

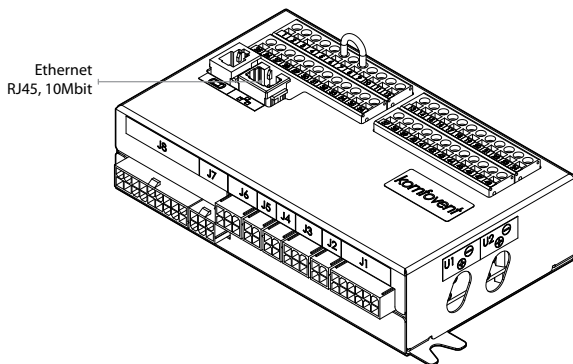
BACNET CONNECTION C5

INSTALLATION AND SERVICE MANUAL

BACNET CONNECTION AND SETTINGS

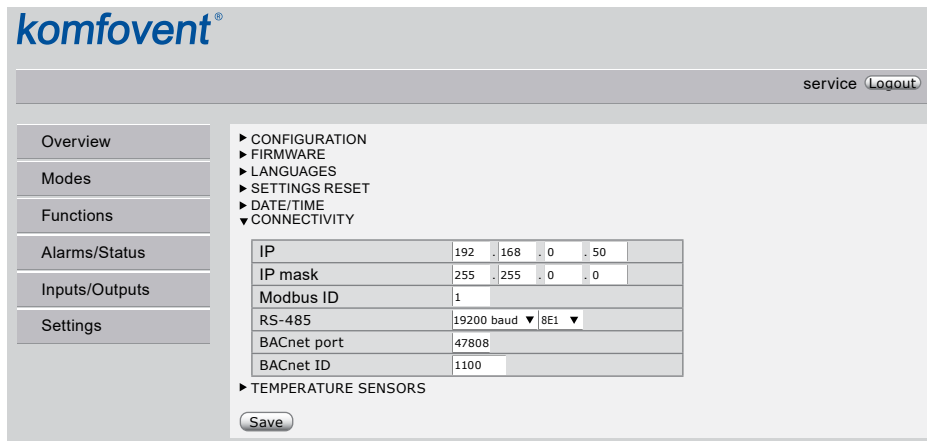
BACnet is a standard communication protocol for Building Automation and Control (BAC) networks that can be used to monitor and control Komfovent air handling units with C5 controller. The supported Data Link Layer is BACnet / IP.

BACnet protocol works via Ethernet interface, connection is provided to RJ-45 socket (Pic.1) on the C5 controller (CAT5 cable is recommended):



Picture 1. C5 controller board

Below is default network settings of the C5 controller. These can be changed according to the building network software requirements. To do so, it is needed to connect a laptop to the integrated webserver of C5 controller:

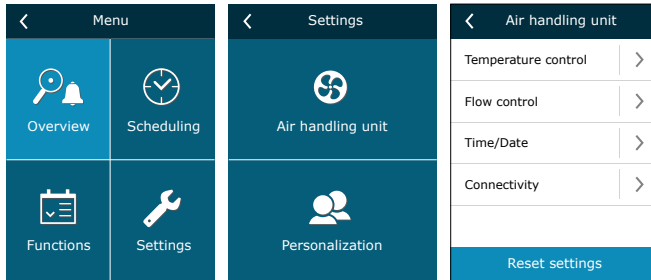


Picture 2. Connectivity settings



To have a stable connection between BMS and AHU via BACnet network, at least 1s. polling time is recommended.

C5 controller IP can also be viewed and changed on the control panel – from *Main menu* go to *Settings->Air handling unit->Connectivity*:



Picture 3. Connectivity settings on C5.1 control panel display

BACnet Interoperability Building Blocks Supported:

Data Sharing	DS-RP-B	Data Sharing-Read Property-B
	DS-RPM-B	Data Sharing-Read Property Multiple-B
	DS-WP-B	Data Sharing-Write Property-B
Device Management	DM-DDB-B	Device Management-Dynamic Device Binding-B
	DM-DOB-B	Device Management-Dynamic Object Binding-B

Standard Object Types Supported:

Analog Input	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Description, Reliability,
Analog Output	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Priority_Array, Relinquish_Default,
Analog Value	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Units, Description, Priority_Array, Relinquish_Default, Max_Pres_Value, Min_Pres_Value, Resolution,
Binary Input	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Polarity, Description
Binary Output	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Polarity, Priority_Array, Relinquish_Default, Active_Text, Inactive_Text,
Binary Value	Object_Identifier, Object_Name, Object_Type, Present_Value, Status_Flags, Event_State, Out_Of_Service, Priority_Array, Relinquish_Default,
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, Description, Location,

Analog input

Name	Object Instance	Range	Unit	Access	Description
Monitoring data					
Supply air temperature	0	-50.0..+120.0	°C	R	
Extract air temperature	1	-50.0..+120.0	°C	R	
Outdoor air temperature	2	-50.0..+120.0	°C	R	
Exhaust air temperature	3	-50.0..+120.0	°C	R	
Water temperature	4	-50.0..+120.0	°C	R	
Air quality	5	0..100	%	R	
Supply air humidity	6	0..100	%RH	R	
Supply air flow	7	0..1000000	variable ¹	R	
Exhaust air flow	8	0..1000000	variable ¹	R	
Outdoor air filter pressure	9	0..5500	Pa	R	
Extract air filter pressure	10	0..5500	Pa	R	
Zone 1 supply air temperature	11	-50.0..+120.0	°C	R	
Zone 1 water temperature	12	-30.0..+120.0	°C	R	
Zone 2 supply air temperature	13	-50.0..+120.0	°C	R	
Zone 2 water temperature	14	-30.0..+120.0	°C	R	
Internal supply air temperature	15	-50.0..+120.0	°C	R	
Zone 1 air quality	16	0..100	%	R	
Zone 1 heater temperature	17	0..+120.0	°C	R	
Zone 2 air quality	18	0..100	%	R	
Zone 2 heater temperature	19	0..+120.0	°C	R	
Supply temperature set-point	20	+5..+45	°C	R	
Supply air absolute humidity	21	0..40.0	g/m ³ or g/kg	R	
Supply air pressure	22	0..5500	Pa	R	
Extract air pressure	23	0..5500	Pa	R	

Analog output

Name	Object Instance	Range	Unit	Access	Description
Output signals					
Water heater level	0	0..100	%	R	
Water cooler level	1	0..100	%	R	
Humidifier level	2	0..100	%	R	
Heat exchanger level	3	0..100	%	R	
Recirculation level	4	0..100	%	R	
Supply fan level	5	0..100	%	R	
Exhaust fan level	6	0..100	%	R	
Outdoor air damper level	7	0..100	%	R	
Exhaust air damper level	8	0..100	%	R	

¹ See Analog Value Object Instance 72.

Name	Object Instance	Range	Unit	Access	Description
Output signals					
El. Heater level	9	0..100	%	R	
DX level	10	-100..+100	%	R	
Heat pump level	11	-100..+100	%	R	
Zone 1 level/heater level	12	-100..+100	%	R	
Zone 2 level/heater level	13	-100..+100	%	R	
Zone 1 cooler level	14	0..100	%	R	
Zone 2 cooler level	15	0..100	%	R	
Zone 1 temperature setpoint/ error	16	+5..+40 / 0..100	°C or %	R	
Zone 2 temperature setpoint/ error	17	+5..+40 / 0..100	°C or %	R	

Digital input

Name	Object Instance	Range	Unit	Access	Description
External contacts					
OVR	0	0..1		R	0-open, 1- closed
External stop	1	0..1		R	0-open, 1- closed
Zone 1 electric heater TK100	2	0..1		R	0-open, 1- closed
Zone 1 electric heater TK60	3	0..1		R	0-open, 1- closed
Zone 1 electric heater TK70	4	0..1		R	0-open, 1- closed
Zone 1 low water temperature	5	0..1		R	0-open, 1- closed
Zone 1 combined coil	6	0..1		R	0-open, 1- closed
Zone 1 external stop	7	0..1		R	0-open, 1- closed
Zone 2 electric heater TK100	8	0..1		R	0-open, 1- closed
Zone 2 electric heater TK60	9	0..1		R	0-open, 1- closed
Zone 2 electric heater TK70	10	0..1		R	0-open, 1- closed
Zone 2 low water temperature	11	0..1		R	0-open, 1- closed
Zone 2 combined coil	12	0..1		R	0-open, 1- closed
Zone 2 external stop	13	0..1		R	0-open, 1- closed
Outdoor air filter	14	0..1		R	0-open, 1- closed
Extract air filter	15	0..1		R	0-open, 1- closed
C5 Control	16	0..1		R	0-open, 1-closed

Digital output

Name	Object Instance	Range	Unit	Access	Description
Water pumps					
Water heating pump	0	0..1		R	0-stop, 1- run
Water cooling pump	1	0..1		R	0-stop, 1- run
Zone 1					
Zone 1 stage 1	2	0..1		R	0-stop, 1- run

Name	Object Instance	Range	Unit	Access	Description
Zone 1 stage 2	3	0..1		R	0-stop, 1- run
Zone 1 stage 3	4	0..1		R	0-stop, 1- run
Zone 1 stage 4	5	0..1		R	0-stop, 1- run
Zone 1 heating water pump	6	0..1		R	0-stop, 1- run
Zone 1 cooling water pump	7	0..1		R	0-stop, 1- run
Zone 1 DX level unit reverse	8	0..1		R	0-stop, 1- run
Zone 1 DX modulated unit operation	9	0..1		R	0-stop, 1- run
Zone 1 DX modulated unit cooling	10	0..1		R	0-stop, 1- run
Zone 1 DX modulated unit heating	11	0..1		R	0-stop, 1- run
Zone 2					
Zone 2 stage 1	12	0..1		R	0-stop, 1- run
Zone 2 stage 2	13	0..1		R	0-stop, 1- run
Zone 2 stage 3	14	0..1		R	0-stop, 1- run
Zone 2 stage 4	15	0..1		R	0-stop, 1- run
Zone 2 heating water pump	16	0..1		R	0-stop, 1- run
Zone 2 cooling water pump	17	0..1		R	0-stop, 1- run
Zone 2 DX level unit reverse	18	0..1		R	0-stop, 1- run
Zone 2 DX modulated unit operation	19	0..1		R	0-stop, 1- run
Zone 2 DX modulated unit cooling	20	0..1		R	0-stop, 1- run
Zone 2 DX modulated unit heating	21	0..1		R	0-stop, 1- run
Alarm output					
Alarm DOUT	22	0..1		R	0-no alarm, 1-alarm
Active functions					
AQC active	23	0..1		R	0-stop, 1- run
OCV active	24	0..1		R	0-stop, 1- run
MTC active	25	0..1		R	0-stop, 1- run
OVR active	26	0..1		R	0-stop, 1- run
SNC active	27	0..1		R	0-stop, 1- run
OOD active	28	0..1		R	0-stop, 1- run
REC active	29	0..1		R	0-stop, 1- run
HUM active	30	0..1		R	0-stop, 1- run
Defrost active	31	0..1		R	0-stop, 1- run

Digital value

Name	Object Instance	Range	Unit	Access	Description
Alarms					
Low supply air flow	0	0..1		R	
Low extract air flow	1	0..1		R	
VAV calibration fail	2	0..1		R	
Change outdoor air filter	3	0..1		R	
Change extract air filter	4	0..1		R	
Electric heater off	5	0..1		R	
High pressure on compressor	6	0..1		R	
Low pressure on compressor	7	0..1		R	
Service time	8	0..1		R	
Service mode	9	0..1		R	
Supply air temp. sensor failure	10	0..1		R	
Extract air temp. sensor failure	11	0..1		R	
Outdoor air temp. sensor failure	12	0..1		R	
Exhaust air temp. sensor failure	13	0..1		R	
Water temp. sensor failure	14	0..1		R	
Return water temp low	15	0..1		R	
Internal fire alarm	16	0..1		R	
External fire alarm	17	0..1		R	
External stop	18	0..1		R	
Heat exchanger failure	19	0..1		R	
Heat exchanger icing	20	0..1		R	
Low supply air temperature	21	0..1		R	
High supply air temperature	22	0..1		R	
Electric heater overheat	23	0..1		R	
Evaporator air temp. sensor failure	24	0..1		R	
Evaporator coil temp. sensor failure	25	0..1		R	
Compressor failure	26	0..1		R	
Supply fan drive failure	27	0..1		R	
Supply fan drive overload	28	0..1		R	
Supply fan motor failure	29	0..1		R	
Supply fan motor overload	30	0..1		R	
Exhaust drive failure	31	0..1		R	
Exhaust fan drive overload	32	0..1		R	
Exhaust fan motor failure	33	0..1		R	
Exhaust fan motor overload	34	0..1		R	
Rotor drive failure	35	0..1		R	
Rotor drive overload	36	0..1		R	
Rotor motor failure	37	0..1		R	
Rotor motor overload	38	0..1		R	

Name	Object Instance	Range	Unit	Access	Description
Alarms					
Communication error	39	0..1		R	
Controller failure	40	0..1		R	
Compressor off	41	0..1		R	
Evaporator icing	42	0..1		R	
Zone 1 TK100 alarm	43	0..1		R	
Zone 1 TK70 alarm	44	0..1		R	
Zone 1 TK60 alarm	45	0..1		R	
Zone 1 low water temperature	46	0..1		R	
Zone 1 external stop	47	0..1		R	
Zone 2 TK100 alarm	48	0..1		R	
Zone 2 TK70 alarm	49	0..1		R	
Zone 2 TK60 alarm	50	0..1		R	
Zone 2 low water temperature	51	0..1		R	
Zone 2 external stop	52	0..1		R	
Low heat exchanger efficiency	53	0..1		R	
Water pump / coil alarm	54	0..1		R	

Analog value

Name	Object Instance	Range	Unit	Access	Description
Unit On/Off	0	0..1		R/W	0-Off, 1-On
Ventilation modes					
Current mode	1	0..5		R	0-Off/Standby, 1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
Mode selection	2	1..6		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special, 6-Program
Comfort1 Supply flow	3	0..200000	variable ¹	R/W	
Comfort1 Extract flow	4	0..200000	variable ¹	R/W	
Comfort1 Setpoint	5	+5..+40	°C	R/W	
Comfort2 Supply flow	6	0..200000	variable ¹	R/W	
Comfort2 Extract flow	7	0..200000	variable ¹	R/W	
Comfort2 Setpoint	8	+5..+40	°C	R/W	
Economy1 Supply flow	9	0..200000	variable ¹	R/W	
Economy1 Extract flow	10	0..200000	variable ¹	R/W	
Economy1 Setpoint	11	+5..+40	°C	R/W	
Economy2 Supply flow	12	0..200000	variable ¹	R/W	
Economy2 Extract flow	13	0..200000	variable ¹	R/W	
Economy2 Setpoint	14	+5..+40	°C	R/W	
Special Supply flow	15	0..200000	variable ¹	R/W	
Special Extract flow	16	0..200000	variable ¹	R/W	
Special Setpoint	17	+5..+40	°C	R/W	
Special mode Heating	18	0..1		R/W	0-Disable, 1-Enable
Special mode Cooling	19	0..1		R/W	0-Disable, 1-Enable
Special mode Recirculation	20	0..1		R/W	0-Disable, 1-Enable
Special mode Humidifying	21	0..1		R/W	0-Disable, 1-Enable
Special mode Dehumidifying	22	0..1		R/W	0-Disable, 1-Enable
Flow control mode	23	0..2		R/W	0-CAV, 1-VAV, 2-DCV
Temp. control mode	24	0..3		R/W	0-Supply, 1-Extract, 2-Room, 3-Balance

¹ See Analog Value Object Instance 72.

Analog value

Name	Object Instance	Range	Unit	Access	Description
Functions					
AQC Enable	25	0..1		R/W	0-Disable, 1-Enable
AQC Setpoint 1	26	variable ¹	variable ¹	R/W	200..1800 ppm, or 10..90 % or 5,0..45,0 °C
AQC Mode 1	27	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
AQC Setpoint 2	28	variable ¹	variable ¹	R/W	200..1800 ppm, or 10..90 % or 5,0..45,0 °C
AQC Mode 2	29	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
OCV Enable	30	0..1		R/W	0-Disable, 1-Enable
OCV Winter compensation stop	31	-40,0..+50,0	°C	R/W	
OCV Winter compensation start	32	-40,0..+50,0	°C	R/W	
OCV Summer compensation start	33	-40,0..+50,0	°C	R/W	
OCV Summer compensation stop	34	-40,0..+50,0	°C	R/W	
MTC Enable	35	0..1		R/W	0-Disable, 1-Enable
MTC Setpoint	36	-40,0..+50,0	°C	R/W	
OVR Enable	37	0..1		R/W	0-Disable, 1-Enable
OVR Type	38	0..2		R/W	0-Alltime, 1-If on, 2-If off
OVR Mode	39	0..6		R/W	0-Standby, 1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special, 6-Program
SNC Enable	40	0..1		R/W	0-Disable, 1-Enable
SNC Start temperature	41	15,0..+50,0	°C	R/W	
SNC Stop temperature	42	15,0..+50,0	°C	R/W	
OOD Enable	43	0..1		R/W	0-Disable, 1-Enable
OOD Setpoint	44	variable ¹	variable ¹	R/W	200..1800 ppm, or 10..90 % or 5,0..45,0 °C
REC Enable	45	0..1		R/W	0-Disable, 1-Enable
REC Setpoint 1	46	variable ¹	variable ¹	R/W	200..1800 ppm, or 10..90 % or 5,0..45,0 °C

¹ Dependent on the value of air quality control sensor type (CO2, VOC, RH, Temperature sensor types supported).

Name	Object Instance	Range	Unit	Access	Description
Functions					
REC Mode 1	47	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
REC Setpoint 2	48	variable ¹	variable ¹	R/W	200..1800 ppm, or 10..90 % or 5,0..45,0 °C

Analog value

Name	Object Instance	Range	Unit	Access	Description
Functions					
REC Mode 2	49	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
REC Min. Fresh Air 1	50	0..100	%	R/W	
REC Min. Fresh Air 2	51	0..100	%	R/W	
REC Winter end	52	-40.0..+50.0	°C	R/W	
REC Winter start	53	-40.0..+50.0	°C	R/W	
REC Summer start	54	-40.0..+50.0	°C	R/W	
REC Summer end	55	-40.0..+50.0	°C	R/W	
REC Default recirculation	56	0..100	%	R/W	
REC Activated recirculation	57	0..100	%	R/W	
HUM Enable	77	0..1		R/W	0-Disable, 1-Enable
HUM Setpoint 1	78	10..90	%	R/W	
HUM Mode 1	79	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2, 5-Special
HUM Setpoint 2	80	10..90	%	R/W	
HUM Mode 2	81	1..5		R/W	1-Comfort1, 2-Comfort2, 3-Economy1, 4-Economy2
CF heatexchanger calibration	84	0..2		R/W	0-No calibration, 1- Calibrated, 2-Calibrating. Write 1 to start calibration
HUM mode	85	0..2		R/W	0-Supply, 1-Indoor+Supply, 2-Indoor
HUM Type	86	0..1		R/W	0-RH, 1-AH
HUM Units	87	0..1		R/W	AH: 0-g/m ³ , 1-g/kg
OCV Minimum airflow	88	20..100		R/W	%
Water heater: Enable/Disable	89	0..1		R/W	0-Disable, 1-Enable

Name	Object Instance	Range	Unit	Access	Description
Functions					
Water cooler: Enable/Disable	90	0..1		R/W	0-Disable, 1-Enable
Alarm reset					
Actual alarms reset	58	1		W	1-Reset current alarm
Counters					
Air heater operation	59	0..2 ³²	hours	R/W	
Supply fan operation	60	0..2 ³²	hours	R/W	
Exhaust fan operation	61	0..2 ³²	hours	R/W	
Heat exchanger thermal efficiency	62	1..100	%	R	255-none
Heat exchanger recovery	63	0..2 ³²	watt	R	
Thermal energy saving	64	0..100	%	R	
Supply SFP	65	0..655		R	
Exhaust SFP	66	0..655		R	
User settings					
Day	67	1..31	days	R/W	
Month	68	1..12	months	R/W	
Year	69	2000..2250	years	R/W	
Hours	70	0..23	hours	R/W	
Minutes	71	0..59	minutes	R/W	
Flow units	72	0..3		R/W	0-m ³ /h, 1-l/s, 2-m ³ /s, 3-Pa
External room temperature sensor	73	-50.0..+120.0	°C	R/W	Values outside the range disables override
Zone 1 setpoint	74	-50.0..+40.0	°C	R/W	
Zone 2 setpoint	75	-50.0..+40.0	°C	R/W	
Digital input IN4 override	76	-1..2		R/W	-1 – disabled, 0 – heating, 1 – cooling, 2 – error
Daylight saving time	82	0..1		R/W	0-Disable, 1-Enable
BACnet Broadcast Management Device	83	0..1		R/W	0-Disable, 1-Enable

SERVICE AND SUPPORT

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