Installations- und Bedienungsanleitung

BACnet Gateway

in Verbindung mit SAT Ethernet (Art.Nr.: 0043.0398)

Geeignet für:
Reco-Boxx ZXR
Reco-Boxx ZX
Reco-Boxx ZXA
Reco-Boxx Flat (-H)
Reco-Boxx RX
Compact Recovery Boxx CRB

Installations- und Bedienungsanleitung

(Englisch / Deutsch)

1. Overview / Überblick

BACnet support for up to 4 units equipped with TAC5 control boards with SAT ETHERNET (Art.Nr. 0043.0398)
The **BACnet Standardized Device Profile (Annex L)** of the BACnet device is:
BACnet Application Specific Controller (B-ASC).
The supported Data Link Layer Options are BACnet / IP and MS/TP slave.

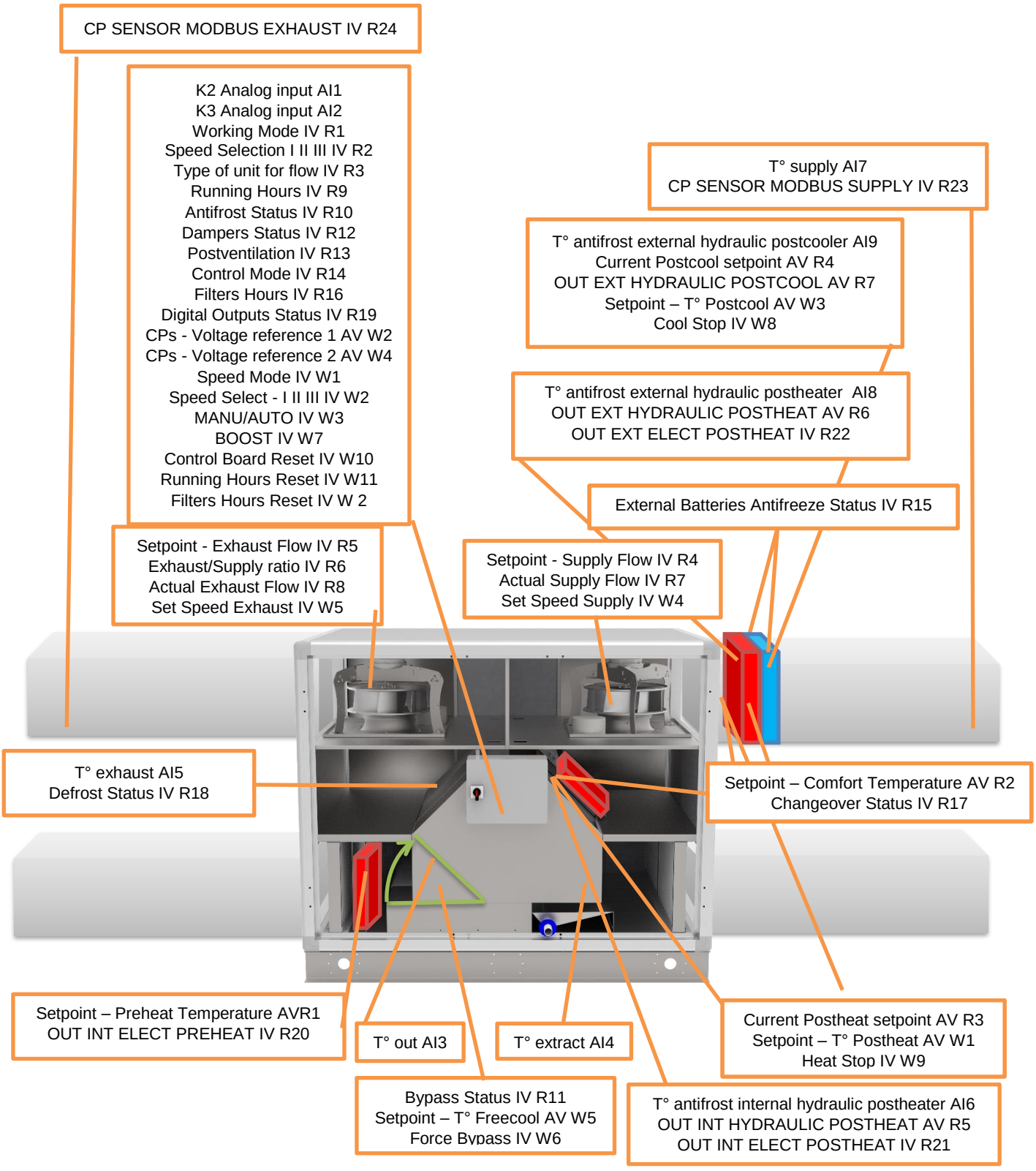
BACnet-Unterstützung für bis zu 4 Geräte, die mit TAC5-Steuerung und mit SAT ETHERNET ausgestattet sind (Art.Nr. 0043.0398).
Das BACnet-standardisierte Geräteprofil (Anhang L) des BACnet-Geräts lautet:
BACnet Application Specific Controller (B-ASC).
Die unterstützten Datenverbindungsschichtoptionen sind BACnet / IP- und MS / TP-Slave.

2. Standard objects supported / Unterstützte Standardobjekte

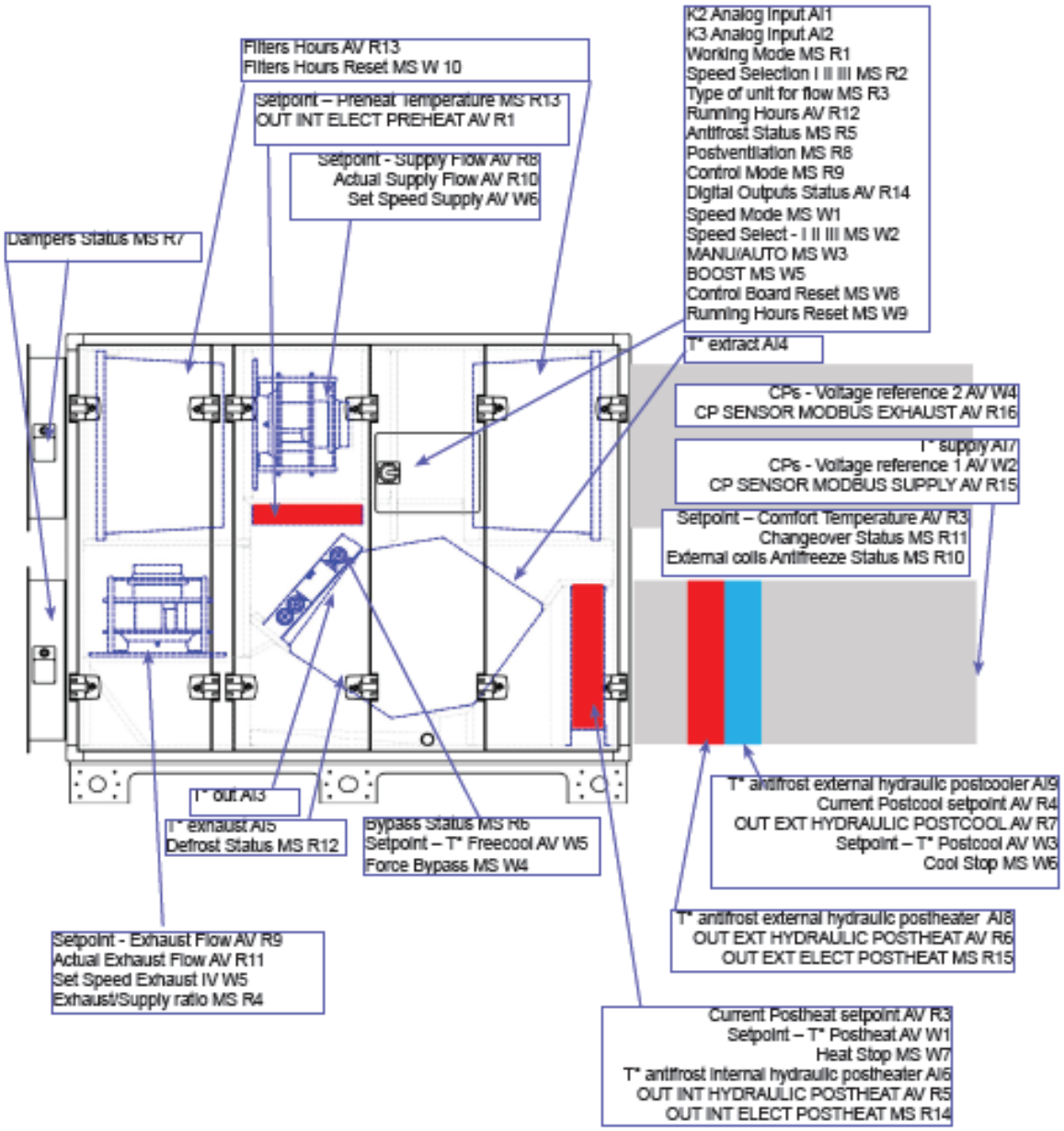
Object Type	_
Analog Input **Analoger Eingang**	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Description.
Analog Value **Analogwert**	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Description.
Integer Value Integer Wert	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Description.
Device **Gerät**	Object_Identifier, Object_Name, Object_Type, System_Status, Vendor_Name, Vendor_Identifier, Model_Name, Firmware_Revision, Application_Software_Version, Protocol_Version, Protocol_Revision, Protocol_Services_Supported, Protocol_Object_Types_Supported, Object_List, Max_APDU_Length_Accepted, Segmentation_Supported.

3. Objects Description / Objektbeschreibung

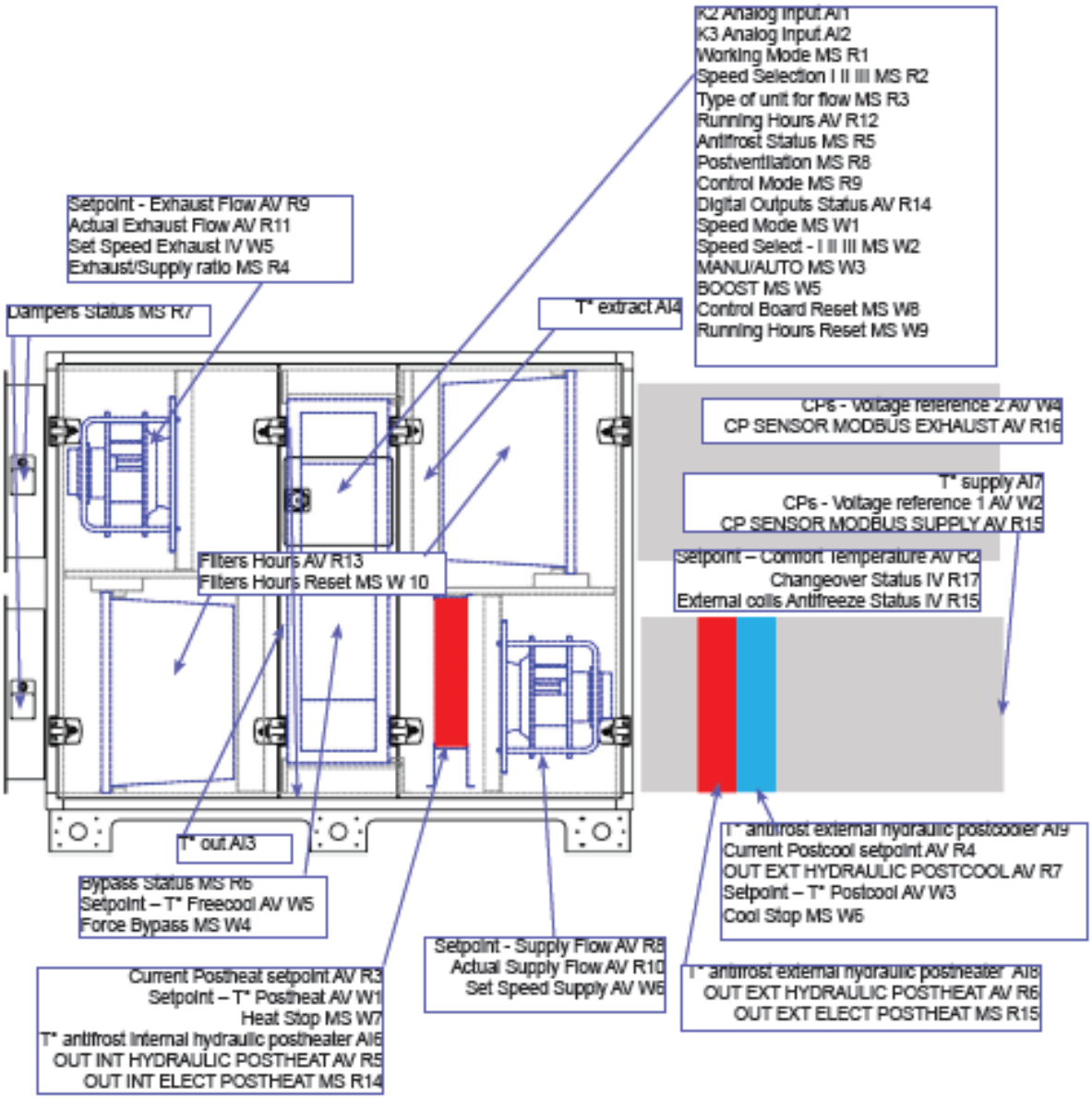
3.1 Overview / Überblick



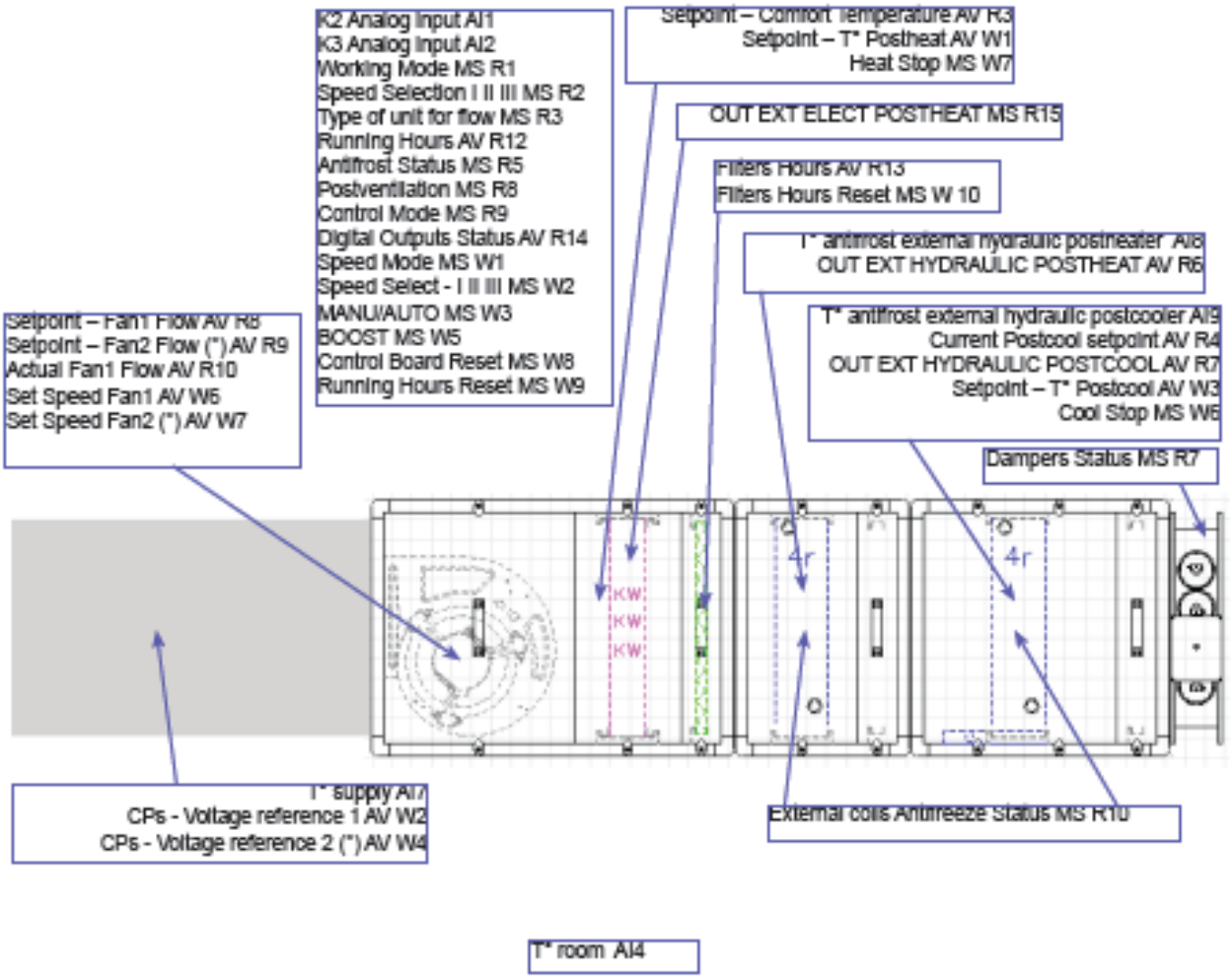
3.1.1 BACnet Object on Reco-Boxx ZXR / ZXA / Flat units with plate heat exchanger (PX) / BACnet-Objekt auf Reco-Boxx ZXR / ZXA / Flat-Geräten mit Plattenwärmetauscher (PX)



3.1.2 BACnet Object on Reco-Boxx RX units with rotor heat exchanger (RX) / BACnet-Objekt bei Reco-Boxx RX-Geräten mit Rotorwärmetauscher (RX)



3.1.3 BACnet Object on Uni-Box R-MaxControl units without heat exchanger (SD) / BACnet-Objekt an Uni-Box R-MaxControl-Geräten ohne Wärmetauscher (SD)



3.2 BACnet objects tables / BACnet-Objekttabellen

Here follows the description of the BACnet objects divided into tables with same data type.
At each object row description, a cross marked on PX, RX or SD indicates that the corresponding unit type does not use this specific object.
Hier folgt die Beschreibung der BACnet-Objekte, die in Tabellen mit demselben Datentyp unterteilt sind. Bei jeder Objektzeilenbeschreibung zeigt ein auf PX, RX oder SD markiertes Kreuz an, dass der entsprechende Gerätetyp dieses spezifische Objekt nicht verwendet.

3.2.1 Analogue Input (RO): AI

Object Instance	Object Name	Min/Max
1	K2 Analog input	0-10,0 [V]
PX | RX | SD	Analog input on K2 contact	
2	K3 Analog input	0-10,0 [V]
PX | RX | SD	Analog input on K3 contact	
3	T° out	-99,9-99,9 [°C]
PX | RX | SD	Outside temperature measured on T1 sensor (-999=open, +999=short circuit)	
4	T° extract/room	-99,9-99,9 [°C]
PX | RX | SD	Extract/room temperature measured on T2 sensor (-999=open, +999=short circuit)	
5	T° exhaust	-99,9-99,9 [°C]
PX |	Exhaust temperature measured on T3 sensor (-999=open, +999=short circuit)	
6	T° antifrost internal hydraulic postheater	-99,9-99,9 [°C]
PX | RX |	Temperature for the antifrost protection of the hydraulic postheater inside the unit measured on T4 sensor (-999=open, +999=short)	
7	T° supply	-99,9-99,9 [°C]
PX | RX | SD	Supply temperature measured on T5 sensor (-999=open, +999=short)	
8	T° antifrost external hydraulic postheater	-99,9-99,9 [°C]
PX | RX | SD	Temperature for the antifrost protection of the hydraulic postheater external to the unit measured on T7 sensor (-999=open, +999=short)	
9	T° antifrost external hydraulic postcooler	-99,9-99,9 [°C]
PX | RX | SD	Temperature for the antifrost protection of the hydraulic postcooler external to the unit measured on T8 sensor (-999=open, +999=short)	

3.2.2 Analogue Value (RO): AV R / Analogwert (RO): AV R

Object Instance	Object Name	Min/Max
1	Setpoint – Preheat Temperature	-9,9-9,9 [°C]
RX	Preheat T° setpoint	
2	Setpoint – Comfort Temperature	0,1-99,9 [°C]
RX | RX | SD	Current Comfort T° setpoint (KWout/NV/BA+/BA-) (0=OFF)	
3	Current Postheat setpoint	0,1-99,9 [°C]
RX | RX | SD	Current Postheat setpoint (KWout/NV/BA+/KWext) (0=OFF)	
4	Current Postcool setpoint	0,1-99,9 [°C]
RX | RX | SD	Current PostCooling setpoint (BA-) (0=OFF)	
5	OUT INT HYDRAULIC POSTHEAT	0-10,0 [V]
RX | RX	Output for the power control of the hydraulic postheater inside the unit	
6	OUT EXT HYDRAULIC POSTHEAT	0-10,0 [V]
RX | RX | SD	Output for the power control of the hydraulic postheater external to the unit	
7	OUT EXT HYDRAULIC POSTCOOL	0-10,0 [V]
RX | RX | SD	Output for the power control of the hydraulic postcooler external to the unit	
8	Setpoint - Supply Flow. *Note for SD units: the supply fan corresponds to fan1.*	0-99999
RX | RX | SD	Current setpoint for the supply fan (unit defined in object "Type of unit for flow"). *Note for SD units: the supply fan corresponds to fan1.*	
9	Setpoint - Exhaust Flow *Note for SD units: the exhaust fan corresponds to fan2, if present.*	0-99999
RX | RX | SD	Current setpoint for the exhaust fan (unit defined in object "Type of unit for flow"). *Note for SD units: the exhaust fan corresponds to fan2, if present.*	
10	Actual Supply Flow. *Note for SD units: the supply fan corresponds to fan 1.*	0-99999
RX | RX | SD	Actual Supply Flow (unit defined in object "Type of unit for flow"). *Note for SD units: the supply fan corresponds to fan1.*	
11	Actual Exhaust Flow. *Note for SD units: the exhaust fan corresponds to fan2, if present.*	0-99999
RX | RX | SD	Actual Exhaust Flow (unit defined in object "Type of unit for flow"). *Note for SD units: the exhaust fan corresponds to fan2, if present.*	
12	Running Hours	0-999999 [H]
RX | RX | SD	Run time, working hours	
13	Filters Hours	0-999999 [H]
RX | RX | SD	Filters alarm: hours count	

Object Instance	Object Name	Min/Max
14	Digital Outputs Status	0-65536
RX | RX | SD	Contains a bit for each of the digital outputs: bit0="AL1 (alarm)" bit6="OR1 SAT "pressure alarm"" bit7="OR2 SAT "fan on"" bit8="OR3 SAT "water pump internal water postheater" bit9="OR4 SAT "bypass on"" bit10="SATBA WP": water pump external water postheater/postcooler"	
15	CP SENSOR MODBUS SUPPLY	0-9999 [Pa]
RX | RX	Pressure measured by the Modbus sensor located on the supply duct	
16	CP SENSOR MODBUS EXHAUST	0-9999 [Pa]
RX | RX	Pressure measured by the Modbus sensor located on the exhaust duct	

3.2.3 Multi State (RO): MS R / Multi State (RO): MS R.

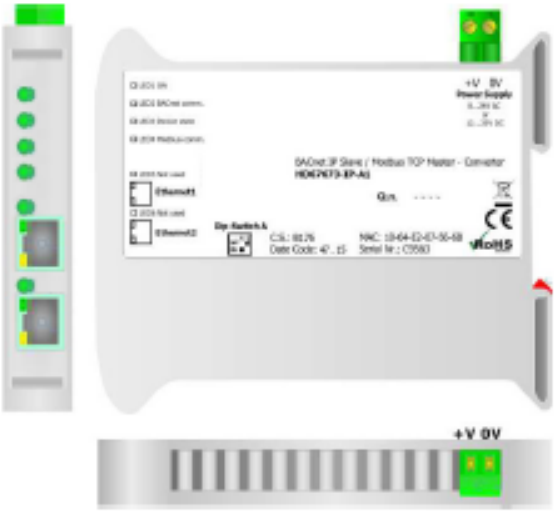
Object Instance	Object Name	Min/Max
1	Working Mode	0-9
PX | RX | SD	Current Working mode (0=OFF 1=CA 2=LS 3=CPf 4=CPs (5=CAs) 6=TQ 9=InitPa)	
2	Speed Selection I II III	0-3
PX | RX | SD	Current speed (0=STOP 1=LOW/I 2=MEDIUM/II 3=HIGH/III)	
3	Type of unit for flow	0-4
PX | RX | SD	Current main Setpoint unit (0= m3/h 1=Pa 2=0,1V 3=torque% 4=l/s)	
4	Exhaust/Supply ratio. *Note for SD units: the exhaust fan corresponds to fan1 and the exhaust fan corresponds to fan2, if present.*	5-127
PX | RX | SD	% (F3F4/F1F2) for PX, RX; %F2/F1 for SD.	
5	Antifrost Status	0-2
PX | RX | ~~SD~~	0=OFF 1=REC ON 2=NV ON	
6	Bypass Status	0-2
PX | RX | ~~SD~~	0=CLOSED/OFF 1=OPEN/ON 2=PARTIALLY OPEN	
7	Dampers Status	0-2
PX | RX | SD	0=CLOSED 1=OPENING/CLOSING 2=OPEN	
8	Postventilation	0-1
PX | RX | SD	Post ventilation status (0=NO 1=YES)	
9	Control Mode	0-10
PX | RX | SD	Control by (1=ERROR 2=FIREALARM 3=VIEWER 4=CBR 5=VIEWSCHED 6=MBSCHED 7=MB40201 8=BYPASS 9=BOOST 10=MB40204). Can be used to check whether the unit is in alarm (then value will be 1 or 2 if fire alarm).	
10	External Batteries Antifreeze Status	0-3
PX | RX | SD	BA+ BA- Antifreeze status (0=OFF, 1=BA+ ON or BA+/- ON, 2=BA- ON, 3=BA+ and BA- ON)	
11	Changeover Status	0-1
PX | RX | ~~SD~~	Automatic changeover between heating and cooling (0=inactive, 1=heating, 2=cooling)	
12	Defrost Status	0-2
PX | RX | ~~SD~~	0=IDLE, 1=ACTIVE, 2=STOP to drain water	
13	OUT INT ELECT PREHEAT	0-100
PX | ~~RX~~ | ~~SD~~	Output percentage for the power control of the electrical preheater	
14	OUT INT ELECT POSTHEAT	0-100
PX | RX | ~~SD~~	Output percentage for the power control of the electrical postheater inside the unit	
15	OUT EXT ELECT POSTHEAT	0-100
PX | RX | SD	Output percentage for the power control of the electrical postheater external to the unit	

3.2.4 Analogue Value (R/W): AV W / Analogwert (R / W): AV W

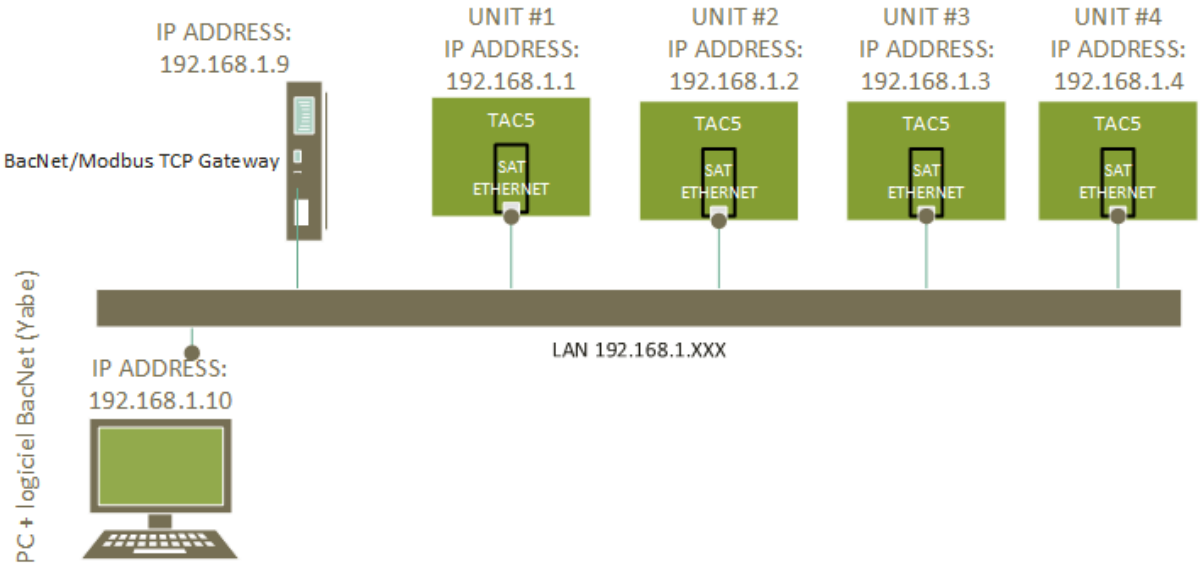
Object Instance	Object Name	Min/Max
1	Setpoint – T° Postheat	0-99,9 [°C]
RX | BX | SD	Postheating T° setpoint (0=OFF)	
2	CPs - Voltage reference 1	0-10,0 [V]
RX | BX | SD	CPs mode: setpoint voltage for [CPs on SUP] or [CPs on EXH]	
3	Setpoint – T° Postcool	0-99,9 [°C]
RX | BX | SD	Postcooling T° setpoint (0=OFF)	
4	CPs - Voltage reference 2	0-10,0 [V]
RX | BX | SD	CPs mode: setpoint voltage for [CPs on SUP + EXH]	
5	Setpoint – T° Freecool	0-99,9 [°C]
RX | BX | SD	Freecooling T° setpoint (0=OFF)	
6	Set Speed Supply. *Note for SD units: the supply fan corresonds to fan1.*	0-99999
RX | BX | SD	Set supply Flow (m3/h or l/s) or Torque (%) . *Note for SD units: the supply fan corresonds to fan1.*	
7	Set Speed Exhaust. *Note for SD units: the exhaust fan corresonds to fan2, if present.*	0-99999
RX | BX | SD	Set exhaust Flow (m3/h or l/s) or Torque (%). *Note for SD units: the exhaust fan corresonds to fan2, if present.*	

4. Installation / Installation

LED 1 - GREEN: ON
LED 2 - GREEN: BACnet comm.
LED 3 - Device state
LED 4 - GREEN: Modbus comm.
LED 5 - GREEN: Not used
LED 6 - GREEN: Not used
Connector 3: Ethernet 1 Port (RJ45 Plug)
Connector 4: Ethernet 2 Port (RJ45 Plug)
Power supply:
0V = Ground
+V = Positive wire
VAC : min 8V ; max 24V
VDC : min 12V ; max 25V



4.1 Topology / Topologie



5. Configuration/Konfiguration

5.1 Default configuration / Standardkonfiguration

The default configuration is indicated in the following table: / Die Standardkonfiguration ist in der folgenden Tabelle angegeben:

BACnet gateway:
o IP ADDRESS gateway: 192.168.1.9
o SUBNET MASK: 255.255.255.0
o GATEWAY: 0.0.0.0
o PORT: 47808
o BACnet device name: Lemmens
o Device Identifier: 1

- Unit n°1: IP ADDRESS: 192.168.1.1
- Unit n°2: IP ADDRESS: 192.168.1.2
- Unit n°3: IP ADDRESS: 192.168.1.3
- Unit n°4: IP ADDRESS: 192.168.1.4

5.2 Custom configuration / Benutzerdefinierte Konfiguration

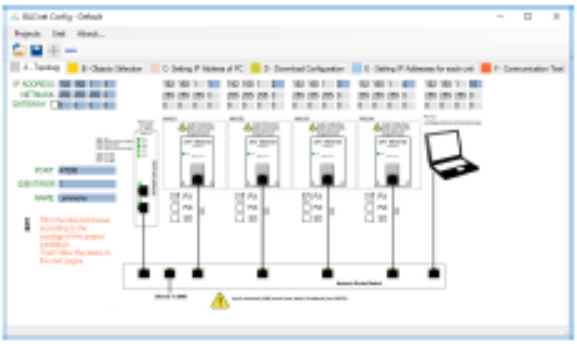
It is possible to reduce the number of units that will be controlled through the Bacnet gateway, or to change the IP address of the gateway and of the units as well.

- Download from www.aerex.de website "BACnet config".

- Proceed with installation.

Start BACnet config.exe:

Es ist möglich, die Anzahl der Einheiten zu reduzieren, die über das Bacnet-Gateway gesteuert werden, oder die IP-Adresse des Gateways und der Einheiten zu ändern.
=> **Download von www.aerex.de "BACnet config".**
=> Fahren Sie mit der Installation fort.
Starten Sie BACnet config.exe:



With the interface it is possible to:
o Remove a unit or add a unit
o Change the gateway IP configuration
o Change the gateway communication port
o Change the last number of the IP address of the units on the corresponding row inside the table.

N.B.: for the units, only the last number of the IP address can be changed since it must be within the same range of the gateway IP address.
o Choose for each unit its type: PX (default), RX or SD.
o Select/unselect objects (tab 'B')
o Save the configuration
o Open a previously saved configuration

Mit der Schnittstelle ist es möglich:
- Entfernen oder hinzufügen einer Einheit (RLT-Gerät)
- Ändern der Gateway-IP-Konfiguration
- Ändern des Gateway-Kommunikationsport
- Ändern der letzten Nummer der IP-Adresse der Einheiten in der entsprechenden Zeile in der Tabelle.

Hinweis: Für die Geräte kann nur die letzte Nummer der IP-Adresse geändert werden, da sie innerhalb des gleichen Bereichs der Gateway-IP-Adresse liegen muss.
- Wählen Sie für jedes Gerät seinen Typ: PX (Standard), RX oder SD.
- Objekte auswählen / abwählen (Registerkarte 'B')
- Speichern der Konfiguration
- Öffnen einer zuvor gespeicherten Konfiguration

5.3 Download configuration / Konfiguration herunterladen

The module has a default configuration loaded, so there should be no need to make any changes if the default configuration can be used.

Procedure to change the configuration of the module:

1. Set up first the computer used for downloading in order to be able to communicate with the gateway:

Follow step C of BACnetConfig application or

Set directly IP address of the computer to 192.168.1.10.

The net mask will be 255.255.255.0.

The gateway: 0.0.0.0.

2. Follow Step D of BACnet Config application

Auf dem Modul ist eine Standardkonfiguration geladen, sodass keine Änderungen erforderlich sein sollten, wenn die Standardkonfiguration verwendet werden kann.
Vorgehensweise zum Ändern der Konfiguration des Moduls:

1. Richten Sie zuerst den zum Herunterladen verwendeten Computer ein, um mit dem Gateway kommunizieren zu können: Befolgen Sie Schritt C der BACnetConfig-Anwendung oder stellen Sie die IP-Adresse des Computers direkt auf 192.168.1.10 ein.

Die Netzmaske lautet 255.255.255.0.

Das Gateway: 0.0.0.0.

2.Befolgen Sie Schritt D der BACnet Config-Anwendung

5.4 Resetting the IP address / Zurücksetzen der IP-Adresse

The gateway comes with default IP address 192.168.1.9. If this address has been changed later on and the address is not known anymore, follows this procedure to set the back the factory address.
1. Turn off the Device;
2. Put Dip2 of 'Dip-Switch A' at ON position
3. Turn on the device
4. Connect the Ethernet cable;
5. Insert the IP "192.168.2.205";
6. Press the "Ping" button, must appear "Device Found!"
7. Press the "Next" button;
8. Check all operations;
9. Press the "Execute update firmware" button to start the upload;
10. When all the operations are "OK" turn off the Device;
11. Put Dip2 of 'Dip-Switch A' at OFF position
12. Turn on the device.
13. Upload a configuration (see 5.2).

Das Gateway wird mit der Standard-IP-Adresse 192.168.1.9 geliefert. Wenn diese Adresse später geändert wurde und die Adresse nicht mehr bekannt ist, gehen Sie wie folgt vor, um die Werksadresse zurückzusetzen.

1. Schalten Sie das Gerät aus
2. Stellen Sie Dip2 des Dip-Schalters A auf ON
3. Schalten Sie das Gerät ein
4. Schließen Sie das Ethernet-Kabel an
5. Geben Sie die IP "192.168.2.205" ein
6. Drücken Sie die Taste "Ping". Es muss "Gerät gefunden!" Angezeigt werden
7. Drücken Sie die Taste "Weiter"
8. Überprüfen Sie alle Vorgänge
9. Klicken Sie auf die Schaltfläche „Firmware aktualisieren", um den Upload zu starten
10. Wenn alle Vorgänge in Ordnung sind, schalten Sie das Gerät aus
11. Stellen Sie Dip2 des Dip-Schalters A auf OFF
12. Schalten Sie das Gerät ein
13. Laden Sie eine Konfiguration hoch (siehe 5.2).

Data Link Layer Options:
BACnet IP, (Annex J)
MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200
Point-To-Point, EIA 232 (Clause 10), baud rate(s): 9600, 115200
Character Sets Supported:
ISO 10646 (UTF-8)
Network Security Options:
Non-secure Device - is capable of operating without BACnet Network Security

Datenverbindungsschichtoptionen:
BACnet IP, (Anhang J)MS / TP-Slave (Abschnitt 9), Baudrate (n): 9600, 19200, 38400, 57600, 76800, 115200Punkt-zu-Punkt, UVP 232 (Abschnitt 10), Baudrate (n): 9600, 115200

Unterstützte Zeichensätze:ISO 10646 (UTF-8)

Netzwerksicherheitsoptionen: Nicht sicheres Gerät - kann ohne BACnet-Netzwerksicherheit betrieben werden

AEREX Kontaktdaten

AEREX HaustechnikSysteme GmbH
Steinkirchring 27
78056 Villingen-Schwenningen

Tel.: 0 77 20 / 694-880
Fax: 0 77 20 / 694-881

Service-Hotline: 0 77 20 / 694-122

info@aerex.de
www.aerex.de

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