

CAREL

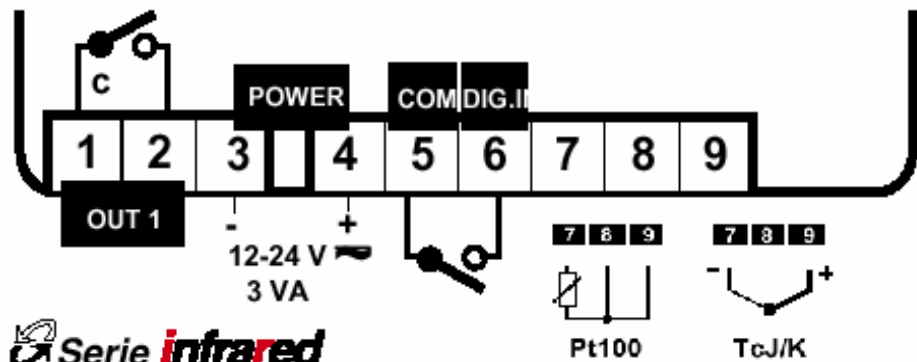
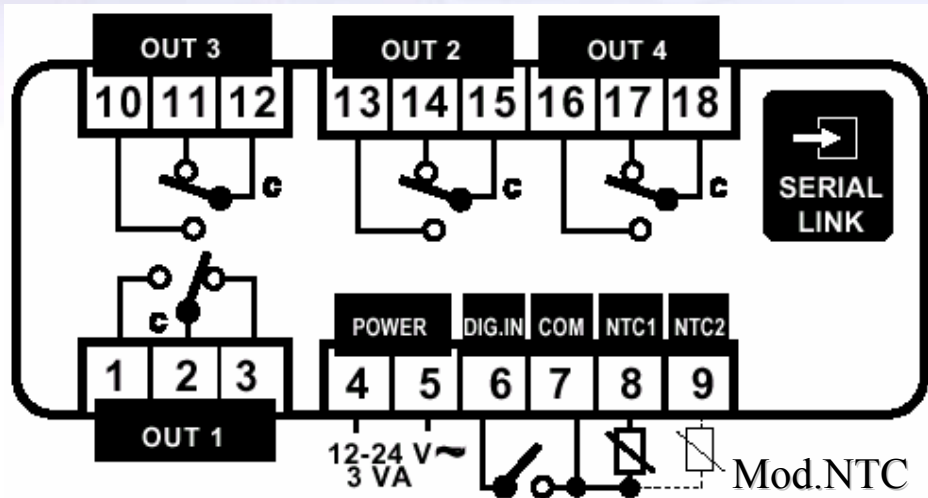


Sterowniki uniwersalne z serii IR32



This is a universal step
control for low cost
solutions

Sterowniki uniwersalne z serii IR32



- Connection to temperature, humidity and pressure sensors (NTC, Pt100, thermocouples type j or k, 0-20mA, 4-20mA, 0-1Vdc)
- 2, 3 and 4 outputs, both in the 8A resistive change over relay version and in the 10Vdc output version operating external SSR.

Sterowniki uniwersalne z serii IR32

- DIN rail or panel mount
- 1, 2 or 4 relays
- anti-short cycle
- RS485 port for serial communication
- Set point compensation



μ Chiller Compact

comp
°C
°F
x 100

12.4

HEAT
STOP

▲
SET

SET

▼
DOWN

μ Chiller

μ Chiller Compact

*the cheap solution
to control*



*air/air air/water water/water
chillers, HPs and condensing units with
one hermetic compressor*

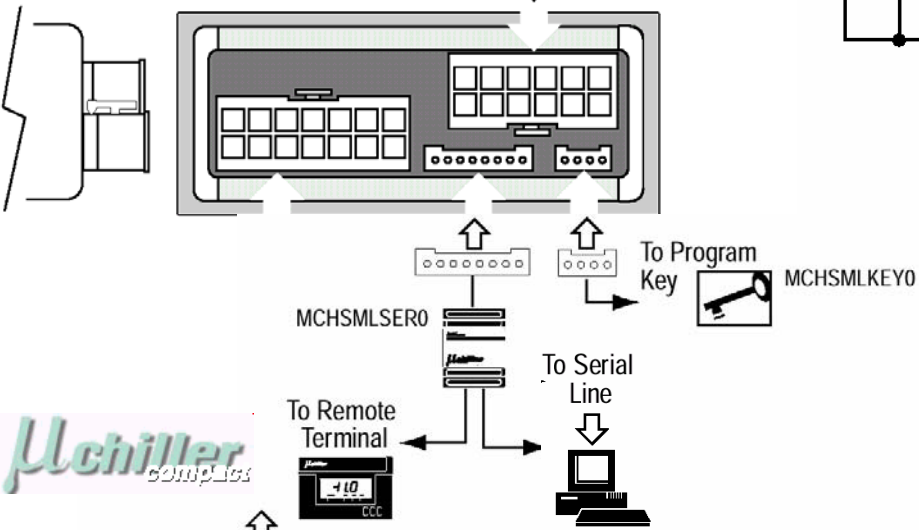
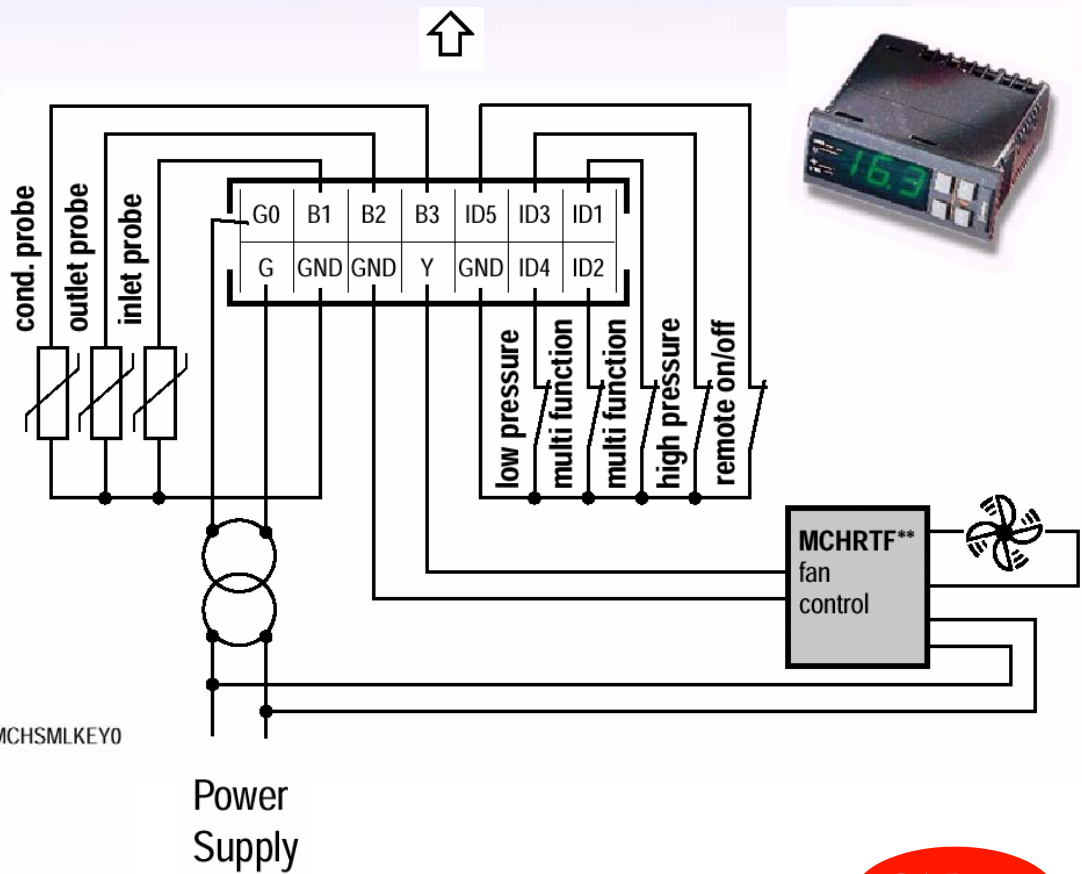
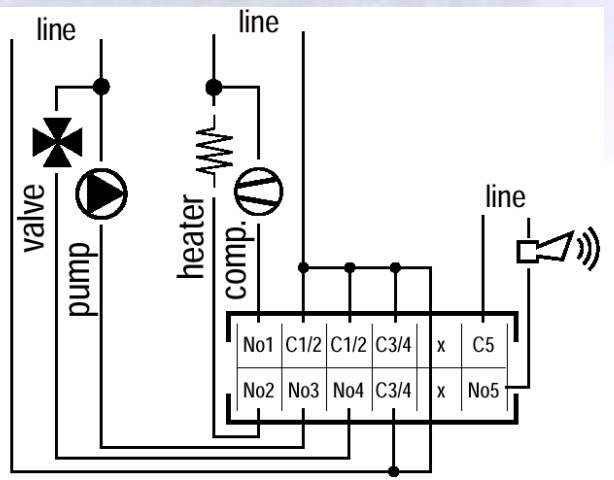
μ Chiller Compact

Main features and options

- condenser fan control (temperature and pressure)
- additional remote terminal (150m)
- hardware programming key
- optional IR remote control unit
- connection to supervisory systems



μChiller Compact Wiring Connection

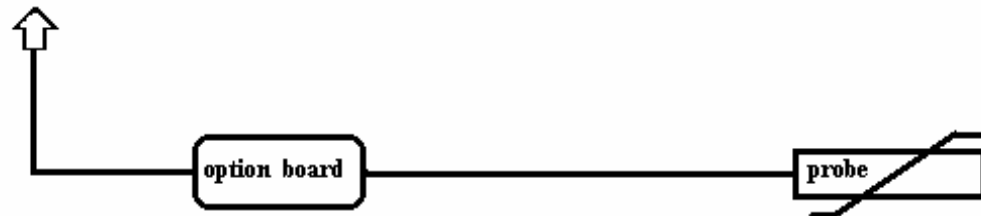
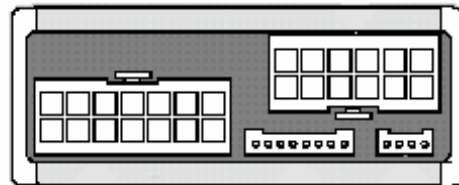


μChiller Compact

New features

Optional board for a fourth sensor probe for external compensation.

IN PROGRESS IN
TECHNICAL DEPT.



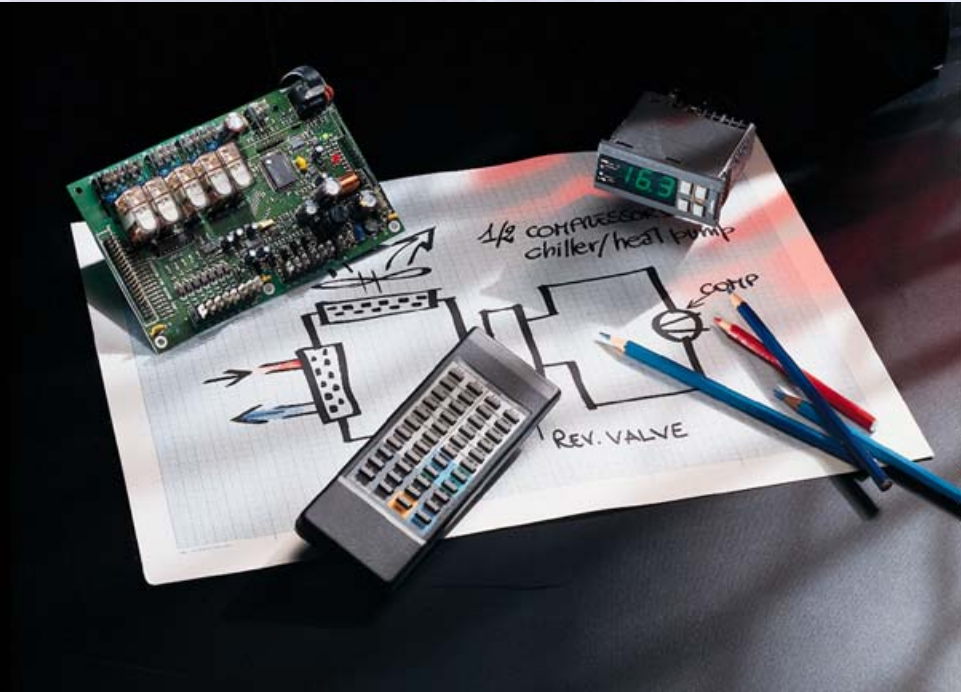
μ Chiller

to control:

air/air

air/water

water/water



chiller and heat pump units with

1 or 2 hermetic compressors

μ Chiller

Main features

- condenser fan control (temperature and pressure)
- hardware programming key
- complete alarm detection
- optional IR remote control unit
- optional connection to supervisory systems

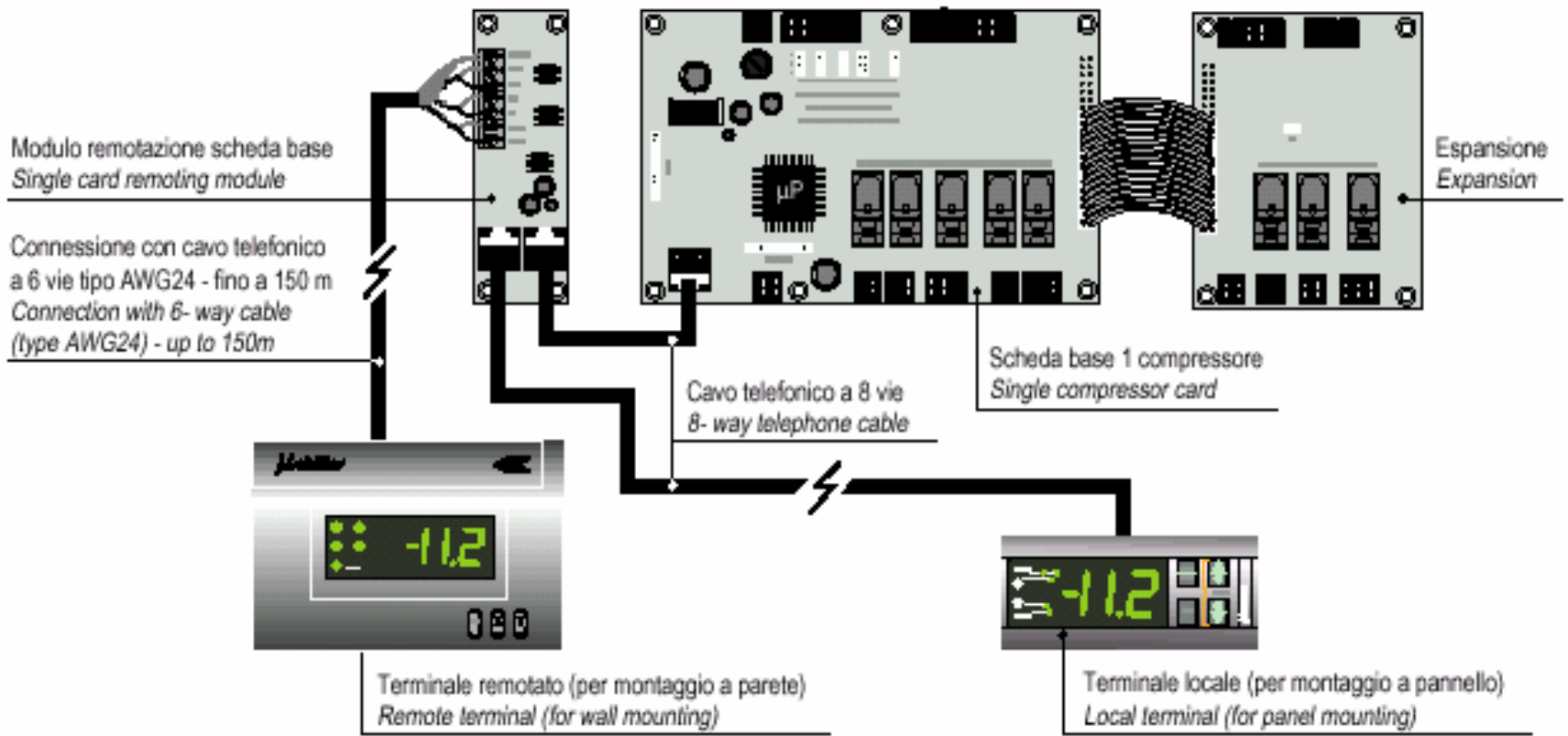


μ Chiller Architecture

- single compressor card
- additional card for 2nd compressor
- local terminal
- fan module
- additional remote terminal (150m)



μChiller Wiring Connection



Aria



Aria

For direct expansion stand-alone units or multi-zone units in residential/commercial applications

(ceiling mount air conditioners
roof top units
heat pump
and split systems
VAV and multizone units)



aria

Aria Target

Mainly designed for the OEM market
as a zone controller with aesthetic
customization



aria



Aria Architecture



(up to 150m)



Architecture n.1

The user terminal is connected to an I/O power board by means of a 2-lead wire

Aria Architecture



Architecture n.2

The user terminal is connected to a zone damper card by means of a 2-lead wire



pLAN
aria

(up to 150m)



Aria

Features

- Temperature and humidity control
- Suitable for stand-alone or multi-zone applications (pLAN)
- Up to 2 steps for cooling and 3 steps for heating
- Drives heat pump systems or conventional units
- Hardware programmig key
- Optional real-time clock card for time based features hardware programming key
- Optional backlit LCD display



aria



Aria Terminal



Terminal

- built-in temperature sensor
- optional humidity sensor
- real time clock
- backlit LCD
- pLAN serial output

Colours and logos customisable for quantities

aria (cost depends on complexity)



Aria

Power card



Power card (Architecture 1)

- 2 versions: 5 or 7 relays
- 3 digital inputs
 - remote On/Off or clogged filter
 - remote heating/cooling selection
 - general alarm or defrost termination
- 1 analog input for condensation temperature

Aria

Power card



Power card (Architecture 2)

- 3 digital inputs
(remote On/Off
remote heating/cooling selection
zone alarm)
- 2 triacs to open/close the local damper

Aria Advantages

- 2 wires, easy to install
- one parameter, 16 configuration, easy to program
- unit control (defrosting, compressor rotation, time delays)
- pLAN to go to a pCO for supervisory system
- humidification/dehumidification control
- hardware key
- remotable sensors



aria



Aria

Codes

TAT00000W0

basic version wall mounting terminal

TAT000**W0

clock, pLAN, backlit LCD, buzzer, second probe, hum.probe wall mounting terminal

TABASE5000

I/O board with 5 relays

TABASE7000

I/O board with 7 relays

TAZONE0000

I/O board for zone control



μAC



a controller for
precision air
conditioners

μAC

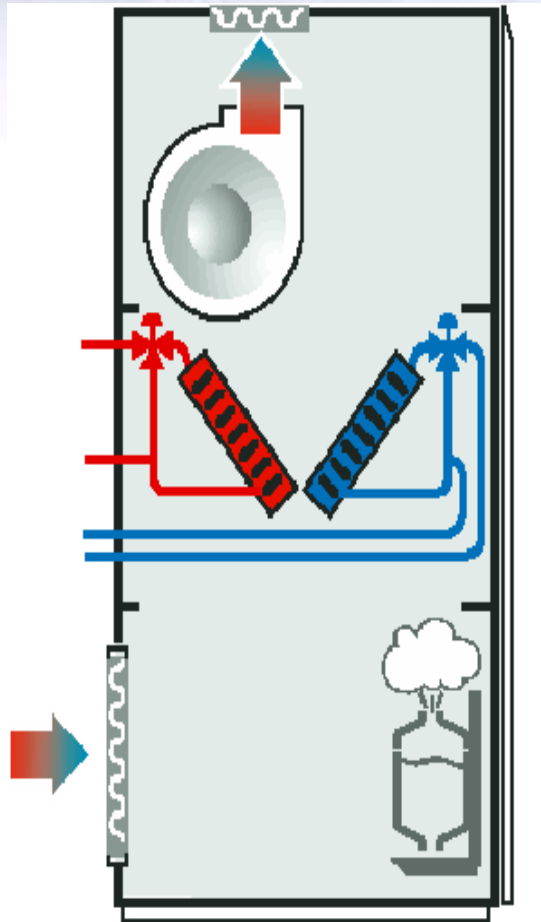
Main functions

- Control of temperature and humidity regulation
- Energy saving through free cooling or compensation
- Dehumidification control
- Supplied-air fan: speed controlled
- Complete alarm management (optional log file)
- Time management (optional)
- Serial connection to a supervisory system (optional)
- Automatic rotation of units



μAC Applications

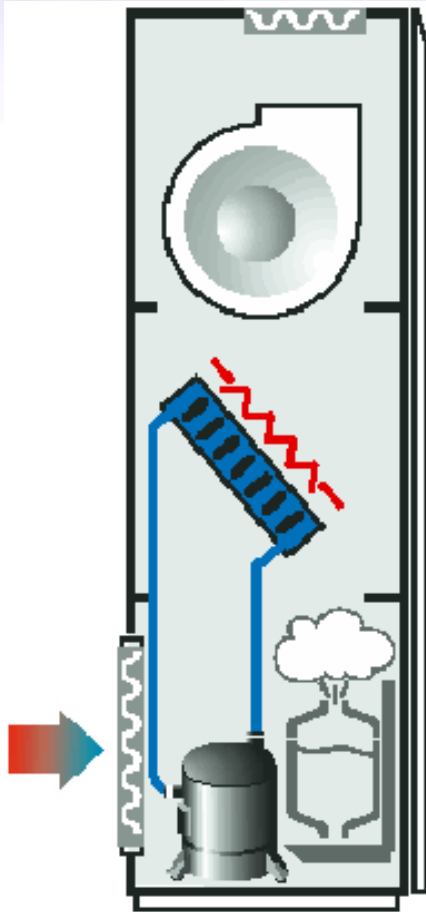
Cooler version



Precision unit with
Cooling and Heating battery



μ AC Applications



Direct expansion version

Precision unit with

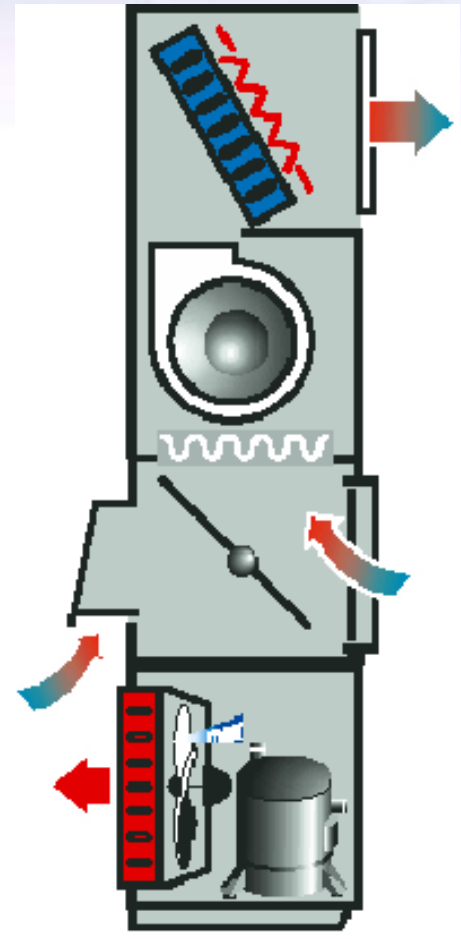
- direct expansion battery
- compressor
- heating element



μAC Applications

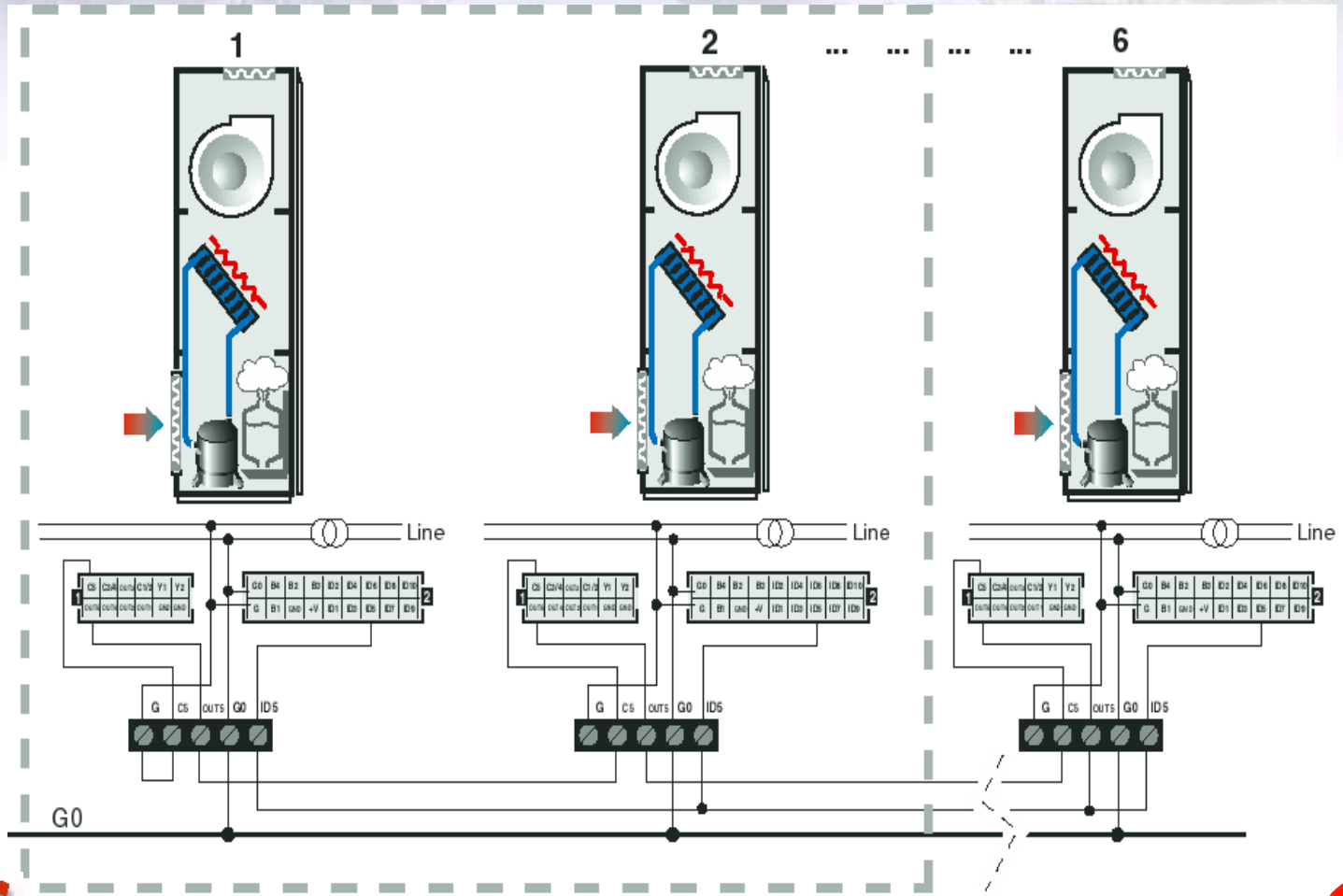
Shelter

Precision unit for shelters



μAC

Modular architecture using I/O contacts



μ AC

Main features

- complete temperature and humidity regulation
- management of 2 compressors and 2 heaters or 2 coolers
- additional temperature probe for automatic set-point compensation
- real time clock card for time-band management and alarm storage
- connection to supervisory systems by rs485 standard
- programming key



μ AC Controlled devices

- 1 or 2 compressors or cooling valve
- 1 or 2 heaters or heating valve
- Main fan: On/Off or proportional control
- Humidifier with proportional control
- Dehumidifier with On/Off control
- Alarm device



pCO sistema

A range of controls and accessories, communication interfaces and development software which allow the right solution to be found in terms of appearance, functions and price

pCO controller

I/O board

User interface

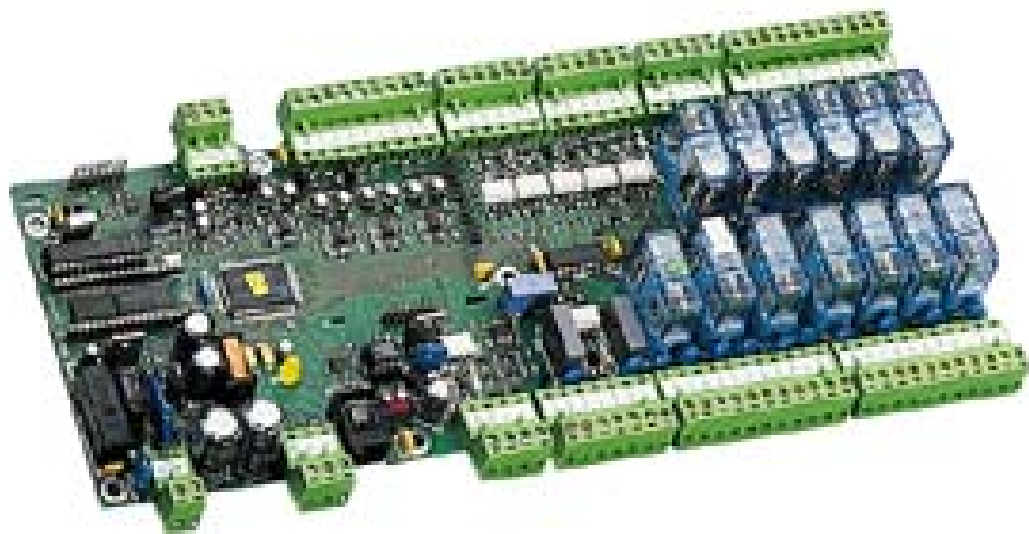
Flexibility: pLAN

Programmability: EasyTools for
Windows™

pCO²-pCO¹ controllers: the new generation



pCO^B I/O board



TYPE	No.
Analog Input	up to 8
Digital Input	12
Digital Output	up to 13
0/10 V Analog Output	up to 2

LCD, LED and LOW COST display

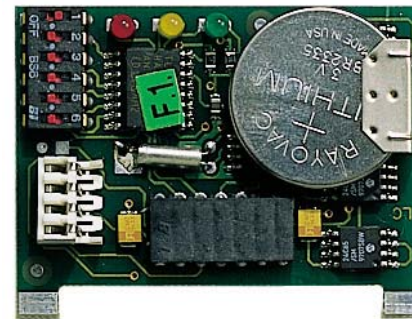
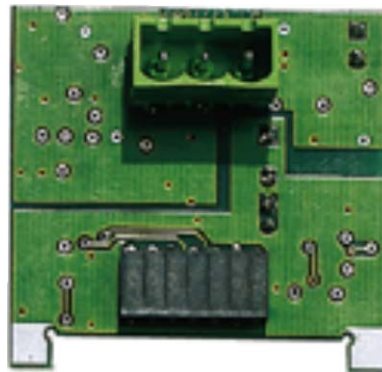
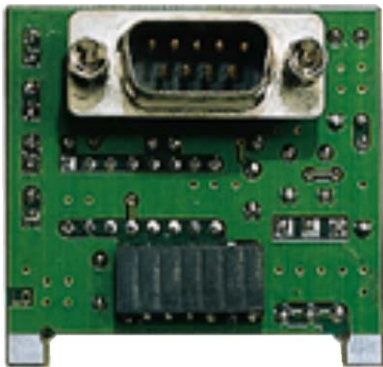


GRAPHIC display



pCO^B accessories

- **Serial cards** for the connection to a Supervisory System (Rs422 card or Rs485 card)
- **Real Time Clock card** for time-band applications
- **Printer features** through a special version of end-terminal user
- **Modem card** to handle a standard Hayes modem directly





pCO²

pCO sistema

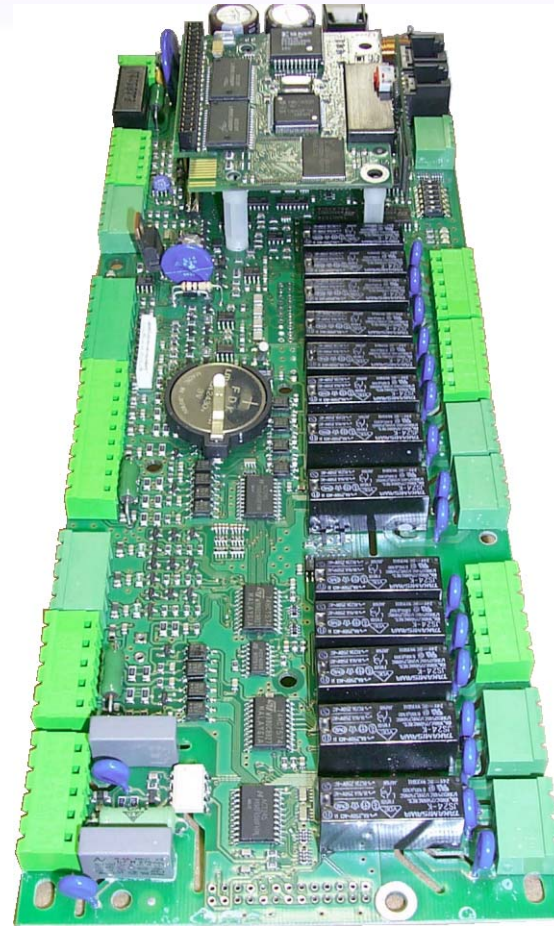


pCO² Flexibility

I/O	Small	Medium	Large
Dig. Inputs	8	14	18
An. Inputs	5	8	10
Relays (SSR)	8(1)	13 (2)	18(3)
An. Outputs	4	4	6



pCO sistema



pCO² Performances

- Different Languages
- Different Communication Protocols (Carel, MODBUS embedded. BACNET and LON via proper optional boards)



- Storing of historical data & alarms
- Code upgradable by modem or PC



pCO² controller

I/O BOARDS IN STOCK:

PCO2000A*0

pCO2 boards small-medium-large without built-in display

PCO2000B*0

pCO2 boards small-medium-large with built-in display

PCO200*A/B0

pCO2 boards small-medium-large with 1,2,3 SSR relays without-with built-in display

COMPATIBILITY WITH THE ALL RANGE OF END-USER DISPLAY



CONNECTORS IN STOCK:

PCO2CON0*0

screw connectors

PCO2CON1*0

spring connectors

PCO2CON2*0

IDC (insulator displacement connectors)

PCO2CON3*0

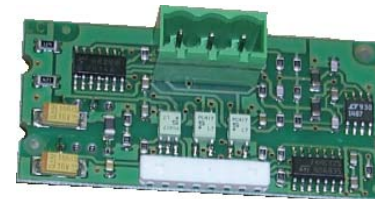
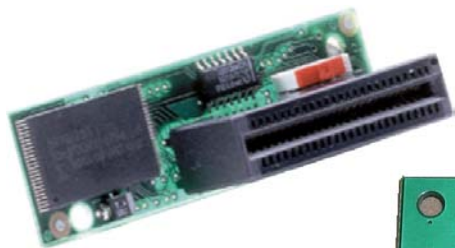
pitch header connectors

* S-M-L (small, medium, large)



pCO² Accessories

- **Serial card** for the connection to a Supervisory System (Rs485)
- **Flash expansion memory**
- **Programming key**
- **Real Time Clock card** for time-band applications (**always present**)
- **Modem card** to handle a standard Hayes or GSM (**SMS messages!**) modem directly from pCO²



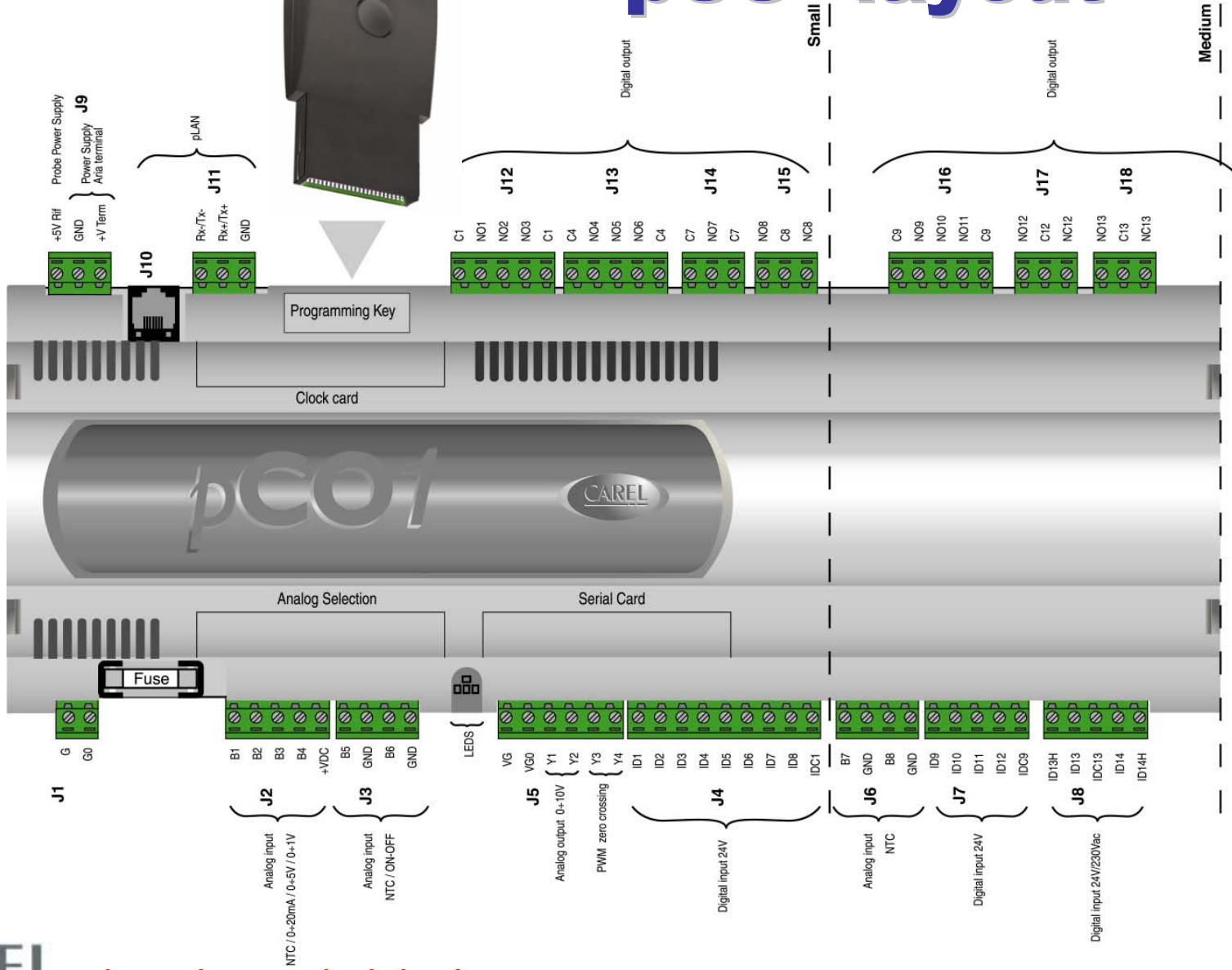
pCO²

STANDARD SOFTWARE IN PROGRESS:

- Standard shelters
- Standard modular chiller 1/4 compressors
- Standard screw compressors
- Standard close control units
- Standard pack compressor units



pCO¹ layout



EasyTools System is:

a powerful development package for
APPLICATION and SUPERVISORY
programs

that works on

a complete range of modular controllers



The development package: EasyTools for Windows™

WINCAD

which allows to design the control algorithm

WINMASK

for developing the user-interface (display-keys-led)

WINSIM

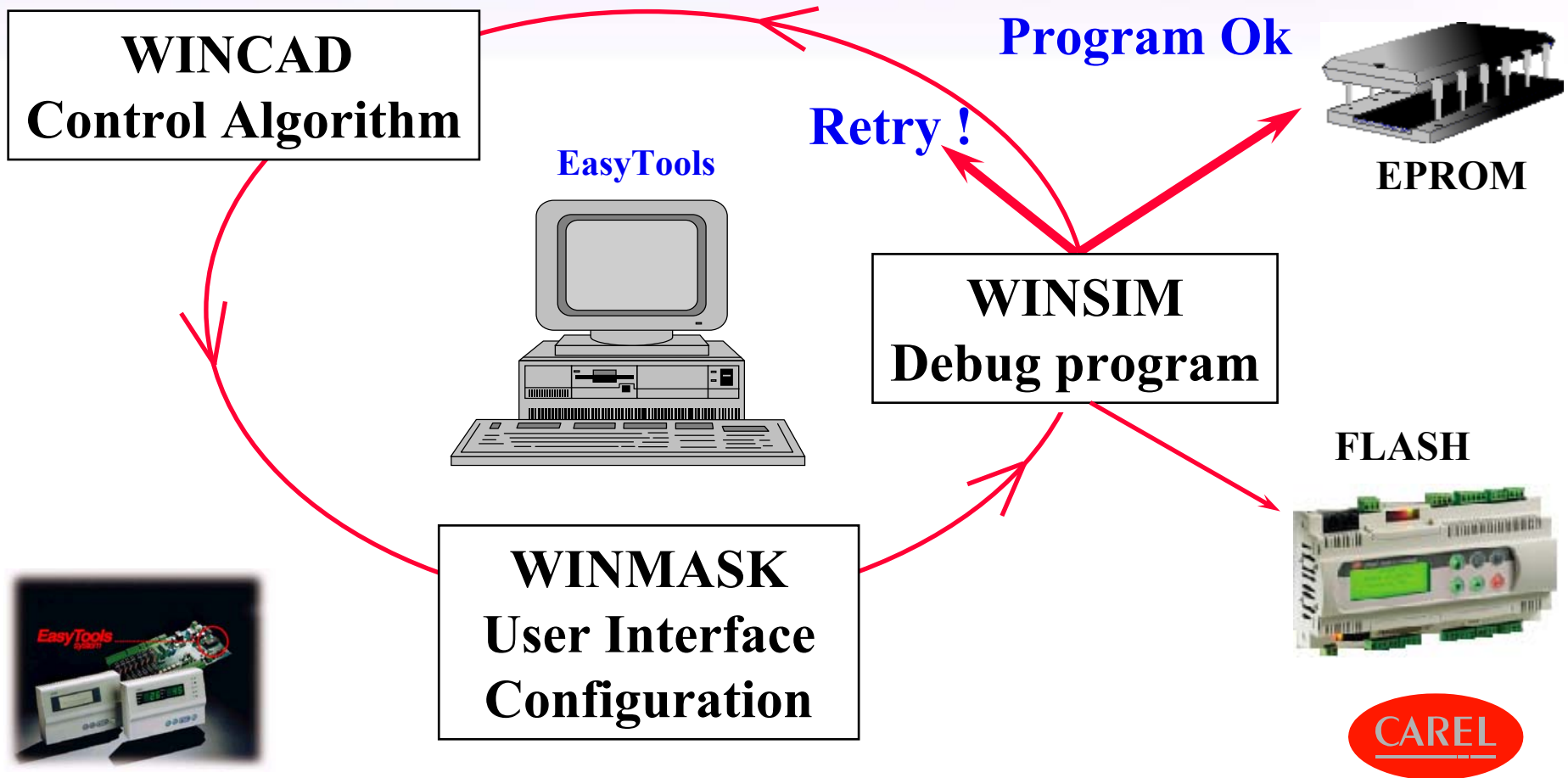
to debug the software directly on the computer

WINNET

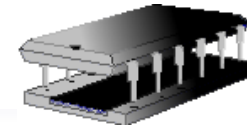
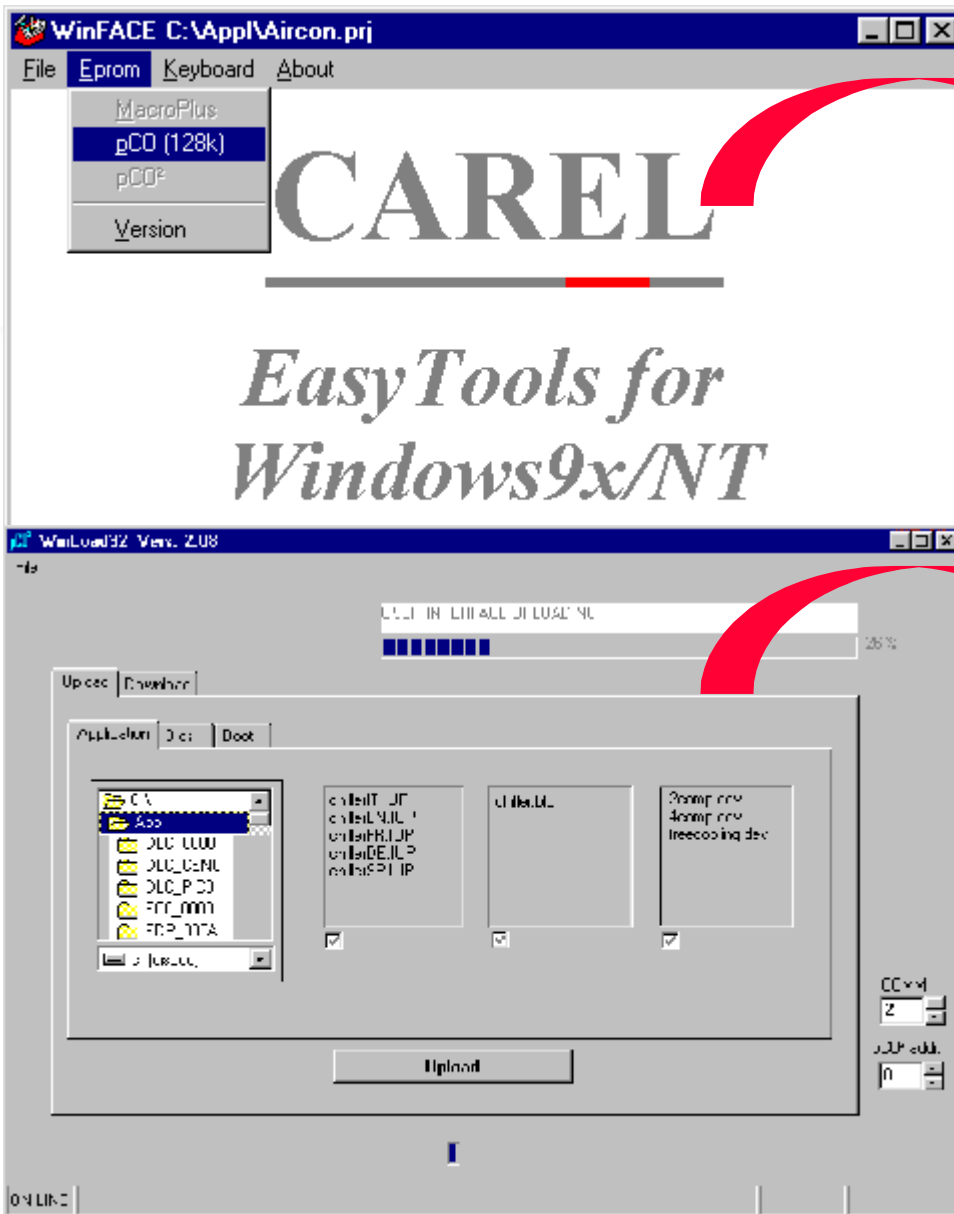
to develop the pLAN network and the supervisory system



Programmability: EasyTools for Windows™



Programmability



EPROM

On pCO the program was upload to an eprom and the eprom was mounted on the pCO...



... NOW the program is directly upload to the controller from the PC through a Rs485 line!



Communication

Gateway

GATEWAYMB0 modbus protocol : several installations already working (Siemens, Landys & Staefa, Honeywell, Johnson, Satchwell...)

GATEWAYBN0 Bacnet protocol in Rs232PTP : test made with Trane France. First field tests in progress.

GATEWAY000 Carel remote protocol connection



Communication

Lon

pCO2 optional boards:

PCO20L4850

PCO20LFTT0

pCO optional boards:

PCOSER485L

PCOSERFTTL





TCP/IP Gateway

TCP/IP Gateway Main Features

- Full compatibility with corporate LAN
- Embedded Web server
- Easy configuration through HTML pages
- Complete visibility of the control's parameters
- No dedicated software required for configuration
- SNMP protocol to transfer data
- 1 or 2 MByte flash memory
- Din rail mounting



TCP/IP Gateway Main Features

- **RS485 network**

- Up to 8 or 16 controls
- 1 Km max. length
- Twisted pair cable
- 19200 baud (configurable)
- Opto-isolation
- Easy installation, no tools required

- **Ethernet**

- 10Mb/s - 10baseT connection
- 90m max. length
- HTTP, FTP, SNMP, protocols supported

- **RS232**

- Gateway configuration
- 19200 baud (configurable)
- *Planned for future Modem connection (PPP)*



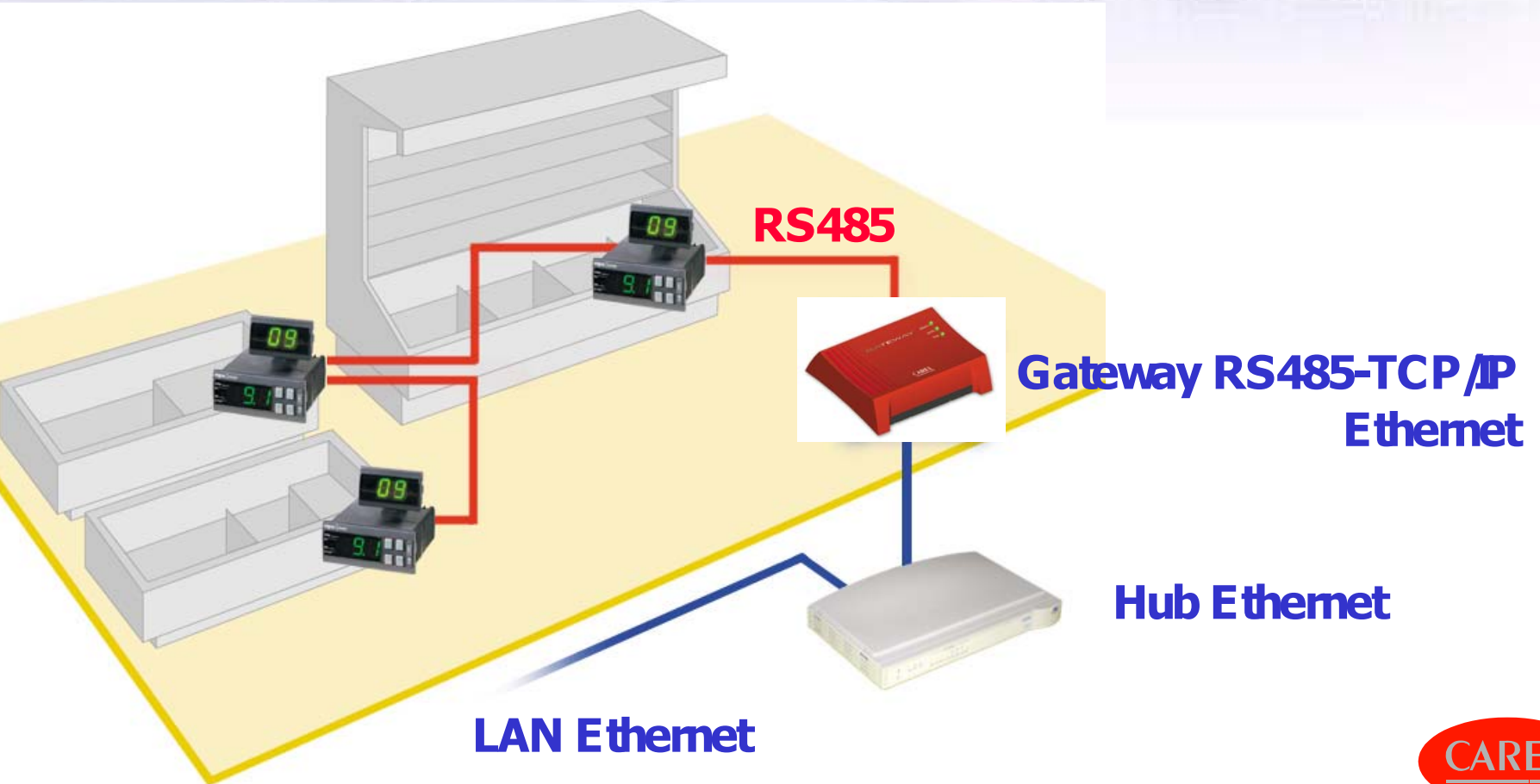
TCP/IP Gateway Main Features

- **HTML Pages**

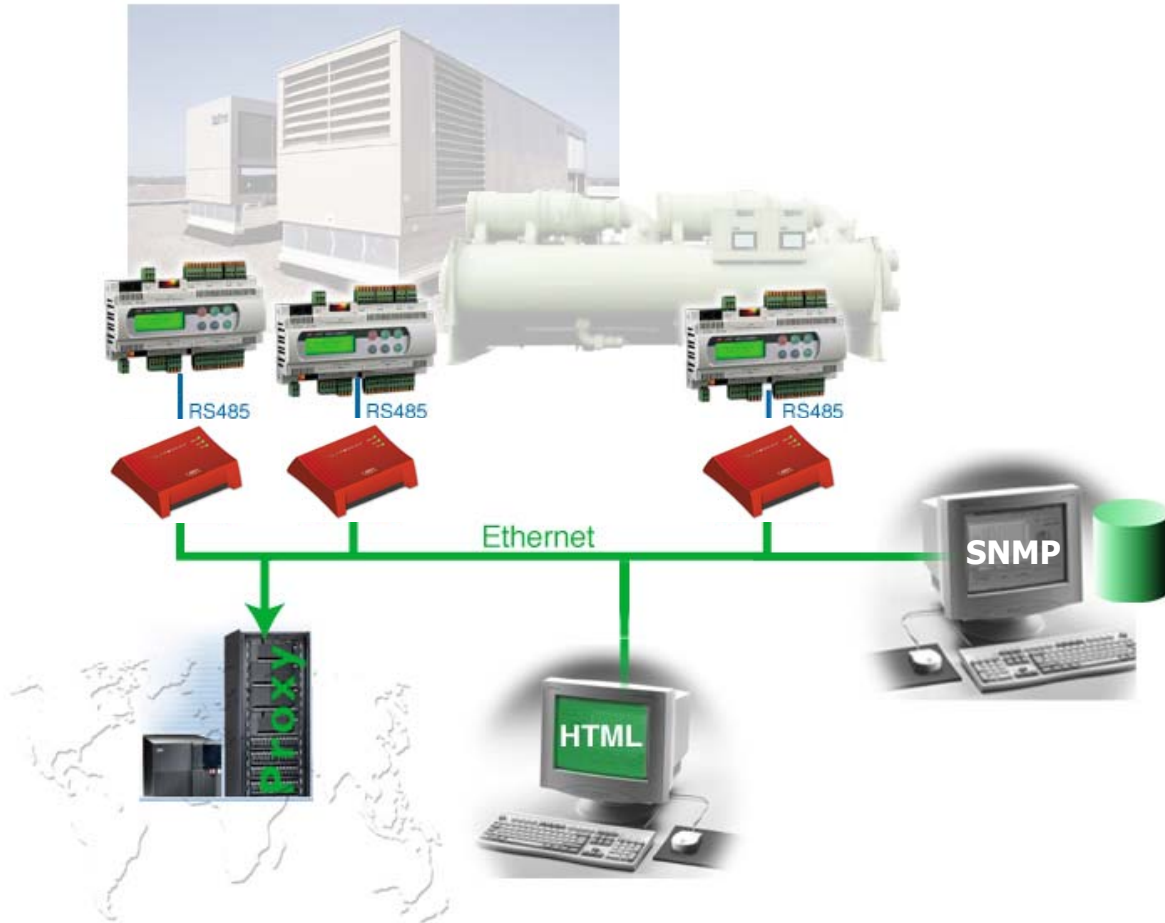
- All parameters of all Carel controls (on a RS485 network) can be monitored and modified
- All Carel controls are handled with Default Pages
- Pages can be customized with an HTML editor (no EasyTools)
 - Special “tags” to access instrument data
 - Network download via FTP
- Characteristics (1MByte Flash Memory):
 - 128: max number of pages
 - 700KByte: total memory available
 - 32KByte: max size per file (page or image)
 - JAVA language: supported
 - Password protection



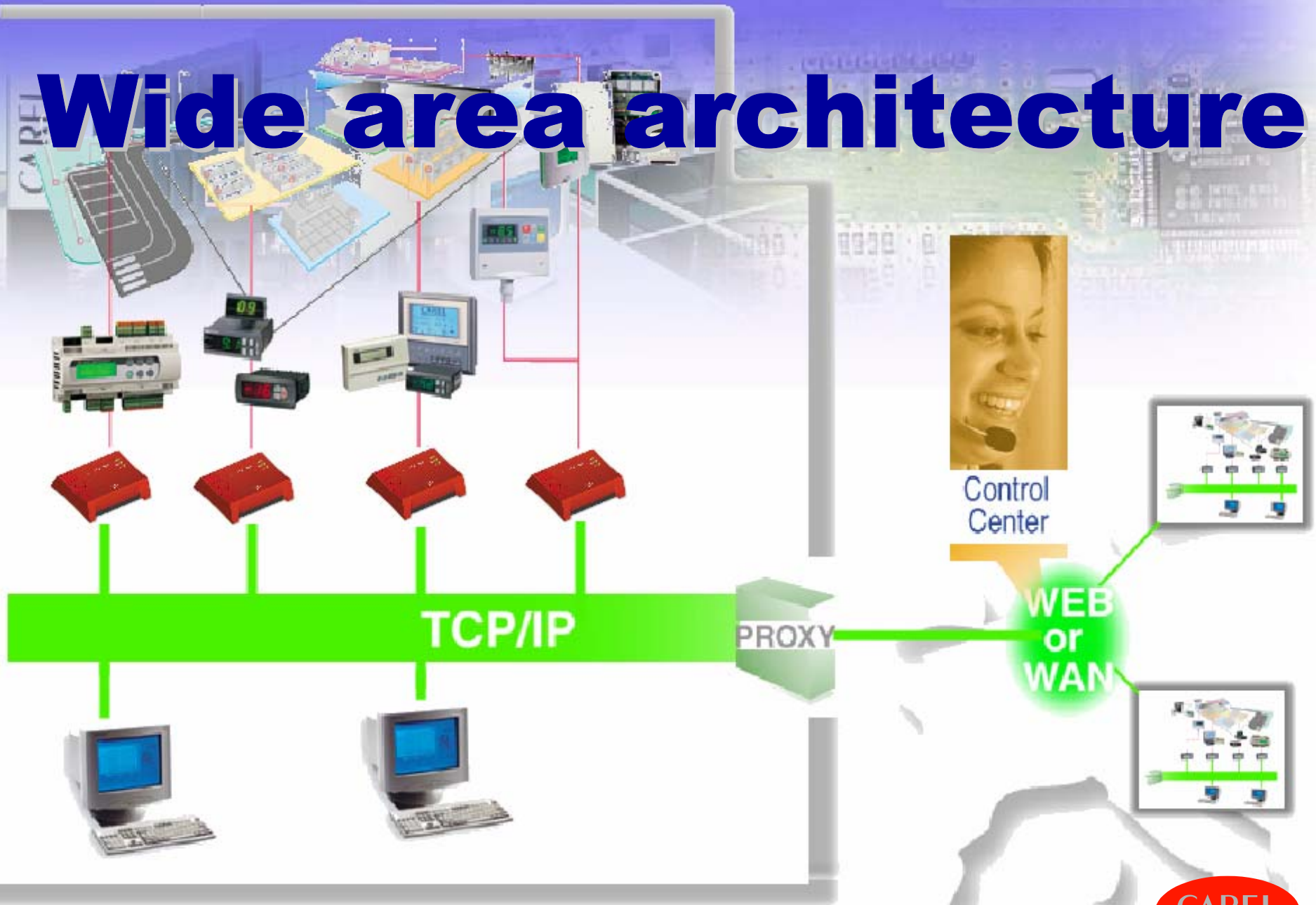
Local area architecture



Local area architecture



Wide area architecture

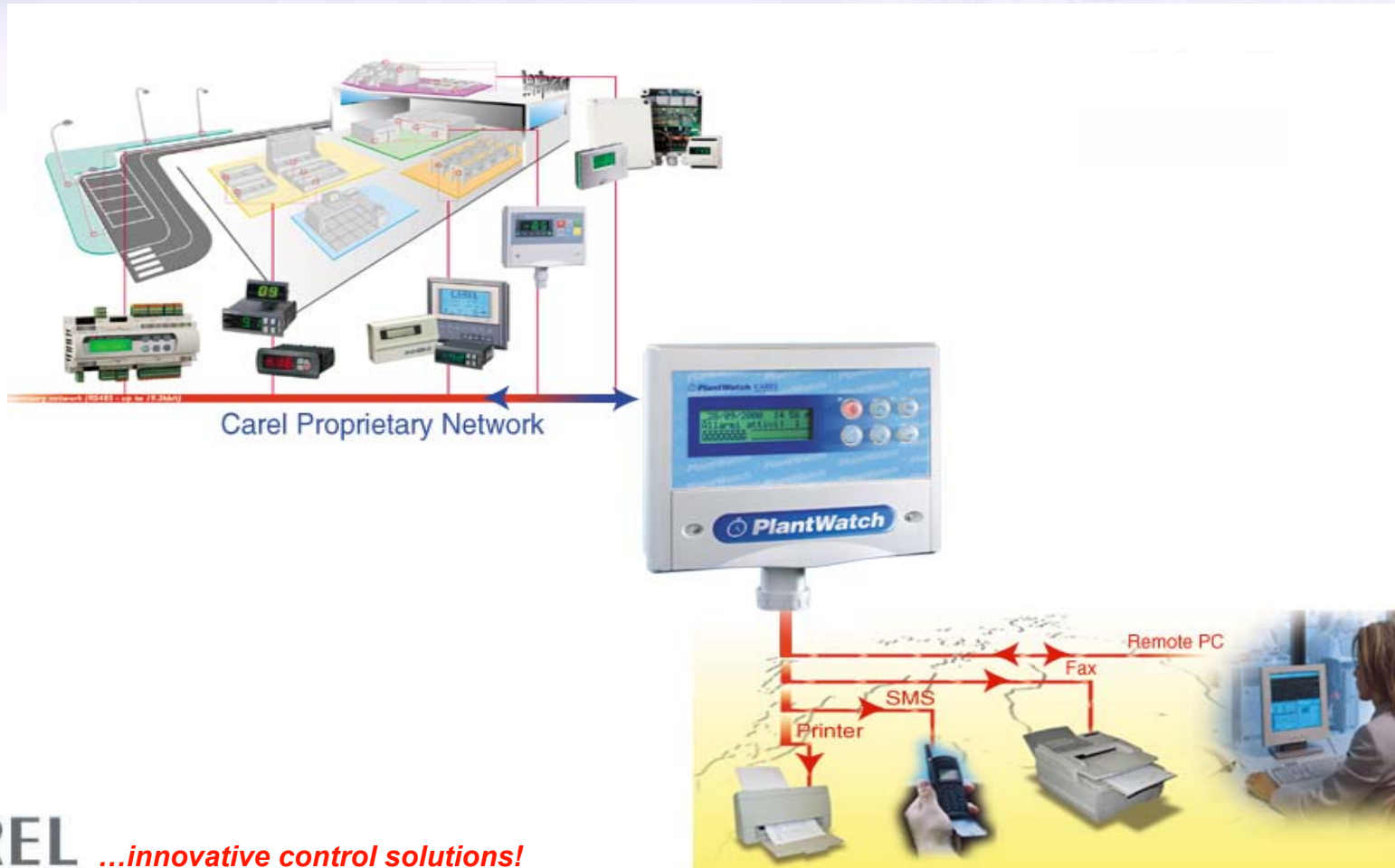


Road Map

End of December 2001:	Prototypes
End of January 2002:	Pre-series
Middle of February 2002:	SNMP
End of March 2002:	Production

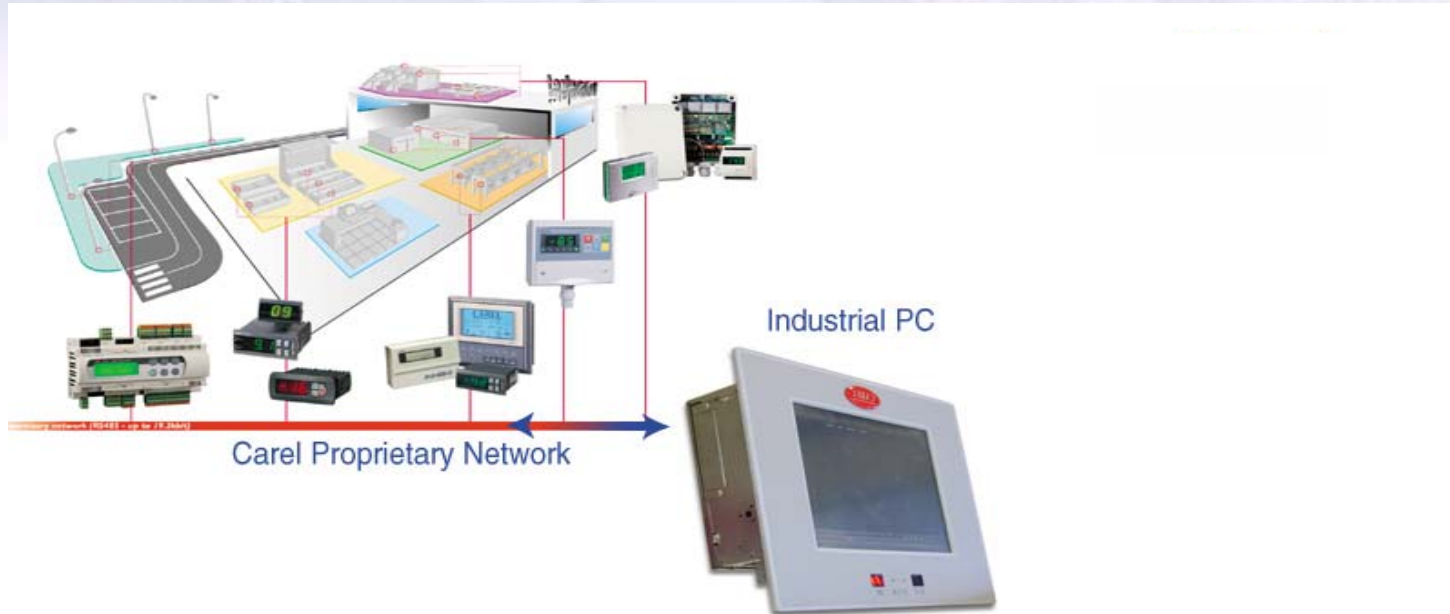


Carel communication Plant Watch



Carel communication

Industrial PC



CAREL

FAN SPEED CONTROLLER



fcm series
fcs series

CAREL

FAN SPEED CONTROLLER Architecture

- FCM: the electronic driver
Connectible to NTC sensors, 4/20mA transmitters, 0/1V sensors
- FCS: the power board
driven with a standard 0/10V single and 3 phase



FAN SPEED CONTROLLER

Main features

- software set up, easy to configure
- splitted solution, more flexibility
- selectable defrost control
- *pLAN* connectible to share information with the chiller controller
- optional infrared remote control unit
- optional connection to supervisory systems



FCM I/O set

- 3 models:
 - FCM00NTC00, 2 NTC sensors
 - FCM0002000, 2 4-20mA sensors
 - FCM0001000, 2 0-10Vdc sensors
- 2 digital inputs for alarms, on/off, setback feature, heating/cooling
- a 0-10Vdc output to drive the slave module
- a relay for alarm, max. capacity signal, on/off actuator



FCM

Main features

- one parameter, 8 functioning mode: easy to program
- usual function (cut off, speed up, softstart) plus Defrost control
- P+I regulation
- *pLAN* / supervisory system connectible
- optional infrared remote control unit



FCS

Main features

- single phase, 2A, 4A, 6A, 8A and 12A, 230Vac (open version)
- three phases, 6A, 12A, 20A, and 40A, 400Vac (IP55)
- three phases 12A,20A,40A 400Vac (open version) IP20
- a 0-10Vdc input as driving signal

for the three-phase models...

- alternatively a PWM input for connection to MCH series
(no need of CONV module)
- 2 algorithms, proportional or quadratic



Fan Speed Controller



FCM: the electronic driver

It is connectible to NTC sensors,
4/20mA transmitters and
0/10V sensors

FCS: the power board

driven with a standard 0/10V
single- and 3-phase



FCM the Master

Models:

FCM00NTC00, 2 NTC sensors

FCM0002000, 2 4-20mA sensors

FCM0001000, 2 0-10Vdc sensors

Features:

- 2 digital alarms input on/off, setback, heating/cooling
- 0-10Vdc output to drive the Slave module
- a relay for alarm, max. capacity signal, on/off actuator



FCM the Master

Main features:

- one parameter for 8 functioning modes: ease to program
- usual function (cut off, speed up, soft-start) plus Defrost control
- pLAN / supervisory system connectible
- optional infrared handset



FCS the Slave

Features:

- splitted solution, more flexibility
- *single phase*: 2-4-6-8-12A, 230Vac
- *three-phases*: 6-12-20A, 400Vac (IP55)
- *three phases*: 12-20-40A 400Vac (IP20)
- a 0-10Vdc/PWM input as driving signal



Probes



AS series probes for

-temperature

-humidity

Series
AS



AS probes

Main features

- wide power supply (from 9 to 30Vdc and from 12 to 24Vac)
- selectable output signal (0/1Vdc and 4/20mA)
- temperature range: according to the application
- humidity range: 10/90%r.H. or 0/100%r.H.



SENSORS

Models

- **ASW:** → T+H, wall mounting
- **ASD:** → T+H, duct mounting
- **ASP:** → T+H, wall mounting for heavy ambient conditions
- **ASIT:** → T, for immersion
- **ASET:** → T, general purpose





www.carel.com