CJC® T²render is a cloud-based Software as a Service (SaaS) solution accessed via the internet.

**It generates warning messages to the equipment owner (subscriber) when:**

- User defined sensor limits exceed thresholds
- and for Pro licenced equipment also when either oil or equipment operating conditions differ from normal

CJC® T²render can be accessed with your preferred browser.

Please go to:

https://t2render.com

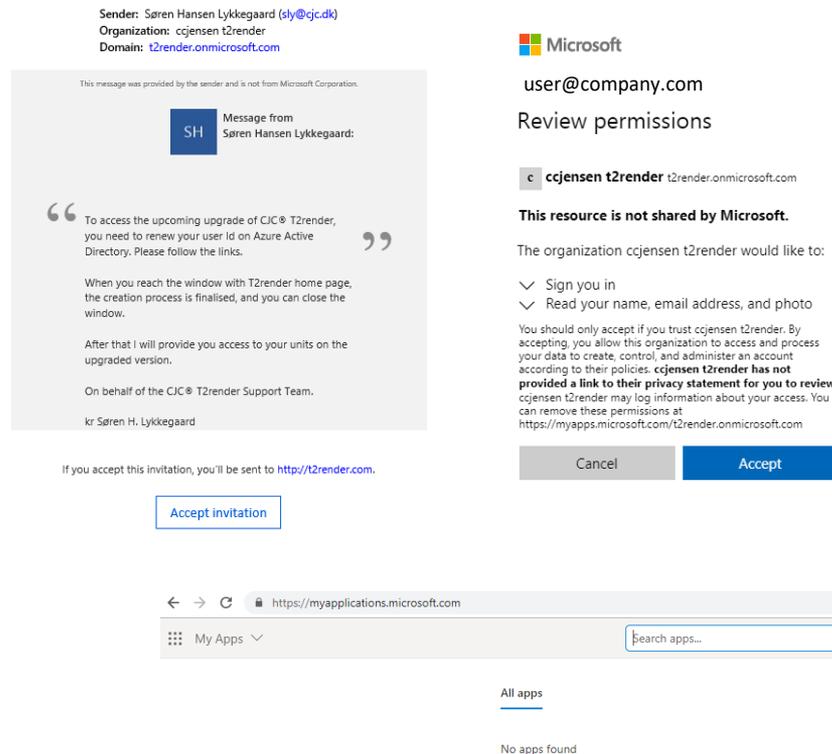and login with your Microsoft Office 365 credentials.
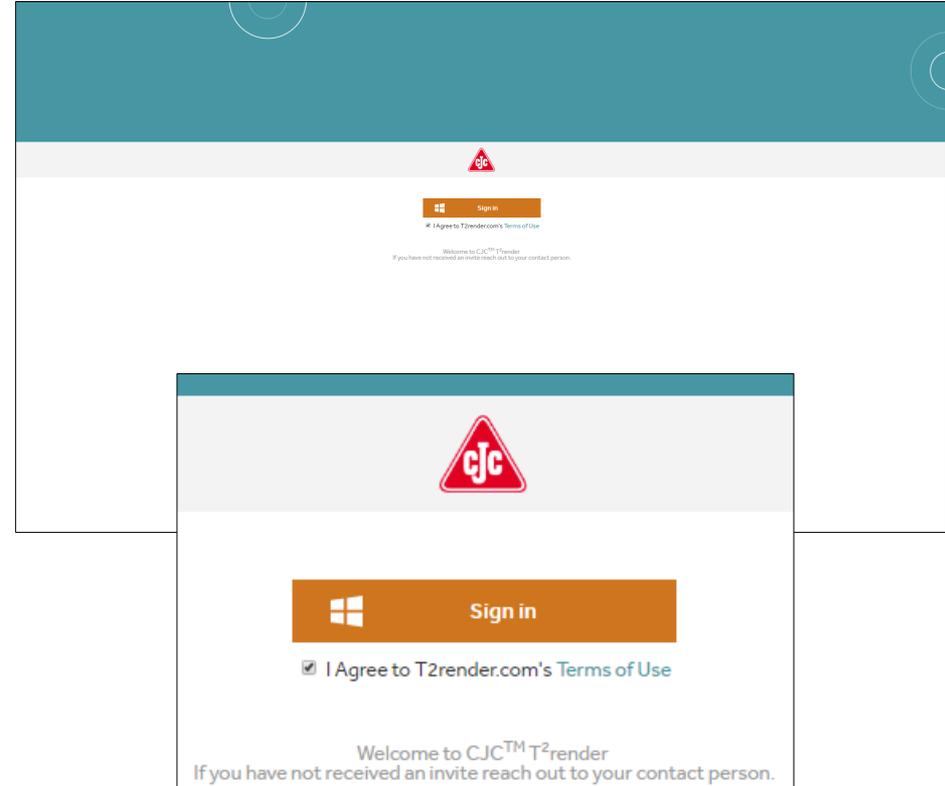
This section describes how to create a user ID for T^{2}render.

All users must have a user ID on Azure Active Directory[1].
If the user do not already have a user ID on Azure Active Directory, the creation process is:

1. A request is sent to support@t2render.com informing which sites to access

2. Once approved, T^{2}render Support Team sends an invitation to the new user to create a user ID on Azure Active Directory. The users company email address must be used.

3. Click "Accept invitation" and create a password or type in an existing password if there is already an active account on Azure Active Directory

4. Click "Accept" that CC Jensen can access the user information on Azure Active Directory

5. When reached the window with available Apps, the creation is finalized, and the user account has been created. "No apps found" might appear. Please disregard this.

[1]Azure Active Directory (Azure AD) is Microsoft's multi-tenant cloud-based directory and identity management service.
For IT Admins, Azure AD provides an affordable, easy to use solution to give employees and business partners single sign-on (SSO) access to thousands of cloud SaaS Applications like Office365, Salesforce.com, DropBox, and Concur.
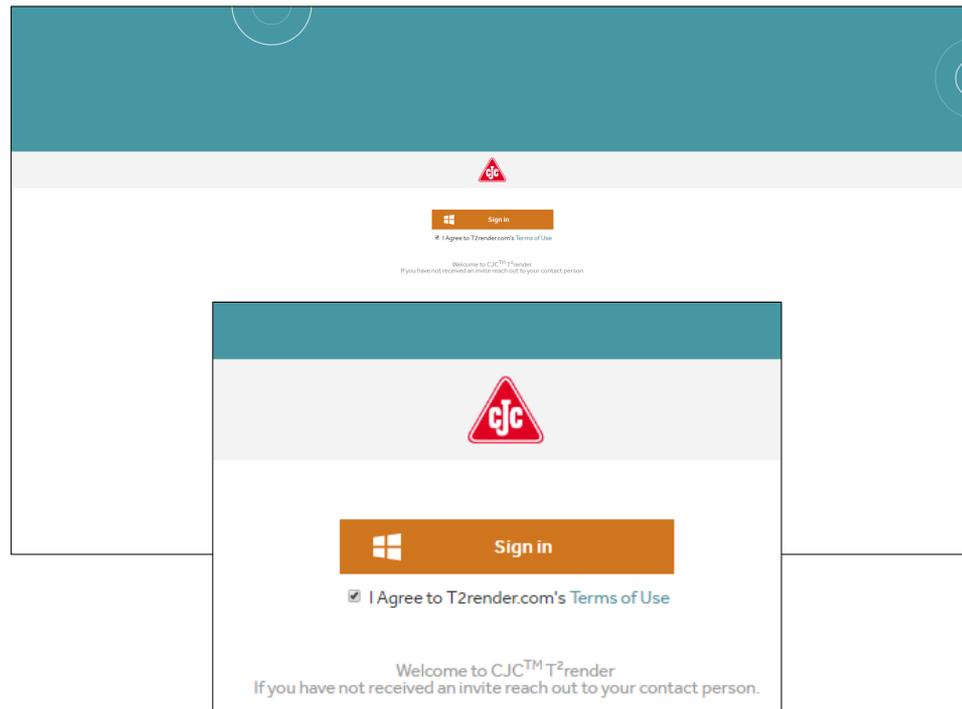
This section describes how to access the systems on T^{2}render appointed to you.

If you already have a user account for T^{2}render, but need access to known systems:

- Send a request to support@t2render.com informing which sites to access

- Once approved T^{2}render Support Team creates the access and informs you

In order to access the data it is necessary to accept the terms of Use (End User License Agreement) by clicking the check mark below the sign-in button.

This section describes how the basic navigation on T^{2}render works

◎ Overview	◎ Oil System	◎ Raw data		Søren Hansen Lykkegaard

Ver. 1.3

⚙ Settings   ⑦ Support   ⏻ Sign out

Company	Site	Equipment Type	Oil System	Equipment
All ⌄	All ⌄	All ⌄	All ⌄	All ⌄

There are 3 main entries to data reports:

Overview
Dashboard overview of all units on all sites for each company. It initially displays status on all accessible units.
It displays all current warnings/alarms from the sensors.

Oil System
Overview of the actual operating condition of a specific oil system/unit.

Raw Data
Detailed insight in all sensor data points of a specific oil system.

Selection Bar
To ease the navigation, a selection bar is available on all standard reports:
- **Company**: The company name of the equipment owner
- **Site**: Name of e.g. the power plant, the vessel, the wind farm, the mining site. Within the same geographic location.
- Equipment Type: Which equipment has T^{2}render Solution installed, e.g. Wind Turbine, Thruster, Crusher, Diesel Storage Tank.
- Oil System type: Which oil system of the equipment has the T^{2}render Solution installed like gear, fuel, hydraulics etc.
- **Equipment**: Name of the specific equipment. Must be unique for a given Company and Site

As minimum **Company** name, **Site** name and **Equipment** name is necessary to filtrate down to a specific unit.
The selection entries are cleared when navigating between the 3 main entries

Navigation

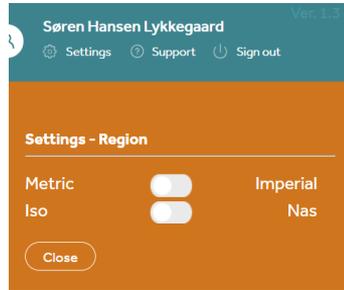This section describes how the basic navigation on T²render works
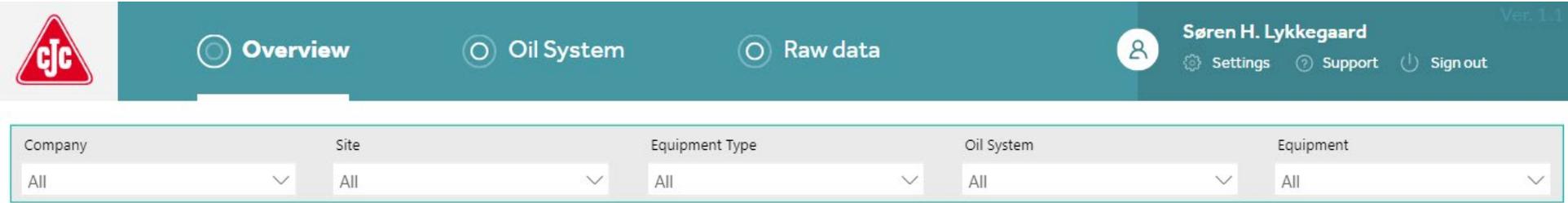
There are 3 additional main buttons:

Settings
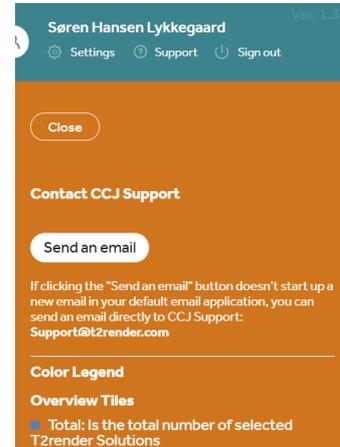User can select preset favourite settings about:

- Metric or Imperial standards
- ISO or NAS standards

Support
Send email button
Color Legend explanation to

- Overview Tiles
- Event Status

Sign out
Using this button it is possible to log out of T²render

This section describes the elements in the Overview Report.

This section describes the functionality of the Equipment Status Element in the Overview Report

The Equipment Status tiles sum up of the current operating status of all selected T^2render Solutions.

Click on the tiles to perform a filtered view of map and Issue Log

The number in the colored tiles represents the number of units with the following current status:

- Total: Is the number of selected T^2render Solutions

- Good – No deviations: Is the number of selected T^2render Solutions with stable operating conditions or no exceeded thresholds

- Major deviations: Is the number of selected T^2render Solutions with major deviations from normal operating conditions based on statistical models or sensor values exceeding thresholds

- Medium deviations: Is the number of selected T^2render Solutions with medium deviations from normal operating conditions based on statistical models

- Minor deviations: Is the number of selected T^2render Solutions with minor deviations from normal operating conditions based on statistical models

This section describes the functionality of the Site Location Element in the Overview Report

Site Location

Each dot on the map represents a Site.

The color codes describes the overall state of the T^2render Solutions within this site.

When hovering over the sites on the map with the mouse it is possible to see the number of installed T^2render Solutions within the site.

Click on the map to perform a filtered view of tiles, map and Issue Log.

This section describes the functionality of the Latest Issue section in the Overview Report

Latest Issues

	Site	Equipment Type	Oil System	Equipment Name	Event Description	Entry From	Event Start	Event End
	Demo	Wind Turbine	Gear	Demo WTG#2	Equipment Condition T2 value is out of limits	Sensor	16-03-19 00:50	16-03-19 05:45
	Demo	Wind Turbine	Gear	Demo WTG#2	Equipment Condition T2 value is out of limits	Sensor	17-03-19 00:45	17-03-19 05:35
	Demo	Wind Turbine	Gear	Demo WTG#2	Equipment Condition T2 value is out of limits	Sensor	17-03-19 17:25	17-03-19 17:25
	Demo	Thruster	Gear	Demo Thruster #1	Oil Condition T2 value is out of limits	Sensor	26-12-17 12:50	26-12-17 15:50
	Demo	Thruster	Gear	Demo Thruster #1	Oil Condition T2 value is out of limits	Sensor	10-01-18 19:00	10-01-18 20:40

The Latest issues log illustrates which of the selected units have had sensor data, Equipment or Oil Conditions out of limits and the time stamps for the event.
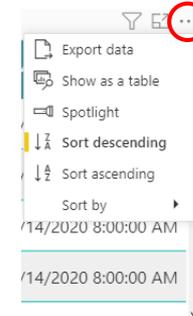
Equipment Condition T2 is a T^2render Pro sensor generated by CC Jensen based on the statistical correlations of all sensors to evaluate the health conditions of the equipment.

Oil ConditionT2 is a T^2render Pro sensor generated by CC Jensen based on the statistical correlations of all sensors to evaluate the health conditions of the oil.

The Latest Issues Log is a table and it is possible to navigate around in the table by filtering the columns and scroll down with the scroll bar to the right.

The Icons in the upper right corner of the table provide additional services:

- Maximise table in a new window
- Export to csv files
- Sort data in the table
- Etc.

Export data
Show as a table
Spotlight
Sort descending
Sort ascending
Sort by

/14/2020 8:00:00 AM

/14/2020 8:00:00 AM

This section describes the elements in the Oil System Report.

The Oil System Report gives an overview of the actual operating conditions of a specific oil system.

This section describes the functionality of the Latest Status section in the Oil System Report

Run Status:
The run status indicates whether the offline filter is operating or not and whether data are coming into the CJC® Cloud as planned

- ●   Filter is running, data are coming in regularly (max delay of 15 min)

- ●   Filter is stopped, data are coming in regularly (max delay 15 min) or filter is running, data are delayed up to 60 min

- ●   Filter is stopped, data are delayed up to 60 min or filter is running, data are delayed up to 120 min

- ●   Filter is stopped, data are delayed more than 60 min or filter is running, data are delayed more than 120 min

Issue Status:

Severity Level based on Equipment status defined in Overview Section

Insert status:

0-100% filled insert based on algorithm

Sensor Tiles:
The sensor tiles show the latest logged sensed/calculated sensor value of 6 default sensors.

The 6 sensor tiles are default for all units. Some units do not have one or more of the pre defined sensors. In that case the tile is left with a "-".

In the settings menu preset selection between Metrics and Imperial is possible

This section describes the functionality of the Issue Status section in the Oil System Report

Issue Status

Status	Event Start	Event End	Entry From	Event
	30-01-2020 11:45:00	30-01-2020 13:55:00	Sensor	T2-Oil contribution: OMT RH % is out of limits.
	30-01-2020 09:05:00	30-01-2020 11:45:00	Sensor	T2-Oil contribution: OMT RH % is out of limits.
	30-01-2020 07:45:00	30-01-2020 09:05:00	Sensor	T2-Oil contribution: OMT RH % is out of limits.
	30-01-2020 07:15:00	30-01-2020 07:25:00	Sensor	T2-Oil contribution: OMT RH % is out of limits.

Issue Status:
The Issue Status is the logbook for the unit containing all registered warnings and all manual entries made by the users.
Manual entries (text) can be added by clicking the "Add Log" button at the bottom of the report.

"Event" contains the direct cause of the event

Short Cut buttons:
At the bottom of the report it is possible to enter manual entries into the equipment logbook or to setup user defined sensor limits on the installed sensors.
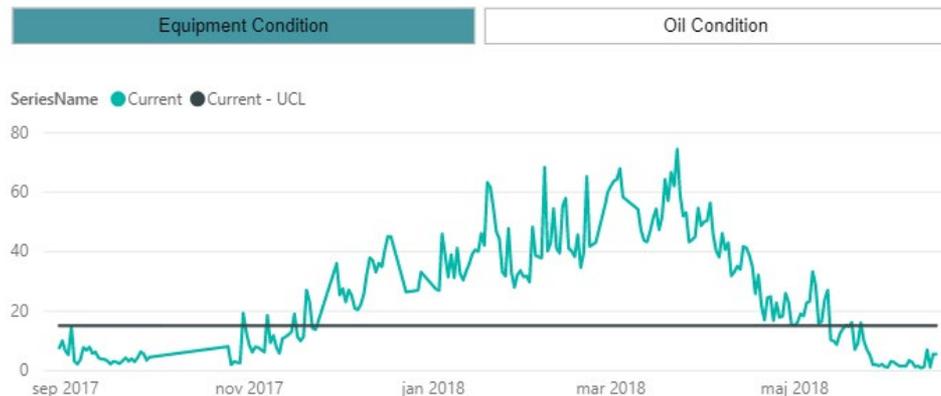
To see the result of the entries it is necessary to refresh the page

Add Log   Equipment Settings

This section describes the functionality of the Equipment & Oil Condition Graphs in the Oil System Report, which is only available with a T²render Pro License

Equipment Condition
Equipment Condition T^2 is a sensor generated by CC Jensen based on the statistical correlations of all relevant sensors to evaluate the health conditions of the equipment.

The model will use all available sensors for:
- Particle measurements
- Filter Inlet Pressure
- Oil Temperature
- Oil Moisture Level (%RH)
- Equipment Load %

Oil Condition/Equipment Condition

T²render Pro License contains monitoring of equipment and oil conditions based on T² models[1].

If a T² model has been generated for the actual oil system (Oil or equipment model) , the current T² status is illustrated as a graph. The graph shows the latest 3 months T² values ss Daily averages. In case it is needed to see specific T² data values, go to "Raw Data" report and monitor the raw T² values.

 The UCL on the graph illustrates the Upper Control Limit, from which the deviation threshold limits are derived.

Oil Condition
Oil Condition T^2 is a sensor generated by CC Jensen based on the statistical correlations of all relevant sensors to evaluate the health conditions of the oil.

The model will use all available sensors for:
- Oil Conductivity
- Oil Moisture level (%RH)
- Oil Temperature

1): **Hotelling's *T*-squared distribution** (*T²*) used in statistics

Equipment Settings
It is possible to enter thresholds for warnings messages based on specific sensor values derived from the list of available sensors on the unit.

The limits are deactivated as default and must be set for each individual system.

Each user with access to the specific unit can set/change the limits. The setting changes are logged in the log book with time, user and new limits.

Choose which sensor you need to monitor. Then choose detail level for the warning trigger; hour average values or daily average values.

Limits are activated if limits are higher than "0" and activation mark in the check box is made

In a T^{2}render Pro version these limits work in parallel with the message thresholds generated by the Equipment and Oil Condition models.

This section describes the different functions in the Raw Data Report.
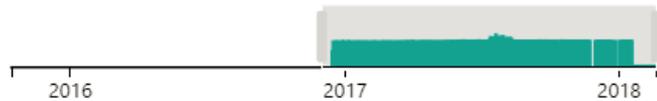
Time slicer

The Raw Data report contains 2 time slicers.

The **Upper time slicer** shows the time span for which there are data for the selected system. (Maximum of 3 years).

Select a window on the time slicer for further analysis.

The **Lower time slicer** is used to select the exact time window to be displayed.

Select a window on the time slicer to be displayed on the graphs.

See illustrated example on next page.

Data granularity

Depending on which detail level is needed, it is possible to toggle between

- Daily average values
- Hour average values
- Raw data (the actual data samples)[1]

The actual data points on the graphs are marked with a "●" . All data points are connected with a straight line between the data points.

Only valid data points are used for the graphs.

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[1] Max. number of visible data points on all the selected sensor parameters are 3.500. In case the number of selected data points are higher than 3.500, High Density Line Sampling is used:
https://docs.microsoft.com/en-us/power-bi/desktop-high-density-sampling
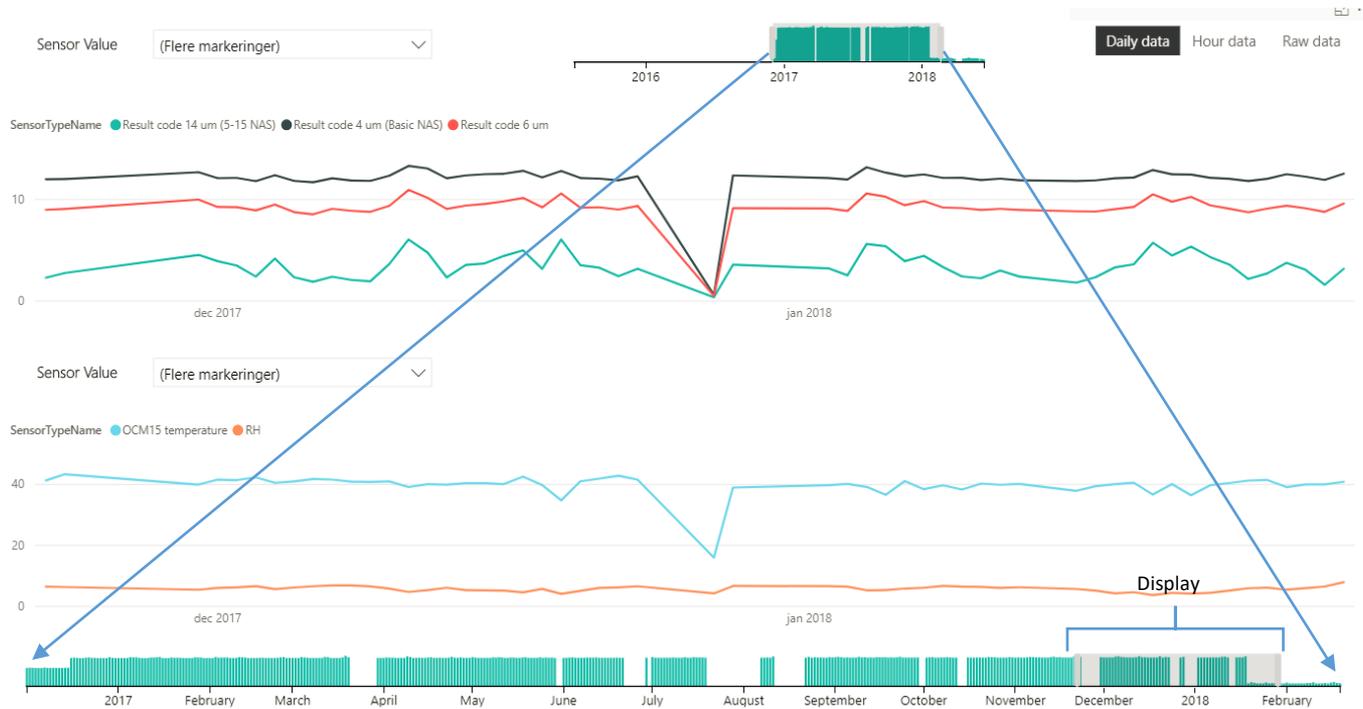
Upper Time slicer illustrates latest 3 years of data
Marked block on upper time slicer defines start and stop point for lower time slicer
Marked block on lower time slicer defines start and stop time on the display

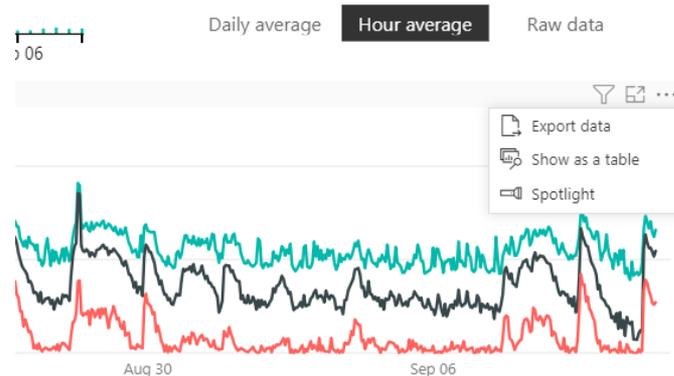This section describes the different functions in the Raw Data Report.

Sensor Value | Multiple selections

Sensor drill down menu:
Open the drill down menu to select/deselect the sensors to display.

The Drill down menu contains all the available sensor parameters for each unit.

Export Data
The graphs have an option to export data to csv-file or xlsx-file. This is available through the menu bar for each graph section, see snapshot above.

Daily average | Hour average | Raw data

Export data
Show as a table
Spotlight

Export data

Which data would you like to export?

○ Summarized data
○ Underlying data

File format:

.xlsx (Excel 150,000-row max)

ⓘ Data exports with all applied filters.

ⓘ For large data models, only a limited number of rows can be exported. Learn more

Export | Cancel

If the predefined thresholds are exceeded, a notification is send to the users that subscribe on notifications.

T2render Pro only:
In case the oil model (T2 oil) or equipment model (T2 equipment) exceed the pre defined limits consistently for:
- Medium deviation (1,0xUCL)
- Major deviation (2,0xUCL)

a notification is sent to the users that subscribe on notifications from the specific unit.

Notifications are resent if the level is changed between
- Medium deviation (1,0xUCL)
- Major deviation(2,0xUCL)

In case you are in doubt if you are setup to receive notifications from a specific systems, please contact support@t2render.com