August, 2021

Network Interface Card Installation Manual
Carel pCOWeb, pCONet & LonWorks Card

⚠ WARNING

1. Disconnect power supply before making wiring connections or installing the interface card to prevent electrical shock and equipment damage.
2. Disconnect any pLAN (J11) and BMS connections as these can carry small levels of power to the unit.
3. All units must be wired strictly in accordance with wiring diagram furnished with the unit. Any wiring different from the wiring diagram could result in a hazard to persons and property.
4. All wiring must be done with a wiring material having a temperature rating of at least 105°C.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these units must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service manual originally shipped with the unit, in addition to any other accompanying component supplier literature.
3. Take preventative measures to reduce risk of exposing the card to ESD (Electric Static Discharge) from the operator. Keep components in the original package until installation. If removed from package and not installed, place back inside original package or another antistatic plastic bag. Failing to take the preventative measure can result in damages to the interface card.

Application

Select Carel microprocessor controllers are available with optional Network Interface Cards to enable communication with Building Management Systems (BMS) via industry standardized communications protocols. The optional interface cards available are (refer to Figure 1.1):

- **pCOWeb:** This card communicates using BACnet protocol. The card connects to the network via an Ethernet cable using SNMP and HTTP communication.

- **pCONet:** This card communicates using BACnet protocol. The card connects to the network via an RS485 connection.

- **LonWorks:** This card communicates using LonWorks protocol. Each LonWorks card has an individual neuron ID that makes it unique and enables differentiation on the LonWorks network.

Figure 1.1 – Network Interface Cards
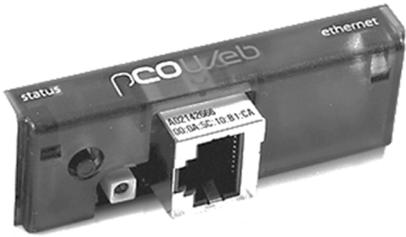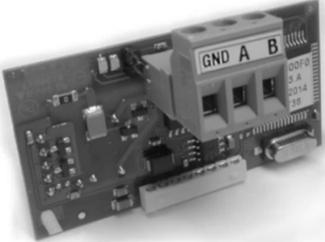
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Interface Card Installation

For the following instructions, the Carel pCO5+ controller is used to demonstrate the installation.

1. Remove the plastic cover that is labeled either serial card or BMS Card (see Figure 2.1). With the cover removed, a white eight pin socket can be seen on the controller circuit board.

    Note: For LonWorks card, remove center of plastic cover, and reuse as the LonWorks interface cover.

    Figure 2.1 – Interface Card Location
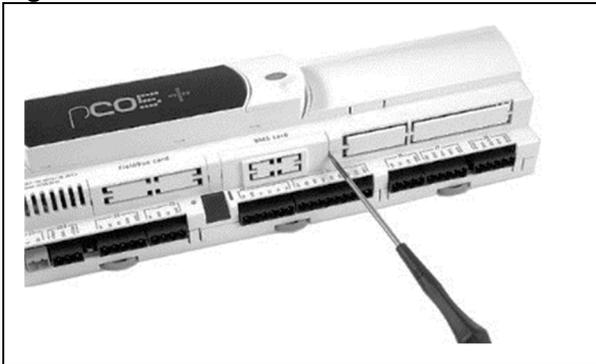
2. **For LonWorks:** Remove the 3-pin LON connector on the LonWorks card. Refer to Figure 2.2.

    Figure 2.2 – LonWorks: Remove Connector
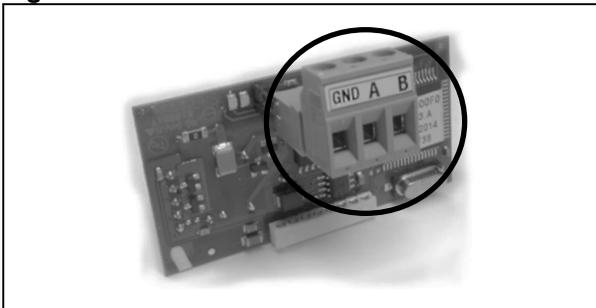
3. **For pCONet:** There are three DIP switches, located underneath the RS485 connection (see Figure 2.3), that must be set as follows:

    a. For the first and last units on the network, set all three switches to the ON position.

    b. For intermediate units on the network, set all three switches to the OFF position.

    Figure 2.3 – pCONet: Set DIP Switches
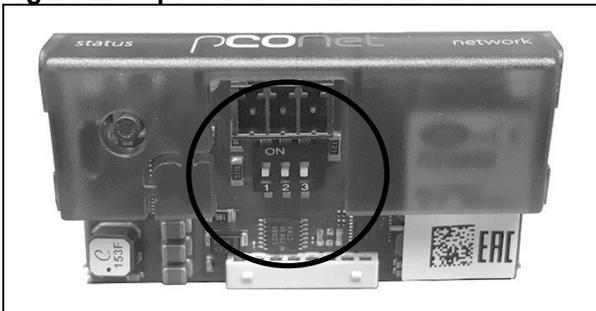
4. Insert the interface card with the 8-pin plug onto the 8-pin socket on the controller. Verify all pins are mated properly. Press firmly until the card clicks into place. Refer to Figure 2.4.

    Figure 2.4 – Insert Card in Controller BMS Slot
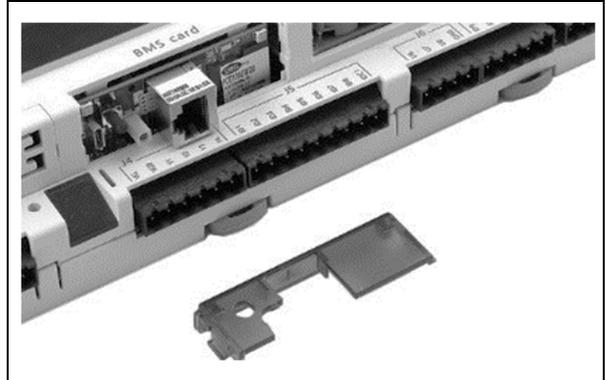
5. Insert the interface card cover by placing the left-hand side in place then press the right-hand side in until it clicks into place. Refer to Figure 2.5.

    Figure 2.5 – Insert Card Cover
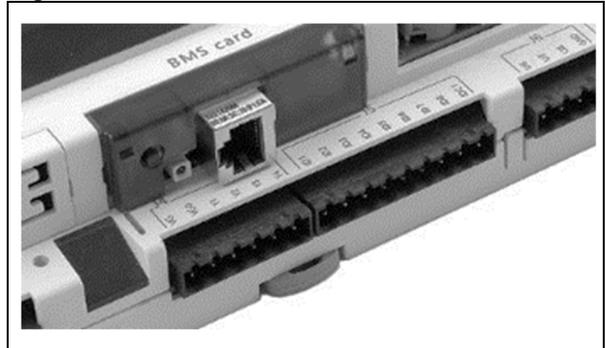
6. **For LonWorks:** Replace the 3-pin LON connector onto the LonWorks card. Refer to Figure 2.6.

    Figure 2.6 – LonWorks Card Installed

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Resetting Factory Defaults
(pCOWeb & pCONet)

1. Restart the software by either turning the unit off then back on, or by holding the reset button for 5-10 seconds. After releasing the button, the status LED will stop flashing and 15 seconds later the pCONet or pCOWeb will be restarted.

2. After the card has been restarted, press and hold the reset button on the card, located on the front left, as shown in Figure 3.1. Keep the reset button pressed for at least 20 seconds until the status LED starts to flash red slowly three times. Release the reset button while the red LED is flashing. If done correctly, the status LED will turn green, then quickly flash red 3 times.

Figure 3.1 – pCOnet: Reset Button

Note: Button on the pCOWeb card is in the same location.
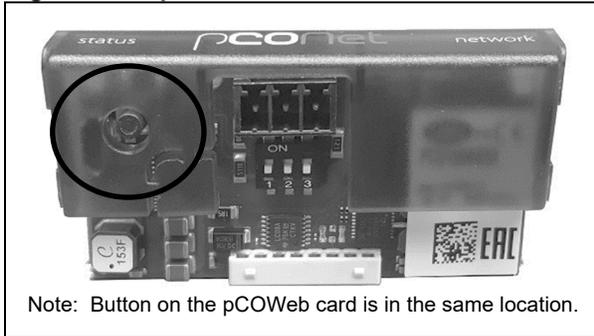
3. Wait one minute for the card to complete its boot phase.

4. The factory recall function will not permanently overwrite previously stored settings, it will only recall them for the duration of the time the card has power to it. If the card loses power, it will require resetting again to use the factory settings.

BMS Controller Setup

The BMS setup can be done using the display/keypad on the controller or the remote display/keypad (Remote User Interface). Refer to the unit Controls Manual or the Remote User Interface Manual that shipped with the unit for more information.

1. Turn power on after the interface card is installed.

2. To access the BMS settings from the main screen, press PRG button then using the UP or DOWN buttons, scroll through the menu to find the Service Settings and press the ENTER button. Inside the Service Settings menu scroll to the BMS Config menu selection and press the ENTER button. **NOTE:** The default password is "1500."

3. Press the ENTER button to select what option you would like to change and use the UP or DOWN buttons to change the values of a selection. Move the cursor back to the top to change screens.

4. For each card, change the "BMS CARD Protocol" as follows:

   a. **For pCOWeb:** Change to "BACnet IP/Eth."

   b. **For pCONet:** Change to "BACnet MSTP."

   c. **For LonWorks:** Change to "Lon". Press the ENTER button to save the selection and the Lon BMS selection is complete.

5. For pCOWeb or pCONet, on the next screen, the controller will ask if a card has been installed into the controller. Select "Yes".

6. Adjust the following settings:

   i. For pCONET, BACnet MSTP setup automatically pulls the information from the pCONet card, confirming the values with the values given by the factory as each card is different. To save changes to the card, go to the BACnet Read/ Write screen, select "Write" and update to "Yes."

   ii. For pCOWeb, BACnet IP setup will automatically pull the instance of the pCOWeb card; however, the network information needs to be completed in order to successfully communicate with the network. To save changes to the card if needed, go to the BACnet Read/Write screen, select "Write" and change update to "Yes."

pCONet Setup & Operation

The pCONet cover has two labels for LED's located on the card, one labeled status and the other network. The status LED indicates the status of communication with the controller and the status of the pCONet. The network LED indicates the status of communication with the BACnet MS/TP network.

Status LED: During the starting sequence, this LED will remain off for two seconds, and will then flash red-green-red two seconds after starting. Five seconds after restarting it will be a constant green. After 50 seconds normal operation, these are the possible status indicators:

1. Quick green-OFF-green: This indicates proper communication with the controller.

2. Slow red-OFF-red: This indicates that there is no communication with the controller.

3. Green-red-green: This indicates that the pCONet detects errors or a lack of response from the controller.

Network LED: During the starting sequence, this LED will remain off for about 50 seconds then flash green-red-green-red, after this the BACnet will be active. The network LED will now indicate the quality of the connection with these possible statuses:

1. Green with the occasional red flashes: This indicates communication is ok.

2. Green and red both on: This indicates that communication has not been established.

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pCOWeb Setup & Operation

IMPORTANT

Before connecting the pCOWeb to an Ethernet network, it is strongly recommended to contact the network administrator. Incorrect configuration of the pCOWeb may temporarily shut down the entire network.

For the pCOWeb to operate correctly several basic parameters need to be set such as the IP address and Netmask. The pCOWeb is supplied with a DHCP function already active. Therefore, on a network served by a DHCP, the pCOWeb will automatically acquire the necessary parameters without requiring configuration.

For networks without DHCP, it is recommended to connect the pCOWeb directly to a computer using a cross over Ethernet cable. Then start the board with the "factory bootswitch" parameters by restarting in factory default values. See page 3 for instructions on resetting.

Setting up Personal Computer (PC) Configuration for pCOWeb

The PC must be set to use IP address 172.16.0.2, not the DHCP, to communicate with the card. The Subnet mask field needs to be set to 255.255.0.0.

1. Go to your PC's "Control Panel"

2. Open your Network configurations settings

3. Open the local area connection settings

4. Click "Properties"

5. Double click 'Internet Protocol (TCP/IP)" in the list.

    Note: It is helpful to record all setting changes in order to configure the pCOWeb. When finished, these settings need to be reversed for the PC to communicate with the data network it was previously connected to.

6. Click "Use the following IP-address"

7. Set the Following Parameters:

    IP address = 172.16.0.2

    Subnet Mask = 255.255.0.0

8. Click the OK button to close all the windows and save the settings.

Disabling Proxy settings

If the computer is using a proxy server, this must be disabled before communication with the pCOWeb is possible. If the computer does not use a Proxy server, ignore these steps.

1. Go to your PC's "Control Panel"

2. Double Click "Internet Options"

3. Click "Connections" from the top row of options

4. Under the Connections Tab Click "LAN Settings…"

    Note: It is helpful to record all setting changes in order to configure the pCOWeb. When finished, these settings need to be reversed for the PC to communicate with the data network it was previously connected to.

5. Disable Proxy server

6. Close the windows and save settings using the OK button.

Factory parameters will remain active until the pCOWeb is restarted, when rebooted and the button is not pressed the pCOWeb will return to the "User" configuration.

Table 4.1 – pCOWeb Factory Parameters

Parameter	Value
IP Address	172.16.0.1
Subnet Mask	255.255.0.0
"admin" password	fadmin

The factory values are a part of the "bootswitch parameters" and, unlike the user parameters, cannot be modified. The bootswitch parameters never copy over the user parameters.

Connecting to the pCOWeb via Web Browser and Crossover Cable

After starting the Controller and pCOWeb with the Factory Parameters, make sure the pCOWeb startup phase is complete. Check that the Status LED is flashing normally, otherwise the required web pages will not be sent to the PC.

On the PC, open an Internet browser and in the address field enter the IP address of the pCOWeb card:

172.16.0.1

Then press "Enter" to load the pCOWeb default page.

Establishing a connection between the PC and pCOWeb Via a Network

Before connection to the pCOWeb via a network these following steps must have been previously completed:

1. The pCOWeb must be installed in the controller.

2. The pCOWeb must be connected to an Ethernet network using a standard cable (NOT a crossover cable).

3. The pCOWeb network communication parameters are already correctly configured and the static IP address for the pCOWeb being used must be known.

4. The PC must be already connected and configured to the data network.

If all these conditions are met, the pCOWeb can be accessed via a network by opening an Internet browser on the PC and typing the IP address of the pCOWeb. **Note:** It is important that the pCOWeb has completed startup before attempting to connect to it.

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pCOWeb LED Status

During the starting sequence, on power up, or after restarting, the LED preforms the following sequence.

1. Two seconds after starting: quick red-green flash

2. Five seconds after starting: green steady

3. 60 seconds after starting: Board is in operation mode LED depends on communication status.

The quality of communication with the controller is indicated with the Status LED.

1. Fast green-dark: Communication with controller is OK

2. Slow red-dark: Communication with the controller is not established.

3. Green/red: Temporary errors, lack of a response from controller.

The Ethernet LED flashes to indicate the quality of the connection to the Ethernet network.

1. Green: Communication is ok

2. Flashing green: Exchanging data

3. Red: Communication not established with the other side.

LonWorks Setup & Operation

After the LonWorks card has been installed and connected to the LonWorks network, it needs to send out a "handshake protocol" to be identified on the network. This is done with the service pins. To activate the service pins and send out the "handshake protocol," the two pins must be shorted. This can be done easily with the tip of a screwdriver. The confirmation of a successful "handshake" is indicated by the green service LED.

A red LED light indicates a loss of connection to the controller. If this light is illuminated, check that the BMS Configuration on the controller is set to Lon, See the "BMS Controller Setup" for instructions.

Note: The real connection to the LonWorks network must be performed following the LonWorks instructions and specifications. For further information on installation, cross section and type of cable please refer to LonWorks documentation.

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and therefore reserves the right to change design and specifications without notice.

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