pChrono
the lighting management
solution

pChrono: supermarket lighting and load control system

Innovative solution for precise control of lighting, combining occupancy sensors, dimming, daylight-linking, scheduling and brightness profiles, all easy to configure, and all on one controller.

An intelligent and reliable system that works independently, without affecting comfort, safety or security

A complete, modular and flexible solution for:

- managing lighting control needs
- reducing running costs and energy wastage
- increasing integration with HVAC/R systems

A smart controller…

The pChrono control system monitors the lights in a supermarket, creating the right atmosphere for every different section. Appropriately highlighting the goods on display while saving energy and ensuring integration between artificial and natural light are just some of the benefits of the pChrono system.
A complete solution, designed to cut costs and enhance the shopping experience for customers.

…that's also eco-friendly

Lighting accounts for more than 30% of a supermarket's energy bill. Nonetheless, reducing power consumption does not have to mean affecting the quality of lighting, which in supermarkets and stores not only represents a fundamental component in terms of comfort, but above all is an important factor in encouraging customers to purchase the goods on sale.

Energy Saving

The right light, when it's needed. Scheduling, dimming, integration with natural light…small steps that bring significant savings.

Responsibility

The lower the energy consumption, the lower the CO2 emissions; CAREL helps sustain environmentally-friendly energy usage.

Reliability

A high-tech product that's reliable and easy to install, developed based on CAREL's experience in the field of precision electronic controllers.

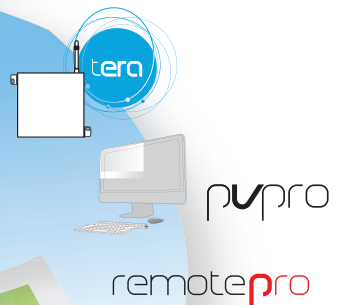# pChrono: we give light to your needs

FEATURES

- Scheduler with 20 time bands and 10 periods
- 15 special periods for managing exceptions
- Smart Wizard for system configuration
- Easy integration and interaction with HVAC systems
- pCOe expansion modules
- Wireless I/O management
- Error-free I/O configuration
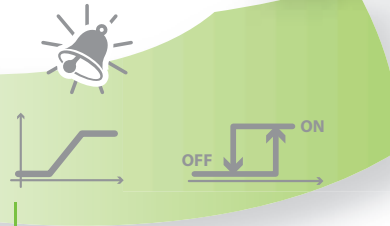- Interaction with PlantVisorPRO ECO-HVAC and ENERGY plug-ins

CONNECTIVITY

- Integration with PlantVisorPRO system as standard
- RemotePRO
- tERA

LIGHTING

- Management of over 50 light fixtures
- Synchronous management of 20 lighting areas
- Integration of wireless or wired brightness sensors
- Integration of occupancy sensors
- Dimming based on brightness set point
- Reduction in light intensity according to occupancy
- Stage-controlled switch on of lights with burglar alarm
- Astronomical twilight management thanks to interaction with PlantVisorPRO

COMPLETE AUTOMATION

- ON/OFF or modular (0-10V) load management
- Scheduling of generic loads or by event
- Accessible toilet alarm management
- Fish counter sink drain pulse function
- Management of common inputs for generic activation
- Alarm log from digital input
- Alarm log for analogue inputs with specific thresholds and delays

Flexibility
Easy installation and configuration: a solution that effortlessly offers solutions for many needs.

Integration
Just one solution, perfectly supported by the PlantVisorPRO BMS for integration and interaction with HVAC/R systems.

Professionalism
A team at your service, to identify the best solution for your needs.

A versatile system, with ample possibilities

Constant monitoring of the environment, in relation to brightness and occupancy, means the system can automatically adjust lighting based on different needs.

A system that exchanges information is an efficient system that can bring significant cost savings in a short time.

Outdoor lighting (car parks)

In outdoor areas, it is important to create an atmosphere that is welcoming, bright and safe. Correct management of these areas means cost savings, reliability, safety and security.

pChrono   Access Point

Office lighting

An efficient supermarket is also the result of an active, dynamic and well-equipped back-office. The right visual comfort also needs to be guaranteed in the offices, exploiting natural daylight as much as possible

Wireless plug with energy meter function

Wireless temperature, humidity and brightness sensor

Indoor occupancy and
brightness sensor

Router Bridge

pCOe I/O
expansion
module

Outdoor occupancy
and brightness sensor

Lighting in storage areas

Uniform lighting in areas where
goods are handled and stored is
fundamental, as it simplifies visual
inspection and improves staff
efficiency

Accent lighting

Highlight the fresh fruit & veg,
the meat, fish and dairy, with
narrow-beam cones of light, drawing
customer attention and distinguishing
what is important from what
is not, bringing the produce visually to
the forefront

Background lighting
(aisles and check-outs)

Uniform, shadow-free light makes
shopping safe, both along aisles and at
the check-out.

PlantVisorPRO

Wireless temperature and
humidity sensor

The right light for every need

The pChrono solution can give your supermarket added value in many different ways; specific functions have been designed for every part of the supermarket: from the sales floor to the storage areas, car park and check-outs.

Giving the right importance to each.

Intelligent use of natural daylight and lighting profiles before opening and after closing
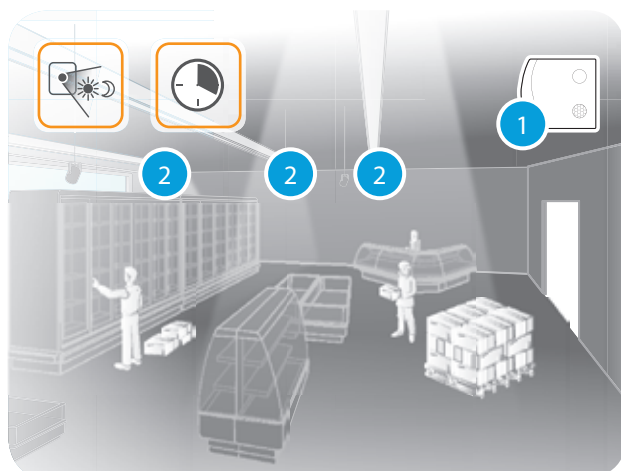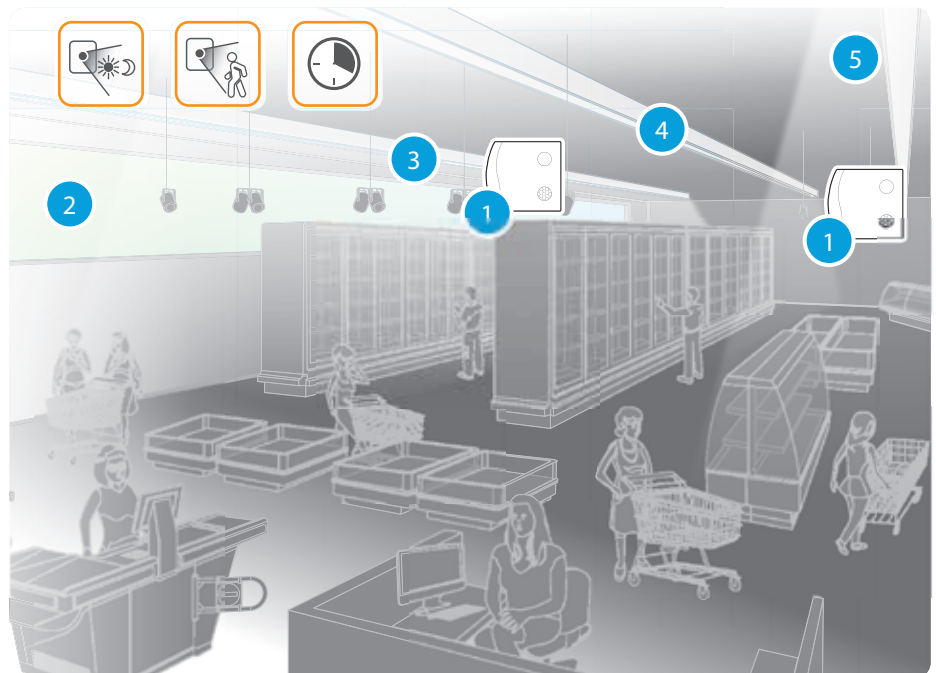
Background lighting (aisles and check-outs)

The use of brightness sensors ensures visual comfort at all times when the store is open, as well as complying with legislation in force, where possible using a combination of artificial light and natural daylight.

Optional occupancy sensors can be integrated to anticipate customers' need for light.

Store trading hours

1. *Brightness sensor, Set point 700 LUX*

2. *External natural light source*

3. *Lights dimmed to 40% of total power*

4. *Lights dimmed to 65% of total power*

5. *Lights dimmed to 80% of total power*

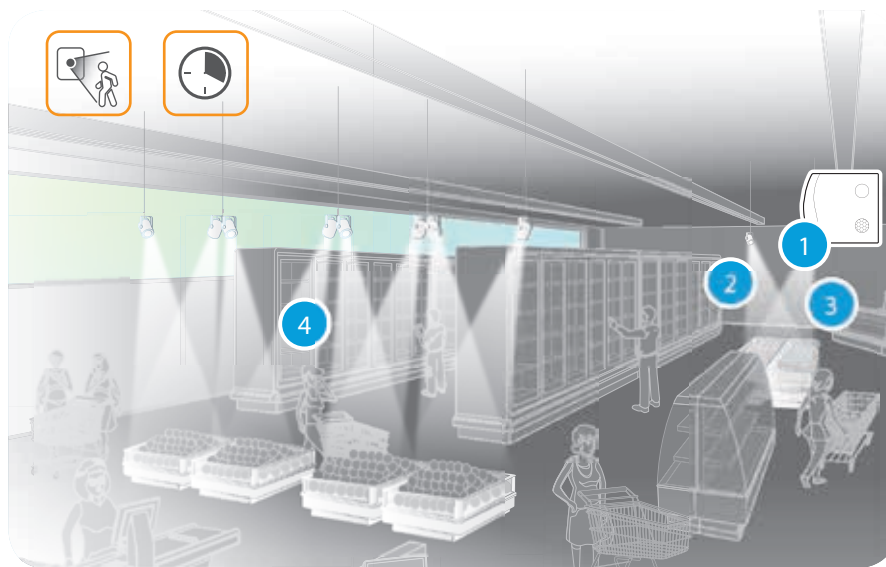### Before opening and after closing times

1. *Brightness sensor, Set point 400 LUX*

2. *Lights dimmed to 30% of total power*

arianna
a CAREL company

Founded in 2009, Arianna S.p.A. is a company specialising in the design and manufacture of LED lighting systems for public areas, roads, tunnels, roundabouts and commercial areas. Part of the Carel group since 2012, the company today also offers patented lighting solutions for the retail industry.

Promotional areas (accent lights)

We offer precise scheduling, including integration of occupancy sensors to make promotional areas even more appealing.
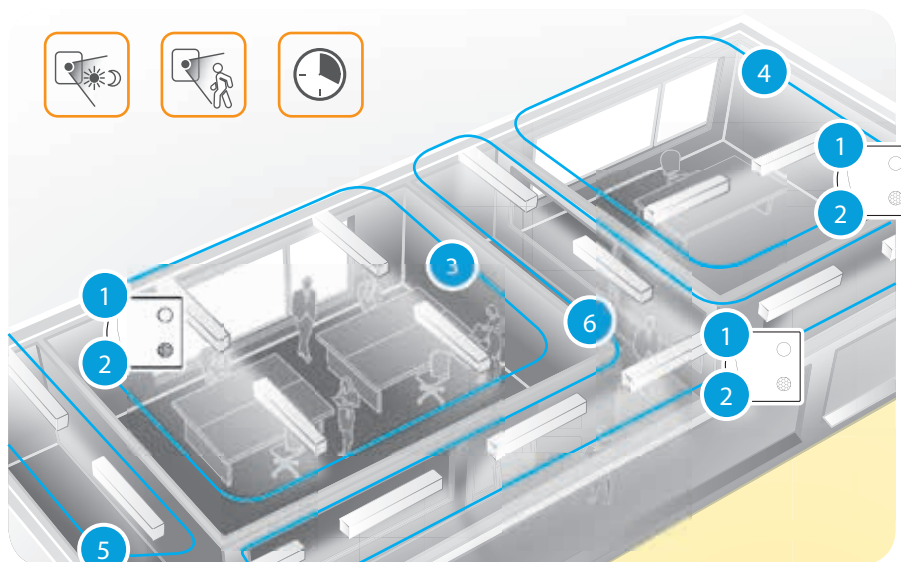

Attract customer attention by bringing the products visually to the forefront.

1 *Occupancy sensor*

2 *Lights dimmed to 70% of total power, without customers near the promotional stands*

3 *Lights dimmed to 100% of total power, with customers in the area*

4 *Lights on at full power during trading hours*

Office lighting

A zone controller is used to split the environment into separate working and meeting areas. pChrono interacts with the brightness sensors to ensure a perfect balance of natural daylight and artificial light; continuous control based on the brightness set point, supported by specific sensors.

Natural light combined harmoniously with artificial light

1 *Brightness sensor, Set point 500 LUX*

2 *Occupancy sensor*

3 *Area occupied, lights dimmed to 40%, integration with natural daylight*

4 *Area not occupied, lights off*

5 *Aisle not occupied, lights dimmed to 30%*
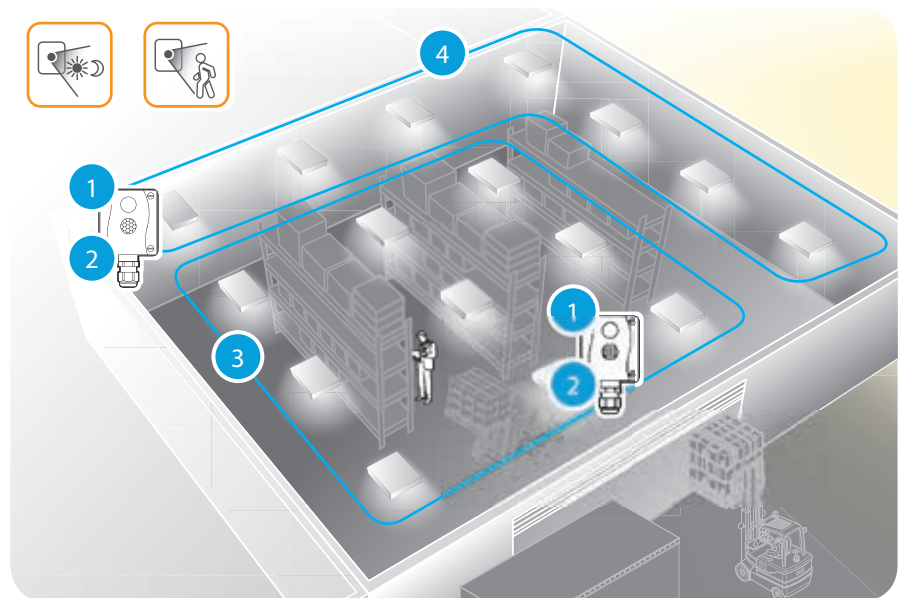
6 *Aisle occupied, lights on at full power*

A functional lighting system that anticipates the operations carried out by store personnel and makes the work environment safer

1. *Brightness sensor, Set point 400 LUX*

2. *Occupancy sensor*

3. *Area occupied, lights on at full power*

4. *Area not occupied, lights dimmed to 15%*

Lighting in storage areas

Different zones can be managed in the same store, with a light switched on in each when needed. The use of occupancy sensors guarantees the correct amount of light to ensure a completely safe environment.
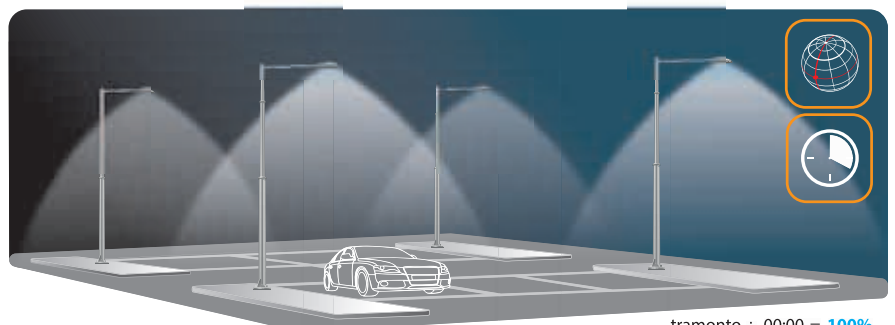

The precision of astronomical twilight management and the flexibility of pChrono

1. *Astronomical twilight configured on PlantVisorPRO*

2. *Tim scheduling to control lights at 50%*

Outdoor lighting (car parks)

The Geo-Lighting astronomical twilight option available with the ECO-HVAC plug-in on the Carel supervisory system calculates, based on the site's latitude and longitude, the time of sunrise (switch off) and sunset (switch on).

The interaction between pChrono and the supervisory system guarantees that the systems switch on simultaneously, even in multiple installations. Moreover, the system can be activated at part capacity (on-off or dimming) after a certain time.

tramonto ÷ 00:00 = **100%**
00:00 ÷ alba = **50%**

The Carel supervisory system

> Intelligence does not lie in the single controller, but rather in an integrated system that interacts and exchanges information.

The Carel BMS is designed to satisfy the needs of all supermarkets. PlantVisorPRO can in fact integrate all standard Carel devices, highlighting the features, the main information and providing all users a specific access profile.

pChrono is integrated into the supervisory system with a neat and simple graphic interface, yet at the same time showing a complete set of information from the field; from the status of an individual light fixture, to its physical connection. It also acts as a commissioning tool to help installers change any settings with a simple click.

Main screen

Just one simple and dynamic screen offering a complete overview: system configuration, loads managed, signal quality, wireless sensor battery level, etc.

Lighting areas in detail

Each area is shown as it is configured. Users can interact with the system by switching each individual light on or off manually. The name of the areas can be edited for easier identification.

energy

lighting

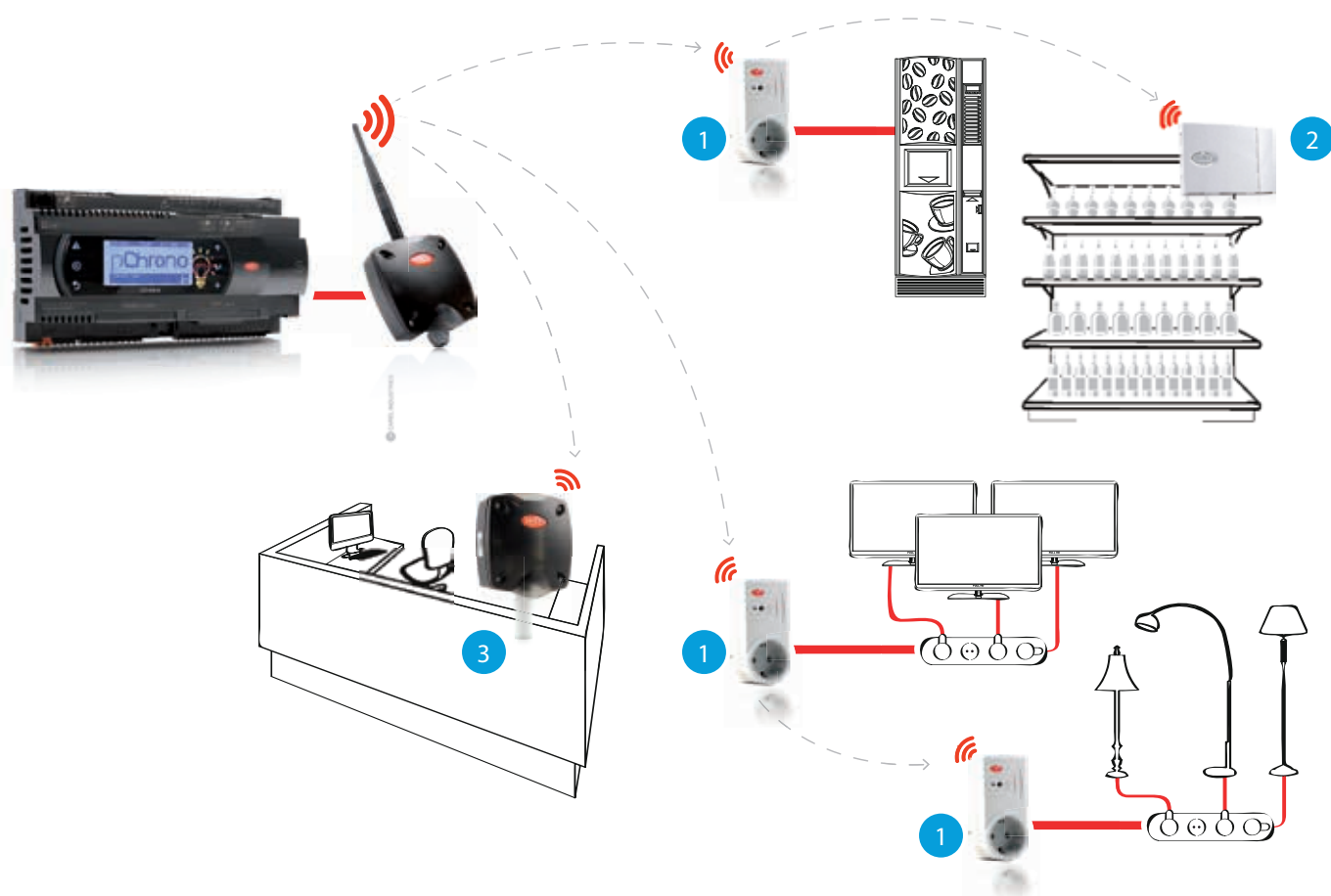alarms

air-conditioning

refrigeration

The other faces of pChrono

Carel, always paying heed to customer requirements, has added a series of transversal functions to pChrono that combine together to give the offering added value, providing users special algorithms to ensure energy saving and easy operation.

pChrono adds more value to the lighting needs , giving opportunities for greater savings.

pChrono add the integration of devices to the lighting system, thus increasing the efficiency of the supermarket as a whole. Not only does it give added value to each of the lighting areas, but, thanks to wireless technology, pChrono can also monitor the power consumption of single-phase loads, and schedule their operation flexibly and precisely. Such loads managed include Carel ultrasonic humidifiers, making the fresh vegetables on sale and consequently the entire store more appealing. System integrators are offered a whole range of specific functions to optimise, for example, the activation of extractor fans, the lawn irrigation system and opening of car park boom gates.
pChrono can moreover log any type of alarm from digital inputs and, using PlantVisorPRO, offer precise and detailed reports on the logged events.
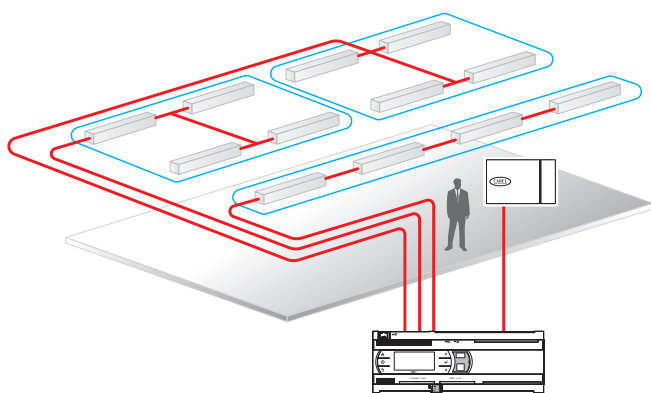
1   *Monitoring of energy consumption and scheduling for loads that are often forgotten to be switched off or simply left in standby*

2   *Monitoring of temperature/humidity for wine and similar areas, where temperature/humidity control is needed for product sales*

3   *Monitoring of temperature/ humidity in areas where goods are handled and light intensity needs to be controlled in compliance with legislation in force*
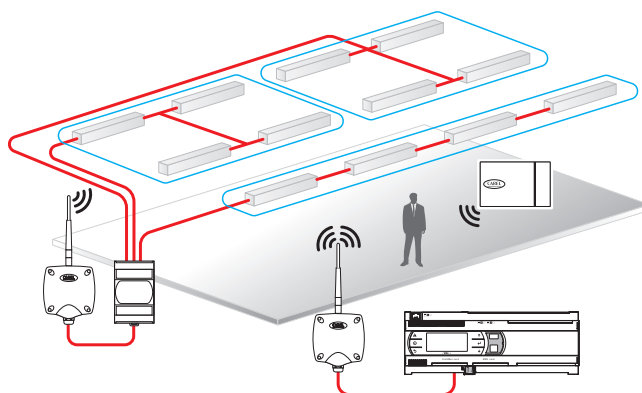
Traditional installation

Traditional connection in which each element, or lighting area, is connected to the pChrono system.
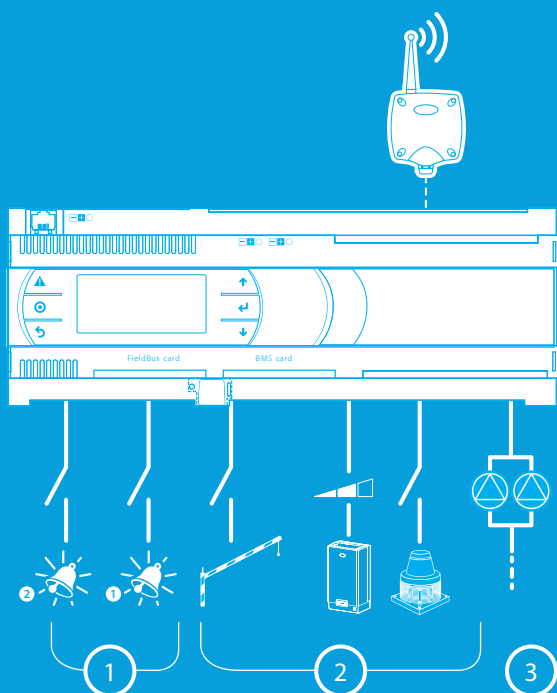
Wireless installation

The same installation fitted with the Carel wireless system, in which pChrono controls the lights via a wireless mesh network, and at the same time reads information on temperature, humidity and brightness in the environment.

The simplicity and versatility of a complete system

1 *Possibility of alarm signals with different activation priorities*

2 *Management of boom gates for controlled access, proportional humidification request and field automation devices, such as the opening of skylights and dampers*

3 *Control of domestic hot water pumps, with rotation of two pumps (one as backup)*

4 *Lighting control, probe readings and alarm management with wireless system*

A complete system

① pChrono

The innovative CAREL controller for the management of lighting and loads in supermarkets.
Available in Small (8 dig. out) or Large sizes (18 dig. out), the solution is scalable and can manage up to more than 50 light fixtures.
It can also manage any load that requires precise and customised scheduling. Completely integrated into the PlantVisorPRO supervisory system

② Motion and brightness sensors

Combined motion and brightness sensors with 4 to 20 mA signal, for indoors and outdoors.

③ pCOe module

I/O expansion module, 4 modules, with 4 digital inputs/outputs, 4 analogue inputs and one analogue output.

④ Access Point & Router Bridge

Gateway and Router Bridge for the wireless connection of field devices to pChrono.

⑤ Wireless plugs

Devices that integrate the energy meter and router functions and can control up to 10 A loads.

⑥ Sensori wireless

SA –Wireless temperature/humidity sensor

Battery-powered wireless sensor, simple design, able to read both temperature and humidity.

SI – Wireless temperature/humidity and brightness sensor

Battery-powered wireless sensor, for industrial environments, for monitoring temperature , humidity and brightness.

⑦ PlantVisorPRO

Monitoring and supervision solution for integration with HVAC/R systems.

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