



W3000

Second Edition

INTERFACE MANUAL

C0240122-09-08-GB

For software versions CA04 and higher

Replaces C0240122-02-08-GB

GB

CLIMAVENETA S.p.A
Via Sarson, 57C
36061 Bassano del Grappa(VI)-ITALY
Tel. (+39) 0424 509 500
Fax. (+39) 0424 509 509
www.climaveneta.it
<mailto:info@climaveneta.it>

*The information contained in this document may be modified without prior notice.
No part of this document may be reproduced and/or disclosed to third parties or competitors.*

September 2008

1 CONTENTS

1	CONTENTS	2
2	USE	3
3	INTERFACING WITH THE FWS 3000	4
3.1	Components required.....	4
3.2	Installing the serial interface card.....	4
3.3	Setting supervisor parameters.....	5
3.4	Setting up the supervisor network.....	5
4	INTERFACING WITH THE BMS (MODBUS)	6
4.1	Components required.....	6
4.2	Installing the serial interface card.....	6
4.3	Setting supervisor parameters.....	7
4.4	Setting up the supervisor network.....	7
4.5	Interface database (software releases GA04 and higher).....	8
5	INTERFACING WITH THE TREND SYSTEM	12
5.1	Components required.....	12
5.2	Installing the serial interface card to the TREND system	12
5.3	Setting supervisor parameters.....	13
5.4	Setting up the supervisor network.....	13
5.5	Programming the TREND system serial interface card.....	13
5.6	Meaning of variables.....	13
6	INTERFACING WITH THE LONWORKS SYSTEM	14
6.1	Components required.....	14
6.2	Installing the serial interface card to the LONWORKS system.....	14
6.3	Setting supervisor parameters.....	15
6.4	Setting up the supervisor network.....	15
6.5	Programming the LONWORKS system serial interface card.....	16
7	INTERFACING WITH THE BACNET SYSTEM	18
7.1	Components required.....	18
7.2	Installing the serial interface card to the BACNET system.....	18
7.3	Setting supervisor parameters.....	19
7.4	Setting up the supervisor network.....	19
7.5	Meaning of variables.....	19
8	ATTACHMENTS	20
8.1	AWG (American Wire Gauge) conversion table.....	20

2 Use

This document may only be used for the W 3000 SE or later versions of the electronically-controlled CLIMAVENETA units with GA04.04 software.

Information on the version of the electronic controller is shown in the programming menu which can be accessed as shown below.



Press "**PRG**" to access the main machine.

```
Manuf.
Unit
Setpoint
```

Access mask to main menu. Press "UP" or "DOWN" to scroll, "ENTER" to access.

```
User
←          ↑
          ↓
```

Access mask to user menu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.

```
W3000 SE
Code GA 04r04 GB ④
```

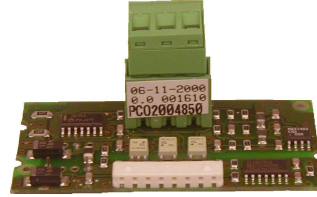
Mask indicating the installed software version (the example shows version GA 04r04).

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

3 Interfacing with the FWS 3000

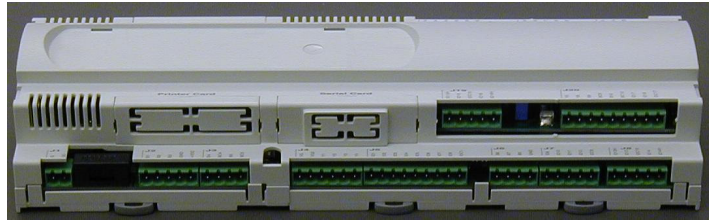
3.1 Components required

Serial interface card



Electronic control card.
(Already fitted to the unit)

The photos refer to the card with the highest number of terminals, but the procedure is identical for the smaller cards

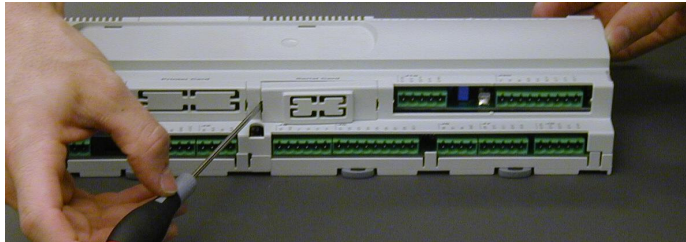


3.2 Installing the serial interface card

The operations required to install and connect the components for interfacing the electronic controller with the FWS 3000 are shown below.

The cards must not be powered during these operations.

Remove the "Serial Card" cover



Fit the FWS 3000 serial interface card (if not present) into the slot.



Put back the cover.



3.3 Setting supervisor parameters

To communicate with the FWS 3000, set the parameters as shown below.

Enter the programming menu, type in the password and scroll down to the following masks.

```
En. from dig. input:
On/Off:             N
Chiller/HP:         N
```

Enables external signals.

```
Serial line
configuration:
Supervision
```

Communication towards a supervisor system must be enabled.

```
Superv. enable:
On/Off:         Y
Operating mode: Y
```

Selects the on/off status and changes the operating mode of the unit through a supervision system.

Supervisor enables must be set as shown to the left:

♣ On/off enable: **Yes**

♣ Operating mode enable **Yes**

```
Serial setting
Protocol Modbus
Speed 9600 baud
ID          011
```

The supervisor connection parameters must be set as shown to the left:

♣ Protocol: **Modbus**

♣ Communication speed: **9600 baud or 192000 baud**

♣ Unit ID: from **001 to 200 (default 11, ...)**

3.4 Setting up the supervisor network

The supervisor network must be set up as shown below.

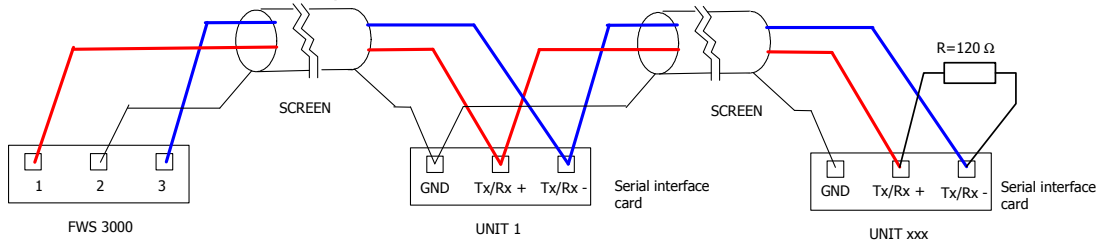


Fig.1

Take great care when connecting the serial line to the units. This is an RS485 serial line, based on a balanced differential communication line with a characteristic impedance of 120 ohm.

The maximum length of the connection depends on the Baud-rate, background electrical noise, and the type and quality of the cable. Operation is generally guaranteed up to 1000 m.

Use a twisted and shielded AWG 20/22 cable for the RS 485 serial line.

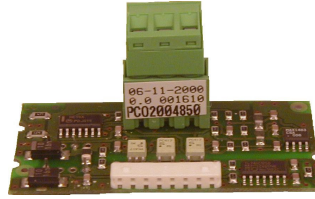
The FWS 3000 and the "Slaves" are normally connected together in a chain configuration, with derivations from the line limited to about two metres. Star derivations with multiple connections to the devices must be avoided. It is important, particularly in long connections, for the last device to "close" the line, thus preventing reflection phenomena: to achieve this, simply add a 120 ohm resistance in parallel to the last "slave".

The shield of each connection cable must be connected to the relative GND terminal at both ends, but the ground connection must be made in just one point. In an extremely disturbed ambient, it may be best to ground the other GND terminals with a 10 nF 400V capacitor.

4 Interfacing with the BMS (MODBUS)

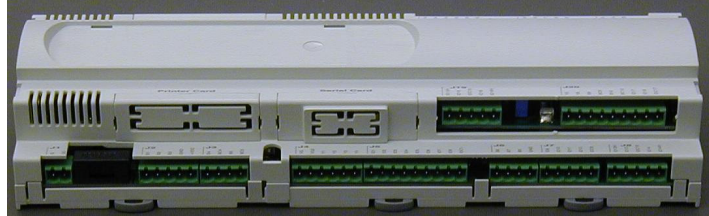
4.1 Components required

Serial interface card.



Electronic control card.
(Already fitted to the unit)

The photos refer to the card with the highest number of terminals, but the procedure is identical for the smaller cards

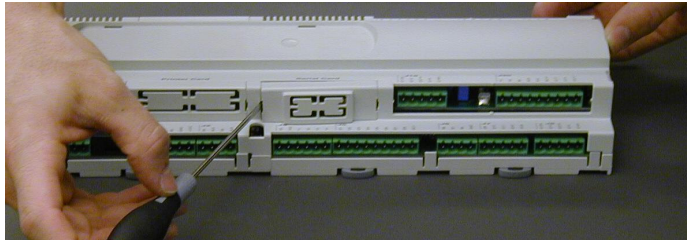


4.2 Installing the serial interface card

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

The cards must not be powered during these operations.

Remove the "Serial Card" cover



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



Put back the cover.



4.3 Setting supervisor parameters

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

Enter the programming menu, type in the password and scroll down to the following masks.

En. from dig. input:	
On/Off:	N
Chiller/HP:	N

Enables external signals.

Serial line configuration:	
Supervision	

Communication towards a supervisor system must be enabled.

Superv. enable:	
On/Off:	Y
Operating mode:	Y

Selects the on/off status and changes the operating mode of the unit through a supervision system.

Supervisor enables must be set as shown to the left:

♣ On/off enable: **Yes**

♣ Operating mode enable **Yes**

Serial setting	
Protocol Modbus	
Speed 9600 baud	
ID	011

Protocol: **Modbus / Standard**

Communication speed: from **1200 baud** to **19200 baud**

Unit ID: from **001** to **200**

4.4 Setting up the supervisor network

The supervisor network must be set up as shown below.

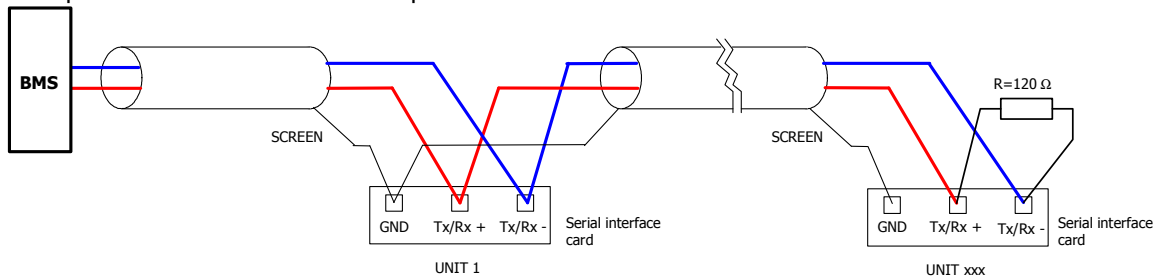


Fig.2

Take great care when connecting the serial line to the units. This is an RS485 serial line, based on a balanced differential communication line with a characteristic impedance of 120 ohm.

The maximum length of the connection depends on the Baud-rate, background electrical noise, and the type and quality of the cable. Operation is generally guaranteed up to 1000 m.

Use a twisted and shielded AWG 20/22 cable for the RS 485 serial line.

The serial connection is made with a single cable running from the BMS to the first (nearest) unit, from the first to the second (in order of distance), and so one.

The serial cable must be kept separate from the power cables.

A maximum of 200 units can be connected to the network.

4.5 Interface database (software releases GA04 and higher)

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
001	000	B		NOT MANAGED
002	001	B	OUT	Unit status (0:Off - 1:On)
004	003	B	OUT	Evaporator pump 1 status (0:Off - 1:On)
005	004	B	OUT	Evaporator pump 2 status (0:Off - 1:On)
006	005	B	OUT	Recuperator pump status (0:Off - 1:On)
007	006	B	OUT	Condenser pump status (0:Off - 1:On)
009	008	B	IN / OUT	On/Off command from supervisor (0:Off - 1:On)
010	009	B	IN / OUT	Modify date/time and confirmation
011	010	B	IN / OUT	Enable time band settings from supervisor
012	011	B	OUT	Enable operating mode change from supervisor
40001	000	A		NOT MANAGED
40002	001	A	IN / OUT	Chiller temperature setpoint
40003	002	A	IN / OUT	Heat pump temperature setpoint
40004	003	A	IN / OUT	Recovery setpoint
40005	004	A	IN / OUT	Temperature adjustment band
40006	005	A	IN / OUT	Recovery adjustment band
40007	006	A	OUT	Evaporator inlet temperature
40008	007	A	OUT	Evaporator outlet temperature (average)
40009	008	A	OUT	Condenser inlet temperature
40010	009	A	OUT	Condenser outlet temperature (average)
40011	010	A	OUT	Recuperator inlet temperature
40012	011	A	OUT	Recuperator outlet temperature
40013	012	A	OUT	High pressure transducer 1
40014	013	A	OUT	High pressure transducer 2
40015	014	A	OUT	High pressure transducer 3
40016	015	A	OUT	High pressure transducer 4
40017	016	A	OUT	Low pressure transducer 1
40018	017	A	OUT	Low pressure transducer 2
40019	018	A	OUT	Low pressure transducer 3
40020	019	A	OUT	Low pressure transducer 4
40021	020	A	OUT	External air temperature
40022	021	A	OUT	Optional probe temperature
40023	022	A	OUT	Freecooling inlet temperature
40041	040	A	OUT	Revs (x10) demand to centrifuge comp./inverter 1
40042	041	A	OUT	Revs (x10) demand to centrifuge comp./inverter 2
40043	042	A	OUT	Revs (x10) demand to centrifuge comp./inverter 3
40044	043	A	OUT	Revs (x10) demand to centrifuge comp./inverter 4
40045	044	A	OUT	Power in KW of demand (x10) to centrifuge compressor 1
40046	045	A	OUT	Power in KW of demand (x10) to centrifuge compressor 2
40047	046	A	OUT	Power in KW of demand (x10) to centrifuge compressor 3
40048	047	A	OUT	Power in KW of demand (x10) to centrifuge compressor 4
40049	048	A	OUT	Power (x10) absorbed by centrifuge comp./inverter 1
40050	049	A	OUT	Power (x10) absorbed by centrifuge comp./inverter 2
40051	050	A	OUT	Power (x10) absorbed by centrifuge comp./inverter 3
40052	051	A	OUT	Power (x10) absorbed by centrifuge comp./inverter 4
40053	052	A	OUT	IGV position (%x10) of centrifuge comp. 1
40054	053	A	OUT	IGV position (%x10) of centrifuge comp. 2
40055	054	A	OUT	IGV position (%x10) of centrifuge comp. 3
40056	055	A	OUT	IGV position (%x10) of centrifuge comp. 4
40057	056	A	OUT	Internal inlet pressure (bargx10) to centrifuge comp. 1
40058	057	A	OUT	Internal inlet pressure (bargx10) to centrifuge comp. 2
40059	058	A	OUT	Internal inlet pressure (bargx10) to centrifuge comp. 3
40060	059	A	OUT	Internal inlet pressure (bargx10) to centrifuge comp. 4
40061	060	A	OUT	Inlet temperature (x10) of centrifuge comp. 1
40062	061	A	OUT	Inlet temperature (x10) of centrifuge comp. 2
40063	062	A	OUT	Inlet temperature (x10) of centrifuge comp. 3
40064	063	A	OUT	Inlet temperature (x10) of centrifuge comp. 4
40065	064	A	OUT	SCR temperature (x10) of centrifuge comp. 1
40066	065	A	OUT	SCR temperature (x10) of centrifuge comp. 2
40067	066	A	OUT	SCR temperature (x10) of centrifuge comp. 3

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
40068	067	A	OUT	SCR temperature (x10) of centrifuge comp. 4
40069	068	A	OUT	Outlet temperature (x10) of centrifuge comp. 1
40070	069	A	OUT	Outlet temperature (x10) of centrifuge comp. 2
40071	070	A	OUT	Outlet temperature (x10) of centrifuge comp. 3
40072	071	A	OUT	Outlet temperature (x10) of centrifuge comp. 4
40073	072	A	OUT	Cavity temperature (x10) of centrifuge comp. 1
40074	073	A	OUT	Cavity temperature (x10) of centrifuge comp. 2
40075	074	A	OUT	Cavity temperature (x10) of centrifuge comp. 3
40076	075	A	OUT	Cavity temperature (x10) of centrifuge comp. 4
40077	076	A	OUT	Temperature (x10) centrifuge comp. 1 inverter
40078	077	A	OUT	Temperature (x10) centrifuge comp. 2 inverter
40079	078	A	OUT	Temperature (x10) centrifuge comp. 3 inverter
40080	079	A	OUT	Temperature (x10) centrifuge comp. 4 inverter
40081	080	A	OUT	Compression ratio in absolute bar (x10) of comp. 1
40082	081	A	OUT	Compression ratio in absolute bar (x10) of comp. 2
40083	082	A	OUT	Compression ratio in absolute bar (x10) of comp. 3
40084	083	A	OUT	Compression ratio in absolute bar (x10) of comp. 4
40129	000	I		NOT MANAGED
40132	003	I	OUT	Software release
40133	004	I	OUT	Software release (revision)
40134	005	I	OUT	Type of unit configuration (00:Chiller - 01:Chiller+recovery - 02:Chiller+freecooling - 10:Heat pump - 11:Heat pump+recovery - 21:Multi-use)
40135	006	I	OUT	N° circuits
40136	007	I	OUT	N° compressors
40137	008	I	OUT	N° separation stages per compressor
40138	009	I	OUT	Type of compressors (0:Centrifuge - 1:Hermetic - 2:Alternative - 3:Screw)
40139	010	I	OUT	Unit configuration status [1] (Bit0: 0:Heat pump disabled, 1:Heat pump enabled Bit1: 0:Quick Mind disabled, 1:Quick Mind enabled Bit2: 0:Input, 1:Output Bit3: 0:FreeCooling disabled, 1:FreeCooling enabled Bit4: 0:FreeHeating disabled, 1:Freeheating enabled Bit5: 0:Dehumidification disabled, 1:Dehumidification enabled Bit6: 0:Humidification disabled, 1:Humidification enabled Bit7: 0:Summer enthalpy disabled, 1:Summer enthalpy enabled Bit8: 0:Winter enthalpy disabled, 1:Winter enthalpy enabled Bit9: 0:Room washing disabled, 1:Room washing enabled Bit10: 0:Start-up disabled, 1:Start-up enabled Bit11: 0:Recovery disabled, 1:Recovery enabled Bit12: 0:Hot valve disabled, 1:Hot valve enabled Bit13: 0:Heating elements disabled, 1:Heating elements enabled Bit14: 0:Heat modules disabled, 1:Heat modules enabled Bit15: 0:Ventilation only disabled, 1:Ventilation only enabled)
40140	011	I	OUT	Unit configuration status [2] (Bit0: 0:Hour intervals disabled, 1:Hour intervals enabled Bit1: 0:Pumpdown disabled, 1:Pumpdown enabled Bit2: 0:Setpoint modification disabled, 1:Setpoint modification enabled Bit3: 0:Air cooling, 1:Water cooling Bit4: 0:Sequencer disabled, 1:Sequencer enabled Bit5 - Bit15: Not used)
40141	012	I	OUT	Unit status (0:ON from keyboard - 1:ON from digital input - 2:ON from time bands - 3:ON from supervisor - 4:OFF from alarm - 5:OFF from supervisor - 6:OFF from time bands - 7:OFF from digital input - 8:OFF from keyboard - 9:Manual mode 10:OFF)
40142	013	I	OUT	Unit timer status (0:Error - 1:Starting - 2:Heating - 3:Unit start-up - 4:Switching off - 5:Compressor timing - 6:Pump/main fan timing)
40143	014	I	IN / OUT	Operating mode Chiller (3:chiller) Chiller + freecooling (7:chiller - 8:chiller+fc) Chiller + recovery (2:chiller+rec - 3:chiller) Heat pump (3:chiller - 4:heatpump) All-in-one (0:auto - 1:recovery - 2:chiller+rec - 3:chiller) Heat pump with recovery (10:summer auto - 11:summer rec - 12:summer ch+rec - 13:summer ch - 14:winter hp - 15:winter rec - 16:winter auto)

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
40144	015	I	OUT	Compressor 1 status (Bit0: 0:Configured, 1:Unconfigured Bit1: 0:Disabled, 1:Enabled Bit2: 0:OFF, 1:ON Bit3: 0:Pump-down inactive, 1:Pump-down active Bit4: 0:Alarm inactive, 1:Alarm active Bit5: 0:---, 1:ON with 3 steps active; start for screw and centrifuge compressors Bit6: 0:---, 1:ON with 2 steps active Bit7: 0:---, 1:ON with 1 steps active Bit8: 0:---, 1:ON entire Bit9: 0:---, 1:chiller Bit10: 0:---, 1:heat pump Bit11: 0:---, 1:recovery Bit12: 0:---, 1:defrosting Bit13: 0:---, 1:freecooling Bit14: 0:---, 1:dripping Bit15: 0:---, 1:request)
40145	016	I	OUT	Compressor 2 status (see compressor 1 status)
40146	017	I	OUT	Compressor 3 status (see compressor 1 status)
40147	018	I	OUT	Compressor 4 status (see compressor 1 status)
40148	019	I	OUT	Compressor 5 status (see compressor 1 status)
40149	020	I	OUT	Compressor 6 status (see compressor 1 status)
40152	023	I	OUT	Average hours compressors (thousands)
40153	024	I	OUT	Average hours compressors (units)
40154	025	I	IN / OUT	Year / Month
40155	026	I	IN / OUT	Day / Hour / Minutes
40156	027	I	OUT	Pump codes (Bit0: 0: ---, 1:Enable pump 1 Bit1: 0: ---, 1:Enable pump 2 Bit2: 0: ---, 1:Enable recovery pump Bit3: 0: ---, Bit4: 0: ---, 1:Enable condenser pump Bit5: 0: ---, Bit6: 0: ---, Bit7: 0: ---, Bit8: 0: ---, 1:Pump 1 alarm Bit9: 0: ---, 1:Pump 2 alarm Bit10: 0: ---, 1:Recovery pump alarm Bit11: 0: ---, Bit12: 0: ---, 1:Condenser pump alarm Bit13: 0: ---, 1:Condenser flow or antifreeze alarm Bit14: 0: ---, 1:Unit no longer available -stop_by_alarm- Bit15: 0: ---, 1:Unit in alarm status but with requested pumps -no_stop_pump-)
40157	028	I	OUT	Flashing operating mode (Bit0: 0: ---, Bit1: 0: ---, Bit2: 0: ---, Bit3: 0: ---, Bit4: 0: ---, Bit5: 0: ---, Bit6: 0: ---, Bit7: 0:---, 1:Unit with power limitation enabled Bit8: 0: ---, 1:Unit with antifreeze limitation enabled Bit9 - Bit15: Not used)
40161	032	I	OUT	Alarm code active (with higher priority)
40162	033	I	OUT	Screw compressor model (0:Bitzer - 1:Hitachi - 2:Fu-Sheng - 3:Bitzer inverter)
40163	034	I	OUT	Chiller thermoregulator demand (%)
40164	035	I	OUT	Active power of chiller thermoregulator (%)
40165	036	I	OUT	Available power of chiller thermoregulator (%)
40166	037	I	OUT	Heat pump thermoregulator demand (%)
40167	038	I	OUT	Active power of heat pump thermoregulator (%)
40168	039	I	OUT	Available power of heat pump thermoregulator (%)
40169	040	I	OUT	Recovery thermoregulator demand (%)
40170	041	I	OUT	Active power of recovery thermoregulator (%)
40171	042	I	OUT	Available power of recovery thermoregulator (%)
40172	043	I	IN / OUT	Thermoregulator limitation in chiller mode (%)
40173	044	I	IN / OUT	Thermoregulator limitation in heat pump mode (%)

Register/Coil Modbus protocol	Protocol addresses: - Standard - Trend - Bacnet	Type	Flow	Description
40174	045	I	IN / OUT	Thermoregulator limitation in recovery mode (%)
40175	046	I	OUT	RPM/10 centrifuge comp./inverter 1
40176	047	I	OUT	Giri al minuto/10 comp. centrifugo/inverter 2
40177	048	I	OUT	Giri al minuto/10 comp. centrifugo/inverter 3
40178	049	I	OUT	Giri al minuto/10 comp. centrifugo/inverter 4
40183	054	I	OUT	Compressor 1 hours (thousands)
40184	055	I	OUT	Compressor 1 hours (units)
40185	056	I	OUT	Compressor 2 hours (thousands)
40186	057	I	OUT	Compressor 2 hours (units)
40187	058	I	OUT	Compressor 3 hours (thousands)
40188	059	I	OUT	Compressor 3 hours (units)
40189	060	I	OUT	Compressor 4 hours (thousands)
40190	061	I	OUT	Compressor 4 hours (units)
40191	062	I	OUT	Compressor 5 hours (thousands)
40192	063	I	OUT	Compressor 5 hours (units)
40193	064	I	OUT	Compressor 6 hours (thousands)
40194	065	I	OUT	Compressor 6 hours (units)
40199	070	I	OUT	Three-phase input voltage of centrifuge compressor/inverter 1
40200	071	I	OUT	Three-phase input voltage of centrifuge compressor/inverter 2
40201	072	I	OUT	Three-phase input voltage of centrifuge compressor/inverter 3
40202	073	I	OUT	Three-phase input voltage of centrifuge compressor/inverter 4
40203	074	I	OUT	Current absorbed (/10) by centrifuge compressor 1
40204	075	I	OUT	Current absorbed (/10) by centrifuge compressor 2
40205	076	I	OUT	Current absorbed (/10) by centrifuge compressor 3
40206	077	I	OUT	Current absorbed (/10) by centrifuge compressor 4
40207	078	I	OUT	Surge threshold RPM (/10) of centrifuge comp. 1
40208	079	I	OUT	Surge threshold RPM (/10) of centrifuge comp. 2
40209	080	I	OUT	Surge threshold RPM (/10) of centrifuge comp. 3
40210	081	I	OUT	Surge threshold RPM (/10) of centrifuge comp. 4
40211	082	I	OUT	Choke threshold RPM (/10) of centrifuge comp. 1
40212	083	I	OUT	Choke threshold RPM (/10) of centrifuge comp. 2
40213	084	I	OUT	Choke threshold RPM (/10) of centrifuge comp. 3
40214	085	I	OUT	Choke threshold RPM (/10) of centrifuge comp. 4
40231	102	I	OUT	Pump speed % (x10) with VPF management

Address:

This is the supervision variable address in the electronic control unit. When using the addresses with the ModBus protocol, add 128 for whole variables.

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

Type:

B: Boolean variable (Coil 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

Analogue variables are expressed with a decimal number (e.g.: 12.0 bar -> 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.

If the BMS is connected to the units via an FWS 3000, *the analogue, whole and digital variables with address 0* are considered as incorrect and return the "ILLEGAL DATA ADDRESS" error code.

All the addresses not indicated in the database must not be used.

5 Interfacing with the TREND system

5.1 Components required

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

Software release CA11.00 or higher is required to interface the W 3000 with a Trend supervisor system.

Serial interface card to the TREND system. (Not supplied by CLIMAVENETA)



Electronic control card.
Already fitted to the unit.

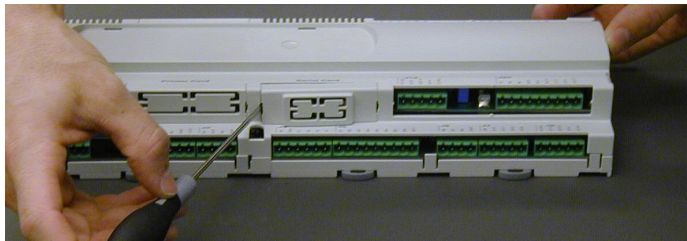


5.2 Installing the serial interface card to the TREND system

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

The cards must not be powered during these operations.

Remove the "Serial Card" cover



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



Put back the cover.



5.3 Setting supervisor parameters

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

Enter the programming menu, type in the password and scroll down to the following masks.

En. from dig. input:	
On/Off:	N
Chiller/HP:	N

Enables external signals.

Serial line configuration:	
Supervision	

Communication towards a supervisor system must be enabled.

En. from superv.:	
On/Off:	Y
Operating mode:	Y

Selects the on/off status and changes the operating mode of the unit through a supervision system.

Supervisor enables must be set as shown to the left:

♣ On/off enable: **Yes**

♣ Operating mode enable **Yes**

Serial setting	
Protocol Trend	
Speed 19200 baud	
ID	001

The supervisor connection parameters must be set as shown to the left.

♣ Protocol: **Standard**

♣ Communication speed: **19200 baud**

♣ Unit ID: **001**

5.4 Setting up the supervisor network

The supervisor network is set up by TREND staff.

N.B.: CLIMAVENETA will provide some files required by the TREND engineers to configure the network.
A .CDE file will be supplied.

5.5 Programming the TREND system serial interface card

The interface boards are programmed by TREND engineers.

The reference database for systems using the TREND networks is shown in paragraph 4.5.:

5.6 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.

6 Interfacing with the LONWORKS system

6.1 Components required

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

Serial interface card to the LONWORKS system.

Electronic control card.
Already fitted to the unit.

The photos refer to the card with the highest number of terminals, but the procedure is identical for the smaller cards

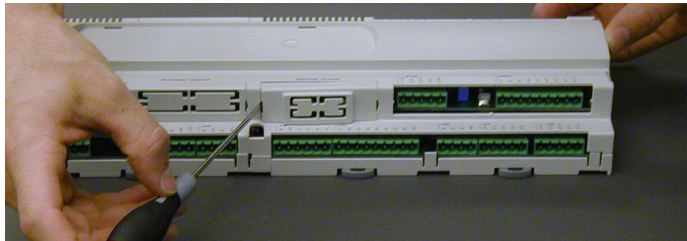


6.2 Installing the serial interface card to the LONWORKS system

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



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



Put back the cover.



6.3 Setting supervisor parameters

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

Enter the programming menu, type in the password and scroll down to the following masks.

```
En. from dig. input:
On/Off:             N
Chiller/HP:         N
```

Enables external signals.

```
Serial line
configuration:
Supervision
```

Communication towards a supervisor system must be enabled.

```
En. from superv.:
On/Off:           Y
Operating mode:   Y
```

Selects the on/off status and changes the operating mode of the unit through a supervision system.

Supervisor enables must be set as shown to the left:

♣ On/off enable: **Yes**

♣ Operating mode enable **Yes**

```
Serial setting
Protocol LonWorks
Speed 4800 baud
ID                001
```

The supervisor connection parameters must be set as shown to the left.

♣ Protocol: **LonWorks**

♣ Communication speed: 4800 **baud**

♣ Unit ID: **001**

6.4 Setting up the supervisor network

The supervisor network is set up by LONWORKS staff.

NB: CLIMAVENETA will provide the serial cards and some files required by the LONWORKS engineers to configure the network.

A .NXE file and a .XIF file will be provided.

The card is programmed by the technician developing the integration.

6.5 Programming the LONWORKS system serial interface card

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

Address	Type	NV Type	Flow	Description
001	A	105	IN / OUT	Chiller temperature setpoint
002	A	105	IN / OUT	Heat pump temperature setpoint
003	A	105	IN / OUT	Recovery setpoint
006	A	105	OUT	Evaporator inlet temperature
007	A	105	OUT	Evaporator outlet temperature (average)
008	A	105	OUT	Condenser inlet temperature
009	A	105	OUT	Condenser outlet temperature (average)
010	A	105	OUT	Recuperator inlet temperature
011	A	105	OUT	Recuperator outlet temperature
001	B	95	OUT	Unit status (0:Off - 1:On)
003	B	95	OUT	Evaporator pump 1 status (0:Off - 1:On)
004	B	95	OUT	Evaporator pump 2 status (0:Off - 1:On)
005	B	95	OUT	Recuperator pump status (0:Off - 1:On)
006	B	95	OUT	Condenser pump status (0:Off - 1:On)
007	B	95	OUT	Status of secondary pump for water/water unit with water side reversal (0:Off - 1:On) (no longer used)
008	B	95	IN / OUT	On/Off command from supervisor (0:Off - 1:On)
005	I	8	OUT	Type of unit configuration (00:Chiller - 01:Chiller+recovery - 02:Chiller+freecooling - 10:Heat pump - 11:Heat pump+recovery - 21:Multi-use)
006	I	8	OUT	N° circuits
007	I	8	OUT	N° compressors
008	I	8	OUT	N° separation stages per compressor
009	I	8	OUT	Type of compressors (0:Centrifuge - 1:Hermetic - 2:Alternative - 3:Screw)
012	I	8	OUT	Unit status (0:ON from keyboard - 1:ON from digital input - 2:ON from time bands - 3:ON from supervisor - 4:OFF from alarm - 5:OFF from supervisor - 6:OFF from time bands - 7:OFF from digital input - 8:OFF from keyboard - 9:Manual mode 10:OFF)
013	I	8	OUT	Unit timer status (0:Error - 1:Starting - 2:Heating - 3:Unit start-up - 4:Switching off - 5:Compressor timing - 6:Pump/main fan timing)
014	I	8	IN / OUT	Operating mode Chiller (3:chiller) Chiller + freecooling (7:chiller - 8:chiller+fc) Chiller + recovery (2:chiller+rec - 3:chiller) Heat pump (3:chiller 4:heatpump) All-in-one unit (0:auto -1:recovery - 2:chiller+rec - 3:chiller) Heat pump with recovery (10:summer auto - 11:summer rec - 12:summer ch+rec - 13:summer ch - 14:winter hp - 15:winter rec - 16:winter auto)
015	I	83	OUT	Compressor 1 status (Bit0: 0:Configured, 1:Unconfigured Bit1: 0:Disabled, 1:Enabled Bit2: 0:OFF, 1:ON Bit3: 0:Pump-down inactive, 1:Pump-down active Bit4: 0:Alarm inactive, 1:Alarm active Bit5: 0:--- ,1:ON with 3 steps active Bit6: 0:--- ,1:ON with 2 steps active Bit7: 0:--- ,1:ON with 1 steps active Bit8: 0:--- ,1:ON entire Bit9: 0:--- ,1:chiller Bit10: 0:--- ,1:heat pump Bit11: 0:--- ,1:recovery Bit12: 0:--- ,1:defrosting Bit13: 0:--- ,1:freecooling Bit14: 0:--- ,1:dripping Bit15: 0:--- ,1:request)
016	I	83	OUT	Compressor 2 status (see compressor 1 status)
017	I	83	OUT	Compressor 3 status (see compressor 1 status)
018	I	83	OUT	Compressor 4 status (see compressor 1 status)
019	I	83	OUT	Compressor 5 status (see compressor 1 status)
020	I	83	OUT	Compressor 6 status (see compressor 1 status)
032	I	8	OUT	Alarm code active (with higher priority)
034	I	81	OUT	Chiller thermoregulator demand (%)
035	I	81	OUT	Active power of chiller thermoregulator (%)

Address	Type	NV Type	Flow	Description
037	I	81	OUT	Heat pump thermoregulator demand (%)
038	I	81	OUT	Active power of heat pump thermoregulator (%)
040	I	81	OUT	Recovery thermoregulator demand (%)
041	I	81	OUT	Active power of recovery thermoregulator (%)
043	I	81	IN / OUT	Thermoregulator limitation in chiller mode (%)
044	I	81	IN / OUT	Thermoregulator limitation in heat pump mode (%)
045	I	81	IN / OUT	Thermoregulator limitation in recovery mode (%)
046	I	102	OUT	RPM (/10) centrifuge compressor 1
047	I	102	OUT	RPM (/10) centrifuge compressor 2
048	I	102	OUT	RPM (/10) centrifuge compressor 3
049	I	102	OUT	RPM (/10) centrifuge compressor 4

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.

7 Interfacing with the BACNET system

7.1 Components required

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

Serial interface card to the BACNET system.

Electronic control card.
Already fitted to the unit.

The photos refer to the card with the highest number of terminals, but the procedure is identical for the smaller cards

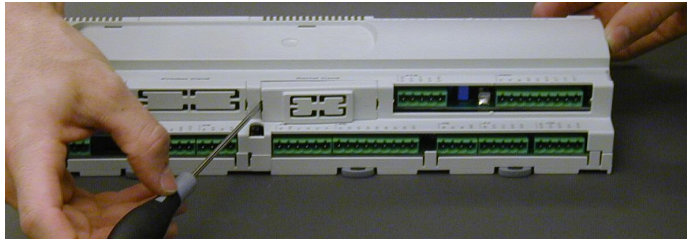


7.2 Installing the serial interface card to the BACNET system

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



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



Put back the cover.



7.3 Setting supervisor parameters

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

Enter the programming menu, type in the password and scroll down to the following masks.

```
En. from dig. input:
On/Off:             N
Chiller/HP:         N
```

Enables external signals.

```
Serial line
configuration:
Supervision
```

Communication towards a supervisor system must be enabled.

```
En. from superv.:
On/Off:           Y
Operating mode:   Y
```

Selects the on/off status and changes the operating mode of the unit through a supervision system.

Supervisor enables must be set as shown to the left:

♣ On/off enable: **Yes**

♣ Operating mode enable **Yes**

```
Serial setting
Protocol Bacnet
Speed 19200 baud
ID                001
```

Protocol: **Bacnet**

Communication speed: **19200 baud**

Unit ID: from **001** to **200**

7.4 Setting up the supervisor network

The supervisor network is set up by the technicians developing the BACNET interface.
The interface database is shown in paragraph 4.5.

7.5 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.

8 Attachments

8.1 AWG (American Wire Gauge) conversion table

Conversion : AWG number – diameter in mm – area in mm²

AWG n°	Diam. mm	Area mm ²		AWG n°	Diam. mm	Area mm ²
1	7.350	42.400		16	1.290	1.310
2	6.540	33.600		17	1.150	1.040
3	5.830	26.700		18	1.024	0.823
4	5.190	21.200		19	0.912	0.653
5	4.620	16.800		20	0.812	0.519
6	4.110	13.300		21	0.723	0.412
7	3.670	10.600		22	0.644	0.325
8	3.260	8.350		23	0.573	0.259
9	2.910	6.620		24	0.511	0.205
10	2.590	5.270		25	0.455	0.163
11	2.300	4.150		26	0.405	0.128
12	2.050	3.310		27	0.361	0.102
13	1.830	2.630		28	0.321	0.080
14	1.630	2.080		29	0.286	0.065
15	1.450	1.650		30	0.255	0.050



Climaveneta S.p.A. Via Sarson 57/c 36061 Bassano del Grappa (Vi) Italia
Tel. +39 / 0424 509500 - Fax. +39 / 0424 509509
www.climaveneta.it