WISE™ Care Package 1

System update with focus on flexibility and time-/cost savings

Swegon

Content

WISE Care Package 1

In WISE Care Package 1 the focus is on flexibility, time- and cost savings. This is achieved through the innovative functions available in WISE Care Package 1.

WISE Care Package 1 is for the entire WISE-system, i.e. room-, zone- and system levels, which means the update is an comprehensive solution to the WISE-system.

The system is self-commissioning which results in time- and cost savings. WISE Care Package 1 consists of following functions:

Main functions:

- 2-Steps optimisation
- Summation of airflow

Other functions:

- Global commissioning
- Light-control
- Normally open valve actuators
- Cold draft protection
- Forced closing of zone dampers
- Alarm handling
- Dividing the airflow
- Time- and date setting in Super WISE
- Communication scanning
- Super WISE webpage

2-Steps optimisation

Zone- and room optimisation

The 2-steps optimisation is a further development of the current optimisation performed by the Super WISE. All zone dampers continuously monitor the damper position of the products that are on the level below the zone dampers, and are connected via Modbus. It is always the room damper with the greatest degree of opening which controls the zone damper for optimisation.

During normal operation, the most open room dampers are normally 70-90% open. If the most open room damper is open more than 90% it is not enough airflow in the zone. The zone damper will in this case open until the most open room damper is open less than 90%. If the most open room damper is open less than 70%, the airflow in the zone is too high. The zone damper will in that case close until the most open room damper is open more than 70%.

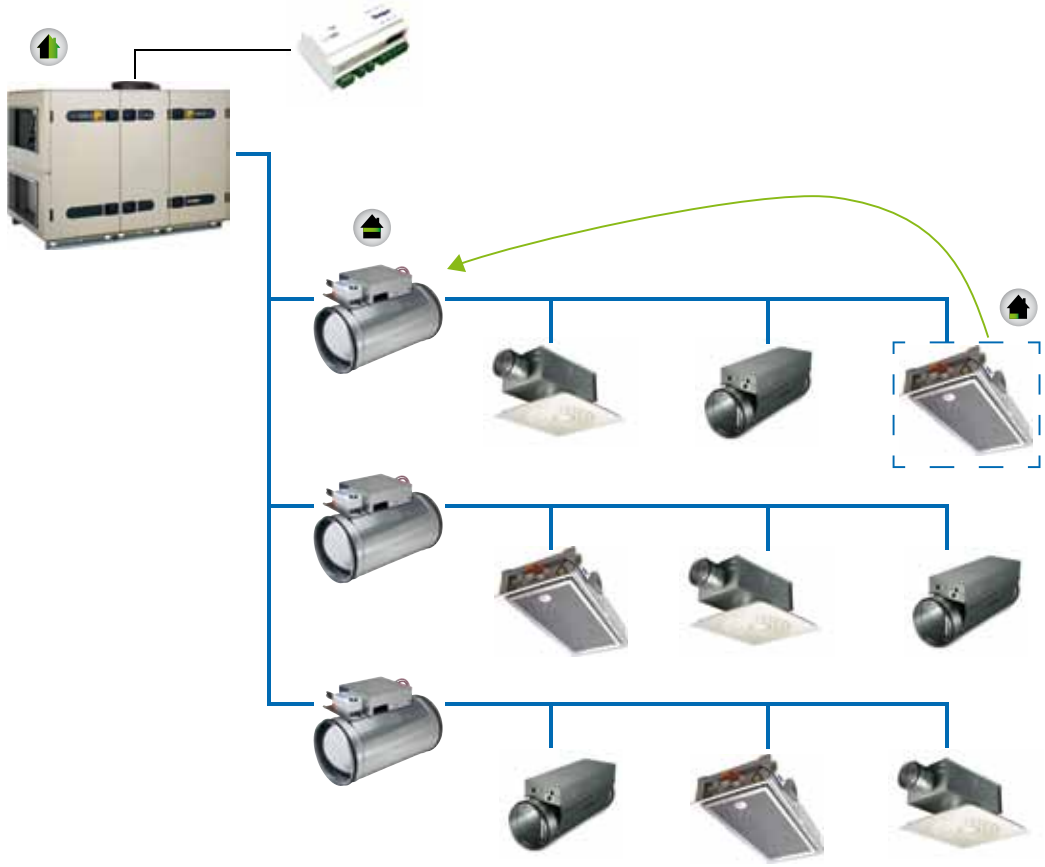

Figure 1. If a room damper is outside of the limit 70-90% open, the zone damper adjusts by opening or closing.

AHU and zone optimisation

Super WISE continuously monitors the position of the zone dampers, according to the same principle as previously described for room dampers. The AHU's pressure set point is increased/decreased depending on the need in the zones. The router simulates a zone damper and always displays the most open room product for both supply air and extract air, which is connected via Modbus to the router. If only a supply air or an extract air is connected, the router will only show this.

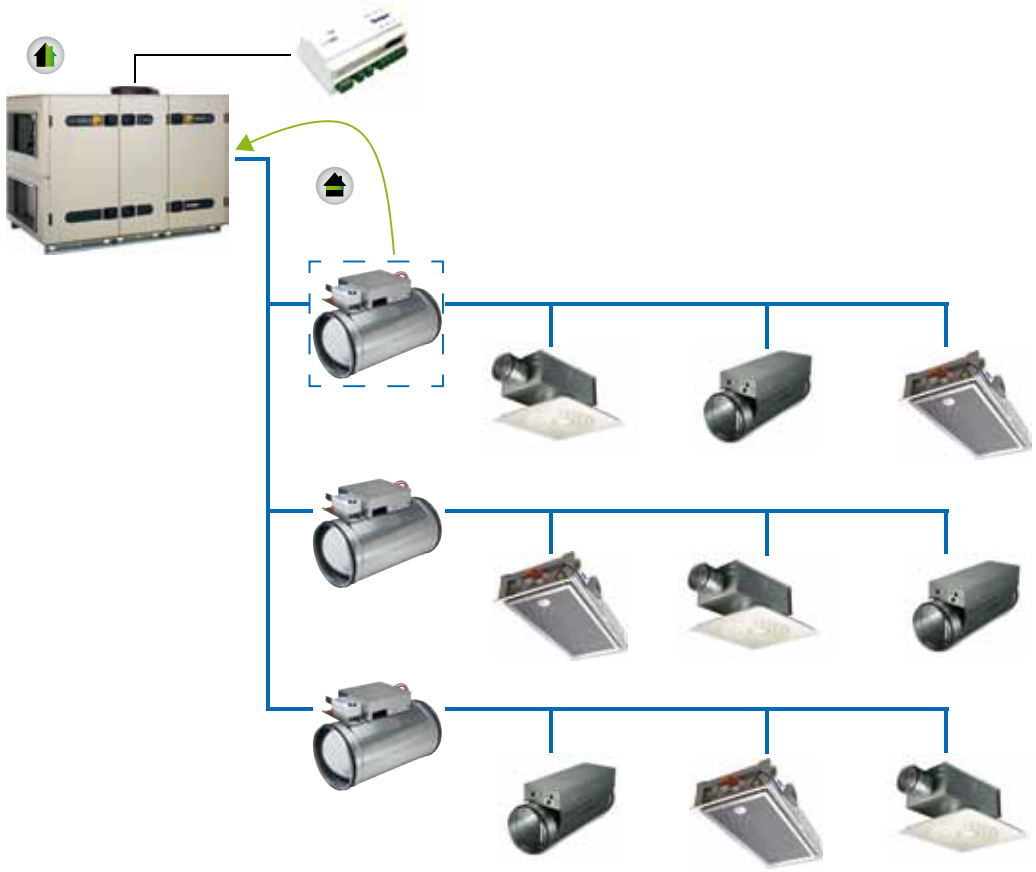

Figure 2. If a zone damper is out of the limit 70-90% open, the AHU will increase/decrease the unit's set point until the zone damper is within the limits.

The system is optimized continuously at all levels to keep the pressure drop as low as possible during all circumstances. Since the system is self-commissioning, air adjustments are no longer necessary. This saves both work time and money.

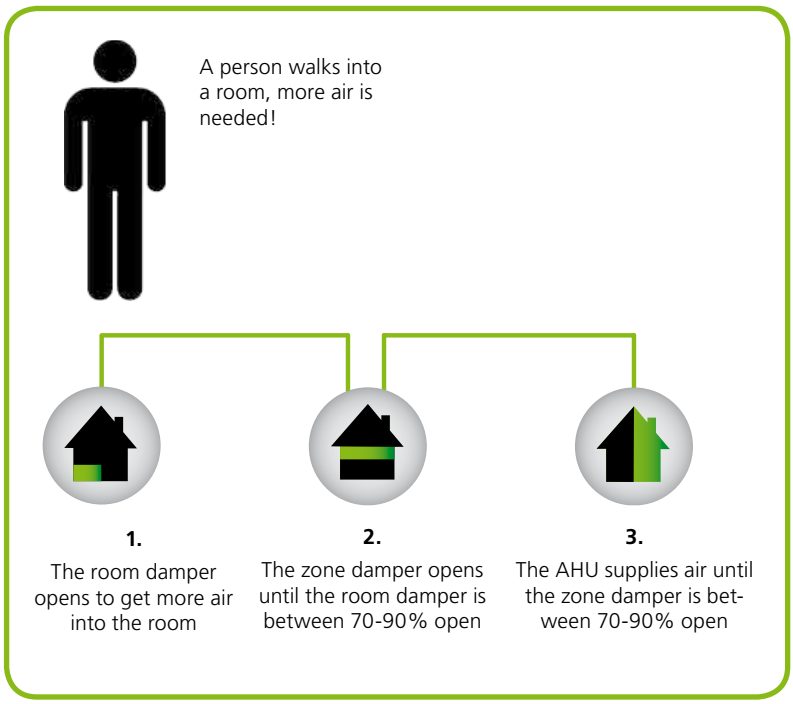

Figure 3. Illustration of the 2-steps optimisation.

Summary of airflow

Summary of airflow is a function which allows summation of air flows from room products. The summed air flows are sent as a set point to a central extract air, which is either a zone damper or an extract air room product.

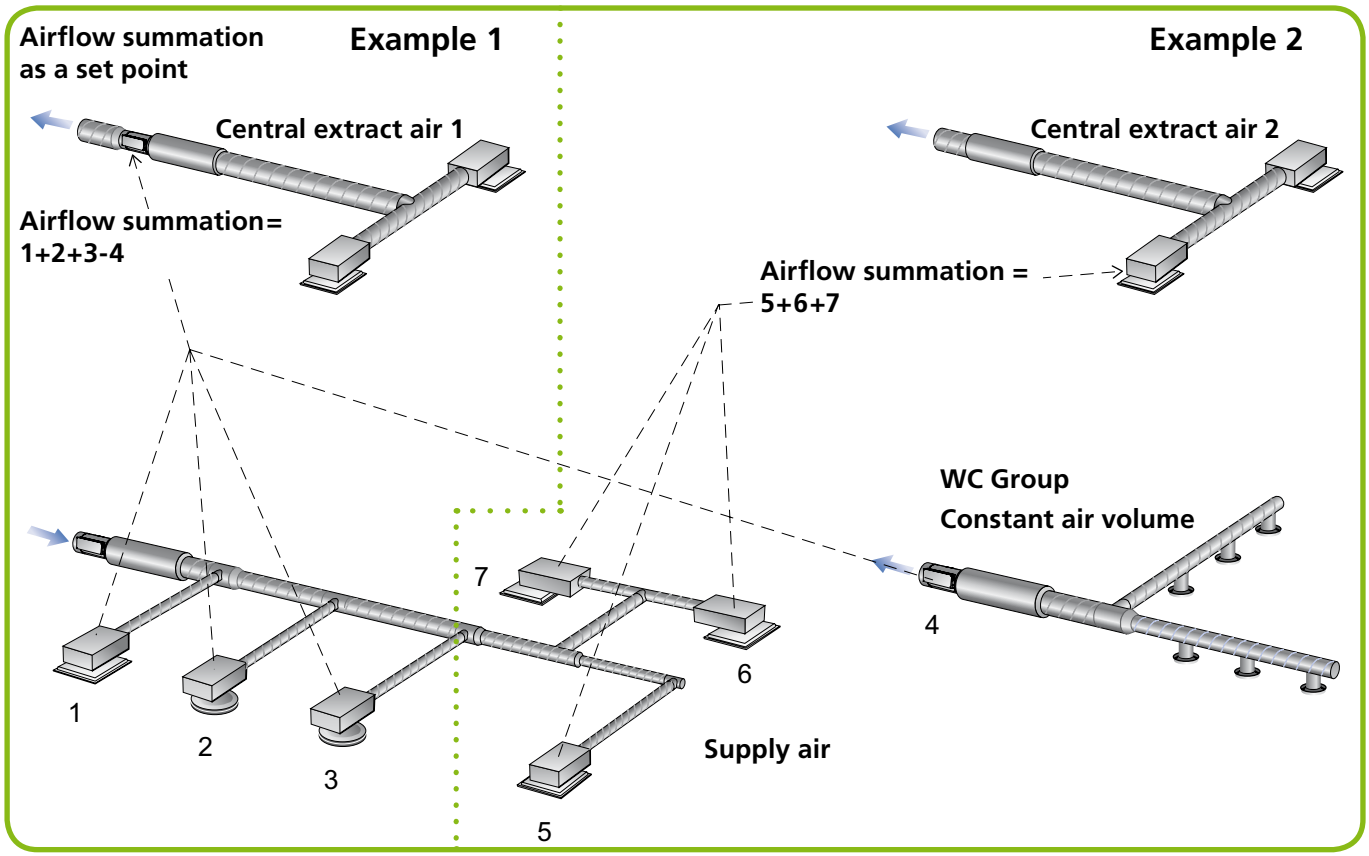

Figure 4. Illustration of airflow summation.

Example

Example 1

Select the supply air room products to be summarized. This air flow sum is sent as a set point to a zone damper, i.e. CONTROL Zone FE, which is a central extract air.

One or several extract air room products can then be subtracted from the air flow sum.

Example 2

In this example, a room-product is used as a central extract air. A number of supply air products are summed, the total air flow is sent as a set point to the extract air product. One or several extract air diffusers can be subtracted from the air flow summation.

NOTE!

- All room products which will be summed must be connected via Modbus RTU to the same zone product.
- If a zone product has an airflow summation as a set point, the summed room products must be connected via Modbus RTU to the zone product.
- The extract room air must be connected via Modbus RTU to the same zone damper as the supply air room products.

Setting the airflow summing

All settings for the summation function is easily done via the Super WISE webpage. Below is an example of this, where one summation group has been created, which belongs to the zone control with Modbus ID 1.

In "group number 1" three room products have been selected. MB-ID: 8, 12 and 16, to be summed to MB ID 250 with an offset selected to -150 l/s. Which means 150 l/s less air will be extracted than the summed airflow. This function can be applied when a mechanical adjusted constant flow damper is used, i.e. a toilet-group.

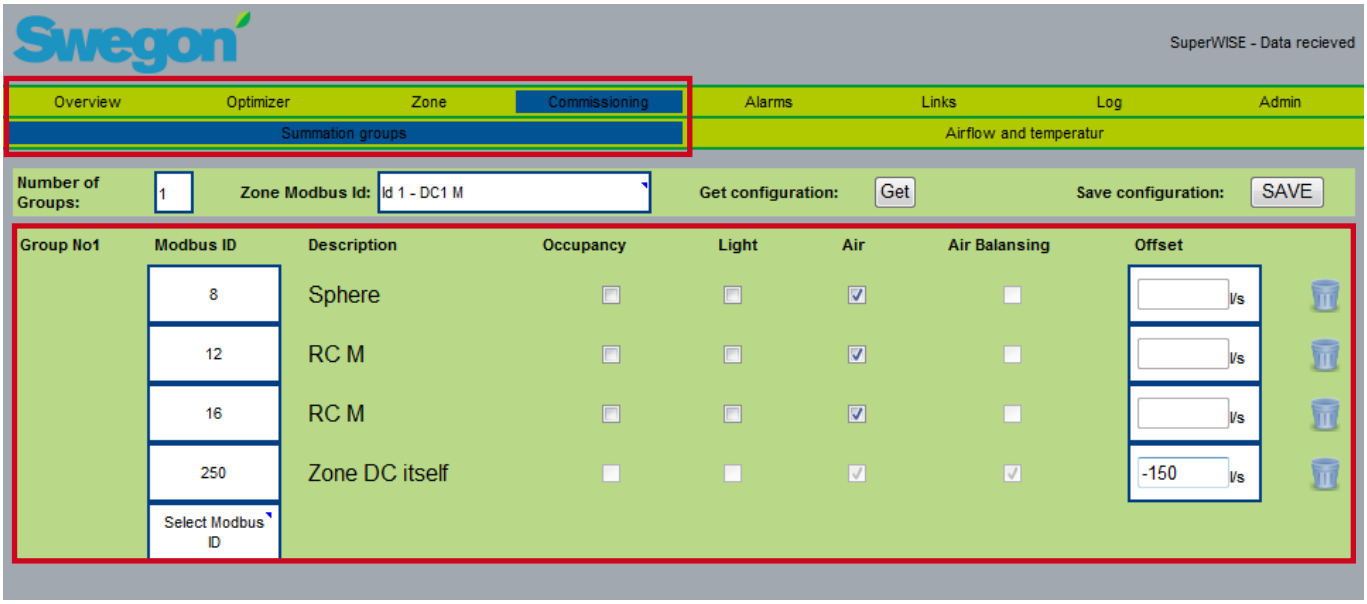

Figure 5. Setting the airflow summation.

Other functions in WISE Care Package 1

Global commissioning

The function global commissioning enables to put the entire system, or a single zone, in any commissioning mode. This is performed by single button push in Super WISE. The user chooses which commissioning mode the room products should be in, and chooses whether this applies to all zones or only a specified zone . A counter will start counting from 0-100%. When the counter has reached 100%, all room products are in the chosen commissioning mode.

This applies both for the commissioning of airflows and for the commissioning of valve actuators for water circuits. Valve actuators for water circuits can be forced to fully open. This can be done for valve actuators for cooling or for valve actuators for heating, both cannot be forced to fully open simultaneously.

When the system or a zone is set in a specific commissioning mode the room products remain in this position until one chooses to once again put them in normal mode. This is done by the same simple procedure that were used to put them in commissioning mode.

Example of when this feature is useful and saves work time:

All room products are delivered adjusted to commissioning mode with maximum flow from the factory, this is to facilitate the commissioning. All room products will continue to be delivered in this mode, even though the 2- steps optimisation is selected. Since no commissioning is required when the 2- steps optimisation is used, it is still desirable to have the products set to maximum flow. When the entire system is powered on and the 2- steps optimisation is in use, the max flow setting is used as a safety control to make sure everything is working as it is intended to. When the system is checked and the user is satisfied with the functionality, the entire system can be put in normal operation by the simple method described above.

By using the global commissioning function the user saves a lot of time compared to before. Before, it was necessary to either visit each room to manually set the products to normal operation using the controller TUNE Adapt, or manually go into each room in Super WISE and set the products to maximum flow through the web page.

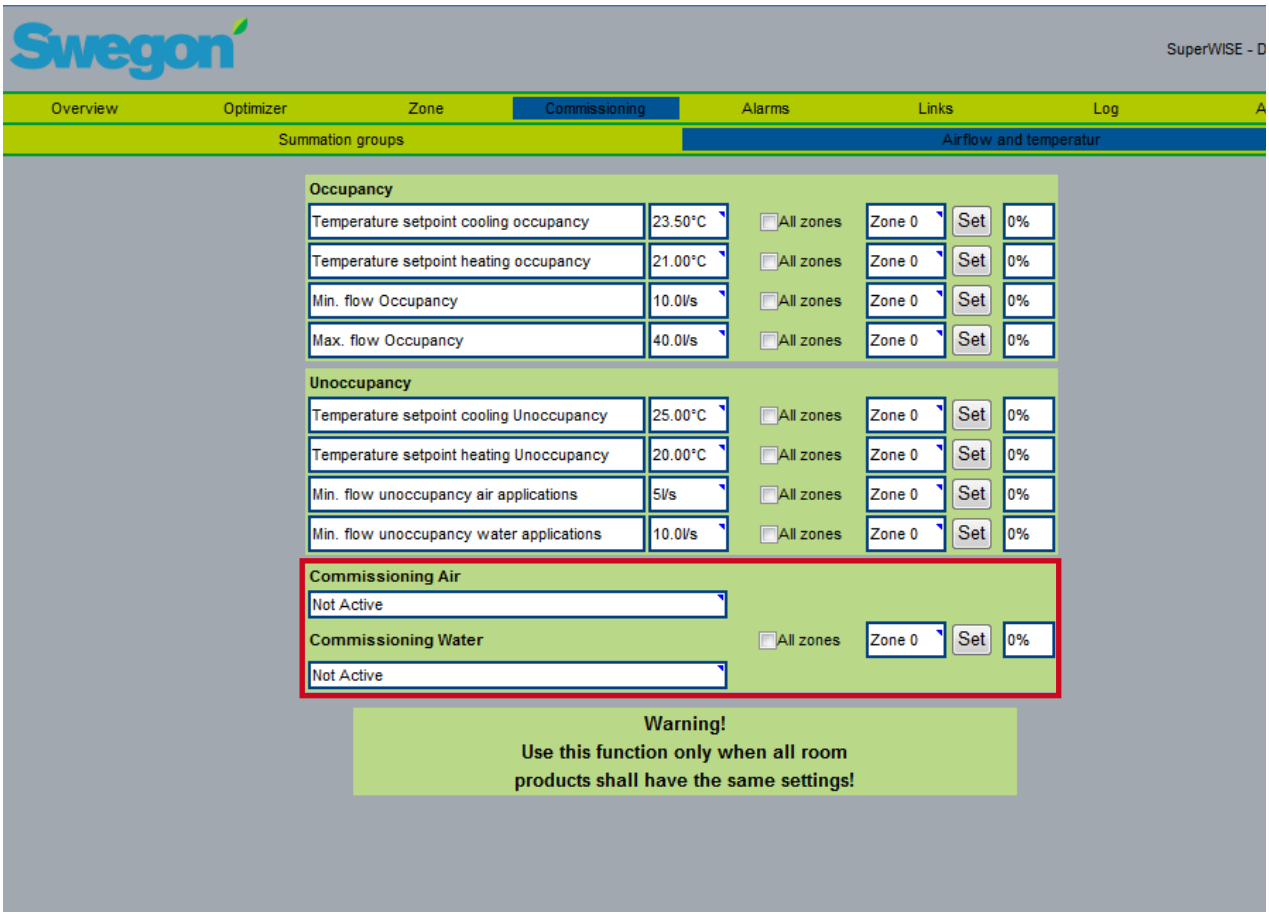

Figure 6. Global commissioning in Super WISE.

Light Control

With WISE Care Package 1, it is possible to use an momentary light switch together with the integrated occupancy sensor to control the lighting in rooms. By connecting an impulse light switch to the airborne ADAPT products in the WISE system, additional electrical energy is saved when the user must make an active choice to turn on the lights in a room.

When the user enters a room and wishes to turn on the light, a light switch is used and a signal goes to the ADAPT product, which turns on the light via ADAPT Relay, ADAPT Triac or other suitable third party relay. If the user wishes to turn the light off, the light switch is used and the ADAPT product turns off the light.

If the user leaves the room, without turning off the light, a timer starts counting down from a pre-set value. When the occupancy sensor does not detect any presence, within the pre-set value, the ADAPT product will automatically turn off the light in the room for maximum energy savings. If the sensor detects presence within one minute after the light was turned off, the lights will automatically be switched on. If no presence is detected within one minute, using the light switch is required to turn on the lights.

This function removes energy waste by removing the chances of accidental switching on the light in a room. Which could be caused by, for example, someone passing by in the hallway or outside the window.

To facilitate the connection and to ensure the lighting function, a special CONNECT Adapt has been developed, it should always be used with the new lighting feature. The lightning is connected to the CONNECT Adapt as usual on a screw terminal. If further simplified wiring is desired there is a wiring box with quick connectors and built-in relay available as an option.

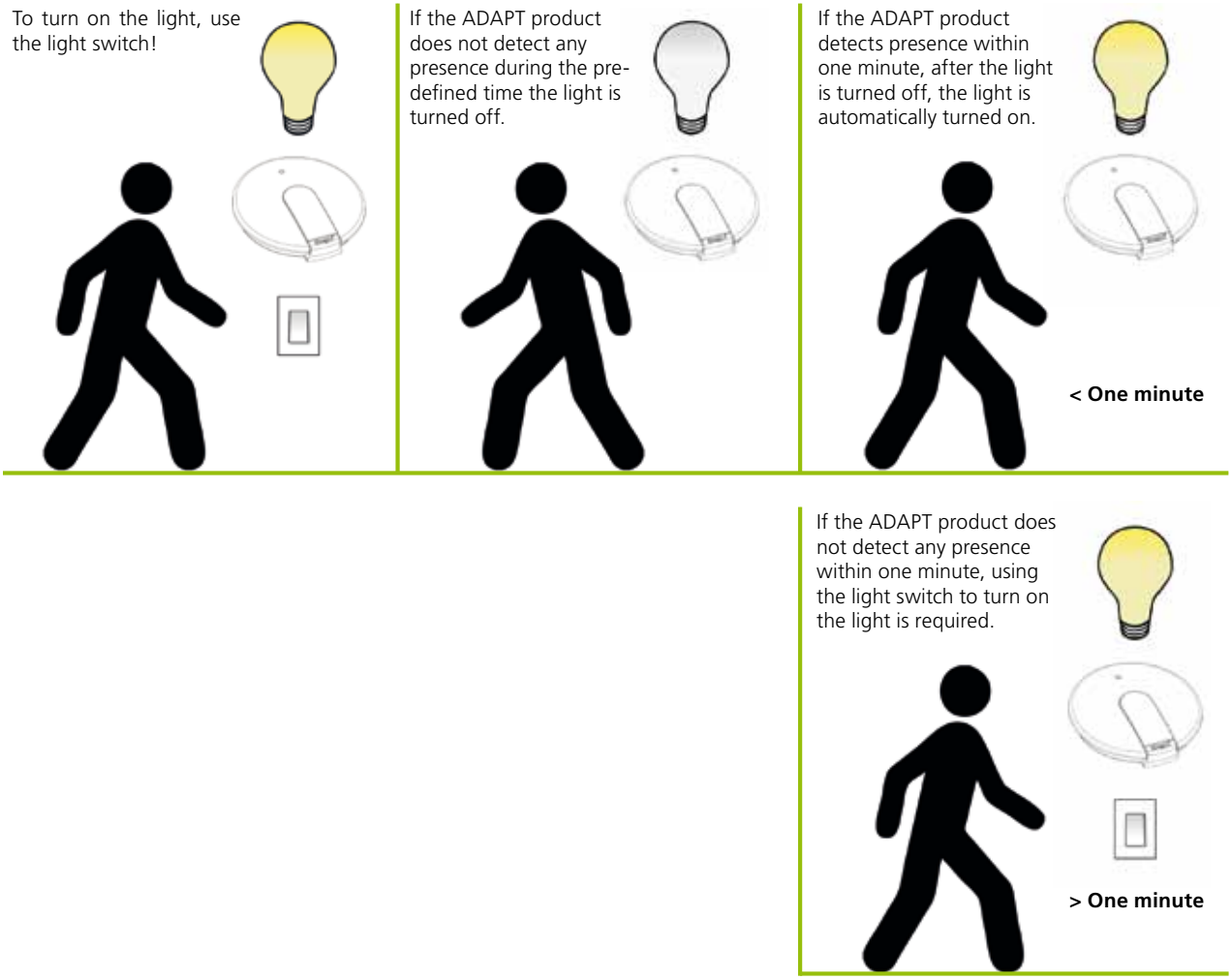

Figure 7. Light control.

Another light feature has been added which enables great flexibility. In addition to creating air flow groups at room level, it is also possible to create light groups. If it is desired that the lighting in two or more rooms (maximum 100 rooms) should be switched on, or off, at the same time, the user creates a group of rooms which should have common lights. When a user switches on the light in one room, the lights will be switched on in all the rooms included in the group. As long as any of the occupancy sensors detect presence in one of the rooms, the lights will be on in every room (in the group). When none of the occupancy sensors have detected any presence, during the predefined time, the lights will be turned off in all the rooms.

This function is very convenient when, for example, two separate offices with an ADAPT product in each room, is rebuilt to one large room. There is no need to re-wire the wires for light control, neither from light switches or fixtures.

The lighting group functionality is only intended for use with the new lighting control function described on the previous page.

When creating occupancy groups, only the internal occupancy in the products' controllers is set and is therefore only intended for ventilation control.

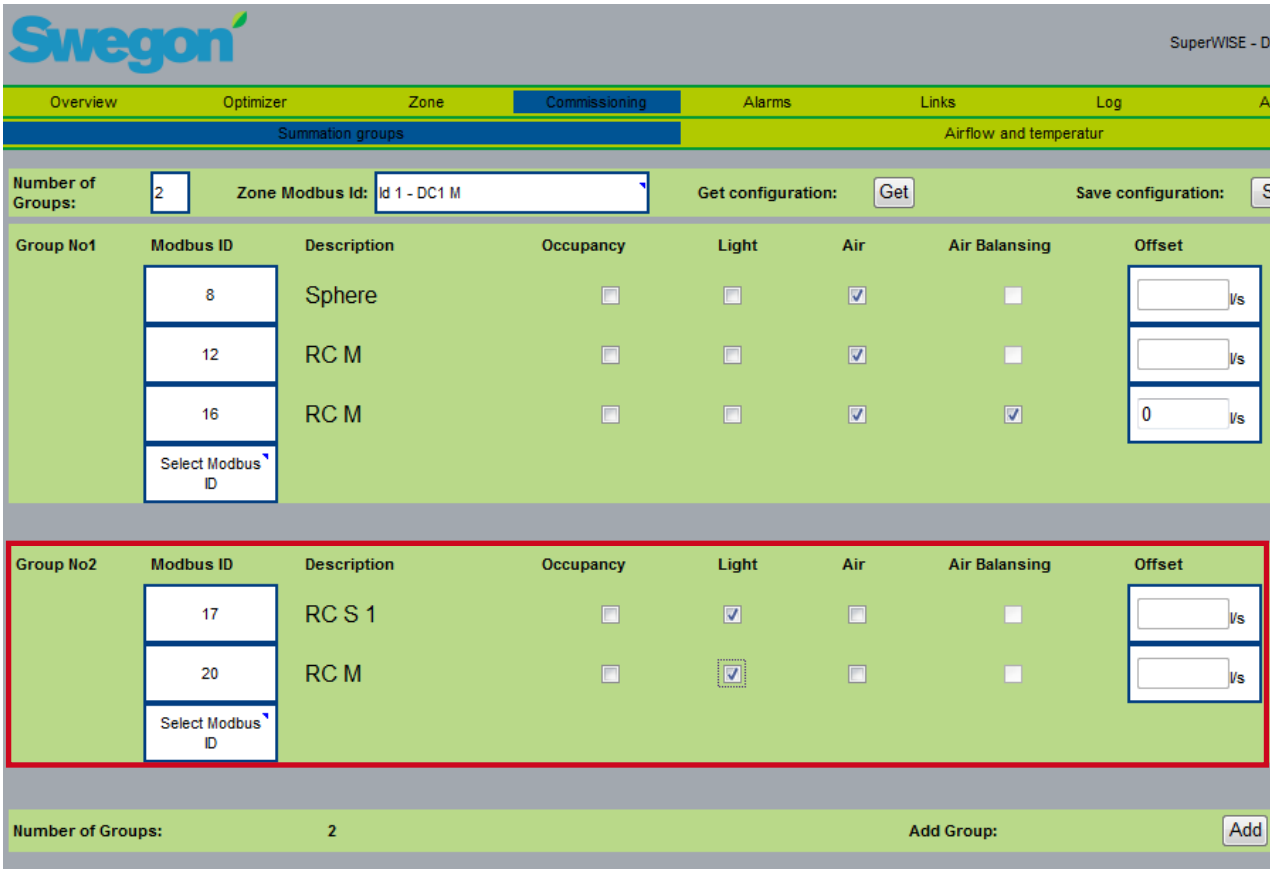

Figure 8. Group light control.

Normally open valve actuators

All room products in the WISE system, with WISE Care Package 1, supports normally open valve actuators. Previously, only the airborne ADAPT products handled normally open valve actuators and remaining products only supported normally closed valve actuators.

Normally closed valve actuator means that when the actuator is not powered, the actuator is closed. This solution is ideal for when you want to control a flow of water that is not critical to be throttled in case of power blackout in the room or building.

Normally open valve actuator means that when the actuator is not powered, the actuator is fully open. This solution is best when you want to control a flow of water which is critical not to be throttled by a power failure in the room or building. For example, the hot water in colder climates. This solution will consume more electrical energy when the valve actuator is powered when it is not open, which is generally most of the time.

Cold draft

All room products in the WISE system, with WISE Care Package 1, has the function cold draft protection for radiators mounted below windows. Previously, this function was only available in the ADAPT products, but is now also available for CONTROL Room, CONDUCTOR W1-W4 and ADAPT Parasol.

Until the cooling condition exceeds the set value (default 50%), the product will keep the valve actuators for heat partially open (default 20%). Cold draft is then avoided close to windows when the temperature outside is cooler than the temperature inside. The radiator, mounted below the window, is letting a bit of heat to rise. This prevents cooling of the air closest to the window; this air is then prevented of falling down in the zone and creating discomfort.

Figure 9. Cold draft protection.

Forced closing of zone dampers

During renovation of a building, in many cases it may be desirable to turn off the ventilation on the part being rebuilt. With WISE Care Package 1 it is possible to force one or more zone dampers to be fully closed to not vent the part of the building being renovated. The zone dampers will be fully closed with damper leakage class 4 for circular dampers, or damper leakage class 3 for rectangular dampers, until you choose to enable normal operation again. Forced closure and reset to normal operation is easily done by pushing a button in Super WISE. It is also possible to force a zone damper to fully open, through the same way just described. Zone damper shall always be set to "Auto" mode, if you go in between these settings.

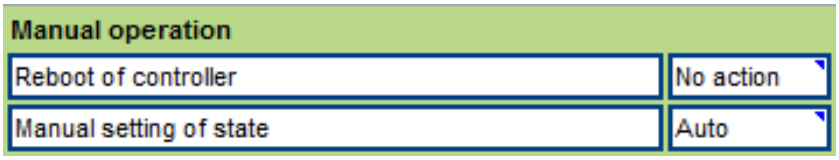

Figure 10. Forced closing of zone dampers.

Alarm handling

WISE Care Package 1 consists of several new alarm functions.

Operating status of the AHU

Super WISE constantly checks the operating status of the AHU. When the unit is idle or is turned off, for example overnight, all the alarms in the WISE system related to no air being produced will be blocked in the Super WISE, until the unit is re-activated and starts producing air.

The following alarms are blocked when the AHU is turned off :

Airborne ADAPT products

- Alarm no. 8 - Room temperature deviation too high
- Alarm no. 9 - CO_2 level too high
- Alarm no. 10 - Comfort alarm: RH deviation
- Alarm no. 11 – AHU VOC-level greater than VOC-level
- Alarm no. 12 - Moisture addition is too high

CONTROL and CONDUCTOR

- Alarm no. 11 - PI controller overload
- Alarm no. 12 - Set point not reached
- Alarm no. 13 - Incorrect supply air temperature
- Alert No 41 - No supply pressure from AHU
- Alarm no. 42 - Nothing exhaust pressure from AHU
- Alarm no. 43 - Supply duct 100% open
- Alarm no. 44 - Exhaust duct 100% open
- Alarm no. 48 - Negative Pressure

ADAPT Parasol

- Alarm no. 10 - Low nozzle pressure
- Alarm no. 25 - Comfort alarm: Heat
- Alarm no. 26 - Comfort alert: Cooling
- Alarm no. 28 - Comfort alert air quality

Disabling alarms

In all the CONTROL and CONDUCTOR products, it is now possible to disable alarms. Alarms should normally not be possible to disable because they are there for a reason (indicating that something is wrong in the system). However, there may be cases where a facility is incorrectly configured, for example, an old ventilation system which does not achieve the standard that our products expect, which will result in an alarm. In many cases the system weaknesses are known, the products are working well individually, the indoor climate is within reasonable limits and the deviations are accepted by the customer. It is then possible to disable alarms regarding these discrepancies. This avoids unnecessary alarms being displayed.

The alarms which should be disable in the CONTROL and CONDCUTOR products are easily blocked by setting the delay time of the alarm to "0". This is performed through TUNE Control / CONDUCTOR RU or by downloading a new parameter file with chosen values already blocked.

Alarm e-mail

In Super WISE there is the possibility to send an e-mail, sent to pre-set email addresses, when critical alarms occur. Every five minutes the Super WISE checks the alarm system, if a critical alarm has occurred an e-mail is sent to selected addresses. There is also a function to send a test e-mail to the selected receivers to make sure the settings are correct. See page 12 for more information.

Classification of alarms

Classification of the alarms in A- and B-levels are introduced in the WISE system. This means that the alarms which the customer considers to be significant will be classified as A-alarms, these alarms will always appear in the Super WISE tree structure and a notification will be sent to the selected e-mail addresses. The alarms which are considered less significant will be classified as B-alarms. The customers can choose in the Super WISE web page how alarms should be handled. The following options are available:

- Always show A- and B-alarms
- Hide B-alarms in the alarm summary and in e-mails
- Hide B-alarms both in the alarm summary and for each individual room view in the Super WISE

Delivered from factory, the Super WISE has all function alarms, such as sensor failure, damper stuck, set as A-alarms. All the comfort alarms, such as incorrect temperature are set as B-alarms. After delivery, the user can choose exactly which alarms should be set as A-alarm and which should be set as B-alarms in the Super WISE webpage. To change the classification the user selects an alarm in i.e. the B column and click the arrow pointing to the A column to make it an A-alarm. The alarms will then change priority from B to A for all products, where the alarm is relevant, see red marking in figure 11. The same procedure is applicable when an A-alarm should be changed to a B-alarm.

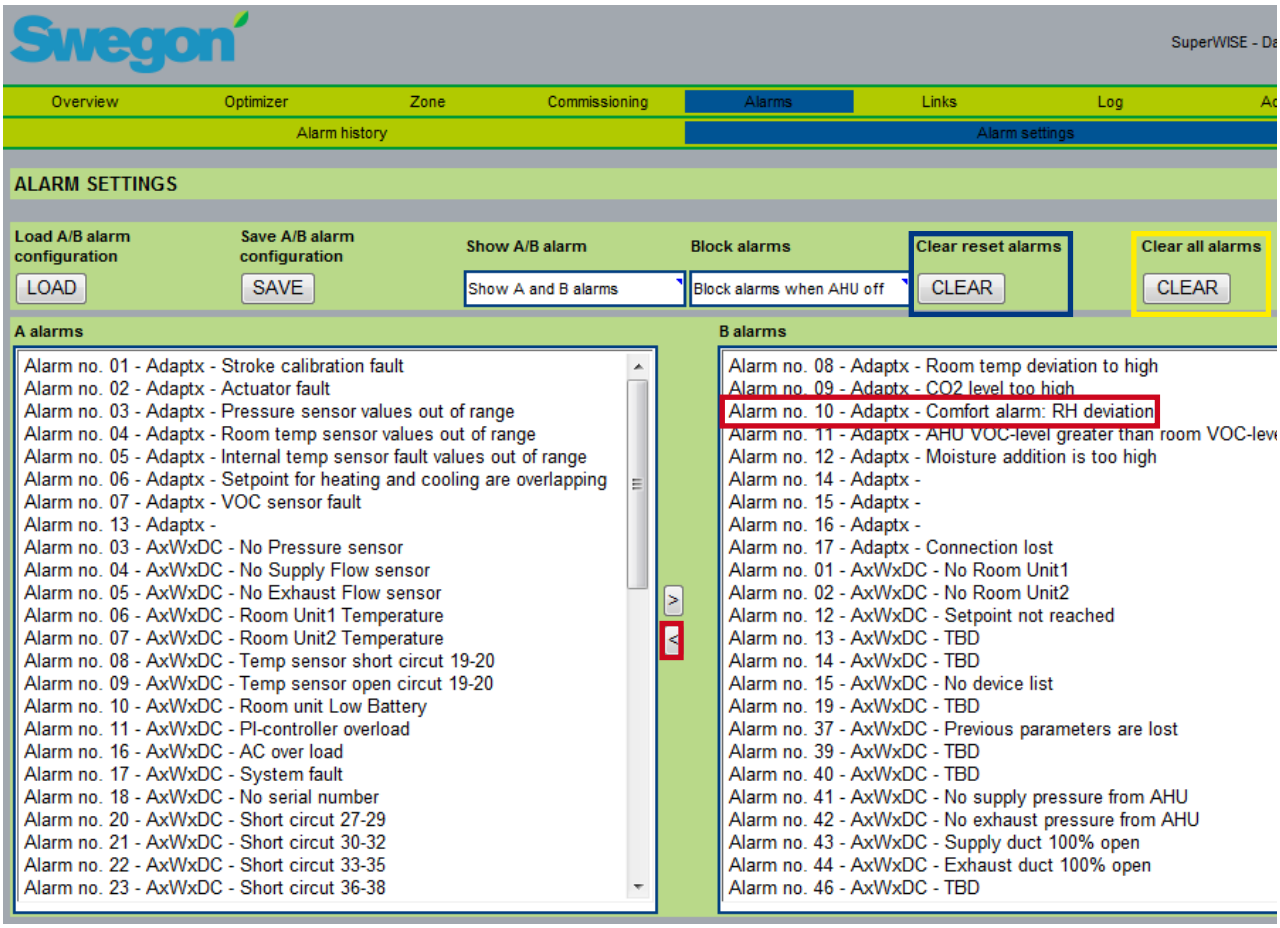

Figure 11. Classifications.

Clearing the alarm history

With WISE Care Package 1 it is possible to clear the alarm history of the alarms which have been reset, see the blue marking in figure 11. It is also possible to clear all alarms, Super WISE will then reload all active alarms, see the yellow marking in figure 11.

Removed alarm

Former alarm no. 10 - "Low battery in room unit" is removed for all zone products as this alarm serves no purpose.

One readable alarm parameter for communication

Previously, a BMS / PLC had to read all alarm parameters in Super WISE to check if there was any alarm in the system. To save time for the BMS / PLC integrator there is now one readable parameter which indicates if there is any alarm in the WISE system.

Dividing the air flow

Previously, when creating air flow sum slaves in the Super WISE on zone level to sum a number of supply air dampers to several extract air dampers, the extract air dampers received equal amount of the summed air flow as set point.

With WISE Care Package 1 it is possible to set how much percentage of the total air flow sum each extract air damper should have as a set point. This allows for different sized ducts and dampers on the central exhaust air dampers, even a combination of circular and rectangular dampers is possible. All settings are easily configured on the zone page.

For example, the total summed flow from the supply air dampers is 2000 l/s, we have three extract air dampers, where we want this sum flow as set point. The extract air dampers have following sizes: 400 mm, 500 mm and 600 mm. We set the percentage flow to the extract air damper with size 400 mm to 27%, the damper with size 500 mm to 33%. The left over percentage will automatically be assigned to the remaining damper. The damper with size 600 mm will hence get 100 -27-33 % = 40% of the total sum flow.

Time and date settings in Super WISE

Since Super WISE log function is very comprehensive and log data up to 999 days, it is important that the time and date are set correctly in the Super WISE. When the user logs on to Super WISE, Super WISE checks if its own internal time setting deviates from the user's computer. If the settings differ, Super WISE will automatically update its internal clock to the user's system clock. This ensures the setting for time and date is always up to date

Communication scanning

When the user manually push the "Scan" button (in the Admin tab -> Misc.) to initiate a scanning of new products in the WISE system, a counter starts (marked in red in figure 12) counting from 0-100%. When the counter reaches 100%, the scan is completed.

Figure 12. Status of communication scanning.

Super WISE webpage

The Super WISE webpage has a number of updates. All parameters and readable values which are not relevant to the current operating mode are hidden until they become relevant. For example, if the CAC feature is disabled on an ADAPT Damper the settings and values are not displayed for CAC function in the Super WISE. When the CAC function is enabled, these settings and values are displayed in the Super WISE webpage. See example below marked with red.

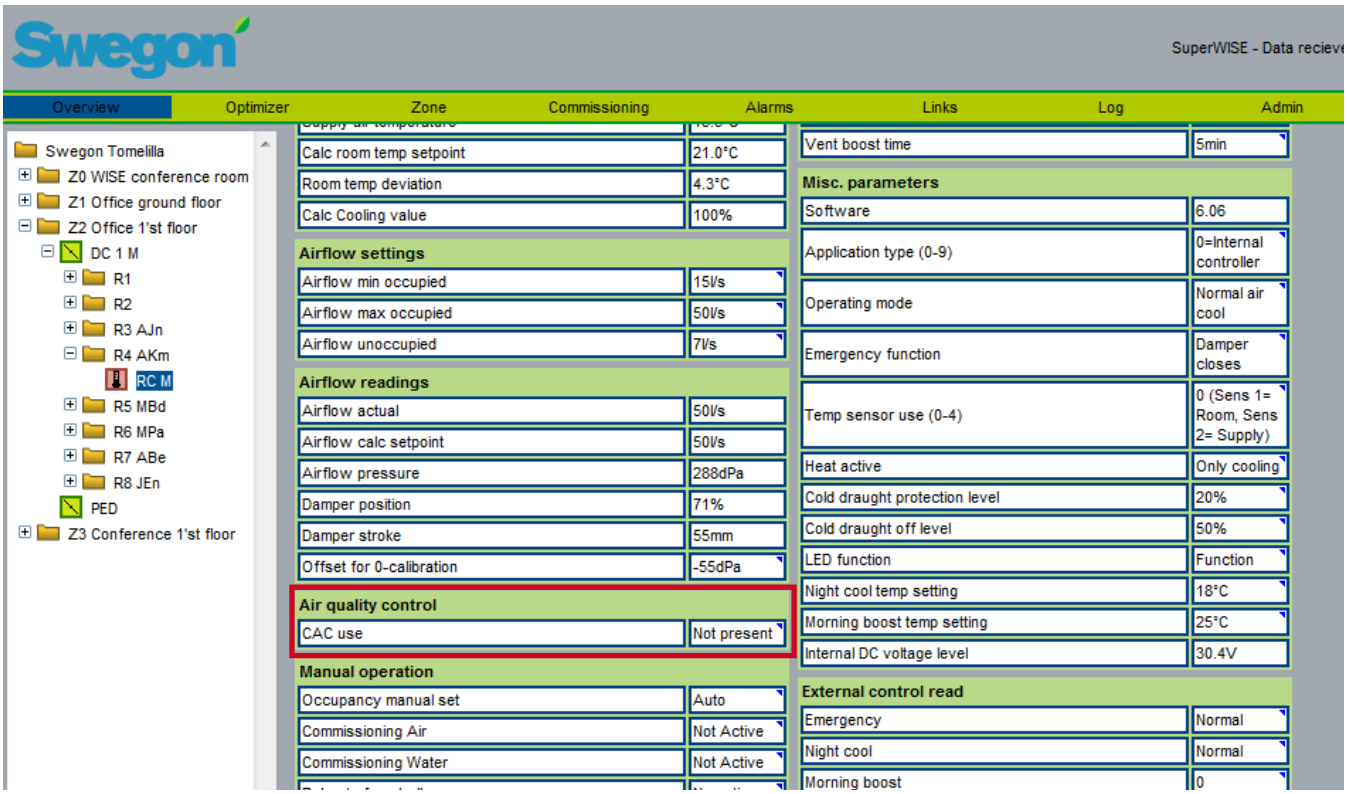

Figure 13. Super WISE webpage.

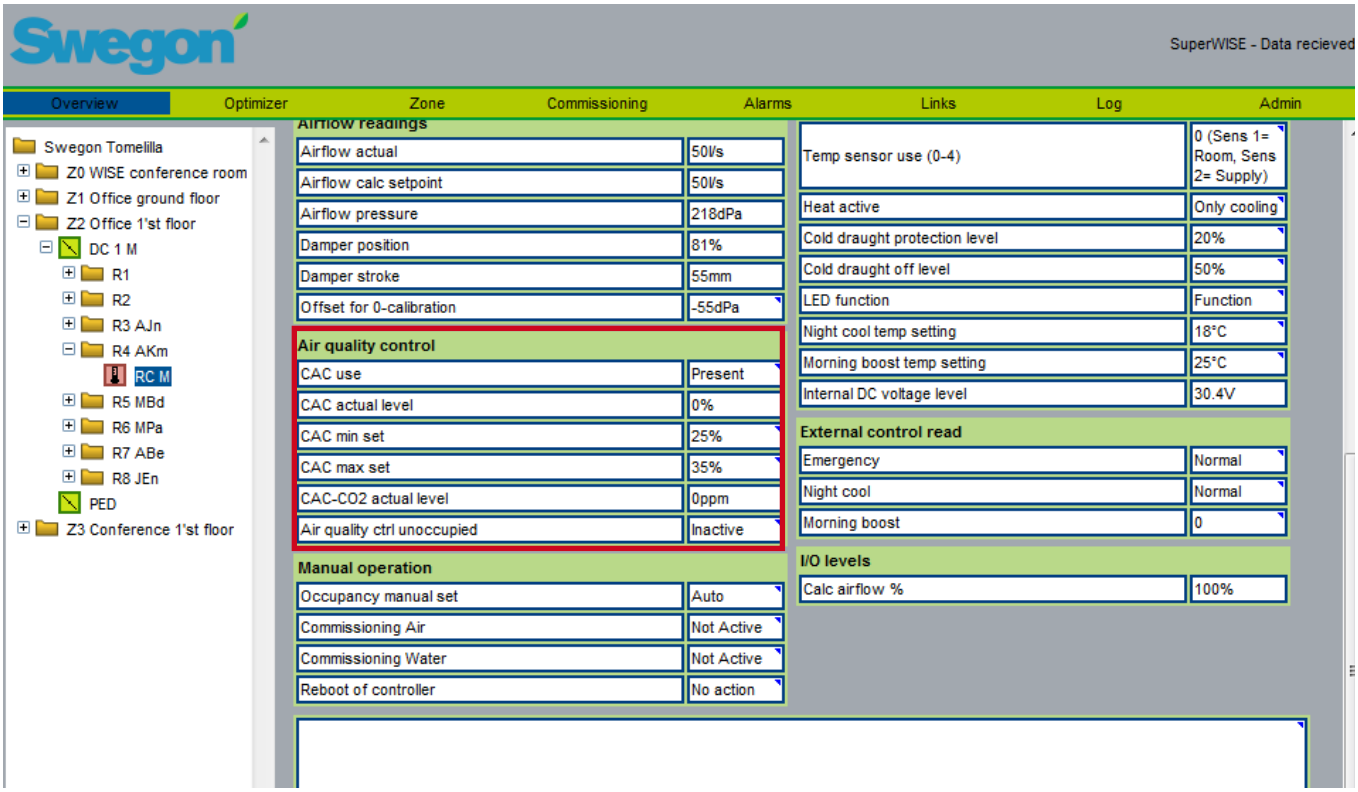

Figure 14. Super WISE webpage.