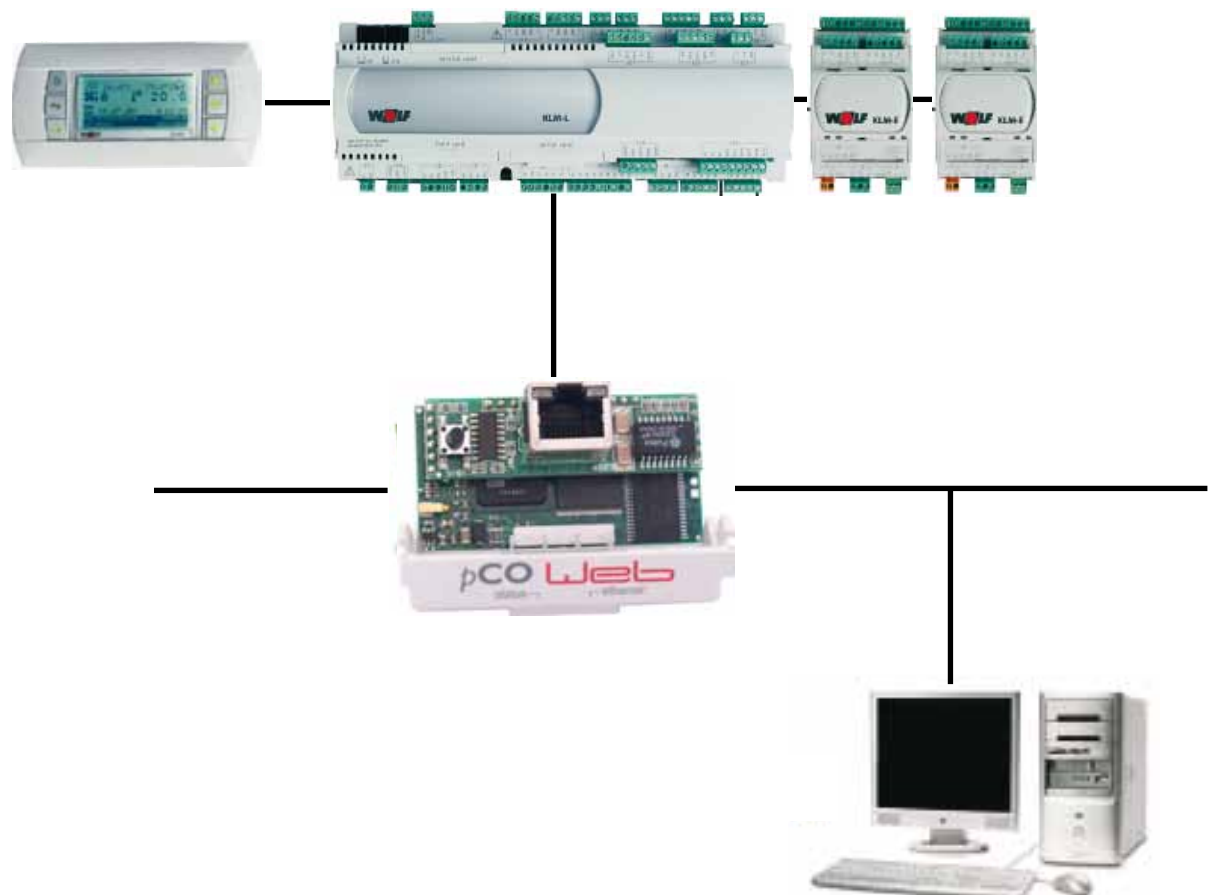


Installation and operating instructions

BACnet interface for WRS-K
(Translation of the original)



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2.1 Other applicable documents

WRS-K installation and operating instructions.

The instructions for all accessory modules and further accessories may also apply.

2.2 Safekeeping of these documents

The system operator or user should ensure the safekeeping of all instruction manuals.

→ Pass on these operating instructions as well as all other applicable manuals.

2.3 Symbols and warnings used

The following symbols are used in conjunction with these important instructions concerning personal safety, as well as operational reliability.



"Safety instructions" are instructions with which you must comply exactly, to prevent risks and injuries to individuals and material losses.



Danger through 'live' electrical components!
Please note: Switch OFF the ON/OFF switch before removing the casing.

Never touch electrical components or contacts when the ON/OFF switch is in the ON position! This results in a risk of electrocution that may lead to injury or death.

Please note

"Please note" indicates technical instructions that you must observe to prevent material losses and equipment malfunctions.

Warning structure

You will recognise warnings in this manual by a pictogram with a line above and below respectively. These warnings are structured according to the following principle:



Signal word
Type and source of the risk.
Explanation of the risk.
→ Action to prevent the risk.

2.4 Applicability of these instructions

These operating instructions are valid for the BACnet interface for WRS-K.

3. Standards and directives

The components of the Wolf WRS-K control system comply with the following regulations:

EC Directives

- 2006/95/EC Low Voltage Directive
- 2004/108/EC EMC Directive

EN Standards

- EN 55014-1 Emission
- EN 55014-2 Immunity
- EN 55022 Radio disturbance characteristics
- EN 55024 Immunity characteristics
- EN 60730-1 Automatic electrical controls for household and similar use
- EN 60730-2-9 Particular requirements for temperature sensing controls
- EN 61000-6-1 Immunity for residential, commercial and light-industrial environments
- EN 61000-6-2 EMC Immunity for industrial environments
- EN 61000-6-3 EMC Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-4 Emission standard for industrial environments
- EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use

3.1 Installation / commissioning

- In accordance with DIN EN 50110-1, installation and commissioning may only be performed by qualified electricians
- Observe all regulations stipulated by your local power supply utility and all VDE or local regulations
- DIN VDE 0100 Regulations regarding the installation of high voltage systems up to 1000 V
- DIN VDE 0105-100 Operation of electrical installations.

3.2 Warnings



Only operate the system in perfect technical condition. Immediately remove / remedy any faults and damage that may impact on safety.

3.3 Service / repair

Please note

- Regularly check the perfect function of all electrical equipment.
- Only qualified personnel may remove faults or repair damage.
- Only replace faulty components or equipment with original Wolf spare parts.

We accept no liability for any damage or loss resulting from technical modifications to Wolf control units.

3.4 Disposal

Observe the following information regarding the disposal of faulty system components or the system at the end of its service life: Dispose of all components in accordance with applicable regulations, i.e. separate material groups correctly. The aim should be the maximum possible recycling of basic materials with the least environmental impact. Never throw electrical or electronic scrap into the household waste, but recycle it appropriately.

Generally, dispose of materials in the most environmentally responsible manner according to environmental, recycling and disposal standards.

4. Standard delivery



1 BACnet interface

2 Cover

3 Labels

5. Installation

The BACnet interface is usually supplied fully assembled with the control unit. If it is retrofitted, please observe the following points:

The BACnet interface is inserted into the "serial card" slot on the KLM-M controller (part no. 2744747) or KLM-L controller (part no. 2744746). To do this, proceed as follows:



1. Isolate the KLM-M or KLM-L air conditioning and ventilation module from the power supply.
2. Remove the cover of the "serial card" slot using a screwdriver.



3. Insert the BACnet interface into the free slot such that a plug-in connection is made between the connection block of the BACnet interface and the pins of the air conditioning and ventilation module (connection block clicks into place).

4. Refit the slot cover.

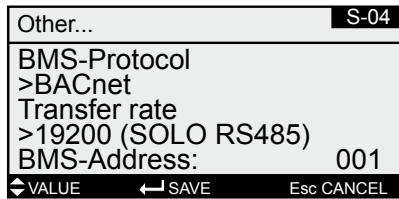
5. Reconnect the power supply.

6. Affix the labels supplied:

Every BACnet interface has its own MAC address. This is noted on the labels supplied as well as on the interface. If the interface is no longer accessible once it has been installed, the labels can be affixed in an accessible area so that the MAC address can be viewed at any time as required.



6. Interface configuration



Note

If the BACnet interface was supplied fully assembled with the control unit, it is also already configured. No further settings are required.

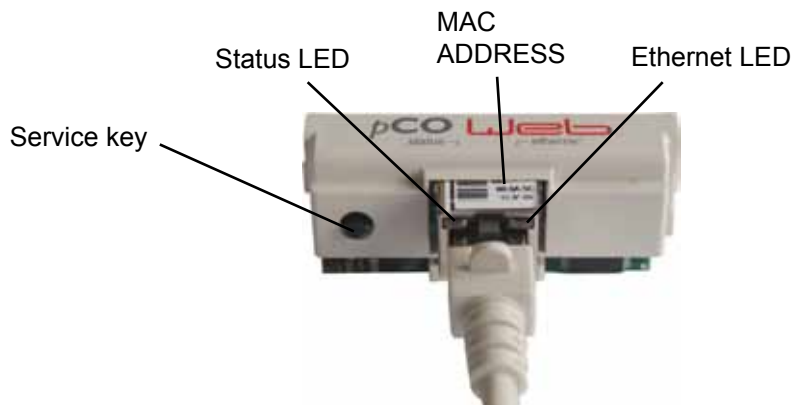
If the interface is retrofitted, it can be configured as follows:

1. Navigate to the main menu with the Esc key on the BMK programming module.
2. Select menu item **Heating contractor** with Enter.
3. Enter password "1234" and confirm with Enter.
4. Select menu item **Other...** with Enter.
5. Navigate to menu item BMS-Protocol with the up/down arrows.
6. Use Enter to highlight the BMS-Protocol and the up/down arrows to select protocol type BACnet.
The transfer rate is then automatically set to 19200 and the BMS address to 001.
7. Confirm these entries with Enter.
8. Use Esc to complete the entry and exit the menu item.

Note

The precise procedure for operating the BMK programming module can be found in the WRS-K installation and operating instructions.

7. LED displays / service key



7.1 LED displays

Both LEDs (status LED and Ethernet LED) illuminate immediately after the control unit is started, as described below. If the LEDs do not illuminate after start-up, check whether:

- The BACnet interface is correctly inserted into the KLM air conditioning and ventilation module.
- The power supply is present.

7.1.1 Status LED

- During system start-up:

After the control unit is switched on, the status LED illuminates as follows:

1. Remains switched off for 2 seconds.
2. Flashes green/red for 2 seconds.
3. Illuminates green for 1.5 minutes.
4. Flashes green or red:

Flashing green:

The start-up procedure is complete and the BACnet interface is communicating correctly with the KLM air conditioning and ventilation module.

Flashing red:

The start-up procedure is complete but the BACnet interface is not communicating correctly with the KLM air conditioning and ventilation module.

- During operation:

Flashing green (3x per second)	Standard mode
Slowly flashing red (1x every 2 seconds)	No communication between BACnet interface and KLM air conditioning and ventilation module
Flashing red once and then flashing green	A single communication error has occurred
Illuminated red	Rescue mode

7.1.2 Ethernet LED

- During system start-up:

After the control unit is switched on, the Ethernet LED illuminates green. If it remains red, no connection to a network has been established.

This may have the following causes:

- Directly connected PC is switched off.
- Plug is not correctly inserted into the BACnet interface or PC.
- The cable used is faulty.

- During operation:

Illuminated green	Correct Ethernet data connection recognised
Flashing green	Correct Ethernet data exchange
Red	No Ethernet signal detected

7.2 Service key

Using the service key, the factory setting for the network settings can be enabled. The factory settings are:

IP address = **172.16.0.1**

Subnet mask = **255.255.0.0**

To enable the factory setting, proceed as follows:

1. Restart the controller.
2. Immediately after restarting and as soon as the status LED illuminates green, press and hold the service key.
3. After approx. 20 s, the status LED slowly flashes red 3 times; when it does so, release the service key.
4. The status LED illuminates green, then briefly flashes red 3 times for confirmation, before illuminating green for about one minute.
5. Subsequently, the status LED flashes green (standard mode).

Note:

The factory setting remains enabled until the controller is next restarted. When it is restarted, the user-defined setting (if available) is enabled again.

If required, the interface can be configured via a direct connection between a PC and the BACnet interface.

This means a permanent IP address can be set (factory setting = DHCP).

8.1 Making a connection between a PC and BACnet interface

Using a crossover cable, a direct connection to the BACnet interface can be made via a PC or laptop. It is then possible to access the interface via a browser (e.g. Internet Explorer).

8.1.1 PC configuration

First, the network settings of the PC have to be set up in a way that allows access to the BACnet interface.

To do this, proceed as follows:

1. Control unit is not supplied with power and the PC is connected to the BACnet interface with a crossover cable.
2. Make the following network settings at the PC:

IP address = 172.16.0.2

Subnet mask = 255.255.0.0

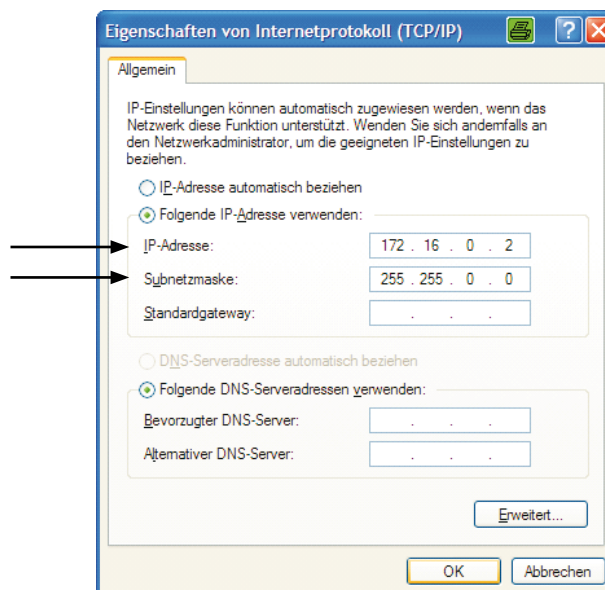
For this, in Control Panel, double click to select "Network Connections", then double click to select "LAN Connection".

Click on "Properties" with the left mouse button, highlight "Internet Protocol" and click on "Properties" (or double click "Internet Protocol").

Note:

Make a note of the settings or save the relevant screenshot so that you can reinstate the original settings later.

Enable "Use the following IP address" and enter **172.16.0.2** under IP address, and **255.255.0.0** under subnet mask. The settings under Default Gateway can be retained.



Use "OK" to close all windows.

8. Settings

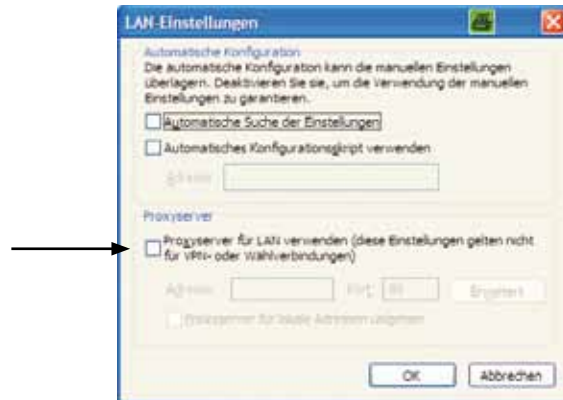
3. Disable the proxy:

In Control Panel, double click to select "Internet Options", select tab "Connections", and then click to select "LAN settings"

Note:

Make a note of the settings or save the relevant screenshot so that you can reinstate the original settings later.

Disable the proxy server:



"Use proxy server for LAN" must not be enabled.

Use "OK" to close all windows.

8.1.2 Making a connection

In order to access the BACnet interface, a PC/laptop and the interface must first be connected via a crossover cable.

The controller is then supplied with power and the factory setting is made with the service key (see 7.2 Service key).

It is then possible to access the card via a browser (e.g. Internet Explorer). For this, IP address **172.16.0.1** must be entered in the address line of the browser.

The following page is shown:



Note:

A connection cannot be established until the BACnet interface is back in standard mode following the reset, i.e. the status LED is flashing green.

8.2 Configuration

In order to make settings, access to the administrator area is required. For this, click "Go to Administrator Area".

You will be asked for a password. At the factory, the following input is stored:

User name: **admin**

Password: **fadmin**

After entering this information and confirming with "OK", the following page is shown:

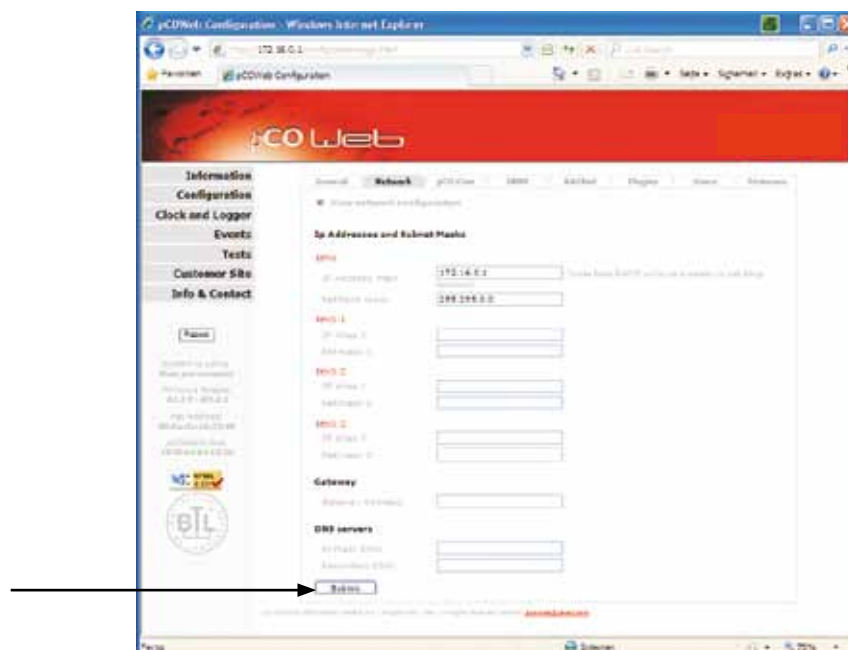


Click on "Configuration" on the left side of the screen to reach the configuration level.

Here, the page "Network" can be selected, where a permanent IP address can be entered. The factory setting is DHCP. In order to permanently save the factory-set address, for example, make the following entries:

IP Address main: 172.16.0.1

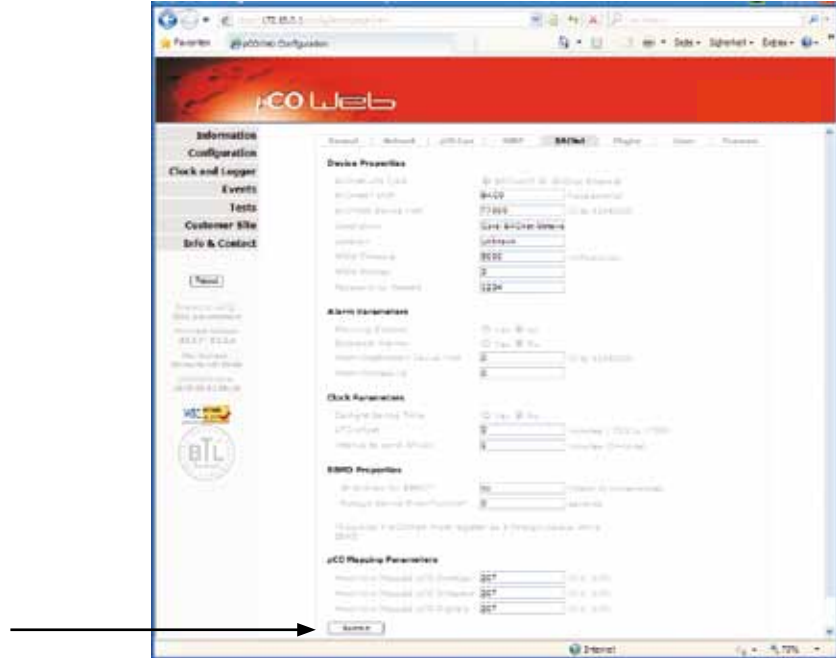
NetMask main: 255.255.0.0



Click "Submit" to accept the setting.

8. Settings

On the "BACnet" page, settings specific to the BACnet can be made. For example, it is possible to choose between the two supported standards "BACnet IP" or "BACnet Ethernet", and to adjust the device instance as required (Factory setting = 77000). In general, the settings are made via the responsible systems integrator who links the control unit into the building network.



Click "Submit" to accept the setting.

Further settings of the BACnet interface and individual objects can be made with the software tool "BACset". This can be downloaded from ksa.carel.com.



Via the BACnet interface, it is possible to gain read and write access to the air conditioning control unit.

The associated EDE file can be downloaded from www.wolf-heiztechnik.de

9.1 Read access

The following data is available for read access:

9.1.1 Operating data

Description	Object Type	Object Instance	Object Name / Description	Unit
Central fault	Binary Value	1	Alarm_General	-
External system enable	Binary Value	2	Ext_Request_Enable	-
Hygrostat humidity	Binary Value	3	Hygrostat	-
Humidifier enable	Binary Value	4	Humidifier_Enable	-
System status	Binary Value	5	Status_AHU	-
Operating status 2)	Binary Value	117	Status_Operation	-
Pump, hot water	Binary Value	60	Pump_Heating	-
Pump, cold water	Binary Value	18	Pump_Cooling	-
Heat source demand	Binary Value	61	Request_Heating	-
Enable or pump HR	Binary Value	62	Request_Heat_Recovery	-
Outside/supply air damper	Binary Value	63	Request_Damper_Supply	-
Exhaust/extract air damper	Binary Value	64	Request_Damper_Exhaust	-
Enable gas valve	Binary Value	65	Enable_Gas_Valve	-
Enable or pump, adiabatic cooling	Binary Value	87	Adiabatic_Cooling_Enable	-
Enable convector heater (WO)	Binary Value	89	Air_Heater_Enable	-
Thermostat, convector heater (WO)	Binary Value	90	Thermostat_Air_Heater	-
Water supply line drain valve, adiabatic cooling, open	Binary Value	91	Drain_Valve_Supply_Water	-
Pan drain valve, adiabatic cooling, open	Binary Value	92	Drain_Valve_Tank	-
Inlet valve, adiabatic cooling, open	Binary Value	94	Feed_Valve_Adiabatic_Cooling	-
Supply air temperature	Analog Value	1	Temperature_Supply_Air	Degrees Celsius
Outside temperature	Analog Value	2	Temperature_Outside	Degrees Celsius
Room temperature	Analog Value	3	Temperature_Room	Degrees Celsius
Extract air temperature	Analog Value	4	Temperature_Exhaust_Air	Degrees Celsius
Air quality	Analog Value	5	Air_Quality_VOC	Volts
Set value transducer	Analog Value	6	Setpoint_Device	Degrees Celsius
Room air humidity	Analog Value	7	Humidity_Room	Percent relative humidity
Relative humidity, extract air	Analog Value	8	Humidity_Exhaust_Air	Percent relative humidity
Relative humidity, supply air	Analog Value	9	Humidity_Supply_Air	Percent relative humidity
Current set value, supply air temperature	Analog Value	10	Setpoint_Temperature_Supply_Air	Degrees Celsius
Current set temperature	Analog Value	11	Setpoint_Temperature	Degrees Celsius
Current set value, fresh air proportion	Analog Value	12	Setpoint_Fresh_Air	Percent
Current set speed, supply air fan	Analog Value	13	Setpoint_Speed_Supply_Fan	Percent
Current set speed, extract air fan	Analog Value	14	Setpoint_Speed_Exhaust_Fan	Percent
Current set value, relative humidity	Analog Value	23	Setpoint_Humidity	Percent relative humidity
Current set value, absolute humidity	Analog Value	24	Setpoint_Humidity_Abs	Grams of water per kilogram dry air
Icing-up sensor	Analog Value	27	Temperature_Heat_Recovery	Degrees Celsius
Actuating signal, heating valve	Analog Value	28	Signal_Valve_Heating	Percent
Actuating signal, cooling valve	Analog Value	29	Signal_Valve_Cooling	Percent
Actuating signal, HR	Analog Value	30	Signal_Heat_Recovery	Percent

Description	Object Type	Object Instance	Object Name / Description	Unit
Actuating signal, humidifier	Analog Value	31	Signal_Humidifier	Percent
Extract air temperature downstream of humidifier for adiabatic cooling	Analog Value	32	Temperature_Adiabatic_Cooling	-
Actuation signal reheating 2)	Analog Value	33	Signal_Valve_Reheating	Percent
Air quality (CO2)	Analog Value	1001	Air_Quality_CO2	Parts-Per-Million
Supply air pressure	Analog Value	1002	Pressure_Supply_Air	Pascals
Extract air pressure	Analog Value	1003	Pressure_Exhaust_Air	Pascals
Supply air flow rate*	Analog Value	1004	Volume_Supply_Air	Cubic-Meters-Per-Hour
Extract air flow rate*	Analog Value	1005	Volume-Exhaust_Air	Cubic-Meters-Per-Hour
Operating mode	Analog Value	1006	Operation_Mode	-
Current set value, fan stage	Analog Value	1007	Setpoint_Fan_Stage	-
Current set pressure, supply air	Analog Value	1008	Setpoint_Pressure_Supply_Air	Pascals
Current set pressure, extract air	Analog Value	1009	Setpoint_Pressure_Exh_Air	Pascals
Current set flow rate, supply air*	Analog Value	1010	Setpoint_Volume_Supply_Air	Cubic-Meters-Per-Hour
Current set flow rate, extract air*	Analog Value	1011	Setpoint_Volume_Exhaust_Air	Cubic-Meters-Per-Hour
Direct evaporator stage	Analog Value	1025	Chiller_Stage	-
Cooling source demand, stage 1/2	Analog Value	1012	Request_Cooling	-
Electric heater bank stage	Analog Value	1024	EHeating_Stage	-
Operating mode, heat pump 2)	Analog Value	1047	Heatpump-Mode	-

1) Available WRS-K software version 3.0.000 or higher

2) Available up to WRS-K software version 2.1.031

Encoding

Description	Value	Explanation
Current set value, fan stage	0	Fans Off
	1	Fans On (single stage and variable fans) Fans stage 1 On (multi stage fans)
	2	Fans stage 2 On
	3	Fans stage 3 On
Operating mode	0	Manual mode
	1	7-day program
	2	BMS mode
System status	0	Standby
	1	Ready for operation
Operating status	0	System not in use
	1	System in use
Operating mode, heat pump	0	Not enabled
	1	Enable heating
	2	Enable cooling

9.1.2 Special operating modes Any special operating modes which are enabled will be transferred as described below. Function descriptions of the special operating modes can be found in the WRS-K installation and operating instructions.

Description	Object Type	Object Instance	Object Name / Description
Holiday program	Binary Value	6	Special_Holiday
Filter test	Binary Value	7	Special_Filter
Preheat program	Binary Value	8	Special_Preheat
Night ventilation	Binary Value	9	Special_NightVentilation
Backup mode	Binary Value	10	Special_BackupMode
Extension of utilisation time	Binary Value	11	Special_Utilisation
Peak ventilation	Binary Value	12	Special_PeakVentilation
Natural cooling	Binary Value	13	Special_NaturalCooling
Hygostat function	Binary Value	14	Special_Hygostat
Air quality control	Binary Value	15	Special_AirQuality
External demand	Binary Value	16	Special_ExternalDemand
Run-on	Binary Value	17	Special_RunOn
HR-Ice guard	Binary Value	101	Special_HR_Icing
Speed reduction	Binary Value	102	Special_Speed Reduction
Setback mode 1)	Binary Value	112	Special_Setback Mode
Winter start HR 1)	Binary Value	113	Special_Winterstart

1) Available WRS-K software version 3.0.000 or higher

Value	Explanation
OFF	Special operating mode not enabled
ON	Special operating mode enabled

Note:

Several special operating modes can be enabled at the same time.

9.1.3 Alarms

Any enabled alarms will be transferred as described below. Descriptions of the causes and possible solutions can be found in the WRS-K installation and operating instructions.

Description	Object Type	Object Instance	Object Name / Description
Fault, inverter, supply air fan	Binary Value	19	Alarm_Inverter_Supply
Motor temperature too high, supply air fan	Binary Value	20	Alarm_Temp_Motor_Supply
Repair switch, supply air fan	Binary Value	21	Alarm_RepairSwitch_Supply
Air flow monitor, supply air	Binary Value	22	Alarm_AirFlow_Supply
Fault, inverter, extract air fan	Binary Value	23	Alarm_Inverter_Exhaust
Motor temperature too high, extract air fan	Binary Value	24	Alarm_Temp_Motor_Exhaust
Repair switch, extract air fan	Binary Value	25	Alarm_RepairSwitch_Exhaust
Air flow monitor, extract air	Binary Value	26	Alarm_AirFlow_Exhaust
Outside air filter contaminated	Binary Value	27	Alarm_Filter_Outside
Supply air filter contaminated	Binary Value	28	Alarm_Filter_Supply
Extract air filter contaminated	Binary Value	29	Alarm_Filter_Exhaust
Pump fault, DHW bank	Binary Value	30	Alarm_Pump_HotWater
Frost stat has responded	Binary Value	31	Alarm_Frost
Frost protection temperature, supply air not reached	Binary Value	32	Alarm_Frost_SupplyAir
Temperature limiter, electric heater bank	Binary Value	33	Alarm_TempLimiter_EHeater
High limit safety cut-out, electric heater bank	Binary Value	34	Alarm_SafetyTempLimiter_EHeater
Fault, pump, cold water bank	Binary Value	35	Alarm_Pump_ColdWater

Description	Object Type	Object Instance	Object Name / Description
Central fault, external refrigeration unit	Binary Value	36	Alarm_Chiller
Alarm, fire alarm system, central fault message	Binary Value	37	Alarm_Fire
Supply air temperature sensor faulty or not connected	Binary Value	38	Alarm_Temp_Supply
Supply air humidity sensor faulty or not connected	Binary Value	39	Alarm_Humi_Supply
Room temperature sensor faulty or not connected	Binary Value	40	Alarm_Temp_Room
Room air humidity sensor faulty or not connected	Binary Value	41	Alarm_Humi_Room
Extract air temperature sensor faulty or not connected	Binary Value	42	Alarm_Temp_Exhaust
Extract air humidity sensor faulty or not connected	Binary Value	43	Alarm_Humi_Exhaust
Outside temperature sensor faulty or not connected	Binary Value	44	Alarm_Temp_Out
Icing-up sensor HR faulty or not connected	Binary Value	46	Alarm_Temp_HR
Fire damper responded	Binary Value	47	Alarm_Fire_Damper
Fault, EC motor, supply air fan	Binary Value	48	Alarm_EC_Supply
Fault, EC motor, extract air fan	Binary Value	49	Alarm_EC_Exhaust
Databus fault, extension modules	Binary Value	50	Alarm_KLM_E
Remote control not connected or databus fault	Binary Value	51	Alarm_BMK_F
Service required	Binary Value	52	Alarm_Service
Icing-up temperature HR below set value 2)	Binary Value	53	Alarm_HR_Icing
Fault, heat recovery	Binary Value	54	Alarm_HR
Service message, humidifier	Binary Value	55	Alarm_Service_Humi
Fault, humidifier	Binary Value	56	Alarm_Humi
External fault	Binary Value	57	Alarm_Extern
Smoke detector responded	Binary Value	58	Alarm_SmokeAlarm
Set value transducer not or incorrectly connected	Binary Value	59	Alarm_Setpoint_Device
Fire damper 1 responded	Binary Value	66	Alarm_Fire_Damper_1
Fire damper 2 responded	Binary Value	67	Alarm_Fire_Damper_2
Fire damper 3 responded	Binary Value	68	Alarm_Fire_Damper_3
Fire damper 4 responded	Binary Value	69	Alarm_Fire_Damper_4
Fire damper 5 responded	Binary Value	70	Alarm_Fire_Damper_5
Fire damper 6 responded	Binary Value	71	Alarm_Fire_Damper_6
Fire damper 7 responded	Binary Value	72	Alarm_Fire_Damper_7
Fire damper 8 responded	Binary Value	73	Alarm_Fire_Damper_8
Fire damper 9 responded	Binary Value	74	Alarm_Fire_Damper_9
Fire damper 10 responded	Binary Value	75	Alarm_Fire_Damper_10
Fire damper 11 responded	Binary Value	76	Alarm_Fire_Damper_11
Fire damper 12 responded	Binary Value	77	Alarm_Fire_Damper_12
Fire damper 13 responded	Binary Value	78	Alarm_Fire_Damper_13
Fire damper 14 responded	Binary Value	79	Alarm_Fire_Damper_14
Fire damper 15 responded	Binary Value	80	Alarm_Fire_Damper_15
Fire damper 16 responded	Binary Value	81	Alarm_Fire_Damper_16
Fire damper 17 responded	Binary Value	82	Alarm_Fire_Damper_17
Fire damper 18 responded	Binary Value	83	Alarm_Fire_Damper_18
Fire damper 19 responded	Binary Value	84	Alarm_Fire_Damper_19
Fire damper 20 responded	Binary Value	85	Alarm_Fire_Damper_20
Fire damper 21 responded	Binary Value	86	Alarm_Fire_Damper_21
Scaling, freshwater contact humidifier, adiabatic cooling	Binary Value	88	Alarm_AC_Calcification
Fault, convector heater (WO) burner	Binary Value	95	Alarm_Air_Heater
Fault, humidifier for adiabatic cooling	Binary Value	96	Alarm_AC_Humi

Description	Object Type	Object Instance	Object Name / Description
No adiabatic cooling	Binary Value	97	Alarm_AC_Cooling_Power
Humidifier for adiabatic cooling at risk of icing up	Binary Value	98	Alarm_AC_Icing
Extract air temperature sensor downstream of humidifier for adiabatic cooling faulty or not connected	Binary Value	99	Alarm_Temp_AC
Service message, humidifier for adiabatic cooling	Binary Value	100	Alarm_Service_AC_Humi
Pump fault, heat pump 1)	Binary Value	114	Alarm_HP
Pump fault, reheater bank1)	Binary Value	115	Alarm_Pump_Reheating
Frost thermostat responded, reheater bank 1)	Binary Value	116	Alarm_Frost_Reheating

1) Available WRS-K software version 3.0.000 or higher

2) Available up to WRS-K software version 2.1.031

Value	Explanation
OFF	Alarm disabled
ON	Alarm enabled

Note:

Several alarms can be enabled at the same time.

An alarm remains enabled until it is acknowledged at the BMK programming module.

9.2 Write access

With write access, set values can be specified or adjusted, subject to operating mode, via a BACnet network. In addition, the system can be switched on or off and the operating mode specified.

9.2.1 Data

The following data is available for write access:

Description	Object Type	Object Instance	Object Name / Description	Unit
Set temperature from BMS	Analog Value	15	Setpoint_Temperature_BMS	Degrees Celsius
Set speed, supply air fan from BMS	Analog Value	16	Setpoint_Speed_Supply_BMS	Percent
Set speed, extract air fan from BMS	Analog Value	17	Setpoint_Speed_Exhaust_BMS	Percent
Set value, fresh air proportion from BMS	Analog Value	1013	Setpoint_Fresh_Air_BMS	Percent
Set value, fan mode (stage or ON/OFF) from BMS	Analog Value	1014	Setpoint_Fan_Step_BMS	-
Set pressure, supply air from BMS	Analog Value	1015	Setpoint_Pressure_Supply_Air_BMS	Pascals
Set pressure, extract air from BMS	Analog Value	1016	Setpoint_Pressure_Exhaust_Air_BMS	Pascals
Set flow rate, supply air from BMS 1)	Analog Value	1017	Setpoint_Volume_Supply_Air_BMS	Cubic-meters-per-hour
Set flow rate, extract air from BMS 1)	Analog Value	1018	Setpoint_Volume_Exhaust_Air_BMS	Cubic-meters-per-hour
Set value, rel. humidity from BMS	Analog Value	25	Setpoint_Humidity_BMS	Percent relative humidity
Set value, absolute humidity from BMS	Analog Value	26	Setpoint_Humidity_Abs_BMS	Grams of water per kilogram dry air
Offset set temperature	Analog Value	18	Offset_Temperature_BMS	Delta degrees kelvin
Offset set speed, supply air fan	Analog Value	19	Offset_Speed_Supply_Fan	Percent
Offset set speed, extract air fan	Analog Value	20	Offset_Speed_Exhaust_Fan	Percent
Offset set value, fresh air proportion	Analog Value	1019	Offset_Fresh_Air_BMS	Percent
Offset set pressure, supply air	Analog Value	1020	Offset_Pressure_Supply_Air_BMS	Pascals
Offset set pressure, extract air	Analog Value	1021	Offset_Pressure_Exhaust_Air_BMS	Pascals
Offset set value, relative humidity	Analog Value	21	Offset_Humidity_BMS	-
Offset set value, absolute humidity	Analog Value	22	Offset_Humidity_Abs_BMS	-
Offset set flow rate, supply air 1)	Analog Value	1022	Offset_Volume_Supply_Air_BMS	Cubic-meters-per-hour
Offset set flow rate, extract air 1)	Analog Value	1023	Offset_Volume_Exhaust_Air_BMS	Cubic-meters-per-hour
Operating mode	Analog Value	1006	Operation_Mode	-

1) Actual value = 10 times the transferred value

9.2.2 Operating mode

If a BACnet interface is installed, the system can be operated in 3 different operating modes:

- Manual mode
- 7-day program
- BMS mode

Manual mode

The system runs with the set values specified for manual mode via the BMK programming module. The set values can be adjusted via offsets using the BACnet interface.

7-day program

The system runs with the times and set values specified in the 7-day program. The set values can be adjusted via offsets using the BACnet interface.

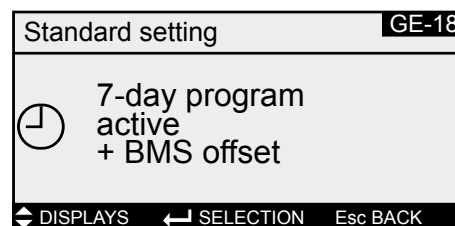
BMS mode

The system runs with the set values specified via the BACnet interface. The system is switched on and off via the BACnet interface.

The operating mode can be changed via the BMK programming module or the BACnet interface.

- Selecting the operating mode via the BMK programming module:

1. Navigate to the main menu with the Esc key on the BMK programming module.
2. Select menu item **Standard settings** with Enter.
3. Navigate to the operating mode with the up/down arrows.
4. Highlight the operating mode with Enter.
5. Select the required operating mode with the up/down arrows and confirm with Enter.



6. Use Esc to complete the entry and exit the menu item.

- Selecting the operating mode via BACnet interface:

Via object "Operation mode", the operating mode can be changed using the BACnet interface:

Value	Explanation
0	Manual mode
1	7-day program
2	BMS mode

**9.2.3 Manual mode /
7-day program**

In manual mode or with a 7-day program enabled, the set values can be adjusted via the offset variables. The system runs as specified by manual mode or the 7-day program.

The following objects are effective:

- Offset_Temperature_BMS (adjust set temperature)
- Offset_Speed_Supply_Fan (adjust set speed for supply air fan)
- Offset_Speed_Exhaust_Fan (adjust set speed for extract air fan)
- Offset_Fresh_Air_BMS (adjust fresh air proportion)
- Offset_Pressure_Supply_Air_BMS (adjust set pressure for supply air)
- Offset_Pressure_Exhaust_Air_BMS (adjust set pressure for extract air)
- Offset_Volume_Supply_Air_BMS (adjust set flow rate for supply air)
- Offset_Volume_Exhaust_Air_BMS (adjust set flow rate for extract air)
- Offset_Humidity_BMS (adjust set value for relative humidity)
- Offset_Humidity_Abs_BMS (adjust set value for absolute humidity)
- Operation_Mode

Please note:

Any adjustment of the set values is always relative to the set values selected for manual mode or the 7-day program.

Any adjustment of the set value for humidity is relative to the set value selected in the associated parameter.

For systems with active set value transducers, the set temperature cannot be adjusted via the interface.

**Systems with BMK-F remote
control:****Adjusting the set temperature:**

If the set value is adjusted via the BACnet interface, after the set value has been altered via the remote control, a changeover is made to the set value for manual mode or the 7-day program, plus offset, via the BACnet interface.

Example:

Set value for manual mode = **21 °C**; adjustment of the set value via BMK-F to **23 °C**. If an offset (Offset_Temperature_BMS) of **-1 K** is then specified, a new set value of **20 °C** (21 °C-1 K) is enabled.

Adjustment of set speed / pressure / flow rate:

The set values for speed, pressure or flow rate can be adjusted via the remote control in 3 stages (see WRS-K installation and operating instructions). Here, the set value is altered according to the values specified in the standard settings for supply air and extract air.

If, after altering a set value via the remote control, a set value is adjusted via the BACnet interface for supply air **or** extract air, a changeover is made to the set values for manual mode or the 7-day program, plus offset, via the BACnet interface for supply air **and** extract air.

Example:

Set speed for supply air in manual mode = 50%; set speed for extract air in manual mode = 45%; set speeds changed via BMK-F to 60% (supply air) and 55% (extract air).

If an offset for the supply air speed (Offset_Speed_Supply_Fan) of 30% is then specified, but no offset for the extract air fan is set, new set values of 80% (50%+30%) for the supply air fan and 45% (= set value for manual mode) for the extract air fan are enabled.

Adjusting the set value for fresh air proportion:

If the set value is adjusted via the BACnet interface, after the set value has been altered via the remote control, a changeover is made to the set value for manual mode or the 7-day program, plus offset, via the BACnet interface.

Example:

Set value for manual mode = **40%**; set value adjusted via BMK-F to **50%**. If an offset (Offset_Fresh_Air_BMS) = **-10%** is then specified, a new set value of **30%** (40%-10%) is enabled.

9.2.4 BMS mode

In BMS mode, all set values are specified via the BACnet interface. The system is also switched on and off via the BACnet interface.

The following objects are effective:

- Setpoint_Temperature_BMS
- Setpoint_Speed_Supply_BMS (set speed for supply air fan)
- Setpoint_Speed_Exhaust_BMS (set speed for extract air fan)
- Setpoint_Fresh_Air_BMS (set value for fresh air proportion)
- Setpoint_Pressure_Supply_Air_BMS
- Setpoint_Pressure_Exhaust_Air_BMS (set pressure for extract air)
- Setpoint_Volume_Supply_Air_BMS (set flow rate for supply air)
- Setpoint_Volume_Exhaust_Air_BMS (set flow rate for extract air)
- Setpoint_Fan_Step_BMS (set value for fan mode)
- Setpoint_Humidity_BMS (set value for relative humidity)
- Setpoint_Humidity_Abs_BMS (set value for absolute humidity)
- Operation_Mode

Via object **Setpoint_Fan_Step_BMS**, the fans are switched on and the system is thus enabled with the set values specified by the BACnet interface:

For single stage and variable speed fans:

Value	Explanation
0	System OFF
1	System ON

For multi stage fans (2- or 3-stage):

Value	Explanation
0	System OFF
1	System ON with fan stage 1
2	System ON with fan stage 2
3	System ON with fan stage 3

Systems with BMK-F remote control:

Set temperature:

If the set value has been altered via the remote control, a new set value specification is accepted via the BACnet interface when the value of object "Setpoint_Temperature_BMS" is **changed**.

Set speed / pressure / flow rate:

If the set value has been altered via the remote control, a new set value specification is accepted via the BACnet interface when the value of object is **changed**. As soon as a new set value for supply air **or** extract air is specified, the set values specified via the BACnet interface for supply air **and** extract air are enabled.

If the set value for the supply air speed or supply air pressure is set to 0, the set value for the extract air speed or extract air pressure is also set to 0.

Set value for fresh air proportion:

If the set value has been altered via the remote control, a new set value specification is accepted via the BACnet interface when the value of object "Setpoint_Fresh_Air_BMS" is **changed**.

Operating conditions	-0-55 °C, 20-80% r.H. not condensing
Storage conditions	-20-70 °C, 20-80% r.H. not condensing
Ethernet interface	RJ45 for Ethernet 10BaseT for screened CAT 5 cable
Max. cable length	100 m
Protocols supported	BACnet Ethernet ISO8802-2/8802-3, BACnet/IP
Memory	16 MB RAM, 8 MB Flash
CPU	ARM7 TDMI@74 MHz clock
Operating system	LINUX 2.4.21