



“Sequencer”

INTERFACE MANUAL

C0242121-04-11-EN

For software versions DC0505

Replaces C0242121-03-06

EN

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Contents

1	INTERFACING WITH THE BMS (MODBUS)	5
1.1	Components required.....	5
1.2	Installing the serial interface card.....	5
1.3	Setting supervisor parameters	5
1.4	Interface database	6
1.5	Meaning of variables.....	7
2	INTERFACING WITH LONWORKS SYSTEMS	9
2.1	Components required.....	9
2.2	Installing the serial interface card to the LONWORKS system.....	9
2.3	Setting up the supervisor network.....	10
3	INTERFACING WITH THE BACNET SYSTEM	11
3.1	Components required.....	11
3.2	Installing the serial interface card to the BACNET system	11
3.3	Setting up the supervisor network.....	12



Caution: *The Sequencer controller software is protected by a digital signature. This means that it can only work on boards supplied by Climaveneta and not on boards purchased from other dealers.*

Introduction

This document exclusively refers to CLIMAVENETA systems managed by the Sequencer electronic controller running on DC05r00 software or later versions. It can manage Modbus, Lonworks or Bacnet interface systems. Information on the version of the electronic controller is shown in the "Info" menu. Access instructions starting from the main screen are shown below.

Water Inlet	12.4°C	Main screen.
Water Outlet	08.7°C	
Request	080%	
Unit on	EST	

Press "esc" on the "main mask" and scroll the list of menus with the "up" or "down" buttons until the description "■→ 4. INFO" appears. Press "enter".

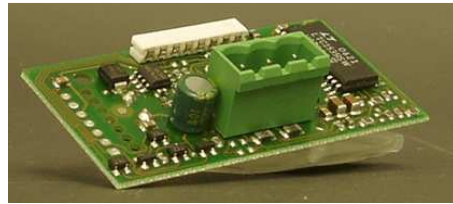
Screen	Description
Menu Selection <input type="checkbox"/> ■→ 4. INFO <input type="checkbox"/>	Screen displaying the menus that can be selected. Press "enter" to access the highlighted menu.

Screen	Description
Cod. DC 05.00 EN	Screen displaying information on the software version of the sequencer.

1 INTERFACING WITH THE BMS (MODBUS)

1.1 Components required

Serial interface card PCOS004850.



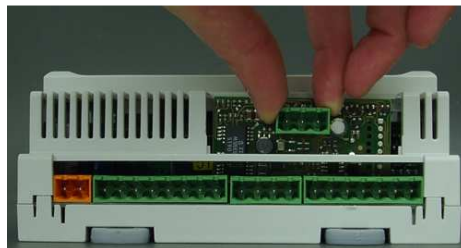
1.2 Installing the serial interface card

The operations required to install and connect the components for interfacing the Sequencer electronic controller with the BMS are shown below. The card must not be powered during these operations.

Remove the “Serial Card” cover from the electronic control card in the sequencer panel.



Fit the BMS serial interface card (if not present) into the slot.



Put back the cover.



1.3 Setting supervisor parameters

The electronic controller may only be installed and programmed by adequately trained technical staff.

To communicate with the BMS, set the parameters as shown below.

Enter the user menu and scroll to the screen described below.

Supervision	N	Supervision enable
Identification	N 001	unit identification number: from 001 to 200
Speed	19200	Communication speed: from 1200 baud to 19200 baud
Protocol	Modbus	Protocol: Modbus

The supervisor network must be set up as shown below.

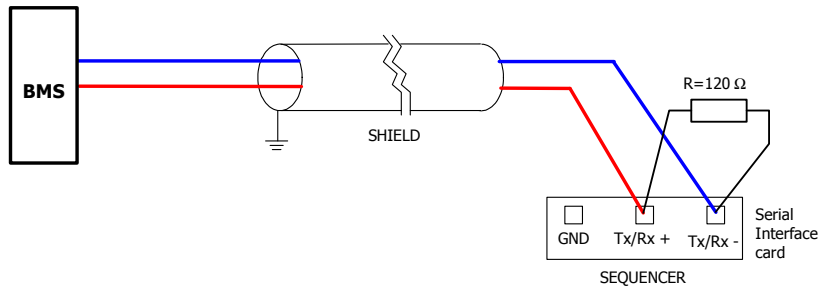


Figure 1.3: Diagram showing a possible BMS supervision network layout

The serial connection cable between the BMS and the Sequencer must be shielded and twisted and have a cross-section of 2x1mm² up to a length of 300 metres and 2x1.5mm² up to a length of 1000 metres. The length of the cable running from the BMS to the last unit must not exceed 1000 metres. The serial cable must be kept separate from the power cables. A maximum of 200 Sequencers can be connected to the network.

1.4 Interface database

Register/Coil Modbus protocol	Protocol address: - Standard - Trend - Bacnet	Type	Flow	Description
001	000	B		NOT MANAGED
002	001	B	IN / OUT	On/off command from supervisor (0:Off - 1:On)
004	003	B	IN / OUT	Mode command from supervisor (0:Summer - 1:Winter)
007	006	B	OUT	Enable Demand Limit (0:Off - 1:On)
008	007	B	OUT	Enable time bands (0:Off - 1:On)
	...			
022	021	B	OUT	Unit 1 online
023	022	B	OUT	Unit 2 online
024	023	B	OUT	Unit 3 online
025	024	B	OUT	Unit 4 online
026	025	B	OUT	Unit 5 online
027	026	B	IN / OUT	Unit 1 enable
028	027	B	IN / OUT	Unit 2 enable
029	028	B	IN / OUT	Unit 3 enable
030	029	B	IN / OUT	Unit 4 enable
031	030	B	IN / OUT	Unit 5 enable
40001	000	A		NOT MANAGED
40002	001	A	OUT	System inlet temperature
40003	002	A	OUT	System outlet temperature
40004	003	A	OUT	External air temperature
	...			
40006	005	A	IN / OUT	Summer temperature setpoint
40007	006	A	IN / OUT	Summer adjustment band
40008	007	A	IN / OUT	Winter temperature setpoint
40009	008	A	IN / OUT	Winter adjustment band
40010	009	A	IN / OUT	dhw setpoint
	...			
40012	011	A	OUT	Main active setpoint
40013	012	A	OUT	DHW active setpoint
	...			
40022	021	A	OUT	Unit 1 inlet temperature
40023	022	A	OUT	Unit 1 outlet temperature
40024	023	A	OUT	Unit 2 inlet temperature
40025	024	A	OUT	Unit 2 outlet temperature
40026	025	A	OUT	Unit 3 inlet temperature
40027	026	A	OUT	Unit 3 outlet temperature
40028	027	A	OUT	Unit 4 inlet temperature
40029	028	A	OUT	Unit 4 outlet temperature
40030	029	A	OUT	Unit 5 inlet temperature
40031	030	A	OUT	Unit 5 outlet temperature
Register/Coil	Protocol	Type	Flow	Description

Modbus protocol	address: - Standard - Trend - Bacnet			
40032	031	A	OUT	DHW storage boiler temperature unit 1
40033	032	A	OUT	DHW storage boiler temperature unit 2
40034	033	A	OUT	DHW storage boiler temperature unit 3
40035	034	A	OUT	DHW storage boiler temperature unit 4
40036	035	A	OUT	DHW storage boiler temperature unit 5
40130	001	I	OUT	Unit status (0:ON - 1:OFF from alarm - 2:OFF from supervisor - 3:OFF from time bands - 4:OFF from digital input - 5:OFF from keyboard - 6:Manual mode)
40131	002	I	OUT	Active alarm code (with greater priority)
40132	003	I	OUT	Software release
40133	004	I	OUT	Software revision
40134	005	I	OUT	Thermoregulator demand (%)
40135	006	I	OUT	Thermoregulator active power (%)
40136	007	I	IN / OUT	Summer power limit (%)
40137	008	I	IN / OUT	Winter power limit (%)
	...			
40140	011	I	OUT	Unit 1 status (see relative manual)
40141	012	I	OUT	Unit 2 status (see relative manual)
40142	013	I	OUT	Unit 3 status (see relative manual)
40143	014	I	OUT	Unit 4 status (see relative manual)
40144	015	I	OUT	Unit 5 status (see relative manual)
40145	016	I	OUT	Active alarm code unit 1 (with greater priority)
40146	017	I	OUT	Active alarm code unit 2 (with greater priority)
40147	018	I	OUT	Active alarm code unit 3 (with greater priority)
40148	019	I	OUT	Active alarm code unit 4 (with greater priority)
40149	020	I	OUT	Active alarm code unit 5 (with greater priority)
40150	021	I	OUT	Summer demand unit 1 (%)
40151	022	I	OUT	Winter demand unit 1 (%)
40152	023	I	OUT	Summer demand unit 2 (%)
40153	024	I	OUT	Winter demand unit 2 (%)
40154	025	I	OUT	Summer demand unit 3 (%)
40155	026	I	OUT	Winter demand unit 3 (%)
40156	027	I	OUT	Summer demand unit 4 (%)
40157	028	I	OUT	Winter demand unit 4 (%)
40158	029	I	OUT	Summer demand unit 5 (%)
40159	030	I	OUT	Winter demand unit 5 (%)
40160	031	I	OUT	Power delivered unit 1 (%)
40161	032	I	OUT	Power delivered unit 2 (%)
40162	033	I	OUT	Power delivered unit 3 (%)
40163	034	I	OUT	Power delivered unit 4 (%)
40164	035	I	OUT	Power delivered unit 5 (%)
40165	036	I	OUT	Manual override DHW mode unit 1
40166	037	I	OUT	Manual override DHW mode unit 2
40167	038	I	OUT	Manual override DHW mode unit 3
40168	039	I	OUT	Manual override DHW mode unit 4
40169	040	I	OUT	Manual override DHW mode unit 5

Address:

this is the address of the supervision variable in the electronic controller; in the ModBus protocol, for whole variables add 128 to the address.

(e.g.: Software address 3 -> Modbus address 131 [128+3])

Type:

B: Boolean variable (Coils for the Modbus protocol)

I: Whole variable (Register for the Modbus protocol)

A: Analogue variable (Register for the Modbus protocol)

Flow:

OUT: Read-only variable for the BMS

IN / OUT: Read/write variable for the BMS

1.5 Meaning of variables

Analogue variables are expressed with a decimal number (e.g.: 12.0bar -> 120; 33.8°C -> 338).

If a probe is in an alarm condition a value equal to -99.9 is sent.

If a probe or a parameter is not configured a value equal to -88.8 is sent.

Analogue variables, whole and digital with address 0 are considered as incorrect and throw the "ILLEGAL DATA ADDRESS" error code.
All the addresses not indicated in the database must not be used.

2 INTERFACING WITH LONWORKS SYSTEMS

2.1 Components required

The components required to interface CLIMAVENETA units with an electronic controller to the LONWORKS system are described below.

Serial interface card to the LONWORKS system.



2.2 Installing the serial interface card to the LONWORKS system

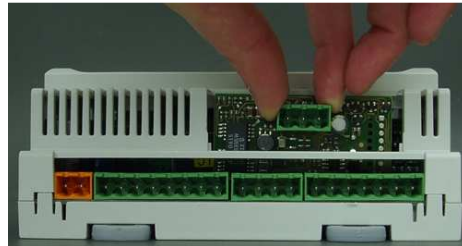
The operations required to install and connect the components for interfacing the electronic controller with the LONWORKS system are shown below.

The cards must not be powered during these operations.

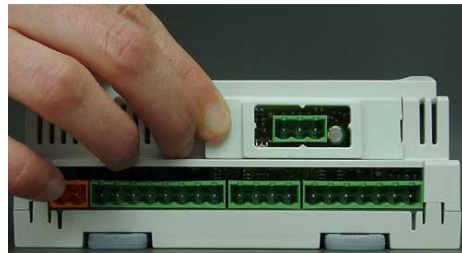
Remove the "Serial Card" cover from the electronic control card in the sequencer panel.



Insert the LONWORKS interface card for connection to BMS into the relative slot.



Put back the cover.



To communicate with the LONWORKS system, set the parameters as shown below.

Supervision	N
Identification	N 001
Speed	4800
Protocol	Lonworks

It is necessary to set the parameters for connecting with the supervisor as indicated alongside.

- Protocol: **Standard**
- Communication speed: **4800 baud (*)**
- unit identification number: from **001** to **200**

(*) Speed of communication between Sequencer and GATEWAY.
The speed of communication towards the external BMS is always 78 kbps.

2.3 Setting up the supervisor network

The supervisor network is set up by LONWORKS staff.

NB: CLIMAVENETA will supply the serial files and some files necessary for LONWORKS technicians to configure the network. A file in .NXE format and a file in .XIF will be supplied.

The card is programmed by the technician developing the integration.

The reference database for systems using the LONWORKS networks is shown below:

Address	Type	NV type	Flow	Description
001	B	95	IN / OUT	On/off command from supervisor (0:Off - 1:On)
003	B	95	IN / OUT	Mode command from supervisor (0:Summer - 1:Winter)
006	B	95	OUT	Enable Demand Limit (0:Off - 1:On)
007	B	95	OUT	Enable time bands (0:Off - 1:On)
	B	95		
001	A	105	OUT	System inlet temperature
002	A	105	OUT	System outlet temperature
003	A	105	OUT	External air temperature
005	A	105	IN/OUT	Summer temperature setpoint
006	A	105	IN/OUT	Summer adjustment band
007	A	105	IN/OUT	Winter temperature setpoint
008	A	105	IN/OUT	Winter adjustment band
009	A	105	IN/OUT	dhw setpoint
011	A	105	OUT	Main active setpoint
012	A	105	OUT	DHW active setpoint
031	A	105	OUT	DHW storage boiler temperature unit 1
032	A	105	OUT	DHW storage boiler temperature unit 2
033	A	105	OUT	DHW storage boiler temperature unit 3
034	A	105	OUT	DHW storage boiler temperature unit 4
035	A	105	OUT	DHW storage boiler temperature unit 5
	A			
001	I	8	OUT	Unit status (0:ON - 1:OFF from alarm - 2:OFF from supervisor - 3:OFF from time bands - 4:OFF from digital input - 5:OFF from keyboard - 6:Manual mode)
002	I	8	OUT	Active alarm code (with greater priority)
005	I	81	OUT	Thermoregulator demand (%)
006	I	81	OUT	Thermoregulator active power (%)
007	I	81	IN/OUT	Summer power limit (%)
008	I	81	IN/OUT	Winter power limit (%)
011	I	8	OUT	Unit 1 status (see relative manual)
012	I	8	OUT	Unit 2 status (see relative manual)
013	I	8	OUT	Unit 3 status (see relative manual)
014	I	8	OUT	Unit 4 status (see relative manual)
015	I	8	OUT	Unit 5 status (see relative manual)
016	I	8	OUT	Active alarm code unit 1 (with greater priority)
017	I	8	OUT	Active alarm code unit 2 (with greater priority)
018	I	8	OUT	Active alarm code unit 3 (with greater priority)
019	I	8	OUT	Active alarm code unit 4 (with greater priority)
020	I	8	OUT	Active alarm code unit 5 (with greater priority)
021	I	81	OUT	Summer demand unit 1 (%)
022	I	81	OUT	Winter demand unit 1 (%)
023	I	81	OUT	Summer demand unit 2 (%)
024	I	81	OUT	Winter demand unit 2 (%)
025	I	81	OUT	Summer demand unit 3 (%)
026	I	81	OUT	Winter demand unit 3 (%)
027	I	81	OUT	Summer demand unit 4 (%)
028	I	81	OUT	Winter demand unit 4 (%)
029	I	81	OUT	Summer demand unit 5 (%)
030	I	81	OUT	Winter demand unit 5 (%)

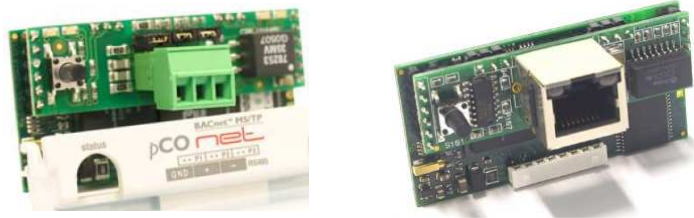
3 INTERFACING WITH THE BACNET SYSTEM

3.1 Components required

The components required to interface CLIMAVENETA units with an electronic controller to the BANCET system are described below.

Serial interface card
BACNET.

As well as the BACNET MS/TP card (for RS485 network) the BACNET TCP/IP serial card is also available



3.2 Installing the serial interface card to the BACNET system

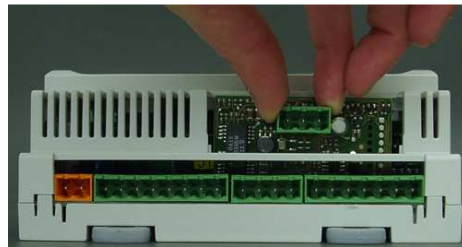
The operations required to install and connect the components for interfacing the electronic controller with the BACNET system are shown below.

The cards must not be powered during these operations.

Remove the “Serial Card” cover from the electronic control card in the sequencer panel.



Insert the BACNET interface card for connection to BMS into the relative slot.



Put back the cover.



To communicate with the BACNET system, set the parameters as shown below.

Supervision	N
Identification	N 001
Speed	19200
Protocol	Bacnet

It is necessary to set the parameters for connecting with the supervisor as indicated alongside.

- Protocol: **Standard**
- Communication speed: **19200 baud**
- unit identification number: from **001** to **200**

(*) Speed of communication between Sequencer and GATEWAY.
The speed of communication to the external BMS may be 9600-19200-36400-76800.

3.3 Setting up the supervisor network

The supervisor network is set up by the technicians developing the BACNET interface.
The Modbus protocol database is used for interfacing

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