GB

DK

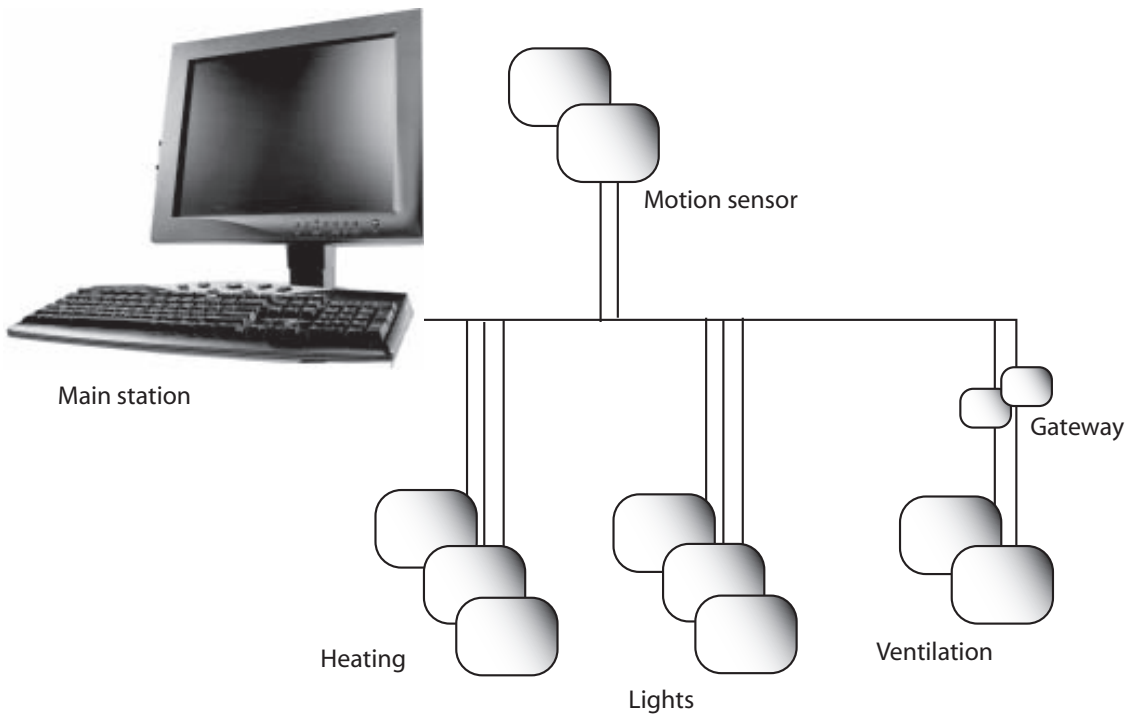
DE

NO

SE

NL

FI



BACnet Protocol
EXact/EXact2

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EXHAUSTO

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2. Connection

1. DK - Indledning

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1. GB - Introduction

1.1 Overview

Air handling unit (AHU) fitted with an EXHAUSTO EXact/EXact2 control unit
BACnet functionality has been implemented in the EXHAUSTO EXact web server with software
version 3.0-xxxx or later. EXHAUSTO EXact is a BACnet Application Specific Controller (B-ASC) with supported data link layer options: BACnet IP or BACnet MSTP.
See also the document "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Communication

TCP/IP: qty. 1 10/100 Mbit Ethernet, RJ45 connector.
MSTP: qty. 1 RS-485

1.3 Supported BACnet Interoperability Building Blocks

Data sharing	DS-RP-B	Data Sharing-ReadProperty-B
Data sharing	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Data sharing	DS-WP-B	Data Sharing-WriteProperty-B
Data sharing	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Device management	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Device management	DM-DOB-B	Device Management-DynamicObjectBinding-B
Device management	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Device management	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 Supported BACnet IP standard object types

Standard object types **RO = Read only** **RW = Read/Write**	**Features**
Device	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analog input AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analog output AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Dual input (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standard object types **RO = Read only** **RW = Read/Write**	**Features**
Dual output DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate input (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate output (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Connection

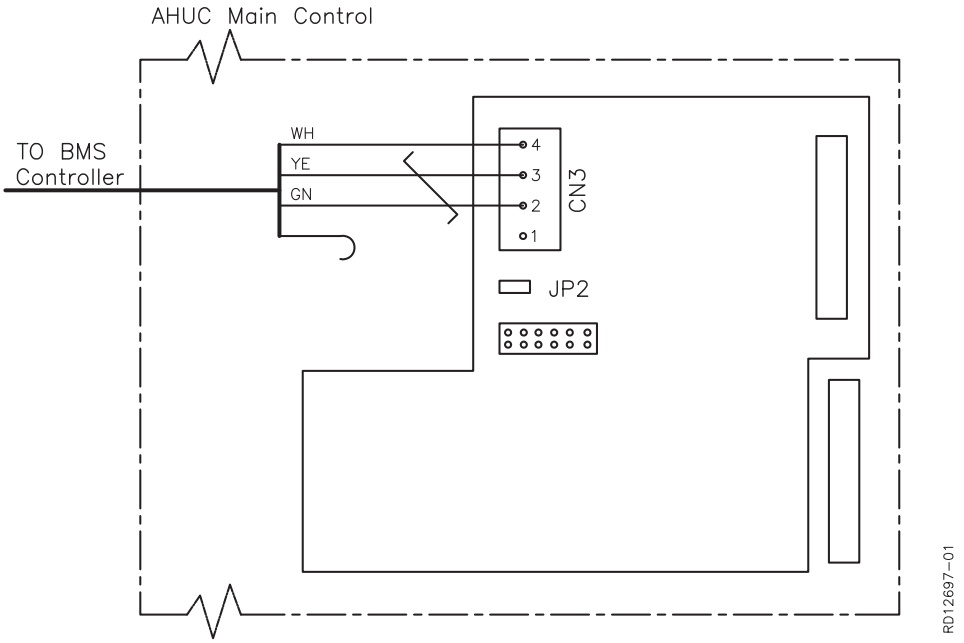
2.1 Connection MSTP

Cable

The BACnet MSTP cable must be 2 x 2 x 0.25 □ twisted pair cable.

EXact/EXact2

The BACnet MSTP connection is connected to CN3 of the main control. Only BACnet MSTP A, B and 0 V DC (chassis) may be fitted. See diagram



Key to diagram

CN3: BACnet MSTP (RS-485)

Terminal	Signal description
1	Do not connect
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (Chassis)

A and B signal (terminals 2-3) must be twisted pair.

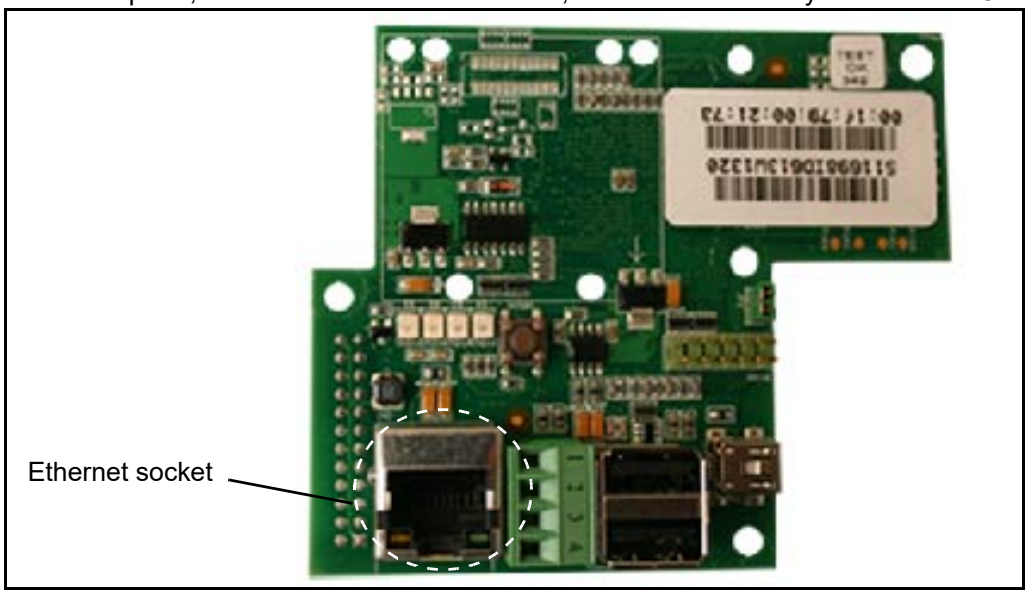
Termination

If the EXact/EXact2 control system is the final device on the cable, a terminating resistor of 120 Ω must be mounted. You do this at jumper JP2 on the web server.

2.2 Connection BACnet IP

Connecting the network

Connect the network to the Ethernet plug. If the web server is to be connected directly to the computer, use crossover cable. However, this is not necessary with newer PCs.



MAC address

The web server's MAC address can be seen on the web server PCB and in menu 3.6 on the HMI panel.

Cable type and length

Cable	Cable length
CAT5E STP cable (shielded cable)	EXHAUSTO recommends max. cable length: 70 m.

2.2.1 Configuring the web server

The web server supports both static and dynamic IP addresses. These are configured in menu 3.6 on the HMI panel.

Example

3.6 Web server
DHCP > No
IP address
> 192.168.001.180
Subnet mask
> 255.255.255.000
Standard gateway
> 192.168.001.001
Port number > 80
MAC address
00:1F:79:00:00:D0
Reset password > No

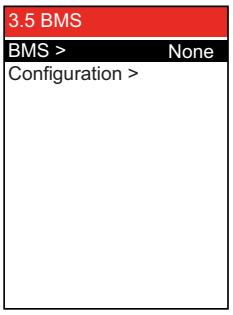
See “EXact Basic Instructions” on how to:
- change settings
- save changes

Port number

In the case of several devices on the same router, you can give them different port numbers and employ port forwarding.

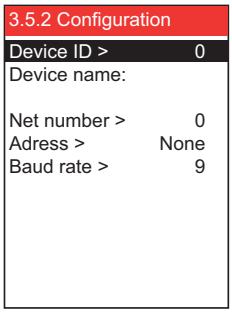
2.2.2 Configuring BACnet

Example



- Select BACnet MSTP or BACnet IP across from BMS in menu 3.5

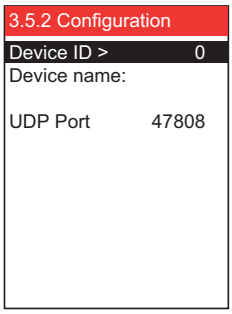
Only for BACnet MSTP



Set the following values, as defined by the systems manager:

- Device ID (0 - 4194303)
- Device name - NB this can only be set in the web server
- Net Number (0 - 65535)
- Address (0 - 127)
- Baud rate (9600, 19200, 115200)

Only for BACnet IP



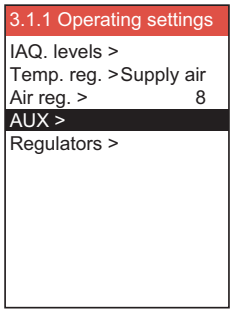
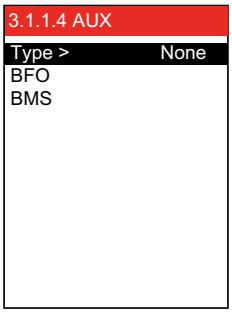
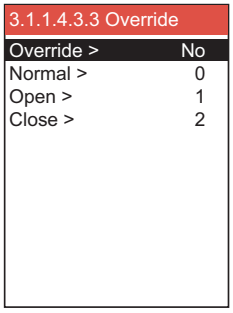
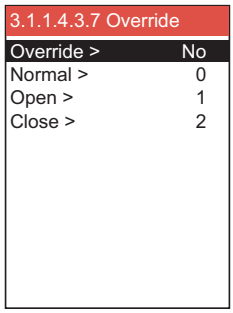
Set the following values, as defined by the systems manager:

- Device ID (0 - 4194303)
- Device name - NB this can only be set in the web server
- UDP Port (47808-47823)

2.3 Overriding external dampers

In air control method 8, "External control of fan speeds", it may be necessary in certain operating situations to override external dampers in the duct system.
External dampers may, for example, be VAV dampers.
In case of fire, de-icing or night-time cooling, the VEX unit may send a signal to the BMS unit to open or close dampers in the extract air or supply air ducts.

2.3.1 Setting the override function (only air control method 8)

Step	Action	The display shows
1	• Switch to menu Settings “->Device->Operating settings” • Set "Air control" to "8".	
2	• Switch to menu "AUX" • Set "Type" to "BMS"	
3	• Switch to menu "BMS" • Switch to menu "Override" under "Supply air" • Set "Override" to "Yes" • Set "Normal" to the desired value to be sent when the VEX unit does not require an override on the supply air damper • Set "Open" to the desired value to be sent when the VEX unit requires the supply dampers to be open • Set "Close" to the desired value to be sent when the VEX unit requires the supply dampers to be closed • Return to menu "BMS"	
3	• Switch to menu "Override" under "Extract air" • Set "Override" to "Yes" • Set "Normal" to the desired value to be sent when the VEX unit does not require an override on the extract air damper • Set "Open" to the desired value to be sent when the VEX unit requires the extract air dampers to be open • Set "Close" to the desired value to be sent when the VEX unit requires the extract air dampers to be closed • Note that the values for Normal, Open and Closed must not be the same.	
If no override is desired on either or both ducts, set "Override" to "No".		

2.4 Example of device control

2.4.1 Control of airflow, supply air temperature and manual mode/timer program

Setting air flow

Step	Action
1	Set Object type AV - Index 06 **-** BMSInValue.AirSP to a value between 0 and 100%. The value 0% will stop the unit.

Setting supply air temperature

Step	Action
1	Set Object type AV - Index 07 **-** BMSInValue.TempSP to a value between 10 and 35°C. NB: The temperature set point may be limited by other settings and functions.

Timer program

Set Object type BV - Index 00 - BMSInValue.CtrlMode to “1”, if the device is to return to the timer program.

1. DK - Indledning

1.1 Oversigt

Luftbehandlingsaggregat (AHU), der er udstyret med en EXHAUSTO EXact/EXact2 styreenhed.
BACnet funktionaliteten er implementeret i EXHAUSTO EXact webserver med software version 3.0-xxxx eller nyere. EXHAUSTO EXact er en BACnet Application Specific Controller (B-ASC) med understøttede data link layer valgmuligheder: BACnet IP eller BACnet MSTP.
Der henvises desuden til dokumentet "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Kommunikation

TCP/IP: 1 stk. 10/100 Mbit Ethernet, RJ45 kontakt.
MSTP: 1 stk. RS-485

1.3 Understøttede BACnet Interoperability Building Blocks

Datadeling	DS-RP-B	Data Sharing-ReadProperty-B
Datadeling	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Datadeling	DS-WP-B	Data Sharing-WriteProperty-B
Datadeling	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Enheds håndtering	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Enheds håndtering	DM-DOB-B	Device Management-DynamicObjectBinding-B
Enheds håndtering	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Enheds håndtering	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 Understøttede BACnet IP standard objekttyper

Standard objekttyper **RO = Read only** **RW = Read / Write**	**Egenskaber**
Enhed	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analog indgang AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analog værdi AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binær indgang DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standard objekttyper **RO = Read only** **RW = Read / Write**	**Egenskaber**
Binær værdi DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate indgang (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate værdi (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Tilslutning

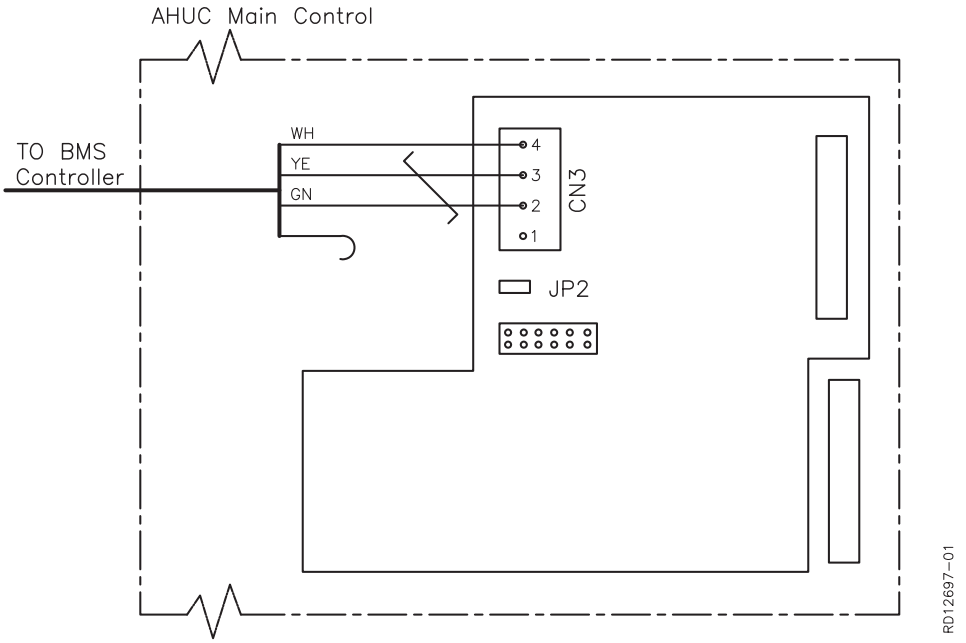
2.1 Tilslutning MSTP

Kabel

BACnet MSTP kablet skal være 2 x 2 x 0,25□ parsnoet kabel.

BACnet MSTP forbindelsen tilsluttes hovedstyringens CN3. Kun BACnet MSTP A, B og stel må monteres. Se diagram.

EXact/EXact2



Forklaring til diagram

CN3: BACnet MSTP (RS-485)

Klemme	Signalbeskrivelse
1	Må ikke forbindes
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (Stel)

A og B signalet (klemme 2 - 3) skal være parsnoet.

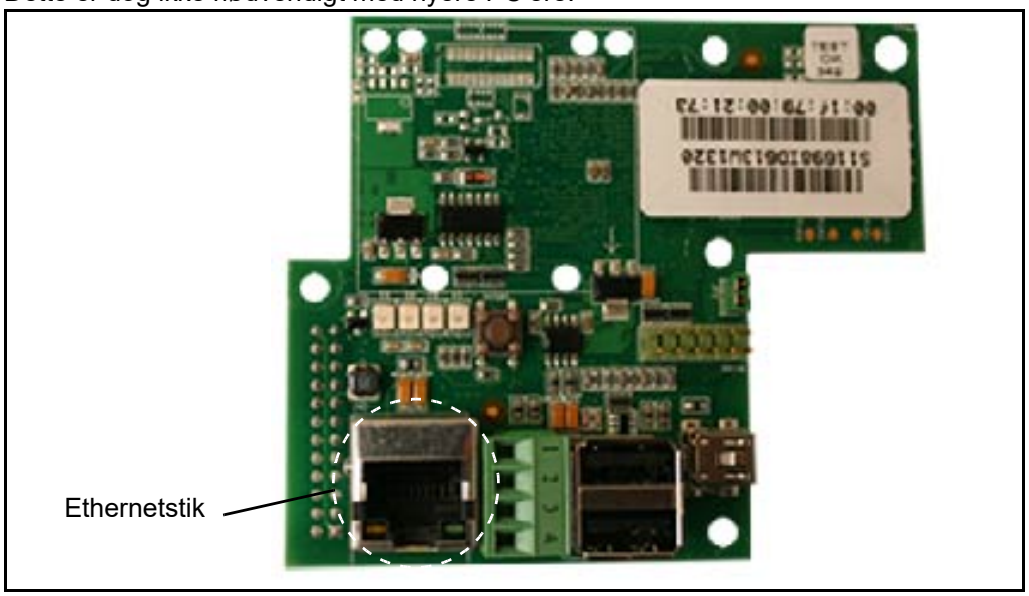
Endeterminering

Hvis EXact/EXact2 styringen er den sidste enhed på kablet skal der monteres en termineringsmodstand på 120 Ω. Dette gøres via jumper JP2 på webserveren.

2.2 Tilslutning BACnet IP

Tilslutning af netværk

Netværksstikket monteres i ethernetstikket. Hvis webserveren skal tilsluttes direkte til PC, skal der anvendes et krydset netværkskabel.
Dette er dog ikke nødvendigt med nyere PC'ere.



MAC-adresse

Webserverens MAC-adresse kan aflæses på webserver-printet samt i menu 3.6 i HMI-panelet.

Kabeltype og længde

Kabel	Kabellængde
CAT5E STP-kabel (skærmet kabel)	EXHAUSTO anbefaler maks. kabellængde: 70 m.

2.2.1 Opsætning af webserver

Webserver understøtter både statiske og dynamiske IP-adresser. Dette konfigureres i menu 3.6 i HMI-panelet.

Eksempel

3.6 Web server
DHCP > Nej
IP-adresse
> 192.168.001.180
Undernetmaske
> 255.255.255.000
Standardgateway
> 192.168.001.001
Portnummer > 80
MAC adresse
00:1F:79:00:00:D0
Nulstil adg.kode > Nej

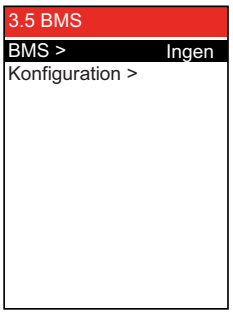
Se i EXact basisvejledning
hvordan du:
- ændrer indstillinger
- gemmer ændrede indstillinger

Portnummer

Hvis man har flere anlæg på samme router kan man give dem forskellige portnumre og så benytte sig af port forwarding.

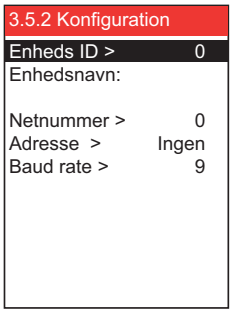
2.2.2 Opsætning af BACnet

Eksempel



- Der skal vælges BACnet MSTP eller BACnet IP ud for BMS i menu 3.5.

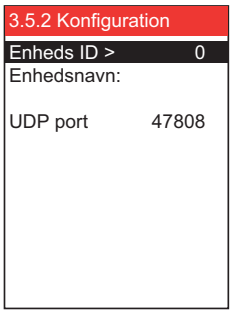
Kun for BACnet MSTP



Indstil følgende værdier som defineret af den systemansvarlige:

- Enheds ID (0 - 4194303)
- Enhedsnavn: - Bemærk kan kun indstilles i Webserveren
- Netnummer (0 - 65535)
- Adresse (0 - 127)
- Baud rate (9600, 19200, 115200)

Kun for BACnet IP



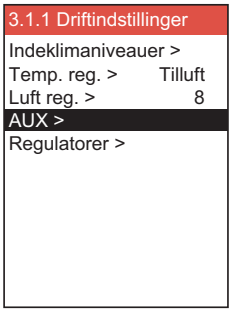
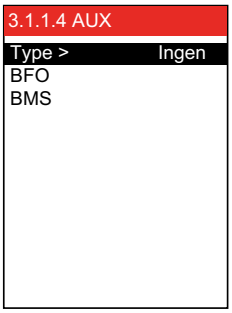
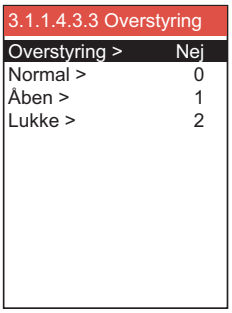
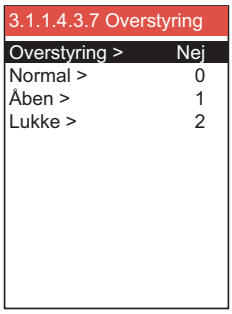
Indstil følgende værdier som defineret af den systemansvarlige:

- Enheds ID (0 - 4194303)
- Enhedsnavn: - Bemærk kan kun indstilles i Webserveren
- UDP port (47808-47823)

2.3 Overstyring af eksterne spjæld

Ved luft regulerings metode 8, ”Eksterne styring af ventilator hastigheder”, kan det i visse drift situationer være nødvendigt at overstyrer eksterne spjæld i kanal systemet. Eksterne spjæld kan f.eks. være VAV spjæld.
Ved brand, afisning eller natkøling kan VEX aggregatet sende et signal til BMS anlægget om at åbne eller lukke spjæld i fraluft eller tilluft kanalen.

2.3.1 Indstilling af overstyringsfunktion (kun luftreguleringsmetode 8)

Trin	Handling	Display viser...
1	• Skift til menu Indstillinger “->Anlæg->Driftindstillinger” • Indstil ”Luft reg.” til ”8”	
2	• Skift til menu ”AUX” • Indstil ”Type” til ”BMS”	
3	• Skift til menu “BMS” • Skift til menu ”Overstyring” under ”Tilluft” • Indstil ”Overstyring til ”Ja” • Indstil ”Normal” til den værdi der ønskes sendt, når VEX aggregatet ikke kræver overstyring af tilluft spjæld • Indstil ”Åben” til den værdi der ønskes sendt, når VEX aggregatet kræver at tilluft spjæld er åbne • Indstil ”Lukke” til den værdi der ønskes sendt, når VEX aggregatet kræver at tilluft spjæld er lukkede • Skift tilbage til menu ”BMS”	
3	• Skift til menu ”Overstyring” under ”Fraluft” • Indstil ”Overstyring til ”Ja” • Indstil ”Normal” til den værdi der ønskes sendt, når VEX aggregatet ikke kræver overstyring af fraluft spjæld • Indstil ”Åben” til den værdi der ønskes sendt, når VEX aggregatet kræver at fraluft spjæld er åbne • Indstil ”Lukke” til den værdi der ønskes sendt, når VEX aggregatet kræver at fraluft spjæld er lukkede • Bemærk af værdierne for Normal, Åben og Lukket ikke må være ens.	
Ønskes der ingen overstyring for en eller begge kanaler sættes ”Overstyring” til ”Nej”.		

2.4 Eksempel på styring af anlæg

2.4.1 Styring af luftmængde, tilluftstemperatur og manuel mode/urprogram

Indstilling af luftmængden

Trin	Handling
1	Sæt Object type AV - Index 06 **-** BMSInValue.AirSP til en værdi mellem 0 og 100%. Værdien 0% standser aggregatet.

Indstilling af tillufttemperaturen

Trin	Handling
1	Sæt Object type AV - Index 07 **-** BMSInValue.TempSP til en værdi mellem 10 og 35°C. Bemærk: Temperatursetpunktet kan været begrænset af andre indstillinger og funktioner.

Urprogram

Sæt Object type BV - Index 00 - BMSInValue.CtrlMode til “1”, hvis aggregatet skal tilbage på urprogram.

1. DE - Einleitung

1.1 Übersicht

Das Lüftungsgerät (AHU) ist mit einer EXact/EXact2-Automatik von EXHAUSTO ausgerüstet.
Die BACnet-Funktionalität wurde in den EXHAUSTO EXact-Webservern mit der Software Version 3.0-xxxx oder neuer eingeführt. EXHAUSTO EXact ist ein BACnet Application Specific Controller (B-ASC) mit unterstützten Daten-Link-Layer-Optionen: BACnet IP oder BACnet MSTP.
Es wird ferner auf das Dokument "EXact_EDE_ddmmyy" (Engineering Data Exchange) verwiesen.

1.2 Kommunikation

TCP/IP: 1 Stck. 10/100 Mbit Ethernet, RJ45-Kontakt.
MSTP: 1 Stck. RS-485

1.3 Unterstützte BACnet Interoperability Building Blocks

Datenteilung	DS-RP-B	Data Sharing-ReadProperty-B
Datenteilung	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Datenteilung	DS-WP-B	Data Sharing-WriteProperty-B
Datenteilung	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Gerätemanager	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Gerätemanager	DM-DOB-B	Device Management-DynamicObjectBinding-B
Gerätemanager	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Gerätemanager	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 Unterstützte BACnet IP-Standardobjekttypen

Standardobjekttypen **RO = Read only** **RW = Read / Write**	**Eigenschaften**
Einheit	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analogeingang AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analogwert AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binäreingang DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standardobjekttypen **RO = Read only** **RW = Read / Write**	**Eigenschaften**
Binärwert DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate-Eingang (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate-Wert (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Anschluss

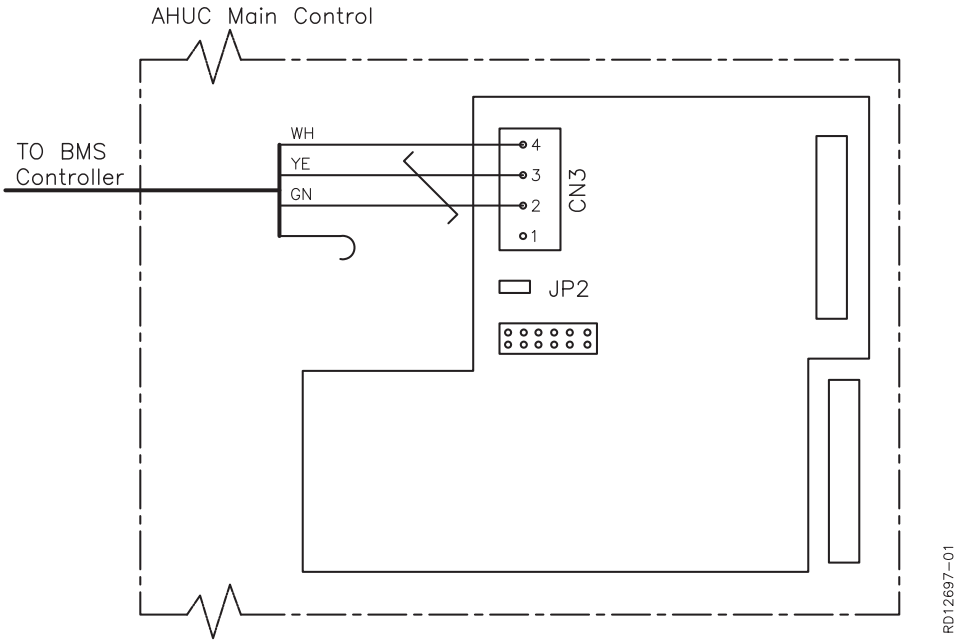
2.1 Anschließen von MSTP

Kabel

Das BACnet MSTP-Kabel muss vom Typ 2 x 2 x 0,25 □ Twisted-Pair-Kabel sein.

Der BACnet MSTP-Anschluss ist direkt an CN3 der Hauptautomatik anzuschließen. Es dürfen nur BACnet MSTP A, B und Masse angeschlossen werden. Siehe Diagramm.

EXact/EXact2



Erläuterung zum Diagramm

CN3: BACnet MSTP (RS-485)

Klemme	Signalbeschreibung
1	Darf nicht benutzt werden
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (Masse)

Das Signal A und B (Klemme 2 - 3) muss paarweise gewunden sein.

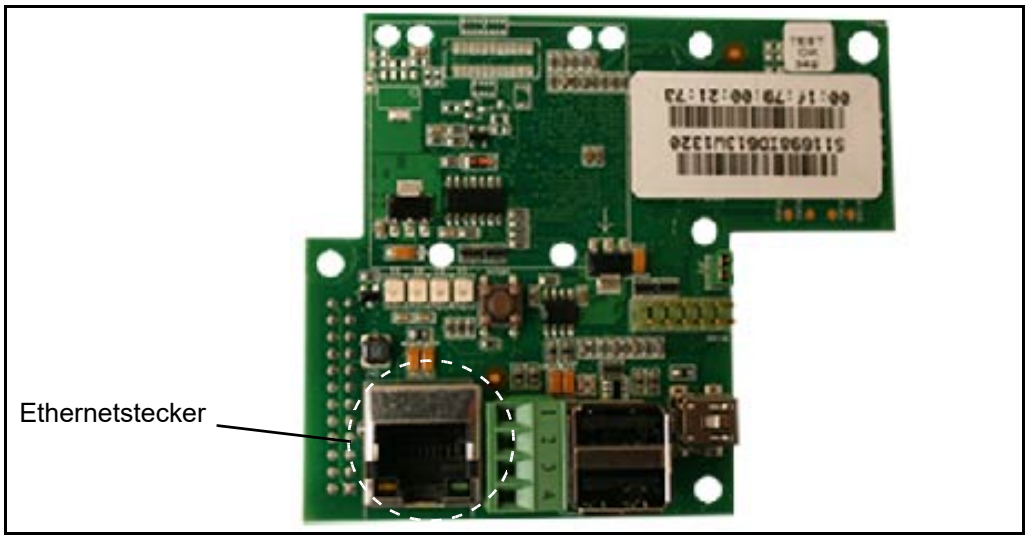
Endterminierung

Falls die EXact/EXact2-Automatik die letzte Einheit am Kabel ist, muss ein Terminierungswiderstand von 120 Ω montiert werden. Dies erfolgt über die Kurzschlussbrücke JP2 am Webserver.

2.2 Anschließen von BACnet IP

Netzwerk-anschluss

Der Netzwerkanschluss wird im Ethernetstecker montieret. Wenn der Webserver direkt an einen PC angeschlossen werden soll, ist ein gekreuztes Netzwerkkabel erforderlich. Dies ist bei neueren PCs jedoch nicht erforderlich.



Mac-Adresse

Die Mac-Adresse geht aus der Webserverplatine sowie aus Menü 3.6 im HMI-Panel hervor.

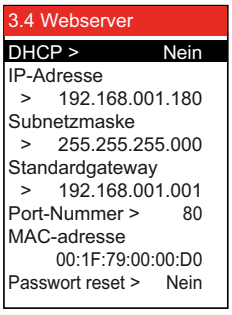
Kabeltyp und Länge

Kabel	Kabellänge
CAT5E STP-Kabel (geschirmtes Kabel)	EXHAUSTO empfiehlt als max. Kabellänge: 70 m.

2.2.1 Konfigurieren des Webservers

Der Webserver unterstützt statische wie dynamische IP-Adressen. Dies wird in Menü 3.6 im HMI-Panel konfiguriert.

Beispiel



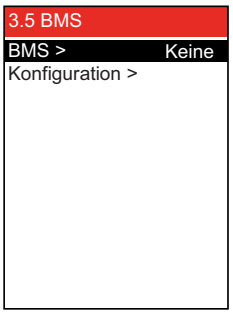
Siehe die EXact-Basisanleitung bezüglich:
- Ändern von Einstellungen
- Speichern der geänderten Einstellungen

Portnummer

Wenn mehrere Anlagen am selben Router angeschlossen sind, kann man ihnen verschiedene Portnummern zuteilen und dann Portweiterleitung benutzen.

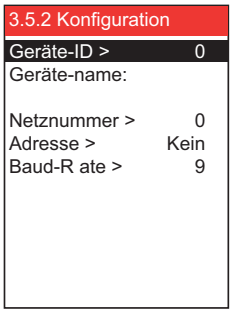
2.2.2 Konfigurieren von BACnet

Beispiel



- Bei BMS in Menü 3.5 BACnet MSTP oder BACnet IP wählen.

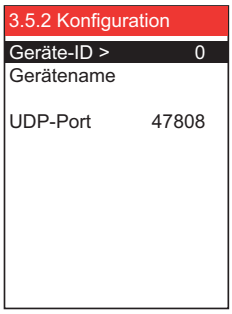
Nur für BACnet MSTP



Folgende vom Systemverantwortlichen definierten Werte eingeben:

- Geräte-ID (0 - 4194303)
- Geräte-name - Hinweis: Lässt sich nur im Webserver einstellen
- Netznummer (0 - 65535)
- Adresse (0 - 127)
- Baud-Rate (9600, 19200, 115200)

Nur für BACnet IP



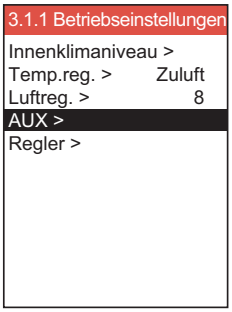
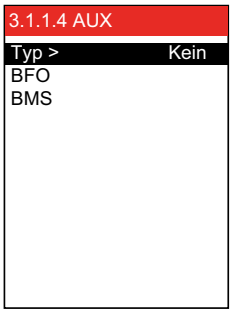
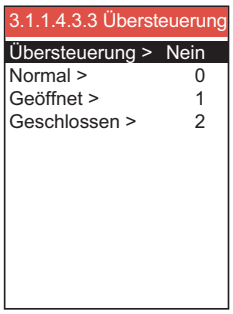
Folgende vom Systemverantwortlichen definierten Werte eingeben:

- Geräte-ID (0 - 4194303)
- Geräte-name - Hinweis: Lässt sich nur im Webserver einstellen
- UDP-Port (47808-47823)

2.3 Übersteuerung externer Klappen

Bei Luftregelungsverfahren 8, ”Externe Regelung der Ventilatordrehzahl”, kann es in gewissen Situationen erforderlich sein, externe Klappen im Kanalsystem zu übersteuern.
Externe Klappen sind beispielsweise VAV-Klappen.
Bei Brand, Enteisung oder Nachtkühlung kann das VEX-Gerät ein Signal an die BMS-Anlage senden, dass Klappen im Abluft- oder Zuluftkanal geöffnet bzw. geschlossen werden müssen.

2.3.1 Einstellen der Übersteuerungsfunktion (nur Luftregelungsverfahren 8)7

Schritt	Vorgehen	Das Display zeigt …
1	• Zum Menü Einstellungen “->Anlage->Bertriebseinstellungen” wechseln • ”Luftreg.” auf ”8” einstellen	
2	• Zum Menü ”AUX” wechseln • ”Typ” auf ”BMS” einstellen	
3	• Zum Menü ”BMS” wechseln • Zum Menü ”Übersteuern” unter ”Zuluft” wechseln • ”Übersteuern" auf ”Ja” einstellen • ”Normal” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät keine Übersteuerung der Zuluftklappe erfordert • ”Geöffnet” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät erfordert, dass die Zuluftklappen geöffnet sind • ”Geschlossen” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät erfordert, dass die Zuluftklappen geschlossen sind • Zurück zum Menü ”BMS” wechseln	

Schritt	Vorgehen	Das Display zeigt …
3	• Zum Menü ”Übersteuern” unter ”Abluft” wechseln • ”Übersteuern" auf ”Ja” einstellen • ”Normal” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät keine Übersteuerung der Abluftklappe erfordert • ”Geöffnet” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät erfordert, dass die Abluftklappen geöffnet sind • ”Geschlossen” auf den Wert einstellen, der übertragen werden soll, wenn das VEX-Gerät erfordert, dass die Abluftklappen geschlossen sind • Hinweis: Die Werte für Normal, Geöffnet und Geschlossen dürfen nicht identisch sein	
Wenn für einen oder beide Kanäle keine Übersteuerung gewünscht wird, ist ”Übersteuern” auf ”Nein” einzustellen.		

2.4 Beispiel für Regelung der Anlage

2.4.1 Regelung von Luftmenge, Zulufttemperatur und manuellem Modus/Uhrprogramm

Einstellen der Luftmenge

Schritt	Vorgehen
1	Object type AV - Index 06 **-** BMSInValue.AirSP auf einen Wert zwischen 0 und 100% einstellen. Beim Wert 0% wird das Gerät abgeschaltet.

Einstellen der Zulufttemperatur

Schritt	Vorgehen
1	Object type AV - Index 07 **-** BMSInValue.TempSP auf einen Wert zwischen 10 und 35°C einstellen. Hinweis: Der Temperatursollwert kann Begrenzungen durch andere Einstellungen und Funktionen unterliegen.

Uhrprogramm

Object type BV - Index 00 - BMSInValue.CtrlMode auf “1” einstellen, wenn das Gerät auf Uhrprogramm zurückgeschaltet werden soll.

1. NO - Innledning

1.1 Oversikt

Luftbehandlingsaggregat (AHU) som er utstyrt med en EXHAUSTO EXact/EXact2 styreenhet.
BACnet-funksjonaliteten er implementert i EXHAUSTO EXact nettserver med programvare
versjon 3.0-xxxx eller nyere. EXHAUSTO EXact er en BACnet Application Specific Controller (B-ASC) med understøttede data link layer-valgmuligheter: BACnet IP eller BACnet MSTP.
Det henvises dessuten til dokumentet "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Kommunikasjon

TCP/IP: 1 stk. 10/100Mbit Ethernet, RJ45-tilkobling.
MSTP: 1 stk. RS-485

1.3 BACnet Interoperability Building Blocks understøttes

Datadeling	DS-RP-B	Data Sharing-ReadProperty-B
Datadeling	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Datadeling	DS-WP-B	Data Sharing-WriteProperty-B
Datadeling	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Enhetshåndtering	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Enhetshåndtering	DM-DOB-B	Device Management-DynamicObjectBinding-B
Enhetshåndtering	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Enhetshåndtering	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 BACnet IP standard objekttyper understøttes

Standard objekttyper **RO = Read Only** **RW = Read / Write**	**Egenskaper**
Enhet	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analog inngang AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analog verdi AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binær inngang DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standard objekttyper **RO = Read Only** **RW = Read / Write**	**Egenskaper**
Binær verdi DO (R/W)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate inngang (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate verdi (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Tilkobling

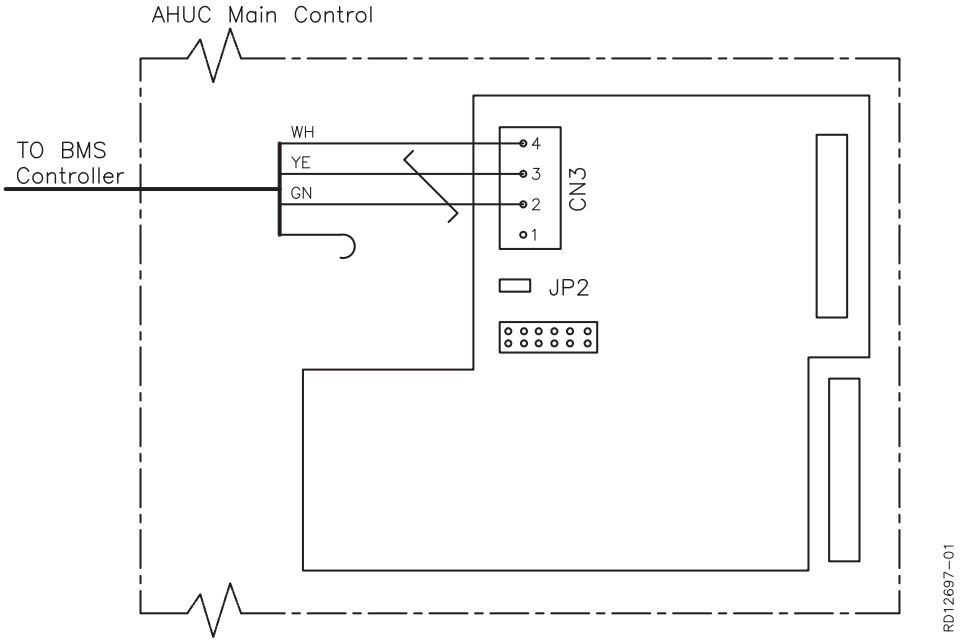
2.1 Tilkobling MSTP

Kabel

BACnet MSTP-kabelen skal være 2 x 2 x 0,25 □ parsnodd kabel.

BACnet MSTP-forbindelsen kobles til CN3 på hovedstyringen. Kun BACnet MSTP A, B og jord kan monteres. Se skjema.

EXact/EXact2



Forklaring til skjemaet

CN3: BACnet MSTP (RS-485)

Klemme	Signalbeskrivelse
1	Må ikke forbindes
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (jord)

A- og B-signalet (klemme 2 - 3) må være parsnodd.

Terminering

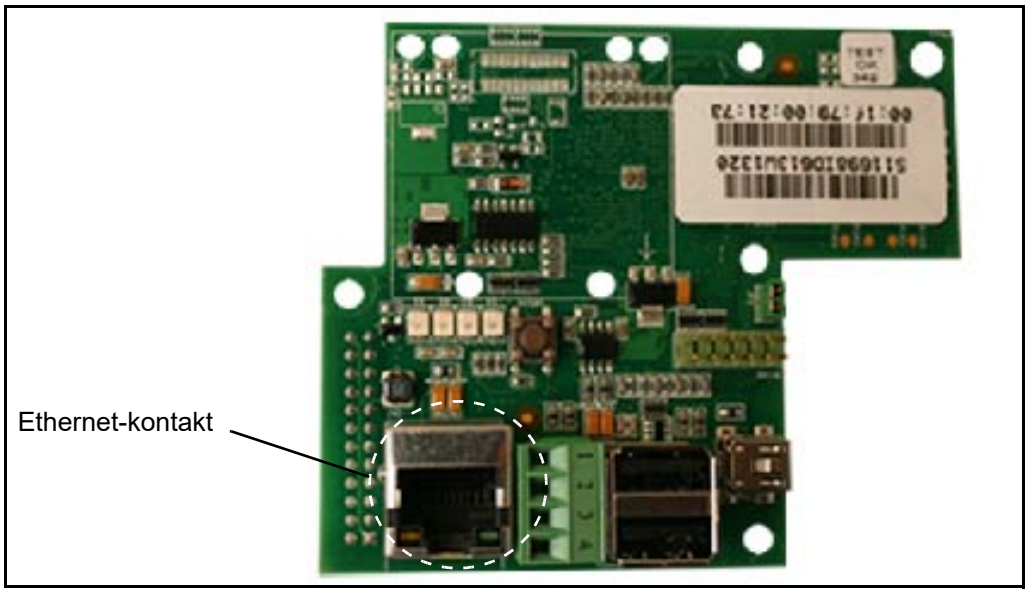
Dersom EXact/EXact2-styringen er den siste enheten på kabelen, må det monteres en termineringsmotstand på 120 Ω. Dette gjøres via jumper JP2 på nettserveren.

EXHAUSTO

2.2 Tilkobling BACnet IP

Tilkobling av nettverk

Nettverkskabelen kobles til Ethernet-kontakten. Dersom nettserveren skal tilkobles direkte til en PC, må det brukes en krysset nettverkskabel. Dette er imidlertid ikke nødvendig med nyere PC-er.



MAC-adresse

Nettserverens MAC-adresse kan avleses på nettserver-kretskortet og i meny 3.6 i HMI-panelet.

Kabeltype og lengde

Kabel	Kabellengde
CAT5E STP-kabel (skjermet kabel)	EXHAUSTO anbefaler maks. kabellengde: 70 m.

2.2.1 Nettserver-oppsett

Nettserveren understøtter både statiske og dynamiske IP-adresser. Dette konfigureres i meny 3.6 i HMI-panelet.

Eksempel

```
3.6 Webserver
DHCP >          Nei
IP-adresse
  >   192.168.001.180
Undernettmaske
  >   255.255.255.000
Standardgateway
  >   192.168.001.001
Portnummer >      80
MAC-adresse
      00:1F:79:00:00:D0
Nullstill adg.kode >  Nei
```

Se i basisveiledningen for EXact hvordan du:
- endrer innstillinger
- lagrer endrede innstillinger

Portnummer

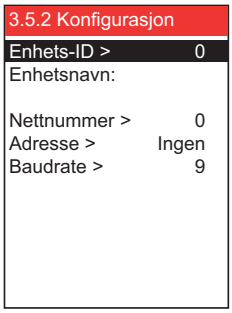
Er flere anlegg tilkoblet samme ruter, kan man gi dem forskjellig portnummer og bruke portviderekobling (port forwarding).

2.2.2 BACnet-oppsett

Eksempel

- Det må velges BACnet MSTP eller BACnet IP foran BMS i meny 3.5.

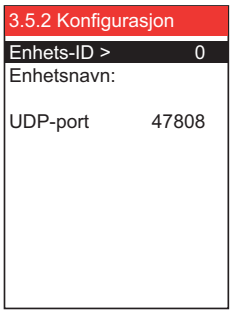
Kun for BACnet MSTP



Still inn følgende verdier som definert av den systemansvarlige:

- Enhets-ID (0 - 4194303)
- Enhetsnavn: - Merk: Kan kun innstilles i nettserveren
- Nettnummer (0 - 65535)
- Adresse (0 - 127)
- Baud rate (9600, 19200, 115200)

Kun for BACnet IP



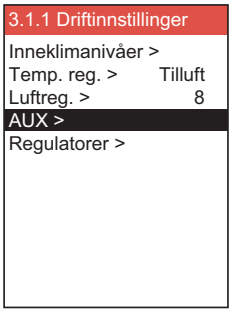
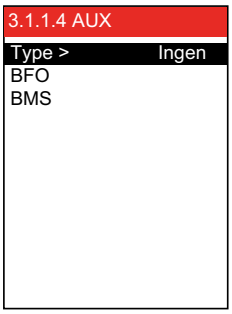
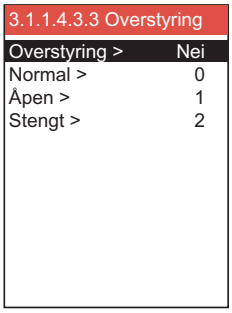
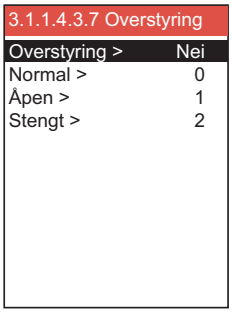
Still inn følgende verdier som definert av den systemansvarlige:

- Enhets-ID (0 - 4194303)
- Enhetsnavn: - Merk: Kan kun innstilles i nettserveren
- UDP-port (47808-47823)

2.3 Overstyring av eksterne spjeld

Ved luft reguleringsmetode 8, «Ekstern styring av viftehastigheter», kan det i visse driftssituasjoner være nødvendig å overstyre eksterne spjeld i kanalsystemet.
Eksterne spjeld kan f.eks. være VAV-spjeld.
Ved brann, avising eller nattkjøling kan VEX-aggregatet sende et signal til BMS-anlegget om å åpne eller stenge spjeld i avtrekks- eller tilluftskanalen.

2.3.1 Innstilling av overstyringsfunksjon (kun luftreguleringsmetode 8)

Trin	Handling	Displayet viser ...
1	• Skift til menyen «Innstillinger->Anlegg->Driftsinnstillinger» • Still inn «Luft reg.» på «8»	
2	• Skift til menyen «AUX» • Still inn «Type» på «BMS»	
3	• Skift til menyen «BMS» • Skift til menyen «Overstyring» under «Tilluft» • Still inn «Overstyring» på «Ja» • Still inn «Normal» på verdien som ønskes sendt når VEX-aggregatet ikke krever overstyring av tilluftsspjeld • Still inn «Åpen» på verdien som ønskes sendt når VEX-aggregatet krever at tilluftsspjeld er åpne • Still inn «Stengt» på verdien som ønskes sendt når VEX-aggregatet krever at tilluftsspjeld er stengt • Skift til tilbake til menyen «BMS»	
3	• Skift til menyen «Overstyring» under «Avtrekk» • Still inn «Overstyring» på «Ja» • Still inn «Normal» på verdien som ønskes sendt når VEX-aggregatet ikke krever overstyring av avtrekksspjeld • Still inn «Åpen» på verdien som ønskes sendt når VEX-aggregatet krever at avtrekksspjeld er åpne • Still inn «Stengt» på verdien som ønskes sendt når VEX-aggregatet krever at avtrekksspjeld er stengt • Merk at verdiene for Normal, Åpen og Stengt ikke må være like.	
Ønskes det ikke overstyring for en eller begge kanaler, settes «Overstyring» til «Nei».		

2.4 Eksempel på styring av anlegg

2.4.1 Styring av luftmengde, tilluftstemperatur og manuell modus/urprogram

Innstilling av luftmengden

Trinn	Handling
1	Sett Object type AV - Index 06 - BMSInValue.AirSP på en verdi mellom 0 og 100 %. Verdien 0 % stopper aggregatet.

Innstilling av tilluftstemperaturen

Trinn	Handling
1	Sett Object type AV - Index 07 - BMSInValue.AirSP på en verdi mellom 10 og 35 °C. Merk: Temperatursettpunktet kan være begrenset av andre innstillinger og funksjoner.

Urprogram

Sett Object type BV - Index 00 - BMSInValue.CtrlMode på «1» hvis aggregatet skal tilbake på urprogram.

1. SE – Inledning

1.1 Översikt

Luftbehandlingsaggregat (AHU), som är utrustat med en EXHAUSTO EXact/EXact2 styrenhet.
BACnet-funktionen är implementerad i EXHAUSTO EXact webbserver med mjukvara version 3.0-xxxx eller senare. EXHAUSTO EXact är en BACnet Application Specific Controller (B-ASC) med möjlighet att välja data link layer med fullt stöd: BACnet IP eller BACnet MSTP.
Vidare hänvisar vi till dokumentet "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Kommunikation

TCP/IP: 1 st. 10/100 Mbit Ethernet, RJ45-kontakt.
MSTP: 1 st. RS-485

1.3 BACnet Interoperability Building Blocks som stöds

Datadelning	DS-RP-B	Data Sharing-ReadProperty-B
Datadelning	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Datadelning	DS-WP-B	Data Sharing-WriteProperty-B
Datadelning	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Enhetshantering	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Enhetshantering	DM-DOB-B	Device Management-DynamicObjectBinding-B
Enhetshantering	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Enhetshantering	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 BACnet IP standardobjekttyper som stöds

Standardobjekttyper **RO = Read only** **RW = Read / Write**	**Egenskaper**
Enhet	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analog ingång AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analogt värde AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binär ingång DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standardobjekttyper **RO = Read only** **RW = Read / Write**	**Egenskaper**
Binärt värde DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate-ingång (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate-värde (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Anslutning

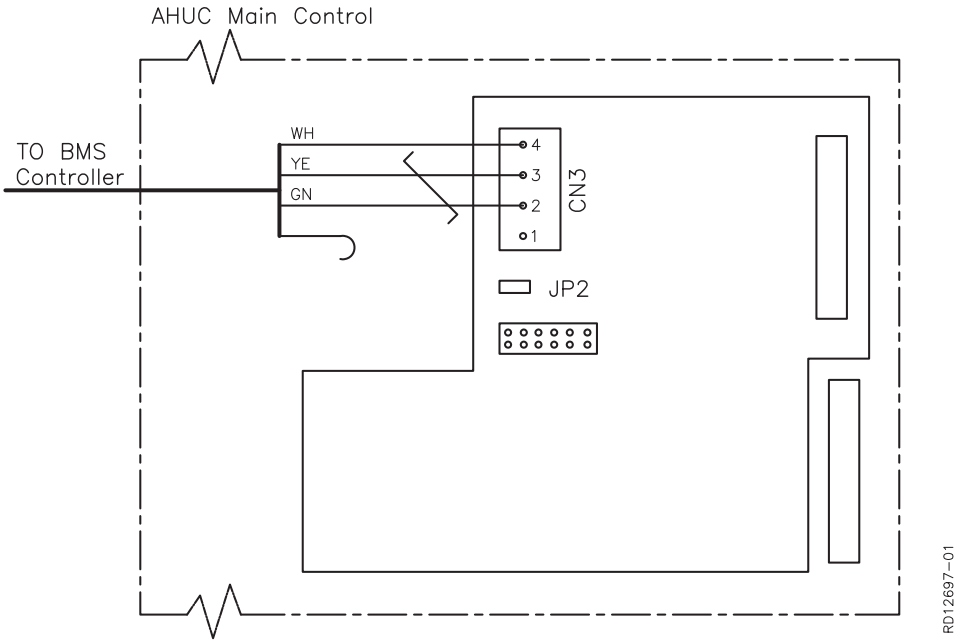
2.1 Anslutning MSTP

Kabel

BACnet MSTP-kabeln ska vara 2 x 2 x 0,25□ tvinnad parkabel.

BACnet MSTP-förbindelsen ansluts till huvudstyrningens CN3. Endast BACnet MSTP A, B och stativ får monteras. Se schema.

EXact/EXact2



Förklaring till diagram

CN3: BACnet MSTP (RS-485)

Klämma	Signalbeskrivning
1	Får inte anslutas
2	RS485 + (A)
3	RS485 – (B)
4	0VDC (chassi/jord)

A- och B-signalledningarna (anslutning 2–3) ska vara partvinnade.

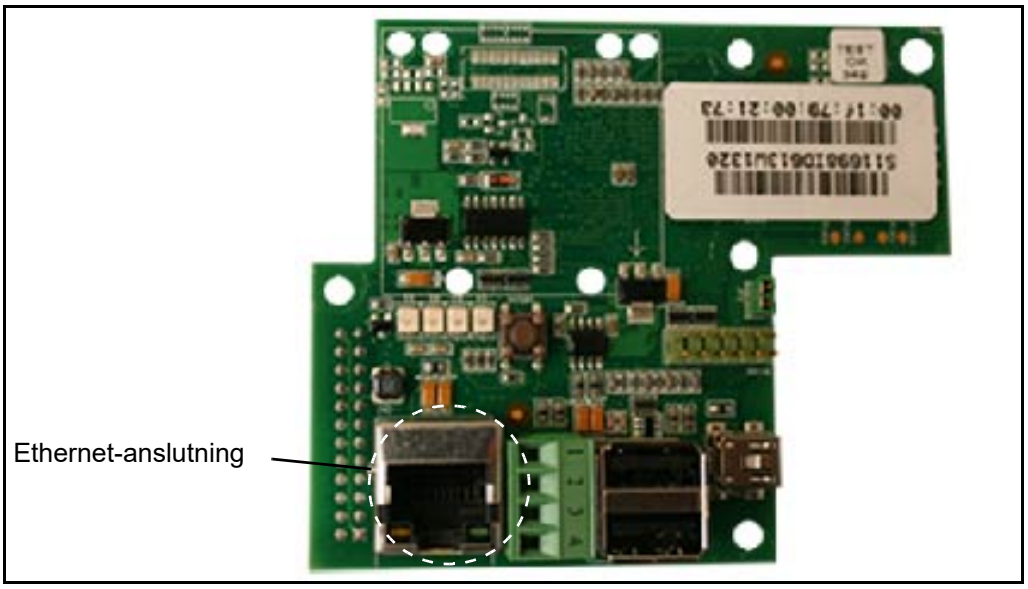
Ändterminering

Om EXact-/EXact2-styrningen är den sista enheten på kabeln ska ett termineringsmotstånd på 120 Ω monteras. Detta sker via jumper JP2 på webbservern.

2.2 Anslutning av BACnet IP

Anslutning av nätverk

Nätverkskontakten sätts i ethernetanslutningen. Om webbservern ska anslutas direkt till en PC ska en korsad nätverkskabel användas.
Detta är dock inte nödvändigt för nyare datorer.



MAC-adress

Webbserverns MAC-adress finns på webbserver-kortet samt i meny 3.6 på manöverpanelen.

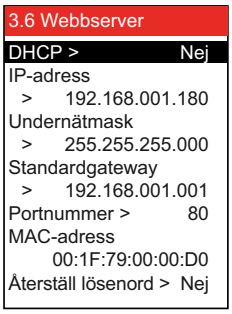
Kabeltyp och längd

Kabel	Kabellängd
CAT5E STP-kabel (skärmad kabel)	EXHAUSTO rekommenderar max kabellängd: 70 m.

2.2.1 Installation av webbserver:

Webbservern stödjer både statiska och dynamiska IP-adresser. Detta konfigureras i meny 3.6 på manöverpanelen.

Exempel



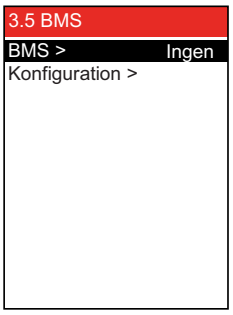
Läs i produkthandboken för EXact om hur du
– ändrar inställningar
– sparar ändrade inställningar.

Portnummer

Om man har flera anläggningar på samma router kan man ge dem olika portnummer och använda sig av port forwarding.

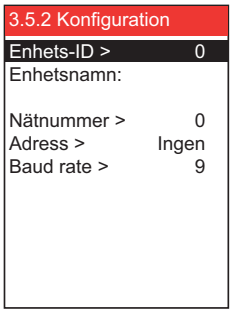
2.2.2 Uppsättning av BACnet

Exempel



- Man ska välja BACnet MSTP eller BACnet IP under BMS i meny 3.5.

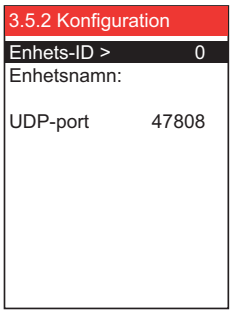
Endast för BACnet MSTP



Ställ in följande värden som definierade av systemansvarig:

- Enhets-ID (0 – 4194303)
- Enhetsnamn: – Kan endast ställas in i webbservern
- Nätnummer (0 – 65535)
- Adress (0 – 127)
- Baud rate (9600, 19200, 115200)

Endast för BACnet IP



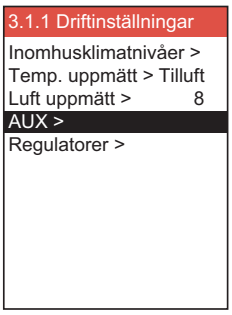
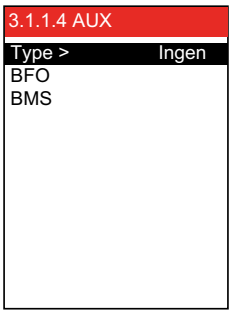
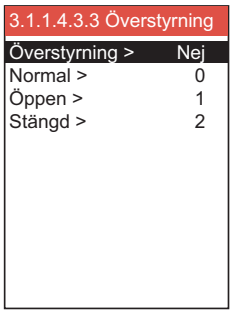
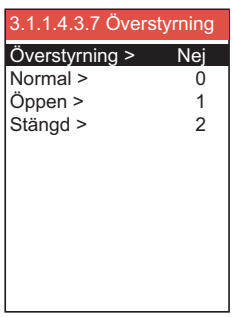
Ställ in följande värden som definierade av systemansvarig:

- Enhets-ID (0 – 4194303)
- Enhetsnamn: – Kan endast ställas in i webbservern
- UDP-port (47808-47823)

2.3 Överstyrning av externa spjäll

Vid luftregleringsmetod 8, ”Extern styrning av fläkthastigheter”, kan det i vissa driftssituationer vara nödvändigt att överstyra externa spjäll i kanalsystemet.
Externa spjäll kan t.ex. vara VAV-spjäll.
Vid brand, avfrostning eller nattkylning kan VEX-aggregatet skicka en signal till BMS-anläggningen om att öppna eller stänga spjäll i avlufts- eller tilluftskanalen.

2.3.1 Inställning av överstyrningsfunktion (endast luftregleringsmetod 8)

Steg	Åtgärd	Displayen visar …
1	• Växla till menyn Inställningar ”–>Anläggning–>Driftinställningar” • Ställ in ”Luft reg.” på ”8”	
2	• Växla till menyn ”AUX” • Ställ in ”Typ” på ”BMS”	
3	• Växla till menyn ”BMS” • Växla till menyn ”Överstyrning” under ”Tilluft” • Ställ in ”Överstyrning” på ”Ja” • Ställ in ”Normal” på det värde som man vill ska skickas när VEX-aggregatet inte kräver överstyrning av tilluftsspjäll • Ställ in ”Öppna” på det värde som man vill skicka när VEX-aggregatet kräver att tilluftsspjäll är öppna • Ställ in ”Stäng” på det värde som man vill skicka när VEX-aggregatet kräver att tilluftsspjäll är stängda • Växla tillbaka till menyn ”BMS”	
3	• Växla till menyn ”Överstyrning” under ”Frånluft” • Ställ in ”Överstyrning” på ”Ja” • Ställ in ”Normal” på det värde som man vill ska skickas när VEX-aggregatet inte kräver överstyrning av avluftsspjäll • Ställ in ”Öppna” på det värde som man vill skicka när VEX-aggregatet kräver att avluftsspjäll är öppna • Ställ in ”Stäng” på det värde som man vill skicka när VEX-aggregatet kräver att avluftsspjäll är stängda • Observera att värdena för Normal, Öppna och Stäng inte får vara lika.	
Om det inte önskas någon överstyrning för en eller båda kanalerna ställs ”Överstyrning” in på ”Nej”.		

2.4 Exempel på styrning av anläggning

2.4.1 Styrning av luftflöde, tilluftstemperatur och manuellt/timerprogram

Inställning av Luftflöden

Steg	Åtgärd
1	Ställ in Object type AV – Index 06 **–** BMSInValue.AirSP på ett värde mellan 0 och 100 %. Värdet 0% stoppar aggregatet.

Inställning av tilluftstemperaturen

Steg	Åtgärd
1	Ställ in Object type AV – Index 07 **–** BMSInValue.TempSP på ett värde mellan 10 och 35 °C. Obs! Temperaturinställningspunkten kan vara begränsad av andra inställningar och funktioner.

Timerprogram Ställ in Object type BV – Index 00 – BMSInValue.CtrlMode på ”1”, om aggregatet ska gå tillbaka på timerprogram

1. NL - Inleiding

1.1 Overzicht

Luchtbehandelingsunit (AHU), die voorzien is van een EXact/EXact2-regeleenheid van EXHAUSTO.
De BACnet-functionaliteit is geïmplementeerd in de EXact-webserver van EXHAUSTO met software
versie 3.0-xxxx of nieuwer. EXHAUSTO EXact is een BACnet Application Specific Controller (B-ASC) met ondersteuning van de volgende keuzemogelijkheden voor data link layer: BACnet IP of BACnet MSTP.
Zie voor meer informatie ook het document "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Communicatie

TCP/IP: 1 st. 10/100 Mbit Ethernet, RJ45-contact.
MSTP: 1 st. RS-485

1.3 Ondersteuning van BACnet Interoperability Building Blocks

Gegevensuitwisseling	DS-RP-B	Data Sharing-ReadProperty-B
Gegevensuitwisseling	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Gegevensuitwisseling	DS-WP-B	Data Sharing-WriteProperty-B
Gegevensuitwisseling	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Apparaatbeheer	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Apparaatbeheer	DM-DOB-B	Device Management-DynamicObjectBinding-B
Apparaatbeheer	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Apparaatbeheer	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 Ondersteunde standaard objecttypen voor BACnet IP

Standaard objecttypen **RO = Read Only** **RW = Read / Write**	**Eigenschappen**
Eenheid	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analoge ingang AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Analoge waarde AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binaire ingang DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Standaard objecttypen **RO = Read Only** **RW = Read / Write**	**Eigenschappen**
Binaire waarde DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate ingang DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate-waarde (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Aansluiting

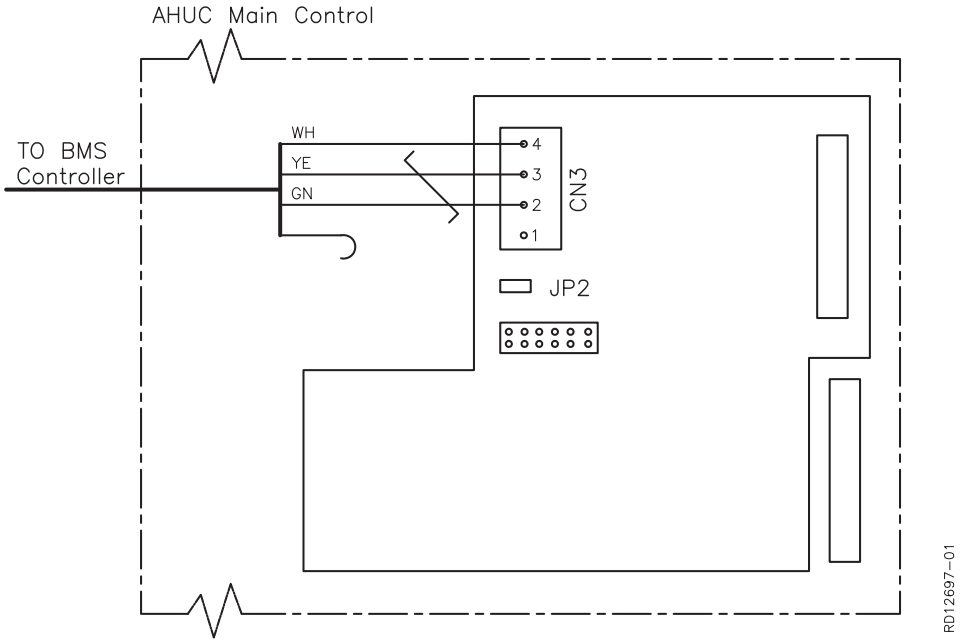
2.1 Aansluiting MSTP

Kabel

De BACnet MSTP-kabel moet een getwiste 2 x 2 x 0,25 □ kabel zijn.

Sluit de BACnet MSTP-verbinding aan op de CN3 van de hoofdregeling. Alleen BACnet MSTP A, B en de massa mogen gemonteerd worden. Zie schema.

EXact/EXact2



Verklaring bij schema

CN3: BACnet MSTP (RS-485)

Klem	Signaalbeschrijving
1	Mag niet verbonden worden
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (massa)

Het A en B-signaal (klem 2 - 3) moet een getwist aderpaar zijn.

Eindafsluiting

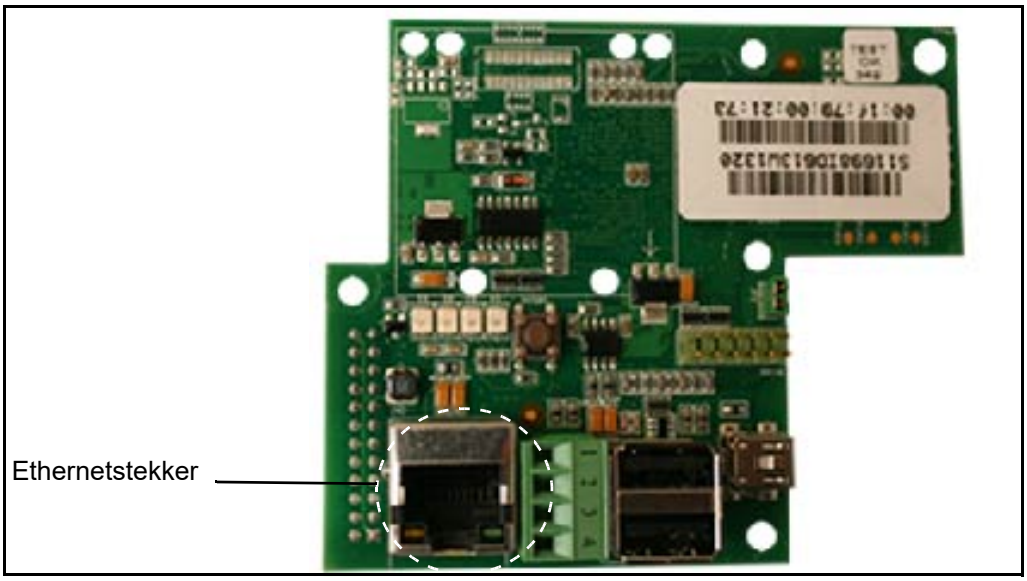
Als de EXact/EXact2-regeling de laatste eenheid op de kabel is, moet er een afsluitingsweerstand van 120 Ω worden gemonteerd. Dit doet u via jumper JP2 op de webserver.

EXHAUSTO

2.2 Aansluiting BACnet IP

Aansluiten van netwerk

Monteer de netwerkstekker in de ethernetstekker. Als de webserver direct op de pc wordt aangesloten, moet een gekruiste netwerkkabel worden gebruikt.
De pc hoeft echter niet zo nieuw te zijn.



MAC-adres

Het MAC-adres van de webserver kan worden afgelezen op de printplaat van de webserver en in menu 3.6 in het HMI-paneel.

Kabeltype en -lengte

Kabel	Kabellengte
CAT5E STP-kabel (afgeschermde kabel)	EXHAUSTO adviseert als max. kabellengte: 70 m.

2.2.1 Instellen van de webserver

De webserver ondersteunt zowel statische als dynamische IP-adressen. Dit kan worden geconfigureerd in menu 3.6 in het HMI-paneel.

Voorbeeld

3.6 Webserver
DHCP > Nee
IP-adres
> 192.168.001.180
Submasker
> 255.255.255.000
Standaard gateway
> 192.168.001.001
Poortnummer > 80
MAC-adres
00:1F:79:00:00:D0
Reset wachtwoord > Nee

Zie in de EXact-basishandleiding hoe u:
- instellingen wijzigt
- gewijzigde instellingen opslaat

Poortnummer

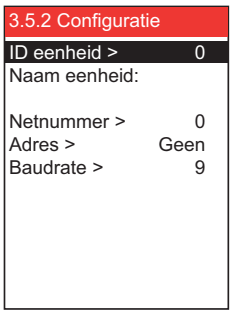
Indien er meer installaties met dezelfde router verbonden zijn, kan men verschillende poortnummers aan deze installaties toewijzen en zo gebruik maken van 'port forwarding'.

2.2.2 Instellen van BACnet

Voorbeeld

- Er moet worden gekozen voor BACnet MSTP of BACnet IP uit voor BMS in menu 3.5.

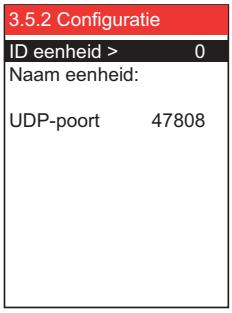
Alleen voor BACnet MSTP



Stel de volgende waarden in zoals gedefinieerd door de systeembeheerder:

- ID eenheid(0 - 4194303)
- Naam eenheid: - Opgelet: kan alleen in de webserver ingesteld worden
- Netnummer (0 - 65535)
- Adres (0 - 127)
- Baudrate (9600, 19200, 115200)

Alleen voor BACnet IP



Stel de volgende waarden in zoals gedefinieerd door de systeembeheerder:

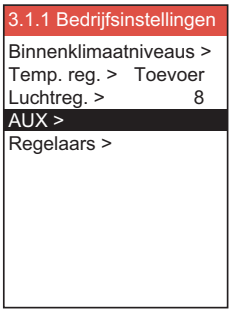
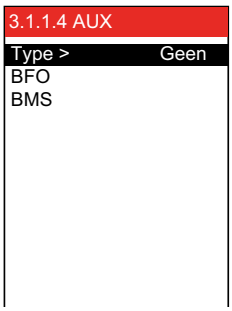
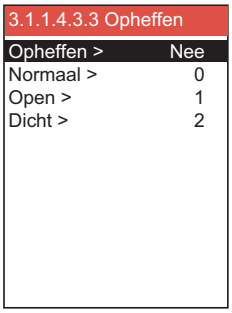
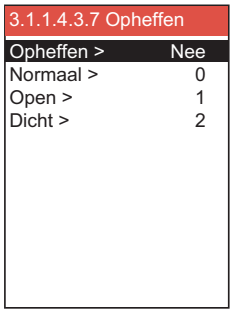
- ID eenheid(0 - 4194303)
- Naam eenheid: - Opgelet: kan alleen in de webserver ingesteld worden
- UDP-poort (47808-47823)

EXHAUSTO

2.3 Overnemen van externe klep

Bij luchtregelmethode 8, "Externe regeling van ventilatorsnelheden", kan het onder bepaalde bedrijfsomstandigheden noodzakelijk zijn om een externe klep in het kanaalsysteem over te nemen.
Zo'n externe klep kan bijv. een VAV -klep zijn.
Bij brand, ontdooien of nachtkoeling kan de VEX-unit een signaal sturen voor de BMS-installatie om een klep in het afvoer- of toevoerluchtkanaal te openen of te sluiten.

2.3.1 Instelling van overnamefunctie (alleen voor luchtregelmethode 8)

Stap	Handeling	Het display toont...
1	• Wissel naar menu-instellingen "->Installatie->Bedrijfsinstellingen" • Stel "Luchtreg." in op "8"	
2	• Wissel naar menu "AUX" • Stel "Type" in op "BMS"	
3	• Wissel naar menu "BMS" • Wissel naar menu "Overnemen" onder "Toevoerlucht" • Stel "Overnemen" in op "Ja" • Stel "Normaal" in op de waarde die moet worden verzonden als de VEX-unit geen overname van de toevoerluchtklep vereist • Stel "Open" in op de waarde die moet worden verzonden als de VEX-unit vereist dat de toevoerluchtklep open is • Stel "Sluiten" in op de waarde die verzonden moet worden als de VEX-unit vereist dat de toevoerluchtklep gesloten is • Wissel terug naar het menu "BMS"	
3	• Wissel naar het menu "Overnemen" onder "Afvoerlucht" • Stel "Overnemen" in op "Ja" • Stel "Normaal" in op de waarde die moet worden verzonden als de VEX-unit geen overname van de afvoerluchtklep vereist • Stel "Open" in op de waarde die moet worden verzonden als de VEX-unit vereist dat de afvoerluchtklep open is • Stel "Sluiten" in op de waarde die verzonden moet worden als de VEX-unit vereist dat de afvoerluchtklep gesloten is • Denk eraan dat de waarden voor Normaal, Open en Gesloten niet hetzelfde mogen zijn.	
Stel, wanneer overname van een of beide kanalen niet gewenst is, "Overnemen" in op "Nee".		

2.4 Voorbeeld van installatieregeling

2.4.1 Regeling van luchtvolume, toevoerluchttemperatuur en handmatige stand/ klokprogramma

Instelling van het luchtvolume...

Stap	Handeling
1	Zet objecttype AV - Index 06 **-** BMSInValue.AirSP op een waarde tussen 0 en 100%. De waarde 0% stopt de unit.

Instelling van de toevoerluchttemperatuur

Stap	Handeling
1	Zet objecttype AV - Index 07 **-** BMSInValue.TempSP op een waarde tussen 10 en 35%. NB: Let erop dat het instelpunt voor de temperatuur beperkt kan zijn door andere instellingen en functies.

Klokprogramma Zet objecttype BV - Index 00 - BMSInValue.CtrlMode op "1" als de unit terug moet gaan naar het klokprogramma.

1. FI - Johdanto

1.1 Yleiskuvaus

Ilmankäsittelykone (AHU) on varustettu EXHAUSTO EXact/EXact2 -ohjausyksiköllä. BACnet-toiminto on käytössä EXHAUSTO EXact -web-palvelimessa, jonka ohjelmisto-versio on 3.0-xxxx tai uudempi. EXHAUSTO EXact on BACnet Application Specific Controller (B-ASC). Siinä on seuraavat data link layer -vaihtoehdot: BACnet IP tai BACnet MSTP.
Lisätietoja on asiakirjassa "EXact_EDE_ddmmyy" (Engineering Data Exchange).

1.2 Tiedonsiirto

TCP/IP: 1 kpl 10/100 Mbit Ethernet, RJ45-liitäntä.
MSTP: 1 kpl RS-485

1.3 BACnet Interoperability Building Blocks -yhteensopivuus

Tietojen jakaminen	DS-RP-B	Data Sharing-ReadProperty-B
Tietojen jakaminen	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
Tietojen jakaminen	DS-WP-B	Data Sharing-WriteProperty-B
Tietojen jakaminen	DS-WPM-B	Data Sharing-WritePropertyMultiple-B
Yksikön käsittely	DM-DDB-B	Device Management-DynamicDeviceBinding-B
Yksikön käsittely	DM-DOB-B	Device Management-DynamicObjectBinding-B
Yksikön käsittely	DM-DCC-B	Device Management-DeviceCommunicationControl-B
Yksikön käsittely	DM-RD-B	Device Management-ReinitializeDevice-B

1.4 Yhteensopivat BACnet IP -vakio-objektityypit

Vakio-objektityypit **RO = Vain luku (Read only)** **RW = Luku/kirjoitus (Read / Write)**	**Ominaisuudet**
Yksikkö	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 APDU_Timeout Number_Of_APDU_Retries Device_Address_Binding Database_Revision
Analoginen tulo AI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Yksiköt
Analoginen arvo AO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Units
Binaarinen tulo DI (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Polarity

Vakio-objektityypit **RO = Vain luku (Read only)** **RW = Luku/kirjoitus (Read / Write)**	**Ominaisuudet**
Binaarinen arvo DO (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service
Multistate-tulo (RO)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States
Multistate-arvo (RW)	Object_Identifier Object_Name Object_Type Present_Value Status_Flags Event_State Out_Of_Service Number_Of_States

2. Liitäntä

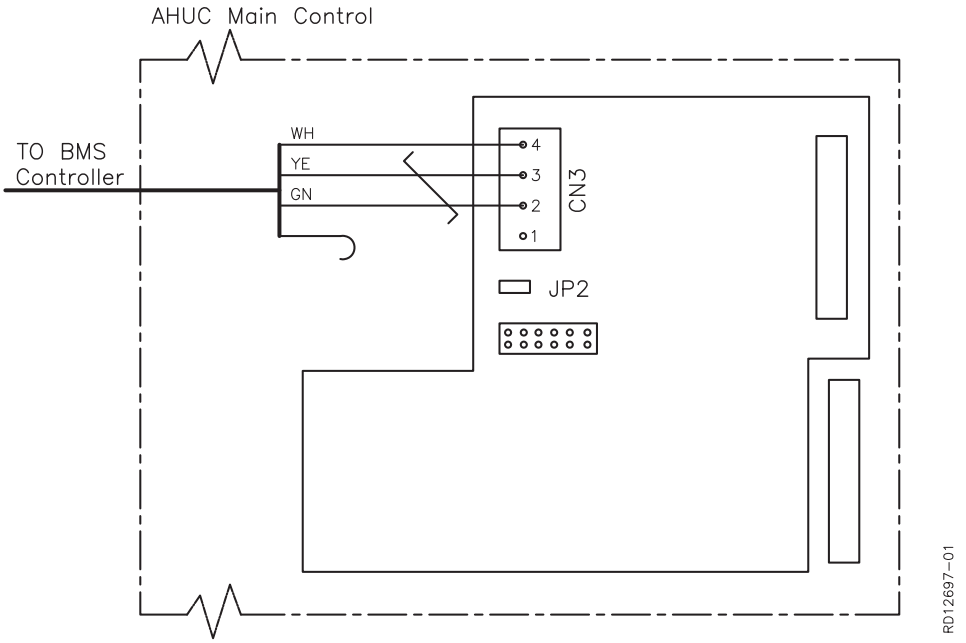
2.1 MSTP-liitäntä

Kaapeli

BACnet MSTP -kaapelin tulee olla 2 x 2 x 0,25□ -kokoinen kierretty parikaapeli.

BACnet MSTP -liitäntä kytketään pääohjauksen CN3:een. Vain BACnet MSTP A, B ja runko voidaan asentaa. Katso kaaviota.

EXact/EXact2



Kaavioiden selitykset

CN3: BACnet MSTP (RS-485)

Liitäntä	Signaalin kuvaus
1	Ei voida liittää
2	RS485 + (A)
3	RS485 – (B)
4	0V DC (runko)

A- ja B-signaalin (liitännät 2-3) on oltava parikierretty.

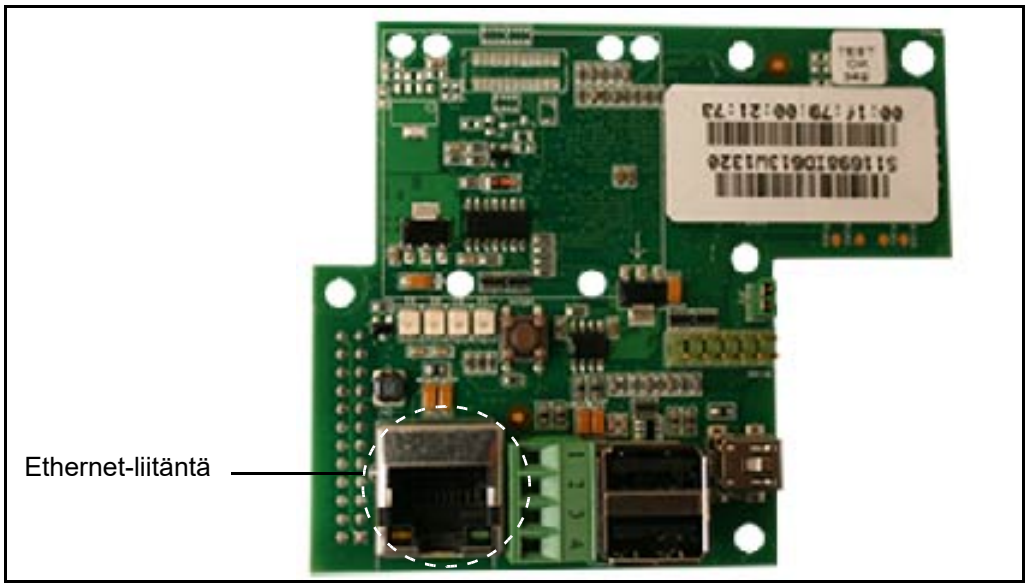
Terminointi

Jos EXact/EXact2-ohjaus on kaapelin viimeinen yksikkö, on asennettava 120 Ω:n terminointivastus. Tämä tehdään web-palvelimen JP2-hyppyjohtimella.

2.2 BACnet IP -liitäntä

Yhdistäminen verkkoon

Verkkopistoke asennetaan Ethernet-liitäntään. Jos web-palvelin liitetään suoraan tietokoneeseen, on käytettävä ristiinkytkettyä verkkokaapelia.
Tietokoneiden ei kuitenkaan tarvitse olla uusia.



MAC-osoite

Web-palvelimen MAC-osoite voidaan lukea web-palvelinpiiristä ja HMI-paneelin valikosta 3.6.

Kaapelin tyyppi ja pituus

Kaapeli	Kaapelin pituus
CAT5E STP-kaapeli (suojattu)	EXHAUSTOn suosittelema kaapelin enimmäispituus: 70 m.

2.2.1 Web-palvelimen säädöt

Web-palvelin tukee staattisia ja dynaamisia IP-osoitteita. Ne määritetään HMI-paneelin valikossa 3.6.

Esimerkki

3.6 Web-palvelin
DHCP Ei
IP-osoite
> 192.168.001.180
Aliverkkomaski
> 255.255.255.000
Vakioväylä
> 192.168.001.001
Porttinumero > 80
MAC-osoite
00:1F:79:00:00:D0
Vaihda salasana > Ei

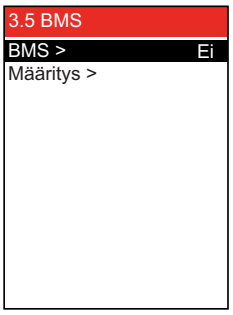
Katso EXact-käyttöoppaasta, kuinka
- muutat asetuksia
- tallennat muutetut asetukset.

Portin numero

Jos samaan reitittimeen on yhdistetty useita laitteistoja, niille voidaan antaa erilaiset porttien numerot. Tällöin port forwarding on käytettävissä.

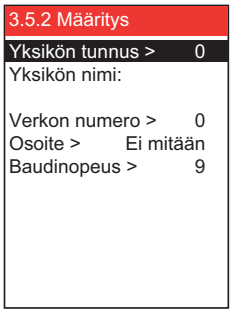
2.2.2 BACnet-asetukset

Esimerkki



- Valikossa 3.5 on valittava BMS-asetukseksi BACnet MSTP tai BACnet IP.

Vain BACnet MSTP



Aseta seuraavat järjestelmän pääkäyttäjän määrittämät arvot:

- Yksikön tunnus (0 - 4194303)
- Yksikön nimi: - voidaan asettaa vain Web-palvelimessa
- Verkon numero (0 - 65535)
- Osoite (0 - 127)
- Baudinopeus (9600, 19200, 115200)

Vain BACnet IP

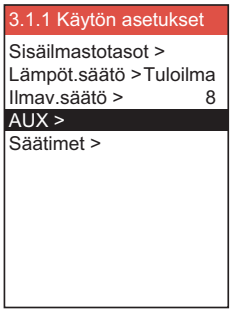
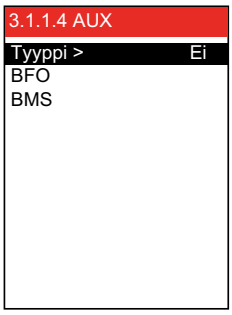
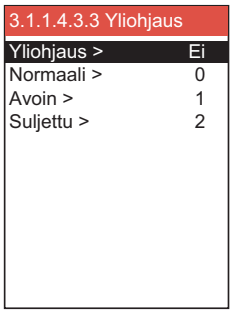
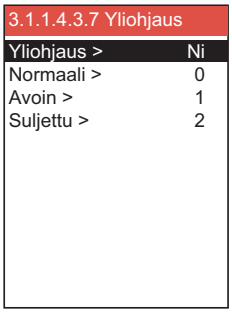
Aseta seuraavat järjestelmän pääkäyttäjän määrittämät arvot:

- Yksikön tunnus (0 - 4194303)
- Yksikön nimi: - voidaan asettaa vain Web-palvelimessa
- UDP-portti (47808-47823)

2.3 Ulkoisten peltien ohitusohjaaminen

Jos käytössä on ilmansäätömenetelmä 8 Puhallinnopeuksien ulkoinen säätö, tietyissä käyttötilanteissa on ohitusohjattava kanavajärjestelmän ulkoisia peltejä.
Ulkoinen pelti voi olla esimerkiksi VAV-pelti.
Tulipalo-, jäänpoisto- tai yöjäähdytystilanteessa VEX-laite voi lähettää signaalin BMS-laitteelle tulo- tai poistoilmakanavan pellin avaamiseksi tai sulkemiseksi.

2.3.1 Ohitusohjaustoiminnon asetukset (vain ilmansäätömenetelmä 8)

Vaihe	Toimenpide	Näytön näkymä
1	• Siirtää edelliseen Asetukset ->Laitteisto ->Käyttöasetukset -valikkoon. • Valitse Ilman rek. -asetukseksi 8.	
2	• Siirtää AUX-valikkoon. • Aseta Tyyppi-asetukseksi BMS.	
3	• Siirtää BMS-valikkoon. • Siirtää Tuloilma-kohdan Ohitusohjaus-valikkoon. • Valitse Ohitusohjaus-asetukseksi Kyllä. • Aseta Normaali-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen ei tarvitse ohitusohjata tuloilmapeltiä. • Aseta Avaa-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen täytyy avata tuloilmapelti. • Aseta Sulje-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen täytyy sulkea tuloilmapelti. • Siirtää takaisin BMS-valikkoon.	
3	• Siirtää Poistoilma-kohdan Ohitusohjaus-valikkoon. • Valitse Ohitusohjaus-asetukseksi Kyllä. • Aseta Normaali-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen ei tarvitse ohitusohjata poistoilmapeltiä. • Aseta Avaa-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen täytyy avata poistoilmapelti. • Aseta Sulje-kohtaan arvo, joka halutaan lähettää, kun VEX-laitteen täytyy sulkea poistoilmapelti. • Huomaa, että Normaali-, Avaa- ja Sulje-arvot eivät saa olla samoja.	
Jos ohitusohjausta ei tarvita, yhden kanavan tai molempien kanavien Ohitusohjaus-arvoksi asetetaan Ei.		

2.4 Esimerkki laitteiston ohjaamisesta

2.4.1 Ilmamäärän, tuloilman lämpötilan ja manuaalisen tilan / ajastusohjelman ohjaus

Ilmamäärän asetus

Vaihe	Toimenpide
1	Aseta Object type AV - Index 06 **-** BMSInValue.AirSP -arvo väliltä 0 - 100 %. Arvo 0 % pysäyttää laitteen.

Tuloilman lämpötilan asetus

Vaihe	Toimenpide
1	Aseta Object type AV - Index 07 **-** BMSInValue.TempSP -arvo alueelle 10 - 35 °C. Huomaa: Muut asetukset ja toiminnot voivat rajoittaa lämpötilan asetuspistettä.

Ajastinohjelma Aseta Object type BV - Index 00 - BMSInValue.CtrlMode -arvoksi 1, jos laitteiston halutaan palaavan ajastinohjelmaan.

3. Appendix - Complete list of Registers - in English

3.1 Appendix

3.1.1 Object type AV

Index	Name	Default value	Poll interval	Unit	Description
00	BMSInValue.TimeSecond	60.0	30	73/Seconds	Second from internal real time clock
01	BMSInValue.TimeMinute	60.0	30	72/Minutes	Minute from internal real time clock
02	BMSInValue.TimeHour	24	30	71/Hours	Hour from internal real time clock
03	BMSInValue.TimeDay	0	30	70/Day	Day in month from internal real time clock
04	BMSInValue.TimeMonth	0	30	68/Month	Month from internal real time clock
05	BMSInValue.TimeYear	2099	30	67/Year	Year from internal real time clock
06	BMSInValue.AirSP	1001	30	98/%	Airflow set point. This register sets the airflow set point.
07	BMSInValue.TempSP	0	30	62/°C	Temperature set point: This register is used to set the temperature set point to the supply air or room temperature regulator, depending the configuration.
08	BMSInValue.AirSPFixed	10001	30	87/ l/s	Fixed airflow set point: This register sets the airflow set point for the extract air air fan or supply air fan, when using air regulation method 4 or 3.
09	BMSInValue.Balance	0	30	95	Air balance: This register indicates the balance set point between supply air and extract air set point.
10	BMSInValue.RH	0	30	98/%	Relative humidity: This register holds the measured RH value for the compensation function.
11	BMSInValue.CO2	0	30	96/ppm	CO2: This register holds the measured CO2 value for the compensation function.
12	BMSInValue.OutDTemp	1500	30	62/°C	Outdoor temperature compensation of supply air: This register holds the measured temperature for the compensation function.
13	BMSInValue.AirRedTemp	1500	30	62/°C	Supply temperature controlled air reduction: This register holds the measured temperature for the compensation function.
14	BMSInValue.EFdPWarn	256	30	53/Pa	Extract air filter warning level: This register holds the value for the extract air filter warning level.
15	BMSInValue.EFdPAlm	256	30	53/Pa	Extract air filter alarm level: This register holds the value for the extract air filter alarm level.
16	BMSInValue.SFdPWarn	256	30	53/Pa	Supply air filter warning level: This register holds the value for the supply air filter warning level.

3.1.1 Object type AV

Index	Name	Default value	Poll interval	Unit	Description
17	BMSInValue.SFdPAlm	256	30	53/Pa	Supply filter alarm level: This register holds the value for the supply air filter Alarm level.
18	VEXConfig.HeatRegType	0	30	95	Heat regulator type: This variable holds the value for the current heat regulator type. 0 = Supply temperature regulation. 1 = Room temperature regulation.
19	BMSInValue.AUXExtSet	1001	30	98/%	Extract fan speed setpoint when controlling VEX unit from BMS. 0-1000 = 0.0-100.0%. 1001 = default value. Air reg. = 8 (menu 3.1.1) and AUX = BMS (menu 3.1.14).
20	BMSInValue.AUXSupSet	1001	30	98/%	Supply fan speed setpoint when controlling VEX unit from BMS. 0-1000 = 0.0-100.0%. 1001 = default value. Air reg. = 8 (menu 3.1.1) and AUX = BMS (menu 3.1.14).
21	BMSOutValue.AUXExtOr	65535	30	95	BMS override output for dampers in extract duct. This variable holds a user specified value, that indicates weather external dampers must be open, closed or free running. See “EXact menuguide” for instructions.
22	BMSOutValue.AUXSupOr	65535	30	95	BMS override output for dampers in supply duct. This variable holds a user specified value, that indicates weather external dampers must be open, closed or free running. See “EXact menuguide” for instructions.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
0	BMSOutValue.IpAdr3	0.0	30	95	IP Address 1: This register indicates the IP address for the onboard webserver.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
01	BMSOutValue.IpAdr2	0.0	30	95	IP Address 2: This register indicates the IP address for the onboard webserver.
02	BMSOutValue.IpAdr1	0.0	30	95	IP Address 3: This register indicates the IP address for the onboard webserver.
03	BMSOutValue.IpAdr0	0.0	30	95	IP Address 4: This register indicates the IP address for the onboard webserver.
04	BMSOutValue.IpMask3	0.0	30	95	IP Mask 1: This register indicates the IP mask for the onboard webserver.
05	BMSOutValue.IpMask2	0.0	30	95	IP Mask 2: This register indicates the IP mask for the onboard webserver.
06	BMSOutValue.IpMask1	0.0	30	95	IP Mask 3: This register indicates the IP mask for the onboard webserver.
07	BMSOutValue.IpMask0	0.0	30	95	IP Mask 4: This register indicates the IP mask for the onboard webserver.
08	BMSOutValue.IpGateway3	0.0	30	95	IP Gateway 1: This register indicates the IP gateway for the onboard webserver.
09	BMSOutValue.IpGateway2	0.0	30	95	IP Gateway 2: This register indicates the IP gateway for the onboard webserver.
10	BMSOutValue.IpGateway1	0.0	30	95	IP Gateway 3: This register indicates the IP gateway for the onboard webserver.
11	BMSOutValue.IpGateway0	0.0	30	95	IP Gateway 4: This register indicates the IP gateway for the onboard webserver.
12	FC1.WFreqRef	0.0	30	95	MC1 setpoint: Depends on the motortype; Hz for FC-motors and rpm for EC-motors. This register indicates the current frequency output from the FC.
13	FC1.OutPower	0.0	30	47/W	FC1 power: This register indicates the current power output from the FC.
14	FC2.WFreqRef	0.0	30	95	MC2 setpoint: Depends on the motortype; Hz for FC-motors and rpm for EC-motors. This register indicates the current frequency output from the FC.
15	FC2.OutPower	0.0	30	47/W	FC2 power: This register indicates the current power output from the FC.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
16	RHX2M.Setpoint	0.0	30	98/%	RHX2M set point: This register indicates is the set point for the rotary heat exchanger unit.
17	MHC1.Setpoint	0.0	30	98/%	Heating unit 1 set point: This register indicates the set point for the heating unit.
18	MHC1.ValveSet	0.0	30	98/%	Heating unit 1 status: This register indicates the status of the heating unit. Value: 0 = Heat retetion mode 1 = Normal operation, with frost safety surveliance activated.
19	MHC1.MHCE_Out	0.0	30	98/%	Heating unit 1 valve set point: This register indicates the set point to the valve.
20	MHC4.Setpoint	0.0	30	98/%	External cooling unit set point This register indicates the set point to the cooling unit.
21	MHC4.ValveSet	0.0	30	98/%	External cooling unit valve set point This register indicates the set point to the valve.
22	MCUC.Setpoint	0.0	30	98/%	Cooling unit set point: This register indicates the set point to the cooling unit.
23	Air.Setpoint	0.0	30	98/%	Airflow set point: This register indicates the actual airflow set point in percent.
24	Air.SetpointFix	0.0	30	87/ l/s	Fixed airflow set point This register indicates the airflow set point for the extract air fan or supply fan, when using air-flow regulation methode 4 or 3.
25	Air.ExtSpeed	0.0	30	98/%	Extract air fan speed: This register indicates the fan speed.
26	Air.ExtSpeedMin	0.0	30	98/%	Minimum extract air fan speed: This register indicates the minimum fan speed.
27	Air.ExtSpeedMax	0.0	30	98/%	Maximum extract air fan speed: This register indicates the maximum fan speed.
28	Air.SupSpeed	0.0	30	98/%	Supply air fan speed: This register indicates the fan speed.
29	Air.SupSpeedMin	0.0	30	98/%	Minimum supply air fan speed: This register indicates the minimum fan speed.
30	Air.SupSpeedMax	0.0	30	98/%	Maximum supply air fan speed: This register indicates the maximum fan speed.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
31	Air.SetpComp	0.0	30	98/%	Airflow set point compensated: This register is used to indicate the compensated air set point. CO2 and RH level affects this value.
32	Air.SetpExt	0.0	30	98/%	Extract air set point: This register indicates the set point to the extract airflow regulator. This is the output from either fixed speed, constant flow or constant pressure regulator.
33	Air.SetpSup	0.0	30	98/%	Supply air set point: This register indicates the set point to the supply airflow regulator. This is the output form either fixed speed, constant flow or constant pressure regulator.
34	Air.Mode	0.0	30	95	Airflow regulator mode: This register indicates the state of the airflow regulator. Value: 0 = OFF 1 = Starting 2 = Dampers opening 3 = Extract air fan starting 4 = Supply air fan starting 5 = Unit is running 6 = Unit is stopping but is doing post ventilation 7 = Dampers are closing
35	Air_Qv.ExtP_InLet	0.0	30	53/Pa	Extract air fan inlet pressure: This register indicates the pressure drop across the extract air fan inlet. This pressure is converted to temperature compensated flow in index 36.
36	Air_Qv.Ext_Qv	0.0	30	87/ l/s	Extract air flow: This register indicates flow in the extract air duct.
37	Air_Qv.SupP_Inlet	0.0	30	53/Pa	Supply air fan inlet pressure: This register indicates the pressure drop across the supply air fan inlet. This pressure is converted to temperature compensated flow in index 38.
38	Air_Qv.Sup_Qv	0.0	30	87/ l/s	Supply airflow: This register indicates airflow in the supply air duct.
39	Air_Filter.Extract	0.0	30	53/Pa	Extract air filter pressure drop: This register indicates the pressure drop across the extract air filter.
40	Air_Filter.Supply	0.0	30	53/Pa	Supply air filter pressure drop: This register indicates the pressure drop across the supply air filter.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
41	Air_Duct.Extract	0.0	30	53/Pa	Extract air duct pressure. This register indicates the pressure in extract air duct.
42	Air_Duct.Supply	0.0	30	53/Pa	Supply air duct pressure. This register indicates the pressure in supply air duct.
43	AirCFExt.SP_Unit	0.0	30	87/ l/s	Constant extract airflow regulator set point: This register indicates the set point for the extract air flow regulator.
44	AirCFExt.PV_Unit	0.0	30	87/ l/s	Constant extract airflow regulator feedback: This register indicates the set point for the extract air flow regulator.
45	AirCFSup.SP_Unit	0.0	30	87/ l/s	Constant supply airflow regulator set point: This register indicates the set point for the supply air flow regulator.
46	AirCFSup.PV_Unit	0.0	30	87/ l/s	Constant supply airflow regulator feedback: This register indicates the set point for the supply air flow regulator.
47	AirCSExt.SP_Unit	0.0	30	98/ %	Constant extract air speed regulator set point: This register indicates the set point for the extract air speed regulator.
48	AirCSSup.SP_Unit	0.0	30	98/ %	Constant supply air speed regulator set point: This register indicates the set point for the supply air speed regulator.
49	AirCPExt.SP_Unit	0.0	30	53/Pa	Constant extract air pressure regulator set point: This register indicates the set point for the extract air pressure regulator.
50	AirCPExt.PV_Unit	0.0	30	53/Pa	Constant extract air pressure regulator feedback: This register indicates the set point for the extract air pressure regulator.
51	AirCPSup.SP_Unit	0.0	30	53/Pa	Constant supply air pressure regulator set point: This register indicates the set point for the supply air pressure regulator.
52	AirCPSup.PV_Unit	0.0	30	53/Pa	Constant supply air pressure regulator feedback: This register indicates the set point for the supply air pressure regulator.
53	Alarm.Alarm0	0.0	30	95	Current active alarm 1 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
54	Alarm.Alarm1	0.0	30	95	Current active alarm 2 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
55	Alarm.Alarm2	0.0	30	95	Current active alarm 3output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
56	Alarm.Alarm3	0.0	30	95	Current active alarm 4 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
57	Alarm.Alarm4	0.0	30	95	Current active alarm 5 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
58	Alarm.Alarm5	0.0	30	95	Current active alarm 6 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
59	Alarm.Alarm6	0.0	30	95	Current active alarm 7 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
60	Alarm.Alarm7	0.0	30	95	Current active alarm 8 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
61	Alarm.Alarm8	0.0	30	95	Current active alarm 9 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
62	Alarm.Alarm9	0.0	30	95	Current active alarm 10 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
63	Alarm.Alarm10	0.0	30	95	Current active alarm 11 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
64	Alarm.Alarm11	0.0	30	95	Current active alarm 12 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
65	Alarm.Alarm12	0.0	30	95	Current active alarm 13 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
66	Alarm.Alarm13	0.0	30	95	Current active alarm 14 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
67	Alarm.Alarm14	0.0	30	95	Current active alarm 15 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
68	Alarm.Alarm15	0.0	30	95	Current active alarm 16 output: The register shows there is an active alarm. See also EXact control menu 4.5 "Current List".
69	Balance.Balance	0.0	30	95	Air balance: This register indicates balance set point between supply air and extract air set point.
70	Comp_Room.SP_Comp	0.0	30	62/°C	Outdoor temperature compensation of room temperature set point: This register indicates the set point for starting of room temperature compensation
71	Comp_Supply.SP_Comp	0.0	30	62/°C	Outdoor temperature compensation of supply air temperature set point: This register indicates the set point for beginning of supply air temperature compensation

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
72	Manager.ActProfile	0.0	30	95	Active profile: This register indicates which profile is active. Value: -1 = Off 0 = Comfort 1 = Standby 2 = Economy
73	Counter.Heat1	0.0	30	95	Hour count heating unit 1: This register indicates the hour count for the unit.
74	Counter.Rotor	0.0	30	95	Hour count rotary heat exchanger unit: This register indicates the hour count for the unit.
75	Counter.Cool	0.0	30	95	Hour count cooling unit: This register indicates the hour count for the unit.
76	Counter.ExtractFan	0.0	30	95	Hour count extract air fan unit: This register indicates the hour count for the unit.
77	Counter.SupplyFan	0.0	30	95	Hour count supply air fan unit: This register indicates the hour count for the unit.
78	Temp_Set.Setpoint	0.0	30	62/°C	Temperature set point: This register indicates the current temperature set point.
79	Temp_Set.Setpoint	0.0	30	62/°C	Compensated temperature set point: This register indicates the compensated temperature regulator set point.
80	Temp_Set.State	0.0	30	95	Temperature regulator status: This register indicates if the temperature regulator is active. State: 0 = Not active, 1 = Active
81	Temp_Set.Mode	0.0	30	95	Temperature regulator mode: This register indicates the current mode of the temperature regulator. Value 0 = Automatic. Automatic switching between heating, recovery and cooling. Value 4 = Night cooling active. Value 6 = Unit is in Master OFF. Value 10 = Cooling recovery is active. Value 13 = Unit has been temporarily forced into Economy mode (during start-up only). Value 255 = Non-initialised value (during power-up only).
82	Temp_Output.Heat1	0.0	30	98/%	Heating unit 1 set point: This register indicates the set point for heating unit 1.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
83	Temp_Output.Recov_Heat	0.0	30	98/%	Heat recovery unit set point: This register indicates the set point for the heat recovery unit.
84	Temp_Output.Recov_Cool	0.0	30	98/%	Cool recovery unit set point: This register indicates the set point for the cool recovery unit.
85	Temp_Output.Cool	0.0	30	98/%	Cooling unit set point: This register indicates the set point for the cooling unit.
86	TempCSupply.Setpoint	0.0	30	62/°C	Constant supply temperature regulator set point: This register indicates the set point for the supply air temperature regulator
87	TempCSupply.Feedback	0.0	30	62/°C	Constant supply air temperature regulator feedback: This register indicates the feedback for the supply air temperature regulator
88	TempCSupply.Sp_Heat1	0.0	30	62/°C	Heating unit 1 regulator set point: This register indicates the set point for the heating unit 1 regulator
89	TempCSupply.Sp_Recover	0.0	30	62/°C	Recovery unit regulator set point: This register indicates the set point for the recovery unit regulator.
90	TempCSupply.Sp_Cool	0.0	30	62/°C	Cooling unit regulator set point: This register indicates the set point for the cooling unit regulator.
91	TempCRoom.Setpoint	0.0	30	62/°C	Constant room temperature regulator set point: This register indicates the set point for the room temperature regulator
92	TempCRoom.Feedback	0.0	30	62/°C	Constant room temperature regulator feedback: This register indicates the feedback for the room temperature regulator
93	TempCRoom.Output	0.0	30	62/°C	Constant room temperature regulator: This register indicates the output of the room temperature regulator
94	Temp_Sensor.Supply	0.0	30	62/°C	Supply air temperature sensor: This register indicates the value of the current active supply air temperature sensor.
95	Temp_Sensor.SupplyInt	0.0	30	62/°C	Supply air temperature sensor internal: This register indicates the value of the internal supply air temperature sensor.
96	Temp_Sensor.SupplyHeat1	0.0	30	62/°C	Supply air temperature sensor heating unit 1: This register indicates the value of the supply air temperatur sensor in heating unit 1.
97	Temp_Sensor.SupplyCool	0.0	30	62/°C	Supply air temperature sensor cooling unit: This register indicates the value of the supply air temperatur sensor in the cooling unit.
98	Temp_Sensor.Outdoor	0.0	30	62/°C	Outdoor air temperature sensor: This register indicates the value of the current active outdoor air temperatur sensor.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
99	Temp_Sensor.OutdoorInt	0.0	30	62/°C	Outdoor air temperature sensor internal: This register indicates the value of the internal outdoor air temperatur sensor.
100	Temp_Sensor.OutdoorExt	0.0	30	62/°C	Outdoor air temperature sensor external: This register indicates the value of the external outdoor air temperatur sensor.
101	Temp_Sensor.Exhaust	0.0	30	62/°C	Exhaust air temperature sensor: This register indicates the value of the exhaust air temperatur sensor.
102	Temp_Sensor.Extract	0.0	30	62/°C	Extract air temperature sensor: This register indicates the value of the current active extract air temperatur sensor.
103	Temp_Sensor.ExtractInt	0.0	30	62/°C	Extract air temperature sensor internal: This register indicates the value of the internal extract air temperatur sensor.
104	Temp_Sensor.ExtractRoom	0.0	30	62/°C	Extract air temperature sensor external: This register indicates the value of the External extract air temperatur sensor.
105	Temp_Sensor.RetPipe1	0.0	30	62/°C	Return pipe temperature heating coil 1: This register indicates the temperature on the internal return pipe on water heating coil 1 (TE-RPT).
106	Temp_Sensor.RetPipeX1	0.0	30	62/°C	Return pipe temperature external heating coil 1: This register indicates the temperature on the external return pipe on water heating coil 1 (TE-RPT-X).
107	Temp_Sensor.SupPipe1	0.0	30	62/°C	Supply pipe temperature heating coil 1: This register indicates the temperature on the internal supply air pipe on water heating coil 1 (TE-SPT).
108	DeIce.HeatExPress	0.0	30	53/Pa	Pressure across the heat exchanger in the extract air. This variable indicates the current pressure across the heat exchanger. A increasing pressure at a constant air flow can indicate either moisture or ice build up inside the heat exchanger.
109	DeIce.PressInc	0.0	30	98/%	Heat exchanger pressure increase in %. This variable indicates how much the pressure has increased, across the heat exchanger compared to the normal pressure drop, when the heat exchanger is dry. Values over 0% indicates build up of moisture or ice.
110	Temp_Sensor.TIce	0.0	30	62/°C	Temperature inside the heat exchanger. This variable shows the temperature inside the heat exchanger. This is used to control the deice function, when the DeIce function is set to TIce.

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
111	VEXConfig.AirRegType	0.0	30	95	Air regulations method. This variable shows which air regulation current is active. 1 - Manual control 2 - Airflow control 3 - Constant pressure regulation of extract air 4 - Constant pressure regulation of supply air 5 - Constant pressure regulation of extract air 6 - Constant pressure regulation of supply air 7 - Constant pressure regulation of both extract air and supply air 8 - External control of fan speeds
112	NightCool.Status	0.0	30	95	Night-time cooling status: This output network variable indicates if the night cooling function is active State: 0 = Inactive, 1 = Active.
113	DeIce.State	0.0	30	95	Active DeIce state. This variable indicates which DeIce state currently is active. 0 = Off. No Ice is detected. 1 = Idle. Ice is preset, but deIce is not yet active. 2 = Return Air (VEX340 Only) or Bypass deice function is active. 3 = Balanced air reduction is active. 4 = Unbalanced supply air reduction is active. 5 = Unbalanced extract air increase is active. 6 = Hibernation. VEX unit is temporarily in hibernation. 7 = Hibernation restart. VEX unit is attempting to restart after hibernation. 8 = Deice falied. The pressure across the heat exchanger has exceeded maximum allowed pressure or the number of restart attempts has been exceeded.
114	MXHP.HeatCap	0.0	30	98/%	MXHP heating setpoint This register indicates the set point for the MXHP, when it is heating.
115	MXHP.CoolCap	0.0	30	98/%	MXHP cooling setpoint This register indicates the set point for the MXHP, when it is cooling.
116	MXHP.StartStop	0.0	30	95	MXHP status This register value indicates the status of the MXHP module: 0 = OFF, 1 = ON
117	MXHP.CoolHeat	0.0	30	95	MXHP cooling - heating mode This register value indicates the cooling - heating mode of the MXHP module: 0 = Cooling mode 1 = Heating mode

3.1.2 Object type AI

Index	Name	Default value	Poll interval	Unit/ Active text	Description
118	MHC4.AlarmReg	0.0	30	95	MXHP alarm status This register value indicates the alarm status of the MXHP: 0 = No alarm 1 = Temperture sensor disconnected 2 = Temperture sensor shortcircuited 4 = External DX unit alarm
119	MCOCW.CoolHeat	0.0	30	95	MCOCW cooling - heating mode This register value indicates the cooling - heating mode of the MCOCW module: 0 = Cooling mode 1 = Heating mode
120	MHC1.AlarmReg	0.0	30	95	MCOCW summarized alarm This register value indicates the alarm status of the MCOCW: 0 = No alarm 1 = Summarized alarm. All alarms regarding MCOCW.

3.1.3 Object type BV

Index	Name	Default value	Poll interval	Unit/ Active text	Unit/ Inactive text	Description
00	BMSInValue.CtrlMode	0	30	On	Off	Control mode: This register holds the value for the control mode of the Unit. Value: Off = Manual, Value: On = Weekly plan
01	BMSInValue.ResetAlarm	0	30	On	Off	Alarm reset: This register holdes the value for the alarm reset flag. Value: Off = Not active, Value: On = Active
02	BMSInValue.NightCoolEn	0	30	On	Off	Night-time cooling enabled: This register holds the enable value for the night cooling function. Value: Off = Disabled, On = Enabled

3.1.4 Object type BI

Index	Name	Default value	Poll interval	Unit/Active text	Unit/Inactive text	Description
01	Alarm.A_Alarm	0	30	On	Off	A Alarm. This variable shows if an A alarm is active. A Alarm is set when alarms codes ending on 3, 4 or 5 are active.
02	Alarm.B_Alarm	0	30	On	Off	B Alarm (Warning). This variable shows if a B alarm is active. B Alarm is set when alarm codes ending on 2 are active.
03	BMS_Config.UseDHCP	0	30	Yes	No	Use DHCP: This register indicates if the onboard webserver uses DHCP. State: Off = Does not use DHCP , On = Uses DHCP
04	FC1.Operation	0	30	On	Off	FC1 operation: This register indicates if the FC is running or not. State: Off = Not running, On = Running
05	FC2.Operation	0	30	On	Off	FC2 operation: This register indicates if the FC is running or not. State: Off = Not running, On = Running
06	RHX2M.On_Off	0	30	On	Off	DRHX status: This register indicates if the rotary heat exchanger unit is online or not. State: Off = Not running, On = Running
07	MHC1.Run	0	30	On	Off	Heating unit 1 status: This register indicates the status of the heating unit. Value: Off = Heat retetion mode, Off = Normal operation, with frost safety survelliance activated.
08	MHC1.PumpState	0	30	On	Off	Heating unit 1 pump state This register indicates the current state of the pump.
09	MHC4.Run	0	30	On	Off	External cooling unit status This register indicates the status of the cooling unit.
10	MHC4.PumpState	0	30	On	Off	External cooling unit pump status: This register indicates the current state of the pump.
11	MCUC.State	0	30	On	Off	Cooling unit status: This register indicates the status of the cooling unit.
12	Air.LSA	0	30	On	Off	Extract air damper status: This register indicates the state of the extract air damper. State: Off = Closed, On = Open

3.1.4 Object type BI

Index	Name	Default value	Poll interval	Unit/Active text	Unit/Inactive text	Description
13	Air.LSF	0	30	On	Off	Supply air damper status: This register indicates the state of the supply air damper. State: Off = Closed, On = Open
14	Air.State	0	30	On	Off	State: This register indicates if the unit is running or not.
15	Comp_RH.Active	0	30	On	Off	Relative humidity compensation status: This register indicates if RH compensation is active. State: Off = Inactive, On = Active
16	Comp_CO2.Active	0	30	On	Off	CO2 compensation status: This register indicates if CO2 compensation is active. State: Off = Inactive, On = Active
17	Comp_OutD.Active	0	30	On	Off	Outdoor temperature compensation of supply air status: This register indicates if outdoor temperature compensation of supply air is active. State: Off = Inactive, On = Active
18	Comp_AirR.Active	0	30	On	Off	Supply air temperature controlled air reduction status: This register indicates if supply air temperature controlled air reduction is active. State: Off = Inactive, On = Active
19	Comp_Room.Active	0	30	On	Off	Outdoor temperature compensation of room temperature status: This register indicates if outdoor air temperature compensation of room temperature is active. State: Off = Inactive, On = Active
20	Comp_Supply.Active	0	30	On	Off	Outdoor temperature compensation of supply air temperature active: This register indicates if outdoor temperature compensation of supply air temperature is active. State: Off = Inactive, On = Active
21	VEXConfig.DST	0	30	On	Off	Daylight savings time: This register indicates if daylight savings time is now. State: Off = No, On = Yes
22	DeIce.Allowed	0	30	On	Off	DeIce allowed. This variable shows if the DeIce function is allowed. Off = Not allowed, On = Allowed
23	MHC1.FS_Activ	0	30	On	Off	Frost safty function for HCW is active. This variable shows if the frost safty function for either MHCW or iHCW currently is active. Off = Inactive , On = Active

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