

COMMISSIONING INSTRUCTIONS



The intelligent solution for VAV zone control

OJ GreenZone™



Intelligent control
Maximum comfort
Low energy consumption

Save up to 65% CO₂



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Note!

It is important that installers read these instructions thoroughly before beginning to configure the OJ GreenZone™ system. The instructions provide valuable information which must be used if the OJ GreenZone™ system is to function optimally and provide maximum comfort with least possible energy consumption.

INTRODUCTION

OJ GreenZone™ is an intelligent VAV zone control system capable of controlling up to 125 VAV zones in a ventilation system. These instructions should be used when commissioning an OJ GreenZone™ system. The instructions assume that the OJ GreenZone™ Masters, OJ GreenZone™ Modules and their associated sensors and actuators have been correctly fitted and tested and are in working order.

Complete installation consists of the following parts:

- Mechanical and technical installation: AHU/fans, valves and VAV dampers
- Heating system plumbing: Heating elements, circulation pumps, etc.
- Cooling system plumbing: Cooling elements, circulation pumps, etc.
- Electrical installation: Connection of sensors, valves and actuators to the OJ GreenZone™ Modules in individual rooms. Connection of the OJ GreenZone™ Modules, AHU and (if used) a TCP/IP network to the OJ GreenZone™ Master.

Instructions concerning mechanical and electrical installation can be found in the following technical instructions:

- Instructions “OJ GreenZone™ Module”
- Instructions “OJ GreenZone™ Master”

The instructions will guide the installer step by step through the various stages of the commissioning process:

- Connecting the built-in web server
- Checking the installation
- Alarms
- Setting up the various zones
- Controlling the AHU
- Connecting to a Building Management System (BMS)
- Updating software

For the installer

The product has been developed with the aim of making VAV zone set-up as easy and user-friendly as possible. The system therefore configures itself for optimum VAV damper operation on the basis of the components connected to each individual OJ GreenZone™ Module. The control loops automatically take into account whether temperature sensors, CO₂/VOC sensors or humidity sensors are connected. When cooling is required, high CO₂ or high humidity will increase the air flow through the VAV dampers. If the system contains a cooling valve, it will operate automatically as in cooling step 2. If a heating valve is connected, it operates automatically as in heating step 1.

As each separate zone is individually self-configuring, the installer need only enter the air volumes and names of the individual zones, e.g. canteen, gym, classroom, office, etc.

The built-in optimisation procedures mean that the controls monitor the settings of all the system's actuators and regulate the AHU in such a way as to minimise energy loss in the ventilation valves and cooling system.

For the system integrator

OJ GreenZone™ is one of the most flexible systems on the market when it is integrated in a BMS. As a basis there is both an inbuilt Modbus TCP/IP and BAC net TCP/IP server. In addition there is the potential for connection of KNX sensors in the individual room. The associated protocols can be downloaded from www.ojelectronics.com. The permanently defined protocol addresses allow system integrators to optimise their routines as it is possible to copy from one zone to another.

For the service technician

As a service technician, you have perhaps experienced spending precious time taking down numerous ceiling panels only to discover that *“No, the controller wasn’t placed here either”*. OJ Electronics has found a solution to this, allowing you to spend your time on more exciting tasks. A “beeper” is built into all OJ GreenZone™ Modules, ensuring easy location of components concealed behind suspended ceilings. If OJ GreenZone™ is connected to WLAN, the beeper can be activated from an Internet browser, e.g. on your smart phone, while you are present in the room.

For users

Users have the possibility of carrying the VAV system in their pocket thanks to the built-in web server. From a laptop computer or smart phone, the school’s caretaker or others can therefore easily monitor system status, set user parameters or read and acknowledge alarms.

CONNECTING THE BUILT-IN WEB SERVER

The user interface of the OJ GreenZone™ VAV zone control system is based on a web server built into the OJ GreenZone™ Master. The following is necessary to gain access to the web server from a PC:

1. The OJ GreenZone™ Master is connected to a power supply.
2. The OJ GreenZone™ Master is connected to the same TCP/IP network as the PC.
3. The OJ GreenZone™ Master’s IP address is known by and visible to the PC.
4. An Internet browser is installed on the PC (Google Chrome, Internet Explorer, Mozilla Firefox).

The PC and OJ GreenZone™ Master can either be connected directly or via a TCP/IP network. Further details can be found in Appendix 1.

The IP address is factory set to the following:

Static/dynamic IP:	Static
IP address:	192.168.1.101
Net mask:	255.255.255.0
Gateway:	192.168.1.1
DNS:	192.168.1.1
Alternative DNS:	0.0.0.0

If the OJ GreenZone™ Masters IP address is unknown, it can be found via the PC program “IPconfig Setup”, which is found on www.ojelectronics.com together with the OJ GreenZone masters’ documentation. This program can also be used to change the IP addresses in the event of conflict on the network. If several OJ GreenZone™ Masters are installed on the same network, their IP addresses must be changed so that they differ from one another. Further details can be found in Appendix 2.

Once the OJ GreenZone™ Master’s IP address has been entered in the Internet browser, the following web page will appear:

If the Internet browser cannot locate the web page, check items 1 to 4 above.

If the web page still cannot be found, it is possible that the Internet browser is set to use a proxy server. Use the Internet browser’s help function to locate proxy server settings and disable the proxy server.



Figure 1: Welcome to OJ GreenZone™

CHECKING THE INSTALLATION

Before finely tuning the VAV zone system, it must be verified that installation has been performed correctly in the individual rooms.

The easiest way to do this is as follows:

1. Select the user interface language.
2. Unlock the service interface using the password “Service”.
3. Check that components are connected correctly in each individual zone.

Selecting the language

Click anywhere on the web page shown in figure 1. The web page shown in figure 2 will appear.

Note: Internet Explorer can only display the page correctly if compatibility view is disabled.

The number of “zone sections” displayed depends on how many OJ GreenZone™ Masters are installed in the system. The maximum number is 5. Each OJ GreenZone™ Master constitutes a “zone section”. Please refer to Appendix 2 if any are missing.

Select language by clicking on the flags shown in figure 2. The web page shown in figure 3 will appear.

Click on the required language. Return to the main menu by clicking the Home button.

Unlocking the service interface

Unlock the service interface by clicking the padlock shown in figure 2. The web page shown in figure 4 will appear.

Click on the padlock. The password field will appear. See figure 5.



Figure 2: Main menu (Home)



Figure 3: Language menu

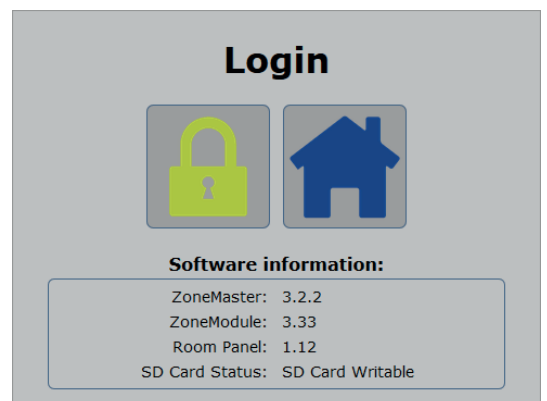


Figure 4: Login

Type in "Service" as both the username and password. Click on the Login button. For access to enable changing of set points for temperature, CO₂, humidity and PIR air volume, type in the username "Setpoint" and password "1234".

The padlock is only opened when the correct password is entered. The password will only be approved if the Internet browser is set to accept cookies. If necessary, use the Internet browser's help function to locate cookie settings and enable cookies.

Changing the password

When logged in you are able to change the password by clicking on the text -- *change password* --.

Type in the old password in the field *Old password*.

Type in the new password in the field *New password*.

Repeat the new password in the field *Repeat new password*.

Click on *Change* to change to the new password.

Then return to the main menu by clicking the Home button. The web page will change to that shown in figure 6.

Checking components

The components connected in the zones can now be checked by clicking each individual zone section when the web page shown in figure 7 has appeared.



Figure 5: Password

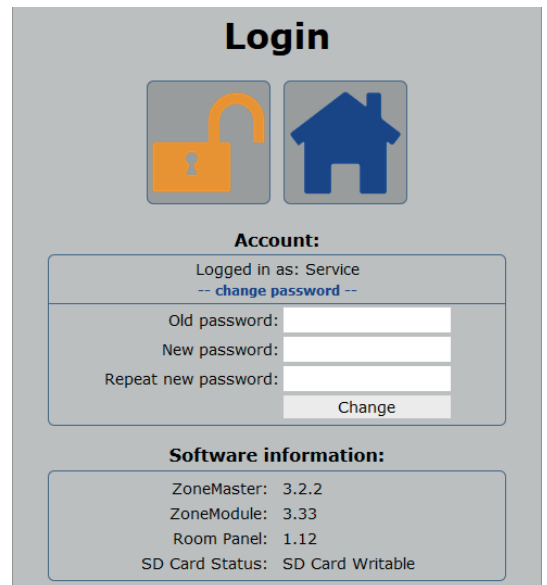


Figure 5-2: Changing the password

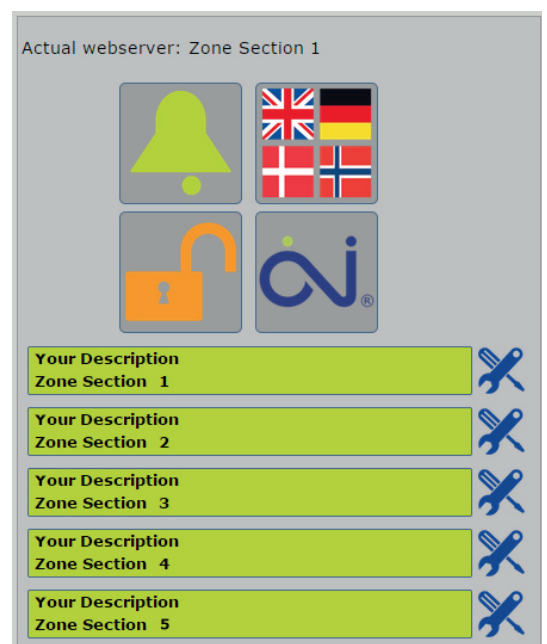


Figure 6: Main menu (Service)

The number of zones in each section depends on how many zone modules are connected to the section's OJ GreenZone™ Master. The maximum number is 25. If zones are missing, check the electrical installations. See the troubleshooting table in the “OJ GreenZone™Master” instructions.

Click on the tools next to “Zone section 1”. The web page shown in figure 8 will appear.

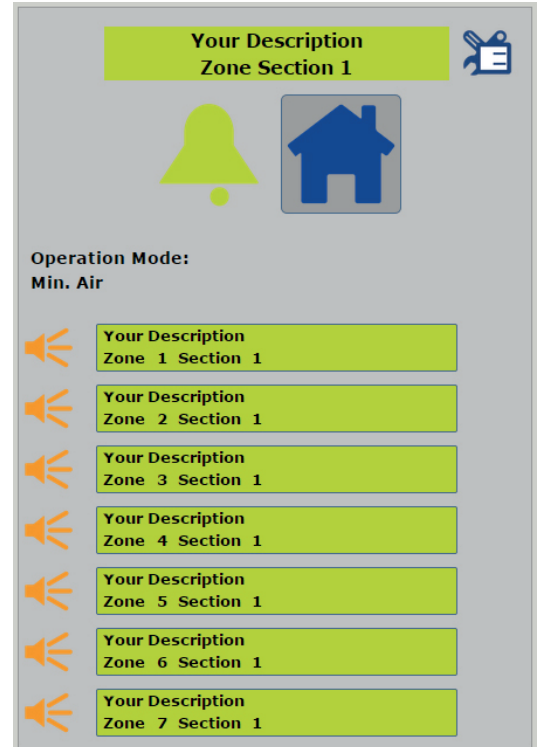


Figure 7: Zone menu (Service)

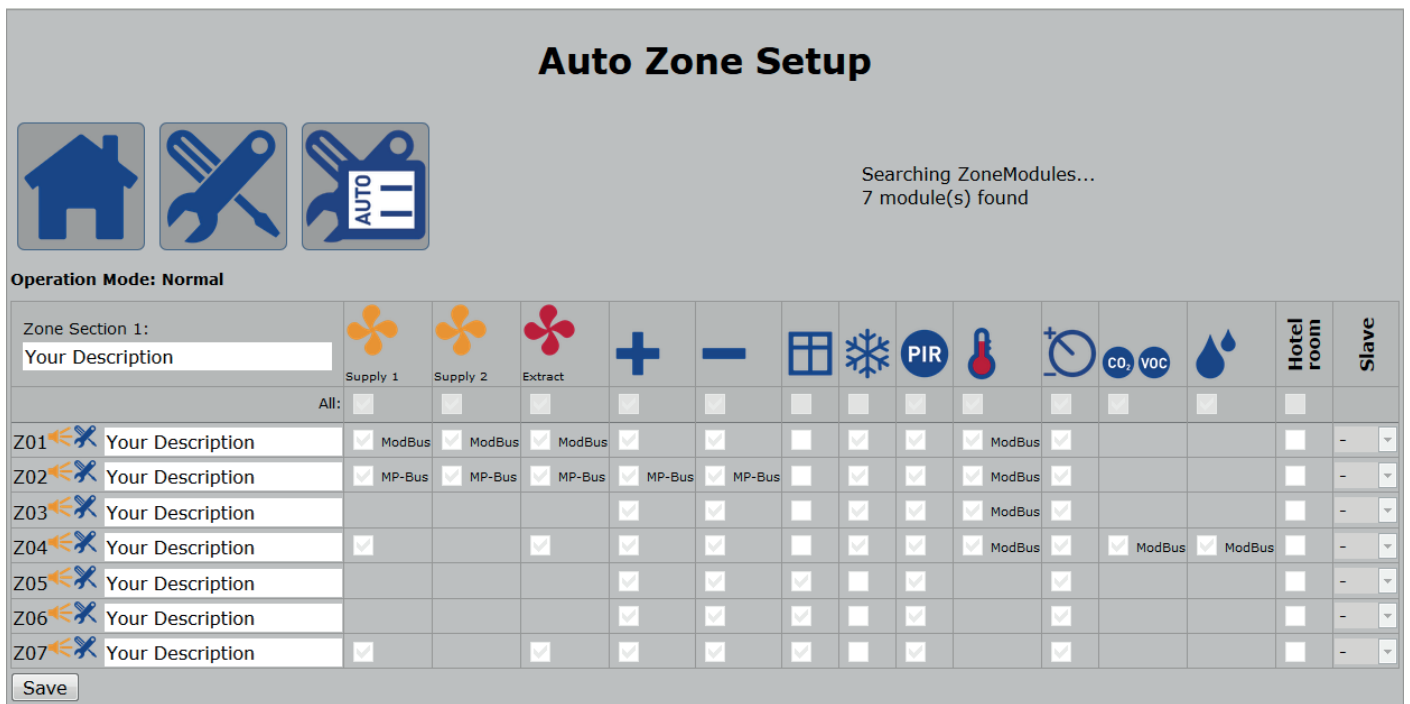



Figure 8: Automatic section set-up

If the web page displays Manual Zone Set-up, click this button ->
 Confirm activation of auto-configuration by clicking OK.
 Wait approx. 2 minutes while auto-configuration is performed.
 When auto configuration is finished the number of zone modules found is shown.










The number of zones (Z01 to Z25) is the same as shown in figure 7. The number of columns depends on the actuators and sensor types installed. If, for example, there is no humidity sensor in the section, the humidity column on the right will not be displayed. If columns or components are lacking in the individual zones, check the electrical installations. See the troubleshooting table in the “OJ GreenZone™Module” instructions.

Enter the required text to describe the section (S1) and its individual zones (Z01, Z02... etc.). e.g. “1st floor” and “Office 1”, “Office 2” etc. Save the text by clicking the “Save” button at the bottom of the page.

Check that the text corresponds to the individual rooms either by reading the section and zone numbers on the OJ GreenZone™ Modules’ displays or by listening for three beeps after clicking the beeper button. 

Click the AUTO button to lock the configuration in Manual Zone Set-up. Changes in the number of zone modules or faulty actuators or sensors will now trigger an alarm.

Manual Zone Setup

Operation Mode: Normal





















Zone Section 1:															Hotel room	Slave
Your Description	All:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z01  Your Description	<input checked="" type="checkbox"/>	ModBus	ModBus	ModBus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z02  Your Description	<input checked="" type="checkbox"/>	MP-Bus	MP-Bus	MP-Bus	MP-Bus	MP-Bus	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z03  Your Description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z04  Your Description	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-
Z05  Your Description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z06  Your Description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z07  Your Description	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-

Figure 9: Manual section set-up

Remove the ticks in each individual zone for components which are not to be installed. If, for example, the tick is removed from the PIR sensor, the sensor will disappear from the user interface for the zone concerned. This increases the clarity and user-friendliness of the system. If, for example, the heating valve is not connected to Modbus, the + column should only be ticked if the heating relay is used to enable, for example, radiator heating.

Ticks can be added or removed for one column at a time by clicking on the topmost tick-box (All). If, for example, you need to remove all window contact except zone Z02 and Z03, the topmost tick-box with window contact can be removed. After that ticks can be put in zone Z02 and Z03.

Save the settings by clicking the “Save” button at the bottom of the page. Click on the Home button and repeat the same procedure for the next zone section, if one is installed. Access to service level can be interrupted by clicking the padlock.

Setting the nominal air volume

To set the nominal air volume for the dampers, click this button -> and the web page shown in figure 10 will appear.



Air Volume Setup

Operation Mode: Normal

S1	Your Description	✿	✿	✿	Common Extract				
		Supply 1 Vnom (m ³ /h)	Supply 2 Vnom (m ³ /h)	Extract Vnom (m ³ /h)	1	2	3	4	5
Z01	Your Description	100	100	200	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z02	Your Description	170	170	170	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z03	Your Description				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z04	Your Description	100		500	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z05	Your Description				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z06	Your Description				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z07	Your Description	100		100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 10: Setting the nominal air volume

Vnom means the following:

The nominal air volume corresponds to the maximum air volume for which the VAV damper is designed. The value depends on the type and size of the VAV damper and will be stated on the rating plate or data sheet of the damper.

Where manual input of Vnom is required the field will be white and for units that automatically get Vnom the field will be grey. Zone module MP and Zone 2 module M automatically get Vnom (-M if VAV dampers software is minimum 1.07).

Set common extract by ticking the fields on the right. If, for example, ticks are added as shown in figure 11, the extract set point in Z07 will correspond to the sum of supply for Z01 - Z04.

Air Volume Setup

Operation Mode: Normal

S1	Your Description	✿	✿	✿	Common Extract				
		Supply 1 Vnom (m ³ /h)	Supply 2 Vnom (m ³ /h)	Extract Vnom (m ³ /h)	1	2	3	4	5
Z01	Your Description	100	100	200	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z02	Your Description	170	170	170	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z03	Your Description				✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z04	Your Description	100		500	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z05	Your Description				✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z06	Your Description				✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z07	Your Description	100		100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 11: Example of settings for common extract

Installing supply dampers




If supply dampers are used, set the extract branch damper by clicking this button ->
 The web page shown in figure 12 will appear.



Branch dampers are used in situations where large pressure differentials can occur in the duct system, e.g. in multi-storey buildings. A branch damper reduces the pressure across a subsequent VAV damper in the branch. This reduces noise and improves regulation.

Set the branch damper by ticking the fields on the right. If, for example, ticks are added as shown in figure 12, the damper in zone Z05 and Z06 will function as a branch damper. Zone Z01 and Z02 must be mounted after the branch damper Z05 in the same branch and zone Z03 and Z04 must be mounted after branch damper Z06 in the same branch. The branch damper must be set to Open Loop with the help of Bemilo PC Tool.

Supply Branch Setup

Operation Mode: Normal

S1	Your Description	Optimizer	75.0%		Supply Branch					Branch VAV	P-value (%)	I-time (s)
			Supply 1 Damper pos.	Supply 2 Damper pos.	1	2	3	4	5			
Z01	Your Description	<input checked="" type="checkbox"/>	100.0%	100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z02	Your Description	<input checked="" type="checkbox"/>	100.0%	100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z03	Your Description	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z04	Your Description	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z05	Your Description	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z06	Your Description	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z07	Your Description	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Figure 12: Example of settings for extract branch damper

Furthest to the right, it is possible to change the P-value and I-time for the branch damper. Values for P and I are factory set and need not normally be changed. If faster control is required, P-value can be increased and I-time reduced. If the VAV set point of the damper fluctuates and is unstable, P-value should be reduced and I-time increased.

All dampers, as a basis of operation, go into optimisation of fan speed. If a tick is removed from the column "Optimizer" the damper's actual damper position can no longer affect the inlet fan. Damper position for the most open damper is shown with a green background.

Click Save to finish. While saving, the textual description of the branch damper is changed automatically.

Click on this button. The web page shown in figure 9 will appear. ->






Setting an extract branch damper

If branch dampers are used, set the extract branch damper by clicking this button ->
 The web page shown in figure 14 will appear.



Set the branch damper by ticking the fields on the right. If, for example, ticks are added as shown in figure 14, the damper in zone Z07 will function as a branch damper. Zones Z03 and Z04 must be located after the branch damper in the same branch. The branch damper must be set to Open Loop with the help of Bemilo PC Tool.

Extract Branch Setup

Operation Mode: Normal
















S1	Your Description	Optimizer	 80,0% Extract Damper pos.	Extract Branch					Branch VAV	P-value (%)	I-time (s)
				1	2	3	4	5			
Z01	  Your Description	<input checked="" type="checkbox"/>	100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z02	  Your Description	<input checked="" type="checkbox"/>	100.0%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z03	  Your Description	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z04	  Your Description	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z05	  Your Description	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z06	  Your Description	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Z07	  Your Description	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Figure 14: Setting an extract branch damper

Furthest to the right, it is possible to change the P-value and I-time for the branch damper. Values for P and I are factory set and need not normally be changed. If faster control is required, P-value can be increased and I-time reduced. If the VAV set point of the damper fluctuates and is unstable, P-value should be reduced and I-time increased.

All dampers are normally used for optimisation of fan speed. If a tick is removed from the column "Optimizer" the damper's actual damper position will no longer affect the exhaust fan. The damper position for the most open damper is shown with a green background.

Click Save to finish. While saving, the textual description of the branch damper is changed automatically.

Click on this button. The web page shown in figure 9 will appear. ->



Selecting hotel room mode








The function is often used for hotel rooms where the guest can adjust the temperature and air volume from a RPT-20T as they require. Once a day the guest's setting is reset, typically midday, when the guest checks out. If a tick is put against a zone in the column "Hotel Room" in figure 15, the zone's clock program will deactivate. The zone follows the selected temperature and air volume until the time when it resets. After that the temperature is again set to the required set point and the air volume is set to Auto.

Changing the time for reset and the set point for temperature is described under *ZoneMaster set-up*.

Selection of Slave Zone

In larger rooms several zone modules can work together. When a zone module is set as a slave of another zone module, the slave will use the same signal values for damper and valves. A zone module can have several slaves, but cannot at the same time be a slave itself. In the example in figure 15 the zones Z01 and Z07 are set to be slaves of zone Z03.

Manual Zone Setup

Operation Mode: Normal





















Zone Section 1: Your Description															Hotel room	Slave
All:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z01  Your Description	<input checked="" type="checkbox"/>	ModBus	ModBus	ModBus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Z03
Z02  Your Description	<input checked="" type="checkbox"/>	MP-Bus	MP-Bus	MP-Bus	<input checked="" type="checkbox"/>	MP-Bus	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z03  Your Description	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z04  Your Description	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ModBus	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-
Z05  Your Description	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z06  Your Description	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Z07  Your Description	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Z03

Figure 15: Manual Zone Set-up

Backup and Restore

When the system is correctly set-up the settings can be saved on an SD card by pressing this button -> This requires an SD card to be inserted. A saved setting can also be retrieved from an SD card.



Backup

Click on the "Backup" button to save the current setting on the SD card. The file is saved on the SD card in the folder "Backups". Note that the function is not available if the SD card is write protected.

It is recommended to make a backup when the system is commissioned.

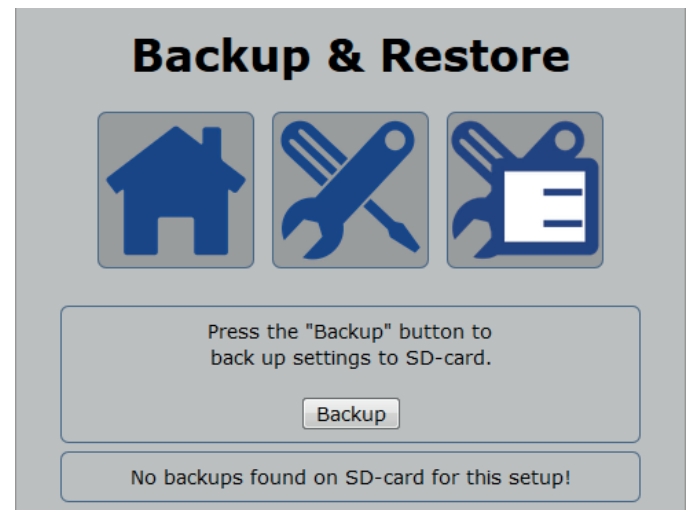


Figure 15-1: Save settings

Restore

In order to retrieve a saved setting first select the required file on the SD card. Then click on the button "Rewrite". After this the settings automatically change to those in the backup file.

Be aware that only settings files can be retrieved which are compatible with the system's current software versions. Setting files which are not compatible will not be shown in the list. Thus, remember to always make a new backup after updating.

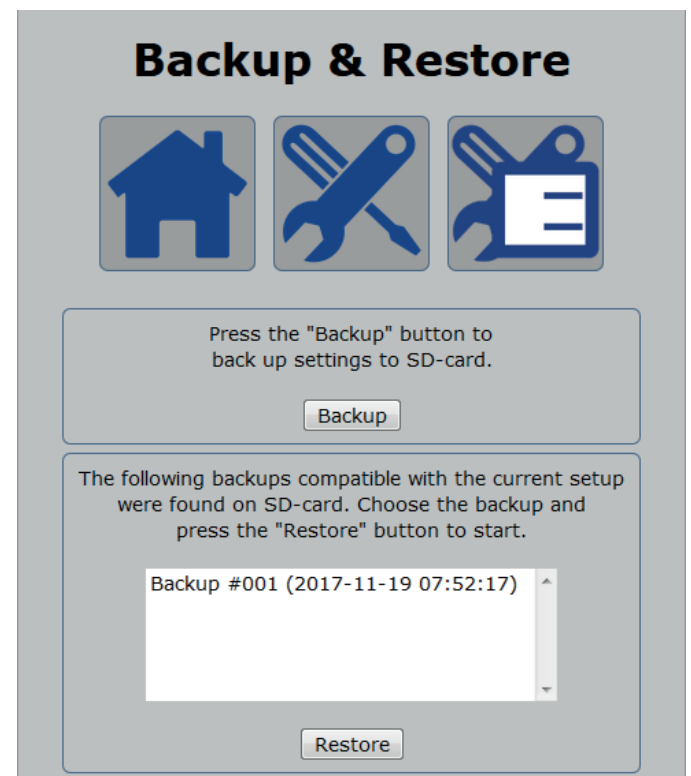


Figure 15-2: Retrieve settings

Click on the home button. The web page shown in figure 6 will appear. ->



ALARMS

The alarm bell and all zone sections are green when no alarms have been activated. The colour depends on the actual alarm status.

Green: OK System OK

Orange: B-alarm Fault somewhere in the system but ventilation is still active.

Red: A-alarm Ventilation stopped.

Click on the alarm bell to view a list of all zones in the whole system in which alarms are active (see figure 17).

If you click the zone section instead of the alarm bell shown in figure 16, an overall alarm status for all zones in the section is displayed (see figure 19).

Click on “Reset” (the alarm bell) to reset alarms. If the fault condition continues, the alarm will be quickly activated again. Click on a zone to view a list of alarms for that zone (see figure 18).

Remedy the fault using the troubleshooting table in the instructions for “OJ GreenZone™ Module” and “OJ GreenZone™ Master”. To allow any loose connections to be recorded, these alarms remain visible after the fault has been remedied. Alarms must be reset by clicking Reset (alarm bell). The alarm list in Appendix 3 describes all possible alarms in the system.

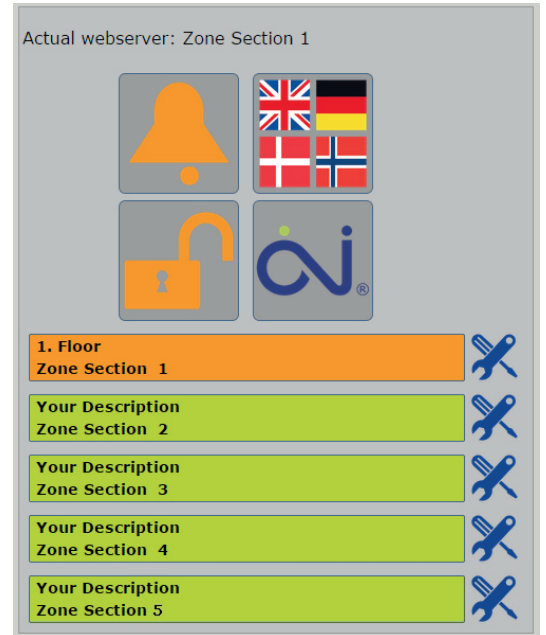


Figure 16: B-alarm activated

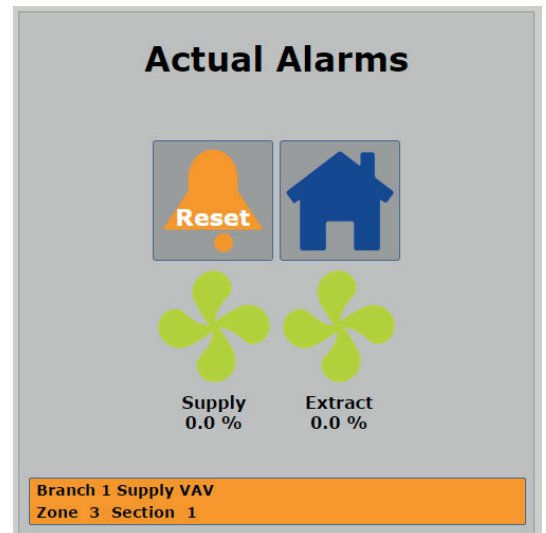


Figure 17: Overview of zones with alarms

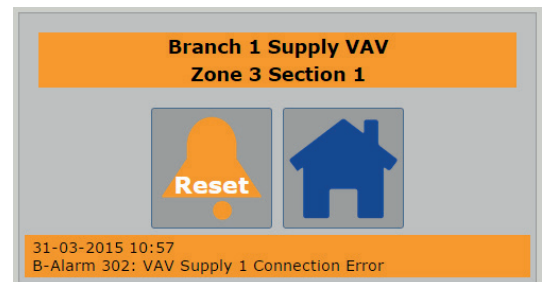


Figure 18: Overview of alarms in a zone

If you click on a zone with an active alarm, the web page shown in figure 20 will appear.

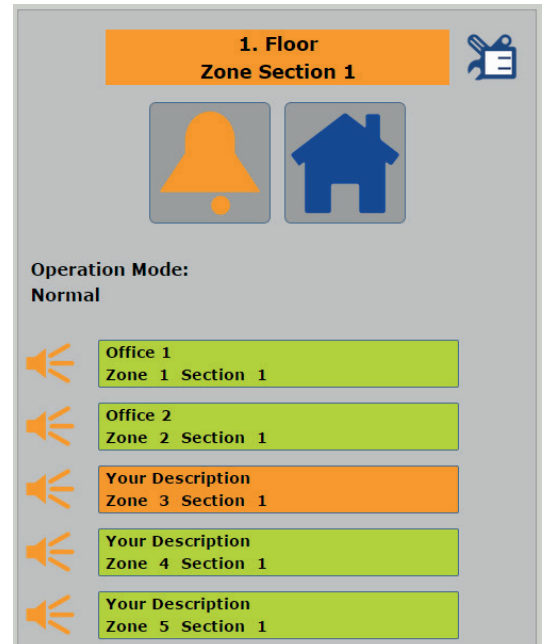


Figure 19: Alarm status for zones in the section

Defective actuators and sensor values are shown in red text. If the alarm disconnects a sensor, the system operates in emergency mode as if the sensor was not installed.

Click on the alarm clock to view a list of alarms for that zone (see figure 18).

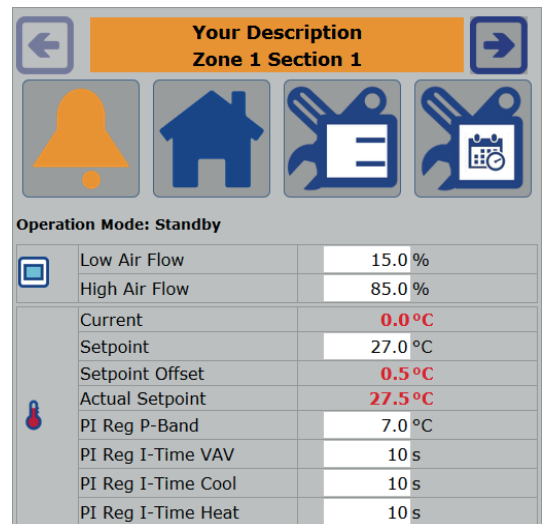


Figure 20: Alarms in the zone

SETTING UP THE VARIOUS ZONES

Once the installation has been checked, and the system has no alarms, the zones can be set up by adjusting the set points for indoor climate and air exchange.

Start from figure 21: Main menu (Service).

Click on a zone section. The web page shown in figure 22 will appear.

Click on a zone. The web page shown in figure 23 will appear.

It is possible to jump to the next/previous zone by clicking arrow right/left.

Setting set points

What is displayed on the page depends on which actuators and sensor types are installed in the zone concerned.

The set points for room temperature (°C), CO₂ (ppm) and humidity (RF%) can be changed and saved by clicking on the “Save” button at the bottom of the page.

If the set points are exceeded, the PI controllers will increase the set point of the VAV dampers. P and I are factory set and need not normally be changed. If faster control is required, P-band and I-time can be reduced. If the VAV damper set point is unstable, increase P-band and I-time.

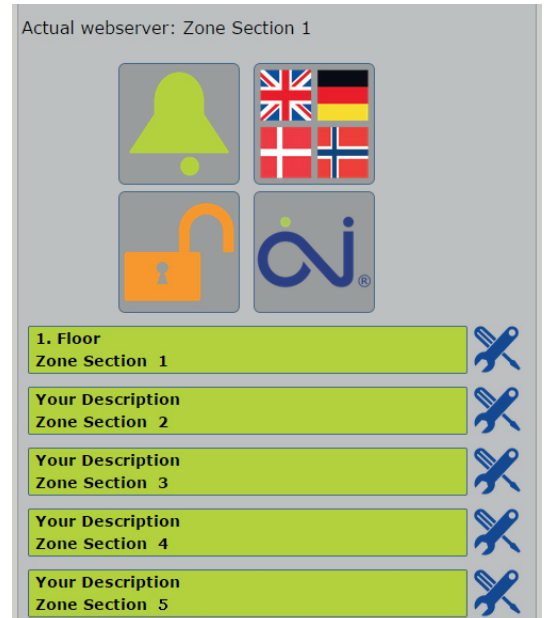


Figure 21: Main menu (Service)

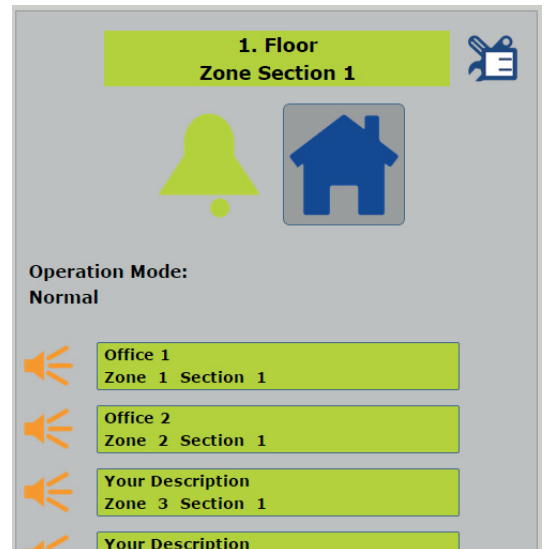


Figure 22: Zone menu (Service)

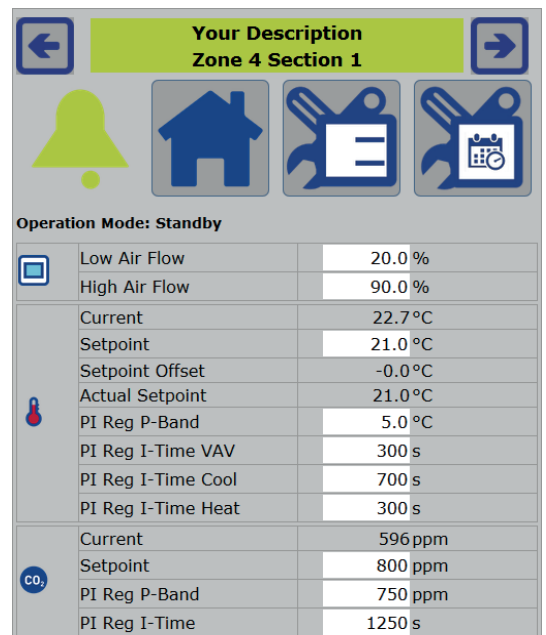


Figure 23: Zone (Service)

Setting VAV dampers

Air volumes of VAV dampers are factory set for nominal air flow (Vnom), maximum air flow (Vmax) and minimum air flow (Vmin). The values depend on the size of the VAV damper. Vmax and Vmin must be adapted for the installation using the programming unit Service tool ZTH-GEN from Belimo. Alternatively, the Vmax and Vmin values of the VAV dampers can be changed by entering new values in the “Max. air flow” and “Min. air flow” fields, see figure 23. To obtain balanced ventilation, the air flow (measured in m³/h) must be the same in the inlet and exhaust valves. When common extract is used, the sum of the supply air volumes must equal the extract air volume.

OJ-RPT-20T 2” touch panel (optional)

If an OJ-RPT-20T is connected to a zone, a few additional parameters will be visible in the zone set-up, see figure 23-2.

Low/High Airflow

If min. or max air volume is selected on the touch panel, the volume of air will be controlled according to this value. This air volume will be maintained until the override has elapsed.

Override, time-out

If min. or max. air volume is selected, the system will return to Auto mode after the override has elapsed. Min. 10 minutes and max. 90 minutes.

Show menu

Hide or show the Menu button on OJ-RPT-20T Room control.

Password

Most parameters in the menu are password protected. The password must consist of 4 numbers, each between 1 and 6.

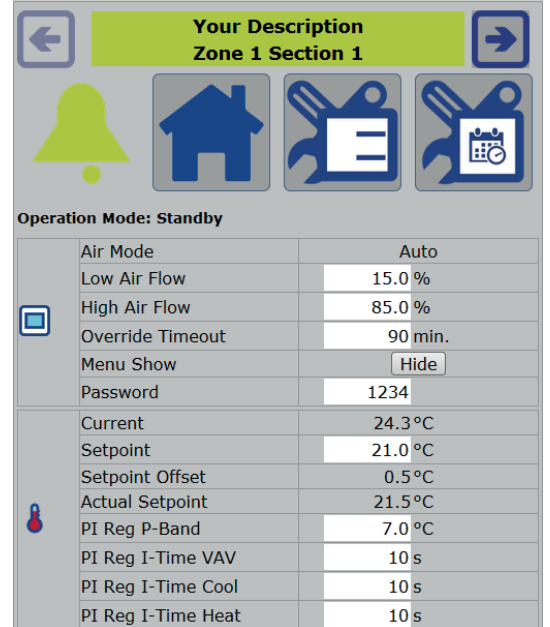


Figure 23-2: OJ-RPT-20T touch panel

Room temperature sensor

RPT-20T has an inbuilt room temperature sensor which is automatically used. If the sensor is de-selected (see figure 9) the temperature settings are hidden in the web user interface and on RPT-20T.

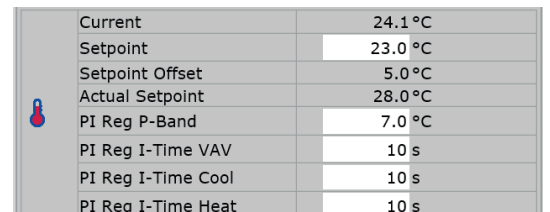


Figure 23-5: Room temperature sensor

Set point offset on exhaust

If CAV damper without zone modules is used in the exhaust to, for example, toilets, the CAV damper's air volume is put in as a negative set point offset. It will reduce the exhaust set point the applicable amount so it reaches a balance between air intake and exhaust.

The values for the set point offset are given in m³/h in the zone menu within the section *Exhaust*.

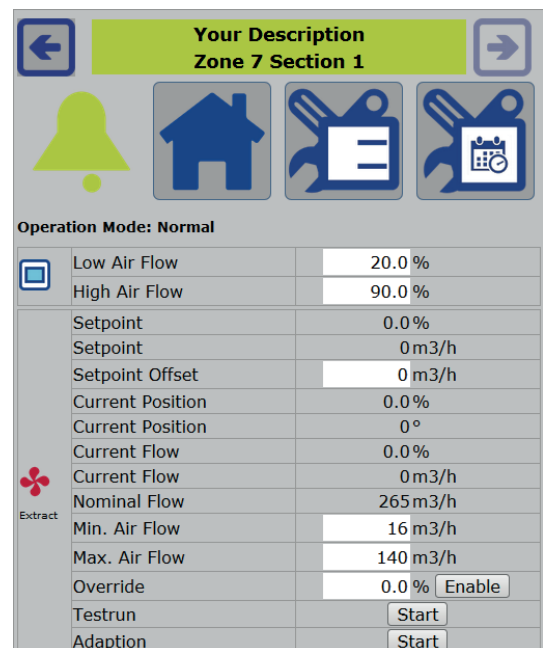


Figure 23-3: Set point offset on exhaust

Week program

In the week program the individual zones can be set to different operations depending on the time and day of the week. Every zone module has its own Week program. To set up the week program click on the Week program icon. The icon is in the Zone module menu.



Week program can run according to 3 different settings.

- *Same program every day*

A program is set up which runs every day the whole week without exception.

- *Different programs every day*

A program is set up for each day of the week.

- *Weekdays/weekend program*

A program is set up which runs from Monday to Friday and a program which runs during the weekend.

The program for each day is divided into 4 groups; morning, midday, afternoon and night. For every group there is an appropriate temperature and ventilation speed.

Temperature [18.0°C - 27.0°C]

Temperature can be set with an interval of 0.5°C

Click on the temperature to set it up. An up arrow and down arrow, which are used to set the required temperature, appear.

Fan speed [Auto, Low, High and Stop]

The speed on the fan is as a default set to Auto as a zone is often required to be controlled by a sensor. The speed can be adjusted however to Low, High or Stop. Click on the fan icon to change the fan speed.

Start time points

For each of the 4 groups the start time can be put forward for up to 6 hours. For example, the group for morning can, with a normal start of 6:00 am, be put forward to start at midnight.

Morning 00:00 - 06:00

Day 06:00 - 12:00

Afternoon 12:00 - 18:00

Night 18:00 - 24:00

To change the start time click on the time under fan speed. By clicking on the up arrow or down arrow you can set the time to the required value.

When all settings for Week program are completed you must click on Save before leaving the page. If the page is left before the settings are saved, the settings will be lost.

! Note that if a RPT-20T Room panel is connected to the applicable zone, the Week program on Web and Week program on RPT-20T will automatically synchronise with each other. See RPT-20T instructions for further description of RPT-20T functions.

! Also note that the Week program is ignored if the zone is set to Hotel mode. For further information see the section Hotel mode.

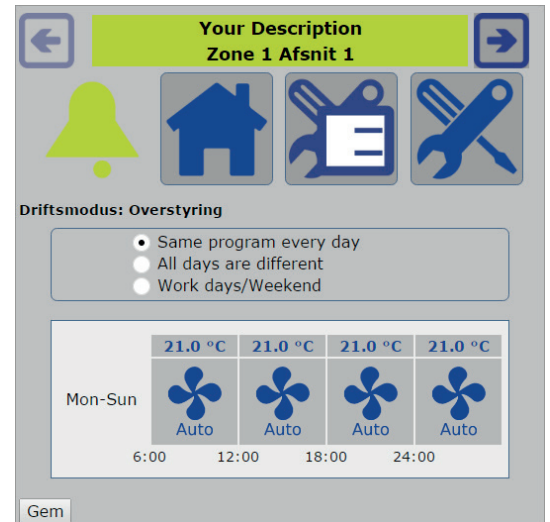


Figure 23-4: Week program

Copying settings

If several rooms are to have the same settings, time can be saved by copying the settings from the completed zone to the others. Click on the “Copy” button at the bottom of the page (see figure 24).

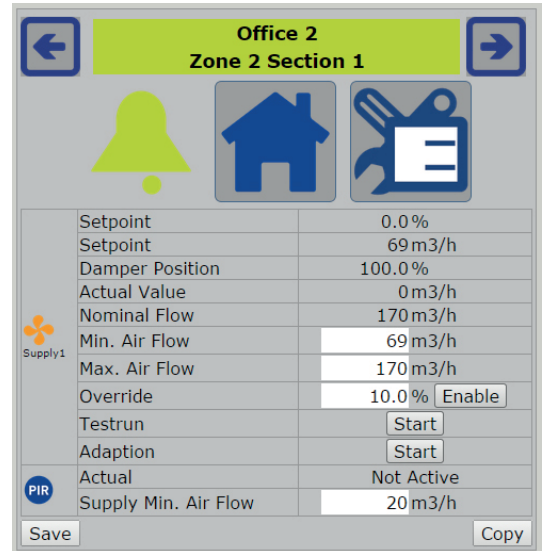


Figure 24: Copy settings

All settings including week program for the zone concerned are copied to the entered zone number(s). If settings are to be copied to several zones at once, successive zone numbers must be separated by a comma. Any air volumes that exceed Vnom are automatically reduced to Vnom. In figure 25, clicking “Copy” will overwrite the set points in Section 1 “Zone 1” and “Zone 3” with the values from Zone 2.

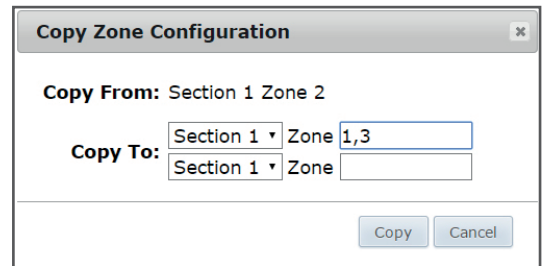


Figure 25: Copying example

In the example shown in figure 26, the set points in Section 1 “Zone 2” are copied to all zones, starting with Section 1 “Zone 1” and ending with Section 5 “Zone 25”. A maximum of 25 zones at a time can be copied.

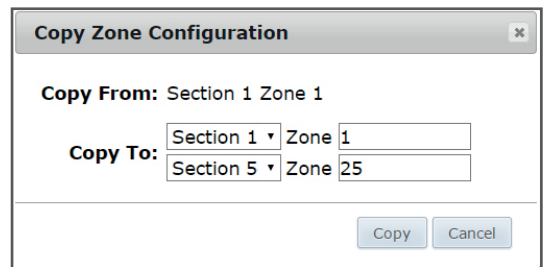


Figure 26: Copying to all zones

Using override for testing purposes

In connection with service, VAV damper and heating and cooling set points can be forced to a certain set point by entering a %-value in “Override” and clicking the “Enable” button (see figure 27).

The text on the button changes to “Disable” and the button lights red when override is active (see figure 28).

Click the “Disable” button to terminate override.

By clicking the “Start” button during testing, the actuator can be forced to move from one extreme position to the other within 2-3 minutes (see figure 28). The “Start” button lights red while testing is performed.

Click the “Start” button beside Adaption to force the actuator to move from one mechanical extremity to the other, a process which takes 4-5 minutes. At the extremities, the actuator records damper positions 0% and 100%. The “Start” button lights red while Adaption is performed.

Setpoint	0.0%
Setpoint	0 m3/h
Setpoint Offset	0 m3/h
Current Position	56.8%
Current Position	49°
Current Flow	0.0%
Current Flow	0 m3/h
Nominal Flow	265 m3/h
Min. Air Flow	16 m3/h
Max. Air Flow	140 m3/h
Override	0.0% <input type="button" value="Enable"/>
Testrun	<input type="button" value="Start"/>
Adaption	<input type="button" value="Start"/>

Figure 27: Using override for testing purposes

Setpoint	50.0%
Setpoint	78 m3/h
Setpoint Offset	0 m3/h
Current Position	3.0%
Current Position	2°
Current Flow	0.0%
Current Flow	0 m3/h
Nominal Flow	265 m3/h
Min. Air Flow	16 m3/h
Max. Air Flow	140 m3/h
Override	50% <input type="button" value="Disable"/>
Testrun	<input type="button" value="Start"/>
Adaption	<input type="button" value="Start"/>

Figure 28: Override active

OPTIMISING OF AHU/FAN OPERATION

AHU/fan operation can be optimised when the installation is free of alarms.

Start from figure 29: Main menu (Service).

Click on the tools symbol next to zone section 1. The web page shown in figure 30 will appear.

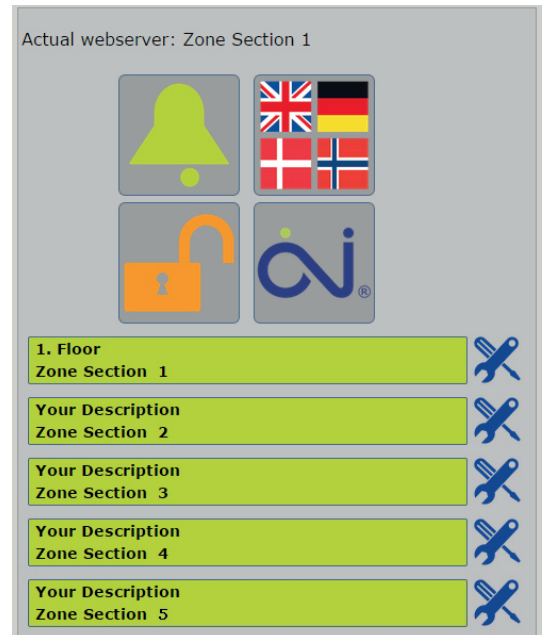


Figure 29: Main menu (Service)

Control of AHU/fans

Click on the AHU field in "Service Menu". The web page shown in figure 31 will appear.

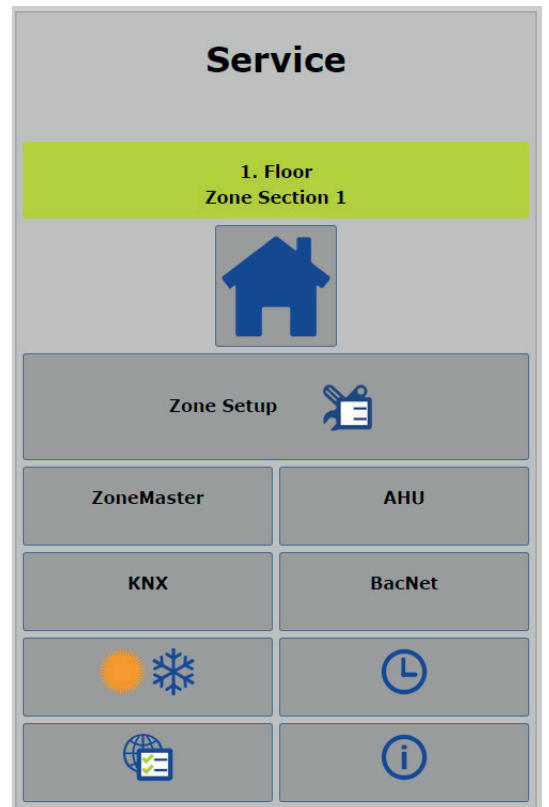


Figure 30: Zone section 1, Service menu

AHU Setup



AHU Type

Baudrate

Parity

Stop Bits

Address

Supported AHU Functions	Enable	Modbus Type	Address	Value	Scale	Reading Unit
Set Supply Fan Control Loop	<input checked="" type="checkbox"/>	Holding Register	1	7	0	
Set Extract Fan Control Loop	<input checked="" type="checkbox"/>	Holding Register	1	7	0	
Set Temperature Control Loop	<input checked="" type="checkbox"/>	Holding Register	147	0	0	
Set Supply Fan Setpoint	<input checked="" type="checkbox"/>	Holding Register	241		0.0	%
Set Extract Fan Setpoint	<input checked="" type="checkbox"/>	Holding Register	242		0.0	%
Set Supply Air Temp. Setpoint	<input checked="" type="checkbox"/>	Holding Register	148		0.0	°C
Set PIR Input If PIR Active In a Zone	<input checked="" type="checkbox"/>	Coil Status	9	1	0	
Read Summer Night Cooling Active	<input checked="" type="checkbox"/>	Input Status	10	1	0	
Read Fire Active	<input checked="" type="checkbox"/>	Input Status	36	1	0	
Read AHU In Stop	<input type="checkbox"/>	Input Register	0	0-99	1	
Read AHU In Low Speed	<input type="checkbox"/>	Input Register	0	100-199	0	
Read Outdoor Temperature	<input checked="" type="checkbox"/>	Input Register	23		0.0	°C
Read Supply Fan Alarm	<input checked="" type="checkbox"/>	Input Status	70	1	0	
Read Extract Fan Alarm	<input checked="" type="checkbox"/>	Input Status	80	1	0	
Read Combi-Coil Heat	<input type="checkbox"/>	Input Status	259	1	0	
Read Combi-Coil Cool	<input type="checkbox"/>	Input Status	260	1	0	

Figure 31: Control of AHU/fans

The settings on this page depend on whether the AHU/fans are controlled by the OJ GreenZone™ Master via analogue/digital signals or via Modbus RS485. Information on the electrical connection is available in the instructions for the OJ GreenZone™ Master. It is always the OJ GreenZone™ Master in zone section 1 that controls the AHU/fans.

AHU type must be set to one of the following in zone section 1:

- None: Control of AHU/fans with analogue/digital signals.
- OJ-Air2: Control of AHU with built-in OJ-Air2 controls via Modbus RS485.
- Custom: Control of AHU via Modbus RS485 with adapted protocol.

If either "None" or "OJ Air2" is selected, there is usually no need for additional settings. Click "Save" to complete the selection.

AHU type must be set to the following in zone sections 2 to 5 (if installed):

- None: The AHU is controlled via the Master in zone section 1.

Further details of AHU control using Modbus are provided in Appendix 4.

ZoneMaster set-up

Return to the Service menu by clicking this button ->
 The web page shown in figure 30 will appear.
 Click on ZoneMaster in the "Service menu". The web page shown in figure 32 will appear.



Fan optimisation

The set points for the inlet and exhaust fans are optimised individually for minimal pressure loss in the valves. This is achieved by means of PI controllers on the basis of the required air volume and VAV damper opening.

P and I are factory set and need not normally be changed. If faster control is required, the P-value should be increased and I-time reduced. If the fan set point is unstable, decrease P-value and increase I-time.

Fan operating range can be limited by setting min. fan speed and max. fan speed. If fan speed has been 100% for 24 hours, it is likely that there is a fault in the air duct or set-up. A duct may lack an end plate, preventing the build-up of sufficient pressure, for example, or a VAV damper may have been fitted back to front, allowing air to flow the wrong way through the damper. Any OJ GreenZone™ Master settings in zone sections 2 to 5 will be ineffective as the AHU is controlled from the OJ GreenZone™ Master in zone section 1.

Pressure protection

If pressure transmitters are installed to prevent overpressure in the supply duct and under pressure in the extract duct, pressure limits must be set in "Max. supply pressure" and "max. extract pressure".

These fields are only visible if pressure transmitters are correctly installed with the address selector set to 1 for extract and 2 for supply and they are connected to ZoneMaster Modbus Out2. If changes are made to the pressure transmitters, auto set-up must be performed, see the description in connection with figure 8.

Pressure P-value should be set in the same way as described under fan optimisation.

ZoneMaster Setup

Operation Mode: Normal

Settings	Description	Value
	Minimum Supply Air Temperature	10.0 °C
	Max. Water Temp. Cooling	15.0 °C
	Min. Water Temp. Heating	25.0 °C
	Fire Mode Operation Supply	Max. Air
	Fire Mode Operation Extract	Max. Air
	Setpoint Offset Range	5.0 °C
	Open Window VAV operation	Closed
	Regulation Cooling Sequence	Air, Water
	Min. Supply Fan Speed	10.0 %
	Max. Supply Fan Speed	75.0 %
	Min. Extract Fan Speed	15.0 %
	Max. Extract Fan Speed	80.0 %
	Max. Extract Pressure	200 Pa
	Fan Speed Supply PI Controller P-value	10.0 %
	Fan Speed Supply Pressure PI Controller P-value	40.0 %
	Fan Speed Supply PI Controller I-time	10 s
	Fan Speed Extract PI Controller P-value	10.0 %
	Fan Speed Extract Pressure PI Controller P-value	40.0 %
	Fan Speed Extract PI Controller I-time	10 s
	Pump Speed Cooling PI Controller P-value	10.0 %
	Pump Speed Cooling PI Controller I-time	10 s
	Outdoor Temperature Sensor	<input checked="" type="checkbox"/>
	Water Temperature Sensor	No
	Extract Pressure Sensor	<input checked="" type="checkbox"/>
	Hotel Room Reset Hour	22:01 h
	Hotel Room Temp. Setpoint	26.0 °C
	PIR Run-on Time	10 s
	Enable digital input sharing	<input checked="" type="checkbox"/>
Output	Description	Status
Aout1	Supply Fan Speed	75.0 %
Aout2	Extract Fan Speed	80.0 %
Aout3	Cooling Pump Speed	100.0 %
Dout1	Start Pump Cooling	On
Dout2	Start Pump Heating	On
Dout3	Start Fans	On
Dout4	A Alarm Active	Off
Dout5	B Alarm Active	Off
Input	Description	Status
Din1	Supply Fan Alarm	Open
Din2	Extract Fan Alarm	Open
Din3	Start Zones	Closed
Din4	Fire	Closed
Din5	Open Dampers	Open
Din6	Close Dampers	Open
Tin1	Water Temperature	12.3 °C
Tin2	Outdoor Temperature	24.4 °C
PTH1	Extract Pressure	7 Pa
Combined	Description	Status
	Supply Fan Alarm	Open
	Extract Fan Alarm	Open
	Start Zones	Closed
	Fire	Closed
	Open Dampers	Open
	Close Dampers	Open
	Water Temperature	12.3 °C
	Outdoor Temperature	24.4 °C

Save

Figure 32: Optimising AHU/fan operation

Temperature optimisation

OJ GreenZone™ Master can optimise AHU inlet temperature via Modbus RS485. When cooling is needed, the set point will be lowered to that set under “Min. inlet temperature”. When there is no cooling demand, the set point corresponds to the lowest set point in the zones. OJ GreenZone™ Master settings for zone sections 2 to 5 have no effect as the AHU is controlled by the OJ GreenZone™ Master in zone section 1.

Water temperature

The water temperature is only visible in the user interface when the sensor is installed. It's function depends on the set-up of the “water temperature sensor”. The set-up can only be changed when the system is in “Manual zone set-up”.

No

Water temperature is not used.

Cooling

Alarm for high flow temperature in cooling circuit. The alarm is active if the water temperature is higher than the set “max. Temp. cooling”.

Combi-coil

The temperature sensor is mounted on a heating pump buffer tank and is used to detect if there is heating or cooling available in the tank. The zone system combi-coil only opens for heating if the water temperature is higher than “Min. Water temp. heating”. The combi-coil only opens for cooling if the water temperature is lower than “Max. water temp. cooling”.

Operation in the event of fire alarm

Fire alarm mode can be activated either from the OJ GreenZone™ Master's digital “Fire” input or from the AHU controls via Modbus RS485. In the event of fire alarm, fan and VAV damper can be set to either maximum air volume or no air flow. The settings for fire alarm operation must be the same in zone sections 1 to 5.

Temperature adjustment with room potentiometer

In the “Set point offset range” field, the room potentiometer working range can be set for the zones connected to zone section 1. If, for example, the setting is $\pm 3^{\circ}\text{C}$, the room potentiometer will lower the temperature set point 3°C when in minimum position and raise the temperature set point 3°C when in maximum position. The temperature offset range can be set individually for zone sections 1 to 5.

VAV operation with open window

“Normal”: In case of an open window, heating/cooling valves are closed while VAV dampers remain active.

“Closed”: In case of an open window, heating/cooling valves and VAV dampers are closed.

Return to the Service menu by clicking this button ->

The web page shown in figure 30 will appear.



Regulating the cooling sequence

The cooling sequence can be set to the most energy efficient operation.

Air, water

This is the default setting and is used if cooling is primarily done with air in the zone. When cooling is required, the air volume is increased. The cooling valve only opens when max. air volume is reached.

Water, air

This setting is used if cooling coils are set in the zones.

When cooling is required the cooling valve is opened. The air volume increased only when the cooling valve duct is completely open.

Outdoor temperature sensor

The outdoor temperature sensor is only visible in the user interface when the sensor is installed and selected. The outside temperature is used for summer/winter compensation. The outdoor temperature from zone master 1 is copied automatically to any cascading coupled zone masters. If a local outdoor temperature sensor is connected to a cascade coupled zone mater, the zone master will use its own sensor value.

Hotel room

When the zone system is installed in a hotel, the guests can change the air flow and room temperature set point with RPT-20T. All rooms which are configured in “Hotel mode” are reset to the Auto air volume and temperature set point once a day. Both the time for reset and temperature set point can be set. Settings in the Week program will be ignored.

PIR after-running period

To avoid a lot of mode changes when there are few people moving around the building, the zone system functions in the after-running period as if the PIR sensor was still active. If a fast reaction is required the time can be set to 1 second.

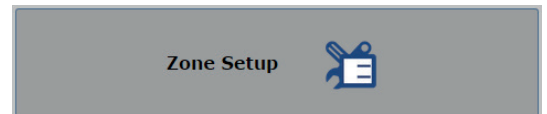
Enable digital input sharing

Activating of a Zone master's digital input FIRE, MIN or MAX is automatically copied to cascading coupled zone masters, if “Enable digital input sharing” is activated. Otherwise the Zone master's individual input is used.





CHECKING AIR VOLUME

It is now possible to check whether the air volumes in individual zones are as intended. If several zone sections are set, the check is repeated for each zone section.

Go to the “Manual Zone Set-up” web page by clicking this button ->



Air Volume Check

Operation Mode: Normal

S1	Your Description	Supply 🌸 75.0%			Extract 🌸 80.0%		
		Supply 1			Setpoint	Current Flow	Damper pos.
		Setpoint	Current Flow	Damper pos.			
Z01	🔍 Your Description	100 m ³ /h	0 m ³ /h	100.0%			
Z02	🔍 Your Description	34 m ³ /h	0 m ³ /h	100.0%	34 m ³ /h	0 m ³ /h	100.0%
Z03	🔍 Your Description						
Z04	🔍 Your Description	20 m ³ /h			420 m ³ /h		
Z05	🔍 Your Description						
Z06	🔍 Your Description						
Z07	🔍 Your Description				0 m ³ /h	0 m ³ /h	0.0%

Figure 33: Checking air volume

Adaption

Adaption must be performed so as to ensure that damper positions 0-100% are correct for the VAV dampers. Adaption can be performed for all VAV dampers in the section by clicking the “Adaption” button, see figure 33. The button “Adaption” will light up red for 6-7 minutes while Adaption is carried out. Adaption occurs firstly on all odd zones and then on all even zones.

If Adaption takes significantly longer than the expected 6-7 minutes, the VAV dampers may be mechanically locked. To locate locked dampers, click the tools icon next to Z01. Then check whether the “Start” button next to Adaption is lit red. Adaption continues automatically once a locked damper has been unlocked. Check subsequent zones by leafing through the zones.

Max. air volume

Once Adaption has been completed correctly, a test of max. air volume must be performed. Click the “Max. Air” button to set all VAV dampers in the section to max. air volume. The button lights red while “Max. Air” is active. Wait while the VAV dampers are moved to the new set point and fan speed is adjusted correspondingly.

There is insufficient air in the system if the actual value differs significantly from the set point and damper position is 100%. If pressure protection is set, Max. supply/exhaust pressure might be set too low.

Click the “Max. Air” button again to end the test.

Min. air volume

Click the “Min. Air” button to set all VAV dampers in the section to min. air volume. The button lights red while “Min. Air” is active. Wait while the VAV dampers are moved to the new set point and fan speed is adjusted correspondingly.

There is excessive pressure in the system or the VAV dampers are defective if the actual value differs significantly from the set point and damper position is 0%.

Click the “Min. Air” button again to end the test.

SUMMER/WINTER COMPENSATION

Click on the sun/frost icon in "Service menu". The web page shown in figure 34 will appear.

Summer/winter compensation can offset the temperature set point depending on the actual outdoor temperature.

By choosing, for example, to increase room temperature when it is very hot outside, energy requirements for cooling will be reduced. The risk of cold draughts will also be reduced and a higher degree of comfort experienced.

Compensation can be set and activated individually in zone sections 1 to 5.

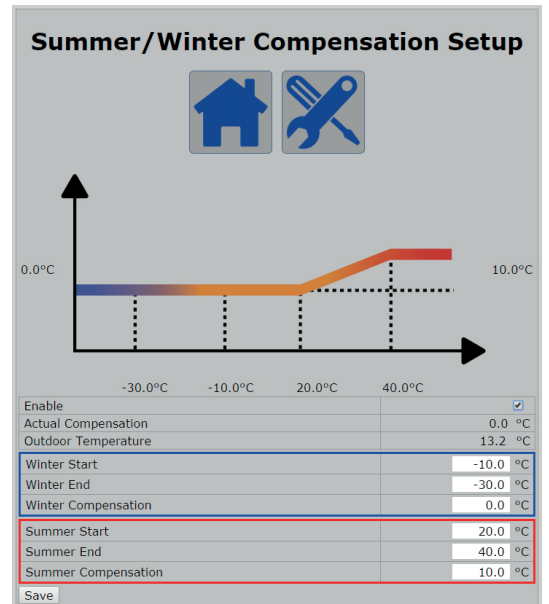


Figure 34: Summer/winter compensation

SETTING TIME AND DATE

Click on the clock icon in "Service menu". The web page shown in figure 35 will appear.

Time and date can be retrieved from a PC/smart phone by clicking on the "PC time" button. Save the new time by clicking "Save". The clock is used by the week program and for time-labelling of alarms, allowing users to see when the alarm was triggered.

Time and date must be set in zone sections 1 to 5 as each OJ GreenZone™ Master has its own clock.

Year	2015
Month	April
Date	07
Week Day	Tuesday
Auto. Summer Time	<input checked="" type="checkbox"/>
Time	11: 09: 48



Figure 35: Setting time and date

IP AND MAC ADDRESS

Click on the Internet icon in “Service menu”. The web page shown in figure 36 will appear.

IP set-up can be checked and altered here. Note that connection to the web server is lost if the IP address is changed and the change is saved. To regain connection, the new IP address must be entered in the Internet browser. Zone sections 1 to 5 must each have their own IP address as the OJ GreenZone™ Masters are connected in the same IP network.

Network Connection



Static/Dynamic IP	Static IP ▾
IP Address	192.168.1.101
NetMask	255.255.255.0
Gateway	192.168.1.1
Required DNS	192.168.1.1
Alternative DNS	0.0.0.0
Mac Address	00:23:38:00:28:CA

Figure 36: IP and MAC address

CONNECTING TO A BUILDING MANAGEMENT SYSTEM (BMS)

The OJ GreenZone™ Master’s built in Modbus TCP/IP and BACnet TCP/IP servers make connection to a Building Management System (BMS) child’s play.

The newest versions of the protocols are available on www.ojelectronics.com



Modbus TCP/IP

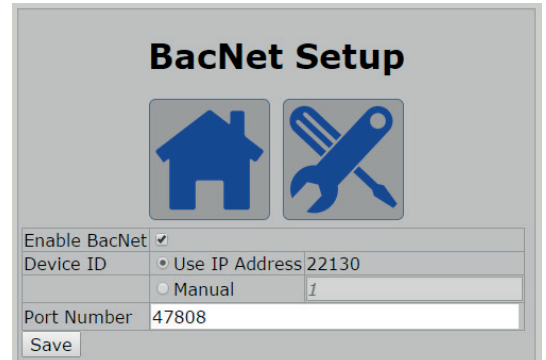
No settings need be made in the OJ GreenZone™ Masters in order to communicate via Modbus TCP/IP. Further information on the protocol can be found in the document “OJ GreenZone™ Modbus protocol”, which can be downloaded from www.ojelectronics.com

BACnet

A few settings must be made in the OJ GreenZone™ Masters in order to communicate via BACnet TCP/IP. Click on the "BACNet" icon in "Zone section 1, Service menu". The web page shown in figure 37 will appear. The BACnet server must be activated. Device ID and port number can be changed if necessary.

Note that zone sections 1 to 5 must each have their own device ID as the OJ GreenZone™ Masters are connected in the same IP network.

Further information on the protocol can be found in the document "OJ GreenZone™ BACnet protocol", which can be downloaded from www.ojelectronics.com



Enable BacNet	<input checked="" type="checkbox"/>
Device ID	<input type="radio"/> Use IP Address 22130
	<input type="radio"/> Manual /
Port Number	47808
<input type="button" value="Save"/>	

Figure 37: BACnet settings

KNX sensors

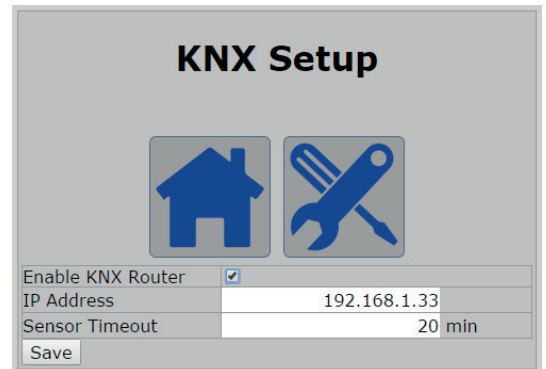
A few settings must be made in the OJ GreenZone™ Masters in order to read data from the KNX sensors. Click on "KNX" in "Service menu". The web page shown in figure 38 will appear.

Activate the KNX router. The IP address must be the same as that of the connected KNX router.

The value in "Sensor time-out" specifies the length of time data may be lacking from the KNX network before an alarm is triggered.

The alarm is disconnected if the value is set to 0. Zone sections 1 to 5 can have different settings but their IP address must be the same if all KNX components are connected to the same router.

Further information on the protocol can be found in the document "OJ GreenZone™ KNX protocol", which can be downloaded from www.ojelectronics.com



Enable KNX Router	<input checked="" type="checkbox"/>
IP Address	192.168.1.33
Sensor Timeout	20 min
<input type="button" value="Save"/>	

Figure 38: KNX settings

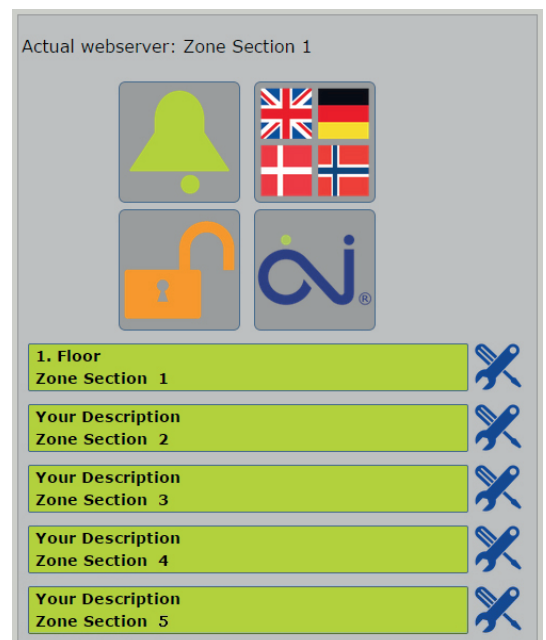
SOFTWARE UPDATING AND SD CARD

The OJ GreenZone™ Master and all its associated OJ GreenZone™ Modules and RPT-20T room panels can be easily updated. This is done by inserting an SD card with the required software version into the OJ GreenZone™ Master.

Updating with SD card

Start from figure 39: Main menu (Service).

Click on the padlock. The web page shown in figure 40 will appear.



Actual webserver: Zone Section 1

1. Floor Zone Section 1	
Your Description Zone Section 2	
Your Description Zone Section 3	
Your Description Zone Section 4	
Your Description Zone Section 5	

Figure 39: Main menu (Service)

Insert a SD card of max. 8 GB capacity into the computer and copy the following files to the card without unpacking them:

1. zonemaster_update_vxxx.tar.gz
2. version.crc

* xxx = version number.

Files 1 and 2 belong together and contain new software for the OJ GreenZone™ Master.

When the SD card containing these files is inserted into an OJ GreenZone™ Master, the versions are compared to those already installed. If the versions are the same, nothing happens. If they differ, the following web page (see figure 41) will appear after approx. 20 seconds.

Clicking "Accept" starts the OJ GreenZone™ Master update (see figure 42).

It takes approx. 2 minutes to update the OJ GreenZone™ Master and then the web page shown in figure 43 will appear.

The text at the top of the page indicates that the Master has been successfully updated and that the associated Modules are now being updated.

Updating takes about 30 seconds per module. While updating is in progress, "SU" is shown on the OJ GreenZone™ Module's display.

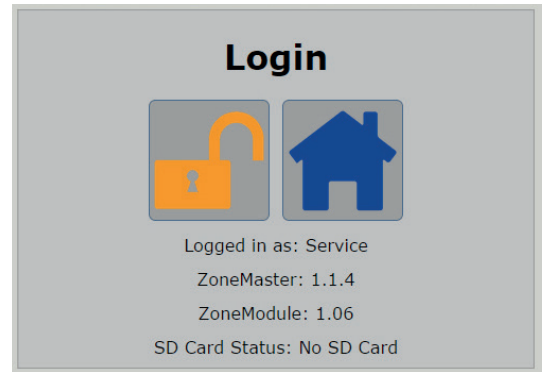


Figure 40: No SD card

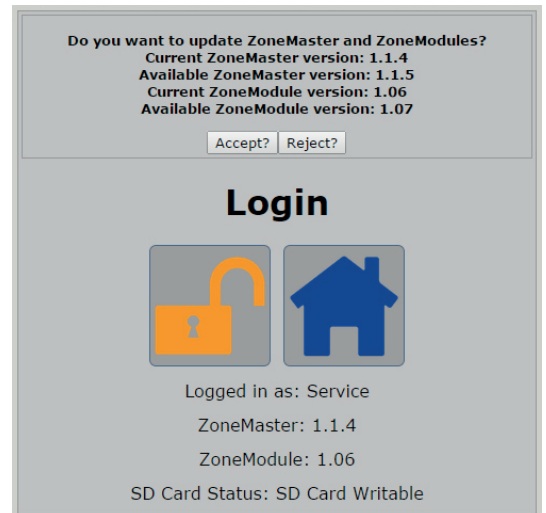


Figure 41: Updating software

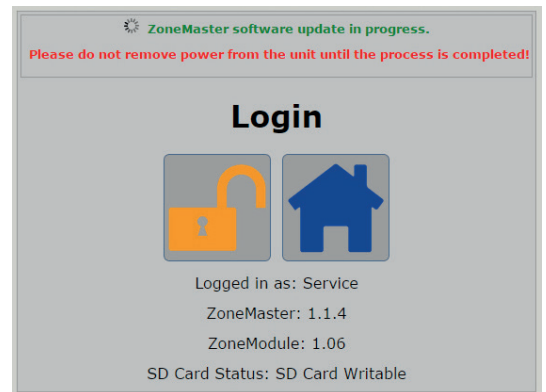


Figure 42: Updating the OJ GreenZone™ Master

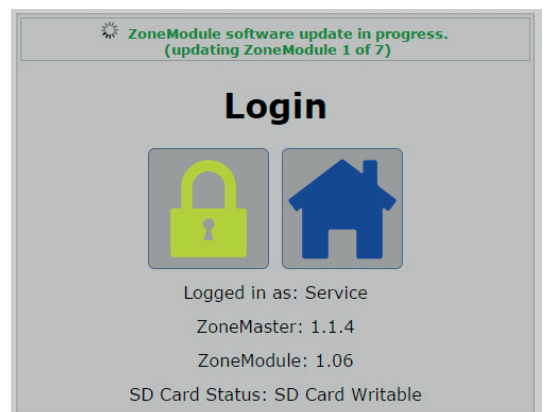


Figure 43: Updating the OJ GreenZone™ Module

Once updating has been completed, the web page shown in figure 44 will appear.

ZoneModule: x.xx now indicates the installed software version.

If the system contains several OJ GreenZone™ Masters, they must all be updated with the SD card as zone sections 1 to 5 must have the same software version.

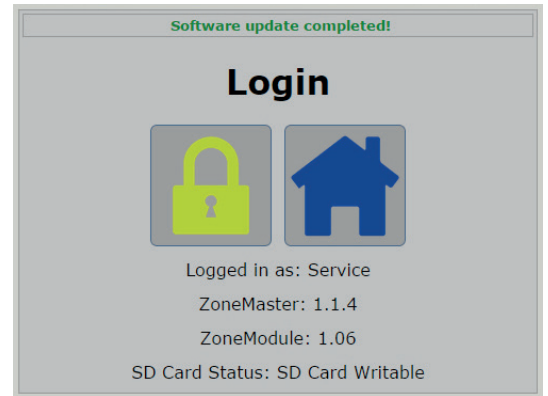


Figure 44: OJ GreenZone™ Module updated

Logging to SD card

When an SD card is inserted into the OJ GreenZone™ Master, and the SD card is OK, log files will be automatically written to the SD card. The log files can store approximately one week's data with the oldest data being continuously overwritten.

In special situations, log files can be sent to OJ Electronics for diagnosis.

Collect log data in a CSV file

The log data that is saved on a SD card can be collected on the web page under the icon "information". The file is a CSV file, comma separated text file, which can be opened in, for example, Excel.

Data is collected in one file which contains selected log data for the applicable GreenZone™ Master and all GreenZone™ Modules which are installed. If there are several GreenZone™ Masters on the same system, log data will be collected for the individual GreenZone™ Masters.



Figure 44-2: Retrieve log data

APPENDIX 1: CONNECTION TO TCP/IP NETWORK

To gain access to the built-in Internet, Modbus and BACnet servers, the OJ GreenZone™ Master must be connected to the same TCP/IP network as the PC.

Direct connection of PC and OJ GreenZone™ Master

Connect a PC to the OJ GreenZone™ Master by means of a standard RJ45 LAN cable.
 OJ GreenZone™ Master is factory set with a static IP address 192.168.1.101.

Set the network card of your PC to "Static" and enter an IP address other than 192.168.1.101, e.g. 192.168.1.100.
 Note that the first three blocks in the IP address must be the same – only the last should differ.

Start an Internet browser (Google Chrome, Mozilla Firefox or Internet Explorer) and enter 192.168.1.101 in the address field – then press Enter.

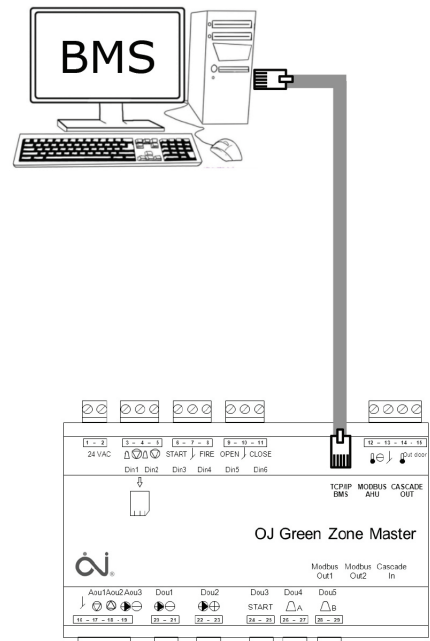


Figure 45: Direct connection of PC and OJ GreenZone™ Master

Static TCP/IP network

Connect the OJ GreenZone™ Master to a local network by means of a standard RJ45 LAN cable. The PC must be connected to the same network.

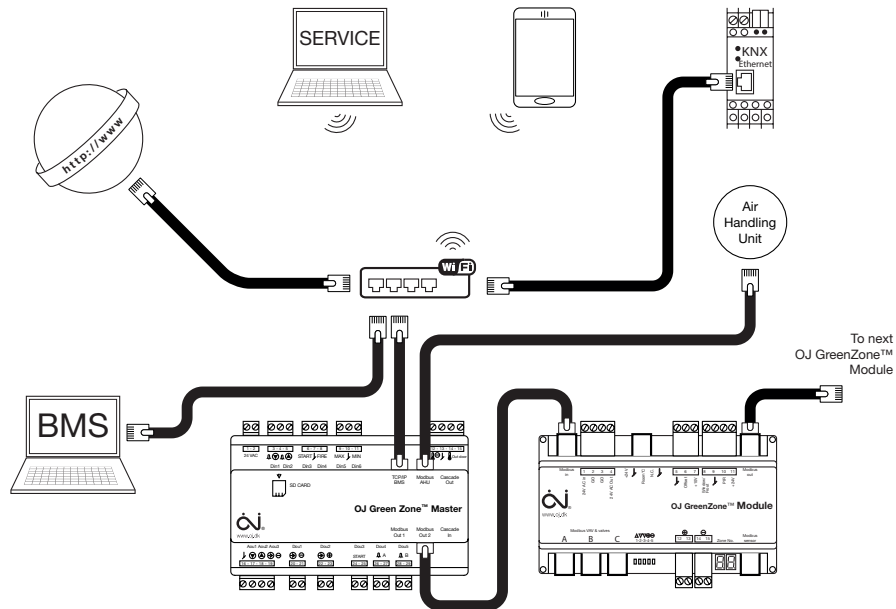


Figure 46: TCP/IP-network.

OJ GreenZone™ Master is factory set with the static IP address 192.168.1.101. If there is conflict with other components on the network, access to the OJ GreenZone™ Master’s servers will be prevented, and the IP address must be changed. See Appendix 2.

Dynamic TCP/IP network

Connect the PC and OJ GreenZone™ Master directly (see figure 45).

Change the IP address of the OJ GreenZone™ Master from “Static” to “DHCP” (see the section titled “IP and MAC address” in this document). Connect the OJ GreenZone™ Master to the local network in the same way as for static TCP/IP network (see figure 46). Wait approx. 2 minutes until the OJ GreenZone™ Master has been allocated a new address by the local network’s DHCP server.

Connect the PC and OJ GreenZone™ Master directly and find the IP address using Netbiter Config. (See Appendix 2). Make a note of the IP address. Contact the network administrator if the IP address is to be reserved for the OJ GreenZone™ Master.

Connect the OJ GreenZone™ Master to the local network again in the same way as for static TCP/IP network (see figure 46).

Start an Internet browser (Google Chrome, Mozilla Firefox or Internet Explorer) and enter the IP address in the address field – then press Enter.

APPENDIX 2: FINDING AND CHANGING IP ADDRESS

If the IP address is known and connection to the OJ GreenZone™ Master’s web server has been established, the set-up can be changed as described in the section titled “IP and MAC address” in this document. If the IP address is unknown, it can be found using the PC program “IPconfig”, which can be downloaded from www.ojelectronics.com.

Find IP addresses with IPconfig

Connect the PC and OJ GreenZone™ Master directly (see figure 45). Start ”IPconfig”, to read the IP address.

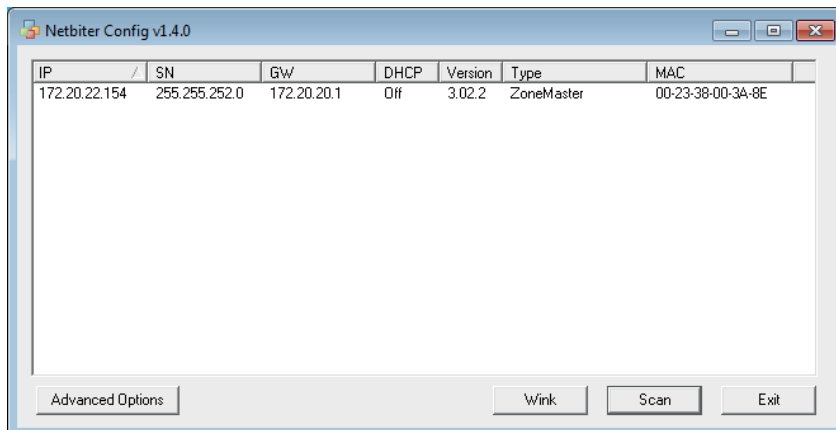


Figure 47: IP address using IPconfig

If no IP address is shown, it may be that the PC’s network card is waiting to be assigned a dynamic IP address.

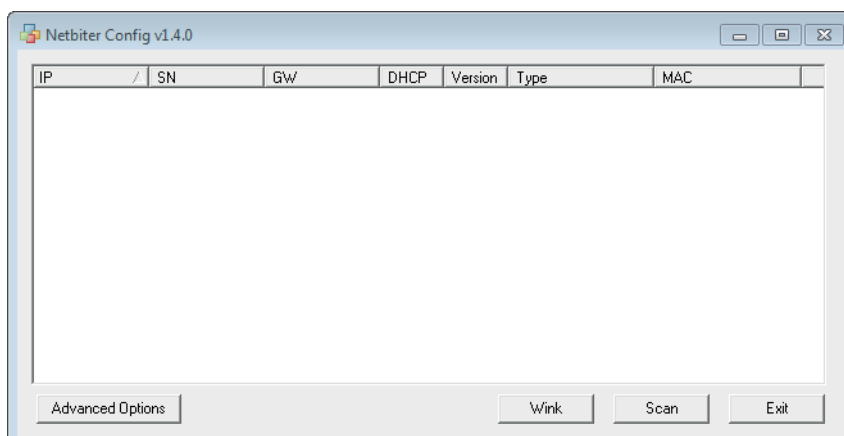
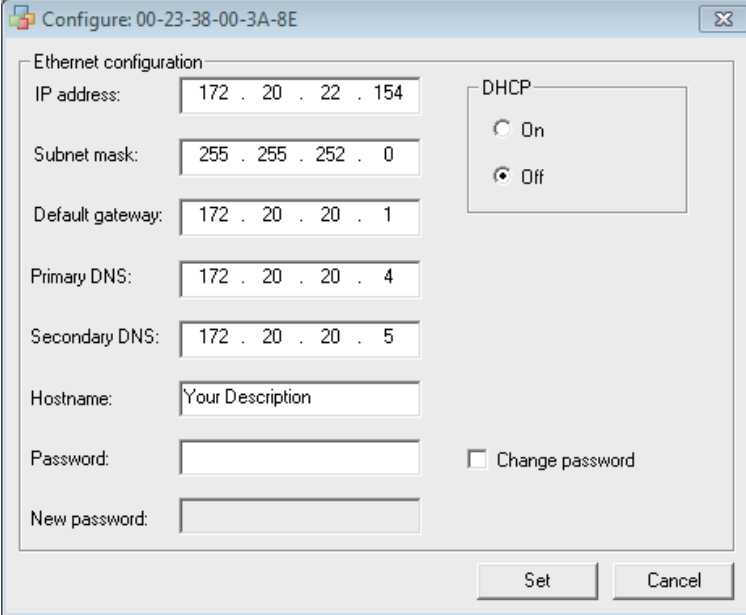


Figure 48: No IP address found

Wait 1-2 minutes until the network card has “Limited or no connection” status and then click on “Scan”. If it is still not possible to find an IP address, check the LAN cable connections and the power supply to the OJ GreenZone™ Master. If OJ GreenZone™ Master is set-up for DHCP, “Enable internal DHCP server” must be chosen under “Settings”.

Change IP addresses with IPconfig

Double click the IP address to be changed and the following pop-up window will appear:



The screenshot shows a configuration window titled "Configure: 00-23-38-00-3A-8E". It contains the following fields and options:

- IP address: 172 . 20 . 22 . 154
- Subnet mask: 255 . 255 . 252 . 0
- Default gateway: 172 . 20 . 20 . 1
- Primary DNS: 172 . 20 . 20 . 4
- Secondary DNS: 172 . 20 . 20 . 5
- Hostname: Your Description
- Password: [Empty field]
- New password: [Empty field]
- DHCP: On, Off
- Change password
- Buttons: Set, Cancel

Figure 50: Changing IP address

- Select DHCP “Off” with static IP address and “On” with dynamic IP address.
- Change the IP address to the required setting.
- “Hostname” is the S1 text in OJ GreenZone™ Master, see figure 8.
May only contain the letters a-Z and numbers 0-9 when IPconfig is being updated.
Spaces are not accepted. Enter, for example, Section1.
- Enter password: ZoneMaster
- Click on “Set”.
- Check that the IP address has been changed by clicking on “Scan” (see figure 47).

Several OJ GreenZone™ Masters on the same network

Up to five OJ GreenZone™ Masters can be linked to form a common system.

The Masters must be connected in cascade by means of Modbus connections between “Cascade In” and “Cascade Out”.

(See Instructions “OJ GreenZone™ Master”).

In addition, each individual OJ GreenZone™ Master must be connected to the same LAN network so that the built-in web servers act as an universal user interface.

Give the OJ GreenZone™ Masters different IP addresses, using for example Netbiter Config (see figure 43).

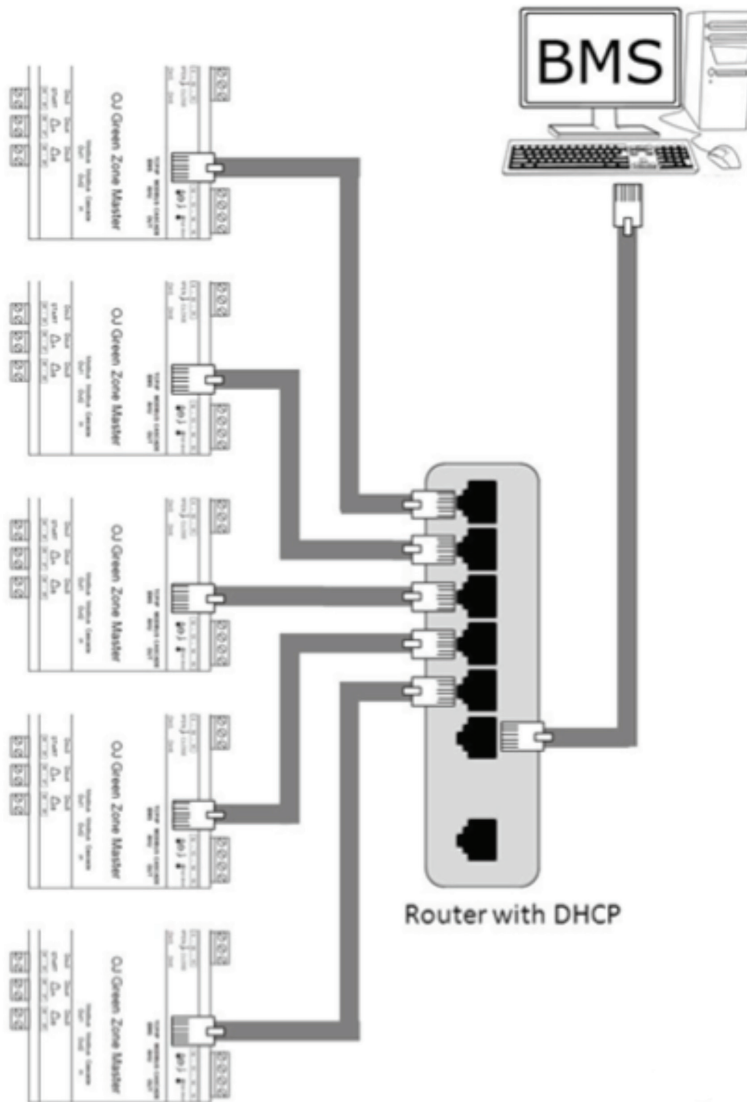


Figure 51: Connecting several OJ GreenZone™ Masters

example:

OJ GreenZone™ Master	IP address
Section1	192.168.1.101 (factory setting)
Section2	192.168.1.102
Section3	192.168.1.103
Section4	192.168.1.104
Section5	192.168.1.105

When the IP addresses are changed and the masters connected to a LAN, all the Zone masters must be set to “Auto”, see fig. 8. The Zone masters are now automatically configured to master section 1, 2, 3, 4 and 5 via the modbus Cascade connection. The zone masters are then visible in the user interface as shown in fig. 2.

APPENDIX 3: ALARM LIST

Alarm no.	Alarm	Alarm text	Troubleshooting
1	A	High cooling water temperature	Check the cooling water temperature sensor and alarm limit.
2	A	Alarm, inlet fan	Check the inlet fan, the signal on Din1 of the OJ GreenZone™ Master and, if necessary, Modbus from AHU.
3	A	Alarm, exhaust fan	Check the exhaust fan, the signal on Din2 of the OJ GreenZone™ Master Din2 and any Modbus from AHU.
100	B	Fault, outdoor temperature sensor	Check the outdoor temperature sensor and the signal on Tin2 of the OJ GreenZone™ Master.
101	B	Fault, cooling water temperature sensor	Check the cooling water temperature sensor and the signal on Tin1 of the OJ GreenZone™ Master.
102	B	AHU disconnected	Check that the AHU (Air Handling Unit) is switched on and that there is Modbus connection between the OJ GreenZone™ Master and the AHU.
103	B	AHU configuration failed	Check that there is Modbus connection between the OJ GreenZone™ Master and the AHU and that the register set-up is according to the appropriate AHU Modbus protocol.
104	B	OJ GreenZone™ Master, lowest level disconnected	Check the Modbus connection between the "Cascade In" connector of the OJ GreenZone™ Master and the "Cascade Out" connector of the subsequent OJ GreenZone™ Master.
105	B	OJ GreenZone™ Master, highest level disconnected	Check the Modbus connection between the "Cascade Out" connector of the OJ GreenZone™ Master and the "Cascade In" connector of the previous OJ GreenZone™ Master.
106	B	Connection to KNX router failed	Check that the KNX router is switched on and connected to the TCP/IP connector and that the IP address is the same as that set in the OJ GreenZone™ Master.
107	B	Common extract configuration error	Check configuration of common extract.
108	B	Supply pressure sensor error	Check Modbus connection between supply and extract pressure transmitters. The selector knob must be in position 2.
109	B	Extract pressure sensor error	Check Modbus connection between Modbus Out2 on the OJ GreenZone™ Master and the extract pressure transmitter. The selector knob must be in position 1.
110	B	Supply branch VAV configuration error	Check configuration of branch damper.
111	B	Extract Branch VAV Configuration Error	Check configuration of branch damper.
112	B	Outdoor temperature sensor short-circuited	Check the outdoor temperature sensor and its connection to terminals 13 and 14 of the OJ GreenZone™ Master.
113	B	Cooling water temperature sensor short-circuited	Check the cooling water temperature sensor and its signal on terminals 12 and 13 of the OJ GreenZone™ Master.



Alarm no.	Alarm	Alarm text	Troubleshooting
300	B	OJ GreenZone™ Module disconnected	Check the power supply to the OJ GreenZone™ Module and the Modbus connection from "Modbus in" to the "Modbus out" connector of the previous OJ GreenZone™ Module.
301	B	Connection fault, VAV exhaust	Check that the VAV exhaust damper is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 1.
302	B	Connection fault, VAV inlet 1	Check that VAV inlet damper 1 is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 2.
303	B	Connection fault, VAV inlet 2	Check that VAV inlet damper 2 is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 3.
304	B	Connection fault, cooling actuator	Check that the cooling valve is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 5.
305	B	Connection fault, heating actuator	Check that the heating valve is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 4.

Alarm no.	Alarm		Troubleshooting
306	B	Connection fault, combined heating/cooling actuator	Check that the heating/cooling valve is connected to connector A, B or C of the OJ GreenZone™ Module and is set to address 6.
307	B	Connection fault, window contact/frost protection sensor	Check that the sensor is connected either to a digital input or via a KNX router.
308	B	Connection fault, PIR sensor	Check that the sensor is connected either to a digital input or via a KNX router.
309	B	Room temperature sensor removed	Check the room temperature sensor and signal on either the entrance "Room C", or "Modbus Sensor" on the OJ GreenZone™ Module.
310	B	Inlet temperature sensor removed	Check the inlet temperature sensor and signal in the entrance "Room °C" and the OJ GreenZone™ Module, if the room temperature sensor is connected to "Modbus Sensor".
311	B	Connection fault, set point offset sensor	Check the room potentiometer and the signal on terminals 5, 6 and 7 of the OJ GreenZone™ Module.
312	B	Connection fault, CO2/VOC sensor	Check the CO2/VOC sensor and the signal on either the "CO2" or the "Modbus Sensor" connector of the OJ GreenZone™ Module.
313	B	Connection fault RF% sensor	Check the humidity sensor and the connection to the "Modbus Sensor" connector of the OJ GreenZone™ Module.
314	B	Room temperature sensor short-circuited	Check the room temperature sensor and the connection to the "Room °C" connector of the OJ GreenZone™ Module.
315	B	Inlet temperature sensor short-circuited	Check the inlet temperature sensor and the connection to the "Room °C" connector of the OJ GreenZone™ Module, if the room temperature sensor is connected to "Modbus Sensor".
316	B	Mechanical fault, VAV exhaust	Check VAV damper and actuator.
317	B	Mechanical fault, VAV inlet 1	Check VAV damper and actuator.
318	B	Mechanical fault, VAV inlet 2	Check VAV damper and actuator.
319	B	Mechanical fault, cooling actuator	Check cooling valve and actuator.
320	B	Mechanical fault, heating actuator	Check heating valve and actuator.
321	B	Mechanical fault, combined heating/cooling actuator	Check heating/cooling valve and actuator.
322	B	Hardware fault ZoneModule	Replace OJ GreenZone™ Module

APPENDIX 4: OPTIMISING AHU OPERATION VIA MODBUS RS485

AHU operation can be optimised via Modbus RS485 communication.

AHU Setup

AHU Type

Baudrate

Parity

Stop Bits

Address

Supported AHU Functions	Enable	Modbus Type	Address	Value	Scale	ReadingUnit
Set Supply Fan Control Loop	<input checked="" type="checkbox"/>	Holding Register	1	7	0	
Set Extract Fan Control Loop	<input checked="" type="checkbox"/>	Holding Register	1	7	0	
Set Temperature Control Loop	<input checked="" type="checkbox"/>	Holding Register	147	0	0	
Set Supply Fan Setpoint	<input checked="" type="checkbox"/>	Holding Register	241		0.0	%
Set Extract Fan Setpoint	<input checked="" type="checkbox"/>	Holding Register	242		0.0	%
Set Supply Air Temp. Setpoint	<input checked="" type="checkbox"/>	Holding Register	148		0.0	°C
Set PIR Input If PIR Active In a Zone	<input checked="" type="checkbox"/>	Coil Status	9	1	0	
Read Summer Night Cooling Active	<input checked="" type="checkbox"/>	Input Status	10	1	0	
Read Fire Active	<input checked="" type="checkbox"/>	Input Status	36	1	0	
Read AHU In Stop	<input type="checkbox"/>	Input Register	0	0-99	1	
Read AHU In Low Speed	<input type="checkbox"/>	Input Register	0	100-199	0	
Read Outdoor Temperature	<input checked="" type="checkbox"/>	Input Register	23		0.0	°C
Read Supply Fan Alarm	<input checked="" type="checkbox"/>	Input Status	70	1	0	
Read Extract Fan Alarm	<input checked="" type="checkbox"/>	Input Status	80	1	0	
Read Combi-Coil Heat	<input type="checkbox"/>	Input Status	259	1	0	
Read Combi-Coil Cool	<input type="checkbox"/>	Input Status	260	1	0	

Figure 52: Modbus communication to AHU

User Installer

- Operating
- Temperature
- Summer/winter
- Adjustment
- Fire
- Communication
- Language
- Settings

Internet Lon

Set ModBus protocol

Modbus/RTU settings

Modbus address

Baud rate

Start bit

Stop bit

Parity

Figure 53: Modbus communication from AHU

The OJ-Air2 Master must have exactly the same configuration. Press Save to keep your changes.

Modbus parameters have the following functions:

Parameter	Function
Set inlet fan's control circuit	Sets fan control to Modbus controlled set point.
Set exhaust fan's control circuit	Sets fan control to Modbus controlled set point.
Set temperature control circuit	Sets temperature control to constant inlet.
Set inlet fan set point	Controls current fan speed.
Set exhaust fan set point	Controls current fan speed.
Set inlet temperature set point	Controls inlet temperature set point.
Set PIR input, if PIR is active in a zone	Transfers a PIR signal from a zone to the AHU so that the AHU can be started by the PIR signal.
Display summer night cooling active	Opens VAV damper when summer night cooling is activated.
Display fire active	Regulates VAV damper to set position in the event of fire.
Display AHU in stop	Sets the zone system in standby when the AHU is not operating.
Display AHU at low speed	Reserved for future use.
Display outdoor temperature	Outdoor temperature is used for summer/winter compensation of the zone temperature set points.
Show inlet fan alarm	Transfers fan alarm from AHU to zone system.
Show exhaust fan alarm	Transfers fan alarm from AHU to zone system.
Read Combi-coil Heat	Allow opening of valves in the zone system combi-heating/cooling surface with heat requirement. The pipe system is heating.
Read Combi-coil cooling	Allow opening of valves in the zone system combi-heating/cooling surface with cooling requirement. The pipe system is cooling.

AHU with OJ-Air2 controls

If the AHU is equipped with OJ-Air2 controls, the following functions are supported with selection of AHU type: OJ-AIR2:

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	1	4x0002	5	
Set extract fan's control circuit	Holding register (R/W)	1	4x0002	5	
Set temperature control circuit	Holding register (R/W)	147	4x0148	0	
Set supply fan set point	Holding register (R/W)	241	4x0242	1/100	%
Set extract fan set point	Holding register (R/W)	242	4x0243	1/100	%
Set supply temperature set point	Holding register (R/W)	148	4x0149	1/100	°C
Set PIR input, if PIR is active in a zone	Coil status (R/W)	9	0x0010	1	
Display summer night cooling active	Input status (R)	10	1x0011	1	
Display fire active	Input status (R)	36	1x0037	1	
Display AHU in stop	Input register (R)	0	3x0001	0-099	
Display AHU at low speed	Input register (R)	0	3x0001	100-199	
Display outdoor temperature	Input register (R)	23	3x0024	1/100	°C
Show supply fan alarm	Input status (R)	70	1x0071	1	
Show extract fan alarm	Input status (R)	80	1x0081	1	
Read Combi-coil Heat	Input status (R)	259	1x0260	1	
Read Combi-coil Cooling	Input status (R)	260	1x0261	1	

AHU with other make of controls (Custom)

If AHU type "Custom" is selected, Modbus type, register and values can be adapted for other makes. The following examples are for guidance only and adjustments may be necessary. Functions marked "n/a" are not supported and the fields must be left empty.

CLIMATIX

Modbus set-up

- Parity: None, Even, Odd
- Data bits: 8
- Stop bits: 1, 2
- Baud rate: 38.400 baud, 19.200 baud, 9.600 baud 4.800 baud, 2.400 baud
- Address: 1-247

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set extract fan's control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set temperature control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set supply fan set point	Holding register (R/W)	51	4x0052	1	¹ %
Set extract fan set point	Holding register (R/W)	55	4x0056	1	² %
Set supply temperature set point	Holding register (R/W)	n/a	n/a	n/a	n/a
Set PIR input, if PIR is active in a zone	Coil status (R/W)	n/a	n/a	n/a	n/a
Display summer night cooling active	Input status (R)	n/a	n/a	n/a	n/a
Display fire active	Coil status (R)	14	0x0015	1	
Display AHU in stop	Input register (R)	16	3x0017	0 & 10	
Display AHU at low speed	Input status (R)	16	3x0017	2	
Display outdoor temperature	Input register (R)	71	3x0072	1/10	°C
Show supply fan alarm	Input status (R)	26	1x0027	1	
Show extract fan alarm	Input status (R)	29	1x0030	1	
Read Combi-coil Heat	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Cooling	Input status (R)	n/a	n/a	n/a	n/a

¹ This will control the set point for step 3 of the supply fan. % depends on the configuration in Climatix.

² This will control the set point for step 3 of the extract fan. % depends on the configuration in Climatix.

CORRIGO

Modbus set-up

- Parity: None, Even, Odd
- Data bits: 8
- Stop bits: 1, 2
- Baud rate: 9,600 baud
- Address: 1 – 240

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	372	4x0373	0	
Set extract fan's control circuit	Holding register (R/W)	374	4x0375	0	
Set temperature control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set supply fan set point	Holding register (R/W)	373	4x0374	1/1	%.
Set extract fan set point	Holding register (R/W)	375	4x0376	1/1	%
Set supply temperature set point	Holding register (R/W)	0	4x0001	1/1	°C
Set PIR input, if PIR is active in a zone	Input status (R)	7	1x0008	1	
Display summer night cooling active	Input status (R)	n/a	n/a	n/a	n/a
Display fire active	Input status (R)	41	1x0042	1	
Display AHU in stop	Input status (R)	283	1x0284	0	
Display AHU at low speed	Input status (R)	283	1x0284	1	
Display outdoor temperature	Input register (R)	0	3x0001	1/1	°C
Show supply fan alarm	Input status (R)	32	1x0033	1	
Show extract fan alarm	Input status (R)	33	1x0034	1	
Read Combi-coil Heat	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Cooling	Input status (R)	n/a	n/a	n/a	n/a

GOLD RX/PX/CX/SD, GENERATION C/D

Modbus set-up

- Parity: None, Even, Odd
- Data bits: 8
- Stop bits: 1, 2
- Baud rate: 38,400 baud, 19,200 baud, 9,600 baud
- Address: 1 – 240

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	97	4x0098	2	
Set extract fan's control circuit	Holding register (R/W)	98	4x0099	2	
Set temperature control circuit	Holding register (R/W)	100	4x0101	2	
Set supply fan set point	Holding register (R/W)	17	4x0018	1/100	%
Set extract fan set point	Holding register (R/W)	19	4x0020	1/100	%
Set supply temperature set point	Holding register (R/W)	40	4x0041	1/100	°C
Set PIR input, if PIR is active in a zone	Coil status (R/W)	n/a	n/a	n/a	n/a
Display summer night cooling active	Input status (R)	n/a	n/a	n/a	n/a
Display fire active	Input status (R)	13	1x0014	1	
Display AHU in stop	Input register (R)	84	3x0085	0-3	
Display AHU at low speed	Input status (R)	3	1x0004	1	
Display outdoor temperature	Input register (R)	29	3x0030	1/100	°C
Show supply fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Show extract fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Heat	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Cooling	Input status (R)	n/a	n/a	n/a	n/a

GOLD RX/PX/CX/SD, GENERATION E

Modbus set-up

- Parity: None, Even, Odd
- Data bits: 8
- Stop bits: 1, 2
- Baud rate: 38,400 baud, 19,200 baud, 9,600 baud
- Address: 1 – 240

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	00	4x0001	1 ¹	
Set extract fan's control circuit	Holding register (R/W)	01	4x0002	1 ¹	
Set temperature control circuit	Holding register (R/W)	114	4x0115	3	
Set supply fan set point	Holding register (R/W)	20	4x0021	1/10 ²	Pa
Set extract fan set point	Holding register (R/W)	21	4x0022	1/10 ²	Pa
Set supply temperature set point	Holding register (R/W)	131	4x00132	1/100	°C
Set PIR input, if PIR is active in a zone	Coil status (R/W)	n/a	n/a	n/a	n/a
Display summer night cooling active	Input status (R)	08	1x0009	1	
Display fire active	Input status (R)	500	1x0501	1	
Display AHU in stop	Input register (R)	991	3x0992	0-9	
Display AHU at low speed	Input status (R)	2	1x0003	1	
Display outdoor temperature	Input register (R)	72	3x0073	1/100	°C
Show supply fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Show extract fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Heat	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Cooling	Input status (R)	n/a	n/a	n/a	n/a

¹ Value 1 is constant pressure regulation. It is used because the fan set points %SA and %EA are not available in version E.

² The 1/10 Pa scale changes the pressure set point to 0-1000 Pa.

NILAN CTS6000

Modbus set-up

- Parity: None, Even, Odd
- Data bits: 8
- Stop bits: 1, 2
- Baud rate: 38,400 baud, 19,200 baud, 9,600 baud
- Address: 1 – 240

AHU function	Modbus type	Address	Register	Value	Unit
Set supply fan's control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set extract fan's control circuit	Holding register (R/W)	n/a	n/a	n/a	n/a
Set temperature control circuit	Holding register (R/W)	265	4x0266	0	
Set supply fan set point	Holding register (R/W)	263	4x0264	1/10 ¹	Pa
Set extract fan set point	Holding register (R/W)	262	4x0263	1/10 ¹	Pa
Set supply temperature set point	Holding register (R/W)	257	4x0258	1/100	°C
Set PIR input, if PIR is active in a zone	Coil status (R/W)	n/a	n/a	n/a	n/a
Display summer night cooling active	Holding register (R/W)	270	4x0271	4	n/a
Display fire active	Input status (R)	n/a	n/a	n/a	n/a
Display AHU in stop	Input register (R)	n/a	n/a	n/a	n/a
Display AHU at low speed	Input status (R)	n/a	n/a	n/a	n/a
Display outdoor temperature	Input register (R)	23	3x0024	1/100	°C
Show supply fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Show extract fan alarm	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Heat	Input status (R)	n/a	n/a	n/a	n/a
Read Combi-coil Cooling	Input status (R)	n/a	n/a	n/a	n/a

¹ The unit must operate with constant pressure regulation. The 1/10 Pa scale changes the pressure set point to 0-1000 Pa.

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