High
Efficiency
Solutions.

CAREL

New Product Launch

SmartCella

Essential solution for small cold rooms

Dear All,

We are pleased to present SmartCella, a new range of controllers based on the know-how and experience acquired with MasterCella.

SmartCella, together with UltraCella and MasterCella, completes and enhances the CAREL offering for cold rooms.

Main pillars of SmartCella:

- **Smart solution** based on standard electronic controller integrated in an industrial designed IP65 box
- **Flexible and expandable** with additional contents
- **Cost-effective solution** for basic features and component price driven requirements

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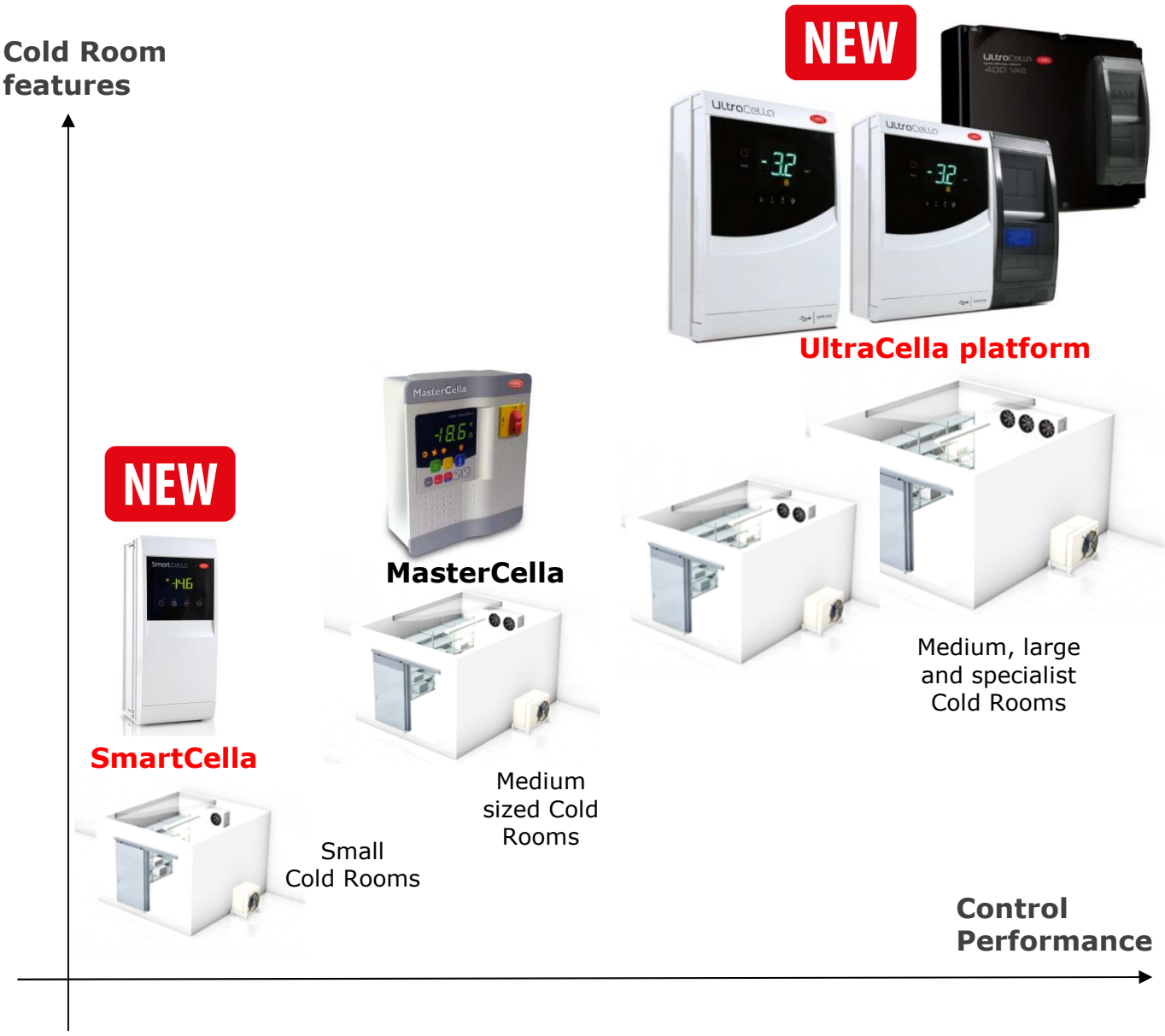
1. The "Cella" range

CAREL can now offer a wide range of solutions for all cold rooms, to fit all needs in terms of types, features and sizes.

UltraCella: new generation of controllers based on the latest CAREL technology and innovative modular mechanical concept. The contents have already been explained in detail in a specific product launch .

MasterCella: solution already present on the market and well known by our sales network and customers.

SmartCella: essential solution for small cold rooms. This is based on the standard ir33+ electronic controller fitted in **UltraCella** plastic expansion box.



2. SmartCella – Benefits and pillars

SmartCella is the essential new solution for small cold rooms, based on the know-how and experience acquired with MasterCella.

Target applications are the kind of cold rooms that require basic features in relation to small volumes (<**20m^3**) or basic requirements:

- Restaurants
- Resorts
- Butchers
- Greengrocers

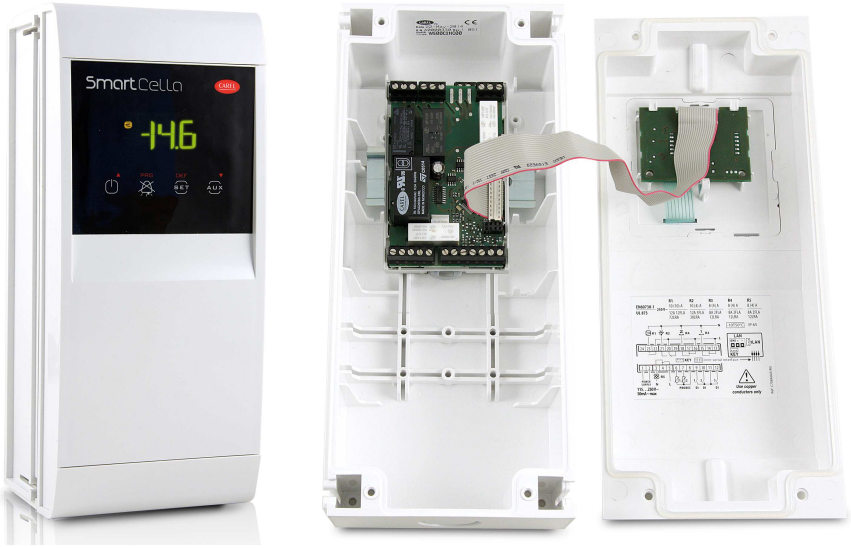
SmartCella adds value to applications typically managed by installers, with a 29x71mm electronic controller on a commercial plastic panel.

2.1 Smart solution

SmartCella can satisfy the need of target applications (small volumes <**20m^3** and essential cold rooms) in terms of:

- Features
- Installation
- Usability
- Expandability
- Flexibility

with an essential but powerful solution.
It is **based on a standard controller integrated in an industrial designed IP65 box**



- **Hardware / Firmware**: ir33+ platform based
- **Box**: **IP65** UltraCella expansion module box
- **Aesthetic**: new membrane keypad
- **Additional contents**: space available in the bottom half for:
  - 3 HP relay
  - Contactors, isolators, auxiliary terminals,…

This choice also allows family-feeling aesthetics with UltraCella for a **uniform offering**.

In terms of P/Ns, only a couple of models directly related to I/Os and features necessary for the applications.

NT (normal temperature) cold rooms
Small normal temperature cold rooms normally do not require heater defrost (evaporation temperature above 0°C) and specific evaporation fan management. Often a controller with one relay for the compressor is sufficient → **model with 1 relay output**

output	inputs				
Relay	Sensors/ Digital inputs				
Compressor	B1	B2	B3	B4	B5
16A, voltage free	NTC		NTC Digital inputs		

LT (low temperature) cold rooms
Small low temperature cold rooms (freezing rooms) normally require heater defrost (evaporation temperature below 0°C) and specific evaporation fan management. In addition to this, it may be helpful to also manage the door switch and light, or an alarm → **model with 4 relay outputs**

output				inputs				
Relays				Sensors/ Digital inputs				
Compressor	Defrost heaters	Evaporators fans	light / aux	B1	B2	B3	B4	B5
2HP, voltage free	16A, voltage free	8A, voltage free	8A, voltage free	NTC		NTC Digital inputs		



Compressor management

- **16A / 2HP (10A) voltage free relay**
- Safe cold room working mode in case of virtual probe failure (**duty setting** function) to prevent food deterioration before service action
- **Second step compressor with automatic rotation** (with AUX relay). This smart function is helpful to prevent compressor wear and to ensure balanced activation.
- **Time delayed second compressor**

Defrost management

- **16A voltage free relay**
- Defrost with heater / hot gas, both by time or by temperature (with defrost probe)
- **Auxiliary evaporator management**, by time or by temperature (AUX relay can activate second defrost heater)
- Defrost scheduled by time and by Supervisor

- Defrost activation by button on keypad and by digital input, with/without delay (useful in case of synchronised defrost across multiple units or otherwise manually controlled by an external contact)
- **Smart defrosts**: possibility to perform defrost in accordance with compressor working time, calculation of defrost time, and eventual skipping, in relation to previous defrosts.

Evaporator fan management

- **8A voltage free relay**
- Standard ir33+ / MasterCella algorithms

Other functions related to AUX relay

- **8A voltage free relays**
- Immediate and delayed alarm, normally open and normally closed
- **Light**: standard ir33+ / MasterCella algorithm 
- **Condenser fan activation**: the condenser fans can be activated in accordance with real condensing temperature, instead of being activated together with compressor (common connection when this option is not available). In this case, some energy saving can be achieved since the fans are activated when exceeding a programmable threshold)
- **Pump down valve**: Pump down is helpful to completely empty the evaporator of refrigerant whenever the compressor stops. After this phase, the compressor can be safely switched off, so that no liquid is present the next time the compressor is started. This can be performed by pressure switch or by time
- **Reverse output (heating) with dead band**

Sensors

- **B1**: NTC 1. Already set as roomprobe
- **B2**: NTC 2.
  Configurable as:
  - Room probe 2
  - Defrost probe
  - Product probe
  - Condenser probe
  - Antifreeze probe
- **B3/B4/B5**: NTC 3/4/5 or digital input DI 1/2/3.
  As NTC, configurable as:
  - Room probe 2
  - Defrost probe
  - Product probe
  - Condenser probe
  - Antifreeze probe

  As digital input DI, configurable as:
  - **Immediate or delayed alarm**
  - **Door switch**
  - **Enable defrost**
  - **Start defrost:** this feature is useful in case of synchronised defrost across multiple units, or otherwise manually controlled by an external contact
  - **Remote ON/OFF**
  - **Low pressure switch**: to signal low pressure alarm and stop compressor, when Pump Down valve is set
  - **AUX relay activation**
  - **Continuous cycle activation**

- **Smart logic based on average measurement of 2 temperature sensors**: control temperature can be calculated by a weighted average of temperatures read by 2 probes configured as room probe

Improvements over ir33/MasterCella

NEW New functions on SmartCella vs ir33/MasterCella:

- **Modbus and Carel protocols with auto-recognition**: thanks to built-in serial port (slave), SmartCella can be integrated in networks with supervisory systems (external serial converter IROPZ485% or serial card IROPZSER30 is necessary).

- Defrost temperature shown directly on display
- User-friendly messages on display during navigation

Easy to use

SmartCella satisfies all cold room user requirements, in all the working phases:

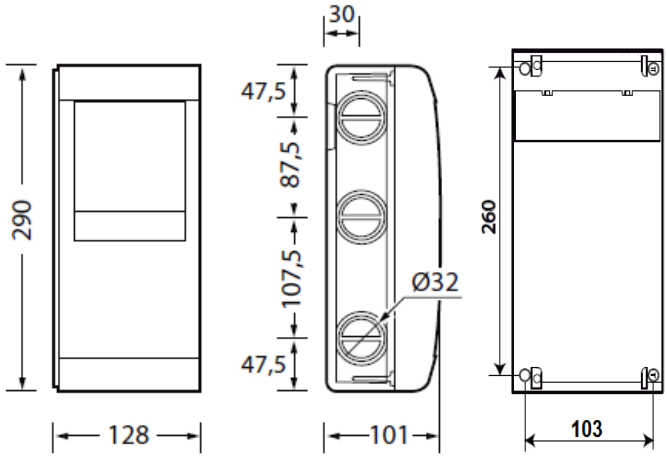
- **Installation** and **commissioning → installers**.
  Our aim is save their time, and this is possible because SmartCella uses electronics that are already well known by our customers

- **Daily use → end users (butchers, greengrocers, restaurateurs…)**.
  They need a clear and simple user interface to obtain the basic information needed

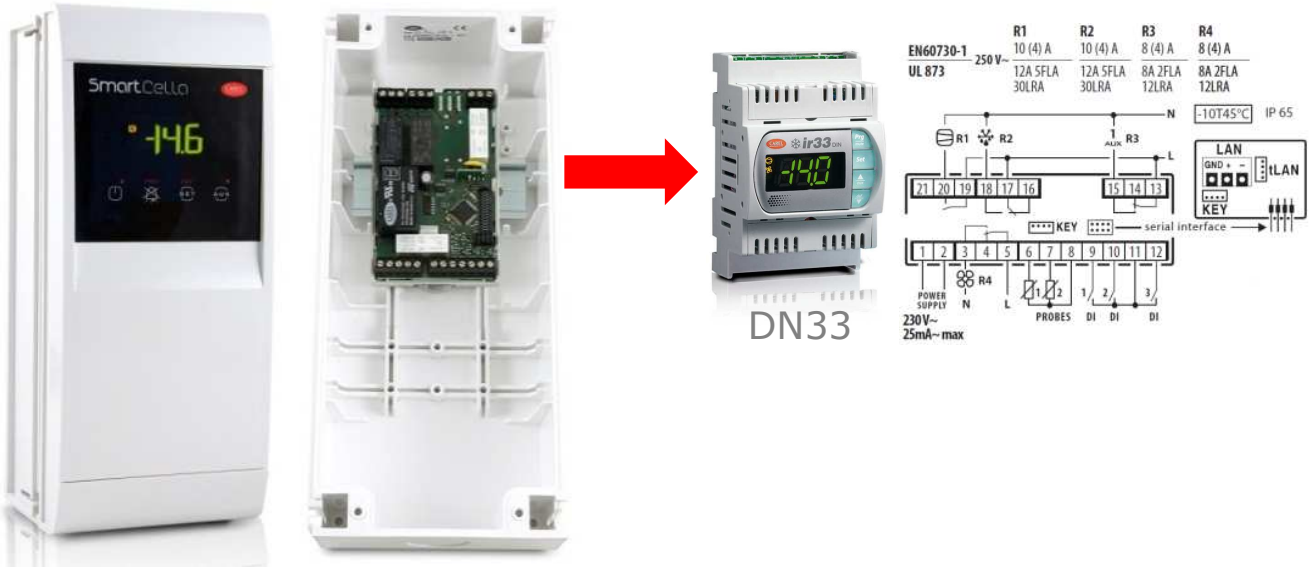
Installation

SmartCella reduces installation and cabling times thanks to…

NEW ➢ **Track for DIN rail** for fast wall mounting



➢ I/O board (**ir33 DIN**) more suitable for installation inside box than standard panel controller



➢ Standard and already well known ir33 DIN **wiring diagrams**

Commissioning and daily use

SmartCella is easy to commission and use in daily work thanks to…

- **ir33+ logic based**:

  Customers who are already familiar with these products won't have start-up and learning issues with SmartCella, since:

  - **Control algorithms**
  - **Parameters**

- A **simple** and **user-friendly user interface**, with:

  - Touch keypad, with large buttons. Feature/button matching is the same as ir33+
  - Large and bright display (ir33+ pure green display, +30% compared to ir33)
  - Contextual messages on display during navigation
  - Editing of parameters by pressing PRG button only

HACCP

SmartCella is compliant with **HACCP International for food safety**.
HACCP International provides validation of a product's 'fit for purpose' and world's best practice in terms of food safety, in accordance with the standards of HACCP International's Food Safety Certification Systems.
SmartCella satisfies, as well as temperature control requirements, also hygiene requirements for food preservation equipment thanks to its flat and touch keypad.

2.2 Flexible and expandable with additional contents

Expandable

SmartCella is easily expandable with additional contents thanks to the choice to use the UltraCella expansion module box.
In addition to providing IP65 protection and family-feeling with the UltraCella platform, this choice allows **free space available** inside the box. This is particularly important, as very often it is almost difficult to forecast in advance specific cold room requirements in terms of additional electrical devices and/or features.

- Models with **free space** (electronic controller only) in the bottom half of the box
- Extremely flexible, as there is the possibility to add electrical devices or additional features, such as
  - External relays
  - Contactor
  - Auxiliary terminals
  - …

- Model with **additional 3HP (30A)** relay for compressor
  - Cooling capacity increased to handle up to 20m^3 volume cold rooms

SmartCella can take advantage of the UltraCella modular platform. The innovative mechanical architecture allows seamless addition of add-on features.

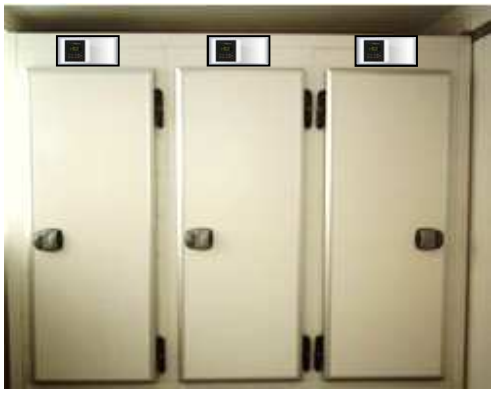
- Thanks to the new modular mechanical system, SmartCella can have **add-on contents coming from the UltraCella platform**:
  - **Ultra EVD module**
  - **Ultra Power module**

N.B. Serial communication between SmartCella and EVD module is not possible

Flexible

In some applications there is no space to put the controller next to the cold room door, especially for very small cold rooms, as the door occupies almost the entire width of the front surface. Thanks to the possible horizontal layout, SmartCella can be placed in the small space available between the top jamb of the door and the ceiling.
Placing the controller above the door can also be helpful when end users are not allowed to access the user interface.

- **Vertical layout**
  - suitable to be placed next to the cold room door

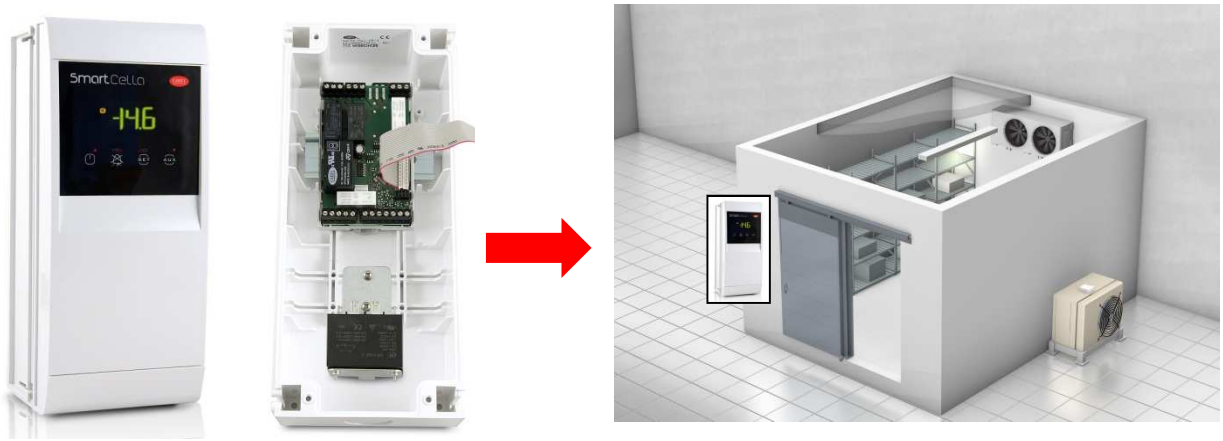


- **Horizontal layout**
  - suitable to be placed above the door when there is lack of space
  - or when end user should not access the user interface

Application examples

- **SmartCella 4 relays** → Low temperature cold rooms up to **15m^3** in volume, **single phase**, cooling capacity up to **2HP** (10A)

- **Smartcella 4 relays + 3Hp relay** → Low temperature cold rooms up to **20m^3** in volume, **single phase**, cooling capacity up to **3Hp** (30A)



3. List price and availability

SmartCella	Code	Description	List price	Availability
	**WE00S1EN00**	SMARTCELLA 230VAC 1 RELAY 16A 180G SCREW TERMINALS	**97,20 €**	**August '14**
	WE00C2HN00	SMARTCELLA 115/230VAC 4 RELAY 2HP 8A 8A 8A 180G SCREW TERMINALS	**119,40 €**	**August '14**

Models with 3HP relay and horizontal models will be available on request after specific business opportunity evaluation.

4. Documentation

Document		Code	Availability
Brochure	SmartCella presentation (Italian)	+3000088IT	On KSA and online in corresponding section on carel.com by 08/08/2014
	SmartCella presentation (English)	+3000088EN	
Technical leaflets	SmartCella characteristics and parameters	+0500091IE	Online in corresponding section on carel.com by 01/08/2014
	SmartCella settings and main features	+0500090ML	
User Manual*	SmartCella platform (Italian)	+0300084IT	Online in dedicated section on carel.com by 12/09/2014
	SmartCella platform (English)	+0300084EN	
Power Point presentations (Italian and English)			On KSA by 25/07/2014

***This document is an annex to the ir33+ User Manual (+0300028EN) to explain SmartCella mounting and installation only. The SmartCella application manual is the same as for the ir33+, to be used as reference for functions, algorithms and parameters details.**

For any information on this product please contactus.