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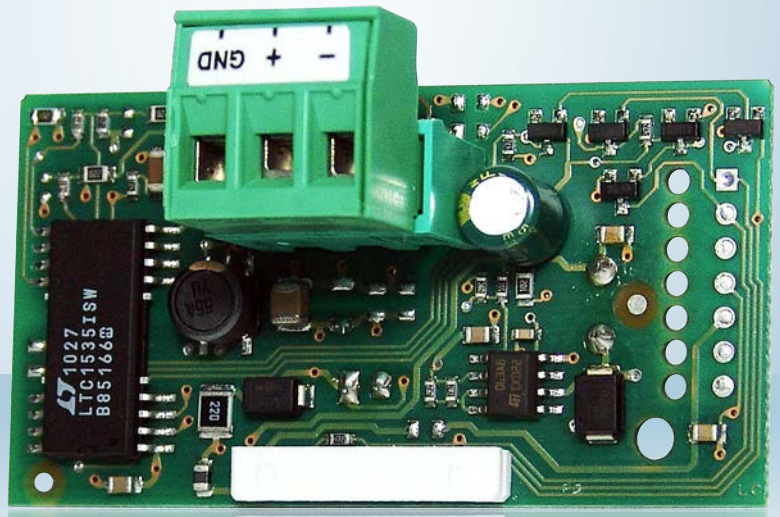


Interfaccia seriale per schede chiller • Serial interface for chiller cards
Interface série pour cartes chiller • Serielle Schnittstelle Für Chiller-Steuerung
Interface serie para tarjetas congelador

AER485P1

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2008 - Cert. n° 0128
CISQ IQNet
AERMEC S.P.A.

CE

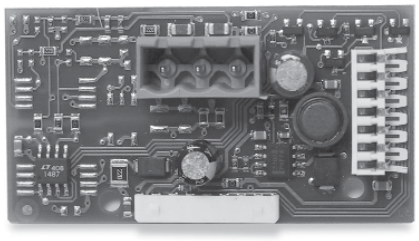
AER485P1_6876423_03

Gentile cliente,
La ringraziamo per aver preferito nell'acquisto un prodotto AERMEC. Esso è frutto di pluriennali esperienze e di particolari studi di progettazione, ed è stato costruito con materiali di primissima scelta e con tecnologie avanzatissime.
La marcatura CE, inoltre, garantisce che gli apparecchi rispondano ai requisiti della Direttiva Macchine Europea in materia di sicurezza. Il livello qualitativo è sotto costante sorveglianza, ed i prodotti AERMEC sono pertanto sinonimo di Sicurezza, Qualità e Affidabilità.

I dati possono subire modifiche ritenute necessarie per il miglioramento del prodotto, in qualsiasi momento senza obbligo di preavviso.

Nuovamente grazie.
AERMEC S.p.A

IT



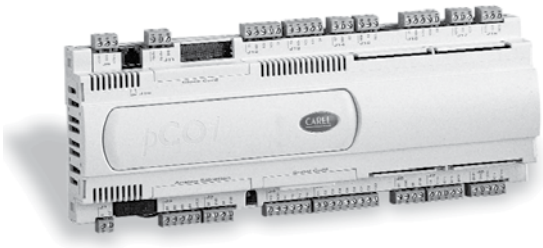


Fig.1

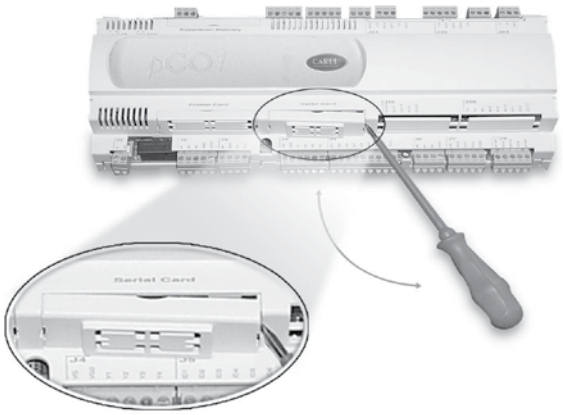
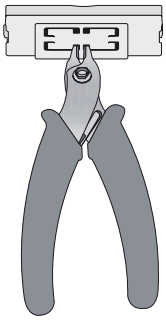
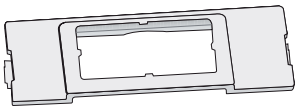


Fig.2





DESCRIZIONE

La scheda AER485P1 è un accessorio di tutta la famiglia di controlli PCO3 (PCO3B esclusi) che permette l'interfacciamento diretto una rete RS485. La scheda garantisce l'optoisolamento del controllore rispetto alla rete seriale RS485. Il baud rate massimo ottenibile è di 19 200 baud (impostabile via software).

MONTAGGIO

Con riferimento alle Figg. 1...4, il collegamento al PCO3 si ottiene secondo questa procedura:

con un cacciavite, togliere lo sportellino "serial card" del controllore elettronico (vedi Fig. 1);
con un tronchesino, eliminare dallo sportellino la parte plastica prefratturata, ottenendo il foro corrispondente all'uscita del connettore a 3 vie (vedi Fig. 2);
inserire la scheda opzionale nel corrispondente connettore a pettine curando che la scheda sia ben inserita e sia in battuta sui due appoggi plastici solidali al contenitore del PCO3 (vedi Fig. 3);
richiudere lo sportellino mediante cacciavite facendo combaciare il connettore esposto della scheda seriale con il foro eseguito sullo sportellino (vedi Fig. 4).

La connessione alla rete RS485 si ottiene tramite il connettore a morsetti estraibili presente sulla scheda.
I significati dei pin su tale connettore (Fig. 5) sono evidenziati dalla serigrafia presenti sulla scheda ed elencati in fig. 6.
Qualora la scheda occupi l'ultima posizione nella linea seriale di supervisione, ai capi dei pin 2 e 3, va collegata una resistenza di chiusura linea, del valore di 120 Ω - 1/4 W come da schema di Fig. 7

Caratteristiche tecniche

Sezione del cavo:	usare cavo ritorto e schermato a due fili AWG20/22 con sezioni, ai morsetti di mm2: min. 0,2 - max. 2,5.
Condizioni di funzionamento:	-10T60 °C; 90 % UR.
Condizioni di immagazzinamento:	-20T70 °C; 90 % UR.
Grado di inquinamento:	normale.
Dimensioni (mm):	60x29x20, (60x29: basetta, 20: larghezza componenti fuori tutto).

A**vvertenze. Precauzioni nel maneggiare la scheda**

I danneggiamenti elettrici che si verificano sui componenti elettronici avvengono quasi sempre a causa delle scariche elettrostatiche indotte dall'operatore. È quindi necessario prendere adeguati accorgimenti per queste categorie di componenti, ed in particolare:

prima di maneggiare qualsiasi componente elettronico o scheda, toccare una messa a terra (il fatto stesso di evitare di toccare un componente non è sufficiente in quanto una scarica di 10000 V, tensione molto facile da raggiungere con l'elettricità statica, innesca un arco di circa 1 cm);
i materiali devono rimanere per quanto possibile all'interno delle loro confezioni originali. Se necessario, prelevare la scheda da una confezione e trasferire il prodotto in un imballo antistatico senza toccare il retro della scheda con le mani;
evitare nel modo più assoluto di utilizzare sacchetti in plastica, polistirolo o spugne non antistatiche;
evitare nel modo più assoluto il passaggio diretto tra operatori (per evitare fenomeni di induzione elettrostatica e conseguenti scariche).

Fig.3

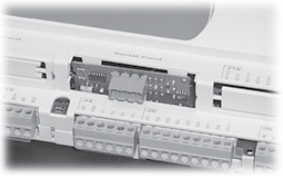


Fig.4

Fig.5

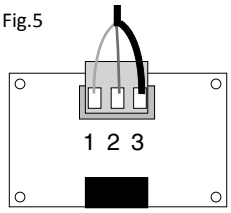
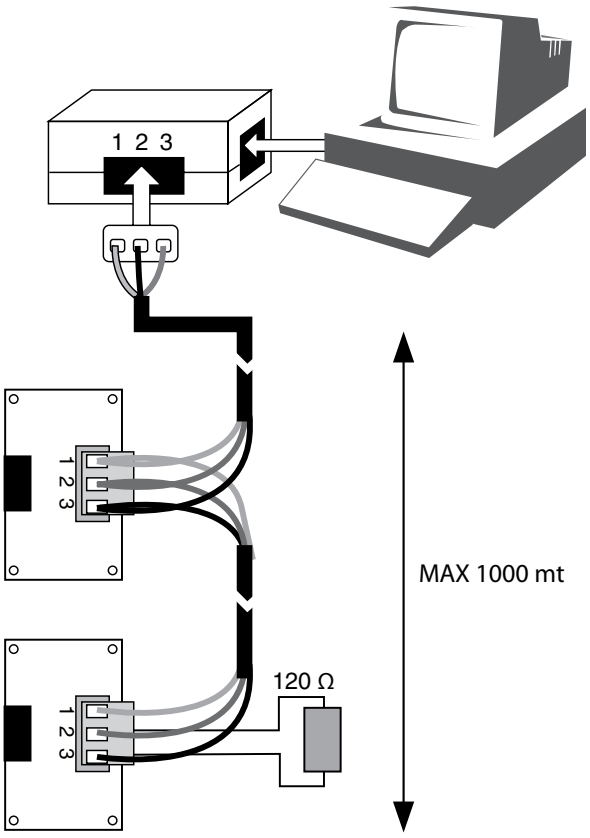


Fig.6

Pin	Significato Meaning
1	GND
2	RX+/TX+
3	RX-/TX

Fig.7



Guida di riferimento per protocollo modaer

Il protocollo di comunicazione Modaer rappresenta lo standard di comunicazione reso disponibile da Aermec per il collegamento tra chiller e sistemi di supervisione o controlli centralizzati (consultare la guida prodotti Aermec per vedere su quali macchine è disponibile questo protocollo).

Il protocollo permette il collegamento sia punto a punto (macchina * supervisore), sia di piu' macchine (max 255) su uno stesso bus di collegamento verso un supervisore, in quanto prevede la gestione di un indirizzo per ogni macchina.

La modalità di comunicazione è del tipo master-slave, quindi il sistema di supervisione è master mentre la macchina è slave.

Questo significa che la macchina risponde solamente alle interrogazioni fatte dal supervisore

Configurazione seriale:

- 1200 to 19200 baud
- 1 bit di start
- no parity
- 2 bit di shigh

Codificazione dati:

Ogni parola di 8 bit (1 byte) contenuta nel messaggio è costituita da due caratteri hex codificati con 4 bit ciascuno (0-9, A-F).

Formato del messaggio:

I campi che compongono il messaggio sono riportati in Tabella 1.

Il messaggio inizia con un intervallo di silenzio lungo almeno 3,5 caratteri (indicati nella Tabella 1 come tempo di silenzio).

La durata di tale intervallo dipende dal baud rate.

Il primo dato ad essere trasmesso è l'indirizzo della macchina; successivamente il tipo di richiesta (tipo di lettura o di scrittura), i dati relativi alla richiesta, il checksum e infine un intervallo di silenzio della stessa lunghezza di quello iniziale**.**

Tab. 1

START	tempo di silenzio
INDIRIZZO	1 byte
COMADO	1 byte
DATO	n x byte
CHECKSUM	2 byte
SHigh	tempo di silenzio

Indirizzo:	è l'indirizzo della macchina e può essere compreso tra 1 e 255.
Comando :	è l'operazione che si vuole eseguire, l'elenco è in "Tab.2. pagi.2 "
Checksun :	è un controllo di sicurezza per verificare la correttezza del dato trasmesso ed è calcolato di volta in volta da chi sta trasmettendo il messaggio; chi lo riceve deve ricalcolarlo e confrontarlo con quello ricevuto per avere la sicurezza che i dati ricevuti sono corretti.

Il checksum viene calcolato considerando tutti i campi tranne il campo checksum e considerando solo gli 8 bit di dati per ogni byte (escludendo bit di start e di shigh).

Il checksum è un dato a 16 bit ed è ottenuto nel modo seguente:

1. settare il dato checksum a 16 bit con tutti 1 (0xffff in hex)
2. eseguire l'exor con il successivo byte del messaggio (partendo dal primo e cioè l'indirizzo)
3. eseguire lo shift di un bit (verso il bit meno significativo) con inserimento di uno 0 sul bit piu' significativo
4. controllo sul bit meno significativo estratto dopo lo shift (bit di carry)
5. se il bit è 1 fare l'exor con il dato fisso hex 0xA001
6. ripetere le operazioni dal punto 3 fino ad effettuare 8 shift
7. ripetere le operazioni dal punto 2 per ogni byte che compone il messaggio.

Tipologia di comandi:

Tab. 2

Comando	Operazione Master
01	Read dati digitali (dati 1 bit)
05	Write dati digitali (dati 1 bit)
03	Read dati analogici (dati 16 bit)
06	Write dati analogici (dati 16 bit)

Formato dei comandi :

Comando 01: Read Dati Digitali

Con questo comando si possono richiedere uno o piu' variabili digitali a partire dall'indirizzo specificato. I dati in risposta vengono raggruppati in byte (8 dati per ogni byte).
Il primo byte ricevuto corrisponde agli 8 dati con indirizzo piu' basso, il bit meno significativo di ogni byte corrisponde al dato con indirizzo piu' basso.
ESEMPIO:

RICHIESTA		
Campo		hex
Indirizzo macchina	01	
Comando	01	
Indirizzo di partenza (byte high)	00	
Indirizzo di partenza (byte low)	00	
N° di dati (parte high)	00	
N° di dati (parte low)	0A	
Checksum	...	

RISPOSTA		
Campo		hex
Indirizzo macchina	01	
Comando	01	
Numero di byte dati in risposta	02	
Dati (0-7)		0E
Dati (8-9)		03
Checksum	...	

Comando 05: Write Digitali
Per assegnare 1 ad un indirizzo digitale bisogna trasmettere il dato hex 0xFF00;
per assegnare 0 bisogna trasmettere il dato hex 0x0000.
Ogni altro tipo di dato viene gestito come errore.
La risposta normale è un echo della richiesta se l'assegnazione del dato è andata a buon fine.
ESEMPIO:

RICHIESTA		
Campo		hex
Indirizzo macchina	01	
Comando	05	
Indirizzo (byte high)	00	
Indirizzo (byte low)		00
Dato nuovo (parte high)		FF
Dato nuovo (parte low)		00
Checksum	...	

RISPOSTA		
Campo		hex
Indirizzo macchina	01	
Comando	05	
Indirizzo (byte high)	00	
Indirizzo (byte low)		00
Dato nuovo (parte high)		FF
Dato nuovo (parte low)		00
Checksum	...	

Comando 03: Read Dati Analogici

Con questo comando si possono richiedere uno o piu' variabili analogiche e intere a partire dall'indirizzo specificato. La codifica adottata è binaria in complemento a 2. Le variabili analogiche vengono rappresentate in decimi (ad esempio il valore 10,0 viene trasmesso come 0064h = 100d)., le intere sono trasferite con il valore effettivo (ad esempio 100 viene trasmesso come 0064h = 100d).
Le variabili intere sono quelle con indirizzo maggiore di 128.
Il numero di dati richiesti si intende a partire dall'indirizzo
ESEMPIO:

RICHIESTA		
Campo		(hex)
Indirizzo macchina	01	
Comando	03	
Indirizzo di partenza (byte high)	00	
Indirizzo di partenza (byte low)	00	
N° di dati richiesti (parte high)	00	
N° di dati richiesti (parte low)	02	
Checksum	...	

RISPOSTA		
Campo		hex
Indirizzo macchina	01	
Comando	03	
Numero di byte dati in risposta	04	
Byte hight dato 0		0c
Byte low dato 0		03
Checksum	...	

Comando 06: Write Dati Analogici

Con questo comando si può scrivere una variabile analogica o intera. La codifica adottata è binaria in complemento a 2.
Le variabili analogiche vengono rappresentate in decimi (ad esempio il valore 10,0 viene trasmesso come 0064h = 100d)., le intere sono trasferite con il valore effettivo (ad esempio 100 viene trasmesso come 0064h = 100d).
Le variabili intere sono quelle con indirizzo maggiore di 128.
La risposta normale è un echo della richiesta se l'assegnazione del dato è andata a buon fine.
ESEMPIO:

RICHIESTA		
Campo		(hex)
Indirizzo macchina	01	
Comando	06	
Indirizzo (byte high)	00	
Indirizzo (byte low)		00
Dato nuovo (parte high)		1B
Dato nuovo ((parte low)		00
Checksum	...	

RISPOSTA		
Campo		hex
Indirizzo macchina	01	
Comando	06	
Indirizzo (byte high)	00	
Indirizzo (byte low)		00
Dato nuovo (parte high)		1B
Dato nuovo ((parte low)		00
Checksum	...	

GESTIONE TIMEOUT ED ERRORI DI COMUNICAZIONE
Di seguito si analizzano i possibili casi in cui puo' evolversi la comunicazione e il comportamento previsto dal master e dallo slave come protocollo.

1. Lo slave riceve la richiesta senza errori di comunicazione : slave : risponde come previsto master : deve prevedere un timeout sulla risposta dello slave di almeno 500mS per dare allo slave la possibilità di elaborare i dati.
2. Lo slave non riceve la richiesta per un errore di comunicazione slave : non dà nessuna risposta master : deve prevedere un timeout sulla risposta
3. Lo slave riceve la richiesta, ma c'è un errore di comunicazione (es. checksum) slave : non dà nessuna risposta master : deve prevedere un timeout sulla risposta
4. Lo slave riceve la richiesta senza errori di comunicazione ma i dati della richiesta

non sono corretti (es. comando non previsto, richiesta numero dati eccedente, indirizzi non previsti, valore dato in scrittura fuori range)
slave : risponde normalmente con il suo indirizzo sul primo campo, sul campo comando risponde aggiungendo 0x80 al codice del comando e come terzo byte risponde con un codice di errore che identifica l'errore riscontrato. (vedere esempio seguente)

I codici di errore sono i seguenti :

01	Comando non valido
02	Indirizzo dato non valido
03	Valore dato (in modo write) fuori range

ESEMPIO 1

Errore di comunicazione		RICHIESTA
Campo		hex
Indirizzo macchina	01	
Comando	07 (comando non valdo)	
Indirizzo macchina	00	
Indirizzo (byte high)	00	
Dato nuovo (parte high)		1B
Dato nuovo (parte low)		00
Checksum	...	

ESEMPIO 2

Errore di comunicazione		RISPOSTA
Campo		hex
Indirizzo macchina	01	
Comando	87	
Codice errore		01 (codice di errore comando non valido)
Checksum	...	

TABELLE INDIRIZZI

Di seguito vengono illustrati gli indirizzi previsti dal protocollo e il significato corrispondente dal punto di vista della macchina.
Gli indirizzi non riportati sono riservati o non utilizzati; pertanto non è consentito utilizzare comandi relativi a indirizzi non riportati in quanto ciò potrebbe comportare malfunzionamenti o rotture della macchina.

Gli indirizzi contrassegnati dal simbolo ✓sono da utilizzare solamente con la scheda master.

CONFIGURAZIONE di serie della scheda pCO3:

Per configurare la comunicazione seriale della scheda pCO3 con la velocità di trasmissione, l'indirizzo di rete e il tipo di protocollo richiesto, selezionare le seguenti maschere nel menu utente (Prog. chiave):

Indirizzo per le autorità di vigilanza	**001**
Baudrate9600	**(RS485)**
Protocollo	**Modbus**

NOTE RIGUARDANTI LETTURA/SCRITTURA DATI TIMER E STORICO DA SUPERVISORE:

Timer :

Per impostare da Supervisore le seguenti fasce:

Giorno	MARTEDI'
Start Fascia 1	03:15Shigh Fascia 1 12:30
Start Fascia 2	14:30
Shigh Fascia 2	20:00

Operazioni da eseguire:

- impostare a '3' la variabile analogica 166 (1=Domenica; 2=Lunedi'; …7=Sabato)
- impostare il valore '3' alla variabile analogica 158
- impostare il valore '15' alla variabile analogica 159
- impostare il valore '12' alla variabile analogica 160
- impostare il valore '30' alla variabile analogica 161
- impostare il valore '14' alla variabile analogica 162
- impostare il valore '30' alla variabile analogica 163
- impostare il valore '10' alla variabile analogica 164
- impostare il valore '00' alla variabile analogica 165
- settare la variabile digitale 74 che memorizza le singole impostazioni.

Viceversa, se l'impostazione fosse stata:

Giorno	MARTEDI'
Start Fascia 1	13:15
Shigh Fascia 1	12:30
Start Fascia 2	14:30
Shigh Fascia 2	20:00

In questo caso la variabile digitale 75 andra' a '1'
anche quando:
lo SHigh Fascia 1 e' MINORE dello START Fascia 1;
lo SHigh Fascia 2 e' MINORE dello START Fascia 2;
lo SHigh Fascia 2 e' MINORE dello START Fascia 1.

N.B.: Nel caso in cui si voglia disabilitare una o piu' Fasce e' sufficiente impostare lo START e lo SHigh fascia a 00:00 - 00:00.

STORICO ALLARMI:

Per interrogare da Supervisore lo storico.
Operazioni da eseguire:

- Settare la variabile digitale 79 in modo da ricevere tutte le informazioni su DATA, TEMP. IN, TEMP. OUT,..... riguardo l'ultimo allarme registrato dal PCO3;
- settare la variabile digitale 78 per richiedere dati relativi all'evento di allarme precedente quello visualizzato
- settare la variabile digitale 77 per richiedere dati relativi all'evento di allarme successivo quello visualizzato

A questo punto leggendo le variabili analogiche 32, 33 e da 167 a 172 si ottengono tutte le informazioni relative all'allarme selezionato.

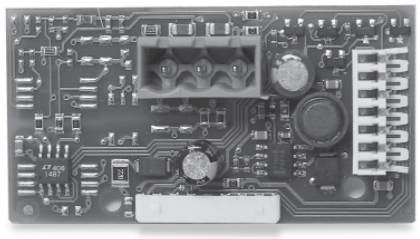
Per resettare lo Storico da Supervisore:

- settare la variabile digitale 76.

REGOLAZIONE ORA

Per regolare l'ora da Supervisore.
Operazioni da eseguire:

- impostare l'ORA nuova sulla variabile analogica 149;
- impostare i MINUTI nuovi sulla variabile analogica 151;
- impostare il GIORNO nuovo sulla variabile analogica 153 (1=Domenica; 2=Lunedi'; …7=Sabato);
- impostare il MESE nuovo sulla variabile analogica 155
- impostare l'ANNO nuovo sulla variabile analogica 157 (2 cifre);
- settare la variabile digitale 56 che copia le variabili appena impostate.



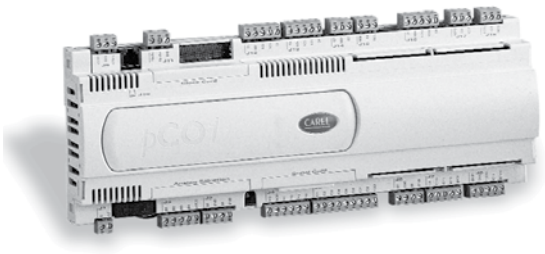


Fig.1

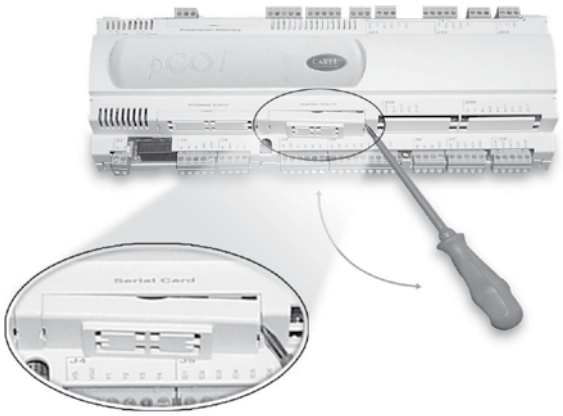
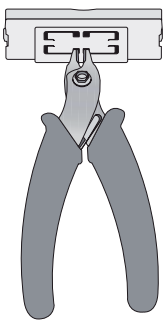
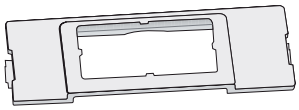


Fig.2





EN

DESCRIPTION

The AER485P1 card is an accessory for the entire PCO3 control series (PCO3B excluded), which allows the direct interface of an RS485 network. The card provides the optical isolation of the controller in relation to the RS485 serial network. The maximum achievable baud rate is 19200 baud (settable via software).

ASSEMBLY

With reference to Figs. 1 ... 4, the connection to the PCO3 is obtained following this procedure:

1. remove the "serial card" of the electronic controller with a screwdriver (see Figure 1);
2. with a pair of nippers, remove the plastic knockout section from the cover, obtaining the opening for the 3-way connector (see Figure 2);
3. insert the optional card into the corresponding comb connector, taking care that the card is correctly inserted and to is in contact with the two plastic supports of the PCO3 container (see Figure 3);
4. close the cover with a screwdriver, lining up the connector of the serial card with the hole on the cover (Fig. 4).

The connection to the RS485 network is obtained using the connector with removable terminals on the card.
The meanings of the pins on the connector (Fig. 5) are indicated by the serigraphy on the card and listed in Fig. 6.
If the card occupies the last position in the serial supervision line, a terminating line resistor with a value of 120 Ω - 1/4 W is connected to the terminals of pins 2 and 3 as in the diagram of Figure 7.

Technical characteristics

Cable section:	use AWG20/22 twisted two wire shielded cable with a 2 mm sections at the terminals: min. 0.2 - max. 2.5.
Operating conditions:	-10T60 °C; 90 % RH.
Storage conditions:	-20T70 °C; 90 % RH.
Degree of pollution:	normal.
Dimensions (mm)	60x29x20, (60x29: terminal strip, 20: overall width of components).

Warnings. Care in handling the card

Electrical damage may occur on electronic components is almost always due to electrostatic discharge caused by the operator. It is therefore necessary take suitable steps for these type of components, in particular:

- before handling any electronic component or card, touch a grounded object (trying to avoid touching a component is not sufficient as a discharge of 10,000 V, which is quite easily achieved by static electricity, produces an arc of about 1 cm);
- the materials must remain in their original packaging as far as possible. If necessary, remove the card from its package and place it in an antistatic bag, without touching the back of the card with the hands;
- the use of plastic, polystyrene or non antistatic bags should be strictly avoided;
- avoid at all cost the direct handling of the card from one operator to another (to avoid electrostatic induction and discharges).

Fig.3

Fig.4

Fig.5

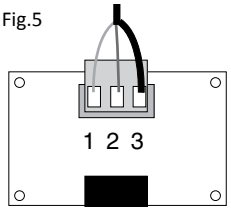
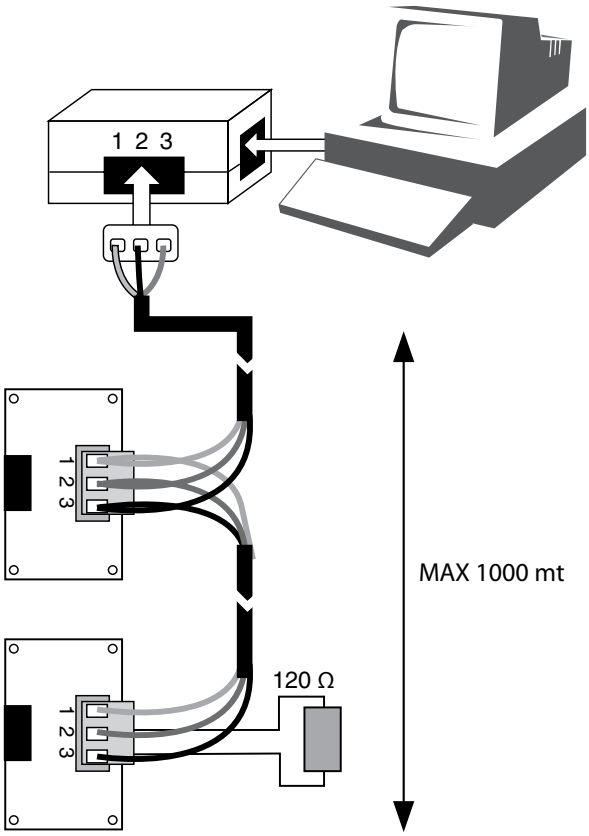


Fig.6

Pin	Meaning Meaning
1	GND
2	RX+/TX+
3	RX-/TX

Fig.7



Reference guide for Modaer protocol

The Modaer communication protocol is the communication standard made available by Aermec for the connection between chillers and centralised supervision or control systems (see the Aermec products guide to see on which machine this protocol is available).

The protocol allows both the point to point connection (machine * supervisor), as well as several machines (max 255) on the same bus link to a supervisor, because it manages one address for each machine.

The system uses a master-slave communication mode, therefore the supervision system is master and the machine slave.

This means that the machine only responds to the enquiry made by the supervisor.

Serial configuration:

- 1200 to 19200 baud
- 1 start bit
- no parity
- 2 shigh bits

Data configuration:

Each 8 bit word (1 byte) in the message is comprised of two coded hex characters with 4 bits each (0-9, A-F).

Message format:

The fields that comprise the message are shown in Table 1.

The message begins with a dead interval of at least 3.5 characters long (indicated in Table 1 as a dead period).

The duration of this interval depends on the baud rate.

The first data to be transmitted is the address of the machine; then the type of request (read or write type), data relating to the request, the checksum and then a dead interval with the same length as that at the beginning **.**

Tab.1

START	dead time
ADDRESS	1 byte
COMMAND	1 byte
DATA	n x byte
CHECKSUM	2 bytes
SHigh	dead time

Address:	this is the machine address and can be comprised between 1 and 255.
Command:	this is the operation you want to perform, the list is in "Tab.2. page 2 "
Checksum:	this is a safety check to verify the correctness of the data being transmitted and is calculated from time to time by the sender of the message; the receiver has to recalculate and compare it with the one received in order to be sure that all information received is correct.

The checksum is calculated by considering all areas except the checksum field and considering only the 8 bits of data for each byte (excluding start and shigh bits).

The checksum is a 16-bit data and is obtained as as follows:

1. set the 16 bit checksum data with all 1 (0xffff in hex)
2. run the Exor with the next byte of the message (starting from the first, i.e. the address)
3. run the shift of a bit (toward the least significant bit) by inserting a 0 on the more significant bit
4. control on the least significant bit extracted after the shift (carry bit)
5. if the bit is 1 perform the exor with the fixed data hex 0xA001
6. repeat the operations from point 3 until 8 shifts have been made
7. repeat the operations from point 2 for each byte that comprises the message.

1. The slave receives the request, but there is a slave communication error (e.g. checksum): no master reply is given: there should be a timeout on the response
2. The slave receives the request without communication errors but the data of the request are incorrect (e.g. command not expected, excess data number request, address not provided, the written value given out of range) slave: normally responds with its address on the first field, responds on the command field by adding 0x80 to the command code and as the third byte responds with an error code that identifies the error found. (see following example)

The error codes are as follows:

01	Invalid command
02	Invalid data address
03	Data value (in write mode) out of range

EXAMPLE 1

Communication error Hex field	REQUEST
Machine address	01
Command	07 (invalid command)
Machine address	00
Address (byte high)	00
New data (high part)	1B
New data (low part)	00
Checksum	...

EXAMPLE 2

Communication error Hex field	REPLY
Machine address	01
Command	87
Error code	01 (invalid command error code)
Checksum	...

FAMILIES: RV - NW - NS - NSB - WS - WF

TABLE OF ADDRESSES

Below are the addresses foreseen by the protocol and the corresponding meaning in terms of the machine.
Addresses not indicated are reserved or unused; therefore the use of commands related to addresses not listed are not permitted as this could lead to malfunctions or failures of the machine.

Addresses marked by ✓ are for use with the master card only.

SERIAL CONFIGURATION OF THE PCO3 CARD:

To configure the serial communication of the PCO^3 card with the Baud rate, the network address and the type of protocol required, select the following masks in the user menu (Prog. key):

Address for supervisor	001
Baud rate9600	(RS485 only)
Protocol	Modbus

NOTES CONCERNING READ/WRITE OF SUPERVISOR TIMER AND LOG DATA :

Timer :

To set the following slots from the supervisor:

Day	TUESDAY		
Start Slot 1	03:15	Shigh Slot 1	12:30
Start Slot 2	14:30		
Shigh Slot 2	20:00		

Operations to perform:

- set the analogue variable 166 to '3' (1=Sunday; 2=Monday; … 7=Saturday)
- set the value '3' to the analogue variable 158
- set the value '15' to the analogue variable 159
- set the value '12' to the analogue variable 160
- set the value '30' to the analogue variable 161
- set the value '14' to the analogue variable 162
- set the value '30' to the analogue variable 163
- set the value '10' to the analogue variable 164
- set the value '00' to the analogue variable 165
- set the digital variable 74 that save the individual settings.

Vice versa, if the setting has been made:

Day	TUESDAY
Start Slot 1	13:15
Shigh Slot 1	12:30
Start Slot 2	14:30
Shigh Slot 2	20:00

In this case the digital variable 75 will go to '1' even when:
SHigh Slot 1 is LESS than the START Slot 1;
SHigh Slot 2 is LESS than the START Slot 2;
SHigh Slot 2 is LESS than the START Slot 1.

N.B.: In case one or more 'Slots need to be disabled simply set the START and SHigh slot to 00:00 - 00:00.

ALARMS LOG:

To interrogate the Log from the Supervisor.
Operations to perform:

- Set the digital variable 79 to receive all DATE, IN TEMP. OUT TEMP. information,..... concerning the last alarm recorded by the PCO3;
- set the digital variable 78 to request data concerning the alarm prior to that displayed;
- set the digital variable 77 to request data concerning the alarm after that displayed.

At this point, reading the analogue variables 32, 33 and from 167 to 172, all the alarm information relating to the alarm selected is obtained.

To reset the Log from the Supervisor.

- set the digital variable 76.

HOUR ADJUSTMENT

To adjust the hour from the Supervisor.
Operations to perform:

- set the new HOUR on the analogue variable 149;
- set the new MINUTES on the analogue variable 151;
- set the new DAY on the analogue variable 153 (1=Sunday; 2=Monday; … 7=Saturday);
- set the new MONTH on the analogue variable 155
- set the new YEAR on the analogue variable 157 (2 digits);
- set the digital variable 56 that copies the variables just set.

FR

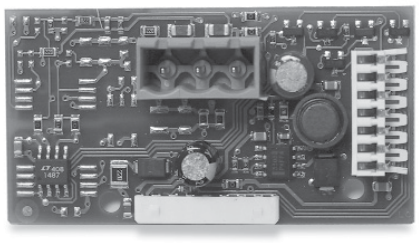


Fig. 1

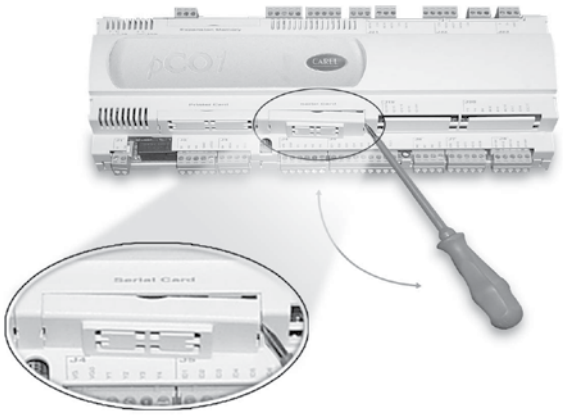
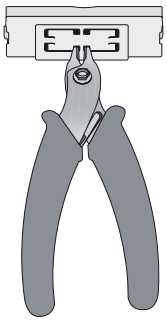
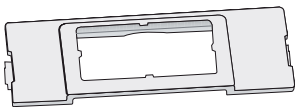


Fig. 2





DESCRIPTION

La carte AER485P1 est un accessoire de toute la famille de contrôles PCO3 (sauf PCO3B) qui permet l'interface directe à un réseau RS485. La carte garantit l'opto-isolation du contrôleur par rapport au réseau sériel RS485. Le baud rate maximum qui peut être obtenu est 19 200 baud (réglable à l'aide du logiciel).

MONTAGE

Pour les Figures 1...4, la connexion au PCO3 se fait en suivant cette procédure :

1. avec un tournevis, ôter le cache "serialcard" du contrôle électronique (voir fig. 1) ;
2. avec un ciseau, éliminer la partie pré-coupée en plastique du cache, de manière à obtenir le trou correspondant à la sortie à 3 voies (voir Figure 2) ;
3. introduire la carte optionnelle dans le connecteur peigne correspondant en veillant à ce que la carte soit correctement insérée et qu'elle bute contre les deux appuis en plastique faisant partie du boîtier du PCO3 (voir figure 3) ;
4. refermer le cache avec le tournevis en faisant coïncider le connecteur exposé de la carte sérielle avec le trou qui a été fait sur le cache (voir figure 4).

La connexion au réseau RS485 s'obtient par l'intermédiaire du connecteur à bornes extractibles qui se trouve sur la carte.
Les sens de pins sur ce connecteur (Fig. 5) sont mis en évidence par la sérigraphie qui se trouvent sur la carte et énumérés à la figure 6.
Si la carte occupe la dernière position dans la ligne sérielle de supervision, aux extrémités des pins 2 et 3, il faut brancher une résistance de fermeture de ligne, de la valeur de 120 Ω - 1/4 W comme d'après le schéma de la Figure 7

Caractéristiques techniques

Section du câble :	utiliser un câble retord et blindé à deux fils AWG20/22 avec une section, aux bornes de mm 2 : min. 0,2 - max. 2,5.
Conditions de fonctionnement :	-10 T60 °C ; 90 % HR
Conditions d'entreposage :	-20T70 °C ; 90 % HR
Degré de pollution :	normal.
Dimensions (mm) :	60x29x20, (60x29 : plaque à bornes, 20 : largeur composants hors tout).

Avertissements. Précautions pour manipuler la carte

Les inconvénients électriques qui se vérifient sur les composants électroniques arrivent presque tous à cause des décharges électrostatiques provoquées par l'opérateur. Il est donc nécessaire de prendre des mesures adéquates pour que ces catégories de composants, et notamment :

- avant de manipuler tout composant électronique ou carte, toucher une mise à terre (le fait même d'éviter de toucher un composant n''est pas suffisant car une décharge de 10000 V, tension très facile à atteindre avec l'électricité statique, provoque un arc d'environ 1 cm) ;
- Les matériaux doivent rester autant que possible dans leurs emballages d'origine. Si nécessaire, prélever la carte de son conditionnement et placer le produit dans un emballage antistatique sans toucher le verso de la carte avec les mains ;
- éviter absolument d'utiliser des sachets en plastique, polystyrène ou des éponges non antistatiques ;
- éviter absolument le passage direct entre opérateurs (pour éviter des phénomènes d'induction électrostatique et les décharges correspondantes).

Fig. 3

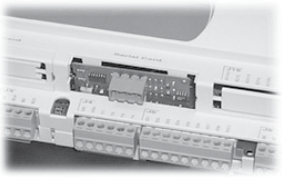


Fig. 4

Fig. 5

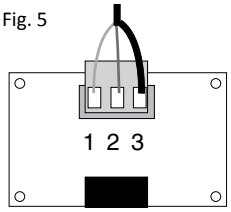
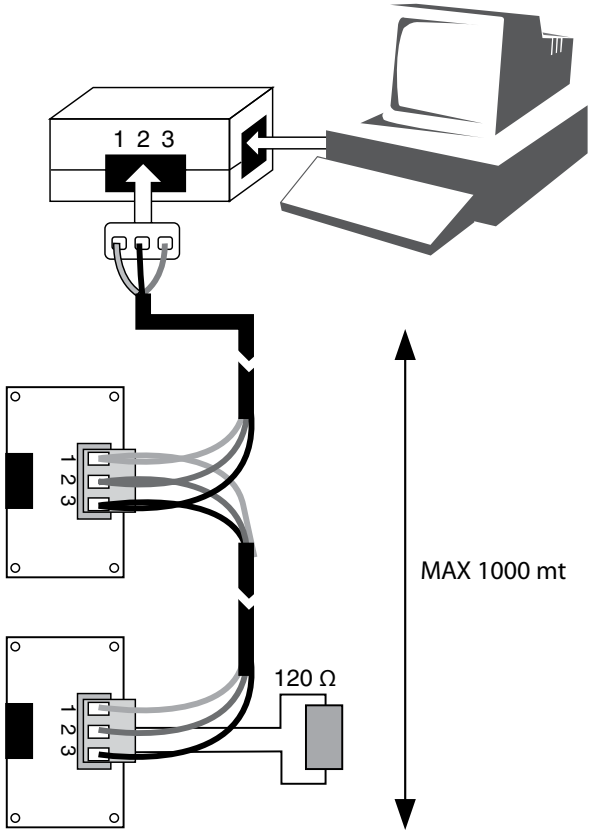


Fig. 6

Pin	Signification Meaning
1	GND
2	RX+/TX+
3	RX-/TX

Fig. 7



Guide de référence pour protocole modaer

Le protocole de communication Modaer représente le standard de communication réseau Aermec pour la connexion entre chillers et les systèmes de supervision ou contrôle centralisés (consulter le catalogue de produits Aermec pour savoir quels appareils acceptent ce protocole).

Le protocole permet la connexion point à point (appareil * superviseur) de plusieurs appareils (max. 255) sur un même bus de liaison vers un superviseur, car il prévoit la gestion d'une adresse pour chaque appareil.

Le mode de communication est de type master-slave, le système de supervision fonctionnant en master, l'appareil en slave.

Cela signifie que l'appareil répond seulement aux requêtes du superviseur.

Configuration série :

- 1200 to 19200 baud
- 1 bit de départ
- aucune parité
- 2 bit d'arrêt

Codification données :

Chaque mot de 8 bits (1 octet) contenu dans le message est constitué de deux caractères hex codifiés avec 4 bits chacun (0-9, A-F).

Format du message :

Les champs qui composent le message sont indiqués dans le Tableau 1.

Le message commence par un intervalle de silence d'au moins 3,5 caractères (indiqués dans le Tableau 1 comme temps de silence).

La durée de cet intervalle dépend du baud rate.

La première donnée transmise est l'adresse de la machine ; ensuite le type de demande (type de lecture ou d'écriture), les données relatives à la demande, le checksum et enfin un

intervalle de silence de la même longueur que celui initiale **.**

Tab.1

START	temps de silence
ADRESSE	1 byte
COMMANDE	1 byte
DONNEE	n x octet
CHECKSUM ...	2 byte
SHigh	temps de silence

Adresse :	est l'adresse de la machine et peut être comprise entre 1 et 255.
Commande	est l'opération que l'on veut exécuter, la liste est en “Tab. 2. page 2“
Checksun :	est un contrôle de sécurité pour vérifier la justesse de la donnée transmise et est calculé chaque fois que le message est transmis ; qui le reçoit doit le recalculer et le comparer avec celui reçu pour être sûr que les données reçues soient correctes.

Le checksum est calculé en considérant tous les champs sauf le champ checksum et en considérant seulement les 8 bits de données pour chaque octet (en excluant le bit de start et de shigh).

Le checksum est une donnée de 16 bits et est obtenu comme suit :

1. régler la donnée checksum à 16 bits avec tous 1 (0xffff in hex)
2. exécuter l’exor avec le octet du message successif (en partant du premier c'est-à-dire de l'adresse)
3. exécuter le shift d'un bit (vers le bit moins significatif) avec insertion d'un 0 sur le bit plus significatif
4. contrôle sur le bit le moins significatif extrait après le shift (bit di carry)
5. si le bit est 1 faire l’exor avec la donnée fixe hex 0xA001
6. répéter les opérations du point 3 jusqu'à effectuer 8 shift
7. répéter les opérations du point 2 pour chaque octet qui compose le message.

Typologie de commandes :

Tab.2

Commande	Opération Master
01	Lecture données numériques (données 1 bit)
05	Écriture données numériques (données 1 bit)
03	Lecture données numériques (données 16 bit)
06	Écriture données numériques (données 16 bit)

Format des commandes :

Commande 01 : Lectures Données Numériques

Avec cette commande l'on peut demander une ou plusieurs variables numériques à partir de l'adresse spécifiée. Les données en réponse sont regroupées en octet (8 données par octet).
Le premier octet reçu correspond aux 8 données avec l'adresse la plus basse, le bit le moins significatif de chaque octet correspond à la donnée avec l'adresse la plus basse.
EXEMPLE :

DEMANDE Champ		hex
Adresse machine		01
Commande		01
Adresse de départ (byte high)	00	
Adresse de départ (byte low)	00	
N° de données (partie high)	00	
N° de données (partie low)		0A
Checksum	...	
REPONSE Champ		hex
Adresse machine		01
Commande		01
Numéro de octet donnés en réponse		02
Données (0-7)		0E
Données (8-9)		03
Checksum	...	

Commande 05 : Écritures Numériques
Pour attribuer 1 à une adresse numérique il faut transmettre la donnée hex 0xFF00 ;
pour attribuer 0 il faut transmettre la donnée hex 0x0000.
Tout autre type de donnée est gérée comme erreur.
La réponse normale est un écho de la réponse si l'attribution de la donnée est allée à bonne fin.
EXEMPLE :

DEMANDE Champ		hex
Adresse machine		01
Commande		05
Adresse (byte high)	00	
Adresse (byte low)		00
Nouvelle donnée (partie high)	FF	
Nouvelle donnée (partie low)	00	
Checksum	...	
REPONSE Champ		hex
Adresse machine		01
Commande		05
Adresse (byte high)	00	
Adresse (byte low)		00
Nouvelle donnée (partie high)	FF	
Nouvelle donnée (partie low)	00	
Checksum	...	

Commande 03 : Lectures Données Analogiques

Avec cette commande l'on peut demander une ou plusieurs variables analogiques et entières à partir de l'adresse spécifiée. L'encodage adopté est binaire en complément à 2. Les variables analogiques sont représentées en dixièmes (par exemple la valeur 10,0 est transmise comme 0064h = 100d)., les entières sont transférées avec la valeur effective (par exemple 100 est transmis comme 0064h = 100d).
Les variables entières sont celles avec l'adresse supérieure à 128.
Le nombre de données demandées s'entend à partir de l'adresse
EXEMPLE :

DEMANDE Champ		(hex)
Adresse machine		01
Commande		03
Adresse de départ (byte high)	00	
Adresse de départ (byte low)	00	
N° de données demandées (partie high)	00	
N° de données demandées (partie low)	02	
Checksum	...	
REPONSE Champ		hex
Adresse machine		01
Commande		03
Numéro de octets donnés en réponse	04	
Octet high donné 0	0c	
octet low donné 0		03
Checksum	...	

Commande 06 : Écritures Données Analogiques

Avec cette commande l'on peut écrire une variable analogique ou entière. L'encodage adopté est binaire en complément à 2.
Les variables analogiques sont représentées en dixièmes (par exemple la valeur 10,0 est transmise comme 0064h = 100d)., les entières sont transférées avec la valeur effective (par exemple 100 est transmis comme 0064h = 100d).
Les variables entières sont celles avec l'adresse supérieure à 128.
La réponse normale est un écho de la réponse si l'attribution de la donnée est allée à bonne fin.
EXEMPLE :

DEMANDE Champ		(hex)
Adresse machine		01
Commande		06
Adresse (byte high)	00	
Adresse (byte low)		00
Nouvelle donnée (partie high)	1B	
Nouvelle donnée (partie low)	00	
Checksum	...	
REPONSE Champ		hex
Adresse machine		01
Commande		06
Adresse (byte high)	00	
Adresse (byte low)		00
Nouvelle donnée (partie high)	1B	
Nouvelle donnée (partie low)	00	
Checksum	...	

GESTION TEMPORISATION ET ERREURS DE COMMUNICATION
Ci-après sont analysés les cas possibles où la communication peut évoluer ainsi que le comportement prévu de master et de slave comme protocole.

1. Le slave reçoit la demande sans erreurs de communication : slave : répond comme prévu master : doit prévoir une temporisation sur la réponse du slave d'au moins 500mS pour donner au slave la possibilité d'élaborer les données.
2. Le slave ne reçoit pas la demande pour une erreur de communication slave : il ne donne aucune réponse master : il doit prévoir une temporisation sur la réponse.

1. Le slave reçoit la demande, mais il y a une erreur de communication (ex. checksum) slave : il ne donne aucune réponse master : il doit prévoir une temporisation sur la réponse
2. Le slave reçoit la demande sans erreurs de communication mais les données de réponse ne sont pas correctes (ex. commande non prévue, demande nombre de données excédante, adresses non prévues, valeur données en écriture hors gamme) slave : il répond normalement avec son adresse sur le premier champ, sur le champ commande il répond en ajoutant 0x80 au code de la commande et comme troisième octet il répond avec un code d'erreur qui identifie l'erreur. (voir exemple suivant)

Les codes d'erreur sont les suivants :

01	Commande non valide
02	Adresse donnée non valide
03	Valeur donnée (en mode écriture) hors gamme

EXEMPLE 1

Erreur de communication	DEMANDE
Champ	hex
Adresse machine	01
Commande	07 (commande non valide)
Adresse machine	00
Adresse (byte high)	00
Nouvelle donnée (partie high)	1B
Nouvelle donnée (partie low)	00
Checksum	...

EXEMPLE 2

Erreur de communication	RÉPONSE
Champ	hex
Adresse machine	01
Commande	87
Code erreur	01 (code d'erreur commande non valide)
Checksum	...

FAMILLE: RV - NW - NS - NSB - WS - WF
TABLEAUX ADRESSES
Ci-après sont indiquées les adresses prévues par le protocole et la signification correspondante du point de vue de l'appareil.
Les adresses non reportées sont réservées ou non utilisées ; par conséquent il n'est pas permis d'utiliser de commandes relatives à des adresses non indiquées car cela pourrait provoquer de mauvais fonctionnements ou des ruptures de la machine.

Les adresses identifiées par le symbole ✓sont à utiliser seulement avec la carte master.

CONFIGURATION SÉRIELLE DE LA CARTE PCO3 :

Pour configurer la communication sérielle de la carte PCO^3
avec le Baud rate, l'adresse de réseau et le type de protocole voulu sélectionner les masques suivants du menu utilisateur (touche Prog.) :

Address for supervisor	001
Baud rate9600	(RS485 only)
Protocol	Modbus

REMARQUES CONCERNANT LA LECTURE/ÉCRITURE DONNÉES TEMPORISATEUR ET HISTORIQUE DE SUPERVISEUR :
Temporisateur :

Pour régler du Superviseur les tranches suivantes:

Jour	MARDI		
Start Tranche 1	03:15	Shigh Tranche 1	12:30
Start Tranche 2	14:30		
Shigh Tranche 2	20:00		

Opérations à effectuer :

- régler sur '3' la variable analogique 166 (1=Dimanche ; 2=Lundi ; … 7=Samedi)
- Régler la valeur '3' à la variable analogique 158
- Régler la valeur '15' à la variable analogique 159
- Régler la valeur '12' à la variable analogique 160
- Régler la valeur '30' à la variable analogique 161
- Régler la valeur '14' à la variable analogique 162
- Régler la valeur '30' à la variable analogique 163
- Régler la valeur '10' à la variable analogique 164
- Régler la valeur '00' à la variable analogique 165
- régler la variable numérique 74 qui mémorise chaque réglage.

Vice-versa, si le réglage avait été :

Jour	MARDI'
Start Tranche 1	13:15
Shigh Tranche 1	12:30
Start Tranche 2	14:30
Shigh Tranche 2	20:00

Dans ce cas la variable numérique 75 ira à '1' même quand :
le SHigh Tranche 1 est INFÉRIEUR au START Tranche 1 ;
le SHigh Tranche 2 est INFÉRIEUR au START Tranche 2 ;
le SHigh Tranche 2 est INFÉRIEUR au START Tranche 1 ;

N.B.: Si l'on veut désactiver une ou plusieurs Tranches il suffit de régler le START et le SHigh tranche sur 00:00 - 00:00.

HISTORIQUE DES ALARMES :
Pour interroger l'historique du Superviseur.
Opérations à effectuer :

- Régler la variable numérique 79 afin de recevoir toutes les informations sur DATE, TEMP. IN, TEMP. OUT,..... concernant la dernière alarme enregistrée du PCO3 ;
- régler la variable numérique 78 pour demander des données relatives à l'évènement d'alarme précédent celui affiché
- régler la variable numérique 77 pour demander des données relatives à l'évènement d'alarme précédent celui affiché

Maintenant en lisant les variables analogiques 32, 33 et de 167 à 172 l'on obtient toutes les informations relatives à l'alarme sélectionné.

Pour réarmer l'Historique du Superviseur :

- régler la variable numérique 76

RÉGLAGE HEURE
Pour régler l'heure du Superviseur.
Opérations à effectuer :

- régler la nouvelle HEURE sur la variable analogique 149 ;
- régler les nouvelles MINUTES sur la variable analogique 151 ;
- régler le nouveau JOUR sur la variable analogique 153 (1=Dimanche ; 2=Lundi ; …7=Samedi) ;
- régler le nouveau MOIS sur la variable analogique 155 ;
- régler la nouvelle ANNÉE sur la variable analogique 157 (2 chiffres) ;
- régler la variable numérique 56 qui copie les variables à peine réglées.

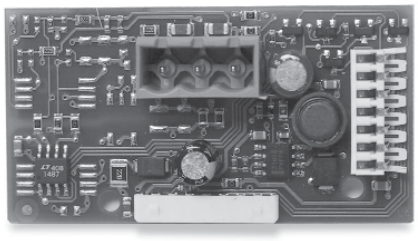


Abb. 1

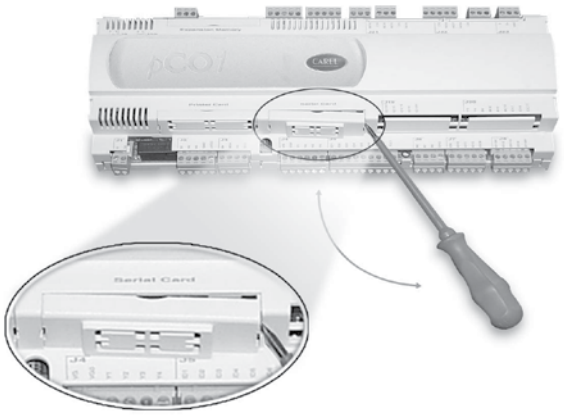
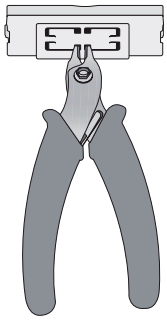
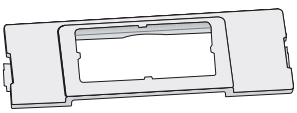


Abb. 2





DE

BESCHREIBUNG

Die Platine AER485P1 ist ein Zubehörteil und gehört zur Familie der PCO3 (ausgenommen PCO3B) Kontrollen, sie dient als direkte Schnittstellenverbindung zu einem RS485 Netz. Die Platine gewährleistet die Optoisolierung des Controllers hinsichtlich des seriellen Netzes RS485. Die maximale erzielbare Baudrate beträgt 19 200 baud (einstellbar über die Software).

MONTAGE

Unter Bezugnahme auf die Abb. 1...4, erfolgt der Anschluss an die Steuerkarte PCO3 wie folgt:

1. die Klappe "Serialcard" des elektronischen Controllers mit einem Schraubendreher abnehmen (siehe Abb. 1);
2. den perforierten Kunststoffteil der Klappe mit einer Trennschere entfernen, wodurch eine Öffnung übereinstimmend mit dem Ausgang des 3-fach Steckverbinders entsteht (siehe Abb. 2);
3. die als Zubehör erhältliche Platine in den dementsprechenden Kammverbinder stecken, darauf achten, dass sie gut steckt und an den beiden Kunststoffstützen am Behälter der Platine PCO3 gut aufsitzt (siehe Abb. 3);
4. die Klappe mithilfe eines Schraubendrehers wieder so schließen, dass der frei liegende Verbinder der seriellen Platine mit der Öffnung an der Klappe übereinstimmt (siehe Abb. 4).

Der Anschluss an das RS485-Netz erfolgt über den an der Platine vorhandenen Steckverbinder mit abnehmbaren Klemmen.
Die Bedeutungen der Stifte auf diesem Steckverbinder (Abb. 5) sind am Siebdruck auf der Platine erkennbar und werden in Abb. 6 aufgelistet.
Sollte die Platine die letzte Position in der seriellen Überwachungsleitung einnehmen, wird an die Endstücke der Stifte 2 und 3 ein Leitungsabschlusswiderstand mit einem Wert von 120 Ω - 1/4 W angeschlossen, wie im Plan aus Abb. 7 ersichtlich

Technische Eigenschaften

Kabelquerschnitt:	ein gedrehtes und geschirmtes 2-drahtiges Kabel AWG20/22 mit Querschnitten an den Klemmen zwischen min. 0,2 und max. 2,5 mm2 verwenden.
Betriebsbedingungen:	-10T60 °C; 90 % RF
Lagerungs-bedingungen:	-20T70 °C; 90 % RF
Verschmutzungsgrad:	normal.
Abmessungen (mm):	60x29x20, (60x29: Sockel, 20: größte Außenbreite der Bauteile).

Hinweise. Vorsicht bei der Handhabung der Platine

Die elektrischen Beschädigungen an den elektronischen Bauteilen erfolgen fast immer durch elektrostatische Entladungen, ausgelöst durch den Bediener. Bei diesen Kategorien von Bauteilen ist daher entsprechende Vorsicht geboten, insbesondere:

- bevor man einen elektronischen Bauteil oder die Platine angreift, muss Masse berührt werden (die Absicht einen elektronischen Bauteil nicht berühren zu wollen alleine reicht nicht aus, da eine Entladung von 10000 V, eine Spannung, die mit der statischen Elektrizität sehr leicht erreicht wird, bewirkt einen ca. 1 cm großen Spannungsbogen);
- die Materialien müssen so weit wie möglich in ihren Originalverpackungen verbleiben. Ggf. die Platine aus einer Verpackung nehmen und das Produkt in eine antistatische Verpackung geben, ohne die Rückseite der Platine mit den Händen zu berühren;
- die Verwendung von Plastiksäcken, Polystyrol oder nicht antistatischen Schwämmen ist strikt zu vermeiden;
- die direkte Übergabe der Platine zwischen Bedienern ist absolut zu vermeiden (zur Vermeidung von elektrostatischer Induktion und daraus resultierende Entladungen).

Abb. 3

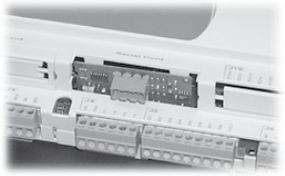


Abb. 4

Abb. 5

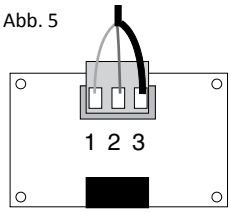
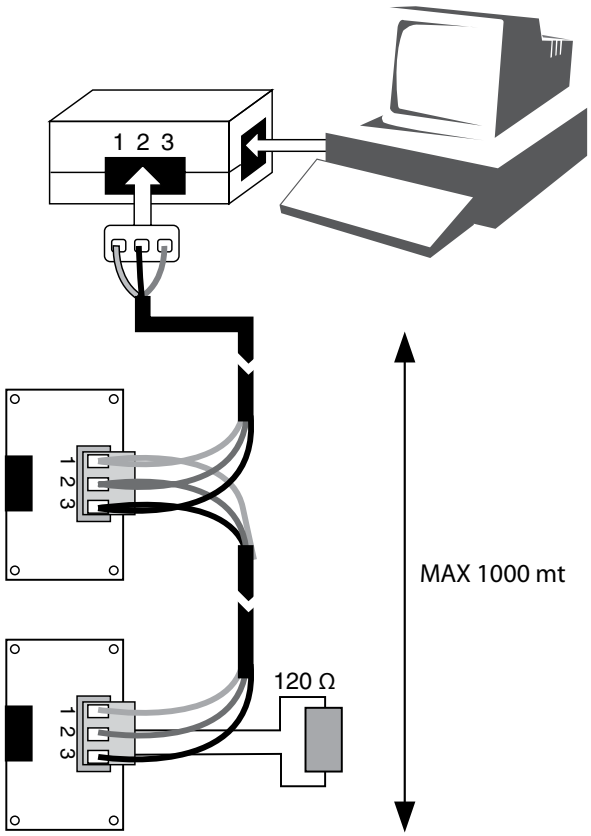


Abb. 6

Pin	Bedeutung Bedeutung
1	GND
2	RX+/TX+
3	RX-/TX

Abb. 7



Anleitung zum Modaer-Protokoll

Das Kommunikationsprotokoll Modaer ist die von Aermec bereitgestellte Standard-kommunikation für die Verbindung zwischen Kaltwassersätzen und zentralgesteuerten Überwachungs- oder Steuerungssystemen (zur Feststellung auf welchen Maschinen dieses Protokoll verfügbar ist, verweisen wir auf den Aermec-Produkt-Katalog).
Durch die Verwaltung von einer Adresse pro Maschine ermöglicht das Protokoll sowohl die Punkt-zu-Punkt Verbindung (Maschine * Überwachungssystem) als auch die Verbindung mehrerer Maschinen (max. 255) über denselben Verbindungsbus zu einem Überwachungssystem.
Der Kommunikationsmodus entspricht dem Typ Master-Slave, das Überwachungssystem ist also der Master, die Maschine ist der Slave.
Das bedeutet, dass die Maschine nur auf Anfragen des Überwachungssystems reagiert

Konfiguration der seriellen Schnittstelle:

- 1200 bis 19200 Baud
- 1 Start-Bit
- no parity
- 2 Shighp-Bit

Datencodierung:

Jedes in der Meldung enthaltene 8-Bit-Datenwort (1 Byte) besteht aus
2 kodierten Hex-Zeichen mit je 4 Bit (0-9, A-F).

Meldungsformat:

Die Felder, aus denen die Meldung besteht, sind in Tabelle 1 angeführt.
Die Meldung beginnt mit einer mindestens 3,5 Zeichen langen Ruhezeit (in der Tabelle 1 als Ruhezeit angegeben).
Die Dauer dieser Ruhezeit hängt von der Baudrate ab.
Als erstes wird die Maschinenadresse übertragen; danach der Anfragetyp (Lese- oder Schreibtyp), die die Anfrage betreffenden Daten, die Prüfsumme und schließlich eine Ruhezeit in derselben Länge wie am Anfang**.**

Tab.1

START	Ruhezeit
ADRESSE	1 Byte
BEFEHL	1 Byte
WERT	n x Byte
PRÜFSUMME	2 Byte
SHighP	Ruhezeit

Adresse:	Maschinenadresse, die zwischen 1 und 255 liegen kann.
Befehl :	Schritt, den man ausführen möchte, die Aufstellung finden Sie in "Tab.2. Seite 2 "
Prüfsumme :	Sicherheitskontrolle zur Überprüfung ob der Datenwert ordnungsgemäß übertragen wurde, sie wird jedes Mal vom Meldungssender neu kalkuliert; um sicherzustellen, dass die empfangenen Daten korrekt sind, muss der Empfänger den Datenwert nochmals berechnen und mit dem erhaltenen vergleichen.

Bei der Berechnung der Prüfsumme werden alle Felder berücksichtigt mit Ausnahme des Prüfsummenfelds und es werden nur die 8 Bit-Daten pro Byte berücksichtigt (Start- und Shighpbit werden nicht berücksichtigt).
Die Prüfsumme ist ein 16-Bit-Wert und wird wie folgt ermittelt:

1. den 16-Bit Prüfsummenwert ausschließlich mit 1 einstellen (0xffff in Hex)
2. Exor mit dem darauf folgenden Meldungsbyte ausführen (ausgehend vom ersten, also der Maschinenadresse)
3. Verschiebung eines Bits (zum niederwertigen Bit hin) mit der Eingabe einer 0 am höherwertigen Bit
4. Kontrolle am nach dem Shift erhaltenen niederwertigen Bit (Übertragungsbit)
5. Ist das Bit gleich 1, Exor mit dem festen Datenwert hex 0xA001 ausführen
6. Die Schritte ab Punkt 3 wiederholen, bis 8 Verschiebungen durchgeführt wurden
7. Für jedes Byte, aus dem die Meldung besteht, die Schritte ab Punkt 2 durchführen.

Typologie der Befehle:

Tab.2

Steuerung	Maßnahme Master
01	Read digitale Daten (1-Bit-Daten)
05	Write digitale Daten (1-Bit-Daten)
03	Read analoge Daten (16-Bit-Daten)
06	Write analoge Daten (16-Bit-Daten)

Befehlsformat :

Befehl 01: Read Digitale Daten

Beginnend mit der spezifischen Adresse können mit diesem Befehl können eine oder mehrere digitale Variablen angefragt werden.
Die Antwort-Daten werden in Bytes zusammengefasst (8 Daten pro Byte).
Das erste empfangene Byte entspricht den 8 Daten mit niedrigerer Adresse, das niederwertige Bit eines jeden Bytes entspricht dem Datenwert mit niedrigerer Adresse.

BEISPIEL:

ANFRAGE		
Feld		hex
Maschinenadresse	01	
Befehl		01
Start-Adresse (Byte high)		00
Start-Adresse (Byte low)		00
Datenanzahl (Bereich high)		00
Datenanzahl (Bereich low)		0A
Prüfsumme		...

ANTWORT		
Feld		hex
Maschinenadresse	01	
Befehl		01
Byteanzahl der Antwortdaten	02	
Daten (0-7)		0E
Daten (8-9)		03E
Prüfsumme		...

Befehl 05: Write Ditigale Daten

Um einer digitalen Adresse den Wert 1 zuzuteilen, muss der Hex -Datenwert 0xFF00 übertragen werden;
für die Zuteilung von 0 muss der Hex-Datenwert 0x0000 übertragen werden.
Andere Daten werden als Fehler verwaltet.
Ist die Datenzuteilung erfolgreich verlaufen, ist die normale Antwort ein Echo auf die Anfrage.

BEISPIEL:

ANFRAGE		
Feld		hex
Maschinenadresse	01	
Befehl		05
Adresse (byte high)	00	
Adresse (byte low)		00
Neuer Wert (Bereich high)		FF
Neuer Wert (Bereich low)		00
Prüfsumme		...

ANTWORT		
Feld		hex
Maschinenadresse	01	
Befehl		05
Adresse (byte high)	00	
Adresse (byte low)		00
Neuer Wert (Bereich high)		FF
Neuer Wert (Bereich low)		00
Prüfsumme		...

Befehl 03: Read Analoge Daten

Beginnend mit der spezifischen Adresse können mit diesem Befehl eine oder mehrere analoge und ganze Variablen angefragt werden. Es wird
die Binärcodierung in Ergänzung auf 2 angewendet. Die analogen Variablen werden in Zehntel dargestellt (z.B. wird der Wert 10,0 als 0064h = 100d
übertragen), die ganzen Variablen werden mit dem effektiven Wert
übertragen (z.B. 100 wird als 0064h = 100d übertragen.
Die Adresse für ganze Variablen ist höher als 128.
Die Anzahl angeforderter Daten wird ab der angegebenen Adresse berechnet

BEISPIEL:

ANFRAGE		
Feld		(hex)
Maschinenadresse	01	
Befehl		03
Start-Adresse (byte high)		00
Start-Adresse (byte low)		00
Anzahl angefragter Daten (Bereich high)	00	
Anzahl angefragter Daten (Bereich low)	02	
Checksum	...	

ANTWORT		
Feld		hex
Maschinenadresse	01	
Befehl		03
Byteanzahl der Antwortdaten	04	
Byte high Datenwert 0		0c
Byte low Datenwert 0	03	
Checksum	...	

Befehl 06: Write Analoge Daten

Mit diesem Befehl kann eine analoge oder eine ganze Variable geschrieben. Es wird die Binärcodierung in Ergänzung auf 2 angewendet.
Die analogen Variablen werden in Zehntel dargestellt (z.B. wird der Wert 10,0 als 0064h = 100d übertragen), die ganzen Variablen werden mit dem effektiven Wert übertragen (z.B. 100 wird als 0064h = 100d übertragen.
Die Adresse für ganze Variablen ist höher als 128.
Ist die Datenzuteilung erfolgreich verlaufen, ist die normale Antwort ein Echo auf die Anfrage.

BEISPIEL:

ANFRAGE		
Feld		(hex)
Maschinenadresse	01	
Befehl		06
Adresse (byte high)	00	
Adresse (byte low)		00
Neuer Wert (Bereich high)		1B
Neuer Wert (Bereich low)		00
Checksum	...	

ANTWORT		
Feld		hex
Maschinenadresse	01	
Befehl		06
Adresse (byte high)	00	
Adresse (byte low)		00
Neuer Wert (Bereich high)		1B
Neuer Wert (Bereich low)		00
Checksum	...	

TIMEOUT-VERWALTUNG UND KOMMUNIKATIONSFEHLER

Im Folgenden werden die verschiedenen Möglichkeiten des Kommunikationsverlaufes und die vorgesehenen Reaktionen von Master und Slave als Protokoll analysiert.

1. Der Slave empfängt die Anfrage ohne Kommunikationsfehler: Slave: antwortet wie vorgesehen Master : muss ein Timeout für die Antwort des Slave von min. 500 ms einberechnen, um dem Slave die Möglichkeit der Datenverarbeitung zu geben.
2. Wegen eines Kommunikationsfehlers empfängt der Slave die Anfrage nicht: er gibt keine Antwort Master : muss ein Timeout für die Antwort einberechnen

1. Der Slave empfängt die Anfrage, aber es liegt ein Kommunikationsfehler vor (z.B. Prüfsumme) Slave : gibt keine Antwort Master : muss ein Timeout für die Antwort einberechnen
2. Der Slave empfängt die Anfrage ohne Kommunikationsfehler, aber die Anfragedaten sind nicht korrekt (z.B. nicht vorgesehener Befehl, Anfrage der Datenanzahl zu hoch, Adressen nicht vorgesehen, Write-Datenwert außerhalb der Bandbreite) Slave : antwortet normal mit eigener Adresse auf dem ersten Feld, auf dem Befehlsfeld antwortet er durch Hinzufügen von 0x80 an den Befehlscode, und als drittes Byte antwortet er mit Fehlercode, der den aufgetretenen Fehler identifiziert. (siehe folgendes Beispiel)

Die Fehlercodes lauten :

01	Ungültiger Befehl
02	Ungültige Datenadresse
03	Datenwert (im Write-Modus) außerhalb der Bandbreite

BEISPIEL 1:

Kommunikationsfehler		ANFRAGE
Feld		hex
Maschinenadresse	01	
Befehl		07 (ungültiger Befehl)
Maschinenadresse	00	
Adresse (byte high)	00	
Neuer Wert (Bereich high)		1B
Neuer Wert (Bereich low)		00
Checksum	...	

BEISPIEL 2

Kommunikationsfehler		ANTWORT
Feld		hex
Maschinenadresse	01	
Befehl		87
Fehlercode		01 (Fehlercode ungültiger Befehl)
Checksum	...	

FAMILIEN: RV - NW - NS - NSB - WS - WF
ADRESSTABELLEN
Nachstehend werden die vom Protokoll vorgesehenen Adressen und ihre Bedeutung aus der Maschinensicht dargestellt.
Die nicht aufgeführten Adressen sind reserviert oder nicht verwendet; es ist daher unzulässig, Befehle von nicht aufgeführten Adressen zu verwenden. Dies könnte zu Fehlfunktionen oder zu schweren Defekten der Maschine führen.

Die Adressen, die mit dem Symbol ✓gekennzeichnet sind, dürfen nur mit der Masterplatine verwendet werden.

SERIELLE KONFIGURATION DER PC03-PLATINE:

Zur Konfiguration der PCO^3 Platine mit der Baud-Rate, der Netzadresse und dem gewünschten Protokolltyp sind aus dem Anwendermenü (Prog-Taste) folgende Masken auszuwählen:

Address for supervisor	001
Baud rate9600	(nur RS485)
Protocol	Modbus

HINWEISE ZUM LESEN/SCHREIBEN DER TIMER- UND ALARMÜBERSICHTSDATEN VOM ÜBERWACHUNGSSYSTEM AUS :
Zeitschalter :

Einstellung der nachfolgenden Zeitspannen aus dem Überwachungssystem:

Tag	DIENSTAG		
Beginn der Zeitspanne 1	03:15	Ende der Zeitspanne 1	12:30
Beginn der Zeitspanne 2	14:30		
Ende der Zeitspanne 2	20:00		

Auszuführende Schritte:

- die analoge Variable 166 auf '3' einstellen (1=Sonntag; 2=Montag; … 7=Samstag)
- die analoge Variable 158 auf '3' einstellen
- die analoge Variable 159 auf '15' einstellen
- die analoge Variable 160 auf '12' einstellen
- die analoge Variable 161 auf '30' einstellen
- die analoge Variable 162 auf '14' einstellen
- die analoge Variable 163 auf '30' einstellen
- die analoge Variable 164 auf '10' einstellen
- die analoge Variable 165 auf '00' einstellen
- die digitale Variable 74 einstellen, die die einzelnen Einstellungen speichert.

Umgekehrt, wenn die Einstellung wie folgt gelautet hätte:

Tag	DIENSTAG
Beginn der Zeitspanne 1	13:15
Ende der Zeitspanne 1	12:30
Beginn der Zeitspanne 2	14:30
Ende der Zeitspanne 2	20:00

würde in diesem Fall die digitale Variable 75 auf '1' eingestellt werden, auch wenn :
das ENDE der Zeitspanne 1 NIEDRIGER ist als der BEGINN der Zeitspanne 1;
das ENDE der Zeitspanne 2 NIEDRIGER ist als der BEGINN der Zeitspanne 2;
das ENDE der Zeitspanne 2 NIEDRIGER ist als der BEGINN der Zeitspanne 1.

Auch wenn während der Planung der Serie UR eine entsprechende Risikoanalyse durchgeführt wurde, vereinfacht die Anwendung der unten angeführten Bildzeichen das Lesen des Handbuchs, da die Aufmerksamkeit des Lesers unverzüglich auf die Gefahrensituationen gelenkt wird, die nicht verhindert bzw. auch durch Anwendung von technischen Maßnahmen und Schutzvorrichtungen nicht ausreichend beschränkt werden konnten. Sollen eine oder mehrere Zeitspannen deaktiviert werden, muss nur der BEGINN und das ENDE der Zeitspanne auf 00:00 - 00:00 eingestellt werden.

ALARMÜBERSICHT:
Für die Abfrage der Alarmübersicht aus dem berwachungssystem.
Auszuführende Schritte:

- Die digitale Variable 79 so einstellen, dass man alle Informationen zu DATUM, EINTRITTSTEMP., AUSTRITTSTEMP.... in Bezug auf den letzten von der PC03-Platine registrierten Alarm erhält;
- die digitale Variable 78 zur Abfrage von Daten zum Alarmereignis, das vor dem angezeigten stattgefunden hat, einstellen;
- die digitale Variable 77 zur Abfrage von Daten zum Alarmereignis, das nach dem angezeigten stattgefunden hat, einstellen.

Werden nun die analogen Variablen 32, 33 und 167 bis 172 gelesen, erhält man alle Informationen zum ausgewählten Alarm.

Zum Rückstellen der Alarmübersicht aus dem Überwachungssystem:

- die digitale Variable 76 einstellen.

EINSTELLUNG DER STUNDE
Einstellung der Stunde aus dem Überwachungssystem.
Auszuführende Schritte:

- die neue STUNDE in der analogen Variablen 149 eintragen;
- die neuen MINUTEN in der analoge Variablen 151 eintragen;
- den neuen TAG in der analogen Variablen 153 eintragen (1=Sonntag; 2=Montag; … 7=Samstag)
- das neue MONAT in der analogen Variablen 155 eintragen
- das neue JAHR in der analogen Variablen 157 eintragen (2 Ziffern);
- die digitale Variable 56 einstellen, die die soeben eingestellten Variablen kopiert.

ES

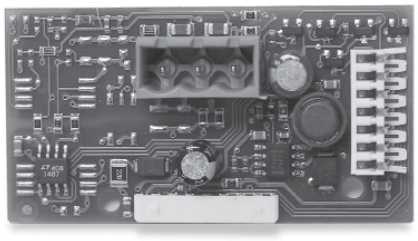


Fig. 1

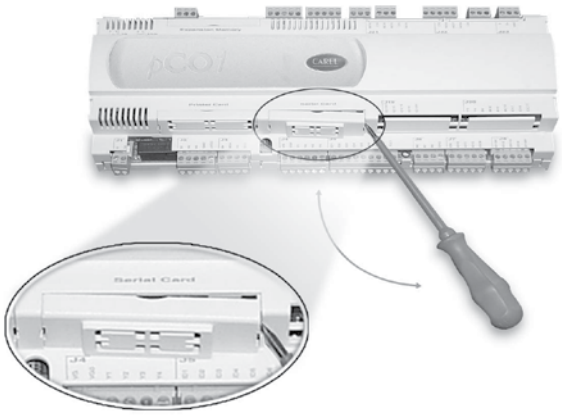
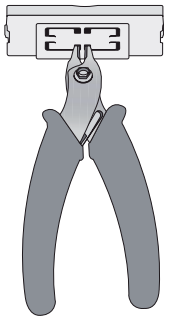
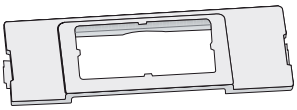


Fig. 2





DESCRIPCIÓN

La tarjeta AER485P1 es un accesorio de toda la familia de controles PCO3 (PCO3B excluidos) que permite la interfaz directa a una red RS485. La tarjeta garantiza el optoaislamiento del controlador con respecto a la red serial RS485. El baud rate máximo que se puede obtener es de 19.200 baudios (configurable vía software).

MONTAJE

En referencia a las Figs. 1 a 4, la conexión al PCO3 se obtiene siguiendo este procedimiento:

1. con un destornillador quitar la tapa “serial card” del controlador electrónico (véase la Fig. 1);
2. con unas tijeras de cortar metal, eliminar la parte de plástico precortada de la tapa, consiguiendo así el orificio correspondiente a la salida del conector de 3 vías (véase la Fig. 2);
3. introducir la tarjeta opcional en el conector de rastrillo correspondiente asegurándose de que la tarjeta haya sido introducida correctamente y bien encajada en las dos bases de plástico conectadas al contenedor del PCO3 (véase la Fig. 3);
4. cerrar la puerta con tornillos haciendo coincidir el conector expuesto de la tarjeta serial con el orificio realizado en la tapa (véase la Fig. 4).

La conexión a la red RS485 se obtiene mediante el conector de terminales extraíbles presente en la tarjeta.
Los significados de los pines en dicho conector (Fig. 5) se evidencian por la serigrafía de la tarjeta y enumerados en la fig. 6.
Si la tarjeta ocupa la última posición en la línea serial de supervisión, en los extremos de los pines 2 y 3 se conecta una resistencia de cierre de línea de valor 120 Ω - 1/4 W como se indica en el esquema de la Fig. 7

Características técnicas

Sección del cable:	usar cable trenzado y protegido de dos hilos AWG20/22 con secciones, en los terminales de mm2: mín. 0,2 - máx. 2,5.
Condiciones de funcionamiento:	-10T60 °C; 90 % HR.
Condiciones de almacenamiento:	-20T70 °C; 90 % HR.
Grado de contaminación:	normal.
Dimensiones (mm)	60x29x20, (60x29: barra, 20: ancho máximo de los componentes).

Advertencias. Precauciones al manejar la tarjeta

Los daños eléctricos que se comprueban en los componentes electrónicos se producen casi siempre a causa de descargas electrostáticas provocadas por el operador. Por lo tanto, se deben tomar las precauciones adecuadas para estas categorías de componentes y en particular:

- antes de manipular cualquier componente electrónico o tarjeta, tocar una puesta a tierra (el hecho de evitar tocar un componente no es suficiente, por cuanto una descarga de 10.000 V, tensión que se alcanza fácilmente con la electricidad estática, provoca un arco de aproximadamente 1 cm);
- los materiales deben permanecen dentro de sus envases originales mientras se pueda. Si es necesario, retirar la tarjeta del envase y transferirla en un embalaje antiestático sin tocar la parte trasera de la tarjeta con las manos;
- por todos los medios evitar usar bolsas de plástico, poliestireno o esponjas que no sean antiestáticas;
- por todos los medios evitar el paso directo entre operadores (para evitar fenómenos de inducción electrostática o descargas).

Fig. 3

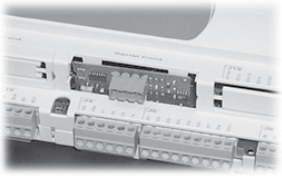


Fig. 4

Fig. 5

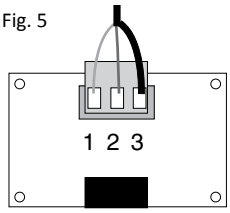
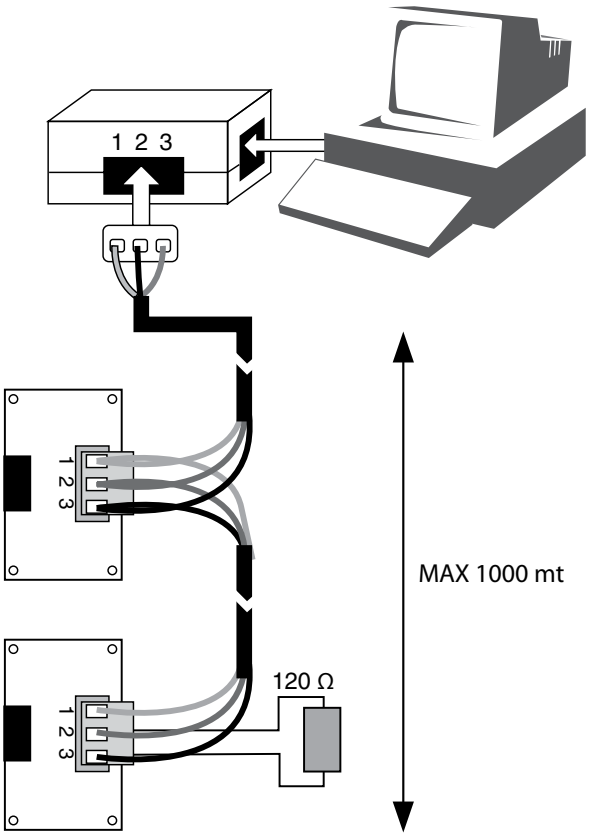


Fig. 6

Pin	Significado Meaning
1	GND
2	RX+/TX+
3	RX-/TX

Fig. 7



Guía de referencia para el protocolo modaer

El protocolo de comunicación Modaer representa el estándar de comunicación puesto a disposición por Aermec para la conexión entre refrigeradores y los sistemas de supervisión o controles centralizados (consultar la guía de productos Aermec para las máquinas en las cuales está disponibles este protocolo).

El protocolo permite la conexión tanto punto a punto (máquina * supervisor) como de varias máquinas (máx. 255) en un mismo bus de conexión hacia un supervisor, por cuanto prevé la gestión de una dirección para cada máquina.

La modalidad de comunicación es tipo master-slave, por lo tanto el sistema de supervisión es master mientras que la máquina es slave.

Esto significa que la máquina responde solamente a las consultas que hace el supervisor

Configuración serial:

- 1.200 a 19.200 baudios
- 1 bit de start
- sin paridad
- 2 bits de shigh

Codificación de datos:

Cada palabra de 8 bits (1 byte) contenida en el mensaje está constituida por dos caracteres hex codificados con 4 bits cada uno (0-9, A-F).

Formato del mensaje:

Los campos que componen el mensaje se indican en la Tabla 1.

El mensaje inicia con un intervalo de silencio de por lo menos 3,5 caracteres de longitud (indicados en la Tabla 1 como tiempo de silencio).

La duración de dicho intervalo depende del baud rate.

El primer dato que se transmite es la dirección de la máquina; sucesivamente el tipo de solicitud (tipo de lectura o de escritura), los datos referidos a la solicitud, el checksum y finalmente un intervalo de silencio de la misma longitud del inicial**.**

Tab.1

START	tiempo de silencio
DIRECCIÓN	1 byte
MANDO	1 byte
DATO	n x byte
CHECKSUM	2 bytes
SHigh	tiempo de silencio

Dirección:	es la dirección de la máquina y puede estar comprendida entre 1 y 255.
Mando:	es la operación que se quiere realizar, la lista está en “Tab. 2. Pág. 2 “
Checksum:	es un control de seguridad para verificar que el dato transmitido sea correcto, y se calcula cada vez que se está transmitiendo el mensaje; quien lo recibe lo debe recalcular y comparar con el recibido para tener la seguridad que los datos recibidos son correctos.

El checksum se calcula considerando todos los campos excepto el campo checksum y considerando sólo los 8 bits de datos para cada byte (excluyendo bit de start y de shigh).

El checksum es un dato de 16 bits y se obtiene del siguiente modo:

1. programar el dato checksum de 16 bits con todos 1 (0xffff en hex)
2. realizar el exor con el sucesivo byte del mensaje (partiendo del primero, es decir la dirección)
3. realizar el shift de un bit (hacia el bit menos significativo) introduciendo un 0 en el bit más significativo
4. control en el bit menos significativo que se extrae luego del shift (bit de carry)
5. si el bit es 1, realizar el exor con el dato fijo hex 0xA001
6. repetir las operaciones desde el punto 3 hasta efectuar 8 shifts
7. repetir las operaciones desde el punto 2 para cada byte que compone el mensaje.

Tipo de mandos:

Tab.2

Mando	Operación MASTER
01	Read datos digitales (datos 1 bit)
05	Write datos digitales (datos 1 bit)
03	Read datos analógicos (datos 16 bit)
06	Write datos analógicos (datos 16 bit)

Formato de los mandos:

Mando 01: Read Datos Digitales

Con este mando se pueden solicitar una o más variables digitales a partir de la dirección especificada. Los datos de respuesta se agrupan en byte (8 datos por cada byte).
El primer byte recibido corresponde a los 8 datos con dirección más baja, el bit menos significativo de cada byte corresponde al dato con dirección más baja.
EJEMPLO:

SOLICITUD		
Campo		hex
Dirección de la máquina		01
Mando		01
Dirección de partida (byte high)	00	
Dirección de partida (byte low)	00	
N° de datos (parte high)		00
N° de datos (parte low)		0A
Checksum	...	

RESPUESTA		
Campo		hex
Dirección de la máquina		01
Mando		01
Número de bytes dados en respuesta		02
Datos (0-7)	0E	
Datos (8-9)	03E	
Checksum	...	

Mando 05: Write Digitales
Para asignar 1 a una dirección digital se debe transmitir el dato hex 0xFF00; para asignar 0 se debe transmitir el dato hex 0x0000.
Cualquier otro tipo de dato se gestiona como un error.
La respuesta normal es un eco de la solicitud si la asignación del dato ha finalizado con éxito.
EJEMPLO:

SOLICITUD		
Campo		hex
Dirección de la máquina		01
Mando		05
Dirección (byte high)	00	
Dirección (byte low)	00	
Dato nuevo (parte high)		FF
Dato nuevo (parte low)		00
Checksum	...	

RESPUESTA		
Campo		hex
Dirección de la máquina		01
Mando		05
Dirección (byte high)	00	
Dirección (byte low)	00	
Dato nuevo (parte high)		FF
Dato nuevo (parte low)		00
Checksum	...	

Mando 03: Read Datos Analógicos

Con este mando se pueden solicitar una o más variables y enteras a partir de la dirección especificada. La codificación adoptada es binaria en complemento a 2. Las variables analógicas se representan en décimos (por ejemplo: el valor 10,0 se transmite como 0064h = 100d), las enteras se transfieren con el valor efectivo (por ejemplo: 100 se transmite como 0064h = 100d).
Las variables enteras son aquéllas con dirección mayor de 128.
El número de datos solicitados se entiende a partir de la dirección.
EJEMPLO:

SOLICITUD		
Campo		(hex)
Dirección de la máquina		01
Mando		03
Dirección de partida (byte high)	00	
Dirección de partida (byte low)	00	
N° de datos solicitados (parte high)		00
N° de datos solicitados (parte low)		02
Checksum	...	

RESPUESTA		
Campo		hex
Dirección de la máquina		01
Mando		03
Número de bytes dados en respuesta		04
Byte hight dato 0		0c
Byte low dato 0		03
Checksum	...	

Mando 06: Write Datos Analógicos

Con este mando se puede escribir una variable analógica o entera.
La codificación adoptada es binaria en complemento a 2.
Las variables analógicas se representan en décimos (por ejemplo: el valor 10,0 se transmite como 0064h = 100d), las enteras se transfieren con el valor efectivo (por ejemplo: 100 se transmite como 0064h = 100d).
Las variables enteras son aquéllas con dirección mayor de 128.
La respuesta normal es un eco de la solicitud si la asignación del dato ha finalizado con éxito.
EJEMPLO:

SOLICITUD		
Campo		(hex)
Dirección de la máquina		01
Mando		06
Dirección (byte high)	00	
Dirección (byte low)	00	
Dato nuevo (parte high)		1B
Dato nuevo (parte low)		00
Checksum	...	

RESPUESTA		
Campo		hex
Dirección de la máquina		01
Mando		06
Dirección (byte high)	00	
Dirección (byte low)	00	
Dato nuevo (parte high)		1B
Dato nuevo (parte low)		00
Checksum	...	

GESTIÓN DE TIMEOUT Y ERRORES DE COMUNICACIÓN
A continuación se analizan los posibles casos en los que puede producirse la comunicación y el comportamiento previsto por el master y por el slave como protocolo.

1. El slave recibe la solicitud sin errores de comunicación: slave: responde come lo ha programado el master : debe prever un timeout en la respuesta del slave de por lo menos 500 mS para darle la posibilidad de elaborar los datos.
2. El slave no recibe la solicitud por un error de comunicación del slave: no da ninguna respuesta al master: debe prever un timeout en la respuesta.

1. El slave recibe la solicitud, pero existe un error de comunicación (por ej.: checksum), el slave: no da ninguna respuesta al master: debe prever un timeout en la respuesta.
2. El slave recibe la solicitud sin errores de comunicación, pero los datos son incorrectos (por ej.: mando no previsto, solicitud de número de datos excedente, direcciones no previstas, valor dado en la escritura fuera de rango) el slave: responde normalmente con su dirección en el primer campo, en el campo mando responde agregando 0x80 al código del mando y como tercer byte responde con un código de error que identifica el error detectado. (véase el siguiente ejemplo).

Los códigos de error son los siguientes:

01	Mando no válido
02	Dirección dada no válida
03	Valor dado (en modo write) fuera de rango

EJEMPLO 1

Error de comunicación	SOLICITUD
Campo	hex
Dirección de la máquina	01
Mando	07 (mando no válido)
Dirección de la máquina	00
Dirección (byte high)	00
Dato nuevo (parte high)	1B
Dato nuevo (parte low)	00
Checksum	...

EJEMPLO 2

Error de comunicación	RESPUESTA
Campo	hex
Dirección de la máquina	01
Mando	87
Código de error	01 (código de error mando no válido)
Checksum	...

FAMILIAS: RV - NW - NS - NSB - WS - WF

TABLAS DE DIRECCIONES

A continuación se indican las direcciones previstas por el protocolo y el correspondiente significado desde el punto de vista de la máquina.
Las direcciones no detalladas son reservadas o no se utilizan; por lo tanto, no está permitido utilizar mandos referidos a direcciones no detalladas por cuanto esto podría provocar fallos o roturas de la máquina.

Las direcciones identificadas con el símbolo ✓sólo se deben utilizar con la tarjeta master.

CONFIGURACIÓN SERIAL DE LA TARJETA PCO3:

Para configurar la comunicación serial de la tarjeta PCO^3 con el Baud rate, la dirección de red y el tipo de protocolo deseado seleccionar las siguientes pantallas en el menú del usuario (tecla Prog.):

Address for supervisor	001
Baud rate9600	(RS485 only)
Protocol	Modbus

NOTAS REFERIDAS A LA LECTURA/ESCRITURA DE DATOS TIMER E HISTORIAL COMO SUPERVISOR:

Temporizador:

Para configurar como Supervisor las siguientes franjas:

Días	MARTES
Start Franja 1	03:15 Shigh Franja 1 12:30
Start Franja 2	14:30
Shigh Franja 2	20:00

Operaciones a realizar:

- configurar en '3' la variable analógica 166 (1=Domingo; 2=Lunes; …7=Sábado)
- configurar el valor '3' en la variable analógica 158
- configurar el valor '15' en la variable analógica 159
- configurar el valor '12' en la variable analógica 160
- configurar el valor '30' en la variable analógica 161
- configurar el valor '14' en la variable analógica 162
- configurar el valor '30' en la variable analógica 163
- configurar el valor '10' en la variable analógica 164
- configurar el valor '00' en la variable analógica 165
- programar la variable digital 74 que memoriza cada configuración.

Por el contrario, si la configuración hubiera sido:

Días	MARTES
Start Franja 1	13:15
Shigh Franja 1	12:30
Start Franja 2	14:30
Shigh Franja 2	20:00

En este caso la variable digital 75 se configurará en '1' aun cuando:
SHigh Franja 1 es MENOR que START Franja 1;
SHigh Franja 2 es MENOR que START Franja 2;
SHigh Franja 2 es MENOR que START Franja 1;

ATENCIÓN: Si se desea deshabilitar una o más Franjas basta configurar START y SHigh franja en 00:00 - 00:00.

HISTORIAL DE ALARMAS:

Para consultar el historial como Supervisor.
Operaciones a realizar:

- Programar la variable digital 79 para recibir las informaciones sobre FECHA, TEMP. IN, TEMP. OUT,... con respecto a la última alarma registrada por el PCO3;
- programar la variable digital 78 para solicitar datos referidos al evento de alarma anterior al visualizado;
- programar la variable digital 77 para solicitar datos referidos al evento de alarma siguiente al visualizado.

En este punto, leyendo las variables analógicas 32, 33 y de 167 a 172 se obtiene la información referida a la alarma seleccionada.

Para programar el Historial como Supervisor.

- programar la variable digital 76.

REGULACIÓN DE LA HORA

Para regular la hora como Supervisor.
Operaciones a realizar:

- configurar la HORA nueva en la variable analógica 149;
- configurar los MINUTOS nuevos en la variable analógica 151;
- configurar el DÍA nuevo en la variable analógica 153 (1=Domingo; 2=Lunes; …7=Sábado);
- configurar el MES nuevo en la variable analógica 155;
- configurar el AÑO nuevo en la variable analógica 157 (2 cifras);
- programar la variable digital 56 que copia las variables que se han configurado.

Tabella parametri supervisione: RV - NW - NS - NSB - WS - WF / Parameters table oversight: RV - NW - NS - NSB - WS - WF

DIGITAL READ	(code 01)				
BMS address	**Description**	**UOM**	**Min.**	**Max**	**Read/Write**
1	✓ Remote On/Off input status				r
2	✓ Remote Summer/Winter input status				r
3	✓ Double setpoint input status				r
4	Serious alarm input status				r
5	Evaporator flow switch input status				r
6	Evaporator pump alarm input status				r
7	Voltage monitor alarm input status				r
8	High pressure alarm input status				r
9	Low pressure alarm input status				r
10	Compressor thermal alarm input status				r
11	Fan thermal alarm input status				r
12	Oil differential alarm input status				r
13	Recovery flow switch alarm input status				r
14	ID14 digital input status NOT USED				r
15	ID15 digital input status NOT USED				r
16	Evaporator pump output status				r
17	Antifreeze heater output status				r
18	Liquid solenoid valve output status				r
19	Liquid injection valve output status				r
20	Alarms summary output status				r
21	Capacity control valve output status 1				r
22	Fan output status				r
23	Reverse cycle valve output status				r
24	Bypass solenoid valve output status				r
25	Recovery 3-way valve output status				r
26	VR recovery valve output status				r
27	VB recovery valve output status				r
28	✓ Unit On/Off from SPV				r
29	Reset alarm				r
48	Reset evaporator pump operating hours				r
49	Reset condenser pump operating hours				r
50	Reset compressor hours				r
52	Enable compressor n°1				
53	Enable compressor n°2				
54	Enable compressor n°3				
55	Enable compressor n°4				
73	Read the setting of the time slots after setting CHOICE_DAY				r
75	1 if there is an error after saving the settings for the time slots				r
81	Alarm summary, unit 1				r
82	✓ Select Sum/Win from SPV (if EN_SPV_SUM_WIN is enabled and EN_DIG_SUM_WIN disabled)				r
83	Serious alarm				r
84	Evaporator pump heating alarm				r
87	Pump maintenance alarm				r
88	Compressor maintenance alarm				r
89	Probe failure alarm B1				r
90	Probe failure alarm B2				r
91	Probe failure alarm B3				r
92	Probe failure alarm B4				r
93	Probe failure alarm B5				r
94	Probe failure alarm B6				r
95	Probe failure alarm B7				r
96	Probe failure alarm B8				r
97	Probe failure alarm B9				r
98	Probe failure alarm B10				r
99	Phase monitor alarm				r
100	Antifreeze alarm				r
101	Unit 1 not connected alarm				r
102	✓ Unit 2 not connected alarm				r
103	✓ Unit 3 not connected alarm				r
104	✓ Unit 4 not connected alarm				r
105	Compressor thermal alarm				r
106	Evaporator flow switch alarm				r
107	Oil pressure switch alarm				r
108	Oil press. diff. low alarm				r
109	High pressure switch alarm				r
110	Transducer high press. alarm				r
111	Low pressure switch alarm				r
112	Transducer low pressure alarm				r
113	Pressing temperature alarm				r
114	Fan thermal alarm				r
115	Fan thermal alarm 2				r
116	✓ Alarm summary, unit 2				r
117	✓ Alarm summary, unit 3				r
118	✓ Alarm summary, unit 4				r
119	✓ CP Master consent (triangular output)				r
120	✓ CP Slave 1 consent (triangular output)				r
121	✓ CP Slave 2 consent (triangular output)				r
122	✓ CP Slave 3 consent (triangular output)				r

DIGITAL WRITE (code 05)					
BMS address	**Description**	**UOM**	**Min.**	**Max.**	**Read/Write**
28	✓ Unit On/Off from supervisor (SPV)				r/w
29	Reset the alarm after acting on address 80				r/w
40	✓ Double setpoint enabling				r/w
56	Save the time by the SPV set with the var. LHOUR / LMINUTE / ….				r/w
73	✓ Read the setting of the time slots after setting CHOICE_DAY				r/w
74	✓ Confirm / Save the settings of the time slots after having set				r/w
77	View the next alarm in the Log				r/w
78	View the previous alarm in the Log				r/w
79	Display the previous alarm in the Log on Log				r/w
80	Reset Buzzer from SPV				r/w
82	✓ Select Summer/Winter				r/w
123	✓ Reset Slave 1				r/w
124	✓ Reset Slave 2				r/w
125	✓ Reset Slave 3				r/w
126	✓ Reset buzzer Slave 1				r/w
127	✓ Reset buzzer Slave 2				r/w
128	✓ Reset buzzer Slave 3				r/w

ANALOGUE READ (Code 03)					
BMS address	**Data description**	**UOM**	**Min.**	**Max**	**read/write**
5	✓ Temperature adjustment range				r
6	✓ Total recovery set				r
7	✓Total recovery differential				r
16	✓ Summer adjustment setpoint				r
17	✓ Winter adjustment setpoint				r
18	✓ Summer adjustment double external setpoint				r
19	✓ Winter adjustment double external setpoint				r
20	✓Setpoint used				r
21	High pressure				r
22	Low pressure				r
23	✓Water inlet temperature				r
24	Compressor delivery temperature				r
25	Water output temperature				r
26	Outside air temperature				r
27	Liquid temperature				r
29	Heat recovery unit inlet temperature				r
30	Heat recovery unit outlet temperature				r
31	Inverter output voltage				r
32	H2O In temperature on alarms log				r
33	H2O Out temperature on alarms log				r
34	High pressure on alarms log				r
35	Low pressure on alarms log				r
36	Discharge gas temperature on alarms log				r
37	Working set on alarms log				r
38	Working set range on alarms log				r
39	Antifreeze set on alarms log				r
140	Evaporator pump operating hours high				r
141	Evaporator pump operating hours low				r
142	Condenser pump operating hours high				r
143	Condenser pump operating hours low				r
144	Compressor operating hours high				r
145	Compressor operating hours low				r
148	Display current HOUR of the PCO^3				r
150	Display the current MINUTES of the PCO^3				r
152	Display the current DAY of the PCO^3 (1=Sunday; 2=Monday; … 7=Saturday)				r
154	Display the current MONTH of the PCO^3				r
156	Display the current YEAR of the PCO^3 (2 digits)				r
158	✓ START HOURS slot 1				r
159	✓ START MINUTES slot 1				r
160	✓ SHigh HOURS slot 1				r
161	✓ SHigh MINUTES slot 1				r
162	✓ START HOURS slot 2				r
163	✓ START MINUTES slot 2				r
164	✓ SHigh HOURS slot 2				r
165	✓ SHigh MINUTES slot 2				r
166	✓ Select DAY for display / change of the time slot				r
167	Sequence number that identifies an alarm (refer to the respective table)				r
168	HOUR of event on alarm log				r

169	MINUTES of event on alarm log				r
170	DAY of event on alarm log				r
171	MONTH of event on alarm log				r
172	YEAR of event on alarm log				r
174	✓ Working hours compressor 2 high				r
175	✓ Working hours compressor 2 low				r
176	✓ Working hours compressor 3 low				r
177	✓ Working hours compressor 3 low				r
178	✓ Working hours compressor 4 high				r
179	✓ Working hours compressor 4 low				r
203	VERSION				r

ANALOGUE WRITE (Code 06)					
Addres	**Data description**	**UOM**	**Min.**	**Max**	**read/write**
5	✓ Temperature adjustment range				r/w
6	✓ Total recovery set				r/w
7	✓ Total recovery differential				r/w
16	✓ Summer adjustment setpoint				r/w
17	✓ Winter adjustment setpoint				r/w
18	✓ Summer adjustment double external setpoint				r/w
19	✓ Winter adjustment double external setpoint				r/w
149	Set new HOUR (then confirm with SAVE_HOUR)				r/w
151	Set MINUTES (then confirm with SAVE_HOUR)				r/w
153	Set DAY (then confirm with SAVE_HOUR)				r/w
155	Set MONTH (then confirm with SAVE_HOUR)				r/w
157	Set MONTH (then confirm with SAVE_HOUR)				r/w
158	✓ START HOURS slot 1				r/w
159	✓ START MINUTES slot 1				r/w
160	✓ SHigh HOURS slot 1				r/w
161	✓ SHigh MINUTES slot 1				r/w
162	✓ SHigh MINUTES slot 1				r/w
163	✓ START MINUTES slot 2				r/w
164	✓ START MINUTES slot 2				r/w
165	✓ SHigh MINUTES slot 2				r/w
166	✓ Select the DAY to display/change the time slots				r/w

Tabella parametri supervisione modello TW110 / Parameters table oversight model TW110

DIGITAL READ (code 01)						
BMS Address	**Description**	**UOM**	**Digital/Analog**	**Min.**	**Max**	**Read/Write**
31	On/Standby	1=On	D			R/W
29/R 30/W	Cooling/Heating	1=heating	D			R/W
28	Summary Alarm	1= alarm	D			R
33	Reset Alarm	1=reset	D			W
23	Cooling setpoint		A			R/W
30	Heating setpoint		A			R/W
44	Outlet water temperature		A			R
	ALARMS					
104	Flowswitch		D			R
112	Condenser pump overload		D			R
113	Evaporator pump overload		D			R
103	Compressor overload		D			R
108/109	Low pressure	109 pressostat	D			R
106/107	High pressure	107 pressostat	D			R
102	Anti freeze		D			R
111	Fans overload		D			R
101	phase current		D			R
100	Automatic reset alarm		D			R
117	Probe 1 Alarm		D			R
118	Probe 2 Alarm		D			R
119	Probe 3 Alarm		D			R
120	Probe 4 Alarm		D			R
121	Probe 5 Alarm		D			R
122	Probe 6 Alarm		D			R
123	Probe 7 Alarm		D			R
124	Probe 8 Alarm		D			R
110	Discharge temperature		D			R
125	C pressure alarm		D			R
126	low pressure LOW		D			R
131	Inverter Temp	Turbocor alarm	D			R
132	Discharge temp	Turbocor alarm	D			R
133	Suction pressure	Turbocor alarm	D			R
134	Discharge pressure	Turbocor alarm	D			R
135	Phase current	Turbocor alarm	D			R
136	Cavity temp	Turbocor alarm	D			R
137	Leaving water	Turbocor alarm	D			R
138	Compressor ratio	Turbocor alarm	D			R
139	Bearing Motor	Turbocor alarm	D			R
140	SCR temp	Turbocor alarm	D			R
141	Locked	Turbocor alarm	D			R
142	Calibration	Turbocor alarm	D			R
143	Startup	Turbocor alarm	D			R
144	Axial disp.	Turbocor alarm	D			R
145	Axial load	Turbocor alarm	D			R
146	Fraddispx	Turbocor alarm	D			R
147	Fraddispy	Turbocor alarm	D			R
148	Fradloadx	Turbocor alarm	D			R
149	Fradloady	Turbocor alarm	D			R
150	Braddispx	Turbocor alarm	D			R
151	Braddispy	Turbocor alarm	D			R
152	BradLoadx		D			R

BMS Address	Description	UOM	Digital/Analog	Min.	Max	Read/Write
153	BradLoady		D			R
154	Overcurrent		D			R
155	Dchighvoltage		D			R
156	Highcurrent		D			R
157	CurrentWarning		D			R
158	IGBTerror		D			R
159	HighcurrentStartup		D			R
160	BearingError		D			R
161	BearingWarning		D			R
162	NoCurrIGBT		D			R
163	AVCData		D			R
164	EMFLow		D			R
165	Eprom		D			R
166	GeneratorMode		D			R
167	SCRPhase		D			R
95	WARNING DP		D			R
96	ALLARME COM TURBO		D			R
145	Condenser antifreeze		D			R
146	Condenser flowswitch		D			R
147	Battery EEV		D			R
148	Overload pump glicole free		D			R
149	Flowswitch glicole free		D			R
150	No probe		D			R
	Analog input					
43	ERWT (ev. ret. water. Temp)		A			R
44	ELWT (ev. leav. water temp)		A			R
54	TAE		A			R
51	TL C1		A			R
56	CRWT (con. ret. water. Temp)		A			R
55	CLWT (con. leav. water temp)		A			R
40	HP		A			R
41	LP		A			R
50	DGT (disch. Gas temp.)		A			R
42	SGT (Suct. Gas temp.)		A			R
47	Suction pressure		A			R
48	Discharge pressure		A			R
49	Suction temp		A			R
45	Subcooling		A			R
46	Superheating		A			R
	Varie					
149	AmpTrifase		I			R
150	RPM		I			R

Tabella parametri supervisione modello NXW / Model parameters table oversight NXW

Analog variables

ANALOGUE WRITE (Code 06)					
BMS Address	**Description**	**UOM**	**Min**	**Max**	**Read/Write**
1	SUW - Temp, evaporator outlet 1	°C	-3276,8	3276,7	R
2	SIW - Temp, evaporator inlet, 1	°C	-3276,8	3276,7	R
3	Outlet water condensator temp,	°C	-3276,8	3276,7	R
4	Inlet water condensator temp,	°C	-3276,8	3276,7	R
5	SUR1 - Temp, output recovery circ,1	°C	0	99,9	R
6	SIR - Temp, input recovery	°C	-99,9	99,9	R
7	TAP1 - high pressure circ,1	BarG	-3276,8	3276,7	R
8	TBP1 - low pressure circ,1	BarG	-3276,8	3276,7	R
9	TAP2 - high pressure circ,2	BarG	-3276,8	3276,7	R
10	TBP2 - low pressure circ,2	BarG	-3276,8	3276,7	R
11	TAE - Temp, outside air 1	°C	-3276,8	3276,7	R
18	Actual setpoint	°C	-999,9	999,9	R
19	multi-function input	---	-3276,8	3276,7	R
20	Outlet water temperature total recovery circuit 2 (DK units only)	°C	-99,9	99,9	R
21	Outlet water temperature total recovery policy (DK units only)	°C	-99,9	99,9	R
22	SUW2 - Evaporator water outlet probe 2 (DK units only)	°C	-99,9	99,9	R
23	SUCE - Common outlet evaporator probe (DK units only)	°C	-99,9	99,9	R
24	SUWH2 - Probe output capacitor 2 (DK units only)	°C	-99,9	99,9	R
25	SUCC - Probe common output capacitor (unit only DK)	°C	-99,9	99,9	R
197	Active differential system	°C	-99,9	99,9	R
199	Setpoint 1 total recovery	°C	-3276,8	3276,7	R/W
201	Differential total recovery	°C	-3276,8	3276,7	R/W
202	Differential summer planting	°C	0	3276,7	R/W
203	Differential winter planting	°C	0	3276,7	R/W
204	Set point 1, summer	°C	-999,9	999,9	R/W
205	Set point 2, summer	°C	-999,9	999,9	R/W
206	Setpoint 1, winter	°C	-999,9	999,9	R/W
207	Setpoint 2, winter	°C	-999,9	999,9	R/W
209	Chiller Mode State: Heat = 1 , Cool =2		-3276,8	3276,7	R NXW **Software version ≥ 2,2**
210	Chiller Mode Request: Heat = 1 , Cool =2		-3276,8	3276,7	R/W **Software version ≥ 2,2**
216	Counter high, evaporator pumps1	1000h	0	999	R
217	Counter low evaporator pumps 1	h	0	999	R
218	Counter low, pump capacitor 1	1000h	0	999	R
219	Counter high, pump capacitor 1	h	0	999	R
220	Counter high, comp, 1 circuit, 1	1000h	0	999	R
221	Counter low, comp, 1 circuit, 1	h	0	999	R
222	Counter high, comp, 2 circuit 1	1000h	0	999	R
223	Counter low, comp, 2 circuit 1	h	0	999	R
224	Hour counter high, compressor 3 circuit 1	1000h	0	999	R
225	Counter low, compressor 3 circuit 1	h	0	999	R
226	Counter high, pressure, 1 circuit, 2	1000h	0	999	R
227	Counter the low pressure 1, circuit 2	h	0	999	R
228	Hour counter high, 2 pressure, circuit 2	1000h	0	999	R
229	Counter the low pressure 2, circuit 2	h	0	999	R
230	Counter high, 3 pressure, circuit 2	1000h	0	999	R
231	Counter the low pressure 3, circuit 2	h	0	999	R
232	Thermostat %	%	0	1000	R
233	Modulating pump evaporator	0.01V	0	1000	R

234	Modulating pump condensator	0.01V	0	1000	R
235	Fan speed 1 (0,, 1000)	0.01V	0	1000	R
236	Fan speed 2 (0,, 1000)	0.01V	0	1000	R
237	Counter high, evaporator pump 2	1000h	0	999	R
238	Counter low evaporator pump 2	h	0	999	R
239	Counter low, pump capacitor 2	h	0	999	R
240	Counter high condenser pumps 2	1000h	0	999	R
241	Actual Power Capacity	%	0	1000	R **Software version ≥ 2,2**
414	Limit (0-100%) (must be disabled to enter multi-purpose input B8)	%	0	100	R/W
415	Demand (0-100%) (must be disabled to enter multi-purpose input B8) (must be enabled digital address 7)	%	0	100	R/W

DIGITAL READ **(code 01)**

BMS Address	Description	UOM	Min	Max	**Read/Write**
1	On / off control unit (120-sec delay)	---	0	1	R/W
2	Summer / Winter (0 = production, cold water)	---	0	1	R/W
3	Alarm reset (1 = reset)	---	0	1	R/W
4	Request power unit input, digital	---	0	1	R
5	Request cold / hot plant input, digital	---	0	1	R
6	State On / Off	---	0	1	R **Software version ≥ 2,2**
7	BMS enables thermostat	---	0	1	R/W **Software version ≥ 2,2**
30	Evaporator pump 1	---	0	1	R
31	Evaporator pump 2	---	0	1	R
32	Condenser Pump 1	---	0	1	R
33	Condenser Pump 2	---	0	1	R
36	CCP1 - Compressor 1 circuit 1	---	0	1	R
37	CCP1A - Compressor 2 circuit 1	---	0	1	R
39	CCP2 - Compressor 1 circuit 2	---	0	1	R
40	CCP2A - Compressor 1 circuit 2	---	0	1	R
42	CV - 1 fan	---	0	1	R
43	CV1 - fan 2	---	0	1	R
44	VIC- reversing valve, circuit 1	---	0	1	R
45	VIC- reversing valve, circuit 2	---	0	1	R
46	VS1 - 1 liquid solenoid valve, circuit 1	---	0	1	R
47	VS1 - 1 liquid solenoid valve, circuit 2	---	0	1	R
54	Total recovery bypass valve circuit 1	---	0	1	R
55	Total recovery bypass valve circuit 2	---	0	1	R
56	Spillage from recovery circuit 1	---	0	1	R
57	Spillage from capacitor circuit 1	---	0	1	R
58	Spillage from recovery circuit 2	---	0	1	R
59	Spillage from capacitor circuit 2	---	0	1	R
100	Summary alarm	---	0	1	R
101	ALP40 - Evaporator flow switch alarm pump 1	---	0	1	R
102	AL46 -Condenser flow switch alarm pump 1	---	0	1	R
103	ALP42 - Evaporator pump 1 thermal alarm	---	0	1	R
104	ALP43 - Evaporator pump 2 thermal alarm	---	0	1	R
105	AL63 - Heat pump condenser alarm 1	---	0	1	R
106	AL64 - Alarm heat pump condenser 2	---	0	1	R
109	ALC30 - Thermal alarm compressor 1 circuit 1	---	0	1	R
110	ALC30 - Compressor 2 thermal alarm circuit 1	---	0	1	R
111	ALC30 - Compressor 3 thermal alarm circuit 1	---	0	1	R
112	ALC30 - Compressor 1 thermal alarm circuit 2	---	0	1	R

113	ALC30 - Compressor 2 thermal alarm circuit 2	---	0	1	R
114	ALC30 - Compressor 3 thermal alarm circuit 2	---	0	1	R
115	AL65 - Fan 1 thermal alarm	---	0	1	R
116	AL66 - Allarme termico ventilatore 2	---	0	1	R
117	ALU50 - Fan 2 thermal alarm	---	0	1	R
118	not used		0	1	
119	ALB34 - Alarm low pressure circuit 1	---	0	1	R
120	ALB34 - Alarm low pressure circuit 2	---	0	1	R
121	ALB35 - Low pressure alarm circuit 1	---	0	1	R
122	ALB35 - Low pressure alarm circuit 2	---	0	1	R
123	AL75 - Severe low pressure alarm circuit 1	---	0	1	R
124	AL76 - Severe low pressure alarm circuit 2	---	0	1	R
125	ALB36 - High pressure alarm circuit 1	---	0	1	R
126	ALB36 - High pressure alarm circuit 2	---	0	1	R
127	ALB37 - High pressure alarm circuit 1	---	0	1	R
128	ALB37 - High pressure alarm circuit 2	---	0	1	R
129	ALR03 Phase monitor alarm	---	0	1	R
130	ALA15 - Alarm output Evaporator probe failure, 1	---	0	1	R
131	ALA13 - Evaporator inlet probe failure alarm, 1	---	0	1	R
132	ALA20 - Alarm output capacitor faulty probe 1		0	1	
133	ALA14 - Alarm input capacitor faulty probe 1		0	1	
134	AL91 - Alarm output faulty probe recovery 1	---	0	1	R
135	AL90 - Alarm Input faulty probe recovery 1	---	0	1	R
136	ALA05 - Alarm sensor fails high pressure circuit 1	---	0	1	R
137	ALA09 - Alarm sensor fails low pressure circuit 1	---	0	1	R
138	ALA06 - Allarm sensor fails high pressure circuit 2	---	0	1	R
139	ALA10 - Alarm sensor fails low pressure circuit 2	---	0	1	R
140	ALA25 - Outside temperature probe failure alarm	---	0	1	R
147	ALP41 - Evaporator flow switch alarm pump 2	---	0	1	R
148	ALP47 - Condenser flow switch alarm pump 2	---	0	1	R
149	Not used - Free	---	0	1	R
150	ALO04 Slave offline	---	0	1	R
151	ALA07 - High pressure circuit 3 probe broken or not connected (SLAVE)	---	0	1	R
152	ALA08 - High pressure circuit 4 probe broken or not connected (SLAVE)	---	0	1	R
153	ALA11 - Low pressure sensor circuit 3 broken or not connected (SLAVE)	---	0	1	R
154	ALA12 - wave low pressure circuit 4 broken or not connected (SLAVE)	---	0	1	R
155	ALA17 - Evaporator outlet water temperature sensor, 2 broken or not connected (SLAVE)	---	0	1	R
156	ALA18 - Evaporator outlet water temperature sensor, 3 broken or not connected (SLAVE)	---	0	1	R
157	ALA19 - Evaporator outlet water temperature sensor, 4 broken or not connected (SLAVE)	---	0	1	R
158	ALA21 - Condenser outlet water temperature sensor, 2 broken or not connected (SLAVE)	---	0	1	R
159	ALA22 - Condenser outlet water temperature sensor, 3 broken or not connected (SLAVE)	---	0	1	R
160	ALA23 - Condenser outlet water temperature sensor, 4 broken or not connected (SLAVE)	---	0	1	R
161	ALT26 - Maintenance fans required	---	0	1	R
162	ALT27 - Manutenzione ventilatori richiesta	---	0	1	R
163	ALT28 - Condenser pump maintenance required	---	0	1	R
164	ALT29 - Evaporator pump maintenance required	---	0	1	R
165	ALB48 -Antifreeze alarm circuit 1	---	0	1	R
166	ALB48 -Antifreeze alarm circuit 2	---	0	1	R
167	ALP67 - Evaporator flow switch alarm pump 1 (Slave)	---	0	1	R
168	ALP68 - Evaporator flow switch alarm pump 2 (SLAVE)	---	0	1	R

169	ALP71 - Condenser flow switch alarm pump 1 (SLAVE))	---	0	1	R
170	ALP72 - Condenser flow switch alarm pump 2 (SLAVE)	---	0	1	R
171	AL77 - Alarm Circuit Low BP 3 (SLAVE)	---	0	1	R
172	AL78 - Alarm Circuit Low BP 4 (SLAVE)	---	0	1	R
173	AL79 - Alarm heat pump evaporator 1 (SLAVE)	---	0	1	R
174	AL80 - Alarm heat pump evaporator 2 (SLAVE)	---	0	1	R
175	AL81 - Evaporator water outlet temperature sensor, faulty or not connected (SLAVE)	---	0	1	R
176	AL82 - Temperature sensor, evaporator outlet water town, Route or not connected (SLAVE)	---	0	1	R
177	AL83 - Temperature sensor, water common output capacitor, Route or not connected (SLAVE)	---	0	1	R
178	AL84 - Alarm condenser heat pump 1 (Slave)	---	0	1	R
179	AL85 - Evaporator pump 2 thermal alarm (SLAVE)	---	0	1	R
180	AL86 - Evaporator inlet water temperature sensor, broken or not connected (SLAVE)	---	0	1	R
181	AL87 - Condenser water inlet temperature sensor, broken or not connected (SLAVE)	---	0	1	R
182	AL88 - Condenser outlet water temperature sensor, broken or not connected (SLAVE)	---	0	1	R
183	AL89 - Total recovery pCOe Offline	---	0	1	R
184	AL93 - Total recovery pCOe - probe input channel 3 faulty or not connected	---	0	1	R
185	AL94 - Total recovery pCOe - Input channel 4 probe failed or not connected	---	0	1	R
186	AL95 - Total recovery pCOe Offline (SLAVE)	---	0	1	R
187	AL96 - pCOe Total recovery (SLAVE) - probe input channel 1 failed or not connected	---	0	1	R
188	AL97 - pCOe Total recovery (SLAVE) - Sensor Input Channel 2 fails or is not connected	---	0	1	R
189	AL98 - pCOe Total recovery (SLAVE) - Sensor Input Channel 3 fails or is not connected	---	0	1	R
190	AL99 - pCOe Total recovery (SLAVE) - Sensor Input Channel 4 fails or is not connected	---	0	1	R
191	AL101 - pCOe number 2 - Offline (DK units)	---	0	1	R
192	AL102 - pCOe number 2 - (DK units) probe input channel 1 failed or not connected	---	0	1	R
193	AL103 - pCOe number 2 - (DK units) probe input channel 2 failed or not connected	---	0	1	R
194	AL104 - pCOe number 2 - (DK units) probe input channel 3 failed or not connected	---	0	1	R
195	AL105 - pCOe number 2 - (DK units) probe input channel 4 faulty or not connected	---	0	1	R
196	ALB48 - Frost alarm circuit 3	---	0	1	R
197	ALB48 - Frost alarm circuit 4	---	0	1	R

Tabella parametri supervisione modello WRL / Model parameters table oversight WRL

ANALOG VARIABLES

Addresses dedicated to the interface with BMS systems (analog variable)					
BMS Address	Description	Udm	Min	Max	Read Write
1	B1 - SUWH - water outlet temperature geothermal	°C	-999.9	999.9	R
2	B2 - SIWH - return water temperature geothermal	°C	-999.9	999.9	R
3	B3 - SSAN - Temperature Hot Water	°C	-999.9	999.9	R
4	B8 - water outlet temperature zone 1	°C	-999.9	999.9	R
5	B4 - SIW - System return temperature	°C	-999.9	999.9	R
6	pCOe 10 - B1 - dry cooler water temperature	°C	-999.9	999.9	R
8	Delta temperature freecooling September	°C	0	99.9	R/W
10	Temperature control system	°C	-999.9	999.9	R
11	superheat EEV	K	-999.9	999.9	R
12	B7 - SUW-temperature water delivery	°C	-99.9	99.9	R
13	Active setpoint health	°C	-99.9	99.9	R
14	Differential Active Health	°C	-99.9	99.9	R
15	Measured temperature from room No. 1	°C	-999.9	999.9	R
16	Set Point plant cold	°C	0	999.9	R/W
17	Set point facility hot	°C	0	999.9	R/W
18	Eco system set point cold	°C	0	999.9	R/W
19	Eco heat set point facility	°C	0	999.9	R/W
20	Current setpoint Chiller	°C	-999.9	999.9	R
21	B11 - Condensing pressure	BAR	-999.9	999.9	R
22	B12 - Pressure Evaporation	BAR	-999.9	999.9	R
23	B4 - system return water temperature	°C	-999.9	999.9	R
24	B9 - gas compressor discharge temperature	°C	-999.0	999.0	R
25	B7 - System water outlet temperature	°C	-999.9	999.9	R
26	B6 - Outside air temperature	°C	-999.9	999.9	R
27	B10 - SAC evaporation temperature	°C	-999.9	999.9	R
29	Setpoint of the valve which regulates geothermal	---	-99.9	99.9	R
30	Minimum setpoint air in winter	°C	-999.9	999.9	R/W
31	Maximum setpoint air in summer	°C	-999.9	999.9	R/W
32	Alarm set point for minimum temperature zones. water	°C	-999.9	999.9	R/W
33	Zones for maximum temperature alarm set point. water	°C	-999.9	999.9	R/W
34	Setpoint temperature hysteresis freecooling	°C	0	9.9	R/W
35	B6 - SAE - outside air temperature	°C	-99.9	99.9	R
36	Maximum setpoint air in winter	°C	-999.9	999.9	R/W
37	Minimum setpoint in summer air	°C	-999.9	999.9	R/W
38	bandwidth of the valve which regulates geothermal	---	-99.9	99.9	R
39	value that adjusts the valve geothermal	---	-999.9	999.9	R
40	Set point health	°C	0	999.9	R/W
41	Active set point room 1	°C	0	999.9	R/W
42	Active set point room 2	°C	0	999.9	R/W
43	Active set point room 3	°C	0	999.9	R/W
44	Active set point room 4	°C	0	999.9	R/W
45	Active set point room 5	°C	0	999.9	R/W
46	Differential on Chiller setpoint	°C	-99.9	99.9	R
47	historic high-pressure	BAR	-999.9	999.9	R
48	Historical input temp. Geo	°C	-999.9	999.9	R

49	Historical time entry system	°C	-999.9	999.9	R
50	Historic low pressure	BAR	-999.9	999.9	R
51	STA - Humidity measured from room No. 1	%rH	0	99.9	R
52	STA-room air temperature No. 2	°C	-999.9	999.9	R
53	STA - Humidity measured from room No. 2	%rH	0	99.9	R
54	STA-room air temperature No. 3	°C	-999.9	999.9	R
55	STA - Humidity measured from room No. 3	%rH	0	99.9	R
56	STA-air temperature room No. 4	°C	-999.9	999.9	R
57	STA - Humidity measured from room No. 4	%rH	0	99.9	R
58	STA-air temperature room No. 5	°C	-999.9	999.9	R
59	STA - Humidity measured from room No. 5	%rH	0	99.9	R
60	Historical output temp. Geo	°C	-999.9	999.9	R
61	Historical temp health	°C	-999.9	999.9	R
62	Historical time out facility	°C	-999.9	999.9	R
81	Outlet water temperature zone 2 (pCOe1)	°C	-999.9	999.9	R
82	Water temperature discharge zone 3 (pCOe2)	°C	-999.9	999.9	R
88	Set point deumidica comfort zone in mode 1	%rH	0	100.0	R
91	Deumidica set point in the economy mode zone 1	%rH	0	100.0	R
92	Set point deumidica comfort zone in mode 2	%rH	0	100.0	R
93	Deumidica set point in Economy mode zone 2	%rH	0	100.0	R
94	Set point deumidica comfort zone in mode 3	%rH	0	100.0	R
95	Set point in Economy mode deumidica Zone 3	%rH	0	100.0	R
96	Humidifier set point	%rH	0	100.0	R
97	B11 - TAP - High pressure transducer	BAR	-99.9	99.9	R
98	B9 - SGP - Temp.uscita compressor	°C	-999.9	999.9	R
99	B12 - TBP - low pressure transducer	BAR	-999.9	999.9	R
111	Setpoint used by the master. sanitary	---	-32768	32767	R/W
112	Differential use by the master. sanitary	---	-99.9	99.9	R/W
113	Setpoint used by the master. plant	°C	-999.9	999.9	R/W
114	Differential use by the master. plant	---	-99.9	99.9	R/W
197	Active differential system	°C	0	99.9	R

INTEGER VARIABLES

BMS Address	Description	Udm	Min	Max	Read Write
1	Y4 - Analog output humidifier	---	0	9999	R
2	Y3 - Current valve position in zone 1	---	0	9999	R
3	Y1 - Current valve position DHW pump	---	0	9999	R
4	Y2 - Current geothermal pump valve position	---	0	9999	R
5	Number of areas managed by the machine	---	0	3	R/W
6	Number of devices in Zone 1	---	0	1	R/W
7	Pause time waiting for reversing valve health	---	0	999	R
8	Time estimates for low load	---	0	9999	R
9	Current minute	---	0	59	R
10	Current month	---	1	12	R
11	pCOe 11 - Y1 - Analog Zone 2 Valve 3-WAY	---	0	9999	R
12	pCOe 11 - Y1 - Analog Zone 3 Valve 3-WAY	---	0	9999	R
13	State Compr.2 (Off, On, Min.On; Min.Off, Manual, Alarm)	---	-1000	-1000	R
17	Total Number of Compressors	---	1	2	R/W
18	Number of devices in the zone 2	---	0	2	R/W

19	Mode of operation of the machine	---	0	99	R
20	Y1 - Forcing health modulated pump	V	0	1000	R/W
21	Y2 - forcing modulating pump geothermal	V	0	1000	R/W
22	Y3 - forcing modulating valve area 1	V	0	1000	R/W
23	Y4 - forcing modulating output Y4	---	0	1000	R/W
24	software version	---	-32768	32767	R
25	Selection type of geothermal pump adjustment	---	0	3	R/W
26	Day of week calculated from the current date (0 ---, 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday, 7: Sunday;)	---	1	7	R
27	State compr.1 (Off, On, Min.On; Min.Off, Manual, Alarm)	---	-1000	1000	R
28	EEV than more	---	0	999	R
29	Health operating mode	---	0	9	R
31	Mode of operation from room 2	---	0	9	R
32	Mode of operation from room 1	---	0	9	R
33	Mode of operation from room 3	---	0	9	R
34	Mode of operation from room 4	---	0	9	R
35	Mode of operation from room 5	---	0	9	R
36	request health	%	0	9999	R
37	Select On / Off (OFF, ON, "ECONOMY" AUTO;)	---	0	3	R/W
38	request facility	%	0	999	R
39	Boiler / heating, solar icons	---	0	9	R
40	Compressor icons (1 = 1 active comp, freecoling 2 =, 3 = 2 comp on)	---	0	9	R
41	Select type chiller (only cold, cold / hot, just warm)	---	0	2	R/W
42	Sanitary type (desuperheater, priority, priority valve, double pump)	---	0	4	R/W
43	Select integration with the system (NO; BOILER, HEATING AND.)	---	0	9	R/W
44	Select Integration with ACS (NO; BOILER, HEATING AND.)	---	0	9	R/W
45	historic hours	---	0	99	R
46	historic day	---	0	99	R
47	historical minutes	---	0	99	R
48	History Month	---	0	99	R
49	historical years	---	0	99	R
50	Historical alarm code	---	0	999	R
51	Historical-event number	---	0	999	R
52	New day	---	1	31	R/W
53	new month	---	1	12	R/W
54	New year	---	0	99	R/W
55	New hour	h	0	23	R/W
56	New minute	---	0	59	R/W
57	Select Summer Winter ("ONLY HEALTH", SUMMER, WINTER, By T. External)	---	0	3	R/W
58	Current year	---	0	99	R
59	Number of devices in Zone 3	---	0	2	R/W
71	Current Day	---	1	31	R
81	Current hour	h	0	23	R

DIGITAL VARIABLES

BMS Address	Description	Read Write
1	Economy mode activated	R
2	Clearing alarms from BMS	R/W
3	Enabling the presence BMS	R/W
4	Active system status	R/W
5	Active State Health	R
6	POC - Pump Geothermal	R
7	POE - pump system	R
8	Mode system (chiller-cooling / heat pump-Winter)	R
9	State health Valve	R/W
10	State resistance saniatrio	R
11	NO1 - Force ON compressor 1	R/W
12	NO2 - Come On Pump Geothermal	R/W
13	NO3 - Come On plant pump	R/W
14	No4 - Come On DHW pump	R/W
15	NO5 - Come On dehumidifier zone 1	R/W
16	No6 - On Force resistance system	R/W
17	NO7 - AE - General Alarm	R/W
18	No8 - Come On Resistance health	R/W
19	No9 - Force Compressor 2 ON	R/W
20	No10 - Force ON reversing valve VIC	R/W
21	No11-Force ON freecooling V3V	R/W
22	NO12 - Come On Pump Zone 1	R/W
23	Offline WRL 2 options	R
24	AL029 - DHW Alarm anitgelo	R
25	Antifreeze AL044-air room 5	R
26	AL043 4-Room Air Frost	R
27	AL084 - Alarm zone 2 heat pump	R
28	Force On / Off by BMS	R/W
29	Request from the room 1	R
30	AL085 - Alarm Heat Pump Zone 3	R
31	Selecting off on Room 1	R/W
32	AL021 - Alarm system flow	R
34	Selecting off on Room 2	R/W
35	Antifreeze AL042-air room 3	R
36	Selecting off on Room 3	R/W
37	Antifreeze AL041-air room 2	R
38	Selecting off on Room 4	R/W
39	Selecting off on Room 5	R/W
40	Offline WRL 3 options	R
41	Offline WRL 4 options	R
43	AL014 - High pressure alarm from probe	R
44	AL040-1 Antifreeze room air	R
46	AL015 - Low pressure alarm from probe	R
47	Enable Freecooling geothermal	R/W
48	Enable solar kit	R/W
51	AL096 - Alarm offline EEV driver	R
52	Type system integration (integration at PDC, replacing PdC)	R/W
53	AL099 - Low battery alarm EEV	R

54	AL101 - Alarm offline solar kit	R
57	AL013 - High pressure	R
61	AL016 - Alarm Compressor 1 thermal	R
62	AL017 - Alarm Compressor 2 thermal	R
63	Historical - Next item to view	R/W
64	Type of units selected (0 = ON, 1 = Anglo-Saxon)	R
65	AL033-Offline Terminal 2 bedroom zone 2	R
66	Type of intervention in the healthcare integration (integration at PdC, replacing PdC)	R/W
67	AL019 - Alarm geothermal flow	R
68	AL020 - Alarm heat pumps	R
69	AL022 - Alarm boiler / resistor. plant	R
70	AL023 - Alarm dehumidifier zone 1	R
71	ID1 - FLH - Geothermal flow was	R
72	ID2 - MTCP - state thermal compressor 1	R
73	ID3 - RAP - was high pressure switch	R
74	ID4 - COPD - heat pumps was	R
75	ID5 - ALDE0 - alarm status dehumidifier	R
76	ID6 - ALSAN - thermal resistance was health	R
77	ID7 - ACR-state resistance Alarm system	R
78	ID8 - Digital Input On / Off Remote	R
79	ID9 - MTCPA-state thermal compressor 2	R
80	ID10 - FL - flow system was	R
81	At least one active alarm	R
82	BMS forced summer / winter	R/W
83	AL035-room 3 Offline Terminal	R
84	AL036-terminal probe failed to room 4	R
85	AL037 4-room terminal Offline	R
86	AL038-terminal probe failed to room 5	R
87	AL039-5 bedroom terminal Offline	R
88	AL056 - Hours geothermal pump	R
89	AL057 - Hours system pump	R
90	AL058 - DHW pump hour meter	R
91	AL059 - Hours Pump Zone 1	R
92	AL060 - Hours Pump Zone 2	R
93	AL061 - Hours Pump Zone 3	R
94	AL064 - High water temperature alarm zone 1	R
95	AL065 - Low water temperature alarm zone 3	R
96	AL066 - High water temperature alarm zone 2	R
97	AL067 - Low water temperature alarm zone 2	R
98	AL068 - High water temperature alarm zona3	R
99	AL069 - Low water temperature alarm zone 3	R
100	AL024 - Alarm boiler / heating integr.sanitario	R
101	AL071 Alarm high humidity zone 1	R
102	AL026-severe low-pressure alarm sensor	R
103	AL073 Alarm high humidity zone 2	R
104	AL027 - Alarm anitgelo side geothermal	R
105	AL074 Alarm high humidity zone 3	R
106	AL076 - Alarm zone 2 pCOe Offline	R
107	AL077 - Alarm zone 3 pCOe Offline	R

108	AL078 - Alarm sondaguasta pCOe 1 Zone 2	R
109	AL079 - Alarm 1 sondaguasta pCOe Zone 3	R
110	AL080 - Alarm zone 1 Dehumidifier	R
111	AL081 - Zone 2 Alarm Dehumidifier	R
112	AL081 - Alarm zone 3 Dehumidifier	R
113	AL086 - Alarm temparetura high health	R
114	AL087 - High temperature solar panels	R
115	AL089 - Alarm probes EEV driver	R
116	AL090 - Alarm LowSH (low heat)	R
117	AL091 - Alarm LOP (low evaporation temperature)	R
118	AL092 - Alarm MOP (high evaporation temperature)	R
119	Compressor 1 On	R
120	On compressor 2	R
121	AL095 - Alarm error EEV engine	R
122	AL097 - Alarm Low suction temperature EEV	R
123	On-Off from digital input	R
124	AL028 - Alarm system side anitgelo	R
125	On the primary circuit pump	R
126	ON DHW pump	R
127	AL034-terminal probe failed to room 3	R
128	Request dehumidifier zone 1	R
129	On boiler / heating integ. plant	R
130	General alarm digital output	R
131	Domestic hot water resistance on accumulation	R
132	Digital output 4 way reverse cycle valve	R
133	Pump on zone 1	R
134	On free cooling valve	R
135	Enable electronic valve	R/W
136	The form used is the inner EVO EVD (0) or external (1)	R/W
137	Health care Selection On / Off	R/W
138	AL100 - Alarm system low yield (inverted or probes)	R
139	AL094 - Alarm Eeprom EEV	R
140	Historical - previous item to view	R/W
141	set date time	R/W
142	AL054 - Compressor Threshold counter 1	R
143	AL001 - Alarm faulty probe - geothermal discharge	R
144	AL002 - Alarm faulty probe - Return geothermal	R
145	AL003 - Alarm faulty probe - Temp.Sanitario	R
146	AL004 - Alarm faulty probe - temp. return system	R
147	AL005 - Alarm faulty probe - B5	R
148	AL006 - Alarm faulty probe - inlet air temperature outside	R
149	AL007 - Alarm faulty probe - Temp.Mandata facility	R
150	AL008 - probe failure alarm - zone 1 Temp.mix	R
151	AL009 - Alarm faulty probe - Temp.Gas pressing	R
152	AL010 - Alarm faulty probe - Temp.aspirazione	R
153	AL011 - Alarm faulty probe - Press.mandata	R
154	AL012 - Alarm faulty probe - Press.aspirazione	R
155	AL018 - External Alarm by ingr.digitale	R
156	Al025 - Offline Expansion pCOe SELECTABLE	R
157	AL045 - Alarm anti-Legionella cycle completed	R

158	AL055 - Compressor Threshold counter 2	R
159	AL030-1 probe failed to terminal room	R
160	AL031-1 Offline terminal room zone 1	R
161	AL032-faulty sensor to the terminal room 2	R
207	Cancellation alarm history	R/W

SUMMARY TABLE ALARMS

Code alarm	Description	Reset	Cause	Delay
AL001	Flow temperature sensor B1-side geo broken or disconnected		20s	
AL002	Return temperature sensor B2 geo hand broken or disconnected		20s	
AL003	Temperature probe B3 Accumulation health broken or disconnected		20s	
AL004	B4 probe temperature system return broken or disconnected		20s	
AL005	Auxiliary Temperature Probe B5 broken or disconnected		20s	
AL006	Outdoor Air Temperature Probe B6 broken or disconnected		20s	
AL007	B7 system water flow temperature sensor broken or disconnected		20s	
AL008	B8 probe temperature water delivery zone 1 broken or disconnected		20s	
AL009	Compressor outlet temperature sensor B9 TGP broken or disconnected		20s	
AL010	Intake temperature sensor B10 compress. broken or disconnected		20s	
AL011	Compressor discharge pressure sensor B11 broken or disconnected		20s	
AL012	B12 intake pressure sensor compress. broken or disconnected		20s	
AL013	Location: High pressure ID3		0s	
AL014	Location: B11 High pressure compressor / transducer from the		Imp.	
AL015	Position: B-12 Low-pressure compressor / transducer from the		Imp.	

AL016	Location: ID2 thermal compressor 1		0s	
AL017	Location: ID9 Thermal Compressor 2		0s	
AL018	Position: External Alarm pCOe ID1		0s	
AL019	Location: ID1-side flow geothermal well		Imp.	
AL020	Location: ID4 Heat pumps / RCS		0s	Heat pumps or research phase sequence
AL021	Location: ID10 water flow system side		Imp.	
AL022	Location: ID7 alarm boiler / res. integr. plant		0s	
AL023	Location: ID5 humidity alarm / digital input deumid		0s	alarm Dehumidifier
AL024	Position: Alarm ID6 thermal resistance accumulation ACS ingr. digital		0s	
AL025	Expansion pCOe offline option		0s	pCOe expansion (address 10)
AL026	Position: B-12 Low Pressure serious compressor / transducer from the		0s	exhaust system
AL027	Antifreeze geothermal heat exchanger		Imp.	
AL028	Antifreeze exchanger system		Imp.	
AL029	Frost build-up health		Imp.	
AL040	Room 1 air frost			
AL041	2 bedroom air frost			
AL042	3 bedroom air frost			
AL043	Antifreeze room air 4			
AL044	Antifreeze air room 5			
AL045	Procedure for legionella is not finished			
AL053	High compressor discharge temperature		Imp.	Gas flow temperature (B9)
AL054	Reached the threshold of hours worked incl. 1		0s	
AL055	Reached the threshold of hours worked incl. 2		0s	
AL056	Reached the threshold of hours worked geo pump		0s	
AL057	Reached the threshold of hours worked primary pump		0s	
AL058	Reached the threshold of hours worked DHW pump		0s	
AL059	Reached the threshold of hours worked pump mix zone 1		0s	
AL060	Reached the threshold of hours worked pump mix zone 2		0s	
AL061	Reached the threshold of hours worked pump mix zone 3		0s	
AL064	High water temperature discharge zone 1			
AL065	Low water temperature discharge zone 1			

AL066	High temperature water outlet zone 2			
AL067	Low water temperature discharge zone 2			
AL068	High temperature water outlet zone 3			
AL069	Low water temperature discharge zone 3			
AL070	Reached minimum humidity threshold zone 1			
AL071	Reached maximum humidity threshold zone 1			
AL072	Reached minimum humidity threshold zone 2			
AL073	Reached maximum humidity threshold zone 2			
AL074	Reached minimum humidity threshold zone 3			
AL075	Reached maximum humidity threshold zone 3			
AL076	Expansion pCOe dedicated to zone 2 offline			
AL077	Expansion pCOe dedicated to zone 3 offline			
AL078	Probe B1 expansion pCOe Water Temp Zone 2 broken or disconnected			
AL079	Probe B1 expansion pCOe Water Temp Zone 3 broken or disconnected			
AL080	Alarm dehumidifier 1		0s	
AL081	Alarm dehumidifier 2		0s	
AL082	Alarm dehumidifier 3		0s	
AL084	2 zone heat pump		0s	
AL085	3 zone heat pump		0s	
AL086	Threshold reached high DHW temperature			
AL087	Threshold reached maximum DHW temperature solar collectors			
AL088	Black out (indicates that there ‘was a power failure)			Alarm only visible in the historic
AL089	EEV driver probe S1: S2 probe:			EEV electronic valve
AL090	Driver EEV Low superheat (LowSH)			EEV electronic valve
AL091	Driver EEV Low evaporation temperature (LOP)			EEV electronic valve
AL092	Driver EEV High evaporation temperature (MOP)			EEV electronic valve
AL094	EEV driver EEPROM alarm			EEV electronic valve
AL095	Driver Error EEV engine valve			EEV electronic valve
AL096	Driver EEV Driver offline			EEV electronic valve
AL097	Driver EEV Low suction temperature			EEV electronic valve
AL098	EEV Driver Battery			EEV electronic valve

AL099	**Lack heat output on the system side (control probes) (check VIC)**			**off units**
AL100	**Lack geothermal heat output side (control probes) (check VIC)**			
AL101	**Offline solar module**			
AL102	**Rapid configuration unfinished Press PRG to start**			
AL103	**Alarm exchange pump with manifold**			
AL104	**Pump alarm exchange with domestic hot water storage**			
AL105	**Third alarm threshold exceeded safety manifold**			
AL106	**Broken or disconnected sensor alarm temp.collettore**			
AL107	**Tank sensor alarm system broken or disconnected**			
AL108	**Alert healthcare tank sensor broken or disconnected**			
AL109	**Room nß01 probe / and STA / H broken or disconnected**			
AL110	**Room Alarm nß01 STA / H unplugged**		**30s**	**1 room thermostat disconnected**
AL111	**Room nß02 probe / and STA / H broken or disconnected**			
AL112	**Room Alarm nß02 STA / H unplugged**		**30s**	**Room thermostat unplugged 2**
AL113	**Room nß03 probe / and STA / H broken or disconnected**			
AL114	**Room Alarm nß03 STA / H unplugged**		**30s**	**Room thermostat unplugged 3**
AL115	**Room nß04 probe / and STA / H broken or disconnected**			
AL116	**Room Alarm nß04 STA / H unplugged**		**30s**	**Room thermostat disconnected 4**
AL117	**Room nß05 probe / and STA / H broken or disconnected**			
AL118	**Room Alarm nß05 STA / H unplugged**		**30s**	**Room thermostat disconnected 5**

Tabella parametri supervisione SW multichiller 1.6 / Parameters table oversight multichiller SW 1.6

MULTICHILLER (ANALOG VARIABLE 129 = 0 = default value)						
BMS address	**Description**	**UOM**	**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
1	In (Common Inlet water temperature read by multichiller)				A	R
2	Out (Common Outlet water temperature read by multichiller)				A	R
3	Global Chiller Cooling Setpoint				A	R/W
4	Global Chiller Heating Setpoint				A	R/W
5	Global Actual Cooling Setpoint				A	R
6	Global Actual Heating Setpoint				A	R
7	Global Chiller 2° Cooling Setpoint				A	R/W
8	Global Chiller 2° Heating Setpoint				A	R/W
9	Delta temperature chiller full load				A	R/W
10	Delta setpoint in setpoint reset Off				A	R/W
11	Delta setpoint in setpoint reset On				A	R/W
12	Leaving water temp. start chiller (on cooling)				A	R/W
13	Return water temp. shigh chiller 2 (on cooling)				A	R/W
14	Return water temp. shigh chiller 3 (on cooling)				A	R/W
15	Return water temp. shigh chiller 4 (on cooling)				A	R/W
16	Return water temp. shigh chiller 5 (on cooling)				A	R/W
17	Return water temp. shigh chiller 6 (on cooling)				A	R/W
18	Return water temp. shigh chiller 7 (on cooling)				A	R/W
19	Return water temp. shigh chiller 8 (on cooling)				A	R/W
20	Return water temp. shigh chiller 9 (on cooling)				A	R/W
21	Leaving water temp. start chiller (on heating)				A	R/W
22	Return water temp. shigh chiller 2 (on heating)				A	R/W
23	Return water temp. shigh chiller 3 (on heating)				A	R/W
24	Return water temp. shigh chiller 4 (on heating)				A	R/W
25	Return water temp. shigh chiller 5 (on heating)				A	R/W
26	Return water temp. shigh chiller 6 (on heating)				A	R/W
27	Return water temp. shigh chiller 7 (on heating)				A	R/W
28	Return water temp. shigh chiller 8 (on heating)				A	R/W
29	Return water temp. shigh chiller 9 (on heating)				A	R/W
30	Setpoint compensation 1 On (On cooling)				A	R/W
31	Setpoint compensation 2 On (On cooling)				A	R/W
32	Setpoint compensation 3 On (On cooling)				A	R/W
33	Setpoint compensation 4 On (On cooling)				A	R/W
34	Setpoint compensation 5 On (On cooling)				A	R/W
35	Setpoint compensation 6 On (On cooling)				A	R/W
36	Setpoint compensation 7 On (On cooling)				A	R/W
37	Setpoint compensation 8 On (On cooling)				A	R/W
38	Setpoint compensation 1 On (On heating)				A	R/W
39	Setpoint compensation 2 On (On heating)				A	R/W
40	Setpoint compensation 3 On (On heating)				A	R/W
41	Setpoint compensation 4 On (On heating)				A	R/W
42	Setpoint compensation 5 On (On heating)				A	R/W
43	Setpoint compensation 6 On (On heating)				A	R/W
44	Setpoint compensation 7 On (On heating)				A	R/W
45	Setpoint compensation 8 On (On heating)				A	R/W
46	TUA2 Outlet water temperature sensor SUW2 read by multichiller				A	R
47	TUA3 Outlet water temperature sensor SUW3 read by multichiller				A	R
48	Actual Load % (based on Load regulation)				A	R

BMS address	Description	UOM	Min	Max	A=Analogic D= Digital	Read / Write
131	Delay filter for request demand condition				A	R/W
132	Delay between start next chiller				A	R/W
133	Delay between shigh next chiller				A	R/W
134	% Load Minimum				A	R/W
135	% Load Chiller to start next				A	R/W
136	% Load Chiller to shigh next				A	R/W
137	Delay for setpoint reset before Off				A	R/W
138	Delay for setpoint reset after Off				A	R/W
139	Delay for setpoint reset before On				A	R/W
140	Delay for setpoint reset after On				A	R/W
141	Standby chiller				A	R/W
142	Input Selection				A	R
143	Function Selection				A	R
144	Max number chiller demand				A	R
145	Max number chiller limit				A	R
146	Min number chiller limit				A	R
147	N° min chiller On (On cooling)				A	R/W
148	N° min chiller On (On heating)				A	R/W
149	State of Chiller1					
0=NONE; 1=ON; 2=OFF; 3=ALLARME						
4=HalfALARM_OFF; 5=NOT CONNECTED 6=HalfALARM_ON	A				R	
150	State of Chiller2				A	R
151	State of Chiller 3				A	R
152	State of Chiller 4				A	R
153	State of Chiller r5				A	R
154	State of Chiller 6				A	R
155	State of Chiller 7				A	R
156	State of Chiller 8				A	R
157	State of Chiller 9				A	R
158	Running % of total capacity Chiller 1				A	R
159	Running % of total capacity Chiller 2				A	R
160	Running % of total capacity Chiller 3				A	R
161	Running % of total capacity Chiller 4				A	R
162	Running % of total capacity Chiller 5				A	R
163	Running % of total capacity Chiller 6				A	R
164	Running % of total capacity Chiller 7				A	R
165	Running % of total capacity Chiller 8				A	R
166	Running % of total capacity Chiller 9				A	R
167	Running % of total capacity of all Chillers				A	R
1	Multichiller Enable				D	R/W
2	Global On/Off				D	R/W
3	Global Mode C/F				D	R/W
4	Chiller 1 On/Off				D	R/W
5	Chiller 2 On/Off				D	R/W
6	Chiller 3 On/Off				D	R/W
7	Chiller 4 On/Off				D	R/W
8	Chiller 5 On/Off				D	R/W
9	Chiller 6 On/Off				D	R/W
10	Chiller 7 On/Off				D	R/W
11	Chiller 8 On/Off				D	R/W

12	Chiller 9 On/Off				D	R/W
13	Reset Allarm Chiller 1				D	W
14	Reset Allarm Chiller 2				D	W
15	Reset Allarm Chiller 3				D	W
16	Reset Allarm Chiller 4				D	W
17	Reset Allarm Chiller 5				D	W
18	Reset Allarm Chiller 6				D	W
19	Reset Allarm Chiller 7				D	W
20	Reset Allarm Chiller 8				D	W
21	Reset Allarm Chiller 9				D	W
22	Selection Load or Temperature Regulation type				D	R/W
23	Chiller rotation Fixed 1 to 9 or By work hours				D	R/W
24	Enable expansion (PCO3E)				D	R
25	Enable Heat Pump Chiller				D	R
26	Enable double setpoint				D	R
27	Global Alarm Chiller 1				D	R
28	Global Alarm Chiller 2				D	R
29	Global Alarm Chiller 3				D	R
30	Global Alarm Chiller 4				D	R
31	Global Alarm Chiller 5				D	R
32	Global Alarm Chiller 6				D	R
33	Global Alarm Chiller 7				D	R
34	Global Alarm Chiller 8				D	R
35	Global Alarm Chiller 9				D	R
36	Global Alarm PCO3E				D	R
In the table below the simbol X in the right columns means if data are available in that chiller series						
CHILLER (ANALOG VARIABLE 129 = 1 to 9)						
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
1	TIA Evaporator inlet water temperature				A	R
2	TUA C1 Evaporator oulet water temperature Circuit 1				A	R
3	TUA C2 Evaporator oulet water temperature Circuit 2				A	R
4	TAE Ambient temperature				A	R
5	TL C1 Liquid temperaure circuit 1				A	R
6	TL C2 Liquid temperaure circuit 1				A	R
7	TIAH Condenser inlet water temperature				A	R
8	TUAH C1 Condenser outlet water temperature circuit 1				A	R
9	TUAH C2 Condenser outlet water temperature circuit 2				A	R
10	TIR Recovery exchanger inlet water				A	R
11	TUR 1 Recovery exchanger outlet water circuit 1				A	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
12	TUR 2 Recovery exchanger outlet water circuit 2				A	R
13	AP 1 High pressure circuit 1				A	R
14	AP 2 High pressure circuit 2				A	R
15	BP 1 Low pressure circuit 1				A	R
16	BP 2 Low pressure circuit 2				A	R
17	TEV1 Evaporator gas temperature circuit1				A	R
18	TEV2 Evaporator gas temperature circuit2				A	R
19	SAC Tank water temperature				A	R
20	SFC inlet Freecooling exchanger water temperature				A	R
21	Discharge temperature				A	R
22	Single chiller Cooling setpoint				A	R
23	Single chiller Heating setpoint				A	R
24	Chiller capacity (0-100%)				A	R
25	Pf_Master (0-100%)					

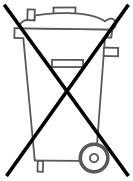
Only for NSB,WS	A				R	
26	Pf_Slave1 (0-100%)					
Only for NSB,WS	A				R	
27	Pf_Slave2 (0-100%)					
Only for NSB,WS	A				R	
28	Pf_Slave3 (0-100%)					
Only for NSB,WS	A				R	
29	Steps_active Master					
Only for RV NW	A				R	
30	Steps_active Slave 1					
Only for RV NW	A				R	
31	Steps_active Slave 2					
Only for RV NW	A				R	
32	Steps_active Slave 3					
Only for RV NW	A				R	
33	Suction temperature				A	R
34	TIA TW110 Not used				A	R
35	TUA TW110 Not used				A	R
36	BP turbo Low pressure circuit				A	R
37	AP turbo High pressure circuit				A	R
38	Suction temperature TW110				A	R
39	Subcooling				A	R
40	Superheating				A	R
41	Power Demand				A	R
42	Reg Demand (Regulation demand)				A	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
43	TurboAmp (Supply Current TW110)				A	R
44	Earthcurrent				A	R
45	Turbopower				A	R
46	IGVOpen				A	R
47	Cavitytemp				A	R
48	Invertertemp				A	R
49	SCRtemp				A	R
131	Work hour Compressor CP1					
(data low)	A				R	X
132	Work hour Compressor CP1 (data high)				A	R
133	Work hour Compressor CP2 (data low)				A	R
134	Work hour Compressor CP2 (data high)				A	R
135	Work hour Compressor CP1A (or CP3) (data low)				A	R
136	Work hour Compressor CP1A (or CP3) (data high)				A	R
137	Work hour Compressor CP2A (or CP4) (data low)				A	R
138	Work hour Compressor CP2A (or CP4) (data high)				A	R
139	Work hour Compressor CP1B				A	R
140	Work hour Compressor CP2B				A	R
141	Supply Voltage Vac 3ø				A	R
142	Supply Current A 3ø				A	R
143	Act RPM (Actual RPM)				A	R
144	Des RPM (Desired RPM)				A	R
145	Min RPM				A	R
146	Max RPM				A	R
147	Solenoid Status				A	R
1	On/Off				D	R
2	Cooling / Heating				D	R
3	RA1 (Summary alarm C1)				D	R
4	RA2 (Summary alarm C2)				D	R

5	RA3 (Summary alarm C3)				D	R
6	RA4 (Summary alarm C4)				D	R
7	CP1 (State Compressor 1)				D	R
8	CP2 (State Compressor 2)				D	R
9	CP1A (or CP3) (State Compressor 3)				D	R
10	CP2A (or CP4) (State Compressor 4)				D	R
11	CP1B (State Compressor 1B)				D	R
12	CP2B (State Compressor 2B)				D	R
13	Alarm Flowswitch				D	R
14	Alarm condensator pump				D	R
15	Alarm evaporator pump				D	R
16	Alarm low capacity				D	R
17	Alarm compressor 1				D	R
18	Alarm low pressure C1 (by pressure switch for screw comp.)				D	R
19	Alarm low pressure C1 (transducers for screw comp.)				D	R
20	Alarm high pressure C1 (by pressure switch for screw comp.)				D	R
21	Alarm high pressure C1 (transducers for screw comp.)				D	R
22	Alarm antifreeze C1				D	R
23	Alarm fan C1				D	R
24	Alarm oil pressure switch C1				D	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
25	Alarm sensor C1				D	R
26	Alarm compressor 2				D	R
27	Alarm low pressure C2				D	R
28	Alarm high pressure C2				D	R
29	Alarm antifreeze C2				D	R
30	Alarm fan C2				D	R
31	Alarm oil pressure switch C2				D	R
32	Alarm sensor C2				D	R
33	Alarm phase monitor				D	R
34	Alarm pumpdown C1				D	R
35	Alarm pumpdown C2				D	R
36	Alarm eeprom				D	R
37	Alarm clock calendar				D	R
38	Alarm compressor 1A				D	R
39	Alarm compressor A				D	R
40	Alarm evaporator pump 1				D	R
41	Alarm evaporator pump 2				D	R
41	Alarm evaporator pump 3				D	R
43	Alarm antifreeze gas evaporator C1				D	R
44	Alarm antifreeze gas evaporator C2				D	R
45	Alarm compressor 1B				D	R
46	Alarm compressor 2B				D	R
47	Alarm automatic reset				D	R
48	Alarm maintenance ev.pump				D	R
49	Alarm maintenance compressor				D	R
50	Allarme sensor B1				D	R
51	Allarme sensor B2				D	R
52	Allarme sensor B3				D	R
53	Allarme sensor B4				D	R
54	Allarme sensor B5				D	R
55	Allarme sensor B6				D	R
56	Allarme sensor B7				D	R
57	Allarme sensor B8				D	R

58	Allarme sensor B9				D	R
59	Allarme sensor B10				D	R
60	Alarm Unit 1 Not connected				D	R
61	Alarm Unit 2 Not connected				D	R
62	Alarm Unit 3 Not connected				D	R
63	Alarm Unit 4 Not connected				D	R
64	Alarm oil pressure				D	R
64	Alarm discharge temperature				D	R
66	Alarm Condenser pressure				D	R
67	Alarm lo pressure low				D	R
68	Alarm sensor B11				D	R
69	Alarm sensor B12				D	R
70	Alarm expansion board				D	R
71	Alarm antifreeze by digital input				D	R
72	Alarm increase relè				D	R
73	Alarm decrease relè				D	R
74	Alarm amperometric transformer				D	R
75	relè PARZ 1 (70%)				D	R
76	relè PARZ 2 (50%)				D	R
77	PARZ 3 (25%)				D	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
78	Alarm Inverter Temp (Allarme)				D	R
79	Alarm Discharge temp				D	R
80	Alarm Suction pressure				D	R
81	Alarm Discharge pressure				D	R
82	Alarm Phase current				D	R
83	Alarm Cavity temp				D	R
84	Alarm Leaving water				D	R
85	Alarm Compressor ratio				D	R
86	Alarm Bearing Motor				D	R
87	Alarm SCR temp				D	R
88	Alarm Locked				D	R
89	Alarm Calibration				D	R
90	Alarm Startup				D	R
91	Alarm Axial disp.				D	R
92	Alarm Axial load				D	R
93	Alarm Fraddispx				D	R
94	Alarm Fraddispy				D	R
95	Alarm Fradloadx				D	R
96	Alarm Fradloady				D	R
97	Alarm Braddispx				D	R
98	Alarm Braddispy				D	R
99	Alarm BradLoadx				D	R
100	Alarm BradLoady				D	R
101	Alarm Overcurrent				D	R
102	Alarm Dchighvoltage				D	R
103	Alarm Highcurrent				D	R
104	Alarm CurrentWarning				D	R
105	Alarm IGBTerror				D	R
106	Alarm HighcurrentStartup				D	R
107	Alarm BearingError				D	R
108	Alarm BearingWarning				D	R
109	Alarm NoCurrIGBT				D	R
110	Alarm AVCData				D	R
111	Alarm EMFLow				D	R
112	Alarm Eprom				D	R

113	Alarm GeneratorMode				D	R
114	Alarm SCRPhase				D	R
115	Alarm Inverter Temp (Prealarm)				D	R
116	Alarm Discharge temp				D	R
117	Alarm Suction pressure				D	R
118	Alarm Discharge pressure				D	R
119	Alarm Phase current				D	R
120	Alarm Cavity temp				D	R
121	Alarm Leaving water				D	R
122	Alarm Compressor ratio				D	R
123	Alarm Bearing Motor				D	R
124	Alarm SCR temp				D	R
125	Alarm Calibration				D	R
126	Alarm Startup				D	R
127	Alarm Axial disp.				D	R
128	Alarm Axial load				D	R
129	Alarm Fraddispx				D	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
130	Alarm Fraddispy				D	R
131	Alarm Fradloadx				D	R
132	Alarm Fradloady				D	R
133	Alarm Braddispx				D	R
134	Alarm Braddispy				D	R
135	Alarm BradLoadx				D	R
136	Alarm BradLoady				D	R
137	Alarm Overcurrent				D	R
138	Alarm Dchighvoltage				D	R
139	Alarm Highcurrent				D	R
140	Alarm CurrentWarning				D	R
141	Alarm IGBTerror				D	R
142	Alarm HighcurrentStartup				D	R
143	Alarm BearingError				D	R
144	Alarm BearingWarning				D	R
145	Alarm NoCurrIGBT				D	R
146	Alarm AVCData				D	R
147	Alarm EMFLow				D	R
148	Alarm Eprom				D	R
149	Alarm GeneratorMode				D	R
150	Alarm SCRPhase				D	R
151	Alarm WARNING DP				D	R
152	Alarm communication				D	R
153	state output evaporator pump				D	R
154	state output antifreeze rehearter				D	R
155	state output fan				D	R
156	state output solenoid valve				D	R
157	state output economizer				D	R
158	state output VSBS				D	R
159	state output Interlock				D	R
160	state output summary alarm				D	R
161	state output 4 way valve				D	R
162	state output C10				D	R
163	state output C11				D	R
164	state output C12				D	R
165	state output C13				D	R
166	state 3 way freecooling valve				D	R

113	Alarm GeneratorMode				D	R
114	Alarm SCRPhase				D	R
115	Alarm Inverter Temp (Prealarm)				D	R
116	Alarm Discharge temp				D	R
117	Alarm Suction pressure				D	R
118	Alarm Discharge pressure				D	R
119	Alarm Phase current				D	R
120	Alarm Cavity temp				D	R
121	Alarm Leaving water				D	R
122	Alarm Compressor ratio				D	R
123	Alarm Bearing Motor				D	R
124	Alarm SCR temp				D	R
125	Alarm Calibration				D	R
126	Alarm Startup				D	R
127	Alarm Axial disp.				D	R
128	Alarm Axial load				D	R
129	Alarm Fraddispx				D	R
BMS address	**Description**		**Min**	**Max**	**A=Analogic D= Digital**	**Read / Write**
130	Alarm Fraddispy				D	R
131	Alarm Fradloadx				D	R
132	Alarm Fradloady				D	R
133	Alarm Braddispx				D	R
134	Alarm Braddispy				D	R
135	Alarm BradLoadx				D	R
136	Alarm BradLoady				D	R
137	Alarm Overcurrent				D	R
138	Alarm Dchighvoltage				D	R
139	Alarm Highcurrent				D	R
140	Alarm CurrentWarning				D	R
141	Alarm IGBTerror				D	R
142	Alarm HighcurrentStartup				D	R
143	Alarm BearingError				D	R
144	Alarm BearingWarning				D	R
145	Alarm NoCurrIGBT				D	R
146	Alarm AVCData				D	R
147	Alarm EMFLow				D	R
148	Alarm Eprom				D	R
149	Alarm GeneratorMode				D	R
150	Alarm SCRPhase				D	R
151	Alarm WARNING DP				D	R
152	Alarm communication				D	R
153	state output evaporator pump				D	R
154	state output antifreeze rehearter				D	R
155	state output fan				D	R
156	state output solenoid valve				D	R
157	state output economizer				D	R
158	state output VSBS				D	R
159	state output Interlock				D	R
160	state output summary alarm				D	R
161	state output 4 way valve				D	R
162	state output C10				D	R
163	state output C11				D	R
164	state output C12				D	R
165	state output C13				D	R
166	state 3 way freecooling valve				D	R



Smaltimento del prodotto
L'apparecchiatura (o il prodotto) deve essere oggetto di raccolta separata in conformità alle vigenti normative locali in materia di smaltimento.
Product Disposal
The device (or product) must be disposed of separately in accordance with local regulations regarding disposal.
Élimination du produit
L'appareillage (ou le produit) doit faire l'objet d'une collecte séparée conformément aux réglementations locales en vigueur en matière d'élimination.
Entsorgung des Produkts
Das Gerät (oder das Produkt) muss entsprechend den lokalen Entsorgungsvorschriften getrennt entsorgt werden.
Eliminación del producto
El equipo (o el producto) debe ser objeto de recogida selectiva acorde a lo especificado por las normativas locales vigentes en materia de eliminación.

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