

# pCO<sub>2</sub> Overview

February 2010  
Air Conditioning Business Unit



Integrated Control Solutions & Energy Savings

# pCO5



# pCO5 Overview



The most advanced CAREL programmable controller.

Designed for multiple applications in the fields of air-conditioning and refrigeration.

# pCO5 Overview



**Back  
Compatibility  
with pCO3**



# pCO5: Back compatibility with pCO3



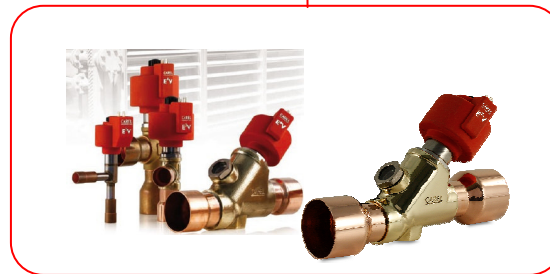
**Hardware: *Pin to pin compatible to pCO3***

**Software: *pCO3 Bios emulator built-in***

# pCO5 Overview

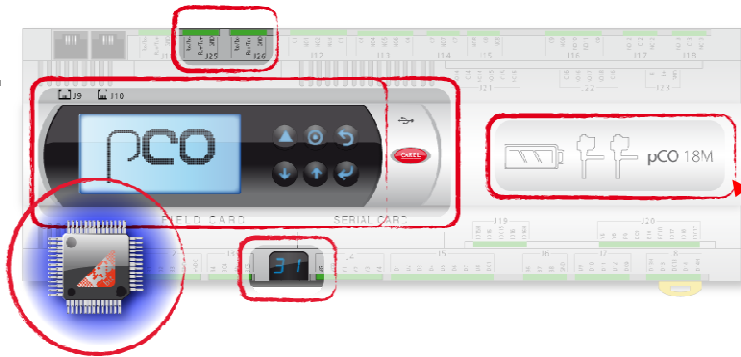


**Back Compatibility  
with pCO3**



**Integrated solution  
and energy saving**

# pCO5 Features: Embedded EXV drives



- **Embedded drivers for EXV:** Energy saving and system efficiency  
Super-Heat regulation based on EVO algorithm  
MOP / LOP integrated protection  
Low / High Super-Heat protection
- **Integrated Super Capacitor:** Application safety and cost reduction  
Closing procedure in case of power supply fault  
No battery and recharged battery required  
No solenoid valve in the medium/large application

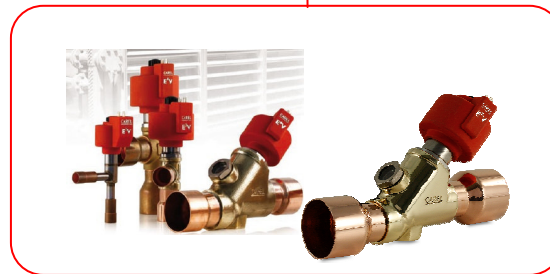
# pCO5 Overview



Back Compatibility  
with pCO3



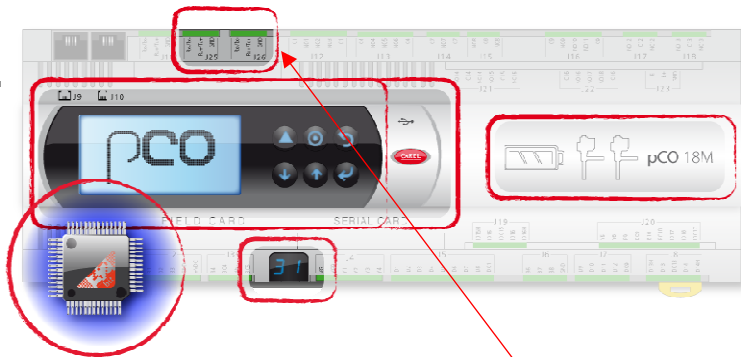
Connectivity



Integrated solution  
and energy saving



# pCO5 Features: Embedded Serial ports



- **BMS RS485**

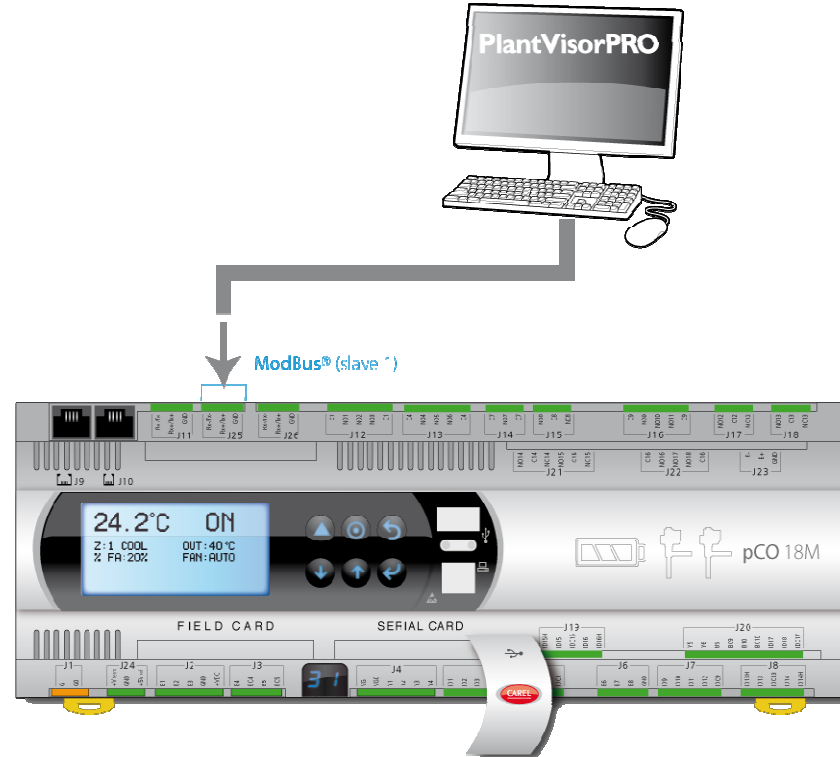
No additional costs to connect the control to:  
PlantVisor Pro  
PlantWatch Pro  
Modbus ®  
OPC Server™

- **Field Bus RS485**

No additional costs to connect intelligent actuators:  
CPY\* Humidifier control  
pCOE I/O expansion boards  
VFD  
Modbus Energy meter  
...

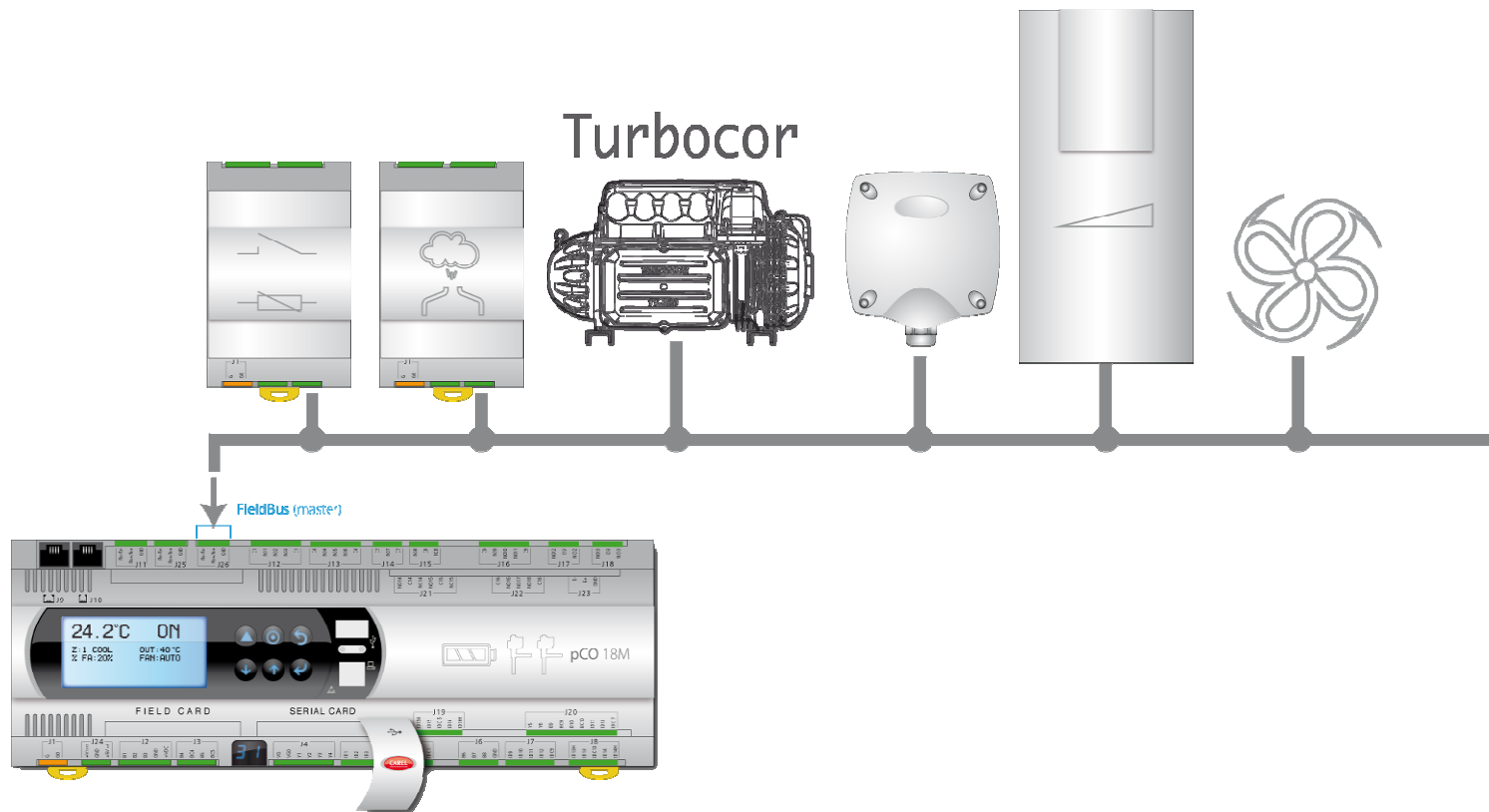
# pCO5 Features: Embedded Serial ports

## Example of connection for BMS RS485



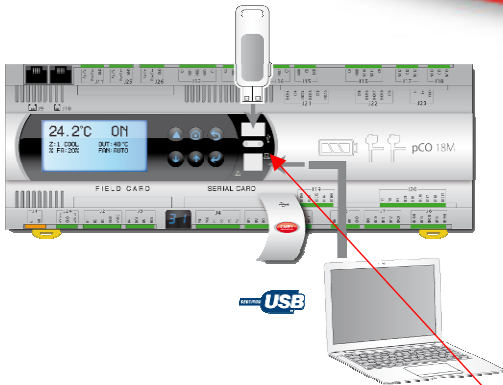
# pCO5 Features: Embedded Serial ports

## Example of connection for Field Bus RS485



# pCO5 Features:

## USB



- **USB Host**

To connect a standard USB dongle for:

- SW application upgrade
- Download pCO5 logs

- **USB Device**

To connect to PC (without external converters) for:

- SW application upgrade
- Download pCO5 logs
- Configure and monitor the unit by commissioning tool

# pCO5 Overview



- **Power supply** : 28...36 Vdc and 24 Vac  $\pm 15\%$ , 50/60Hz.
  - **Flexible I/O count**,  
(small, medium, large and extralarge)
  - **Plastic case** that guarantees high mechanical protection and reduces the risk of electrostatic discharges due to incorrect handling
  - **DIN rail mounting**, allowing significant savings in wiring and assembly times
  - Large Operative Range Temperature **(-25T70 °C)**

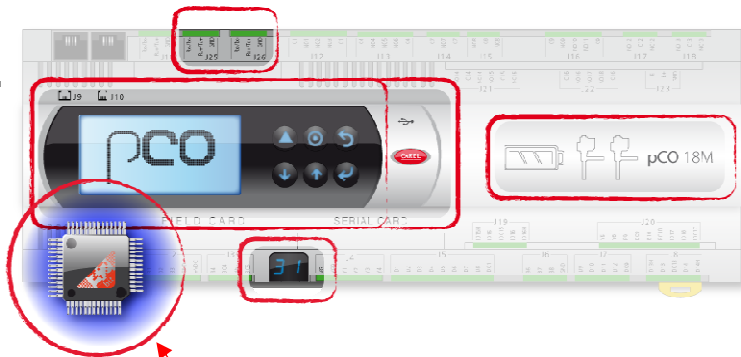
# pCO5 Features: I/O count

	PC05*S	PC05*M	PC05*L	PC05*X L N.O.
<b>Max.number analog inputs</b>	<b>5</b>	<b>8</b>	<b>10</b>	<b>8</b>
PT1000 inputs	2	2	4	2
0...10 Vdc inputs	3	6	6	6
0...1 Vdc inputs	3	6	6	6
4...20 mA or 0...20 mA inputs	3	6	6	6
NTC inputs	5	8	10	8
0...5 Vdc ratiometrics inputs	3	6	6	6
<b>Max number digital inputs</b>	<b>8</b>	<b>14</b>	<b>18</b>	<b>14</b>
24 Vac/dc inputs	8	14	18	14
230 Vac/dc inputs		2	4	2
Fast digital inputs	1	2	2	2
Free voltage inputs	2	2	4	2
<b>Max number analog outputs</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>4</b>
0...10 Vdc outputs	4	4	6	4
<b>Max number digital outputs</b>	<b>8</b>	<b>13</b>	<b>18</b>	<b>29</b>
SPST relay	7	10	13	26
SPDT relay	1	3	5	3
<b>Max number SSR outputs</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>6</b>



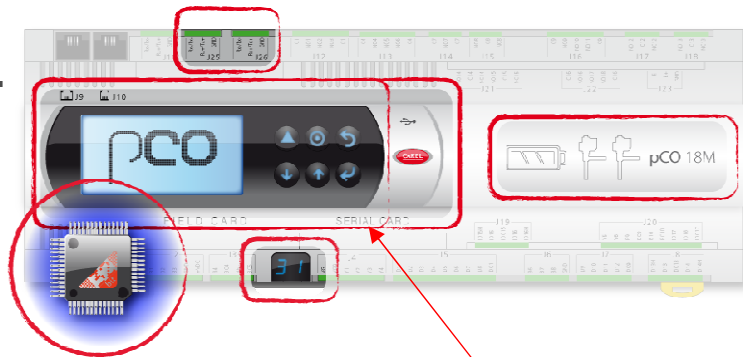
# pCO5 Features:

## CPU



- **Microprocessor:** 32 bit 24 MHz  
Higher processing speed of the pCO5 compared to the pCO3  
(around 2/3 times faster)
- **Flash memory:** 4MB (2+2) or 8MB (6+2)  
The first 6MB are reserved for the application software  
(application software + bios + boot), while the other two are  
for the logs.
- **RAM memory:** 512KB or 1MB  
allowing more complex software applications to be managed.

# pCO5 Features: Built-in pGD1 restyling



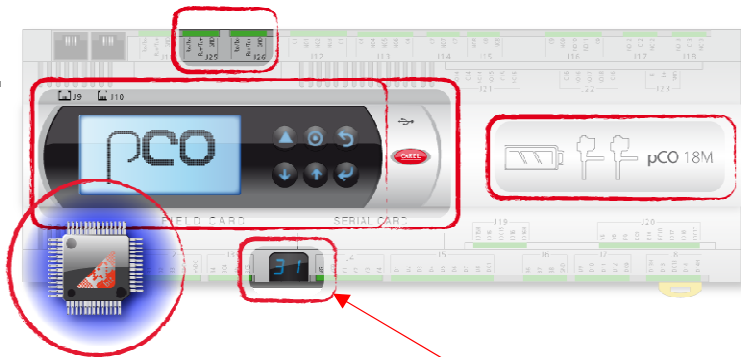
## **Built-in pGD1 display embedded**

White backlight

Show the status of the devices in customizable icons  
Cyrillic, Greek, Danish, Swedish, Norway,.. characters available  
Different Text mode type



# pCO5 Features: Service display



## **Service display**

pLAN address (NO SW addressing procedure)  
pCO5 HW and SW information  
Programmable by 1tool (user information)

# pCO5 Features: Other plus compared with pCO3



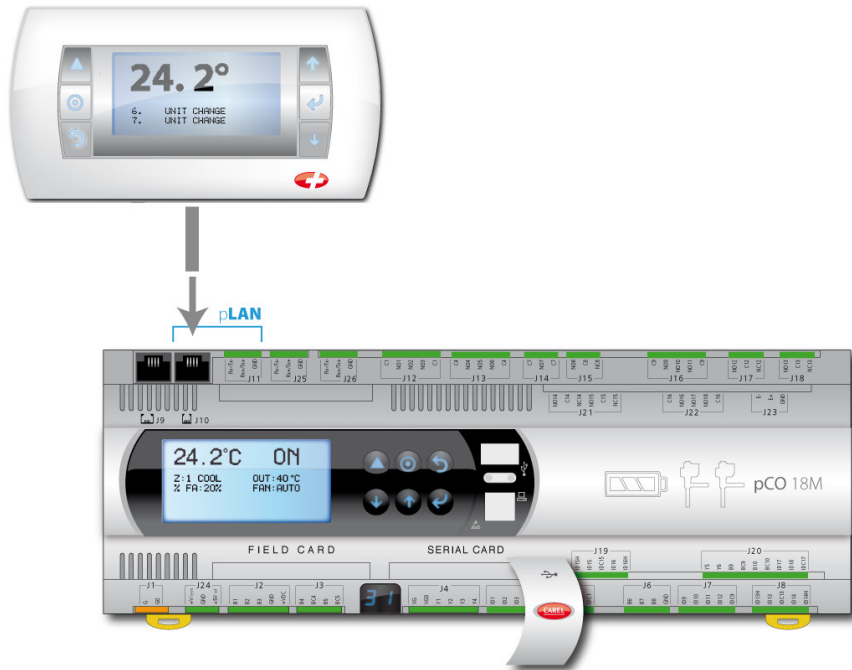
- **New system variables** : to know the *internal temperature*, the *voltage* of power supply and the *current* absorbed.
- **Fast digital inputs**: 2 digital inputs which can measure signal with frequency up to 2 KHz;
- **SSR outputs**: possibility to have also model with 230V SSR
  - **Insulation of relay**: up to 11 different relay groups (according to the size of pCO5) which can be connected to different voltage.

# pGD touch



## Advance graphic feature

- 65 k colors touch display
- Animated gauges (simulated rela pressures or temperature gauges)
- Graphic trend, real time and history.
- Scalable vector graphic, graphics objects are independent from LCD dimension and resolutions.
- Transparent image



### pLAN (pCO Local Area Network)

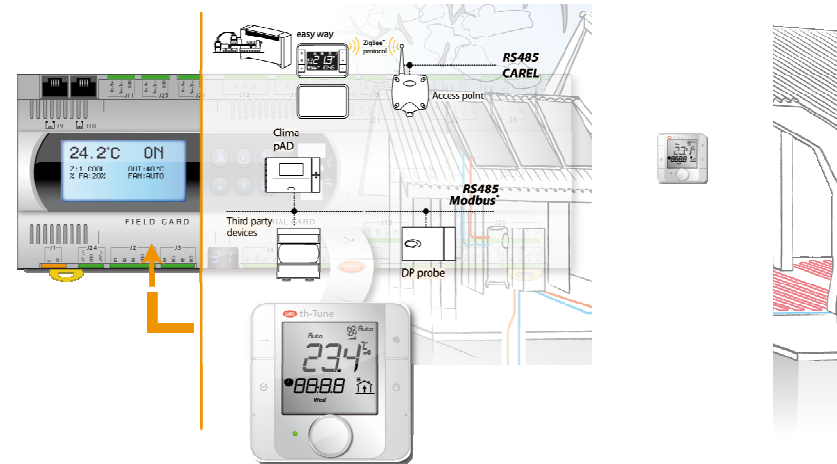
- Multi master protocol  
Peer to peer local area network
- Compatible with pCO3, pCO1 and pCOXS
- Data sharing for all pCO controls
- Just one shared pGD display to configure and monitor all pCO\*

# pCO5 Features: Optional Field Bus card

## Optional Field Bus card

Connection for:

- RS485 (Carel/Modbus ® )
- MP-BUS ® (Belimo actuators)
- CANbus (Carel e-dronic system)
- tLAN (I/O exp.boards)



# pCO5 Features: Optional BMS card

## Optional BMS card

Connection for:

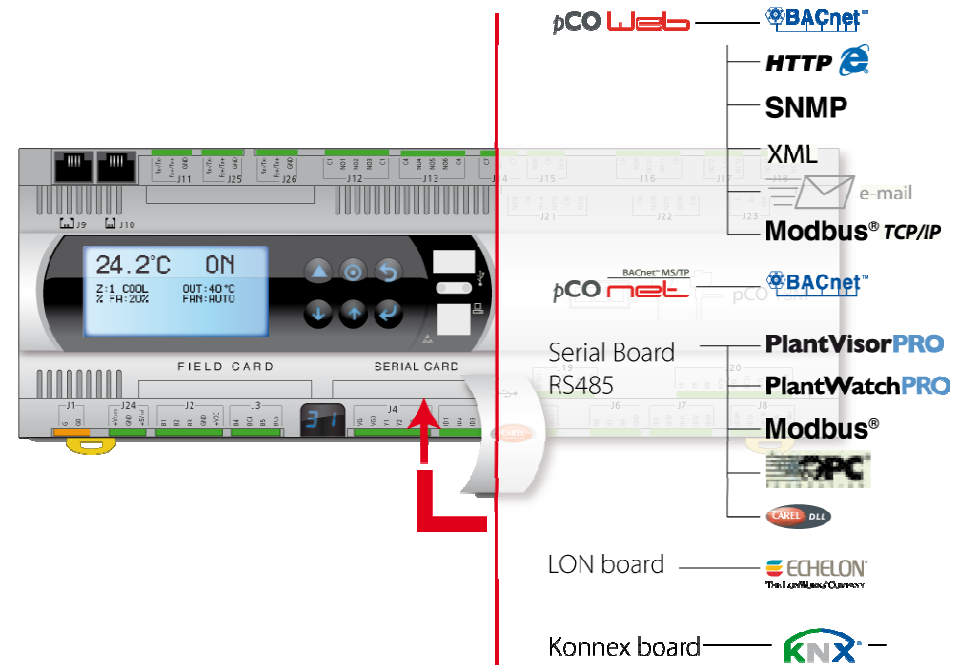
- PCO Web TCP/IP

HTTP  
BACnet™  
FTP server  
Modbus  
SNMP  
XML  
e-mail

- PCO Net (BACnet™ MSTP RS485)

- LON Board

- Konnex Board



# pCO5 Features: Programmed by 1tool



**1tool**

**Multi programming levels**  
To provide the right level of flexibility according to application complexity requirements

**Integrated user interface management**

**Maximum application robustness with several levels of simulation possible, even on real-hardware**

**Simplify and save time to test and debug the application by new functionality as Real Time data values, breakpoint and more...**

**Faster system set-up**  
**Full control of the installation**  
**Trouble-free service and maintenance**

## Table of contents

		PC05*S	PC05*M	PC05*L	PC05*XL		
Hardware Features	Memory	Flas Memory	8 MB	8 MB	8 MB	8 MB	
		RAM Memory	1 MB	1 MB	1 MB	1 MB	
		Nand Flash	32 MB (optional)	32 MB (optional)	32 MB (optional)	32 MB (optional)	
		Black box Function memory	2 MB	2 MB	2 MB	2 MB	
	Embedded EXV drivers	1 Driver for EXV		■			
		2 Drivers for EXV		■			
		1 Driver for EXV + Super Capacitor		■			
		2 Driver for EXV + Super Capacitor		■			
	Real Time Clock	●	●	●	●		
	Display built-in	■	■	■	■		
Connectivity	Peer to peer local area network		pCO controls	●	●	●	●
			pGD* terminals	●	●	●	●
	BMS Embedded	RS485	Modbus® Supervisor	●	●	●	●
			PlantVisor PRO	●	●	●	●
	Field Bus Embedded	RS485	Modbus® actuators	●	●	●	●
			Carel actuators	●	●	●	●
	BMS plug-in card	pCO Web TCP/IP	HTTP	■	■	■	■
			BACnet™	■	■	■	■
			FTP server	■	■	■	■
			Modbus	■	■	■	■
			SNMP	■	■	■	■
			XML	■	■	■	■
		RS485	Modbus® Supervisor	■	■	■	■
			PlantVisor PRO	■	■	■	■
			OPC® Server	■	■	■	■
			pCO Net	■	■	■	■
			Lon Board	■	■	■	■
			GPRS Board	■	■	■	■
	Field Bus plug-in card	RS485	Konnex board	■	■	■	■
			Modbus® actuators	■	■	■	■
		tLAN	Carel actuators	■	■	■	■
			Carel actuators	■	■	■	■
Carel e-dronic system			■	■	■	■	
MP-BUS®			■	■	■	■	
USB	Host	USB dongle	■	■	■	■	
		Client	■	■	■	■	
Inputs / Outputs	Analogue inputs	<b>Max.number</b>	<b>5</b>	<b>8</b>	<b>10</b>	<b>8</b>	
		PT1000	2	2	4	2	
		0...10 Vdc	3	6	6	6	
		0...1 Vdc	3	6	6	6	
		4...20 mA or 0...20 mA	3	6	6	6	
		NTC	5	8	10	8	
		0...5 Vdc	3	6	6	6	
		<b>Max.number</b>	<b>8</b>	<b>14</b>	<b>18</b>	<b>14</b>	
	Digital inputs	24 Vac/dc inputs	8	14	18	14	
		24 Vac/dc or 230 Vac/dc inputs		2	4	2	
		Free voltage digital inputs	2	2	4	2	
	Analogue outputs	<b>Max.number</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>4</b>	
		0...10 Vdc	4	4	6	4	
	Digital outputs	<b>Max.number</b>	<b>8</b>	<b>13</b>	<b>18</b>	<b>29</b>	
		SPST relays	7	10	13	26	
		SPDT relays	1	3	5	3	
SSR relays		2	4	6	6		

● : standard  
■ : optional