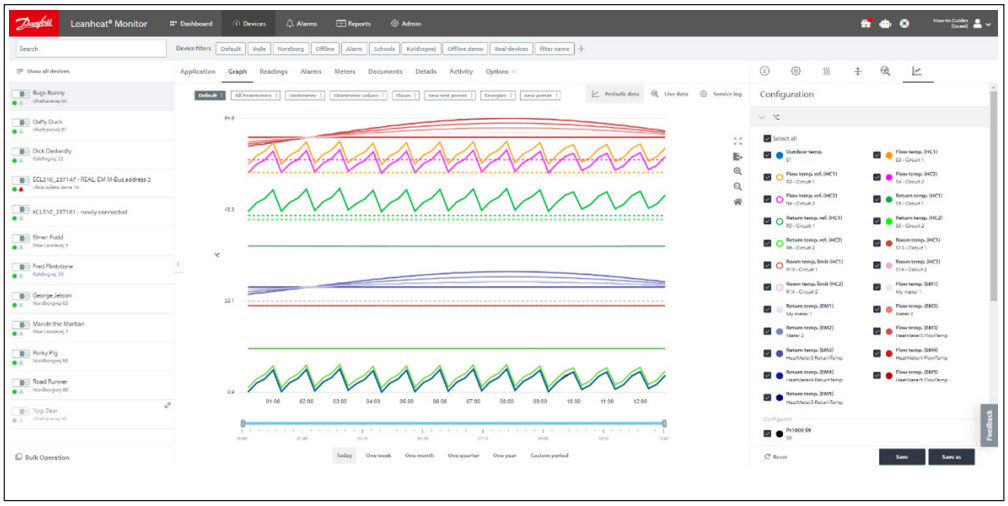
Data sheet

Danfoss Leanheat® Monitor

A web-based SCADA software application hosted in Microsoft Azure

Description



Leanheat® Monitor

Danfoss Leanheat® Monitor is a web-based SCADA (Supervisory Control And Data Acquisition) software application hosted in Microsoft Azure for district heating systems.

Leanheat® Monitor is built on strong bases of already established Danfoss solutions with new and improved features for remote monitoring, control and optimization of your district heating.

A reliable and stable software solution brings you a cost effective and energy efficient management and lays the foundations for a connected future of your district energy system.

Leanheat® Monitor is offered as a hosted SaaS solution. This means that Danfoss takes care of all maintenance, backup and security updates of the system.
Customers can access the system from any internet connected PC or mobile device.

The user of Leanheat® Monitor can remote control and monitor the parameters settings in the controllers and monitor actual, reference and historical values of sensors and energy consumption meters connected to the controllers.

User benefits

The advantages of Leanheat® Monitor are among others:

Customized for district energy

Danfoss Leanheat® Monitor is tailored specifically for district energy systems. Every function is designed to simplify your daily tasks and ensure that your system operates with improved control and better efficiency.
This can be achieved by providing you with a better system overview by dashboards and customizable KPI widgets, with predefined alarms and report templates, functions like virtual measurements and group settings. At the same time you can fully customize it to the specific needs of your district energy utility.

- Improve your network control and management with actionable information insights
- Faster and more efficient management of your daily tasks with easy to use reporting and alarming as well as functions like easy commissioning, group settings
- Easy integration of new devices
- Danfoss district energy and app experts available for support
- Faster and more efficient management of your daily tasks

Modern web-based solution

Being a web-based solution hosted in Microsoft Azure, Danfoss Leanheat® Monitor can never be outdated, as the regular improvements and upgrades are instantly available and provided to you. The online system can be accessible from everywhere using a standard web browser on desktop or mobile devices. At the same time it provides efficient protection for all interfaces and stores data with the trusted security mechanism ensuring all your data stays safe and secure.

- Always up to date – the latest version is automatically available for your use
- Clear and customizable user interface
- Access from anywhere and from any device (mobile, desktop compatible)
- Trusted security mechanisms for safe and secured data storage.

Open, connected and transparent

Benefit from open communication and data interfaces. Besides wide range of Danfoss products, you can easily integrate devices from other (third party) providers providing the devices that can communicate over modbus RTU/TCP. Collected data can also be made available for other business (e.g. billing) and operational systems (optimizers, energy management ...).

- Connect with any device using standard Modbus communication
- Easy integration with business intelligence and optimization solutions using API
- Part of Danfoss Leanheat® software suite

Operate with more control and better efficiency

The software was developed with a special attention on your daily tasks and our dedication to simplify them to save your time.
Get a better overview of your system with improved alarming features and reporting.
And with easier commissioning, group settings, etc. you are now able to manage your daily business in a faster and more efficient way.

Always up to date

Your investment will never be outdated.
We are dedicated to constantly improve and upgrade the solution and will provide you with the access to all the latest features and improvements.

Lower your investment cost

Using the Danfoss Leanheat® Monitor subscription model (Software as a Service) will result in:

- Lower total cost of ownership and improved return on investment
- Reduced IT investments and maintenance costs using Software as a Service
- No local IT infrastructure and knowledge required
- Unlocking your resources to focus on your primary business

Safe and secure

Your data will stay safe and secure as Danfoss Leanheat® Monitor provides protection for all interfaces and stores data with the trusted security mechanisms.
Leanheat® Monitor is hosted in highly secure modern data centers located within the EU. Data within Leanheat® Monitor is processed, stored and secured in compliance with EU regulations.

Team of experts at your service

Benefit from our know-how database, access to online and on-site trainings, online video guides, support forums and engineers.
This will result in your improved performance and overall satisfaction.

Application

Leanheat® Monitor automatically adapts its user interface to fit the application in the controller. For ECL Comfort 296 and 310 controllers Leanheat® Monitor can automatically detect the correct application. However, for some older controllers it is necessary to select the correct application during commissioning.

The following controller applications are supported:

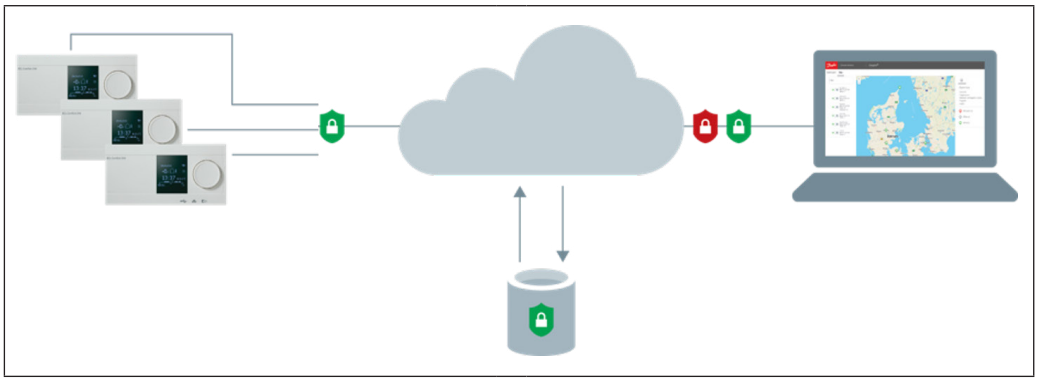
- ECL Comfort 310 controller
  - o Please see 'List of application keys supported by Leanheat® Monitor'. Go to: https://www.danfoss.com In the 'Service and support' menu select 'Documentation' > 'Data sheets' and search for the literature number. (AI131486467165)
- OPR0020 Controller
  - o Firmware R9 and newer

ECL Comfort 120 and ECL Comfort 220 can also be integrated into Leanheat® Monitor. They are well suited for small-scale applications, such as residential heating or domestic hot water systems, and offer basic monitoring capabilities.

As an option the ECL Apex 20 controller can be integrated into Leanheat® Monitor to remote control and monitor the district heating utility or boiler house.

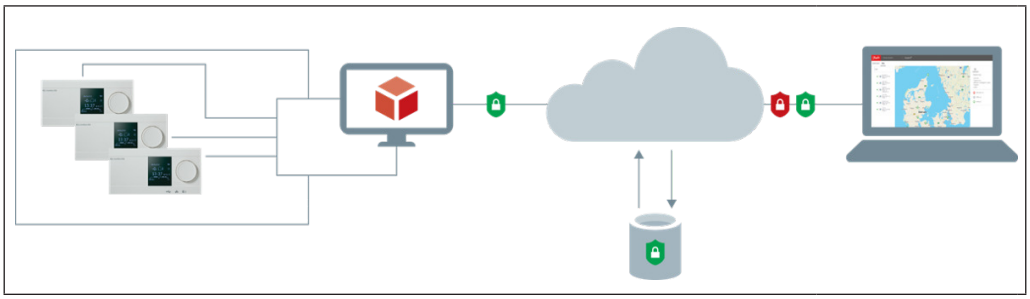
This requires a system integrator to develop a customized application for the ECL Apex 20 controller. A special Modbus adapter software also has to run in the same subnet as the ECL Apex 20 either on a PC or a hardware gateway that supports this option.

Below is an example of Leanheat® Monitor configured with ECL Comfort 310 electronic controllers connected over TCP. This is the recommended connection method for controllers to Leanheat® Monitor, as this avoids running any IT infrastructure locally at the customer's site. In this case, Leanheat® Monitor and the controllers communicate via Modbus/TCP over a secure encrypted connection.



Application

Below is an example of connecting controllers on a closed network (e.g. a serial to Leanheat® Monitor). In this case, the controllers can be connected through a local OPC-UA server or if they communicate over Modbus RTU/TCP they can be connected through a Modbus adapter software that does not require an OPC server.
Leanheat® Monitor includes two light-weight software gateways that must be installed in the same network as the devices or OPC server is located. One gateway is for OPC UA communication and the other for direct Modbus communication.
The communication between the controllers and the OPC-UA server can be any protocol supported by the controllers, server, and network, e.g. Modbus/RS485, Modbus/TCP or LON.



Languages

The following languages are supported by the graphical user interface of Leanheat® Monitor:

- Danish
- Dutch
- English
- French
- German
- Lithuanian
- Polish
- Russian
- Slovenian
- Swedish
- Turkish
- Ukrainian
- Czech
- Italian

Supported controllers

The following controllers are supported by Leanheat® Monitor:

- Danfoss ECL Comfort 120 electronic controller
- Danfoss ECL Comfort 220 electronic controller
- Danfoss ECL Comfort 296 electroniccontrollers
- Danfoss ECL Comfort 310 electronic
- controllers
- Danfoss ECL Comfort 310B electronic
- controllers
- NOPRO OPR0020 electronic controller (via
- built-in OPC-UA server)
- Danfoss ECL APEX 20 free programmable
- controller (via Modbus adapter software)
- * Any third party controller supporting Modbus RTU/TCP communication

* Modbus compatibility alone does not guarantee plug-and-play integration. Each third-party device requires individual compatibility assessment and commissioning support by Danfoss Service. Integration complexity, effort, timeline, and cost vary depending on the device type and configuration. Full feature parity or user experience equivalence with Danfoss native devices cannot be guaranteed.

Supported application keys

Please see data sheet 'List of application keys supported by Leanheat® Monitor' (AI131486467165).

Note:
When connecting through an OPC-UA server, the server must also support the relevant applications for the controllers to be supported by Leanheat® Monitor.
An example is when a Modbus-RS485 subnet of ECL controllers or OPR0020 controllers, or a mix hereof, is connected to Leanheat® Monitor via this OPC-UA server.

Supported energy meters (M-bus)

Please see data sheet 'Energy meters supported by Danfoss SCADA solutions and ECL Comfort 296/310' (AI150386468396).
Please be aware that battery operated energy meters are not recommended, because the data communication will shorten the battery lifetime.

Data communication

The options for data communication between controllers and server are listed below.

Type	Description	Remarks
Direct	ECL Comfort 296/310 controllers as well as ECL Comfort 120/220 can connect directly to Leanheat Monitor using the ethernet connection on the controller.	It is highly recommended to enable encryption in the controller settings in order to secure the transmission of data end-to-end.
Via OPC-UA	Intended for connecting existing serial networks to Leanheat® Monitor. In this case, the Leanheat® Monitor software gateway must be installed alongside the OPC UA server to facilitate secure communication to Leanheat® Monitor.	In that case, Leanheat® Monitor will handle security from the OPC UA server and to Leanheat® Monitor. Security and reliability of the network below the OPC UA server is not managed by Leanheat® Monitor. Performance of Leanheat® Monitor may be degraded due to technical limitations of the OPC UA server and underlying controller network.
Via Modbus RTU/TCP	Intended for connecting existing Modbus RTU/TCP networks and third party devices to Leanheat® Monitor. In this case, the Leanheat® Monitor Modbus adapter software has to be installed either on a PC or a hardware gateway that supports it. The Modbus adapter software facilitates secure communication to Leanheat® Monitor.	In that case, Leanheat® Monitor will handle security from the devices and to Leanheat® Monitor. Security and reliability of the Modbus network is not managed by Leanheat® Monitor. Performance of Leanheat® Monitor may be degraded due to the underlying controller network.
Teltotnika Gateway	Intended for connecting existing Modbus RTU/TCP networks and third party devices to Leanheat® Monitor. In this case the instalation of additional software is not neccessary as the Teltonika serves as a gateway.	In that case, Leanheat® Monitor will handle security from the devices and to Leanheat® Monitor. Security and reliability of the Modbus network is not managed by Leanheat® Monitor. Performance of Leanheat® Monitor may be degraded due to the underlying controller network.

Ordering

Please contact your local Danfoss sales company.

Technical data

For further information on technical data, please go to:
https://www.danfoss.com

In the 'Service and support' menu select 'Documentation' > 'Manuals & guides' and search for the literature number.
https://www.danfoss.com/en/service-and-support/documentation/

Type	Description	Literature no.
Instructions/ Operating guide	ECL Comfort 210 / 296 / 310, communication description	AQ074886472234
Service guide	ECL Comfort 296 / 310 controllers Modbus networking guide	AX236986479687
Operating guide	Connection of ECL Comfort 296 / 310 controller to wireless network (WLAN)	AQ070386470176
User guide	ECL Comfort 120	BC447732473369
User guide	ECL Comfort 220	BC493450078453
User guide	ECL Comfort 120 controller and app	AQ428842090782

System requirements

Requirements to the client computer accessing Leanheat® Monitor:

Operating system	Windows 10 (any version) or newer.
CPU	Modern dual-core processor, e.g. Intel Core i5 or similar.
RAM	2GB of free memory.
Free disc space	500MB
Internet connection	A stable always-on internet connection is required for the Leanheat® Monitor software gateway to transmit data to Leanheat® Monitor.
Backup and security	Since Leanheat® Monitor is offered as a hosted solution, Danfoss ensures that the transmitted data is securely encrypted, stored, and backed up. Danfoss strongly recommends that customers keep all software up to date including their operating system on all systems connected to the internet.

Note:
Performance may be impacted by other software and/or tasks running on the same PC as the OPC server and the Leanheat® Monitor software OPC gateway.
If the above specifications are adhered to, and performance is lacking, make sure that the PC is not being used for additional workloads.

Requirements to Leanheat® Monitor software OPC gateway:

The Leanheat® Monitor software OPC gateways is designed to be installed on the same PC as the OPC server is running on.

Web browser	Latest version of • Google Chrome • Mozilla Firefox • Microsoft Edge • Opera • Safari Danfoss always recommends keeping your browser up to date.

System requirements

Requirements to the ECL Comfort 296 / 310 controllers:

Controller software	ECL Comfort 296 / ECL Comfort 310 controllers must be software version 1.11 (or newer). If it is version 1.11 – 1.30 then it will automatically be updated by the application key to at least version 1.30. If it is older than version 1.11 then it cannot be used for Leanheat® Monitor.
Application key software	1.04 (or newer)
ECA 30 Remote Control (optional)	1.30 (or newer)

Requirements to the ECL Comfort 120 /220 controllers:

Controller software	ECL Comfort 120 and ECL Comfort 220 controllers must be commissioned using the Danfoss Installer App

Requirements to the NOPRO OPR0020 controller:

Controller software	NOPRO OPR0020 controllers must be software version R9 (or newer).

Technical literature and additional information

Please go to:
https://www.danfoss.com

In the 'Service and support' menu select 'Documentation' > 'Data sheets'
and search for the literature number.
https://www.danfoss.com/en/service-and-support/documentation/

Type	Description	Literature no.
Appendix to data sheets	Energy meters supported by Danfoss SCADA solutions, Leanheat® Monitor and ECL Comfort 296 / 310	AI150386468396
Appendix to data sheet on Leanheat® Monitor	List of application keys supported by Leanheat® Monitor	AI131486467165

For further information on supported application keys, please visit http://danfoss.com

In the 'Products' menu select 'Climate Solutions for heating' >'Software solutions' > 'Leanheat® Software Suite & Services' > 'Discover more about Leanheat® Monitor > Documents

https://www.danfoss.com/en/products/dhs/software-solutions/danfoss-leanheat-software-suite-services/leanheat-monitor/#tab-documents

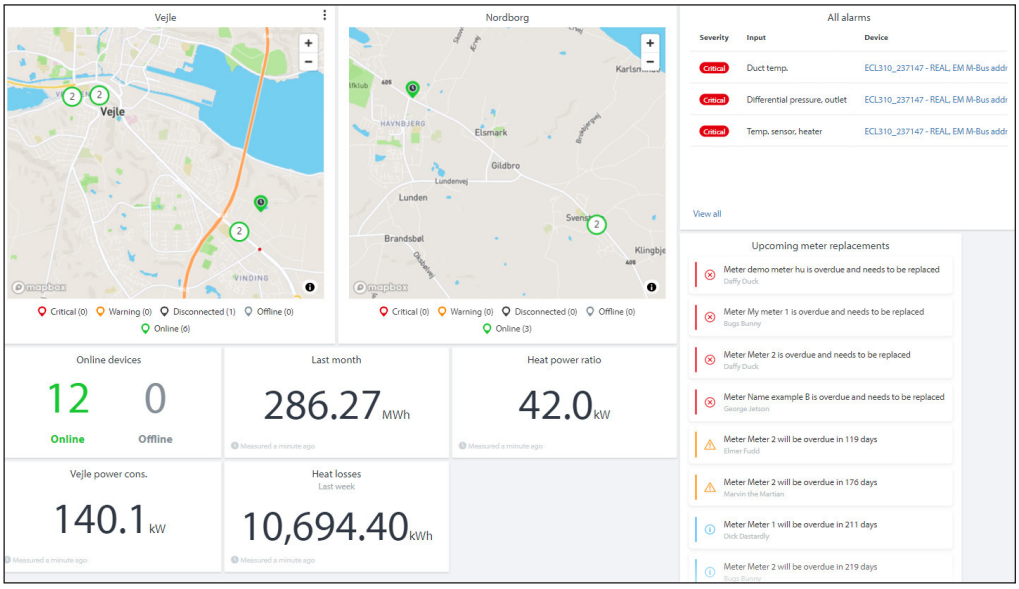
You can also access further information through our support center available here:

https://leanheatmonitor.zendesk.com/hc/en-us

Leanheat® Monitor main functionalities

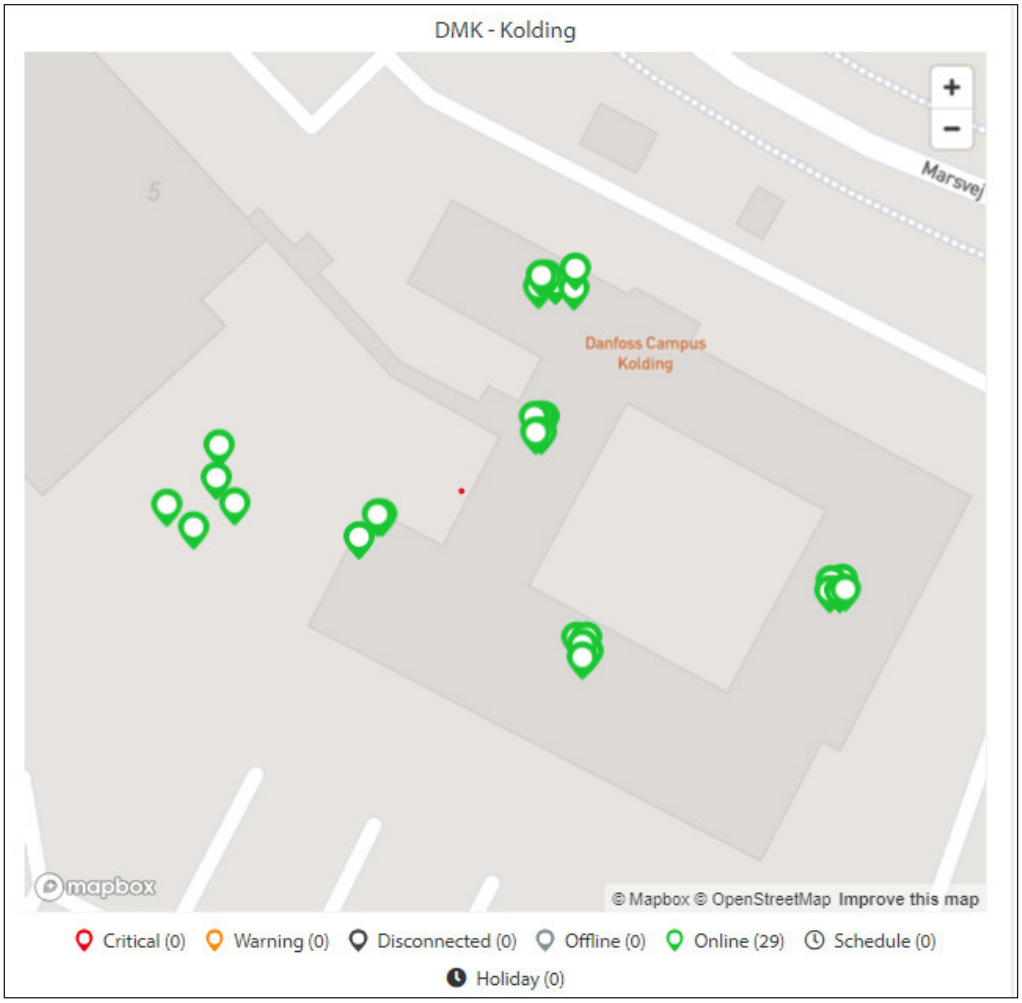
- Dashboard
- Maps
- Smart groups
- Flow diagrams
- Heatmeter support
- Readings
- Device table
- Graphs
- Live graphs
- Alarms
- Reporting
- Mobile version
- API
- Configurable inputs
- User management
- Areas
- Data relays
- Commissioning report
- Data analytics
- Smart Weather Compensation

Dashboard



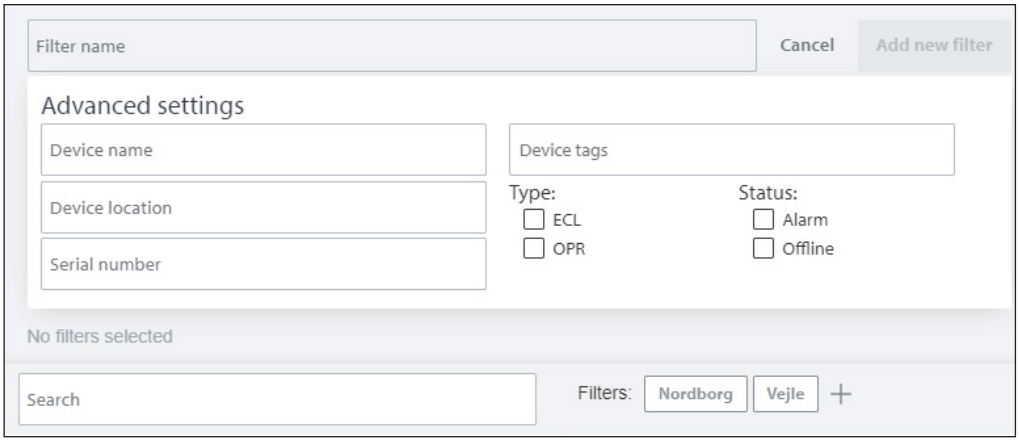
- This is a landing page after the user enters the application.
- With different widgets that are available, it represents the current district heating system status as:
  - Communication status
  - Current system power (production, consumption, losses)
  - Alarms and warnings status
  - Meter replacement warnings
  - Performance of a substation
  - A map for areas
  - …
- It is fully flexible, so users can place the widgets, set them up with parameters, define size and position.
- Dashboard of the Leanheat® Monitor can be placed on one or multiple pages.

Maps



- Pins on the map representing device location and status (based on the color of the pin).
- Users can access the device by clicking on the pin.
- Users can navigate around the map or use the zoom function.
- For the map “Open street map” is used. It is connected directly to the map service, so the map is always up to date.
- The map offers a customizable legend at the bottom to aid accessibility.

Smart groups

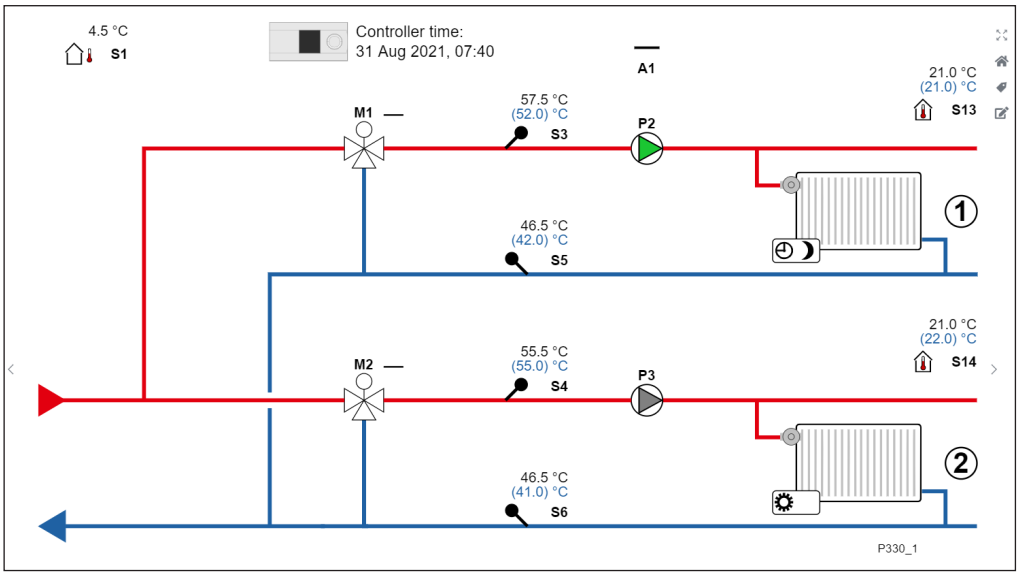


- In order to have better presentation and easier access to devices, the user is able to create smart groups.
- Groups can be created based on different criteria:

  - o Device name
  - o Device location
  - o Device tag
  - o …

- Smart groups can be used as a selection of devices presented in the list and map.
- They can also be used for the selection of devices when the user is creating a report, alarm rule, executing bulk operation, etc.

Flow diagrams



- Represents physical installation on the field.
- All components are drawn in the diagram, which is equipped with live sensors data and other active components data, e.g. pumps, valves, actuators, etc.
- The refresh rate of data on the diagram is 10 seconds.
- Flow diagrams for Danfoss ECL controllers with the standard application are pre-created and stored in the diagram library.

Heat meter support

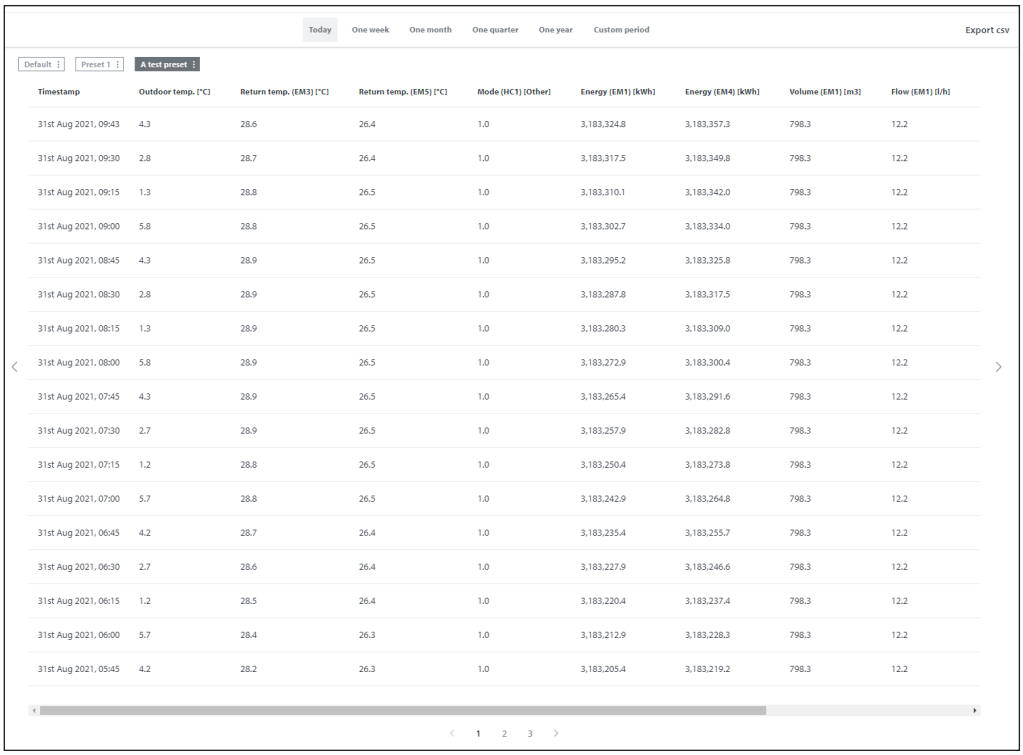
Meter 1

Energy	3,183,327.4 kWh
Volume	798.3 m3
Flow	12.2 l/h
Power	29.8 kW
T supply	61.2 °C
T return	26.4 °C
Serial no.	304099941

- In case that energy meters are connected to the ECL Comfort controller, those are represented in Leanheat® Monitor without any manual intervention.
- There are two different ways of connecting a meter into Leanheat® Monitor.
  1. Device meter (The device, e.g. ECL, reads the meter and then Leanheat® Monitor reads from the ECL).
  2. M-bus meter (Leanheat® Monitor reads directly from the meter via M-bus, each M-bus meter has to be added individually via the meter menu).
- Heat meter data can be presented in the readings table and graph or used in the reports, alarming, etc.

For more information about meters in Leanheat® Monitor, please refer to the following webpage: https://leanheatmonitor.zendesk.com/hc/en-us/articles/5714080990993-Meters

Readings



Today | One week | One month | One quarter | One year | Custom period | Export csv

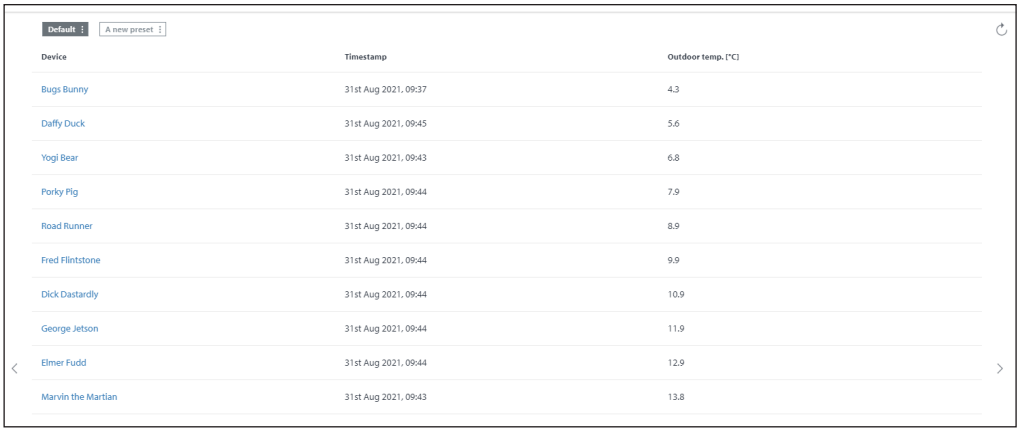
Default | Preset 1 | A test preset

Timestamp	Outdoor temp. [°C]	Return temp. (EM3) [°C]	Return temp. (EM5) [°C]	Mode (HC1) [Other]	Energy (EM1) [kWh]	Energy (EM4) [kWh]	Volume (EM1) [m3]	Flow (EM1) [l/h]
31st Aug 2021, 09:43	4.3	28.6	26.4	1.0	3,183,324.8	3,183,357.3	798.3	12.2
31st Aug 2021, 09:30	2.8	28.7	26.4	1.0	3,183,317.5	3,183,349.8	798.3	12.2
31st Aug 2021, 09:15	1.3	28.8	26.5	1.0	3,183,310.1	3,183,342.0	798.3	12.2
31st Aug 2021, 09:00	5.8	28.8	26.5	1.0	3,183,302.7	3,183,334.0	798.3	12.2
31st Aug 2021, 08:45	4.3	28.9	26.5	1.0	3,183,295.2	3,183,325.8	798.3	12.2
31st Aug 2021, 08:30	2.8	28.9	26.5	1.0	3,183,287.8	3,183,317.5	798.3	12.2
31st Aug 2021, 08:15	1.3	28.9	26.5	1.0	3,183,280.3	3,183,309.0	798.3	12.2
31st Aug 2021, 08:00	5.8	28.9	26.5	1.0	3,183,272.9	3,183,300.4	798.3	12.2
31st Aug 2021, 07:45	4.3	28.9	26.5	1.0	3,183,265.4	3,183,291.6	798.3	12.2
31st Aug 2021, 07:30	2.7	28.9	26.5	1.0	3,183,257.9	3,183,282.8	798.3	12.2
31st Aug 2021, 07:15	1.2	28.8	26.5	1.0	3,183,250.4	3,183,273.8	798.3	12.2
31st Aug 2021, 07:00	5.7	28.8	26.5	1.0	3,183,242.9	3,183,264.8	798.3	12.2
31st Aug 2021, 06:45	4.2	28.7	26.4	1.0	3,183,235.4	3,183,255.7	798.3	12.2
31st Aug 2021, 06:30	2.7	28.6	26.4	1.0	3,183,227.9	3,183,246.6	798.3	12.2
31st Aug 2021, 06:15	1.2	28.5	26.4	1.0	3,183,220.4	3,183,237.4	798.3	12.2
31st Aug 2021, 06:00	5.7	28.4	26.3	1.0	3,183,212.9	3,183,228.3	798.3	12.2
31st Aug 2021, 05:45	4.2	28.2	26.3	1.0	3,183,205.4	3,183,219.2	798.3	12.2

1 2 3

- All sensor and energy meter data are stored in the database every 15 minutes.
- Those data can be represented in the “Readings table”, where users have an option to select, which sensors they would like to include and for which period. Users can choose one of the predefined periods, like today, one week, one month, one quarter, one year, or define a custom period.
- If the user wants to use the same selection in the future a preset function can be used.
- Data can be exported in a CSV file directly from the readings table.

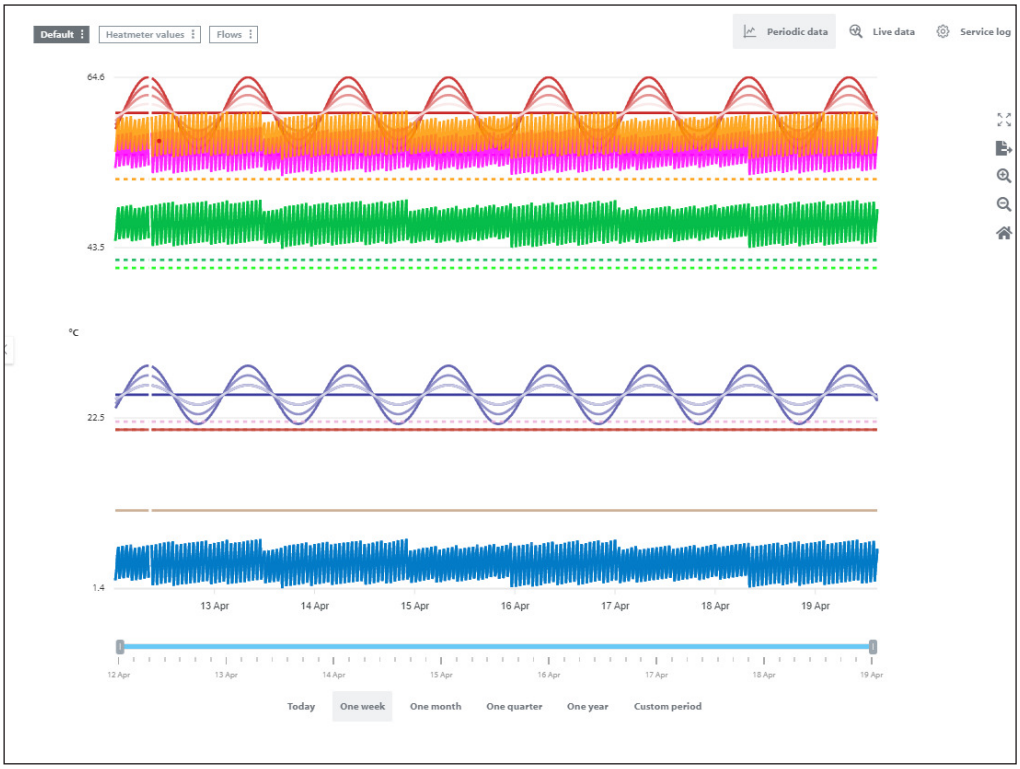
Device table



Device	Timestamp	Outdoor temp. [°C]
Bugs Bunny	31st Aug 2021, 09:37	4.3
Daffy Duck	31st Aug 2021, 09:45	5.6
Yogi Bear	31st Aug 2021, 09:43	6.8
Porky Pig	31st Aug 2021, 09:44	7.9
Road Runner	31st Aug 2021, 09:44	8.9
Fred Flintstone	31st Aug 2021, 09:44	9.9
Dick Dastardly	31st Aug 2021, 09:44	10.9
George Jetson	31st Aug 2021, 09:44	11.9
Elmer Fudd	31st Aug 2021, 09:44	12.9
Marvin the Martian	31st Aug 2021, 09:43	13.8

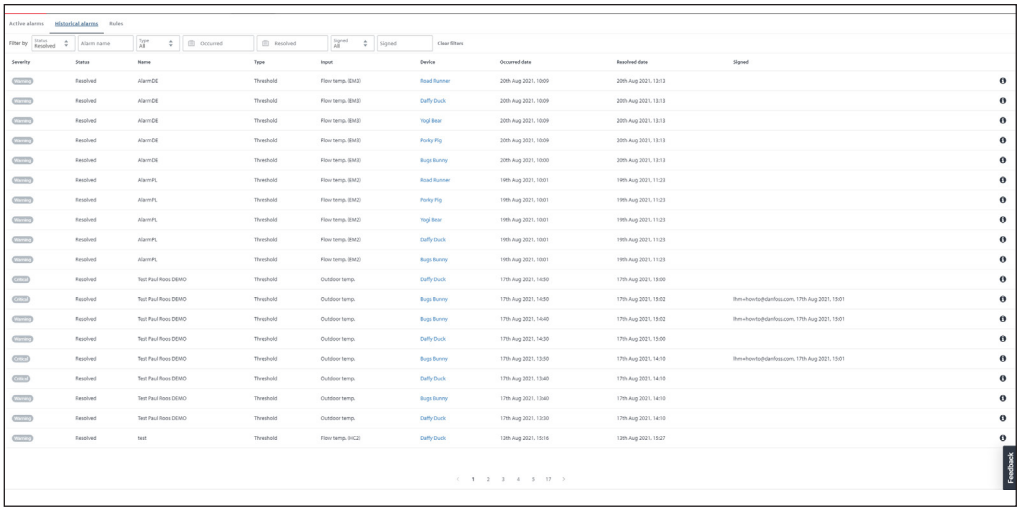
- Is a table that represents selected sensors for multiple devices in order to compare the values (e.g. flow temperature, return temperature, …).
- Users can select devices manually or use smart filters.
- Sensors can also be selected manually, or presets can be used.
- Devices can be sorted based on a particular sensor, selected by the user.

Graphs



- All sensor and energy meter data are stored in the database every 15 minutes.
- Those data can be represented in a graph where users have an option to select which sensors they would like to include and for which period. Users can choose one of the predefined periods, like today, one week, one month, one quarter, one year or define a custom period.
- If the user wants to use the same selection in the future a preset can be created.
- The graph can be exported as a picture in PNG or PDF format.
- Service log allows the user to view data stored on the ECL itself (ECL stores up to 10 days of data).
- Data can be plotted on a graph in real time using the »live graph« feature that updates every 10 seconds with new data.

Alarms

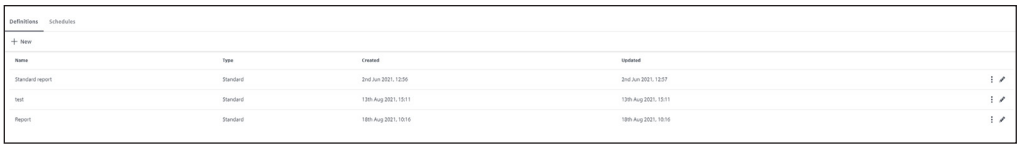


Leanheat® Monitor supports three types of Alarms:

1. The first type is “Threshold alarms” which is based on periodically stored data. Users select the sensor and define threshold values for it.
2. The second supported type is “ECL alarms”. That means that alarm logic is in the controller, but the user can make settings from the Leanheat® Monitor.
3. The third type is “Offline alarms“ which tells the user when communication between the controller and Leanheat® Monitor is interrupted.
4. Fourth type of alarm that we support is the “Consumption alarm”. It is designed to activate whenever (within a designated time period) the trigger value for a chose sensor (energy or volume) is surpassed.

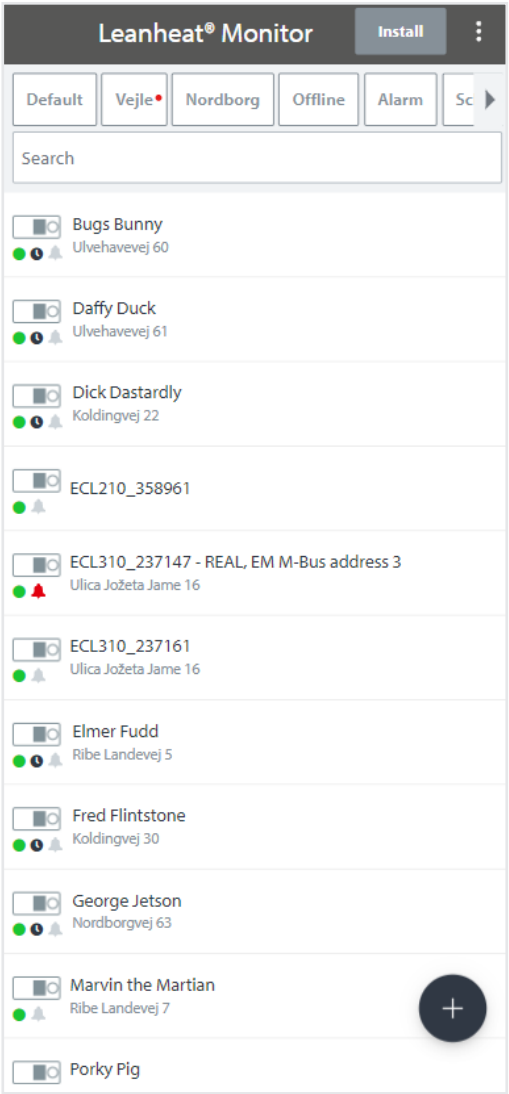
For all types, users can define controllers for which a particular Alarm rule is applied, optional Alarm recipients, schedule, and optional delays (occurrence and notification).

Report definitions



- All data stored in a database can be exported by using the Reports functionality. For that purpose, “Reports definitions editor” should be used.
- The user defines, period, controllers, sensors and other data that will be included in the report.
- Reports can be executed manually or by the schedule.
- Reports can be sent to specified recipients or only generated and available for the manual download.

Mobile version (PWA)



- If the user accesses the application with a mobile device, the resolution of that device is automatically recognized and the mobile version of Leanheat® Monitor opens.
- Not all the functionalities are available in the mobile version, but when using it users can still connect new controllers, see the flow diagrams, alarms, documents or remotely change controller settings.
- Users can always decide to switch to the desktop version manually.

API

- API offers access to data in the Leanheat® Monitor database for the Danfoss optimization software suite and 3rd party applications.
- In an opposite direction, optimization applications or 3rd party applications can write calculated setpoints or any other values directly to the controller.
- Detailed API documentation is available in order to integrate 3rd party application.

Reports

- We support three types of reports: detailed, standard and energy consumption. They can be generated from the reports tab manually. Additionally, we offer the option of scheduled reports that are periodically sent out to the user.

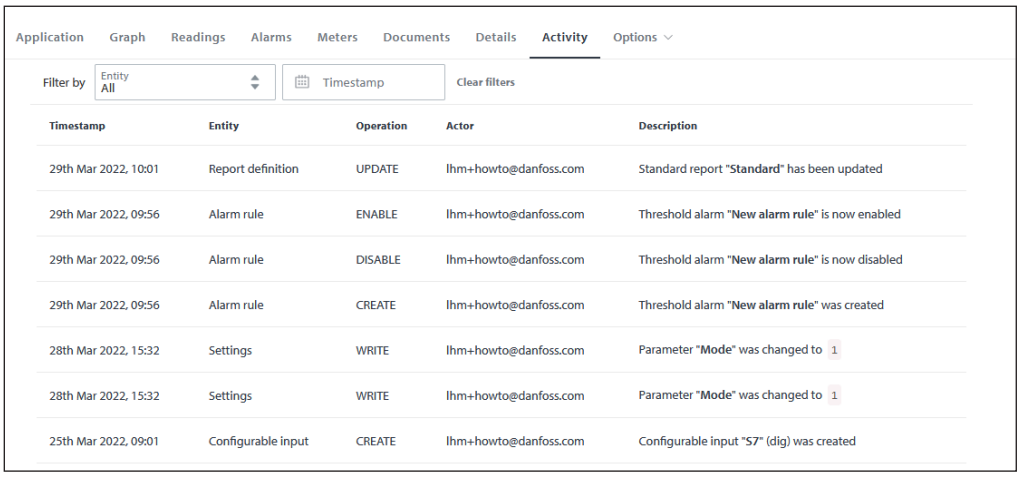
1. Standard report exports data for a selected time period. It displays one value per column per device for the selected time period.
2. Detailed report exports data for a specific time period. For each data interval a value is shown. For example time period »Yesterday« and »Data interval« 15 minutes will report the selected value for yesterday for every 15 minutes.
3. Energy consumption reports show the change in energy and volume for the selected time period and meters.

Commissioning report

- “Commissioning report” is a report containing device settings at the moment of executing the report.
- We recommend this report to be stored in the documents section of the device.

Activity log

- Activity log tracks actions taken inside of the Leanheat® Monitor. Any change done such as device settings, new device connection, report execution, alarm editing, etc. can be viewed in the activity log.
- The activity can be sorted and filtered by the time stamp, entity, operation and the actor. It also offers a short description of the action taken.



Timestamp	Entity	Operation	Actor	Description
29th Mar 2022, 10:01	Report definition	UPDATE	lhm+howto@danfoss.com	Standard report "**Standard**" has been updated
29th Mar 2022, 09:56	Alarm rule	ENABLE	lhm+howto@danfoss.com	Threshold alarm "**New alarm rule**" is now enabled
29th Mar 2022, 09:56	Alarm rule	DISABLE	lhm+howto@danfoss.com	Threshold alarm "**New alarm rule**" is now disabled
29th Mar 2022, 09:56	Alarm rule	CREATE	lhm+howto@danfoss.com	Threshold alarm "**New alarm rule**" was created
28th Mar 2022, 15:32	Settings	WRITE	lhm+howto@danfoss.com	Parameter "**Mode**" was changed to 1
28th Mar 2022, 15:32	Settings	WRITE	lhm+howto@danfoss.com	Parameter "**Mode**" was changed to 1
25th Mar 2022, 09:01	Configurable input	CREATE	lhm+howto@danfoss.com	Configurable input "**S7**" (dig) was created

User management

- A tenant in Leanheat® Monitor can be accessed by multiple users.
- The users may have different roles, such as:
  - Admin – has full access to everything
  - Full – access to assigned devices, without access to the admin section
  - Limited – access to assigned devices with limited device setting privileges
  - Basic – access to assigned devices and only primary settings
  - Read only – can only view assigned devices.
- Guests are users that are already tied to a Leanheat® Monitor tenant. Guests can have access to multiple tenants and switch between them. An example of a guest is a technician who is not tied to just one tenant/company or a Danfoss technician.

All roles privilegs

× Exit comparison

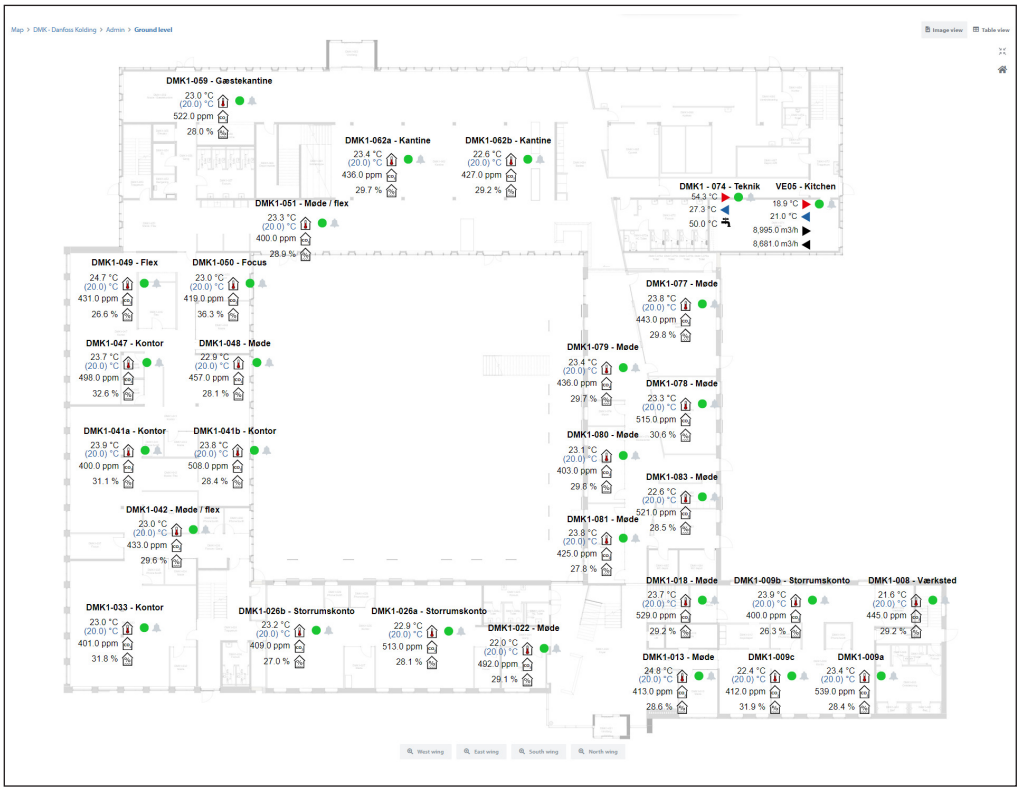
	Admin	Full	Limited	Basic	Read-only
Devices	All	Assigned	Assigned	Assigned	Assigned
Settings	All	All	Limited	Primary settings	Readonly
User management	Everything	Own account	Own account	Own account	Own account
Alarms and alarm rules	Everything	Yes	Yes	Readonly	Readonly
Reports, definitions and schedules	All	Readonly	Readonly	Readonly	Readonly
Device management	Everything	Everything	Everything	Everything	Readonly
API Setup	Everything	Everything	Everything	-	-
General settings	Everything	Everything	Everything	-	-

Configurable inputs

- Inputs on the ECL 296 / 310 that are not used by the application can be used as extra configurable inputs (Pt1000, 0-10V, digital).
- The readouts from these configurable inputs can be displayed in graphs, readings and used in reports.
- Additionally Leanheat® Monitor allows the user to edit the flow diagram and add a configurable input onto it for easier monitoring.

Areas

- The areas feature gives the user the option to group devices that are in an area. These can be multiple devices inside of a building, or a housing complex etc.

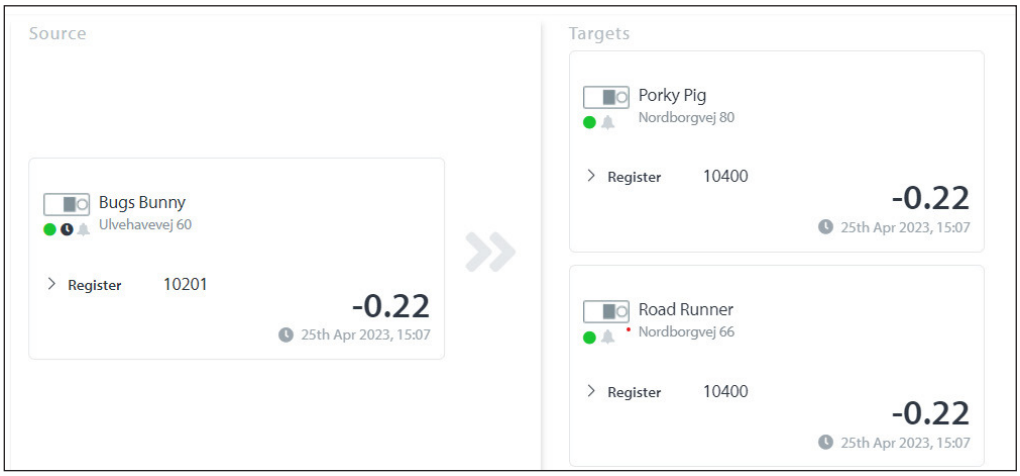


- Areas can be structured into layers and sublayers. Each sublayer can have its own image, as seen on the picture.
- The user has an option to switch between image and table view of the selected area.
- Devices inside of an area section can have a shared time schedule that applies to all or selected devices inside of an area.

- There are 2 different types of schedules you can create:
  1. Daily schedule (sets comfort mode for the set period).
  2. Holiday schedule (sets holiday comfort, constant setback temperature or frost protection for the set period).

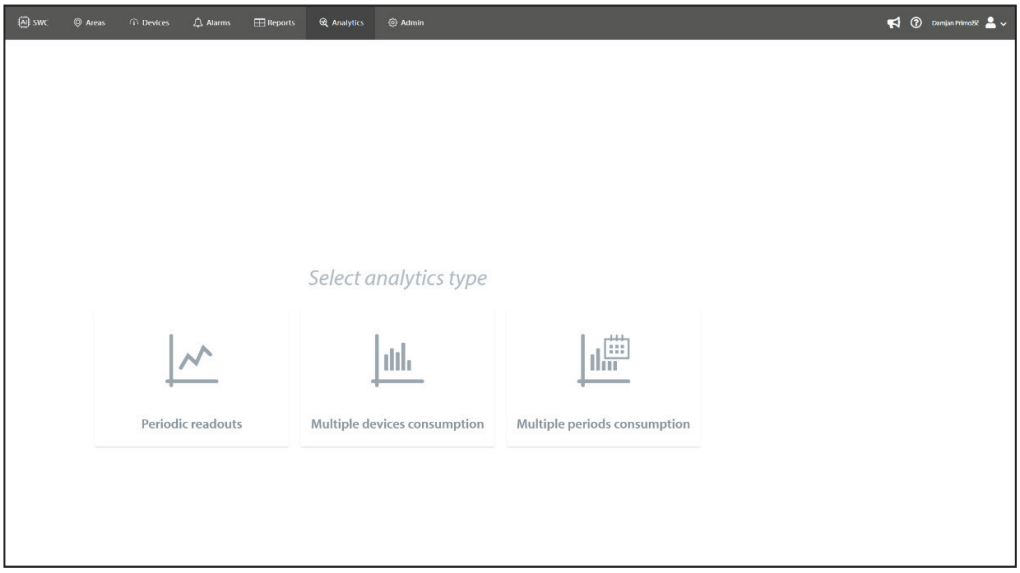
Data relays

- Data relays allow the user to relay information from one controller to another. If only one controller has an outside temperature connected, it can relay that information to other controllers.



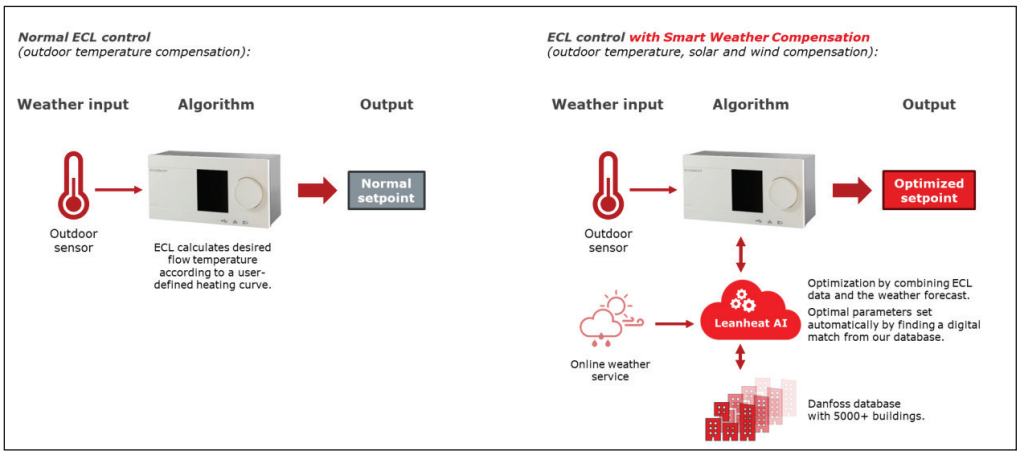
Analytics

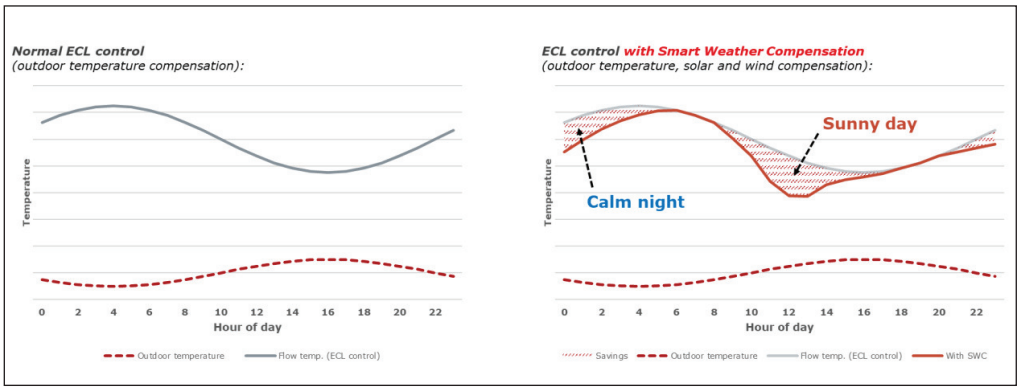
- Comprehensive Data Comparison Across Multiple Devices Up to 50 devices and 2 sensors can be selected, for comparison over a specified period.
- Holistic Energy Consumption Analysis Across Multiple Devices Up to 50 devices and 2 Energy values can be selected, for comparison over a specified period.
- Comparison of Historical Energy Consumption Periods Single meter energy register can be selected and compared across two distinct periods (Day to Day, Month to Mont, Year to Year or custom).



Smart Weather Compensation

- SWC improves traditional weather compensation by using advanced weather forecasts. With SWC, each compatible* Danfoss ECL 310 in Leanheat® Monitor starts utilizing local information about solar radiation, wind speed, and humidity. SWC operates by introducing an optimized offset to the flow temperature, allowing your ECLs to adjust more precisely to the outside weather. This ensures optimal energy use while maintaining indoor comfort. SWC is fully automated, requiring no manual configurations from the user. Comprehensive Data Comparison Across Multiple Devices.





*Software version must be 1.42 or higher. The following ECL 310 heating applications are supported: A230, A237, A247, A260, A266, A267, A275, A319, A330, A333, A367, A376, A377, A390, P330, P348, P370.

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