SuperNode
programmable controller
for connectivity solutions
CAREL, leader in control solutions for HVAC/R, offers the market a product that is the expression of decades’ long experience acquired in the design and production of programmable controllers and in the field of serial connectivity.

Its profound knowledge of HVAC/R applications and market requirements has allowed CAREL to design a product that is at the cutting edge, versatile and complete.

The new Supernode series is the result of the need for a controller than can manage considerable information flows, from the viewpoint of distributed intelligence of the systems, making it ideal as a system coordinator, with simultaneous access by two supervisory systems and the master function for multiple serial connections.

Being fully programmable, it is adaptable to all kinds of applications and needs.
Connectivity ports

**pLAN**
Serial port for the management of terminals (pGD, pAD, …). Supernode, based on its memory space and processing speed, is ideal as the driver for the PGD2/3 touch screen terminal.

**FIELD BUS /tLAN**
Optically-isolated serial port, used to manage devices over the Modbus or CAREL master protocol, such as room terminals, expansions, electronic valve drivers, compressors, inverter, ….
**USB MASTER**
Connection to a pendrive for the fast and direct upgrading of the application or downloading alarm logs.

**USB SLAVE**
Direct connection to a PC without requiring additional converters, running pCO Manager (commissioning, monitoring, routine maintenance and service).

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**BMS 1 & 2**
The BMS serial ports are used for connection to Building Management Systems, a local PlantVisorPRO/PlantWatchPRO supervisor, or a remote connection via internet or analogue/GSM modem. The extensive range of protocols managed by the pCO sistema plug-in serial cards allows communication with the most commonly-used BMS on the market (BACnet™, LON, Modbus®, SNMP, Konnex,...).

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Supernode is the first compact CAREL programmable controller (6 DIN modules) with 32-bit microprocessor and embedded 4 MB flash memory.

- **Flexible**: ideal for more demanding applications, using the numerous I/Os available and a modern and functional semi-graphic display.
- **Powerful**: the power of the new platform makes the management of information fast and reliable
- **Connectable**: 6 serial ports available
  - 2 built-in RS485 ports, one of which optically isolated
  - 2 slots for BMS plug-in cards
  - 2 USB ports (Master & Slave)
Integrated management of the home is no longer a problem, using the several connection options available on Supernode. The versatility of the device ensures simple control of the following:

- Ground source heat pumps;
- A series of room terminals for precise comfort control;
- Touch screen area controller as a single access point for global control of the home;
- Complete management of time bands;
- Energy consumption

**Multi-serial master**

In terms of serial management, Supernode can acquire information from three serial ports at the same time, as the Master:

- The classic multimaster pLAN, to connect pCO controllers, pAD, PGDO/1/2/3,…
- The optically-isolated field bus, with CAREL or Modbus® protocol
- One of the two BMS serial ports used as Master with CAREL or Modbus® protocol.

**32 bit**

Guaranteed performance and reliability with the new 32-bit µP

**RTC**

Real Time Clock as standard for managing time bands and logs

**Inputs/Outputs**

The numerous un outputs available may be used as the main types of unit (Chill)
Supervision

The installation becomes interactive, capable of interacting with a wide range of supervisors and communication systems. The vast availability of protocols over different types of networks make the installation open to the world.

PGD2/3 driver

Some types of installation require the simultaneous presence of a unit terminal (PGD 0/1) and an area terminal (PGD 2/3) to manage the entire installation from a single position. In this case, Supernode (in the version without built-in display) is the ideal solution as the driver that acquires information from the unit via Field Bus or pLAN and displays it on the PGD2/3.

Outputs

Universal inputs and mean the device can controller for various (HP, Roof top, …)

Energy

The fast digital input (with division of the pulses selectable by the application), standard on all versions, can be used to directly read energy meters

Flexibility

Extensive adaptability to different HVAC/R installations, customisable software
A building coordinator for all occasions

Supernode is the concentrator node for air-conditioning, refrigeration and humidification systems.

**Programmability**

Programmability using 1Tool, plus the availability of the optically-isolated field serial port (Field Bus/tLAN), integrated as standard, mean numerous different devices can be managed as system coordinator.

Supernode thus acquires information from the various devices, applying programmable logic/strategies to make the operation of the installation more efficient.

**Contextual display and keypad**

The Supernode built-in display has the same resolution as the pGD1 (132x64 pixels; 8 rows x 22 characters), however is more compact.

The keypad is placed horizontally underneath the display, without screen printing, and the functions associated with each button can be customised and change from mask to mask.

The functions, managed by the application, are shown on the bottom row of the display.

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1tool

The new development tool that allows the designer to manage all the phases of the application program: design, testing, debugging and commissioning directly in the field.

Field Bus/tLAN

Integrated and optically-isolated RS485 serial port for the management of numerous field devices.

US

Simple service and run as standard.
**Dual BMS**

In large buildings, centralised control is managed by the Building Management System (i.e. BACnet, LON, ...). If the HVAC/R unit maintenance personnel need to access the unit for monitoring and supervision, they have to get authorisation from the system integrator or go on site for local control.

Supernode is designed to be the sole point of access for monitoring the entire installation, providing a dedicated serial connection for the BMS plus a further supervision port for connection via Ethernet, GSM or analogue modem, PlantVisor PRO, PlantWatch PRO, or other protocols available with the pCO sistema boards for local or remote supervision, independent of the BMS.

**Semi-graphic display**

Built-in semi-graphic display, 132x64 pixels, negative blue (like the PGD1)

**Connectivity**

Possibility to connect to two different supervisor systems at the same time: Modbus®, BACnet®, LON, etc.
### Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>SNS*M</th>
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<td>4Mb flash memory</td>
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<tr>
<td>8Mb flash memory</td>
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<td>512kb RAM</td>
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<td>2Mb RAM</td>
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<td>32Mb NAND flash</td>
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<td>Real Time Clock</td>
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<td>Max. no. of serial ports</td>
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<td>pLAN</td>
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<td>Opto-isolated RS485/tLAN/PST-PLD</td>
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<td>BMS card 1 connector</td>
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<td>BMS card 2 connector</td>
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<td>Master USB port</td>
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<td>Slave USB port</td>
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<tr>
<td>Ready for programming key</td>
<td>■</td>
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<tr>
<td>Negative blue built-in display, 132x64 pixels</td>
<td>■</td>
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<tr>
<td>User interface with 6 LEDs + 1 button</td>
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<td>Black Box</td>
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<td>Max. no. of inputs</td>
<td>7</td>
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<tr>
<td>PT1000 inputs</td>
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<tr>
<td>0 to 10 V inputs</td>
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<tr>
<td>0 to 1 V inputs</td>
<td>6</td>
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<tr>
<td>4 to 20 mA or 0 to 20 mA inputs</td>
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<tr>
<td>NTC inputs</td>
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<tr>
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<tr>
<td>Select AIN by software</td>
<td>■</td>
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<td>Max. no. of analogue outputs</td>
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<td>0 to 10 Vdc outputs</td>
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<tr>
<td>PWM outputs (phase control)</td>
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<td>Max. no. of digital outputs</td>
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<td>SPST relay outputs</td>
<td>1</td>
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<td>SPDT relay outputs</td>
<td>1</td>
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<tr>
<td>Max. no. of SSR outputs</td>
<td>2</td>
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<tr>
<td>48 Vdc power supply</td>
<td>■</td>
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<tr>
<td>24 Vac power supply</td>
<td>■</td>
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</tbody>
</table>

- standard - ■ optional

### Dimensions (mm)

![Dimensions Diagram]
OVERVIEW DRAWING

Probes
- SPKT*: 4 to 20 mA pressure probes - 0 to 5 V ratiometric probes
- NTC/PT1000: temperature probes
- DPP*: temperature & humidity probes for industrial environments
- DPW*: temperature & humidity probes for civil environments
- DPD*: temperature & humidity probes for ducts

EVD EVO
- EVD*2: EVD*4: EEV drivers
- EVD EVO
- EVD*4: EEV drivers
- EVD EVO
- EVD*4: EEV drivers

PCOE*: pCO I/O expansion for tLAN
- EVD EVO
- EVD*4: EEV drivers

CPY: KUE* humidifier control boards

(*): The tLAN CANNOT be connected to PCOEB00TLN0 & PLD* terminals at the same time!