DAIKIN APPLIED EUROPE S.p.A.

BAS integration guide

BACnet® protocol

Doc. Name:
D-EIGOC00103-21EN-DZ

Product name:
EWWD-DZ
EWWH-DZ

Control software name:
VORTEX

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1. Introduction

This document contains information to incorporate a MicroTech® III and Microtech 4 Unit Controllers into a building automation system (BAS) via BACnet communication protocols.

Microtech III and Microtech 4 are suitable for network integration. Data points accessible from a BACnet network are made available to a BAS provided that the proper communication module (Microtech III and Microtech 4) or the corresponding software option (Microtech 4) are installed / acrivated.

Communication settings and the BACnet® properties with corresponding controller data points are described.
BACnet® terms are not defined. Refer to the respective specifications for definitions and details.

2. About this document

2.1 Revision History

Version	Date	Description
D-EIGOC00103-21EN-DZ	14/04/2021	First edition

2.2 Notice

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- **BACnet** from American Society of Heating, Refrigerating and Air-Conditioning Engineers,
- **MicroTech** III from Daikin Applied Europe.
- **MicroTech 4** from Daikin Applied Europe.

2.3 Before starting

Application range

This document refers to the following components:

Microtech III	Controller
Microtech 4	Controller
POL908.00/STD	BACnet IP module
POL904.00/STD	BACnet MS/TP module

Users

Users of this document are intended to be:

- BACnet systems integrators
- Service Technicians
- Plant Engineers
- Sales staff

Conventions

Microtech III e Microtech 4 further in this document and when proper will be referred to as “Microtech”

Abbreviation

BACnet	**B**uilding **A**utomation and **C**ontrol **Net**work
BSP	**B**oard **S**upport **P**ackage (operating system)

References

- ANSI/ ASHRAE 135-2004. “**BACnet** - A Data Communication Protocol for Building Automation and Control Networks”. American Society of Heating, Refrigerating and Air-Conditioning Engineers - www.ashrae.org.
- Siemens Building Technologies - CB1P3933en - **BACnet** communication modules

3. Safety information

Only personnel qualified in accordance with IEC (International Electrotechnical Commission) recommendations may be permitted access to electrical components. It is particularly recommended that all sources of electricity to the unit be shut off before any work is begun. Shut off main power supply at the main circuit breaker or isolator.

IMPORTANT: This equipment uses and emits electromagnetic signals. Tests have shown that the equipment conforms to all applicable codes with respect to electromagnetic compatibility.

	**RISK OF ELECTROCUTION: Even when the main circuit breaker or isolator is switched off, certain circuits may still be energized, since they may be connected to a separate power source.**
	**RISK OF BURNS: Electrical currents cause components to get hot either temporarily or permanently. Handle power cable, electrical cables and conduits, terminal box covers and motor frames with great care.**

Field of application



Use BACnet communication modules only for control and monitoring functions in ventilation, air conditioning and refrigeration plants.

Intended use



Trouble-free and safe product operation of the above products presupposes transport, storage, mounting, installation, and commissioning as intended as well as careful operation.

Electrical installation



Fuses, switches, wiring and grounding must comply with local safety regulations for electrical installations.

Wiring



When wiring, strictly separate AC 230 V mains voltage from AC 24 V safety extralow voltage (SELV) to protect against electrical shock!

Commissioning and maintenance



Only qualified staff trained accordingly may prepare for use, commission, and maintain BACnet communication modules.

Maintenance of BACnet communication modules generally only means regular cleaning. We recommend removing dust and dirt from system components installed in the control panels during standard service.

Faults



Only authorized staff may diagnose and correct faults and recommission the plant. This applies to working within the panel as well (e.g. testing or changing fuses).

Storage and transport



Refer to the environmental conditions specified in the respective data sheets for storage and transport. If in doubt, contact your supplier.

Disposal



Devices contain electrical and electronic components; do not dispose of them in household garbage. Observe all local and applicable laws.

4. Commission this unit in a BACnet network

4.1 General information

Compatibility

The Microtech controllers are tested according to the BACnet Testing Laboratory (BTL) Test Plan. They are designed to meet the requirements of the BACnet Standard as stated in the Protocol Implementation and Conformance Statement (PICS). However, they are not BTL listed. The PICS is located at the end of the present document.

Unit controller is a Microtech III or a POL638

Microtech III controller can be integrated in an interoperable BACnet network provided that it is equipped with the proper communication module. See “Communication modules” section below in this page.

Unit controller is a Microtech 4

Microtech 4 controller can be integrated in an interoperable BACnet network provided one of the followings:

a) it is equipped with the proper communication module
b) the onboard communication has been made available (software option).

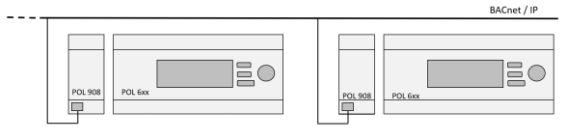
Communication modules

Available communication modules to configure Microtech controllers in BACnet network are:

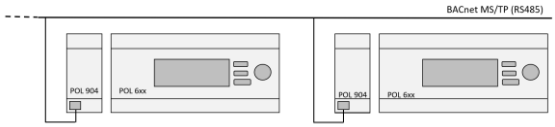
1. **BACnet/IP** (dedicated network or shared Ethernet LAN)
2. **BACnet MS/TP** (Master/Slave Token Passing).

Both communication modules comply with the standardized profile for BACnet equipment **(B-AAC BACnet Advanced Application Controller).**

BACnet/IP (POL908)



BACnet MS/TP (POL904)



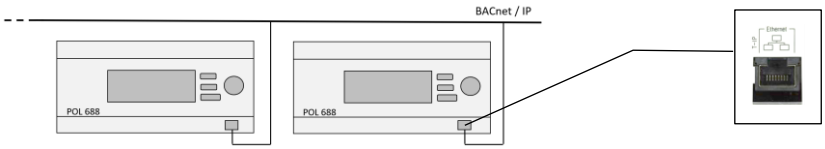
Communication software option

For Microtech 4, BACnet communication is also available onborad the controller as a software option.

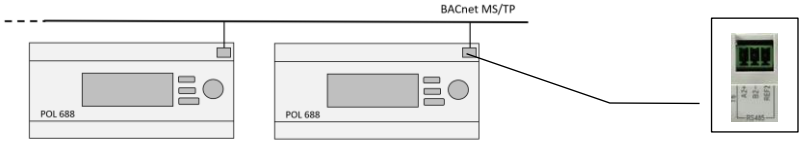
1. **BACnet/IP** (dedicated network or shared Ethernet LAN)
2. **BACnet MS/TP** (Master/Slave Token Passing).

Both communication options comply with the standardized profile for BACnet equipment **(B-AAC BACnet Advanced Application Controller).**

BACnet/IP

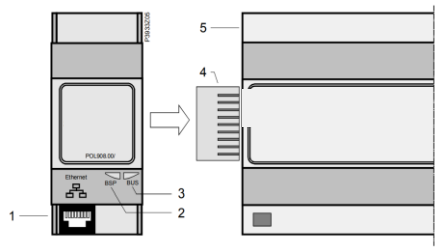


BACnet MS/TP



4.2 BACnet IP module (POL908)

Module description



Part	Description
1	Ethernet interface 10/100 Mbit (IEEE 802.3U), RJ45 plug, 8-pin.
2	Status display "BSP" (Board Support Package).
3	Status display "BUS" (bus connections / bus traffic o.k.).
4	Plug connection "Communication extension bus".
5	Microtech III controller.

BSP Led

Color	Flashing frequency	Meaning
Green	Steady on	BSP operating and communication with controller working.
Yellow	Steady on	BSP operating, but no communication with controller.
Red	Steady on	Hardware fault.
Red/Yellow	Flashing at 1 Hz (1 second on/ 1 second off)	Upgrade mode running.
Red	Flashing at 2 Hz (0,5 second on/ 0,5 second off)	BSP error (software error).

BUS Led

Color	Flashing frequency	Meaning
Green	Steady on	Communication active.
Yellow	Steady on	Initializing
Red	Steady on	Communication interrupted.

Module connection

Step	Action
1	Power off the controller
2	Connect POL908 module to the controller via plug connection (part 4).
3	Connect the TCP/IP bus cable to the POL908.
4	Power on the controller

Configuration

Step	Action
1	Check that BUS led status is steady on green coloured.
2	Navigate the unit's keypad/display to the main menu page and set the "service" password
3	Navigate the unit's keypad/display following the path below: **Main menu→Commissioning→BACNetIP Setup**
4	Set parameters in the table below as needed according to the local network

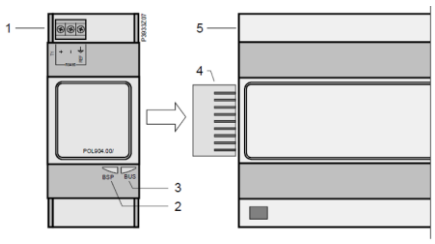
Parameter	Default value
Device Instance	1
UDP Port Number	47808 (BAC0)
DHCP(1)	OFF
Given IP Address[2]	127.0.0.1
Given IP Subnet Mask[2]	255.255.255.000
Given Gateway Address[2]	127.0.0.1
Unit Support	English
NC Dev 1	0
NC Dev 2	0

(1) Verify whether DHCP should or should not be enabled. If not, obtain the IP Subnet Mask of the shared network from the network administrator. Then, obtain static IP Addresses for all MicroTech III Unit Controllers you are integrating into the shared network. Finally, obtain the address of an IP Router to use for sending IP messages to and from the BACnet IP subnets.

(2) These addresses are used if DHCP (Dynamic Host Configuration Property) is set to Off. For changes to these parameters to take effect, use the keypad/display and set Apply Changes on the BACnet IP Setup menu to Yes. This will cause the power on the unit controller to reset.

4.3 BACnet MS/TP module (POL904.00/STD)

Module description



Part	Description
1	Interface RS485, plug-in terminals with screw/terminal connections.
2	Status display "BSP" (Board Support Package).
3	Status display "BUS" (bus connections / bus traffic o.k.).
4	Plug connection "Communication extension bus".
5	Microtech III controller.

BSP Led

Color	Flashing frequency	Meaning
Green	Steady on	BSP operating and communication with controller working.
Yellow	Steady on	BSP operating, but no communication with controller.
Red	Steady on	Hardware fault.
Red/Yellow	Flashing at 1 Hz (1 second on/ 1 second off)	Upgrade mode running.
Red	Flashing at 2 Hz (0,5 second on/ 0,5 second off)	BSP error (software error).

BUS Led

Color	Flashing frequency	Meaning
Green	Steady on	Communication active.
Yellow	Steady on	Initializing
Red	Steady on	Communication interrupted.

Module connection

Step	Action
1	Power off the controller
2	Connect POL904 module to the controller via plug connection (part 4).
3	Connect the TCP/IP bus cable to the POL908.
4	Power on the controller

Configuration procedure

Step	Action
1	Check that BUS led status is steady on green coloured.
2	Navigate the unit's keypad/display to the main menu page and set the "service" password
3	Navigate the unit's keypad/display following the path below: **Main menu→Commissioning→BACnetMSTP Setup**
4	Set parameters in the table below as needed according to the local network

Configuration parameters

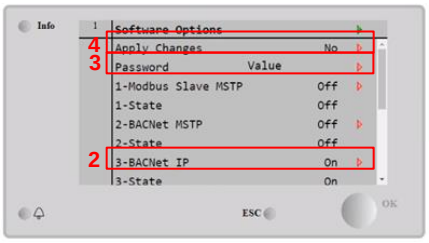
Parameter	Default value	Notes	
Device Instance	variable	The last 8 digits are computed from the production number and date code.	
MSTP Address	24 (0x18)	Cycle power after changing it for the changes to take effect.	
Baud Rate	38400	**Baud rate**	**Number of devices**
		76800	64
		38400	32
		19200 and lower	Value not recommended
Max Master	127	Recommended value is the number of MS/TP devices (device address) + 1	
Max Info Frames	1	1, unless device generates high-priority events (alarm, COV, client functionality).	
Unit Support	English		

4.4 BACnet / IP software option (Microtech 4)

Option enabling

1. From the HMI main menu choose:

   Commissioning→ Configuration→ Software Options

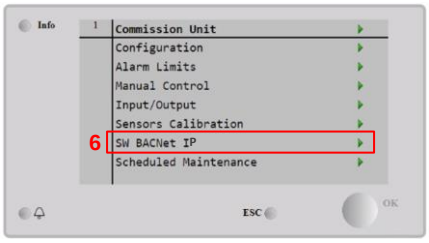


2. Select “On” for option #3-BACNet IP
3. Insert the unlock password
4. Apply Changes

Option configuration

5. From the HMI main menu choose:

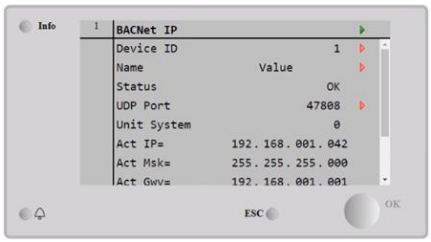
   Commissioning

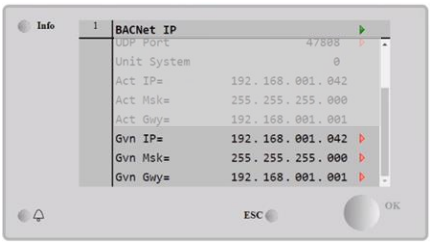


6. Select “SW BACNet IP”

7. Select proper parameters for BACNet IP communication

Parameter	Default value
Device Instance	1
UDP Port Number	47808 (BAC0)
DHCP(1)	OFF
Given IP Address[2]	127.0.0.1
Given IP Subnet Mask[2]	255.255.255.000
Given Gateway Address[2]	127.0.0.1
Unit Support	English
NC Dev 1	0
NC Dev 2	0





(1) Verify whether DHCP should or should not be enabled. If not, obtain the IP Subnet Mask of the shared network from the network administrator. Then, obtain static IP Addresses for all MicroTech 4 Unit Controllers you are integrating into the shared network. Finally, obtain the address of an IP Router to use for sending IP messages to and from the BACnet IP subnets.

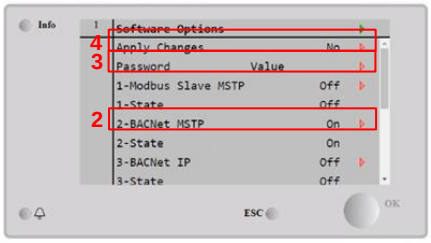
(2) These addresses are used if DHCP (Dynamic Host Configuration Property) is set to Off. For changes to these parameters to take effect, use the keypad/display and set Apply Changes on the BACnet IP Setup menu to Yes. This will cause the power on the unit controller to reset.

4.5 BACnet MS/TP software option (Microtech 4)

Option enabling

1. From the HMI main menu choose:

Commissioning→ Configuration→ Software Options

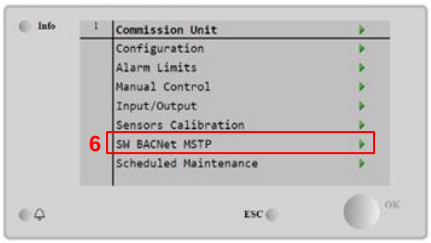


2. Select “On” for option #2-BACNet MSTP
3. Insert the unlock password
4. Apply Changes

Option configuration

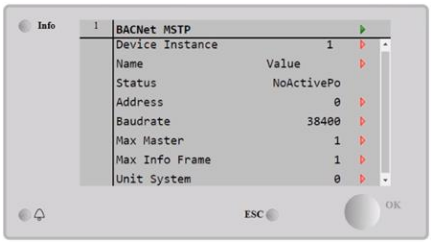
5. From the HMI main menu choose:

Commissioning



6. Select “SW BACNet MSTP”

7. Select proper parameters for BACNet MSTP communication



Parameter	Default value	Notes	
Device Instance	variable	-	
Address	0	MSTP Address	
Baud Rate	38400	**Baud rate**	**Number of devices**
		76800	64
		38400	32
		19200 and lower	Value not recommended
Max Master	1	Recommended value is the number of MS/TP devices (device address) + 1	
Max Info Frames	1	1, unless device generates high-priority events (alarm, COV, client functionality).	

5. VORTEX integration list

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Active Capacity Limit	ActiveCapacityLimit	AV	1	%	0..100%	1	Unsigned Word	R
Active Energy	ActiveEnergy	AV	990	kW	-	0.1	Signed Word	R
Active Leaving Water Target	ActiveLvgWaterTarget	AV	5	°C	-	0.1	Signed Word	R
Active Mode[1]	ActiveMode	MSV	2	-	1 = Cool 2 = Ice 3 = Heat 4 = Pursuit 5 = Cool/Heat Recovery	1	Unsigned Word	R
Unit general alarm	AlarmDigitalOutput	BI	10	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Active fault code	AVFaultAlarmCode	AV	905	-	See Annex 1	1	Unsigned Word	R
Active fault index	AVFaultAlarmIndex	AV	901	-	See Annex 1	1	Unsigned Word	R
Active problem code	AVProblemAlarmCode	AV	904	-	See Annex 1	1	Unsigned Word	R
Active problem index	AVProblemAlarmIndex	AV	900	-	See Annex 1	1	Unsigned Word	R
Active warning code	AVWarningAlarmCode	AV	903	-	See Annex 1	1	Unsigned Word	R
Active warning index	AVWarningAlarmIndex	AV	902	-	See Annex 1	1	Unsigned Word	R
Bad current limit input	BadCurrentLimitInput	BV	918	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Bad demand limit input	BadDemandLimitInput	BV	513	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Bad setpoint override input	BadSPointOverrideInput	BV	512	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

[1] *It is the actual unit mode, determined by the input selection and the available modes of the unit. See note about* "Chiller operating mode setpoint".

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Circuit #1 - Board offline	C1ControlBoardOffline	BV	882	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Circuit #2 - Board offline	C2ControlBoardOffline	BV	883	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Chiller capacity	ChillerCapacity	AV	2	%	0..100%	1	Unsigned Word	R
Chiller current	ChillerCurrent	AI	993	Amperes	-	1	Unsigned Word	R
Chiller enable state	ChillerEnableOutput	BI	7	-	0 = Disable 1 = Enable 2 = NULL	1	Unsigned Word	R
Chiller enable setpoint	ChillerEnableStp	BV	2	-	0 = Disable 1 = Enable 2 = NULL	1	Unsigned Word	R/W
Chiller Kilowatts	ChillerKilowatts	AV	994	kW	-	0.1	Signed Word	R
Chiller limited	ChillerLimited	BI	6	-	0 = Not limited 1 = limited 2 = NULL	1	Unsigned Word	R
Chiller Local/Remote	ChillerLocalRemote	BI	3	-	0 = Local 1 = Remote 2 = NULL	1	Unsigned Word	R/W
Chiller operating mode setpoint[2]	ChillerOperationMode	MSV	3	-	1 = Ice 2 = Cool 3 = Heat 4 = Pursuit	1	Unsigned Word	R/W
Chiller voltage	ChillerVoltage	AV	992	Volts	-	0.1	Signed Word	R
Clear alarm	ClearAlarm	BV	8	-	0 = No 1 = Yes 2 = NULL	1	Unsigned Word	R/W
Comp#1 - Actual capacity	Comp1ActCapacity	AV	131	%	0..100%	1	Unsigned Word	R
Comp#1 - Actual speed	Comp1ActualSpeed	AV	300	rpm	-	1	Unsigned Word	R
Comp#1 - Alarm active	Comp1AlarmActive	BV	991	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

[2] *The set unit mode must be compliant with the unit actual available modes. The available modes setpoint is located in View/Set Unit submenu of the controller HMI.*

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Comp#1 - Current	Comp1Current	AV	8	Amperes	-	1	Unsigned Word	R
Comp#1 - Discharge temperature	Comp1DischargeTemp	AI	62	°C	-	0.1	Signed Word	R
Comp#1 - Economizer pressure	Comp1EconomizerPress	AI	191	kPa	-	0.1	Signed Word	R
Comp#1 - IGV position	Comp1IGVPos	AV	290	%	0..100%	1	Unsigned Word	R
Comp#1 - Low discharge superheat	Comp1LowDSuperHeat	BV	961	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 - Off Bmc fault	Comp1OffBmcFault	BV	92	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 - Off Check Valve Fault	Comp1OffCheckVlvFault	BV	100	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 - Off Compressor fault	Comp1OffCmpFault	CS	322	-	0 = No Alarm 1 = Alarm	1	Unsigned Word	R
Comp#1 -Off Current High	Comp1OffCurrentHi	BV	606	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off Discharge pressure sensor fault	Comp1OffDischPSenf	BV	312	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off Disch temperature high	Comp1OffDischTempHi	BV	694	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off Motor temperature high	Comp1OFFMotorTempHi	BV	637	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off sensor fault	Comp1OffSensorFault	BV	304	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off suction pressure sensor fault	Comp1OffSuctPSenf	BV	316	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off suction temperature sensor fault	Comp1OFFSuctTempSen	BV	857	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Comp#1 -Off Vfd communication fail	Comp1OffVfdCommFail	BV	948	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Off Vfd fault	Comp1OffVfdFault	BV	886	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Over Voltage	Comp1OverVoltage	BV	655	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Power	Comp1Power	AV	45	kW	-	0.1	Signed Word	R
Comp#1 -Restart delay power low while run	Comp1RestartDelayPwrLRun	BV	529	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Run Hours	Comp1RunHours	AV	74	hours	-	1	Unsigned Word	R
Comp#1 -Starts	Comp1Starts	AV	92	-	0…4294967292	1	Unsigned Word	R
Comp#1 -Suction temperature	Comp1SuctionTemp	AI	105	°C	-	0.1	Signed Word	R
Comp#1 -Under Voltage	Comp1UnderVoltage	BV	661	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#1 -Voltage	Comp1Voltage	AV	27	Volts	-	0.1	Signed Word	R
Comp#2 -Actual capacity	Comp2ActCapacity	AV	132	%	0..100%	1	Unsigned Word	R
Comp#2 -Actual Speed	Comp2ActualSpeed	AV	301	rpm	-	1	Unsigned Word	R
Comp#2 -Alarm Active	Comp2AlarmActive	AV	992	-	0 = No Alarm 1 = Alarm	1	Unsigned Word	R
Comp#2 -Current	Comp2Current	AV	9	Amperes	-	1	Unsigned Word	R
Comp#2 -Discharge temperature	Comp2DischargeTemp	AI	63	°C	-	0.1	Signed Word	R
Comp#2 -Economizer pressure	Comp2EconomizerPress	AI	192	kPa	-	0.1	Signed Word	R
Comp#2 -IGV position	Comp2IGVPos	AV	291	%	0..100%	1	Unsigned Word	R
Comp#2 -Low discharge superheat	Comp2LowDSuperHeat	BI	962	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Bmc fault	Comp2OffBmcFault	BI	93	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Comp#2 -Off CheckValve fault	Comp2OffCheckVlvFault	BI	101	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Compressor fault	Comp2OffCmpFault	BI	323	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Current high	Comp2OffCurrentHi	BV	607	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Discharge pressure sensor fault	Comp2OffDischPSenf	BV	313	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Discharge temperature high	Comp2OffDischTempHi	BI	695	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -OFF Motor temperature high	Comp2OFFMotorTempHi	BI	638	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off sensor fault	Comp2OffSensorFault	BI	305	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off suction pressure sensor fault	Comp2OffSuctPSenf	BI	317	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off suction temperature sensor fault	Comp2OFFSuctTempSen	BI	858	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Vfd communication fail	Comp2OffVfdCommFail	BV	949	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Off Vfd fault	Comp2OffVfdFault	BV	887	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Over Voltage	Comp2OverVoltage	BV	656	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Power	Comp2Power	AV	46	kW	-	0.1	Signed Word	R
Comp#2 -Run Hours	Comp2RunHours	AV	75	hours	-	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Comp#2 -Starts	Comp2Starts	AV	93	-	0…4294967292	1	Unsigned Word	R
Comp#2 -Suction temperature	Comp2SuctionTemp	AI	106	°C	-	0.1	Signed Word	R
Comp#2 -Under voltage	Comp2UnderVoltage	BV	662	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#2 -Voltage	Comp2Voltage	AV	28	Volts	-	0.1	Signed Word	R
Comp#3 -Actual capacity	Comp3ActCapacity	AV	133	%	0..100%	1	Unsigned Word	R
Comp#3 -Actual Speed	Comp3ActualSpeed	AV	302	rpm	-	1	Unsigned Word	R
Comp#3 -Alarm Active	Comp3AlarmActive	BV	993	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Current	Comp3Current	AV	10	Amperes	-	0.1	Signed Word	R
Comp#3 -Discharge temperature	Comp3DischargeTemp	AI	64	°C	-	0.1	Signed Word	R
Comp#3 -Economizer pressure	Comp3EconomizerPress	AI	193	kPa	-	0.1	Signed Word	R
Comp#3 -IGV position	Comp3IGVPos	AV	292	%	0..100%	1	Unsigned Word	R
Comp#3 -Low discharge superheat	Comp3LowDSuperHeat	BV	965	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Bmc fault	Comp3OffBmcFault	BV	94	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off CheckValve fault	Comp3OffCheckVlvFault	BV	102	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Compressor fault	Comp3OffCmpFault	BV	324	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Current high	Comp3OffCurrentHi	BV	609	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Discharge pressure sensor fault	Comp3OffDischPSenf	BV	314	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Comp#3 -Off Discharge temperature high	Comp3OffDischTempHi	BI	698	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -OFF Motor temperature high	Comp3OFFMotorTempHi	BV	641	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off sensor fault	Comp3OffSensorFault	BV	306	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off suction pressure sensor fault	Comp3OffSuctPSenf	BV	318	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off suction temperature sensor fault	Comp3OFFSuctTempSen	BV	861	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Vfd communication fail	Comp3OffVfdCommFail	BV	952	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Off Vfd fault	Comp3OffVfdFault	BV	890	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Over Voltage	Comp3OverVoltage	BV	659	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Power	Comp3Power	AV	47	kW	-	0.1	Signed Word	R
Comp#3 -Run Hours	Comp3RunHours	AV	76	hours	-	1	Unsigned Word	R
Comp#3 -Starts	Comp3Starts	AV	94	-	0…4294967292	1	Unsigned Word	R
Comp#3 -Suction temperature	Comp3SuctionTemp	AI	107	°C	-	0.1	Signed Word	R
Comp#3 -Under voltage	Comp3UnderVoltage	BV	665	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Comp#3 -Voltage	Comp3Voltage	AV	29	Volts	-	0.1	Signed Word	R
Unit - Off condenser flow loss	CondenserFlowLoss	BV	674	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Unit - Off condenser freeze	CondenserFreeze	BV	989	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Condenser entering water temperature	CondEntWTemp	AI	3	°C	-	0.1	Signed Word	R
Condenser entering water temperature sensor fault	CondEWTSensorFault	BV	500	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Condenser flow switch status	CondFlowSwStatus	MSV	1	-	1 = Off 2 = On	1	Unsigned Word	R
Condenser leaving water temperature	CondLeavWTemp	AI	4	°C	-	0.1	Signed Word	R
Condenser leaving water temperature sensor fault	CondLWTSensorFault	BV	503	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Condenser pump #1 fault	CondPump1Fault	BV	548	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Condenser pump #1 run hours	CondPump1RunHrs	AV	110	hours	-	1	Unsigned Word	R
Condenser pump #1 status	CondPump1Status	BI	11	-	0 = PumpOffRequest 1 = PumpOnRequest 2 = NULL	1	Unsigned Word	R
Condenser pump #2 fault	CondPump2Fault	BV	549	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Condenser pump #2 run hours	CondPump2RunHrs	AV	111	hours	-	1	Unsigned Word	R
Condenser pump #2 status	CondPump2Status	BI	12	-	0 = PumpOffRequest 1 = PumpOnRequest 2 = NULL	1	Unsigned Word	R
Condensig refrigerant pressure	CondRefPressure	AI	99	kPa	-	0.1	Signed Word	R
Condensing saturated refrigerant temperature	CondSatRefTemp	AI	44	°C	-	0.1	Signed Word	R
CPM State	CPMState	AV	178	-	-	1	Unsigned Word	R
Current Limit setpoint network	CurrentLimSetpNtw	AV	175	Amperes	-	0.1	Signed Word	R/W
Emergency Stop Alarm	EmergencyStopAlarm	BV	921	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Energy Meter communication failt	EnergyMtrCommFail	BV	980	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Evaporator entering water temperature	EntEvapWaterTemp	AI	1	°C	-	0.1	Signed Word	R
Evaporator Approach temperature	EvapApproachT	AI	161	°C	-	0.1	Signed Word	R
Evaporator entering water temperature sensor fault	EvapEntWTempSensorFail	BV	917	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Evaporator EEXV position	EvapExvPos	AV	167	-	-	1	Unsigned Word	R
Evaporator Pump#1 fault	EvapPump1Fault	BV	575	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Evaporator Pump#1 run hours	EvapPump1RunHours	AV	112	hours	-	1	Unsigned Word	R
Evaporator Pump#1 status	EvapPump1Status	BI	8	-	0 = PumpOffRequest 1 = PumpOnRequest 2 = NULL	1	Unsigned Word	R
Evaporator Pump#2 fault	EvapPump2Fault	BV	576	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Evaporator Pump#2 run hours	EvapPump2RunHours	AV	113	hours	-	1	Unsigned Word	R
Evaporator Pump#2 status	EvapPump2Status	BI	9	-	0 = PumpOffRequest 1 = PumpOnRequest 2 = NULL	1	Unsigned Word	R
Evaporator water flow status	EvapWaterFlowStatus	BI	2	-	0 = No flow 1 = Flow	1	Unsigned Word	R
Evaporator water temperature inverted	EvapWTempInverted	BV	922	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
External Alarm	ExternalAlarm	BV	923	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
External Event	ExternalEvent	BV	924	-	0 = No Event 1 = Event 2 = NULL	1	Unsigned Word	R
Heat setpoint network	HeatSetpNetwork	AV	6	°C	0	0.1	Signed Word	RW

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Refrigerant leakage alarm	LeakAlarm	BV	988	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Liquid refrigerant line temperature	LiqLineRefTemp	AI	218	°C	-	0.1	Signed Word	R
Evaporator leaving water temperature	LvgEvapWaterTempUnit	AI	2	°C	-	0.1	Signed Word	R
McQ_Chiller	McQ_Chiller	AV	500	-	-	1	Unsigned Word	R
Capacity limit percentage network	NetworkCapacityLimitPct	AV	3	%	0..100%	1	Unsigned Word	R/W
Cool setpoint network	NetworkCoolTempSetpoint	AV	4	°C	0	0.1	Signed Word	R/W
Number of circuits	NumberOfCircuits	AV	171	-	0	1	Unsigned Word	R
Number of tons	NumberOfTons	AV	173	-	0	1	Unsigned Word	R
Option controller communication fail	OptionCtrlrCommFail	BV	919	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Power Factor	PowerFactor	AV	991	-	-	1	Unsigned Word	R
Refrigerant type	RefrigerantType	MSV	6	-	1 = R22 2 = R134a 3 = R407c 4 = R410a 5 = R1234ze 6 = R513a	1	Unsigned Word	R
Run Enabled	RunEnabled	BI	5	-	0 = Disable 1 = Enable 2 = NULL	1	Unsigned Word	R
Condenser Approach temperature	UnitCondApproachT	AI	160	°C	-	0.1	Signed Word	R
Evaporating refrigerant pressure	UnitEvapRefPressure	AI	141	kPa	-	0.1	Signed Word	R
Evaporating refrigerant saturated temperature	UnitEvapSatRefTemp	AI	68	°C	-	0.1	Signed Word	R
Unit I/O expansion alarm	UnitExpAlarm	BV	592	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Unit - Off Condensing pressure sensor fault	UnitOFFCondPressSen	BV	668	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R

Description	BACnet name	Object Type	Object Instance	Units	Value range	Accuracy	Data Type	R/W
Unit - Off evaporator leaving water temperature low	UnitOFFEvapLvgWTempLo	BV	702	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Unit - Off evaporator leaving water temperature sensor fault	UnitOFFEvapLvgWTempSen	BV	748	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Unit Off evaporating pressure sensor fault	UnitOFFEvapPressSen	BV	711	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Unit - Off evaporator water flow	UnitOFFEvapWaterFlow	0	701	-	0 = No Alarm 1 = Alarm	1	Unsigned Word	R
Unit - Off High pressure	UnitOFFHighPress	BV	760	-	0 = No Alarm 1 = Alarm 2 = NULL	1	Unsigned Word	R
Unit - Off Phase voltage	UnitOFFPhaseVoltage	0	820	-	0 = No Alarm 1 = Alarm	1	Unsigned Word	R
Unit On/Off status	UnitOnOff	BI	4	-	0 = Off 1 = On 2 = NULL	1	Unsigned Word	R
Unit power restore	UnitPwrRestore	0	515	-	-	1	Unsigned Word	R
Unit Status	UnitStatus	MSV	1	-	1 = Off 2 = Start 3 = Run 4 = Pre Shutdown 5 = Service	1	Unsigned Word	R

6. Annex 1 - Alarming

Data point	BACnet Obj type	BACnet Obj Instance	Values
Fault Alarm Code	AV	905	0=No Alarms 32551=COMP SHUTDOWN–Low pressure ratio Circ #1, Comp #1 32583=COMP SHUTDOWN – Low pressure ratio Circ #2, Comp #1 32615=COMP SHUTDOWN–Low pressure ratio Circ #3, Comp #1 32651=COMP SHUTDOWN – Minimum Delta Pressure Circuit #1 32652= COMP SHUTDOWN – Minimum Delta Pressure Circuit #2 32653= COMP SHUTDOWN – Minimum Delta Pressure Circuit #3 32771=COMP SHUTDOWN-Outside Air Temp Sensor Fault, 33063=COMP SHUTDOWN-Current Overload Circ #1, Comp #1 33095=COMP SHUTDOWN-Current Overload Circ #2, Comp #1 33127= COMP SHUTDOWN-Current Overload Circ #3, Comp #1 34087= COMP SHUTDOWN– Motor Protector Circ #1 Comp #1 34119= COMP SHUTDOWN– Motor Protector Circ #2 Comp #1 34599=COMP SHUTDOWN–Motor Temp High Circ #1, Comp #1 34631=COMP SHUTDOWN-Motor Temp High Circ #2, Comp #1 34663=COMP SHUTDOWN–Motor Temp High Circ #3, Comp #1 34855= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #1, Comp #1 34887= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #2, Comp #1 34919= COMP SHUTDOWN–Motor Temp Sensor Fault Circ #3, Comp #1 36387=CIRC SHUTDOWN – Condenser Pressure Sensor Circ #1 Fault 36391=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #1, Comp #1 36419=CIRC SHUTDOWN – Condenser Pressure Sensor Circ #2 Fault 36423=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #2, Comp #1 36455=COMP SHUTDOWN-Condenser Pressure Sensor Fault Circ #3, Comp #1 36611=UNIT SHUTDOWN-Condenser Flow Loss 37155=CIRC SHUTDOWN – Condenser Pressure High Circ #1 Fault 37159=COMP SHUTDOWN-Condenser Pressure High Circ #1, Comp #1 37187=CIRC SHUTDOWN – Condenser Pressure High Circ #2 Fault 37191=COMP SHUTDOWN-Condenser Pressure High Circ #2, Comp #1 37223=COMP SHUTDOWN-Condenser Pressure High Circ #3, Comp #1 37671=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #1, Comp #1 37703=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #2, Comp #1 37735=COMP SHUTDOWN-Discharge Temp Sensor Fault Circ #3, Comp #1 37927=COMP SHUTDOWN-Discharge Temp High Circ #1, Comp #1 37959=COMP SHUTDOWN-Discharge Temp High Circ #2, Comp #1 37991=COMP SHUTDOWN-Discharge Temp High Circ #3, Comp #1 38403=UNIT SHUTDOWN-Evaporator Water Flow Loss 38659=UNIT SHUTDOWN–Evaporator Leaving Water Temp Low (Freeze) 38915=COMP SHUTDOWN-Evaporator Pressure Low 39203=CIRC SHUTDOWN – Low Evaporator Pressure Circ #1 Fault 39207=COMP SHUTDOWN-Evaporator Pressure Low Circ #1, Comp #1 39235=CIRC SHUTDOWN – Low Evaporator Pressure Circ #2 Fault 39239=COMP SHUTDOWN–Evaporator Pressure Low Circ #2, Comp #1 39271=COMP SHUTDOWN-Evaporator Pressure Low Circ #3, Comp #1 39715=CIRC SHUTDOWN – Evaporator Pressure Sensor Circ #1 Fault 39719=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #1, Comp #1 39747=CIRC SHUTDOWN – Evaporator Pressure Sensor Circ #2 Fault 39751=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #2, Comp #1 39783=COMP SHUTDOWN-Evaporator Pressure Sensor Fault Circ #3, Comp #1 41255=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #1, Comp #1 41287=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #2, Comp #1 41319=COMP LOCKOUT- Num of Allowed Re-Starts Exceeded Circ #3, Comp #1 41475=UNIT SHUTDOWN-Evaporator Leaving Water Temp Sensor Fault 41731=UNIT SHUTDOWN-Evaporator Entering Water Temp Sensor Fault 42535=COMP SHUTDOWN-Mechanical High Pressure Circ #1, Comp #1 42567=COMP SHUTDOWN-Mechanical High Pressure Circ #2, Comp #1 42599=COMP SHUTDOWN-Mechanical High Pressure Circ #3, Comp #1 44071= COMP SHUTDOWN-Oil Delta Pressure High Circuit #1, Comp #1 44327=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #1, Comp #1 44359=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #2, Comp #1 44391=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault Circ #3, Comp #1 45059= UNIT SHUTDOWN-Phase Voltage Protection 45091= COMP SHUTDOWN– Phase Voltage Protection Circ #1, Comp #1 45123= COMP SHUTDOWN– Phase Voltage Protection Circ #2, Comp #1 45155= COMP SHUTDOWN– Phase Voltage Protection Circ #3, Comp #1

Data point	BACnet Obj type	BACnet Obj Instance	Values
			45351=COMP SHUTDOWN–Starter Fault Comp Circ #1, Comp #1 45383=COMP SHUTDOWN–Starter Fault Comp Circ #2, Comp #1 45415=COMP SHUTDOWN–Starter Fault Comp Circ #3, Comp #1 46887=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #1, Comp #1 46919=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #2, Comp #1 46951=COMP SHUTDOWN-Suction Temp Sensor Fault Circ #3, Comp #1 47911=COMP SHUTDOWN–Mechanical Low Pressure Circ #1, Comp #1 47943=COMP SHUTDOWN–Mechanical Low Pressure Circ #2, Comp #1 47975=COMP SHUTDOWN–Mechanical Low Pressure Circ #3, Comp #1 48131=Unit Controller offline 48163=Controller board offline Circ #1 48195=Controller board offline Circ #2 48227=Controller board offline Circ #3 48911=Circuit Global Alarm, Circuit #1 48912=Circuit Global Alarm, Circuit #2 48913=Circuit Global Alarm, Circuit #3 48419=COMP SHUTDOWN–No Pressure Change After Start Circ #1 48451=COMP SHUTDOWN–No Pressure Change After Start Circ #2 48483=COMP SHUTDOWN–No Pressure Change After Start Circ #3 48675=COMP SHUTDOWN–No Pressure at Startup Circ #1 48707=COMP SHUTDOWN–No Pressure at Startup Circ #2 48739=COMP SHUTDOWN–No Pressure at Startup Circ #3 48935=COMP SHUTDOWN-Slide position sensor fault Circ #1, Comp#1 48967=COMP SHUTDOWN-Slide position sensor fault Circ #2, Comp#1 48999=COMP SHUTDOWN-Slide position sensor fault Circ #3, Comp#1 49155=UNIT STOP–Emergency Stop Alarm 49411=UNIT STOP–Evaporator Water Temps Inverted 49667=UNIT STOP–External Alarm 49923=Evaporator Leaving Water Temp 1 Sensor Fault 50179=Evaporator Leaving Water Temp 2 Sensor Fault 50435=CIRC SHUTDOWN-Evaporator 1 Freeze Protection 50691=CIRC SHUTDOWN-Evaporator 2 Freeze Protection 50983=COMP SHUTDOWN-COMP VFD Fault Circ #1, Comp #1 51015=COMP SHUTDOWN-COMP VFD Fault Circ #2, Comp #1 51047=COMP SHUTDOWN-COMP VFD Fault Circ #3, Comp #1 51239=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #1, Comp #1 51271=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #2, Comp #1 51303=COMP SHUTDOWN-COMP VFD Over Heat Fault Circ #3, Comp #1 51495=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #1, Comp #1 51527=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #2, Comp #1 51559=COMP SHUTDOWN-COM ERROR With COMP VFD Circ #3, Comp #1 51755 = COMP SHUTDOWN -Low Discharge Superheat Circ #1, Comp #1 51783 = COMP SHUTDOWN -Low Discharge Superheat Circ #2, Comp #1 51815 = COMP SHUTDOWN -Low Discharge Superheat Circ #3, Comp #1 58371= UNIT STOP - PVM GFP Fault 58403= CIRC SHUTDOWN- PVM GFP Circ #1 Fault 58435= CIRC SHUTDOWN- PVM GFP Circ #2 Fault 58915=COMP SHUTDOWN-Refrig Charge Circ #1 58947=COMP SHUTDOWN-Refrig Charge Circ #2 58979=COMP SHUTDOWN-Refrig Charge Circ #3 59235=UNIT STOP – Gas Leakage Alarm 59747=UNIT SHUTDOWN – Condenser Freeze Protection

Fault Alarm Index	AV	901	0=No Alarms
			127=COMP SHUTDOWN–Low pressure ratio #n
			128=COMP SHUTDOWN-Outside Air Temp Sensor Fault
			129=COMP SHUTDOWN-Current Overload Circuit #n, Comp #n
			135=COMP SHUTDOWN–Motor Temp High Circuit #n
			136=COMP SHUTDOWN–Motor Temp Sensor Fault #n
			142=COMP SHUTDOWN-Condenser Pressure Sensor Fault #n
			143=UNIT SHUTDOWN-Condenser Flow Loss
			145=COMP SHUTDOWN-Condenser Pressure High #n
			147=COMP SHUTDOWN-Discharge Temp Sensor Fault #n
			148=COMP SHUTDOWN-Discharge Temp High #n
			150=UNIT SHUTDOWN-Evaporator Water Flow Loss
			151=UNIT SHUTDOWN–Evaporator Leaving Water Temp Low (Freeze)
			153=COMP SHUTDOWN-Evaporator Pressure Low #n,
			155=COMP SHUTDOWN-Evaporator Pressure Sensor Fault #n
			161=COMP LOCKOUT-Number of Allowed Re-Starts Exceeded #n
			162=UNIT SHUTDOWN-Evaporator Leaving Water Temp Sensor Fault
			163=UNIT SHUTDOWN-Evaporator Entering Water Temp Sensor Failure
			166=COMP SHUTDOWN-Mechanical High Pressure #n

Data point	BACnet Obj type	BACnet Obj Instance	Values

			172=COMP SHUTDOWN-Oil Delta Pressure High Circuit #1, Comp #1
			173=COMP SHUTDOWN-Oil Feed Pressure Sensor Fault #n
			176=SHUTDOWN–Phase Voltage Protection
			177=COMP SHUTDOWN–Starter Fault Comp #n
			183=COMP SHUTDOWN-Suction Temp Sensor Fault #n
			187=COMP SHUTDOWN–Mechanical Low Pressure #n
			188=Controller board offline Circuit #n
			189=COMP SHUTDOWN –No Pressure Change After Start
			190=COMP SHUTDOWN–No Pressure at Startup
			191=CIRCUIT SHUTDOWN–Slide Position Sensor Fault
			192=UNIT STOP–Emergency Stop Alarm
			193=UNIT STOP–Evaporator Water Temps Inverted
			194=UNIT STOP–External Alarm
			195=Evaporator Leaving Water Temp 1 Sensor Fault
			196=Evaporator Leaving Water Temp 2 Sensor Fault
			197=CIRCUIT SHUTDOWN-Evaporator 1 Freeze Protection
			198=CIRCUIT SHUTDOWN-Evaporator 2 Freeze Protection
			199=COMP SHUTDOWN-COMP VFD Fault Circuit #n, Comp #n
			200=COMP SHUTDOWN-COMP VFD Over Heat Fault Circuit #n, Comp #n
			201=COMP SHUTDOWN-COM ERROR With COMP VFD Circuit #n, Comp #n
			202=COMP SHUTDOWN-Low Discharge Superheat Circuit #n, Comp #n
			230=COMP SHUTDOWN-Refrig Charge Circuit #n
			231=UNIT STOP – Gas Leakage Alarm
			233=UNIT SHUTDOWN – Condenser Freeze Protection
			251=CIRCUIT STOP – Global Alarm, Circuit #1
			252=CIRCUIT STOP – Global Alarm, Circuit #2
			253= CIRCUIT STOP – Global Alarm, Circuit #3
			261=CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #1
			262= CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #2
			263= CIRCUIT SHUTDOWN - Minimum Delta Pressure Circuit #3

Problem Alarm Code	AV	904	0=No Alarms 16418=RESTART DELAYED - Power Loss While Running Circuit #1 16450=RESTART DELAYED - Power Loss While Running Circuit #2 16482=RESTART DELAYED - Power Loss While Running Circuit #3 16642=START INHIBITED - Ambient Temp Low 16898=INHIBIT LOAD – Condenser Pressure High 17186=INHIBIT LOAD – Condenser Pressure High Circuit #1 17218=INHIBIT LOAD – Condenser Pressure High Circuit #2 17250=INHIBIT LOAD – Condenser Pressure High Circuit #3 17282=INHIBIT LOAD –Condenser Pressure High Circuit #1 17730=UNLOAD Condenser Pressure High Circuit #2 17762=UNLOAD Condenser Pressure High Circuit #3 17794=UNLOAD LOAD - Evaporator Pressure Low Circuit #1 18178=PUMP #2 START ATTEMPTED - Condenser Pump #1 Failure 18434=PUMP #1 START ATTEMPTED - Condenser Pump #2 Failure 19522=INHIBIT LOAD - Evaporator Pressure Low Circuit #2 19554=INHIBIT LOAD - Evaporator Pressure Low Circuit #3 19586=INHIBIT LOAD - Evaporator Pressure Low Circuit #1 20034=UNLOAD - Evaporator Pressure Low Circuit #2 20066=UNLOAD - Evaporator Pressure Low Circuit #3 20098=UNLOAD - Evaporator 20262=UNLOAD-Comp Motor Current High Circuit #1, Comp #1 20294=UNLOAD-Comp Motor Current High Circuit #2, Comp #1 20326=UNLOAD-Comp Motor Current High Circuit #3, Comp #1 20738=PUMP #2 START ATTEMPTED - Evaporator Pump #1 Failure 20994=PUMP #1 START ATTEMPTED - Evaporator Pump #2 Failure 21542=INHIBIT LOAD-Comp Motor Current High Circuit #1, Comp #1 21574=INHIBIT LOAD-Comp Motor Current High Circuit #2, Comp #1 21606= INHIBIT LOAD-Comp Motor Current High Circuit #3, Comp #1 32258=Expansion Alarm – Problem

Problem Alarm Index	AV	900	0=No Alarms
			64=RESTART DELAYED-Power Loss While Running Circuit #n
			65=START INHIBITED - Ambient Temp Low
			67=INHIBIT LOAD – Condenser Pressure High Circuit #n
			69=UNLOAD – Condenser Pressure High Circuit #n
			71=PUMP #2 START ATTEMPTED - Condenser Pump #1 Failure
			72=PUMP #1 START ATTEMPTED - Condenser Pump #2 Failure
			76=INHIBIT LOAD - Evaporator Pressure Low Circuit #n
			78=UNLOAD - Evaporator Pressure Low Circuit #n
			79=UNLOAD - Comp Motor Current High Circuit #n, Comp #n
			81=PUMP #2 START ATTEMPTED - Evaporator Pump #1 Failure
			82=PUMP #1 START ATTEMPTED - Evaporator Pump #2 Failure

Data point	BACnet Obj type	BACnet Obj Instance	Values

			84= INHIBIT LOAD-Comp Motor Current High Circuit #n, Comp #n
			126=Expansion Alarm

Warning Alarm Code	AV	903	0=No Alarms 513=Evaporator Entering Water Temp Sensor Failure 2049=Bad setpoint override input 2305=Bad demand limit input 2401=Circuit 1 failed pumpdown Hi Press 2402=Circuit 2 Failed pumpdown Hi Press 2403=Circuit 3 Failed pumpdown Hi Press 2817=Unit power restore 3105=Circuit 1 failed pumpdown 3137=Circuit 2 Failed pumpdown 3169=Circuit 3 failed pumpdown 3201=Circuit 4 failed pumpdown 3329=External Event 3585=Bad Current Limit Input 3841=Option Controller Communication Failed 4352=Chiller Network Communication Failure
Warning Alarm Index	AV	902	0=No Alarms 8=Bad setpoint override input 9=Bad demand limit input 11=Unit power restore 12=Circuit failed pumpdown 13=External Event 14 = Bad Current Limit Input 15=Option Controller Communication Failed 17=Chiller Network Communication Failure 21= Circuit 1 failed pumpdown Hi Press 22= Circuit 2 failed pumpdown Hi Press 23= Circuit 3 failed pumpdown Hi Press

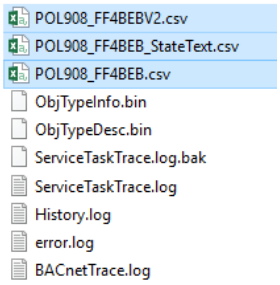
7. Annex 2 – EDE files for BACnet

Premise

The EDE files are created by the BACnet server each time the server is started. Download and import new files if s any change in controller configuration is done. Some BACnet objects could be no more available or new objects could be added. Also change in BACnet settings affect the new EDE file.

EDE file from BACnet IP module (POL908.00)

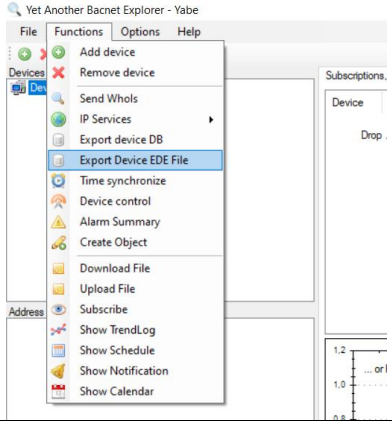
EDE files from POL908 module can be exported via ftp as it follows:

Step	Action
1	Connect POL908 module to the controller via plug connection.
2	Connect to the POL908 TCP/IP port the bus cable from: • a LAN if DHCP of the module is set to ON • a PC with static IP address if DHCP of the module is set to OFF
3	Set proper IP address and Subnet mask of the module and apply changes. i.e. IP 192.168.1.45 Subnet mask 255.255.255.0
4	Open a resource explorer instance and type the module IP address. i.e. ftp://192.168.1.45/Temp. In the folder "Temp" the EDE files in .csv format are available: 

EDE file from both modules:

BACnet MS/TP (POL904.00)

BACnet IP (POL908.00)

Step	Action
1	Connect POL904/908 module to the controller via plug connection.
2	Connect PC to POL904 by mean of a RS485-USB converter or to POL908 by mean of ethernet cable.
3	A BACnet explorer tool is needed in order to access the module and export the EDE files from it. Freeware tools are available on the internet, i.e. YABE
4	From YABE the EDE export option is available in functions menu. 

8. Annex 2 - Microtech III PICS for BACnet

8.1 BACnet standardized device profile

☐	BACnet Operator Workstation	(B-OWS)
☒	BACnet Building Controller	(B-BC)
☐	BACnet Advanced Application Controller	(B-AAC)
☐	BACnet Application Specific Controller	(B-ASC)
☐	BACnet Smart Sensor	(B-SS)
☐	BACnet Smart Actuator	(B-SA)

8.2 BACnet interoperability building blocks supported

Data sharing	Data Sharing – ReadProperty-A	DS-RP-A
	Data Sharing – ReadProperty-B	DS-RP-B
	Data Sharing – ReadPropertyMultiple-A	DS-RPM-A
	Data Sharing – ReadPropertyMultiple-B	DS-RPM-B
	Data Sharing – WriteProperty-A	DS-WP-A
	Data Sharing – WriteProperty-B	DS-WP-B
	Data Sharing – WritePropertyMultiple-B	DS-WPM-B
	Data Sharing – COV-B	DS-COV-B
	Data Sharing – COV-A	DS-COV-A
Alarm and event management	Alarm and Event – Notification Internal-B	AE-N-I-B
	Alarm and Event – AcknowledgeAlarm-B	AE-ACK- B
	Alarm and Event – Information-B	AE-INFO-B
	Alarm and Event – Alarm Summary-B	AE-ASUM-B
	Alarm and Event – Event-Enrollment Summary-B	AE-ESUM-B
Scheduling	Scheduling – Internal-B	SCHED-I-B
	Scheduling – External-B	SCHED-E-B
Trending	Trending-Viewing and Modifying Trends Internal-B	T-VMT-I-B
	Trending-Automated Trend Retrieval-B	T-ATR-B
Device management	Device Management – Dynamic Device Binding-A	DM-DDB-A
	Device Management – Dynamic Device Binding-B	DM-DDB-B
	Device Management – Dynamic Object Binding-B	DM-DOB-B
	Device Management – DeviceCommunicationControl-B	DM-DCC-B
	Device Management – TimeSynchronization-B	DM-TS-B
	Device Management – UTCTimeSynchronization-B	DM-UTC-B
	Device Management – ReinitializeDevice-B	DM-RD-B
	Device Management – List Manipulation-B	DM-LM-B
	Device Management – Object Creation and Deletion-B	DM-OCD-B
	Device Management – Backup and Restore-B	DM-BR-B
Network management	Network Management-Connection Establishment-A	NM-CE-A

8.3 BACnet standard object types supported

Object type	Supported	Can be created dynamically	Can be deleted dynamically
Analog Input	☒	☐	☐
Analog Output	☒	☐	☐
Analog Value	☒	☐	☐
Binary Input	☒	☐	☐
Binary Output	☒	☐	☐
Binary Value	☒	☐	☐
Calendar	☒	☐	☐
Command	☐	☐	☐
Device	☒	☐	☐
Event Enrollment	☒	☒	☒
File	☒	☐	☐
Group	☐	☐	☐
Loop	☐	☐	☐
Multi-State Input	☒	☐	☐
Multi-State Output	☒	☐	☐
Multi-State Value	☒	☐	☐
Notification Class	☒	☐	☐
Program	☐	☐	☐
Schedule	☒	☐	☐
Averaging	☐	☐	☐
Trend Log	☒	☐	☐
Life-Safety-Point	☐	☐	☐
Life-Safety-Zone	☐	☐	☐
Accumulator	☐	☐	☐
Pulse-Converter	☐	☐	☐

8.4 BACnet standard object types description

Analog Input

Property supported	Writable	Range restrictions
Object_Identifier		
Object_Name		
Object_Type		
Present_Value	X	
Description		
Status_Flags		
Event_State		
Reliability		
Out_Of_Service	X	
Units		
Max_Pres_Value		
Min_Pres_Value		
Priority_Array		
Relinquish_Default	X	
COV_Increment	X	0 .. maxReal
Time_Delay		
Notification_Class		
High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Deadband	X	0 .. maxReal
Limit_Enable	X	
Event_Enable	X	
Acked_Transitions		
Notify_Type		
Event_Time_Stamps		

Analog Output

Property supported	Writable	Range restrictions
Object_Identifier		

Object_Name		
Object_Type		
Present_Value	X	
Description		
Status_Flags		
Event_State		
Reliability		
Out_Of_Service	X	
Units		
Max_Pres_Value		
Min_Pres_Value		
Priority_Array		
Relinquish_Default	X	
COV_Increment	X	0 .. maxReal
Time_Delay		
Notification_Class		
High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Deadband	X	0 .. maxReal
Limit_Enable	X	
Event_Enable	X	
Acked_Transitions		
Notify_Type		
Event_Time_Stamps		

Analog Value

Property supported	**Writable**	**Range restrictions**
Object_Identifier		
Object_Name		
Object_Type		
Present_Value	X	Depends on the Unit
Description		
Status_Flags		
Event_State		
Reliability		
Out_Of_Service	X	
Units		
Max_Pres_Value		
Min_Pres_Value		
Priority_Array		
Relinquish_Default	X	
COV_Increment	X	0 .. maxReal
Time_Delay		
Notification_Class		
High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
Deadband	X	0 .. maxReal
Limit_Enable	X	
Event_Enable	X	
Acked_Transitions		
Notify_Type		
Event_Time_Stamps		

Analog Value (setpoints)

Property supported	**Writable**	**Range restrictions**
Object_Identifier		
Object_Name		
Object_Type		
Present_Value	X(1)	Depends on the Unit
Units		
Status_Flags		
COV_Increment	X	0 .. maxReal
Out_Of_Service	X(1)	
Event_State		

(1) Writeable if Out_Of_Service=True

Binary Input

Property supported	Writable	Range restrictions
Object_Identifier		
Object_Name		
Object_Type		
Description		
Present_Value	X(1)	
Status_Flags		
Out_Of_Service	X	
Event_State		
Inactive_Text		
Active_Text		
Polarity	X	
Notification_Class		
Reliability		
Acked_Transitions		
Event_Enable	X	
Alarm_Value	X	
Notify_Type		
Time_Delay		
Event_Time_Stamps		
Elapsed-active-time	X	Only 0
Time-of-active-time-reset		

(1) Writeable if Out_Of_Service=True

Binary Output

Property supported	Writable	Range restrictions
Object_Identifier		
Object_Name		
Object_Type		
Description		
Present_Value	X	
Status_Flags		
Out_Of_Service	X	
Event_State		
Inactive_Text		
Active_Text		
Notification_Class		
Reliability		
Acked_Transitions		
Event_Enable	X	
Notify_Type		
Time_Delay		
Event_Time_Stamps		
Polarity	X	
Feedback_Value		
Priority_Array		
Relinquish_Default	X	
Elapsed-active-time	X	Only 0
Time-of-active-time-reset		

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