MAXA AIR CONDITIONING

V.415

Multifunction control unit for electrical panel

Controller manual

Model:

Hub

MULTIFUNCTION CONTROL UNIT FOR ELECTRICAL PANEL

INDEX

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Rev	**Data**	**Redacted**	**Checked**	**Approved**	**Description Updates**

Catalogo / Catalogue / Katalog / Catalogue **MUI01110120001-00**	Serie / Series / Serie / Serie / Série **MULTIFUNCTION CENTROL UNIT FOR ELECTRIC PANEL**

The electrical and electronic products and any waste should not be disposed of with normal household waste, but disposed of according to WEEE law in accordance with the directive 2012/19/EU, inquiring thereof at the place of residence or with the retailer in the case where the product is replaced with a similar one.

1 NOTES

1.1 WARNINGS

Read carefully the instructions contained in the next document because they provide important information about the safety of the installation, use and maintenance.

Every operation must be executed carefully, in compliance with the current workplace safety standards. After removing the packaging, make sure about the integrity and the entirety of the content. It is forbidden to disperse or leave within the reach of children the packaging material, in as much it can be potentially source of danger.

It is forbidden to modify the security or regulation devices without authorization and indications of the product builder. Do not modify the appliance because dangerous situations could be created, and the builder will not be responsable for any damage caused. Do not allow the product to get wet and do not install the device in environments where condensation may form. The product should be used and stored in environments that meet the temperature and humidity limits specified in this manual, values outside the limits may damage the device.

Separate as possible the signal wires from power cables to avoid possible electromagnetic interference.

The execution of all works must be carried out by professional and qualified, competent in current norms of the nation where the installation is made.

Repair or maintenance work must be done by the Technical Assistance Service or by qualified personnel in accordance with this booklet. The company excludes all contractual and extra-contractual liability for damage caused to people, animals or things, from installation, adjustment and maintenance errors, from improper use or from a partial or superficial reading of the information contained in this manual. Any other use than that permitted is prohibited.

1.2 CONSERVATION OF THE MANUAL

The manual must be always kept for future reference. It must be stored in a safe place, away from dusts and moisture. It must be also available and accessible to all users who shall consult it any time they are in doubt on how to operate the equipment.

The company reserves the right to modify its products and related manuals without necessarily updating previous versions of the reference material. It also declines any responsibility for possible inaccuracies in the manual if due to printing or transcription errors.

The customer must keep any updated copy of the manual or parts of it delivered by the manufacturer as an attachment to this manual.

Any updates sent to the customer must be kept attached to this manual.

1.3 NORMATIVE REFERENCES

The units have been designed in accordance with the following directives and harmonised standards:

- EU Directives 2014/35/UE, 2014/30/EU, 2011/65/EU, 2012/19/EU
- EN standards 60730-1, EN 50581

1.4 DISPOSAL

Referring to the directive 2012/19/UE of European Parliament and the council of 4 July 2012 and the relating to national implementing regulations, we inform the costumer that:

- there is an obligation not to dispose of WEEE as municipal waste and to collect such waste separately.
- public or private collection systems provided for by local laws must be used for disposal. It is also possible to return the equipment to the distributor at the end of its life in case of purchase of a new one.

- This equipment may contain hazardous substances: improper use or disposal could have adverse effects on human health and the environment.

- The symbol (crossed-out wheeled bin) on the product or on the packaging and on the instruction, sheet indicates that the equipment was placed on the market after August 13, 2005 and must be collected separately.

- In the event of abusive disposal of electrical and electronic waste, penalties are established by the local regulations in force regarding disposal.

2 TECHNICAL DATA

Hub is an electronic device to environmental data acquisition through sensors and the control of external devices trough relay. The device has also a communication interface to allow the monitoring and the remote control of LAN network or internet.

It allows winter and summer climate regulation having control to the heat pump, the radiant system or the fan coil. The option to use more addressable sensors MTH enable to manage up to 12 climate zones. The user can set setpoint values and time schedules for each zone and networked units.

Features	Usual	Min.	Max.
Power supply storage	24Vdc	20Vac	28Vac
Absorbed power	180mA		
Usual operation environment temperature	25°C	-10°C	50°C
Ambient operating humidity (non-condensing)	45%	10%	90%
Storage room temperature	25°C	-20°C	50°C
Humidity storage room temperature (no condensate)	30%	10%	90%
Device class (*REG UE 2013-811)*	Classe VIII		
Temperature control contribution to seasonal energy efficiency of room heating. (REG UE 2013-811)	5%		
Isolating class (protection from electric shock)	Not applicable		

2.1 ELECTROMACHINES FEATURES

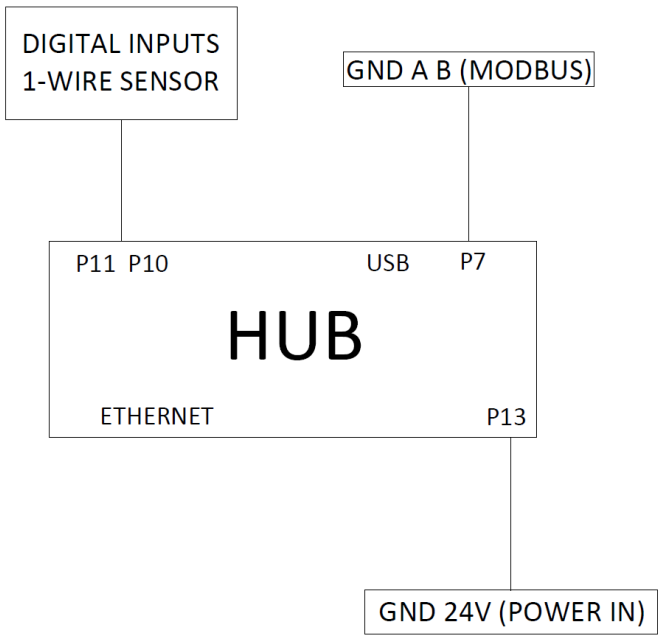
Ethernet interface	10/100 Mbps (RJ45)
Wi-Fi interface	EE802.11 b/g/n
Digital Inputs	6 canals
Serial input	RS485/Modbus Master
Sensors interface	Temperature sensors 1WR
Real time clock	Integrated battery, keep data and hour for 4h power alimentation

3 INSTALLATION

3.1 MOUNTING

Hub has been designed to be installed on DIN rail 46277 horizontally in a electric panel. Follows a wiring diagram with the possible electric connections for the correct device operation.

3.2 CONNECTIONS



3.3 ALIMENTATION CONNECTION

The power supply must be connected to the "PWR IN 24V" terminals. The supply voltage must be 24Vdc; respect the indicated polarity.

The upper voltage limits must never be exceeded, otherwise the device will be seriously damaged. It is necessary to protect the power source from possible module faults by means of a suitably sized fuse.

3.4 ETHERNET CONNECTION

The device has a connector RJ45 on the frontal side “Ethernet”. Here it is connected an Ethernet CAT5 connected to a switch or a LAN router.

3.5 DIGITAL INPUT CONNECTIONS

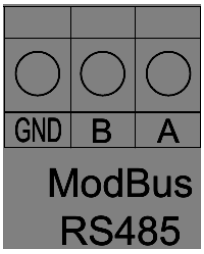
The device has "Digital IO 1" (**P10**) and "Digital IO 2" (**P11**) terminals on the rear side to connect digital inputs. You can also connect the 1-Wire sensor bus.

P10		P11	
1	Digital Input 1	1	Digital Input 3
2	Common 1 and 3	2	Data for 1-wire
3	Digital Input 2	3	3.3V for 1-wire
4	Common 2 and 3	4	GND for 1-wire

3.6 CONNECTION BUS RS485/MODBUS

The device has terminals “RS485/Modbus” (P7) on back side to connect the bus RS485/Modbus.

The heat pump must be connected to this clamp, respecting the indications given in the terminals of the controller and the corresponding GND, A, B clamps of the machine terminal board (see terminal board in the MUI of the corresponding PDC).



P7	
A	RS485 A wire
B	RS485 B wire
GND	GND

3.7 POWERING

- Verify that all connections have been performed correctly as shown in paragraph 2.2.
- Supply power to the device.
- Check that the red LED D5 on the front side lights up steadily.
- Check that the yellow LED D4 on the back side starts flashing irregularly (the operative system is loaded).
- After ca. 30 s the yellow LED D4 starts flashing regularly (the connection to LAN network has been done).
- The system is operative.

3.8 EASY CONNECT

To associate a system to a user, you can use the Easy Connect button on the control unit. With this function the user can associate his smartphone (Android or iOS) to a system, through the control unit with a simple click.
The procedure is the following:

- Connect smartphone and base station to the same network
- From a smartphone, start “MyMaxa” application and register or log in if already registered
- From the app, press the "find control unit" button, the button will appear

- From the control unit, press and hold the button, simultaneously press the same button on the app.

If the operation is successful, it will be displayed by the newly assigned system.
This procedure can also be performed without logging in to the application, with the difference that the system will only be displayed locally, and the data will not be recorded on the portal

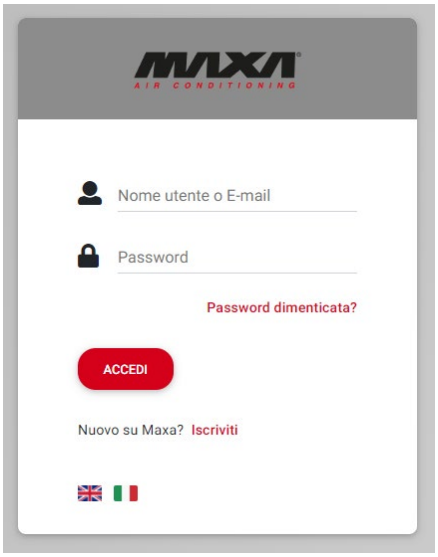
4 MALFUNCTION ANALYSIS

Problem	Cause
Red LED off	No power supply
Yellow LED off	LAN connection not executed
Sensors values not detected	Sensors not connected correctly

5 MAXASETUP

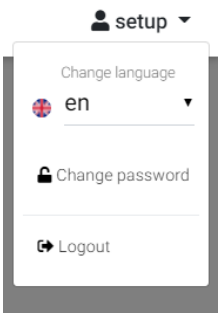
MaxaSetup is a tool with which it is possible to configure the control unit and perform the first test of the installed system through a series of tools such as diagnostics, probe and relay reading and parameter setting. No software installation is required to use MaxaSetup as it runs directly on the control unit; access can be made in two ways:

1. From the browser of the pc writing “my.maxa.local” with the control unit direct ethernet connection.
2. From the "my.maxa.it" portal using the MaxaSetup button if access has been made with installer credentials. To obtain access credentials, you must send a request to **support@advantixspa.it**, communicating the user name chosen at the time of registration.



Open the drop down menu on the left of the screen. The default address is with the following credentials:
Username: setup
Password: setup

After the first access it is recommended to change the password using the drop-down menu in the top right hand corner



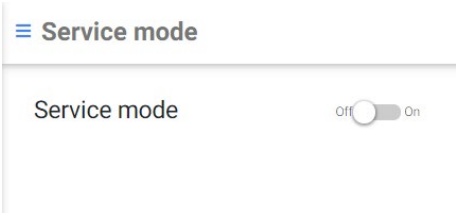
You have access to the following menus:

5.1 SERVICE MODE

Only for systems where Zone thermoregulation is present.

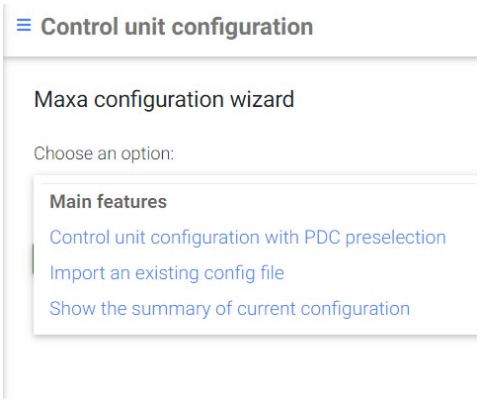
The service mode is used to disable the thermoregulation during the testing operation. During testing, this mode must always be activated to prevent the temperature control logic from interfering with the tests.

Once the test has been completed, it is important to deactivate this mode and restart the control unit.



5.2 CONTROL UNIT CONFIGURATION

Using a drop-down menu you can select the required option:

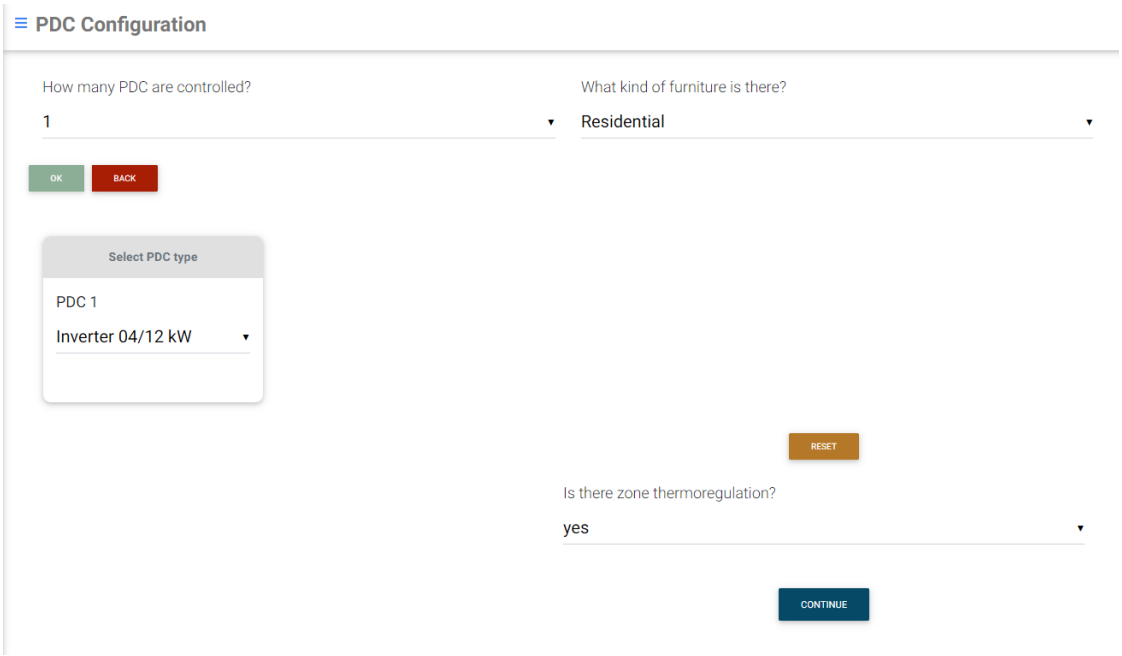


- **Control unit configuration with PDC preselection:** guided configuration of the system that precludes the presence of the Maxa heat pump/chiller.
- **Import an existing configuration file:** load a preconfigured system.
- **Display a summary of the current configuration:** displays a summary of what is configured on the controller.

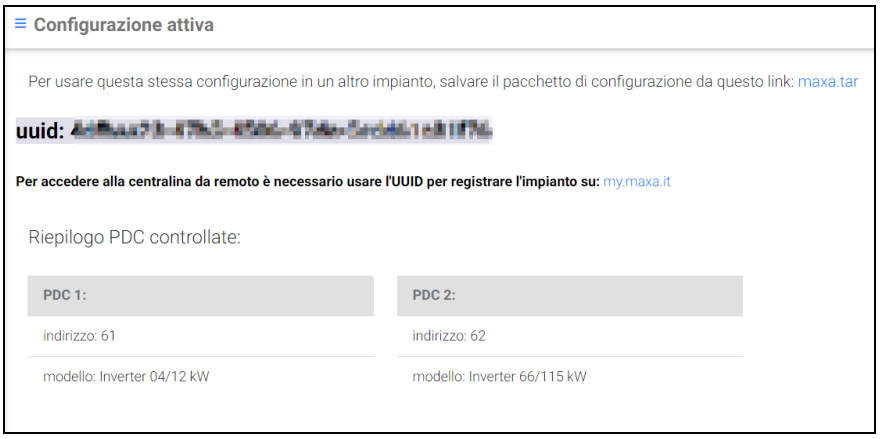
The configuration of the controller with PDC preselection includes the following steps:

5.2.1 CONTROLLER CONFIGURATION WITH PDC PRESELECTION

1- Select the number of PDCs controlled, their typology and type of furniture: residential, industrial or absent



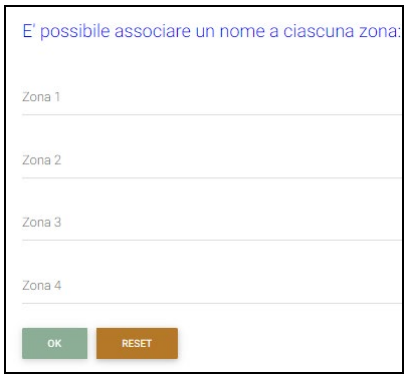
2- If the system provides for the presence of temperature control zones, select yes on the appropriate selection



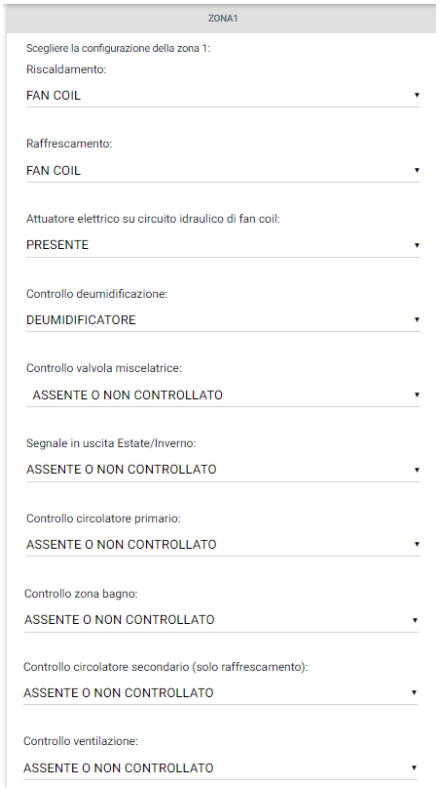
The screen resumes the configuration carried out, showing the modbus addresses that the controller requires.
It is therefore necessary to set the modbus addresses shown on the heat pumps, and "None parity, 1 stop bit" in all machines.
In this example they must be set:

- PDC 1: H125=3 (parity), H126=61 (modbus address)
- PDC 2: H125=3, H126=62

3- Select the number of zones. From here you can also modify their name, which otherwise will be Zone 1, ... , Zone n (with n = number of controlled zones).



4- For each zone it is possible to choose the configuration, an example is given below:


ZONA1
Scegliere la configurazione della zona 1:
Riscaldamento:
FAN COIL
Raffrescamento:
FAN COIL
Attuatore elettrico su circuito idraulico di fan coil:
PRESENTE
Controllo deumidificazione:
DEUMIDIFICATORE
Controllo valvola miscelatrice:
ASSENTE O NON CONTROLLATO
Segnale in uscita Estate/Inverno:
ASSENTE O NON CONTROLLATO
Controllo circolatore primario:
ASSENTE O NON CONTROLLATO
Controllo zona bagno:
ASSENTE O NON CONTROLLATO
Controllo circolatore secondario (solo raffrescamento):
ASSENTE O NON CONTROLLATO
Controllo ventilazione:
ASSENTE O NON CONTROLLATO

- **Heating**

Title	Description	I/O necessary
Absent or uncontrolled	The system does not include any heating system	-
Radiant	The heating is provided by a radiant circuit	1 relay 1 probe
Radiator	Heating is via a radiator with solenoid valve	1 relays 1 probe
Radiant controlled by zone terminal	Heating is via radiant circuit controlled by Maxa R-Touch	No I/O is required because you use those on board the R-Touch thermostat
Fan coil	Heating is via 3-speed fan coil	3 relays 1 probe
Analogue fan coil	Heating by means of 0-10V fan coil	1 exit 0-10V 1 probe
Fan coil controlled by zone terminal	Heating is via fan coil controlled by Maxa R-Touch	No I/O is required because you use those on board the R-Touch thermostat
Fancoil without temperature control	Heating is via 3-speed fan coil without temperature control	3 relays
Analogue fan coil without temperature control	Heating is done by 0-10V fan coil without temperature control	1 exit 0-10V

- **Cooling**

Title	Description	I/O necessary
Absent or uncontrolled	The system does not include any cooling system	-
Radiant	Cooling is carried out by means of a radiant circuit	1 relay 1 probe
Radiant controlled by zone terminal	Cooling takes place by means of a radiant circuit controlled by Maxa R-Touch	No I/O is required because you use those on board the R-Touch thermostat
Fan coil	Cooling takes place by means of 3-speed fan coil	3 relays 1 probe
Radiant + fan coil	Cooling is carried out by means of radiant heaters and 3-speed fan coils Speed 1: radiant only Speed 2: radiant + fan coil speed 1 Speed 3: radiante + fan coil speed 3	4 relays 1 probe
Analogue fan coil	Cooling is done by 0-10V fan coil	1 exit 0-10V 1 probe
Radiant + analogue fan coil	Cooling is by means of radiant and fan coil 0-10V	1 relay 1 exit 0-10V 1 probe
Fan coil controlled by zone terminal	Cooling is carried out by fan coil controlled by Maxa R-Touch	No I/O is required because you use those on board the R-Touch thermostat
Fancoil with ventilation consent	Cooling is by 3-speed fan coil with water temperature control	3 relays 1 1WT probe
Analogue fan coil with ventilation consent	Cooling is done by 0-10V fan coil with water temperature control	1 exit 0-10V 1 1WT probe

- **Electric actuator on hydraulic fan coil circuit**

If the option used for heating or cooling control includes "Fan coil" or "Fan coil without temperature control" it is necessary to specify whether or not an electric actuator (solenoid valve) is present.

- **Dehumidification control**

A humidity reading probe (MTH sensor or on board the 7-touch control unit) is required. The operation only concerns the Summer mode. Through the setting of configurable parameters, it is possible to implement a better setpoint humidity tracking by the system and to compensate the reading offset of the sensor.

Title	Description	I/O necessary
Absent or uncontrolled	The system does not include any dehumidification control	-
Dehumidifier	dehumidifier mounted on the hydraulic circuit downstream of the mixing valve. When this dehumidifier is activated, the circulator associated with the hydraulic circuit also starts.	1 relay 1 probe 1 humidity sensor
Dehumidifier pre-mix	dehumidifier mounted on the hydraulic circuit upstream of the mixing valve. The activation of this dehumidifier does not affect the control of the circulator.	1 relay 1 probe 1 humidity sensor
Dehumidifier with integration	2-speed dehumidifier. The second speed (integration) is activated when the dew alarm limit is exceeded.	2 relays 1 probe 1 humidity sensor
Fan coil	allows the use of a 3-speed fancoil also for dehumidification as well as cooling	3 relays 1 probe 1 humidity sensor
Analogue fan coil	allows to use a fancoil with 0/10V control also for dehumidification, in addition to cooling	1 exit 0-10V 1 sonda 1 humidity sensor
Fan coil without temperature control	allows to use a 3-speed fancoil also for dehumidification, without any temperature control	3 relays 1 humidity sensor
Analogue fan coil without temperature control	allows to use a fancoil with 0/10V control also for dehumidification, without any temperature contro	1 uscita 0-10V 1 humidity sensor

- **Mixing valve control**

The "Mixer" module controls the servomotor of a mixing valve which varies its opening according to the flow temperature calculated from the climate curve settings. The climate curve is a function that calculates the flow temperature based on the measured outside temperature.

By setting parameters that can be configured by qualified personnel, the servomotor rotation time and the temperature range for which it is not considered necessary to vary the mixing.

Title	Description	I/O necessary
Absent or uncontrolled	The system does not include any mixing valve	-
Analogue mixing valve	The valve is controlled by an analogue output	1 exit 0-10V 1 external probe 1 output probe
3-way mixing valve	The valve is controlled with a 3-way actuator	2 relays 1 external probe 1 output probe

- **Summer/Winter output signal**

Select "present" in case you want to use a relay- Summer/Winter output signal

to signal the season.Select "present" in case you want to use a relay to signal the season. Relay open in Winter, closed in Summer.

- **Primary circulator control**

Mixed circulator (can be used in case of radiant or fancoil). A primary circulator can be configured for heating only or for heating and cooling. The primary circulator is activated when at least one device mounted on the associated hydraulic circuit (e.g. radiant, fan

coil, dehumidifier) is activated via a thermostat or humidistat. The reference probes (and offsets) are those associated with the thermostat or humidistat.

1 relay is required.

- **Secondary circulator control (cooling only)**

Circulator for hydraulic devices that operate only in cooling mode.

- **Ventilation control**

The ventilation device is activated according to a weekly time schedule specifying the "on" and "off" periods.

The Controlled Mechanical Ventilation module acts by operating the fans of the ventilating unit at regular intervals in order to obtain the number of hours of air change that has been set by the configuration interface.

Title	Description	I/O necessary
Absent or uncontrolled	The system does not include any ventilation control	-
Generic on-off	Ventilation is controlled by on and off periods	1 relay
Generic 0-10V	The ventilation is controlled via a 0-10V output, which allows the introduction of an intermediate ventilation threshold (used as night mode).	Exit 0-10V

1 After each zone has been configured, multi-zone modules must be set up. These modules are devices that can be shared by several zones.

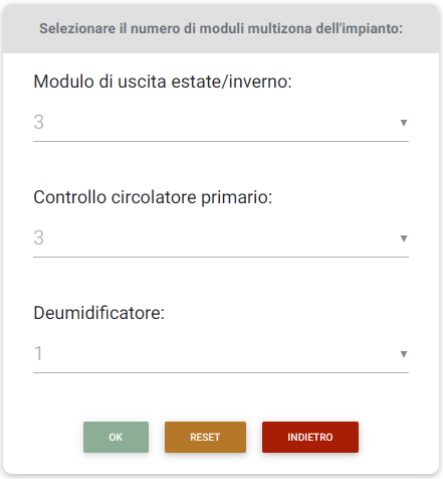
If there is a single zone, or no multi-zone modules are present, a screen will be visualised inviting you to continue without a multi-zone configuration.

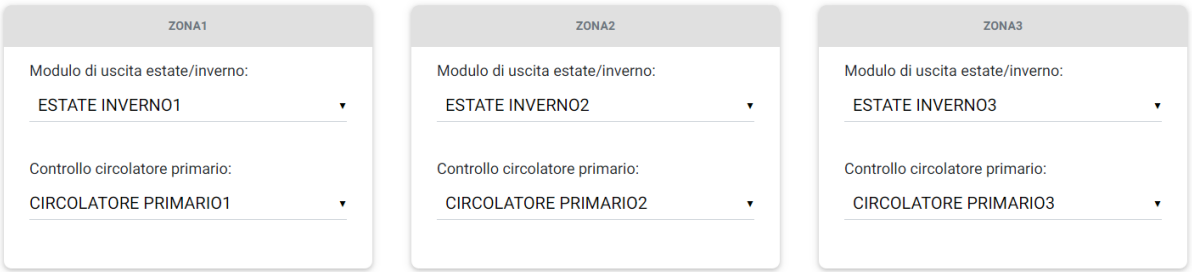
Otherwise you will be asked to select the number of devices and assign them to each zone.

The following table shows the devices that can be assigned multi zones; the example refers to the case of 3 zones.

Device	One device for all zones	More than one device for all zones
Dehumidifier	No further configuration required for zone ZONE 1, 2 and 3	Define the reference dehumidifier for each zone
Summer/Winter output module	No further configuration required for zone ZONE 1, 2 and 3	Define the reference Summer/Winter output module for each zone
Primary circulator	No further configuration required for zone ZONE 1, 2 and 3	Define for each zone the primary circulator of reference
Secondary circulator	No further configuration required for zone ZONE 1, 2 and 3	Define for each zone the primary circulator of reference
Bathroom area control	No further configuration required for zone ZONE 1, 2 and 3	Define the reference bathroom area control for each zone

Example:

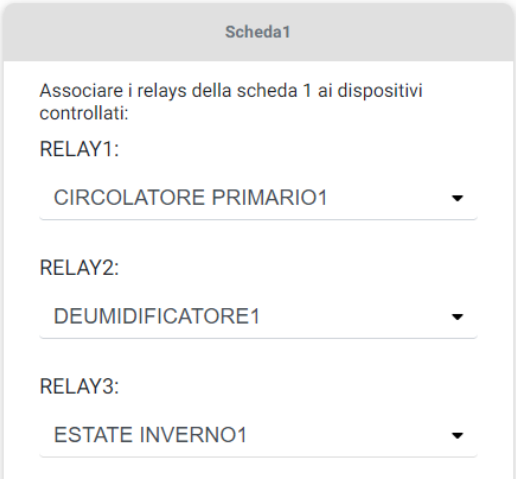




2 Summary of controlled devices in each zone

On this page there is a summary of the devices required for our system. You can also configure a larger number of Compact-8 cards.

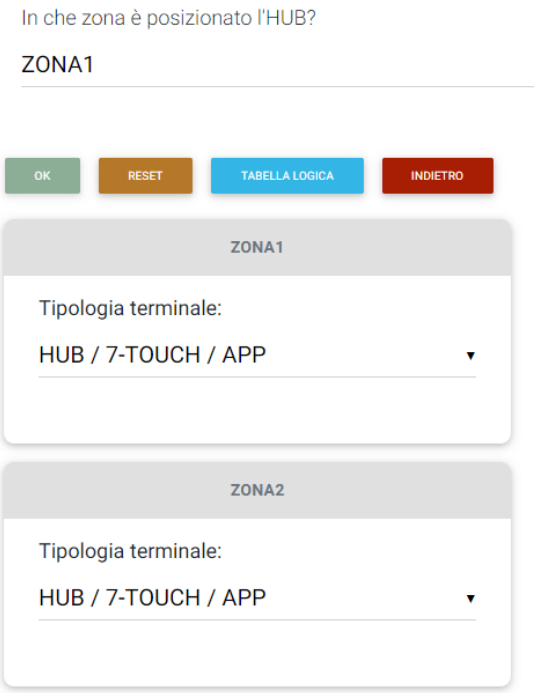
3 Once ok is pressed, you will access the page for assigning functions to each I/O of the devices.



4 Terminal configuration

Select the zone where the control unit is located; or if it is outside the controlled zones.

Select for each zone the type of control terminal (HUB/7-TOUCH/APP or R-TOUCH).

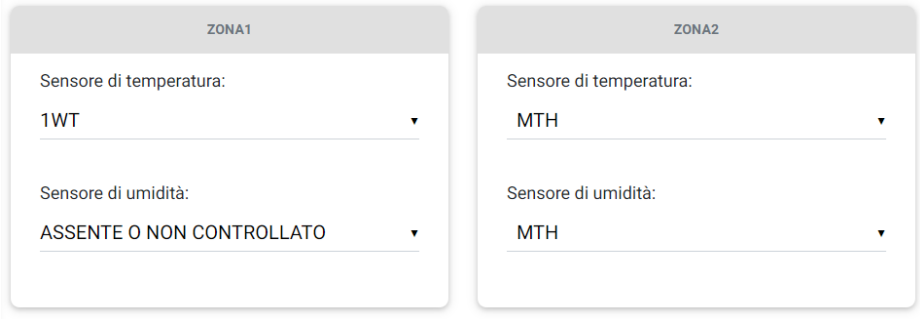


5 Logic table

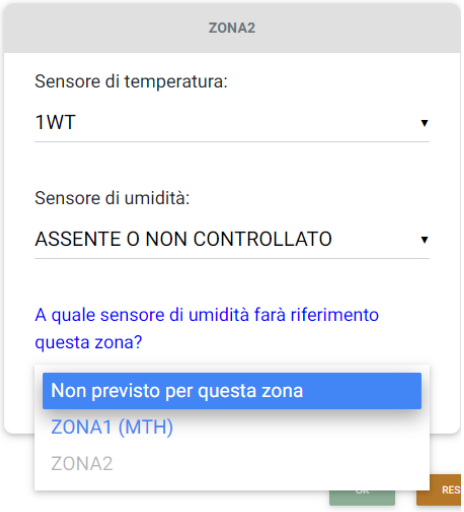
This page displays a table used for remote assistance.

6 Sensor configuration

From this page you can assign the type of temperature sensor for each zone.



If you choose the "absent or uncontrolled" humidity sensor, you can choose to refer to the temperature read by the sensor in another zone.



7 Active configuration

This page displays a summary of the set configuration. Two links are also displayed:

maxa.tar to save the configuration package (with the possibility of using it in another system)

my.maxa.it to access the control unit remotely

There are also the modbus addresses to be set in each device.

Remember to switch the control unit off and on again at the end of configuration.

5.3 DEVICES CONFIGURATION

The device configuration page is divided into three boards for 1WT, MTH and relay boards. This step also serves to give the address to the devices.

A simple automatic procedure will guide the user to connect the devices one at a time, until all the devices in the system are correctly configured.

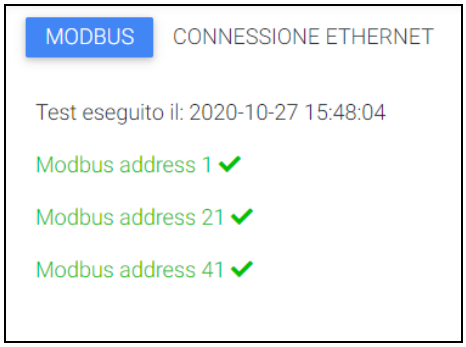
5.4 DIAGNOSTIC

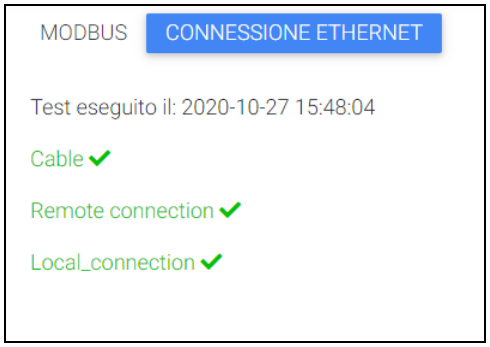
The diagnostic page is used to check that all connections have been made correctly.

To perform the test simply click on the TEST button, and the program will check that all connections are correct.

If some probe or terminal has not been connected correctly, the page will indicate which ones.

It is also analysed whether or not the control unit is connected remotely via Ethernet connection diagnostics.

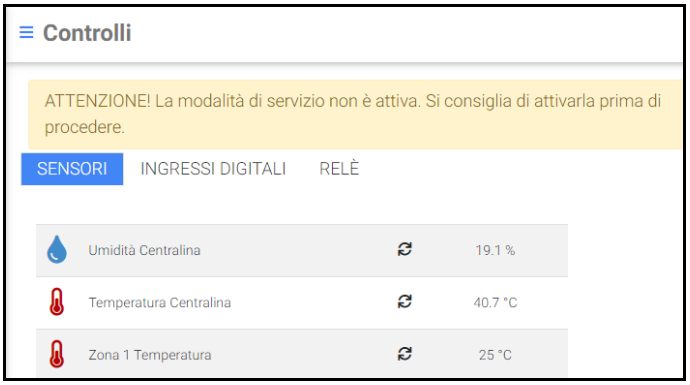




5.5 CONTROLS

With the check page we can verify that the readings are performed correctly. In this page we can read the sensors (temperature and humidity), digital inputs, relays, analogue inputs and mixing valves.

For the relays it is also possible to change the status to verify their correct operation (Service mode ON).



5.6 SETTINGS

From this page it is possible to change some of the operating parameters of the thermoregulation.

This page is divided into:

- Global parameters

- Zones

- Mixing valves

In the global parameters there are the parameters that act on all zones.

The zone parameters are parameters that act on the individual zones.

Finally there are the parameters of the mixing valves, which act on the climatic curve.

IMPORTANT: After completing the test, turn the service mode back to OFF, otherwise the thermoregulation will remain stationary.

5.6.1 GLOBAL PARAMETERS

These parameters apply to the entire system and are not specific to a single area.

T max	Maximum temperature that can be set by the user
T min	Minimum temperature that can be set by the user

5.6.2 ZONE PARAMETERS

These parameters can be set for each individual zone. Below the parameters are grouped for the functionality to which they apply. On the settings page will appear only the parameters related to the functionalities that have been configured in the system

Thermostat These parameters can be set if a heating device has been configured and/or Cooling.	**T offset**	Temperature probe correction
	T hysteresis	Temperature Hysteresis
Humidostat These parameters can be set if a dehumidifier has been configured. H offset	**H offset**	Humidity probe correction
	H hysteresis	Humidity hysteresis
	H set point	Set point of the humidistat, if it is set the user cannot set it from the Touch screen
Dew point These parameters can be set if a dehumidifier has been configured	**Dew limit**	Dew alarm limit, if not set the alarm is disabled
	Dew safety	Dew safety limit, if not set the alarm is disabled
Ventilation These parameters can be set if a ventilation device has been configured	**VCM speed**	VMC speed when switched on

5.6.3 MIXING VALVE PARAMETERS

These parameters can be set for each mixing valve that has been configured

Valve opening	Total opening time from 0 to 100% (in s), only required for 3-point valve
T Set (0°C) Winter	Parameter of the winter climate curve, Outlet setpoint at 0°C outside
T Set (20°C) Winter	Parameter of the winter climate curve, Outlet setpoint at 20°C outdoors
T Min Winter	Winter climate curve parameter, Minimum flow setpoint
T Max Winter	Parameter of the winter climate curve, maximum flow setpoint
T Set (20°C) Summer	Parameter of the summer climate curve, Outlet setpoint at 20°C outdoors
T Set (40°C) Summer	Parameter of the summer climate curve, Outlet setpoint at 40°C outdoors
T Min Summer	Parameter of the summer climate curve, minimum flow setpoint
T Max Summer	Parameter of the summer climate curve, maximum flow setpoint

5.7 WIFI CONFIGURATION

Here is possible to select one of the WiFi networks that are visible from the control unit.

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