BACnet MS-TP Configuration Guide

Rheem Commercial Heat Pump BMS Card



Install a Rheem

Configuration on Heat Pump Display



Control Panel Operation Quick Guide

Press and release Press and release ↑ or ↓ to highlight desired main menu screen Press and release ↑ or ↓ to navigate to desired parameter screen Press and release ↑ or ↓ to navigate to desired parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter Press and release ↑ or ↓ to change parameter setting Press and release For a compare back one screen Repeatedly press and release For a compare 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 MS-TP card features a button (PUSHBUTTON) and two indicator lights (STATUS LED and NETWORK LED).

Functions of the button:

- When starting up the BACnet MS-TP, 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.

Starting sequence: on power-up, or after restarting card, the Status LED switches in the following sequence: • off;

- 1 seconds after restarting: quick flash red-green-red-green...;
- 3 seconds after restarting: green on steady;
- around 45 seconds after restarting: flashing (colour: see below -Status of communication with the card) card communication starts.

Status of communication with the card: once the starting sequence has been completed, the Status LED flashes to indicate the quality of communication with the card:

- quick green-OFF-green if communication with the card is OK (card ON-LINE);
- slow red-OFF-red if communication has not been established with the card (card OFF-LINE)
- green-red-green if card detects errors or a temporary lack of response.

Network LED: The Network LED (right) indicates the status of communication with the BACnet MS/TP network (RS485). The LED shows the following information:

Starting sequence: on power-up or after rebooting card, the Network LED switches in the following sequence:

- off for around 45 seconds;
- around 45 seconds after restarting the card: slow green-red-green-red: at the end, BACnet will be active.

Status of communication with the BACnet MS/TP network: once the starting sequence has been completed, the Network LED flashes to indicate the quality of communication with the BACnet MS/TP network:

• green with occasional red flashes if communication is OK (BACnet MS/TP meaning: green ON = card keeps the Token (control of the MS/TP network); green OFF = card DOES NOT keep the Token; red on = Poll-For-Master, search for a Master to pass the Token to);

• green and red ON together (BACnet MS/TP meaning: continuous Poll-For-Master): communication not established (connection problems, or no network device found); this may depend on electrical connection difficulties or communication settings that are not compatible with the other network devices connected



To configure the card, it is required to be powered. This can be done by turning ON the heat pump or using a Micro USB cable.

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 3rd 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.
- 4. Connect the BACnet MS/TP card to your laptop via the USB-RS485 Convertor (CVSTDUMOR0). The driver for the adapter can be found at http://www.ftdichip.com/Drivers/VCP.htm

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



Install a Rheem

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			 Poscurity devices 	×

- 5. Open up Device Manager via the control panel to confirm the port number and settings.
- 6. Open the Ports (COM & LPT) tab
- Confirm that your PC has detected the USB Serial converter used. It will need to be connected t o COM 1
- 8. Right click on the USB serial port and open properties.
- 9. Confirm that the port settings have the following values:
 - Bits per second- 38400
 - Data Bits- 8
 - Parity- None
 - Stop Bits- 2
 - Flow control- None
- 10. If required, Open the advanced menu and change the port to COM1 (if COM1 is already in use, you will need to confirm the override as the BACSet program is looking for com port 1).

Note: BACSet is a program provided by card manufacturer to configure BACnet MS-TP card



How to Install BACset version 2.15.4

- a. Go to https://ksa.carel.com/
- b. Create an account to log in
- c. Once logged in, select "software and support"
- d. Select "pCONet and pCOWeb"
- e. Select the "pCONet SE" tab. (this should be <u>https://ksa.carel.com/group/2234798/pcone</u> <u>t-se</u>)
- f. Once in the pCONet SE section, select the BACSet folder. This will then allow the user to download the files "BACSet_INSTALLER" and "BACSet_2.15.5.exe". Install the program in the "BACSet_INSTALLER" folder first. Then replace the .exe file as per the instructions below.

How to replace BACset exe

In order to change BACset version (from 2.15) to version 2.15.4 is necessary have access where BACset is installed. The standard folder is:

C:\Program Files (x86)\Carel\BACset

C:\Program Files (x86)\Carel\BACset





How to Install BACset version 2.15.4

Here select the first option, Move and replace:



Now opening BACset you will see:







- 11. Open up the BACSet program.
- 12. Select MS/TP a.nd No Router and press OK.



	A STREET					
ACset for pCOWeb/pCOr	net BACnet(R) Windo	ws 8/10 v2.15.4 - Re	started - MS/TP			-
pCOWeb Device Instanc	e 77000					
Device Objects	Notify Classes	Schedules Ca	endars Test	Dat	abase System	m Plugin
Read	Write Fact	ory			UTC Time Sync	Time Sync
Read/Write Statu	100 % R	ead Complete				Cancel
Device Se	ttings for 77000;	This device	was started in Fact	bry Mode un	til next reboot	
		(Device=77	000, Station Addr=0), MaxMaste	sr=127, Maxinfo=20	, Baud=38400)
MS/TP Baud Rate *	38400 💌		MS/TP Station	Address	0	(0 to 127)
C Enable	/	e Instance Write	Ма	k Master	127	(0 to 127)
Device Instance	77000	(0 to 4194303)	Max Info	Frames	20	(0 to 255)
Object Name	pC0net77000			Firmware	A2.0.7 - B2.0.7	
Description	Carel BACnet Gate	vay			App Softwa	are 2.15.48
Location	Unknown					
APDU Timeout	5000	milliseconds	Alam	Enabled	⊙ Yes ⊙ No	
APDU Retries	3	(0 to 255)				
Password for Restart	1234					
Local Date/Time	1970-1-1 (Thu) 00:0	19:50	1			
Daylight Savings Time	C Yes @ No					
UTC Offset	0	minutes (-720 to +72	20)			
Internal to an dischaste	1	minutes (0=none)				
Interval to send whois	207 Max Integ	er Vars* 207 M	ax Digital Vars" 20	Max T	otal Vars 621	Reboot
Max Analog Vars*					* Munt unbook	



- Leave the pCOWeb device instance as 77000 and select the READ button. The progress bar should count up to 100% Read Complete. (Both LEDs will flash on the convertor)
- 14. Once the read is complete, you will see some text stating that the device was started in Factory Mode until next reboot. This will allow you to make changes to the parameters which will not take effect until the next reboot.

If you receive an error message, refer to the last page of this guide for definition.



BACse	et for po	OWeb/pCOr	net BACnet®		CAREL
Cset for pCOWeb/pCO	net BACnet(R) Wind	ows 8/10 v2.15.4	- Restarted - MS/TP		
COWeb Device Instanc	e 77000	_			
Device Diects	Notify Classes	Schedules	Calendars Test	Database	System Plugin
16 Bent	Write Eac	tory		UTC Time 1	Sunc Time Sunc
Rand Aufrida State	100 % 5	Pand Complete		- OTO TIMO	
riedu/ white oldit	100 ~ r	read Complete			Lancel
Device Se	ttings for 77000:	This de	vice was started in Factory Mod	le until next reboo	t
		(Device	e=/7000, Station Addr=0, MaxM	taster=127, Maxin	nto=20, Baud=38400)
MS/TP Baud Rate *	38400 💌		MS/TP Station Addres	: 0	(0 to 127)
• Enable	/ C Disable Devic	e Instance Write	Max Maste	127	(0 to 127)
Device Instance	77000	(0 to 4194303)	15 Max Info Frame	s 20	(0 to 255)
Ubject Name	pcunet/7000		Firm	vare A2.0.7 - B2	2.0.7
Description	Carel BACnet Gate	1489		Арр	Software 2.15.48
e.e.e.e.e.e.e.e.e.e.e.e.e.e.e.e.e.e.e.					
Location	Unknown				
Location APDU Timeout	Unknown 5000	milliseconds	Alarm Enabl	ed Corres (5 M.
Location APDU Timeout APDU Retries	Unknown 5000 3	milliseconds (0 to 255)	Alarm Enabl	ed 🕥 🚲 (2 115
Location APDU Timeout APDU Retries Password for Restart	Unknown 5000 3 1234	milliseconds (0 to 255)	Alarm Enabl	_] ed @ γ⇔ (9 115
Location APDU Timeout APDU Retries Password for Restart Local Date/Time	Unknown 5000 3 1234 1970-1-1 (Thu) 00:	milliseconds (0 to 255) 09:50	Alam Enabl	 ed ● /o, (a no
Location APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time	Unknown 5000 3 1234 1970-1-1 (Thu) 00: © 765 © 10	milliseconds (0 to 255) 09:50	Alarm Enabl	ed 🛈 7.5 (9 Ho.
Location APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset	Unknown 5000 3 1234 1970-1-1 (Thu) 00: © 765 @ 16 0	milliseconds (0 to 255) 09:50 minutes (-720 to	Alarm Enabl 	d € γ ₆₅ (9 110
Location APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols	Unknown 5000 3 1234 1970-1-1 (Thu) 00: 0 10 1 1	milliseconds (0 to 255) 09:50 minutes (-720 to minutes (0=nor	Alarm Enabl o +720) we)	ed 🕥 7.5 (3 110
Location APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols Max Analog Vars*	Unknown 5000 3 1234 1970-1-1 (Thu) 00: C Yes C Ho 0 1 207 Max Integ	milliseconds (0 to 255) 09:50 minutes (-720 to minutes (0=non ger Vars* 207	Alarm Enabl o +720) re) Max Digital Vars* 207 M	ed C (s (621 Reboot
Location APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols Max Analog Vars*	Unknown 5000 3 1234 1970-1-1 (Thu) 00: 0 1 207 Max Integ Carel	milliseconds (0 to 255) 09:50 minutes (-720 to minutes (0=non ger Vars* 207	Alarm Enabl o +720) we) Max Digital Vars* 207 M.	ed O 755 (ax Total Vars "Must r	621 Reboot

- 15. Select the Enable button and enter the desired Device Instance (based on the customer's network).
- 16. Select the Write button.
- 17. A warning message with pop-up as shown below. Select Yes to confirm the BACnet configuration overwrite.

BACset for p	COWeb/pCOnet BACnet(R) W	indows		×
1	Writing the BACnet configuration he current configuration. Do yo configuration now?	n to the device v u want to Write	vill overwrite the new	
		Yes	No	

18. Wait for the progress bar to read 'Write Complete' (this may take a few seconds before anything happens)



BACse	et for pC	OWeb/pCOnet	BACnet®	<u>C/</u>	AREL
Cset for pCOWeb/pCO	net BACnet(R) Windo	ows 8/10 v2.15.4 - Re	estarted - MS/TP		
COWeb Device Instanc	e 77000	-			
Device Objects	Notify Classes	Schedules Ca	endars Test Dat	abase System	Plugin
Bead	Write Fact	orv		UTC Time Sync	Time Sync
Read Au/rite State	* 100 % \v	Lute Complete			Const
Tredus verne state		vine complete			Lancel
Device Se	ttings for 77000:	This device	was started in Factory Mode un	til next reboot	
		(Device=//	1000, Station Addr=0, MaxMaste	r=127, Maxinto=20, t	saud=38400)
			-		
MS/TP Baud Rate *	38400 💌		MS/TP Station Address	1	110 127)
(19) Enable	Disable Device	e Instance Write	Max Master	127	(U to 127)
Device Instance	77000	(0 to 4194303)	Max Info Frames	20	(0 to 255)
Object Name	pCOnet77000		Firmware	A2.0.7 - B2.0.7	
Description	Carel BACnet Gate	way		App Software	e 2.15.48
Location	Unknown				
	5000	milliseconds	Alarm Enabled	C Yes No	
APDU Timeout	2	(0 to 255)			
APDU Timeout APDU Retries	3				
APDU Timeout APDU Retries Password for Restart	1234				
APDU Timeout APDU Retries Password for Restart Local Date/Time	1234 1970-1-1 (Thu) 00:0	09:50	1		
APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time	1234 1970-1-1 (Thu) 00:0 C Yes • No	99.50]		
APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset	1234 1970-1-1 (Thu) 00:0 Ves • No 0	99:50 minutes (-720 to +7	20)		
APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols	1234 1970-1-1 (Thu) 00:0 C Yes • No 0 1	09:50 minutes (-720 to +7 minutes (0=none)	20)		
APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols Max Analog Vars*	1234 1970-1-1 (Thu) 00:0 Yes No 0 1 207 Max Integ	99:50 minutes (-720 to +7 minutes (0=none) ter Vars* 207 M	20) ax Digital Vars* 207 Max Ti	otal Vars 621	Reboot
APDU Timeout APDU Retries Password for Restart Local Date/Time Daylight Savings Time UTC Offset Interval to send Whols Max Analog Vars* Interface Protocol *	1234 1970-1-1 (Thu) 00:0 Yes No 0 1 207 Max Integ Carel	09:50 minutes (-720 to +7 minutes (0=none) yer Vars* 207 M	20) ax Digital Vars* 207 Max T	otal Vars 621 * Must reboot	Reboot

- 19. Change the 'enable' selection back to 'Disable Device Instance'.
- 20. Select and change the MS/TP Station. Address to the desired value.
- 21. Select Write again and watch the status change from 0% back to 100% and confirm 'Write Complete'.



Cset for pCOWeb/pCOnet BAC COWeb Device Instance 77 Device Objects No Read Write Read/Write Status Device Settings for	net(R) Windows 8/10 v2.15.4 1000 tity Classes Schedules Factory	Restarted - MS/TP Calendars Test Dat		2
Device Device Instance 77 Device Dijects No Read Write Read/Write Status	1000 http://www.selance.com/ bittp://www.selance.com/ factory	Calendars Test Dat		
Device Objects No Read Write Read/Write Status	tily Classes Schedules Factory	Calendars Test Dat		
Read Write Read/Write Status Device Settings for	Factory		abase System	Plugin
Read/Write Status			UTC Time Sync	Time Sync
Device Settings for	100 % Write Complete			Cancel
Device Settings to	The complete			Canicei
e e rive e e miger re	This dev	nce was started in Factory Mode un	til next reboot	
	Device	=//UUU, Station Addr=U, MaxMaste	r=127, Maxinto=20, b	saud=38400)
MS/TP Baud Rate * 38400	0 •	MS/TP Station Address	0	(0 to 127)
C Enable / 9600	ce Instance Write	22 Max Master	127	(0 to 127)
Device Instance	(0 to 4194303)	Max Info Frames	20	(0 to 255)
Ubject Name jpLUne	877000	Firmware	A2.0.7 - B2.0.7	
Description Carel B	ACnet Gateway		App Software	e 2.15.48
Location Unkno	wan			
APDU Timeout 5000	milliseconds	Alarm Enabled	🔿 Yes 💿 No	
APDU Retries 3	(0 to 255)			
Password for Restart 1234				
Local Date/Time 1970-1	-1 (Thu) 00:09:50			
Daylight Savings Time C Yes	E 🖲 No			
UTC Offset 0	minutes (-720 to	(+720)		
Interval to send Whols 1	minutes (0=non	e)		
Max Analog Vars* 207	Max Integer Vars* 207	Max Digital Vars* 207 Max To	otal Vars 621	Reboot
			* Must rehoot	
Password for Restart 1234 Local Date/Time 1970-1 Daylight Savings Time Yes UTC Offset 0 Interval to send Whols 1 Max Analog Vars* 207	-1 (Thu) 00:09:50 s • No minutes (-720 to minutes (0=non Max Integer Vars* 207	e) Max Digital Vars* 207 Max Ti	otal Vars 621	Beboot

- 22. Change the MS/TP Baud Rate to the desired value.
- 23. Select Write again and watch the status change from 0% back to 100% and confirm 'Write Complete'.

Note: If finalised, you may reboot the card for the new settings to take place.



Card Configuration Test

BACset for pCOWeb/pCOnet BACnet(R) Windows 8/10 v2.15.4	- 🗆 X
BACset for pCOWeb/pCOnet BACnet®	CAREL
BACset for pCDWeb/pCOnet BACnet(R) Windows 8/10 v2.15.4 - Restarted - MS/TP	•
pCOWeb Device Instance 77000	
Device Objects Notity Classes Schedules Calen ars Test Date 24	System Plugin
Read Clear	
Read Status 34 % Read in progress	Cancel
AV 1 to AV 207 AV/MV 1001 to AV/MV 1207 V BV	1 to BV 207
Include O Direct ID O Direct ID /DirectName/Linits O Description/Linits	Show Unreliable Values
ObjID PresentValue	
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- 24. If Connected to a heat pump, you may select the Test tab and read the values from the heat pump controller display.
- 25. If no values appear, confirm that the BMS settings on the heat pump display have the Protocol set to CAREL and the Speed set to 19200. (Go to the Service menu Password 0022>BMS Config)



BACnet MS-TP Common Errors

rice Objects	Notify Class	ses Schedules C	alendars Test	Database System	Plugin
Read	Write	Factory		UTC Time Sync	Time Sync
Read/Write State	4\$ 0 %	?Read Error [-114]?: In	validDestinationAddr at 0	bject Name	Cancel
Device Se	ttings for 77000:				

The error refers to the wrong device instance being searched for. Both LEDs will appear on the USB-RS485 convertor. Perform a factory reset as outlined in steps 1,2 and 3 of this guide to check what has been configured



The error indicates incorrect polarity or open circuit with the connection cables. Their will also be only 1 led lit on the USB-RS485 convertor.



For further assistance, call Rheem Service on 131 031.

The above message indicates that the Com Port settings are incorrect. No LEDs will be shown on the USB-RS485 Convertor. Change the port to COM1 as indicated in step 10 of this guide

