# pChrono

Solution for managing lights and electrical loads

CAREL



ENG User manual

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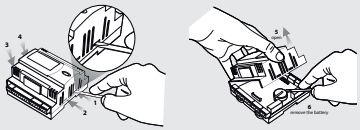
READ AND SAVE THESE INSTRUCTIONS

High Efficiency Solutions

# Content

Guidelines for disposal

- Do not dispose of the product as municipal waste; it must be disposed of through specialist waste disposal centres.
- The product contains a battery that must be removed and separated from the rest of the product according to the instructions provided, before disposing of the product.
- Improper use or incorrect disposal of the product may negative effects on human health and on the environment.
- The public or private waste collection systems defined by local legislation must be used for disposal.
- In the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.



**DISPOSAL OF THE PRODUCT:** The appliance (or the product) must be disposed of separately in accordance with the local waste disposal legislation in force


**ATTENTION:** Separate as much as possible the probe and digital input signal cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance. Never run power cables (including the electrical panel wiring) and signal cables in the same conduits.

**IMPORTANT WARNINGS:** The CAREL product is a state-of-the-art device, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com. The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific installation and/or equipment. The failure to complete such phase, which is required/indicated in the user manual, may cause the final product to malfunction; CAREL accepts no liability in such cases. The customer must use the product only in the manner described in the documentation relating to the product. The liability of CAREL in relation to its products is specified in the CAREL general contract conditions, available on the website www.carel.com and/or by specific agreements with customers.

# 1. INTRODUCTION

The pChrono device can manage several different applications, according to the needs of the system. pChrono has been designed to the most flexible solution possible; a solution that can be used on any installation, thus supporting the work of installers in the field.

Specifically, pChrono includes algorithms for the following applications:
1. Light management
2. Timed device management
3. Pump management
4. Wireless 10A power socket management
5. Universal functions
6. Read wireless temperature/humidity/brightness sensors

All these functions can be used at the same time.

### Available versions

The controller is available in two versions, which differ in terms of the number of I/Os available. For details, see the table of inputs / outputs.

| Hardware | Description | CAREL P/N |
|---|---|---|
| Small | PCHRONO SMALL, USB, BUILT-IN DISPLAY, BMS/FBUS OPTO, CONNECTOR KIT, HKSTDmPCHP5 | PCH550S31UB00 |
| Large | PCHRONO LARGE, USB, BUILT-IN DISPLAY, BMS/FBUS OPTO, CONNECTOR KIT, HKSTDmPCHP5 | PCH550L31UB00 |

Tab. 1.a

# 2. USER INTERFACE

pChrono utilises the pGD1 "built-in" terminal as the user interface. This device comes with the following buttons:

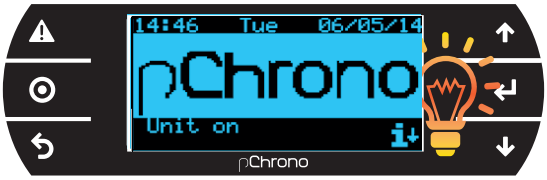


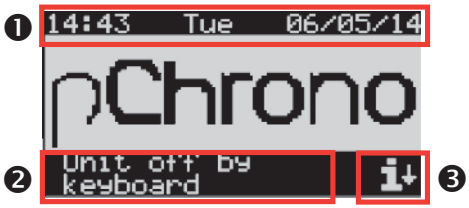

Fig. 2.a

| | | |
|---|---|---|
| | Alarm | displays the list of alarms; |
| | Prg | accesses the main menu tree; |
| | Esc | returns to the previous screen; |
| | Up | scrolls a list upwards or increases the value shown on the display; |
| | Down | scrolls a list downwards or decreases the value shown on the display; |
| | Enter | enters the selected submenu or confirms the set value. |

Tab. 2.a

## 2.1 Display

### Main screen



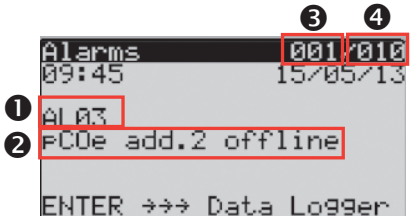

| | |
|---|---|
| ❶ | date, weekday and time |
| ❷ | unit status |
| ❸ | press the DOWN button for information on the loads |

Tab. 2.b

This is the screen displayed during normal unit operation: from any other menu press ESC until reaching this screen.

### Alarm screen

If an alarm is active, the red LED under the ALARM button flashes.

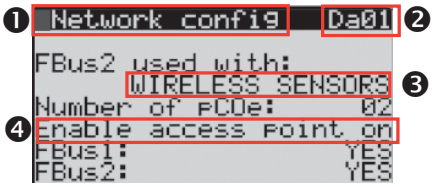



| | |
|---|---|
| ❶ | alarm code |
| ❷ | alarm description |
| ❸ | alarm number |
| ❹ | total number of active alarms |

Tab. 2.c

Use the arrows (UP and DOWN) to scroll the list of alarms; pressing ENTER directly accesses the alarm log. For details on the alarms, see the alarm table, chapter 9.

### Parameter display and editing screens




| | |
|---|---|
| ❶ | name of the function edited on the screen |
| ❷ | screen index |
| ❸ | editable value |
| ❹ | parameter name. |

Tab. 2.d

To access these screens, from the main screen press PRG to enter the menu list: scroll the menus using the UP and DOWN buttons and press ENTER to select (see the function tree).

**Note:** editable fields feature numeric values or upper case letters.

# 3. SYSTEM ARCHITECTURE

pChrono is a device that can cover several functions. For greater system flexibility, pChrono integrates different wireless devices. The flexibility of the architecture can in fact meet the requirements of even more complex installations, where the electrical loads are often located some distance apart, and consequently it is not always feasible to connect them using a Modbus RS485 serial network. The diagram shown here below refers to a pChrono Large, illustrating a typical installation in which the devices are connected to pChrono via the wireless network. The same diagram also applies to the Small version.

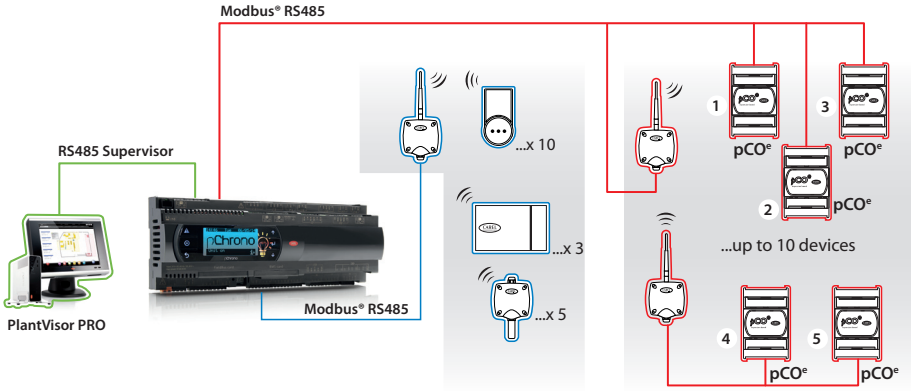



Fig. 3.a

| Device | Modbus RS485 network address | Carel P/N | Reference documents |
|---|---|---|---|
| pChrono | - | PCH550*31UB00 (*=S: Small, L:Large) | pCO5 Plus manual, +0300020EN |
| pCOe RS485 | 2…11 | PCOE004850 | inst. sheet +050003265 |
| Access Point (on FBus1) | 1 | WS01AB2M20 | manual +0300030EN installation guide +0400030EN |
| Access Point (on FBus2) | 1 | WS01AB2M20 | |
| Router Bridge | -- | WS01RB2M20 | |
| SA Sensor, Temperature / Humidity | 16, 17, 18 | WS01G01M00 | |
| SI Sensor, LUX / Temperature / Humidity | 21…25 | WS01F01M00 | |
| 10A wireless plug / switch | 26…35 | WS01C010*0 (*=Schuko, I:Italian, F:French, G:British, X:universal switch) | instruction sheet +0500049ML |
| Battery wireless devices (SI, SA) | -- | WS00BAT000 | -- |

Tab. 3.a

**Important:**

- Both AP Access Points must be set to address 1.
- Addresses from 2 to 11 are available for the pCOe expansion cards.
- The addresses of the pCOe expansion cards must be consecutive, even when using the RB Router Bridge
- The addresses of the SA wireless temperature/humidity sensors must be 16, 17 and 18.
- The addresses of the SI wireless lux/temperature/humidity sensors must be 21, 22, 23, 24 and 25.
- The addresses of the wireless plugs/switches, with energy meter function, must be between 26 and 35.
- The SA, SI devices and the wireless plugs/switches cannot be managed by the same Access Point used for a wireless network with pCOe devices.

## 3.1 Serial network electrical specifications

- The FieldBus2 and BMS2 serial ports are functionally opto-isolated from the power supply, consequently the serial cable used to connect the devices requires a third wire as a common earth reference for the controllers.

Connection specifications

- Use an AWG 20-22 shielded twisted pair cable, with capacitance between the wires < 90pF/m.

| Master device | HW | Lmax(m) | Wire/wire capacitance (pF/m) | Resistor on first and last device | Max no. of slave devices on bus | Data rate (bit/s) |
|---|---|---|---|---|---|---|
| FBUS | RS485 | 1000 | < 90 | 120 Ω | 64 | 19200 |
| PC | | 1000 | < 90 | 120 Ω | 207 | 38400 |

Tab. 3.b

**Note:** the max length allowed for connection of the pCOe or to the BMS is 1000 m. Remember that the 120 Ω, 1/4W terminating resistor on the first and last device in the network is required if the length exceeds 100m.

## 3.2 Wireless network electrical specifications

- Maximum distance between Access Point/Router and Sensors in open field (outdoors): 100 m.
- Maximum distance between Access Point/Router and Sensors with field of sight (indoors): around 30 m (inside rooms and built-up areas).

## 3.3 Features of the wireless devices

**Wireless technology**

The wireless sensors used by pChrono require no electrical connections, as they use a wireless connection with ZigBee™ technology (mesh) encrypted with Carel private key at a transmission frequency of 2.4 GHz authorised for operation in all countries around the world. This is an advanced system that has achieved an excellent level of security for wireless data exchange. Communication between sensors and the Access Point is two way. The sensors, as well as sending the change in the status of the variables, can also receive data.

**pChrono system wireless devices**

The devices described below are part of the Carel rTM SE wireless system (Remote Temperature Monitoring). This solution ensures considerable savings in terms of installation costs (eliminating the cost of wiring), offering flexibility in the layout of supermarkets and allowing faster retrofit installation. The rTM system guarantees maximum flexibility, functionality, reliability, easy operation, reduction in installation costs and easy commissioning/service.

Access Point: this is the coordinator of a wireless network as well as the gateway for the information between the ZigBee™ protocol and the pChrono controller.

Router Bridge: this has the function of extending the local network of Modbus® RS485 pCOe devices if the FieldBus serial connection is not practicable due to installation restrictions or for other reasons.

pCOe RS485: this is a 4 DIN module expansion card used to increase of the number of inputs/outputs available on the pChrono controller; it features 4 digital inputs, 4 analogue inputs, 4 digital outputs and 1 analogue output.

SA sensor, temperature / humidity: measures room temperature and humidity. Battery-powered, it sends data to the Access Point at regular intervals.

SI sensor, temperature / humidity / lux: measures room temperature and humidity, and light intensity. Battery-powered, it sends data to the Access Point at regular intervals.

**Wireless plug / switch**: this device is used to read the power consumption of the connected single-phase loads. It incorporates the functions of energy meter, router and remote relay control; it sends the Access Point the instant power (W) and energy (Wh) values. The maximum current draw of the connected appliance is 10 amperes.

## Example of a Mesh network

The SA sensor (at the top left), not being able to communicate with the Access Point it is bound to, uses a nearer wireless plug (with router function) to transfer its data to the Access Point, then to the pChrono controller.

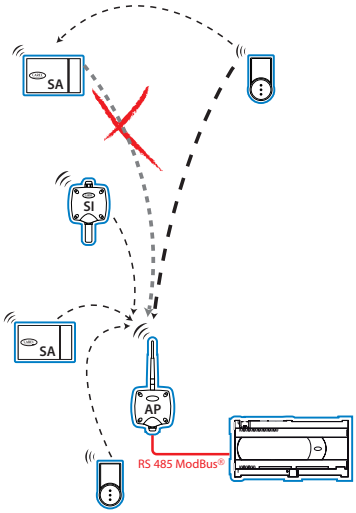



Fig. 3.b

### Example installation with pCOe on Router Bridge and wireless plugs that always incorporate the router function

In the figure, one Access Point is dedicated to communication with the Router Bridge, connected to 4 pCOe devices. The other Access Point communicates with all the other wireless devices (wireless plugs/SA/SI). Note how ZigBee™ technology can support communication even when not always possible (directly) between the device and the Access Point, due to problems of distance, fixed or moving obstacles.

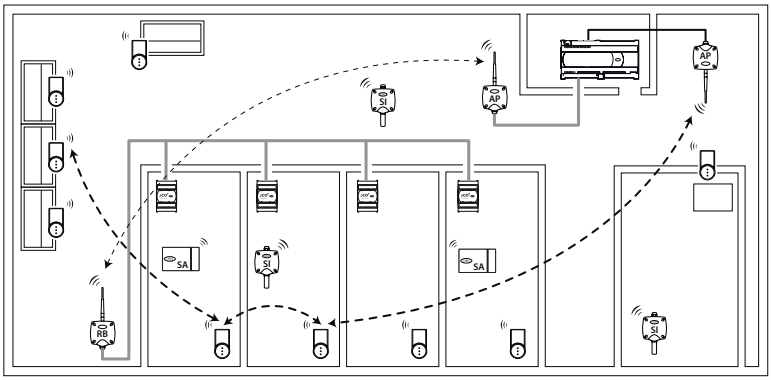



Fig. 3.c

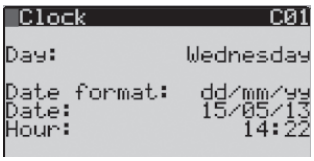
# 4. MAIN MENU – FUNCTION TREE

| | | Main menu | | | Settings menu (with password) |
|---|---|---|---|---|---|
| A. | | On-Off Unit | | | |
| B. | | Load status | | | |
| C. | | Clock/Scheduler | | | |
| D. | | Hardware config. | a. | | Network |
| | | | b. | | pChrono |
| | | | c. | | pCOe |
| | | | d. | | Wireless devices |
| | | | e. | | Initialization |
| E. | | Load config. | a. | | Lights |
| | | | b. | | Pumps |
| | | | c. | | Sockets |
| | | | d. | | Generic loads |
| | | | e. | | Generic functions |
| F. | | Information | | | |

Tab. 4.a

**Note:** the 'Hardware config.' and 'Load config.' menus are accessed after entering a 4-digit password. There are two types of password, one for each of the menus. These passwords can be set on the corresponding screen.

**Note:** the menu structure is reflected by the screen index.
See the following example:




When selecting the following item in the menu:

C. Clock

the letter of the original menu will be shown at the top right of the screen.

**Note:** after 10 minutes of inactivity on the display, the password will need to be entered again and pChrono will automatically display the main screen.

Password:

| Mask index | Description on terminal | Description | Default | UOM | Values |
|---|---|---|---|---|---|
| --- | Enter hardware configuration: password | Password for configuring pChrono and accessories | 1234 | --- | 0…9999 |
| --- | Enter load configuration password | Password for configuring the individual loads | 1234 | --- | 0…9999 |

Tab. 4.b

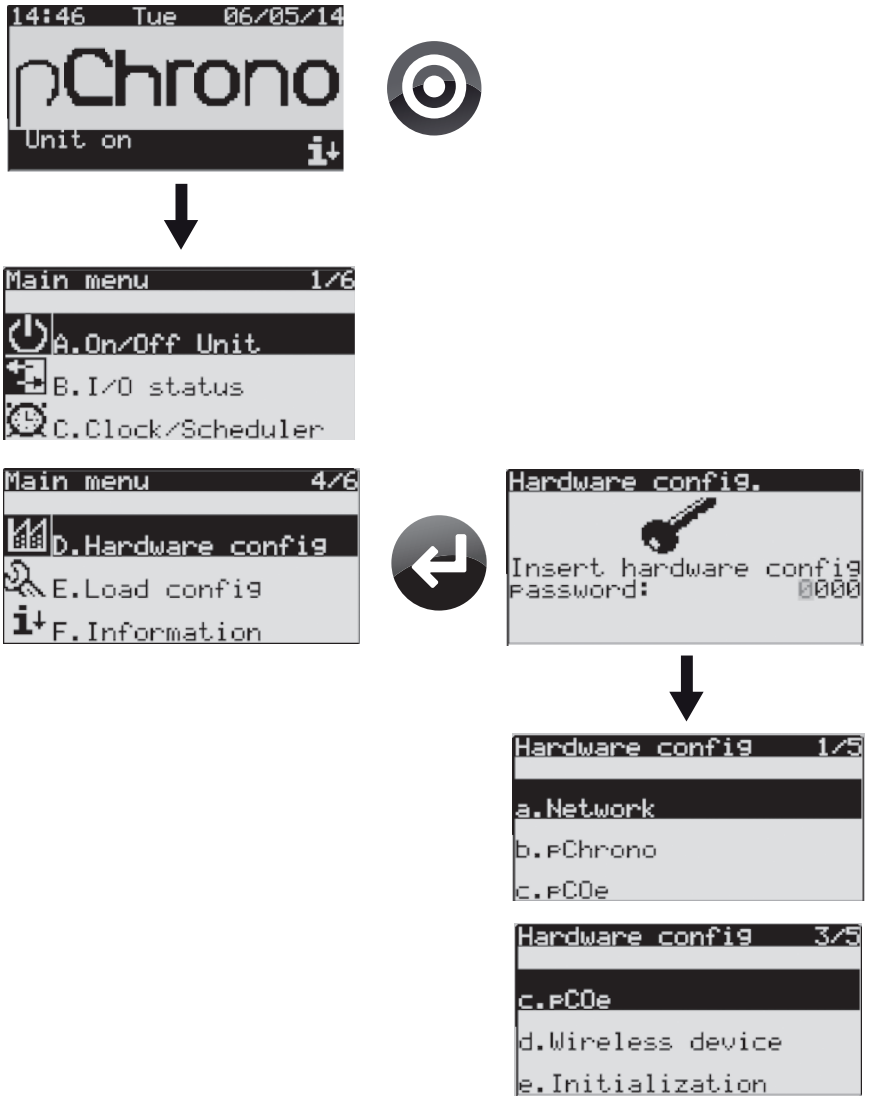
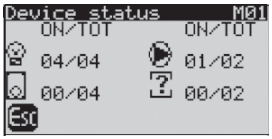

14:46 Tue 06/05/14
pChrono
Unit on
Main menu 1/6
A.On/Off Unit
B.I/O status
C.Clock/Scheduler
Main menu 4/6
D.Hardware config
E.Load config
F.Information
Hardware config.
Insert hardware config
Password: 0000
Hardware config 1/5
a.Network
b.pChrono
c.pCOe
Hardware config 3/5
c.pCOe
d.Wireless device
e.Initialization

Fig. 4.a

# 5. INITIALISING THE SYSTEM

pChrono is structured so that the configuration of each individual device is easy and intuitive. Correct programming of the controlled loads requires an initial configuration of the system, enabling the individual functions one at a time. The main screen only provides information on the date and time; however, pressing the DOWN button displays how many loads have been configured, and how many of these are currently active.


The main screen shows information on unit operating status (On or Off), the current time and date.




From the main screen, pressing DOWN displays the number of loads configured and how many of these are currently active.

In the example shown here, the following loads have been configured:

| Type of load | Active loads | Total loads configured |
|---|---|---|
| Lights (top L) | 4 | 4 |
| Wireless plugs (bottom L) | 0 | 4 |
| Pumps (top R) | 0 | 2 |
| Generic loads (bottom R) | 0 | 2 |

Tab. 5.a

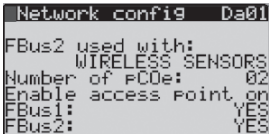
## 5.1 System set-up

When selecting menu 'D. Hardware config.' (password protected), the following loops can be accessed:

a. Network: to enable the individual devices (Access Points, the number of wireless devices or pCOe units in the network), configure the BM1/BMS2 communication ports, the remote on/off digital input, the alarm output and the configuration of the common auxiliary inputs (see paragraph '7.1 Light management', 'Common auxiliary digital inputs function');
b. pChrono: to configure the individual inputs/outputs for the pChrono board only;
c. pCOe: to configure the inputs/outputs on each individual pCOe;
d. Wireless devices: to set each individual device enabled regarding transmission times, alarm thresholds, etc.;
e. Initialisation: to delete the alarm log, set the unit of measure, install the default values, backup or restore the configuration.

### Network settings

'Network' refers to the set of physical devices comprising the pChrono system, as described in chapter 3. System architecture. For details on the maximum number of devices that can be connected to pChrono, see the same chapter; for details on the settings of these devices, see below.




The type of device connected to the integrated FieldBus2 connector can be configured. The options are 'WIRELESS SENSORS' or 'pCOe'. Then, the number of pCOe cards connected can be set, and the 'Access Point' enabled on each FieldBus.

The dipswitches on both Access Points must be configured as shown below.

| | | | | |
|---|---|---|---|---|
| Access point, address 1 | ON | OFF | OFF | ON |

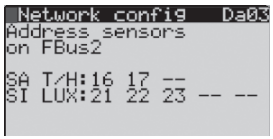
Note:

- The slot marked 'FieldBus card' is FieldBus 1, and requires an optional card, part no. PCO100FD10
- Terminal J26, on the other hand, is the integrated and optically-isolated FieldBus 2 connector (FBus2)
- The pChrono settings for communication with the enabled Access Points involve a baud rate of 19200 bit/s. These settings cannot be modified.


If using a 'Router Bridge' to wirelessly connect some of the pCOe devices, the Access Point will need to be configured 'WITH ROUTER BRIDGE', moreover selecting the range of pCOe addresses available and connected via the wireless network. All 10 pCOe devices can be connected via a Router Bridge; in this case, the Min address will be 2, and the Max will be 11.

The dipswitches on the Router Bridges for wireless pCOe connection must be configured as shown below:

| | | | | |
|---|---|---|---|---|
| Router Bridge, addr. not managed | ON | OFF | ON | OFF |



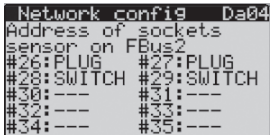

The addresses of the SA (temperature / humidity) and SI sensors (temperature / humidity / brightness) cannot be modified, but rather can be enabled or disabled. This simplifies the configuration procedure and avoids configuration problems in the field. Simply enable the correct address on this screen and set the same serial address on the wireless device using the dipswitches. pChrono will automatically recognise the device and read its parameters as necessary.

The dipswitches on the SA sensors must be configured as shown below.

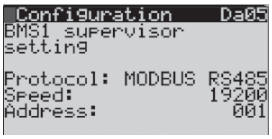
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SA, address 16 | OFF | OFF | OFF | OFF | ON | OFF | OFF | OFF |
| SA, address 17 | ON | OFF | OFF | OFF | ON | OFF | OFF | OFF |
| SA, address 18 | OFF | ON | OFF | OFF | ON | OFF | OFF | OFF |

The dipswitches on the SI sensors must be configured as shown below:

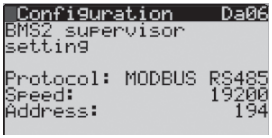
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SI, address 21 | ON | OFF | ON | OFF | ON | OFF | OFF | OFF |
| SI, address 22 | OFF | ON | ON | OFF | ON | OFF | OFF | OFF |
| SI, address 23 | ON | ON | ON | OFF | ON | OFF | OFF | OFF |
| SI, address 24 | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |
| SI, address 25 | ON | OFF | OFF | ON | ON | OFF | OFF | OFF |




The addresses of the wireless plugs are also predefined. The user can configure address #26 (for example) as a PLUG, and address #28 as a SWITCH. This allows better visibility of the data corresponding to the device when browsing the screens. In addition, the pChrono template on PlantVisorPRO will show, based on the address of the device being accessed, the image of a Plug or Switch. The address of the aforementioned devices can be configured using the button; for details see instruction sheet +0500049ML, or , at paragraph "5.2 Wireless network configuration".



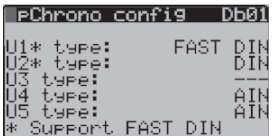

Communication port BMS1 is enabled for the connection of a second supervisory system; this can in fact be used to install the pCOWeb card. The protocol can be selected as pCO MANAGER (to update the application program) or MODBUS RS485.



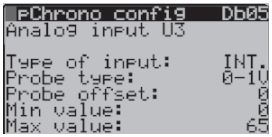

The integrated communication port BMS2 is enabled for the connection of a supervisory system, such as Carel PlantVisorPRO. The protocol can be selected as pCO MANAGER (to update the application program) or MODBUS RS485.

**pChrono settings**

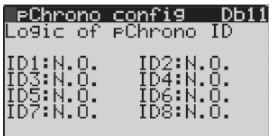
This loop is used to configure the inputs/outputs on the pChrono device; different screens will be enabled depending on whether the device in question is a pChrono Small or pChrono Large.



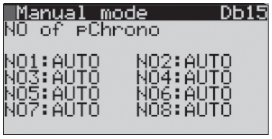

The type of universal inputs on the pChrono can be selected, so as to configure the software to manage these inputs. The options are Analogue Inputs (AIN), Analogue Outputs (AOUT), Digital Inputs (DIN) or Fast Digital Input (FAST DIN, for the light Button management) according to the requirements of the system.




For inputs configured as probe or sensor connections, a screen is provided for setting the Type, an Offset and the end scale Limits. The reading value can be set as Analog or Integer value.



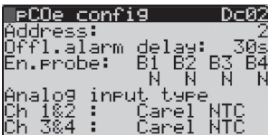

The digital inputs, as well as the digital outputs, can be N.O. (normally open) or N.C. (normally closed) contacts.




The digital outputs can be tested. Set AUTO for the software to manage the output as per the settings, ON to activate the output, or OFF to deactivate the digital output (always off).

**pCOe settings**

This loop is used to configure each of the pCOe devices.




The address of the pCOe being configured is shown on the second line (Address:). The settings available are delay for offline alarm, enable probes/sensors and, for each pair of probes/sensors (B1-B2 and B3-B4), set the type. Other configurations, such as probe offset, manual overrides or output logic are available on the subsequent screens.

The pCOe expansion card must be configured with the dipswitches as shown below:

| | | | | |
|---|---|---|---|---|
| pCOe, address 2 | OFF | ON | OFF | OFF |
| pCOe, address 3 | ON | ON | OFF | OFF |
| pCOe, address 4 | OFF | OFF | ON | OFF |
| pCOe, address 5 | ON | OFF | ON | OFF |
| pCOe, address 6 | OFF | ON | ON | OFF |

| | | | | |
|---|---|---|---|---|
| pCOe, address 7 | ON | ON | ON | OFF |
| pCOe, address 8 | OFF | OFF | OFF | ON |
| pCOe, address 9 | ON | OFF | OFF | ON |
| pCOe, address 10 | OFF | ON | OFF | ON |
| pCOe, address 11 | ON | ON | OFF | ON |

Note:

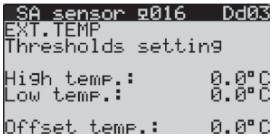
- The pCOe expansion cards are connected to the RS485 serial line using the recommended connections and connector J3 on the pCOe.
- The pChrono settings for communication with the enabled pCOe cards involve a baud rate of 19200 bit/s. These settings cannot be modified.

### Wireless device settings

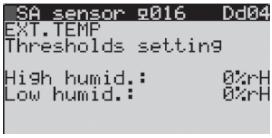
This loop is reserved for the settings of the wireless devices, such as the SA sensors (T/H), the SI sensors (T/H/LUX), and the wireless plugs/switches. For the features of the individual devices see paragraph '3. System architecture'. Only the devices enabled in the 'Network configuration' loop will be visible for the following configurations.

SA sensor, Temperature / Humidity


The heading on line zero identifies the type of sensor and the serial address; line 1 on the other hand shows an editable 8-digit text to identify the location of the sensor. This screen is used to set the transmission time for refreshing the values measured by the sensor on pChrono. The lower the time, the shorter the battery life. Typically, for a transmission time of 5 minutes, the battery will last 5 years. Further details are available in the rTM manual, +0300030xx.




This screen, on the other hand, is used to set the limits for the high and low temperature alarms. An offset can also be entered for the sensor reading.

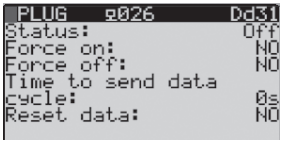



The high and low humidity alarm threshold is set on this screen. No offset is available for the room humidity reading.

SI sensor, LUX / Temperature / Humidity


For the SI sensor too, an 8-digit text is available for identifying the sensor; compared to the SA sensor, this also measures brightness in the room, with the high and low brightness alarm thresholds set on this screen; a coefficient is also available for adjusting the reading, set by default to 1000; unless in special cases, this parameter should not be changed.

Wireless plug with built-in energy meter function

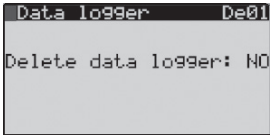



This screen is used to override the relay on the device (On or Off). As this device is mains powered, the transmission time does not affect system flexibility. The energy meter can be reset using the parameter on screen. The energy reading is supplied by the wireless device, which saves the data and transmits these to pChrono every 'data transmission time', together with instant power. These readings are shown in loop 'B. Load status'.

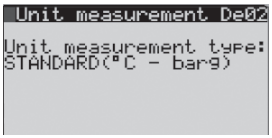
The wireless plugs do not have dipswitches for setting the serial address; for the correct procedure, see instruction sheet +0500049ML included in the packaging with the devices, and online at carel.com. In paragraph "5.2 Wireless network configuration" , however, shows an extract of the procedure to be followed.

**Initialisation**

This loop is reserved for initialising pChrono: delete the alarm log, backup the current configuration.

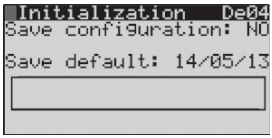



This parameter is used to delete the alarms saved since the previous reset. The log is also reset when restoring the default values.




The values can also be displayed using Imperial units of measure. Temperature will be expressed in degrees Fahrenheit (°F) and pressure in PSI (psig).


Select YES to confirm, the default values shown in the parameter table will be installed.




This screen is used to save the current pChrono configuration; the date displayed will be updated with the current date. This function allows the configuration to be modified, saved and then subsequently restored if and when needed. The progress bar advances as the data is saved; the procedure typically takes less than two minutes. When loading a previously saved configuration, a message prompts the user to switch the unit off and on again.
The mask is available only with Unit OFF.


Both passwords are 1234 by default; these values can be changed here.

## 5.2 Wireless network configuration

The procedure described here refers to a system being initialised in which none of the listed devices has already been configured. The devices should be configured near one another for better control over the binding procedure.

To configure the Access Point follow the instructions shown below:

1. set the dipswitches as described above
2. Connect the AP to the desired FBus serial port (previously enabled)
3. Power up the AP at 12/24 Vac
4. Press button T1 on the AP to automatically select the wireless channel. Wait around 10 seconds until L1 starts flashing slowly (1s). L1 flashing means that the wireless network has been automatically selected by the Access Point.

A. Binding the SA or SI sensors to the Access Point

5.a Press button T1 on the AP again. LED L1 flashes quickly (0.25s); this means that the wireless network has been opened and is ready to bind the sensors.
6.a On the SA or SI device, set the address to be used for communication with the AP
7.a Remove the insulating protection on the battery and make sure that the LEDs come on for a few seconds.
8.a To bind the device to the AP, press button T1. LED L1 on the SA or SI sensor will come on for around 10s, then L1, L2, L3 will flash together several times, and finally go off. The procedure for checking the quality of the wireless signal is then activated (around 1 minute).
9.a Press button T1 on the AP to close the wireless channel.

B. Binding the wireless plugs / switches to the Access Point

Starting from point 4, proceed as follows:

5.b press button T1 on the AP again. LED L1 flashes quickly (0.25s); this means that the wireless network has been opened and is ready to bind the devices.
6.b Power up the wireless plug / switch and wait a few seconds: the procedure for binding to the Access Point starts automatically. The procedure ends when the yellow LED on the plug/switch flashes every 1s.
7.b Now assign the serial address to the devices using the button, following the procedure described below.
8.b Press button T1 on the AP to close the wireless channel.

Assigning the serial address to the wireless plugs/switches

As mentioned above, these devices do not have dipswitches for setting the serial address; consequently, proceed as follows:

9.b Press the local button four separate times for no more than a second, and no more than a second apart. Accessing this mode is confirmed by a sequence of green-red-yellow flashes of the LED for 1.5 seconds.
10.b After accessing this mode, the LED goes off and the device waits for the button to be pressed; data entry is divided into two stages, entering the tens and entering the units.

Set the tens of the Modbus address.

11.b The number of times the button is pressed during this stage represents the tens of the new Modbus address.
12.b During this stage, pressing the button causes the LED to flash red. The button must be pressed 2 or 3 times, as the possible addresses are between 26 and 35.
13.b The first stage ends 3 seconds after the button was last pressed.
14.b At the end of the first stage, the LED flashes green-red-yellow to indicate the changeover from tens to units.

Set the units of the Modbus address

15.b The number of times the button is pressed during this stage represents the units of the new Modbus address.
16.b During this stage, pressing the button causes the LED to flash green; the button must be pressed between 0 and 9 times, as the possible addresses are between 26 and 35.
17.b The second stage ends 3 seconds after the button was last pressed.
18.b At the end of the second stage, the LED flashes green-red-yellow to confirm the end of the setting procedure.

The assigned Modbus address should now be checked; press the local button twice for no more than a second, and no more than a second apart. Then count the flashes: red for the tens, green for the units.

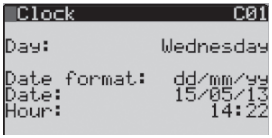
C. Binding the Router Bridge to the Access Point

If the wireless network requires a Router Bridge device (example Fig.3.c.), use the following procedure to bind the RB to the dedicated AP. Starting from point 4, proceed as follow

5.c press button T1 on the AP again. LED L1 flashes quickly (0.25s); this means that the wireless network has been opened and is ready to bind the devices.
6.c Power up the Router and wait a few seconds: the procedure for binding to the Access Point starts automatically. The binding operation generally lasts less than 30s.
7.c Press button T1 on the AP to close the wireless channel.

## 5.3 Setting the clock and time bands

Select loop 'C. Clock/Scheduler' on the main menu to set the current time and date, and configure, enable or disable daylight saving time.




This screen is used to set the date format ("dd/mm/yy", "mm/dd/yy" or "yy. mm.dd"), set the date and time. (*)


If daylight saving time is managed, the changeover period can be set here. (*)

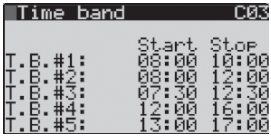
The same loop can be used to set the Time bands and the Periods in which such time bands are active. The scheduler function on the pChrono includes:
20 Time bands
10 Periods

Every load that uses the scheduler can be controlled using the time band/periods proposed here, selecting the most suitable one. This ensures flexibility and fast configuration of the entire system during system set-up. Moreover, all the loads affected can be realigned together without needing additional reconfiguration by simply adjust the settings for a time band or period.

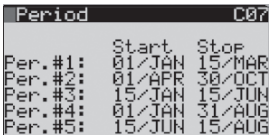
The following settings are required for each time band:
- Time band start hours/minutes
- Time band end hours/minutes

The following settings are required for each period:
- Period start day/month
- Period end day/month

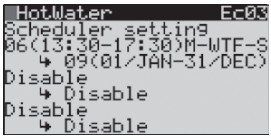
The days of the week on which the time band and period settings are active will be selected in the scheduler relating to the individual device.



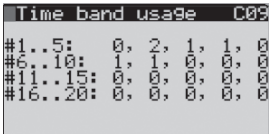

Each time band can be set with the time band start/end hours/minutes. Minimum resolution is 1 minute.



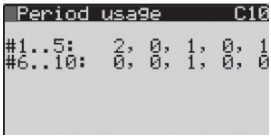

Each period can be set with the period start/end day/month. Minimum resolution is 1 day.




The example illustrated here, shows how the first time band (of three) selected for managing the load is number "6", with settings "13:30 - 17:30", and is displayed in brackets "(...)". The active reference period is number "9", pre-configured as "1/JANUARY – 31/DECEMBER". The only days the load will be enabled on are MONDAY, WEDNESDAY, THURSDAY, FRIDAY and SUNDAY. The day is enabled if the corresponding first letter is visible.




This screen (and C10 for the periods) summarises how many times the reference time band has been selected. The example shows how time bands "1" and "2" have been used twice, while "4" and "7" once only. The others, on the other hand, have not been used. This provides quick feedback on if and how many times that specific time band has been used, but not by which load. Information on how many times the time band has been used by the loads helps understand how many of these will be affected by the new settings, without needing to search through each individual load. (**)

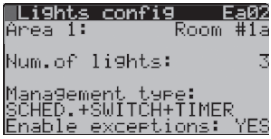



The same also applies to the periods. In this case, period "2" has been used twice, while periods "2", "3" and "4" once only. See the notes relating to screen "C09". (**)

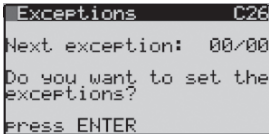
Note:
- (*) The PlantVisorPRO supervisory system (from version SP 2.2.0) provides the automatic clock syncronization plugin to update the clock time on pChrono, according to the same one on PlantVisorPRO with a specific scheduler setted by the user himself. Please, refer to "Synchronization Clock timeband" on PlantVisorPRO setting.
- (**) The pChrono template for the PlantVisorPRO supervisory system (from version SP 2.1.0) provides the same information. Select the 'Parameters' tab, then 'Scheduler'. The number shown in brackets alongside each 'time band' or 'period' indicates the value described here and displayed on screens C09 and C10.

## 5.4 Setting the exceptions

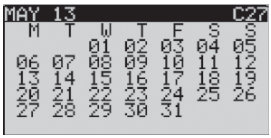
Up to 15 special periods can be set, representing exceptions to the time bands selected for the individual load. That means that for each load, scheduling can be enabled or disabled in the period specified by the exceptions. This is useful, for example, for configuring loads that need to be enabled when an exception disables the majority of the loads; for example, managing car park lights or illuminated signs on a Sunday or public holiday.



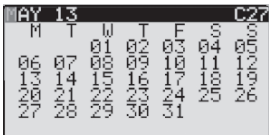

Area 1, called "Room #1a", has three light fixtures, managed by the scheduler, one switch and a button. Enabling the exceptions will disable the action of the scheduler and the switch (which always depends on the scheduler); the action of the button, on the other hand, will be always enabled. Further details are available under loop '7.1 Light management'. To set the exceptions in menu 'C. Clock/Scheduler', proceed as follows.



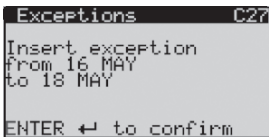

This highlights the 'next exception' (dd/mm); in the example, no exceptions have been configured. Press ENTER to set an exception



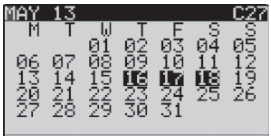

The screen displays the current month; with the cursor on "0:0", use UP or DOWN to select the month the exception applies to.



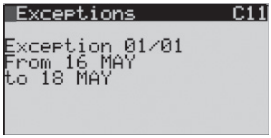

From position "0:0", pressing ENTER moves the cursor to day 1 of the month. Use the UP arrow to scroll to the desired day. In the example, 16 MAY. Press ENTER to configure the exception.




This screen is used to change the exception period. In the example, the exception will be active from 16 May to 18 May.
Press ENTER to confirm the exception 16-18 May.




The exception is then displayed on this screen. The selected days refer to the exception period.
In this form, by selecting the first useful exception set day (the 16th in this case), if you press the ENTER key, the exception will be removed.




The active exceptions will be listed here, and on other dedicated screens. "01/01" indicates that the exception displayed is number '1' out of a total of '1'

# 6. FUNCTIONS

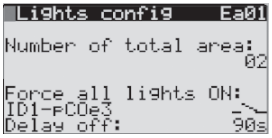
As described above, pChrono can manage many types on units and different system requirements. Before configuring pChrono, the unit is recommended OFF. Below is a list of the functions available, with the details for each:

- Lights: up to 20 areas, each with up to 4 light fixtures
- Pumps: up to 2 groups of pumps, each with 2 ON/OFF pumps
- Wireless plugs: up to 10 devices (switches or plugs)
- Generic loads: up to 20 generic loads
- Generic functions: up to 20 functions (thermostat/modulating/generic alarm/pulses/ WC-Alarm)
- Read wireless sensors: 5 SI sensors (T/H/LUX), 3 SA sensors (T/H)

## 6.1 Special functions

**Security function (burglar alarm)**

pChrono can manage the simultaneous activation of more than one area configured using just one digital input with switch function. This function is often requested by security companies when the burglar alarm is activated; simultaneous activation of all the lights helps identify the culprits.




The closing of input ID1 on the expansion card with serial address 3, "ID1-pCOe3", will switch on the lights in the configured areas, on the next mask. The current status of input ID1-pCOe3 is 'Contact Open'. The time parameter will keep the lights ON after the alarm condition back to the normal operation; the DOUT status blink during this time on.

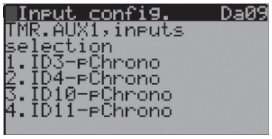
**Common auxiliary digital inputs function**

When need to manage a load by more than one digital input is aided by the Auxiliary Inputs. pChrono it offers five different types, each one in number of five.

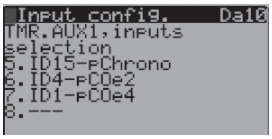
Common 'Timer' management (inputs TMR.AUX1, TMR.AUX2, TMR.AUX3, TMR.AUX4, TMR.AUX5)

Management of the Timer can be associated with the use of motion detectors. Often however, more than one detector is needed in a certain area, especially larger areas. For this function, pChrono provides 5 'virtual' inputs that group together the action of multiple digital inputs used as timers (TMR.AUX*). These inputs can be configured under loop "D:Hardware config.\a. Network". Each "TMR.AUXx" input can be associated with up to 8 different digital inputs. The specific TMR.AUX* is then selected in the load configuration screens; the user can select the input by scrolling the list of I/Os available in the field on the 'Timer' screen.

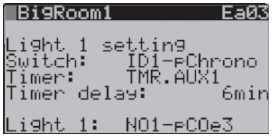
Remember that the logical state of these inputs is the logical "OR" of all the inputs configured on TMR.AUX*: each of the inputs will in fact restart the 'Timer' time count, cancelling the switching (Open→Closed, Closed→Open) of the previous input. The light will switch OFF when the set time has elapsed.




Input TMRAUX1 will depend on the status of inputs ID3-pChrono, ID4-pChrono, ID10-pChrono, Id11-pChrono; for further details, see screen Da10.




Input TMR.AUX1 will have a logical value of 1 and will also depend on ID15-pChrono, ID4-pCOe2, ID1-pCOe4, plus those inputs previously configured on screen Da09.




The input selected for the Timer function is a 'virtual' input; in fact "TMR. AUX1" will be the logical OR of inputs ID3, ID4, ID10, ID11, ID15 on pChrono, ID4 on the pCOe with serial address 2, and ID1 on the pCOe serial 4 (see screens Da08, Da09 above).

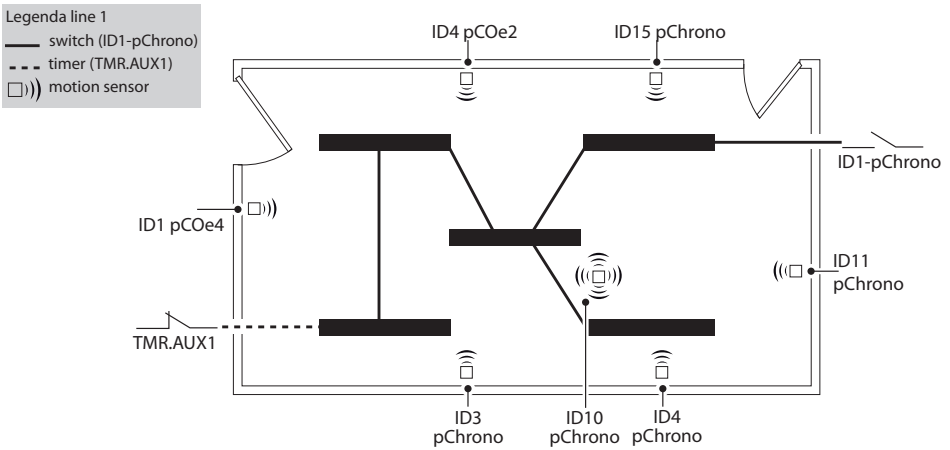



Fig. 6.a

Common 'switch' management (inputs SWI.AUX1, SWI.AUX2, SWI.AUX3, SWI.AUX4, SWI.AUX5)
An individual light fixture can be controlled by several different switches. For this function, pChrono provides 5 'virtual' inputs that group together the action of multiple digital inputs (SWI.AUX*). The action of each reverses the current status of the digital input. These inputs can be configured under loop "D:Hardware config.\a. Network". Each "SWI.AUX*" input can be associated with up to 5 different digital inputs. The specific SWI.AUX* is then selected in the load configuration screens; the user can select the input by scrolling the list of I/Os available in the field on the 'Switch' screen.

Common 'AND' input management (inputs AND.AUX1, AND.AUX2, AND.AUX3, AND.AUX4, AND.AUX5)
pChrono provides 5 'virtual' inputs that group together the action of multiple digital inputs (AND.AUX*). When all the digital inputs configured for AND.AUX* are closed, the logical value of the AND.AUX* virtual input will be '1'. When the logical state of even just one of the inputs is '0', the value of the virtual input will be '0'. Each "AND. AUX*" can be associated with up to 4 different digital inputs. The AND.AUX* input is then selected in the load configuration screens; the user can select the input by scrolling the list of I/Os available in the field on a 'Switch' or 'Button' screen. Two are the delay times set by mask: one of delay for the ON action, another for the OFF action.

| In1 | In2 | In3 | In4 | OUT |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| X | X | X | X | 0 |
| 1 | 1 | 1 | 1 | 1 |

Common 'OR' input management (inputs OR.AUX1, OR.AUX2, OR.AUX3, OR.AUX4, OR.AUX5)
pChrono provides 5 'virtual' inputs that group together the action of multiple digital inputs (OR.AUX*). When at least one of the digital inputs configured for OR.AUX* is closed, the logical value of the OR.AUX* virtual input will be '1'. When the logical state of all of the inputs is '0', the value of the virtual input will be '0'. Each "OR.AUX*" can be associated with up to 4 different digital inputs. The OR.AUX* input is then selected in the load configuration screens; the user can select the input by scrolling the list of I/Os available in the field on a 'Switch' or 'Button' screen. Two are the delay times set by mask: one of delay for the ON action, another for the OFF action.

| In1 | In2 | In3 | In4 | OUT |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| X | X | X | X | 1 |
| 1 | 1 | 1 | 1 | 1 |

Common 'BUTTON' input management (inputs BUT.AUX1, BUT.AUX2, BUT.AUX3, BUT.AUX4, BUT.AUX5)
pChrono provides 5 'virtual' inputs that group together the action of multiple digital inputs (BUT.AUX*). When at least one of the digital inputs configured for BUT.AUX* is closed, the logical value of the BUT.AUX* virtual input will be, for an time impulse, '1'. Each "BUT.AUX*" can be associated with up to 5 different digital inputs. The BUT.AUX* input is then selected in the load configuration screens; the user can select the input by scrolling the list of I/Os available in the field on a 'Button' screen.

'INTERNAL TEMPORARY VARIABLE' management (internal variables TMP.VAR1, ..., TMP.VAR10)
pChrono provides 10 digital Internal support variables for a flexible I/O management and a more easier and faster installation. The above variables can be used as a function of Output and Input of another. For example, you might configure a temperature step, and on the logic state of this one, you can enable a light, a generic load or how much is needed in the plant. This flexibility, as mentioned, can meet the most varied demands without having to wire the electrical panel in the invasive way by reporting phisically the status of the digital output into a digital input. In the 'B. I/O Status' loop you can see the status of the mentioned variables.

As described, the inputs/outputs can be selected by the installer according to system requirements. The complete selection of the inputs used as a Switch or Button is shown below, to simplify configuration in the field.

List of inputs used for setting the Switch or Button:
---;ID1-pChrono;ID2-pChrono;ID3-pChrono;ID4-pChrono;ID5-pChrono;ID6-pChrono;ID7-pChrono;ID8-pChrono;ID9-pChrono;ID10-pChrono;ID11-pChrono;ID12-pChrono;ID13-pChrono;ID14-pChrono;ID15-pChrono;ID16-pChrono;ID17-pChrono;ID18-pChrono;ID1-pCOe2;ID2-pCOe2;ID3-pCOe2;ID4-pCOe2;ID1-pCOe3;ID2-pCOe3;ID3-pCOe3;ID4-pCOe3;ID1-pCOe4;ID2-pCOe4;ID3-pCOe4;ID4-pCOe4;ID1-pCOe5;ID2-pCOe5;ID3-pCOe5;ID4-pCOe5;ID1-pCOe6;ID2-pCOe6;ID3-pCOe6;ID4-pCOe6;ID1-pCOe7;ID2-pCOe7;ID3-pCOe7;ID4-pCOe7;ID1-pCOe8;ID2-pCOe8;ID3-pCOe8;ID4-pCOe8;ID1-pCOe9;ID2-pCOe9;ID3-pCOe9;ID4-pCOe9;ID1-pCOe10;ID2-pCOe10;ID3-pCOe10;ID4-pCOe10;ID1-pCOe11;ID2-pCOe11;ID3-pCOe11;ID4-pCOe11;U1-pChrono;U2-pChrono;U3-pChrono;U4-pChrono;U5-pChrono;U6-pChrono;U7-pChrono;U8-pChrono;U9-pChrono;U10-pChrono;TMR.AUX1;TMR.AUX2;TMR.AUX3;TMR.AUX4;TMR.AUX5;SWI.AUX1;SWI.AUX2;SWI.AUX3;SWI.AUX4;SWI.AUX5;AND.AUX1;AND.AUX2;AND.AUX3;AND.AUX4;AND.AUX5;OR.AUX1;OR.AUX2;OR.AUX3;OR.AUX4;OR.AUX5;BUT.AUX1;BUT.AUX2;BUT.AUX3;BUT.AUX4;BUT.AUX5;TMP.VAR1;TMP.VAR2;TMP.VAR3;TMP.VAR4;TMP.VAR5;TMP.VAR6;TMP.VAR7;TMP.VAR8;TMP.VAR9;TMP.VAR10.

Below on the other hand is the list of analogue inputs that can be used, for example, to connect a brightness sensor (LUX):
---;U1-pChrono;U2-pChrono;U3-pChrono;U4-pChrono;U5-pChrono;U6-pChrono;U7-pChrono;U8-pChrono;U9-pChrono;U10-pChrono;B1-pCOe2;B2-pCOe2;B3-pCOe2;B4-pCOe2;B1-pCOe3;B2-pCOe3;B3-pCOe3;B4-pCOe3;B1-pCOe4;B2-pCOe4;B3-pCOe4;B4-pCOe4;B1-pCOe5;B2-pCOe5;B3-pCOe5;B4-pCOe5;B1-pCOe6;B2-pCOe6;B3-pCOe6;B4-pCOe6;B1-pCOe7;B2-pCOe7;B3-pCOe7;B4-pCOe7;B1-pCOe8;B2-pCOe8;B3-pCOe8;B4-pCOe8;B1-pCOe9;B2-pCOe9;B3-pCOe9;B4-pCOe9;B1-pCOe10;B2-pCOe10;B3-pCOe10;B4-pCOe10;B1-pCOe11;B2-pCOe11;B3-pCOe11;B4-pCOe11;SI add.21;SI add.22;SI add.23;SI add.24;SI add.25.

**Note:** at the end of this manual there is a table for noting the actual configuration of the various inputs/outputs.

## 6.2 Light management

pChrono manages up to 20 light areas. Each area can be named using up to 8 digits. The name associated with the area will then be shown on the screens used to configure such areas; the same name will also be available on PlantVisorPRO, here editable too. To better understand how to use pChrono for managing lights, the following terms will be used, as described below.

- Area: this refers to a physical, or logical environment that shares the same scheduler. The inputs and outputs will be defined in the configuration stage. Up to 20 areas are available.
- Lights: this refers to how many digital outputs are reserved for the area being configured. Each area can have between 1 and 4 light fixtures.
- Switch: this is the On/Off switch that manages the individual light fixture. The action on the input (Open→Closed, Closed→Open) opens or closes the digital output connected to the light fixture. The action of the Switch always reflects the enabling of the scheduler.
- Timer: this is a switch that turns on the lights for a set time. It is physically an On/Off switch, whose action (Open→Closed, Closed→Open) closes the digital output connected to the light fixture. Repeating the action on the digital input configured as a timer (e.g. a motion detector), will reset the time; when the set time has elapsed, only for the timers in the specific area, the lights will be switched off, unless otherwise activated. The action of the timer is independent of the scheduler or the exceptions.
- Button: it's a physical button that, by shorting the input of pChrono, reverse the state of the controlled digital output. If the dedicated input, it's a Universal Input suitably configured (as FAST DIN), the shorting of the input UX trough GND is interpreted as a closed contact and the light is turned on (if off) or off (if on). The closure of the Universal Input can have duration <2 ms. If the input is instead dedicated a normal digital input (DIN), it will be desirable to provide an input signal to pChrono input for at least 2sec.

Wiring diagram for the switch, timer and button used with pChrono:

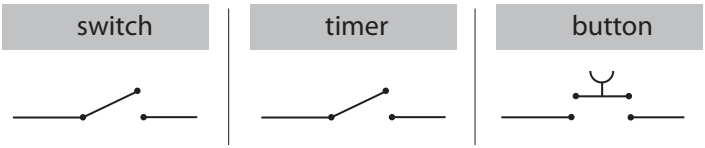



Fig. 6.b

Diagram illustrating the behaviour of the switch and button.

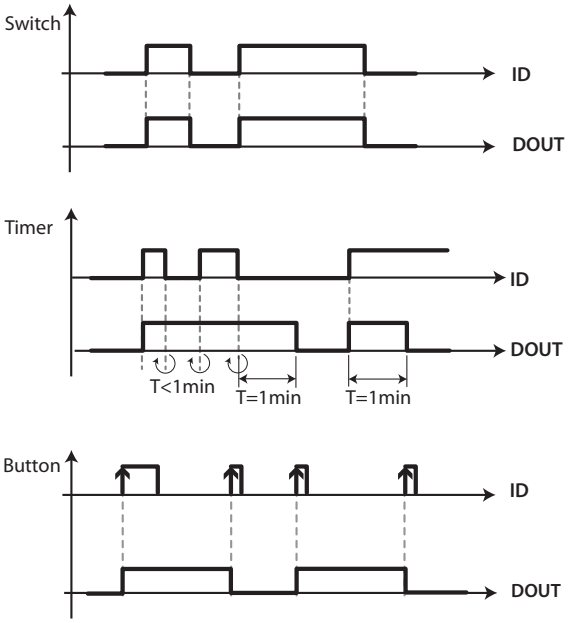



Fig. 6.c

Note how the digital output controlled by the 'switch' follows the status of the digital input. On the other hand, the digital output managed by a logical 'timer' is managed by time, which is reset whenever the digital input switches status before the set time of 1 min. If, on the other hand, the digital output does not switch over before the set time, when the time elapses the digital output is de-energised. While, the 'button' input always reverse the status of the releted digital outputs. Each area can be managed in different ways, according to system requirements. pChrono provides 15 types of management:

1. ONLY SCHEDULER the lights are ON when enabled by the scheduler.

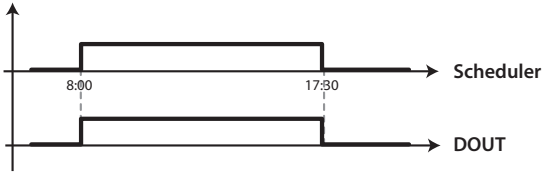



Fig. 6.d

2. ONLY SWITCH: the lights are ON when enabled by the switch input.

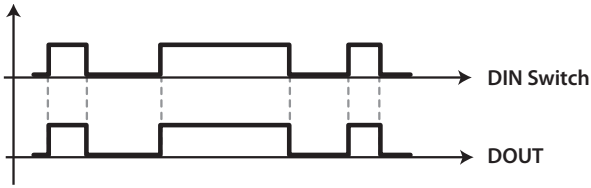



Fig. 6.e

3. SCHEDULER + SWITCH: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the corresponding switch input. Outside of the time bands, the lights will be OFF.

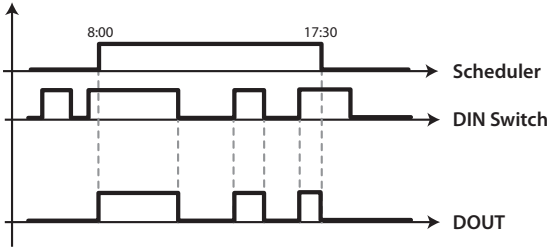



Fig. 6.f

4. SCHEDULER + SWITCH + TIMER: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the corresponding switch input. The timer will switch ON the lights for the set time, independently of whether they are enabled by the scheduler or the switch.

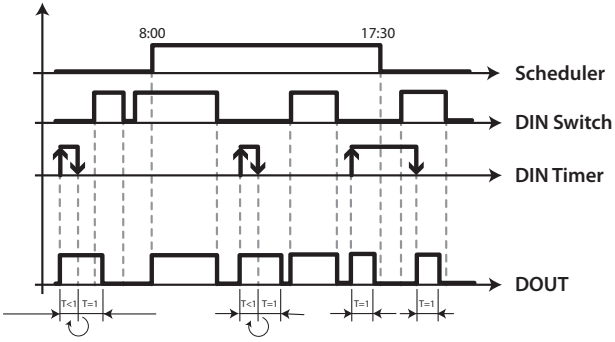



Fig. 6.g

5. SCHEDULER + SPV: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the special function on the supervisor. A list of 30 variables is provided for this function. This configuration is useful when using a remote enabling system that identifies daytime (or night-time), for example, for the management of outside lights (see example 3 below, with 'Geo-Lighting' in 'ECO-HVAC' package for PlantVisorPRO).

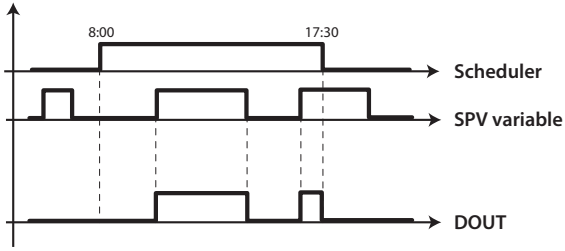



Fig. 6.h

6. SCHEDULER + SPV + TIMER: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the special function on the supervisor. A list of 30 variables is provided for this function. The timer will switch ON the lights for the set time, independently of whether they are enabled by the scheduler or the supervisor.

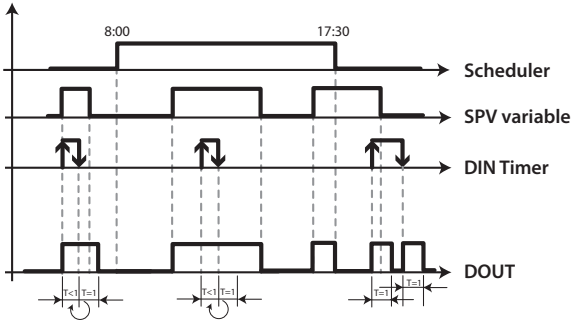



Fig. 6.i

7. SCHEDULER + LUX: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the brightness reading from a LUX sensor. This setting requires the configuration of a LUX set point and band. Stepped or modulating management via analogue output is available.

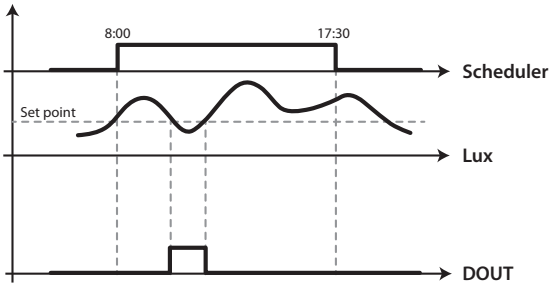



Fig. 6.j

8. SCHEDULER + LUX + TIMER: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the brightness reading from a LUX sensor. This setting requires the configuration of a LUX set point and band. Stepped or modulating management via analogue output is available. The Timer will switch ON the lights for the set time, independently of whether they are enabled by the scheduler.

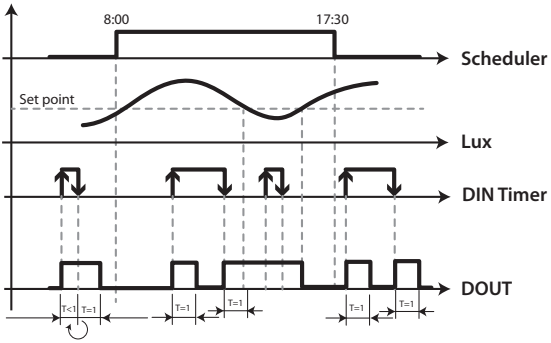



Fig. 6.k

9. ONLY BUTTON: the lights are ON when enabled by the button input. If the button is connected to a universal input configured as FAST DIN just short the input to turn ON/OFF the lights; in the other cases, the input (DIN) must be kept closed for a couple of seconds for pChrono detect the new state.

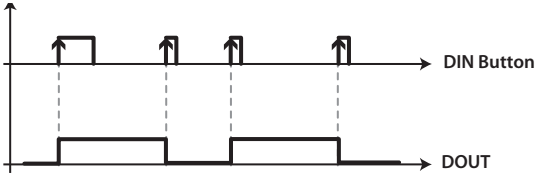



Fig. 6.l

10. SCHEDULER + BUTTON: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the corresponding button input. Outside of the time bands, the lights will be OFF.

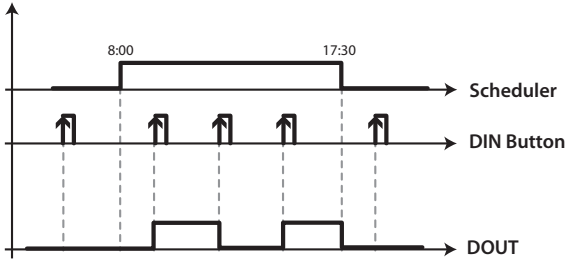



Fig. 6.m

11. SCHEDULER + SPV + BUTTON: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the special function on the supervisor. A list of 30 variables is provided for this function. The button will switch ON the lights for the set time, independently of whether they are enabled by the scheduler or the supervisor.

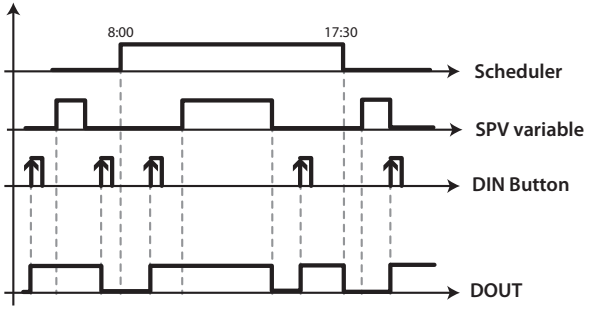



Fig. 6.n

12. SCHEDULER + LUX + BUTTON: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the brightness reading from a LUX sensor. This setting requires the configuration of a LUX set point and band. Stepped or modulating management via analogue output is available. The button will switch ON the lights for the set time, independently of whether they are enabled by the scheduler.

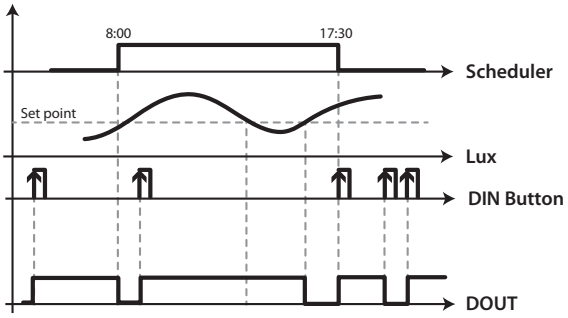



Fig. 6.o

13. SCHEDULER + TIMER: the lights are enabled to be switched ON based on the scheduler settings, but are only actually switched ON using the corresponding timer input. Outside of the time bands, the lights will be OFF.

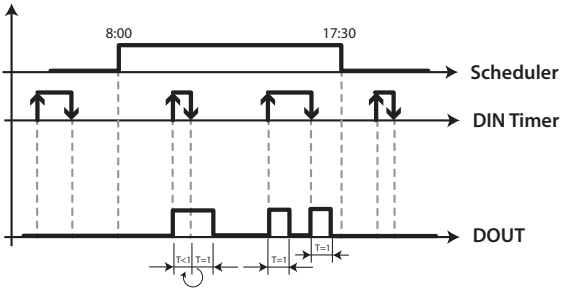



Fig. 6.p

14. SWITCH+ BUTTON: the lights are enabled to be switched ON based on switch status, but are only actually switched ON using the corresponding button input.

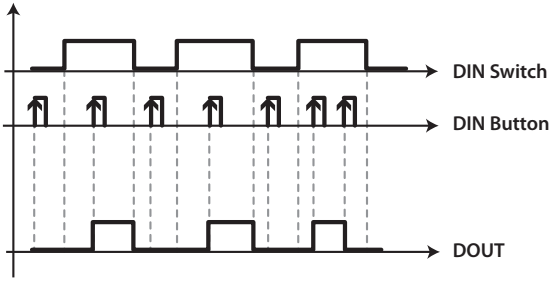



Fig. 6.q

15. SCHEDULER+SWITCH+LUX: The lights are enabled ON by the three conditions, namely by the scheduler, the state of the switch and the LUX reading sensor. This setting requires the configuration of a LUX set point and band.

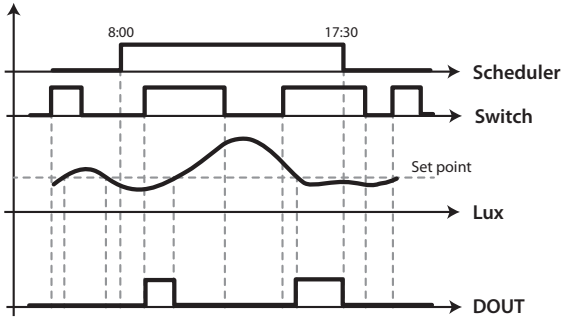



Fig. 6.r

The following table summarizes graphically how the various managements act on the configurated load:

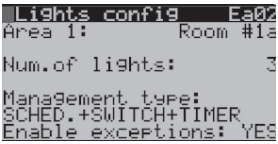
| | | Light management | |
|---|---|---|---|
| | | Joint action | Action 24h |
| 1 | only scheduler | | scheduler |
| 2 | only switch | | switch |
| 3 | scheduler + switch | scheduler + switch | |
| 4 | scheduler + switch + timer | scheduler + switch | timer |
| 5 | scheduler + SPV | scheduler + SPV | |
| 6 | scheduler + SPV + timer | scheduler + SPV | timer |
| 7 | scheduler + lux | scheduler + lux | |
| 8 | scheduler + lux + timer | scheduler + lux | timer |
| 9 | only button | | button |
| 10 | scheduler + button | scheduler + button | |
| 11 | scheduler + SPV + button | scheduler + SPV | button |
| 12 | scheduler + LUX + button | scheduler + lux | button |
| 13 | scheduler + timer | scheduler + timer | |
| 14 | switch + button | switch + button | |
| 15 | scheduler + switch + lux | scheduler + switch + lux | |

Tab. 6.a

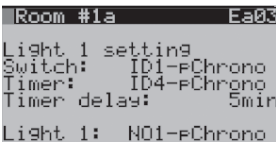
Below are some examples of how the user can configure the light areas.

**Example 1**

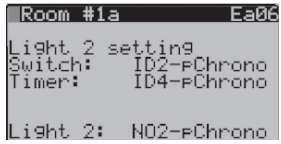
- Name Area1 "Room #1a"
- Light fixtures installed: 3
- Light management: Scheduler + Switch + Timer
- Lights off based on scheduled exceptions: Yes
- Switch DI for light fixture 1, Area 1: ID1 on pChrono
- Switch DI for light fixture 2, Area 1: ID2 on pChrono
- Switch DI for light fixture 3, Area 1: ID3 on pChrono
- Timer input DI for light fixture 1, 2 and 3, Area 1: ID4 on pChrono (common to all three light fixtures)
- Scheduling:
  - From 1 January to 15 March → from 7:30 to 12:30, from Monday to Friday
  - From 15 June to 15 August → from 8:00 to 12:00, from Monday to Friday
  - From 1 January to 31 December → from 13:30 to 17:30, Saturday & Sunday only



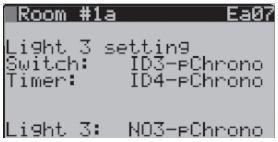

Area 1 has been named "Room #1a". There are '3' light fixtures; management is "Scheduler + Switch + Timer" and the lights in the area will be disabled during the periods specified in the exceptions. Remember that the Timer always switches ON the lights, even outside of the scheduled periods.



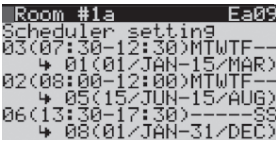

Light fixture 1, in area 1, is switched ON/OFF by ID1-pChrono. The Timer that switches light 1 on for 5 minutes is associated with ID4-pChorno. The dedicated digital output is NO1 on pChrono




Light fixture 2, in area 1, is switched on/off by ID2-pChrono. The Timer that switches light 2 on (for 5 minutes) is associated with ID4-pChorno. The dedicated digital output is NO2 on pChrono




Light fixture 3, in area 1, is switched ON/OFF by ID3-pChrono. The Timer that switches light 3 on (for 5 minutes) is associated with ID4-pChrono. The dedicated digital output is NO3 on pChrono




The scheduler is set here as per specifications. For the days of the week, note how when the first letter of the day is visible, the scheduler is active on that day.

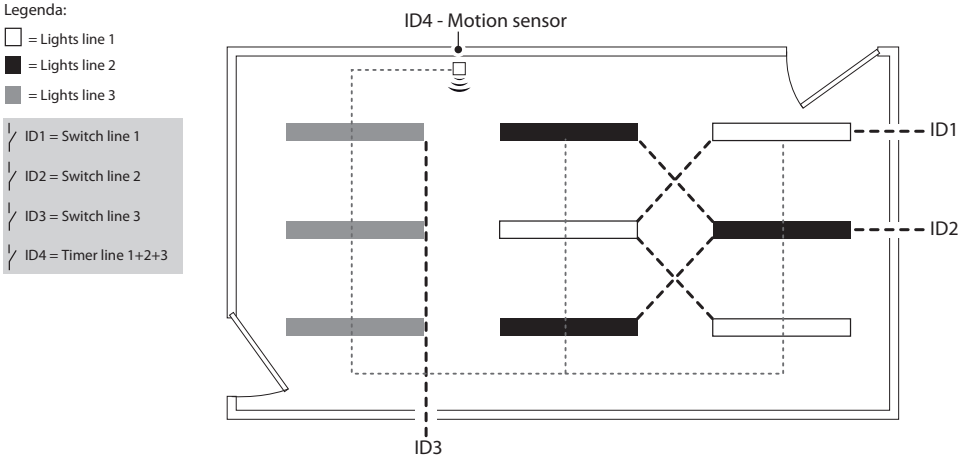



Fig. 6.s

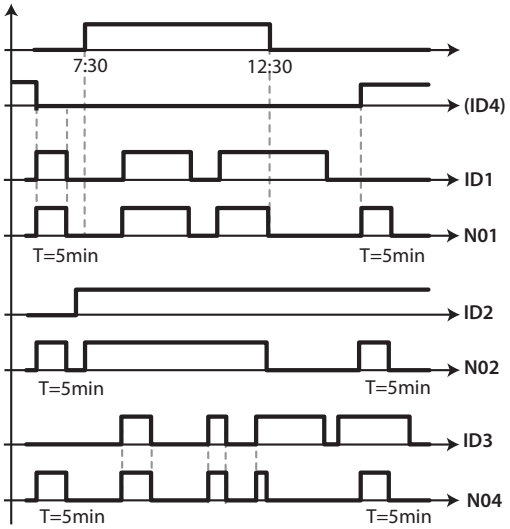
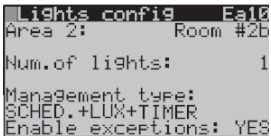


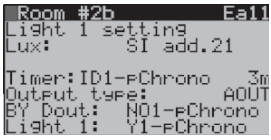

Fig. 6.t

**Example 2**

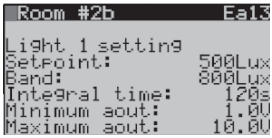
- Name Area 2 "Room #2b"
- Light fixtures installed: 1, analogue (1-10V), Analog Output Y1 pChrono
- Light management: Scheduler + LUX + Button
- Digital output for lighting power supply enable: DOUT 1 pChrono
- Lights off based on scheduled exceptions: Yes
- LUX sensor input for light fixture 1, Area 2: SI sensor with serial address 21
- Button DI for light fixture 1, Area 2: ID1 on pCOe with serial address 2
- Scheduling:
  - From 1 January to 31 December → from 7:30 to 12:30, from Monday to Friday
  - From 1 January to 31 December → from 08:00 to 12:00, Saturday only



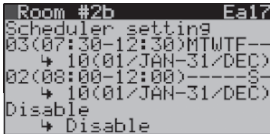

Area 2 has been named "Room #2b". There is just one light fixture available, with analogue control; management is "Scheduler + LUX + Timer" and the light will be disabled during the periods specified in the exceptions. Remember that the Timer always switches on the lights, even outside of the scheduled periods




Light fixture 1, in area 2, is managed with modulating control by the wireless SI sensor with address 21. The Timer that switches the light on, for 3 minutes, is associated with ID1 on the pCOe with serial address 2. The dedicated analogue output is Y1 on pChrono. The digital output, if configured, will be ON when the value of the LUX value will be greater than the setpoint and above, however, the minimum voltage value set in the following screen.




The set point in the room is 500 LUX, the band is set to 800 LUX and the integral time (PI control) is 120 seconds. This time means control via the analogue output is filtered against sudden variations in room brightness. Then, it is possible to set the range of the analog output with the minimum and maximum voltage value. It's suggested to set a big value of Band (even more than the setpoint value). It's suggested to keep the default value, as proposed.




The scheduler is set here as per specifications. For the days of the week, note how when the first letter of the day is visible, the scheduler is active on that day.

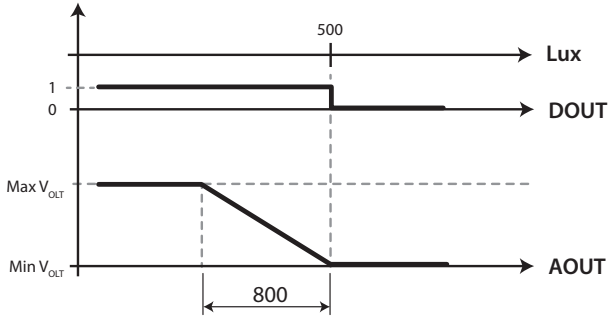



Fig. 6.u

**Note:** behaviour would be different if needing to manage 4 on/off lights always brightness sensor. The graph below in fact shows the behaviour of the 4 digital outputs.

- Set point: 500 LUX
- Band: 200

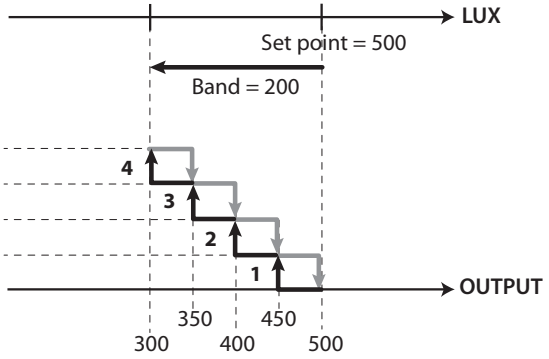
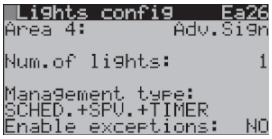



Fig. 6.v

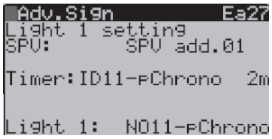
**Example 3**

The following scheduling is made possible by the BMS (PlantVisorPRO for example) providing a variable that indicates the number of hours of daylight or night (darkness). This function is available using the Geo-Lighting plugin in the ECO-HVAC package on PlantVisorPRO. Specifically, the Geo-Lighting plugin provides, based on latitude and longitude data, the sunrise and sunset time for the current day. For further details see the online help in PlantVisorPRO.

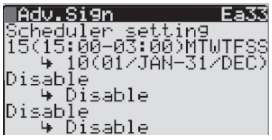
- Name Area 4 "Adv.sign", ('Advertising sign')
- Light fixtures installed: 1
- Light management: Scheduler + SPV + Timer
- Lights off based on scheduled exceptions: No
- Supervisor variable for light fixture 1, Area 3: SPV addr.1
- Timer DI for light fixture 1, Area 3: ID11 on pChrono
- Scheduling:
  - From 1 January to 31 December → from sunset to 3:00 a.m.




The name "Adv.Sign" is assigned to area 4, the number of light fixtures is set to '1', management is configured as requested and the light is not enabled for exceptions.




Selecting the variable "SPV.add.01", pChrono awaits the signal from the BMS to enable light fixture 'NO11-pChrono'; this output will switch on the outdoor advertising sign, from sunset until the time set in the scheduler. The action on button 'ID11-pChrono' switches on the lights for 2 minutes to check for any blown bulbs.




The time band is enabled from 03pm to 3:00am. The sign will not however be switched on before sunset, as defined by the 'Geo-Lighting' plugin (or in any case by the BMS). The changeover at midnight is properly managed.

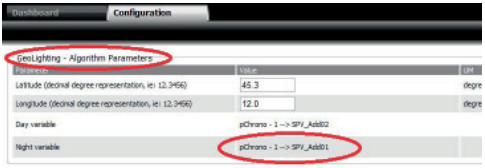



Fig. 6.w

The configuration shown here refers to the city of Brugine (Padova, Italy), latitude "45.3 North" and longitude "12.0 East". The variable that identifies night-time status is associated with variable "SPV_Add01" on pChrono.

**Note:** The passage of the midnight is handled properly as long as the next day needs the same scheduling, otherwise the band will disable the load at midnight.

Fig. 6.x

On the Geo-Lighting plugin dashboard, sunset for the current day has been calculated at 20:55 (current day: 5 June 2013). That means that the lights in the advertising signs managed by 'NO11-pChrono' will be switched on note at 20:55, and off at 3:00, as set in the scheduler.

## 6.3 Pumps management

pChrono provides functions for managing up to two groups of pumps. Each group can manage two on/off pumps. If there are no active alarms, when the corresponding digital input sends the signal to start the pump, this will be switched on. The no-flow alarm (flow switch) has a fixed delay of 30 seconds (non-modifiable) from when the pump starts, so as to ignore any variations in water flow-rate. The following functions are available for pump management:

- If there are two pumps, manual or automatic rotation between pumps so as to equally share the workload and operating hours between pumps. Automatic rotation occurs:
  - after a certain period of time;
  - if there is an overload (thermal protector activated) or no flow on one of the two pumps.
- Pump overload management (thermal protector activated). The fault is signalled and the pump stops immediately. Automatic rotation if a second pump is available.
- Management of the flow switch that controls circulation of fluid in the system. The fault is signalled until the pump is eventually shutdown. Automatic rotation if a second pump with fluid flow is available.
- Function to prevent blocking, with the pump started occasionally during extended periods in which the system is not operating.
- Antifreeze function, with the pump started to force circulation of the fluid.

### Flow control

Flow control is always enabled, and pChrono attempts to guarantee system operation even when there is no flow. Each pump signals the malfunction repeatedly (until reaching the 'Max number of water flow warnings') before activating the no-flow alarm.

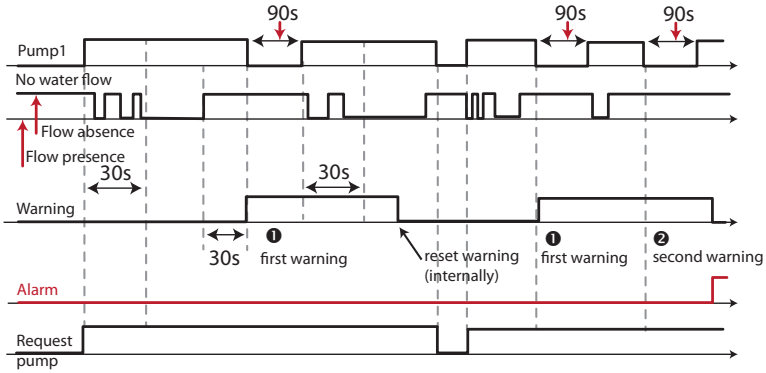



Fig. 6.y

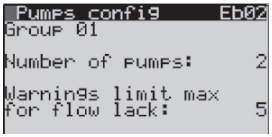
While remembering that the warnings described below are managed internally by pChrono and therefore nothing is shown on the display, it is important to observe that:

- The number of warnings is reset as soon as water flow is measured.
- When the alarm is activated, the warning is automatically reset.
- If there is an active warning, the pump is switched off for 90 seconds (non-modifiable). Only after this time interval is the pump started again using the start-up procedure: the warning is only reset when flow is measured and the pump is on.
- If 'Max number of water flow warnings' = 0, the alarm is activated immediately and no attempts are performed to restore fluid flow.

When there are two pumps, and the first warning is signalled on one of the pumps, operation alternates between the pumps (rotation). The two possible cases are described in detail as follows:

- One pump (Number of pumps = 1): If the flow switch input = 1 for > 30 seconds (non-modifiable), the pump continues operating until the internal warning counter > 'Max number of water flow warnings', then the Pump alarm is signalled and the pump is switched off, until the alarm is reset manually by pressing the Alarm button. If when restarting flow is measured for > 30 seconds (non-modifiable), the internal warning counter is set to zero.
- Two pumps (Number of pumps = 2): If the flow switch input = 1 for > 30 seconds (non-modifiable), the pump stops and the other pump starts, unless this too has an active alarm. If there is still no flow, the pumps continue alternating until the 'Max number of water flow warnings' is reached on both. If on each pump the internal warning counter reaches the maximum number of warnings, then the Pump alarm is signalled and the pumps are switched off, until the alarm is reset manually by pressing the Alarm button. If when restarting flow is measured on each pump for > 30 seconds (non-modifiable), the respective internal warning counter is set to zero. Some examples are shown below.

Exemple 1:




Pump group 1 manages 2 pumps, with 5 warnings before the water flow alarm.

Rotation between pumps with no flow:
Number of pumps = 2
Max number of water flow warnings = 5
Initial situation: first pump on, and flow constantly absent (flow switch input = 1) then:

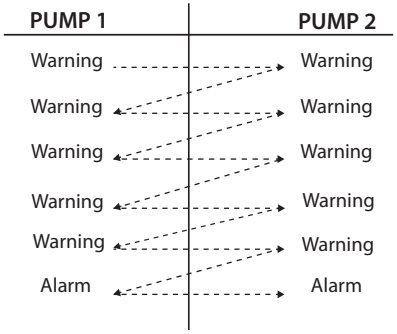



Fig. 6.z

Exemple 2:

Rotation between pumps with no flow:
Number of pumps = 2
Max number of water flow warnings = 5
Initial situation: pump 1 on and flow absent. At a certain moment flow is measured, and lasts for a limited time.

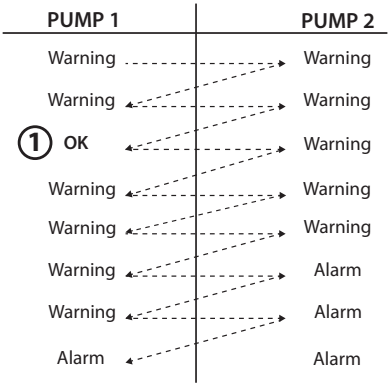
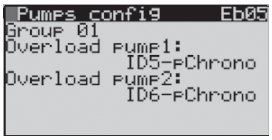



Fig. 6.aa

Legenda
[1]: Water flow detection for a time > 30s (fix time) then, again without water flow.

**Pump overload (thermal protector activated)**

If an overload is measured, the corresponding pump stops immediately and an alarm is activated. If there is a second pump with no alarms, operation switches to the second pump.




Pump 1 overload is associated with input ID5 on the pChrono controller; pump 2 with ID6.

**Antifreeze**

The antifreeze function is always enabled.
The antifreeze request ('Antifreeze active' input = 1) is managed based on the status of the pumps:

16. if one pump is on, this will continue operating until the antifreeze request terminates ('Antifreeze active' input = 0). If there is a second pump, alternating operation is guaranteed, based on the 'Rotation time'.
17. if all the pumps are off, pChrono starts the pump that should start next due to rotation.

The antifreeze function ends when the 'Antifreeze active' input = 0.
The following diagram shows the operation of the antifreeze procedure:

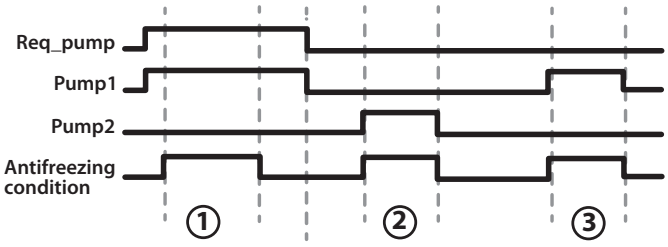
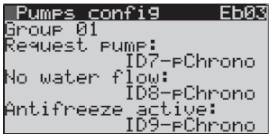



Fig. 6.ab

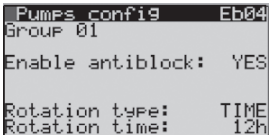
Key:
[1]: Pump 1 is already on, therefore antifreeze has no effect.
[2]: No pump was on, therefore the antifreeze function, by rotation, starts pump 2.
[3]: No pump was on, therefore the antifreeze function, by rotation, starts pump 1.




Input configuration for pump request (common to both pumps), Flow switch and Antifreeze input.

**Anti-block**

This function is used to prevent physical or mechanical blockages due to rust or fouling in the pumps, following stoppages for an extended period of time.The anti-blocking function is always enabled.
If a pump is not started for more than 7 days (non-modifiable), pChrono automatically switches it on for 30 seconds (non-modifiable), then switches it off again. The anti-blocking function does not affect the operation of any pumps that are already operating.

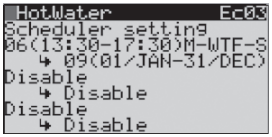



The anti-blocking function is enabled.
Pump operation is rotated based on operating time, every 12 hours.

## 6.4 Wireless plug management

Integration of these devices is useful when needing to monitor the power consumption of certain loads and schedule operation based on specific needs. Typical appliances that require monitoring and control as electrical loads are coffee machines, vending machines, water heaters, printers, etc., the power consumption of which is often neglected, even when in standby. Shutting down these appliances completely often brings considerable reductions in total power consumption.
pChrono can manage up to 10 wireless devices that act as energy meters and can control an on/off load according to the dedicated scheduler. The scheduler for these devices can also be bypassed using the exceptions configured in loop 'C. Clock/Scheduler'. Each load/appliance can be named using the 8-digit text available. The name associated with the load will then be shown on the screens used to configure such loads; the same name will also be available on PlantVisorPRO, here editable too. Management of these devices, which also include the router function, requires an Access Point connected to FBus1 or FBus2, see paragraph '3. System architecture'.


The load has been identified with the name 'HotWater'. The load will be switched off based on the configured exceptions.




The scheduler for the 'HotWater' load (shown in the heading, line '0' on the screen) is configured to operate every Monday, Wednesday, Thursday, Friday and Sunday from 13:30 to 17:30.

For further details on using these devices, see the corresponding instruction sheet, +0500049ML.

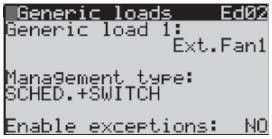
## 6.5 Generic load management

pChrono can manage up to 20 generic loads. This is especially useful for loads that require simple timed operation; for example, exhaust fans, air curtains, dampers and irrigation systems. Each device can be named using the 8-digit text available. The name associated with the load will then be shown on the screens used to configure such loads; the same name will also be available on PlantVisorPRO, here editable too. For details on some of the technical terms used here, see paragraph '6.2 Lights'. Each load can be managed in different ways, according to system requirements. pChrono provides 11 types of management:

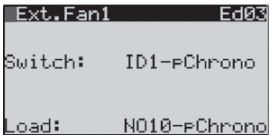
1. ONLY SCHEDULER: the load is on when enabled by the scheduler.
2. ONLY SWITCH: the load is on when enabled by the switch input.
3. SCHEDULER + SWITCH: the load is enabled to be switched on based on the scheduler settings, but is only actually switched on using the corresponding switch input. Outside of the time bands, the load will be off.
4. SCHEDULER + SWITCH + TIMER: the load is enabled to be switched on based on the scheduler settings, but are only actually switched on using the corresponding switch input. The Timer will switch on the load for the set time, independently of whether it is enabled by the scheduler or the switch.
5. SCHEDULER + SPV: the load is enabled to be switched on based on the scheduler settings, but are only actually switched on using the special function on the supervisor. A list of 30 variables is provided for this function.
6. SCHEDULER + SPV + TIMER: the load is enabled to be switched on based on the scheduler settings, but are only actually switched on using the special function on the supervisor. A list of 30 variables is provided for this function. The button will switch on the load for the set time, independently of whether it is enabled by the scheduler or the supervisor.
7. ONLY BUTTON: the loads are on when enabled by the button input. If the button is connected to a universal input configured as FAST DIN just short the input to turn on / off the loads; in the other cases, the input must be kept closed for a couple of seconds for pChrono detect the new state.
8. SCHEDULER + BUTTON: the loads are enabled to be switched on based on the scheduler settings, but are only actually switched on using the corresponding button input. Outside of the time bands, the loads will be off.
9. SCHEDULER + SPV + BUTTON: the loads are enabled to be switched on based on the scheduler settings, but are only actually switched on using the special function on the supervisor. A list of 30 variables is provided for this function. The button will switch on the loads for the set time, independently of whether they are enabled by the scheduler or the supervisor.
10. SCHEDULER + TIMER: the loads are enabled to be switched on based on the scheduler settings, but are only actually switched on using the corresponding timer input. Outside of the time bands, the loads will be off.

11. SWITCH+ BUTTON: the loads are enabled to be switched on based on switch status, but are only actually switched ON using the corresponding button input.

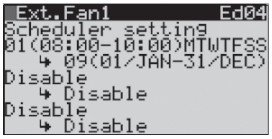
For further details on the behaviour of the different options, refer to corresponding graphs on par. "6.2 Light management".




The exhaust fan "Ext.Fan1" is enabled with SCHEDULER + SWITCH management. Operation will not be affected by the set exceptions.




The switch configured to start the fan inside the time band is connected to ID1 on pChrono, while the output is NO10, again on pChrono.




The fan will be enabled every day of the year, from 8.00 to 10:00. Remember that the scheduler simply enables the action of the switch.

The following table summarizes graphically how the various managements act on the configurated load:

| | | Loads managements | |
|---|---|---|---|
| | | Joint action | Action 24h |
| 1 | only scheduler | | scheduler |
| 2 | only switch | | switch |
| 3 | scheduler + switch | scheduler + switch | |
| 4 | scheduler + switch + timer | scheduler + switch | timer |
| 5 | scheduler + SPV | scheduler + SPV | |
| 6 | scheduler + SPV + timer | scheduler + SPV | timer |
| 7 | only button | | button |
| 8 | scheduler + button | scheduler + button | |
| 9 | scheduler + SPV + button | scheduler + SPV | button |
| 10 | scheduler + timer | scheduler + timer | |
| 11 | switch + button | switch + button | |

Tab. 6.b

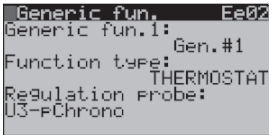
## 6.6 Generic function management

pChrono provides users up to 20 generic functions, which can be configured according to system requirements. These are particularly useful, for example, for managing ON/OFF operation of a valve based on the temperature/pressure/other reading. Each functions can be named using the 8-digit text available. The name associated with the management will then be shown on the screens used to configure such loads; the same name will also be available on PlantVisorPRO, here editable too. Each function can be configured as:

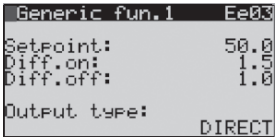
- **Thermostat:** to manage a 'Direct' or 'Reverse' step based on the settings of a set point, an ON differential and an OFF differential. The high and low alarm thresholds and the corresponding alarm delay time can also be set
- **Modulating:** to manage a 'Direct' or 'Reverse' ramp based on the settings of a set point and a band. The action can be 'Proportional' or 'Proportional + Integral'. The integral time, high and low alarm thresholds and the corresponding alarm delay time can also be set
- **Generic alarm:** to manage a generic alarm signal. The alarm input is set, together with the corresponding output that will be activated in the event of alarms, the operating logic and an activation delay. This option

allow pChrono to generate one single alarm for up to 12 alarms; just need to select the Alarm code 'from list'. This function is usefull when is necessary to activate different lights color according to different alarms group; the selection of the alarm is thanks to the alarm list on par. "8.Alarm Table".

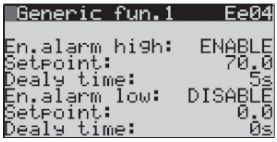
- **Pulses:** the selected digital output will be closed and open for a setting time ON and OFF. The action is enabled only when the scheduler is active. This action is required when a 'square wave' behaviour is neeed; for example in the fish shop, where a water jet cleans drains from debris.
- **WC alarm:** this function provides inputs and outputs to manage the security alarm, required by law, to be placed in the disabled toilets. One input is closed by pulling the string; this action enabled the dout buzzer output. The Reset digital input acts opening the buzzer contact, so the alarm is resetted.



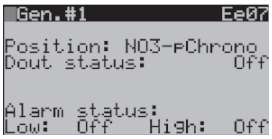

Generic function 1 has been set as 'Thermostat'. The control probe is connected to universal input U3 on pChrono. This function is maned "Gen.#1"




The set point is 50.0 (the unit of measure refers to the monotored value, not defined here). The step has a positive differential of 1.5 from the set point (50+1.5) and a negative differential of 1.0 from the set point (50-1.0). As the output is set as 'Direct', the output NO3-pCOe3 will be:
NO3-pChrono = ON, if U3-pChrono > 51.5
NO3-pChrono = OFF, if U3-pChorno < 49.0




The high alarm is enabled and has a set point of 70.0 and an activation delay of 5 seconds. The low alarm, on the other hand, is disabled. A fixed offset of 2.0 (20 on the generic analogue input reading) is managed to avoid swings in the two alarms.




The digital output for generic function 1 is NO3 on the pCOe with serial address 3. Its current status is off; neither alarm is active.

The settings described previously are illustrated here below.

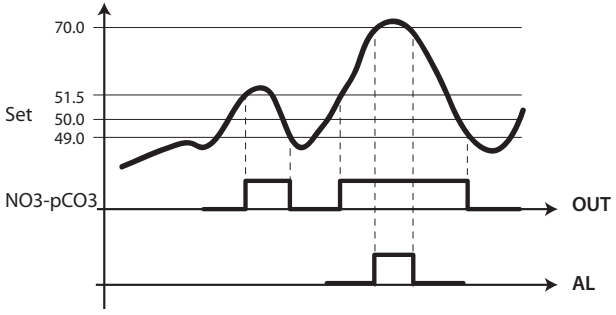



Fig. 6.ac

Here below a diagram schema for the 'Impulse' function:

Pulses management

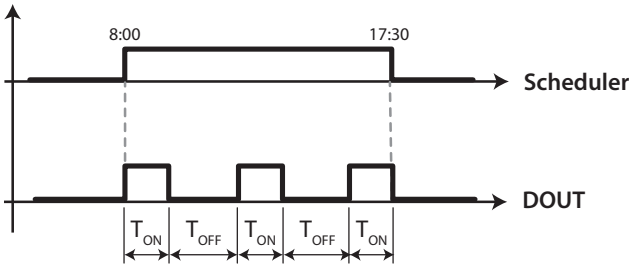



Fig. 6.ad

## 6.7 Read wireless temperature / humidity / brightness sensors

The installation of a dedicated Access Point, on one of the two FieldBus ports, makes the reading of a number of wireless sensors available. This further increases the flexibility of pChrono. Each wireless sensor can be named using the 8-digit text available. The name associated with the sensor will then be shown on the screens used to configure such sensors; the same name will also be available on PlantVisorPRO, here editable too. .As mentioned in paragraph '3. System architecture', pChrono manages:

| pChrono model | Type of wireless sensor | Number of devices |
|---|---|---|
| Small / Large | SA, Temperature/ Humidity | 3 |
| | SI, Temperature/ Humidity/ Brightness | 5 |

Integration of these sensors makes the pChrono system even more flexible and adaptable; the system is therefore suitable for all installations, offering installers adequate support in the field. As pChrono can read these sensors, it is also suitable for managing lights (SI sensors) or a temperature or humidity value that can then be shared with other devices or simply monitored. An integrated system in fact helps the user identify the information needed to optimise the installation. The outside temperature, for example, read using pChrono, can then be shared with the air handling unit to enable free cooling where possible. Likewise, the room temperature and humidity reading improves management of anti-sweat heaters on refrigerated cabinets, through calculation of the dew point.

# 7. PARAMETER TABLE

**"Mask index":** indicates the unique address of each screen and consequently the path needed to reach the parameters available on this screen; for example, to reach the parameters corresponding to the suction pressure probe with mask index Bab01, proceed as follows:

Main menu B.In./Out. → a.Status → b.Analog.in.

Below is the table of the parameters that can be displayed on the terminal. The values indicated with '---' are not significant or are not set, while the values indicated with '…' may vary according to the configuration, with the possible options visible on the user terminal. A row of '…' means that there are a series of parameters similar to the previous ones.

**Note:** not all the screens and parameters shown in the table are always visible or can be set, the screens and parameters that are visible or can be set depend on the configuration and the access level.

| Mask index | Display description | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| Main screen | | | | | |
| Main screen for pChrono | pChrono | The name of the product | ... | ... | ... |
| | Time and date | Hours and minutes | ... | ... | 0...23, 0...59 |
| | | Weekday (Monday to Sunday) | ... | ... | 1...7 |
| | | Date (20/6/13) | ... | ... | ... |
| | Unit status | Unit status (with unit OFF) | ... | ... | 1: Unit ON<br>0: Unit OFF by keyboard |
| | i | Press down to see the device status | ... | ... | ... |
| M01 (read only) | ON/TOT | Number of lights on | ... | ... | 0...80 |
| | | Number of lights configured | ... | ... | 0...80 |
| | ON/TOT | Number of pumps on | ... | ... | 0...4 |
| | | Number of pumps configured | ... | ... | 0...4 |
| | ON/TOT | Number of sockets on | ... | ... | 0...10 |
| | | Number of sockets configured | ... | ... | 0...10 |
| | ON/TOT | Number of generic loads on | ... | ... | 0...20 |
| | | Number of generic loads configured | ... | ... | 0...20 |
| | Esc | Press Esc key to go back to main mask | ... | ... | ... |

Tab. 7.a

| Mask index | Display description | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| A.On/Off unit | | | | | |
| A01 | --- | Unit status | --- | --- | 7: OFF by KEY<br>1: Unit on |

Tab. 7.b

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| B.Load status (the I/Os available depend on the selected configuration, the following are just some examples.) | | | | | |
| B01 | ID1: | Status of digital input 1 | ... | ... | Open / Close |
| (Read only) | ID2: | Status of digital input 2 | ... | ... | Open / Close |
| | ID3: | Status of digital input 3 | ... | ... | Open / Close |
| | ID4: | Status of digital input 4 | ... | ... | Open / Close |
| | ... | | | | |
| B05 | U1: | Valore ingresso U1 (can be: DIN, AIN, FAST DIN) | ... | | -32767...32768 |
| (Read only) | U2: | Valore ingresso U2 (can be: DIN, AIN, FAST DIN) | ... | | -32767...32768 |
| | U3: | Value of U3 input (can be digital input or analogue input) | ... | ... | -32767...32768 |
| | U4: | Value of U4 input (can be digital input or analogue input) | ... | ... | -32767...32768 |
| | U5: | Value of U5 input (can be digital input or analogue input) | ... | ... | -32767...32768 |
| ... | ... | ... | ... | | ... |
| B07 | NO1: | Status of digital output 1 | ... | ... | Off / On |
| (Read only) | NO2: | Status of digital output 2 | ... | ... | Off / On |
| | NO3: | Status of digital output 3 | ... | ... | Off / On |
| | NO4: | Status of digital output 4 | ... | ... | Off / On |
| ... | ... | | ... | ... | ... |
| B011 | Y1: | Output value of Y1 | ... | V | 0...10.0 |
| (Read only) | Y2: | Output value of Y2 | ... | V | 0...10.0 |
| | Y3: | Output value of Y3 | ... | V | 0...10.0 |
| | Y4: | Output value of Y4 | ... | V | 0...10.0 |
| ... | ... | | ... | | ... |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| B013 (Read only if enable) | pCOe address: | Address of pCOe read | ... | ... | 2...11 |
| | Digital input Channel 1: | Status of digital input 1 | ... | ... | Open / Close |
| | Channel 2: | Status of digital input 2 | ... | ... | Open / Close |
| | Channel 3: | Status of digital input 3 | ... | ... | Open / Close |
| | Channel 4: | Status of digital input 4 | ... | ... | Open / Close |
| B014 (Read only if enable) | pCOe address: | Address of pCOe read | ... | ... | 2...11 |
| | Analog input Channel 1: | Value of analog input 1 | ... | ... | -32767...32768 |
| | Channel 2: | Value of analog input 2 | ... | ... | -32767...32768 |
| | Channel 3: | Value of analog input 3 | ... | ... | -32767...32768 |
| | Channel 4: | Value of analog input 4 | ... | ... | -32767...32768 |
| B015 (Read only if enable) | pCOe address: | Address of pCOe read | ... | ... | 2...11 |
| | Digital output | Off / On of output channel 1 | ... | ... | Off / On |
| | | Off / On of output channel 2 | ... | ... | Off / On |
| | | Off / On of output channel 3 | ... | ... | Off / On |
| | | Off / On of output channel 4 | ... | ... | Off / On |
| | Analog output | Output value of Y1 | ... | ... | 0.0...10.0 |
| ... | ... | ... | ... | | ... |
| B43 (Read only, if enable) | AP address | Access point address connected FB1 | ... | ... | 1 |
| | Connected on FBus1 Firmware version: | Access point version | ... | ... | 2051 |
| | AP trasmi. power: | Access point trasmission power | ... | ... | 0...100 |
| | Radio signal lev.: | Radio signal level | ... | ... | 0...100 |
| B44 (Read only, if enable) | AP address | Access point address connected FB1 | ... | ... | 1 |
| | Connected on FBus1 Num.of connected units (online units): | Number of units connected on AP (end device) | ... | ... | 0...18 |
| | Num.of connected units (access point): | Number of units connected on AP | ... | ... | 0...18 |
| | Num.of units connected through RB-device: | Number of routers in the network | ... | ... | 0 |
| B45 (Read only, if enable) | AP address | Access point address connected FB2 | ... | ... | 1 |
| | Connected on FBus2 Firmware version: | Access point version | ... | ... | 2051 |
| | AP trasmi. power: | Access point trasmission power | ... | ... | 0...100 |
| | Radio signal lev.: | Radio signal level | ... | ... | 0...100 |
| B46 (Read only, if enable) | AP address | Access point address connected FB2 | ... | ... | 1 |
| | Connected on FBus2 Num.of connected units (online units): | Number of units connected on AP (end device) | ... | ... | 0...1 |
| | Num.of connected units (access point): | Number of units connected on AP | ... | ... | 0...1 |
| | Num.of units connected through RB-device: | Number of routers in the network | ... | ... | 0...1 |
| B47 (Read only, if enable) | AP address | Access point address connected FB2 | ... | ... | 1 |
| | Number of router in the network: | Number of routers in the network | ... | ... | 0...65535 |
| | Number of router nearby: | Number of router nearby | ... | ... | 0...10 |
| | Num.of router nearby with good connect.: | Number of router nearby with good connection | ... | ... | 0...10 |
| B48 (Read only, if enable) | SA sensor | Address of SA sensor | ... | ... | 16 |
| | ... | Name of SA letter 1 | ... | ... | 0...72 |
| | | Name of SA letter 2 | ... | ... | 0...72 |
| | | Name of SA letter 3 | ... | ... | 0...72 |
| | | Name of SA letter 4 | ... | ... | 0...72 |
| | | Name of SA letter 5 | ... | ... | 0...72 |
| | | Name of SA letter 6 | ... | ... | 0...72 |
| | | Name of SA letter 7 | ... | ... | 0...72 |
| | | Name of SA letter 8 | ... | ... | 0...72 |
| | Firmware version: | Firmware version of SA | ... | ... | 2051 |
| | Temperature: | Temperature of SA | ... | °C / °F | -500...1000 |
| | Humidity: | Humidity of SA | ... | %rH | 0...100 |
| | --- | Battery level | ... | ... | 0...4 |
| | --- | Signal level | ... | ... | 0...4 |
| ... | ... | ... | ... | ... | ... |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| B51 | SI sensor | Address of SI sensor | ... | ... | 21 |
| (Read only, if enable) | --- | Name of SI letter 1 | ... | ... | 0...72 |
| | | Name of SI letter 2 | ... | ... | 0...72 |
| | | Name of SI letter 3 | ... | ... | 0...72 |
| | | Name of SI letter 4 | ... | ... | 0...72 |
| | | Name of SI letter 5 | ... | ... | 0...72 |
| | | Name of SI letter 6 | ... | ... | 0...72 |
| | | Name of SI letter 7 | ... | ... | 0...72 |
| | | Name of SI letter 8 | ... | ... | 0...72 |
| | Firmware version: | Firmware version of SI | ... | ... | 2051 |
| | Temperature: | Temperature of SI | --- | ºC / ºF | -500...1000 |
| | Humidity: | Humidity of SI | --- | %rH | 0...100 |
| | Light: | Light of SI | --- | LUX | 0...65535 |
| | --- | Battery level | --- | --- | 0...4 |
| | --- | Signal level | --- | --- | 0...4 |
| ... | ... | ... | ... | | ... |
| B56 | PLUG/SWITCH | Address of socket | ... | ... | 26 |
| (Read only, if enable) | --- | Name of the socket letter 1 | ... | ... | 0...72 |
| | | Name of the socket letter 2 | ... | ... | 0...72 |
| | | Name of the socket letter 3 | ... | ... | 0...72 |
| | | Name of the socket letter 4 | ... | ... | 0...72 |
| | | Name of the socket letter 5 | ... | ... | 0...72 |
| | | Name of the socket letter 6 | ... | ... | 0...72 |
| | | Name of the socket letter 7 | ... | ... | 0...72 |
| | | Name of the socket letter 8 | ... | ... | 0...72 |
| | Firmware version: | Firmware version of socket | ... | ... | 2053 |
| | Energy: | Energy of the socket | ... | Wh | 0...4294967296 |
| | Power: | Power of socket | ... | W | 0...2300 |
| | Status: | Status of socket | ... | ... | Off / On |
| | --- | Signal level | ... | ... | 0...4 |
| ... | ... | ... | ... | ... | ... |
| B66 | Generic loads --- | Name of generic load 1 | ... | ... | Off / On |
| (Read only, if enable) | --- | Name of generic load 2 | ... | ... | Off / On |
| | --- | Name of generic load 3 | ... | ... | Off / On |
| | --- | Name of generic load 4 | ... | ... | Off / On |
| | --- | Name of generic load 5 | ... | ... | Off / On |
| ... | ... | | ... | ... | ... |
| B70 | Pump 1 of group 1: | Working hours of pump 1 group 1 | ... | H | 0...999999 |
| (Read only, if enable) | Pump 2 of group 1: | Working hours of pump 2 group 1 | ... | H | 0...999999 |
| B71 | Pump 1 of group 2: | Working hours of pump 1 group 2 | ... | H | 0...999999 |
| (Read only, if enable) | Pump 2 of group 2: | Working hours of pump 2 group 2 | ... | H | 0...999999 |

Tab. 7.c

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| c.clock/scheduler | | | | | |
| C01 | Day: | Weekday (Monday to Sunday) | ... | ... | 0: ***<br>1: Monday<br>2: Tuesday<br>3: Wednesday<br>4: Thursday<br>5: Friday<br>6: Saturday<br>7: Sunday |
| | Date format: | Date format showing on the main mask | 1 | ... | 1: DD/MM/YY<br>2: MM/DD/YY<br>3: YY.MM.DD |
| | Date: | Set the new date – day | ... | ... | 0...31 |
| | | Set the new date – month | ... | ... | 0...12 |
| | | Set the new date – year | ... | ... | 0...99 |
| | Hour: | Set the new time – hour | ... | ... | 0...23 |
| | | Set the new time - minute | ... | ... | 0...59 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| C02 | DST: | Activates the module algorithm | 1 | ... | 0: Disable 1: Enable |
| | Start: | Start weekly in one month | 0 | ... | 0: Last<br>1: First<br>2: Second<br>3: Third<br>4: Fourth |
| | | Start day in one week | 0 | ... | 0: ***<br>1: Monday<br>2: Tuesday<br>3: Wednesday<br>4: Thursday<br>5: Friday<br>6: Saturday<br>7: Sunday |
| | in | Start month | 0 | ... | 1: January<br>2: February<br>3: March<br>4: April<br>5: May<br>6: June<br>7: July<br>8: August<br>9: September<br>10: October<br>11: Novermber<br>12: December |
| | | Start hour | 0 | ... | 0...23 |
| | End: | End weekly in one month | 0 | ... | 0: Last<br>1: First<br>2: Second<br>3: Third<br>4: Fourth |
| | | End day in one week | 0 | ... | 0: ***<br>1: Monday<br>2: Tuesday<br>3: Wednesday<br>4: Thursday<br>5: Friday<br>6: Saturday<br>7: Sunday |
| | In | End month | 0 | ... | 1: January<br>2: February<br>3: March<br>4: April<br>5: May<br>6: June<br>7: July<br>8: August<br>9: September<br>10: October<br>11: Novermber<br>12: December |
| | | End hour | 0 | ... | 0...23 |
| C03 | T.B.#1: | Starting of Time Band 1 | 8 | H | 0...23 |
| | | Starting of Time Band 1 | 30 | M | 0...59 |
| | | Ending of Time Band 1 | 20 | H | 0...23 |
| | | Ending of Time Band 1 | 30 | M | 0...59 |
| | T.B.#2: | Starting of Time Band 2 | 8 | H | 0...23 |
| | | Starting of Time Band 2 | 30 | M | 0...59 |
| | | Ending of Time Band 2 | 12 | H | 0...23 |
| | | Ending of Time Band 2 | 30 | M | 0...59 |
| | T.B.#3: | Starting of Time Band 3 | 13 | H | 0...23 |
| | | Starting of Time Band 3 | 30 | M | 0...59 |
| | | Ending of Time Band 3 | 17 | H | 0...23 |
| | | Ending of Time Band 3 | 30 | M | 0...59 |
| | T.B.#4: | Starting of Time Band 4 | 13 | H | 0...23 |
| | | Starting of Time Band 4 | 30 | M | 0...59 |
| | | Ending of Time Band 4 | 20 | H | 0...23 |
| | | Ending of Time Band 4 | 30 | M | 0...59 |
| | T.B.#5: | Starting of Time Band 5 | 0 | H | 0...23 |
| | | Starting of Time Band 5 | 0 | M | 0...59 |
| | | Ending of Time Band 5 | 0 | H | 0...23 |
| | | Ending of Time Band 5 | 0 | M | 0...59 |
| ... | ... | ... | ... | ... | ... |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| C07 | Per.#1: | Starting of Period 1 | 20 | ... | 1...31 |
| | | Starting of Period 1 | 3 | ... | 1...12 |
| | | Ending of Period 1 | 20 | ... | 1...31 |
| | | Ending of Period 1 | 6 | ... | 1...12 |
| | Per.#2: | Starting of Period 2 | 21 | ... | 1...31 |
| | | Starting of Period 2 | 3 | ... | 1...12 |
| | | Ending of Period 2 | 20 | ... | 1...31 |
| | | Ending of Period 2 | 9 | ... | 1...12 |
| | Per.#3: | Starting of Period 3 | 22 | ... | 1...31 |
| | | Starting of Period 3 | 9 | ... | 1...12 |
| | | Ending of Period 3 | 20 | ... | 1...31 |
| | | Ending of Period 3 | 12 | ... | 1...12 |
| | Per.#4: | Starting of Period 4 | 21 | ... | 1...31 |
| | | Starting of Period 4 | 12 | ... | 1...12 |
| | | Ending of Period 4 | 19 | ... | 1...31 |
| | | Ending of Period 4 | 3 | ... | 1...12 |
| | Per.#5: | Starting of Period 5 | 20 | ... | 1...31 |
| | | Starting of Period 5 | 6 | ... | 1...12 |
| | | Ending of Period 5 | 21 | ... | 1...31 |
| | | Ending of Period 5 | 9 | ... | 1...12 |
| ... | ... | ... | ... | ... | ... |
| C09 | #1..5: | Time band usage from time band 1 to time band 5 | ... | ... | 0...50 |
| | #6..10: | Time band usage from time band 6 to time band 10 | ... | ... | 0...50 |
| | #11..15: | Time band usage from time band 11 to time band 15 | ... | ... | 0...50 |
| | #16..20: | Time band usage from time band 16 to time band 20 | ... | ... | 0...50 |
| C10 | #1..5: | Period usage from period 1 to period 5 | ... | ... | 0...50 |
| | #6..10: | Period usage from period 6 to period 10 | ... | ... | 0...50 |
| C11 | Exception 01/01 | Indicate the exception | ... | ... | --- |
| | From | Exception from date | ... | ... | 1...31, 1...12 |
| | to | Exception end date | ... | ... | 1...31, 1...12 |
| ... | ... | ... | ... | ... | ... |
| C26 | Next exception: | Showing next exception date | ... | ... | 1...31, 1...12 |
| | Do you want to set exceptions? | --- | ... | ... | ... |
| | press ENTER | --- | ... | ... | ... |
| C27 | Inset exception from | Set start day | ... | ... | 0...31 |
| | | Set start month | ... | ... | 0...12 |
| | to | Set end day | ... | ... | 0...31 |
| | | Set end month | ... | ... | 0...12 |
| | ... | Enter to confirm | ... | ... | ... |

Tab. 7.d

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| D.Hardware config. (The I/Os available depend on the selected configuration, the following are just some examples) | | | | | |
| Da01 | FBus 2 used with: | Select which device connected to FBus2 | 0 | --- | 0: pCOe<br>1: Wireless sensors |
| | Number of pCOe | How many pCOe used | 0 | --- | 0...10 |
| | Enable access point on FBus1: FBus2: | Enable access point connected on FBus1 and FBus2 | 0 | --- | 0: No 1: Yes |
| Da02 (If enable AP on FBus2, and used pCOe) | Access point on FBus2: | Choose router bridge connected on AP or not | 0 | --- | 21: Without router-bridge<br>17: With router-bridge |
| | pCOe on router bridge<br>Min address:<br>Max address: | Min and max address set to connected on router bridge | 0 | --- | 2...11 |
| Da03 | Address sensors on FBus1 SA T/H: | Enable the address for SA sensor | 0 | --- | 0: Disabled \|1: Abilitato |
| | SI LUX: | Enable the address for SI sensor | 0 | --- | 0: Disabled \|1: Abled |
| Da04 | Address of socket sensors on FBus1 #26: #27: | Set the socket type | 0 | --- | 0: Plug \|1: Switch |
| | #28: #29: | Set the socket type | 0 | --- | 0: Plug \|1: Switch |
| | #30: #31: | Set the socket type | 0 | --- | 0: Plug \|1: Switch |
| | #32: #33: | Set the socket type | 0 | --- | 0: Plug \|1: Switch |
| | #34: #35: | Set the socket type | 0 | --- | 0: Plug \|1: Switch |
| Da05 | BMS1 supervisor setting Protocol: | Set protocol for BMS1 | 0 | --- | 0: None<br>1: Modbus RS485<br>2: pCO Manager |
| | Speed: | Set speed for protocol | 4 | --- | 0: 1200 1: 2400<br>2: 4800 3: 9600<br>4: 19200 |
| | Address | Set address for SPV | 1 | --- | 1...207 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| Da06 | BMS2 supervisor setting Protocol: | Set protocol for BMS1 | 0 | --- | 0: None<br>1: Modbus RS485<br>2: pCO Manager |
| | Speed: | Set speed for protocol | 4 | --- | 0: 1200<br>1: 2400<br>2: 4800<br>3: 9600<br>4: 19200 |
| | Address | Set address for SPV | 1 | --- | 1...207 |
| Da07 | Enable buzzer | Enable buzzer beep | 1 | --- | 0: No 1: Yes |
| | Alarms output Output position: | Set the position for alarm output | 0 | --- | 0...58 |
| | Relay status: | Logic of alarm output relay output status | --- | --- | 0: NO 1: NC |
| | Waring blackout: | Enable blackout warning | 1 | --- | 0: NO |
| Da08 | BUT.AUX1, inputs selsection 1: YES | Button logic input 1 for DIN AUX1 | --- | --- | 0...66 |
| | 2. | Button logic input 2 for DIN AUX1 | --- | --- | 0...66 |
| | 3. | Button logic input 3 for DIN AUX1 | --- | --- | 0...66 |
| | 4. | Button logic input 4 for DIN AUX1 | --- | --- | 0...66 |
| Da09 | BUT.AUX1,inputs selsection 5. | Button logic input 5 for DIN AUX1 | --- | --- | 0...66 |
| | 6. | Button logic input 6 for DIN AUX1 | --- | --- | 0...66 |
| | 7. | Button logic input 7 for DIN AUX1 | --- | --- | 0...66 |
| | 8. | Button logic input 8 for DIN AUX1 | --- | --- | 0...66 |
| ... | ... | ... | ... | ... | ... |
| Da18 | SWI.AUX1,inputs selection 1. | Switch logic input 1 for DIN AUX1 | --- | --- | 0...66 |
| | 2. | Switch logic input 2 for DIN AUX1 | --- | --- | 0...66 |
| | 3. | Switch logic input 3 for DIN AUX1 | --- | --- | 0...66 |
| | 4. | Switch logic input 4 for DIN AUX1 | --- | --- | 0...66 |
| ... | ... | ... | ... | ... | ... |
| Da23 | AND.AUX,inputs selection 1. | And logic input 1 for DIN AUX1 | --- | --- | 0...66 |
| | 2. | And logic input 2 for DIN AUX1 | --- | --- | 0...66 |
| | 3. | And logic input 3 for DIN AUX1 | --- | --- | 0...66 |
| | 4. | And logic input 4 for DIN AUX1 | --- | --- | 0...66 |
| | ON: sec<br>OFF: sec | Delay on and delay off time for AND AUX1 | 0 | s | 0...999 |
| ... | ... | ... | ... | ... | ... |
| Da28 | OR.AUX1,inputs selection 1. | Or logic input 1 for DIN AUX1 | --- | --- | 0...66 |
| | 2. | Or logic input 2 for DIN AUX1 | --- | --- | 0...66 |
| | 3. | Or logic input 3 for DIN AUX1 | --- | --- | 0...66 |
| | 4. | Or logic input 4 for DIN AUX1 | --- | --- | 0...66 |
| | ON: sec<br>OFF: sec | Delay on and delay off time for Or AUX1 | 0 | s | 0...999 |
| ... | ... | ... | ... | ... | ... |
| Db01 | U1 type: | Type for the U1 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U2 type: | Type for the U2 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U3 type: | Type for the U3 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U4 type: | Type for the U4 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U5 type: | Type for the U5 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| Db02 (If large board) | U6 type: | Type for the U6 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U7 type: | Type for the U7 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U8 type: | Type for the U8 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U9 type: | Type for the U9 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| | U10 type: | Type for the U10 | --- | --- | 0:--- \|1:DIN \|2:AIN |
| Db03 (If enable) | Analog input U3 Probe type: | Analog type for U3 | 0 | --- | 0:NTC<br>1:PT1000<br>2:0-1V<br>3:0-10V<br>4:4-20mA<br>5:0-5V |
| | Probe offset: | Probe offset for U3 | 0 | --- | -9.9...9.9 |
| | Min value: | Set min value for analog input | 0.0 | --- | -3276.7...3276.8 |
| | Max value | Set max value for analog input | 0.0 | --- | -3276.7...3276.8 |
| ... | ... | ... | ... | ... | ... |
| Db11 | Logic of pChrono ID ID1: ID2: | Logic for ID1 and ID2 | --- | --- | 0:NC 1:NO |
| | ID3: ID4: | Logic for ID3 and ID4 | --- | --- | 0:NC 1:NO |
| | ID5: ID6: | Logic for ID5 and ID6 | --- | --- | 0:NC 1:NO |
| | ID7: ID8: | Logic for ID7 and ID8 | --- | --- | 0:NC 1:NO |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| ... | ... | ... | ... | ... | ... |
| Db13 | Logic of pChrono NO<br>NO1: NO2: | Logic for NO1 and NO2 | --- | --- | 0:NO 1:NC |
| | NO3: NO4: | Logic for NO3 and NO4 | --- | --- | 0:NO 1:NC |
| | NO5: NO6: | Logic for NO5 and NO6 | --- | --- | 0:NO 1:NC |
| | NO7: NO8: | Logic for NO7 and NO8 | --- | --- | 0:NO 1:NC |
| ... | ... | ... | ... | ... | ... |
| Db15 | NO of pChrono<br>NO1: NO2: | Set AUTO/OFF/ON for NO1 and NO2 | --- | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO3: NO4: | Set AUTO/OFF/ON for NO3 and NO4 | --- | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO5: NO6: | Set AUTO/OFF/ON for NO5 and NO6 | --- | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO7: NO8: | Set AUTO/OFF/ON for NO7 and NO7 | --- | --- | 0:AUTO<br>1:OFF<br>2:ON |
| … | … | … | … | … | … |
| Dc01 | No pCOe devices | --- | --- | --- | --- |
| Dc02 | Address: | Address of pCOe | 2 | --- | 2 |
| | Offl.alarm delay: | Offline alarm delay time | 30 | --- | 0...300 |
| | En.probe: B1 B2 B3 B4 | Enable analog input for B1 to B4 | 0 | --- | 0:N 1:Y |
| | Analog input type Ch 1&2: | Analog type of probe | 0 | -- | 0:Carel NTC 1:0..1V<br>2:0..20mA 3:4..20mA<br>4:0..5V 6:NTC-HT |
| | Ch 3&4: | Analog type of probe | 0 | -- | 0:Carel NTC<br>1:0..1V 2:0..20mA<br>3:4..20mA 4:0..5V<br>6:NTC-HT |
| Dc03 | Address: | Address of pCOe | 2 | --- | 2 |
| | Analog input limits<br>Ch 1 Min: | Min value of probe 1 | --- | --- | -999.9...999.9 |
| | Ch 1 Max: | Max value of probe 1 | --- | --- | -999.9...999.9 |
| | Ch 2 Min: | Min value of probe 2 | --- | --- | -999.9...999.9 |
| | Ch 2 Max: | Max value of probe 2 | --- | --- | -999.9...999.9 |
| Dc04 | Address: | Address of pCOe | 2 | --- | 2 |
| | Analog input limits<br>Ch 3 Min: | Min value of probe 3 | --- | --- | -999.9...999.9 |
| | Ch 3 Max: | Max value of probe 3 | --- | --- | -999.9...999.9 |
| | Ch 4 Min: | Min value of probe 4 | --- | --- | -999.9...999.9 |
| | Ch 4 Max: | Max value of probe 4 | --- | --- | -999.9...999.9 |
| Dc05 | Address: | Address of pCOe | 2 | --- | 2 |
| | Logic of pCOe<br>ID1: ID2: | Logic of ID1 and ID2 | 0 | --- | 0:NC 1:NO |
| | ID3: ID4: | Logic of ID3 and ID4 | 0 | --- | 0:NC 1:NO |
| | NO1: NO2: | Logic of NO1 and NO2 | 0 | --- | 0:NO 1:NC |
| | NO3: NO4: | Logic of NO3 and NO4 | 0 | --- | 0:NO 1:NC |
| Dc06 | Address: | Address of pCOe | 2 | --- | 2 |
| | NO1: | Set AUTO/OFF/ON for NO1 | 0 | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO2: | Set AUTO/OFF/ON for NO2 | 0 | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO3: | Set AUTO/OFF/ON for NO3 | 0 | --- | 0:AUTO<br>1:OFF<br>2:ON |
| | NO4: | Set AUTO/OFF/ON for NO4 | 0 | --- | 0:AUTO<br>1:OFF<br>2:ON |
| ... | ... | .... | ... | ... | ... |
| Dd01 | No wireless device | --- | ... | ... | ... |
| Dd02 | SA sensor | Address of SA sensor | 16 | --- | 16 |
| | --- | Name of SA letter 1 | --- | --- | 0...72 |
| | | Name of SA letter 2 | --- | --- | 0...72 |
| | | Name of SA letter 3 | --- | --- | 0...72 |
| | | Name of SA letter 4 | --- | --- | 0...72 |
| | | Name of SA letter 5 | --- | --- | 0...72 |
| | | Name of SA letter 6 | --- | --- | 0...72 |
| | | Name of SA letter 7 | --- | --- | 0...72 |
| | | Name of SA letter 8 | --- | --- | 0...72 |
| | Time to send data cycle: | Each cycle to send data to AP | 60 | s | 5...3600 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| Dd03 | SA sensor | Address of SA sensor | 16 | --- | 16 |
| | --- | Name of SA letter 1 | --- | --- | 0...72 |
| | | Name of SA letter 2 | --- | --- | 0...72 |
| | | Name of SA letter 3 | --- | --- | 0...72 |
| | | Name of SA letter 4 | --- | --- | 0...72 |
| | | Name of SA letter 5 | --- | --- | 0...72 |
| | | Name of SA letter 6 | --- | --- | 0...72 |
| | | Name of SA letter 7 | --- | --- | 0...72 |
| | | Name of SA letter 8 | --- | --- | 0...72 |
| | Threshol. setting High temp.: | High temperature threshold set | --- | °C/°F | -999.9...999.9 |
| | Low temp.: | Low temperature threshold set | --- | °C/°F | -999.9...999.9 |
| | Offset temp.: | Offset of temperature probe | --- | °C/°F | -99.9...99.9 |
| Dd04 | SA sensor | Address of SA sensor | 16 | --- | 16 |
| | --- | Name of SA letter 1 | --- | --- | 0...72 |
| | | Name of SA letter 2 | --- | --- | 0...72 |
| | | Name of SA letter 3 | --- | --- | 0...72 |
| | | Name of SA letter 4 | --- | --- | 0...72 |
| | | Name of SA letter 5 | --- | --- | 0...72 |
| | | Name of SA letter 6 | --- | --- | 0...72 |
| | | Name of SA letter 7 | --- | --- | 0...72 |
| | | Name of SA letter 8 | --- | --- | 0...72 |
| | Threshol. setting High humid.: | High humidity threshold set | --- | %rH | 0...100 |
| | Low humid.: | Low humidity threshold set | --- | %rH | 0...100 |
| ... | ... | ... | ... | ... | ... |
| Dd11 | SI sensor | Address of SI sensor | 21 | --- | 21 |
| | --- | Name of SI letter 1 | --- | --- | 0...72 |
| | | Name of SI letter 2 | --- | --- | 0...72 |
| | | Name of SI letter 3 | --- | --- | 0...72 |
| | | Name of SI letter 4 | --- | --- | 0...72 |
| | | Name of SI letter 5 | --- | --- | 0...72 |
| | | Name of SI letter 6 | --- | --- | 0...72 |
| | | Name of SI letter 7 | --- | --- | 0...72 |
| | | Name of SI letter 8 | --- | --- | 0...72 |
| | Time to send data cycle: | Each cycle to send data to AP | 60 | s | 5...3600 |
| Dd12 | SI sensor | Address of SI sensor | 21 | --- | 21 |
| | --- | Name of SI letter 1 | --- | --- | 0...72 |
| | | Name of SI letter 2 | --- | --- | 0...72 |
| | | Name of SI letter 3 | --- | --- | 0...72 |
| | | Name of SI letter 4 | --- | --- | 0...72 |
| | | Name of SI letter 5 | --- | --- | 0...72 |
| | | Name of SI letter 6 | --- | --- | 0...72 |
| | | Name of SI letter 7 | --- | --- | 0...72 |
| | | Name of SI letter 8 | --- | --- | 0...72 |
| | Threshol. setting High temp.: | High temperature threshold set | --- | °C/°F | -999.9...999.9 |
| | Low temp.: | Low temperature threshold set | --- | °C/°F | -999.9...999.9 |
| | Offset temp.: | Offset of temperature probe | --- | °C/°F | -99.9...99.9 |
| Dd13 | SI sensor | Address of SI sensor | 21 | --- | 21 |
| | --- | Name of SI letter 1 | --- | --- | 0...72 |
| | | Name of SI letter 2 | --- | --- | 0...72 |
| | | Name of SI letter 3 | --- | --- | 0...72 |
| | | Name of SI letter 4 | --- | --- | 0...72 |
| | | Name of SI letter 5 | --- | --- | 0...72 |
| | | Name of SI letter 6 | --- | --- | 0...72 |
| | | Name of SI letter 7 | --- | --- | 0...72 |
| | | Name of SI letter 8 | --- | --- | 0...72 |
| | Threshol. setting High humid.: | High humidity threshold set | --- | %rH | 0...100 |
| | Low humid.: | Low humidity threshold set | --- | %rH | 0...100 |
| Dd14 | SI sensor | Address of SI sensor | 21 | --- | 21 |
| | --- | Name of SI letter 1 | --- | --- | 0...72 |
| | | Name of SI letter 2 | --- | --- | 0...72 |
| | | Name of SI letter 3 | --- | --- | 0...72 |
| | | Name of SI letter 4 | --- | --- | 0...72 |
| | | Name of SI letter 5 | --- | --- | 0...72 |
| | | Name of SI letter 6 | --- | --- | 0...72 |
| | | Name of SI letter 7 | --- | --- | 0...72 |
| | | Name of SI letter 8 | --- | --- | 0...72 |
| | Threshol. setting High light: | High light threshold set | --- | | 0...9999 |
| | Low light: | Low light threshold set | --- | | 0...9999 |
| | Coeff.light: | Light multiplicative coefficient | --- | | 0...9999 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| ... | ... | ... | ... | ... | ... |
| Dd31 | PLUG/SWITCH | Address of PLUG/SWITCH | 26 | --- | 26 |
| | Status: | Status of PLUG/SWITCH | --- | --- | 0:OFF 1:ON |
| | Force on: | Force on PLUG/SWITCH | --- | --- | 0:No 1:Yes |
| | Force off: | Force off PLUG/SWITCH | --- | --- | 0:No 1:Yes |
| | Time to send data cycle: | Each cycle to send data to AP | 20 | s | 5...3600 |
| | Reset data: | Reset value | --- | --- | 0:No 1:Yes |
| | --- | Wait please... | | | |
| ... | ... | ... | ... | ... | ... |
| De01 | Delete data logger: | Delete alarm history | --- | --- | 0:No 1:Yes |
| De02 | Unit measurement type: | Set unit measurement for unit | --- | --- | 1:ºC/Barg<br>2:ºF/Psig |
| De03 | DEFAULT INSTALLATION Erase user settings and install global default value: | Load default | --- | --- | 0:No 1:Yes |
| De04 | --- | Save user default | --- | --- | 0:No 1:Yes |
| | --- | Load user default | --- | --- | 0:No 1:Yes |
| | Save default: | Show the date for the latest default value | --- | --- | 1...31, 1...12, 0...99 |
| De05 | Insert new hardware config password: | Set new hardware password | --- | --- | 0...9999 |
| | Insert new load config password: | Set new load config password | --- | --- | 0...9999 |

Tab. 7.e

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| E.Load config. (The I/Os available depend on the selected configuration, the following are just some examples) | | | | | |
| Ea01 | Number of total area: | Lights area number set | 1 | --- | 0...20 |
| | Force all lights ON: | Set input position for force all lights ON | -- | --- | 0...88 |
| | --- | Status of Force on function | --- | --- | Open / Close |
| | Delay off time | Delay off time for force all lights on | 0 | --- | 0...999 |
| Ea02 | Area 1: | Name of area 1 (8 letters) | --- | --- | 0...72 |
| | Num.of lights: | Set numbers in area | --- | --- | 0...4 |
| | Management type: | Set management type for lights | --- | --- | 0:---<br>1:only scheduler<br>2:only switch<br>3.sched.+switch<br>4:sched.+switch+ button<br>5:sched.+spv.<br>6:sched.+spv.+ button<br>7:sched.+lux<br>8:sched.+lux+ button |
| | Enable exceptions: | Enable/Disable exceptions | --- | --- | 0:No 1:Yes |
| Ea03 | --- | Name of area 1 (8 letters) | --- | --- | 0...72 |
| | Light 1 setting | Switch, set position for switch (if enable) | --- | --- | 0...88 |
| | --- | Button, set position for button (if enable) | --- | --- | 0...88 |
| | --- | SPV, set position for SPV (if enable) | --- | --- | 0...30 |
| | --- | Lux, set position for Lux (if enable) | --- | --- | 0...55 |
| | --- | Button on time (if enable) | 1 | min | 0...999 |
| | --- | Output type (if enable) | --- | --- | 0: DOUT<br>1: AOUT |
| | Light 1: | Light 1 output position | --- | --- | 0...58 (Dout)<br>0...16 (Aout) |
| Ea04 (if enable LUX, and set Dout) | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Lights setting Setpoint: | Setpoint for the lux of dout | 500 | Lux | 0...32767 |
| | Band: | Band for lux of dout | 200 | Lux | 0...32767 |
| Ea05 (if enable LUX, and set Aout) | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Light 1 PI setting Setpoint: | Setpoint for lux of aout | 500 | Lux | 0...32767 |
| | Band: | Band for lux of aout | 800 | Lux | 0...32767 |
| | Integral time: | Integral time for aout | 120 | s | 0...9999 |
| | Minmum aout: | Set minimum aout for light | --- | V | 0...10.0 |
| | Maximum aout: | Set maximum aout for light | --- | V | 0...10.0 |
| Ea06 (if enable) | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Light 2 setting | Switch, set position for switch (if enable) | --- | --- | 0...88 |
| | --- | Button, set position for button (if enable) | --- | --- | 0...88 |
| | --- | SPV, set position for SPV (if enable) | --- | --- | 0...30 |
| | Light 2: | Light 2 output position (if enable) | --- | --- | 0...58 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| Ea07 (if enable) | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Light 3 setting | Switch, set position for switch (if enable) | --- | --- | 0...88 |
| | --- | Button, set position for button (if enable) | --- | --- | 0...88 |
| | --- | SPV, set position for SPV (if enable) | --- | --- | 0...30 |
| | Light 3: | Light 3 output position (if enable) | --- | --- | 0...58 |
| Ea08 (if enable) | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Light 4 setting | Switch, set position for switch (if enable) | --- | --- | 0...88 |
| | --- | Button, set position for button (if enable) | --- | --- | 0...88 |
| | --- | SPV, set position for SPV (if enable) | --- | --- | 0...30 |
| | Light 4: | Light 4 output position (if enable) | --- | --- | 0...58 |
| Ea09 | --- | Name of the area 1 (8 letters) | --- | --- | 0...72 |
| | Scheduler setting | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| ... | ... | ... | ... | ... | ... |
| Eb01 | Number of pumps group: | Set number of pump groups | 0 | --- | 0...2 |
| | Alarms of pumps: | Set the pumps alarm output position | 0 | --- | 0...58 |
| | Status: | Show the status of pump alarms | --- | --- | Open / Close |
| Eb02 | Group 01 Number of pumps: | Set number of pumps | 0 | --- | 0...2 |
| | Warnings limit max for flow lack: | Set maximum number of flow lack warning | 0 | --- | 0...5 |
| Eb03 | Group 01 Request pump: | Set input position for request pumps | 0 | --- | 0...88 |
| | No water flow: | Set input position for no water flow | 0 | --- | 0...88 |
| | Antifreeze active: | Set input position for antifreeze active | 0 | --- | 0...88 |
| Eb04 | Group 01 Enable anti-block: | Enable antiblock for pumps | 0 | --- | 0:No 1:Yes |
| | Rotation type: | Select rotation type | 0 | --- | 0:TIME 1:SWITCH |
| | --- | Rotation time (if enable) | 1 | h | 1...999 |
| Eb05 | Group 01 Overload pump1: | Set input position for pump 1 overload | 0 | --- | 0...88 |
| | Pump 2 (if enable) | Set input position for pump 2 overload | 0 | --- | 0...88 |
| | Rotation by switch (if enable) | Set input position for switch pumps | 0 | --- | 0...88 |
| Eb06 | Group 01 Pump1: | Set output position for pump 1 output | 0 | --- | 0...58 |
| | Pump 2 (if enable) | Set output position for pump 2 output | 0 | --- | 0...58 |
| Eb07 | Group 01 Pumps working hour setting | Set pumps working hour | 100000 | h | 0...999999 |
| ... | ... | ... | ... | ... | ... |
| Ec01 | No socket devices | --- | --- | --- | --- |
| Ec02 | Plug/Switch | Plug/Switch address | 26 | --- | 26 |
| | Name: | Set the name for PLUG/SWITCH (8 letters) | --- | --- | 0...72 |
| | Enable exceptions: | Enable/Disable the exceptions for sockets | 0 | --- | 0:No 1:Yes |
| Ec03 | --- | Name of the plug/switch (8 letters) | --- | --- | 0...72 |
| | Scheduler setting | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| ... | ... | ... | ... | ... | ... |
| Ed01 | Number of generic loads: | Set number of generic loads | 0 | --- | 0...20 |

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| Ed02 | Generic load 1: | Set the name for generic load 1 (8 letters) | 0 | --- | 0...72 |
| | Management type: | Set management type for generic load 1 | 0 | --- | 0:--- 1:only scheduler 2:only switch 3.sched.+ switch 4:sched.+switch+ button 5:sched.+spv 6:sched.+spv.+ button |
| | Enable exceptions: | Enable/Disable exceptions | 0 | --- | 0:No 1:Yes |
| Ed03 | --- | Name of generic load 1 (8 letters) | --- | --- | 0...72 |
| | --- | Switch, set position for switch (if enable) | --- | --- | 0...88 |
| | --- | Button, set position for button (if enable) | --- | --- | 0...88 |
| | --- | SPV, set position for SPV (if enable) | --- | --- | 0...30 |
| | --- | Button on time (if enable) | 0 | min | 0...999 |
| | Load: | Set the output position for output | 0 | --- | 0...58 |
| Ed04 | --- | Name of generic load 1 (8 letters) | --- | --- | 0...72 |
| | Scheduler setting | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| | --- | Select which time band use | 0 | --- | 0...20 |
| | --- | Show the current time band | --- | --- | --- |
| | --- | Enable weekday | 0 | --- | 0:Disable 1:Enable |
| | --- | Select which period use | 0 | --- | 0...10 |
| | --- | Show the current period | --- | --- | --- |
| ... | ... | ... | ... | ... | ... |
| Ee01 | Number of generic functions: | Set number of generic functions | 0 | --- | 0...5 |
| Ee02 | Function type: | Set function type | 0 | --- | 0: Thermostat 1: Modulating 2: Generic alarm |
| | Regulation probe: | Set input position for regulation probe (if enable) | 0 | --- | 0...75 |
| | Input for gen.alarn | Set input position for generic alarm (if enable) | 0 | --- | 0...88 |
| Ee03 (if enable) | Setpoint: | Setpoint for thermostat | 0.0 | --- | -3276.7...3276.7 |
| | Diff.on: | Diff on for thermostat | 0.0 | --- | -3276.7...3276.7 |
| | Diff.off: | Diff off for thermostat | 0.0 | --- | -3276.7...3276.7 |
| | Output type: | Set output type for thermostat | 0 | --- | 0:Direct 1:Reverse |
| Ee04 (if enable) | En.alarm high: | Enable high alarm | 0 | --- | 0:Disable 1:Enable |
| | Setpoint: | High alarm setpoint (diff is fixed to 2.0) | 0.0 | --- | -3276.7...3276.7 |
| | Delay time: | High alarm delay time | 0 | S | 0...999 |
| | En.alarm low: | Enable low alarm | 0 | --- | 0:Disable 1:Enable |
| | Setpoint: | Low alarm setpointc (diff is fixed to 2.0) | 0.0 | --- | -3276.7...3276.7 |
| | Delay time: | Low alarm delay time | 0 | S | 0...999 |
| Ee05 (if enable) | Regulation type: | Set regulation type for modulating output | 0 | --- | 0:P 1:PI |
| | Setpoint: | Setpoint for modulating output | 0.0 | --- | -3276.7...3276.7 |
| | Band: | Band for modulating output | 0.0 | --- | -3276.7...3276.7 |
| | --- | Integral time (if enable) | 0 | s | 0...999 |
| | Output type: | Set output type for modulating | 0 | --- | 0:Direct 1:Reverse |
| Ee06 (if enable) | En.alarm high: | Enable high alarm | 0 | --- | 0:Disable 1:Enable |
| | Setpoint: | High alarm setpoint (diff is fixed to 2.0) | 0.0 | --- | -3276.7...3276.7 |
| | Delay time: | High alarm delay time | 0 | S | 0...999 |
| | En.alarm low: | Enable low alarm | 0 | --- | 0:Disable 1:Enable |
| | Setpoint: | Low alarm setpoint (diff is fixed to 2.0) | 0.0 | --- | -3276.7...3276.7 |
| | Delay time: | Low alarm delay time | 0 | S | 0...999 |
| Ee07 | Position: | Set position for output | 0 | --- | 0...58 (Dout) 0...16 (Aout) |
| | Dout status: | Output value (if enable) | --- | --- | 0: Off 1: On |
| | Minimum aout: | Set minimum aout (if enable) | --- | V | 0...10.0 |
| | Maximum aout: | Set maximum aout (if enable) | --- | V | 0...10.0 |
| | Aout value: | Output value (if enable) | --- | --- | 0...10.0 |
| | Alarm status: Low: High: | Low alarm status High alarm status | --- | --- | 0:No 1:Yes |
| Ee08 (if enable) | Position: | Set generic alarm output position | --- | --- | 0...58 |
| | Enable reverse: | Set reverse for input | --- | --- | 0: NO 1: YES |
| | Alarm delay: | Set delay time for generic alarm | --- | S | 0...999 |
| ... | ... | ... | ... | ... | ... |

Tab. 7.f

| Mask index | Display descr. | Description | Def. | UOM | Values |
|---|---|---|---|---|---|
| F. Information | | | | | |
| F01 | Language | Change language (press Enter to change) | --- | --- | 0: English 1: Italian |
| | --- | Press ESC to confirm | --- | --- | --- |
| | --- | Show mask time | --- | S | 0...999 |
| F02 | Code: pChrono | --- | --- | --- | --- |
| | Ver.: | Software version and date | --- | --- | --- |
| | Bios: | Bios version and date | --- | --- | --- |
| | Boot: | Boot version and date | --- | --- | --- |
| F03 | Board type: | Board type | --- | --- | Small / Large |
| | Board size: | --- | --- | --- | --- |
| | Total flash: | Total flash | --- | --- | --- |
| | RAM: | Ram memory | --- | --- | --- |
| | Built-In type | Built-in type | --- | --- | --- |
| | Main cycle: | Program cycle | --- | --- | --- |

Tab. 7.g

# 8. ALARM TABLE

Below is the list of alarms managed by pChrono. Most of the alarms have automatic reset, so if the alarm condition disappears, the alarm stops automatically. Otherwise, manual operation is required by Alarm button, after the reset of the alarm condition.

| Code | Description | Reset | Action |
|---|---|---|---|
| AL01 | Clock board fault or not connected | Manual | --- |
| AL02 | Extended memory error | Manual | --- |
| AL03 | pCOe address 2 offline | Automatic | --- |
| AL04 | pCOe address 3 offline | Automatic | --- |
| AL05 | pCOe address 4 offline | Automatic | --- |
| AL06 | pCOe address 5 offline | Automatic | --- |
| AL07 | pCOe address 6 offline | Automatic | --- |
| AL08 | pCOe address 7 offline | Automatic | --- |
| AL09 | pCOe address 8 offline | Automatic | --- |
| AL10 | pCOe address 9 offline | Automatic | --- |
| AL11 | pCOe address 10 offline | Automatic | --- |
| AL12 | pCOe address 11 offline | Automatic | --- |
| AL13 | Access point connected on FBus1 offline | Automatic | --- |
| AL14 | Access point connected on FBus2 offline | Automatic | --- |
| AL15 | SA sensor address 16 offline | Automatic | --- |
| AL16 | SA sensor address 17 offline | Automatic | --- |
| AL17 | SA sensor address 18 offline | Automatic | --- |
| AL18 | SI sensor address 21 offline | Automatic | --- |
| AL19 | SI sensor address 22 offline | Automatic | --- |
| AL20 | SI sensor address 23 offline | Automatic | --- |
| AL21 | SI sensor address 24 offline | Automatic | --- |
| AL22 | SI sensor address 25 offline | Automatic | --- |
| AL23 | Low temperature alarm of SA address 16 | Automatic | --- |
| AL24 | High temperature alarm of SA address 16 | Automatic | --- |
| AL25 | Low humidity alarm of SA address 16 | Automatic | --- |
| AL26 | High humidity alarm of SA address 16 | Automatic | --- |
| AL27 | Probe error of SA address 16 | Automatic | --- |
| AL28 | Low battery alarm of SA address 16 | Automatic | --- |
| AL29 | Low temperature alarm of SA address 17 | Automatic | --- |
| AL30 | High temperature alarm of SA address 17 | Automatic | --- |
| AL31 | Low humidity alarm of SA address 17 | Automatic | --- |
| AL32 | High humidity alarm of SA address 17 | Automatic | --- |
| AL33 | Probe error of SA address 17 | Automatic | --- |
| AL34 | Low battery alarm of SA address 17 | Automatic | --- |
| AL35 | Low temperature alarm of SA address 18 | Automatic | --- |
| AL36 | High temperature alarm of SA address 18 | Automatic | --- |
| AL37 | Low humidity alarm of SA address 18 | Automatic | --- |
| AL38 | High humidity alarm of SA address 18 | Automatic | --- |
| AL39 | Probe error of SA address 18 | Automatic | --- |
| AL40 | Low battery alarm of SA address 18 | Automatic | --- |
| AL41 | Low temperature alarm of SI address 21 | Automatic | --- |
| AL42 | High temperature alarm of SI address 21 | Automatic | --- |
| AL43 | Low humidity alarm of SI address 21 | Automatic | --- |
| AL44 | High humidity alarm of SI address 21 | Automatic | --- |
| AL45 | Low light alarm of SI address 21 | Automatic | --- |

| | | | |
|---|---|---|---|
| AL46 | High light alarm of SI address 21 | Automatic | --- |
| AL47 | Probe error of SI address 21 | Automatic | --- |
| AL48 | Low battery alarm of SI address 21 | Automatic | --- |
| AL49 | Low temperature alarm of SI address 22 | Automatic | --- |
| AL50 | High temperature alarm of SI address 22 | Automatic | --- |
| AL51 | Low humidity alarm of SI address 22 | Automatic | --- |
| AL52 | High humidity alarm of SI address 22 | Automatic | --- |
| AL53 | Low light alarm of SI address 22 | Automatic | --- |
| AL54 | High light alarm of SI address 22 | Automatic | --- |
| AL55 | Probe error of SI address 22 | Automatic | --- |
| AL56 | Low battery alarm of SI address 22 | Automatic | --- |
| AL57 | Low temperature alarm of SI address 23 | Automatic | --- |
| AL58 | High temperature alarm of SI address 23 | Automatic | --- |
| AL59 | Low humidity alarm of SI address 23 | Automatic | --- |
| AL60 | High humidity alarm of SI address 23 | Automatic | --- |
| AL61 | Low light alarm of SI address 23 | Automatic | --- |
| AL62 | High light alarm of SI address 23 | Automatic | --- |
| AL63 | Probe error of SI address 23 | Automatic | --- |
| AL64 | Low battery alarm of SI address 23 | Automatic | --- |
| AL65 | Low temperature alarm of SI address 24 | Automatic | --- |
| AL66 | High temperature alarm of SI address 24 | Automatic | --- |
| AL67 | Low humidity alarm of SI address 24 | Automatic | --- |
| AL68 | High humidity alarm of SI address 24 | Automatic | --- |
| AL69 | Low light alarm of SI address 24 | Automatic | --- |
| AL70 | High light alarm of SI address 24 | Automatic | --- |
| AL71 | Probe error of SI address 24 | Automatic | --- |
| AL72 | Low battery alarm of SI address 24 | Automatic | --- |
| AL73 | Low temperature alarm of SI address 25 | Automatic | --- |
| AL74 | High temperature alarm of SI address 25 | Automatic | --- |
| AL75 | Low humidity alarm of SI address 25 | Automatic | --- |
| AL76 | High humidity alarm of SI address 25 | Automatic | --- |
| AL77 | Low light alarm of SI address 25 | Automatic | --- |
| AL78 | High light alarm of SI address 25 | Automatic | --- |
| AL79 | Probe error of SI address 25 | Automatic | --- |
| AL80 | Low battery alarm of SI address 25 | Automatic | --- |
| AL81 | Pump 1 alarm in group 1 | Manuale | --- |
| AL82 | Pump 2 alarm in group 1 | Manuale | --- |
| AL83 | Pump 1 alarm in group 2 | Manuale | --- |
| AL84 | Pump 2 alarm in group 2 | Manuale | --- |
| AL85 | Probe B1 alarm of pCOe address 2 | Automatic | --- |
| AL86 | Probe B2 alarm of pCOe address 2 | Automatic | --- |
| AL87 | Probe B3 alarm of pCOe address 2 | Automatic | --- |
| AL88 | Probe B4 alarm of pCOe address 2 | Automatic | --- |
| AL89 | Probe B1 alarm of pCOe address 3 | Automatic | --- |
| AL90 | Probe B2 alarm of pCOe address 3 | Automatic | --- |
| AL91 | Probe B3 alarm of pCOe address 3 | Automatic | --- |
| AL92 | Probe B4 alarm of pCOe address 3 | Automatic | --- |
| AL93 | Probe B1 alarm of pCOe address 4 | Automatic | --- |
| AL94 | Probe B2 alarm of pCOe address 4 | Automatic | --- |
| AL95 | Probe B3 alarm of pCOe address 4 | Automatic | --- |
| AL96 | Probe B4 alarm of pCOe address 4 | Automatic | --- |
| AL97 | Probe B1 alarm of pCOe address 5 | Automatic | --- |
| AL98 | Probe B2 alarm of pCOe address 5 | Automatic | --- |
| AL99 | Probe B3 alarm of pCOe address 5 | Automatic | --- |
| AL100 | Probe B4 alarm of pCOe address 5 | Automatic | --- |
| AL101 | Probe B1 alarm of pCOe address 6 | Automatic | --- |
| AL102 | Probe B2 alarm of pCOe address 6 | Automatic | --- |
| AL103 | Probe B3 alarm of pCOe address 6 | Automatic | --- |
| AL104 | Probe B4 alarm of pCOe address 6 | Automatic | --- |
| AL105 | Probe B1 alarm of pCOe address 7 | Automatic | --- |
| AL106 | Probe B2 alarm of pCOe address 7 | Automatic | --- |
| AL107 | Probe B3 alarm of pCOe address 7 | Automatic | --- |
| AL108 | Probe B4 alarm of pCOe address 7 | Automatic | --- |
| AL109 | Probe B1 alarm of pCOe address 8 | Automatic | --- |
| AL110 | Probe B2 alarm of pCOe address 8 | Automatic | --- |
| AL111 | Probe B3 alarm of pCOe address 8 | Automatic | --- |
| AL112 | Probe B4 alarm of pCOe address 8 | Automatic | --- |
| AL113 | Probe B1 alarm of pCOe address 9 | Automatic | --- |
| AL114 | Probe B2 alarm of pCOe address 9 | Automatic | --- |
| AL115 | Probe B3 alarm of pCOe address 9 | Automatic | --- |
| AL116 | Probe B4 alarm of pCOe address 9 | Automatic | --- |
| AL117 | Probe B1 alarm of pCOe address 10 | Automatic | --- |
| AL118 | Probe B2 alarm of pCOe address 10 | Automatic | --- |
| AL119 | Probe B3 alarm of pCOe address 10 | Automatic | --- |
| AL120 | Probe B4 alarm of pCOe address 10 | Automatic | --- |
| AL121 | Probe B1 alarm of pCOe address 11 | Automatic | --- |
| AL122 | Probe B2 alarm of pCOe address 11 | Automatic | --- |

| | | | |
|---|---|---|---|
| AL123 | Probe B3 alarm of pCOe address 11 | Automatic | --- |
| AL124 | Probe B4 alarm of pCOe address 11 | Automatic | --- |
| --- | --- | --- | --- |
| AL128 | No water flow warning of pump 1 group 1 | Automatic | --- |
| AL129 | No water flow warning of pump 2 group 1 | Automatic | --- |
| AL130 | No water flow warning of pump 1 group 2 | Automatic | --- |
| AL131 | No water flow warning of pump 2 group 2 | Automatic | --- |
| AL132 | Pump 1 group 1 working hour warning | Automatic | --- |
| AL133 | Pump 2 group 1 working hour warning | Automatic | --- |
| AL134 | Pump 1 group 2 working hour warning | Automatic | --- |
| AL135 | Pump 2 group 2 working hour warning | Automatic | --- |
| AL136 | Generic alarm of generic function 1 | Automatic | --- |
| AL137 | Generic alarm of generic function 2 | Automatic | --- |
| AL138 | Generic alarm of generic function 3 | Automatic | --- |
| AL139 | Generic alarm of generic function 4 | Automatic | --- |
| AL140 | Generic alarm of generic function 5 | Automatic | --- |
| AL141 | Probe U1 disconnected or fault | | |
| AL142 | Probe U2 disconnected or fault | | |
| AL143 | Probe U3 disconnected or fault | | |
| AL144 | Probe U4 disconnected or fault | | |
| AL145 | Probe U5 disconnected or fault | | |
| AL146 | Probe U6 disconnected or fault | | |
| AL147 | Probe U17disconnected or fault | | |
| AL148 | Probe U8 disconnected or fault | | |
| AL149 | Probe U9 disconnected or fault | | |
| AL150 | Probe U10 disconnected or fault | | |
| AL151 | Socket add.26 offline | | |
| AL152 | Socket add.27 offline | | |
| AL153 | Socket add.28 offline | | |
| AL154 | Socket add.29 offline | | |
| AL155 | Socket add.30 offline | | |
| AL156 | Socket add.31 offline | | |
| AL157 | Socket add.32 offline | | |
| AL158 | Socket add.33 offline | | |
| AL159 | Socket add.34 offline | | |
| AL160 | Socket add.35 offline | | |
| AL161 | High alarm of generic function 1 | | |
| AL162 | High alarm of generic function 2 | | |
| AL163 | High alarm of generic function 3 | | |
| AL164 | High alarm of generic function 4 | | |
| AL165 | High alarm of generic function 5 | | |
| AL166 | Low alarm of generic function 1 | | |
| AL167 | Low alarm of generic function 2 | | |
| AL168 | Low alarm of generic function 3 | | |
| AL169 | Low alarm of generic function 4 | | |
| AL170 | Low alarm of generic function 5 | | |
| AL171 | High alarm of generic function 6 | Automatic | --- |
| AL172 | High alarm of generic function 7 | Automatic | --- |
| AL173 | High alarm of generic function 8 | Automatic | --- |
| AL174 | High alarm of generic function 9 | Automatic | --- |
| AL175 | High alarm of generic function 10 | Automatic | --- |
| AL176 | High alarm of generic function 11 | Automatic | --- |
| AL177 | High alarm of generic function 12 | Automatic | --- |
| AL178 | High alarm of generic function 13 | Automatic | --- |
| AL179 | High alarm of generic function 14 | Automatic | --- |
| AL180 | High alarm of generic function 15 | Automatic | --- |
| AL181 | High alarm of generic function 16 | Automatic | --- |
| AL182 | High alarm of generic function 17 | Automatic | --- |
| AL183 | High alarm of generic function 18 | Automatic | --- |
| AL184 | High alarm of generic function 19 | Automatic | --- |
| AL185 | High alarm of generic function 20 | Automatic | --- |
| AL186 | Low alarm of generic function 6 | Automatic | --- |
| AL187 | Low alarm of generic function 7 | Automatic | --- |
| AL188 | Low alarm of generic function 8 | Automatic | --- |
| AL189 | Low alarm of generic function 9 | Automatic | --- |
| AL190 | Low alarm of generic function 10 | Automatic | --- |
| AL191 | Low alarm of generic function 11 | Automatic | --- |
| AL192 | Low alarm of generic function 12 | Automatic | --- |
| AL193 | Low alarm of generic function 13 | Automatic | --- |
| AL194 | Low alarm of generic function 14 | Automatic | --- |
| AL195 | Low alarm of generic function 15 | Automatic | --- |
| AL196 | Low alarm of generic function 16 | Automatic | --- |
| AL197 | Low alarm of generic function 17 | Automatic | --- |
| AL198 | Low alarm of generic function 18 | Automatic | --- |
| AL199 | Low alarm of generic function 19 | Automatic | --- |
| AL200 | Low alarm of generic function 20 | Automatic | --- |

| | | | |
|---|---|---|---|
| AL201 | WC alarm 1 | Manual | --- |
| AL202 | WC alarm 2 | Manual | --- |
| AL203 | WC alarm 3 | Manual | --- |
| AL204 | WC alarm 4 | Manual | --- |
| AL205 | WC alarm 5 | Manual | --- |
| AL206 | WC alarm 6 | Manual | --- |
| AL207 | WC alarm 7 | Manual | --- |
| AL208 | WC alarm 8 | Manual | --- |
| AL209 | WC alarm 9 | Manual | --- |
| AL210 | WC alarm 10 | Manual | --- |
| AL211 | WC alarm 11 | Manual | --- |
| AL212 | WC alarm 12 | Manual | --- |
| AL213 | WC alarm 13 | Manual | --- |
| AL214 | WC alarm 14 | Manual | --- |
| AL215 | WC alarm 15 | Manual | --- |
| AL216 | WC alarm 16 | Manual | --- |
| AL217 | WC alarm 17 | Manual | --- |
| AL218 | WC alarm 18 | Manual | --- |
| AL219 | WC alarm 19 | Manual | --- |
| AL220 | WC alarm 20 | Manual | --- |
| AL221 | Blackout warning | --- | --- |
| AL222 | Generic alarm of generic function 6 | Automatic | --- |
| AL223 | Generic alarm of generic function 7 | Automatic | --- |
| AL224 | Generic alarm of generic function 8 | Automatic | --- |
| AL225 | Generic alarm of generic function 9 | Automatic | --- |
| AL226 | Generic alarm of generic function 10 | Automatic | --- |
| AL227 | Generic alarm of generic function 11 | Automatic | --- |
| AL228 | Generic alarm of generic function 12 | Automatic | --- |
| AL229 | Generic alarm of generic function 13 | Automatic | --- |
| AL230 | Generic alarm of generic function 14 | Automatic | --- |
| AL231 | Generic alarm of generic function 15 | Automatic | --- |
| AL232 | Generic alarm of generic function 16 | Automatic | --- |
| AL233 | Generic alarm of generic function 17 | Automatic | --- |
| AL234 | Generic alarm of generic function 18 | Automatic | --- |
| AL235 | Generic alarm of generic function 19 | Automatic | --- |
| AL236 | Generic alarm of generic function 20 | Automatic | --- |
| | | | |

Tab. 8.h

# 9. INPUTS/OUTPUTS TABLE

The flexibility of pChrono in managing inputs and outputs means that an I/O table cannot be provided in the same way as for other controllers. Configuration of the load inputs/outputs is nonetheless managed using a guided procedure during installation. Simplified configuration of the inputs/outputs allows the same input to be shared between different devices; for example, a light button used to switch on several light fixtures at the

| | | pChrono board | | | | |
|---|---|---|---|---|---|---|
| | | SMALL | | LARGE | | Label |
| Universal inputs/outputs | NTC input | 5 | | 10 | | U |
| | PTC input | 5 | | 10 | | U |
| | PT500 input | 5 | | 10 | | U |
| | PT1000 input | 5 | | 10 | | U |
| | PT100 input | max 2 | | max 4 | | U |
| | 0 to 1 Vdc / 0 to 10 Vdc input (**) (powered by controller) | max tot 5 | 5 | max tot 10 | max 6 | U |
| | 0 to 1 Vdc / 0 to 10 Vdc input (**) (powered externally) | max tot 5 | 5 | max tot 10 | 10 | U |
| | 0 to 5 Vdc input | - | | - | | - |
| | 0 to 20 / 4 to 20 mA input (powered by controller) | max tot 4 | max 4 | max tot 9 | max 6 | U |
| | 0 to 20 / 4 to 20 mA input (powered externally) | max tot 4 | max 4 | max tot 9 | max 9 | U |
| | 0 to 5 V input for ratiometric probe (+5Vref) | max 5 | | max 6 | | U |
| | Digital input with voltage-free contact | 5 | | 10 | | U |
| | Fast digital inputs | max 2 | | max 6 | | U |
| | 0 to 10 Vdc output, not optically-isolated | 5 | | 10 | | U |
| | PWM output, not optically-isolated | 5 | | 10 | | U |
| | | max tot 5 | | max tot 10 | | |
| Digital inputs | 24 Vac/Vdc input, optically-isolated | 8 | | 14 | | ID |
| | 24 Vac/Vdc or 230 Vac (50/60 Hz) input | - | | 4 | | ID |
| | | max tot 8 | | max tot 18 | | |
| Analogue outputs | 0 to 10 Vdc output, optically-isolated | 4 | | 6 | | Y |
| | PWM output, optically-isolated | 2 | | 2 | | Y3, Y4 |
| | Output for two-pole stepper motor | - | | - | | 1-3-2-4 |
| | | max tot 4 | | max tot 6 | | |
| Digital outputs | NO/NC relay output | 1 | | 6 | | NO/NC |
| | NO relay output | 7 | | 12 | | NO |
| | 24 V SSR output | 1 | | 3/4 | | NO/NC |
| | 230 V SSR output | 1 | | 3/4 | | NO/NC |
| | | max tot 8 | | max tot 18 | | |
| | **Total I/Os** | **25** | | **48** | | |
| Terminal power | | 1 | | 1 | | J10 |
| | | 1 | | 1 | | +Vterm |
| Probe power | | 1 | | 1 | | +VDC |
| | | 1 | | 1 | | +5 VREF |
| Analogue output power | | 1 | | 1 | | VG, VG0 |
| pLAN ports | | 1 | | 1 | | J10 |
| | | 1 | | 1 | | J11 |
| Integrated Fieldbus ports | | 1 | | 2 | | J23/ J26 |
| Additional Fieldbus ports | | 1 | | 1 | | Fbus card |
| Integrated BMS ports | | 1 | | 1 | | J25 |
| Additional BMS ports | | 1 | | 1 | | BMS card |
| Host USB port (if featured) | | 1 | | 1 | | |
| Slave USB port (if featured) | | 1 | | 1 | | |

(*) On the pCOe expansion card, the inputs are selectable via software in pairs (B1, B2 and B3, B4)
(**) pCOe card: 0 to 1 V inputs only

same time. For further details, see the examples shown in chapter '7. Functions'.

For further details on the features of the inputs/outputs, and the electrical and serial connections on the controllers used in the pChrono system, see the manual listed in chapter "3. System architecture".

| | | pCOe I/O expansion card | | | |
|---|---|---|---|---|---|
| In/Out | Type | PCOE* | Label | In/Out | Type |
| In | Universal I/O | 4 | B | In | Analogue in. (*) |
| In | Universal I/O | - | - | - | - |
| In | Universal I/O | - | - | - | - |
| In | Universal I/O | - | - | - | - |
| In | Universal I/O | - | - | - | - |
| In | Universal I/O | 4 | B | In | Analogue in. (*) |
| In | Universal I/O | 4 | B | In | Analogue in. (*) |
| - | - | 4 | B | In | Analogue in. (*) |
| In | Universal I/O | 4 | B | In | Analogue in. (*) |
| In | Universal I/O | - | - | - | - |
| In | Universal I/O | 4 | B | In | Analogue in. (*) |
| In | Universal I/O | - | - | - | Digital input |
| In | Universal I/O | - | - | - | Digital input |
| Out | Universal I/O | - | - | - | Analogue output |
| Out | Universal I/O | - | - | - | Analogue output |
| | | | | | |
| In | Digital input | 4 | ID | In | Digital input |
| In | Digital input | - | - | - | |
| | | | | | |
| Out | Analogue output | 1 | Y | Out | |
| Out | Analogue output | - | - | - | |
| Out | Analogue output | - | - | - | |
| | | | | | |
| Out | Digital output | 4 | NO/NC | Out | Digital output |
| Out | Digital output | - | - | - | |
| Out | Digital output | - | - | - | |
| Out | Digital output | - | - | - | |

| | | | Total I/Os |
|---|---|---|---|
| | | | Telephone conn. (pLAN) J10 |
| | | | Additional terminal power |
| | | | Active probe power |
| | | | Ratiometric probe power |
| 1 | VG,VG0 | | |
| | | | Signal and power supply |
| | | | Signal only |

Tab. 9.a

## 9.1 pChrono Small and Large: connection terminals

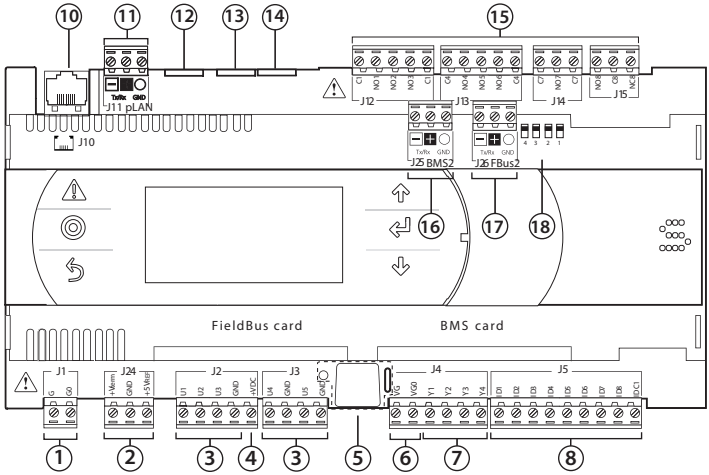



Fig. 9.a

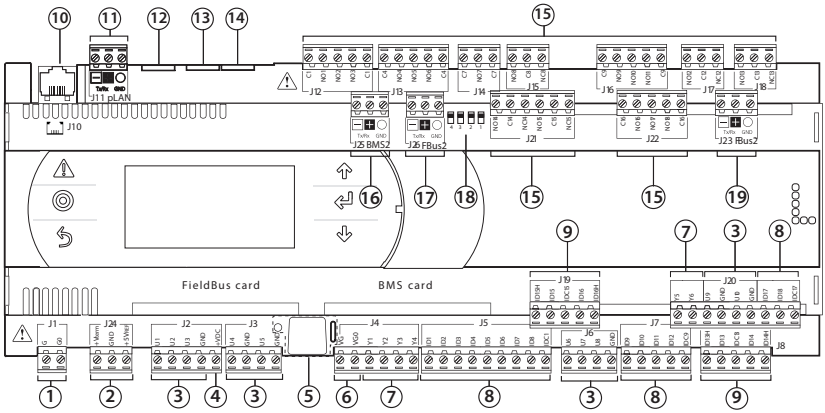



Fig. 9.b

| Ref. | Description |
|---|---|
| 1 | Power supply connector [G(+), G0(-)] |
| 2 | +Vterm: power supply for additional terminal<br>+5 VREF power supply for ratiometric probes |
| 3 | Universal inputs/outputs |
| 4 | +VDC: power supply for active probes |
| 5 | Button for setting pLAN address, secondary display, LEDs |
| 6 | VG: power supply at voltage A(*) for opto-isolated analogue output<br>VG0: power for optically-isolated analogue output, 0 Vac/Vdc |
| 7 | Analogue outputs |
| 8 | ID: digital inputs at voltage A (*) |
| 9 | ID..: digital inputs at voltage A (*)<br>IDH..: digital inputs at voltage B (**) |
| 10 | pLAN telephone connector for terminal/downloading application |

| Ref. | Description |
|---|---|
| 11 | pLAN plug-in connector |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Relay digital outputs |
| 16 | BMS2 port |
| 17 | FieldBus2 port |
| 18 | Jumpers, leave at ON position |
| 19 | Not used |

(*) Voltage A: 24 Vac or 28 to 36 Vdc; (**) Voltage B: 230 Vac - 50/60 Hz.

Tab. 9.b

## 9.2 pCOe expansion card: connection terminals

The pCOe card is used to increase the number of inputs and outputs on a pChrono controller, according to system requirements.

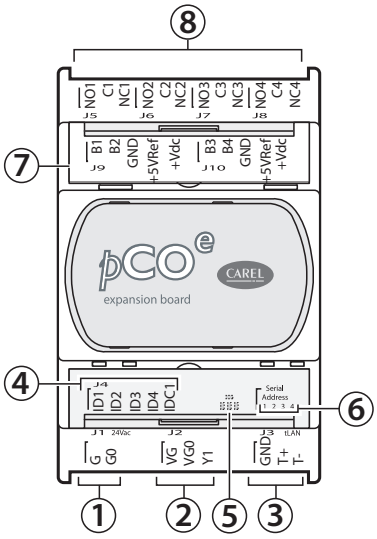



Fig. 9.c

| Ref. | Description |
|---|---|
| 1 | Power supply connector [G(+), G0(-)] |
| 2 | Optically-isolated 0 to 10 V analogue output |
| 3 | RS485 connector network (GND, T+, T-) |
| 4 | Optically-isolated digital inputs, 24 Vac/Vdc |
| 5 | Yellow power LED e 3 signal LEDs |
| 6 | Serial Indirizzo |
| 7 | Analogue inputs e probe power supply |
| 8 | Relay digital outputs |

## 9.3 Description of the pChrono terminals

See the figures on the previous pages relating to pChrono.

| Ref. | Term. | Label | Description |
|---|---|---|---|
| 1 | J1-1 | G | Power supply at voltage A(*) |
| | J1-2 | G0 | Power supply reference |
| 2 | J24-1 | +Vterm | Additional power supply terminal |
| | J24-2 | GND | Power supply common |
| | J24-3 | +5 Vref | Power supply to 0 to 5 V ratiometric probes |
| 3 | J2-1 | U1 | Universal input/output 1 |
| | J2-2 | U2 | Universal input/output 2 |
| | J2-3 | U3 | Universal input/output 3 |
| | J2-4 | GND | Common for universal inputs/outputs 1, 2, 3 |
| 3 | J3-1 | U4 | Universal input/output 4 |
| | J3-2 | GND | Common for universal input/output 4 |
| | J3-3 | U5 | Universal input/output 5 |
| | J3-4 | GND | Common for universal input/output 5 |
| 3 | J6-1 | U6 | Universal input/output 6 |
| | J6-2 | U7 | Universal input/output 7 |
| | J6-3 | U8 | Universal input/output 8 |
| | J6-4 | GND | Common for universal inputs/outputs 6, 7, 8 |
| 3 | J20-3♦ | U9 | Universal input/output 9 |
| | J20-4♦ | GND | Common for universal input/output 9 |
| | J20-5♦ | U10 | Universal input/output 10 |
| | J20-6♦ | GND | Common for universal input/output 10 |
| 4 | J2-5 | +VDC | Power to active probes |
| 5 | Button for setting pLAN address, secondary display, signal LEDs | | |
| 6 | J4-1 | VG | Power to optically-isolated analogue output, voltage A(*) |
| | J4-2 | VG0 | Power to optically-isolated analogue output, 0 Vac/Vdc |

| | | | |
|---|---|---|---|
| 7 | J4-3 | Y1 | Analogue output 1, 0 to 10 V |
| | J4-4 | Y2 | Analogue output 2, 0 to 10 V |
| | J4-5 | Y3 | Analogue output 3, 0 to 10 V |
| | J4-6 | Y4 | Analogue output 4, 0 to 10 V |
| 7 | J20-1◆ | Y5 | Analogue output 5, 0 to 10 V |
| | J20-2◆ | Y6 | Analogue output 6, 0 to 10 V |
| 8 | J5-1 | ID1 | Digital input 1 at voltage A(*) |
| | J5-2 | ID2 | Digital input 2 at voltage A(*) |
| | J5-3 | ID3 | Digital input 3 at voltage A(*) |
| | J5-4 | ID4 | Digital input 4 at voltage A(*) |
| | J5-5 | ID5 | Digital input 5 at voltage A(*) |
| | J5-6 | ID6 | Digital input 6 at voltage A(*) |
| | J5-7 | ID7 | Digital input 7 at voltage A(*) |
| | J5-8 | ID8 | Digital input 8 at voltage A(*) |
| | J5-9 | IDC1 | Common for digital inputs from 1 to 8 (negative pole if group with DC power supply) |
| 8 | J7-1 | ID9 | Digital input 9 at voltage A(*) |
| | J7-2 | ID10 | Digital input 10 at voltage A(*) |
| | J7-3 | ID11 | Digital input 11 at voltage A(*) |
| | J7-4 | ID12 | Digital input 12 at voltage A(*) |
| | J7-5 | IDC9 | Common for digital inputs from 9 to 12 (negative pole if group with DC power supply) |
| 8 | J20-7◆ | ID17 | Digital input 17 at voltage A(*) |
| | J20-8◆ | ID18 | Digital input 18 at voltage A(*) |
| | J20-9◆ | IDC17 | Common for digital inputs 17 and 18 (negative pole if group with DC power supply) |
| 9 | J8-1 | ID13H | Digital input 13 at voltage B(**) |
| | J8-2 | ID13 | Digital input 13 at voltage A(*) |
| | J8-3 | IDC13 | Common for digital inputs 13 and 14 (negative pole if group with DC power supply) |
| | J8-4 | ID14 | Digital input 14 at voltage A(*) |
| | J8-5 | ID14H | Digital input 14 at voltage B(**) |
| 9 | J19-1◆ | ID15H | Digital input 15 at voltage B(**) |
| | J19-2◆ | ID15 | Digital input 15 at voltage A(*) |
| | J19-3◆ | IDC15 | Common for digital inputs 15 and 16 (negative pole if group with DC power supply) |
| | J19-4◆ | ID16 | Digital input 16 at voltage A(*) |
| | J19-5◆ | ID16H | Digital input 16 at voltage B(**) |
| 10 | J10 | - | Connector for pLAN telephone cable |
| 11 | J11-1 | Tx-/Rx- | Tx-/Rx- pLAN RS485 port |
| | J11-2 | Tx+/Rx+ | Tx+/Rx+ pLAN RS485 port |
| | J11-3 | GND | GND pLAN RS485 port |
| 12 | - | - | Reserved |
| 13 | - | - | Reserved |
| 14 | - | - | Reserved |
| 15 | J12-1 | C1 | Common for relays 1, 2, 3 |
| | J12-2 | NO1 | Normally open contact, relay 1 |
| | J12-3 | NO2 | Normally open contact, relay 2 |
| | J12-4 | NO3 | Normally open contact, relay 3 |
| | J12-5 | C1 | Common for relays 1, 2, 3 |
| 15 | J13-1 | C4 | Common for relays 4, 5, 6 |
| | J13-2 | NO4 | Normally open contact, relay 4 |
| | J13-3 | NO5 | Normally open contact, relay 5 |
| | J13-4 | NO6 | Normally open contact, relay 6 |
| | J13-5 | C4 | Common for relays 4, 5, 6 |
| 15 | J14-1 | C7 | Common for relay 7 |
| | J14-2 | NO7 | Normally open contact, relay 7 |
| | J14-3 | C7 | Common for relay 7 |
| 15 | J15-1 | NO8 | Normally open contact, relay 8 |
| | J15-2 | C8 | Common for relay 8 |
| | J15-3 | NC8 | Normally closed contact relay 8 |
| 15 | J16-1 | C9 | Common for relay 9, 10, 11 |
| | J16-2 | NO9 | Normally open contact, relay 9 |
| | J16-3 | NO10 | Normally open contact, relay 10 |
| | J16-4 | NO11 | Normally open contact, relay 11 |
| | J16-5 | C9 | Common for relay 9, 10, 11 |

| | | | |
|---|---|---|---|
| 15 | J17-1 | NO12 | Normally open contact, relay 12 |
| | J17-2 | C12 | Common for relay 12 |
| | J17-3 | NC12 | Normally closed contact relay 12 |
| 15 | J18-1 | NO13 | Normally open contact, relay 13 |
| | J18-2 | C13 | Common for relay 13 |
| | J18-3 | NC13 | Normally closed contact relay 13 |
| 15 | J21-1♦ | NO14 | Normally open contact, relay 14 |
| | J21-2♦ | C14 | Common for relay 14 |
| | J21-3♦ | NC14 | Normally closed contact relay 14 |
| | J21-4♦ | NO15 | Normally open contact, relay 15 |
| | J21-5♦ | C15 | Common for relay 15 |
| | J21-6♦ | NC15 | Normally closed contact relay 15 |
| 15 | J22-1♦ | C16 | Common for relay 16, 17, 18 |
| | J22-2♦ | NO16 | Normally open contact, relay 16 |
| | J22-3♦ | NO17 | Normally open contact, relay 17 |
| | J22-4♦ | NO18 | Normally closed contact relay 18 |
| | J22-5♦ | C16 | Common for relay 16, 17, 18 |
| 16 | J25-1 | Tx-/Rx- | Tx-/Rx- BMS2 RS485 port |
| | J25-2 | Tx+/Rx+ | Tx+/Rx+ BMS2 RS485 port |
| | J25-3 | GND | GND BMS2 RS485 port |
| 17 | J26-1 | Tx-/Rx- | Tx-/Rx- Fieldbus 2 RS485 port |
| | J26-2 | Tx+/Rx+ | Tx+/Rx+ Fieldbus 2 RS485 port |
| | J26-3 | GND | GND Fieldbus 2 RS485 port |
| 18 | Microswitches for configuring port J26, leave at ON position | | |
| 18 | Microswitches for configuring port J26, leave at ON position | | |
| 19 | J23-1 | Tx-/Rx- | Tx-/Rx- Fieldbus 2 RS485 port, not used |
| | J23-2 | Tx+/Rx+ | Tx+/Rx+ Fieldbus 2 RS485 port, not used |
| | J23-3 | GND | GND Fieldbus 2 RS485 network port, not used |

Tab. 9.c

(*): voltage A: 24 Vac or 28 to 36 Vdc;

(**): voltage B: 230 Vac - 50/60 Hz.

♦: Large model

# 10. pChrono SPECIFICATIONS

## 10.1 Power supply

The following figure shows the power supply connection diagram. Use a class II safety transformer with protection against short-circuits and overload. See the table of technical specifications for the size of the transformer according to the model.

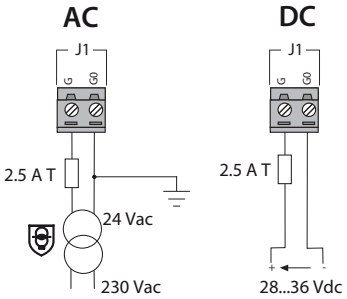



Fig. 10.a

**Important:**

- a power supply voltage other than the rated value may seriously damage the controller;
- if the power transformer secondary is earthed, check that the earth wire is connected to terminal G0. This applies to all the devices connected to the to the pChrono via serial network;
- the power supply to the controller should be separated from the power supply to the other electrical devices (contactors and other electromechanical components) inside the electrical panel.

**Note:** power to the controller is indicated by a yellow LED;

## 10.2 Digital inputs

The controller features digital inputs for connecting safety devices, alarms, device status and remote switches. These inputs are all optically isolated from the other terminals and can work at 24 Vac (+10/-15%) or 28 to 36 Vdc (-20/+10%) (indicated as ID*) and some a 230 Vac (indicated as IDH*).

Note:
- if the control voltage is drawn in parallel with a coil, fit a dedicated RC filter in parallel with the coil (typical ratings are 100 Ω, 0.5 µF, 630 V);
- if connecting the digital inputs to safety systems (alarms), the presence of voltage across the contact must be the normal operating condition, while no voltage must represent an alarm situation. This will ensure that any interruption (or disconnection) of the input will also be signalled;
- do not connect the neutral in place of an open digital input;
- always interrupt the phase.

**Important:** sseparate as much as possible (at least 3 cm) the probe and digital input cables from the power cables to loads to avoid possible electromagnetic disturbance. Never insert power cables (including the electrical cables) and probe signal cables in the same conduits.

### 24 Vac digital inputs

Digital inputs ID... can be controlled at 24 Vac.

Note:
- the digital inputs only have functional insulation from the rest of the controller;
- to maintain the optical isolation of the digital inputs, a separate power supply must be used for each of these;
- the digital inputs can be powered at a different voltage from the controller.

**Cable cross-section:** lethe sizes of the cables for the remote connection of the digital inputs are: cross-section for length < 50 m = 0.25 ($mm^2$)

**Important**: if the controller is installed in an industrial environment (EN 61000-6-2), the maximum length of the connections is 30 m. To avoid measurement errors, never exceed this length.

Example connection diagram: (LARGE model):

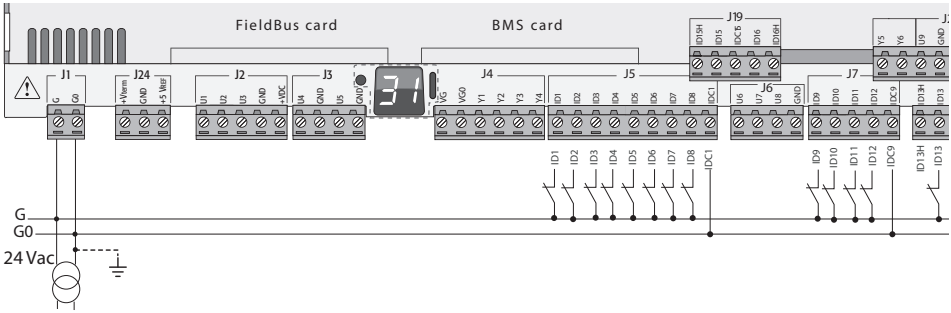



Fig. 10.b

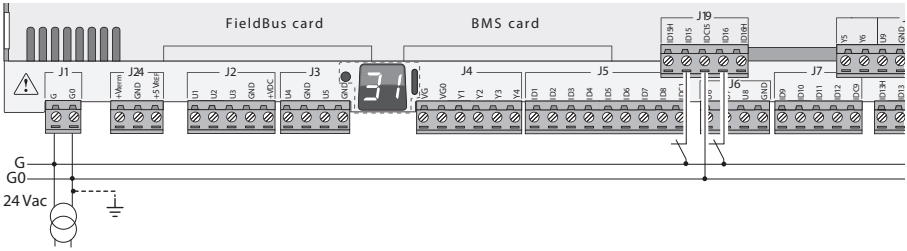



Fig. 10.c

## 24 Vdc digital inputs

Digital inputs ID... can be controlled at 24 Vdc.

Example connection diagram: (LARGE model):

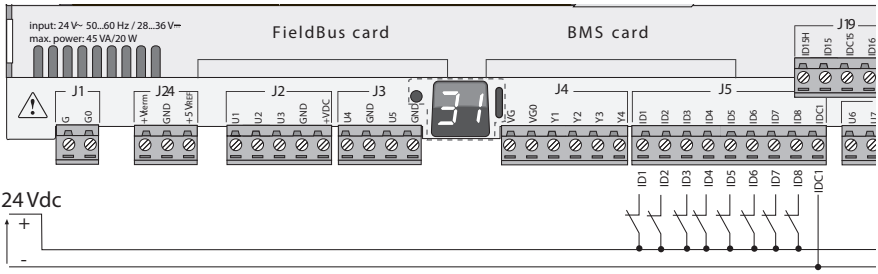



Fig. 10.d

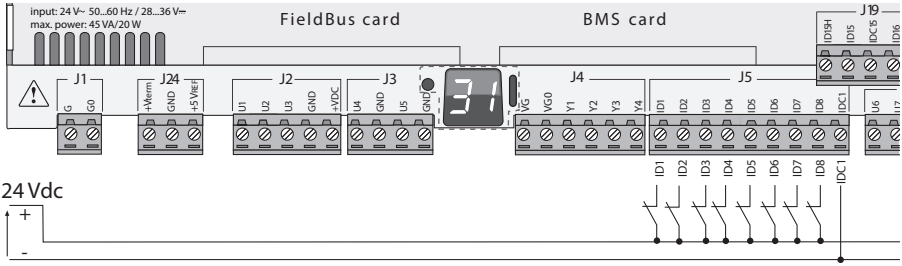



Fig. 10.e

## 230 Vac digital inputs

On the Large version there are two groups of inputs that can be powered at 230 Vac, terminals J8 and J19. Each group has two 230 Vac digital inputs, indicated as ID*H, and two 24 Vac/Vdc inputs, indicated as ID*.. The groups of 230 Vac inputs feature double insulation between them and the controller: the digital inputs connected can be 24 Vac/dc in one group and 230 Vac in the other. In each group, the two inputs have the same common pole. The insulation is main. Within each group the digital inputs must be powered at the same voltage (24 Vac, 28 to 36 Vdc or 230 Vac) to avoid dangerous short-circuits and/or the powering of lower-voltage circuits at 230 Vac

Note:

- the range of uncertainty for the activation threshold is from 43 to 90 Vac;
- the voltage must be 230 Vac (+10/-15%), 50/60 Hz.

Example 1: connection diagram with 230 Vac inputs.

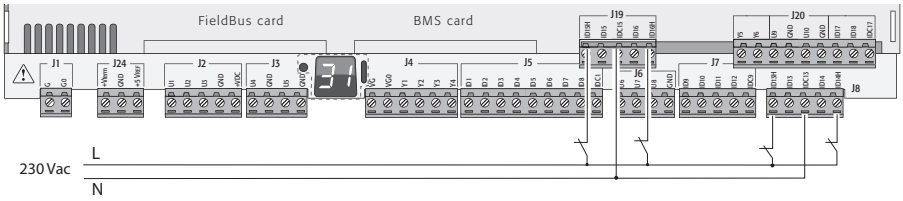



Fig. 10.f

Example 2: connection diagram with digital inputs at different voltages.

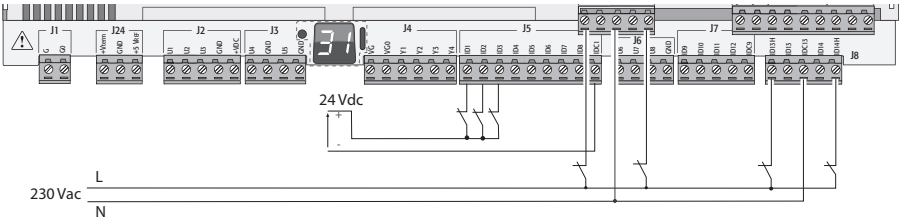



Fig. 10.g

## 10.3 Digital outputs

**Electromechanical relay digital outputs:** the controller features digital outputs with electromechanical relays. For ease of installation, the common terminals of some of the relays have been grouped together. See the following table as regards the type of insulation. Also see the table of the technical specifications.

| Type of insulation | |
|---|---|
| Between relays in same group | functional insulation |
| Between groups of relays | reinforced insulation |
| Between relays and rest of controller | reinforced insulation |

Note:
- inside each group, the relays have basic insulation and must have the same voltage (generally 24 Vac or 110/230 Vac);
- between groups of relays there is reinforced insulation and thus the groups can have different voltages.

Example connection diagram (LARGE model):

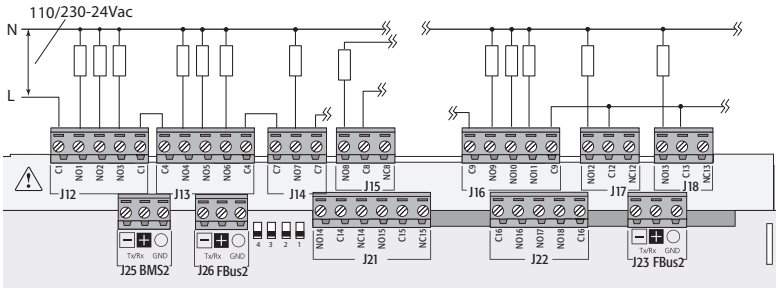



Fig. 10.h

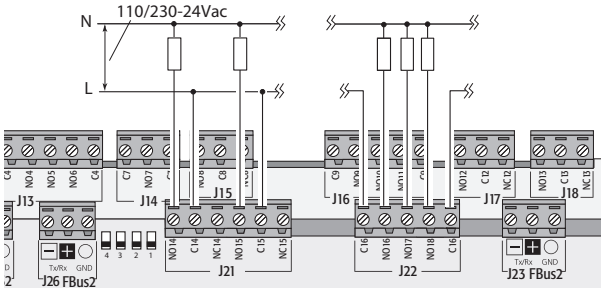



Fig. 10.i

**Important:** the current running through the common terminals must not exceed the rated current of an individual terminal (8 A). Some relays feature changeover contacts.

Relays with changeover contacts

| | pChrono model | |
|---|---|---|
| | Small | Large |
| No. outputs | 8 | 8, 12, 13 |

### Remote connection of digital outputs

The sizes of the cables based on the current are shown in the table below.

| Size (mm²)/AWG | Current (A) |
|---|---|
| 0.5/20 | 2 |
| 1.5/15 | 6 |
| 2.5/14 | 8 |

## 10.4 pChrono technical specifications

### Physical specifications

| | | | |
|---|---|---|---|
| Dimensions | SMALL | 13 DIN modules | 110 X 227.5 X 60 mm |
| | LARGE | 18 DIN modules | 110 X 315 X 60 mm |
| Plastic case | Assembly | fitted on DIN rail in accordance with DIN 43880 CEI EN 50022 | |
| | Material | technopolymer | |
| | Flammability | V2 (UL94) and 850 °C (in accordance with IEC 60695) | |
| | Ball pressure test | 125 °C | |
| | Resistance to creeping current | ≥ 250 V | |
| | Colour | Grey RAL 7016 | |
| Built-in terminal | pGD1 (132x64 pixel) with backlit keypad | | |

### Other specifications

| | |
|---|---|
| Operating conditions | -20T60 °C, 90% RH non-condensing |
| Storage conditions | -30T70 °C, 90% RH non-condensing |
| Ingress protection | IP20 on the front panel only |
| Pollution rating for disposal | 2 |
| Class according to protection against electric shock | to be integrated into Class I and/or II equipment in versions without valve driver |
| PTI of the insulating materials | PCB: PTI 250 V; insulating material: PTI 175 |
| Period of stress across the insulating parts | long |
| Type of action | 1C |
| Type of disconnection or microswitching | microswitching |
| Heat and fire resistance category | Category D (UL94-V2) |
| Ageing characteristics (operating hours) | 80,000 |
| Number of automatic operating cycles | 100,000 (EN 60730-1); 30,000 (UL60730) |
| Rated impulse voltage | 2500V |

## Electrical specifications

| | | | | | |
|---|---|---|---|---|---|
| Power supply | SMALL, LARGE: use a dedicated class II safety transformer, 50 VA.. | | | | |
| | | Vac | P (Vac) | Vdc | P (Vdc) |
| | SMALL | 24 Vac (+10/-15%), 50/60 Hz | 45 VA | 28-36 Vdc (-20/+10%) | 30 W |
| | LARGE | protected by external 250 A T fuse | | protected by external 250 A T fuse | |
| Terminal block | with male/female plug-in connectors | | | | |
| Cable cross-section | min 0.5 $mm^2$ - max 2.5 $mm^2$ | | | | |
| CPU | 32 bit, 100 MHz | | | | |
| Non-volatile memory (FLASH) | 9 Mbyte (2 Mbyte Bios + 7 Mbyte application program + 4MB logs) | | | | |
| Data memory (RAM) | 3.2 Mbyte (1.76 Mbyte Bios + 1.44 Mbyte application program) | | | | |
| T buffer memory (EEPROM) | 13 KByte | | | | |
| P parameter memory (EEPROM) | 32 kbyte (not available to the pLAN) | | | | |
| Working cycle duration (medium compl. applications) | 0.2 s (typical) | | | | |
| Clock with battery | standard, precision 100 ppm | | | | |
| Buzzer | can be enabled via software | | | | |
| Battery | lithium button battery type CR2430 voltage 3 Vdc (dimensions 24x3 mm) | | | | |
| Software class and structure | Class A | | | | |
| Category of immunity to voltage surges (EN 61000-4-5) | Category III | | | | |

Device not designed to be hand-held when powered

## Universal inputs/outputs (U...): Analogue inputs, Lmax = 30 m, (maximum number)

| | | SMALL | | LARGE |
|---|---|---|---|---|
| - CAREL NTC probes (-50T90°C; R/T 10 kΩ±1% at 25°C);<br>- HT NTC(0T150°C); - PTC (600Ω ...2200Ω)<br>- PT500 (-100T300°C) - PT1000 (-100T400°C) | | 5 | | 10 |
| - PT100 probes (-100T400°C) | | 2 | | 4 (2 on U1...U5,<br>1 on U6...U8, 1 on U9...U10) |
| - 0 to 1 Vdc/0 to 10 Vdc signals from probes powered by the controller (*) | max tot 5 | 5 | max tot 10 | 6 |
| - 0 to 1 Vdc/0 to 10 Vdc signals powered externally (*) | max tot 5 | 5 | max tot 10 | 10 |
| - 0 to 20 mA inputs /4 to 20 mA from probes powered by the controller (*) | max tot 4 | 4 | max tot 9 | 6 (max 4 on U1...U5, 3 on U6...U8, 2 on U9...U10) |
| - 0 to 20 mA inputs /4 to 20 mA powered externally (*) | max tot 4 | 4 | max tot 9 | 9 (max 4 on U1...U5,<br>3 on U6...U8, 2 on U9...U10) |
| - 0 -5 V signals from ratiometric probes powered by controller (*) | | 5 | | 6 |

Input precision: ± 0.3 % f.s.

Time constant for each input: 0.5 s

Classification of measuring circuits (CEI EN 61010-1): category I

## Digital inputs without optical-isolation, Lmax = 30 m (maximum number)

| | SMALL | LARGE |
|---|---|---|
| - voltage-free contacts | 5 | 10 |
| - fast digital inputs<br>type: voltage-free contact<br>max current: 10 mA<br>max frequency 2kHz and resolution ±1 Hz | max 2 | 6 (max 2 on U1...U5,<br>max 2 on U6...U8,<br>2 on U9...U10) |

**Important:**

- for active probes powered externally (0 to 1 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA ), to avoid irreparably damaging the controller, implement adequate current protection measures that must always ensure < 100 mA;
- the ratiometric probes can only be powered by the controller;
- on power-up, the universal inputs/outputs remain shorted to GND for around 500 ms until the end of the configuration procedure.

Power supply to probes and terminals:

Analogue outputs without optical-isolation (maximum number), Lmax = 30 m

| | | SMALL | LARGE |
|---|---|---|---|
| | 0 to 10 Vdc (*) (maximum current 2 mA) | 5 | 10 |
| | PWM (output 0/3.3 Vdc, maximum current 2 mA, frequency: 2kHz asynchronous, 100 Hz asynchronous) | 5 | 10 |
| +Vdc | the 24/21 Vdc ± 10% (*) available at terminal +VDC (J2) can be used to power any active probes. The maximum current available is 150 mA, protected against the short-circuits. | | |
| +5Vref | to power the 0 to 5V ratiometric probes, use the 5 Vdc (± 5%) available at terminal +5VREF(J24). The maximum current available is 60 mA. | | |
| Vterm | 24 Vdc ± 10% (*) Used to power an external terminal as an alternative to the one connected to J10, Pmax = 1.5 W | | |

**Important:** if the length exceeds 10 m, use shielded cable with the shield connected to earth. In any case, the max length allowed is 30 m.

Digital inputs (ID..., IDH...)

| | | | |
|---|---|---|---|
| Type | Optically-isolated | | |
| Lmax | 30 m | | |
| | | no. of opto-isolated inputs, 24 Vac or 24 Vdc | |
| Maximum number | SMALL | 8 | |
| | LARGE | 14 | |
| Minimum digital input pulse detection time | Normally open (open-closed-open) | 200 ms | |
| | Normally closed (closed-open-closed) | 400 ms | |
| Power supply to the inputs | External | IDH...: 230 Vac (+10/-15%) 50/60 Hz | |
| | | ID...: 24 Vac (+10/-15%) 50/60 Hz o 28...36 Vdc (+10/-20%) | |
| Classification of measuring circuits (CEI EN 61010-1) | Category I: 24 Vac/Vdc (J5, J7, J20) Category III: 230 Vac (J8, J19) | | |
| Digital input current draw at 24 Vac/Vdc | | 5 mA | |
| Digital input current draw at 230 Vac | | 5 mA | |

Analogue outputs (Y...)

| | | |
|---|---|---|
| Type | 0...10 V optically-isolated on Y1...Y6 | |
| Lmax | 30 m | |
| Maximum number | SMALL: 4 | LARGE: 6 |
| Power supply | external | 24 Vac (+10/-15%) or 28 to 36 Vdc on VG(+), VG0(-) (*) |
| Precision | Y1...Y6 | ± 2% full scale |
| Resolution | 8 bit | |
| Settling time | Y1...Y6 | from 1 s (slew rate 10 V/s) a 20 s (slew rate 0.5 V/s) selectable via SW |
| Maximum load | 1 kΩ (10 mA) | |

Important:

- for lengths > 10 m, only use shielded cable, with the shield connected to earth;
- a 0 to 10 Vdc analogue output can be connected in parallel to other outputs of the same type, or alternatively to an external source of voltage. The higher voltage will be considered. Correct operation is not guaranteed if actuators with voltage inputs are connected;
- power the VG-VG0 analogue outputs at the same voltage on G-G0: Connect G to VG and G0 to VG0. This is valid for both alternating and direct current power supplies.

Digital outputs (NO..., NC...)

| | |
|---|---|
| Type | Relay. Minimum contact current: 50 mA. |
| Maximum no. | 8: SMALL; 18: LARGE |
| Insulation distance | The relay outputs have different features depending on the model of controller. The outputs can be divided into groups. The relays belonging to the same group (individual cell in the table) have functional insulation and therefore must have the same voltage. Between groups (cells in the table) there is reinforced insulation and consequently these may have different voltages. There is also reinforced insulation between each terminal of the digital outputs and the rest of the controller. |
| | Relays with same insulation |

| | | Group | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Makeup of the groups | Model | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | SMALL<br>Type of relay | 1...3<br>Type A | 4...6<br>Type A | 7<br>Type A | 8<br>Type A | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- | -<br>- |
| | LARGE<br>Type of relay | 1...3<br>Type A | 4...6<br>Type A | 7<br>Type A | 8<br>Type A | 9...11<br>Type A | 12<br>Type A | 13<br>Type A | 14...15<br>Type A | 16...18<br>Type A | -<br>- | -<br>- |

| | |
|---|---|
| Number of changeover contacts | 1: SMALL (relay 8)<br>5: LARGE (relays 8, 12, 13, 14 e 15) |

**Note:** the output relays have different features, depending on the model of pChrono.

| | | | | |
|---|---|---|---|---|
| Switchable power | Type A relay | Rated data | SPDT, 2000 VA, 250 Vac, 8A resistive | |
| | | Approval | UL60730 | 2 A resistive, 250 Vac, 30,000 cycles Pilot duty C300, 240Vac, 30,000 cycles |
| | | | EN 60730-1 | 2(2)A, 250 Vac, 100,000 cycles |
| | Type B relay | Rated data relay | SPST, 1250 VA, 250 Vac, 5A resistive | |
| | | Approval | UL60730 | 1 A resistive, 250 Vac, 30,000 cycles Pilot duty C300, 240Vac, 30,000 cycles |
| | | | EN 60730-1 | 1(1), 250 Vac, 100,000 cycles |

**Important:**

- to power external loads, use the same power supply as the controller (connected to terminals G-G0); this must always be dedicated and not in common with the power supply to other devices on the electrical panel (such as contactors, coils, etc...);
- the groups that the digital outputs are divided into have two common pole terminals to simplify wiring;
- make sure that the current running through the common terminals does not exceed the rated current of an individual terminal, i.e. 8 A.

(*) class 2

Serial ports
use AWG 20-22 twisted pair shielded cable for the i +/-

| Serial | Type/connectors | Features |
|---|---|---|
| Serial 0 | pLAN/J10, J11 | • Integrated on main board<br>• HW driver: asynchronous half duplex RS485 pLAN<br>• Not optically-isolated<br>• Connectors: 6-pin telephone jack + 3-pin plug-in<br>• Maximum length: 500 m<br>• Max data rate: 115200 bit/s<br>• Maximum number of connectable devices: 32 |
| Serial ONE | BMS 1 Serial Card | • Not integrated on main board<br>• HW driver: not featured<br>• Can be used with all pCO family optional BMS cards |
| Serial TWO | FieldBus 1 Serial Card | • Not integrated on main board<br>• HW driver: not featured<br>• Can be used with all pCO family optional FieldBus cards |
| Serial THREE | BMS 2 / J25 | • Integrated on main board<br>• HW driver: asynchronous half duplex RS485 Slave<br>• Optically-isolated<br>• 3-pin plug-in connector p. 5.08<br>• Maximum length: 1000 m<br>• Max data rate: 384000 bit/s<br>• Maximum number of connectable devices: 16 |
| Serial FOUR | FieldBus 2 / J23 | • Integrated on main board<br>• HW driver: asynchronous half duplex RS485 Master/Slave<br>• J26: optically-isolated<br>• 3-pin plug-in connector p. 5.08 |

**Note:** in industrial/residential environments, for distances > 10 m, shielded cable is required, with the shield connected to earth. In residential environments (EN 55014), irrespective of the cable length, connection cable between the controller and the terminal and the serial cable must be shielded and connected to earth at both ends.

## 10.5 Standards compliance

| | |
|---|---|
| Electrical safety | EN 60730-1, EN 60730-2-9, EN 61010-1, UL60730 |
| Electromagnetic compatibility | Versions without valve driver: EN 61000-6-1, EN 61000-6-2, EN 61000-6-2/EC, EN 61000-6-2/IS1, EN 61000-6-3, EN 61000-6-4; EN 55014-1, EN 55014-2, EN 55014-2/EC, EN 55014-2/A1, EN 55014-2/IS1, EN 55014-2/A2<br>Versions with valve driver with or without Ultracap module: EN 61000-6-1, EN 61000-6-2, EN 61000-6-2/EC, EN 61000-6-2/IS1, EN61000-6-3, EN 61000-6-4 |

# 11. NOTE - SYSTEM CONFIGURATION

## 11.1 pChrono solution I/O table

pChrono

| Type | Label | Description | Scheduler | Switch | Button | SPV | Action on… | Note |
|---|---|---|---|---|---|---|---|---|
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| | ID5 | | | | | | | |
| | ID6 | | | | | | | |
| | ID7 | | | | | | | |
| | ID8 | | | | | | | |
| | ID9 | | | | | | | |
| | ID10 | | | | | | | |
| | ID11 | | | | | | | |
| | ID12 | | | | | | | |
| | ID13 | | | | | | | |
| | ID14 | | | | | | | |
| | ID15 | | | | | | | |
| | ID16 | | | | | | | |
| | ID17 | | | | | | | |
| | ID18 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| | NO5 | | | | | | | |
| | NO6 | | | | | | | |
| | NO7 | | | | | | | |
| | NO8 | | | | | | | |
| | NO9 | | | | | | | |
| | NO10 | | | | | | | |
| | NO11 | | | | | | | |
| | NO12 | | | | | | | |
| | NO13 | | | | | | | |
| | NO14 | | | | | | | |
| | NO15 | | | | | | | |
| | NO16 | | | | | | | |
| | NO17 | | | | | | | |
| | NO18 | | | | | | | |
| Universal inputs | U1 | | | | | | | |
| | U2 | | | | | | | |
| | U3 | | | | | | | |
| | U4 | | | | | | | |
| | U5 | | | | | | | |
| | U6 | | | | | | | |
| | U7 | | | | | | | |
| | U8 | | | | | | | |
| | U9 | | | | | | | |
| | U10 | | | | | | | |
| Analogue outputs | Y1 | | | | | | | |
| | Y2 | | | | | | | |
| | Y3 | | | | | | | |
| | Y4 | | | | | | | |
| | Y5 | | | | | | | |
| | Y6 | | | | | | | |

| Type | Label | Description | Scheduler | Switch | Button | SPV | Action on… | Note |
|---|---|---|---|---|---|---|---|---|
| **pCOe addr. #2** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #3** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #4** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |

| Type | Label | Description | Scheduler | Switch | Button | SPV | Action on… | Note |
|---|---|---|---|---|---|---|---|---|
| **pCOe addr. #5** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #6** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #7** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |

| Type | Label | Description | Scheduler | Switch | Button | SPV | Action on… | Note |
|---|---|---|---|---|---|---|---|---|
| **pCOe addr. #8** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #9** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |
| **pCOe addr. #10** | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |

| Type | Label | Description | Scheduler | Switch | Button | SPV | Action on… | Note |
|---|---|---|---|---|---|---|---|---|
| pCOe addr. #10 | | | | | | | | |
| Digital inputs | ID1 | | | | | | | |
| | ID2 | | | | | | | |
| | ID3 | | | | | | | |
| | ID4 | | | | | | | |
| Digital outputs | NO1 | | | | | | | |
| | NO2 | | | | | | | |
| | NO3 | | | | | | | |
| | NO4 | | | | | | | |
| Analogue inputs | B1 | | | | | | | |
| | B2 | | | | | | | |
| | B3 | | | | | | | |
| | B4 | | | | | | | |
| Analog out. | Y1 | | | | | | | |

| Type | Label | Description | Action on… | Note |
|---|---|---|---|---|
| SA wireless sensor addr. #16 (T/H) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| SA wireless sensor addr. #17 (T/H) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| SA wireless sensor addr. #18 (T/H) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| SI wireless sensor addr. #21 (T/H/LUX) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| | LUX | | | |
| SI wireless sensor addr. #22 (T/H/LUX) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| | LUX | | | |
| SI wireless sensor addr. #23 (T/H/LUX) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| | LUX | | | |
| SI wireless sensor addr. #24 (T/H/LUX) | | | | |
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| | LUX | | | |

SI wireless sensor addr. #25 (T/H/LUX)

| | | | | |
|---|---|---|---|---|
| Analogue inputs | Temp. | | | |
| | Humid. | | | |
| | LUX | | | |

Wireless plug addr. #26

| Type | Description | Scheduler | Switch | Plug | Action on… | Note |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #27

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #28

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #29

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #30

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #31

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #32

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #33

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #34

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Wireless plug addr. #35

| | | | | | | |
|---|---|---|---|---|---|---|
| 10A socket | | | | | | |

Time bands

| Time band | Start | End |
|---|---|---|
| Time band 1 | | |
| Time band 2 | | |
| Time band 3 | | |
| Time band 4 | | |
| Time band 5 | | |
| Time band 6 | | |
| Time band 7 | | |
| Time band 8 | | |
| Time band 9 | | |
| Time band 10 | | |

| Time band | Start | End |
|---|---|---|
| Time band 11 | | |
| Time band 12 | | |
| Time band 13 | | |
| Time band 14 | | |
| Time band 15 | | |
| Time band 16 | | |
| Time band 17 | | |
| Time band 18 | | |
| Time band 19 | | |
| Time band 20 | | |

Periods

| Period | Start | End |
|---|---|---|
| Period 1 | | |
| Period 2 | | |
| Period 3 | | |
| Period 4 | | |
| Period 5 | | |

| Period | Start | End |
|---|---|---|
| Period 6 | | |
| Period 7 | | |
| Period 8 | | |
| Period 9 | | |
| Period 10 | | |

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