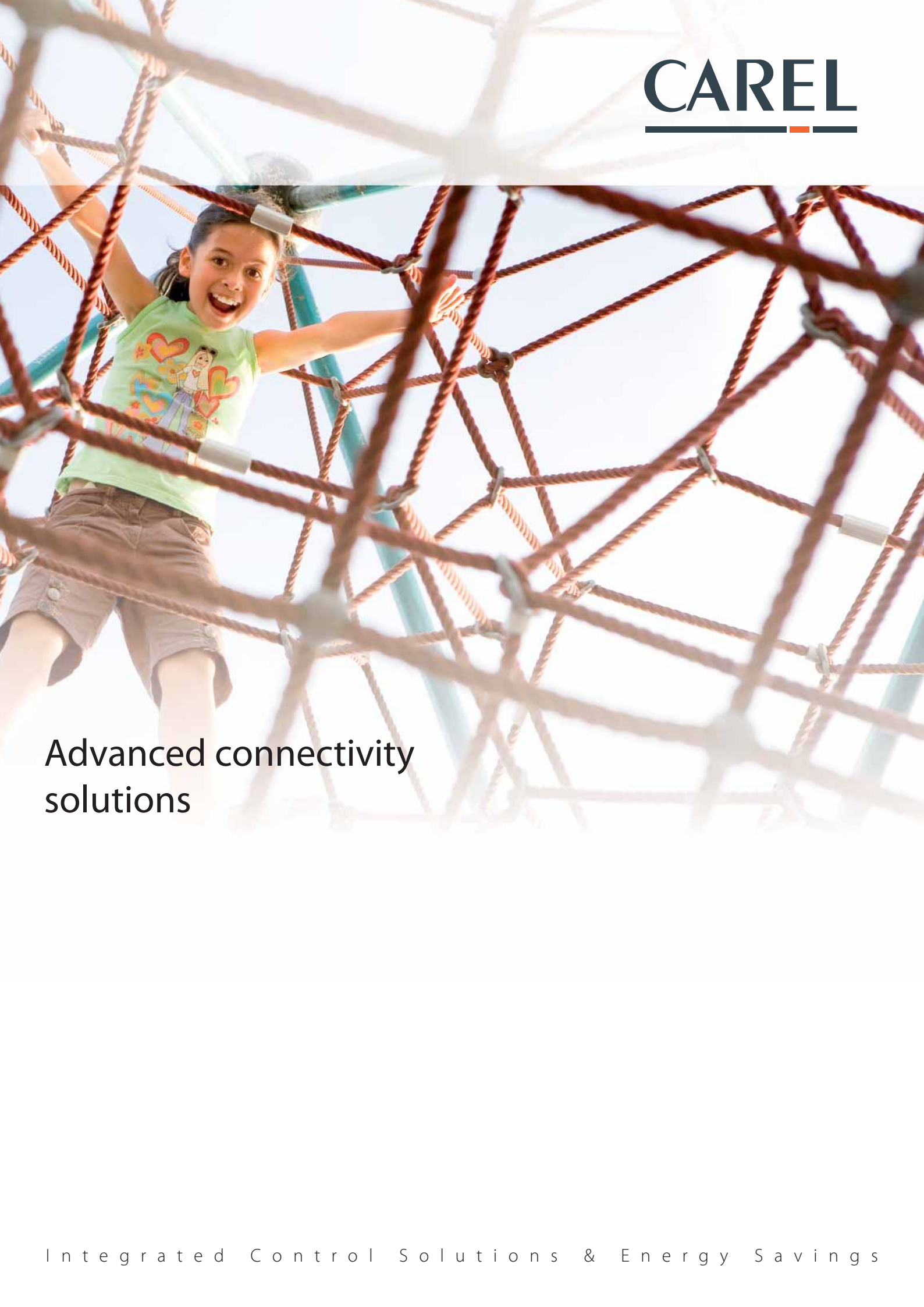


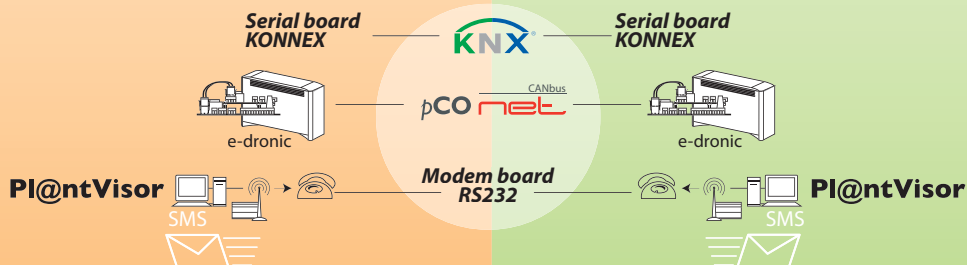
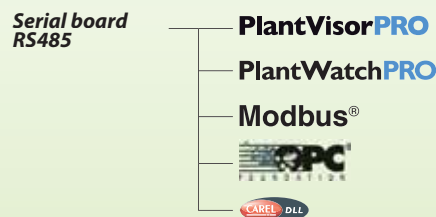
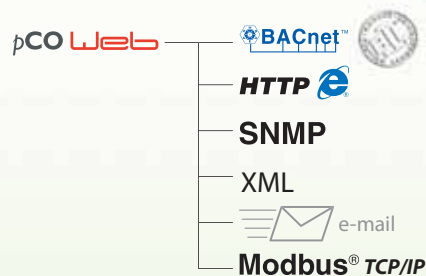
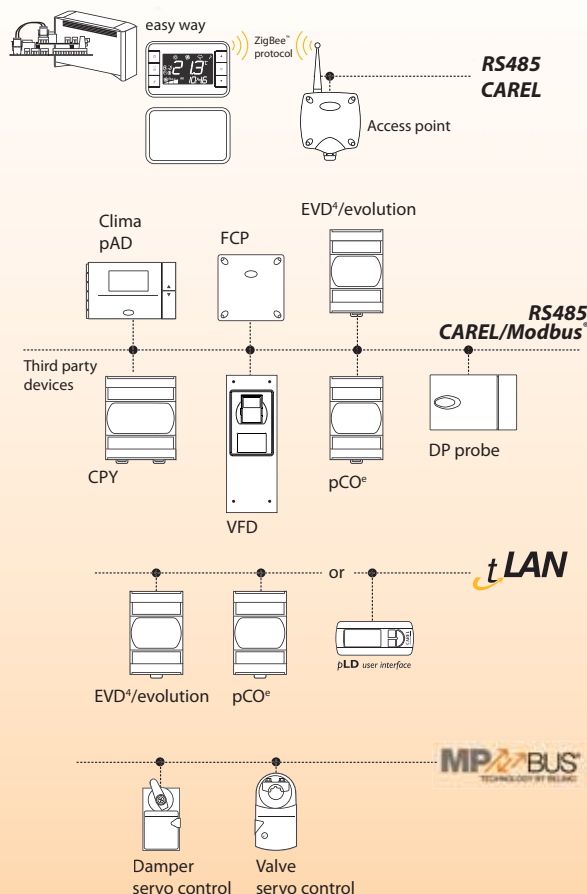
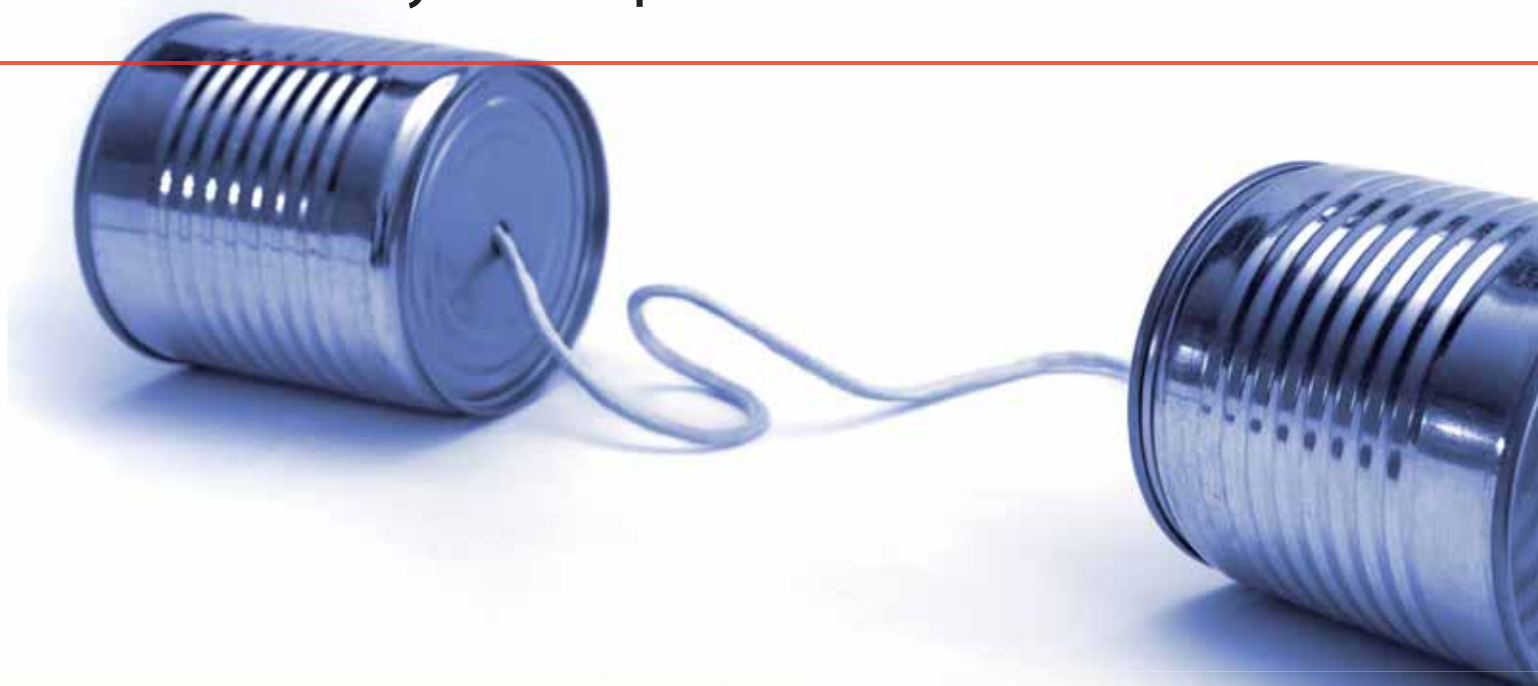
A young girl with dark hair, wearing a light green t-shirt with a cartoon graphic and brown shorts, is climbing a complex rope structure on a playground. She is smiling and looking towards the camera. The structure is made of thick red ropes connected by metal rings, forming a web-like pattern. The background is a clear blue sky.

CAREL

Advanced connectivity
solutions

I n t e g r a t e d C o n t r o l S o l u t i o n s & E n e r g y S a v i n g s

CAREL connectivity, in line with your requirements.





connectivity

Connectivity is the result of CAREL's extensive experience in the design and manufacture of programmable controllers for HVAC/R units. The strategy involving the use of optional serial cards ensures greater flexibility and a wider choice by the customer based on the effective needs of the system. CAREL constantly follows the technological advances in communications, focusing on several fundamental concepts.

Connectivity

Interfacing and compatibility with the more commonly-used BMS (Building Management Systems): BACnet™, LonWorks®, Modbus®, SNMP.

This ensures:

- remote management of the unit via modem and the Internet, including using a simple browser;
- authorised personnel, wherever they may, are notified of any alarm situations, including by SMS and e-mail;
- simple creation of alarms and graphs for prompt unit diagnostics.

Interoperability

Ability to work and cooperate in a distributed intelligence system and with integrated solutions, acquiring from and sharing information with third party devices for:

- optimised management of the unit;
- high efficiency of the installation (energy savings).

Security

Risk-free transmission of information and data exchange, an important factor above all when using networks that are universally accessible.

CAREL devices can be configured for:

- differentiated access to the unit for maintenance or supervision personnel;
- secure access via internet or VPN (virtual private network).

Supervision

CAREL has integrated the range of connectivity solutions into PlantWatchPRO and PlantVisorPRO, supervision and monitoring systems that meet the demands of various system requirements.



BMS connectivity

CAREL controllers can be connected to the BMS in the following ways:

- directly, thanks to the ability of the pCO sistema series controllers to select the protocol used (CAREL, Modbus®);
- using a serial card that communicates with the protocol used by the (BACnet™, SNMP, LON...);
- integrating the driver for the management of the CAREL proprietary protocol into the BMS (OPC®, CAREL DLL).



This is the protocol designated in 1995 by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) as the organisation's official protocol.

Type of protocols supported:

- BACnet™ Ethernet™ ISO8802-2 over 8802-3;
- BACnet™/IP;
- BACnet™ MS/TP; EIA-485 communication standard.

The BACset tool (available for download from ksa.carel.com) can be used to configure and test the cards. pCOWeb and pCOnet are tested by the BTL (BACnet Test Laboratory).

www.bacnetinternational.org.



pCOnet

Interface with the BACnet™ MS/TP protocol based on the EIA-485 standard.

info: pcoweb@carel.com



(B) (C) (D) (E)

pCOWeb

Interface with the emerging protocols in the HVAC sector and based on the Ethernet™ standard connection to the following networks:

- SNMP v1,v2,v3 networks with TRAP;
- BACnet™ Ethernet, BACnet™ networks /IP;
- Modbus® networks over IP;
- LAN or Internet.

Using the Web-Server function embedded in the pCOWeb, the user can download the HTML pages relating to their own application via FTP and then use a browser for the remote management of the installation. The embedded LINUX™ operating system allows the addition of plug-ins developed by the user for their own requirements. The pCO application can therefore now be downloaded from a remote station across the Ethernet network, in maximum security. It also features a logger for creating log files (.CSV) and graphs (.BMP) of limited numbers of variables. These files can be received daily via e-mail.

info: pcoweb@carel.com



HTTP

SNMP

XML

Modbus® TCP/IP



(B) (C) (D) (E) (F)



(B) (C) (D) (E) (F) (G)

Web-GATE: TCP/IP interface

Connection to a local Ethernet™-TCP/IP network at 10 Mbps. Connection to the following networks:

- SNMP v1 networks;
- LAN or Internet.

Using the Web-Server function of the

Web-GATE, the user can download the HTML pages relating to the application via FTP and then open a browser for the remote management of the installation.

Can be used with:

- (A) = pCO⁵ / pCO³ / pCO¹
- (B) = pCO⁵ / pCO³ / pCO¹ / pCO^{XS} / pCO^C
- (C) = pCO⁵ compact / Supernode
- (D) = Mastercase3 / pCO rack *
- (E) = humiSteam X-plus / gaSteam / MC *
- (F) = e-drofan
- (G) = others

* check compatibility with the application program

RS485

The RS485 option for the BMS serial port can be used for interfacing to supervisory systems, such as PlantVisorPRO, OPC, Modbus®, or proprietary (CAREL DLL), using the CAREL slave or Modbus® RTU slave protocols.



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Modbus®

Introduced in the 1970s and now one of the most widely-used BMS protocols. The pCO sistema series controllers are Modbus® native.



CAREL provides a DLL that manages communication with CAREL controllers. In particular, using the services supplied by the routines contained in the CAREL DLL (available for download from ksa.carel.com), supervision software can be developed for receiving and sending data from/to all CAREL peripherals without needing to know the protocol that these adopt.



This is an industrial standard created by a consortium of companies, in collaboration with Microsoft®, to standardise the drivers for proprietary devices. Using the CAREL OPC server, any Windows® OPC client application (SCADA, supervisors, management software, etc.) can communicate with all CAREL devices in user-friendly OPC mode, without requiring a gateway.

LONWORKS®

Info: lon@carel.com

The LonWorks® system, developed by Echelon®, is one of the dominant solutions in the market of automation and control in industry, offices, homes and transport. Electrical standard supported: FTT10. CAREL is a LonMark® Partner. The LONset tool (available for download from ksa.carel.com) can be used to create the LON files (NXE and XIF) for the custom profiles.



Ⓑ Ⓒ Ⓓ Ⓔ



Konnex KNX®

info: konnex@carel.com

The KNX technological standard is now widely used in building automation and control for commercial and residential use. CAREL is member of the KNX Association (www.knx.org). The CAREL Konnex card is compatible with all KNX/EIB devices and can be installed on the BMS port of the pCO sistema or e-drofan controllers. The K-Set tool (can be downloaded from ksa.carel.com) is used to create an XML file for custom profiles.



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Modem

Direct connection to a PSTN or GSM modem. This allows:

- remote supervision by PlantVisor;
- remote connection via Winload.

The use of a GSM modem also offers the possibility to communicate via SMS (short message service), so as to:

- send alarms and information;
- receive commands to reset alarms or perform any actions without having to physically go to the installation.



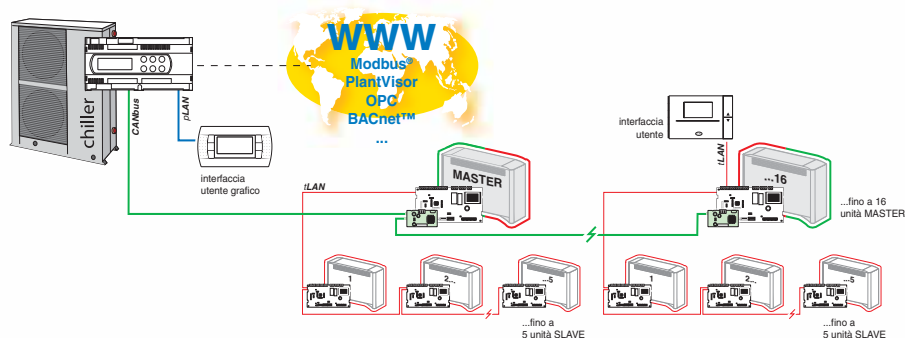
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FieldBus connectivity

From the viewpoint of communication between controllers made by different companies, CAREL also offers a wide variety of solutions for interfacing the pCO family controllers with field devices such as valves, VFDs, serial sensors, Belimo actuators etc. In this way, the pCO sistema series controllers not only manage the individual units, but the entire air-conditioning/refrigeration installation.

CANbus

The CANbus option allows the pCO controllers to be connected to the CAREL fan coil management system (e-drofan), thus ensuring simpler management of the installation and optimising, through synergy between the controllers, comfort and running costs.



Konnex



The KNX technological standard is now widely used in building automation and control for commercial and residential use.

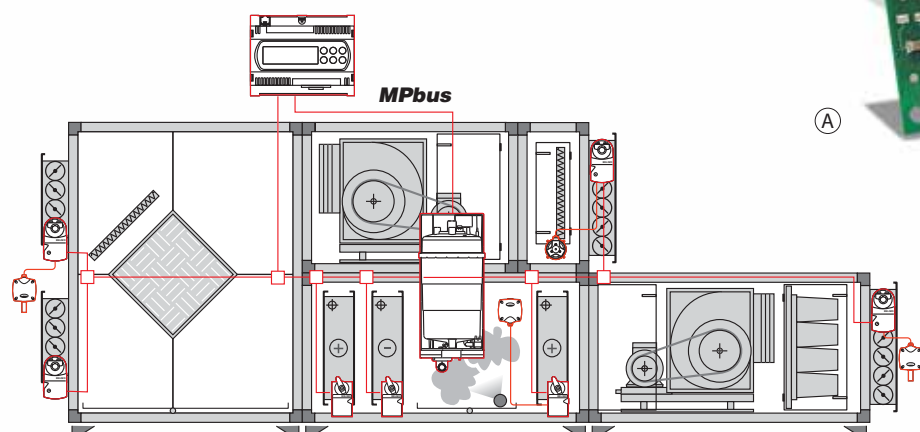
CAREL is member of the KNX Association (www.knx.org). The CAREL Konnex card is compatible with all KNX/EIB devices and can be installed on the FieldBus port of the pCO³ controllers.

The K-Set tool (can be downloaded from ksa.carel.com) is used to create an XML file for custom profiles.

info: konnex@carel.com



pCO⁵ / pCO³



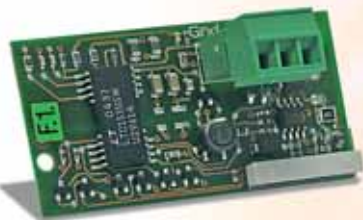
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MPBUS
TECHNOLOGY BY BELIMO

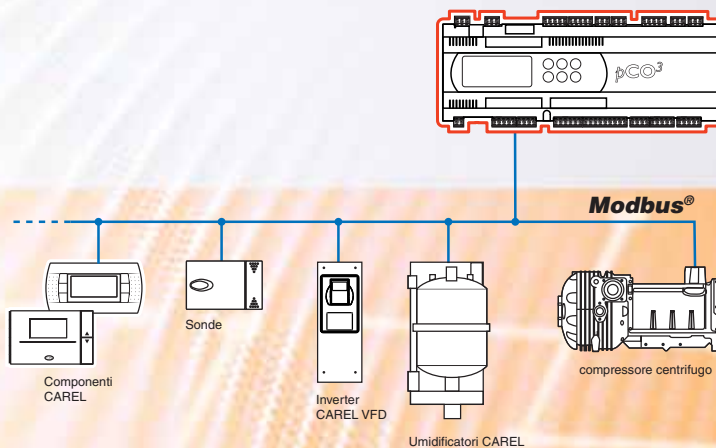
The MP-BUS[®] protocol can be used to manage up to 8 Belimo servo controls via a simple two-wire connection cable.

RS485

The RS485 option for the FieldBus serial port can be used with the Modbus® Master or CAREL Master protocols.



(A)

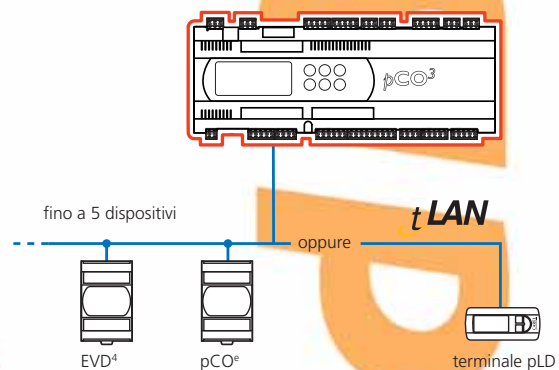


tLAN

The tLAN option is used to connect to CAREL devices, such as I/O expansions (pCOe) or electronic valve drivers (EVD4), up to a maximum of 5. Alternatively, this option can be used to connect to the PLD/PST display.



(A)



Modem

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- remote connection via Winload.

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- (F) = e-drofan
- (G) = others

* check compatibility with the application program

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