DAIKIN APPLIED EUROPE S.p.A.

BAS integration guide

BACnet®protocol

Doc. Name:
D-EIGOCAH00900103-21EN

Product Name:
ADK (Digital AHU)

Control software name:
DSTREAM

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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 are installed / activated.

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-EIGOCAH00900103-21EN	18/03/2021	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

a) Microtech 4 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.

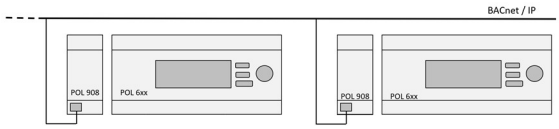
Communication modules

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

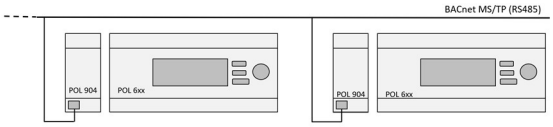
1. **BACnet/IP** (dedicated network or shared Ethernet LAN)
2. **BACnet MS/TP** (Master/Slave Token Passing).

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

BACnet/IP (POL908)

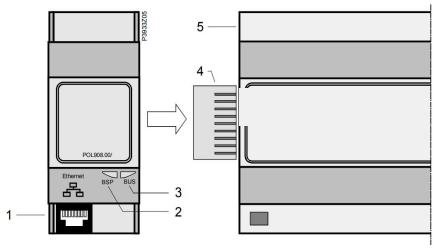


BACnet MS/TP (POL904)



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

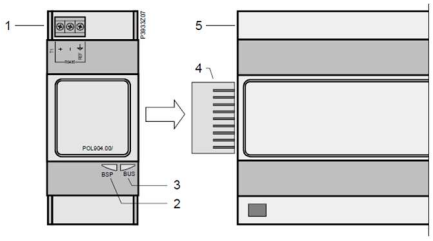
Parameter	Default value
Device Instance	1
UDP Port Number	47808 (BAC0)
DHCP(1)	OFF
Given IP Address(2)	127.0.0.1
Given IP Subnet Mask(2)	255.255.255.000
Given Gateway Address(2)	127.0.0.1
Unit Support	English
NC Dev 1	0
NC Dev 2	0

(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		

5. BACnet integration list

The following tables contains the complete list of BACnet data points properties available from the AHU Unit Controller. Different BACnet objects combination will be available based on different AHU configurations.

Tables listed in this section are divided according to the particular BACnet Object Type.

Caution: improper use of the following data and set points can lead to unwanted or unexpected behavior of the unit.

5.1.1 Analog Input

Object Name	Object Instance	Object Description	Dimension	Read/Write
SupplyTmp	45150	Supply air temperature	°C	R
RmUTmp1	33923	Room unit temperature	°C	R
ReturnAirTmp	28256	Return air temperature	°C	R
OutTmp	53218	Outside air temperature	°C	R
PreHeatTemp	29568	Pre-Heating temperature	°C	R
SupplyPrs	20400	Supply air pressure	Pa	R
ReturnPrs	39576	Return air pressure	Pa	R
SupplyFlow	9497	Supply air flow	m^3/h	R
ReturnFlow	38593	Return air flow	m^3/h	R
RoomHum	37799	Room humidity relative	%rH	R
AirQuality	3737	Air quality (CO_2)	ppm	R
ERQ1Load	19419	ERQ1 actual load	%	R
ERQ2Load	42249	ERQ2 actual load	%	R
ERQ3Load	3928	ERQ3 actual load	%	R
ERQ4Load	26764	ERQ4 actual load	%	R
ERQGlobalLoad	36987	Global ERQ actual load	%	R

Table 1. Analog Input list

5.1.2 Analog Output

Object Name	Object Instance	Object Description	Dimension	Read/Write
SplyFanVarPos	59037	Supply fan output	%	R
ExhFanVarPos	40119	Return fan output	%	R
HumidityCtrlPos	39618	Humidifier output	%	R
ElectricalHtgPos	37442	Electrical heating output	%	R
HrecDampPos	42156	Mixing damper output	%	R
HrecPos	5922	Recovery device output	%	R
CoolingPos	30925	Cooling coil output	%	R
HeatingPos	26209	Heating coil output	%	R
FanTempCompPos	62755	Fan temperature compensation output	%	R

Table 2. Analog Output list

5.1.3 Analog Values

Object Name	Object Instance	Object Description	Dimension	Read/Write
SplyFanSpvSt1Spv	52572	Supply fan setpoint	m^3/h or Pa	R/W
SplyFanSpvEcSpv	57915	Supply fan economy setpoint	m^3/h or Pa	R/W
SplyFanSpvMaxForce	25092	Supply fan max force	m^3/h or Pa	R/W
ExhFanSpvSt1Spv	45030	Return fan setpoint	m^3/h or Pa	R/W
ExhFanSpvEcSpv	6118	Return fan economy setpoint	m^3/h or Pa	R/W
ExhFanSpvMaxForce	2525	Return fan max force	m^3/h or Pa	R/W
SplyFanActVal	56628	Supply fan actual value	m^3/h or Pa	R
ExhFanActVal	59694	Return fan actual value	m^3/h or Pa	R
SplyFanActSpv	46589	Supply fan actual setpoint	m^3/h or Pa	R
ExhFanActSpv	33255	Return fan actual setpoint	m^3/h or Pa	R
AirQSpv	22649	Air quality setpoint	ppm	R/W
RmEnth	61369	Room enthalpy	J	R
RmHumAbs	17315	Room humidity absolute	g/kg	R
HumSpvRelSpvDehum	11342	Dehumidity setpoint relative	%rH	R/W
HumSpvRelSpvHum	10627	Humidity setpoint relative	%rH	R/W
ActCtrlValHum	38385	Actual controlled humidity	%rH	R
TmpSpvCoSpvClg	8970	Cooling setpoint	°C	R/W
TmpSpvCoSpvHtg	22817	Heating setpoint	°C	R/W
TmpSpvEcSpvClg	61866	Economy cooling setpoint	°C	R/W
TmpSpvEcSpvHtg	35713	Economy heating setpoint	°C	R/W
MaxSplyTmp	23336	Supply temp max setpoint	°C	R/W
MinSplyTmp	53160	Supply temp min setpoint	°C	R/W
ActMainSpvHtg	4018	Actual heating setpoint (depending on actual control mode)	°C	R
ActMainSpvClg	30105	Actual cooling setpoint (depending on actual control mode)	°C	R
ActTempSetpt	56276	Active temperature setpoint	°C	R
ActCtrlVal	52988	Actual controlled temperature	°C	R
HrecDampminFrshAir	41552	Minimum fresh air	%	R/W
SuWiSwtchCheckOutTmpDampd	24338	Outside air temp damped	°C	R
RoomUnitsOccTm	1206	Room unit presence time	h	R/W
RoomUnitOffset	8926	Room unit temperature setpoint offset	°C	R/W
MaxSupplyTempSu	753	Setpoint for maximum supply temperature during summer	°C	R
MaxSupplyTempWi	7560	Setpoint for maximum supply temperature during winter	°C	R/W
MinSupplyTempSu	18262	Setpoint for minimum supply temperature during summer	°C	R/W
MinSupplyTempWi	22575	Setpoint for minimum supply temperature during winter	°C	R/W
SupplyFanRunHours	47818	Running hours of supply fan	h	R
ReturnFanRunHours	52983	Running hours of return fan	h	R
Pursuit – Setpoint	19448	Temperature setpoint for Pursuit mode	°C	R/W

Pursuit – Setpoint Eco	23744	Temperature setpoint for Eco-Pursuit mode	°C	R/W
Pursuit – Band	12721	Pursuit Band	°C	R/W

Table 3. Analog Values list

5.1.4 Binary Inputs

Object Name	Object Instance	Object Description	State texts	Read/Write
HtgFrstDtctr	21294	Heating frost monitor	0 = OK 1 = Alarm	R
HtgPmpAlm	47847	Heating pump alarm	0 = OK 1 = Alarm	R
ElHtgAlm	4964	Electrical heating alarm	0 = OK 1 = Alarm	R
HRecAlm	62931	Recovery device alarm	0 = OK 1 = Alarm	R
ClgPmpAlm	40242	Cooling pump alarm	0 = OK 1 = Alarm	R
SplyFanAlm	28757	Supply fan alarm	0 = OK 1 = Alarm	R
ExhFanAlm	55865	Exhaust fan alarm	0 = OK 1 = Alarm	R
FilterAlm [Compact]	13699	Filter alarm	0 = OK 1 = Alarm	R
SplyFilterAlm [PRO]	34066	Supply filter alarm	0 = OK 1 = Alarm	R
ExhFilterAlm [PRO]	45320	Exhaust filter alarm	0 = OK 1 = Alarm	R
FireAlm	28514	Fire alarm	0 = OK 1 = Alarm	R
ExtCtrl1	11643	Unit Enable Switch	0 = Standby 1 = On	R
EmergencyStop	9864	Emergency stop	0 = Alarm 1 = OK	R
ERQ1OnOff	19724	ERQ1 On/Off state	0 = Off 1 = On	R
ERQ1Defrost	48775	ERQ1 Defrost state	0 = No Defrost 1 = Defrost	R
ERQ2OnOff	33772	ERQ2 On/Off state	0 = Off 1 = On	R
ERQ2Defrost	30450	ERQ2 Defrost state	0 = No Defrost 1 = Defrost	R
ERQ3OnOff	50764	ERQ3 On/Off state	0 = Off 1 = On	R
ERQ3Defrost	12577	ERQ3 Defrost state	0 = No Defrost 1 = Defrost	R
ERQ4OnOff	3597	ERQ4 On/Off state	0 = Off 1 = On	R
ERQ4Defrost	63033	ERQ4 Defrost state	0 = No Defrost 1 = Defrost	R

Table 4. Binary Inputs list

5.1.5 Binary Outputs

Object Name	Object Instance	Object Description	State texts	Read/Write
DamperSplyOnOff	6170	Fresh air damper command	0 = Off 1 = On	R
HumidityCtrlCmdOnOff	18044	Humidifier command	0 = Off 1 = On	R
CoolingPmpCmdOnOff	10276	Cooling pump command	0 = Off 1 = On	R
HeatingPmpCmdOnOff	10264	Heating pump command	0 = Off 1 = On	R
AlmOutHigh	5714	AHU General alarm output	0 = Normal 1 = Alarm	R

Table 5. Binary Outputs list

5.1.6 Schedule

Object Name	Object Instance	Object Description	State texts	Read/Write
ScheduleSt	31059	Time scheduler actual state	1 = Off 2 = On 3 = Ventilation 4 = Economy	R

Table 6. Schedule list

5.1.7 Multistate Outputs

Object Name	Object Instance	Object Description	State texts	Read/Write
SplyFanCmdSt	21928	Supply fan command	1 = Off 2 = On	R
ExhFanCmdSt	14719	Exhaust fan command	1 = Off 2 = On	R

Table 7. Multistate Outputs list

5.1.8 Multistate Value

Object Name	Object Instance	Object Description	State texts	Read/Write
ActOpMode	6080	Actual operating mode	1 = Off 2 = On 3 = Ventilation 4 = Economy 5 = Standby	R
ActOpSta	32321	Present unit status	1 = Fire	R
			2 = Emergency	
			3 = Fault	
			4 = Alarm	
			5 = NA	
			6 = Manual	
			7 = PanelSwtch	
			8 = LocalSwtch	
			9 = NA	
			10 = BMS	
			11 = Scheduler	
			12 = Occupancy	
			13 = NA	
			14 = NA	
			15 = NA	
			16 = Ready	
AckAlmPls	39130	Alarm acknowledge (**Note!** This object is used to acknowledge all alarms in the controller)	1 = Off 2 = On	R/W
SuWiSwtchCheckState	24616	SummerWinter mode	1 = Winter 2 = Summer	R
AlmCl0	46769	Danger alarm (A)	1 = Normal 2 = On	R
AlmCl1	42640	Critical alarm (A)	1 = Normal 2 = On	R
AlmCl2	38643	Low alarm (B)	1 = Normal 2 = On	R
AlmCl3	34514	Warning alarm (C)	1 = Normal 2 = On	R
NetworkCtrl	24562	Network control abilitation	1 = Off 2 = On	R/W
SuWiNetworkChgover	28594	Summer/Winter network changeover command	1 = Winter 2 = Summer	R/W
FireDamperCmd	59712	Fire damper command	1 = Close 2 = Open	R
ExhEngUnit	43819	Return air engineering Unit	1 = % 2 = Pa 3 = m^3/h	R

Object Name	Object Instance	Object Description	State texts	Read/Write
SplyEngUnit	54155	Supply air engineering Unit	1 = % 2 = Pa 3 = m^3/h	R
HumEngUnit	13725	Humidity engineering unit	1 = %rH 2 = g/kg	R
Pre-Htg Electrical	25214	Pre-heating electrical command	1 = Off 2 = Step 1 3 = Step 2	R
Electrical Heating State	41370	Electrical heating command	1 = Off 2 = Step 1 3 = Step 2	R
ClgDxStages	9333	Cooling Dx actual stage	1 = Off 2 = Stage 1 3 = Stage 2	R
CommTestEn	1708	Enable Test	1 = No 2 = Yes	R/W
SuWiChgSrc	9493	Set source for summer/winter changeover	1 = Auto 2 = HMI 3 = BMS (BACnet)	R/W
TimeShedSt	12316	Indicates Time Scheduler active mode	1 = On 2 = Off 3 = Ventilation 4 = Economy	R
ActFanStep	28279	Indicates the active fan step	1 = Off 2 = Stage 1 3 = Stage 2 4 = Stage 3	R
ActControlMode	28561	Indicates mode for the regulation control	1 = Room 2 = Exhaust 3 = Supply	R
OpModeTspCopyUnitPls	33544	When set to On, Time schedule settings made in “Monday” are automatically copied into the other weekdays.	1 = Off 2 = On	R/W

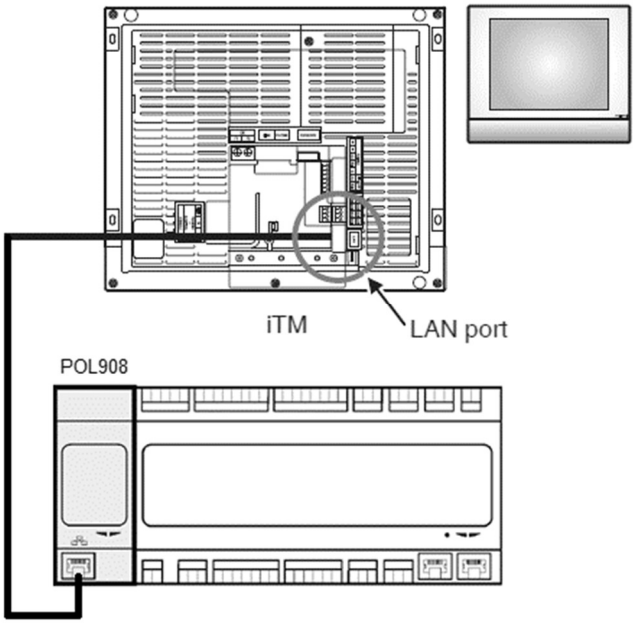
Table 8. Multistate Value list

6. Annex 1 – iTM Installation & Configuration

⚠	IMPORTANT! The following procedure is valid only for iTM software version 1.21 and later. If you have a previous version installed, please update it first by following the procedure included in iTM manual.

The D-AHU in natively compatible with the Daikin intelligent Touch Manager (iTM), which acts as a mini building management system and enables the control of various AHU setpoints through its touchscreen interface. Refer to iTM specific operating manual for additional details on the device functionality.

If the AHU is provided with a BACnet-IP communication module (POL908), it can be connected to the iTM trough an Ethernet cable and remotely controlled. The following figure shows how to connect the iTM with the BACnet-IP communication module.



The following procedure allows the user to configure the iTM communication with the AHU controller and must be followed in order to properly set up both devices.

First configure the BACnet communication module (POL908) installed on the AHU controller. Go to the communication module configuration page located in:

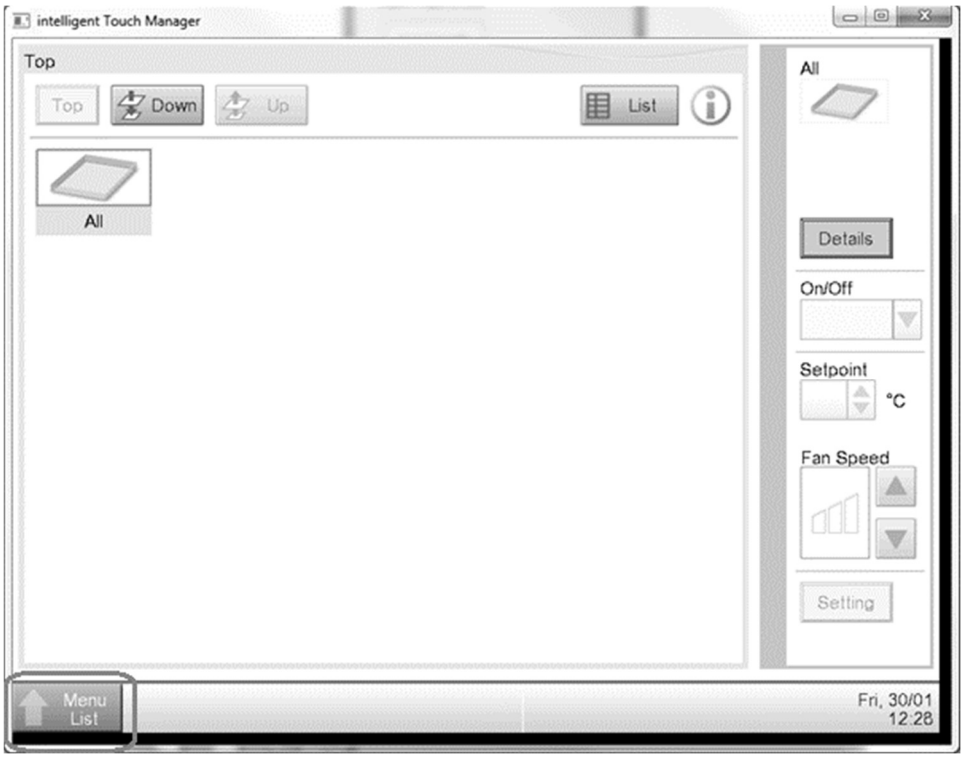
HMI Path: Main Menu -> Commissioning -> Communications -> Comm modules -> #-BACnet-IP

Now configure the module as follow:

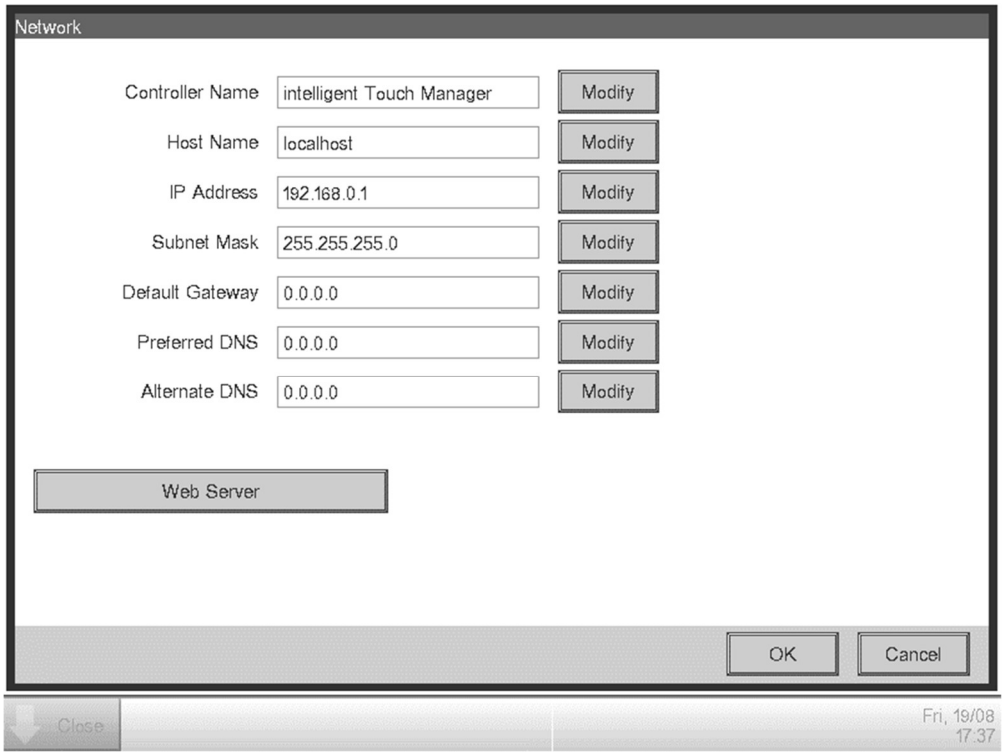
- **Device ID = xx** (xx must be a unique number for every AHU controller on the same network)
- DHCP = Passive
- **Given IP = 192.168.0.xxx** (xxx is a number between 0 & 255 and must be different from any other address in the same network)
- Given Mask = 255.255.255.0
- Write setting = Active

Restart the module using "**Restart required!**" item located at the end of the page. After the reboot, check if the configuration parameters above have been saved. At this point it is necessary to configure the iTM. Check network configuration settings on the iTM by following these steps.

Touch the "**Network**" button on the "**System Settings**" tab of the "**Menu List**" screen to display the Network screen.



As default, the following configuration should appear:

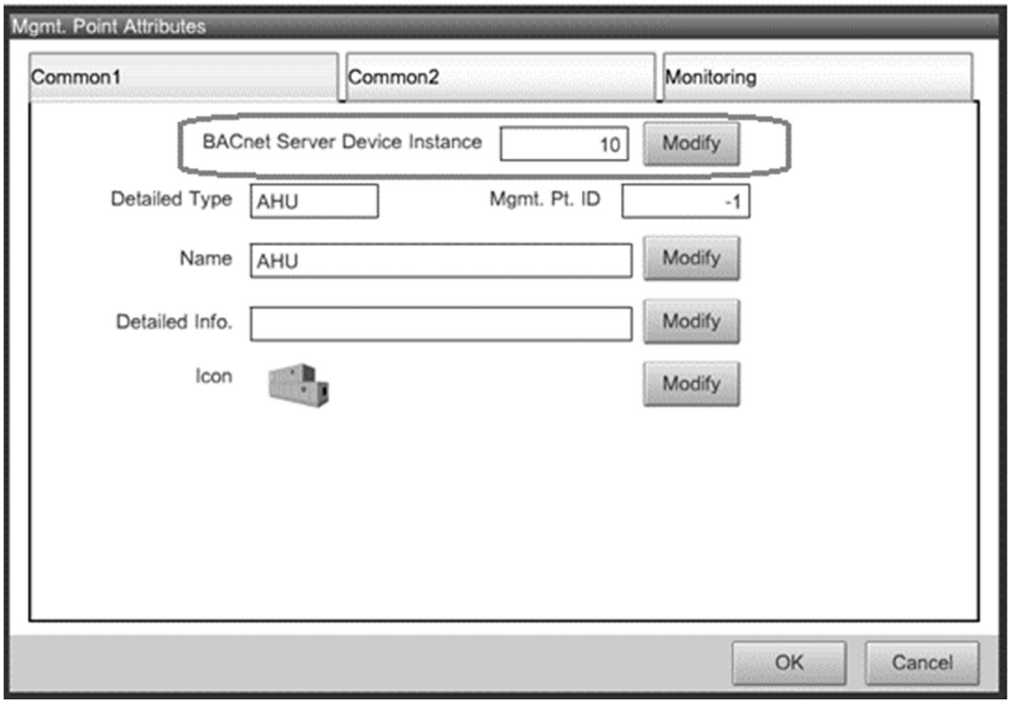


The IP address must be set to "**192.168.0.yyy**", where **yyy** is a number between 0 & 255 and must be different from any other address in the same network.

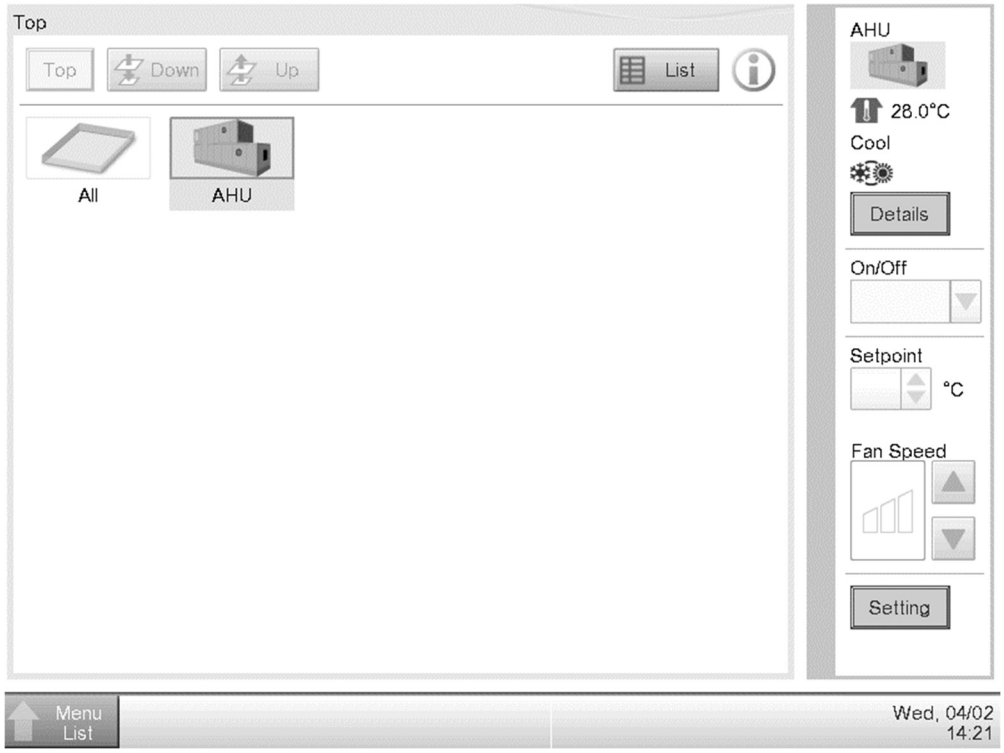
In order to be able to configure BACnet objects on the iTM, the user must log into the Service Mode (SE) from the "**Menu List**" screen (refer to ***iTM commissioning manual***). Once in SE mode, go to "**Mgmt. Pnt DataRegist**" under "**Service Settings**" tab.

Add an AHU device by selecting “Add -> Others -> AHU”.

Modify the “**BACnet Server Device Instance**” number so that it matches the “**Device ID**” number configured on the BACnet communication module (POL908) of the controller.



If necessary, restart the iTM. Now you can control the AHU in the iTM main screen.


Top
Top
Down
Up
List
All
AHU
AHU
28.0°C
Cool
Details
On/Off
Setpoint
°C
Fan Speed
Setting
Menu
List
Wed, 04/02
14:21

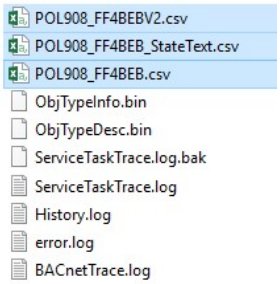
7. Annex 2 – EDE files for BACnet

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:

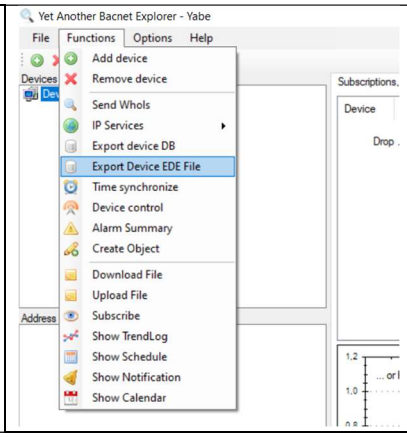
Step	Action
1	Connect POL908 module to the controller via plug connection.
2	Connect to the POL908 TCP/IP port the bus cable from: • a LAN if DHCP of the module is set to ON • a PC with static IP address if DHCP of the module is set to OFF
3	Set proper IP address and Subnet mask of the module and apply 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.


Yet Another Bacnet Explorer - Yabe
File
Functions
Options
Help
Add device
Remove device
Send Whois
IP Services
Export device DB
Export Device EDE File
Time synchronize
Device control
Alarm Summary
Create Object
Download File
Upload File
Subscribe
Show TrendLog
Show Schedule
Show Notification
Show Calendar
Devices
Subscriptions
Device
Drop
Address

8. Annex 3 - 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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DAIKIN APPLIED EUROPE S.p.A.
Via Piani di Santa Maria, 72 - 00072 Ariccia (Roma) - Italia
Tel: (+39) 06 93 73 11 - Fax: (+39) 06 93 74 014
http://www.daikinapplied.eu