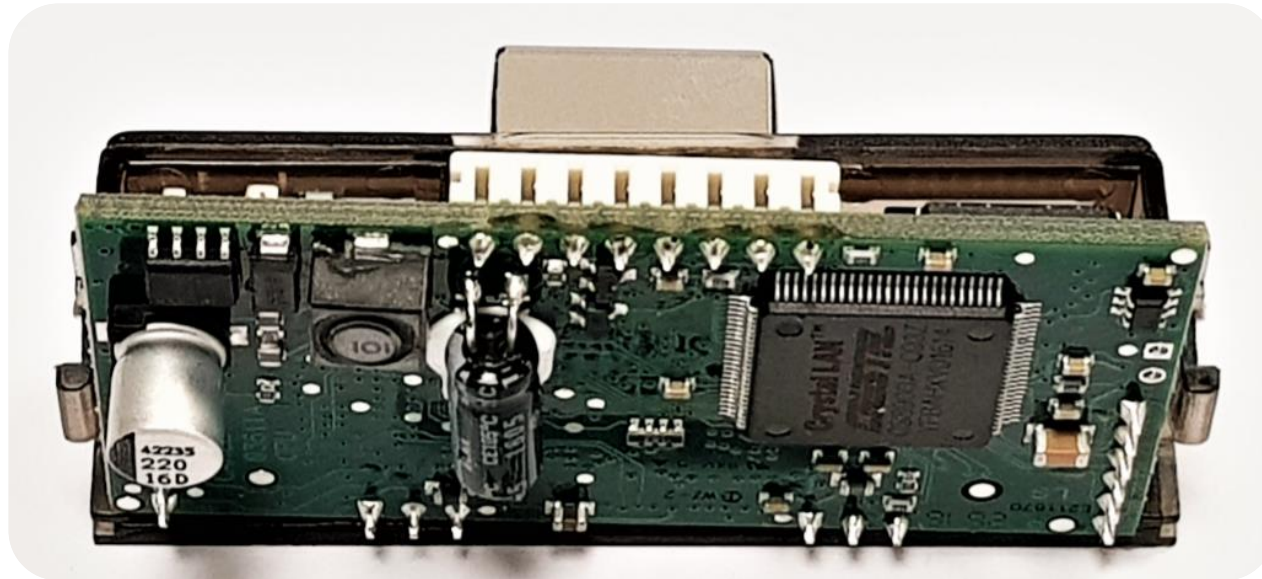


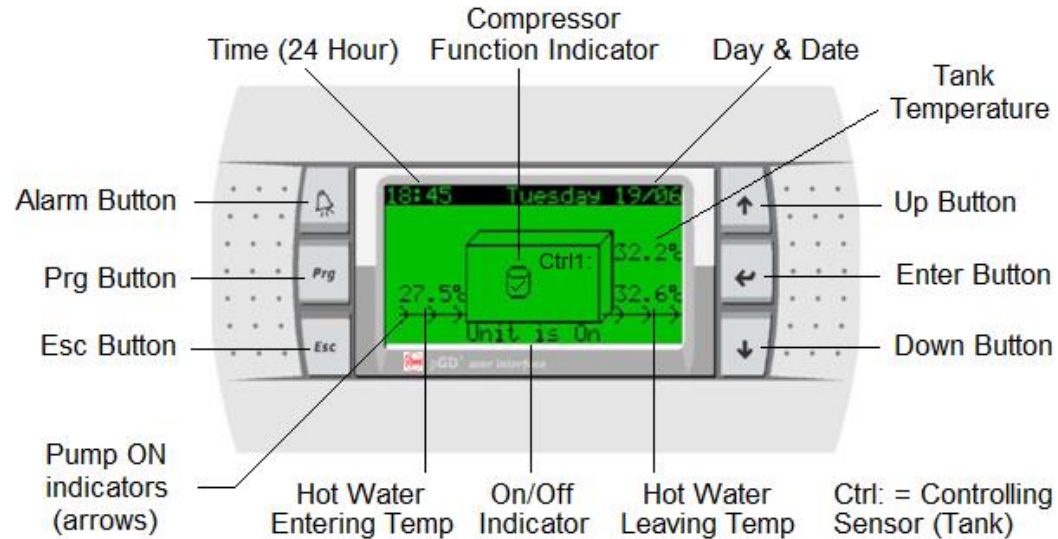
# BACnet/IP & Modbus TCP/IP on Ethernet Configuration Guide

Rheem Commercial Heat Pump BMS Card



*Install a Rheem*

# Configuration on Heat Pump Display



## Control Panel Operation Quick Guide

Press and release **Esc** to enter main menu (from home screen)  
Press and release **↑** or **↓** to highlight desired main menu screen  
Press and release **←** to enter highlighted main menu screen  
Press and release **↑** or **↓** to navigate to desired parameter screen  
Press and release **←** to move cursor to desired parameter  
Press and release **↑** or **↓** to change parameter  
Press and release **←** to accept new parameter setting  
Press and release **Esc** to navigate back one screen  
Repeatedly press and release **Esc** to navigate back to home screen

- After commissioning the Master heat pump, go to the Service menu
- Service- Password 0022>BMS Config
- Go to BMS configuration (will time out after 5 minutes if no buttons pressed)
- Change the settings for BMS configuration from the display menu as mentioned below.

**Address:** No change required (address is irrelevant for this card)

**Protocol:** CAREL

**Speed:** 19200 (this value is set from factory to communicate between heat pump and BMS card)

# Inspection of BMS Card

Open the heat pump enclosure and check the BMS card.



The BACnet/IP & Modbus TCP-IP card features a button (PUSHBUTTON) and two indicator lights (STATUS LED and NETWORK LED).

Functions of the button:

- When starting up the BACnet/IP & Modbus TCP-IP, this is used to select, for network communication, whether to use the factory parameters or the user parameters
- In normal operation, reboots the card without needing to disconnect the power supply

**Status LED:** indicates the status of communication with the heat pump controller and the status of the card, and must normally be green and flash around 3 times a second; in special circumstances it displays the operation of service activities, such as the restart of the internal program on the card, the remote updating of the program, or others. See the table below.

Status LED	Meaning	Notes
Green flashing (3 times/sec)	Regular communication	When running demanding tasks (sending a large number of notifications), this may be green steady for a few seconds
Red flashing slowly (once every 2 seconds)	Communication not established	-
Single red flash and then flashing green	Single communication error, one failed response or attempt to write a variable with an index higher than 207	After 5 failed responses, the Status LED starts flashing red until communication resumes
Off, then green-red repeated in rapid succession, then green steady for 1 minute	Card reboot phase	-
Green steady for a minute	Card reboot phase	Wait for the conclusion of the reboot
Red- Off slow (1sec-1sec) repeated 3 times	Detection of button pressed during reboot for selecting factory parameters (rather than User parameters)	Release the button to confirm
Red- Off fast (3 times a second) repeated 3 times	During reboot, confirms that factory parameters have been selected by pressing the button	-
Blue steady for a minute	During firmware update, writing to non-volatile memory	Do not interrupt the power supply

**Network LED:** displays the status of the physical network connection (Ethernet connection signals), regardless of whether the network parameters are correct; usually this must be green and flash when data is transmitted/received.

Network LED	Meaning
Green steady	Correct Ethernet data connection signals
Green flashing	Correct Ethernet data exchange
Red	No Ethernet signal detected

# Card Configuration via Laptop/PC

To configure the card, it is required to be powered. This can be done by turning ON the heat pump.

An Ethernet cable will be required to connect the card to a laptop or PC.

In order to access the configuration, the card can be started using the “factory boot-switch parameters”:

1. Switch on the power supply source and hold the black pushbutton on the card for approx. 10 seconds until the Status LED begins to flash SLOWLY 3 times, red-OFF.
2. **You will need to release the button before the 3<sup>rd</sup> red flash.**
3. After about 35 seconds, the status LED will flash regularly and the card will have booted with its factory boot switch parameters in place of the user settings.

Note: These factory settings will remain in place until the next Reboot.



Default Address settings of the card:  
IP address= 172.16.0.1;  
Net mask= 255.255.0.0;

BMS settings:  
Protocol= Carel  
Baud Rate/Speed = 19200



# Card Configuration via Laptop/PC

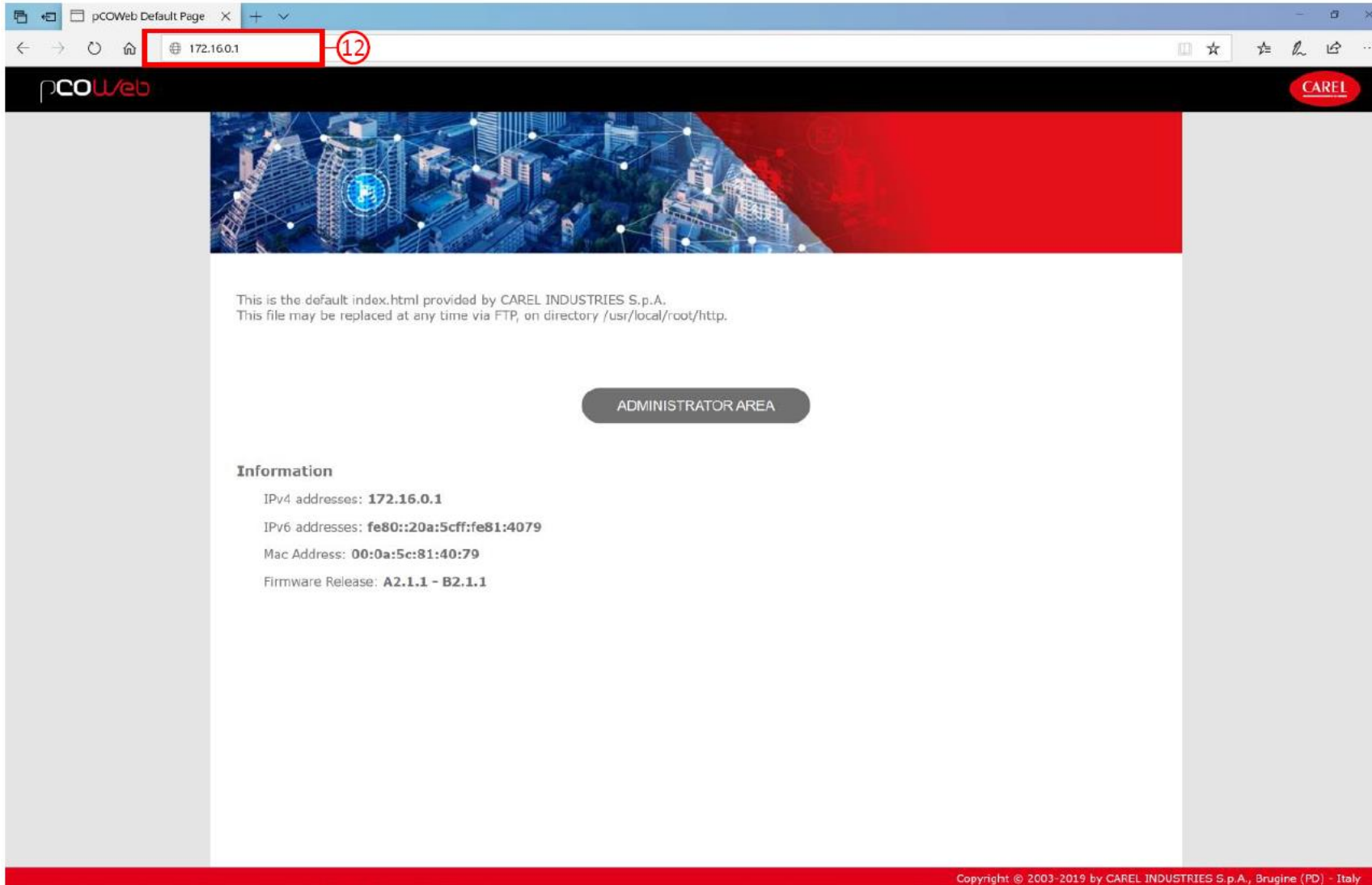
The image displays four sequential screenshots of Windows network configuration steps, numbered 4 through 11:

- 4:** Network and Sharing Center window. The 'Ethernet 2' connection is selected under 'Connections'.
- 5:** Ethernet 2 Properties window. The 'Networking' tab is active, and 'Internet Protocol Version 4 (TCP/IPv4)' is checked.
- 6-11:** Internet Protocol Version 4 (TCP/IPv4) Properties window. The 'General' tab is active. The radio button for 'Use the following IP address' is selected. The IP address is set to 172.16.0.100 and the Subnet mask is 255.255.0.0. The 'OK' button is highlighted.
- 6:** Ethernet 2 Status window. The 'Properties' button is highlighted.

4. Open the network and sharing centre via the control panel
5. Open the Ethernet settings
6. Select Properties
7. Select Internet Protocol Version 4 (TCP/IPv4) and select properties
8. Change from “Obtain an IP address automatically” to “Use the following IP address”
9. Enter the the IP Address of 172.16.0.xxx ( we have used 100 in the example Do not use 172.16.0.1 as this is the card’s default IP address)
10. Enter the Subnet mask as 255.255.0.0
11. Select OK on the two properties boxes to confirm settings

Note: Once you have completed the configuration of the card, you will need to change your network settings back to how they were previous to adjusting.

# Card Configuration via Laptop/PC



12. Open your browser of choice and enter the card IP address, 172.16.0.1, into the address bar
13. The card default page will open and you can now select to open the 'Administrator Area'



# Card Configuration via Laptop/PC



This is the default index.html provided by CAREL INDUSTRIES S.p.A.  
This file may be replaced at any time via

## Information

IPv4 addresses: **172.16.0.1**

IPv6 addresses: **fe80::20a:5cff:fe8**

Mac Address: **00:0a:5c:81:40:79**

Firmware Release: **A2.1.1 - B2.1.1**



14. Enter the default user name and password-

- User Name: admin
- Password: fadmin

15. Select OK

**Note:** It is possible to change this user login password once inside the configuration menu.

# Card Configuration via Laptop/PC

The screenshot shows a web browser window with the URL 172.16.0.1/config/adminpage.html. The page title is 'Information Page' and it displays 'Data is live, it automatically updates every 5s, double click on a value to change it'. Below this, there are buttons for 'Cells per row' with values 10, 20, 30, 40, and 50. The 'Configuration' tab is highlighted with a red box and a circled '16'. The page is divided into three sections: Digital Variables, Analog Variables, and Integer Variables. Each section has a table with columns for 'Up to' and 20 data points. All data points in the tables are 'U'. A 'REBOOT' button and the BTL logo are visible at the bottom left. Copyright information for CAREL INDUSTRIES S.p.A. is at the bottom.

16. Once inside the configuration menu, the default page is the information page and it displays the variables that the card is reading from the heat pump controller.

Select the 'Configuration' tab

17. Note: If the card is installed within heat pump controller board and the variables return a value of 'U', this indicates that the card is not communicating with the heat pump.

Confirm that the BMS settings in the heat pump controller display are set to 'CAREL' as the protocol and '19200' as the baud rate/speed.





# Card Configuration via Laptop/PC

The screenshot shows the pCOWeb configuration interface. The 'Network' menu is selected, and the 'IPv4 Configuration' section is highlighted with a red box and a circled '19'. The 'Static' radio button is selected. The 'Address Main' field contains '172.16.0.1' and the 'Netmask' field contains '255.255.0.0'. Below this, there are fields for 'Alias 1', 'Alias 2', 'Alias 3', and 'Gateway Address'. The 'IPv6 Configuration' section has 'SLAAC' selected. Below that are fields for 'Address 1' through 'Address 4' and 'Prefix' for each. The 'DNS servers' section has fields for 'Primary DNS' and 'Secondary DNS'. A 'Submit' button is at the bottom. The interface also shows a 'REBOOT' button and the BTL logo.

18. Once inside the configuration menu, select the 'Network' menu

19. Select 'Static'

20. Enter in the network settings provided to you by the BMS/Site contact.

21. Typical settings provided will be the IP Address (Address main), Subnet Mask (Netmask) and the Default Gateway (Gateway address)

22. Once entered, select 'Submit'

**Note:** Once submitted, you will be prompted to reboot. You do not need to reboot immediately if you still require to configure further settings such as the BACnet settings. If finalised, you may reboot for the new settings to take place.

# Card Configuration via Laptop/PC

The screenshot shows the pCOWeb configuration interface. The 'BACnet' tab is selected and highlighted with a red box and the number 23. In the 'Service configuration' section, the 'BACnet status' dropdown is set to 'Enabled' (labeled 24) and the 'BACnet/IP port' is set to '77000' (labeled 25). The 'Device Properties' section shows 'BACnet LAN type' as 'BACnet/IP' and 'pCOWeb Device Instance' as '77000'. The 'Alarm Parameters' section has 'Alarming enabled' set to 'No'. The 'Clock Parameters' section has 'Daylight Saving Time' set to 'No'. The 'BBMD Properties' section has 'IP address for BBMD\*' set to 'no' and 'Foreign device Time-To-Live\*' set to '0'. The 'pCO Mapping Parameters' section has 'Mapped digital variables', 'Mapped analog variables', and 'Mapped integer variables' all set to '207'. A 'REBOOT' button is located at the bottom left, and a 'Submit' button is at the bottom center. The footer contains the copyright information: 'Copyright © 2003-2019 by CAREL INDUSTRIES S.p.A., Brugine (PD) - Italy. All rights reserved.'

## If the requested protocol is BACnet/IP

23. Select the BACnet tab.

24. Set the BACnet status to 'Enabled'

25. Change the 'pCOWeb Device Instance' to the value provided you by the BMS contact.

26. Select Submit

**Note:** Once submitted, you will be prompted to reboot. You do not need to reboot immediately if you still require to configure further settings. If finalised, you may reboot for the new settings to take place.

# Card Configuration via Laptop/PC

The screenshot shows the pCOWeb configuration interface. The top navigation bar includes tabs for General, Network, pCO Com, ModbusTCP (highlighted with a red box and circled 27), SNMP, BACnet, Plugins, Users, and Firmware. The ModbusTCP tab is active, showing the following configuration options:

- Service Configuration:**
  - Modbus TCP status: Enabled (highlighted with a red box and circled 28)
  - Modbus TCP port: 502 (with a default value of 502)
- System Configuration:**
  - Map mode\*: v1.5.x (new)

Below the configuration options is a reference mapping table:

Mode	Digital	Analog	Integer
v1.5.x	2-2049	2-5001	5003-10002
v1.4.x	1-2049	2-5001	5002-10001

A 'Submit' button is located at the bottom of the configuration section. The left sidebar contains various system information and a 'REBOOT' button. The bottom of the page features the BTL logo and the Rheem logo.

## If the requested protocol is Modbus TCP/IP

27. Select the ModbusTCP tab

28. Set the Modbus TCP status to 'Enabled'

29. Select Submit

**Note:** Once submitted, you will be prompted to reboot. You do not need to reboot immediately if you still require to configure further settings. If finalised, you may reboot for the new settings to take place.

# Inspection of BMS Card Connection



Status RED- card not communicating with heat pump  
Ethernet RED- No connection between card and network



Status RED- card not communicating with heat pump  
Ethernet GREEN- Network connection OK



Status GREEN- card communication OK  
Ethernet RED- No connection between card and network



Status GREEN- card communication OK  
Ethernet GREEN- Network connection OK

For further assistance, call Rheem Service on 131 031.

