NV Embedded®
Operation guide for facility managers

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Contents

1. Application 3
1.1 Disclaimer and privacy policy 3
2. General 3
3. Hardware components 4
4. Software structure 5
4.1 License key 5
4.2 WxC 3x0 P structure 5
4.3 Assigning NV Controllers to building zones 7
5. Operation 8
5.1 Configuration tools 8
5.1.1 Motor controller Touchscreen 8
5.1.2 WMaFlexiSmokeRemote 9
5.1.3 WMaMotorParamTool 9
5.1.4 WMaCloud 10
5.2 Configuration parameters 10
5.2.1 Adapting the NV Controller settings 10
5.2.2 Adapting Motor group settings 16
5.2.3 Adapting Motor line settings 17
5.3 Status 17
5.3.1 NV controller 17
5.3.2 WSK-Link™ 20
5.3.3 Motor group 20
5.3.4 Motor line 21
APPENDIX A – Definitions and terms 22

1. Application

The NV Embedded® system is exclusively designed for the automatic indoor climate control. Among other things the system opens and closes windows, flaps, doors or heating valves and running solar shade curtains, awnings or blinds up and down.
Always check that your system meets the valid national regulations.
Pay attention to windows, flaps or doors opening time and opening speed.

1.1 Disclaimer and privacy policy

WindowMaster shall not be liable for consequential damage that may arise in connection with the Customer's, the Administrator's, the facility manager, registered users', or anybody else's configuration changes in or operating the NV Embedded® system.

When using WindowMaster's app or dashboard to control the indoor climate in connection with an NV Embedded® solution, you register as a user with name, email address and password. Before you register as a user, you must accept our Terms of Use and General Terms for NV Embedded®, which is stated before downloading the app.
Your contact information is not stored in our CRM system, but only in a secured WindowMaster Cloud and only in connection with the building to which you have been granted access.

2. General

NV Embedded® (NVE) is an indoor climate control solution, utilizing natural ventilation to deliver optimized indoor climate in buildings. The NVE climate control is based on temperature, CO_2 level and relative humidity as well as outdoor temperature, wind, and precipitation. The solution includes hardware and software components and is in this document referred to as the system.

This document helps building facility managers with how to operate the NVE system and specifically how to adapt the performance of the NV Controller to achieve optimal indoor climate conditions and respond to specific needs of building users. The document assumes a fully operational NVE. It does not discuss setting the system up or commissioning it.

The document assumes that the reader has general knowledge of WindowMaster actuators and WindowMaster control units, specifically the WCC 3xx MotorController Plus series and the WSC 3x0 CompactSmoke™ Plus series. It also assumes that the reader is familiar with indoor climate control concepts and methods.

Integration levels

NVE can run as a standalone system, or it can be integrated with Building Management Systems (BMS). The required level of integration determines how the NVE is to be configured. Integration can be achieved through either the BACnet, the Modbus or the KNX fieldbus technology. This document describes the operation of NVE when it is running as a standalone system. Similar operations can be achieved through integrated BMS systems.

WMaCloud

A Cloud solution, called WMaCloud, is an optional part of the system. WMaCloud is used for data logging and remote access. The Dashboard of the WMaCloud solution, provides facility managers with the same operation functionality as described in this document. The WMaCloud solution also includes a mobile device app, giving occupants of a building overview on indoor climate in the building and the possibility to override the automatic control of windows.
WMaCloud is not described in this document.

3. Hardware components

The system described here includes the Natural Ventilation (NV) control module of the NVE. Other modules of the system like Heating control, Mechanical ventilation or sun shading control are discussed but their hardware components are not described.

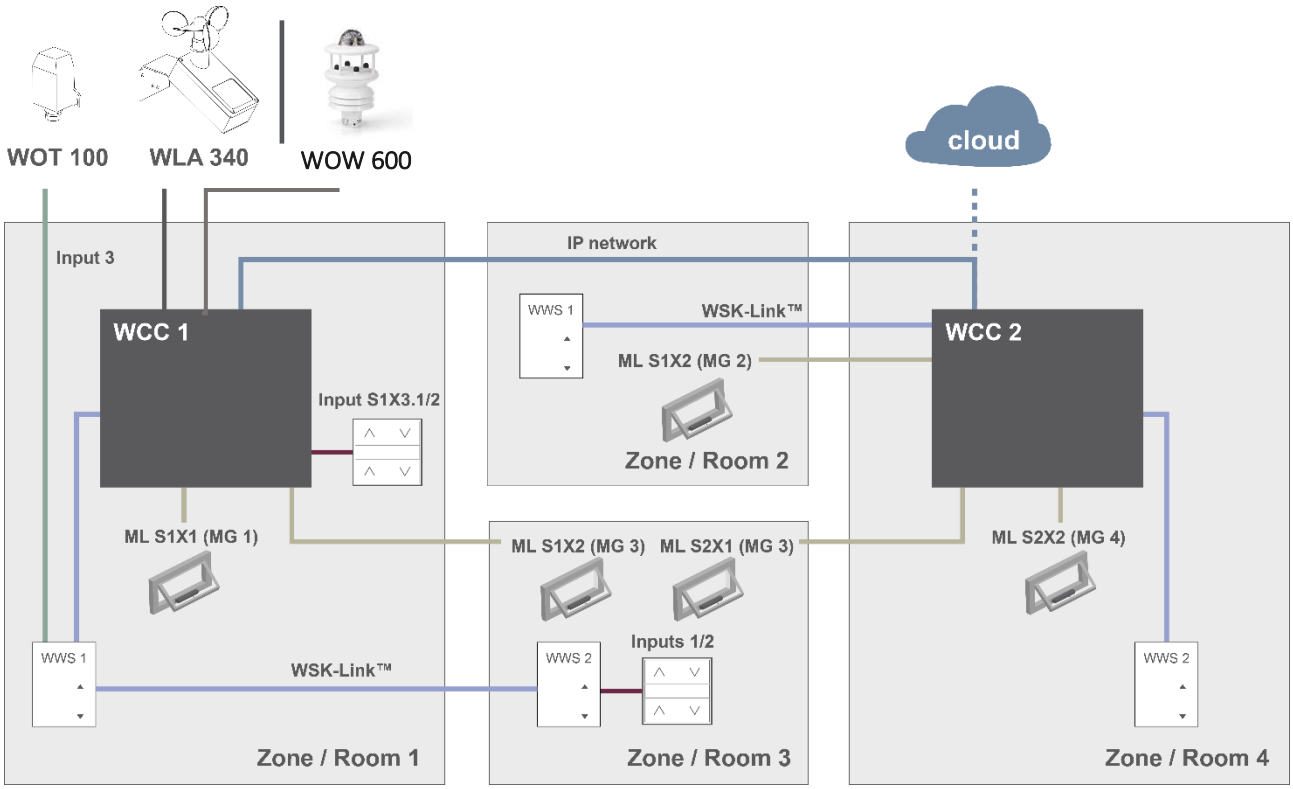


Figure 1

The above figure shows the components and the connecting cables, which are required to implement a NVE system in a building with 4 zones and 5 windows.

The **product list of this system includes:**

- MotorController: 1 x WCC 310 P 0202 and 1 x WCC 320 P 1012
- Actuator: 5 x WMX 804-1
- Indoor room sensor: 4 x WWS 100
- Comfort keypad: 2 x WSK 120
- Weather station: 1 x WOT 100 and 1 x WLA 340 | or 1 x WOW 600

4. Software structure

4.1 License key

The software implementing the Indoor Climate Control of the NVE system is embedded in and running on the WxC 3x0 P Control Unit, hence the name NV Embedded®. To activate the NVE software on the Control Unit the NVE Dongle license key must be inserted in the USB port on the Control Unit.

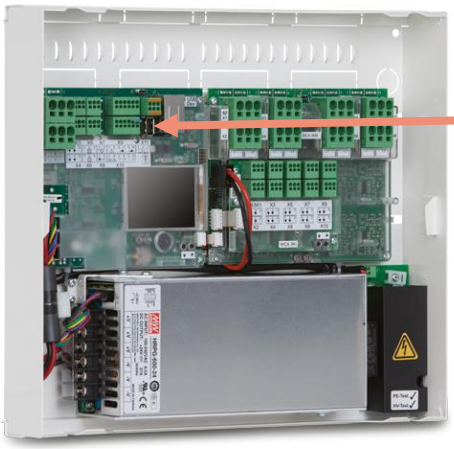


Figure 2

WCC 3xx P xxxx – MotorController, used for running window actuators, heating valves and sun shading actuators, as well as running the NV Embedded® software to control the indoors climate in a building.

Figure 3

NVE Dongle – A USB key including a license key for the NV Embedded® software and information for Cloud connecting, as well as a Cloud ID.

4.2 WxC 3x0 P structure

The indoor climate control embedded in the WxC 3x0 P Motor controller is implemented with the following software modules, referred to as:

- **NV Controller**
  Controls the Natural Ventilation (NV) in a zone by opening/closing openings in the facade and/or the roof of the building. Must be active for a Heating or a Mech. Vent. Controller to be able to run.
- **Heating Controller**
  Controls the temperature in a zone using the available heating source like radiators, floor heating, air handling units and the like. The Heating controller is dependent on the NV Controller for temperature set points and actual sensor values. Heating Controller #1 is depending on NV Controller #1 and so on.
- **Mech. Vent. Controller**
  Controls mechanical ventilation equipment like VAV, AHU, exhaust ventilators and the like. The Mech. Vent. controller is dependent on the NV Controller for temperature set points and actual sensor values. Mech. Vent. Controller #1 is depending on NV Controller #1 and so on.
- **Sun shading Controller**
  Controls sun shading equipment.

- **Pulse schedule**
  Defines time schedules for pulse ventilation in addition to or instead for the demand driven pulse ventilation. Pulse ventilation is utilized when the system is in the Winter (heating) mode.

- **Building schedule**
  Defines a schedule for activating different building control scenarios. 3 basic control scenarios including building: “Occupied”, “Secured” and “Unoccupied” can be defined. A “Night” state can be selected with each of the basic scenarios.

the below figure illustrates the structure of WCC 3xx P MotorController and the relationship between its hardware and software components.

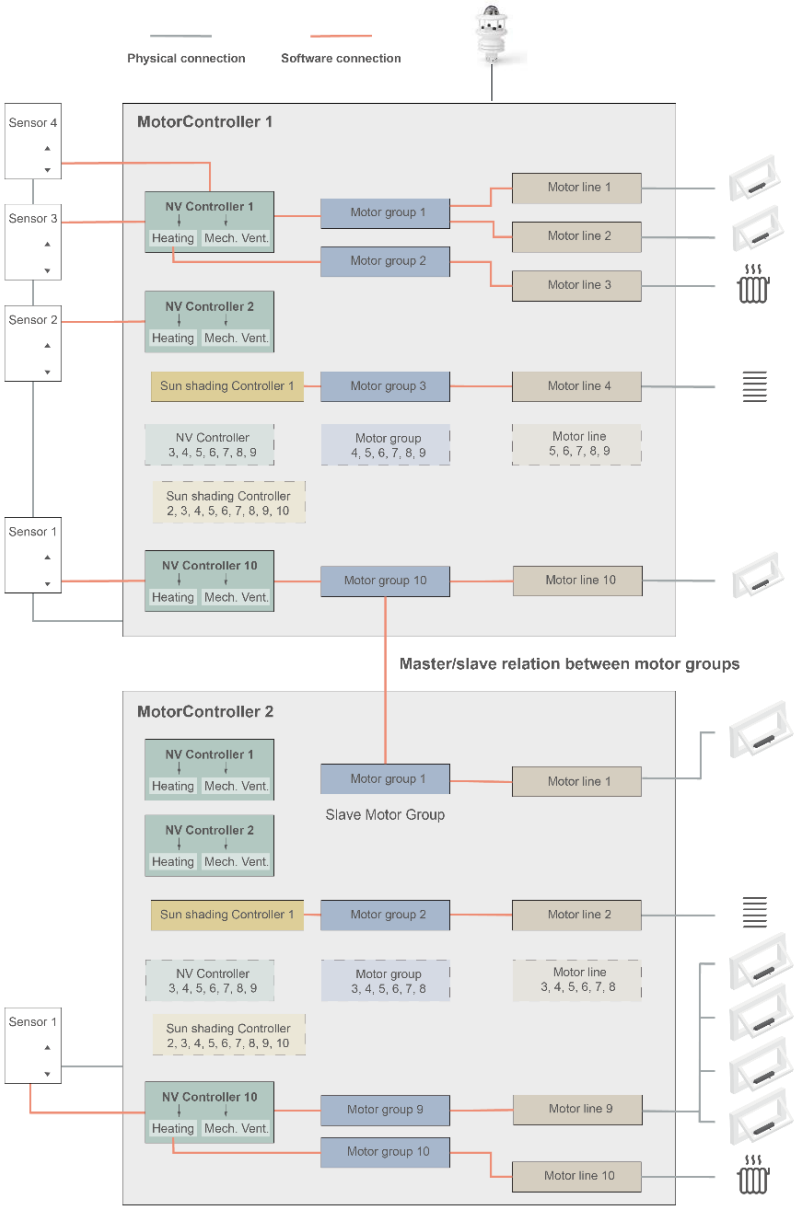


Figure 4

- Actuators, mounted on windows, are physically connected to the motor lines of the MotorController.
- Motor lines are associated with motor groups.
- Motor groups are associated with NV Controllers.
- WWS 100 sensors are physically connected to MotorControllers through WSK-Link™ cables. The sensors are then associated with NV Controllers.
- Motor groups on 2 different MotorControllers can be related in a 'Master/Slave' relation so the Slave Motor group always follow the position of the Master motor group.

Max number of components on a MotorController

- Max 10 motor lines per MotorController
- Max 10 motor groups per MotorController
- Max 10 NV controllers per MotorController
- Max 15 WWS 100 sensors connected per MotorController

4.3 Assigning NV Controllers to building zones

A building is divided into zones. Most often a room is equal to a zone, but in some cases larger areas in a building, like a large open office area or a sports hall, can be divided into several logical zones. NVE controls the indoor climate in each zone independently from all other zones.

The indoor climate in a zone is controlled by a NV Controller, sometimes together with other Controllers. When NVE only controls the heating in a zone, the corresponding NV Controller must still be active to supply the Heating controller with set points and current sensor values.

Not all software controllers have to be active/present in a zone but when they are, they are working together to deliver the optimal indoor climate in the zone.

To select the Control Unit, which will run the NV Controller for a specific zone you have to look for the WWS 100 sensor that is installed in that specific zone. The Control Unit, this sensor is connected to, is the Control Unit that must run the NV Controller that will control the zone. Figure 5 illustrates assigning NV Controllers to the 4 zones in our example project.

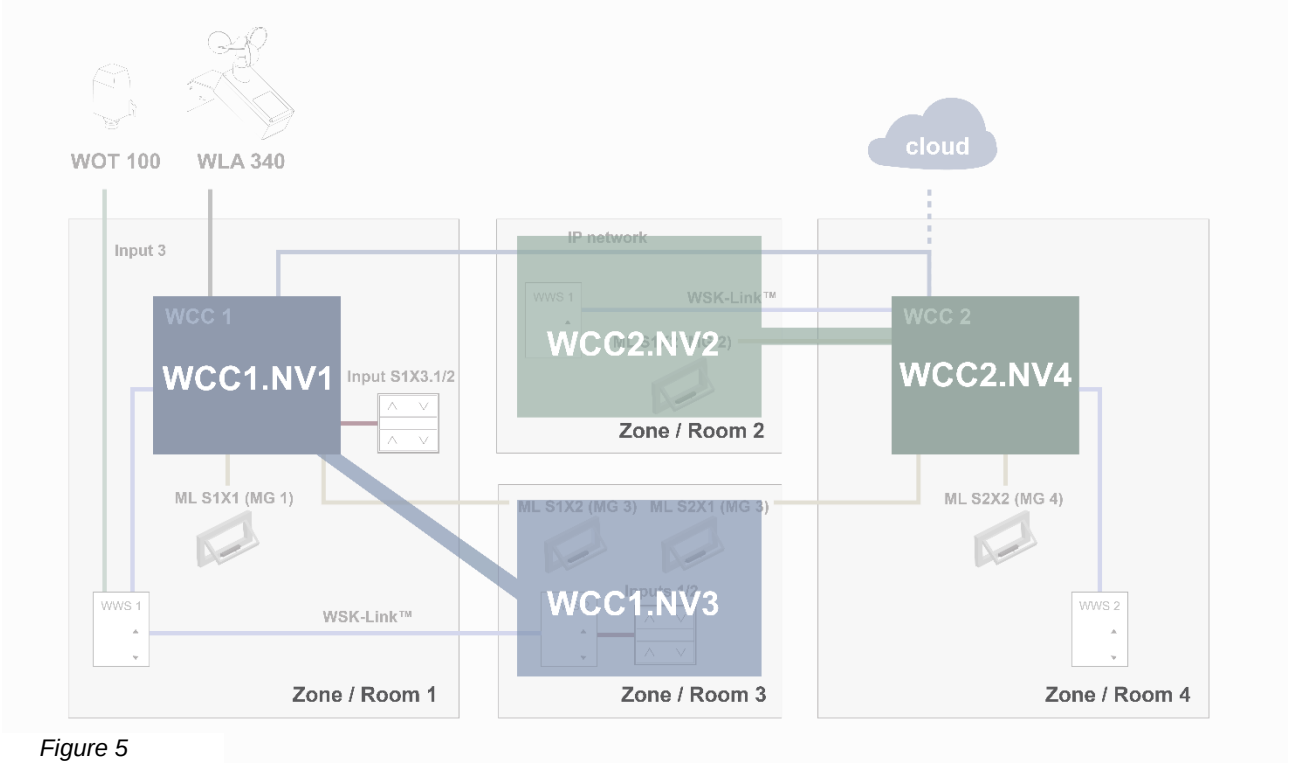


Figure 5

In the example project, we assigned WCC1.NV Controller1 (WCC1.NV1) to control Zone 1 since sensor WCC1.WWS1 and window WCC1.S1X1 are physically connected on WCC1.

We assigned WCC1.NV Controller3 (WCC1.NV3) to control Zone 3 since sensor WCC1.WWS2 and window WCC1.S1X2 are physically connected on WCC1.
Note that Zone3 has another window connected on WCC2. To control this window from WCC1.NV3, we defined a Master/Slave relation between WCC1.MG3 and WCC2.MG3.

We assigned WCC2.NV2 to control Zone 2 since sensor WCC2.WWS1 and window WCC2.S1X2 are physically connected on WCC2.

We assigned WCC2.NV4 to control Zone 4 since sensor WCC2.WWS2 and window WCC2.S2X2 are physically connected on WCC2

5. Operation

The NV Embedded® logic for controlling the indoor climate of a zone in a building is implemented in the NV controller software module. The NV controller employs and shares data with other software modules, like the Heating controller or the Pulse schedule, to achieve the optimal indoor climate in the zone.

The NV controller utilizes two basic ventilation strategies to control the indoor climate in a zone, depending on the temperature condition in the zone.
When a zone needs cooling, the zone is said to be in a “Summer mode” and the NV controller will employ the ‘Temperature control’ ventilation mode, operating windows to lower the temperature in the zone to the desired temperature setpoint.
When a zone needs heating, the zone is said to be in a “Winter mode” and the NV controller will employ the ‘Pulse and Trickle ventilation’ modes, operating windows to keep a good air quality in the zone, while minimizing heating energy loss and uncomfortable tract, due to opening windows and getting colder air into the zone.

Adapting the operation of the NVE system is achieved by manipulating Configuration parameter values. Different configuration tools are available, giving access to these parameters. The same tools also give access to Status parameters that indicate the actual status of the NVE system.

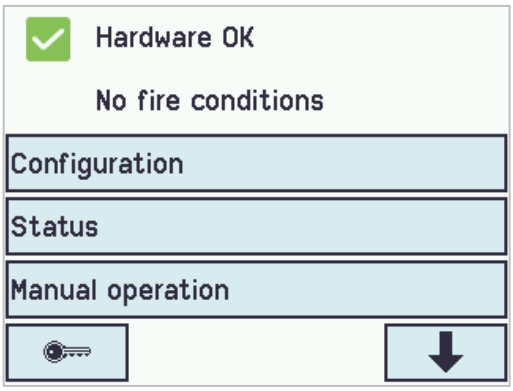
5.1 Configuration tools

There are 4 different configuration tools available, each with their own strengths.

5.1.1 Motor controller Touchscreen

The entire configuration of an NVE system can be achieved from the touchscreen of the WxC 3x0 P control units. To access configuration parameters, press the ‘key’ button and use the Level 3 PIN code (4321) to logon.

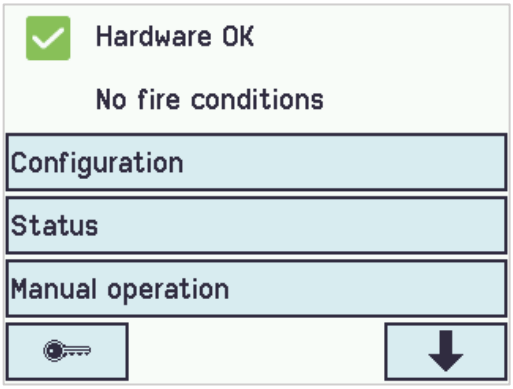
Note – Basic configuration parameters are visible in the ‘Configuration’ menu point while more advanced parameters are only available in the ‘View all details’ menu point. Scroll down in the Main menu to find the ‘View all details’ menu point. Status parameters are visible in the ‘Status menu point.



+ Always available. A computer is not needed.
+ Access to all parameters, depending on PIN code.
- Requires physical access to the Motor control.
- Access to only one Motor controller at a time, lacking system overview.

5.1.2 WMaFlexiSmokeRemote

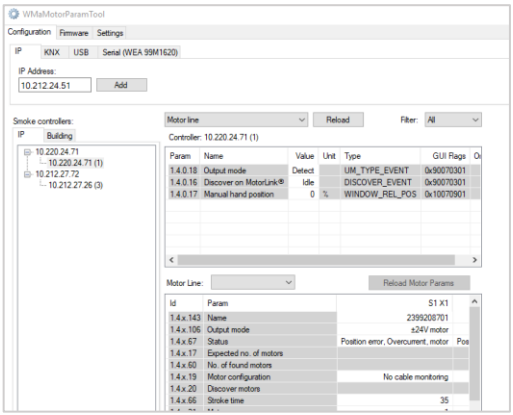
Once Network settings are done, configuration can be achieved through the WMaFlexiSmokeRemote tool. The tool communicates with Motor controllers on the LAN. It replicates the Touchscreen of the Motor controller on a computer screen. This tool is available from the WindowMaster website.



+ Remote access via network.
- Requires pre-knowledge of IP addresses.
- Access to only one Motor controller at a time. Limited system overview.
- 'Enable remote control' must be "Yes".

5.1.3 WMaMotorParamTool

Once Network settings are done, configuration can be achieved through the WMaMotorParamTool tool. The tool communicates with Motor controllers on the LAN. Contact WindowMaster for access to the tool.



+ Remote access via network.
+ System overview of Motor controllers and building zones.
+ Automatic discovery of Motor controllers connected on LAN.
+ Possibility to manipulate more than one parameter at a time.
- Motor controllers must be preconfigured with IP addresses.
- 'Enable parameter set from network' must be "Yes".

Note – The WMaMotorParamTool communicates with the Motor controllers by using the polling method. It means that the values and parameters you see on screen, are from the last time a Motor controller was polled. Values are not automatically updated when they are changing on the Motor controller. To ensure you are looking at the current values and current visible parameters on a Motor controller, **you must press the 'Reload'** button.

Note – Some parameters only become visible when the functions they support become available. For example, the parameters of a NV Controller become visible once you “Enable” the NV Controller. To see newly visible parameters, **you must press the ‘Reload’ button.**

5.1.4 WMaCloud

The WMaCloud Dashboard implements the Facility managers User interface to the NVE system. To learn about WMaCloud please refer to the WMaCloud User manual.

5.2 Configuration parameters

This document uses screenshots from the Motor Controller’s Touchscreen to discuss the Configuration and the Status parameters.

The configuration parameters, discussed here, are the parameters most used to adapt the operation of the NVE system to the specific needs of building users. For a description of all available parameters please consult the Appendix to the Motor controller´s Installation manual.

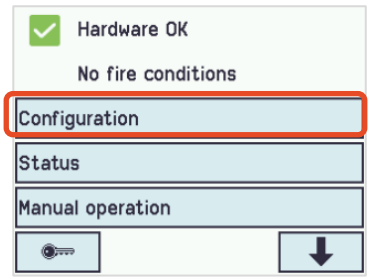
5.2.1 Adapting the NV Controller settings

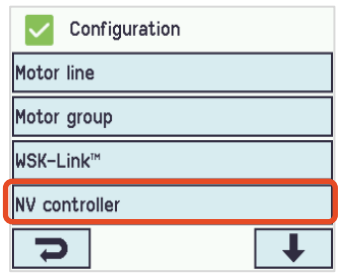
NV Controllers are the software objects controlling the indoor climate in the building zones. NV Controllers include many parameters to enable adapting the controlling of the indoor climate in the zones to the specific needs of their occupants. In most cases, the default parameter values of the NV controller can be used, and only few parameters may need altering.

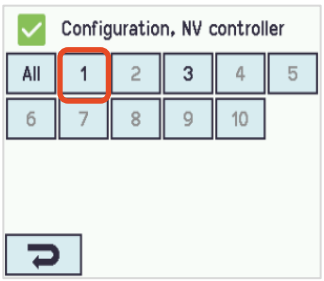
The NV controller employs the ‘Temperature controlled’ ventilation when in the “Summer” mode. The main purpose of opening windows in ‘Temperature controlled’ ventilation is to let colder air into the building to lower the indoor temperatures to the *‘Comfort temperature setpoint’*. The controller employs ‘Pulse ventilation’ or ‘Trickle ventilation’ when in the “Winter” mode. The main purpose of opening windows in ‘Pulse’ or ‘Trickle’ ventilation is to let fresh air into the building to secure air quality.

The following are the most common parameters you should consider when adapting the operation of NV controllers to user requirements.

Select: *Configuration>NV Controller>[#]* (The no. of the NV controller you would like to manipulate) to reach the NV controller’s configuration parameters and then scroll down to the parameter to adapt.







5.2.1.1 Temperature setpoints

Temperature setpoints are noted here in Kelvin units. Note that 1K=1°C.

The *'Comfort temperature setpoint'* is the basic setpoint the controller is trying to keep in the zone, when in Comfort state. Setting a higher setpoint will result in a higher temperature in the zone.

When the controller is in the "Winter" mode it will use the *'**Heating** temp. setpoint offset, standby or night'* to calculate the actual setpoint when running in the Standby or the Night state.

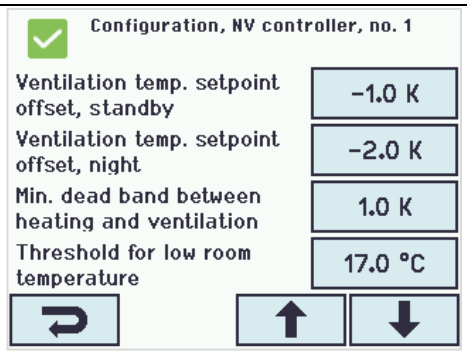
Setting a larger *'Heating temp. setpoint offset, night'* will result in a lower temperature in the zone during the Night state and consequently a larger energy saving during nighttime.
When the controller is in the "Summer" mode it will use the *'**Ventilation** temp. setpoint offset, standby or night'* to calculate the actual setpoint when running in the Standby or the Night state.

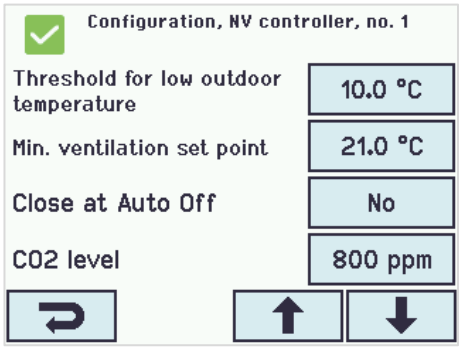
Setting a larger *'Ventilation temp. setpoint offset, night'* will result in a lower temperature in the zone during the Night state and consequently a larger Night-Cooling effect.
The controller uses the *'Min. dead band between heating and ventilation'* and the 'Threshold for low outdoor temperature' to determine when to switch between the "Winter" (heating) and "Summer" (ventilation) modes.

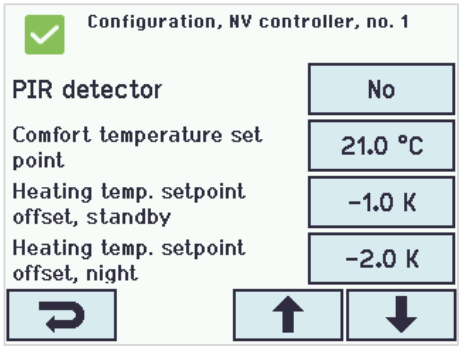
When the controller is in "Winter" mode and the temperature in the zone is rising over the [(Comfort setpoint + deadband) AND the outdoor temperature is over the '*Threshold for low outdoor temperature'*], the controller will switch from "Winter" to Summer" mode.

When the controller is in "Summer" mode and the temperature in the zone is falling under the [(Comfort setpoint - deadband) AND the outdoor temperature is under the *'Threshold for low outdoor temperature'*], the controller will switch from "Summer" to "Winter" mode.
The consequence of a larger deadband is that the controller will be slower to switch between "Winter" and "Summer" modes.

The consequence of a higher *'Threshold for low outdoor temperature'* is that the controller is staying in the "Winter" mode for longer periods.
When the indoor temperature is under the *'Threshold for low room temperature'* The controller will stay in "Winter" mode.
The *'Min. ventilation set point'* guarantees that the actual *'Comfort temperature set point'* cannot be lower than that.



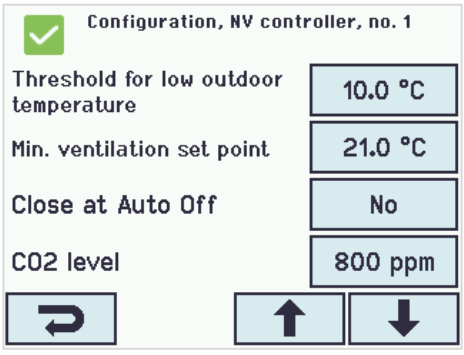




5.2.1.2 CO2 level

The *'CO2 level'* defines the level in which CO2 concentration begins to influence 'Comfort ventilation'. Higher CO2 concentrations reduces the actual *'Comfort ventilation setpoint'* and as a result gets the controller to open the windows more.

The consequence of a higher *'CO2 level'* is less opening of windows and less ventilation.



5.2.1.3 Pulse ventilation

Pulses can be demand driven or scheduled.

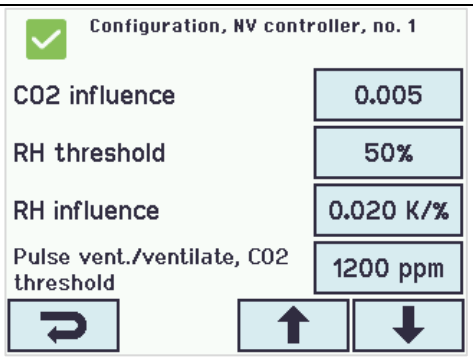
Demand driven pulse ventilation

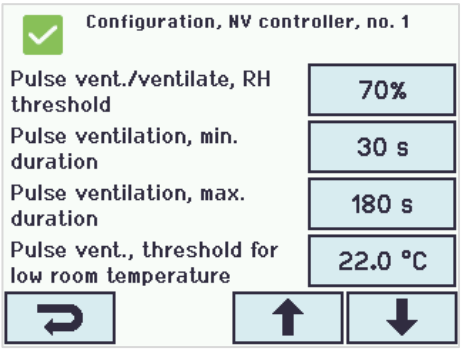
The *'Pulse vent./ventilate, CO2 threshold'* defines the level in which the controller begins to perform pulses. Increasing the *'Pulse vent./ventilate, CO2 threshold'* will result in less ventilation but also less heating loss through opened windows.

The opening position during a pulse depends on the CO2 and humidity levels in relation to the CO2 and Humidity thresholds and it is limited by the 'Max. AER, winter' parameter. AER stands for 'Air Exchange Rate'. The parameter limits the amount of air which is allowed to flow through the windows. It is measured in how many times per hour the amount of air in the zone exchanged. Higher Max. AER will result in windows allowed to open more and potentially more fresh air per hour, coming into the zone.

'Pulse ventilation, min. and max duration' define the minimum and maximum duration of a demand driven pulse. The higher the CO2 concentration the longer is the single pulse duration and the more frequent pulses are performed.

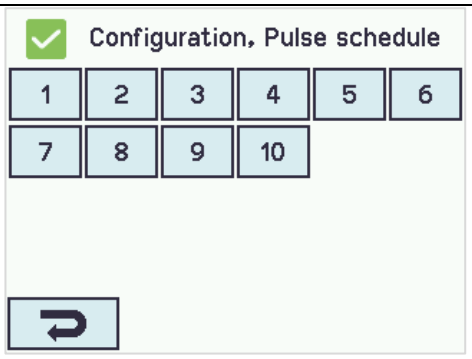
The *'Pulse vent., threshold for low room temperature'* defines the temperature level, under which pulses are not performed.





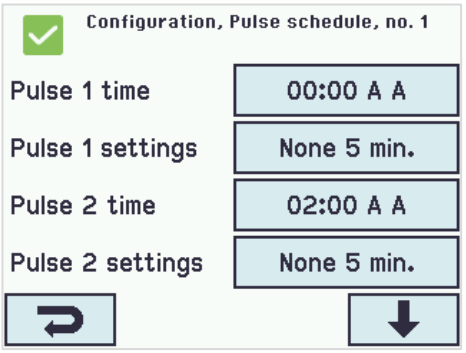
Scheduled pulse ventilation
Navigate to the ‘Pulse schedule’ menu to schedule pulses execution.

Select the schedule number that corresponds to the NV controller that controls the zone you would like to schedule pulses for.



You can schedule up to 12 pulses a day.

Press the ‘Pulse x time’ to define:



The first column from the left defines hour.

The second column defines minutes

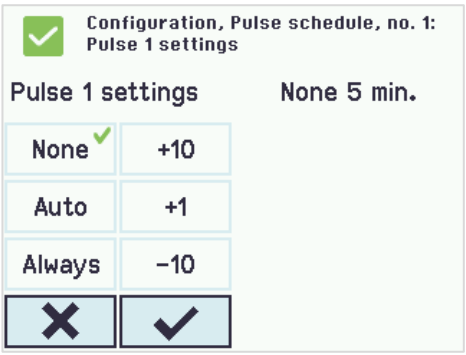
The third column defines if the pulse is to be executed only during working days, only in weekends or in both.

The fourth column defines if the pulse is to be executed in winter mode, in Summer mode or in both.

Press the ‘Pulse x settings’ to define:

The first column defines if the pulse is not to be executed, to be executed automatically, meaning only if the CO2 or humidity levels in the zone, are higher than the threshold, or always, regardless of CO2 and humidity levels.

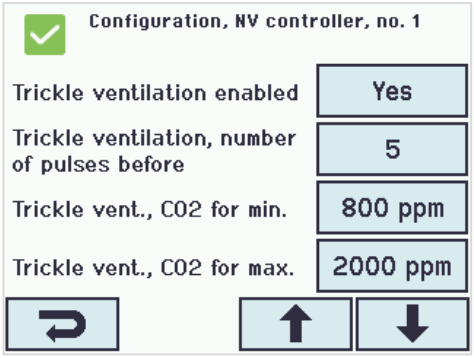
The second column is used to specify the pulse duration.

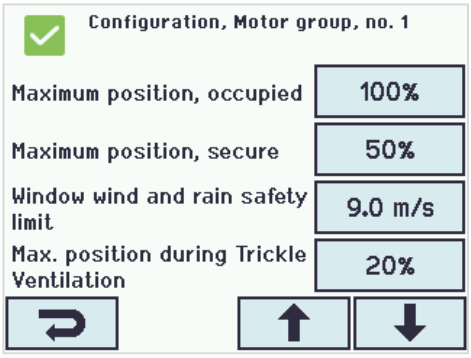


5.2.1.4 Trickle ventilation

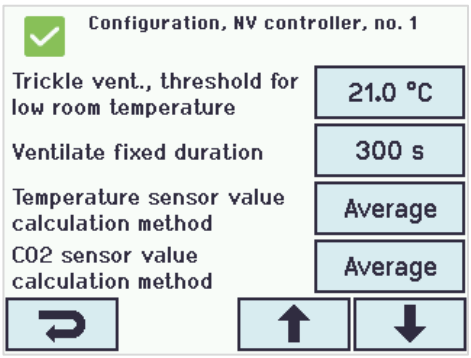
When Trickle ventilation is enabled, the controller will switch automatically from Pulse to Trickle ventilation if the '*Trickle ventilation, number of pulses before'* is performed but the CO2 level has not fallen below the 'CO2 level'. If you set the '*Trickle ventilation, number of pulses before'* = 0, the controller starts Trickle ventilation without trying Pulse ventilation before.

'Trickle vent., CO2 for min and max.' defines the range that corresponds to the window opening. The min. level corresponds to 0% opening, the max. level corresponds to 100% Trickle opening. The actual window opening, that corresponds to 100% Trickle opening, is defined in the *'Max. position during Trickle ventilation'* in the Motor group menu. Different Motor groups in the zone can thus have different Trickle opening.



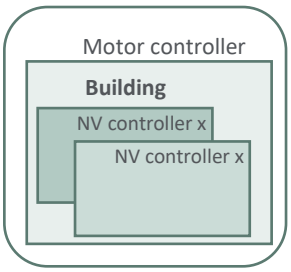


The *'Trickle vent., threshold for low room temperature'* defines the temperature level, under which Trickle ventilation will not start.



5.2.1.5 Building states and the Building schedule

NVE includes a 'Building' software module, as a means of sharing data among the NV controllers running on one and the same Motor controller.

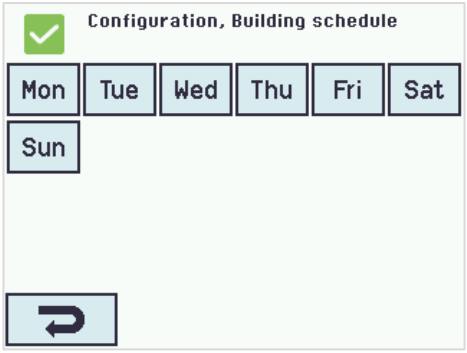


A NV controller can, among other data, receive its security states from the 'Building' module. The Three states available are 'Occupied', 'Secure' and 'Unoccupied'. There are Motor group Max opening position parameters associated with each of the security states. See the next paragraph for farther description of these parameters.

The Building schedule can be used to schedule events where, during the day, the 'Building' and thus its NV controllers, changes from one state to another.

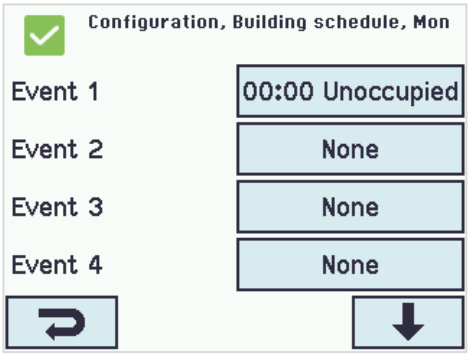
Using the Building schedule

In the Building schedule menu select the day you want to create an event for.



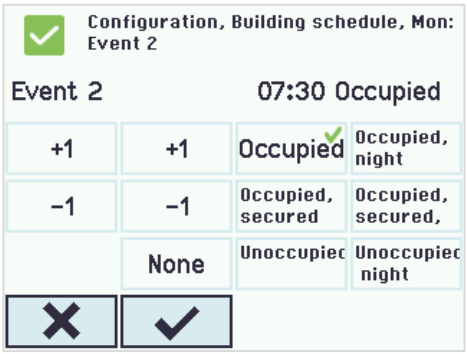
You can create up to 8 events for each day of the week, but you must create the first event at 00:00.

Select an event to create.

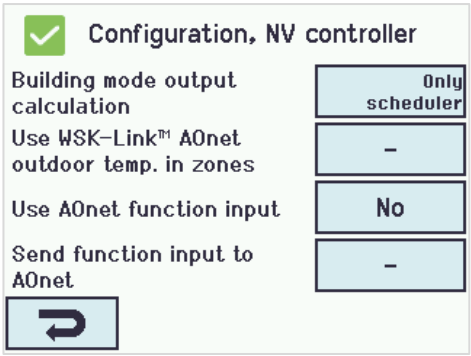


Specify hours and minutes in the 2 left columns to set the time for the event.

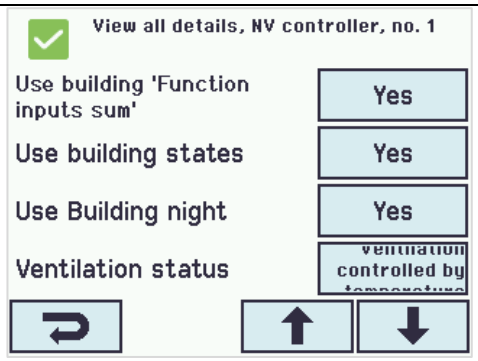
Select the state of the event from the 2 right columns.



In the NV controller>All menu, set the *'Building mode out calculation'* to "Only scheduler".



For each NV controller that you want to receive the Building states, go the ‘View all details>NV controller’ menu, select the NV controller instance and set the *‘Use building states’ to “Yes”.*



5.2.2 Adapting Motor group settings

You can limit the maximum allowed opening of windows in different situations. You can, for example, define the max opening when the building is ‘occupied’ and when the building is ‘unoccupied’. Setting the max opening is done in the Motor group level, allowing, for example, for skylight windows to be open more than façade windows when a building is unoccupied. When maximum opening parameters limit opening to different degrees, it is always the most limiting parameter that is the actual maximum opening of a Motor group.

5.2.2.1 Maximum opening settings

The *‘Comfort maximum position’* is for general limitation. Use it if there is a permanent obstacle that prevents a Motor group from opening fully.

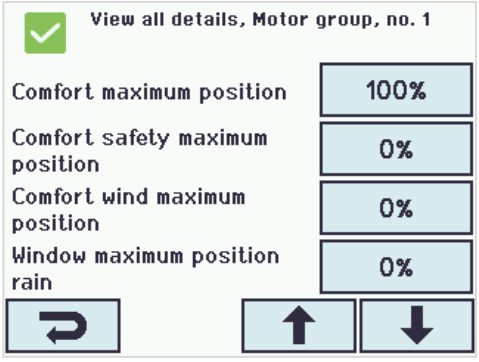
The *‘Comfort safety maximum position’* is active when a Motor group receives an active “Safety” signal. A signal that the burglary alarm is activated can, for example, be sent as a “Safety” signal to a Motor group.

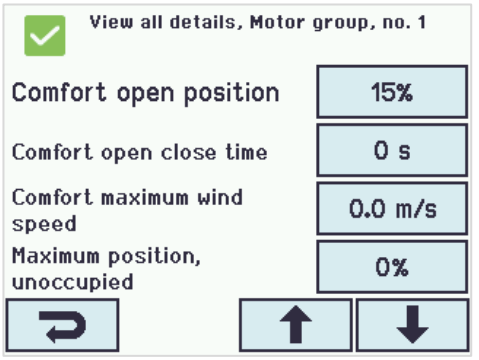
The ‘C*omfort wind maximum position’* is activated when the actual wind speed exceeds the *‘Comfort maximum wind speed’* Threshold. When the *‘Comfort maximum wind speed’* is set to 0, the ‘C*omfort wind maximum position’* is disabled.

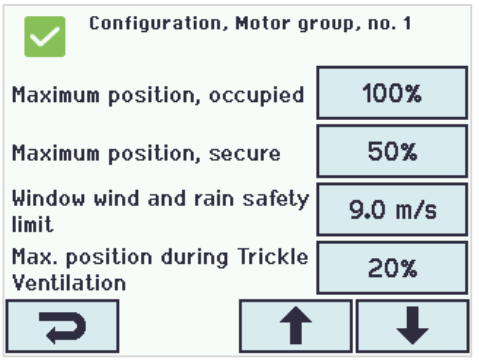
The ‘*window maximum position rain’* is active when a Motor group receives an active “Rain” signal.

Consult the Motor controller Installation manual to learn how to send the “Safety” and “Rain” signals to Motor groups.

The *‘Maximum position, unoccupied, occupied and secure’* are active when a NV Controller, the Motor group is associated with, is in the “Unoccupied”, “Occupied” or “Secure” state. A NV Controller can receive its states from either Local Inputs or from the Building schedule.



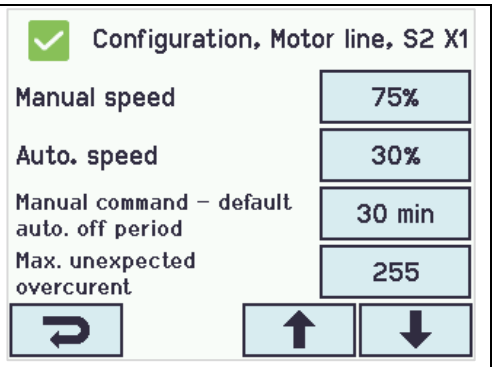




5.2.3 Adapting Motor line settings

5.2.3.1 Manual override

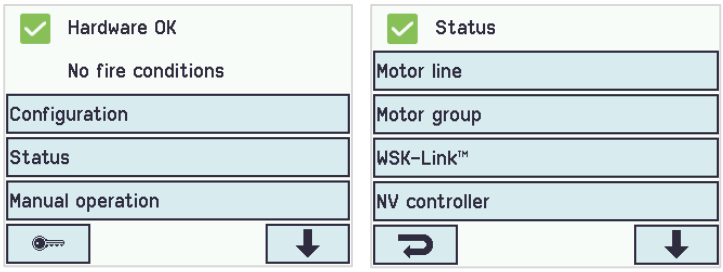
The *'Manual command – default auto. Off period'* defines the period, the Motor line ignores the auto commands, after a manual command is given to it. The longer the period, the longer the Motor line is kept out of the automatic control of the system.



5.3 Status

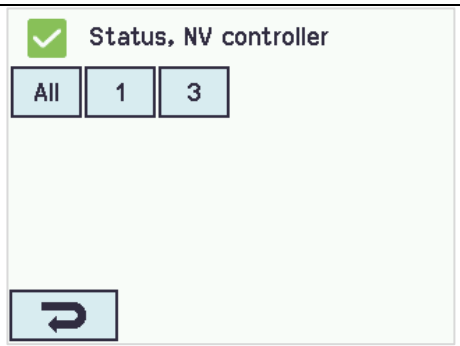
The values of Status parameters indicate the current state of different parts of the system. Status parameters help you understand what the system is currently doing and thus enables you to adjust and adapt the performance of it to suit the needs of the users of the building. In the following we review the most common Status parameters.

Select the <Status> menu and then the relevant sub-menu points.



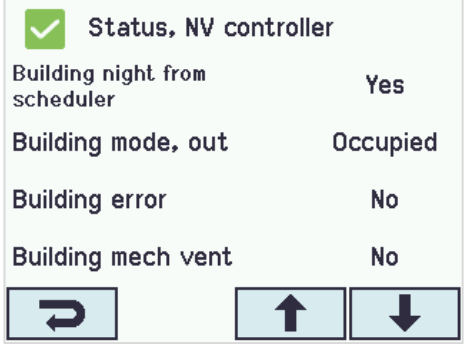
5.3.1 NV controller

The <All> menu is also called the Building menu because it shows status related to all the NV controllers in the specific Motor controller.



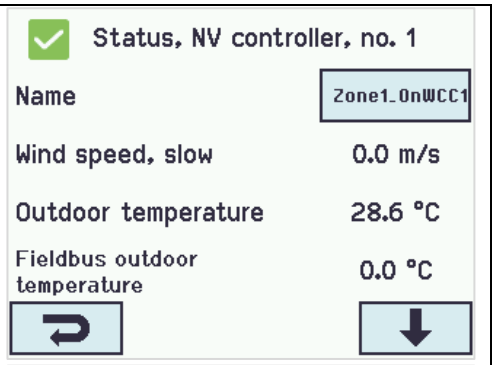
'Building mode, out' shows the current Building mode - "Occupied/Unoccupied/Secure".

'Building error' indicates that there is at least one NV Controller with an error.

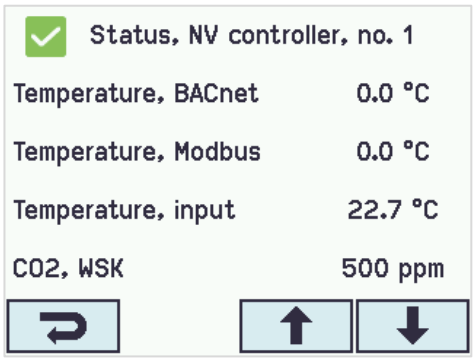


The main Status parameters specific for each NV controller –

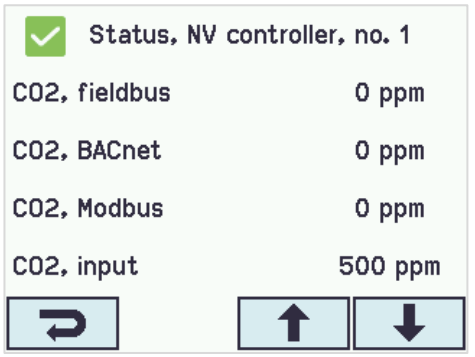
'Wind speed' and *'Outdoor temperature'* indicate the weather conditions the NV controller receives.



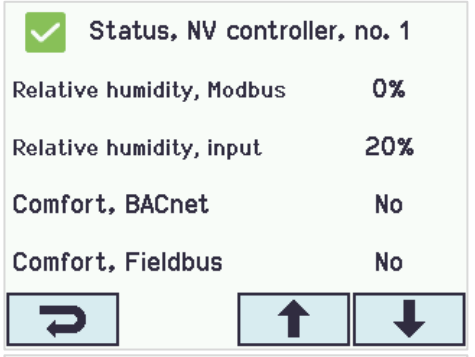
'Temperature input' is the current temperature in the zone.



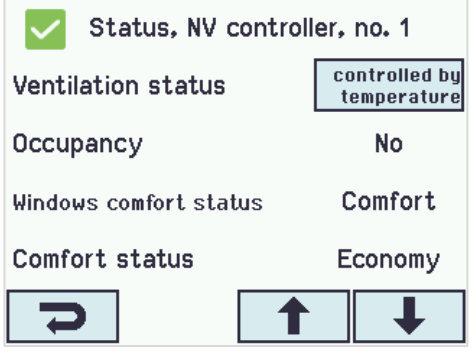
'CO2 input' is the current CO2 level in the zone.



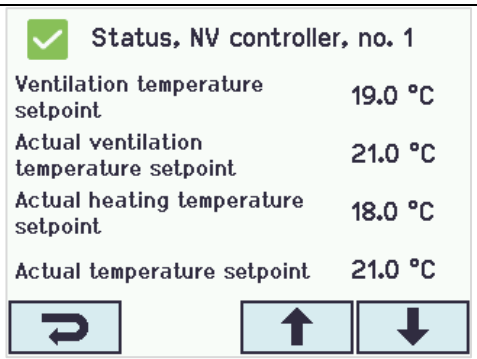
'Relative humidity input' is the current humidity level in the zone.



'Ventilation status' indicates the current ventilation mode of the NV controller.

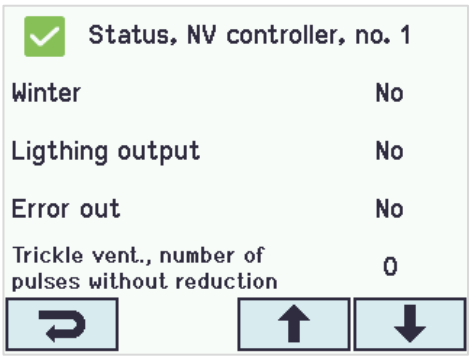


'Actual temperature setpoint' indicates the current temperature setpoint the NC controller is using.

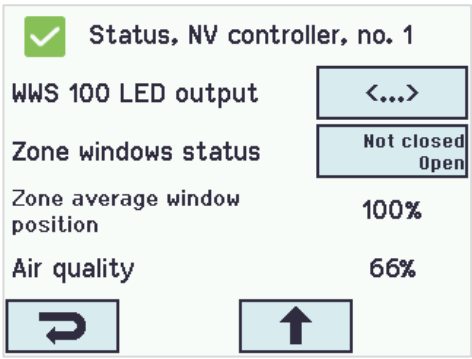


'Winter' indicate whether the NV controller is in "Winter" or "Summer mode.

'Error out' indicates an error in the zone.



'Zone windows status' and 'Zone average window position indicate the current state and average position of the windows in the zone.

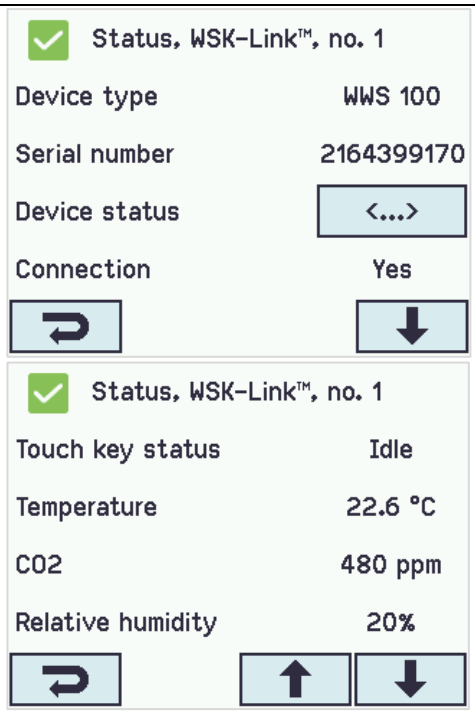


5.3.2 WSK-Link™

In the WSK-Link™ menu you can see the status of each WWS 100 sensor connected on the Motor controller.

'Device status' indicates the status of the WWS 100 sensor. Press the button to see the details.

'Temperature', 'CO2' and *'Relative humidity'* indicate the current measured values.



5.3.3 Motor group

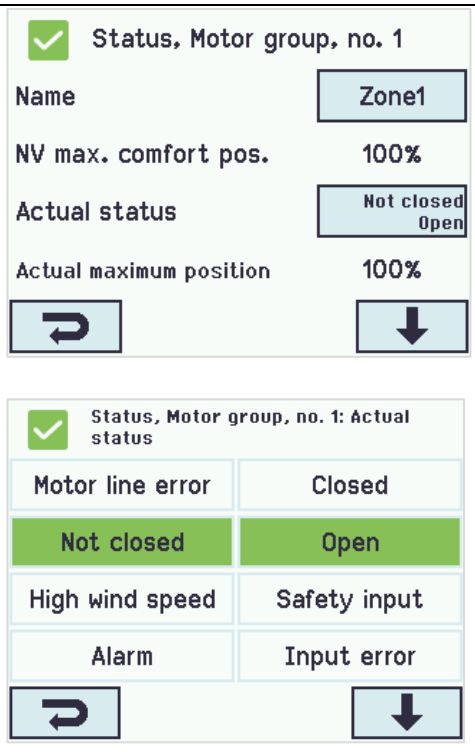
The *'Actual status'* indicates the current state of the Motor group. Press the button to see the details.

The *'Actual maximum position'* indicates the current Motor group opening limitation, regardless of the active limiting signal. The

'Actual status' is indicated by the active signals in green.

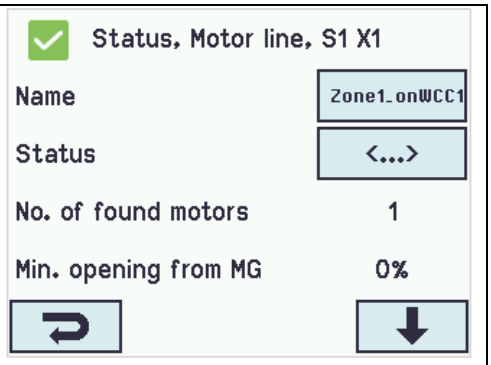
The *'Actual maximum* position' limitation is sent to all the Motor lines, associated with the Motor group.

When windows are not opening as you expect, you should always look at the *'Actual status'* and *'Actual maximum position'* of their Motor group, to see if, and why, their maximum position is limited.



5.3.4 Motor line

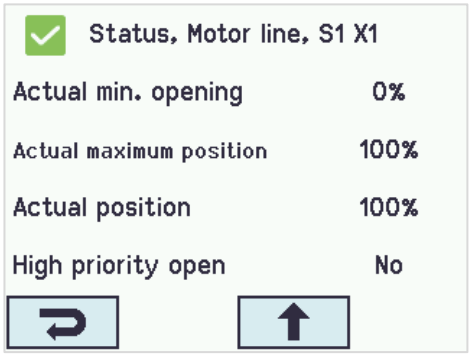
The *'Status'* indicates the current state of the Motor line. Press the button to see the details.



The *'Actual maximum position'* indicates the current Motor line opening limitation.

When windows are not opening as you expect, you should always look at the *'Actual maximum position'* to see if their maximum position is limited.

The *'Actual position'* indicates the current position of the windows, connected on the Motor line.



APPENDIX A – Definitions and terms

CompactSmoke™ panel	A physical device, to which the window actuators, weather station and WWS 100 sensors can be connected. The NVE software is also running on this device.
Heating Controller	A software object for controlling heating actuators.
Mech. Vent. Controller	A software object for controlling mechanical ventilation.
Motor group	A group of one or more Motor lines that you intend to control together. For example, you may want to control façade and skylight windows in a zone in two separate Motor groups
Motor line	An output to physically run window actuators. You can connect more than one actuator to a single Motor line and can therefor run more than one window from one Motor line but if a single window requires more than one actuator to run, we strongly recommend that you use one Motor line to run a single window.
MotorController	A physical device, to which the window actuators, weather station and WWS 100 sensors are connected. Either type WCC 3x0 P or a CompactSmoke™ panel type WSC 3x0 P. The NVE software is also running on this device.
NV Controller	A software object to control the indoors climate in a zone. The NV Controller receives sensor information and controls windows, heating, and mechanical ventilation to maintain the desired indoor climate in the zone.
NVE Dongle	A USB stick, which includes the license key for the NV Embedded® software, as well as the cloud ID to be used by the Motor controller, when connecting to WMaCloud.
Sun shading controller	A software object for controlling sun shading actuators.
WMaCloud	A Cloud solution provided by WindowMaster enabling system administration from the Cloud and the use of a mobile app.
Zone	An area in a building that a NV Controller controls. A zone in most cases corresponds to a room – an office, a classroom – in the building. In some cases, one large space in a building, such as an atrium or an open plan office, can be divided into 2 zones.