RIDDER

Installation Manual
HortiMaX-Go!

Helping you grow
your way

Contents

1   Introduction to this manual

Welcome to the Installation Manual for the HortiMaX-Go!. This manual was originally published in Dutch and English.

1.1   Introduction

The HortiMaX-Go! is an easy-to-use and affordable control computer designed specifically for the horticultural sector. With the HortiMaX-Go!, you can control both the climate and irrigation inside your greenhouse. The HortiMaX-Go! is easy to customize by selecting the 'Smart Switches' that meet your individual needs. These Switches provide simple plug-and-play installation.

The HortiMaX-Go! is also a breeze to operate using its touchscreen display. By using the CloudBox and the HortiMaX-Go! app, you can even operate the HortiMaX-Go! remotely with your smartphone. You can manage your Cloudboxes, controllers and app users on our CloudPortal.

1.2   Purpose

The purpose of this manual is to instruct you on how to install the HortiMaX-Go!.

1.3   Target group

This manual is intended for dealers and installers.

1.4   Symbols and method of notation

This manual uses specific symbols and methods of notation. This section explains the main symbols and methods of notation used.

1.4.1   Symbols

This document may contain the following symbols:

> **!** Note: This notice provides important information or a warning. Ignoring this information may result in product damage or personal injury.

> **!** Note: This notice provides important information or a warning.

> **i** Information: This notice provides additional information or a brief explanation.

> **☀** Tip: A tip provides a useful suggestion, such as a preference setting or a recommended course of action.

1.4.2 Method of notation

The following method of notation is used in the user instructions:

- » A button is indicated as follows: the <u>Start</u> button.
- » A field is indicated as follows: the `Connect string` field.
- » A setting is indicated as follows: the *Current time zone* setting.
- » A window is indicated as follows: the **Log On** window.

1.5 Documentation overview

For more information, please consult the online help or the following manuals:

- » HortiMaX-Go! User Manual
- » CloudPortal User Manual
- » CloudBox Quick Start Guide
- » Smart Switch wiring diagrams
- » Smart Switch inserts
- » The OEM (Original Equipment Manufacturer) documentation provided

Scan the QR code to access the online help.

help.hortimax-go.com

1.6 Disclaimer

Ridder Growing Solutions has done its best to include up-to-date images and screenshots in this manual. However, the images and screenshots used may differ from the actual ones shown.

2 Product information

This chapter contains more information about the HortiMaX-Go!.

2.1 What is the HortiMaX-Go!?

The HortiMaX-Go! is an easy-to-use and affordable control computer designed specifically for the horticultural sector. With the HortiMaX-Go!, you can control both the irrigation and the climate inside your greenhouse. The HortiMaX-Go! is easy to customize by choosing unique 'Smart Switches' that can be installed in a plug-and-play manner.

2.2 Associated components

This sections provides an overview of the various components of the HortiMaX-Go!.

HortiMaX-Go! control cabinet

Panel cabinet with a built-in HortiMaX-Go! panel PC, which runs the controller software.

FertiMiX-Go!

Dosing unit for mixing fertilizers, including HortiMaX-Go! control cabinet.

HortiMaX-Go!

Individual HortiMaX-Go! panel PC running the controller software. Installation dimensions: H118 x W196 mm.

HortiMaX-Go! Smart Switch

Switch for the automatic (computerized) control and manual control of connected equipment. Various versions available.

Meteo-Go!

All-in-one weather station for measuring the solar radiation, outside temperature, outside humidity, wind direction and wind speed. It is also capable of detecting rain and its GPS location.

MTV-Go!

Sensor unit for measuring the ambient temperature and humidity inside the greenhouse.

MTV-Go! Smart Switch

Individual sensor unit board for MTV-Go!.

HortiMaX-Go! CloudBox

The HortiMaX-Go! CloudBox enables you to link your controllers to the Internet.

Terminal resistor

120Ω resistor for closing the fieldbus.

Motor control boxes (MCB)

Switch boxes for increasing the power level of motors and other equipment or devices. May contain various versions of Smart Switches.
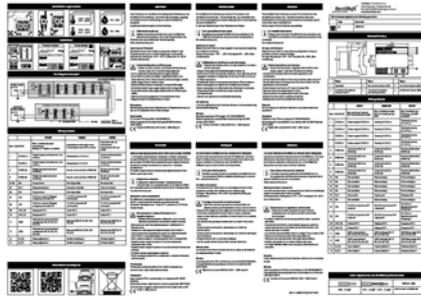
Product insert

The insert included with the product. This contains essential information about the correct use of the product.

Address list

List allowing you to specify which Smart Switches have been assigned to which addresses in the system.

2.3 System architecture

The HortiMaX-Go! features a modular design. Every system is different in terms of the number and types of Smart Switches as well as the number of HortiMaX-Go! controllers. The FertiMiX-Go! is always equipped with a dedicated controller.

The illustration below is an example of a HortiMaX-Go! configuration that includes a limited number of Smart Switches.
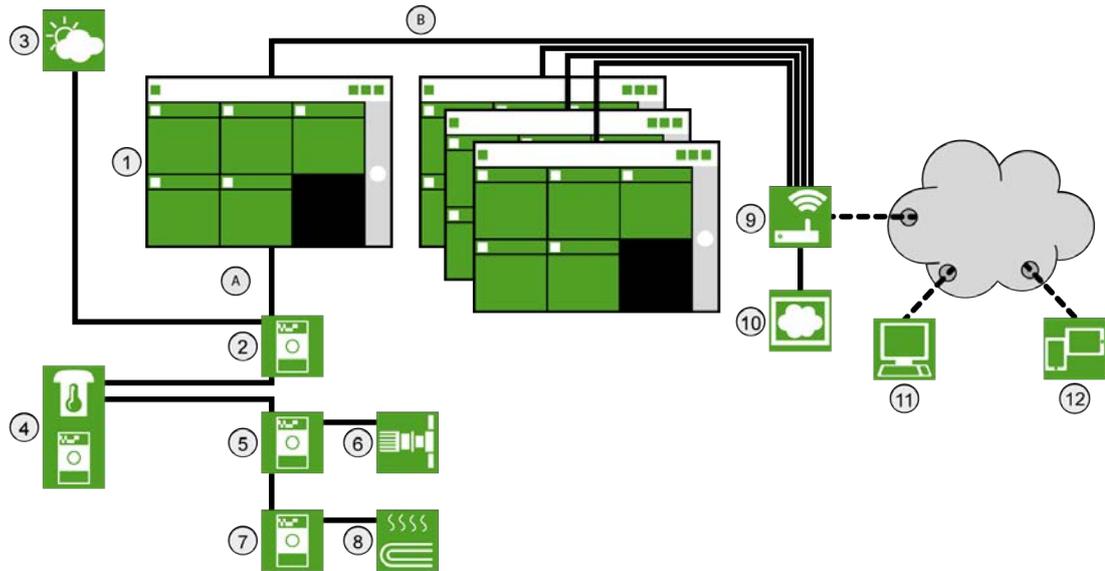
No.	Description
1	HortiMaX-Go! controller
2	Meteo-Go!/Alarm Smart Switch
3	Meteo-Go! weather station
4	MTV-Go! sensor unit for measuring the temperature and humidity level
5	Ventilation Smart Switch
6	Ventilation motor
7	Heating Smart Switch
8	Pipe heating
9	Router with DHCP
10	HortiMaX-Go! CloudBox
11	CloudPortal
12	Tablet device or mobile phone running the HortiMaX-Go! app
A	Fieldbus network (RS485)
B	Local network - LAN Backbone

2.4 Storage and transport

Ridder Growing Solutions takes the utmost care to deliver the purchased product to you in perfect condition. In rare cases, however, damage may occur during shipping. That is why you should always check the packaging and the product for damage or signs of rough handling. Please report any damage to the carrier and Ridder Growing Solutions.

Store the unit and any separate components in a dry and dust-free place. Do not expose products to direct sunlight. Keep the various components in their original packaging for as long as possible.

2.5   Removal

At the end of its useful life, please return the HortiMaX-Go! to Ridder Growing Solutions or dispose of the HortiMaX-Go! in accordance with local regulations.

3 Installation

This chapter contains more information about the installation process. This includes information on the installation requirements, step-by-step instructions on how to install and configure the HortiMaX-Go!, and finally instructions on how to install the main HortiMaX-Go! cabinet, the Smart Switches, the MTV-Go! and the Meteo-Go!.

3.1 Requirements

The following components are required to install the HortiMaX-Go!:

I. HortiMaX-Go! controller.
II. HortiMaX-Go! Smart Switches.
III. 2x 120Ω terminal resistor.
IV. Bus cable, type: Cat5e.
V. Cables between the system and Smart Switches. Cable diameter: AWG 24.

VI. Supply voltage: 110V-230V 50-60hz with ground (earth) connection.
VII. Power source(s): DC24V.
VIII. 1x MTV-Go! sensor unit per zone and one Meteo-Go! weather station (locally or in the network).
IX. Local network with DHCP router for shared weather data and Internet connection.
X. If applicable, calibration solutions for the EC and pH sensors.
XI. Required screwdrivers:
   a. Phillips screwdriver PH1 for the sensor unit
   b. Flat-blade screwdriver VDE flat 4.0 mm for unlocking terminals. (Included with the MTV-Go! or FertiMiX-Go!.)

To install the control cabinets (switch cabinets), motor control boxes (MCBs) and other equipment: cables, mounting materials and various tools.

3.2 Step-by-step installation and configuration instructions

You need to complete steps 1 to 7 in order to install the HortiMaX-Go!. You then need to complete steps 8 to 14 in order to carry out the configuration.

Step	Description
1	Unpack the required materials and check for defects.
2	Examine the descriptions included with the equipment.
3	Assign addresses to all Smart Switches using the instructions provided on the address list, zone and product stickers.

Step	Description
4	Install the motor control boxes (MCBs), and then mount the Smart Switches in the desired locations.
5	Use the bus cable (type: Cat 5E) to connect the Smart Switches and the controller in series. Install terminal resistors on the first Smart Switch and the last one.
6	Connect the DC24V power supply (or supplies). Connect the 'signal ground' to the earth (ground) of the control cabinet.
7	Activate the HortiMaX-Go! and the Smart Switches by switching the supply voltage on.
8	When the HortiMaX-Go! is configured for the first time, the display will show start menu. Select the desired language and unit of measurement. Tap confirm '⊘'.
9	On the scanning screen, tap the Scan button '▶'. The system will detect the connected Smart Switches automatically.
10	Check whether all the connected Smart Switches are in the address list and there are no address conflicts or other problems.
11	Disable any valves and start contacts that are not connected, then disable any valve groups that are not required.
12	Configure the system settings, such as location, time and IP address.
13	Configure all the connected 'open-close' systems by entering the required settings, such as the run times and opening directions.
14	Calibrate the EC and pH sensors using the calibration solution provided. Follow the instructions on the display.

3.3   HortiMaX-Go! control cabinet

> See "Appendix A: HortiMaX-Go!-Pro touchscreen Controller" on page 35 for the wiring diagram.

The HortiMaX-Go! control cabinet houses a panel PC (controller), a Smart Switch with an alarm output, and a connection for the weather station.
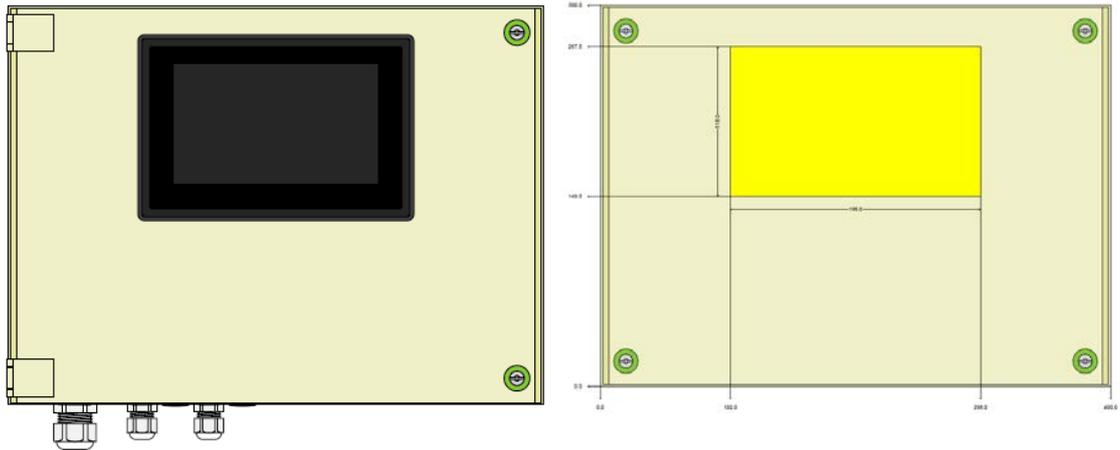
Figure 3-1: Front view of HortiMaX-Go!

3.3.1 Location and connection requirements

Bear in mind the following when choosing a location for the control cabinet:

1. Make sure that the cabinet is easy to access.
2. Keep the cabinet out of direct sunlight, so the display is easy to read. Keep out of reach of rain, condensation water and sprinkler irrigation.
3. Do not exceed the maximum field bus length (500 metres).

3.3.2 Connecting supply voltage (power supply)

The connection value of the cabinet's supply voltage is 110-230V, 50-60Hz. Proper grounding (earthing) is required. The power supply voltage of the cabinet is DC24V with 1.8A.
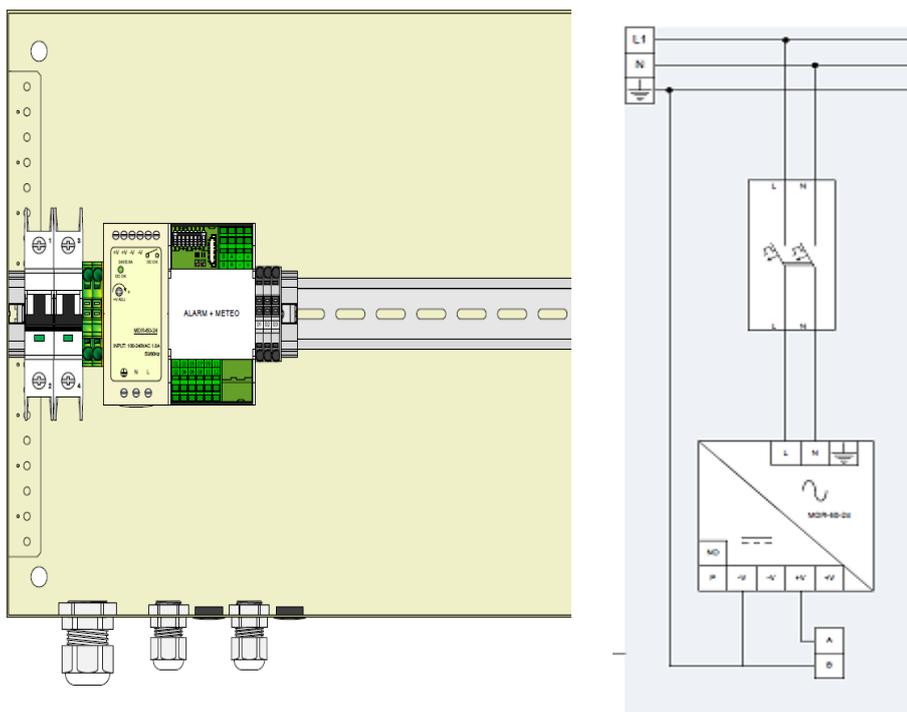
Figure 3-2: Front view without cabinet door and flow chart

3.3.3 Fieldbus

Communication with and between the Smart Switches occurs via a fieldbus. In order to prevent communication problems, the cables must be connected correctly. Use CAT5e cables to interconnect the Smart Switches as follows:
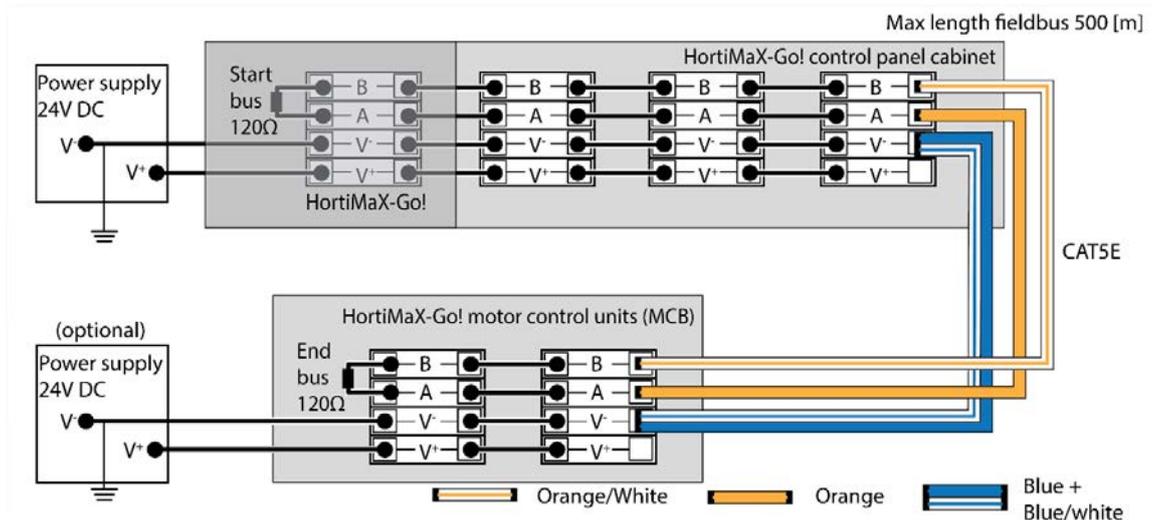
When connecting the Smart Switches in series, there should be no branches in the bus communication. Use the orange wire for connection 'A', and the orange-white wire for connection 'B'. Never use two twisted pairs of wires on the same bus terminal.

If using two or more power sources, no potential difference may arise. Connect the blue/blue-white pair of twisted wires on V- to avoid any potential difference. Connect the V- of the control cabinet to earth (ground).

> ❗ Never increase the supply voltage of the Smart Switches above DC24V, as this will inevitably cause damage. Install additional power supplies if the distance between Smart Switches is too great and/or more power is required.

3.4 Smart Switches

Smart Switches are the manual control switches used for the HortiMaX-Go!. These switches feature an electrical circuit, a processor and software. The Smart Switches perform specific control actions for the equipment connected to them. The switches are advanced control devices that can process a wide range of information, such as status and position detection, and run and operating times. The installation engineer can also connect various contacts to the switches, such as end contacts, emergency stop contacts and thermal cut-out contacts (also called 'thermal protector contacts'). The Smart Switches can use the collected status information to control the equipment in your greenhouse, and can relay also that information to the central HortiMaX-Go! controller. This greatly enhances the reliability of the system. For example, the system will generate an alarm instantly should something go wrong with your equipment.

The main components of the Smart Switches are:
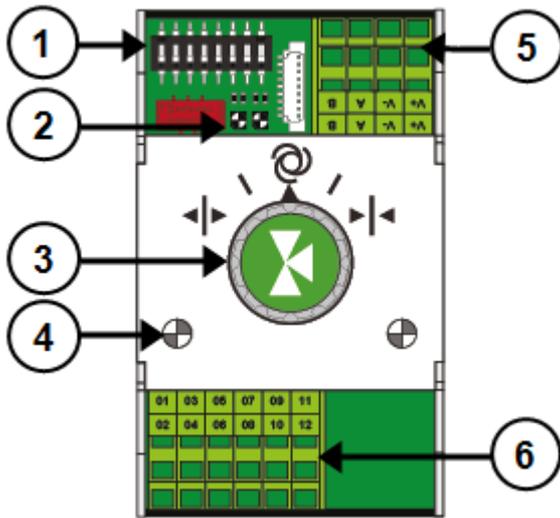
1. DIP switch for setting the Smart Switch address
2. LED indicators for bus communication
3. Manual control knob (optional)
4. LED indicators for control actions active
5. Power supply and bus connections
6. Connection for peripheral equipment

3.4.1 DIP switch

Up to 32 Smart Switches can be connected to the HortiMaX-Go!. To install Smart Switches, you first need to assign addresses to the Smart Switches. Each Smart Switch requires a unique address. This address is set with the DIP switch. By moving the small toggle switches (or 'DIPs') up or down, you can set a binary number that will be used as the Smart Switch address. Using the address list provided, you can set a unique address or DIP switch position for each Smart Switch.

Every system includes an alarm/weather Smart Switch with address 0, or all 'DIPs' down. The other switches in the system need to be assigned to a particular climate zone. Every zone (or compartment) in the greenhouse is equipped with an MTV-Go! sensor unit. DIP switches 1, 2 and 3 determine which zone the Smart Switch belongs to. This means that there can be more than one Smart Switch in the same zone.
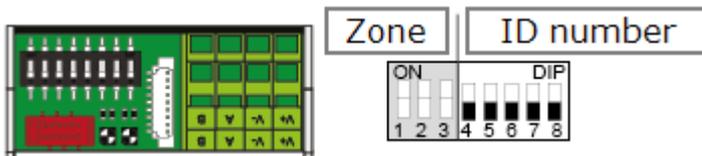
Figure 3-3: DIP switch

DIP switches 4, 5, 6, 7 and 8 determine the unique address or ID number of the Smart Switch (called 'DIP switch position' in the software). Each ID number may only occur once for a particular HortiMaX-Go! system.

Setting the DIP switch address

» Place the product sticker, included with the Smart Switch, in an empty spot on the wiring list.
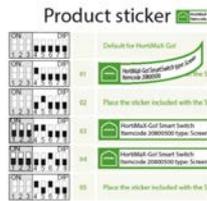
» Determine up to which zone the Smart Switch belongs (1 - 8). On the wiring list, place the relevant 'zone sticker' on the line of the Smart Switch next to the ID number.
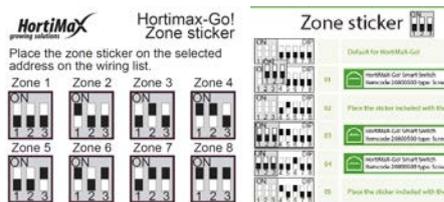
» Set the DIP switch on the Smart Switch to the DIP switch position shown on the wiring list.

> ❗ If two Smart Switches are assigned the same address, one or both Smart Switches may not be detected during scanning. Even if one of the Smart Switches is detected, the system will be unable to use it because the system is also receiving data from the other Smart Switch. The scanning screen will display 'address conflict'.

3.4.2 LED indicators for bus communication

The switches are connected to each other using a 'fieldbus system'. The fieldbus system enables digital communication between the switches and the controller via a network cable.

When the LED is lit green, it indicates that communication is occurring. When the LED is lit red continuously, it indicates that no communication is possible. This may have various causes:

» Controller failure
» Broken cable
» Wrong cable used
» Power failure at one of the connected switches
» Failure of one or more switches

» Disruption by an external factor such as a frequency controller or high-voltage cable
» Incorrect ID address (DIP switch position)
» Incorrect or duplicate terminal resistance installed.

When the LED is lit red, check whether a connection can be made.

Communication problems due to incorrect installation may sometimes only arise after some time or following a system expansion. To avoid such problems, make sure to follow the installation instructions carefully.

3.4.3   LED indicators for operation

The Smart Switches feature two types of LEDs on the bottom circuit board and the switch covers. Listed below are the meanings of the different LED indications:
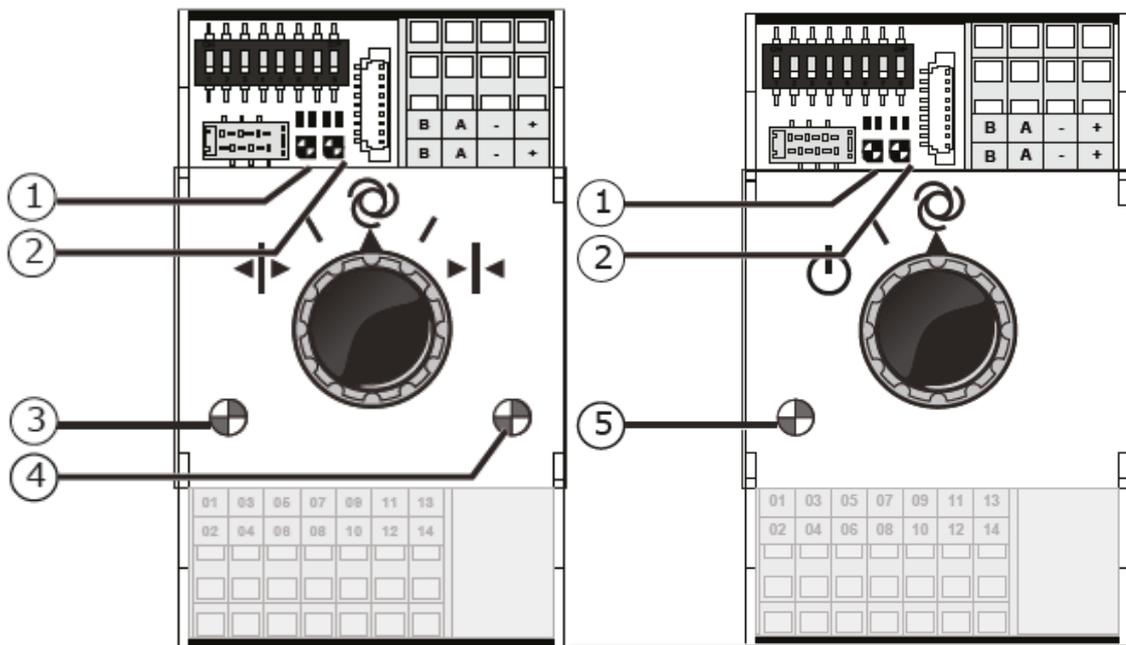
1: Green continuous	Communication has been established with the HortiMaX-Go!.	**1: Red continuous**	No communication has been established with the HortiMaX-Go!. Check whether a connection can be made.
1: Green flashing	Smart Switch control is active. The Smart Switch is controlling the device in question.	**1: Red flashing**	Smart Switch control is active, but the connected device has generated an alarm. Check the device and remedy the fault.
2: Green	The Smart Switch is receiving data via the bus.	**2: Red**	The Smart Switch is sending data via the bus.
3: Green continuous	The open output is active. (For example, a vent is being opened.)	**4: Red continuous**	The close output is active. (For example, a vent is being closed.)

3: Green flashing	The open end position has been reached. (For example: a vent is 100% open.)	**4: Red flashing**	The close end position has been reached. (For example, the vent is closed.)
5: Green continuous	The output is active. (For example: the pump is switched on.)	**3,4: Green and Red flashing**	Emergency contact (normally closed contact) active. (Example: Vent emergency stop.)

3.4.4   Location and connection requirements
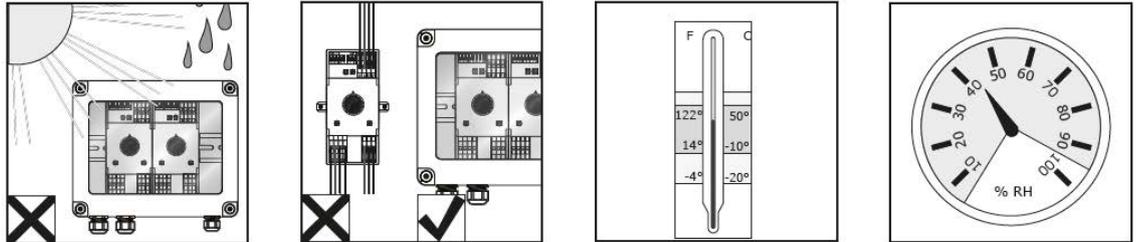
Smart Switches are not moisture-resistant and have an IP rating of 20. Install the Smart Switch in a sealed cabinet that will protect the Smart Switch from moisture (IP65). Avoid direct sunlight on the Smart Switch cabinets. Ensure that the temperature remains between -10°C and 50°C. Ensure that the humidity level remains between 5% and 95% (no condensation).

The connection terminals are spring terminals.

Wiring requirements:

   I.   Use ferrules if stranded wires are used.
  II.   Use wires with a minimum diameter of 0.14 mm² and a maximum diameter of 2.5 mm². AWG 28-14.
 III.   The desired length of a stripped wire is 6.0 mm.
  IV.   Use the screwdriver provided (VDE, flat, 4.0 mm) to unlock a spring terminal.

3.4.5   Connecting equipment and contacts

Terminals 1-14 on the underside of the Smart Switch are the connections for inputs and outputs. The control signals and various contacts of the existing equipment are connected to these input and output connections.

Always follow the connection instructions that are provided with the equipment. The Smart Switch outputs can send a plus or minus DC24V control signal, depending on whether the connection to the common is plus or minus.

Before connecting the limit contacts, remove the wire bridges. This functionality needs to be set up on the controller.

Most equipment is protected by a PKZ thermal cut-out (also called a 'thermal protector'). Most PKZ cut-outs are equipped with an auxiliary contact that is connected to the controller I/Os. Remove the wire bridge and connect the output of the PKZ cut-out. The controller will generate an alarm alert if a thermal cut-out is tripped. You can also connect the PKZ alarm outputs of multiple devices in series (as a 'daisy chain'), in which case the alarm will also apply for the group of connected devices. In the event of an alarm, climate and irrigation control will remain active. However, the power supply to the equipment causing the alarm will be interrupted.

> **i** Use auxiliary relays if multiple devices need to be connected to one output or an AC control current is required. The maximum power level that can be controlled is 5 Watts.

3.5 MTV-Go!

The MTV-Go! is the indoor sensor unit of the HortiMaX-Go!. The MTV-Go! is a special Smart Switch, enclosed in a naturally ventilated dual housing, that measures both the temperature and humidity levels inside the greenhouse. The electronic humidity sensor is located at one end (the bottom end) of the printed circuit board (PCB); the power supply and bus connections are located at the other end (the top end). The top end is installed in a moisture-resistant inner housing.
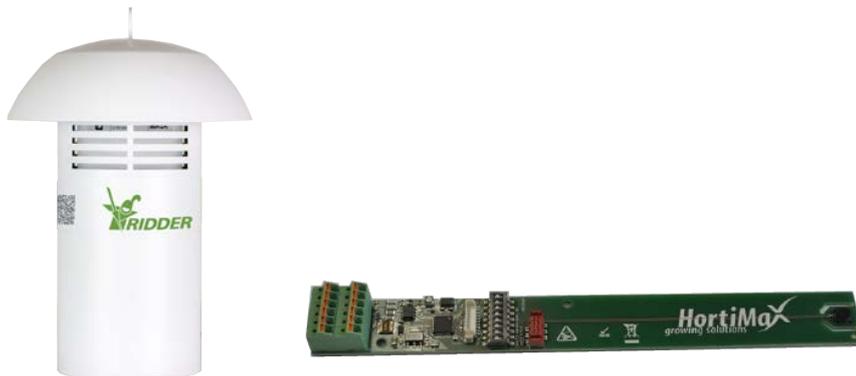
Figure 3-4: MTV-Go! and Smart Switch MTV-Go!.

3.5.1 Installation instructions

Step	Description
1	To install the sensor unit, first detach the entire outer tube from the top cover.
2	Then detach the inner housing from the top cover and screw it open. Do this using a Phillips screwdriver PH11.
3	Set the DIP switch address, as described in "Setting the DIP switch address" on page 17.
4	Insert the cables through the cable gland and connect them, preferably using matching ferrules. To remove wires, use the flat-blade screwdriver provided (4.0 mm).
5	Close the inner housing tightly and reattach it to the top cover.

Step	Description
6	Reattach the outer tube to the top cover.
7	Hang the sensor unit in a representative location inside the greenhouse (see: "Representative location" below).

3.5.2   Representative location

The MTV-Go! sensor unit is essential for controlling the climate inside the greenhouse. That is why it must be hung in a location that is representative of the entire climate zone. Recommended locations are:

- » For tall crops: in between the plants
- » For short crops: just above the plants

Do not hang the sensor unit too close to a path or wall. To avoid the bus cable becoming too long, hang the sensor unit near to the other Smart Switches.

Use the free Green-Green-White wire to feed power from a control cabinet (housing the Smart Switches) to the sensor unit. Use the Brown (A) and Brown-White (B) wires for the return if the sensor unit is not the last device on the bus. This does require the Smart Switch before and after the sensor unit to be located in the same control cabinet.
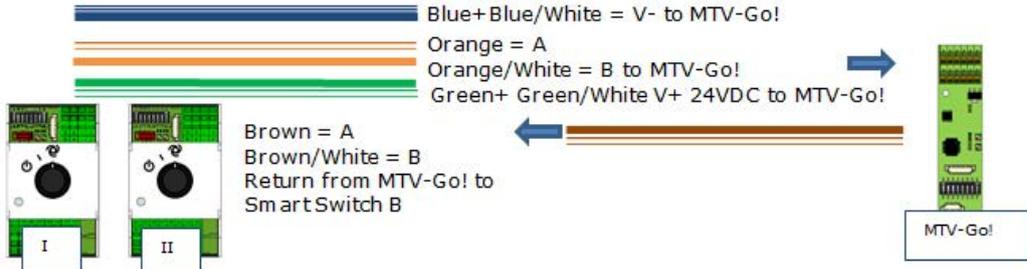
3.6   Meteo-Go!

The Meteo-Go! weather station is used to measure the solar radiation, outside temperature, outside humidity, wind direction and wind speed. The Meteo-Go! is also capable of rain detection and automatically determining its GPS coordinates. The cable provided with the weather station is connected to the Weather/Alarm Smart Switch in the main control cabinet.

Figure 3-5: Meteo-Go!

3.6.1 Location

Install the weather station on a pole (diameter: 25 mm) 2 metres above the greenhouse roof; the Allen bolt should be positioned north. Make sure to choose a location for the Meteo-Go! that is free from shade and not too close to an exhaust such as a chimney.

3.6.2 Sharing a weather station

If you have more than one controller, then they can share the readouts from the same weather station. To share the weather data, the controllers must be connected to the same network and each controller must have a unique ID number (this setting is called the *Controller instance* in the software). You can set the ID number in the configuration menu.

EXAMPLE

The readings from a weather station are used by two controllers. The weather station with the Meteo-Go! has a *Controller instance* setting of 1; the other controller has a setting of 0.

Figure 3-6: Configuration menu with the 'Controller instance' setting

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3.6.3 Network connection

There is one network connection on the rear side of the panel PC. The network connection is used for sharing the weather station data among multiple systems and to control the weather station remotely. No peripheral equipment for creating networks is supplied with the HortiMaX-Go!. To create a network, use commonly available devices. If possible, use standard CAT 5 cables or higher and normal patch cables. Do not use cross cables between the controllers.

EXAMPLE

LAN

HortiMaX-Go! controller

HortiMaX-Go! controller

Router with DHCP

CloudBox

Fieldbus

Fieldbus

Figure 3-7: Network connection diagram
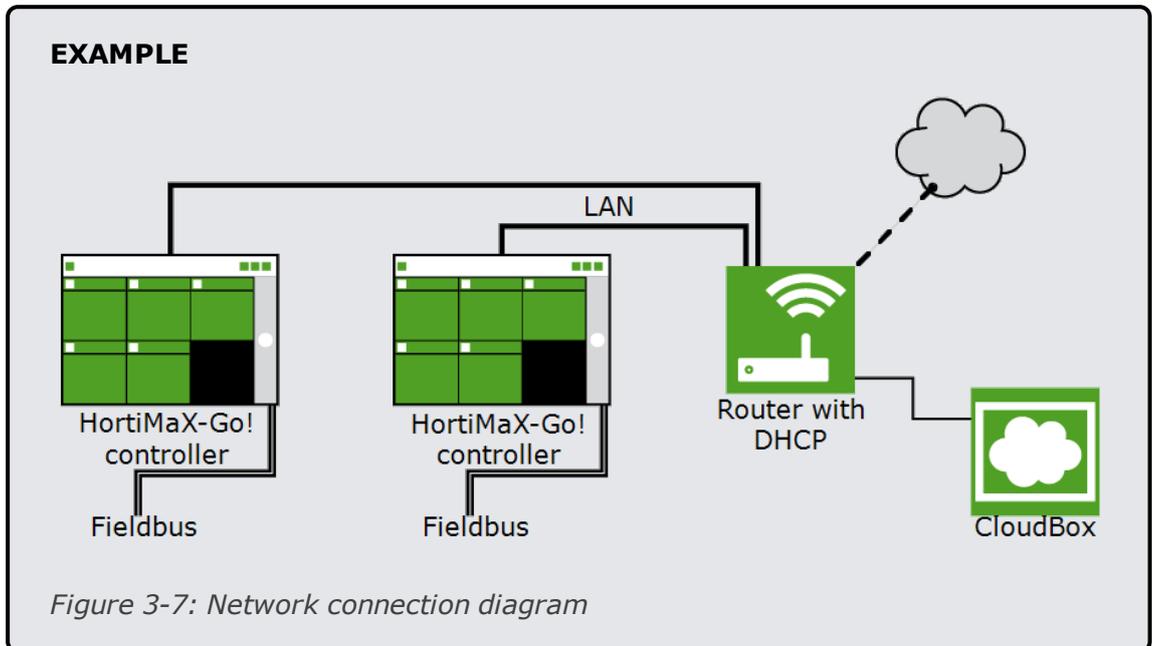
The controllers can be incorporated in the company network with Internet access.

> **!** The system requires a router with DHCP service in order to determine the IP addresses. One or more network switches may also be required in order to connect to the network. The maximum length of a conventionally wired Ethernet network without extenders is 100 metres.

4 Configuration

This chapter contains more information on how to configure the HortiMaX-Go!.

For instructions on how to configure the HortiMaX-Go!, please see the following sections:

» **System settings** In order to put the system into operation, you need to set the display language, unit of measurement and the Smart Switches that are connected to the system.
» **Configuration settings** Before fully automatic control is possible, you need to set various configuration settings and control values.
» **Climate settings** In order for the ventilation and screen systems to operate correctly, you need to set the run times and opening direction.
» **Irrigation settings** In order to configure the irrigation program, you need to assign valves to valve groups and calibrate the sensors.

> ℹ️ An overview of all settings can be found in the appendix, see "Appendix B: Settings overview" on page 38.

4.1 System settings

When using the system for the first time, you need to set the desired language and unit of measurement. You also need to specify which components (Smart Switches) are present in the system.

4.1.1 New start

When you start up the system for the first time, you will be taken to the start-up menu. Here you set the display language and the unit of measurement.

> ❗ Please note that you cannot alter the unit of measurement later.

EXAMPLE

Figure 4-1: Start-up menu
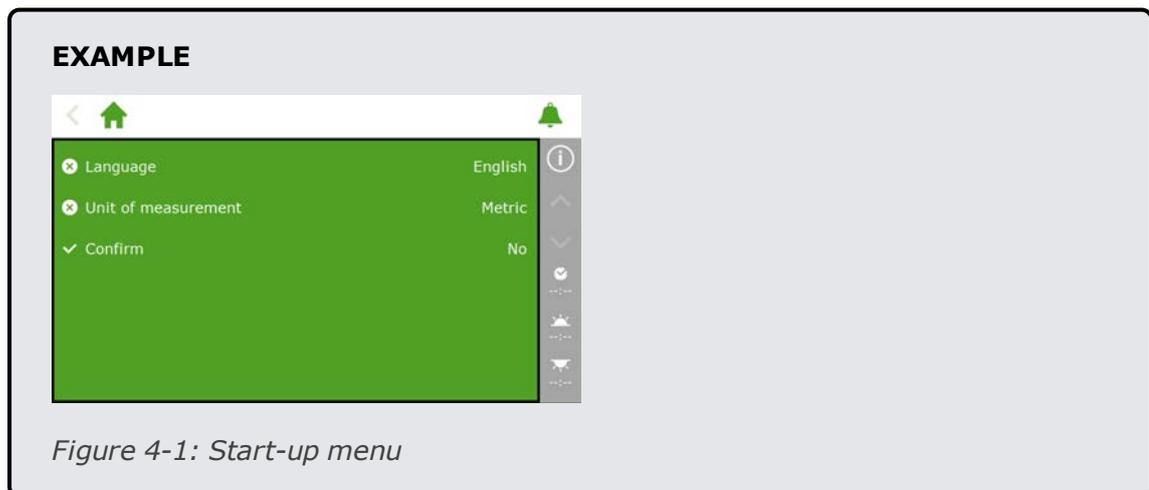
» Tap the *Language* setting. A pop-up menu appears.
  » Select the desired language.
  » Tap confirm '☑'.
» Tap the *Unit of measurement* setting. A pop-up menu appears.
  » Select the desired unit of measurement.
  » Tap confirm '☑'.
» Tap the *Confirm* setting. A pop-up menu appears.
  » Select Yes.
  » Tap confirm '☑'.

You have now completed the necessary steps in the start-up menu. The scanning screen will open automatically.

4.1.2 Scanning

The control switches of the HortiMaX-Go! are the Smart Switches. The system needs to know which Smart Switches are present. For this reason, you need to scan the system. You can do this from the scanning screen. This screen opens automatically when you use your system for the first time.

> **i** To open the scanning screen manually, proceed as follows:
>
> » Tap the system time icon '☑' to open the configuration screen.
>
> » Navigate the path: 🏠 ▸ 📈₁ ▸ 📈₁ ▸ 🔍₁ ▸ ⚙ .

Initially, the scanning screen will be empty. This means that no Smart Switches have yet been detected.

» Tap the scan icon '▶'.

The system will now start scanning for Smart Switches. Once scanning is complete, all Smart Switches detected in the system will appear.

Figure 4-2: Smart Switches found in the system.

If Smart Switches are found that are not used or connected, you need to remove these from the configuration. You can do this by changing the configuration status of these Smart Switches. Do this as follows:

» Tap the Smart Switch that you want to disable/remove. A pop-up menu appears.
» Select the desired status.

The status has been changed.

> **i** If necessary, you can restore the previous configuration status. To do this, complete the above steps again and select the 'Recover' status.
>
>
>
> *Figure 4-3: Changing status*
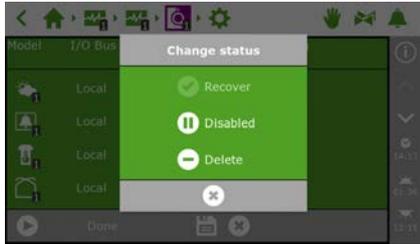
Once you have checked all the components and made sure the configuration is correct, tap the save icon '🖫'. The system will now update the configuration automatically and will then take you to the home screen.

4.2 Configuration settings

After scanning, the system will contain all the required functions for controlling the climate and irrigation equipment in the greenhouse. However, before this equipment can be fully automated, you first need to enter certain configuration settings and control values. To access the configuration settings, tap the system time icon '☑'.
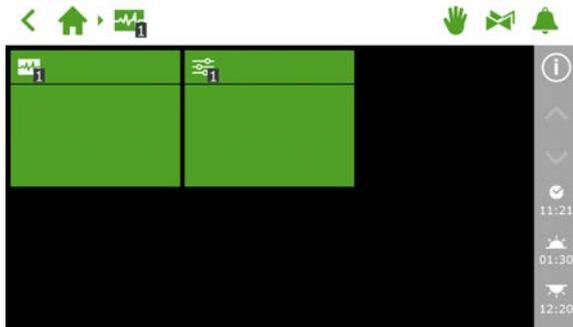
Figure 4-4: Tap the system time icon to open the configuration menu.

To access the configuration settings, navigate this path: .

The following settings are required:

» **Time** Required for time-related settings, such as: *system date/time*, *time format* and *time zone*.
» **Location** The system's location is necessary in order to determine the sunrise and sunset times.

» **Network address** If a network is required, you need to check your network settings.

» **Physical components** Various control have purple tiles representing the physical components.

4.2.1 System time

The system time needs to be set correctly in order to ensure that automatic control actions are performed at the right times. You can find the required settings on the settings screen '⚙'.

The time-related settings are:

» System date/time
The system date/time is displayed automatically. Check whether the *System date/time* setting is correct.

» Time format
You can choose from a 12-hour format (using AM and PM) or a 24-hour format. Use the *Time format* setting.

» Time zone
You need to specify your current time zone and the UTC offset (compensation) for your location.

Current time zone

The HortiMaX-Go! cannot automatically determine when Summer Time (Daylight saving time) and Winter Time (standard time) start and end. This is because Summer Time and Winter Time do not take effect everywhere at the same time and some countries have different rules regarding these time adjustments. That means that you need to adjust the current time zone manually.

» Tap the *Current time zone* setting.
» Select the applicable time zone.
» Tap confirm '✅'.

You have set the current time zone.

Time zone offset summer and winter time

The time zone offset for summer time (daylight saving time) and winter time (standard time) can be determined based on the UTC (Coordinated Universal Time). The time zone offset is the number of hours/minutes that your local time differs from the UTC. This offset needs to be set for both summer time and winter time. The offset for summer time will usually be 60 minutes less than that for winter time.

Use the *Time zone offset winter time* and *Time zone offset summer time* to set the offset manually.

> **EXAMPLE**
>
> The offset for a location in North America is 5 hours. This means that you need to enter the following on the HortiMaX-Go!:
>
> » Time zone offset winter time [min] = -300.
> » Time zone offset summer time [min] = -240.

4.2.2 Location

The system's location is necessary to determine the sunrise and sunset times. This location can either be retrieved automatically or entered manually.

Retrieve automatically

If a Meteo-Go! is connected to your system, then the location can be detected automatically based on the internal GPS chip.

The location settings can be found on the settings screen '⚙'.

Figure 4-5: The 'GPS coordinates for weather readings' setting is enabled

Enter manually

A GPS location can be indicated in various ways. The HortiMaX-Go! uses the 'signed degrees' format. This means that:

» a positive longitude is used for the Eastern Hemisphere (this is east of Greenwich).
» a negative longitude is used for the Western Hemisphere.
» a positive latitude is used for the Northern Hemisphere (this is north of the equator).
» a negative latitude is used for the Southern Hemisphere.

The *Longitude* and *Latitude* settings can be found on the settings screen '⚙'. Tap the longitude (or latitude) setting to enter a location manually.

4.2.3   Network address

If the HortiMaX-Go! has been connected to the network correctly, the IP address will be retrieved automatically. The system uses the router's DHCP service to set the IP address. It is not possible to set the IP address manually.

The network data can be found on the network settings screen '⤳'.
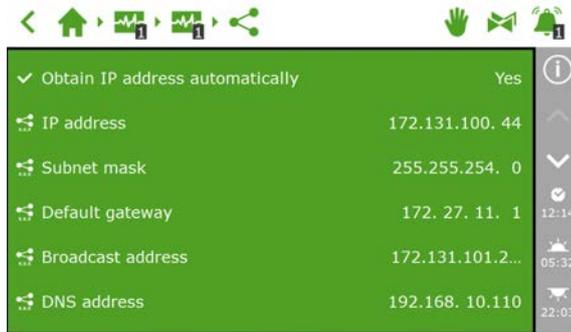
Figure 4-6: Network settings

> » Switch the *Obtain IP address automatically* setting to 'Yes'.
> » Check whether the IP addresses have been entered.

If this is not the case, make sure that the cables have been connected properly and that the router has been set to DHCP server. If necessary, contact your network administrator.

4.2.4   Physical components

The purple tiles represent the physical components (connected devices) in the system. Certain devices have specific properties or configuration settings '⚙' that you can change. For other devices, you can only view data on the readout screen '🔍'.

Figure 4-7: Purple tiles

EXAMPLE

A valve only provides readout information, such as 'valve status'. In contrast, the flow meter has both configuration settings and a readout screen. This means that you can set the K-factor and view the flow rate for the flow meter.
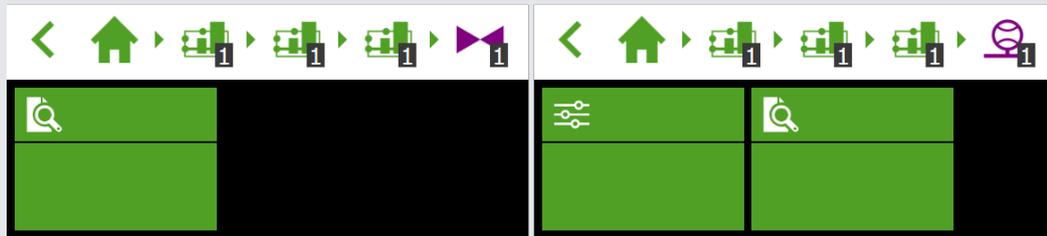
Figure 4-8: Left: valves only have a readout screen, right: the flow meter has both configuration settings and a readout screen.

4.3 Climate settings

To ensure the ventilation and screen systems operate correctly, you need to set the following:

» Run times
The *Run time open* and *Run time close* settings enable you to program the run times of various systems (i.e. valves, screens and ventilation).

» Opening direction
You need to enter the *Vent opening direction* setting for side and roof ventilation, so that the system can determine the leeward side and the windward side.

4.3.1 Run times

Measure the run times with a stopwatch. Set the system in question (valve, screen or roof/side vents) to manual control and let it run from the fully closed position (0%) to the fully open position (100%) without interruption. Measure the time it takes for the system to fully open and fully close individually, as these run times can differ significantly.

You can find the required settings, such as *Run time open* and *Run time close*, by navigating this path, for example: .

> Connecting the end contacts has a key advantage: Your controller will be able to better determine the current position of the motor. When the limit contacts have been connected, the run times can be determined automatically.
>
> 1. Connect the end contacts.
> 2. Select 'Yes' for the *Limit switches connected* setting.
> 3. Adjust the equipment in question to a position that is not 0 or 100%. (Use the switch of the Smart Switch in question.)
> 4. Turn the control knob to 0% and wait until the limit switch engages.
> 5. Turn the control knob to 100% and wait until the limit switch on the other side is reached.
> 6. Turn the control knob back to 0%.
> 7. Check whether the run times have been adjusted.
> 8. If desired, turn the control knob back to automatic mode.

4.3.2 Opening direction

Setting the opening direction is necessary in order to determine whether the vents are located on the leeward or windward side of the greenhouse roof. To set the vent opening direction, use a compass to determine the correct compass point and select it in the software.

You can find the *Vent opening direction* setting by navigating this path (for example):

 .

> Many mobile phones include a compass app. Before use, calibrate the compass app according to the instructions on your phone.

4.4 Irrigation settings

The following settings are required to configure the irrigation program:

» Assigning valves to valve groups
» Valves simultaneously
» Calibrating the EC and pH sensors
» Flow sensor (if a litre counter is used)

4.4.1 Assigning valves to valve groups

The irrigation program works based on valve groups. A valve group consists of one or more valves including the start conditions and irrigation settings set for those valves.

To assign valves to a valve group, navigate the following path (for each valve group):

 .

» Tap assign valves to valve groups ''. A pop-up window appears.
» Select the valves that you want to assign to the valve group by tapping them. A white border appears around the selected valves.
» Tap confirm ''.

You have assigned valves to a valve group.
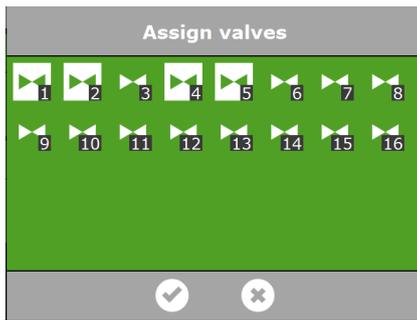
Figure 4-9: Assigning valves

> The irrigation program enables you to use a separate valve group for each valve.

4.4.2 Valves simultaneously

Use the *Valves simultaneously* setting to specify how many valves may open simultaneously. To get to this setting, navigate this path:

.

- » Tap the *Valves simultaneously* setting. A pop-up window appears.
- » Enter the number of valves.
- » Tap confirm ' '.

You have set how many valves may open simultaneously.
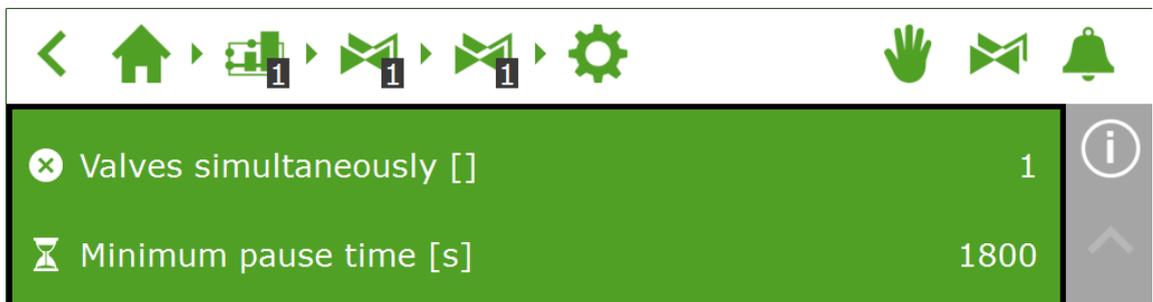
Figure 4-10: The Valves simultaneously setting

4.4.3 Calibrating the EC and pH sensors

Each EC and pH sensor needs to be calibrated individually. The sensors also need to be calibrated regularly to continue to ensure accurate measurements. A pH sensor requires calibration once every six months and an EC sensor once every twelve months. You should also calibrate a sensor if measurement deviations are detected using a secondary sensor, called a "monitor sensor".

The calibration process requires special calibration solutions. To calibrate an EC sensor, you will need EC 1.4 and EC 5.0 solutions. To calibrate a pH sensor, you will need pH 7.0 and 4.0 solutions. The order in which the solutions need to be used is fixed and may not be reversed.

	EC	pH
Calibration	Every twelve months	Every six months
Calibration solution	1.4 and 5.0.	7.0 and 4.0.

Calibration steps for EC sensor

The calibration process involves a few simple steps; the controller will describe the steps that you need to carry out.

To calibrate an EC sensor, navigate this path: ⟨ 🏠 ▸ 📟1 ▸ 📟1 ▸ EC1 ▸ ⊕ .

» Select the sensor (1 or 2). A pop-up window appears.

» Start calibration.
Tap confirm '☑'.

» Place sensor in EC 1.4.
Tap confirm '☑'.

» Measure EC 1.4.
Stir the sensor during the wait time so that the liquid will remain homogeneous.

» Measurement complete.
Tap confirm '☑'.

» Place sensor in EC 5.0.
Tap confirm '☑'.

» Measure EC 5.0.
Stir the sensor during the wait time so that the liquid will remain homogeneous.

» Measurement complete.
Tap confirm '☑'.

» Save calibration values.
Tap the save icon '💾'.

You have calibrated the sensor. The system will display the correct measurement values.

> **i** The measured values are not displayed during the calibration process, as the values are still fluctuating. A readout will appear in the step between the two calibration solutions. This readout may differ slightly from the final value, as the calibration process is not yet complete. However, this intermediate value will provide an indication of the measured value at that time.

Calibration steps for pH sensor

The calibration process involves a few simple steps; the controller will describe the steps that you need to carry out.

To calibrate a pH sensor, navigate this path: ⟨ 🏠 ▸ 📟1 ▸ 📟1 ▸ pH1 ▸ ⊕ .

» Select the sensor (1 or 2). A pop-up window appears.

» Start calibration.
Tap confirm '☑'.

» Place sensor in pH 7.0.
Tap confirm '☑'.

» Measure pH 7.0.
Stir the sensor during the wait time so that the liquid will remain homogeneous.

» Measurement complete.
Tap confirm '☑'.

» Place sensor in pH 4.0.
Tap confirm '☑'.

» Measure pH 4.0.
Stir the sensor during the wait time so that the liquid will remain homogeneous.

» Measurement complete.
Tap confirm '☑'.

» Save calibration values.
Tap the save icon '💾'.

You have calibrated the sensor. The system will display the correct measurement values.

> ℹ The measured values are not displayed during the calibration process, as the values are still fluctuating. A readout will appear in the step between the two calibration solutions. This readout may differ slightly from the final value, as the calibration process is not yet complete. However, this intermediate value will provide an indication of the measured value at that time.

4.4.4 Setting up flow sensor

If the irrigation unit is equipped with a litre counter, you will need to set the 'K-factor' (pulse/litre). The value to be set for the K-factor depends greatly on how and where the sensor has been installed. Follow the instructions provided with the sensor to install the sensor correctly and to determine the K-factor.

To set the K-factor, navigate this path: ‹ 🏠 ▸ ▸ ▸ ▸ 🔧 .

k-factor [pulse/l]   7.82
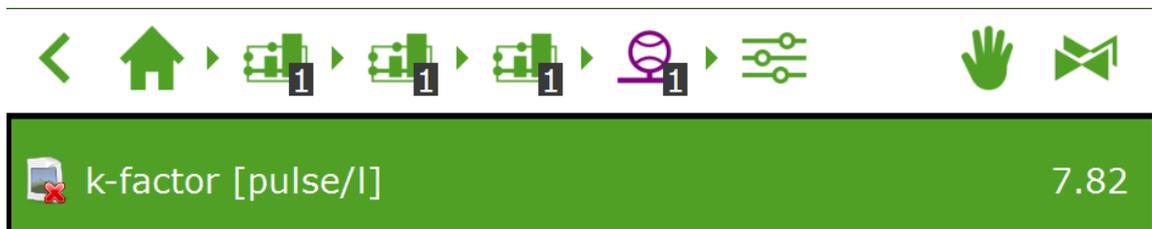
Figure 4-11: The set K-factor

Appendix A: HortiMaX-Go!-Pro touchscreen Controller

1P230V + N + PE 50Hz

Panel PC 1

Excerpt - page 4.

Panel PC 2

Excerpt - page 4.

L1
N

A
B

[RED]
[BLUE]
[YELLOW/GREEN]

[ORANGE]
[WHITE]

Z1

L   N

L   N

Rt = 120 Ω

Smartswitch RS485 bridge [00]

B	RS485 [B]
A	RS485 [A]
-	DC24V [-]
+	DC24V [+]

B	RS485 [B]
A	RS485 [A]
-	DC24V [-]
+	DC24V [+]

01 P1   PANEL PC
GND
02
CAN_L
03
CAN_H
04
A2
05
B2
06
A1
07
B1
08
TXD2
09
RXD2
10
TXD1
11
RXD1
12
+5V

13   P2
+   (DC:6-42V)
14
-
15   HOST OTG LAN
G

L   N   ⏚

PS1   MDR-60-24

NO

P   -V   -V   +V   +V

A
B

DC24V [+]
DC24V [-]
RS485 [A]
RS485 [B]
RS485 [SG]
REL_CO
DC24V [+]   01
DC24V [-]   03
RS485 [A]   05
RS485 [B]   07
REL_NO   09
REL_NC   11

02   04   06   08   10   12

[SHIELD]
[WHITE]
[BROWN]
[GREEN]
[YELLOW]
[GREY]

METEO GO!

M01

PE   PE

PE

A   B   SG

PE: PROTECTIVE GROUND TERMINAL
Z1:   CIRCUIT BREAKER
PS1:   POWER SUPPLY AC110-240V / DC24V

Rt: BUS TERMINATION RESISTOR

M01:   METEO STATION

A: RS485 [A]
B: RS485 [B]
SG: RS485 [SG]

MAIN SUPPLY: 1P230V+N+PE 50Hz
FUSE MAX: 16 [A]

L1
N

A
B

[RED]
[BLUE]
[YELLOW/GREEN]

[ORANGE]
[WHITE]

Z1

L N

L N

PS1 MDR-60-24

NO

P -V -V +V +V

A
B

⊘01 — P1 PANEL PC
CAN2_H
⊘02
CAN2_L
⊘03
CAN1_H
⊘04
CAN1_L
⊘05
RS485_2 [-]
⊘06
RS485_2 [+]
⊘07
RS485_5 [-]
⊘08
RS485_5 [+]
⊘09
RS485_4 [-]
⊘10
RS485_4 [+]
⊘11
RS232_3_RXD
⊘12
RS232_3_TXD
⊘13
RS232_1_RXD
⊘14
RS232_1_TXD
⊘15
GND
⊘16
+5V

Rt = 120 Ω

⊘17 — P2 DC:6-36V
G
⊘18
-
⊘19
+

Smartswitch RS485 bridge [00]

B RS485 [B]
A RS485 [A]
- DC24V [-]
+ DC24V [+]

B RS485 [B]
A RS485 [A]
- DC24V [-]
+ DC24V [+]

DC24V [+] 01
DC24V [-] 03
RS485 [A] 05
RS485 [B] 07
REL_NO 09
REL_NC 11

DC24V [+] 02
DC24V [-] 04
RS485 [A] 06
RS485 [B] 08
RS485 [SG] 10
REL_CO 12

[SHIELD]
[WHITE]
[BROWN]
[GREEN]
[YELLOW]
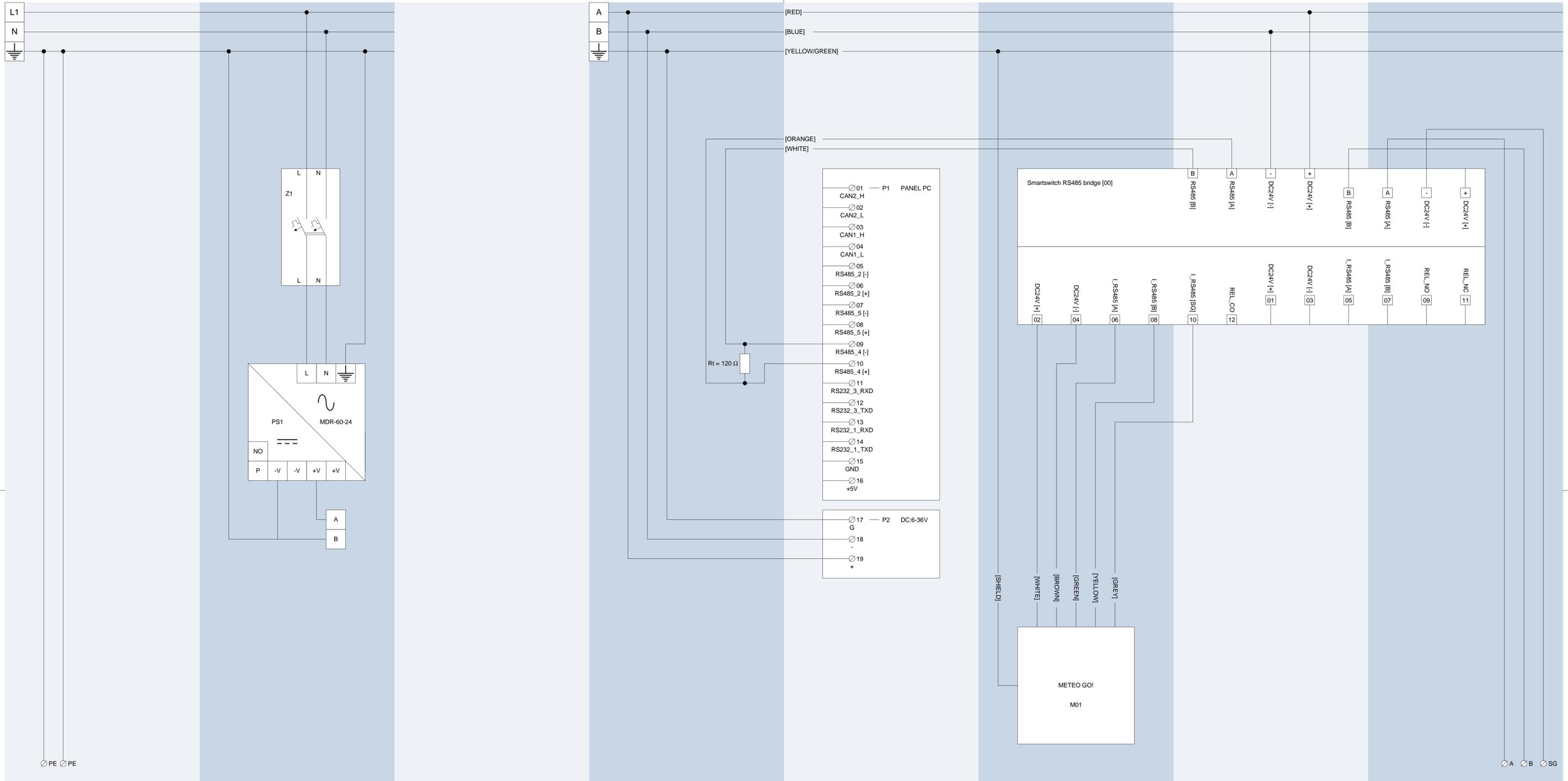[GREY]

METEO GO!
M01

⊘PE ⊘PE

⊘A ⊘B ⊘SG

⊘A ⊘B ⊘SG

PE: PROTECTIVE GROUND TERMINAL
PS1: POWER SUPPLY AC110-240V / DC24V
Z1: CIRCUIT BREAKER

Rt: BUS TERMINATION RESISTOR

M01: METEO STATION

A: RS485 [A]
B: RS485 [B]
SG: RS485 [SG]

MAIN SUPPLY: 1P230V+N+PE 50Hz
FUSE MAX: 16 [A]

PROJECTNUMBER: **PD15.003**	DRAWINGSCALE: **1 : 1**	DRAWINGUNITS: **mm**	AUTHOR: **MB**	CREATION DATE: **04/04/2016**
PROJECTNAME: **HortiMaX Go**			AUTHORISED: **AddK**	REVISION DATE: **01/04/2018**
SUBJECT: **CIRCUIT DIAGRAM**			PAGE: **4 OF 7**	STATUS: **INTERNAL**
FILENAME: **150132DRA030 044 HortiMaX Go-PRO touchscreen controller [1P230V+N+PE 50Hz] drawing.vsd**				

HortiMaX
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Appendix B: Settings overview

6.1   Alarm settings

Here you can find a list of the alarm settings.

Test alarm
Alarm contact

6.2   Climate settings

Here you can find a list of the climate settings.

6.2.1   Standard zone measurements

Ramp-up time [min]
Ramp-down time [min]
Stage delay time [min]
Humidification override off below [°C]
Dehumidification override off above [°C]

6.2.2   Leeward side

Maximum position rain [%]
Wind speed gale [m/s]
Maximum position gale [%]
Start wind speed trajectory vent position [m/s]
End wind speed trajectory vent position [m/s]
Max. position end wind speed trajectory
Frost limit [°C]
Maximum position frost [%]
Control speed [%]

6.2.3   Windward side

Maximum position rain [%]
Wind speed gale [m/s]
Maximum position gale [%]
Start wind speed trajectory vent position [m/s]
End wind speed trajectory vent position [m/s]
Max. position end wind speed trajectory
Frost limit [°C]
Maximum position frost [%]
Control speed [%]

6.2.4   Side ventilation

Maximum position rain leeward [%]
Maximum position rain windward [%]
Wind speed gale [m/s]
Maximum position gale [%]
Start wind speed trajectory vent position [m/s]
End wind speed trajectory vent position [m/s]
Max. position end wind speed trajectory leeward
Max. position end wind speed trajectory windward
Frost limit [°C]
Maximum position frost [%]
Control speed [%]

6.2.5   Screen

Start blackout period
End blackout period
Start thermal period
End thermal period
Close below outside temperature [°C]

Maximum radiation for close [W/m^2]

Reset number of screening hours

6.2.6 Hot air heater

Minimum time on [min]

Minimum time off [min]

Reset operating time

6.2.7 Central heating

Maximum pipe temperature control [°C]

Reset operating time

6.2.8 CO$_2$ valve

Minimum time on [min]

Minimum time off [min]

Reset operating time

6.2.9 Humidification (fogging)

Time off [s]

Time on [s]

Reset operating time

6.2.10   Pad and fan

| Minimum time on [min] |
| Minimum time off [min] |
| Reset operating time |

6.2.11   Pad valve

| Time off [s] |
| Time on [s] |
| Reset operating time |

6.2.12   Cooling

| Minimum time on [min] |
| Minimum time off [min] |
| Reset operating time |

6.2.13   Recirculation fan

| Minimum time on [min] |
| Minimum time off [min] |
| Reset operating time |

6.2.14 Inflation fan

| Inflation control enabled |
| Time off [s] |
| Time on [s] |
| Reset operating time |

6.2.15 Cyclic program

| Reset operating time |

6.2.16 Supplementary lighting

| Start time |
| End time |
| Radiation limit on [W/m^2] |
| Radiation limit off [W/m^2] |
| Minimum time on [min] |
| Minimum time off [min] |
| Reset operating time |

6.3 Irrigation settings

Here you can find a list of the irrigation settings.

6.3.1 EC pre-blending

| Alarm zone [mS/cm] |
| Alarm delay time [s] |

6.3.2 Fertilizer dosing (irrigation)

Alarm zone [mS/cm]
Maximum difference between EC sensors [mS/cm]
Alarm delay time [s]

6.3.3 Acid dosing

Alarm zone []
Maximum difference between pH sensors []
Alarm delay time [s]

6.3.4 Valve group

Valves simultaneously []
Minimum pause time [s]

6.3.5 Fertilizer dosing (valve group)

Ratio fertilizer 1 []
Ratio fertilizer 2 []
Ratio fertilizer 3 []
Ratio fertilizer 4 []

6.4 System settings

Here you can find a list of the system settings.

GPS coordinates for weather readings	
Longitude [°]	
Latitude [°]	
System date/time	
Time zone offset winter time [min]	
Time zone offset summer time [min]	
Current time zone	
Language	
Time format	
Restart system	
Shut down system	
Alarm after restart	
Date format	
Erase all settings?	

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