CLEVER PRO Control

INSTALLATION AND OPERATION MANUAL

Please, read these instructions carefully before attempting installation

⚠	*Using a wrong tailor made RJ11 cable, the PCB or TFT can be damaged.* *If so, the components are out of guarantee.* *If the user wishes to lengthen one of both cables, a twisted pair shielded cable must be used and the enclosed instructions must be followed.*

SECURITY ADVISORY SYMBOLS

⚠ *¡Attention, Danger, Safety Advice!*

ⓘ *Important information*

INDEX

1. INTRODUCTION

1.1. Description

The **CLEVER PRO** is the new total control specially designed for air curtains management.
It is a versatile control which can communicate via Modbus and choose different functioning modes: semi-automatic and automatic. All these modes adapt the functioning of the air curtain to the entrance climatic conditions to keep the comfort and enhance energy savings.

Simple Plug&Play standard 4-way RJ11 cable installation, compatible with Airtècnics full air curtains range:
- 2 and 5 ventilation speed.
- All heating types: unheated, water heated, electrical heated and heat pump.

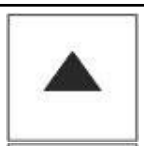
The **CLEVER PRO** control enables the maximum air curtain management possibilities based on user configuration, different temperatures (such as set, room and outdoor) and the door status.
In addition, it includes a scheduler, a boost function and a wide range of parameters to configure.

1.2. Main Features

- Backlight TFT display shows air curtain status in different screen modes: ventilation speeds and heating stages; set, ambient, outdoor, inlet and discharge temperatures; door status; alarms and errors; etc.
- Modbus connection to manage the air curtains connected to the Clever PRO control. Start/Stop the air curtain, modify ventilation speed and heating stages, send and read temperatures, etc.
- Different working modes that in combination with different temperature sensors (room, outdoor, inlet and discharge) modify the air curtains behaviour.
- It has two configurable digital inputs, like all inputs and outputs from the air curtains PCB.
- Multiple function mode (in development). Controls different doors with various functions with one Clever PRO control.
- Easy to update. Both Clever PRO control, and air curtains PCB, can be updated using an USB.

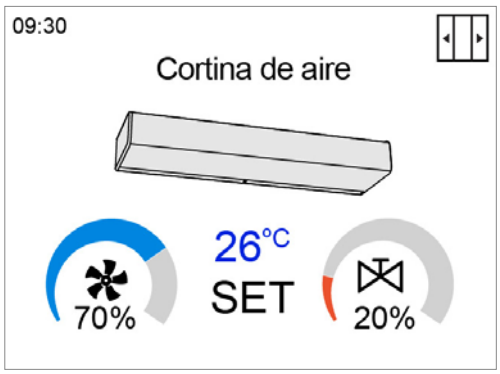
1.3. Screen and Buttons

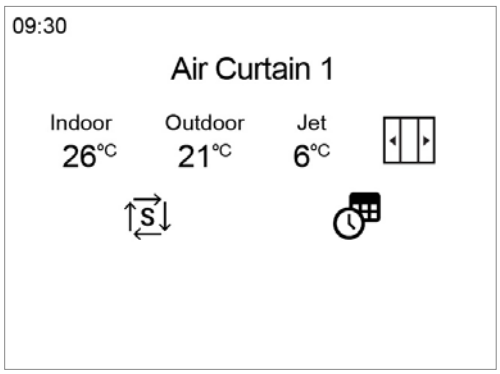
1.3.1. Buttons Layout:

	Turn ON/OFF the equipment. When multiple function (more than 1 unit with different functionings) it will ask if the user wants to turn ON/OFF the current unit or all**.**	
	State Screen	Go to User Menu
	Menus	- Exit Menu (if the user is in first level) - Go back to previous menu screen (if the user is in level 2 or higher) - When editing speed, time, hour, etc. It goes back to the previous value.
	State Screen	Up arrow: changes between units when multiple function is activated. Down arrow: Changes between the two screens displayed in main screen.
	Menus	Scroll through option (left) or editing value (between arrows)
	State Screen	On the main screen where the curtain appears: it changes SET temperature and it changes ventilation speed and heating stages.
	Menus	Go from left side to right side (in order to edit the values) Confirm the selected value and back to left Enter to edit with “✓” sign.

1.3.2. Screen Layout:

Two different main screens by switching with down arrow. (see “Main state screen” for further information)

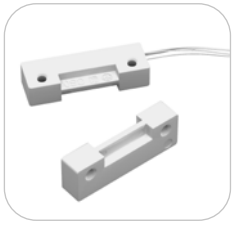




1.4. Included components

CLEVER PRO CONTROL

- Colour TFT screen 2.8 inch
- 114 (h) x 85 (w) x 14 (d) mm
- Prepared for surface installation



DOOR CONTACT

- Monitoring Door Status
- Magnetic contact

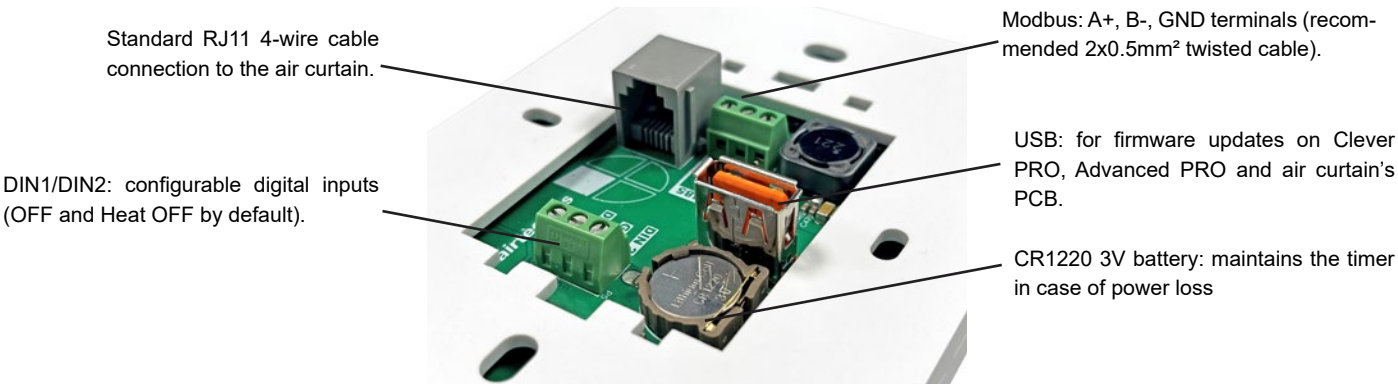
RJ11 CABLE (included with air curtain)

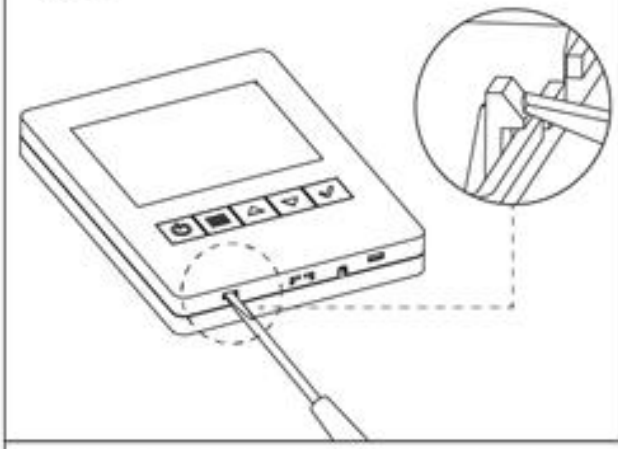
- 7/10m depending on air curtain
- Prepared for surface installation

TEMPERATURE SENSOR

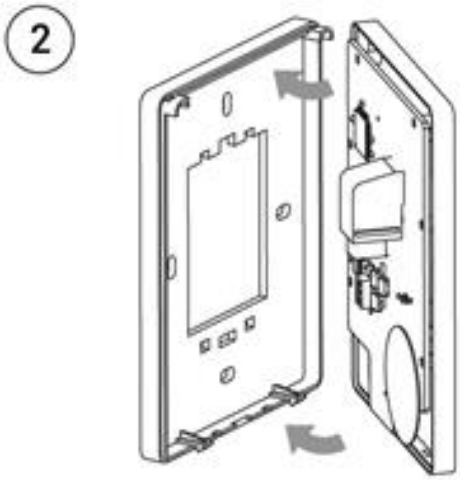
- Real-time temperature values
- IP65 Protection

WALL SUPPORT

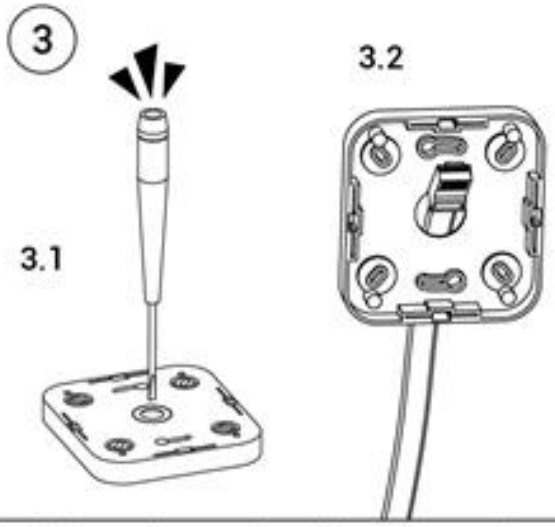




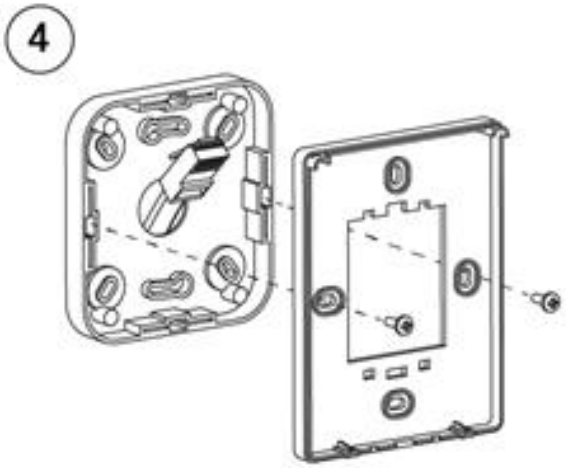
Disassemble the casing using a flathead screwdriver (press the two bottom locking tabs).



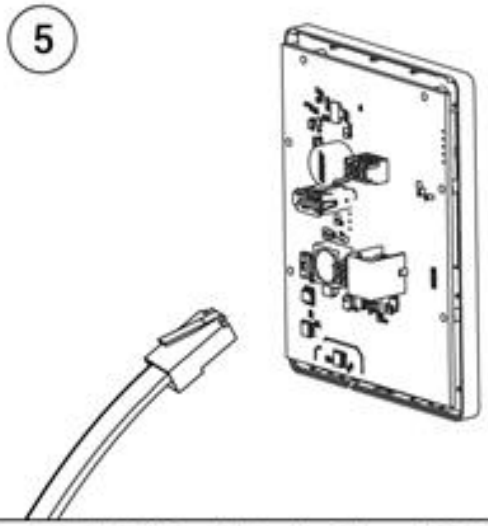
Separate the casing into two halves.



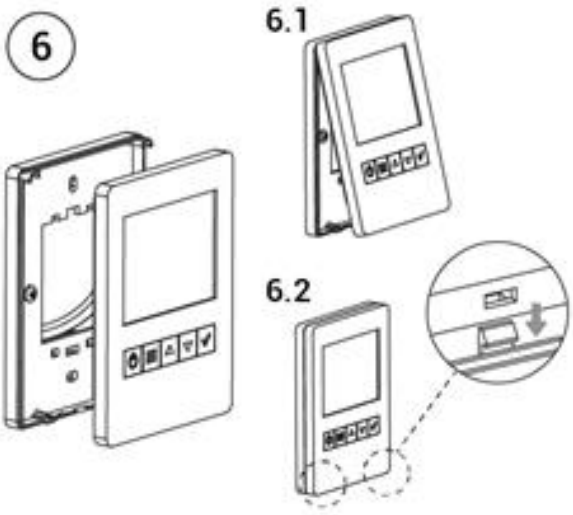
Identify the wall connection. If there is no wall switch box, use the Clever PRO support accessory.



Mount the back cover onto the wall switch box.

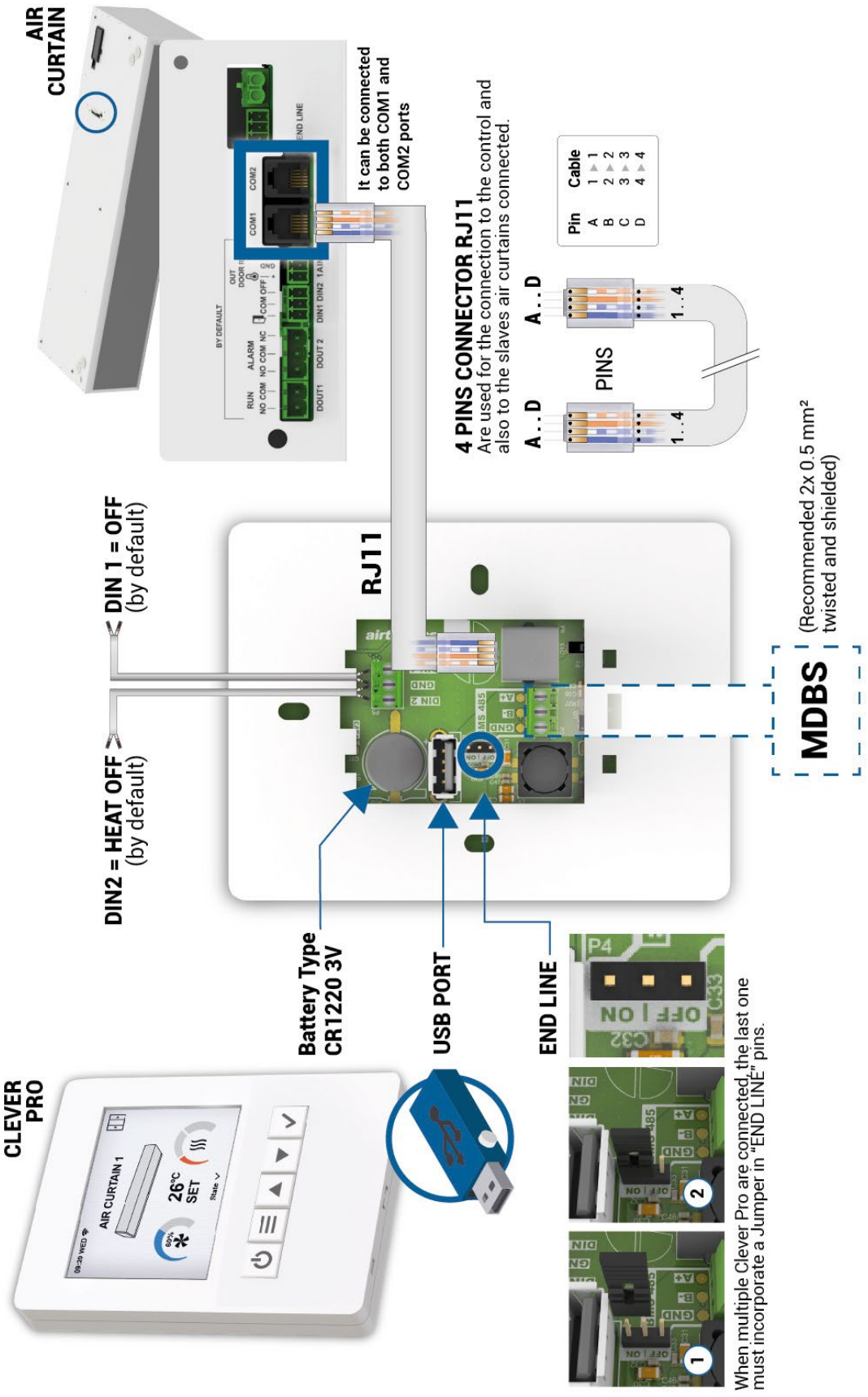


Connect the RJ11 cable to the Clever PRO PCB connector located on the front cover.



Assemble the front cover: First, position it at the top, then press the bottom to clip the tabs into place.

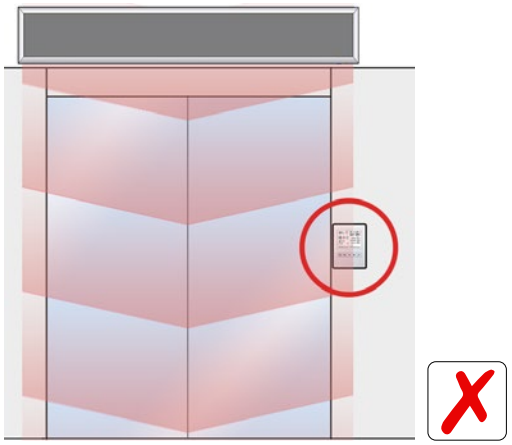
2. CONNECTION DIAGRAM

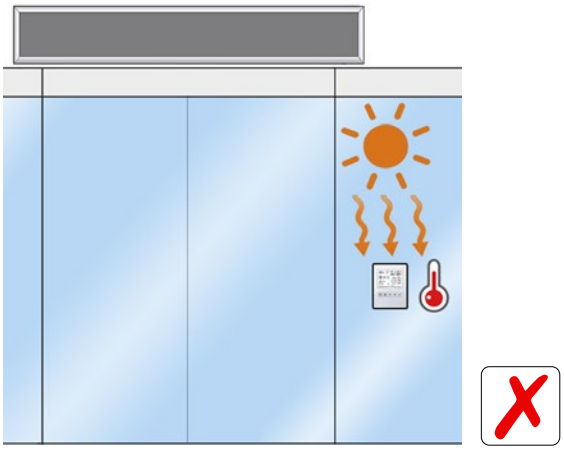


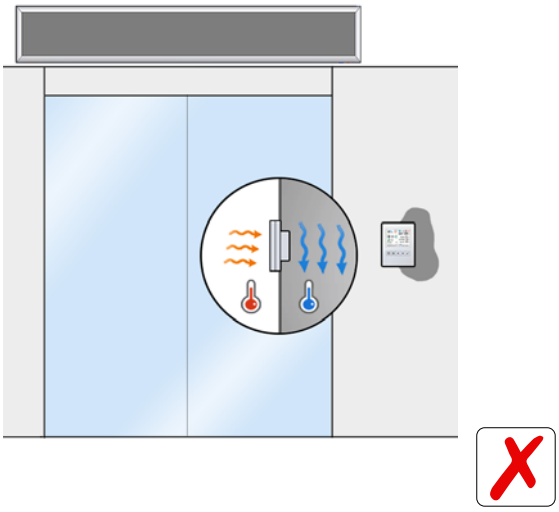
3. TFT INSTALLATION

It is important to install the Clever PRO control in a right place to avoid problems and incorrect data readings.

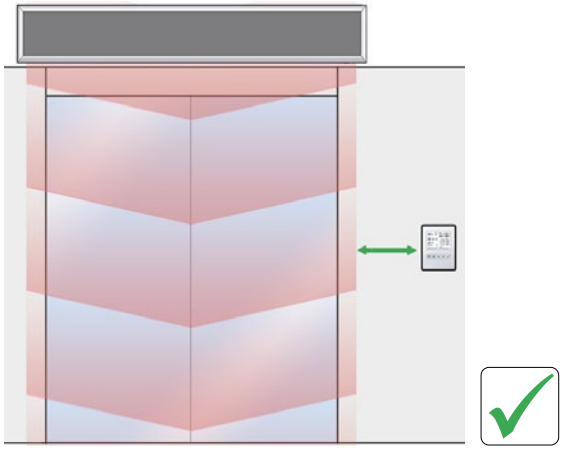
The next 3 images show how Clever PRO control MUST NOT be installed:







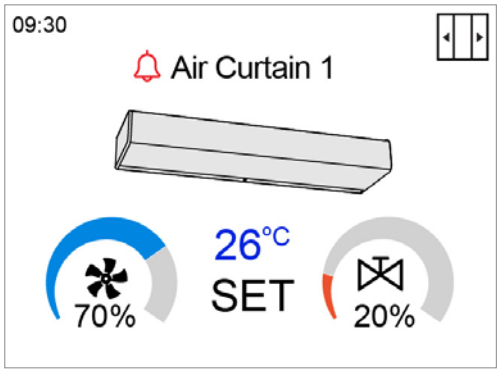
The following image shows how TFT control MUST be installed:



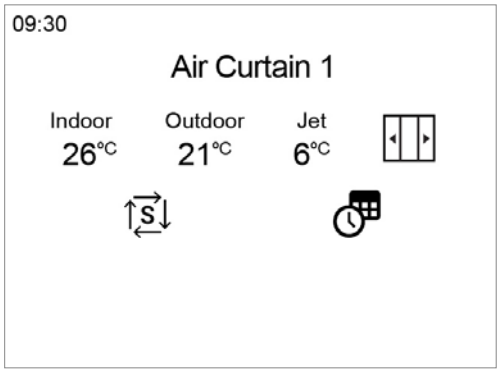
4. MAIN STATE SCREENS

Main state screen indicates the most important settings, including: ventilation speed, heating, temperatures, door state, working mode and program, filter state, day/hour, timer, etc.

Push down button (▼)to change between main screens.



Home screen



State screen

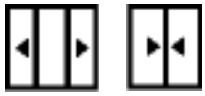
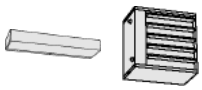
Home screen

It is the first screen showed when Clever PRO control initializes. As shown above, certain icons are displayed regarding time, day, door status, temperature, ventilation, climate and alarm signal when activated. Take into account ventilation speeds available are displayed as two or five, depending on the air curtain and PCB.

State screen

Shows a set of icons referencing certain Clever PRO control functions. See a detailed explanation below on the following point.

4.1. Icons and functions

	FAN SPEED	Indicates the fan speed, stages (2 or 5) or modulating
	HEATING STAGES	Indicates state: heating stage, ON/OFF or modulating, heating (orange) / cooling (dark blue)
	DOOR STATE	Indicates if the door is open or closed
	AUTO / MODBUS / SEMI-AUTO	Indicates if unit works in modbus, automatic or semi-automatic mode
	FILTER STATE	Indicates the state of the filter (green = clean, red = dirty)
	UNIT	Indicates the type of unit (air curtain, fan heater, etc.).

	TIMER	Indicates timer is activated. It has different states: ON, ON Day, ON Night, ON manual at desired speed or OFF
	DAY / NIGHT	Indicates Day or Night Function is activated to have two different set temperatures (in order to save energy)
	UNIT LOCKED	Indicates the unit is locked. Unit does not work until the user unlocks it by code.
	ALARM	The flashing red sign indicates there is an alarm. If affects any parameter, it will also flash. A second screen with a message will indicate: - Name of device that have the alarm - Which alarm is - Explain or ask the user to do something
	TEMPERATURES	Indicates the set temperature (desired). Shows the current temperatures according to the installed sensors: Indoor, Outdoor, Jet (when 2 or more PCB connected, Jet temp changes from one to antoher) and inlet (shows highest)
09:30	TIME	Indicates time.
	WIFI (in development)	Indicates connection with Wi-Fi / ethernet
	UNIT SELECTION	When there are arrows, indicates there is more than one device connected to the Clever PRO control (pressing “✓” it will change to blue colour and with the up arrow, user can change between other units).
	CLIMATE MODE	Indicates if it is working in heating mode or coooling mode.
	DESINFECTION	Indicates disinfection mode (in development).

5. SCREEN MENUS

5.1. Unlock codes

There are **four** unlock levels available. Depending on the code entered, the level unlocked allows a certain set of options.

Access codes:

- 1st level → **Screen lock** code. It leaves the screen inoperative, the user must enter the code to unlock sreen use. This lock is only active if the menu option (Lock Screen) is activated. The user has to enter the code between the values 0000-2999 each time it is activated.
- 2nd level → **Basic** code 4321. Modifiable, the user can change to a 4 digit code between 3000-5999.
- 3rd level → **Installer** code. Modifiable, the user can set a code between 6000-8999. To be able to modify the code, the user needs the initial installer code, rights reserved by Airtècnics.
- 4th level → **Distributor** code. Non modifiable, rights reserved by Airtècnics.

All of the mentioned code levels are indicated in each menu screen in this document. To unlock the funcions, the user can use the required level code or higher. For instance, in case 3 code level is shown, an installer code or superior is mandatory for that particular screen to be displayed.

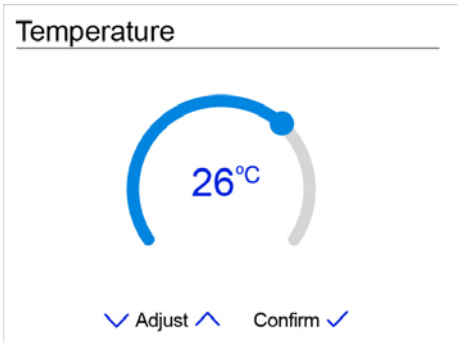
5.2. Screens

5.2.1. Quick Menu

Access: Press "✓" button to access next screen

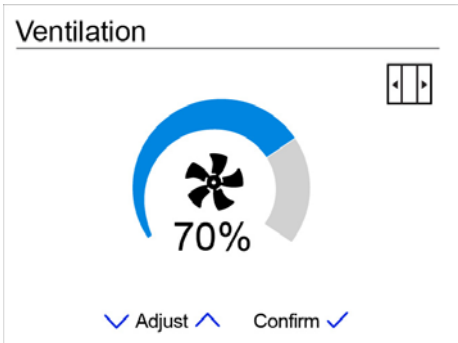
Level: 1

Example: For 5 ventilation speeds, Water ON/OFF.



Configuration of SET temperature.

(Not available for air curtains with Heat Pump)



Setting of ventilation speed for open door first and for closed door afterwards.

It can be either ventilation speeds or modulating as shown in this screen.

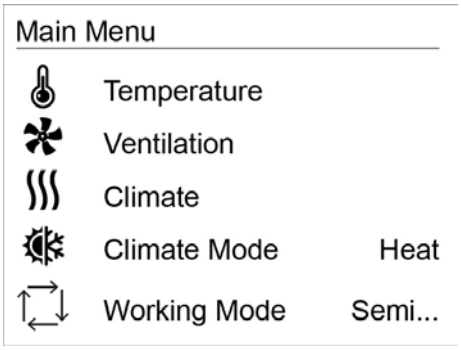
Similarly to previous screens, setting of the heating stage for open door first and for closed door finally.

It will only be displayed with heated air curtains, it can be heating stages, ON/OFF or modulating.

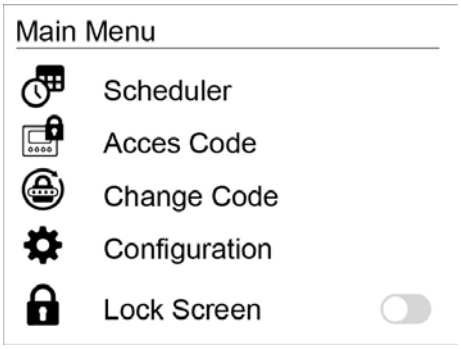
5.2.2. User Menu

Access: Press Menu button → User Menu

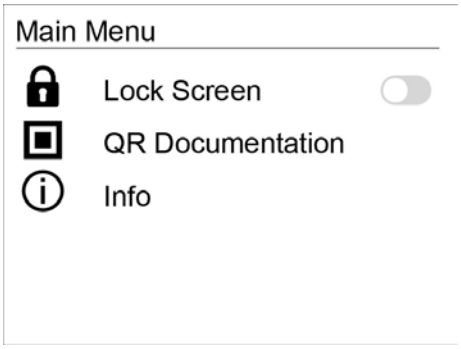
Level: 1



- **Temperature:** Set temperature.
- **Ventilation:** Ventilation speed.
- **Climate:** Heating stage.
- **Climate mode:** Air curtain climate working mode (heat, cold, none)
- **Working mode (Level 2):** Changes between automatic, semi-automatic and Modbus. Further explained in this document.



- **Scheduler (Level 2):** Configure up to 10 different actions for each day of the week.
- **Access code:** Introduce corresponding level unlock code.
- **Change code (Level 3):** It allows to change the unlock code according to the level at which the option is unlocked. For example: if the level 3 code is entered to “Access code”, it allows to change the code of “Lock screen”, “Basic” and “Installer (level 3)”.
- **Configuration (Level 2):** Modification of configuration parameters and operation of the air curtain (see following pages).



- **Lock screen:** turn on the “lock code” (level 1). The user should introduce a new code between 0000-2999.
- **QR (in development):** Shows different QR with interesting information for the user (manuals, video tutorials, technical documentation and catalogues)
- **Info:** Shows Clever PRO control and PCB firmware version.

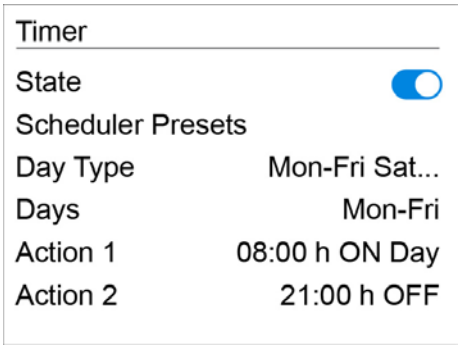
5.2.2.1. Scheduler

Access: Press Menu button → User Menu

Level: 2

By default it's OFF

To activate press "✓" button to activate it and show all the options

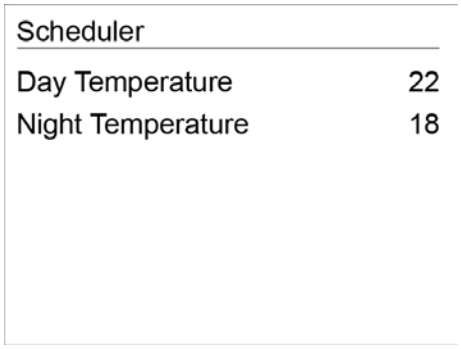


TIMER MENU:

- Enable / Disable Time Programmer.
- Scheduler presets
- Select "Day Type" group.
- Select "Day" to modify/create/erase actions
- Create from 1 to 10 different Timer Actions
- Erase selected action.

→ Scheduler presets

Allows to configure Day temperature and Night temperature, both presets can be chosen any time of the day. Its values by default are 22 and 18 respectively.

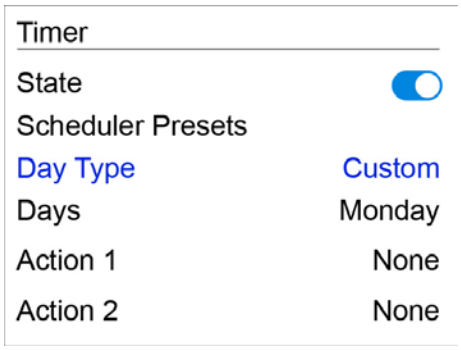


→ Day Type

To make the choice of groups easier the user can choose among predefined groups of days which have the same program.

Groups are:

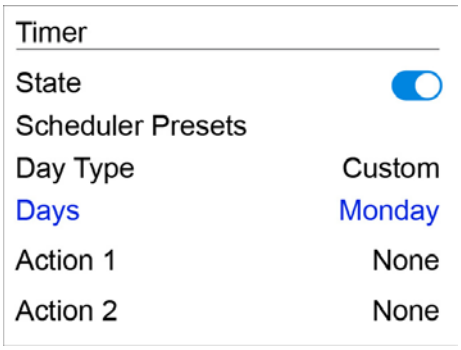
- **Custom (by default):** Customize each day of the week with a different schedule, it must be programmed daily with desired schedule.
- **Mon-Fri:** Monday to Friday. (Same actions for these days)
- **Mon-Sat:** Monday to Saturday. (Same actions for these days)
- **Mon-Sun:** Monday to Sunday. (Same actions for these days)
- **Sun-Thu:** Sunday to Thursday. (Same actions for these days)
- **Mon-Fri Sat:** Monday to Friday and Saturday. (Same actions Mon to Fri and Sat different actions)
- **Mon Fri-Sat-Sun**: Monday to Friday and Saturday to Sunday (Same actions Mon to Fri and Sat-Sun different actions)



→ Days

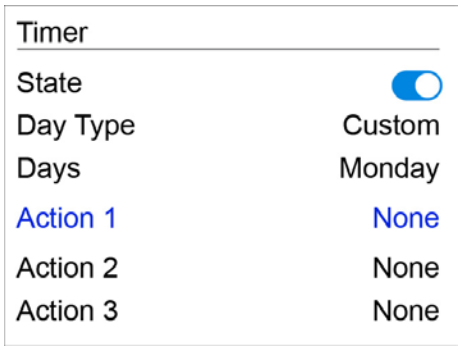
Only appears if there are two or more days to program (Custom, Mon-Fri Sat, Mon-Fri Sat-Sun).

It changes between available configurations depending on the day type group. For example, if Mon-Fri Sat day type is selected, in Days function the user can change between Monday to Friday configuration and Saturday configuration.

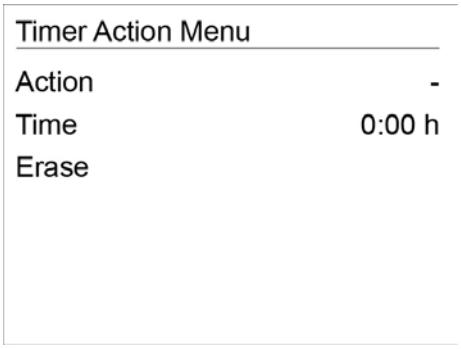


→ Actions

Use Scroll Up/Down button to select an Action, and press “✓” button to create a new one or edit an existing one.



→ **New Action / Edit Action**



TIMER ACTION MENU:

Access this menu to create the desired action.

Action: (by default “NO”)
- ON: Turn ON the unit using current “Set” temperature.
- OFF: Turn OFF the unit.
- ON Day: Turn ON the unit with “Day Temperature”.
- ON Night: Turn ON the unit with “Night Temperature”.
- V1,V2,V3,V4,V5: Turn ON the unit in semi-automatic mode with fan speed 1, 2, 3, 4 or 5.

Time:
- Hour: Select from 0 to 23 h.
- Minute: Select from 0 to 59 min.

Confirm: Should press to confirm user selection and go back to Timer general menu.

Erase: If the user wants to delete the editing action, select Yes and press “✓”.

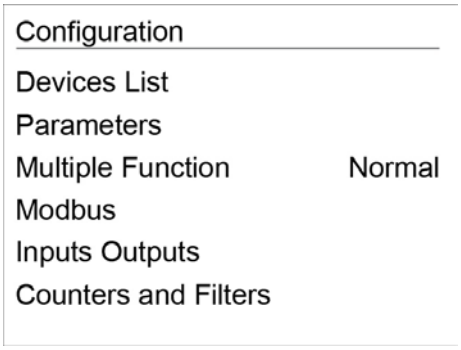
5.2.2.2. Configuration

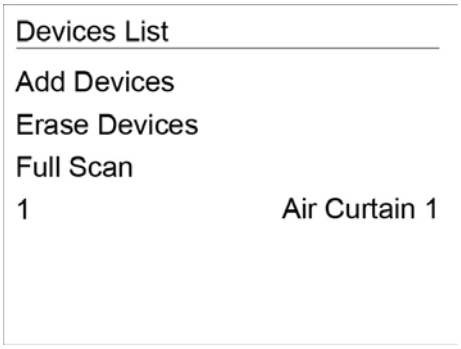
Access: Press Menu button → User Menu

Level: 2

Guide:

- Bold titles = main configuration functions
Arrowed titles (→) = inner menu functions

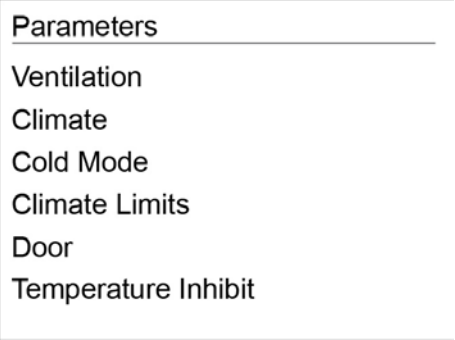




- Devices List

List of detected devices appears.

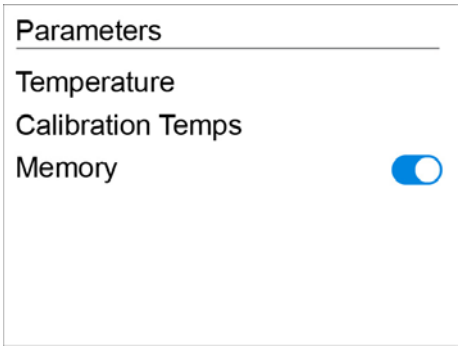
- Pressing “Add Devices” the user can make a complete scan to find new devices
- With “Erase Devices” all existing devices are deleted.
- Selecting “Full Scan” all devices will be erased and a search will be done to update the list.



- Parameters

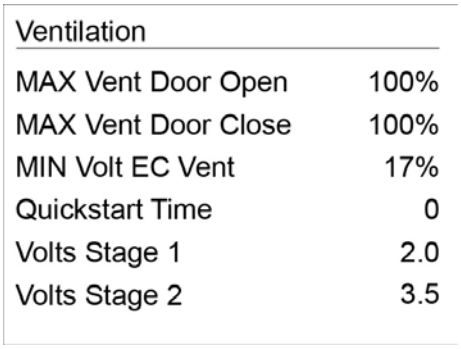
Allows different operating limits to be set depending on the level of unlocking:

Ventilation Speed, Climate, Climate Limits, Door, Temperature Inhibit, Temperature, Calibration Temps, Memory.



→ Memory:

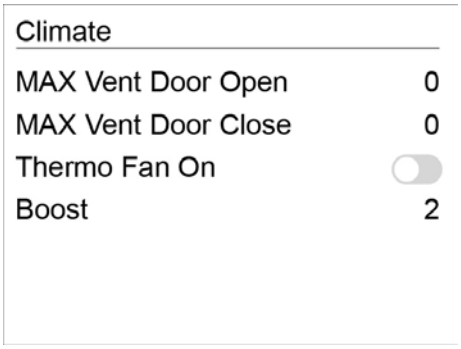
Activate memory so the Clever PRO control configuration, regarding fan speeds and heating stages saved in case of power outage.



→ Ventilation Speed

Define:

- Maximum ventilation speed when door is open.
- Maximum ventilation speed when door is closed.
- Minimum ventilation speed when door is open (only for automatic mode).
- Minimum ventilation speed when door is closed (only for automatic mode).
- Min Volt EC Vent: Only for EC fan air curtains.
- Quick start time.

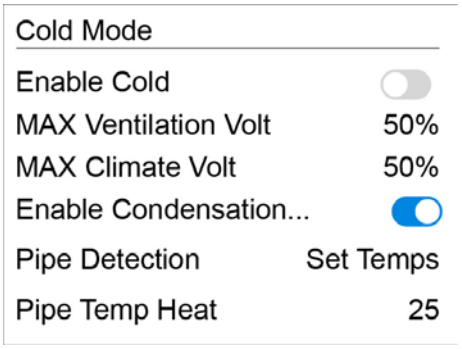


→ Climate

Define:

- Maximum heating stage when door is open.
- Maximum heating stage when door is closed.
- *Thermo ON/OFF: Select whether the user wants the air curtain ventilation speed to be ON or OFF when SET temperature is reached with closed door.
- *Boost: A value xºC that with open door will add virtually to the SET. Not applicable if the difference between the SET and outside temperature <7. Door contact and an active probe are required.

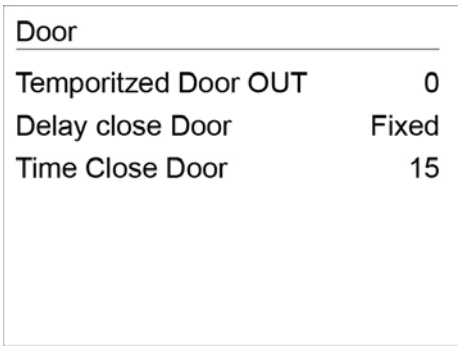
*Further explained in this document (see page 33)



→ Cold

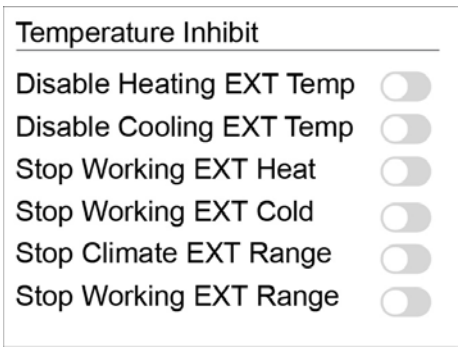
Only appears when the control is connected to an air curtain with cold function. (water or DX heated)

- Cold activation: Used to activate Cold and Auto options in the climate control mode.
- Maximum ventilation volt. (%) in cooling mode.
- Maximum climate volt. (%) in cooling mode.
- Condensate control (in development): Limits operation depending on humidity. Requires a humidity sensor on an analog input. (DX)
- Condensate control speed. (DX)
- Pipe detection: Hysteresis, which allows pipe and jet values configuration, or Set Temps for pipe heat and cold and jet setting.
- Water pump delay: Time the water pump continues to work when the user stops the air curtain so that it continues to drain the water (40s by default).
- Defrost volt.: Voltage (%) for defrost function (0 or 1).
- Cold mode cooldown: Time margin for climate change.



→ Door

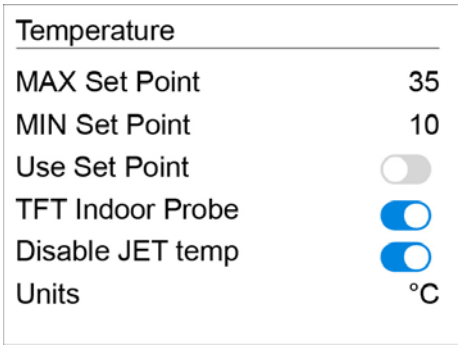
- Delay Close Door. Choose between:
  NO delay
  Fixed
- Time Close Door will pop out (15s by default), choose between 5-600 with 5s intervals.



→ Temperature Inhibit

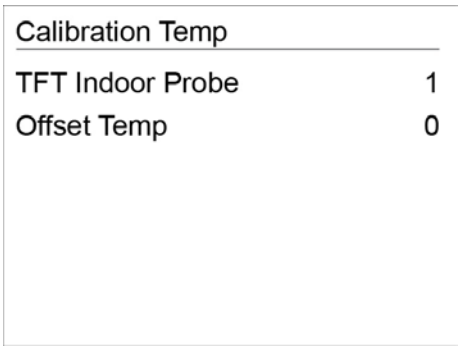
Activate or leave deactivated different options (heating, cooling, stop air curtain, etc.) depending on exterior temperature.

- Disable Heating EXT Temp: Stops climate when exterior temperature is higher than configured value.
- Disable Cooling EXT Temp: Stops climate when exterior temperature is lower than configured value.
- Stop Working EXT Heat: Stops both ventilation and heating, when exterior temperature is higher than configured value.
- Stop Working EXT Cold: Stops both ventilation and heating, when exterior temperature is lower than configured value.
- Stop Climate/Working EXT Range: Climate or air curtain stops if exterior temperature is higher or lower than configured value.



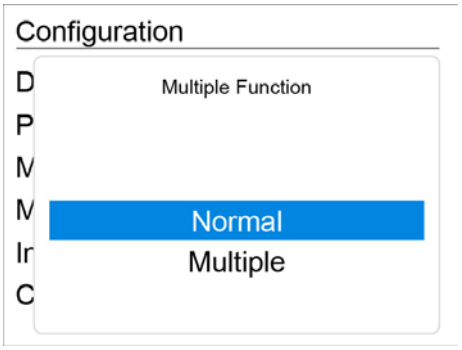
→ Temperature

Define
- Maximum Set Point the user can set.
- Minimum Set Pint the user can set.
- Activate or deactivate use of Set Point (thermostat function).
- Activate or deactivate TFT Indoor Probe and Jet Temp.
- Change temperature units (ºC by default).



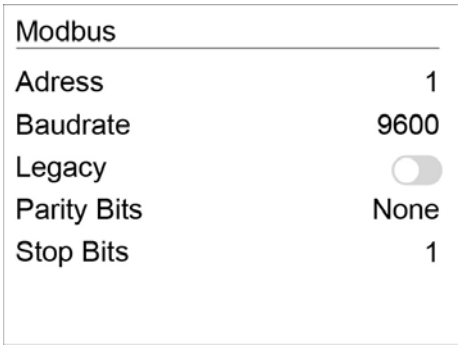
→ Calibration temps

Only the connected sensors will appear, with the value registered. There is the possibility to add or subtract to that value to calibrate sensor.
Possible sensors:
- Room (TFT, inbuilt)
- Room (External)
- Outdoor
- Discharge / Jet
- Inlet
- Pipe (Cold/Heat)



- Multiple functioning / Screen mode
(in development)

In case there is more than one unit connected to the same Clever PRO control. The user can select equal or different functionings for each unit.



- Modbus

Adjustable parameters for Modbus operating mode.

- Address: Changes Modbus address of Clever PRO control
- Baudrate: Changes communication speed (9600 by default)
- Legacy: Changes Modbus register to the old version of Clever Kit
- Parity Bits: None, Odd or Even
- Stop Bits: Select between 1 and 2

Further explained in this document (see page 26)

Inputs Outputs
Digital Input
Digital Output
Analog Input
Probe Temp
Clever Pro Digital Inputs

- Inputs Outputs

Permits to choose digital inputs and otuputs functions and polarity. Also allows to choose analog input and probe temperature.

Digital Input	
Digital Input 1	Door Signal
Polarity DIN 1	NO
Digital Input 2	Forced OFF
Polarity DIN 2	NO

→ Digital Input

Define:

- Digital Input 1: Choose which digital input function is working for number 1. Door signal as default
- Polarity DIN 1: Then, choose the polarity in which the digital input is working, NO (Normally Open) (default) or NC (Normally Closed).
- Digital Input 2: Same options as DIN1 but Forced OFF as default.
- Polarity DIN 2: Same as DIN1.

Digital Output	
Digital Output 1	Ventilation ON
Polarity DOUT 1	NO
Digital Output 2	General Alarm
Polarity DOUT 2	NO

→ Digital Output

Define:

- Digital Output 1: Choose which digital output function is working for number 1. Ventilation ON as default (Run signal)
- Polarity DOUT 1: Then, choose the polarity in which the digital output is working, NO (Normally Open) (default) or NC (Normally Closed).
- Digital Output 2: Same options as DOUT 1 but General Alarm as default.
- Polarity DOUT 2: Same as DIN1.

Analog Input	
Analog Input 1	Temp Probe
Analog Input 2	Temp Probe

→ Analog Input

Define:

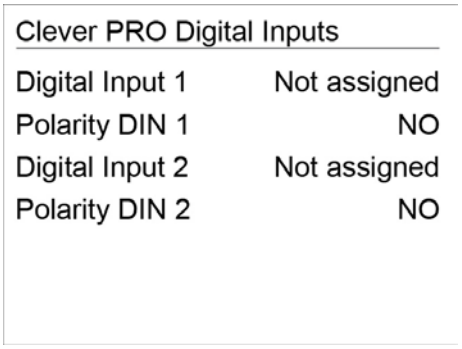
- Analog Input 1: Voltage, Temp Probe (Default), Digital Input
- Analog Input 2: Same as Analog Input 1

Probe Temp	
Temp Input 1	Jet
Temp Input 2	Inlet
Temp AIN 9	Outdoor
Temps AIN 10	Indoor

→ Probe Temp

Shows the Inputs for each corresponding temperature sensor. They are all assigned by default but they can be settled as not assigned (N/A)

- Temp Input 1: Jet/Discharge
- Temp Input 2: Inlet
- Temp AIN 9: Outdoor
- Temp AIN 10: Room/Indoor



→ Clever PRO Digital Inputs

Define:

- Digital Input 1: Choose which digital input function is working for number 1. Not assigned as default
- Polarity DIN 1: Then, choose the polarity in which the digital input is working, NO (default) or NC.
- Digital Input 2: Same options as DIN1. Not assigned as default.
- Polarity DIN 2: Same as DIN1.

There are other available Inputs and Outputs depending on the air curtain heating. Specified in the tables below:

DIGITAL IN				
Only air	**Electrical**	**Water**	**DX**	**Observations**
Door signal				Change state of the door and modify functioning according to the programs
FAN				Forced ON
-			Defrost	Limits ventilation in case exterior unit is frozen
-	Forced Climate OFF *			Stops the Heating/Cooling
-		Disable COLD *		Disables Cold function
-		Climate mode HEAT *		Activates Heat mode climate
-		Climate mode COLD *		Activates Cold mode climate
Fire ON Alarm				Activates fire ON alarm and turns on the air curtain
Fire OFF Alarm				Activates fire OFF alarm and stops the air curtain
-		Antifreezing Alarm	-	Activates air curtain high heating to avoid freezing
-	Overheating Alarm			Activates fan overheating alarm and, after 10 seconds, stops/blocks the air curtain.
Filter Alarm				Activates filter alarm when maintenance is needed
-			Heat Pump Alarm	Only shows a message. It doesn't stop the ventilation and heating of the unit

*Heat Pump only in Master mode

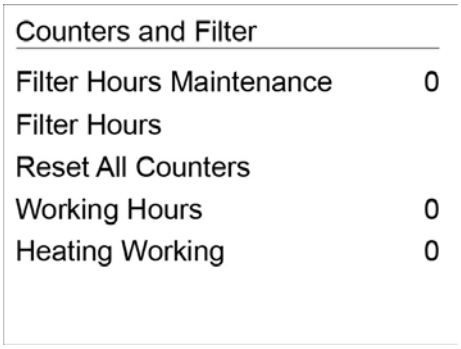
CLEVER PRO DIGITAL IN				
Only air	**Electrical**	**Water**	**DX**	**Observations**
Door signal				Change state of the door and modify functioning according to the programs
Forced OFF				Stops the unit.
-	Forced Climate OFF*			Stops the Heating/Cooling
Fire OFF Alarm				Activates fire OFF alarm and stops the air curtain

DIGITAL OUT				
Only air	**Electrical**	**Water**	**DX**	**Observations**
Ventilation ON				Activates when ventilation speed is >0
Climate ON				Activates when Heating/Cooling is >0
Device OK				Activates in case there are no alarms
-		Condensation Pump		Turns ON when cooling to start the drain pump
-		Cooling Mode		Activates when in cooling mode
-		Heating Mode		Activates when in heating mode
-			Support Heater 1	Activates an external heater 1
-			Support Heater 2	Activates an external heater 2
General Alarm				Indicates general alarm. It is a group of pre-defined alarms. If only 1 of those alarms is activated, activates the general alarm. User can select the alarms of the group.
Fire ON Alarm				Activates with fire ON Alarm
Fire OFF Alarm				Activates with fire OFF Alarm
-		Antifreezing Alarm	-	Activates with Antifreezing Alarm
-	Overheating Alarm		-	Activates with Overheating Alarm
Filter Alarm				Activates filter alarm when maintenance is needed
-			Heat Pump Alarm	Only shows a message. It doesn't stop the ventilation and heating of the unit

ANALOG OUT				
Only air	**Electrical**	**Water**	**DX**	**Observations**
-	-	Heating Modulating Valve 0-10V		Water Heated or Heat Pump Modulating: 0 - 0,2V: OFF 0,3 – 1,2V = 10% 1,3 – 2,2V = 20% 2,3 – 3,2 V = 30% 3,3 – 4,2V = 40% 4,3 – 5,2V = 50% 5,3 – 6,2 V = 60% 6,3 – 7,2V = 70% 7,3 – 8,2V = 80% 8,3 – 9,2 V = 90% 9,3 – 10,2V = 100%

OUT POWER SUPPLY			
Only air	**Electrical**	**Water**	**DX**
-		OUT 24V - Addon 0-10V	-
-		OUT 230V - Addon 230V	-
-		-	OUT 230V - Addon HP (Drain Pump)

TEMPERATURE SENSORS				
Only air	**Electrical**	**Water**	**DX**	**Observations**
Room (TFT, inbuilt)				Air sensor Clever PRO inbuilt, room temperature
Room (External)				Air sensor inside the room, room temperature
Outdoor				Air sensor outside the building
Discharge / Jet				Air sensor at discharge
Inlet				Air sensor at the inlet
Pipe (Cold/Heat)				Tube sensor to detect the mode cool/heating depending on temperature
Return pipe				Tube sensor to limit the water return temperature



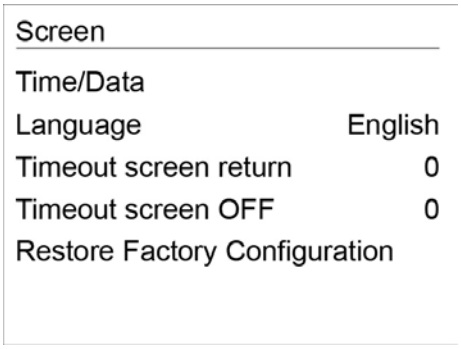
- Counters and Filter

This Configuration function shows working and heating hours, no possibility to reset (except Airtècnics provided code). Additionally, allows to:

→ Filter Hours Maintenance**:** Set hours between 0 and 1000 for the filter maintenance to be done.

→ Filter Hours**:** Reset Filter life hours.

→ Reset All Counters: No possibility to reset (except Airtècnics provided code).



- Screen

Allows to adjust different screen parameters:

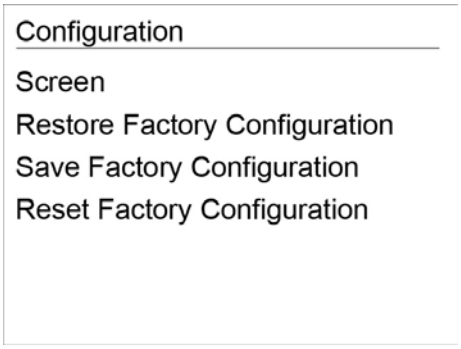
→ Time/Data: Modifies the time and date of the device.

→ Language (in development): The user can select different languages to use the control.

→ Timout screen return: Time before the Clever PRO control returns to previous screen when any button is pressed. When “0” is selected, it never comes back to the previous screen.

→ Timout Screen OFF: Time before the screen switches OFF when no button is pressed. When “0” is selected, it never switches OFF.

→ Restore Factory Configuration of Clever PRO control screen



- Restore Factory Configuration

Returns Clever PRO control and PCB configuration to Airtecnics initial configuration.

- Save Factory Configuration

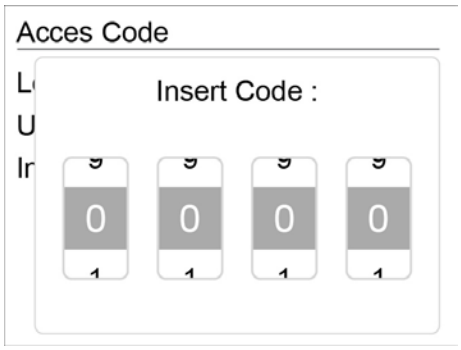
Saves a specific configuration different from the default one.

- Reset Factory Configuration

Deletes the specific configuration different from the default one.

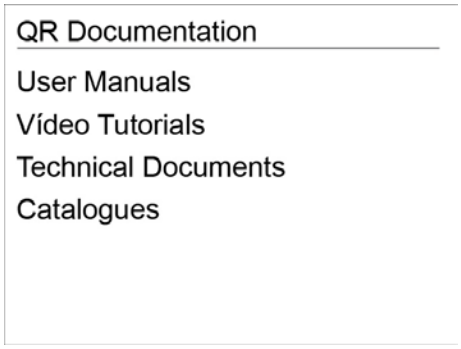
5.2.2.3. Lock Screen

Asks for code to lock and unlock screen.



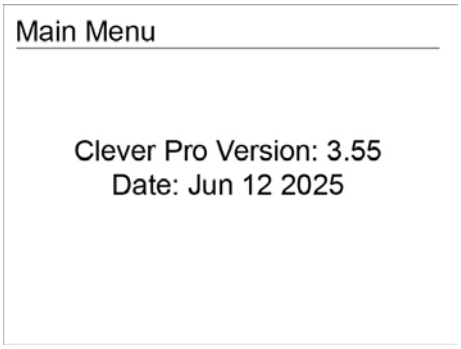
5.2.2.4. QR (in development)

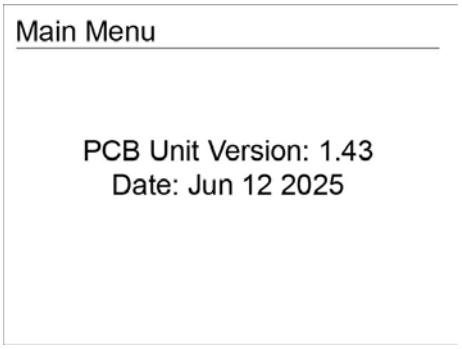
Manuals and tutorials through QR code.



5.2.2.5. Info

Clever PRO and PCB firmware version and date.





6. FUNCTIONING PROGRAMS

6.1. Semi-automatic

Same functioning as Advanced PRO control. The user can select speed and heating stage for both open and closed door and SET temperature. Then, the Clever PRO control modifies the air curtain speed and heating stage depending on the other temperatures detected (room, outdoor, inlet and discharge).

6.1.1. Parameter Variables:

The display will know what functional limits exists and will only show the parameters that the user can modify.

- **Temperature SET:** the desired temperature can be set between 10ºC and 35ºC. If the user wants, these limits can be changed, or the thermostat function can be disabled in the menu: Configuration/Parameters/Temperature. With semi-automatic mode, when door is closed and the room temperature reaches SET temperature, the air curtain stops (thermo function OFF).

- **Fan Speed**: user can select one fan speed for open and another for closed door. If the speed is set to 0 then the unit will be off.

Air Curtain Model	Open Door	Closed Door
2-speed	0-2	0-2
5-speed	0-5	0-5

- **Heating**: it depends on the air curtain model:

- Only Air: It has no heating.

- Electrical heated: The user can select the heating stage based on the configured ventilation speed and the door's status.

	2-Speed		
	STANDARD	0	0
		1	0,1,2,3
		2	0,1,2,3
Exception	1000-9kW and all Aris models (Limited on the air curtain PCB)	0	0
		1	0,1,2
		2	0,1,2,3

5-Speed		
STANDARD	0	0
	1	0, 1
	2	0, 1, 2
	3	0, 1, 2
	4	0, 1, 2, 3
	5	0, 1, 2, 3

- Water heated (ON/OFF): The user can select the valve's on or off state (optional), depending on the configured ventilation speed and the door's status.

- Modulating heating: The user can select the heating stage based on the configured ventilation speed and the door's status.

For water heating models, the only limitation is that a heating stage cannot be selected with a speed of 0.

Single Stage (ON/OFF):
· OFF = 0 segments painted
· ON = 3 segments painted

Modulating (requires modulating Addon):
· 0% - 100%
. 10% Intervals

- Heat Pump:

DX CD: Only one heating stage (ON/OFF) just as the temperature SET. Modulating depending on the brand.

6.2. Modbus

In **Modbus mode** change or select any settings on the screen (speed, heating, temperature, etc.) is not available. The equipment operates solely as a slave device, following the commands received via Modbus. The equipment's status can be read (speed, heating, temperature, etc.) and send basic operating commands for speed and heating.

Considerations:

When the air curtain works in Modbus mode, it is highly recommended to disable the timer and lock the screen to avoid changes on the orders sent via Modbus.

Although the user sends wrong orders to the equipment, the unit will not allow combinations that can damage the internal components. The internal PCB has instructions to run the unit safely.

Examples:

- If the user orders to an electrical heated air curtain to go to the 3rd heating stage and the 1st ventilation speed, it will allow go to air speed 1 but heating will work at stage 1 only (maximum allowed heating stage for the 1st ventilation speed).
- If the user stops ventilation, heating will also stop except: Anti-freezing sensor signal and inimum voltage for 0-10V modulating valves (avoid freezing).

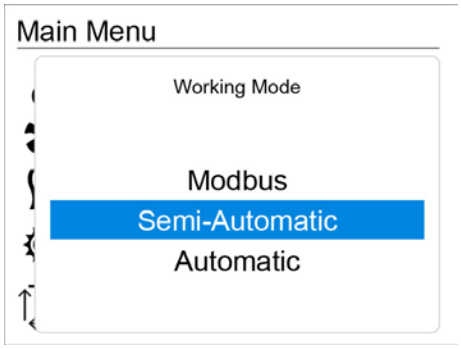
The minimum and maximum parameters (door open and door closed) will be also respected.

Example:

- The user defines (in the configuration parameters menu) that the maximum speed when the door is closed should be the 2nd, then if the user orders ventilation speed 3 and door closes, the air curtain will change from the 3rd speed to the 2nd. When the door opens again, the air curtain will go to the 3rd speed.

The Modbus connection to the BMS should be connected to the "BMS 485" connector on the Clever PRO and when more than one Clever PRO is connected to the BMS, it is needed to put the jumper on ON position on the last Clever PRO (see connection diagram page).

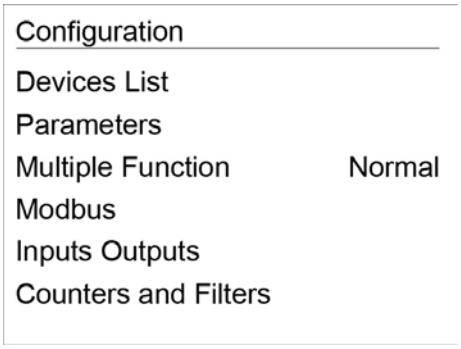
It is recommended to use 0.5mm² x2 shielded and twisted pair cable for Modbus communications.

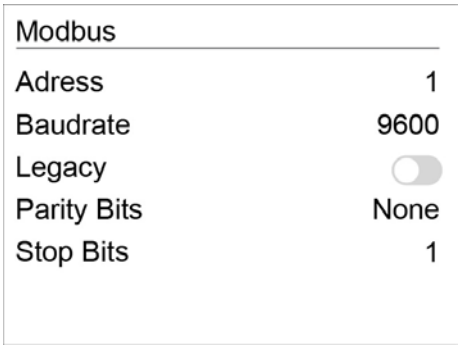


6.2.1. Modbus Configuration

There are some important parameters that are configurable when the air curtain works in Modbus mode, the user needs the **3rd or the 4th unlock level** to have access to the specific menu.

Access: Press Menu button → User Menu → Configuration → Modbus
Level: 3





- Address

Modifies the Clever PRO Modbus Address (1 by default)

- Baudrate

Modifies the mModbus communication speed (9600 by default)

- Legacy

Clever PRO will use the Modbus registers of the **old Clever Kit registers** (see Configurable registers section).

- Parity Bits

None by default. Odd or Even can be selected.

- Stop Bits

1 (default) or 2 can be selected

How to send orders via Modbus:

Assemble and send command in Binary. The BMS program can work in Hexadecimal or Decimal, so it is necessary to convert the signal to Binary.

Modbus Command Structure:

Modbus Command		Observations	Digits
Node	XX	Modbus address, example: 02	2
Function	03	To read register/s	2
	06	To write a single register	2
	10	To write multiple registers	2
Starting register	XX (see registers table)	First register to read/write	2 bytes (4 Hexadecimal or 5 Decimal)
Number of points (registers)	XX	Quantity of registers to read/write	4
Data	XX	When writing = new registers value	4

6.2.2. Registers table (reading)

As seen in the previous section, the Modbus command should be:

Node + Function + Starting Register + Number of registers
(when reading, Airtecnics recommend read one by one register)

- Node should be the Modbus address of the Clever PRO which the user wants to communicate with.
- Function should be “03” for reading.
- Number of registers: for one register “0001”, for two registers (they must be consecutive) “0002”.

6.2.2.1. Standard mode (new registers single register reading)

Starting Register (Hexadecimal)	Starting Register (Decimal)	Observations	Digits
0011	00017	Start/Stop the device	ON = 0001; OFF = 0000
0012	00018	SET Point Temperature	ºC multiplicated by 100 in decimal. e.g.: 23,5ºC is 2350 (092E in hexa-decimal).
0013	00019	Fan speed by stages	0000; 0001; 0002; 0003; 0004; 0005
0014	00020	Fan speed by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
0015	00021	Climate by stages	0000; 0001; 0002; 0003
0016	00022	Climate by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
0017	00023	Fan speed by stages when open door	0000; 0001; 0002; 0003; 0004; 0005
0018	00024	Fan speed by modulating when open door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
0019	00025	Fan speed by stages when closed door	0000; 0001; 0002; 0003
001A	00026	Fan speed by modulating when closed door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
001B	00027	Climate by stages when open door	0000; 0001; 0002; 0003
001C	00028	Climate by modulating when open door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
001D	00029	Climate by stages when closed door	0000; 0001; 0002; 0003

001E	00030	Climate by modulating when closed door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
0021	00033	Working mode (which mode the user selected)	0000 → Heat 0001 → Cool 0002 → Auto 0003 → Without heating (only air)
0023	00035	Climate working mode (always Heat, except when the air curtain detects cool in the coil)	0000 → Heat 0001 → Cool
0030	00048	Room Temperature	ºC multiplicated by 100 in decimal.
0031	00049	Outdoor temperature	
0032	00050	Inlet Temperature (if one of the TEMP inputs is configured as Inlet)	e.g.: 23,5ºC is 2350 (092E in hexa-decimal).
0033	00051	Discharge Temperature (if TEMP2 is connected to the air curtain's PCB)	
0034	00052	Pipe Temperature (if one of the TEMP inputs is configured as RE-TURN PIPE)	
0035	00053	Return Pipe Temperature (if one of the TEMP inputs is configured as PIPE)	
0036	00054	Antifreezing Temperature (if one of the TEMP inputs is configured as Antifreezing)	

6.2.2.3. Legacy mode (single register reading)

Starting Register (Hexadecimal)	Starting Register (Decimal)	Observations	Digits
300C	12300	Start/Stop the device	ON = 0001; OFF = 0000
1016	4118	Fan speed by stages	0000; 0001; 0002; 0003; 0004; 0005
		Fan speed by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
1017	4119	Climate by stages	0000; 0001; 0002; 0003
		Climate by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
300D	12301	SET Point temperature	ºC multiplicated by 100 in decimal. e.g.: 23,5ºC is 2350 (092E in hexa-decimal).
1007	4103	Room temperature	
1008	4104	Outdoor temperature	
1009	4105	Discharge temperature (if TEMP2 is connected on the air curtain's PCB)	
100A	4106	Ambient temperature	

6.2.2.2. Legacy mode (double register reading)

Starting Register (Hexadecimal)	Starting Register (Decimal)	Observations	Digits
1016	4118	Fan speed + Climate stage	Concatenation of answers reading single register e.g.: Air curtain working in 3rd vent. speed and 2nd climate stage; the answer will be 00030002
3000	12300	Door Status	BIT 3 and 4 00 → Door Closed 01 → Closing Door 11 → Door open
		Filter State	BIT 21 and 22 00 → Filter clean 10 →Filter getting dirty
		Heating Blocked (by program)	BIT 16 0 → Not Blocked 1 → Blocked
		Ventilation Blocked (by program)	BIT 17 0 → Not Blocked 1 → Blocked
3002	12290	General Alarm	BIT 0 0 → Alarm OFF 1 → Alarm ON
		Overheating Alarm	BIT 1 0 → Alarm OFF 1 → Alarm ON
		Autocooling Alarm	BIT 2 0 → Alarm OFF 1 → Alarm ON
		Dirty Filter Alarm	BIT 3 0 → Alarm OFF 1 → Alarm ON
		Electrical Heating Blocked Alarm	BIT 5 0 → Alarm OFF 1 → Alarm ON
		Fire ON Alarm	BIT 7 0 → Alarm OFF 1 → Alarm ON
		Fire OFF Alarm	BIT 8 0 → Alarm OFF 1 → Alarm ON
		Temperature Sensor Alarm	BIT 9 0 → Alarm OFF 1 → Alarm ON
		Antifreezing Alarm	BIT 15 0 → Alarm OFF 1 → Alarm ON

6.2.3. Registers table (writing)

For Modbus write operations, the message structure should be the same as for read operations, but using the appropriate starting registers for writing. Please refer to the explanatory tables below.

6.2.3.1.Standard mode

Starting Register (Hexadecimal)	Starting Register (Decimal)	Observations	Digits
0011	00017	Start/Stop the device	ON = 0001; OFF = 0000
0012	00018	SET Point Temperature	ºC multiplicated by 100 in decimal. e.g.: 23,5ºC is 2350 (092E in hexa-decimal).
0013	00019	Fan speed by stages	0000; 0001; 0002; 0003; 0004; 0005
0014	00020	Fan speed by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
0015	00021	Climate by stages	0000; 0001; 0002; 0003
0016	00022	Climate by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
0017	00023	Fan speed by stages when open door	0000; 0001; 0002; 0003; 0004; 0005
0018	00024	Fan speed by modulating when open door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
0019	00025	Fan speed by stages when closed door	0000; 0001; 0002; 0003
001A	00026	Fan speed by modulating when closed door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
001B	00027	Climate by stages when open door	0000; 0001; 0002; 0003
001C	00028	Climate by modulating when open door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
001D	00029	Climate by stages when closed door	0000; 0001; 0002; 0003
001E	00030	Climate by modulating when closed door	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)

0021	00033	Working mode (which mode the user selected)	0000 → Heat 0001 → Cool 0002 → Auto 0003 → Without heating (only air)
0023	00035	Climate working mode (always Heat, except when the air curtain detects cool in the coil)	0000 → Heat 0001 → Cool
0030	00048	Room Temperature	ºC multiplicated by 100 in decimal.
0031	00049	Outdoor temperature	
0032	00050	Inlet Temperature (if one of the TEMP inputs is configured as Inlet)	e.g.: 23,5ºC is 2350 (092E in hexadecimal).
0033	00051	Discharge Temperature (if TEMP2 is connected to the air curtain's PCB)	
0034	00052	Pipe Temperature (if one of the TEMP inputs is configured as RETURN PIPE)	
0035	00053	Return Pipe Temperature (if one of the TEMP inputs is configured as PIPE)	
0036	00054	Antifreezing Temperature (if one of the TEMP inputs is configured as Antifreezing)	

6.2.3.2. Legacy mode

Starting Register (Hexadecimal)	Starting Register (Decimal)	Observations	Digits
300C	12300	Start/Stop the device	ON = 0001; OFF = 0000
3015	12309	Fan speed by stages	0000; 0001; 0002; 0003; 0004; 0005
		Fan speed by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 50% is 5000 in decimal (1388 in hexadecimal)
3016	12310	Climate by stages	0000; 0001; 0002; 0003
		Climate by modulating	Scale 0 to 10.000 that equals 0% to 100% e.g.: 75% is 7500 in decimal (1D4C in hexadecimal)
203B	08251	Set Point temperature	ºC multiplicated by 100 in decimal. e.g.: 23,5ºC is 2350 (092E in hexadecimal).
F050	61520	Room temperature	
F051	61521	Outdoor temperature	

6.3. Automatic (in development)

The **automatic mode** only the temperature can be configured manually. The equipment automatically selects the speed and heating based on the door status, temperatures, and other factors.

The Clever PRO control continuously analyzes the thermal conditions of the environment and adjusts all operating parameters without user intervention.

It automatically switches between climate control modes (heat, cold or air only) according to the detected temperatures. Having the limits configured by customer as maximum and minim desired for heating stage.

Thermo FAN (ON) - Ventilation turns ON when room temperature reaches SET temperature at closed door.
Thermo FAN (OFF) - Ventilation turns OFF when room temperature reaches SET temperature at closed door.

The **Boost function** increases automatically the setpoint temperature (SET) when the door is open. For the function to be active, the door contact or the exterior sensor must be installed and, in addition, the Boost function varies according to the accessories installed:

Door contact	Exterior sensor	Boost
NO	NO	Not available
YES	NO	Open door → Always Boost *
NO	YES	Exterior temperature ≤ SET Temperature -7
YES	YES	Open door + Exterior temperature ≤ SET Temperature -7

*If the user wants to deactivate this function, set function 10 in the configuration menu to 0°.

7. USB FIRMWARE UPDATE

To carry out this updating process, the corresponding components are needed:

- Air Curtain PCB
- Clever PRO control
- LCD Advanced PRO (if wanted to update, ask for additional instructions)
- Pen Drive USB
- RJ11 Cable (Standars, new PRO controls version)

To start the update process:

1. **Download the program** from Airtècnics webpage and put it on a Pen Drive USB.

2. **Connect Pen Drive USB** to Clever PRO control.

Pen Drive
USB

Clever Pro

3. **Connect RJ11 cable** to supply voltage to the Clever PRO control.

4. **Access the USB menu** after setting the **distributor code** (level 4).

5. **Check** Update Clever PRO control option (only Clever PRO control updating) or check Update All option (for control and PCB to be updated).

6. Select the **programming file.**

7. **Finish** when the pop up of the rotating screen disappears.

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