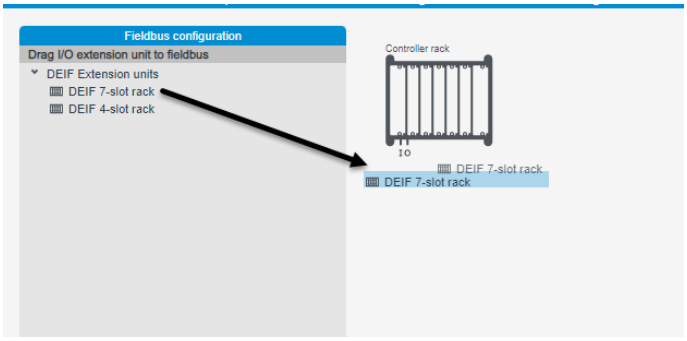
11.7.4 Add extension racks

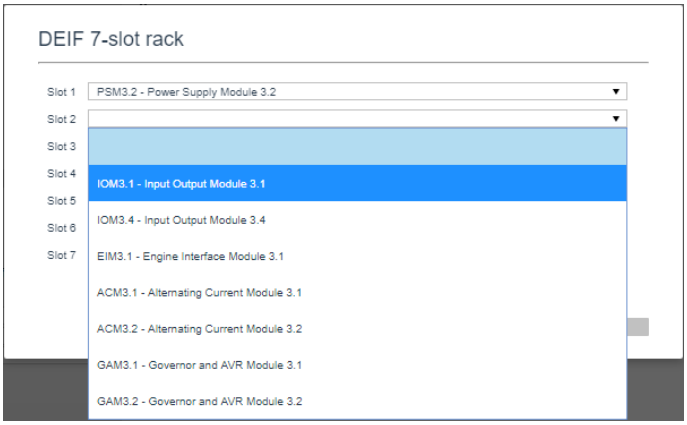
Extension racks must be powered off when you exchange or re-connect to another controller. If an extension rack is not powered off, there could be unintended actions from the rack modules.

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

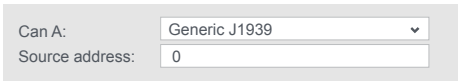
1. Drag and drop the required extension rack to the fieldbus diagram.
   - 

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.

11.7.5 Add an ECU

1. Select the controller to configure.

2. Select the CAN A protocol from the selection, the default is **Generic J1939**.
3. Change the source address if needed, the default is address **0**.
   - 

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

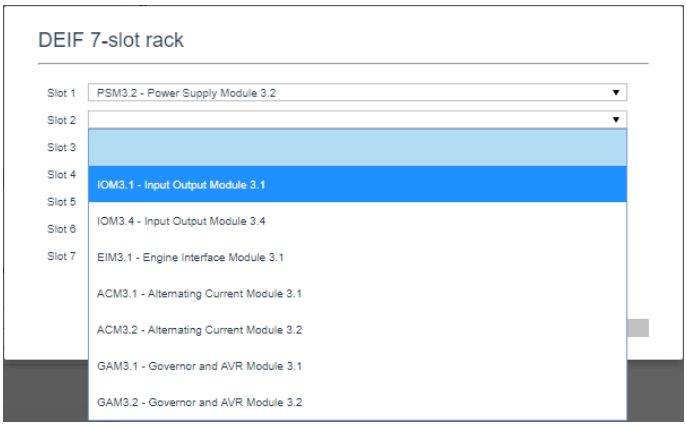
The ECU can now be used for reading information, assigning functions in input/output, I/O status, Live data, alarms, and logs.

11.7.6 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

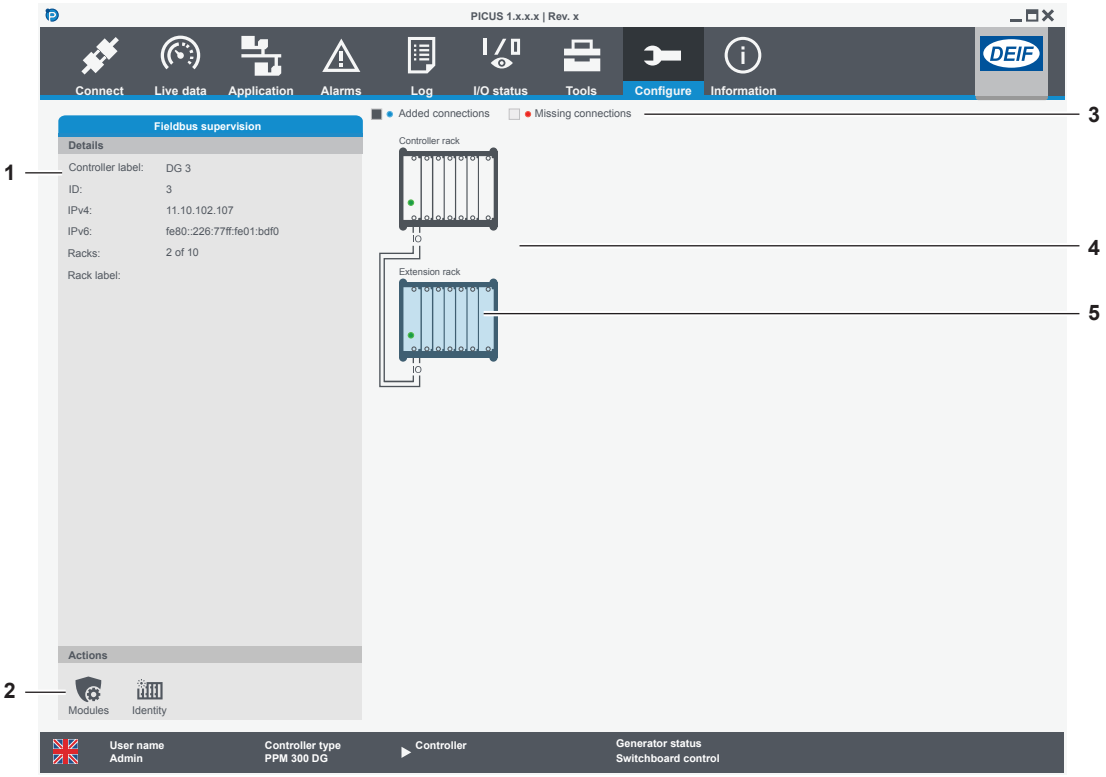
1. Select the rack to configure.
2. Select the Label field and enter the new name for the rack.
   - The default name for the rack is written in grey text if the rack does not have a custom name.
3. Select **Write** to write the changes to the controller.

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.

11.8 Fieldbus supervision

11.8.1 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** the 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.	

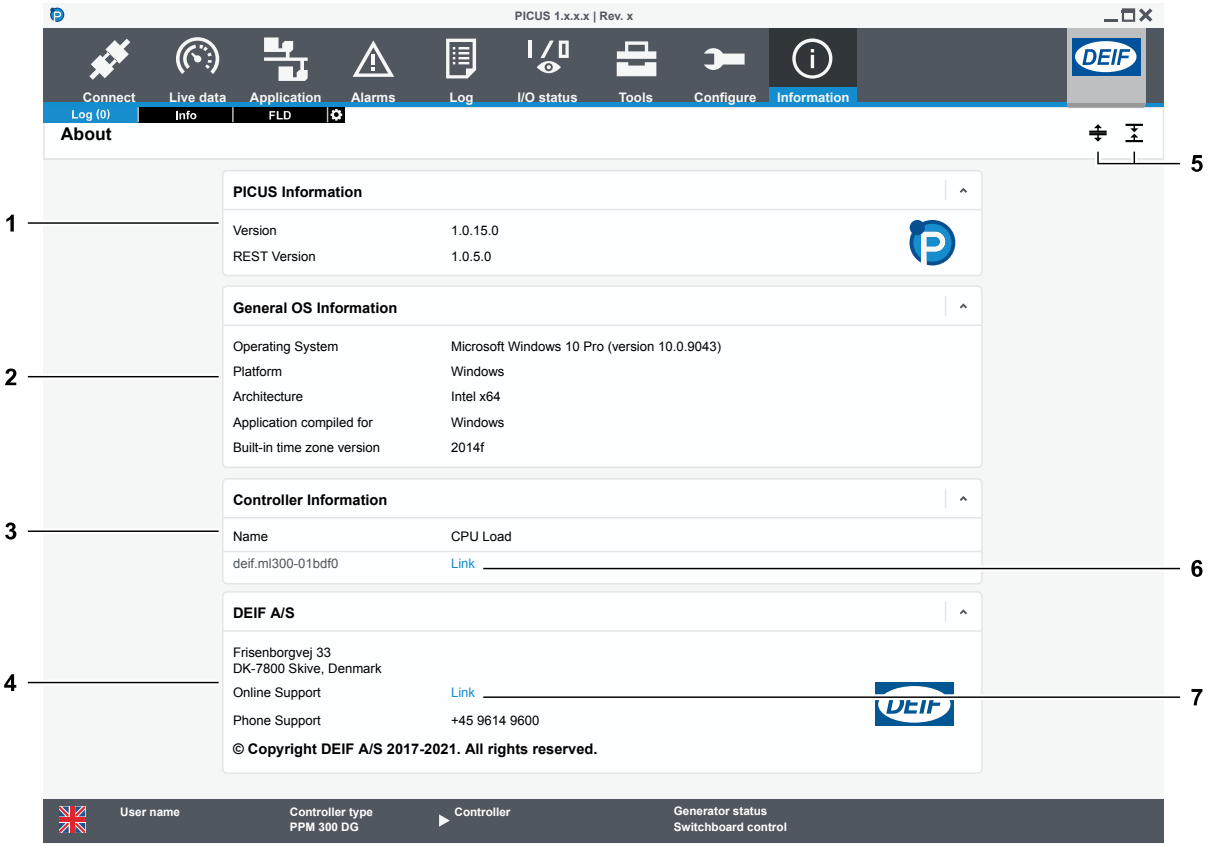
11.8.2 Identify hardware

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 PSM3.1 controller or PSM3.2 extension unit Power LED now flashes.
   - The LED repeats a cycle of fast, medium, and slow flashing.
   - The flashing ends after 30 seconds.

12. Information

12.1 About page

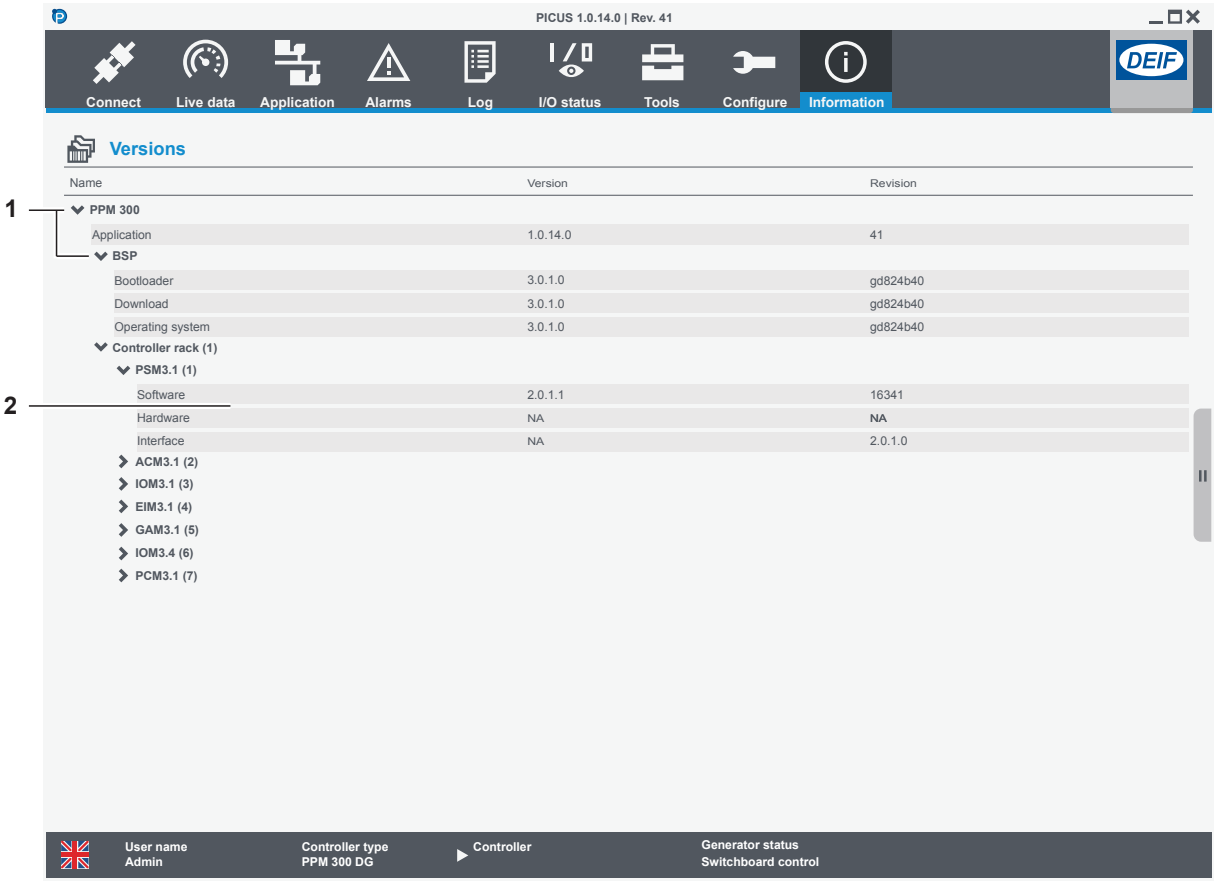
The About page provides information about PICUS, the operating system, and connected controllers. It can also be useful if you need to contact DEIF support for assistance.



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	Expand all/Collapse all	Expand or collapse all in the view pane.
6	CPU Load Link	Link to a web page with an overview of the CPU load.
7	Support Link	Link to the DEIF Online Helpdesk.

12.2 Versions page

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



No.	Item	Notes
1	Controller hardware	Select the hardware and category.
2	Version information	Shows details of the software version and revision. • Controller rack BSP • Controller rack modules

13. Troubleshooting

13.1 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 the Ethernet cable correctly.
	Ethernet cable is damaged.	Replace the Ethernet cable.
	Bonjour is not installed	Install *Bonjour*, see **2.3 Download and install**.
	Bonjour is not running.	Run *Bonjour*, see **2.3 Download and install**.
PICUS cannot connect to controllers listed on the Connect page.	Ethernet cables are not connected between PICUS and the controllers.	Connect the Ethernet cables correctly.
	Ethernet cables are damaged.	Replace the Ethernet cables.
	IP address configured incorrectly.	Configure the IP address and IP address mode correctly.
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.

Fieldbus troubleshooting

Problem	Cause	Solution
Fieldbus connection is missing	The cable between two racks is plugged into the same port type.	Change the cable positions to match the positions in **PICUS > Configure > Fieldbus configuration**.
	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 correctly.
	The cable for the highlighted missing connection is damaged.	Replace the cable.

Problem	Cause	Solution
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 PSM3.2 module power supply is not connected.	Connect the power supply correctly.
	The PSM3.2 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.
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.	Place the hardware modules correctly in the rack. Correct the fieldbus configuration.