



The smart
Greenhouse Controller

Ridder HortiMaX-Go!

Solutions for
Controlled Environment Agriculture



EN 201807

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Helping you grow
your way



The Ridder HortiMaX-Go! The solution that fits

A large part of the Earth's surface is used for agriculture to feed our growing world population. In many countries, open field cultivation is very common. However, this cultivation method requires significant quantities of water and fertilizers per pound of food crop produced. Fresh water is becoming increasingly scarce and fertilizer use needs to be brought back due to environmental concerns and depletion of phosphate resources. Compared to open field cultivation, growing crops in a greenhouse environment (protected cultivation) not only produces higher yields, but also requires less water and fertilizer.

To transition from open field to protected cultivation, growers need a solution that suits their particular situation. So what are those growers looking for in a modern automation solution?

- The system must be able to control both the greenhouse climate and irrigation.
- The system must be simple and 'plug and play'.
- The system must be as easy and intuitive to operate as a smartphone.
- The system's affordability is also a key factor for success.

Let's start smart

The HortiMaX-Go! is unique in how the computer is connected to the greenhouse equipment. A 'Smart Switch' has been developed for each control. A Smart Switch is a switch that features intelligent functionality to perform its specific function for the connected equipment. Every Smart Switch communicates bilaterally with the central controller through a shared network cable (digital bus). This is unique from all other horticultural computers in the entry-level market, which are not capable of bilateral communication.

To meet these market needs, HortiMaX has developed the all-new HortiMaX-Go! - the Smart Greenhouse Controller. The HortiMaX-Go! is a modern, user-friendly and affordable horticultural computer for controlling both the greenhouse climate and irrigation. Its touchscreen allows you to view all vital control data at a glance.

The HortiMaX-Go! utilizes the latest hardware technology and features software specially designed for touchscreen operation. The basic configuration includes all the necessary software. The software is compiled automatically based on the connected equipment. When purchasing a HortiMaX-Go!, you only pay for the components you need. And you can easily add extra components later if your needs change.

'The affordable, plug-and-play horticultural computer that is intuitive and easy to use.'



HortiMaX-Go! Unique and distinctive

The HortiMaX-Go! is an all-new horticultural computer designed for growers starting out in protected cultivation and looking for an entry-level automation system. It is the perfect alternative to the current Dutch high-tech solutions that are often too complex or too expensive. The HortiMaX-Go! is unique and sets itself apart from other horticultural computers in the following ways:

Integrated water and climate control

A unique feature of the HortiMaX-Go! compared to the conventional computers in this price range is that it includes climate, irrigation and fertilizer dosing controls. This allows you to view all greenhouse control data together on one display. As you no longer need to use different computers, you can save a substantial amount of money.

Modern user interface

Current affordable controllers tend to have extremely limited user interfaces with only a few control knobs and small, monochrome one- or two-line displays. The HortiMaX-Go!, however, features a large and modern-colour touchscreen. The software was specially designed for at-a-glance viewing and operation by hand. In fact, it's just as simple and intuitive to operate as a smartphone.

Customized solution

The HortiMaX-Go! is a customized solution: Growers only select the components they need based on their crop, greenhouse and individual needs. The HortiMaX-Go! is also more scalable than other horticultural computers on the market and can therefore fit any budget. As standard, the HortiMaX-Go! comes with all the necessary software and configures itself automatically according to the plug-and-play principle. This is similar to connecting a mouse or keyboard to a PC, where the system automatically recognizes the device that has been connected.

Smart Switch

The analogue input and output signals from the computer and the manual control switches have been combined into 'Smart Switches'. A Smart Switch features intelligent functionality to perform its specific function for the connected equipment. Every Smart Switch communicates with the central controller through a shared network cable (digital bus). This is unique from conventional horticultural computers, where the analogue control signals must be connected individually and there is no bilateral communication between the controller and the equipment. Another benefit is that the controller can monitor the status of the connected equipment at all times.

If needed, the controller can return the equipment to the desired automatic mode or generate a warning message, so you can make quick adjustments.

Plug-and-play installation

Another significant advantage of the Smart Switches is that they are simple to install and commission thanks to the digital bus system. Your network is easy to build and expand by connecting one Smart Switch to another. This connection method provides significant savings on installation and cabling costs. It also makes the system easier to install and upgrade later. In addition, the cabling is kept extremely manageable, even in large systems.

Access anywhere, anytime, and on any device

The HortiMaX-Go! can be accessed anywhere in the world, at any time.. It features a responsive design, making it compatible with any device that uses iOS, Android or Windows. This gives you maximum access and control over your greenhouse.



From selection to solution: Plug, Play and Grow

You can create your own custom HortiMaX-Go! by selecting the desired components and controls. You can choose any components and controls that meet your specific needs. The more elements you add, the more extensive your system will be.

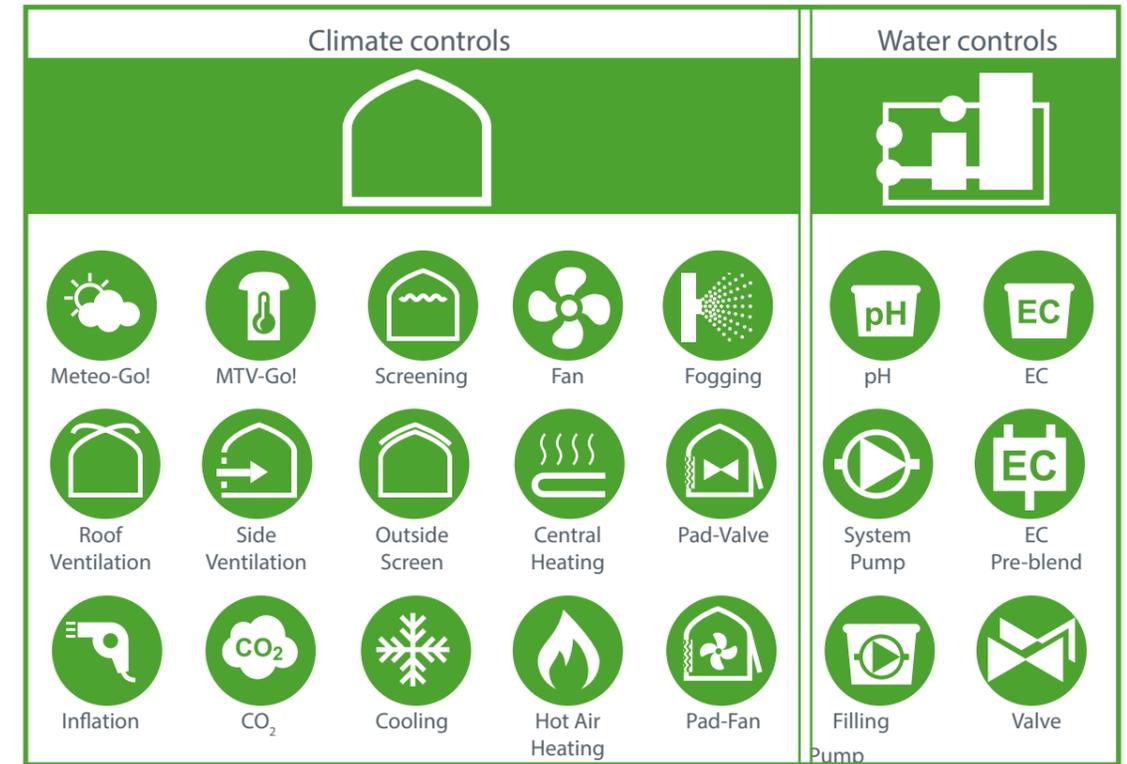
The HortiMaX-Go! consists of the following:

- HortiMaX-Go! Controller
- HortiMaX-Go! Smart Switches
- HortiMaX-Go! Sensor units
- HortiMaX-Go! Control units and panels
- HortiMaX-Go! Cloudbox for internet access



The HortiMaX-Go! is ideal for:

- Growers switching from open field to protected cultivation.
- Growers in protected cultivation looking for an entry-level automation system.
- Growers in protected cultivation who want to replace their conventional automation system.
- In existing poly greenhouses with existing wiring.
- In new poly greenhouse projects where new and cheaper methods of wiring can be used.

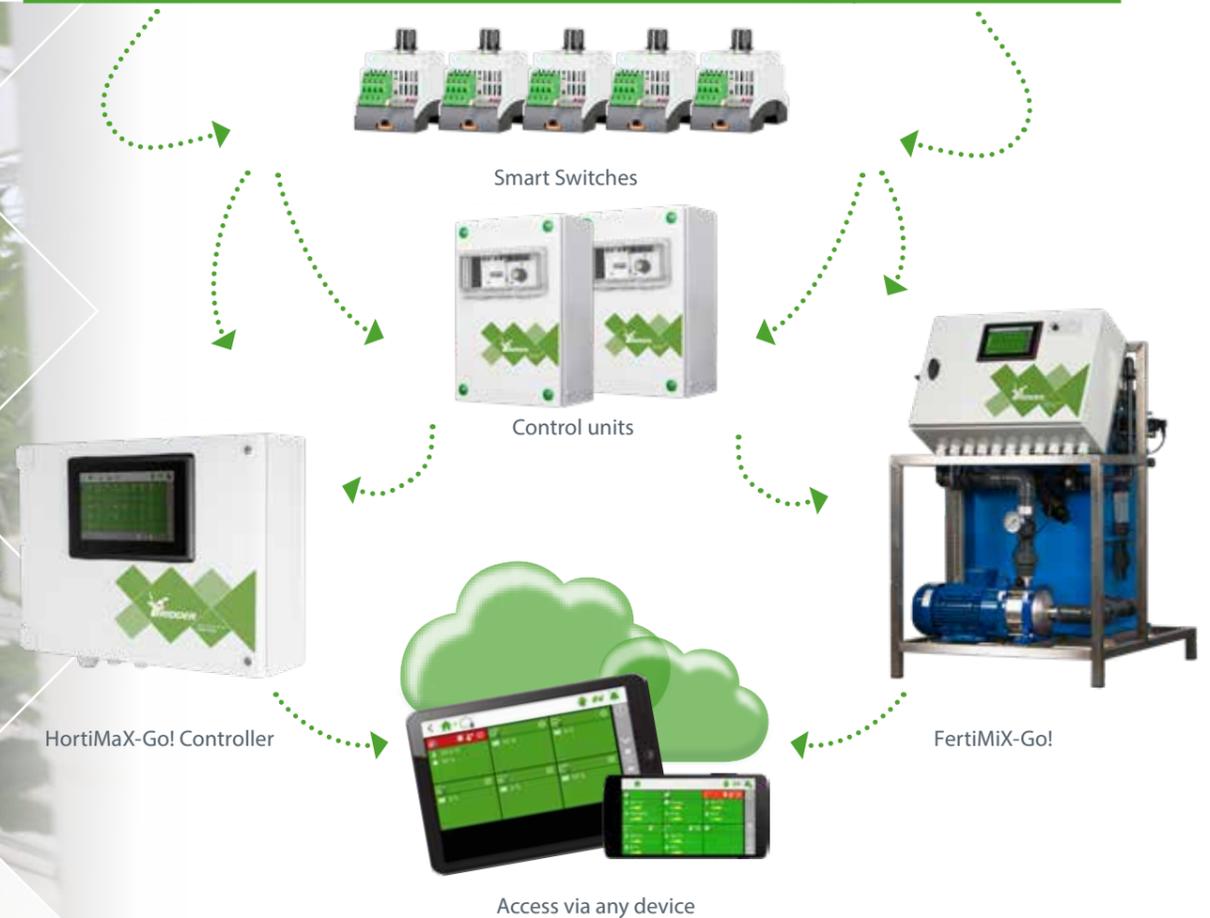


Benefits of HortiMaX-Go! for growers:

- Affordable - customized to your needs, so you only pay for the components used
- A breeze to operate - the touchscreen is as easy to operate as a smartphone
- Irrigation and climate control - view all data together on one display
- Communication between controller and Smart Switches - reliable feedback
- Clearly visible alarm messages - even in manual operation mode
- Multizone controller - one controller can control up to eight zones

Benefits of HortiMaX-Go! for greenhouse builders, reseller or dealers:

- Reliable solution - it is a durable system without unnecessary high-tech features
- Easy to install - thanks to the two-wire bus cable that connects the Smart Switches as a daisy chain
- Automatic configuration - the controller recognizes the connected equipment automatically and adds it to the software on the display
- Suitable for both existing and new greenhouses - with either conventional or new wiring systems



HortiMaX-Go! Controller

The Smart Controller consists of both hardware and software. All required software is included as standard and is ready for use.

Smart Controller hardware

- 7" colour touchscreen
- Installed in a panel or a separate housing
- Industrial grade (-20 –70°C)
- Wide-range supply voltage: 110-230 V
- 50-60 Hz, suitable for use worldwide

Smart Controller software

- The controller includes both irrigation and climate software
- Plug-and-play configuration: computer recognizes the connected devices automatically
- Easy to use, works like a smartphone
- Seven days of historical data storage
- Available in various languages: Dutch, English, French, Spanish, German and Russian
- Supports metric and US measurement units
- 32 Smart Switches per controller

Automatic configuration

A unique feature of the HortiMaX-Go! is that the controller recognizes the connected equipment automatically through the use of Smart Switches. Based on the identified Smart Switches, the software is also built automatically. This means no action is needed to activate the required software. If Smart Switches are added to the configuration, the system will detect this and modify the software automatically.

Easy to program

The main settings of all the connected irrigation and climate equipment can be entered on one comprehensive screen. The HortiMaX-Go! can not only be set to fixed positions or fully automatic control, but also includes stage control. These pre-programmed stages determine the conditions when certain settings will become effective. For instance, in the case of climate control, the temperature and humidity are the determining factors.



Two heating and six cooling stages are available for climate control. Four periods and six different start conditions are available for irrigation and fertilizer dosing control.

There are six different start conditions to start irrigation (see below). These start conditions are described further on.

- Valve group manual start
- Start contact
- Time start
- Radiation sum start
- Cyclic start
- Valve start

Use of periods

The HortiMaX-Go! includes four programmable periods as standard. These periods can be set up as you wish based on real time or astronomical time. The latter is the time relative to sunrise and sunset. A copy button makes it easy to copy settings from one period to another.

A breeze to operate

The HortiMaX-Go! only displays the software of the connected equipment. The controller is operated exclusively via the touchscreen, just like a smartphone. Thanks to clear, self-explanatory symbols and information tiles, the device is very intuitive to use and requires little training. This means you can start growing with your HortiMaX-Go! almost immediately! Any if you need any help, you can access the help function by scanning QR codes. You simply scan the relevant QR code and you will be taken directly to the topic that you want more information on (such as films, instructions, Q&As and downloads), in the desired language.

Clear and unambiguous alarms

Another unique feature of the HortiMaX-Go! is its clear and unambiguous alarm messages. These warning messages are displayed in easy-to-read text that is highlighted in red. Alarms are indicated at the top of the touchscreen, where you will instantly see them and can take quick action.



Historical data

As standard, the HortiMaX-Go! can store up to seven days of sensor readings and measured positions. Alarm messages are retained for up to 12 months. Consumption data of connected equipment are only erased on command and remain available throughout the period in question. Historical data is shown in both readout tables and in pre-programmed graphs. The controller can also display statistical information such as minimum, maximum and average values.



Smart Switches for Climate Controls

Selection of Smart Switches

A HortiMaX-Go! system can be completely custom-built to your needs with a total of 32 controls or Smart Switches. A Smart Switch features intelligent functionality to perform its specific function for the connected equipment. An overview of the available controls can be found later in this brochure.

	<p>Meteo-Go! Weather/Alarm Smart Switch for connecting the weather station and the alarm contact.</p>
	<p>MTV-Go! Smart Switch for controlling the temperature and humidity, including the option to connect a CO₂ sensor. This control includes minimum and maximum alarm limits for the humidity level and temperature readouts. Historical information can be viewed in tables or graphs.</p>
	<p>Roof Ventilation Smart Switch for roof ventilation control, which opens and closes the vents at the top of the greenhouse. This control can be programmed based on temperature and humidity. The temperature and humidity settings are grouped by zone. The leeward and windward sides can be programmed individually. The vents can be set to manual, fully automatic or stage control. To prevent damage to the crops or roof bay structure, this control includes gale, frost and rain safeguards. The control speed control allows you to adjust the response speed of automatic control.</p> <p>If every roof vent is equipped with a Smart Switch, the roof ventilation control can determine the vent run time automatically and synchronize the vents automatically. If more than one motor is connected to one Smart Switch, the vents will be considered 'slave motors' and the run times must be determined manually. If this is the case, our smart synchronization control will be used that can be activated at 20 pre-set times.</p>
	<p>Side Ventilation Smart Switch for side ventilation control, which opens and closes the vents on each sidewall of the greenhouse. This control works in the same way as roof ventilation control, but is not divided into leeward and windward sides. Each sidewall is controlled separately.</p>
	<p>Screening Smart Switch for opening and closing a screen (by operating the screen motor). This screen control is designed for various applications. The simplest application is based on time and fixed positions. The automatic screen control includes special conditions for saving energy, achieving blackouts at fixed times and preventing too much solar radiation from entering the greenhouse. A screen can also be controlled based on temperature and its operation can be restricted based on the humidity level (by setting humidity overrides).</p>
	<p>Hot Air Heating Smart Switch for switching a hot air heater on and off. This is a simple control that is used to activate a heater automatically if it is too cold. There are two heating stages allowing the heaters to be switched on or off in succession (cascade control) based on temperature. The operating time control provides the ability to display how long the heaters have been switched on, so the gas, oil or CO₂ consumption can be determined.</p>

The unique features of our Smart Switches:

- Automatic detection: plug and play
- Returns equipment to original position after manual operation
- Feedback when manual operation is enabled
- Feedback if the thermal overload cut-out is triggered (motor, heater, etc.)

	<p>Fan Smart Switch for switching an air fan on and off. This control is suitable for a one-speed fan (rather than frequency-controlled fans). This control is based on temperature and humidity. The operating time control provides the ability to display how long the fans have been switched on, so the electricity consumption can be determined.</p>
	<p>Pad-Fan (evaporative cooling) / Pad-Valve Smart Switch for switching a pad-and-fan unit on and off. This control requires two Smart Switches: one for the fan and one for the valve. Depending on the system installed, these various combinations of fans and valves can be controlled. Although these components will be shown individually, they can be programmed to operate in unison. For instance, the control can activate the pad and fan units in succession as the temperature increases (cascade control). Humidity overrides can also be programmed for the pad-and-fan units.</p>
	<p>Inflator Smart Switch for switching an inflator unit on and off. The inflation control is applied in double-walled poly greenhouses in order to maintain the pressure inside the greenhouse. The control has adjustable activation and delay times. It can also keep track of the inflation fan's operating time.</p>
	<p>Fogging (humidification) Smart Switch for switching a fogging valve on and off, either to cool or humidify the greenhouse air. Fogging can be activated automatically by setting the desired temperature and humidity levels. The control includes an adjustable on and off time (pause). The operating time control keeps track of the fogging activation time.</p>
	<p>Outside Screen Smart Switch for opening and closing an outside screen (by operating the screen motor). This control is almost identical to the regular screen control. Since the screen is on the outside of your greenhouse, you can program the screen to open in the event of heavy rainfall or strong winds (gales).</p>
	<p>Air-conditioning Smart Switch for switching the air conditioning on and off. Most greenhouses are cooled using various equipment. Cooling control is based on temperature and humidity. The operating time control can display how long the cooling equipment has been switched on.</p>
	<p>Central Heating Double Smart Switch for operating the central heating pump. This control is primarily based on temperature. In addition, by setting a minimum pipe temperature, you can prevent excessive humidity from building up inside your greenhouse. The double Smart Switch controls the pump and the valve autonomously based on the temperature sensor directly connected to it, enabling extremely accurate control.</p>
	<p>CO₂ Smart Switch for opening and closing a CO₂ valve.</p>

HortiMaX-Go! sensor units



Base component: Ridder Meteo-Go!

Our compact and complete Meteo-Go! weather station measures the wind speed, wind direction, outside temperature, humidity and solar radiation, and includes rain detection. The Meteo-Go! is extremely reliable and easy to maintain as it is constructed from one piece. There are no moving parts and a galvanic separation protects the unit against lightning damage.

A GPS connection determines the location of the weather station and the bus connection ensures that the Meteo-Go! is easy to install. In addition, one weather station is sufficient for multiple controllers. A bird protector is also available as an option.

Base component: Ridder MTV-Go!

Our new MTV-Go! accurately measures the temperature and relative humidity inside the greenhouse. In contrast to the Meteo-Go!, where one weather station is sufficient for all zones, one MTV-Go! is required for each zone. As an option, the MTV-Go! can be upgraded with a CO₂ sensor.

The double housing of the MTV-Go! prevents radiation from affecting the measurements and there is no need for a fan thanks to the high level of natural ventilation. The measurements are accurate, the installation is easy and the sensor unit doesn't attract dirt as it contains no moving parts.

Ridder CO₂ sensor unit

Control based on the CO₂ level is not only applied in high-tech greenhouses, but is becoming increasingly common in low-tech greenhouses as well. After all, the use of CO₂ can increase crop yields significantly. That's why CO₂ control is available as an option. The MTV-Go! sensor unit includes an additional connection that makes it easy to daisy-chain the MTV-Go! to our optional CO₂ sensor unit.

By connecting the CO₂ sensor unit directly to the MTV-Go!, it is possible to measure the CO₂ concentration in the greenhouse zone directly. This data is also instantly available for CO₂ control.

HortiMaX-Go! control units and panels

Control units

To ensure fast installation and reliable control of equipment, Ridder has designed various control units. These comply with international legislation and contain first-class components with the required quality marks, making them suitable for use worldwide. For instance, every control unit is equipped with thermal overload protection. This is mandatory worldwide. Certain control units are fitted with an emergency stop for additional protection. Smart Switches and other components are easy to click onto the DIN rail present. Various types of control units are available for the HortiMaX-Go!:

- For controlling one or two motors
- With or without an emergency stop facility
- With or without a Smart Switch



The following table shows an overview of the available control units:

	Smart Switch	Controls two motors	Controls one motor	ON/OFF relay	OPEN/CLOSE relays	Emergency relay
OPEN / CLOSE					x	
MCB A Double Master	x	x			x	
MCB B Double Master	x	x			x	x
MCB C Double Slave		x			x	
MCB D Double Slave		x			x	x
MCB A Single Master	x		x		x	
MCB B Single Master	x		x		x	x
MCB C Single Slave			x		x	
MCB D Single Slave			x		x	x
ON / OFF						
CB E Double	x			x		
CB F Double Slave				x		
CB E Single	x			x		
CB F Single Slave				x		

Control Panels

A control panel combines Smart Switches and other components such as power supplies, thermal overload cut-outs and reversing magnetic switches. These panels are available in a wide range of sizes. Depending on your needs, the panel can be fitted with a blind door with integrated switches or with switches fitted through the door. You can also choose a lockable transparent door. This means that the switches will be visible, but cannot be operated by unauthorized users. Control panels are available on request according to your specifications.



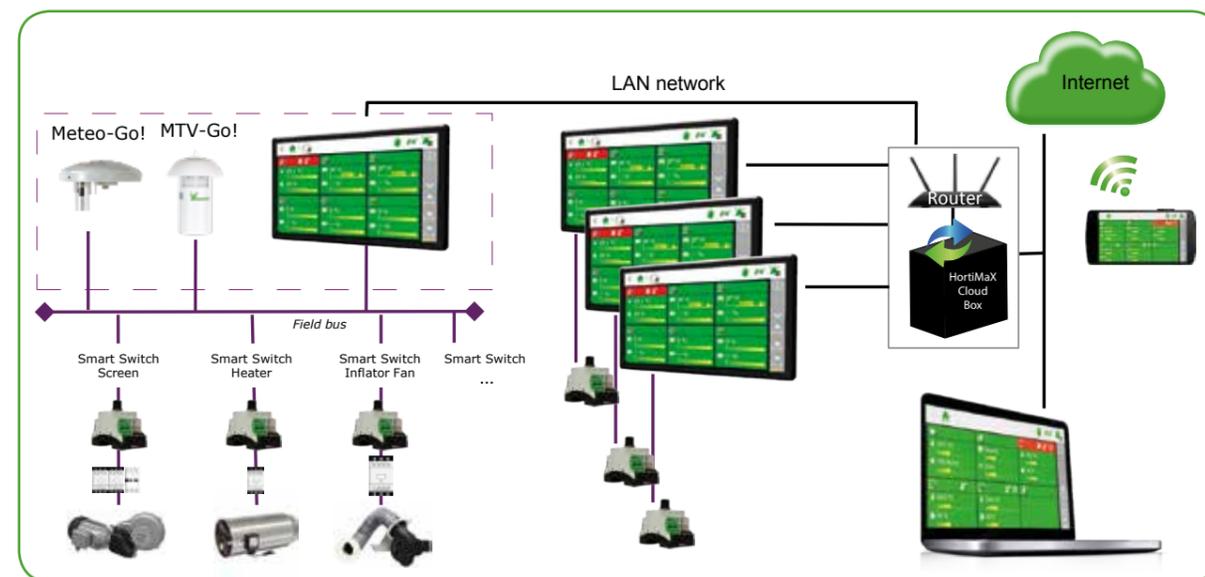
HortiMaX-Go! Cloudbox

The HortiMaX-Go! features a responsive design, making it compatible with any device. It doesn't matter whether you work with iOS, Android or Windows.

To have access anywhere via the Internet, you will need our Cloudbox. This box provides a secure connection between the local HortiMaX-Go! and the Internet. Multiple mobile devices can be connected to the Ridder server, allowing data to be exchanged between them. Our Cloudbox includes one year of access to the Ridder server for all devices, and includes the ability to download apps. Our Cloudbox doesn't include a router or modem; you will need to provide this yourself.

Working in the Cloud has a number of additional benefits:

1. It allows extra historical data to be stored in addition to the HMX-Go! standard.
2. The Cloud works as a back-up facility. All data is saved in a central location and can be easily restored if a problem occurs.
3. Data from different greenhouses can be compared with one another in the case of large businesses with multiple locations.



Ridder FertiMiX-Go!

The FertiMiX-Go! is ideal for growers seeking an automatic fertilizer dosing system that is affordable and easy to use. The FertiMiX-Go! consists of a mixing tank unit that is equipped with a HortiMaX-Go! greenhouse controller. The intuitive touchscreen interface opens up a whole new world of irrigation capabilities. The irrigation controls include a host of start options, fertigation recipes and up to four programmable periods. With the FertiMiX-Go!, you can even control the climate of greenhouse compartments (or 'zones'). Depending on the selected options, the unit can control up to eight climate zones.

The unit can be physically expanded with three fertilizer dosing channels, a pH dosing channel, a filling pump and a mixing valve for blending two different water types based on the EC level. Using the Meteo-Go! weather station, irrigation can be triggered automatically based on solar radiation (sunlight). It is also possible to install secondary sensors to monitor the main EC and pH readings.

The FertiMiX-Go! will allow you to:

- quickly save on water and fertilizers.
- achieve higher yields and a fast return on investment.
- always apply the best fertigation strategy for your needs.
- control up to eight climate zones.

Frequency	50 or 60 Hz
Voltage	230 or 400 (3-phase)
Dimensions (LxWxH) in cm	66 x 116 x 102
Mixing tank volume	100 litres
Standard number of fertilizer dosing channels	1
Maximum number of fertilizer dosing channels	4
Optional pH dosing	Acid or alkali (base)
Nominal capacity m ³ /h at 4 bars	10
Max. number of valves	96
Max. number of valve groups	96
Contact inputs	Two per Smart Switch valve
Alarm output	1
User interface on the unit	Yes
Remote control	In combination with the HortiMaX-Go! Cloudbox and app



Smart Switches for irrigation control

In addition to the above specifications, the FertiMiX-Go! includes the following irrigation controls as standard:

	<p>EC</p> <p>Smart Switch for controlling up to four EC valves if a flow meter and two EC sensors are connected. This control allows up to four fertilizers to be mixed together with the aid of accurate pulse-dosing valves. Using the dosing ratio control, you can set the desired ratio for each fertilizer. The Smart Switch controls the valves autonomously, allowing the best mixing ratio to be achieved through highly accurate pulse doses. Each valve group can be assigned its own fertigation recipe for each period. The unit comes with one EC sensor as standard. An additional EC sensor can be connected to monitor the accuracy of the EC readings.</p>
	<p>pH</p> <p>Smart Switch for connecting two pH sensors and a pH valve. This control is suitable for both acid and alkali (base) dosing. It uses our standard pH sensor. An additional pH sensor can be connected to monitor the accuracy of the pH readings.</p>
	<p>System Pump</p> <p>Smart Switch for switching a system pump on and off. To prevent the pump from running dry and overheating, the pump can be fitted with a temperature sensor as a safeguard.</p>

Modifications to the above specifications are possible, but may affect the price and delivery time. The following options are available for the FertiMiX-Go!:

- Acid dosing (i.e. sensor and dosing channel)
- Dosing of extra fertilizers (up to three extra dosing channels, four in total)
- EC monitoring sensor
- pH monitoring sensor
- Up to 96 valves and valve groups can be connected (eight valves, eight valve groups and two contact inputs for each extra Smart Switch)
- Weather station (for starting irrigation based on radiation sum and monitoring outside conditions)
- Various climate Smart Switches

	<p>EC pre-blending</p> <p>Smart Switch that operates a mixing valve for blending fresh supply water and drain water based on the EC level. The valve's open/close control and an additional EC sensor can be connected to the Smart Switch. An additional EC setpoint is programmed for EC pre-blending control, based on which the supply water will be fed into the mixing tank.</p>
	<p>Filling Pump</p> <p>Smart Switch for switching an optional filling pump on and off.</p>
	<p>Valve Card</p> <p>Smart Switch for expanding your system to eight valves and eight valve groups, including two start contacts.</p>

If the FertiMiX-Go! is used in projects with multiple fertigation units, the controllers can be replaced by a single process computer, such as the Ridder HortiMaX CX500.

The FertiMiX-Go! includes the following options to start and stop irrigation:

	<p>Valve group manual start</p> <p>Allows a valve group to be activated by a manual command.</p>
	<p>Start contact</p> <p>Allows irrigation to be started based on one of the connected contacts (two voltage-free contacts are connected to the valve card input).</p>
	<p>Time start</p> <ul style="list-style-type: none"> • Single (one time start on a specific day) • Daily (choose day(s) and times, e.g. Mon and Wed. at 10 a.m.) • Interval (every so many days at a certain time) • A total of 24 time starts can be added. 
	<p>Radiation sum start</p> <p>Allows irrigation to be started based on the radiation sum, which is the cumulative solar radiation measured.</p>
	<p>Cyclische start</p> <p>Allows irrigation to be started at pre-set intervals.</p>
	<p>Valve start</p> <p>Allows you to activate one or more valves manually.</p>

