Installation and configuration manual GB/en

Single room control

FSL-CONTROL III

for decentralised ventilation units from software version 8.0





TROX® TECHNIK

The art of handling air

Read the instructions prior to performing any task!

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General information

Information on the installation and configuration guide

These instructions enable the installation and configuration of the FSL-CONTROL III control system for decentralised ventilation units from TROX.

This configuration guide is intended for network administrators, instructed persons, and qualified electricians and air conditioning technicians.

The personnel must have carefully read and understood the instructions before starting any work. The basic prerequisite for safe working is to comply with all safety notes and instructions in this manual.

The local regulations for health and safety at work and the general safety regulations for the area of application of the ventilation unit also apply.

This manual must be given to the system owner when handing over the system. The system owner must include the manual with the system documentation. The manual must be kept in a place that is accessible at all times.

Illustrations in this manual are mainly for information and may differ from the actual design.

Other applicable documentation

- Installation and operating manual for the decentralised ventilation unit.
- Project-specific documents, if any

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Table of contents

1 Safety 5
1.1 Symbols in this manual 5
1.2 Correct use 5
1.3 Safety signs 5
1.4 Electric shock hazard 6
1.5 Personnel requirements 6

2 Making electrical connections 7
2.1 Wiring 7
2.1.1 Connecting the supply voltage 7
2.1.2 Connection of the control panel 7
2.1.3 Connection of room temperature sensor 9
2.1.4 Connection of external inputs and outputs 10
2.1.5 Communication FSL-CONTROL III 11
2.2 Connection to the management and control equipment / building automation and control system (MCE/BACS) 15
2.2.1 Modbus RTU / BACnet MS/TP 15
2.2.2 Modbus TCP / BACnet IP 16
2.3 Connection to X-TAIRMINAL 19
2.3.1 Structure 19

3 Control of the ventilation unit 20
3.1 FSL-CONTROL III Control system 20
3.1.1 Control components 20
3.1.2 Functional description 20

4 Description of software 31
4.1 Start page – Diagnostics 32
4.2 Diagnostics menu 33
4.2.1 *'Diagnostics ➔ unit status'* 33
4.2.2 *'Diagnostics ➔ temperature control'* ... 35
4.2.3 *'Diagnostics ➔ fan control'* 35
4.2.4 *'Diagnostics ➔ Alarms und filter reset'* 36
4.2.5 *'Diagnostics ➔ Remaining runtimes*+'* 38
4.2.6 *'Diagnostics ➔ IO connections*+'* 39
4.2.7 *'Diagnostics ➔ secondary air admixture*+'* 40
4.2.8 *'Help'* 40
4.3 Configuration menu 40
4.3.1 *'Configuration ➔ device description'* ... 40
4.3.2 *'Configuration ➔ temperature control'* 40
4.3.3 *'Configuration ➔ clock and timer'* 42
4.3.4 *'Configuration ➔ Fan control'* 43
4.3.5 *'Configuration ➔ Interfaces'* 44
4.3.6 *'Configuration ➔ Control panel'* 46
4.3.7 *'Configuration ➔ Temperature control*+'* 47
4.3.8 *'Configuration ➔ Fan control*+'* 49
4.3.9 *'Configuration ➔ Secondary air admixture damper*+'* 50
4.3.10 *'Configuration ➔ Secondary air admixture fan*+'* 51
4.3.11 *'Configuration ➔ Characteristics*+'* ... 52
4.3.12 *'Configuration ➔ IO connections*+'* .. 57
4.3.13 *'Configuration ➔ Device configuration*+'* 60
4.3.14 *'Configuration ➔ Functions*+'* 61
4.3.15 *'Configuration ➔ Alarms*+'* 63
4.3.16 *'Configuration ➔ Frost protection*+'* 63
4.3.17 *'Configuration ➔ Control panel*+'* 65
4.3.18 *'Configuration ➔ BACnet data points'* 66
4.3.19 *'Configuration ➔ Options*+'* 66
4.3.20 *'Configuration ➔ Overall configuration*+'* 66
4.4 Manual control menu 66
4.4.1 *'Manual control ➔ Commands'* 66
4.5 Menu MCE/BACS 67
4.5.1 Connection to the MCE/BACS via Modbus 67
4.5.2 Connection to MCE/BACS via BACnet 75

5 Control panel 85
5.1 Overview of control panels 85
5.2 Digital room operating unit settings 87
5.3 Analogue control panel settings 91

6 X-TAIRMINAL 92

7 Index 95

1 Safety

1.1 Symbols in this manual

Safety notes

Symbols are used in this manual to alert readers to areas of potential hazard. Signal words express the degree of the hazard.

Comply with all safety instructions and proceed carefully to avoid accidents, injuries and damage to property.

DANGER!
Imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!
Potentially hazardous situation which, if not avoided, may result in death or serious injury.

CAUTION!
Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE!
Potentially hazardous situation which, if not avoided, may result in property damage.

ENVIRONMENT!
Environmental pollution hazard.

Safety notes in the operating instructions

Safety notes can refer to specific, individual instructions. Such safety instructions are embedded in the instructions so that they do not interrupt the flow of reading when carrying out the task. The above listed signal words will be used.

Example:

1. Loosen the screw.
2.
   CAUTION!
   Risk of jamming on the lid!
   Close the lid carefully.
3. Tighten the screw.

Tips and recommendations

Useful tips and recommendations as well as information for efficient and fault-free operation.

Additional markers

In order to highlight instructions, results, lists, references and other elements, the following markers are used in this manual:

Marker	Explanation
1., 2., 3. ...	Step-by-step instructions
⇨	Results of actions
	References to sections in this manual and to other applicable documents
■	Lists without a defined sequence
[Switch]	Operating elements (e.g. push buttons, switches), display elements (e.g. LEDs)
'Display'	Screen elements (e.g. buttons or menus)

1.2 Correct use

The FSL-CONTROL III controller is designed exclusively for the control of TROX decentralised ventilation units.

Correct use also involves complying with all the information provided in this manual.

Any use that goes beyond the correct use or any different use of the unit is regarded as incorrect use.

1.3 Safety signs

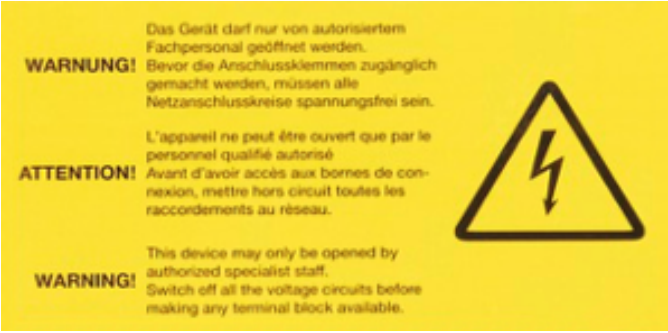
The following symbols and signs are found on the unit. They apply to the very location where they are found.

Electrical voltage



Hazardous electrical voltage that is present in the ventilation unit. Only skilled qualified electricians are allowed to work on parts of the ventilation unit marked with this symbol. Such work must be carried out only by skilled qualified electricians or the technical service.

Controls access panel



Only skilled qualified electricians are allowed to open the controls access panel. Ensure that no voltage is present on any mains circuit before you open the cover to access the terminal connections.

1.4 Electric shock hazard

Electric current

DANGER!

Danger of death due to electric current!

Danger of electric shock! Do not touch any live components! Damaged insulation or damaged parts are a life threatening hazard.

- Only a skilled qualified electrician must work on the electrical systems.
- If the insulation is damaged, disconnect the power supply immediately and have the insulation repaired.
- Switch off the power supply before you carry out maintenance or cleaning.
- Ensure that live parts do not come into contact with moisture. Moisture can cause a short circuit.

1.5 Personnel requirements

Qualification

The qualifications of the persons for the various tasks listed below are specified in these instructions:

Network administrator
Network administrators design, install, configure and maintain the IT infrastructure in companies or organisations.

Qualified electrician
Skilled qualified electricians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on electrical systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

Only persons who can be expected to carry out this work reliably are authorised to carry out any work. Persons whose ability to react is impaired, e.g. by drugs, alcohol or medication, are not authorised.

2 Making electrical connections

DANGER!

Electric shock hazard! Electrical equipment carries a dangerous electrical voltage!

- Only skilled qualified electricians are allowed to work on the electrical system and to connect the unit to the mains.
- Disconnect the cable from the mains (all phases) and secure the unit against being switched on accidentally.
- Ensure that no voltage is present.
- Carry out assembly or connection jobs only as long as no voltage is present.

Notes on the electrical installation

Use only cables that are designed for the supply voltage for which they will be used. The length and cross section as well as any contact resistance may increase voltage losses. The power rating of each unit must also be considered. A skilled qualified electrician has to select the correct cable types and sizes. This job must only be carried out by specialist electrical companies.

- For the electrical connection comply with any applicable regulations and follow the code of good practice. Be sure to comply with the applicable guidelines for working on electrical and electronic equipment as well as with any applicabe local regulations.
- The connection data can be found on the rating plate or in the wiring diagrams.
- Protect any connections from physical damage.
- Feed cables through the cable glands on the ventilation unit.
- Ensure that the unit can be de-energised (all phases) for maintenance such that no voltage is present. This requires separators (e.g. fuses or RCBOs); the distance between contacts should be at least 3 mm.
- For units without integral controls from TROX follow the instructions of the controls provider.

2.1 Wiring

Personnel:

- Qualified electrician

▸ Connect the ventilation unit according to the following wiring diagrams. The position of the electrical connections (terminal box) can be found in the device-specific documentation.

2.1.1 Connecting the supply voltage

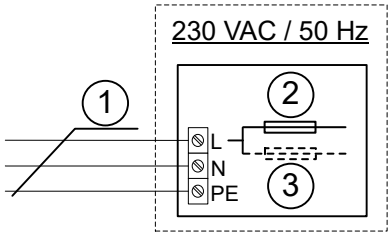


Fig. 1: Connecting the supply voltage

1 Connection cable Ölflex classic 100 3G 1.5 mm² or 2.5 mm², length at least 1 m (TROX scope of delivery)
2 Fuse F3 3.15 A
3 Fuse, not used with ROOMAIR, with SCHOOLAIR only with -EH variant, see table for data.

Fuse Pos. 3

SCHOOLAIR-...	7 A	10 A	13 A
...-V-HV-EH		X	
...-V-HV-EH15	X		
...-D-HV-EH			X
...-D-HV-EH12	X		
...-D-HV-EH18		X	
...-D-HV-EH24			X
...-D-HV-EH30			X
...-S-HV-EH	X		
...-S-HV-EH12	X		
...-S-HV-EH18		X	
...-S-HV-EH24			X
...-S-HV-EH30			X

2.1.2 Connection of the control panel

Notes on control panels

Select an installation location where the control panel is not affected by disturbances. Avoid solar gain and draughts.

Seal the end of the conduit in the junction box as otherwise a draught could occur in the conduit and affect the measurement results.

Schneider, digital

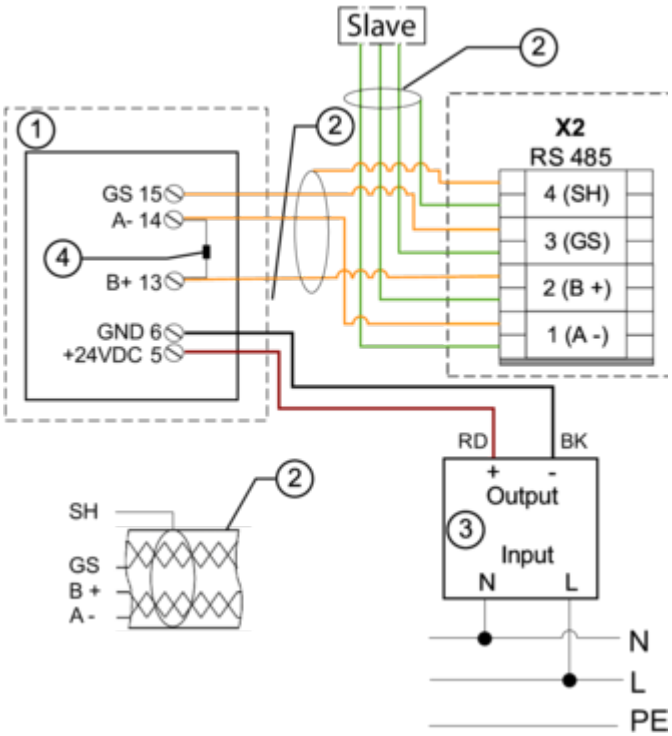


Fig. 2: Wiring of a digital control panel, type Schneider, to terminal X2

1 Control panel, surface mounted, type: TM172DCLWT, TROX order no. A00000086157
2 E.g., Unitronic BUS LD 2 × 2 × 0.22 (or equivalent, provided by the client)
3 Power supply unit, Traco Power, type TIW24-124, TROX order no. : A00000033832 (optional), or on-site supply with 24 VDC
4 Resistor 120 Ohm, set at the first and last bus participant

All network connections using shielded cables.

Attention: For A- and B+, always use a twisted wire pair

Thermokon, with selector switch, 5-stage

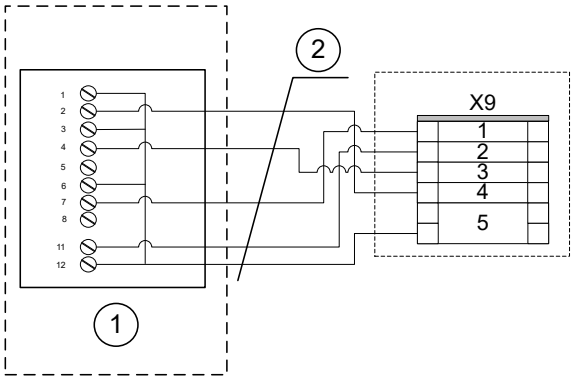


Fig. 3: Wiring of Thermokon control panel (5-stage) to terminal X9

1 Control panel with selector switch, for surface mounting, type WRF04 PSTD NTC20k 5k FS5 gn 5V SA, TROX order no. A00000082515
2 LiYCY 5 x 0.5 mm² shielded (provided by the client)

Thermokon, without selector switch

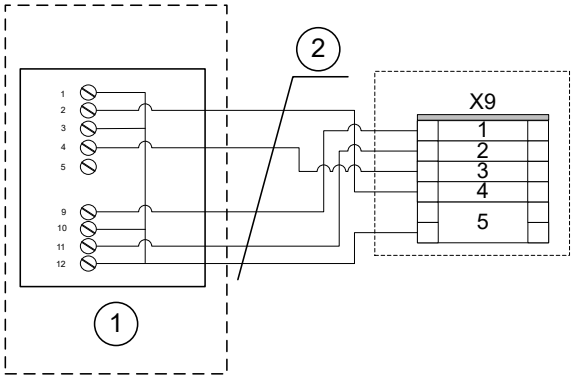


Fig. 4: Wiring of Thermokon control panel to terminal X9

1 Control panel without selector switch for surface mounting, type WRF04 PTD NTC 20k 5k gn, TROX order no. A00000079777
2 LiYCY 5 x 0.5 mm² shielded (provided by the client)

Thermokon, without selector switch, Berker S.1 / Q.3, Busch Jäger Futura, Gira E2

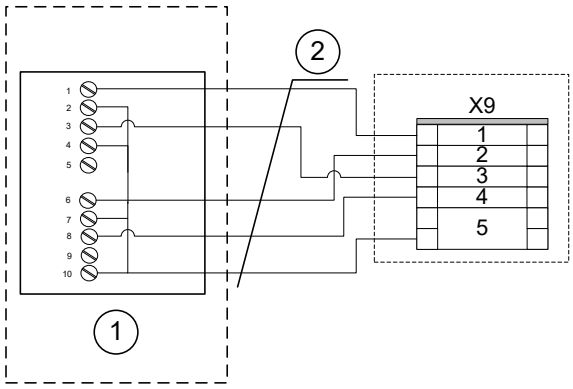


Fig. 5: Wiring of Thermokon control panel to terminal X9

1 Control panel without selector switch, for flush mounting, suitable for switches from the following ranges:
Berker S.1:
Type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000079778
Busch Jäger Futura:
Type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000079779
Berker Q.3:
Type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000081579
Gira E2: Type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000082916
2 LiYCY 5 x 0.5 mm² shielded (provided by the client)

Thermokon, without selector switch, without set-point value adjuster, Gira E2

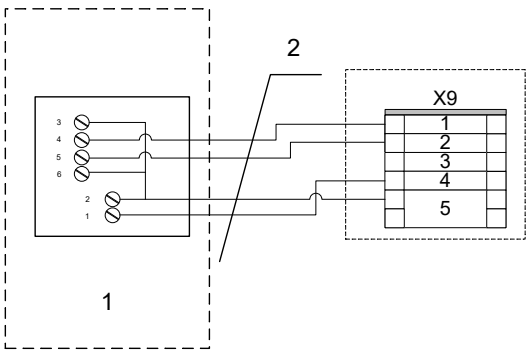


Fig. 6: Wiring of Thermokon control panel to terminal X9

1 Control panel without selector switch and without setpoint value adjuster, for flush mounting, suitable for Gira E2 switch range, type WRF06 TD NTC 20k, TROX order no. A00000081503
2 LiYCY 5 x 0.5 mm² shielded (provided by the client)

2.1.3 Connection of room temperature sensor

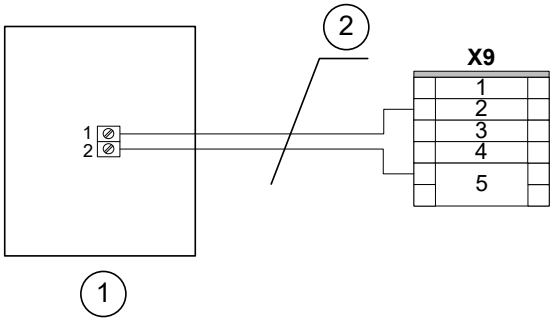


Fig. 7: Connection of room temperature sensor

1 Room temperature sensor, type RTF3-NTC10k, TROX order no. A00000059069
2 LiYCY 2 x 0.5 mm² shielded (by others)

2.1.4 Connection of external inputs and outputs

External switch inputs

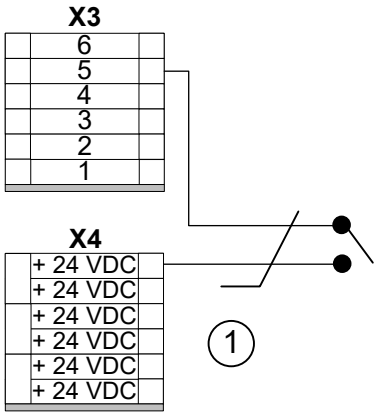


Fig. 8: Wiring example of window contact

1 Connecting cable LiYCY 2 x 0.5 mm² (provided by the client)

Terminal assignment X3

Pos.	Function	Switch	
		Open	Closed
1	Fume cupboard switching	Inactive	Active
2	Changeover [1]	Heating	Cooling
3	Start operation	OFF	Automatic
4	Fire emergency stop [1]	OFF	Automatic
5	Window contact [1]	OFF	Automatic
6	Presence detector	current operating mode	Occupied

1 Cable break safety

External switch outputs

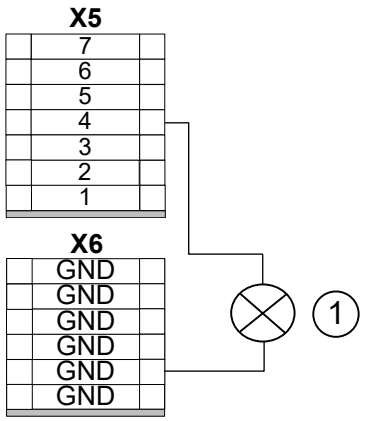


Fig. 9: Wiring example B alarm

1 Connecting cable LiYCY 2 x 0.5 mm² (provided by the client)

Terminal assignment X5

Pos.	Connection	Voltage / Current consumption
1	Request for cooling medium [1]	24 VDC, max. 250 mA
2	Request for heating medium [1]	
3	Ready for operation	
4	B – Alarm	
5	A – Alarm	
6	Enabling heating (room related)	
7	Enabling cooling (room related)	

1 changeover mode only

2.1.5 Communication FSL-CONTROL III

2.1.5.1 Several controllers in a control zone

Up to 11 FSL-CONTROL III devices can be connected in one control zone (1 master device and up to 10 slave devices).

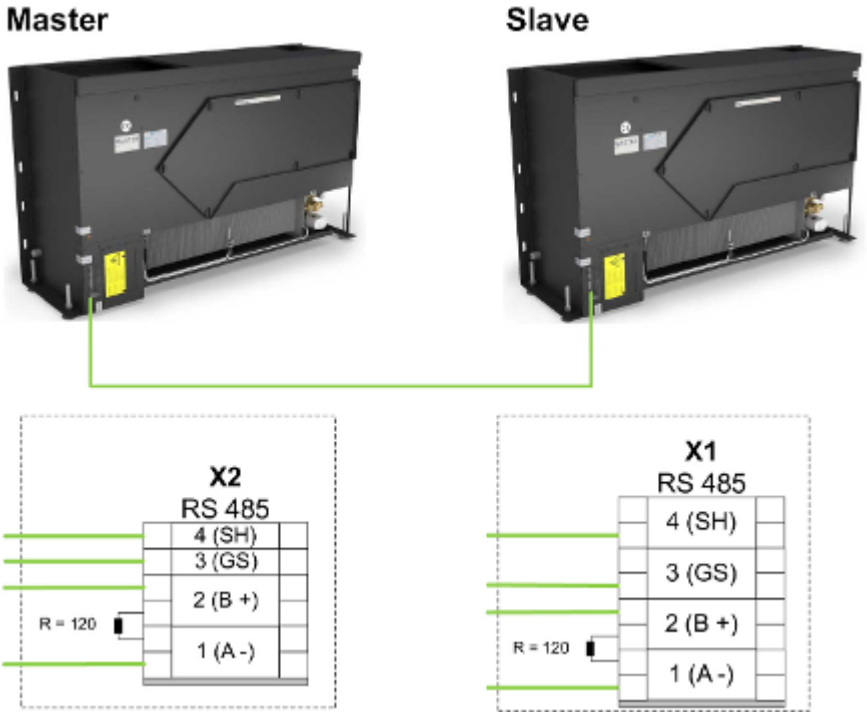


Fig. 10: FSL-CONTROL III Communication with 2 devices

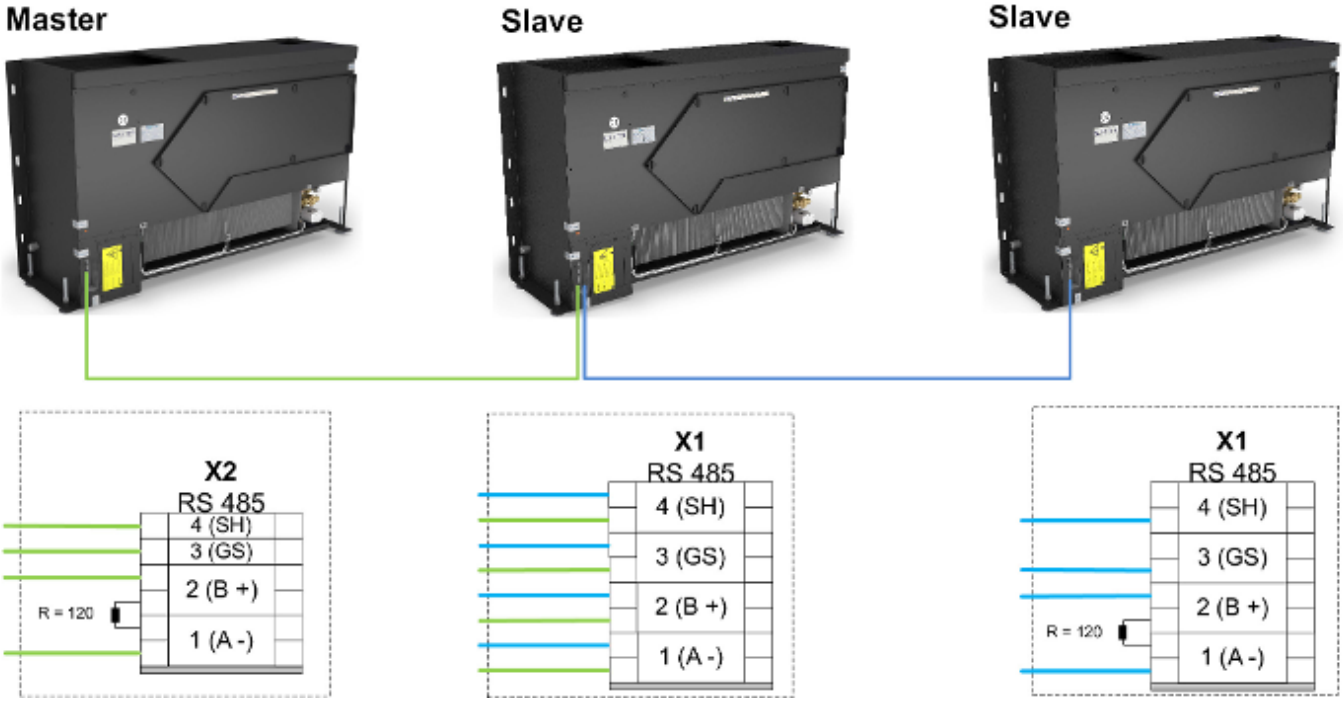


Fig. 11: FSL-CONTROL III Communication with 3 devices

The master device must be installed on one of the two ends of the network (as the first or last device).

Terminal resistor

For smooth data exchange between the controllers, a resistance of 120 ohm must be set on the first and last subscriber, remove the resistors in the other devices (if available).

Installation location of terminal resistor Fig. 10 , Fig. 11

Master devices - Terminal block X2, terminals 1 and 2

Slave devices - Terminal block X1, terminals 1 and 2

Details on network connection

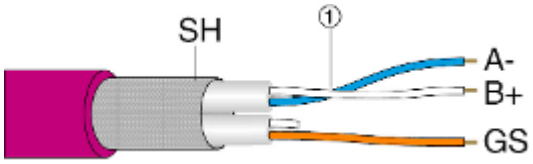


Fig. 12: Wiring

All network connections via shielded cables.

Attention: For A- and B+, use a twisted pair ①!

Recommended network cable (by others): e.g., Unitronic BUS LD 2 x 2 x 0.22 mm² or equivalent

2.1.5.2 Network with several control zones

Network building

Control zones can be networked using one of four existing network protocols (Modbus RTU, Modbus TCP, BACnet MS/TP or BACnet IP). This requires a bus interface card to be connected to the FSL-CONTROL III master controller in the factory.

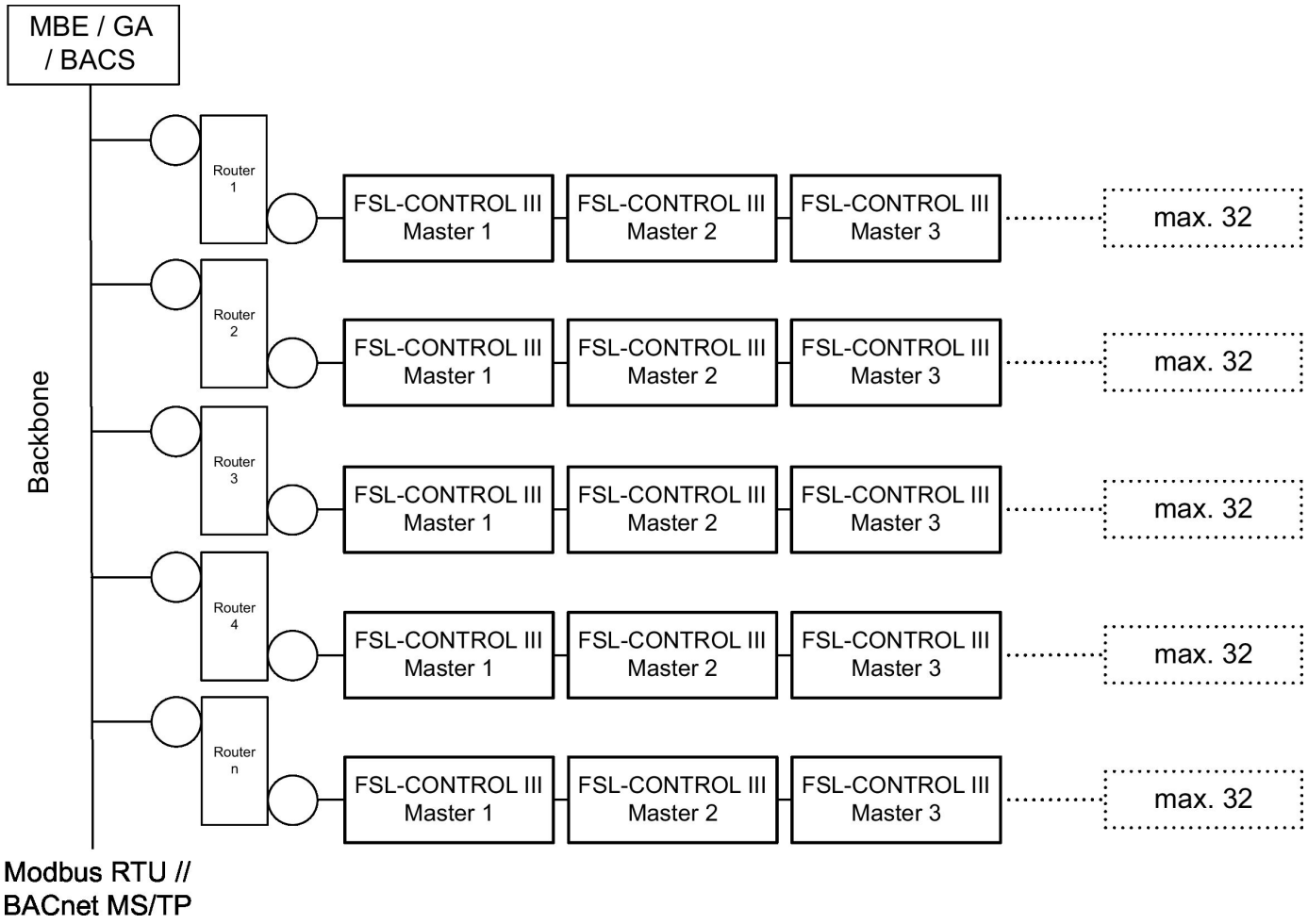


Fig. 13: FSL-CONTROL III Network building, example Modbus RTU; BACnet MS/TP

When integrated into an on-site management and control equipment / building automation and control system, the master controller acts as a slave in the bus network, but serves as a master within the FSL-CONTROL III network!

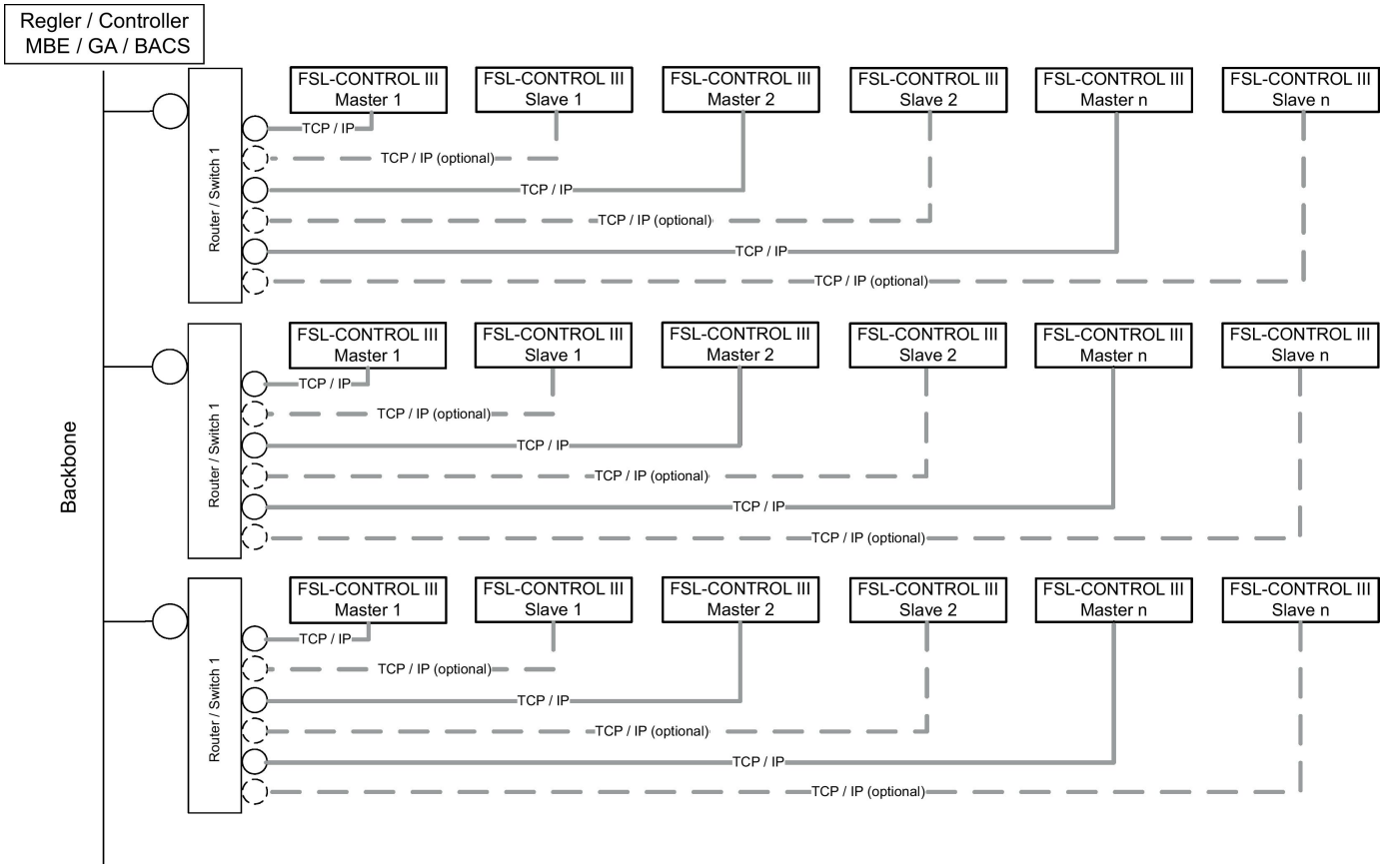


Fig. 14: FSL-CONTROL III Network building, Modbus TCP; BACnet IP

2.2 Connection to the management and control equipment / building automation and control system (MCE/ BACS)

2.2.1 Modbus RTU / BACnet MS/TP

Connecting the data cables

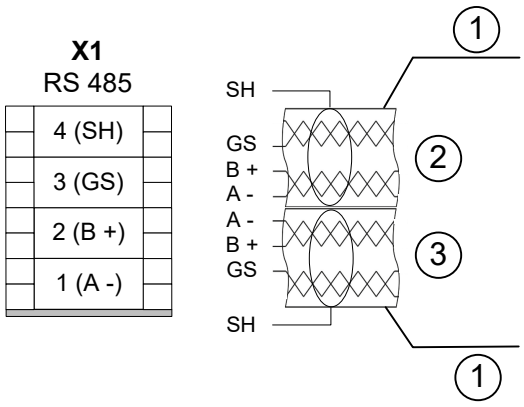


Fig. 15: Connection of MCE/BACS to the master device with Modbus RTU / BACnet MS/TP interface

1 Unitronic BUS LD network cable 2 x 2 x 0.22 (or equivalent, provided by the client)
2 (coming) from the MCE/BACS
3 (leading) to the next BUS participant of the MCE/ BACS
Count up the terminal position from the grey end plate (direction of arrow)

The Modbus RTU / BACnet MS/TP interface has terminals for max. two data cables of an EIA-485 network. A maximum of 32 devices can be operated on one network segment.

Personnel:
- Network administrator

Material:
- Software for bus communication
- Browser

1. ▸ Strip the data cable (at least three wires), insert into the terminals and tighten the screws hand-tight (only use twisted wire pairs for B+ and A-).

   For installation, ensure that the polarity of the wire pairs is correct. Incorrect polarity will result in inverted data signals and hence communication errors.

2. ▸ Fix the bus cables to the casing using the wire clamping bracket.

3. ▸ Connect the shield to the SH terminals.

   Note: Within one channel, connect the shield only at one point to the ground potential. Earthing the shield at every controller may lead to interference voltages.

4. ▸ To avoid cable reflections, network segments must be terminated at both ends with 120 Ω bus terminal resistors. Alternatively, terminal resistors can be switched directly on the circuit board.

Recommended data cables

Unitronic BUS LD 2 x 2 x 0.22 (or equivalent)

2.2.1.1 Setting the network address

Personnel:
- Network administrator

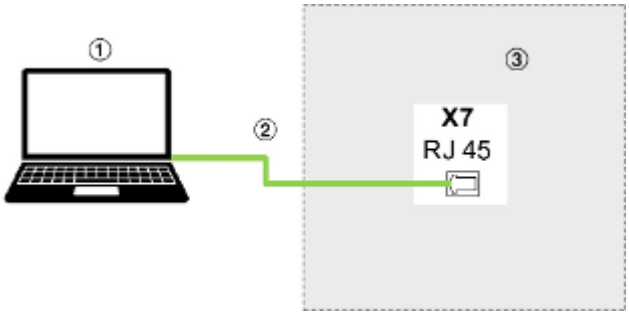


Fig. 16: Connect laptop to ventilation unit

1 Mobile computer with Ethernet interface
2 Network cable min. Cat 5e RJ45
3 Junction box for network cable

Before operation, the interface of devices must be adapted to the existing network structure. The configuration is carried out via the browser, *Chapter 4.3.5 'Configuration ➔ Interfaces' on page 44*.

Factory settings SL1 connection X1 serial bus

Address	Name	Value
16124	Address 1	-
16125	Protocol type	3
16129	Baud rate X1	2
16126	Data bits	8
16128	Parity X1	2
16127	Stop bits X1	1

Master device, configuration of the serial connection to the MCE/BACS (Modbus RTU, BACnet MS/TP)

Address of terminal X1
This is used to address all master devices in the network. Each device is given a unique address. In one network segment, a maximum of 32 network addresses (devices) can be used. The permitted address range is 1 – 127.

For setting information, see *'Settings SL1 Connection X1 Serial Bus' on page 44*

Slave device, configuration for connection to the master device

Address of terminal X1
This is used to address the slave devices in the master / slave network. If only one slave is connected to a master device, no settings are needed. If several slave devices (max. 10) are connected to one master device, each slave device must be given a unique address.

Addressing example:

Slave 1 - Value 2 Modbus address 2

Slave 2 - Value 3 Modbus address 3

Slave n - Value n+1 Modbus address n+1

Slave 10 - Value 11 Modbus address 11

Settings X1

Address	Name	Value
16125	Protocol type **Note:** No settings required, communication between master and slave exclusively via Modbus RTU.	3
16129	Baud rate ⇒ 38400 Baud **Note:** No settings required, for communication between master and slave, only 38400 baud is supported.	2
16126	Data bits The FSL-CONTROL III control only supports 8 data bits.	8
16128	Parity ⇒ Even **Note:** No settings required. Only Even is supported for communication between master and slave.	2
16127	Stop bits The FSL-CONTROL III control only supports 1 stop bit.	1

Modbus address terminal X2

The following settings are factory-set and do not need to be changed.

Address	Name	Value
15774	Modbus address terminal X2	1

2.2.2 Modbus TCP / BACnet IP

Connecting the data cables

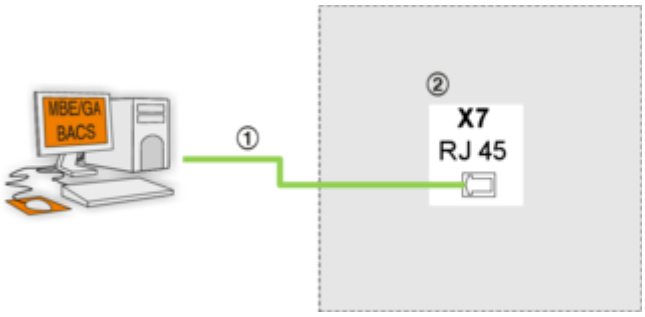


Fig. 17: Connecting MCE/BACS to the master device with Modbus TCP / BACnet IP interface

1 Network management (coming) from the MCE/BACS
Network cable min. Cat 5e RJ45 (or equivalent, provided by the client)
2 Terminal block X7 RJ45 interface

The devices have an RJ45 interface for star-shaped connection of devices to a Modbus TCP / BACnet IP network.

The controller sends a broadcast cyclically to prevent duplicate IP addresses in the network. This broadcast cannot be switched off. The additional data may need to be filtered out using suitable measures.

Personnel:
- Network administrator

Material:
- Software for bus communication
- Browser

▸ Insert the RJ45 plug of the data cable into the socket provided (X7).

Each master must be connected with a separate data cable.

> ***Special feature of external control box, e. g. RA-U-ZAS, RA-U-SEK)***
> *To simplify maintenance, the X7 connection on the ventilation unit is a double connection. One connection is connected to the controller box by a network cable. The second connection can be used for connection to the MCE/ BACS. Internally, both connections are connected, which means that communication with the MCE/BACS is guaranteed.*

Recommended data cables

Network cable min. Cat. 5e RJ45

2.2.2.1 Setting the network address

Personnel:
- Network administrator

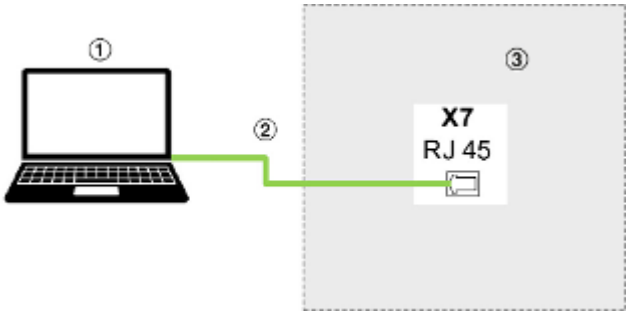


Fig. 18: Connect laptop to ventilation unit

1 Mobile computer with Ethernet interface
2 Network cable min. Cat 5e RJ45
3 Junction box for network cable

Before operation, the interface of devices must be adapted to the existing network structure. The configuration is carried out via browser, *Chapter 4.3.5 ‘ ‘Configuration ➔ Interfaces’ ’ on page 44* .

IP address

The entry fields are used to set the IP address of the FSL-CONTROL III control system. For the entry, the IP address is divided into four address blocks (points).

Entry of IP address

IP-Adresse: 10.2.100.242
IP-Adressblock: 1 2 3 4

IP address factory setting

Master devices - 10.2.100.242

Slave devices - 10.2.100.243

Address	Name
11267	IP address block 1
11268	IP address block 2
11269	IP address block 3
11270	IP address block 4

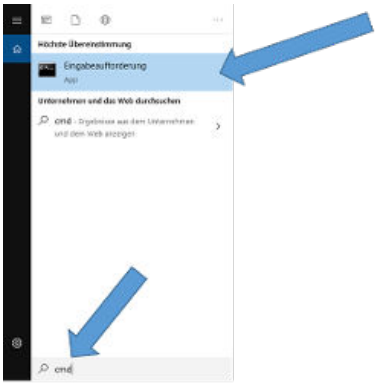
> ***Access with web browser***
> *Connect ventilation unit and mobile device with a patch cable, then enter the IP address into the address line of the web browser to gain access to the ventilation unit. You can then check statuses, read out values and adjust settings.*

> ***Setting fixed IP address***
> *For access via the browser, changes to the default settings on the terminal device may be necessary.*

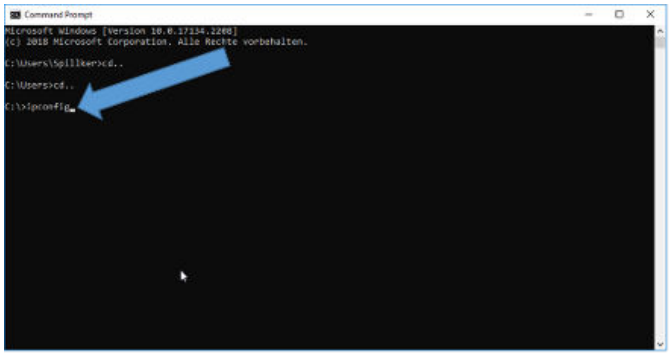
2.2.2.2 Set IP address of PC/laptop

Setting a fixed IP address for 1:1 access to the FSL-CONTROL III controller.

Check your own IP address



1. ▸ Enter `cmd` in the Windows search and press *[Enter]* or select the programme *‘Command Prompt’* with the mouse.



2. In the *'Command Prompt'* window, enter the command `ipconfig` and execute with *[Enter]*.

   ⇨ The command is executed and the Windows IP configuration is displayed.

3. Search for the following entry:
   `IPv4-Adresse . . . . . . . . . . . :`

   The IP address displayed for the connection to the controller must be in the following range:
   `10.2.100.x`

   The value for `x` may be between 1 and 999, with the exception of 242 and 243, as these addresses are already reserved for master and slave devices.

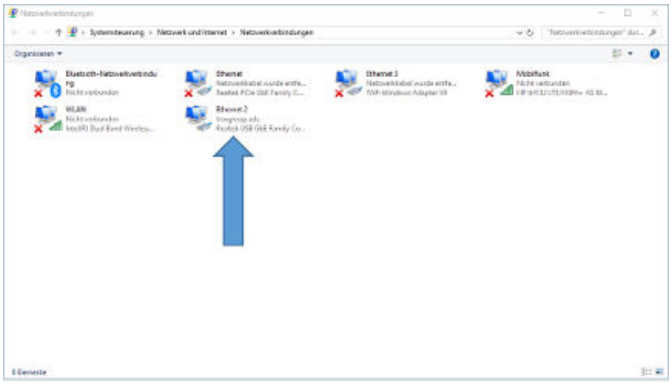
   If the value is within the permissible range, the PC can be connected to the controller. If the IP address needs to be changed, please continue with the following steps.

Setting a fixed IP address

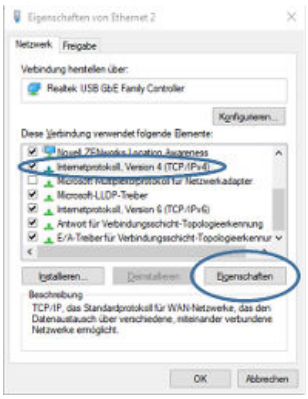


4. Enter `ncpa.cpl` via the Windows search and confirm with *[Enter]*.

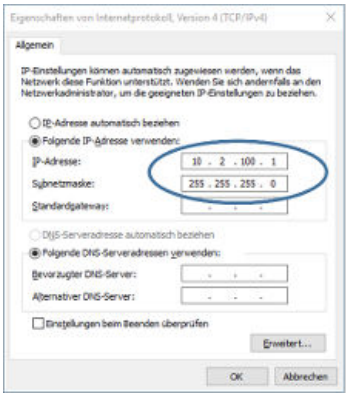
   Important prerequisite: users must have local admin rights.



5. In the following window, right-click on *'Ethernet x'* (example) and select *'Properties'*.



6. In the Properties window, select *'Internet Protocol, Version 4 (TCP, IPv4)'* and select *[Properties]*.



7. Enter the following settings in the window:
   - Activate *' Use the following IP address'*
   - IP address: `10.2.100.1`
   - Subnet mask: `255.255.255.0`
   - all other input fields can remain empty

   Then confirm all windows with OK until only the window *'Network connections'* is open.

2.3 Connection to X-TAIRMINAL

TROX X-TAIRMINAL is a software for displaying, operating and monitoring various TROX sub-ventilation systems, such as decentralised ventilation units, X-CUBE Control, X-CUBE Compact, X-AIRCONTROL or TROX-NETCOM. The display takes place on a Panel PC.
The project-specific user interface for decentralised ventilation devices clearly displays all master and slave devices.

2.3.1 Structure

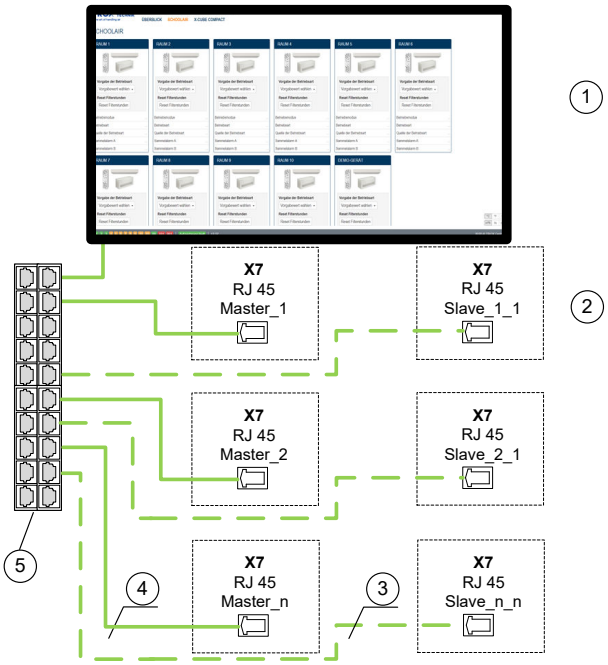


Fig. 19: FSL-CONTROL III X-TAIRMINAL (1)

1 Visualisation on Panel PC
2 Ventilation units (usually as a master-slave network)
3 Connection of slave device (optional) via network cable min. Cat 5e RJ45
4 Connection of master device via network cable min. Cat 5e RJ45
5 Network distribution / switch

2.3.1.1 Communication

Communication takes place via Modbus TCP.

Before operation, the interface of devices must be adapted to the existing network structure. Configuration is carried out via browser.

2.3.1.2 Configuration of the interface

Chapter 2.2.2.1 'Setting the network address ' on page 17

3 Control of the ventilation unit

3.1 FSL-CONTROL III Control system

System overview

FSL-CONTROL III is a single room control system specially designed for decentralised TROX ventilation systems.

With the FSL-CONTROL III control system, all of the following concepts can be realised:

- Room temperature control using the room or extract air temperature
- Control of the supply air temperature (isothermal)
- Room air quality control (optional)

3.1.1 Control components

The modular design of the hardware allows for adding optional equipment to the range of functions of the FSL-CONTROL III control system.



Fig. 20: Controller, valve with thermoelectric actuator

Basic equipment

- Controller for master or slave operation
- Heating and/or cooling valves, including thermoelectric actuators and lockshields; alternatively: electric reheating coil
- Supply air temperature sensor

Optional equipment

- Control panel including setpoint value adjuster and room temperature sensor
- Outdoor temperature sensor
- Air quality sensor (CO_2 / VOC)
- Clock and timer
- Electromotive valve actuators
- Pressure-independent control valve
- Interfaces to management and control equipment / building automation and control system (MCE/ BACS):
  - Modbus RTU interface
  - Modbus TCP interface
  - BACnet MS/TP interface
  - BACnet IP interface
  - Digital switch contacts (inputs and outputs)

3.1.2 Functional description

3.1.2.1 General

The FSL-CONTROL III control system is used to control various parameters for single rooms.

The primary task is to regulate the room temperature to the specified parameters while maintaining a comfortable room climate. Alternatively, the supply air can be brought into the room at a constant temperature. With an air quality sensor (optional) it is possible to control the outdoor air flow rate based on the air quality.

Configuration in the web browser

The devices are configured via the IP interface and the web browser.

3.1.2.2 Room temperature control

The FSL-CONTROL III control system ensures that the comfort temperature range for each operating mode is maintained. Cascade control ensures that the comfort temperature range is quickly achieved. The supply air temperature is regulated within preset limits, taking external and internal loads into account. This is how the comfort requirements are met.

Room temperature control requires the following values:

- Room temperature, e. g. from an optional control panel or from the MCS/BACS.
- Outdoor temperature, e. g. from the MCE/BACS or from an optional temperature sensor in the outdoor air intake of the master device
- Supply air temperature

Room temperature control works best when the room temperature is measured at a carefully selected point. The control panel is ideally installed about 1.5 m above the floor. Select an installation location where the control panel is not affected by disturbances (e.g. direct sunlight or draughts). We recommend adjusting the flow temperature based on the outdoor temperature in heating and cooling mode.

In situations where there is no suitable location for temperature detection in the room or it is not possible to install the control panel, extract air temperature control can be activated as an alternative. The mode of operation described below is identical. The difference is that the temperature is not measured in the room, but in the extract air. The sensor for recording the extract air temperature is located inside the extract air opening in the device.

Sample standard factory settings for room temperature control

Settings	Operating mode	
	Occupied	Unoccupied
Room temperature setpoint value, heating	21.8 °C	18.0 °C
Room temperature setpoint value, cooling	22.2 °C	25.0 °C
comfort zone	21.8 °C – 22.2 °C	18.0 °C – 28.0 °C
Upper limit of supply air temperature (heating)	42.0 °C	42.0 °C
Lower limit of supply air temperature (cooling)	18.0 °C	13.0 °C

Demand-based settings

These factory settings have been selected for their energy efficiency but can be changed via web browser.

For a comfortable room climate, the supply air temperature in 'Occupied' mode should be at least 18 °C. In heating mode, a comfortable room climate can be achieved with supply air temperatures of up to 42 °C.

The minimum permitted supply air temperature for night purge is 2K under the supply air temperature threshold for unoccupied mode.

To avoid frequent switching between heating and cooling mode, the room temperature is not regulated to a fixed setpoint, but within the comfort temperature range.

When cooling, the room temperature setpoint depends on:

- Room temperature
- Operating mode
- Temperature offset (MCE/BACS & control panel)
- Outdoor temperature

When heating, the room temperature setpoint depends on:

- Room temperature
- Operating mode
- Temperature offset (MCE/BACS & control panel)
- Outdoor temperature
- Winter compensation

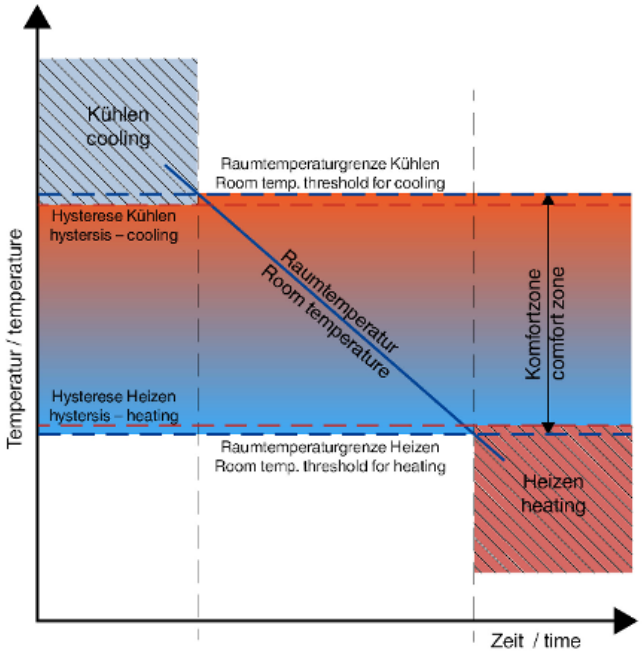


Fig. 21: Room temperature control

Control response for room temperature outside the comfort range:

Room temperature	Control response
below comfort zone	Heating active, room temperature setpoint for heating is set.
above comfort zone	Cooling active, room temperature setpoint for cooling is set.

If the room temperature is within the comfort temperature range, the room temperature setpoint is set depending on the outdoor air temperature.

Control response for room temperature within the comfort range:

Outdoor temperature	Control response
below comfort zone	Heating active, room temperature setpoint for heating is set.
above comfort zone	Cooling active, room temperature setpoint for cooling is set.

If the outdoor temperature is also within the comfort temperature range, the room temperature setpoint is based on the cooling or heating sequence.

If the room temperature setpoint is adjusted on a control panel (e. g. +2 K), both room temperature limits and hence the comfort temperature range are also changed (e. g. +2 K).

If the 'Unoccupied' operating mode is set, temperature control is suspended as soon as the room temperature is within the comfort zone.

Please note: When specifying the room temperature via the building automation system, the comfort zone with the cooling/heating temperature limits can be used, or a fixed room temperature setpoint can be specified. The specification of temperature limits and a fixed setpoint at the same time is not possible. We recommend setting the room temperature using temperature limits.

3.1.2.3 Supply air temperature control

In addition to room temperature control, it is also possible to blow the supply air into the room at a constant temperature. The supply air temperature control is primarily for isothermal applications.
The setpoint value for the supply air temperature depends on the set temperature limits for heating and cooling and the current supply air temperature.
If the supply air temperature is below the set lower limit, the device regulates the lower limit of the comfort band as the set supply air temperature.
If the supply air temperature is above the set upper limit, the device regulates the upper limit of the comfort band as the set supply air temperature.
To ensure the isothermal air supply, the same temperatures must be entered as heating and cooling temperature limits. A supply air temperature setpoint can only be specified via the MCE/BACS for supply air temperature control.

Note: For all appliances with electric air heaters (variant -EH), only supply air temperature control with isothermal air intake is used.

Note:

- *The heating load of the room must be covered by a separate heating source.*
- *The extract air temperature sensor must always be activated.*

***In addition, please note** that, for devices with supply air temperature control in automatic mode, the individual fan stages are only determined on the basis of the air quality. It is therefore advisable to store a minimum fan stage for the Occupied mode. If the devices are to ventilate during the Unoccupied operating mode, a minimum fan stage must also be stored here, however, the devices ventilate exclusively in Outdoor air mode.*

3.1.2.4 Constant bypass heat recovery unit

The ventilation units that are equipped with a cross flow or cross-counterflow heat recovery unit have a constant bypass (0…100%). The bypass is controlled automatically.

The bypass is used to achieve the supply air temperature setpoint in heating and cooling mode. When the "Night Purge" function is active, the bypass is open. The bypass controls the volume flow rate to be heated by the heat recovery unit.

If, for example, the outdoor temperature is low, but a room has to be cooled anyway, the use of the cooling coil can be reduced to a minimum as only a small portion or even no portion of the air has to pass the heat recovery unit.

3.1.2.5 Rotary heat recovery unit

In ventilation units with a rotary heat recovery unit, the rotor speed is automatically adjusted to reach the supply air temperature setpoint. When demand is low, the rotor rotates at minimum speed; when demand increases, the speed increases steadily. As the rotary heat recovery unit is always active, the supply air temperature can be higher than the outside air temperature. Only during "Night purge", the rotary motion of the rotor is switched off.

Due to variable control, the use of the cooling coil can be reduced to a minimum in transition times, i.e. if the outdoor temperature is low but a room has to be cooled anyway.

3.1.2.6 Fan stage switching

The FSL-CONTROL III control system automatically selects the correct fan stage based on temperature control or indoor air quality (optional). The fan stage can also be pre-set by the MCE/BACS (provided by the client) or a control panel.

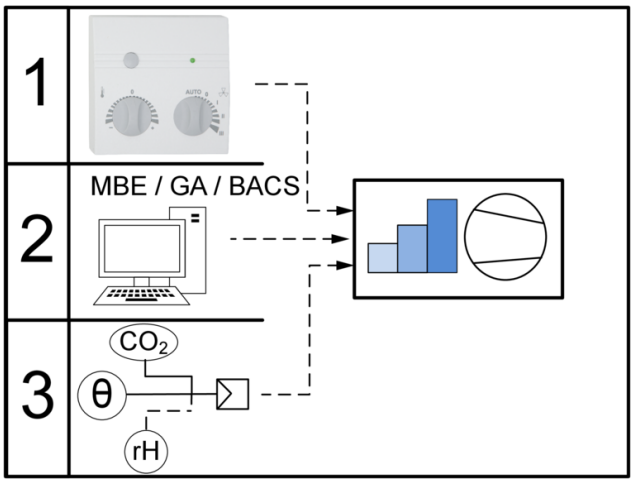


Fig. 22: Fan stage switching – priority

3.1.2.7 Air quality control (optional)

With air quality control, the outdoor air volume flow is controlled depending on the room air quality.

This type of control is only possible with an air quality sensor (optional equipment or provided by the client). The internal sensor optionally detects the CO_2 concentration or the VOC content of the extract air. Air quality control is always active in the *'Occupied'* operating mode. In the *'Unoccupied'* operating mode, air quality control is inactive.

Air quality control – factory settings

CO_2 value [ppm]	Fan stage	
	Outdoor air	Secondary air
< 500		1-3
500 – 750	1	
750 – 1000	2	
> 1000	3	

The system owner can adjust the air quality threshold values.

Secondary air mode and outdoor air mode

If the current measured value of the room air quality is below the first limit value and the potential of the outside air cannot be utilised for cooling, secondary air mode is active. As soon as the configured limit of air quality for fan stage 1 is exceeded, the device automatically switches to outdoor air mode. Minimum dwell times are stored to prevent switching between the stages too quickly.

Outdoor Air mode

When Outdoor Air mode is activated, the ventilation unit exclusively conveys outdoor air, regardless of the first limit value. The fan stages continue to be raised depending on the limit values. Outdoor Air mode can be stored as a fixed parameter, activated on the control panel (configuration of the push button) or set using the MCE/BACS.

3.1.2.8 Operating mode

The operating modes are used for higher-level control of the devices.

The following operating modes are available:

- OFF
- Automatic
- MANUAL

The operating modes mentioned can be set via the MCE/BACS, digital control panel (only *'OFF'* and *'Automatic'*), web browser and via digital switching inputs (only OFF and Automatic).
The operating mode *'MANUAL'* can only be activated via the web browser.

Operating mode OFF

In the operating mode *'OFF'*, the fans are always switched off and the outdoor air and exhaust air dampers are closed. Only self-protection functions such as frost protection are still active.
'OFF' can be used as an operating release if a device is to be controlled independently of the operation on the control panel and independently of the internal clock.

Recommendation

'OFF' serves exclusively the self-protection of the device and can be selected for longer standstill periods, such as holidays. Building protection must then be ensured via other heat sources.

Operating mode Automatic

The operating mode *'Automatic'* is the standard operating mode for ventilation units.

The control of the ventilation unit can be influenced by the following signal transmitters:

- MCE/BACS
- Real time clock (RTC)
- Control panel
- Digital input

Manual operating mode

The operating mode *'MANUAL'* is used for commissioning or equipment maintenance.
It can only be activated on the device itself by accessing the web server.
In the operating mode *'MANUAL'*, individual actuators can be controlled manually, e.g. valves for hydraulic balancing.

3.1.2.9 Operating modes / operating mode override

Automatic operating modes:

- Standby
- Occupied
- Unoccupied

Operating mode override:

- Boost
- Class
- Night purge
- Fan forced circuit

With an operating mode override, the current automatic operating mode is overridden.
Once this override has been completed, the device returns to automatic mode.

The specified operating modes and overrides can be set using the optional real-time clock as well as the MCE/BACS. In addition, the Occupied and Unoccupied operating modes as well as the Boost and Class overrides can be activated from the control panel.

Various comfort temperature ranges can be defined for the operating modes Occupied and Unoccupied. You can define daily schedules and enter start times for each operating mode. Using the optional real time clock (RTC) allows for defining 10 switching points per day.
If no RTC is used, the switchover between the operating modes must be carried out by the management and control equipment / building automation and control system (MCE/BACS) or on the room control panel (RBG). The comfort temperature range for the Occupied mode can be modified on the control panel and by the MCE/BACS.

Operating mode Standby

Standby is selected if the room is not occupied and the ventilation units are not used to maintain the temperature, e.g. at night.

Recommendation:

Standby is used exclusively for the device's own protection and should only be selected if the building is protected by other heat sources.

Operating mode Occupied

The Occupied mode is used when people are present in the room.

The following parameters can be set:

- Comfort temperature range for Occupied mode
- Supply air temperature limits for heating/cooling

Recommendation

Use during the day (e. g. 7 a.m. to 5 p.m.)

Operating mode Unoccupied

The Unoccupied mode is used if no people are present in the room.

The following parameters can be set:

- Comfort temperature range for Unoccupied
- Supply air temperature limits for heating/cooling

Unoccupied

– *This operating mode is used to protect the building; it is required for night purging.*
– *Air quality control is inactive in this operating mode.*

Operating mode override Boost

Boost can be selected to quickly ventilate a room, e. g. during break times. The device ventilates in supply/extract air mode to improve the indoor air quality. Afterwards, the device returns to the Occupied operating mode.

The following parameters can be set:

- Fan setting (default: stage 4)
- Duration (default: 15 min.)

Boost

Boost mode can be enabled using the control panel or MCE/BACS. The setpoints for the comfort zone and the supply air temperature limits of the Occupied operating mode are used.

Class operating mode override

Class mode can be selected if acoustically optimised operation is required. The device conveys a slightly reduced volume flow rate in supply air/extract air operation to improve the indoor air quality. Afterwards, the device returns to the Occupied operating mode.

The following parameters can be set:

- Fan setting (default: stage 2)
- Duration (default: 60 min.)

Class

Class mode can be enabled using the control panel or MCE/BACS. The setpoints for the comfort zone and the supply air temperature limits of the Occupied operating mode are used.

Night purge operating mode override

During the Night purge mode, the room is passively cooled with outdoor air. The minimum supply air temperature corresponds to the supply air temperature limit for heating in Unoccupied mode of -2K. The fans are controlled in the configured stage for night purge. The max. fan stage for Unoccupied operating mode is ignored for the duration of night purge.

The following conditions must be fulfilled at the same time:

- Unoccupied is active
- Night purge is activated
- The current month is in the range Start – End – Month (default: May – September)
- Enabled by RTC, MCE/BACS or DI
- Outdoor air temperature > minimum outdoor air temperature Night purge (default = 12 °C)
- Outdoor air temperature < as a setpoint value for cooling in the Occupied operating mode
- Outdoor air temperature < current room temperature
- Supply air temperature > minimum supply air temperature limit for heating in the Unoccupied operating mode

Night purge function ends immediately when one of the following conditions are fulfilled:

- Frost protection
- Window contact
- Fire shutdown
- Fan forced circuit
- Switch of operating mode to Standby or Occupied
- Switch of operating mode to Off or Manual

In addition to the night purge operating mode override, the devices can be forced to ventilate at night using MCE/BACS. The conditions described above are not checked. The responsibility lies with the MCE/BACS.

Note

When the Night purge operating mode override ends, the device switches to Unoccupied mode. Secondary air units do not execute this override.

Operating mode override Forced Fan Control (fume cupboard switching)

With the Forced Fan Control, there is an override of the fans via the DI, RTC or MCE/BACS. For the duration of the activation, the fans are operated separately from one another in a configurable stage for supply air and extract air. The function must be activated within the software (address 17472).

Fume cupboards

Fume cupboards, e. g. in seminar rooms, can dissipate high volume flow rates. Override control can help to achieve balanced volume flow rates.

The volume flow rates of fume cupboards must be specified when planning devices.

When Forced Fan Control is active, the Occupancy button and the default fan setting are deactivated on the control panel.

3.1.2.10 Functions

The following control functions are factory-set on the basis of customer-specific requirements. TROX HGI Service can change the factory settings at a later stage.

3.1.2.10.1 Winter compensation

Winter compensation is the automatic adjustment of the comfort temperature range depending on the outdoor air temperature.

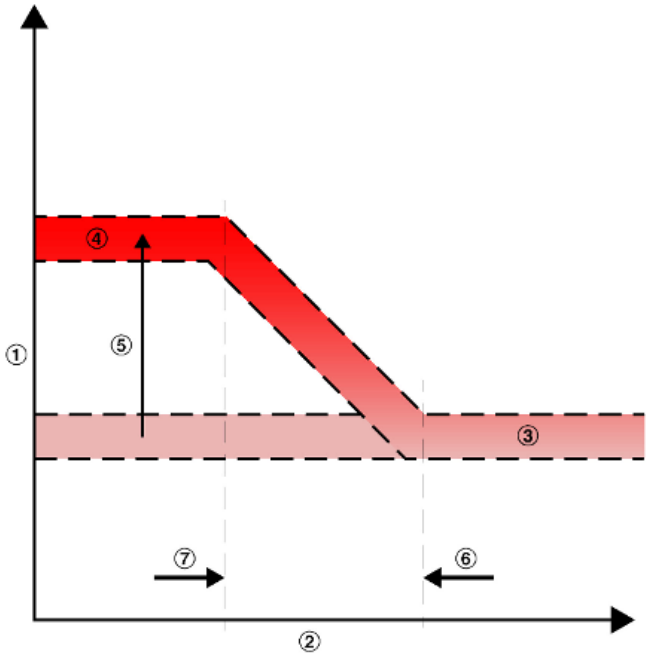


Fig. 23: Example configuration of winter compensation

1 Room temperature setpoint value
2 Outdoor temperature
3 Comfort temperature range without winter compensation
4 Comfort temperature range with winter compensation
5 Max. increase of setpoint value
6 Default temperature for winter compensation start
7 Maximum winter compensation

Recommendation

Winter compensation active

3.1.2.10.2 Minimum fan stages

The minimum fan stage function enables forced ventilation in the various operating modes. There is a choice between fan stages 0-5 for operation of the device in the respective operating mode.

Recommendation

– *Occupied – fan stage 1*
– *Unoccupied – fan stage 0*

3.1.2.10.3 Switching to Secondary air

If the indoor air quality is good, the control system switches to secondary air mode, which is more energy efficient. The shut-off dampers are closed and the supply air fan remains switched on.

The control system compares the indoor air quality limit value to the ACTUAL values measured by the air quality sensor and switches automatically between outdoor air and secondary air mode.

Switching to secondary air is an option and only possible with air quality measurement (integral function or as a data point of the MCE/BACS).

The secondary air switching function is not available for all unit variants.

Recommendation

Threshold value: 500 ppm

3.1.2.10.4 Frost protection

The FSL-CONTROL III control system has frost protection functions to protect the building and devices. When the temperature of the outdoor air, supply air or room is too low, frost protection is activated.

The device carries out the following actions:

- Operating mode = Automatic
- Operating mode = Standby
- Outdoor air and exhaust air dampers closed
- Fan(s) switched off
- Heating valve 100% open

Room temperature frost protection

Devices with room temperature control have room temperaturefrost protection function. Room temperaturefrost protection is dependent on the room temperature that is either measured by the control panel or by the MCE/BACS as a data point. If there is no room temperature (MCE/BACS) or the measured room temperature is below a preset limit value (default = 8 °C), the frost protection function is triggered and the actions described above are carried out. The device will only restart in its original configuration after a configured waiting period (default =360 s) and when a room temperature of at least 1 K (configurable) over the room temperaturefrost limit is reached.

Recommendation

Room temperature limit: 8 °C

For connection to the MCE/BACS: ensure transmission of data points!

Supply air temperature frost protection

To prevent the heat exchanger from freezing and becoming damaged as a consequence, the supply air temperature is measured immediately after the heat exchanger in air flow direction. If the temperature falls below the preset limit for supply air temperature Frost 1 (default = 12 °C), the Frost 1 supply air temperature alarm is activated. Other actions are not executed at this temperature. If the temperature falls below the preset Frost 2 supply air temperature limit (default = 8 °C), the frost protection function is activated and the actions described above are executed. The device will only restart in its original configuration after a configured waiting period (default = 360 s) and when the supply air temperature is above the supply air temperature Frost 2 limit, with a minimum difference of 1 K (configurable).

Recommendation

Frost 1 supply air temperature limit: 12 °C

Frost 2 supply air temperature limit: 8 °C

Device frost protection

If the outdoor temperature is ≤ -20 °C (configurable), the ventilation unit is switched off to protect the device components when operating temperatures are too low.

Recommendation

Threshold value: -20 °C

Heat recovery frost protection

When outdoor air temperatures are low (default = -6 °C depending on the heat recovery unit used), there is the risk that the heat recovery unit on the extract air side will no longer be flown through, or only insufficiently, due to condensate.

The control system opens the motorised bypass damper to completely bypass the heat recovery unit. The bypass remains open until the outdoor air temperature has risen to at least 1 K above the limit.

Recommendation depending on the type of heat recovery unit

Cross flow: -6 °C

Cross counterflow: -4 °C

Heat recovery all year round

In devices with a condensate drain, the heat recovery unit can also be operated when outdoor air temperatures are low. Here, there is a regular switch between supply/extract air operation and secondary air operation. During secondary air operation, ice that might have formed can melt and drain off. The device then returns to supply air and extract air operation. A drain line for condensate is therefore essential.

3.1.2.10.5 Priming (winter start-up delay)

To prevent frost damage to heat exchangers after a device restart, ending of the frost protection function or a switch of fan stage from 0 to 1 in supply/extract air operation, the ventilation unit has a so-called winter start-up delay function. With this function, the device primes during the winter months (November to March, configurable) or when outdoor air temperatures are under 3 °C (configurable), with the heating coil switched on.

The winter start-up delay is executed before commissioning of the fans when one of the following conditions are fulfilled:

- Current month is between November and March
- Outdoor air temperature < limit (default = 3 °C)

To heat the heating coil, the heating valve is 100% opened for 300 seconds (configurable). Ventilation units with constant bypass close the bypass, devices with rotary heat recovery units switch on the rotor. After pre-heating, the heating valve is limited for 45 seconds to 60% (configurable). The device then returns to the specified operating mode.

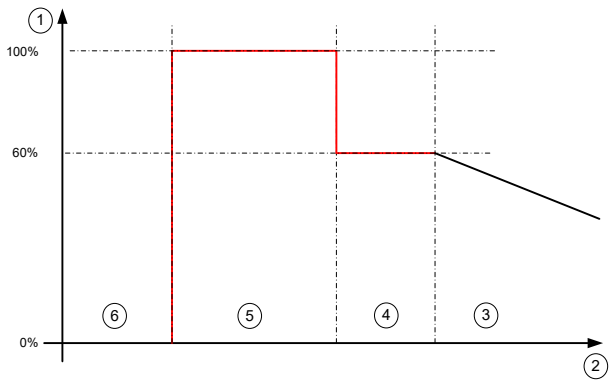


Fig. 24: Diagram control signal heating valve

1 Control signal
2 Time
3 Control system
4 Limitation
5 Priming
6 Standby

Recommendation

– *Limit temperature outdoor air: 3 °C (year-round)*
– *Duration of priming: 300 seconds*
– *Duration of limitation: 45 seconds*
– *Valve setting limitation: 60%*

3.1.2.10.6 Night purge

With the Night purge function, the building can be cooled at night during the summer, as long as the outdoor air offers sufficient cooling potential.

The following requirements must be fulfilled:

- Unoccupied operating mode is active
- Night purge is configured in the device
- Current month is in the start-end-month range for Night purge
- Enabled by RTC, MCE/BACS or DI
- Outdoor air temperature < setpoint value for cooling for Occupied mode (difference can be configured)
- Outdoor air temperature < room temperature (difference can be configured)
- Outdoor air temperature > minimum outdoor air temperature for Night purge (default = 8 °C, configurable) supply air temperature > minimum supply air temperature - heating limit in Unoccupied mode -2K

ENVIRONMENT!

Energy savings

Night purge provides a high energy savings potential as rooms can be 'pre-cooled' at night without using a cooling coil.

Recommendation

– *Highest fan stage*
– *Starting month: May*
– *Ending month: October*

In addition, the devices can be forced to carry out Night purge via MCE/BACS. The MCE/BACS is then responsible for checking the above requirements.

3.1.2.10.7 Monitoring filter change

The *'Monitoring filter replacement interval'* function (i.e. filter change alert) informs users in each of the following cases that a filter change is due:

- The number of operating hours exceeds the preset value (factory-set to 2500 h, configurable)
- The differential pressure at the outdoor air filter exceeds the preset value (only for unit variants *-HE and *-HV)

Signalling filter change by message on the digital control panel, in the web browser via "Operating hours of remaining filter runtime" (11251).
When connected to the management and control equipment / central building management system (MCE/BACS), the filter change is output as a B alarm.

Note

If the permitted differential pressure on the outdoor air filter is exceeded, the "Operating hours of remaining filter time" (11251) is reset to 0 h in the software.

Differential pressure monitoring

The ventilation units (master only) variants *-HE and *-HV come with a differential pressure monitoring function. This function monitors the differential pressure of the outdoor air filter up to the nominal air volume (usually stage 3) If the differential pressure exceeds the preset value for approx. 30 minutes, the filter change alert is activated (see above). In the Boost, Forced Fan Control and Night Purge operating mode overrides, the differential pressure monitoring function is inactive to prevent unnecessary filter changes.

Filter inspection

Differential pressure monitoring does not replace the hygienic or regular inspection of the outdoor air filter.

Resetting the filter change alert

After each filter change, the filter change interval has to be reset using one of the following methods:

- On the digital control panel via the Settings menu
- On the analogue control panel by pressing and holding the presence button (17 - 20 seconds)
- In the web browser *'menu ➔ Reset filter hours, address 10006'*
- MCE/BACS provided by the client

3.1.2.10.8 Forced Fan Control

'Operating mode override Forced Fan Control (fume cupboard switching)' on page 25

3.1.2.11 Interfaces

Master devices have 6 digital inputs and 7 digital outputs. All contacts can be configured as NO or NC contacts. You can use these for the following functions, e. g.:

- Digital inputs
  - **Window contact:** As soon as a monitored window is opened, the master and slave devices in the room are switched off (default: Normally closed).
  - **Changeover function:** Feedback on the medium present (heating/cooling) for 2-pipe-heat exchangers (default: Normally closed).
    Logic:
    Open = Heat medium present
    Closed= Cooling medium present
  - **Fire emergency stop:** Master and slave devices are switched off if a signal is received at the corresponding input (default: Normally closed).
  - **Presence switching:** Manual activation of Occupied operating mode (default: NO contact) e.g. by a PIR sensor.
    Logic:
    Open = Device in valid operating mode
    Closed = Device in Occupied
  - **Fume cupboard switching:** Manual activation of Forced Fan Control (default: NO contact).
  - **Enable:** Enable operation of the device. If not enabled, the device cannot be put into operation (higher-level OFF)

Digital inputs

Wiring of digital inputs with 24 VDC 2.5 mA for connecting volt-free contacts.

- Digital outputs
  - **A – Alarm**
  - **B – Alarm**
  - **Secondary cooling system:** enable for chilled ceiling
  - **Secondary heating system:** enable for heating system
  - **Operational (standby) message**
  - **Heating medium request:**for changeover mode
  - **Cooling medium request:** for changeover mode

Digital outputs:

Admissible load of digital outputs: 24 VDC / 250 mA.

4 Description of software

To set up the FSL-CONTROL III control system, a PC can be connected to the ventilation unit using the IP interface. Typically, the ventilation units are integrated into the building network via the BUS interface during installation. The devices can then be accessed via the MCE/BACS computer *Chapter 2.2 'Connection to the management and control equipment / building automation and control system (MCE/BACS)' on page 15*.

The control parameters are set and configured in the web browser. The web browser is also used for maintenance work.

To connect a PC to the FSL-CONTROL III control system, a patch cable is needed.



Fig. 25: Patch cable min. Cat. 5e S/FTP RJ45

Standard network address

To call up the software, enter the IP address of the control system in the address bar of your browser.

Factory settings:

- *IP address master:* `10.2.100.242`
- *IP address slave:* `10.2.100.243`
- *User name:* `TROX`
- *Password:* `FSL`
- *IP gateway:* `10.2.20.1`
- *Subnet mask:* `255.255.255.0`

The FSL-CONTROL III control system does not have a DHCP, if necessary change the DHCP settings of the Ethernet connection.

4.1 Start page – Diagnostics



Diagnose | Konfiguration | Hand Steuerung | MBE/GA

TROX® TECHNIK The art of handling air

Diagnose > Gerätestatus

Gerätestatus

Adresse	Bezeichnung	Wert
13000	Gerätestatus: Grün=Regelung Grau=Regelung+Übersteuerung Rot=keine Regelung	

Geräteinformationen

Adresse	Bezeichnung	Wert
11055	FSL-CONTROL III Gerätetyp: 1-SEK 2-ZULSEK 3-ZUS 4-ZABSEK 5-ZAS	5
11009	Gerätebezeichnung	SCHOOLAIR
11000	Seriennummer	DE12345678912345
11056	Master/Slave Gerät: 0-Slave 1-Master	1
11036	Softwarename	FSL-CONTROL III
11045	Softwareversion	8.83

Betriebsinformationen

Adresse	Bezeichnung	Wert
11057	Betriebsmodus: 1-Aus 2-Automatik 3-Hand	2
11058	Betriebsart: 0-Ohne 1-Standby 2-Abwesend 3-Anwesend	3
11059	Betriebsartübersteuerung: 0-Ohne 1-Boost 2-Klausur 3-Nachtlüften 4-Lüfterzwangsbeschaltung	0
11060	Betriebsstatus: 0-Ohne 1-Standby 2-Regelung 3-Hand 6-Brand 7-Frost 8-Vorspülen 11-Nachtlüften	2
11061	Quelle der Betriebsart: 1-RBG 2-GLT 3-RTC 4-DI 5-Master 6-PC	6
11131	Frostschutz ausgelöst: 0-Kein Frostschutz 1-Frostschutz	0

Lüftungsinformationen

Adresse	Bezeichnung	Wert
11078	Lüfterstufe Zuluft	0
11260	Volumenstrom Zuluft [m³/h]	0
11077	Lüfterstufe Abluft	0
11261	Volumenstrom Abluft [m³/h]	0
11092	Lüftungsart: 0-Keine Lüftung 1-Sekundärluftbetrieb 2-Außenluftbetrieb	2
11121	RBG - Lüfterstufe: 255=Ohne 0=0 1=1 2=2 3=3 10=Auto	0

Systeminformationen

Adresse	Bezeichnung	Wert
11120	Anzahl aktiver Geräte im System	1
11257	RTC Funktion 0-Deaktiviert 1-Aktiviert	0
11258	Aktiviertes GLT-Protokoll 0-Ohne 1-Modbus 2-BacNet	2
9271	Kommunikationszähler Master <-> Slave	14080

Betriebsstunden

Adresse	Bezeichnung	Wert
11085	Betriebsstunden Lüfter Zuluft	0
11083	Betriebsstunden Lüfter Abluft	0
11087	Betriebsstunden Lüfter Sekundärluft	0
11089	Betriebsstunden Filter	0
11254	Betriebsstunden Filterrestlaufzeit	2400
11062	Betriebsstunden Gerät	0
11251	Betriebsstunden seit letztem Neustart des Gerätes	0

Reglerinformationen

Adresse	Bezeichnung	Wert
13004	SD Karte aktiv 0-Deaktiviert 1-Aktiviert	1
11117	SD Karte Schreibstatus Logging	0
13003	Firmware Version	596
13002	Firmware Revision	12
13005	Regler Type 2051=42-IO 2049=28-IO	2051

Fig. 26: Start page for web browser FSL-CONTROL III

Main menu structure

Schematic illustration	Diagnostics	Configuration	Manual control	MCE/BACS
	■ Device status ■ Temperature control ■ Fan control ■ Alarms and filter reset ■ Help	■ Device description ■ Temperature control ■ Clock and timer ■ Fan control ■ Interfaces ■ Control panel ■ Overall configuration ■ BACnet-Data points	■ Commands	■ Device => MCE/BACS ■ MCE/BACS => Device

Menu items with *+ are protected with a password and are only available to TROX Service.

4.2 Diagnostics menu

4.2.1 *'Diagnostics ➔ unit status'*

Unit status

Address	Name	Value	Explanation
13000	Unit status	green	■ Automatic mode ■ Unit OK
		grey	■ Override active ■ Unit OK
		red	Unit inactive (e. g. as a result of frost protection)

Unit information

Address	Name
11055	**Display of unit type** 1 = Secondary air unit 2 = Supply and secondary air unit, with option to switch to secondary air 3 = Supply air and secondary air unit 4 = Supply and extract air unit, with heat recovery, and option to switch to secondary air 5 = Supply and extract air unit, with heat recovery and secondary air admixture
11009	**Unit description** Individual unit description
11000	**Serial number** Serial number of the unit
11056	**Master / Slave** 0 = Slave unit 1 = Master unit

Address	Name
11036	**Software name** FSL-CONTROL III
11045	**Software version** Display of software version

Operating information

Address	Explanation
11057	**Operating mode** 1 = OFF 2 = Automatic 3 = Manual mode
11058	**Operating type** 0 = No default 1 = Standby 2 = Unoccupied 3 = Occupied

Address	Explanation
11059	**Operating type override** 0 = No override active 1 = Boost activated 2 = Class acticated 3 = Night purge activated 4 = Fan forced operation activated
11060	**Operating status** 0 = none 1 = Standby 2 = Control system 3 = Manual mode 6 = Fire emergency stop 7 = Frost alarm 8 = Priming 11 = Night purge
11061	**Setting of operating type by…** 1 = Room control panel 2 = Management and control equipment / building automation and control systems (MCE/BACS) 3 = Real time clock 4 = Digital input 5 = Master 6 = PC
11131	**Frost protection** 0 = Frost protection inactive 1 = Frost protection active

Ventilation information

Address	Explanation
11078	**Fan stage supply air** Setting of active fan stage for supply air fan.
11260	**Volume flow rate supply air** Specification of the supply air volume flow.
11077	**Fan stage extract air** Setting of active fan stage for extract air fan
11261	**Volume flow rate extract air** Specification of the extract air volume flow.
11092	**Type of ventilation** 0 = No ventilation 1 = Secondary air operation 2 = Outdoor air operation
11121	**Specification of the fan stages TROX room control panel** 255 = None (control panel without selector switch) 1 = 0 2 = 1 3 = 2 4 = 3 10 = Automatic

System information

Address	Explanation
11120	**Number of active devices in the system** Display of recognised master-slave devices in the TROX network
11257	**RTC function** 0 = RTC inactive 1 = RTC active
11258	**Activated MCE/BACS protocol** 0 = no connection to MCE/BACS 1 = Modbus 2 = BACnet
9271	**Communication counter master-slave** Used for monitoring communication between the master device and the connected slave devices

Hours of operation

Address	Explanation
11085	**Operating hours of fan, supply air** Display of operating hours of supply air fan.
11083	**Operating hours of fan, extract air** Display of operating hours of extract air fan.
11087	**Operating hours of fan, secondary air** Display of operating hours of secondary air fan (if available)
11089	**Operating hours filter** Display of operating hours of outdoor air filters.
11254	**Operating hours remaining filter time** Display of the remaining hours until the next filter exchange is due.
11062	**Operating house unit** Display of total operating hours of the ventilation unit.
11251	**Operating hours since the unit was last restarted** Display of operating hours since the device was last restarted.

Controller information

Address	Explanation
13004	**SD card** 0 = SD card inactive 1 = SD card active
11117	**SD card write status** 0 = Card is not being written to 1 = Card is being written to
13003	**Firmware version** Output of the current controller firmware.
13002	**Firmware revision** Output of the current controller revision
13005	**Controller type** Output of the controller type

4.2.2 *'Diagnostics ➔ temperature control'*

Temperature control

Address	Explanation
17305	Output of the configured control strategy 0 = Supply air temperature control (an extract air temperature sensor must be configured for supply air temperature control). 1 = Room temperature control 2 = Extract air temperature control
11104	Output of the current control sequence 1 = Cooling 2 = Cooling with heat recovery 3 = Heating with heat recovery 4 = Heating
11124	Temperature Offset room control panel
11133	Output of current outdoor air temperature
11138	Output of current flow temperature
11137	Output of current return temperature
11135	Output of the current extract air temperature (optional)
11136	Output of the current mixed air temperature (optional)

Temperature sensor

If no measured value is available, e. g. missing temperature sensor, the value 32767 is displayed.

Room / supply air temperatures

Address	Name
11095	Upper temperature limit for cooling, comfort zone [1/10 °C]*
11096	Lower temperature limit for heating, comfort zone [1/10 °C]*
11134	Actual value room temperature [1/10 °C]
11093	Setpoint room temperature [1/10 °C]
11132	Actual value supply air temperature [1/10 °C]
11097	Setpoint supply air temperature [1/10°C]

* An upper and lower temperature limit is usually set for Occupied and Unoccupied.
For room temperature control to an absolute value, the setpoint value is displayed here.
For supply air temperature control, the setpoint value is displayed here.

Control variables

Address	Name
11140	Actual value of heating valve control [1/10%] *
11141	Actual value of cooling valve control [1/10%] *
11145	Actual value of bypass damper control [1/10%] Bypass or rotary heat exchanger [1/10%] heat recovery *
11262	Output of the speed of the rotary heat recovery unit *

*Display depends on the device equipment

4.2.3 *'Diagnostics ➔ fan control'*

Type of ventilation

Address	Name
11092	Type of ventilation: 0 = No ventilation 1 = Secondary air operation 2 = Outdoor air operation
11201	Position of outdoor air dampers 0 = closed 1 = open
11256	Fresh air 0 = Deactivated 1 = Activated
11078	Output of calculated fan stage supply air
11077	Output of calculated fan stage extract air

Address	Name
11079	Output of calculated fan stage secondary air
11081	Output of fan speed, supply air [1/min]
11080	Output of fan speed, extract air [1/min]

Fan stages

Address	Name
11106	Fan speed off Temperature control
11107	Fan speed off Humidity control
11111	Fan stage off Air quality control

Measured values humidity/air quality

Address	Name
11110	Room air humidity [%] *
11113	Room air quality [ppm] *

*Display depends on the device equipment

4.2.4 *'Diagnostics ➔ Alarms und filter reset'*

Reset filter hours

Address	Name
10006	Reset filter hours: 0 = No default value 1 = Reset

A Alarm Standby

Address	Name
11255	A Alarm Fan blockage – unit in Standby 0 = Inactive 1 = Active

A alarm

Category A alarms may result in devices being switched off.

The alarm is always output as a collective fault signal (address 11160) and individually (address 11146 – 11159).

The collective fault message (address 11159) is a 16-digit bit string that summarises all category A alarm messages. It is output as a decimal number that must be converted into the binary number system. The following alarms are displayed, depending on the bit set:

Bit 0 = Conflict of master – slave version
Bit 1 = No communication expansion module
Bit 2 = No communication Control Panel Type01_Digital
Bit 3 = Extract air temperature sensor - measured value outside tolerance
Bit 4 = Group alarm of connected slave devices in case of A alarm
Bit 5 = Supply air fan blockage
Bit 6 = Extract air fan blockage
Bit 7 = Temperature sensor water return - measured value outside tolerance
Bit 8 = Temperature sensor flow flow - measured value outside tolerance
Bit 9 = Temperature sensor supply air - measured value outside tolerance
Bit 10 = Fire emergency stop
Bit 11 = Temperature sensor room air - measured value outside tolerance
Bit 13 = Temperature sensor outdoor air - measured value outside tolerance

Examples:

1) **Address 11160** ⇒ 32 (decimal) ⇒ 0000000000010000 (binary)

Bit 5 = 1 ⇒ Blockage supply air fan

2) **Address 11160** ⇒ 8224 (decimal) ⇒ 0000100000010000 (binary)

Bit 5 = 1 ⇒ Blockage supply air fan

Bit 11 = 1 ⇒ Room air temperature sensor - measured value outside tolerance

The alarms of category A are individually listed below.

Alarm status of the respective alarms

Value 0 - no alarm

Value 1 - Alarm present

A alarm

Address	Name
11159	Alarm A Collective fault signal, see above for description
11146	Conflict master - slave version
11147	No communication with expansion module
11148	No communication Control Panel Type01_Digital
11149	Temperature sensor extract air - Measured value outside tolerance
11150	Group alarm A Alarms Slaves (A1,A2,A3.. > 0)
11151	Supply air fan blockage
11152	Extract air fan blockage
11153	Temperature sensor water return - Measured value outside tolerance
11154	Temperature sensor water flow - Measured value outside tolerance
11155	Temperature sensor supply air - Measured value outside tolerance
11156	Fire emergency stop
11157	Temperature sensor room air - Measured value outside tolerance
11158	Temperature sensor outdoor air - Measured value outside tolerance

B alarm

If a category B alarm is present, a notification is sent. The devices continue to run in the current operating mode.

The alarm is always output as a collective fault signal (address 11174) and individually (address 11160 – 11173).

The collective fault message (address 11174) is a 16-digit bit string that summarises all category B alarm messages. It is output as a decimal number that must be converted into the binary number system. The following alarms are displayed, depending on the bit set:

Bit 0 = Missing heating / cooling medium
Bit 1 = Filter change / filter pressure monitoring triggered
Bit 2 = Frost return temperature
Bit 3 = Frost outdoor air temperature
Bit 4 = Frost room air / extract air temperature
Bit 5 = Frost 1 supply air temperature (< 12°C)
Bit 6 = Frost 2 supply air temperature (< 8°C)
Bit 7 = Temperature sensor mixed air - measured value outside tolerance
Bit 8 = SD card defective
Bit 9 = Rotary heat recovery unit wear and tear
Bit 10 = Humidity sensor - measured value outside tolerance
Bit 11 = Air quality sensor - measured value outside tolerance
Bit 12 = Window contact triggered
Bit 13 = Rotary heat recovery unit defective

Examples

1) **Address 11173** ⇒ 32 (decimal) ⇒ 0000000000010000 (binary)

Bit 5 = 1 ⇒Frost 1 supply air temperature

2) **Address 11173** ⇒ 8224 (decimal) ⇒ 0000100000010000 (binary)

Bit 5 = 1 ⇒ Frost 1 supply air temperature

Bit 11 = 1 ⇒ Air quality sensor - measured value outside tolerance

B alarm

Address	Name
11174	Alarm B Collective fault signal
11160	Missing heating/cooling medium
11161	Filter change reached or pressure monitoring triggered
11162	Frost return temperature
11163	Frost outdoor temperature
11164	Frost room air / extract air temperature
11165	Frost supply air temperature 1 (limit 12°C)
11166	Frost supply air temperature 2 (limit 8°C)
11167	Temperature sensor mixed flow ventilation - measured value outside tolerance
11168	SD card defective

Address	Name
11169	Rotary heat recovery unit wear and tear
11170	Humidity sensor - measured value outside tolerance
11171	Air quality sensor - measured value outside tolerance
11172	Window contact activated
11173	Rotary heat recovery unit defective

4.2.5 *'Diagnostics ➔ Remaining runtimes*+'*

This page provides an overview of all running timers.

Reset times

This way, all timers can be reset to "0".
If the unit is in frost protection mode, for example, because the outdoor temperature was missing and this temperature is now present, the waiting time can be shortened. Use only for commissioning!

To reset the timer, enter the value "1" at address 10022 and confirm with Return.

Operating mode overrides

Address	Name
11229	Display of the remaining time in the operating mode override Boost
11230	Display of the remaining time in the operating mode override Class
11231	Display of the remaining time after activation of overtime
11232	Display of the minimum runtime in the operating mode override Night Purge
11259	Display of the remaining delay after activation of Occupied by DI
11279	Remaining runtime Occupied through DI

Fan

Address	Name
11233	Display of remaining runtime when switching from SEC to ODA or ODA to SEC
11235	Display of the start-up delay of the supply air fan when the shut-off dampers open and the fan was previously switched off.
11236	Display of the start-up delay of the extract air fan when the shut-off dampers open and the fan was previously switched off.
11234	Display of the remaining runtime when switching the fan stages.

Frost

Address	Name
11237	Display until next check whether the supply air temperature is still < 12 °C.
11238	Display until next check whether the supply air temperature is still < 8 °C.
11239	Display until next check whether the condition for room temperature frost (default: 8 °C) is still present. Room temperature frost is also displayed if there is no information about the extract air temperature, although the value is required (supply air or extract air temperature control active)
11240	Display until it is checked again whether the condition for outdoor temperature frost (default: -20 °C) is still present.
11241	Display until it is checked again whether the condition for return temperature frost (default: 8 °C) is still present. Currently in use.
11242	Display until next check whether the condition for heat recovery temperature frost is still present. Different temperatures are stored for the different heat recovery units: **Cross-flow HRU:** -6 °C (if the outside temperature is lower than -6 °C, the bypass is switched or, if active, the secondary air cycle is executed) **Cross-counterflow:** -4°C (If the outdoor temperature is lower than -4°C, the bypass is switched or, if active, the secondary air cycle is executed). **Rotary HRU:** -20 °C (This switches off the heat recovery temperature frost, as rotors cannot freeze).
11243	Display of runtime in outdoor air mode with the secondary air cycle activated
11244	Display of runtime in secondary air mode with the secondary air cycle activated
11246	Display of the remaining duration of the priming process

Filter

Address	Name
11245	Display of the minimum duration until the filter change is displayed for filter pressure monitoring. (Default: 30 min) To prevent gusty wind from triggering the system. Filter pressure monitoring is only active on the master units of the *-HE and *-HV variants.

4.2.6 *'Diagnostics ➔ IO connections*+'*

This page gives an overview of the status of all analogue and digital inputs and outputs.

For all non-configured inputs and outputs, "0" or "32767" is displayed.
The designations refer to the standard wiring of the unit type ZAB.
The wiring of the ZAS devices deviates from this standard wiring; in this case, please always check the wiring diagrams.

AO

Address	Name
11175	Heating valve control signal
11176	Bypass damper control signal / rotary heat recovery unit
11177	Supply air fan control signal
11178	Extract air fan control signal
11179	Control input signal of LED control panel
11180	Cooling valve control signal
11181	Secondary air damper/fan control signal
11182	Free

AI

Address	Name
11185	Current supply air temperature
11186	Current outdoor air temperature
11187	Current air quality
11188	Current humidity
11189	Current resistance value setpoint adjuster
11190	Current resistance button (only RBG Type02) If RBG Type03 is configured, then *'32767'* At the press of the button = *'0'*
11191	Current room air temperature
11192	Current extract air temperature (temperature sensor = NTC10k)
11193	Current return temperature
11194	Current flow temperature
11195	Current measured value of flow sensor (currently not used)
11196	Current extract air temperature (temperature sensor = 0…10 VDC)

DO

Address	Name
11201	Condition of shut-off dampers
11202	A alarm output
11203	B alarm output
11204	"In operation" signal output 1 = Occupied / Unoccupied 0 = Standby
11205	Enabling reheater (currently not used)
11206	Heat transfer fluid request Use only in case of Changeover!
11207	Cooling medium request Use only in case of Changeover!
11208	Humidification request (currently not used)
11209	Enabling preheater (currently not used)
11210	Enabling secondary heating system (room-related!)
11211	Enabling secondary cooling system (room-related!)

DI

The wiring status is basically displayed here.
1 = Wired
0 = Not wired

Address	Name
11213	Speed signal supply air fan
11214	Speed signal extract air fan
11215	Speed signal rotary heat recovery unit (not available for all unit variants)
11216	Occupancy switch 1 = Occupied (overrides RTC, RBG, MCE/BACS) 0 = Occupied / Unoccupied control via RBG, RTC, MCE/BACS

Address	Name
11217	Window contact 1 = Contact closed, device functioning 0 = Contact open, operating mode = OFF
11218	Fire emergency stop 1 = Contact closed, device functioning 0 = contact open, operating mode = OFF, operating mode = 6 (fire)
11219	Enabling 1 = Contact closed, device functioning 0 = Contact open, operating mode = OFF
11220	Change Over 1 = Cooling 0 = Heating
11221	Frost protection sensor Not supported.
11222	Filter monitoring 1 = triggered (time and/or pressure) 0 = not triggered
11223	Night purge Not supported.
11224	Fume cupboard switching 1 = Fan forced operation active 0 = Fan forced operation inactive Attention: The fan force operation must be activated via fan control*+, address 17472.

4.2.7 *'Diagnostics ➔ secondary air admixture*+'*

Mixed air temperature control

Address	Name
11136	Current mixed air temperature Output when mixed air temperature sensor is configured.
11098	Setpoint value of mixed air temperature 0 = No mixed air temperature control active
11144	Output signal for SEC damper 0 = No mixed air temperature control active
11091	Increase of the control voltage for SUP (supply) fan with SEC admixture if condensate prevention is active.

Ventilation

Address	Name
11092	Type of ventilation 0 = OFF 1 = Secondary air operation 2 = Outdoor air operation

Address	Name
11078	Calculated fan stage SUP, depending on temperature and air quality
11077	Calculated fan stage ETA, depending on temperature and air quality
11078	Calculated fan stage SEC, depending on temperature and air quality

Measured values for condensate prevention

Address	Name
11110	Humidity (measured at the ETA)
11135	Current extract air temperature (measured at the humidity + temperature combination sensor)

Help information for fan control

Address	Name
11253	Fan control To check which control function is currently being performed. A flow chart is required for interpretation!

4.2.8 *'Help'*

Display of help pages

Here you will find further information regarding the parameters and settings.

4.3 Configuration menu

4.3.1 *'Configuration ➔ device description'*

Address	Name
17009	Entry of project-specific device description (max. 16 characters)

4.3.2 *'Configuration ➔ temperature control'*

Temperature setpoint values

Entry of temperature setpoint values for heating and cooling for Occupied and Unoccupied modes. The range between the setpoint value for heating and the setpoint value for cooling is the comfort temperature range.

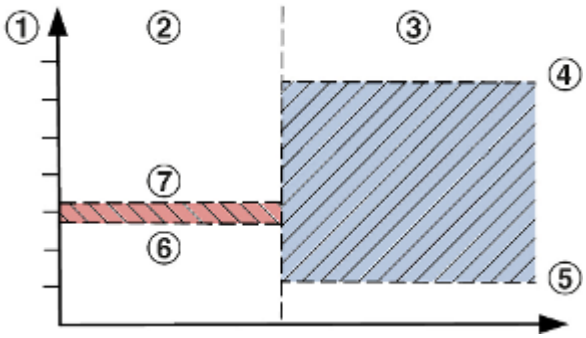


Fig. 27: Comfort zone

red Comfort temperature range for Occupied
blue Comfort temperature range for Unoccupied
1 Room temperature setpoint value
2 Occupied
3 Unoccupied
4 Cooling setpoint value for Unoccupied
5 Heating setpoint value Unoccupied
6 Heating setpoint value for Occupied
7 Cooling setpoint value for Occupied

Address	Name
17322	Cooling temperature setpoint value for Occupied
17323	Heating temperature setpoint value for Occupied
17324	Cooling temperature setpoint value for Unoccupied
17325	Heating temperature setpoint value for Unoccupied

For values marked with [1/10 °C], the values are always entered with a factor of 10.

***Example:** 17322 cooling temperature setpoint value for Occupied = 26 °C*

***Entry** : 260*

Master controller

Address	Name
17319	Proportionality coefficient
17320	Integration time

The values are already preset at the factory. No adjustments are required here.

Supply air temperature limits

Entry of minimum and maximum supply air temperature for Occupied and Unoccupied modes.

Address	Name
17311	Supply air temperature upper limit for Unoccupied
17309	Supply air temperature lower limit for Unoccupied
17310	Supply air temperature upper limit for Occupied
17308	Supply air temperature lower limit for Occupied

Winter compensation

Entry of parameters for the winter compensation function.

Address	Name
17478	Activation of winter compensation 0 = Winter compensation inactive 1 = Winter compensation active
17479	Entry of start temperature
17480	Entry of end temperature
17481	Entry of maximum setpoint value increase

Heating coil

Address	Name
17315	Proportionality coefficient
17316	Integration time
17331	minimum control value
17332	maximum control value

The values are already preset at the factory. No adjustments are required here.

Cooling coil

Address	Name
17312	Proportionality coefficient
17313	Integration time
17329	minimum control value
17330	maximum control value

The values are already preset at the factory. No adjustments are required here.

Temperature sensor Offset

The temperature sensor offset is used as a corrective value when there are temperature deviations.

The entered value is a constant and always has the same effect.

Recommendation: Offset = 0

Address	Name
17273	Entry of supply air temperature sensor correction
17276	Entry of room temperature sensor correction

4.3.3 *'Configuration ➔ clock and timer'*

Current date and time in the unit

Display of the date and time saved in the FSL-CONTROL III control system.

Set internal clock

Decentralised ventilation units from TROX can be delivered with factory-set date and time. However, it may be necessary to change settings or correct deviations.

Address	Name
10008	Default current date
10010	Default current time
10007	Set date and time 0 = No transfer 1 = Transfer to the control system
18077	Summertime (DST) setting 0 = Inactive 1 = Active

Number format

Date: ddmmyy [6 digits without separators]

Time: hhmmss [6 digits without separators]

The data is transferred by entering "1" and Return in the entry field (address 10007).

The date and time must always be entered.

Enabling timer

Activate/deactivate the timer.

Recommendation: Deactivate the timer when connecting the devices to an MCE/BACS.

Weekly programme

An individual profile can be selected for each day of the week.

Address	Name
18000	Profile for Monday
18001	Profile for Tuesday
18002	Profile for Wednesday
18003	Profile for Thursday
18004	Profile for Friday
18005	Profile for Saturday
18006	Profile for Sunday

Profile 1 – 7

For each profile, 10 different switching points can be freely selected.

The following operating modes and overrides are available:

1 - Standby

2 - Unoccupied

3 - Presence

4 - Boost

5 - Class

6 - Night purge

7 - Forced switching

Address	Name
18007	Switching point 1
18008	Switching point 2
18009	Switching point 3
18010	Switching point 4
18011	Switching point 5
18012	Switching point 6
18013	Switching point 7
18014	Switching point 8
18015	Switching point 9
18016	Switching point 10

Always start the profile entry at 00:00 in 'Unoccupied' mode.

We recommend separate profiles for weekdays, weekends and holidays.

For supply air temperature control, please replace the operating mode 'Unoccupied' with 'Standby'. The switching points are always active until the following switching point is reached.

Entry is always a combination of time and operating mode or override.

Prefixed zeros are not displayed after entry.

***Example 1**: Entry of Unoccupied at 00:00 midnight*

Entry = 00002 Display = 2

***Example 2:** Entry of Night purge at 02:00 am*

Entry = 2006 Display = 2006

Example for office

Office hours: 8:00 am – 5:00 pm

00.00 midnight	-	Start Unoccupied ⇒ 2
02.00 am	-	Start Night purge ⇒ 2006
05.00 am	-	End Night purge (Unoccupied) ⇒ 5002
07.00 am	-	Pre-tempering (Occupied) ⇒ 7003
07.45 am	-	Flush with outdoor air (Boost) ⇒ 7454
08.00 am	-	Normal operation (Occupied) ⇒ 8003
12.30 pm	-	Lunch break (Unoccupied) ⇒ 12302
01.30 pm	-	Normal operation (Occupied) ⇒ 13303
05.00 pm	-	Unoccupied ⇒ 17002
09.00 pm	-	Rep. Unoccupied ⇒ 21002

Further information

3.1.2.9 'Operating modes / operating mode override' on page 24

4.3.4 *'Configuration ➔ Fan control'*

Air quality control (optional)

With air quality control, the outdoor air volume flow is controlled depending on the room air quality.

This type of control is only possible with an air quality sensor (optional equipment or provided by the client). The internal sensor optionally detects the CO_2 concentration or the VOC content of the extract air. Air quality control is always active in the *'Occupied'* operating mode. In the *'Unoccupied'* operating mode, air quality control is inactive.

Activation of the function in the *'Unoccupied'* operating mode in address line 17378.

The switching thresholds apply for both *'Occupied'* and *'Unoccupied'* operating modes. If a switching threshold is exceeded, the configured fan stage is activated.

Switching to Secondary air

For devices with secondary air switching, secondary air mode is active until the first switching threshold is reached. If the measured air quality value exceeds the first switching threshold, supply air and extract air operation is activated. When the other switching thresholds are reached, the fan speed is increased.

Address	Name
17378	Enabling air quality control in Unoccupied mode 0 = Inactive 1 = Active
17111	Outdoor air 0 = Inactive 1 = Active
17380	First switching threshold for air quality 0..2000 ppm
17381	Second switching threshold for air quality 0..2000 ppm
17382	Third switching threshold for air quality 0..2000 ppm
17383	Fourth switching threshold for air quality 0..2000 ppm
17384	Fifth switching threshold for air quality 0..2000 ppm

Recommendation

Limit value for first fan stage: 500 ppm

Limit value for second fan stage: 750 ppm

Limit value for third fan stage: 1000 ppm

Limit value for fourth fan stage: 2100 ppm

Limit value for fifth fan stage: 2100 ppm

Humidity control

Humidity control is currently not supported.

Presence via DI

If an on-site presence switch (to be provided by the client) is connected, the corresponding settings can be made here. When activated, the ventilation unit is switched into Occupied mode.

Address	Name
17148	Time until triggering
17149	Enter the duration
17150	Operating mode after termination

4.3.5 *'Configuration ➔ Interfaces'*

Device restart

Address	Name
10003	Device restart 0 = No default value 1 = Restart

Device restart

To change some settings, the control system will need to be restarted. To restart, enter 1 in the entry field for address 10003 and confirm with Return.

Slave devices

Address	Name
17048	Enter of the number (!) of connected devices For master in combination with one slave = 1, for several slaves = number of slaves. For slave devices, the value corresponds to the number of following slave devices.

Settings SL1 Connection X1 Serial Bus

The SL1 connection / terminal X1 is used for master devices to connect the devices to the MCE/BACS.

1 – 127 is available as the address range. A serial bus string can consist of max. 32 devices. With slave devices, the master device is connected at connections SL1 / terminal X1.

Factory-set Modbus address

The factory setting is Modbus address 1 for the master devices and Modbus address 2 for slave devices. In the case of connection from a master device to exactly one slave device, no settings are required. If several slave devices are connected to one master device, the Modbus address is incremented by "1" for each connected slave device.

Example slave 1 = Modbus address terminal X1 = 2

Slave 2 = Modbus address terminal X1 = 3

Slave n = Modbus address terminal X1 = n + 1

Address	Name	Explanation
16124	Entry of Modbus address terminal X1	
16125	Serial protocol type 3 = Modbus RTU / Modbus TCP / BACnet IP 4 = BACnet MS/TP	
16129	Baud rate X1 (RS485-1) 0 = 9600 1 = 19200 2 = 38400 3 = 57600 4 = 76800 Baud	For master devices according to the on site's serial bus system (provided by the client). For slave devices, the baud rate is exclusively 38400 baud (value = 2).
16126	Data bits X1 (RS485-1)	For master devices according to the on site's serial bus system (provided by the client). For slave devices, the number of data bits is exclusively 8 (value = 8).

Address	Name	Explanation
16128	Parity X1 (RS485-1) 0 = Zero 1 = Odd 2 = Even	For master devices according to the on site's serial bus system (provided by the client). For slave devices, the parity is exclusively even (value = 2)
16127	Stop bits X1 (RS485-1)	For master devices according to the on site's serial bus system (provided by the client). For slave devices, the number of stop bits is exclusively 1 (value = 1).

Settings SL2 Connection X2 Serial Bus

For master devices, the SL 2 connection / terminal X2 is used to connect the first slave device.

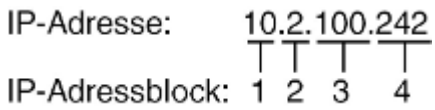
The Modbus address SL 2 / terminal X2 is always 1, no settings are needed.

Address	Name
15774	Address

IP address

The entry fields are used to set the IP address of the FSL-CONTROL III control system. For the entry, the IP address is divided into four address blocks (points).

Entry of IP address



IP address factory setting

Master devices - 10.2.100.242

Slave devices - 10.2.100.243

Note: no DHCP

Address	Name
11267	IP address block 1
11268	IP address block 2
11269	IP address block 3
11270	IP address block 4

> ***Access via web browser***
>
> *Connect ventilation unit and mobile device with a patch cable, then enter the IP address into the address line of the web browser to gain access to the ventilation unit. You can then check statuses, read out values and adjust settings.*

IP gateway

The address of the IP gateway is entered in the entry fields. The input syntax follows the IP address; see *'IP address' on page 45*.

Address	Name
11271	IP gateway block 1
11272	IP gateway block 2
11273	IP gateway block 3
11274	IP gateway block 4

IP network mask

The address of the IP netmask is entered in the entry fields. The input syntax follows the IP address; see *'IP address' on page 45*.

Address	Name
11275	IP network mask block 1
11276	IP network mask block 2
11277	IP network mask block 3
11278	IP network mask block 4

Accepting network settings

Address	Name
10023	To accept changes to the factory preset IP address, IP gateway and IP network mask, please confirm with "1" and Return.

BACnet

*In BACnet, the instance number is displayed as a sum (BACnet identifier + BACnet subnet * 65536). The BACnet ObjectName describes the device name in BACnet.*

In addition, the BACnet identifier and BACnet Object_Name can be used for own settings. Please ensure uniqueness in the network.

No spaces are permitted for the entry of the BACnet Object_Name.

Address	Name
17565	Enter the BACnet identifier as an integer. In BACnet, the identifier is displayed as an instance number according to the logic (BACnet subnet x 65536) + BACnet identifier. Example: Address 17565 = 7 and address 17566 = 1, instance = 1 x 65536 + 7 = 65543.
17569	The BACnet Object Name is displayed as the device name.
17566	BACnet Subnet

4.3.6 *'Configuration ➔ Control panel'*

Times

Address	Name
17439	Run time of overtime operation
17464	Boost run time
17469	Class run time

The values are already preset at the factory and can be customised for specific projects.

HMI digital

Address	Name
17589	Language selection 0 = German 1 = English
17588	Air quality display 0 = inactive 1 = active
17598	Assessment of air quality 0 = inactive 1 = active
17583	Display limit yellow
17584	Display limit red
17585	User password 0 = inactive
17586	Service password
17591	Display sleepscreen 0 = inactive 1 = active
17594	Display time 0 = inactive 1 = active
17597	Room temperature measurement 0 = inactive 1 = active
17600	Display icon labelling 0 = inactive 1 = active
17599	Display remaining run times 0 = inactive 1 = active
17592	Dimming the display Info: Display of the sleep screen after double the time
17593	Residual brightness in dimmed state

The values are already preset at the factory and can be customised for specific projects.

4.3.7 *'Configuration ➔ Temperature control*+'*

Basic settings

Address	Name
17305	Control strategy 0 = Supply air temperature control For isothermal introduction of the supply air. Devices only cover the ventilation heat loss. It is important that the integrated extract air temperature sensor is activated, otherwise room air/extract air frost is active. Replace absence with standby in the clock and time programme. 1 = Room temperature control In conjunction with room temperature via control panel or MCE/BACS. 2 = Extract air temperature control In conjunction with integrated extract air temperature sensor.
17306	Register type 0 = no register 1 = Changeover In changeover mode, the device requires information regarding the medium present via DI or MCE/BACS. If no information is available, the valves are not actuated. 2 = 2L heating Also enter for isothermal supply air intake. 3 = 2L cooling 4 = 4L heat exchanger 5 = Electric heating coil Only for X-CUBE/SCHOOLAIR-V-HV-EH, X-CUBE/SCHOOLAIR-D-HV-EH and X-CUBE/SCHOOLAIR-S-HV-EH.
17327	minimum outside temperature to enable the active cooling sequence, Default setting: 10 °C
17328	Switchover delay heating-cooling, Default setting: 1 min
17110	Room / extract air temperature deviation for max. fan speed, Default setting: 3 K. This means that, if the deviation is > 3 K, the devices switch to the third fan stage. All other stages according to the resulting characteristic curve.

Temperature setpoint values

Address	Name
17322 – 17325	↬ *'Temperature setpoint values' on page 40*
17318	Hysteresis threshold for supply air temperature presetting: 0.2 K; i.e., the supply air temperature may deviate from the specified supply air temperature by this value.

Master controller

The master controller affects the deviation between the setpoint and actual room temperature.
The control of the valves is not affected at this point.
The control parameters of the valves are set via addresses 17312, 17313, 17315, 17316.

Address	Name
17319	Cascade control proportionality coefficient default setting: 15
17320	Cascade control integration time default setting: 400

Supply air temperature limits

Address	Name
17311	Entry of the supply air temperature upper limit for Unoccupied
17309	Entry of the supply air temperature lower limit for Unoccupied
17310	Entry of the supply air temperature upper limit for Occupied
17308	Entry of the supply air temperature lower limit for Occupied

Winter compensation

Address	Name
17478	Enabling winter compensation 0 = inactive 1 = active (default) Entry of the parameters for winter compensation via addresses 17479, 17480 and 17481.

Heating coil

Address	Name
17315 – 17316 17331 – 17332	No changes to the default settings are required.

Cooling coil

Address	Name
17312 – 17313 17329 – 17330	No changes to the default settings are required.

WRG

Address	Name
17336	Heat recovery type 1 = Plate heat recovery unit Setting for the following unit types: ■ All X-CUBE/ROOMAIR units ■ X-CUBE/SCHOOLAIR-B-0-2L / -4L ■ X-CUBE/SCHOOLAIR-B-HE-2L / -4L ■ X-CUBE/SCHOOLAIR-V-0-2L / -4L ■ X-CUBE/SCHOOLAIR-V-1800-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HE-2L / -4L ■ X-CUBE/SCHOOLAIR-D-0-2L / -4L 2 = Rotary heat recovery unit Setting for the following unit types: ■ X-CUBE/SCHOOLAIR-B-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HV-EH ■ X-CUBE/SCHOOLAIR-D-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-D-HV-EH ■ X-CUBE/SCHOOLAIR-S-HV-EH
17337	Heat recovery proportionality coefficient No changes to the default settings are required.
17338	Heat recovery integration time No changes to the default settings are required.
17339	Heat recovery year-round 0 = inactive For all units with a plate-type heat recovery unit and without a condensate drain. Condensate is avoided because the bypass opens when the outdoor temperature is too cold and the air goes directly to the heat exchanger. The available water-side output must cover the entire ventilation heat loss. 1“ = active Basically for all *-HV unit variants, as the rotary heat recovery unit does not generate any condensate to the outside. A condensate connection is mandatory for units with plate heat recovery. In addition, the frost protection cycle (Configuration -> Frost protection*+) must be activated.
17340	Minimum setpoint value of the heat recovery unit (HRU) No changes to the default settings are required.
17341	Maximum setpoint value of hear recovery unit No changes to the default settings are required.
17344	Heat recovery rate of HRU Settings as follows: 60% ■ All X-CUBE/ROOMAIR appliances with cross-flow heat recovery ■ X-CUBE/SCHOOLAIR-B-0-2L / -4L ■ X-CUBE/SCHOOLAIR-V-0-2L /- 4L ■ X-CUBE/SCHOOLAIR-V-1800-2L / -4L ■ X-CUBE/SCHOOLAIR-D-0-2L / -4L 80% ■ X-CUBE/SCHOOLAIR-S-HV-EH 81% ■ X-CUBE/ROOMAIR-B-ZAB/SEK-HE ■ X-CUBE/ROOMAIR-V-ZAB/SEK-HE 84% ■ X-CUBE/SCHOOLAIR-B-HE-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HE-2L / -4L 75% ■ X-CUBE/SCHOOLAIR-B-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-V-HV-EH ■ X-CUBE/SCHOOLAIR-D-HV-2L / -4L ■ X-CUBE/SCHOOLAIR-D-HV-EH
17342	Minimum temperature difference: No changes to the default settings are required.
17343	Waiting time if temperature conditions are favourable

Rotary heat exchanger for heat recovery

Address	Name
17606	Minimum monitoring time for wear/defect detection in minutes
17608	Activation of defect monitoring
17607	Activation of wear monitoring
17609	Input of max. speed with max. control
17610	Enter the max. deviation in %

Electric heating coil

Address	Name
17378	Enabling electric heating coil Dynamic Dynamic influences the maximum heating capacity of the electric heating coil depending on the outdoor air temperature and the fan stage. 0 = inactive 1 = active Only for X-CUBE/SCHOOLAIR-V-HV-EH, X-CUBE/SCHOOLAIR-D-HV-EH and X-CUBE/SCHOOLAIR-S-HV-EH.
17579	Electric heating coil proportion Dynamic Information on proportion Dynamic.

Temperature sensor Offset

For the correction of various temperature sensors. Please make sure that the Offset affects the entire temperature range.

Address	Name
17273	Supply air temperature Offset
17274	Outdoor air temperature Offset
17276	Room air temperature Offset Insofar as a correction of the measurement must be made in the control panel. Please check the installation location of the control panel.
17277	Extract air temperature Offset Affects input AI8, which is always used for extract air temperature if the extract air temperature sensor is an NTC 10k, i.e. for all CO_2- / temperature combination sensors.
17278	Return temperature Offset
17279	Flow temperature Offset
17280	Extract air temperature Affects input AI12, which is always used for extract air temperature when the extract air temperature sensor outputs a 0...10 VDC signal, i.e. for all CO_2- / humidity / temperature combination sensors. Primarily in the X-CUBE/ROOMAIR-U-ZAS.

4.3.8 *'Configuration ➔ Fan control*+'*

Air quality control

Address	Name
17290	Sensor type 0 = none, for all slaves. For master devices, if the integrated CO_2 sensor is not used. 2 = Titec CO_2 The units are supplied with a CO_2 sensor as standard. 3 = Titec VOC
17376	Enabling air quality control 0 = inactive For master devices without internal sensor and without on-site sensor incl. transmission via MCE/BACS. 1 = active For master devices with integrated sensors and for master devices without internal sensors with simultaneous transmission of measured values via the on-site MCE/BACS. The master decides independently which fan stage is active, based on the measured values.
17377	Enabling air quality control in Occupied 0 = inactive during Occupied 1 = active during Occupied (= default setting)
17378	Enabling air quality control in Unoccupied 0 = inactive during Unoccupied (= default setting) 1 = active during Unoccupied
17111	Fresh air 0 = inactive If the measured value for the room air quality is below the first threshold value, the unit ventilates with secondary air in Occupied. 1 = active Regardless of the indoor air quality, the unit always ventilates with outdoor air when Occupied.
17380	First switching threshold for air quality If the measured value is below the 1st switching threshold, the unit ventilates with secondary air, provided that fresh air = 0. If the measured value is above the 1st switching threshold, the unit ventilates with outdoor air. Fan stage = Stage 1.
17381	Second switching threshold for air quality If the measured value is above the 2nd switching threshold, the unit ventilates with outdoor air in the 2nd stage.
17382	Third switching threshold for air quality If the measured value is above the 3nd switching threshold, the unit ventilates with outdoor air in the 3nd stage.

Address	Name
17383	Fourth switching threshold for air quality If the measured value is above the 4nd switching threshold, the unit ventilates with outdoor air in the 4nd stage.
17384	Fifth switching threshold for air quality If the measured value is above the 5nd switching threshold, the unit ventilates with outdoor air in the 5nd stage.

Humidity control

Humidity control is not currently supported.

Fan stages

Address	Name
17072	Minimum fan stage during Occupied 1 = Default setting, fans always run during Occupied.
17074	maximum fan stage during Occupied 3 = Default setting; this setting limits the available fan stages to 3 stages during Occupied.
17071	Minimum fan stage Unoccupied 0 = Default setting, the fans can be switched off provided that the room temperature is within the set point range.
17073	maximum fan stage Unoccupied 4 = Default setting; this setting limits the available fan stages to 4 stages during Unoccupied. The 4th fan stage is activated during Night Purge.
17112	Reduction in fan stage temperature without cooling If the unit are not cooling (2L - heating), this parameter can be used to reduce the fan speed so that the rooms are not heated up too much when the outside temperature is too high(> 28 °C).

Settings Operating type Override settings

Address	Name
17462	Enabling Boost 0 = inactive 1 = active
17463	Fan stage during Boost; entry of the active fan stage for Boost mode. Default stage = stage 4. During Boost, ventilation always uses outdoor air.
17467	Enabling Class 0 = inactive 1 = active
17468	Fan stage during Class; entry of the active fan stage for Class mode. Default stage = stage 2. During Class, ventilation always uses outdoor air.
17450	Enabling Night Purge 0 = inactive 1 = active
17456	Fan stage during Night Purge; entry of the active fan stage for Night Purge mode. Default stage = stage 4. During Night Purge, ventilation always uses outdoor air. Activation via RTC or MCE/BACS required.
17472	Enabling Fan Force mode operation For combination with fume cupboards or separate, time-limited extract air. 0 = inactive 1 = active Activation always via DI or MCE/BACS.
17473	Fan stage Fan forced switching supply air Entry of fan stage for supply air fan.
17474	Fan stage Fan forced switching extract air Entry of fan stage for extract air fan. The stage should always be > 0.

Times

Address	Name
17105	Minimum time at current fan stage To prevent the unit from jumping back and forth between different stages too quickly.
17061	Out damper runtime The fans are only put into operation after this time has elapsed. No change required.
17359	Locking time switchover secondary air - outdoor air The unit can only switch from outdoor air mode to secondary air mode, or vice versa, once this blocking time has elapsed.

4.3.9 *'Configuration ➔ Secondary air admixture damper*+'*

These settings are only required for X-CUBE/ROOMAIR-U-ZAS.

Secondary air damper

Address	Name
17345	Enabling secondary air damper 0 = inactive 1 = active Secondary air damper must be active.
17352	Minimum delay time in current direction of action No changes required.

Condensate prevention

The X-CUBE/ROOMAIR-U-ZAS does not require a condensate drain, as condensate forming is prevented by the temperature control. For this purpose, the air temperature upstream of the heat recovery unit is raised by mixing in secondary air to such an extent that no condensate is formed.

Address	Name
17346	Prevention of condensation - minimum temperature difference (between extract air and outdoor air temperature) for activation Default setting = 5 K. No changes required. The outdoor air must be at least 5 K cooler than the extract air temperature.
17347	Prevention of condensation - temperature offset with regard to the calculated minimum mixed air temperature Default setting = 2 K. For safety reasons, the mixing air temperature to be achieved is raised by 2 K and therefore more secondary air is added.
17349	Maximum total control input signal of supply air fan For mixing, the control voltage of the supply air fan is increased so that it draws in more air in total. This value limits the maximum possible control voltage for acoustic reasons.

Mixed air temperature control

Address	Name
17350 – 17351	No changes required.

Fan stages

These settings affect the fan stages in regard to air quality.

Address	Name
17106	minimum outdoor air stage Default setting = 1 The unit always ventilates with outdoor air at stage 1 during Occupied mode. This means that pure secondary air operation is not possible during Occupied mode.
17107	maximum outdoor air stage Default setting = 3 For limiting the fan stage with outdoor air. If further fan stages are permitted, the difference is covered by secondary air.
17109	maximum stage supply and extract air Default setting = 3

4.3.10 *'Configuration ➔ Secondary air admixture fan*+'*

These settings are only required for X-CUBE/ROOMAIR-B-ZAB+SEK.

Secondary air fan

Address	Name
17354	Enabling secondary air fan 0 = inactive 1 = Active The secondary air fan must be activated.

Fan stages

Address	Name
17355	Minimum secondary air stage Default setting = 1. This means that the secondary air fan always runs at stage 1 so that the supply air is not forced back by the secondary air fan.
17356	Maximum secondary air stage Setting according to the number of fan stages.
17108	minimum supply/extract air stage To ensure the minimum outdoor air volume. Usually stage 1
17109	maximum supply/extract air stage Setting according to the number of fan stages. If a maximum outdoor air volume has been defined in the project, this volume can be set here.

4.3.11 *'Configuration ➔ Characteristics*+'*

Control input signal fan supply air

Address	Name
17080 – 17084	For entering the control voltage of the supply air fan for up to 5 stages. Stage 1 – 3 represent normal operation, Stage 4 for Boost and Night Purge. Control voltages according to table, *'Control voltages ' on page 53 .*
17498	Supply air pressure monitoring limit Entry of the control voltage of the max. fan stage (usually stage 3) up to which the filter pressure monitoring is active. For projects where air volumes exceed the nominal air volume.

Volume flow fan supply air

Address	Name
17075 – 17079	For entering the volume flow rate in the individual fan stages for supply air. This value is output to MCE/BACS.

Control input signal fan extract air

Address	Name
17090 – 17094	For entering the control voltage of the extract air fan for up to 5 stages. Stage 1 – 3 represent normal operation, Stage 4 for Boost and Night Purge. Control voltages according to table, *'Control voltages ' on page 53 .*
17499	Extract air pressure monitoring limit Entry of the control voltage of the max. fan stage (usually stage 3) up to which the filter pressure monitoring is active. For projects where air volumes exceed the nominal air volume. Note: Only the outdoor air filter is monitored.

Volume flow fan extract air

Address	Name
17075 – 17079	For entering the volume flow rate in the individual fan stages for extract air. This value is output to MCE/BACS.

Control input signal fan secondary air

Address	Name
17095 – 17099	For entering the control voltage of the secondary air fan for up to 5 stages.

Control voltages

X-CUBE/SCHOOLAIR-B Control voltages [V]

Volume flow rate		X-CUBE/SCHOOLAIR-B...							
		-0-2L / -4L		-HE-2L / -4L		-HV-2L / -4L *1		-HV-2L / -4L *2	
[m³/h]	[l/s]	SUP	EHA	SUP	EHA	SUP	EHA	SUP	EHA
150	42	42	40	26	29	26	29	25	23
200	56	52	50	32	37	30	33	30	28
250	69	62	60	39	44	34	37	34	32
300	83	72	70	45	52	38	41	40	37
320	89	76	74	47	56	39	43	42	39
350	97			51	60	42	45	45	42
400	111			58	68	46	49	50	48
450	125			64	76	49	54	55	53
500	139					53	58	61	58
550	153					57	62	66	63
600	167					61	66	70	67

*1 with fans from Ziehl-Abegg (colour = blue)

*2 with fans from Dunli (colour = black)

X-CUBE/SCHOOLAIR-V control voltages [V]

Volume flow rate		X-CUBE/SCHOOLAIR-V...									
		-0-2L / -4L		-1800-2L / -4L		-HE-2L / -4L		-HV-2L / -4L / -EH *1		-HV-2L / -4L / -EH *2	
[m³/h]	[l/s]	SUP	EHA	SUP	EHA	SUP	EHA	SUP	EHA	SUP	EHA
150	42	44	44	40	43	27	25	29	26	25	23
200	56	56	56	50	53	35	32	33	30	30	28
230	64	64	64	56	59	39	37	36	33	32	30
240	67	66	66	58	61	41	38	37	34	33	31
250	69	68	68	60	63	42	40	38	34	34	32
280	78	76	76	66	69	47	44	40	37	37	35
300	83	80	80	70	73	50	47	42	38	40	37
320	89	85	85	74	77	52	50	44	40	42	39
350	97			80	83	57	55	46	42	45	42
360	100					58	56	47	43	46	43
400	111							51	46	50	48
450	125							55	50	55	53
500	139							60	54	61	58
550	153							64	58	66	63
600	167							68	62	70	67

*1 with fans from Ziehl-Abegg (colour = blue)

*2 with fans from Dunli (colour = black)

X-CUBE/SCHOOLAIR-D control voltages [V]

Volume flow rate		X-CUBE/SCHOOLAIR-D...					
		-D-0		-HV		-HV-EH	
[m³/h]	[l/s]	SUP	EHA	SUP	EHA	SUP	EHA
150	42	49	53				
200	56	63	66				
250	69	76	80	23	20	23	20
300	83	90	94	26	22	26	22
320	89	95	100	27	23	27	23
400	111			31	28	31	28
500	139			37	33	37	33
600	167			44	39	44	39
700	194			50	46	50	46
800	222			57	53	57	53
900	250			65	61	65	61
1000	278			73	69	73	69
1100	306			81	78	81	78

X-CUBE/SCHOOLAIR-S control voltages [V]

Volume flow rate		X-CUBE/SCHOOLAIR-S...	
		-HV-EH	
[m³/h]	[l/s]	SUP	EHA
200	56	28	24
300	83	36	30
400	111	43	36
500	139	50	41
600	167	57	47
700	194	64	53
800	222	71	59
900	250	79	64
1000	278	86	70
1050	292	89	73

X-CUBE/ROOMAIR-B Control voltages [V]

Volume flow rate		X-CUBE/ROOMAIR-B...						
		-ZAB/SEK		-ZAB/SEK-HE		-ZAB+SEK		
[m³/h]	[l/s]	SUP	EHA	SUP	EHA	SUP	EHA	SEC
60	17	33	33	24	26	19	21	31
90	25	46	46	33	35	31	32	39
120	33	57	57	43	44	43	44	47
150	42	70	70	53	54	55	55	55

X-CUBE/ROOMAIR-V control voltages [V]

Volume flow rate		X-CUBE/ROOMAIR-V...			
		-ZAB/SEK		-ZAB/SEK-HE	
[m³/h]	[l/s]	SUP	EHA	SUP	EHA
60	17	39	43	21	21
90	25	44	47	31	30
120	33	55	56	41	40
150	42	68	70	51	49

X-CUBE/ROOMAIR-U control voltages [V]

Volume flow rate		X-CUBE/ROOMAIR-U...	
		-U-ZAS	
[m³/h]	[l/s]	SUP	EHA
60	17	28	30
90	25	39	40
120	33	49	51
150	42	59	61

Heating valve characteristic

The settings depend on the valve-valve actuator combination used.

Actuator	Valve			
	Siemens - straight-way valve Siemens - 3-way valve		Frese - pressure-independent control valve	
Möhlenhoff, thermoelectric	**X**		**X**	
Möhlenhoff, electromotive		**X**		**X**
Address 17229	100	100	0	0
Address 17230	13	0	100	100

Characteristic bypass/rotary heat exchanger

The settings depend on the design implementation in the unit.

Please note the following table:

Rotary heat exchanger (X-CUBE/SCHOOLAIR-B / -V / -D / -S - HV)

Address	X-CUBE/SCHOOLAIR...	
	-B-HV -V-HV	-D-HV -S-HV
17231	22	35
17232	100	100

Note

During the function test, the control input signal of the heat recovery unit has the following meaning:

100% - 100% heat recovery = maximum speed

0% - 0% heat recovery = minimum speed

Plate heat recovery unit (all other unit variants)

Address	X-CUBE/ROOMAIR-B...			X-CUBE/SCHOOLAIR-B...	
	-ZAB/SEK	-ZAB/SEK-HE	-ZAB+SEK	-0-2L/ -4L	-HE-2L/ -4L
17231	0	0	0	100	100
17232	100	100	100	0	0

Address	X-CUBE/ROOMAIR-V...		X-CUBE/SCHOOLAIR-V...		
	-ZAB/SEK	-ZAB/SEK-HE	-0-2L/ -4L	-HE-2L/ -4L	-1800-2L/ -4L
17231	100	100	100	100	0
17232	0	0	0	0	100

Address	X-CUBE/SCHOOLAIR-D...
	-2L/4L
17231	0
17232	100

Address	X-CUBE/ROOMAIR-U...
	-ZAS
17231	100
17232	0

Note

During the function test, the control input signal of the heat recovery unit has the following meaning:

100% - 100 % Bypass / 0% heat recovery

0% - 0% Bypass / 100 % heat recovery

Special case SCHOOLAIR-V-0-2L / -4L: Damper open = 100% heat recovery!

Cooling valve characteristic

Address	Name
17239 – 17340	Usually, the same settings must be made here as for the heating valve.

Secondary air damper characteristic at AO5

Please note that the LED for the control panel is connected to AO5, exception: X-CUBE/ROOMAIR-U-ZAS.

Address	Name
17237	AO5 characteristic min = 0
17238	AO5 characteristic max = 60 Limitation to 6 VDC, as the LED at the control panel is operated with 5 VDC.

Secondary air damper characteristic at AO7

Address	Name
17241	AO7 characteristic min = 0
17242	AO7 characteristic max = 100

4.3.12 *'Configuration ➔ IO connections*+'*

The configuration described below represents the standard wiring of decentralised ventilation units. Deviations are documented with the wiring diagrams.

Unit restart

Address	Name
10003	After any changes, the controller must be restarted. Enter a "1" and confirm with Return.

Assignment of analogue inputs

Address	Name
17177	Assignment AI1 = 1 (Supply air temperature, NTC 10k)
17178	Assignment AI2 = 2 (Outdoor air temperature, NTC 10k)
17179	Assignment AI3 = 8 (CO_2 - sensor, 0 ... 10 VDC- signal)
17180	Assignment AI4 = 9 (Humidity sensor, 0 … 10 VDC signal)
17181	Assignment AI5 = 12 (Analogue control panel setpoint value adjuster, 5k)
17182	Assignment AI6 = 13 (Analogue control panel, selector switch or push button)
17183	Assignment AI7 = 14 (Analogue control panel, room temperature, NTC 10k or 20k)
17184	Assignment AI8 = 6 (Extract air temperature, NTC 10k)
17185	Assignment AI9 = 5 (Return temperature, NTC 10k)
17186	Assignment AI10 = 4 (Flow temperature, NTC 10k)
17187	Assignment AI11 = currently not used
17188	Assignment AI12 = 7 (extract air temperature, 0 ... 10 VDC-Signal, X-CUBE/ROOMAIR-U-ZAS)
17189	Assignment AI13 = 3 (mixed air temperature, NTC 10k, X-CUBE/ROOMAIR-U-ZAS)
17190	Assignment AI14 = currently not used

Assignment of analogue outputs

Address	Name
17219	Assignment AO1 = 1 (Heating valve, 0 … 10 VDC)
17220	Assignment AO2 = 5 / 7 (Bypass damper / rotary heat recovery)
17221	Assignment AO3 = 3 (Fan supply air, 0 … 10 VDC)
17222	Assignment AO4 = 4 (Fan extract air, 0 … 10 VDC)
17223	Assignment AO5 = 14 (LED control panel, 0 … 10 VDC)
17224	Assignment AO6 = 2 (Cooling valve, 0 … 10 VDC)
17225	Assignment AO7 = 6 (Secondary air damper / fan, 0 ... 10 V)
17226	Assignment AO8 = 9 (Output volume flow rate, 0 … 10 VDC)
17227	Assignment AO9 = currently not used
17228	Assignment AO10 = currently not used

Assignment of digital inputs

Address	Name
17116	Assignment DI1 = 1 (Speed signal fan supply air)
17117	Assignment DI2 = 2 (Speed signal fan extract air)
17118	Assignment DI3 = Rotor run monitoring (only for units with rotary heat recovery unit)
17119	Assignment DI4 = 10 (Presence key) Switching: Open = valid operating mode (RTC, DI, MCE/BACS), Closed = Occupied
17120	Assignment DI5 = 5 (window contact) Switching: Open = Device OFF, Closed = Automatic
17121	Assignment DI6 = 6 (fire emergency stop) Switching: Open = Device OFF, Closed = Automatic
17122	Assignment DI7 = 7 (external enabling) Switching: Open = Device OFF, Closed = Automatic
17123	Assignment DI8 = 8 (changeover) Switching: Open = Heating, Closed = Cooling
17124	Assignment DI9 = 12 (Fan forced switching) Switching: Open = inactive Closed = active
17125	Assignment DI10 = 4 (filter pressure monitoring)
17126	Assignment DI11 = currently not used
17127	Assignment DI12 = currently not used
17128	Assignment DI13 = 2 currently not used
17129	Assignment DI14 = 2 currently not used
17130	Assignment DI15 = 2 currently not used
17131	Assignment DI16 = 2 currently not used

DI

NC-NO contact

Normally Closed - 0

Normally Open - 1

To perform the functions correctly, the DIs must be configured as follows.

Address	Name
17132	DI1 switch type = 1
17133	DI2 switch type = 1
17134	DI3 switch type = 0
17135	DI4 switch type = 1
17136	DI5 switch type = 0
17137	DI6 switch type = 0
17138	DI7 switch type = 1
17139	DI8 switch type = 0
17140	DI9 switch type = 1
17141	DI10 switch type = 1
17142	DI11 switch type = 1
17143	DI12 switch type = 1
17144	DI13 switch type = 1
17145	DI14 switch type = 1
17146	DI15 switch type = 1
17147	DI16 switch type = 1

Assignment of digital outputs

Address	Name
17153	Assignment DO1 = 1 (shut-off dampers)
17154	Assignment DO2 = 2 (A alarm) Switching: Open = inactive Closed = A alarm present
17155	Assignment DO3 = 3 (B alarm) Switching: Open = inactive Closed = B alarm present
17156	Assignment DO4 = 4 (ready for operation) Switching: Open = inactive Closed = Device active
17157	Assignment DO5 = currently not used
17158	Assignment DO6 = 7 (heating request, related to the valve)
17159	Assignment DO7 = 8 (cooling request, related to the valve)
17160	Assignment DO8 = currently not used
17161	Assignment DO9 = currently not used
17162	Assignment DO10 = 11 (heating request/ enabling, related to the room) Switching: Open = inactive Closed = Enabling for external heat transfer fluid
17163	Assignment DO11 = 12 (cooling request/ enabling, related to the room) Switching: Open = inactive Closed = Enabling for external coolant
17164	Assignment DO12 = currently not used

DO Assignment digital outputs

NC-NO contact

Normally Closed - 0

Normally Open - 1

To perform the functions correctly, the DOs must be configured as follows.

Address	Name
17165	DO1 switch type = 1
17166	DO2 switch type = 1
17167	DO3 switch type = 1
17168	DO4 switch type = 0
17169	DO5 switch type = 1
17170	DO6 switch type = 0
17171	DO7 switch type = 0
17172	DO8 switch type = 1
17173	DO9 switch type = 1
17174	DO10 switch type = 0
17175	DO11 switch type = 0
17176	DO12 switch type = 0

To implement the wiring of the DI / DO according to the wiring documents:

Digital inputs

X3	Function	Open	Closed	Cable breakage resistance	physical address controller	Occupancy		DI switch type	
						Address		Address	
1	Fume cupboard switching	Inactive	Active		DI 12	17127	12	17143	1
2	Changeover	Heating	Cooling	Yes	DI 8	17123	8	17139	0
3	Start operation	Off	Automatic		DI 7	17122	7	17138	1
4	Fire emergency stop	Off	Automatic	Yes	DI 6	17121	6	17137	0
5	Window contact	Off	Automatic	Yes	DI 5	17120	5	17136	0
6	Presence detector	current operating mode	Presence		DI 4	17119	10	17135	1

Digital outputs

X5	Function	Open	Closed	Cable breakage resistance	physical address controller	Occupancy		DO Switch type	
						Address		Address	
1	Cooling medium request	Inactive	Active		DO7	17159	7	17171	0
2	Heat transfer fluid request	Inactive	Active		DO6	17158	6	17170	0
3	Ready for operation	Device inactive	Device active		DO4	17156	4	17168	0
4	B alarm	no alarm	Alarm		DO3	17155	3	17167	1
5	A alarm	no alarm	Alarm		DO2	17154	2	17166	1
6	Enabling heating (room related)	Not enabled	Enabling		DO10	17162	11	17174	0
6	Enabling cooling (room related)	Not enabled	Enabling		DO11	17163	12	17175	0

4.3.13 *'Configuration ➔ Device configuration*+'*

Please restart the controller after making any changes!

Restart devices

Address	Name
10003	After any changes, the controller must be restarted. To restart, enter a "1" and confirm with Return.

Device configuration

Address	Name
17036	FSL-CONTROL III unit type 1 = Secondary air units (e.g. X-CUBE/ROOMAIR-U-SEK) 2 = Supply and secondary air unit with separate secondary air fan (currently not available) 3 = Supply and secondary air unit (SEC via mixing damper), (e.g. X-CUBE/ROOMAIR-U-ZUS) 4 = Supply and extract air unit (almost all X-CUBE/ROOMAIR and X-CUBE/SCHOOLAIR units)

Address	Name
	5 = Supply and extract air unit with secondary air admixture (e.g. X-CUBE/ROOMAIR-U-ZAS, X-CUBE/ROOMAIR-B-ZAB+SEK)
17042	Enabling Master This setting determines whether the device is a master (1) or a slave (0) device. 1 = Master 0 = Slave
17358	Switching to Secondary air 1 = active 0 = inactive Usually activated
17046	Control panel type 0 = No CP All master devices without control panel. Often when connected to the MCE/BACS. Instead of room temperature control, extract air temperature can also be activated. Standard for all slave devices 1 = digital control panel 2 = analogue control panel with 20k temperature sensor - all control panels are surface-mounted CPs with selector switch - all control panels for flush mounting 3 = Room temperature sensor with 10k temperature sensor
17044	Start operating mode Refers to the behaviour of the devices after restarting the controller. 1 = OFF 2 = Automatic 3 = MANUAL Only "2" is permitted here.
17045	Start operating mode Refers to the behaviour of the devices after restarting the controller. 1 = Standby 2 = Unoccupied 3 = Occupied Default setting = 3
17047	Number of IO modules Currently only applies to X-CUBE/ROOMAIR-U-ZAS and X-CUBE/ROOMAIR-B-ZAB+SEK with 4L heat exchanger and analogue room control unit connection. In this case, the IOs on the controller are not sufficient and an additional module is required. Only then, a "1" is to be entered here. Default setting = 0.

4.3.14 *'Configuration ➔ Functions*+'*

Night purge

Please note: Night ventilation must also be activated either via RTC or MCE/BACS.

Address	Name
17450	Enabling Night Purge 0 = Night Purge inactive 1 = Night Purge active
17451	Start month To define the period in which night purge may be carried out.
17452	End month To define the period in which night purge may be carried out.
17453	Minimum outdoor temperature Setting of the lower limit of the outdoor temperature.
17455	Stop delta outdoor temperature - room temperature If the difference between the outdoor temperature and the room temperature is smaller than the set value, Night Purge is terminated.
17456	Fan stage Setting of the fan stage during Night Purge. Usually stage 4.
17458	Minimum time for Night Purge Setting of the minimum duration of Night Purge. Usually 5 minutes.

Filter monitoring

Address	Name
17494	Enabling filter monitoring 0 = No filter monitoring 1 = Filter monitoring active Activation of filter monitoring, regardless of whether by time or by time and pressure.
17495	Time monitoring of filter change interval Setting of the time span after which the filter change is displayed. Usually 2500 h.
17496	Pressure monitoring Affects all device types: *-HE, *-HV and *-HV-EH and must be activated. In addition, filter monitoring (4) must be set for DI10 and Normally Closed (0) must be selected as the switch type.

Address	Name
17497	Pressure monitoring message delay Enter the duration for which the pressure monitoring must have been triggered before the message is sent. Usually 30 minutes To prevent gusts of wind from triggering the device.
17498	Limit supply air pressure monitoring Definition of the max. control voltage of the fans up to which pressure monitoring is carried out. Usually level 3
17499	Limit extract air pressure monitoring Definition of the max. control voltage of the fans up to which pressure monitoring is carried out. Usually level 3

Priming

Address	Name
17422	Starting month for priming Determination of the months in which priming is carried out.
17423	Last month for priming Determination of the months in which priming is carried out. Please note that priming is always (!) carried out within this period. Therefore no use, but only the temperature-controlled activation of the priming process. Default setting = 0.
17415	Minimum outdoor temperature Specifies the outdoor temperature at which the priming process is activated, i.e. priming takes place if the temperature falls below the entered value. For ventilation units with electric post-heating coil (*-EH), enter `-250` and deactivate priming.
17416	Maximum priming time Setting of the duration of the priming process. Usually 3 minutes (180 sec).
17418	Heating valve setting at the end of the process The valve is set to this value after priming so that the supply air temperature setpoint value is reached more quickly.
17419	Hold time for heating valve position After the priming process, the valve is moved to the setpoint value (17418) and held for the duration of the value specified here. Regulation of the supply air temperature does not take place during this period.

Address	Name
17414	Minimum priming duration with return temperature monitoring Currently not in use.
17421	Minimum return temperature to end the priming process. Currently not in use.

Logging

The devices permanently log all existing data. E.g. sensor values, operating status, MCE/BACS.

Address	Name
17558	Enabling logging 0 = inactive 1 = active = Default setting
17562	Number of files 31, i.e., a separate file is created for each day of the month. Thus, the last 31 days are always logged.
17559	Logging interval 20, i.e., data is written every 20 seconds. Please do not make any changes, as the resulting amount of data can be processed very well.
17561	Lines per file 4320, corresponds to logging every 20 seconds within 24 hours.
17560	Lines per write operation 10 so that the SD card is not accessed too often.

FTP

Address	Name
17564	Enabling FTP access to the controller 1, so that the controller can be accessed via the service tool, e.g. for software updates.
16138	Enabling FTP Volume 0 = Flash memory 1 = SD card To read the data from the SD card, "1" must be entered here.
16136	Web pages 0 = Use of the web pages located on the controller 1 = Use of the web pages on the SD card. This means that two different languages can be realised.

4.3.15 *'Configuration ➔ Alarms*+'*

Individual alarm messages can be suppressed here. No settings are necessary.

0 - The alarm is not output

1 - The alarm is output

4.3.16 *'Configuration ➔ Frost protection*+'*

Supply air frost protection

Address	Name
17403	Supply air frost protection start temperature Entry of the minimum supply air temperature. The frost protection function is carried out if the temperature falls below this value. Default setting = 8 °C.
17389	Duration Duration of the frost protection function caused by supply air frost. Default setting = 360 seconds.
17390	Restart frost protection delta supply air Enter the temperature at which frost protection is terminated. Default setting = 1 K.

Room frost protection

Address	Name
17391	Room frost protection start temperature Entry of the minimum room temperature. The frost protection function is carried out if the temperature falls below this value. Default setting = 8 °C.
17392	Duration Duration of the frost protection function caused by room frost. Default setting = 360 seconds.
17393	Restart frost protection delta room Enter the temperature at which frost protection is terminated. Default setting = 1 K.

Outdoor temperature Frost protection

Address	Name
17394	Outdoor temperature Frost protection Start temperature Enter the minimum outdoor air temperature. The frost protection function is carried out if the temperature falls below this value. Default setting = -20 °C.
17395	Duration Duration of the frost protection function caused by supply air frost. Default setting = 900 seconds.
17396	Restart frost protection delta outdoor temperature Enter the temperature at which frost protection is terminated. Default setting = 2 K.

Heat recovery unit frost protection

Address	Name
17397	Heat recovery unit frost protection start temperature Entry of the minimum outdoor air temperature: If the value falls below this value, the bypass is opened or the frost protection cycle is carried out (with year-round heat recovery in conjunction with plate-type heat recovery unit). Different values must be set for the different heat recovery systems: Cross-flow heat recovery unit = -6°C Cross counterflow heat recovery unit = -4°C Rotary heat recovery unit = -20°C (rotor does not produce condensate that has to be discharged!)
17399	Duration Duration of the frost protection function caused by heat recovery frost. Default setting = 360 seconds.
17398	Delta temperature close bypass Enter the temperature at which the bypass is closed. Default setting = 1 K.

Heat recovery Frost protection cycle

Address	Name
17409	Enabling frost protection cycle This function enables year-round heat recovery with plate heat recovery units. Please note that this function generates condensate and the devices must (!) have a condensate drain. 0 = inactive 1 = active
17410	Secondary air operating time The secondary air is used to defrost the heat recovery unit, if necessary. Default setting = 20 minutes.
17411	Outdoor air operating time Definition of the maximum duration in supply air and extract air mode until switching to secondary air. Default setting = 180 minutes (i.e. the system switches every 3 hours at the latest).

4.3.17 *'Configuration ➔ Control panel*+'*

Control panel type / Setpoint adjuster / Push-button / Selector switch The settings can be found in the following table:

Address	Honeywell, 5-stage M546FB8 *2	Thermokon, WRF04 PSTD NTC 20k 5k gn 5V SA Axx82515	Schneider STR504 M536BA4 *2	Thermokon, WRF04 PTD NTC 20k 5k gn Axx79777	Titec RTF3-NTC10k Axx59069	Thermokon, WRF06-TD-20k Axx81503	Thermokon WRF07 PTD NTC20k BTyp6 5k-gn Axx79778 Axx79779 Axx81579
	Value	Value	Value	Value	Value	Value	Value
17046 *1	2	2	3	2	3	2	2
17425	1	1	1	1	0	0	1
17434	30	30	30	30	0	30	30
17433	-30	-30	-30	-30	0	-30	-30
17436	5500	2500	5500	2500	0	2500	2500
17437	4785	3000	4785	3000	0	3000	3000
17435	100	100	100	100	0	100	100
17426	1	1	1	1	0	1	1
17427	1	1	1	1	0	1	1
17428	1	1	1	1	0	1	1
17424	1	1	0	1	0	1	1

*1 Control panel setting via Configuration --> Device configuration --> Address 17046

*2 no longer available

Times

Address	Name
17439	Run time of overtime operation Determination of the duration for overtime. Function must be activated, see address 17426 Default setting = 60 minutes
17464	Boost run time Default setting = 15 minutes
17469	Class run time Default setting = 60 minutes

4.3.17.1 Control panel digital

Address	Name
17589	Language selection 0 = German 1 = English
17588	Air quality display 0 = inactive 1 = active

Address	Name
17598	Assessment of air quality 0 = inactive 1 = active
17583	Display limit yellow
17584	Display limit red
17585	User password 0 = inactive

Address	Name
17586	Service password
17591	Display sleepscreen 0 = inactive 1 = active
17594	Display time 0 = inactive 1 = active
17597	Room temperature measurement 0 = inactive 1 = active
17600	Display icon labelling 0 = inactive 1 = active
17599	Display remaining run times 0 = inactive 1 = active
17592	Dimming the display Info: Display of the sleep screen after double the time
17593	Residual brightness in dimmed state

The values are already preset at the factory and can be customised for specific projects.

4.3.18 *'Configuration ➔ BACnet data points'*

For project-specific naming of the data points. The entries are displayed as Object Name in the BACnet Explorer.

4.3.19 *'Configuration ➔ Options*+'*

For enabling the Modbus or BACnet interface to the MCE/BACS. Please ensure that only one(!) interface to the MCE/BACS is active at any one time if the devices are connected to an MCE/BACS. This is a chargeable option, and therefore protected against access with a separate password.

For communication via Modbus RTU or Modbus TCP: Modbus protocol = 1
For communication via BACnet MS/TP or BACnet IP: BACnet = 1
For communication via BACnet IP, enter address 16125 = 3, *'Settings SL1 Connection X1 Serial Bus' on page 44*

4.3.20 *'Configuration ➔ Overall configuration*+'*

After commissioning, a protocol with all settings can be generated here. Using the Print command in the browser and the selection of a *pdf printer, a *.pdf can be generated and given to the customer with the protocol for the commissioning.

4.4 Manual control menu

4.4.1 *'Manual control ➔ Commands'*

Safety instructions for MANUAL control operating mode

NOTICE!

Damage to property by MANUAL control operation!

In MANUAL control operating mode, the safety functions are disabled. The device must be permanently monitored, as e.g. the frost protection monitoring function is disabled.

MANUAL control operating mode

The MANUAL control operating mode is used to control the actuators individually in order to test their function. Entries are made exclusively via the web browser. The function test of actuators is carried out on site at the device.

To exit MANUAL control operating mode, enter `2` (Auto) in the input field (address 10000) and then restart the device. To restart the device, enter `1` in the input field (address 10003) and confirm with Return.

Hydraulic balancing

For commissioning, the valves can be opened in the MANUAL control operating mode for hydraulic balancing.

Address	Name
10000	Operating mode: 0 = No default value 1 = OFF 2 = Auto 3 = MANUAL
10003	Device restart: 0 = No default value 1 = Restart

Device status operating mode *'Off'*

Fans	-	Off
Shut-off dampers	-	closed
Valves	-	closed
Frost control	-	active
Digital inputs	-	Switching deactivated

Reset filter hours

After a filter change, the operating hours counter can be reset using this function.

Address	Name
10006	Reset filter operating hours 0 = No default value 1 = Perform reset

Actuating values for actuators (only in MANUAL control operating mode)

The actuators can be individually started in the MANUAL control operating mode using the following functions.

Address	Name
10012	Bypass/Rotary heat exchanger 0..100 [%]
10013	Outside damper 0/100 [%] 0 = closed 100 = open
10015	Heating valve 0..100 [%]
10016	Cooling valve 0..100 [%]
10017	Supply air fan Stage 0..5 or information in percent 6..100 [%]
10018	Extract air fan Stage 0..5 or information in percent 6..100 [%]
10019	Secondary air fan Stage 0..5 or information in percent 6..100 [%]

4.5 Menu MCE/BACS

The ventilation units can be connected to the management and control equipment / building automation and control systems (MCE/BACS) via Modbus RTU, Modbus TCP, BACnet MS/TP or BACnet IP. All available data points are displayed via the menu for connection to MCE/BACS. The addresses contained in the tables correspond to the Modbus registers.

4.5.1 Connection to the MCE/BACS via Modbus

4.5.1.1 Communication commands

Settings for communication via Modbus:

- *Chapter 2.2.1 'Modbus RTU / BACnet MS/TP' on page 15*
- *Chapter 2.2.2 'Modbus TCP / BACnet IP' on page 16*
- IP address for Modbus TCP *'IP address' on page 45*
- Enter `502` as the port.

The following commands are supported by the control system:

Modbus command	Description
03 (0x03)	read holding registers
16 (0x10)	write multiple holding registers

4.5.1.2 Communication from the device to the MCE/BACS via Modbus

Depending on the software used for communication with the MCE/BACS, it may be necessary to set an offset and thus reduce the address by 1.

Example: *Query of operating status*

Software used = Modbus Poll

Register – address = 9102

The following table shows all data points that can be accessed via the web server. The data points are the same as the ones available in the Modbus protocol.

No.	Address	Name	Notes
1	9100	eOutOperatingMode Operating mode	Output operating mode 1 = OFF 2 = Automatic mode 3 = Manual mode
2	9101	eOutOperatingType Operating mode	Output operating type 0 = No operating mode 1 = Standby 2 = Unoccupied 3 = Occupied
3	9102	fOutOperatingTypeOverriding Operating mode override	Output operating mode override 0 = No operating mode override 1 = Boost 2 = Class 3 = Night purge 4 = Forced Fan Control
4	9103	fOutOperatingState Operating mode	Output operating state 1 = Standby 2 = Control system 3 = Manual mode 6 = Fire emergency stop 7 = Frost protection 8 = Priming 11 = Night purge
5	9104	eOutVentilationType Type of ventilation	Output ventilation type 0 = No ventilation 1 = Secondary air operation 2 = Outdoor air operation
6	9105	fOutTempSupply Current supply air temperature	Measured value = Value 1/10, example: Value 185 ⇒ measured value = 18.5°C Value = 32767 = measured value not available
7	9106	fOutTempOda Current outdoor temperature	Measured value = Value 1/10, example: Value 125 ⇒ measured value = 12.5°C Value = 32767 = measured value not available
8	9107	fOutTempRoom Room temperature actual value	Measured value = Value 1/10, example: Value 225 ⇒ measured value = 22.5°C Value = 32767 = measured value not available
9	9108	fOutTempReturnFlow Current return temperature	Measured value = Value 1/10, example: Value 335 ⇒ measured value = 33.5°C Value = 32767 = measured value not available

No.	Address	Name	Notes
10	9109	fOutTempFlow Current flow temperature	Measured value = Value 1/10, example: Value 600 ⇒ measured value = 60°C Value = 32767 = measured value not available
11	9110	fOutTempOffset Current room / supply air temperature Offset	Offset = Value 1/10, example: Value 10 ⇒ Offset = 1°C Value = 32767 = measured value not available
12	9111	bOutExtratime Overtime activation	Output overtime activation 0 = Deactivated 1 = Activated
13	9112	fOutTempRangeCooling Temperature upper limit, cooling	Temperature limit = Value 1/10, example: Value 420 ⇒ upper limit = 42°C
14	9113	fOutTempRangeHeating Temperature lower limit, heating	Temperature limit = Value 1/10, example: Value 180 ⇒ upper limit = 18°C
15	9114	fOutTempSetPointSupply Supply air temperature setpoint value	Supply air temperature setpoint value = Value 1/10, example: Value 250 ⇒ supply air temperature setpoint value = 25°C
16	9115	fOutFanLevel Fan stage	Output fan stage 1 = Stage 0 (no ventilation) manual operation 2 = Stage 1 manual operation 3 = Stage 2 manual operation 4 = Stage 3 manual operation 5 = Stage 4 manual operation 6 = Stage 5 manual operation 8 = Stage 1 automatic mode 9 = Stage 2 automatic mode 10 = Stage 3 automatic mode 11 = Stage 4 automatic mode 12 = Stage 5 automatic mode
17	9116	fOutHumidityRoom Current room humidity	Room air humidity in % = Value, example: Value 50 ⇒ room air humidity = 50% Value 32767 = Measured value not available
18	9117	fOutAirQualityRoom Current indoor air quality	Indoor air quality in ppm or ppm CO_2 equivalent = Value, example: Value 580 ⇒ indoor air quality = 580ppm Value 32767 = Measured value not available
19	9118	fOutVolumeFlowOda Outdoor air volume flow rate	Output current outdoor air volume flow rate in [l/s]
20	9119	fOutVolumeFlowExhaust Extract air volume flow rate	Output of current extract air volume flow rate in [l/s]
21	9120	fOutAlarmA Alarm A Collective fault signal	Output collective fault signal as bit string *'A alarm' on page 36*
22	9121	fOutAlarmB Alarm B Collective fault signal	Output collective fault signal as bit string *'B alarm' on page 37*
24	9123	bOutWindow Window contact	Output window contact 0 = Inactive 1 = Active

No.	Address	Name	Notes
25	9124	bOutFire Fire emergency stop	Output fire emergency stop 0 = Inactive 1 = Active
26	9125	fOutSystemDevices Number of devices in the system	Output of device number in the network Example 1 master + 1 slave output = 2
27	9126	eOutDemandRoom Request from room	Output of heating and cooling requirements for room 1 = Room must be heated 2 = Room must be cooled
28	9127	eOutDemandValve Request valve	Output of heating and cooling requirements to achieve the supply air temperature 1 = Supply air is heated 2 = Supply air is cooled
29	9128	fOutValvePositionHeatingMaster Control input signal heating valve Master	Output control of heating valve = Value 1/10, example: Value = 400 ⇒ control input signal = 40 %
30	9129	fOutValvePositionCoolingMaster Control of cooling valve Master	Output control of cooling valve = Value 1/10, example: Value = 400 ⇒ control input signal = 40 %
31	9160	fOutBypassValue Current control bypass / rotor	Output control of bypass or rotor Example: Value = 55 ⇒ control input signal = 55%
31	9130	fOutTempSupplySlave01 Supply air temperature slave 1	Display of current supply air temperature slave (x) = Value 1/10, example: Value 275 ⇒ measured value = 27.5°C Value = 32767 = measured value not available
32	9131	fOutTempSupplySlave02 Supply air temperature slave 2	
33	9132	fOutTempSupplySlave03 Supply air temperature slave 3	
34	9133	fOutTempSupplySlave04 Supply air temperature slave 4	
35	9134	fOutTempSupplySlave05 Supply air temperature slave 5	
36	9135	fOutTempSupplySlave06 Supply air temperature slave 6	
37	9136	fOutTempSupplySlave07 Supply air temperature slave 7	
38	9137	fOutTempSupplySlave08 Supply air temperature slave 8	
39	9138	fOutTempSupplySlave09 Supply air temperature slave 9	
40	9139	fOutTempSupplySlave10 Supply air temperature slave 10	
41	9140	fOutValvePositionHeatingSlave01 Heating valve slave 1	Display of current control of heating valve slave (x) = Value 1/10, example: Value 250 ⇒ control input signal = 25% Value = 32767 = measured value not available

No.	Address	Name	Notes
42	9141	fOutValvePositionHeatingSlave02 Heating valve slave 2	
43	9142	fOutValvePositionHeatingSlave03 Heating valve slave 3	
44	9143	fOutValvePositionHeatingSlave04 Heating valve slave 4	
45	9144	fOutValvePositionHeatingSlave05 Heating valve slave 5	
46	9145	fOutValvePositionHeatingSlave06 Heating valve slave 6	
47	9146	fOutValvePositionHeatingSlave07 Heating valve slave 7	
48	9147	fOutValvePositionHeatingSlave08 Heating valve slave 8	
49	9148	fOutValvePositionHeatingSlave09 Heating valve slave 9	
50	9149	fOutValvePositionHeatingSlave10 Heating valve slave 10	
51	9150	fOutValvePositionCoolingSlave01 Cooling valve slave 1	Display of current control of cooling valve slave (x) = Value 1/10, example: Value `650` ⇒ control input signal = 65% Value = `32767` = measured value not available
52	9151	fOutValvePositionCoolingSlave02 Cooling valve slave 2	
53	9152	fOutValvePositionCoolingSlave03 Cooling valve slave 3	
54	9153	fOutValvePositionCoolingSlave04 Cooling valve slave 4	
55	9154	fOutValvePositionCoolingSlave05 Cooling valve slave 5	
56	9155	fOutValvePositionCoolingSlave06 Cooling valve slave 6	
57	9156	fOutValvePositionCoolingSlave07 Cooling valve slave 7	
58	9157	fOutValvePositionCoolingSlave08 Cooling valve slave 8	
59	9158	fOutValvePositionCoolingSlave09 Cooling valve slave 9	
60	9159	fOutValvePositionCoolingSlave10 Cooling valve slave 10	

4.5.1.3 Communication from MCE/BACS to the device via Modbus

The following table shows all the data points that can be transferred from the management and control equipment / building automation and control systems (MCE/BACS) to the device.

Note

For test purposes, entries can be made directly in the web browser if the MCE/BACS has not yet been connected. For example, communication with the MCE/BACS can be tested without the MCE/BACS being completed. In some instances, data points are reset to the value `32767` after entry and processing. The corresponding diagnostics page is available to check whether a command has been accepted.
A prerequisite for the test via web browser is the activation of the Modbus interface for communication via MCE/BACS. If the BACnet interface is active, it is not possible to enter commands via the web browser.

Note on setting the room temperature

The room temperature can be specified either as a comfort band via the cooling / heating temperature limits (register 9004 / 9005) or as a fixed room temperature setpoint (register 9007). It is not possible to specify the setpoint via the comfort band and as a fixed setpoint at the same time.

No.	Address	Name	Notes
1	9000	eInOperatingMode Default operating mode	Default operating mode 1 = OFF 2 = Automatic
2	9001	eInOperatingType Default operating mode	Specification of operating mode 1 = Standby 2 = Unoccupied 3 = Occupied
3	9002	eInOperatingTypOverinding Operating mode override	Default operating mode override 0 = No operating mode override 1 = Boost 2 = Class 3 = Night purge 4 = Forced Fan Control (fume cupboard switching)
4	9003	fInPvTempOda Aktuelle Outdoor temperature	Default current outdoor air temperature = Value 1/10, example: Value `125` ⇒ default = 12.5°C
5	9004	fInSpTempRangeCooling Temperature limit cooling	Default temperature limit cooling = Value 1/10, example: Value `225` ⇒ default = 22.5°C **Note:** Room temperature control or extract air temperature control must be active
6	9005	fInSpTempRangeHeating Temperature limit heating	Default temperature limit heating = Value 1/10, example: Value `218` ⇒ default = 21.8°C **Note:** Room temperature control or extract air temperature control must be active.
7	9006	fInPvTempRoom Room temperature actual value	Default current room temperature = Value 1/10, example: Value `235` ⇒ default = 23.5°C

No.	Address	Name	Notes
8	9007	fInSPTempRoom Room air temperature setpoint	Default room air temperature setpoint = Value 1/10, example: Value 220 ⇒ default = 22.0°C **Note:** Room temperature control or extract air temperature control must be active.
9	9008	fInSpOffsetRoom Offset to the room temperature setpoint	Default offset to the room temperature setpoint = Value 1/10, example: Value 10 ⇒ Offset = 1°C
10	9009	fInSpTempSupplyAir Supply air temperature setpoint value	Transmission of supply air temperature set-point value = Value 1/10, example: Value 230 ⇒ default = 23°C **Note:** Supply air temperature control must be active.
11	9010	fInSpOffsetSuppyAir Offset to the supply air temperature setpoint	Default offset to the supply air temperature set-point = Value 1/10, example: Value 10 ⇒ Offset = 1°C
12	9011	fInPvHumRoom Current relative humidity room air	Default current relative humidity room air in % = Value, example: Value 45 ⇒ room air humidity = 45%
13	9012	eInChangeOver Changeover mode	Message about the attached medium 1 = Heating medium present 2 = Cooling medium
14	9013	fInSpFanLevel Fan stage	Default fan stage 1 = Stage 1 2 = Stage 2 3 = Stage 3 4 = Stage 4 5 = Stage 5
15	9014	fInPvAqRoom Room air quality (internal)	Default Room air quality
16	9015	fInPvAqOda Outdoor air quality (external)	Default Outdoor air quality
17	9016	fInPvVolumeFlowDifference Volume flow rate difference	Default volume flow rate difference
18	9017	bInFire Fire emergency stop	Default fire emergency stop 0 = Inactive 1 = Active
19	9018	bInWindow Window contact	Default window contact 0 = Inactive 1 = Active
20	9020	bInExtratime Overtime	Overtime function activation 0 = Inactive 1 = Active
21	9021	bInFilterReset Default for filter reset	Resetting the filter change alert 0 = Inactive 1 = Active

No.	Address	Name	Notes
22	9022	eInOdaAutomatic Default automatic outdoor air	Activation of outdoor air function 0 = Inactive 1 = Active
23	9023	bInEnableNightPurgeMandatory Default night purge	Night purge activation (forced, without checking the conditions) 0 = Inactive 1 = Active

4.5.2 Connection to MCE/BACS via BACnet

4.5.2.1 Protocoll Implementation Conformance Statement (PICS)

The data points of the BACnet protocol are described in this chapter.

> ***BACnet implementation***
>
> *We provide so-called EDE files for the BACnet implementation on the building automation and control system. These files can be downloaded from our homepage www.troxtechnik.com. Use the search term EDE on the website.*

The BACnet capabilities of the FSL-CONTROL III control system are described below.

Date	-	2020-01-10
Vendor Name	-	Schneider Electric
Product Name	-	M172
Application software version	-	1.0
Firmware revision	-	596.12
BACnet Protocol Revision	-	12

Product Description

- Schneider Electric BACnet IP and MS/TP Interface

BACnet Standardized Device Profile (Annex L):

- BACnet Advanced Application Controller (B-AAC)

List all BACnet Interoperability Building Blocks Supported (Annex K):

- Data Sharing-ReadProperty-B (DS-RP-B)
- Data Sharing-WriteProperty-B (DS-WP-B)
- Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)
- Data Sharing-WritePropertyMultiple-B (DS-WPM-B)
- Data Sharing-COV-B (DS-COV-B)

Segmentation Capability

- Able to transmit segmented messages Window Size 1476 Byte/seg

Standard Object Types Supported

- Analogue Input
- Analogue Output
- Analogue Value
- Binary Value
- Calendar
- Device
- Multistate Input
- Multistate Value
- Notification class
- Schedule

Data Link Layer Options

- BACnet IP, 100 MBPS
- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 56700, 76800

Device Address Binding

- Static device binding not supported

Networking Options

- BACnet/IP Broadcast Management Device (BBMD)
  The BBMD support registrations by Foreign Devices.

Network Security Options:

- Non-secure Device - is capable of operating without BACnet Network Security

Character Sets Supported

- Indicating support for multiple character sets does not imply that they can all be supported simultaneously.
  – ISO 8859-1

Description Device Object

Property	Remark / Value	RW
Object_Identifier	(BACnet Subnet x 65536) + BACnet Identifier	RW-E
Object_Name	Default = "FSL-CONTROL III", BACnet ObjectName	RW-E
Object_Type	DEVICE (8)	R
System_Status	OPERATIONAL (0)	R
Vendor_Name	“Schneider Electric”	R
Vendor_Identifier	10	R
Model_Name	M172	R
Firmware_Revision	“596.12”	R
Application_Software_Version	“1.0”	R
Protocol_Version 1 R	1	R
Protocol_Revision	12	R
Protocol_Services_Supported	read-property, write-property, device-communication-control, reinitialize-device, who-has, who-is	R
Protocol_Object_Types_Supported	DEVICE, ANALOGUE_INPUT,ANALOGUE_VALUE, BINARY_VALUE, MULTISTATE_INPUT,MULTI-STATE_VALUE	R
Object_List	device, analogue-input 0…50, analogue value 0..13,	R
Max_APDU_Length_Accepted	binary-value 0 …7, multistate_input 0…4; multistate-value 0…3	R
Segmentation_Supported	1476	R
APDU_Timeout	NO_SEGMENTATION (3)	R
Number_Of_APDU_Retries	3000	R
Device_Address_Binding	3	R
Database_Revision	-	R
Description Controller Type	0	R
Max_Master default	default 127	RW-E
Max_Info_Frames	default 1	RW-E

R:Read Property, W: Write Property, -E: Storage in EEPROM

Note

Object Name

FSLCONTROLIII is pre-set as the object name (Object_Name).

3.1.2.11 ‘Interfaces’ on page 29 .

Object Identifier

The object identifier is formed from the sum (BACnet subnet x 65536) + BACnet identifier (address 17565)

4.5.2.2 Communication from device to MCE/BACS

Display of all data points that can be transmitted from the device to the management and control equipment / building automation and control systems (MCE/BACS) via BACnet.

Analogue Input Object

Property	Remark / Value	RW
Object_Identifier	Analogue Input Value, instance 1 … 50	R
Object_Name		R
Object_Type	ANALOGUE_INPUT_VALUE (0)	R
Present_Value		R
Status_Flags	IN_ALARM:	
Vendor_Identifier	FAULT:	
Model_Name	OVERRIDDEN:	
Firmware_Revision	OUT_OF_SERVICE:	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units		R

R:Read Property, W: Write Property

Object_Type	Instance	Object_Name	Object_Description_DE	Units	Initial Present_Value	Present_Value
AI	0	fOutFanLevel	Output fan stage 1 = 0_Manual 2 = 1_Manual 3 = 2_Manual 4 = 3_Manual 5 = 4_Manual 6 = 5_Manual 7 = 0_AUTO 8 = 1_AUTO 9 = 2_AUTO 10 = 3_AUTO 11 = 4_AUTO 12 = 5_AUTO	no units (95)	327.67	R
AI	1	fOutOperatingState	Output operating state 0 = OFF 1 = Standby 2 = Control 3 = Manual 4 = Device Start Up 5 = Shutdown 6 = Fire protection 7 = Frost protection 8 = StartUp Circuity 9 = Error 10 = Valve Kick 11 = Night purge	no units (95)	327.67	R

Object_Type	Instance	Object_Name	Object_Description_DE	Units	Initial Present_Value	Present_Value
AI	2	fOutOperatingTypeOverriding	Output operating mode override 0 = None 1 = Boost 2 = Exercise 3 = Night purge 4 = Fan Force	no units (95)	327.67	R
AI	3	fOutValvePositionCoolingSlave03	Output position cooling valve slave 3	percent (98)	327.67	R
AI	4	fOutValvePositionHeatingSlave03	Output position heating valve slave 3	percent (98)	327.67	R
AI	5	fOutTempSupplySlave03	Output supply air temperature slave 3	degrees Celsius (62)	327.67	R
AI	6	fOutTempSupplySlave02	Output supply air temperature slave 2	degrees Celsius (62)	327.67	R
AI	7	fOutValvePositionHeatingSlave02	Output position heating valve slave 2	percent (98)	327.67	R
AI	8	fOutValvePositionCoolingSlave02	Output position cooling valve slave 2	percent (98)	327.67	R
AI	9	fOutValvePositionCoolingSlave01	Output position cooling valve slave 1	percent (98)	327.67	R
AI	10	fOutValvePositionHeatingSlave01	Output position heating valve slave 1	percent (98)	327.67	R
AI	11	fOutTempSupplySlave01	Output supply air temperature slave 1	degrees Celsius (62)	327.67	R
AI	12	fOutAlarmB	Output consolidated alarm B	no units (95)	327.67	R
AI	13	fOutAlarmA	Output consolidated alarm A	no units (95)	327.67	R
AI	14	fOutValvePositionCoolingMaster	Output position cooling valve master	percent (98)	327.67	R
AI	15	fOutValvePositionHeatingMaster	Output position heating valve master	percent (98)	327.67	R
AI	16	fOutSystemDevices	Output number of connected devices	no units (95)	327.67	R
AI	17	fOutVolumeFlowExhaust	Output extract air flow rate	litres-per-second (87)	65535	R
AI	18	fOutVolumeFlowOda	Output supply air flow rate	litres-per-second (87)	65535	R
AI	19	fOutAirQualityRoom	Output air quality	parts-per-million (96)	65535	R
AI	20	fOutHumidityRoom	Output relative humidity	percentage-relative-humidity (29)	327.67	R
AI	21	fOutTempSetPointSupply	Output supply air set-point temperature	degrees Celsius (62)	327.67	R
AI	22	fOutTempRangeHeating	Output lower limit temperature	degrees Celsius (62)	327.67	R

Object_Type	Instance	Object_Name	Object_Description_DE	Units	Initial Present_Value	Present_Value
AI	23	fOutTempRange-Cooling	Output upper limit temperature	degrees Celsius (62)	327.67	R
AI	24	fOutTempOffset	Output temperature offset	degrees Kelvin (63)	327.67	R
AI	25	fOutTempFlow	Output flow temperature	degrees Celsius (62)	327.67	R
AI	26	fOutTempReturnFlow	Output return temperature	degrees Celsius (62)	327.67	R
AI	27	fOutTempRoom	Output room temperature	degrees Celsius (62)	327.67	R
AI	28	fOutTempOda	Output outdoor air temperature	degrees Celsius (62)	327.67	R
AI	29	fOutTempSupply	Output supply air temperature	degrees Celsius (62)	327.67	R

Binary Value

Property	Remark / Value	RW
Object_Identifier	binary-output, instance 1 … 7	R
Object_Name		R
Object_Type	BINARY_VALUE (5)	R
Present_Value	INACTIV (0, Initial) / ACTIVE (1)	
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 OUT_OF_SERVICE: 0	R
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Inactive_Text		
Active_Text		R

R: Read Property, W: Write Property, COVU: Unsolicited Change of Value Notification

Object_Type	Inst.	Object_Name	Object_Description_DE	Inactive_Text	Active Text	Present_Value
BV	5	bOutFire	Output fire emergency stop	"normal"	"fire"	R
BV	6	bOutWindow	Output window contact	"closed"	"open"	R
BV	7	bOutExtratime	Output overtime	"inactive"	"active"	R

Multistate Input Object

Property	Remark / Value	RW
Object_Identifier	Multistate-Input Value, instance 0 … 4	R
Object_Name		R
Object_Type	MULTISTATE_INPUT_VALUE (7)	R
Present_Value	State	
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	
Out_Of_Service	FALSE (0)	
Number_Of_States		
State_Text		R

R: Read Property, W: Write Property, -E: Storage in EEPROM

Object_Type	Inst.	Object_Name	Object_Description_DE	Number_Of_States	State	Initial Present_Value	Present_Value
MI	0	eOutOperatingMode	Output operating mode	3	1	"Off"	R
					2	"Automatic"	
					3	"Manually"	
MI	1	eOutOperatingType	Output operating type	4	1	"None"	R
					2	"Standby"	
					3	"Unoccupied"	
					4	"Occupied"	
MI	2	eOutVentilationType	Output ventilation type	3	1	"None"	R
					2	"Secondary Air"	
					3	"Outside Air"	
MI	3	eOutDemandRoom	Request from room	3	1	"None"	R
					2	"Heating"	
					3	"Cooling"	
MI	4	eOutDemandValve	Request valve	3	1	"None"	R
					2	"Heating"	
					3	"Cooling"	

4.5.2.3 Communication from MCE/BACS to device

Display of all data points that can be transferred from the building automation and control systems to the devices via BACnet.

For BACnet communication, the values coming from the MCE/BACS are written into a buffer, processed, but not deleted. For the following data points, it must therefore be ensured that the MCE/BACS finally sends an 'invalid'.

AV12 - flnPvOperatingTypeOverriding (specification of operating mode override)

MV1 - eInOperatingType (specification of operating mode)

BV3 - bInFilterReset (resetting the filter change display)

Note on setting the room temperature:

The room temperature can be specified either as a comfort band via the cooling/heating temperature limits (AV0 / AV1) or as a fixed room temperature setpoint (AV3). It is not possible to specify the setpoint via the comfort band and as a fixed setpoint at the same time.

Analogue Value Object

Property	Remark / Value	RW
Object_Identifier	Analogue-Value, Instance 0 … 13	R
Object_Name		R
Object_Type	ANALOGUE_VALUE (2)	R
Present_Value		R
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 OUT_OF_SERVICE: 0	
Vendor_Identifier	NORMAL (0)	
Model_Name	FALSE (0)	
Firmware_Revision		
Event_State	Analogue-Value, Instance 0 … 13	R
Out_Of_Service		R
Units		R

R:Read Property, W: Write Property

Object_Type	Instance	Object_Name	Object_Description_DE	Units	Initial Present_Value	Present_Value
AV	0	flnSpTempRange-Cooling	Default temperature limit cooling	degrees Celsius (62)	327.67	RW
AV	1	flnSpTempRange-Heating	Default temperature limit heating	degrees Celsius (62)	327.67	RW
AV	2	flnPvTempRoom	Default current room temperature	degrees Celsius (62)	327.67	RW
AV	3	flnSpTempRoom	Default room temperature setpoint value	degrees Celsius (62)	327.67	RW

Object_Type	Instance	Object_Name	Object_Description_DE	Units	Initial Present_Value	Present_Value
AV	4	fInSpOffsetRoom	Default offset to room temperature setpoint value	degrees Kelvin (63)	327.67	RW
AV	5	fInSpTempSupply	Default supply air temperature setpoint value	degrees Celsius (62)	327.67	RW
AV	6	fInSpOffsetSupply	Default offset to supply air temperature setpoint value	degrees Kelvin (63)	327.67	RW
AV	7	fInPvHumidityRoom	Default relative humidity room air	percentage-relative-humidity (29)	327.67	RW
AV	8	fInSpFanLevel	Default fan stage 1 = Stage 1 2 = Stage 2 3 = Stage 3 4 = Stage 4 5 = Stage 5	no units (95)	327.67	RW
AV	9	fInPvAirQualityqRoom	Default air quality (room)	parts-per-million (96)	327.67	RW
AV	10	fInPvAirQualityOda	Default air quality (external)	parts-per-million (96)	327.67	RW
AV	11	fInPvVolumeFlowDifference	Default volume flow rate difference	litres-per-second (87)	327.67	RW
AV	12	fInPvOperatingTypeOverriding	Default operating mode override 0 = Inactive 1 = Boost 2 = Class 3 = Night purge 4 = Fan Forced operation (Fume cupboard switching)	no units (95)	327.67	RW
AV	13	fInPvTempOda	Default outdoor air temperature	degrees Celsius (62)	327.67	RW

All offset values can be transmitted as signed integer!

+1 K --> 1

-1 K --> -1

Binary Value Objects

Property	Remark / Value	RW
Object_Identifier	Binary-Value, instance 0 … 7	R
Object_Name		R
Object_Type	BINARY_VALUE (5)	R
Present_Value	INACTIVE (0, Initial) / ACTIVE (1)	
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 OUT_OF_SERVICE: 0	
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units		R

R: Read Property, W: Write Property, COVU: Unsolicited Change of Value Notification

Object_Type	Inst.	Object_Name	Object_Description_DE	Inactive_Text	Active Text	Present_Value
BV	0	bInFire	Default fire emergency stop	"normal"	"fire"	RW
BV	1	bInWindow	Default window contact	"closed"	"open"	RW
BV	2	bInExtratime	Default overtime	"inactive"	"active"	RW
BV	3	bInFilterReset	Default filter change	"inactive"	"reset"	RW
BV	4	bInCondensation	Default condensate	"inactive"	"active"	RW

Multistate Value

Property	Remark / Value	RW
Object_Identifier	Multistate-Value, instance 0 … 3	R
Object_Name		R
Object_Type	MULTISTATE_VALUE (9)	R
Present_Value	State	
Status_Flags	IN_ALARM: 0 FAULT: 0 OVERRIDDEN: 0 OUT_OF_SERVICE: 0	R
Event_State	NORMAL (0)	R
Out_Of_Service	FALSE (0)	R
Units R		R

R: Read Property, W: Write Property, -E: Storage in EEPROM

Object_Type	Inst.	Object_Name	Object_Description_DE	Number_Of_States	State	State_Text	Present_Value
MV	0	eInOperatingMode	Default operating mode	3	1	„invalid“	RW
					2	„off“	
					3 (initial)	„automatic“	
MV	1	eInOperatingType	Default operating mode	4	1	„invalid“	RW
					2	„standby“	
					3	„unoccupied“	
					4	„occupied“	
MV	2	eInChangeOver	Default changeover	2	1	"invalid"	RW
					2	"warm water"	
					3	"cold water"	
MV	3	eInCovMode	Default COV Mode	4	1	„invalid“	RW-E
					2	„disabled“	
					3	„local broadcast“	
					4	„global broadcast“	
MV	4	eInOdaAutomatic	Outdoor air	3	1	"invalid"	RW
					2	"inactive"	
					3	"active"	

5 Control panel

5.1 Overview of control panels



Fig. 28: Digital control panel, including CO_2 traffic light display, for surface mounting, type Schneider TM172DCLWT, part number: A00000086157

① Menu
② Setpoint value adjuster
③ Selector switch
④ Occupancy push button



Fig. 29: Control panel with selector switch, for surface mounting, type: WRF04 PSTD NTC20k 5k FS5 gn 5V SA, part number: A00000082515

① Selector switch
② Push button
③ LED
④ Setpoint value adjuster

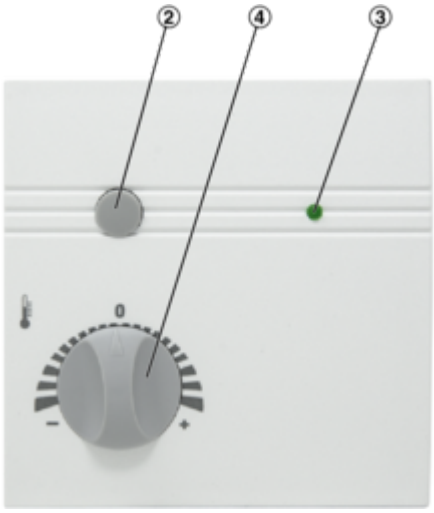


Fig. 30: Control panel without selector switch, for surface mounting, type: WRF04 PTD NTC 20k 5k gn, part number: A00000079777

② Push button
③ LED
④ Setpoint value adjuster



Fig. 31: Control panel without selector switch, for flush mounting, suitable for Berker S.1 switch range, type WRF07 PTD NTC20k BType6 5k gn SA, part no. A00000079778

② Push button
③ LED
④ Setpoint value adjuster

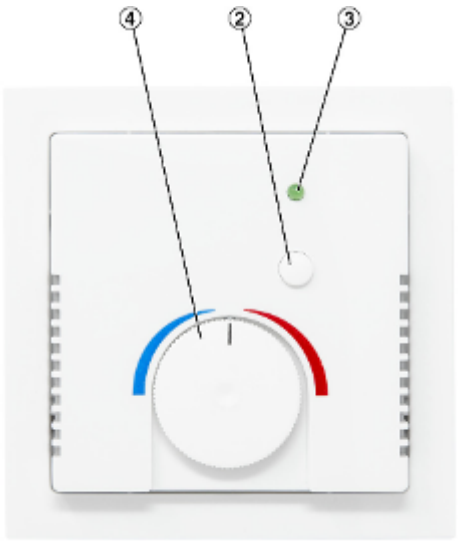


Fig. 32: Control panel without selector switch, for flush mounting, suitable for Busch Jaeger Future linear switch range, type: WRF07 PTD NTC20k BType6 5k gn, part number: A00000079779

② Push button
③ LED
④ Setpoint value adjuster



Fig. 33: Control panel without selector switch, for flush mounting, suitable for Berker Q.3 switch range, type: WRF07 PTD NTC20k BType6 5k gn, part number: A00000081579

② Push button
③ LED
④ Setpoint value adjuster

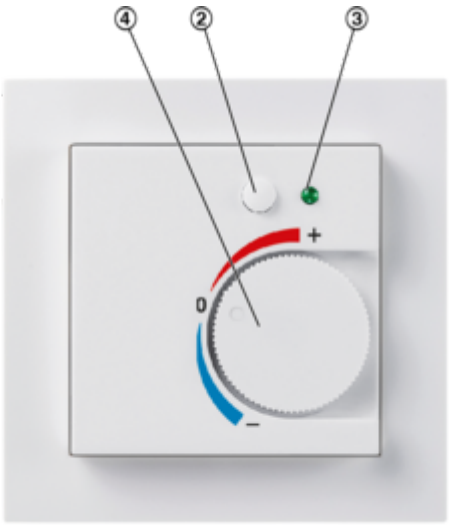


Fig. 34: Control panel without selector switch, for flush mounting, suitable for Gira E2 switch range, FSL-CONTROL III; part number: A000082916

② Push button
③ LED
④ Setpoint value adjuster

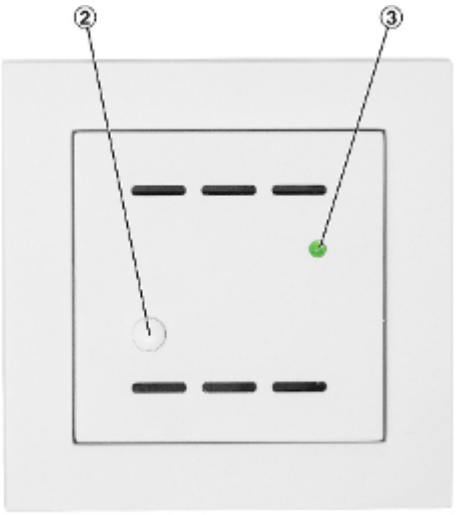


Fig. 35: Control panel without selector switch and without setpoint value adjuster, for flush mounting, suitable for Gira E2 switch range, type WRF06-TD-NTC20k SA, part no. A00000081503

② Push button
③ LED

5.2 Digital room operating unit settings

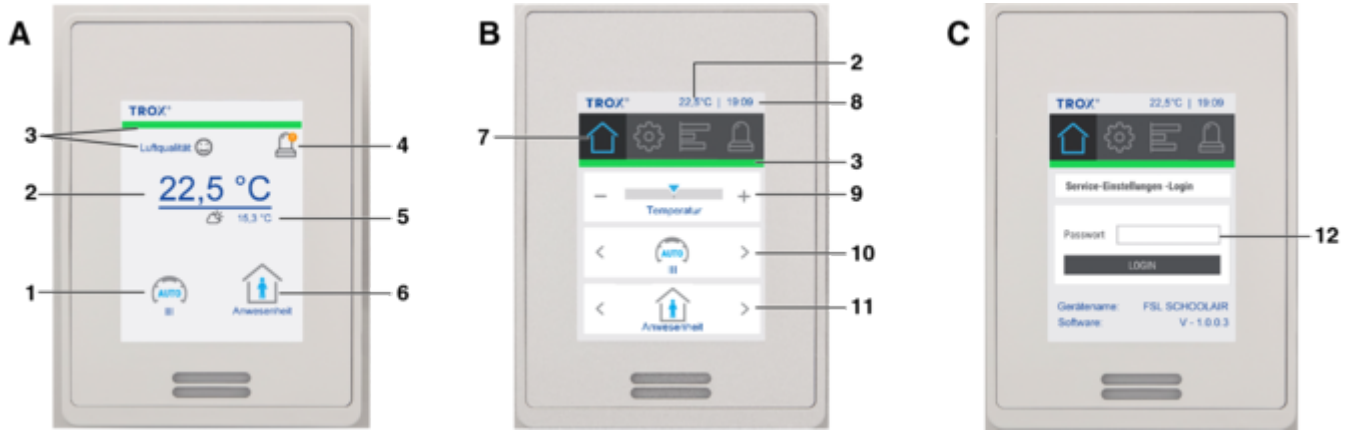


Fig. 36: Digital control panel

A Idle screen, switch to the start screen by touching the display.
B Start page
C Settings page (Login)
1 Display of the current fan stage
2 Diplay of current room temperature
3 Display of CO_2 traffic light incl. evaluation
4 Display of alarm messages (hidden if there are no messages)
5 Display of the current outdoor air temperature
6 Display of the current operating mode
7 Menu
8 Display of time
9 Setting the setpoint temperature (room / extract or supply air temperature depending on the selected control strategy)
10 Setting the fan speed or Boost, Class, Standby
11 Setting the operating mode
12 Input field for password

Room temperature (2)	
22.5 °C	Diplay of current room temperature The room temperature is measured using an integrated room temperature sensor or transmitted to the device via a data point.

Air quality (3)	**Display of the indoor air quality in various gradations (CO_2 - traffic light).**
	green = very good air quality
	orange = sufficient air quality
	red = poor air quality
	The display can be configured via the settings.

Menu (7)	
	**Start page** Display of all essential values and settings.
	**Settings** Display of device name (configurable via settings) and current software version. Password-protected area for resetting the filter change display and activating the holiday mode (operating mode = Off). Access to the settings can be blocked with a password (optional), (Fig. 36 /C). To enter the password, select the field *'Password'* (12). Using the numeric keypad that appears, enter the specific password and confirm with *[Enter]* (bottom left). Then type *[Login]*.
	**Current values** Various settings and measured values are displayed in the menu *'Values'*. ■ **Current values I** – Operating mode – Operating mode – Source of operating mode – Operating mode override – Operating mode ■ **Current values II** – Type of ventilation – Room air quality – Remaining filter runtime – Room temperature – Outdoor temperature ■ **Current values III** – Room temperature offset – Limit cooling – Limit heating – Supply air temperature – Room air humidity (optional) ■ **Current values IV** – Supply air volume flow rate – Extract air volume flow rate
	**Messages** The Messages menu displays all existing A and B alarms in plain text. A maximum of 5 different alarm messages can be displayed at the same time.

Time (8)	
19:09	The top line of the display shows the time. The display can be configured via the settings.

Temperature (9)		
	You can change the setpoint temperature in increments of 1 K You can change the default setpoint temperature from -3 K ... +3 K. Example: ■ Setpoint temperature (control): 21 °C ■ Minimum temperature you can set: 18 °C ■ Maximum temperature you can set: 24 °C	+ Increase of setpoint temperature. – Reduction of setpoint temperature. **Temperature control depending on the control strategy** ■ For supply air temperature control: the supply air setpoint temperature is affected ■ For room / extract air temperature control: the setpoint room or extract air temperature is affected

Ventilation (10)		
	In automatic mode, the device automatically selects the fan stage depending on the temperature deviation and/or air quality.	Press < or > briefly to switch between the fan stages.
	Manual ventilation at the lowest stage.	
	Manual ventilation at a medium stage.	
	Manual ventilation at the highest stage.	
	Class - Operation with lowered airflow for quiet working.	
	Boost - Operation with maximum airflow for quick room flushing with outdoor air.	
	Standby operation. The ventilation units are switched off. No temperature maintenance.	
	Display of the activated fume cupboard switching (Forced fan control). The stage corresponds to the fan stage of the supply air (configurable). Activation takes place via DI or via BACS/MCE. When the fume cupboard switching is active, operation via the control panel is not possible.	

Operating mode (11)		
	**Occupied** *'Occupied'* mode is used when people are present in the room.	Pressing < or > briefly switches between the operating modes *'Occupied'* *'Unoccupied'* and *'Occupied + L'* (optional). In case of *'Occupied'*, the device usually always ventilate at stage 1 at minimum. If the air quality is good, measured by means of an optional CO_2 sensor, the device can run in the energy efficient secondary air mode. If the function outdoor air (*'Occupied + L'*) is activated, the unit ventilates exclusively with outdoor air (fresh air).
	**Unoccupied** The *'Unoccupied'* mode is used when no people are present in the room.	
	**Outdoor air** *'Occupied + L'* (outdoor air) is selected if the room is occupied and the outdoor air function is active at the same time.	
	**Standby** *'Standby'* is selected if the room is not occupied and the ventilation units are not used to maintain the temperature, e.g. at night.	*'Standby'* will only be displayed here. Activation by means of Real Time Clock or by selector switch (stage 0).

5.3 Analogue control panel settings

Function	Description	LED
Fan stages [1]	Using the selector switch, the fan stage can be freely selected. The following functions are available: ■ Automatic (recommended), Fan stages are automatically selected from the temperature control and air quality control (optional) - ■ 0: the device switches into Standby mode ■ 1: Fan stage 1 is selected ■ 2: Fan stage 2 is selected ■ 3: Fan stage 3 is selected Please note: After activating standby mode and then switching to a fan speed or automatic mode, the ventilation unit must also be switched to Occupied mode (via the presence button or MCE/BACS).	
Occupied/ Unoccupied [2]	Press the presence button briefly (1 second) to switch from operating mode *'Occupied'* into *'Unoccupied'*. This allows, e. g., to manually switch to *'Unoccupied'* mode when the room is not in use. Start-up delay: 1 to 2 minutes in summer, 6 to 7 minutes in winter.	Unoccupied: LED off Occupied: LED on
Overtime [2]	Manually switch on the Overtime function while the system is in *'Unoccupied'* mode, by briefly pressing the presence button. This allows you to set the ventilation unit to *'Occupied'* mode for a previously set period of time if, e. g., overtime is required after regular office hours. The overtime period can be configured. After the set period, the device returns to the valid operating mode (RTC / MCE / BACS)	Unoccupied: LED off Overtime: LED on
Boost	Manual function for the quick ventilation of the room: **Switch on:** Press the presence button (2 - 5 seconds) **Switch off:** Press the presence button again (1 second)	LED flashes once per second
Class	Silence in the room is appreciated for quiet working. **Switch on:** Press the presence button (7 - 10 seconds) **Switch off:** Press the presence button again (1 second)	LED flashes: 1 second ON, 1 second OFF.
Filter change	Display after configured number of operating hours (configurable, factory setting: after 2500 h). For devices with differential pressure sensor: Activated if the preset maximum differential pressure or the preset number of operating hours is reached. To reset the number of operating hours, either keep the presence button pressed (17 – 20 seconds) or use the web server	LED flashes: 1 second double-blinking, 1 second OFF.
Alarm	Frost alarm and hardware alarm.	LED flashes twice per second

1) The selector switch is only available with
- Type WRF04 PSTD NTC20k 5k FS5 gn 5V SA, part number: A00000082515

2) The push button on the control panel can either be used to switch between Occupied / Unoccupied or activate the overtime function or Occupied/Unoccupied/Occupied + L. The configuration is carried out using the web browser and can be performed by personnel from TROX GmbH or TROX HGI

6 X-TAIRMINAL

TROX X-TAIRMINAL is a project-specific software for visualisation, operation and monitoring of ventilation systems on a panel PC. The presentation is done on several levels that contain different information. The different menu levels are selected by pressing the respective objects displayed.

Overview

The *'Overview'* page represents the overall ventilation system, which can consist of various sub-ventilation systems. For example, classrooms can be ventilated with decentralised SCHOOLAIR ventilation units, whereas the cafeteria or sports hall are ventilated with central X-CUBE ventilation units.
On the *'Overview'* page, the operating mode and pending alarm messages for each system can be recorded at a glance.

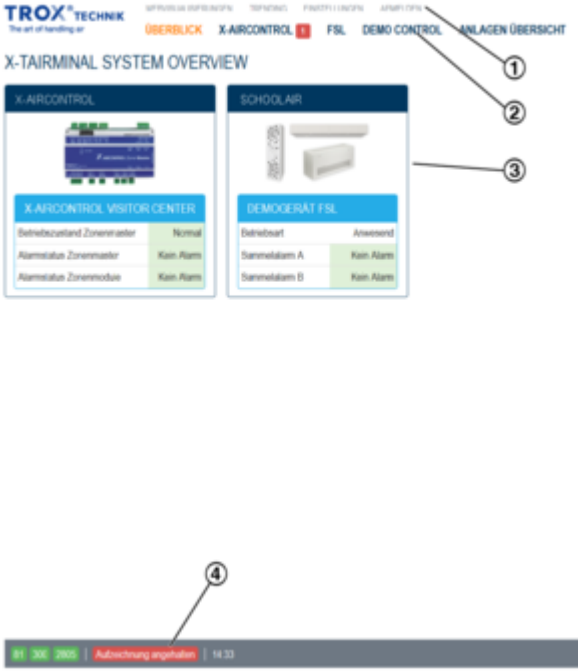


Fig. 37: System overview

1 Menu
2 Navigation bar
3 Room display
4 Status line

SCHOOLAIR

In the *'SCHOOLAIR'* room overview, the overview of the decentrally ventilated rooms is displayed.

The following settings can be made here:

- Operating mode (Off / Automatic)
- Operating mode (Standby / Off / Occupied)
- reset the remaining filter runtime after the filter change
- Fresh air (normal operation / operation with outdoor air)

In addition, the following information is shown for the individual rooms:

- Operating mode
- Operating mode
- Source of operating mode
- Consolidated alarm Category A
- Consolidated alarm Category B



Fig. 38: SCHOOLAIR room overview

1 Default operating mode (OFF, Automatic)
2 Presetting the operating mode (Occupied, Unoccupied, Standby)
3 Resetting the filter change alert
4 Default fresh air (normal operation, outdoor air operation)
5 Display of the current values for operating mode, operating mode, source of operating mode, alarm messages

Room view

The *'room view'* shows the master and slave devices of the selected room.

If the slave device is connected to the network via Modbus TCP (Modbus TCP interface required on the slave device), the same information is displayed on the master device and the slave device. If the slave device is connected to the master, the supply air temperature and the valve positions are displayed.



Fig. 39: Device overview

1 Display of device status
2 Display of operating information

Device view

The *'device view'* shows the operating status and detailed information about the alarm messages.



Fig. 40: Room1

1 Display of operating status
2 Display of alarms Category A
3 Display of alarms Category B

Trending

The *'Trending'* page can be accessed via the main menu. Various data points can be displayed here. To display the data, first set the time frame and select the respective data point. The display takes place as a diagram or as a *.csv file export.



Fig. 41: Trending

1 Definition of the time period
2 Selection of the data points
3 Configuration of the query interval
4 Data export as *.csv file
5 Display in diagram

Web visualisation

The page *'Web visualisation'* can be accessed via the main menu. All device parameters can be accessed here.

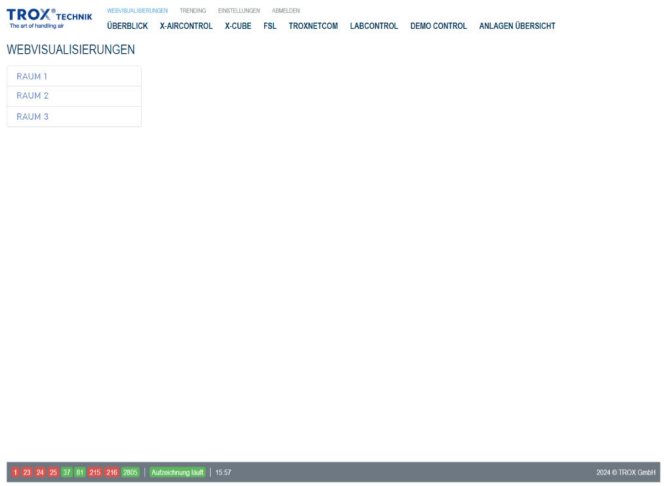


Fig. 42: Web visualisation room selection page

Select the relevant room here and the corresponding device page will appear.

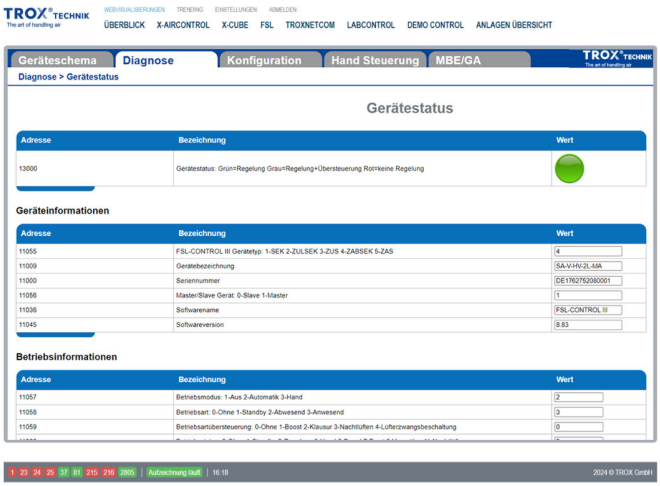


Fig. 43: Web visualisation device page

7 Index

A
A alarm ... 36
Access data ... 31
Actuators ... 67
Air quality
  Control ... 43
Air quality control ... 23 , 43
Alarms ... 36
B
BACnet ... 46
BACnet IP interface ... 16
BACnet MS/TP interface ... 15
B alarm ... 36
Boost ... 25
C
Class ... 25
Clock ... 42
Comfort zone ... 21 , 26 , 28 , 40
Configuration ... 40 , 42
Connection to MCE/BACS ... 67
Control
  Air quality ... 43
  Humidity ... 43
Controller information ... 33
Control panel ... 7
Control variables ... 35
Copyright ... 3
D
Defects liability ... 3
Device restart ... 44
Diagnostics ... 33
Digital switch inputs/switch outputs ... 10 , 29
E
Electrical installation ... 7
F
Fan control ... 43
Fan stages ... 35
Fan stage switching ... 23
Filter hours
  Reset ... 36
Free cooling ... 28
Frost protection ... 26
Functional description ... 20
H
Humidity
  Control ... 43
Humidity control ... 43
Hydraulic balancing ... 66
I
Interfaces ... 29 , 44
  BACnet ... 46
  IP address ... 17 , 45
  IP gateway ... 45
  IP network mask ... 45
IP address ... 17 , 31 , 45
IP gateway ... 45
IP network mask ... 45
L
Limitation of liability ... 3
M
Main menu ... 33
Manual control mode ... 66
MANUAL control operating mode ... 66
MCE/BACS ... 67
Measured values humidity/air quality ... 35
Minimum fan stages ... 26
Modbus address ... 44
Modbus RTU interface ... 15
Modbus TCP interface ... 16
N
Network address ... 31
Night purge ... 25
O
Occupied ... 24
Operating information ... 33
Operating mode
  Automatic ... 23
  Manual ... 23
  OFF ... 23
Operating mode override ... 24
Operating modes ... 24
P
Password ... 31
Personnel ... 6
Q
Qualification ... 6
R
Remaining runtimes ... 38
Reset
  Filter hours ... 36
Reset filter hours ... 66
Room / supply air temperatures ... 35
Room temperature control ... 21
S
Service ... 3
Settings SL1 Connection X1 Serial Bus ... 44

Settings SL2 Connection X2 Serial Bus 45
Signs 5
Slave devices 44
Software
  Web browser 31
  X-Terminal 92
Standby 24
Supply air temperature limits 40
Switching to Secondary air 26
Symbols 5
System information 33

T

Technical support 3
Temperature control 35
Temperature sensor Offset 40
Temperature setpoint values 40
Terminal resistor 12
Timer 42
Type of ventilation 35

U

Unit information 33
Unit status 33
Unoccupied 24
User name 31

V

Ventilation information 33

W

Warranty claims 3
Web browser
  Software 31
Weekly programme 42
Winter compensation ..... 26 , 40

X

X-Terminal
  Software 92

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