

SpaceLogic KNX / KNX Secure 4 Inch Touch Unit

Touch panel 1952/1.0

Application Description

MTN6215-0410S
06/24



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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Before You Begin

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

WARNING

UNGUARDED EQUIPMENT

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions,

government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.


In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

NOTE: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

Start-up and Test

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check are made and that enough time is allowed to perform complete and satisfactory testing.

 **WARNING**

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.

- Perform all start-up tests recommended by the manufacturer.

Operation and Adjustments

The following precautions are from the NEMA Standards Publication ICS 7.1-1995:

(In case of divergence or contradiction between any translation and the English original, the original text in the English language will prevail.)

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

About the Document

Document Scope

This user guide provides comprehensive guidance on using the **Touch panel** ETS application on the KNX Secure 4 Inch Touch Unit device.

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the [Cybersecurity Best Practices](#) document.

Schneider Electric provides additional information and assistance:

- [Subscribe to the Schneider Electric security newsletter.](#)
- [Visit the Cybersecurity Support Portal web page to:](#)
 - [Find Security Notifications.](#)
 - [Report vulnerabilities and incidents.](#)
- [Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:](#)
 - [Access the cybersecurity posture.](#)
 - [Learn more about cybersecurity in the cybersecurity academy.](#)
 - [Explore the cybersecurity services from Schneider Electric.](#)

Product Related Cybersecurity Information

Refer to .

Available Languages of the Document


The document is available in these languages:


- English
- French
- German
- Spanish

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

ETS Operation

Tables with  describe parameter settings in ETS.

The main setting items are on the left.		The specific parameters and their value settings are on the right.	
	Extended settings	Device safety	
		Device safety	At object value "1"
			At object value "0"
		Disabled	
		Cycle time surveillance for Safety object (0 ... 255, unit = 1 s, 0 = inactive)	0

In the ETS, the device parameters are opened using the **Edit parameters** service button.

The user interface is divided into 2 sections: The tabs are on the left and the parameters on the right, together with their values.

Requirements for Safe Operation

Knowledge of the basic rules for operating programs using Windows® is a prerequisite for operation.

The ETS is the software for the KNX system, and is not manufacturer-specific.

Knowledge of ETS operation is required. This also includes selection of the correct sensor or actuator, transferring it to the line and commissioning it.

Special Features of the ETS Software

Restoring Defaults

You can set the factory-specified defaults using the **Default parameters** service button in the ETS.

You can use the **Default** and **Default parameters** service buttons to switch all parameters back to the settings on delivery (following consultation). The ETS will then permanently delete all manual settings.

Express Settings

You can use the **Express settings** to call up pre-set functions. Later, you simply connect group addresses to the functions.

Extended Settings

With the **Extended settings**, you can configure individual functions with extensive options if required

Dependent Functions and Parameters

Many functions are affected by how other functions are set. This means that dependent functions can only be seen and selected in the ETS when the upstream function is enabled.

- If you de-select functions or change parameters, previously connected group addresses may be removed in the process.
- The values of some parameters only become active once the functions influenced by these parameters are activated.

Appropriate ETS Version

The application is suitable for the ETS5. You cannot use earlier versions, e.g., the ETS3, ETS4.

Application files (knxproj) are optimised for the relevant ETS version. If you load an ETS4 application to ETS5, time will be wasted on conversion.

Overview of Functions

General settings, page 19

General	Send delay after voltage recovery
	Cyclic sending live signal
	Delay time for exiting setting status
	Long operation for screen after
	Day/Night mode switchover
	Time for switch to night/day at
User interface	Temperature units
	Interface language
	UI theme style is
	Brightness in normal/night mode
	Turn off screen after
	Use screen saver
Proximity	Screen access
Temperature measurement	The Proximity function triggered via
Advanced function	HVAC controller
	Logic function
	Scene group function

Screen settings, page 27

Screen settings	How many screens do you use
	Screen position 1 – 9
	Use main screen
	Select main screen
	Select main screen

Express settings, page 28

Screen 1 – 9	Function icons setting
Function 1 – 6	Function parameters

HVAC controller, page 53

Controller settings	FCU controller
	Floor heating controller
	Ventilation controller
FCU controller/ Floor heating controller	Setpoint
	Heating control
	Cooling control
	Heating/Cooling control
	Fan
Ventilation controller	Auto operation on object value
	State of auto operation after startup
	Control value reference from

Logic function, page 73

Logic function settings

1st – 8th Logic	Function of channel
-----------------	---------------------

Scene group, page 78

Scene group settings	Scene group function
----------------------	----------------------

Group Addresses, Group Objects

Nr. of group addresses	2000
Nr. of maximum assignments	2000
Group objects	1060

Overview of Group Objects, page 82

KNX Data Secure

The KNX standard has been extended by KNX Data Secure to protect KNX installations from unauthorized access. KNX Data Secure reliably prevents the monitoring of communication and manipulation of the installation. KNX Data Secure describes the encryption at telegram level so that communication via objects is encrypted and therefore secure.

Encrypted telegrams are longer than the previously used unencrypted telegrams. For secure programming via the KNX bus, it is therefore necessary for the interface (e.g. USB) and any line couplers to support these „KNX long frames“.

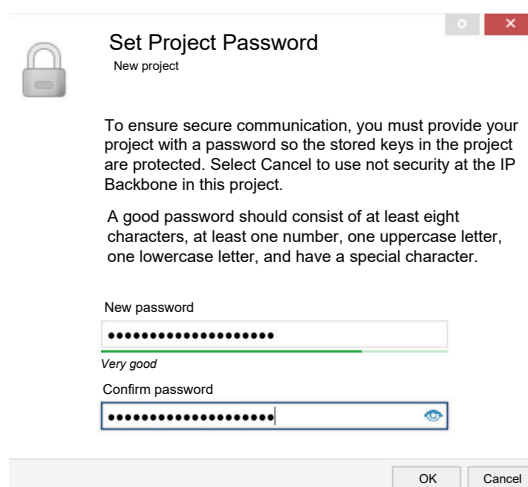
Special conditions must be observed when using secure devices in the ETS. Please refer to the relevant web pages on the KNX website <https://www.knx.org>

Protecting your data is a top priority. Use the options in the ETS and KNX Data Secure to protect your data, configuration and installations from unauthorized access.

Protecting the Project Configuration via the ETS

In the ETS, you can define a project password that protects the devices and configuration data from unauthorized access.

1. Find your project in the **Overview** tab of the ETS.
2. Click the **Details > Security > Add device certificate** and set your project password.



Set Project Password
New project

To ensure secure communication, you must provide your project with a password so the stored keys in the project are protected. Select Cancel to use not security at the IP Backbone in this project.

A good password should consist of at least eight characters, at least one number, one uppercase letter, one lowercase letter, and have a special character.

New password
.....
Very good

Confirm password
.....

OK Cancel

NOTE: A good password should consist of at least 8 characters in the project window, consisting of a number, an upper case letter, a lower case letter and a special character. Never use weak PIN codes, e.g., 1234, 0000.

3. Scan or enter the device certificates for all devices in your project that you intend to download using secure commissioning > click **OK**



Adding Device Certificates
New project

Please scan or enter the device certificates for all devices in your project that you intend to download using secure commissioning.

777777 - 666666 - 555555 - 444444 - 333333 - 222222 ✓

Serial Number FFFF-FFFFDEF7
Factory Key BDEEF7BDEF79CE739CDEF7BDEF5AD6B5

1 certificate added. OK

NOTE: The certificate consists of the serial number and the security key FDSK (Factory Default Setup Key). The FDSK is only used for initial commissioning and is replaced by the ETS during the first download. This prevents unauthorized persons from gaining access to the installation despite knowing the FDSK.

The FDSK is printed on the device label both as a QR code and in text form.

Background information on the encryption process

- Read or enter the FDSK into the ETS.
- The ETS then generates a device-specific tool key.
- When configuring the device, the ETS sends the tool key to the device. The transmission is encrypted and authenticated with the FDSK.
- From this point on, the device only accepts the tool key for communication and the FDSK can only be used to reset the device to the delivery status. All safety-relevant data is deleted during this reset. Therefore, **please keep the FDSK in your project documents.**
- The ETS then generates runtime keys, which are required for protected group communication. The transmission is encrypted and authenticated with the tool key.

Firmware Update

Firmware updates are essential for maintaining the security and functionality of your devices, ensuring they are always up to date.

To **update the firmware** of your device, use the Device Firmware Update Tool (DFU Tool).

Additionally, the DFU Tool offers a **diagnostic function** for individual device troubleshooting.

You can find the instructions on how to perform the firmware update in the DFU Tool user guide available [here](#).

General Settings

General settings apply to all the buttons. You can set general properties such as:

- Bus behavior after voltage recovery
- Display user interface
- Proximity function
- Temperature measurement parameters

In addition, you can choose which advanced functions you want to enable.

General

You can set the **delay time** for sending telegrams to the bus after the device power up and reset. The device initialization time is not included. Bus messages received during the delay period are recorded.

The delay setting prevents the bus from being overwhelmed by telegrams when the power is on again. The function also informs you that the bus is ready for communication and the devices are powered at the same time.

You can set up **cyclic sending** of signals from individual devices. When there is no signal received, the device either does not work or is missing.



General settings: General

Send delay after voltage recovery	0 – 15 s
Cyclic sending live signal	1 – 240 s, 0 = inactive
Delay time for exiting setting status	s
Long operation for screen after	s
Day/Night mode switch over	Via object/Depend on certain time
Time for switch to night/day at	hh:mm

You can also set the time interval after the setting is completed: For example, between the temperature of the set values and the current measurement temperature.

Example:

You want to set the 3-second return time to the function page after you complete the advanced settings of the temperature controller.

Set the **Delay time for exiting setting status** parameter to 3 seconds.

When you finish with settings, the setting page automatically switches to the function page 3 seconds after the idle starts.

You can set the length of the **short** and the beginning of the **long** press of the button. By default, long operation starts after 0,5 s.

You can set the **day and night mode switching** either via the object or to the exact time.

Group Objects

The **Live signal** object sends cyclically 1 to the bus to indicate that the device application layer is operating properly. The sending interval is set by parameters. The date and time information comes from the bus.

No.	Name	Object function	Length	Behavior	Data Type
1	General	Live signal	1 bit	Sends	1.001 switch
2	General	Date	3 byte	Receives	11.001 date
3	General	Time	3 byte	Receives	10.001 time of day

Icons, Backgrounds, Screensaver, Firmware Update

You can update the device icons, backgrounds, screensavers, and firmware via a USB interface.

A system integrator prepares the upgrade package with the icons, backgrounds, screensaver, and firmware and uploads it to an external storage device (USB flash drive).

Make sure your USB flash drive meets the following criteria:

- Volume: Not more than 32 GB and enough space to store firmware, customized backgrounds, screensavers, icons, etc.
- File system: FAT32.

You can format the USB drive to FAT32 in your Windows File Explorer:

Click **This PC** > right mouse click on your USB drive > select **Format...** > select **FAT32** in the **File System** drop-down menu.

To connect your USB drive to the device, you need an OTG USB cable with a micro USB port on one side and a USB 2.0 port on the other.

For using the USB interface for updates and activating micro USB port of the device, set a secure four-digit PIN code. The preset PIN code combination is 1234. USB interface becomes disabled if you set an invalid PIN code.

See more here: [User Interface, page 22](#).

If you want to update your device firmware, backgrounds, screensavers, and import customized icons, proceed as follows:

1. Copy firmware and customized PNG files to the following directories of the USB drive like this:

- Firmware: root directory
- Background: \background
- Screensaver: \screensaver
- Customized icons: \icon

The system can detect your files only if they are correctly named as follows:

Background pictures:

- File format: PNG
- Size: 480 × 480 pixels
- Name: <1.png>, <2.png>, or <3.png>

Screen saver pictures:

- File format: PNG
- Size: 480 × 480 pixels
- Name: 00.png

Icons:

- File format: PNG
- Size: 58 × 58 pixels
- Name: Refer to ETS configuration – 01_G.png (green icon nr. 01), 01_W.png (white icon nr. 01), 30_G.png (green icon nr. 30). After import, you can select them accordingly in the ETS application.

2. To avoid the update being interrupted by unwanted screen events, the following is recommended:
 - Disable the screensaver and delay time temporarily.
 - **General settings > User interface > set Turn off screen after** to “0”.
 - **General settings > User interface > Screen Access > click Deactivation**
 - Remove unnecessary files from the root directory of your USB drive.
3. Connect the USB drive and device with an OTG USB cable and wait for the device to detect the import package. If there is no response, check the following:
 - The device has a micro USB port activated.
 - There are no files in the root directory of the USB drive except for the firmware.
 - USB drive and the device are well connected by micro USB cable.
4. When the import package is recognized, a pop-up message appears:
System upgrade pack detected
Update version:
Current version:
Upgrade version?
Cancel
Confirm
5. For upgrading, click **confirm** > enter your PIN code.
6. If the PIN code is valid, the firmware update starts. Once done, the device reboots automatically.
7. The device automatically checks the background, screensaver, and icon files in your USB drive. Choose which folders you want to import. The system asks you about each detected folder. Click **cancel** or **confirm**.


The system starts importing the files. Once the file import is complete, the device restarts within 10 seconds.

User Interface

User interface function allows you to customize the appearance of the display and displayed parameters.

You can choose:



- Temperature units
- Language and PIN code
- Theme and screensaver
- Brightness level
- Type and brightness of the screensaver

	User interface	Temperature units	Celsius/Fahrenheit
		Interface language	Chinese
			English
			French
			German
			Spanish
			Swedish
			Norwegian
		UI theme style is	1, 2, 3
		Brightness in normal/night mode	10 – 100 %
		Turn off screen after	0 – 255 s, 0 = inactive
		Use screen saver	Enable/Disable
		Screen Access	Deactivation

NOTE: Make sure that you set the code page option in the project properties to UTF-8. Otherwise, the Chinese display (and/or special characters) will not be compatible.

You can set the time for the screen to turn off when idle (**Turn off screen after** parameter). If you set the value to "0 s", you can turn the screen on and off through a 1-bit object.

If you do not want the screen to be just dark when off, enable the **screen saver** function.

	User interface	Use screen saver	Check (Yes)
		Type of screen saver	Clock
			Album
			User defined text
		Brightness in screen saver	10 – 100 %
			Unchange
		Call screen saver after	5 – 255 s
		Screen Access	Deactivation


The screensaver interface displays an electronic clock, images, or custom text with a maximum of 18 English or 6 Chinese characters. If there are cedillas or other special characters in the description that consist of more than one-byte character, the maximum number of characters depends on the number of cedillas or special characters.

You can also set the back light percentage and the delay time for activating the screen saver.

PIN Code

If you activate the screen access function, you can set a four-digit security password and select the output object value sent to the bus after entering the password. You can set up sending with a delay. Once you input the correct password, the device exits from the screen saver to normal mode.

The preset PIN code combination is 1234. Screen access becomes disabled if you set an invalid PIN code (for example, 1234, 1111, or 2222).

	User interface	Use screen access pin code	Check (Yes)
		Password setting	4 digits: 0 – 9
		Output object type when input pin code	No reaction
			1 bit (On/Off)
			1 byte (scene control): 1 – 64
			1 byte: 0 – 255
			1 byte: 0 – 100 %
		Delay time for sending	0 – 255 s

Screen Lock

The screen lock protects the device against unauthorized use. The lock is set using the bus. An activated lock continues even after the device is restarted.

General screen lock

You activate or deactivate the screen lock for ongoing operation. When activated, you can lock the screen pages of the device. You lock with the value "1" and release with the value "0".

NOTE: Once the screen is locked via bus, you can NOT unlock it locally.

Group Objects

If you select **Fahrenheit** as the unit, there is no object for this option. The sensor always measures in degrees Celsius, but the temperature in degrees Fahrenheit is displayed.

No.	Name	Object function	Length	Behavior	Data Type
1053	Screen	Screen locking	1bit	C,W	1.003 enable
1054	Screen	Screen on/off	1bit	C,W	1.001 switch
1055	Screen	Screen brightness	1byte	C,W	5.001 percentage (0..100%)
1056	Night mode	Night mode input	1bit	C,W,T,U	1.024 day/night
1057	Security	Password trigger, 1bit value/ 1 byte value/ scene NO.	1bit/1byte	C,T	1.001 switch 5.010 counter pulses 5.001 percentage 17.001 scene number

Proximity Function

If you come within 12 cm of the device, the **Proximity function** triggers. The display switches on and switches off again after off delay elapses.

The **Proximity function** is activated by default. You can adjust the proximity triggering (default: built-in proximity sensor):



Proximity	The Proximity function triggered via	Never
		Proximity output object
		Proximity input object
		Proximity output or Proximity input object

Value: **Never**

The function is deactivated.

The display is not affected.

Value: **Proximity input object**

The proximity function is triggered via the 1-bit **Proximity input** object.

The proximity object has the same function as the internal proximity sensor.

- An On telegram activates the proximity state.
- An Off telegram activates the no proximity state.

Value: **Proximity output object**

The proximity function is triggered via the internal proximity sensor. The internal sensor sends a 1-bit or 1-byte signal to the bus.

The proximity and no proximity states control the status indication.

Value: **Proximity output or Proximity input object**

The proximity function is triggered via the internal sensor or the external input object.

The sensor and the proximity object are linked to each other. The result of the link corresponds to an OR link.

If the proximity sensor detects no proximity, it sends a 0 telegram to the bus.

Output Object Type

The **proximity** and **no proximity** states control the **Proximity output** object.

The proximity output can be set as:

- 1 bit object - sends values "1" or "0".
- 1 byte object - sends an adjustable value.

Example

Proximity function triggered via: **Sensor**

Object type of output value = **1 bit**

Reaction for proximity approaching: **Send a value**

Output value: **proximity**

Delay time for sending = **0 s**

Reaction for proximity leaving: **Send a value**

Output value: **no proximity**

Delay time for sending = **10 s**


The sensor detects you and the device sends an "ON" telegram immediately. 10 seconds after you leave the room, the device sends an OFF telegram.

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
1058	Proximity function	Disable/Enable Proximity function	1bit	C,W	1.003 enable
1059	Proximity function	Proximity input	1bit	C,W	1.001 switch
1060	Proximity function	Proximity output	1bit 1byte	C,T	1.001 switch 5.010 counter pulses 17.001 scene number 5.001 percentage

Temperature Measurement

The device has a built-in internal temperature sensor. You can set parameters for measuring and sending telegrams.

	Temperature measurement		Internal temperature
	Temperature calibration	- 5 – + 5 °C	
	Send temperature when the result changes by	0 – 10 °C	
	Cyclically send temperature	0 – 255, 0 = inactive	
	Send alarm/telegram for low/high temperature	Do not send	
		Send on read only	
		Send on a change	

You can set a **correction value** for the sensor. This is useful, for example, if the controller is mounted at an unfavorable position in the room. The temperature recording is different when exposed to a draught or close to sources of heat, for example, compared to other places in the room.

The following applies:

Actual temperature = measured temperature + correction value

You can set two parameters for sending the measured temperature to the bus:

- **Temperature difference:** The sensor compares the current temperature with the last value transmitted. If the current measured temperature is higher or lower than the selected deviation, the sensor sends the value to the bus.
- **Time interval:** The sensor transmits temperature values cyclically after the preset time interval. (e.g. to visualization software).

You can use one or a combination of both parameters.

In the last setting you can define a feedback method in case of a **temperature sensor alarm** (if the sensor sends a temperature that exceeds the preset threshold detection range).

The **High/Low temperature alarm** object sends the alert always when the temperature is below or above the threshold.

NOTE: After restarting the device or powering it on, it may take approximately 20 minutes for the device to stabilize, calibrating the built-in temperature sensor. It is recommended not to change the brightness or screen state during this time.

It is also recommended not to change the **1054 Screen on/off** and **1055 Screen brightness** group objects frequently to avoid interfering with the temperature compensation function of the device.

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
4	Internal sensor	Temperature value	2 byte	Sends, Receives	9.001 temperature
5	Internal sensor	Low temperature alarm	1 bit	Sends, Receives	1.005 alarm
6	Internal sensor	High temperature alarm	1 bit	Sends, Receives	1.005 alarm

Advanced Functions

In the **Advanced functions** tab, you can extend the device functionality with HVAC, Logic, and Scene group controllers. You check the appropriate box and then set the required parameters in the main menu. See more in [HVAC Controller](#), page 53.




Advanced function	HVAC controller	
	Logic function	Enable/Disable
	Scene group function	

Screen Settings


In the **Screen settings**, you choose how many screens you want to use to control the device. You can access the room functions via up to 9 function pages and configure each of them in the **Express settings** menu.

Sort the screens by preference. If you enable **Use main screen** function, you can set one of the screens as the main screen.

The following setting is the no-action delay (**Call main screen after**). After it elapses, the device switches back to the main screen. You can adjust the delay time as needed (default = 5 s).

	Screen settings	How many screens do you use	1 – 9
		Screen position 1 – 9	Screen 1 – Screen 9
		Use main screen	Enable/Disable
		Select main screen	Screen 1 – Screen 9
		Call main screen after	5 – 255 s

In the **Customized icon** sub-menu, you can select the number of icons and describe their function.

	Screen settings	Number of customized icons	None – 30
	Customized icon	Icon 1 – 30 ID	01 – 30
		Description	20 bytes allowed

Express Settings

In **Express settings**, you can configure individual screens. You choose the number of function icons and functions of each screen. You can also name them. The name you choose will appear in the left sub-menu under **Express settings**.

Later, you simply connect group addresses to the functions.



Express settings	Number of function icons	1, 4, 6
Screen X	Interface preview	
	Icon X & X set as	1 function / 2 functions
	Screen name	≤20 English or 6 Chinese characters


The function menu depends on the number of function icons selected and the button configuration for each screen. The following table provides an overview of possible combinations.

Icons	Functions
1 icon	No function Brightness dimming RGB dimming RGBW dimming Colour temperature dimming Venetian blind position and slat Air conditioner Room temperature unit Ventilation system Audio control
4 icons 2 icons = 1 function	No function Switch Brightness dimming RGB dimming RGBW dimming Colour temperature dimming Curtain step/move Roller blind step/move Curtain position Roller blind position Venetian blind position and slat Scene Value output Loop operation Multiple operation Weather information Energy monitoring Air conditioner Room temperature unit Ventilation system Audio control

Icons	Functions
4 icons 2 icons = 2 functions	No function Switch Scene Value output Loop operation Multiple operation Weather information Energy monitoring Air quality display
6 icons 2 icons = 1 function	No function Switch Brightness dimming Curtain step/move Roller blind step/move Scene Value output Loop operation Multiple operation Weather information Energy monitoring
6 icons 2 icons = 2 functions	No function Switch Scene Value output Loop operation Multiple operation Weather information Energy monitoring Air quality display

Switch

With **Express settings**, you can switch the lighting or other consumers.

	Express settings	Function	Switch
	Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
	Function 1	Icon preview	
		Function icon	
		Colour of function icon indication when status ON	Green/White
		Colour of function icon indication when status OFF	Green/White

Group Objects


The **Switching** function is carried out via the **Switch** object or external object.

No.	Name	Object function	Length	Behavior	Data Type
244	Function 1	Switch	1 bit	Sends, receives, updates	1.001 switch
249	Function 1	Switch, status	1 bit	Sends, receives, updates	1.001 switch

Scene

It is possible for a device to act as a scene controller. It sends a value to each channel that needs to be controlled and it can receive a scene command from another device or **Scene group** module (see [Scene Group](#), page 78).

Assign a number (1 to 64) to the scene, name it and select an icon.

	Express settings	Function	Scene
	Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
	Function 1	Icon preview	
		Function icon	
		Colour of function icon indication when status ON	Green/White
		Colour of function icon indication when status OFF	Green/White
		Scene number	1 – 64
		Storage scene via long operation	Enable/Disable
		Object with status feedback	Enable/Disable

You can configure a **long press** of the button (≥ 2 s) to initiate a save scene command. This stores the current setting into the scene.

There are two ways how to set up the status feedback:

1. Simple feedback: User gets feedback about the scene when they push the button. The actuator stays out of this.
2. Status of the actuator is linked with icon status feedback: Icon status and status of the actuator are synchronized.

Group Objects

The range of properties depends on whether you enable **Object with status feedback** function.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Scene	1byte	Sends Sends, Receives	18.001 scene control

Value Output

Value output function allows you to send values for different data types, specific data types and values defined by parameters.



Express settings	Function	Value output
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication	Green/White

You can set a different output telegram for each operation. There are always five options for setting the value:

- 1 bit – 1.001 switch
- 2 bit – 2.001 switch control
- 4 bit – 3.007 dimming control
- 1 byte – 5.010 counter pulses (0..255)
- 2 bytes – 7.001 pulses

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Output 1bit value	1bit	Sends	1.001 switch
		Output 2bit value	2bit		2.001 switch control
		Output 4bit value	4bit		3.007 dimming
		Output 1byte value	1byte		5.010 counter pulses
		Output 2byte value	2byte		7.001 pulses

Loop Operation



With the **Loop operation**, you can send values stepwise or step-less. There are two modes, fixed step adjustment and preset value.



Express settings	Function	Loop operation
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication	Green/White

Shift by Step Value

You can set the start/end value of the shift and the size of the step. Short button press then triggers the whole cycle of steps.





Function x	Shift type	Shift by step value
	Lowest value with	0 – 240
	Highest value with (must be larger than lowest value with)	1 – 250
	Step size	0 - 240

The **shift direction** can be set from highest to lowest (decreases) or from lowest to highest (increases). It changes by the size of the step you choose.

In the default setting, the object value is raised by the value "2" if you release the button before the long operation time elapses.

Shift without Step Value

If you choose the option **Shift without step value**, you can set up to 10 different values for each shift (**Shift value**). You send a value with each button action (short press). If, for example, you want to send 5 values with the button, press the button 5 times.



Function x	Shift type	Shift without step value
	Shift number	1 – 10
	Value 1	0 – 255
	..Value 10	0 - 240

Shift direction: The values are sent one after the other in the order you choose (increase or decrease).

Reset Function

By default, a short press starts a cycle of steps or sends individual values. If you enable the **Reset function**, you can reset the **Loop operation** with a long press.

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Register value	1 byte	Sends, receives	5.010 counter pulses (0..255)

Multiple Operation

The **Multiple operation** function allows you to send up to 4 different objects at the same time with a single button operation.

You can set the following:

- Distinction between short and long operation
- Reaction on short/long and press/release operation
- Number of objects (1 – 4)

Multiple operation supports these object functions:

- Switch – on/off - sends telegram depending on settings (Toggle/On/Off).
- Blind – up/down - sends telegram depending on the settings.
- Recall/Store scene – sends call/save scene telegram (Nr. 1 – Nr. 64).
- Percentage/Unsigned value – sends percentage/raw telegram.

Each function has the enable or disable sending option (**No reaction/Send value**).

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Output 1 – On/Off	1 bit	Sends, Receives	1.001 switch
		Output 1 – Up/Down	1 bit	Sends, Receives	1.008 up/down
		Output 1 – SceneControl	1 byte	Sends	18.001 scene control
		Output 1 – Percentage	1 byte	Sends	5.001 percentage (0..100%)
		Output 1 – Unsigned value Object x – Up/Down	1 byte	Sends	5.010 counter pulses

Weather Information

You can set the weather information as either wind speed (in km/h or m/s) or 1-bit sunny/rainy information.



Express settings	Function	Weather information
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication	Green/White

You can also set the time interval for requesting the external sensor.

Group Objects

2-byte **Wind speed** object receives the wind speed status from the bus. After the device restarts, a read request status is sent to the bus.

1-bit **Rainy/Sunny** object receives the rainy or sunny weather information from the bus. After the device restarts, a read request status is sent to the bus.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Wind speed	2 byte	Sends, Receives, Updates	9.005 speed
					9.028 wind speed
244	Screen 1 Function 1	Rainy/Sunny	1 bit	Sends, Receives, Updates	1.022 scene

Energy Monitoring

The **Energy monitoring** function monitors electricity consumption in kWh. Data is retrieved from the bus and displayed on the screen (max. 999 999 kWh).



Express settings	Function	Energy monitoring
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication	Green/White

You can set the time interval for requesting the external sensor.



Express settings	Object datatype of energy display	Value in kWh (DPT 13.013)
	Text for unit	5 bytes allowed
	Time period for request external sensor	0 – 255 (min)

After the device restarts, a read request status is sent to the bus.

Group Objects

Energy data is received from the bus and displayed on the screen, 4 bytes, kWh (DPT 13.013).

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Active energy value	4 byte	Sends, Receives, Updates	13.013 active energy (kWh)

Brightness Dimming

You can increase and reduce the dimming with values and switch the lighting on and off.

Tapping the button sends dimming values from 0 – 100 %.

You can restrict the dimming range by changing the maximum dimming value. The minimum brightness is set to 0 % and the maximum to 100 percent by default.



Express settings	Function	Brightness dimming
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Min. brightness value	0 – 50 %
	Max. brightness value	51 – 100 %

A **short button action** switches on or off. Drag the bar on the screen to dim darker or brighter.

Hold the button down (**long operation**) until you reach the required level of brightness. When you release the button, the dimming object sends a stop telegram and ends the dimming process.

If the object **Switch, status** has the value “0”, a **brighter** telegram is always sent. This ensures that the lighting gets brighter when dimming up without a previous switching on by a short operation of the push button.

Object value Switching	Value of the last dimming telegram	Reaction of the dimming actuator
OFF	Darker	Brighter
OFF	Brighter	Brighter
ON	Darker	Brighter
ON	Brighter	Darker

Group Objects

Switching is carried out via the **Switch** object or the **Brightness dimming** object.

Dimming is carried out via the **Brightness dimming** object.

A dimming function requires minimal 2 group addresses. The first group address links the switching objects of the device with the switching objects of the dimmer channel. The second group address links the dimming objects of the device with the dimming objects of the dimmer.

The status indication is controlled via the **Switch, status** and **Brightness, status** objects.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Switch	1 bit	Sends	1.001 switch
246	Screen 1 Function 1	Brightness dimming	1 byte	Sends	5.001 percentage (0..100%)
249	Screen 1 Function 1	Switch, status	1 bit	Sends, Receives, Updates	1.001 switch
251	Screen 1 Function 1	Brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)

RGB/W Dimming

The **RGB/W dimming** function is an extended dimming function for KNX devices that supports color control.

The user calls up the set lighting color by pressing the button (for example via an RGB/W KNX actuator or a KNX DALI-Gateway).

In ETS, you set the RGB/W value, download the setting to the device and connect it to a specific button.



Express settings	Function	RGB dimming	RGBW dimming
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)	
Function 1	Object datatype	1 x 3 byte / 3 x 1 byte	1 x 6 byte / 4 x 1 byte

Group Objects

Switching is carried out using one bit or one byte. You can dim each color with separate bytes or you can dim all colors together through one group object.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Switch	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	RGB dimming value	3 bytes	Sends	232.600 RGB value 3 x (0..255)
245	Screen 1 Function 1	RGBW dimming value	6 bytes	Sends	251.600 RGBW value 4x(0..100%)
245	Screen 1 Function 1	Red dimming value	1 byte	Sends	5.001 percentage (0..100%)
246	Screen 1 Function 1	Green dimming value	1 byte	Sends	5.001 percentage (0..100%)
247	Screen 1 Function 1	Blue dimming value	1 byte	Sends	5.001 percentage (0..100%)
248	Screen 1 Function 1	White dimming value	1 byte	Sends	5.001 percentage (0..100%)
249	Screen 1 Function 1	Switch, status	1 bit	Sends, Receives, Updates	1.001 switch
250	Screen 1 Function 1	RGB brightness, status	3 bytes	Sends, Receives, Updates	232.600 RGB value 3x(0..255)
250	Screen 1 Function 1	RGBW brightness, status	6 bytes	Sends, Receives, Updates	251.600 DPT Colour RGBW
250	Screen 1 Function 1	Red brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)
251	Screen 1 Function 1	Green brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)
252	Screen 1 Function 1	Blue brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)
253	Screen 1 Function 1	White brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)

Color Temperature Dimming

The **Color temperature dimming** function transmits values for setting the color temperature in Kelvin via the external device.

Pressing the button transmits 2 bytes of absolute color temperature values.

You can set the **minimum** and **maximum** values and the **step width** by which you increase or decrease temperature.



Express settings	Function	Colour temperature dimming
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Increase/Decrease step width	100, 200, 500, 1000 K
	Min. color temperature	1000 – 10000 K
	Max. color temperature	1000 – 10000 K

Group Objects

Switching is carried out via the Switch object or the **Brightness value** object.


Color temperature dimming is carried out via the **Color temperature value** object.

The status indication is controlled via the **Switch, status** and **Color temperature, status** objects.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Switch	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	Color temperature value	2 byte	Sends	7.600 absolute color temperature
246	Screen 1 Function 1	Brightness value	1 byte	Sends	5.001 percentage (0..100%)
249	Screen 1 Function 1	Switch, status	1 bit	Sends, Receives, Updates	1.001 switch
250	Screen 1 Function 1	Color temperature, status	2 byte	Sends, Receives, Updates	7.600 absolute color temperature
251	Screen 1 Function 1	Brightness, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)

Curtain, Roller Blind

With modes **Curtain/Roller blind step/move**, you can open and close curtains and move roller blinds up and down continuously or in steps.

	Express settings	Function	Roller blind/Curtain step/move
	Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
	Function 1	Icon preview	
		Function icon	
		Colour of function icon indication	Green/White

Move Curtain/Roller

Drag the bar on the screen to move the curtain or roller up or down to a certain level and the slat angle.

For complete closing/moving down, the **Open/Close** or **Up/Down** object sends the value “1”, and it sends the value “0” for opening/moving up.

Group Objects

Curtain

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Open/Close	1 bit	Sends	1.009 open/close
245	Screen 1 Function 1	Stop	1 bit	Sends	1.007 step
246	Screen 1 Function 1	Curtain position	1 byte	Sends	5.001 percentage
249	Screen 1 Function 1	Curtain position, status	1 byte	Sends, Receives, Updates	5.001 percentage

Roller blind

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Up/Down	1 bit	Sends	1.008 up/down
245	Screen 1 Function 1	Stop	1 bit	Sends	1.007 step

No.	Name	Object function	Length	Behavior	Data Type
246	Screen 1 Function 1	Blind position	1 byte	Sends	5.001 percentage
249	Screen 1 Function 1	Blind position, status	1 byte	Sends, Receives, Updates	5.001 percentage

Venetian Blind Position and Slat

With the **Venetian blind position and slat** function, you can raise and lower a blind and adjust the slats.



Express settings

Function 1

Function

Function name

Venetian blind position and slat

1 – 8 characters (≤20 English or 6 Chinese characters)

Move the Blinds

Drag the bar on the screen to move the blind either up or down and adjust the slats. When you release the bar, the moving process stops (via **Stop/slat adj.** object).

The blind is moved up or down via the 1-bit **Up/Down** object. If the **Up/Down** object has the value of “1” (down), the value after the next long press is “0” (up) and vice versa.

With **Blind position** function, in addition to opening and closing, you can adjust the position of the curtains/blinds to the certain value (0 to 100 %).

Positions of Slats

You can adjust blind to various opening angles. However, the symbol for the slat position does not reflect the actual opening angle.

The slat position reached with a position value depends on the particular blind.

There are blinds with an **opening angle of 180°** which move up and down when the slats are positioned vertically. When the position value is 50%, the slats are horizontal.

Other blinds have an opening angle of 90° and move up when the slats are positioned horizontally, and down when the slats are positioned vertically.

These blinds turn to the horizontal position with the value 0% and to the half-opened position with the value 50%.

Pause for Change Slat Direction

To adjust the slats in the same direction incrementally, briefly press the button multiple times until you reach the desired position. The slats will continue to move in the same direction as long as you press the button within the adjustable pause time.

Once this pause time elapses, the slats will change their direction of rotation.

Group Objects

The blinds are moved via the **Up/Down, moving** object.

The blinds are stopped and adjusted via the **Stop/Slat, adj.** object.


The status indication is controlled via **Slat position, status** and **Blind position, status** object.

The **Blind position** and **Slat position** object send the value to the bus when you drag the bar on the screen to set the position level.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Up/Down	1 bit	Sends	1.008 up/down
245	Screen 1 Function 1	Stop/Slat adj.	1 bit	Sends	1.007 step
246	Screen 1 Function 1	Blind position	1 byte	Sends	5.001 percentage (0..100%)
247	Screen 1 Function 1	Slat position	1 byte	Sends	5.001 percentage (0..100%)
249	Screen 1 Function 1	Blind position, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)
250	Screen 1 Function 1	Slat position, status	1 byte	Sends, Receives, Updates	5.001 percentage (0..100%)

Air Conditioner Control Panel



With **Air conditioner** function you can regulate the air temperature (heating/cooling, fan speed) and humidity.

	Express settings	Function	Air conditioner
	Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
	Function 1	Icon preview	
		Function icon	
		Colour of function icon indication when status ON	Green/White
		Colour of function icon indication when status OFF	Green/White

The **Interface display temperature** function shows setpoint or actual temperature values on one screen.

Internal and External Temperature Sensor

The device has a built-in internal temperature sensor. However, you can also select an external sensor that sends values to the controller via the bus. The bus then evaluates the current temperature.

	Function 1		Interface display temperature	Setpoint temperature	
				Actual temperature	
				Room temperature reference from	Internal/Internal sensor
				Time period for request external sensor	0 – 255 min

You can set the **time interval** for the device to send a temperature read request to an external temperature sensor (after the bus is reset or programmed).



All the past temperature data get erased.

The device works with new data received from the bus during the time interval.

Object Datatype of the Setpoint

Set the adjustment method of the setpoint temperature.


You can choose whether to send 1-byte offset (**Value in °C**, DPT 5.010) or absolute temperature value (**Float value in °C**, DPT 9.001).

	Function 1	Object datatype of setpoint	Value in °C	Float value in °C
				
		Setpoint temperature adjustment step	1 °C	0,5 °C 1 °C

You should always set the minimum setpoint value below the maximum. Available range is 16°C to 32°C.

Swing

If you want the fan slats to swing, enable the **Swing** function.



	Function 1	Swing	Enable/Disable

Then you get the 1-bit **Wind swing** object (1 = on, 0 = off) and **Wind Swing, status** object that displays the swing status on screen.


Modes

The device provides the setpoint and current room temperature to the AC unit. AC unit compares the setpoint and current temperature and switches between operation modes:

- Auto mode
- Heating mode
- Cooling mode
- Fan mode
- Dehumidification mode

	Function 1	Function	Air conditioner
		Auto mode	
	Mode	Heating mode	
		Cooling mode	
		Fan mode	
		Dehumidification mode	

For each operation mode, you can specify the **output** and **status values** (range 0 – 255). The output value is the one you send to the gateway (KNX to RS485/IR) and the status value is the one visible on the screen (via **Control mode, status** group object).



Mode	Function	Air conditioner
	Auto mode	Output value for auto (0 – 255) Status value for auto (0 – 255)
	Heating mode	Output value for heating (0 – 255) Status value for heating (0 – 255)
	Cooling mode	Output value for cooling (0 – 255) Status value for cooling (0 – 255)
	Fan mode	Output value for fan (0 – 255) Status value for fan (0 – 255)
	Dehumidification mode	Output value for dehumidification (0 – 255) Status value for dehumidification (0 – 255)

Fan

In the **Fan** tab, you can set values for the fan speed. You can check the **Automatic operation function** however, you can still control the fan speed manually on the screen.

You can choose from 2 formats for 1byte object:

- Number between 0 and 255
- Percentage value 0 – 100 %

There are values set as default in the ETS. You can use them or change them later as needed.

The value you set as the output value for each speed is shown on the display via **Fan speed, status** object.

Group Objects

Power on/off group object controls switching on and off.

Power on/off, status object displays on/off status on the screen.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Power on/off	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	Current setpoint adjustment	2 byte 1 byte"	Sends	9.001 temperature 5.010 counter pulses
247	Screen 1 Function 1	Fan speed	1 byte	Sends	5.001 percentage 5.100 fan stage
248	Screen 1 Function 1	Wind swing (1-swing, 0-stop)	1 bit	Sends	1.010 start/stop
250	Screen 1 Function 1	Control mode	1 byte	Sends	20.105 HVAC control mode


No.	Name	Object function	Length	Behavior	Data Type
251	Screen 1 Function 1	Power on/off, status	1 bit	Receives	1.001 switch
252	Screen 1 Function 1	External temperature sensor	2 byte	Sends, Receives, Updates	9.001 temperature
253	Screen 1 Function 1	Current temperature setpoint, status	2 byte 1 byte	Receives, Updates	9.001 temperature 5.010 counter pulses
254	Screen 1 Function 1	Fan speed, status	1 byte	Receives	5.001 percentage 5.100 fan stage
255	Screen 1 Function 1	Wind swing, status	1 bit	Receives	1.010 start/stop
257	Screen 1 Function 1	Control mode, status	1 byte	Receives	20.105 HVAC control mode

Room Temperature Control Panel

Room temperature control panel function offers the possibility of regulating the room temperature of a single room regardless of the temperature in other rooms.

The setting is very similar to the **Air conditioner** setting.

See also [Air Conditioner Control Panel](#), page 39.




	Express settings	Function	Room temperature unit
	Screen 1	Function name	1 – 8 characters
	Function 1	Controller from	Local (FCU controller)
			Local (Floor heating controller)
			External

If you select **Local controller (FCU or Floor heating)**, a warning appears to activate the corresponding function in the HVAC controller menu.

If you select an external controller, you can set the required parameters directly in the **Room temperature control panel** menu.

Internal and External Temperature Sensor

The device has a built-in internal temperature sensor. However, you can also select an **external** sensor that sends values to the controller via the bus. The bus then evaluates the current temperature.

	Function 1  	Controller from	External
		Interface display temperature	Setpoint temperature
			Actual temperature
		Room temperature reference from	Internal/Internal sensor
		Time period for request external sensor	0 – 255 min

You can set the **time interval** for the device to send a temperature read request to an external temperature sensor (after the bus is reset or programmed).

Power On/Off after Download/Voltage Recovery

If the bus voltage fails but the power supply is running, the device continues to operate normally and saves the internal values.



If the power failure exceeds the backup time, the device shuts down safely.

When power has been restored, the device restarts.

You can define the status of the **Room temperature control** function on voltage recovery and after download.

Object Datatype of the Setpoint


Set the adjustment method of the setpoint temperature. You can choose whether to send 1-byte offset (**Value in °C**, DPT 5.010) or absolute temperature value (**Float value in °C**, DPT 9.001).

	Function 1	Object datatype of setpoint	1 bit	2 bytes
				0,5 °C
		Setpoint temperature adjustment step	1 °C	1 °C

You should always set the minimum setpoint value below the maximum. Available range is 5°C to 37°C.

Control Mode

You can choose from four control modes.

	Function 1	Control mode	Heating
			Cooling
			Heating and Cooling
			Heating and Cooling (with auto mode)

The device provides the setpoint and current room temperature to the heating/cooling unit.

Modes:

If you choose the **Heating/Cooling** option, you can manually switch between heating and cooling via **Heating/Cooling mode** group object and see the status on the screen (via **Heating/Cooling mode, status** group object).

Operation Mode

Four operating modes (comfort, ECO, night and frost/heat protection), each with programmable setpoints, are available for differentiated control with different requirements.

During ongoing operation, you can temporarily move the setpoints within adjustable limits, or move them jointly for several operation modes.

Optionally, the basis for the setpoints can also be moved.

On the user interface, you can activate the comfort mode temporarily and set its duration.



Function 1

Operation mode

Enable

Fan

With **Room temperature unit** function, you can also control a KNX HVAC actuator.



Function 1

Fan

Enable



Fan

Fan speed setting

Output value for fan speed

Status feedback for fan speed

Automatic operation function

See more in Fan, page 41.

Group Objects

Room temperature control panel and External controller:

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Power on/off	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	Current setpoint adjustment	2 byte	Sends	9.001 temperature
246	Screen 1 Function 1	Current setpoint adjustment(1bit)	1 bit	Sends	1.007 step
247	Screen 1 Function 1	Fan speed	1 byte	Sends	5.001 percentage 5.100 fan stage"
248	Screen 1 Function 1	Fan automatic operation	1 bit	Sends	1.003 enable
249	Screen 1 Function 1	Heating/Cooling mode	1 bit	Sends	1.100 cooling/ heating
249	Screen 1 Function 1	Switch Control mode	1 byte	Sends	20.107 DPT ChangoverMode
250	Screen 1 Function 1	Operation mode	1byte	Sends	20.102 HVAC mode
251	Screen 1 Function 1	Power on/off, status	1 bit	Receives	1.001 switch
252	Screen 1 Function 1	External temperature sensor	2 byte	Sends, Receives, Updates	9.001 temperature
253	Screen 1 Function 1	Current temperature setpoint, status	2 byte	Receives, Updates	9.001 temperature
254	Screen 1 Function 1	Fan speed, status	1 byte	Receives	5.001 percentage 5.100 fan stage"
255	Screen 1 Function 1	Fan automatic operation, status	1 bit	Receives	1.003 enable
256	Screen 1 Function 1	Heating/Cooling mode, status	1 bit	Receives	1.100 cooling/ heating
256	Screen 1 Function 1	Control mode, status	1 byte	Receives	20.107 DPT ChangoverMode
257	Screen 1 Function 1	Operation mode, status	1 byte	Receives	20.102 HVAC mode

Ventilation System

A ventilation system adjusts ventilation rates in time or by location in a building to be responsive to selected parameters.

In addition to the baseline values, the values for the room temperature, air humidity, and CO₂ and PM_{2.5} content can be transferred via the KNX interfaces to the ventilation system and taken into account during the control.

Ventilation systems can also have sensors to detect airflow, system pressure, or fan energy use in such a way that systems failures can be detected and repaired, as well as when system components need maintenance, such as filter replacement.



Express settings	Function	Ventilation system
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication when status ON	Green/White
	Colour of function icon indication when status OFF	Green/White

You can define the status of the ventilation system on **bus voltage recovery** and **after download** and choose the default fan speed after the ventilation is back on.



Function 1	Power on/off after download	OFF/OF
	Power on/off after voltage recovery	OFF
		ON
		Before voltage failure
	Default fan speed after ventilation on	Low
		Medium
		High
		Last status

Fan Speed Object Datatype

You can choose from 2 formats for 1byte fan speed object:

- Number between 0 and 255
- Percentage value 0 – 100 %

There are values set as default in the ETS. You can use them or change them later as needed.

The value you set as the **output value for each speed** is shown on the display via **Fan speed, status** object.

Automatic Operation

If you enable **Automatic operation** function, the fan coil actuator takes over control of the fan steps. You can still control the fan speed manually on the screen.



Function 1	Automatic operation function	Enable
------------	------------------------------	--------

Automatic operation is controlled by **Fan automatic operation** object and displayed via **Fan automatic operation, status** group object.

Heat Recovery

With active monitored ventilation, a ventilation blows fresh air into the building and extracts the consumed air. The goal of the heat recovery process is to extract **thermal energy** of the discharged air (e.g. via a cross-flow heat exchanger) in order to warm up the “fresh” air with it.

Heat sources inside a building (e.g. lighting, computers) can also help with heating which contributes to an increase in **energy savings**.



Function 1	Heat recovery function	Enable
------------	------------------------	--------

Heat recovery function is controlled by KNX fan coil actuator/controller via 1-bit **Heat recovery** object. The screen displays the status of heat recovery process via 1-bit **Heat recovery, status** object (on/off).

Filter Time Counter

You can set the operating time in hours, after which the fan filter change alarm should trigger. Enable **Filter time counter** and choose the change time.



Function 1	Filter time counter	Enable
	Evaluation time	100 – 1000 h

An audible alarm sounds when the filter change time has elapsed.
You can extend or reset the exchange time at any time in the ETS.

Scenes

You have the option of linking the ventilation with up to five scenes, for which you can set the parameters independently. To do this, use the 1-byte **Scene** object.
If you enable the **Heat recovery** function in **Function** menu, you can adjust the **Heat recovery** parameters in the **Scene** sub-menu.



Function 1	1 – 5 → Assign scene NO.	1– 64, 0 = inactive
Scene	Fan	Unchange
		OFF
		Low
		Medium
		High
	Heat recovery	Unchange
		OFF
		ON

Group Objects

Power on/off group object controls switching the **Ventilation system** on and off.
Power on/off, status object displays on/off status on the screen.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Power on/off	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	Filter timer counter	2 byte	Sends	7.007 time (h)
246	Screen 1 Function 1	Filter alarm	1 bit	Sends	1.005 alarm
247	Screen 1 Function 1	Fan speed	1 byte	Sends	5.001 percentage 5.100 fan stage
248	Screen 1 Function 1	Fan automatic operation	1 bit	Sends	1.003 enable
249	Screen 1 Function 1	Heat recovery	1 bit	Sends	1.003 enable
251	Screen 1 Function 1	Power on/off, status	1 bit	Receives	1.001 switch
252	Screen 1 Function 1	Filter timer counter change	2 byte	Receives	7.007 time (h)
253	Screen 1 Function 1	Filter timer reset	1 bit	Receives	1.015 reset
254	Screen 1 Function 1	Fan speed, status	1 byte	Receives	5.001 percentage 5.100 fan stage
255	Screen 1 Function 1	Fan automatic operation, status	1 bit	Receives	1.003 enable
256	Screen 1 Function 1	Heat recovery, status	1 bit	Receives	1.003 enable
257	Screen 1 Function 1	Scene	1 byte	Receives	18.001 scene control

Audio Control

Audio control function allows you to control music playback. You connect device group objects to a KNX music server and set the function parameters in ETS.



Express settings	Function	Audio control
Screen 1	Function name	1 – 8 characters (≤20 English or 6 Chinese characters)
Function 1	Icon preview	
	Function icon	
	Colour of function icon indication when status ON	Green/White
	Colour of function icon indication when status OFF	Green/White

You can set the volume control method and play mode, enable the **Mute** and **Track name** function.



Function 1	Control mode of volume adjustment	1 bit (relative control)
		1 byte (absolute control)
	Mute	
	Track name	
	Play mode	

Volume

You can select either a 1-bit or a 1-byte object datatype to control the volume.



Function 1	Control mode of volume adjustment	1 bit (relative control)
		1 byte (absolute control)
	Object datatype	Percentage (DPT 5.001)
		Percentage (DPT 5.004)
	Max. volume value	10 – 100 %

With a 1-bit object (**Volume + = 1/Volume – = 0**), you can change the volume one step up or down (relative control):

- 1 = one step up
- 0 = one step down

Absolute control means that you adjust the volume level on a scale **by dragging the bar on the screen**. You can choose whether the volume is transmitted as a percentage (DPT 5.001) or as a percentage (DPT 5.004) from 0 – 100 %.

Play Mode

For each play mode, you can specify the **output** and **status values** (range 0 – 255). The output value is the one you send to the actuator and the status value is the one visible on the screen (via **Play mode, status** group object).



Function 1	Play mode	Enable
	Play in single cycle mode	Output value for play in single cycle mode (0 – 255)
		Status value for play in single cycle mode (0 – 255)
	Play in order mode	Output value for play in order mode (0 – 255)
		Status value for play in order mode (0 – 255)
	Play in random mode	Output value for play in random mode (0 – 255)
		Status value for play in random mode (0 – 255)

Group Objects

Power on/off group object controls switching the **Audio control** on and off.

Power on/off, status object displays on/off status on the screen.

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Power on/off	1 bit	Sends	1.001 switch
245	Screen 1 Function 1	Play=1/Pause=0	1 bit	Sends	1.010 start/stop
246	Screen 1 Function 1	Next track=1/ Previous track=0	1 bit	Sends	1.007 step
247	Screen 1 Function 1	Volume+=1/ Volume-=0 Absolute volume	1 bit 1 byte	Sends	1.007 step 5.001 percentage 5.004 percentage
248	Screen 1 Function 1	Mute	1 bit	Sends	1.003 enable
250	Screen 1 Function 1	Play mode	1 byte	Sends	5.010 counter pulses
251	Screen 1 Function 1	Power on/off, status	1 bit	Receives	1.001 switch
252	Screen 1 Function 1	Play=1/Pause=0, status	1 bit	Receives	1.010 start/stop
254	Screen 1 Function 1	Volume, status	1 byte	Receives	5.001 percentage 5.004 percentage
255	Screen 1 Function 1	Mute, status	1 bit	Receives	1.003 enable
256	Screen 1 Function 1	Play mode, status	1 byte	Receives	5.010 counter pulses
257	Screen 1 Function 1	Track name	14 byte	Receives	16.001 character string (ISO 8859-1)

Air Quality Display

With **Air quality display** function, you can choose which air characteristic you want to display on the screen. The information comes from the sensor or KNX gateway or another KNX device that can send it to the KNX bus in a specified data point.



Express settings

Screen 1

Function 1

Function

Function name

Icon preview

Function icon

Colour of function icon indication

Air quality display

1 – 8 characters (≤20 English or 6 Chinese characters)

Green/White

It can be temperature, humidity, or degree of pollution. You can also monitor the brightness (of the room or outside, depending on the type of your sensor).



Function 1	Type of air quality display	Int. temperature
		Ext. temperature
		Humidity
		PM _{2,5}
		PM ₁₀
		VOC
		CO ₂
		Brightness (lux)
		Percentage (DPT 5.001)
		Percentage (DPT 5.004)
	Object datatype	
	Max. volume value	10 – 100 %

Each characteristic has its own unit. Either it is fixed (temperature – ° C, humidity – %). For other characteristics, you can name the unit yourself (PM_{2,5}, PM₁₀, VOC, CO₂).

Internal Temperature

The internal temperature is displayed based on the value from the **internal temperature sensor**. There is no special internal temperature group object for the Air quality display.



Function 1	Type of air quality display	Int. temperature
	Text for unit	°C

External Temperature

External temperature is displayed based on values from the **external temperature sensor**. You can set the interval for requesting values via the bus.



Function 1	Type of air quality display	Ext. temperature
	Text for unit	°C
	Time period for request external sensor	0 – 255 min

Humidity

The relative humidity values (in percent) come from the **external humidity sensor**. You can set the requesting time interval.





Function 1	Type of air quality display	Humidity
	Text for unit	%
	Time period for request external sensor	0 – 255 min

PM_{2,5}

To display the concentration of the fine particulate matter, you can select either the value in **µg/m³** or the concentration expressed as a **floating value**



You can set the requesting time interval and name the unit.

 	Function 1	Type of air quality display	PM _{2.5}
		Object datatype	Value in µg/m ³ (DPT 7.001)
			Float value in µg/m ³ (DPT 9.030)
		Text for unit	"5 bytes allowed"
		Time period for request external sensor	0 – 255 min

PM₁₀

To display the concentration of the particulate matter, you can select either the value in **µg/m³** or the concentration expressed as a **floating value**.



You can name your unit and set the requesting time interval.

 	Function 1	Type of air quality display	PM ₁₀
		Object datatype	Value in µg/m ³ (DPT 7.001)
			Float value in µg/m ³ (DPT 9.030)
		Text for unit	"5 bytes allowed"
		Time period for request external sensor	0 – 255 min

VOC

You can select either the value in **µg/m³** or the concentration expressed as a **floating value** to display the concentration of the volatile organic compounds (VOC).



You can name your unit and set the requesting time interval.

 	Function 1	Type of air quality display	VOC
		Object datatype	Value in µg/m ³ (DPT 7.001)
			Float value in µg/m ³ (DPT 9.030)
		Text for unit	"5 bytes allowed"
		Time period for request external sensor	0 – 255 min

CO₂

The carbon dioxide content values in the air come from the external sensor. You can select from two types of units to display on the screen: Either a **value in ppm** or a **floating value in ppm**.

You can name your unit and set the requesting time interval.


 	Function 1	Type of air quality display	CO ₂
		Object datatype	Value in ppm (DPT 7.001)
			Float value in ppm (DPT 9.008)
		Text for unit	"5 bytes allowed"
		Time period for request external sensor	0 – 255 min

Brightness

To display the brightness level, you can select either the **value in lux** or as a **floating value in lux**.

You can name your unit and set the requesting time interval.



Function 1 	Type of air quality display	Brightness (lux)
	Object datatype	Value in lux (DPT 7.013)
		Float value in lux (DPT 9.004)
	Text for unit	"5 bytes allowed"
	Time period for request external sensor	0 – 255 min

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
244	Screen 1 Function 1	Ext. temperature value	2 byte	Sends, Receives, Updates	9.001 temperature
244	Screen 1 Function 1	Humidity value	2 byte	Sends, Receives, Updates	9.007 humidity
244	Screen 1 Function 1	PM _{2.5} value	2 byte	Sends, Receives, Updates	7.001 pulse 9.030 concentration (µg/m ³)
244	Screen 1 Function 1	PM ₁₀ value	2 byte	Sends, Receives, Updates	7.001 pulse 9.030 concentration (µg/m ³)
244	Screen 1 Function 1	VOC value	2 byte	Sends, Receives, Updates	7.001 pulse 9.030 concentration (µg/m ³)
244	Screen 1 Function 1	CO ₂ value	2 byte	Sends, Receives, Updates	7.001 pulse 9.008 parts/million (ppm)
244	Screen 1 Function 1	Brightness value	2 byte	Sends, Receives, Updates	9.004 lux (lux) 7.013 brightness (lux)

HVAC Controller

The device integrates the **Heating, Ventilation and Air-Conditioning** to a coherent and efficient climate control. Measured temperature values in the rooms are recorded and supplied to the heating/cooling and ventilation control to generate the optimum temperature and air quality, using fresh air from outdoors.



General settings	HVAC controller	Enable/Disable
Advanced function		
HVAC controller		

The HVAC module supports room temperature and ventilation control.



HVAC controller	FCU controller	Enable
Controller settings	Floor heating controller	
	Ventilation controller	

Turn off the thermostat before ETS download, reset, or micro-USB update. This is to prevent the HVAC system from being driven by a not stabilized built-in temperature sensor.

You can deactivate the thermostat by the ON/OFF icon on the respective screen. It is also recommended to set **Power on/off after download** to OFF in FCU and Floor Heating controller in ETS before download.

- **HVAC controller > FCU controller > Power on/off after download > OFF**
- **HVAC controller > Floor heating controller > Power on/off after download > OFF**

FCU Controller

In the FCU controller sub-menu you can set the parameters for measuring and evaluating the temperature, select the function mode (heating/cooling) and you can even link the FCU module with a bus presence detector or sensors in the windows.

The actual temperature can be registered using various **temperature sensors**:

- Internal sensor of the controller
- External sensor, the values of which are received by the **External temperature sensor** object
- Internal sensor combined with external

The controller can evaluate 2 temperatures proportionately from 0-100 %.

You can also set the **control mode and interval for sending** the measured values and the control value in case of a measurement error.

Power on/off status: With this setting, you can choose how the FCU controls the status after the download is complete and the device is powered on (again).



Function configuration	Power on/off after download	Off/On
FCU controller	Power on/off status after voltage recovery	Off/On/Before voltage failure

Control Modes

You can select the **Heating, Cooling or Heating and cooling** control modes.

Modes can be switched automatically, via an object or with a button. The transition takes place automatically via the button or **Heating/Cooling control value** object.

Both heating and cooling are controlled by comparing the setpoint and the actual temperature.

The controller can control the connected **heating/cooling systems** via corresponding switch telegrams or continuous correcting variables. In this way, both PI controls and 2-step controls can be parametrized.

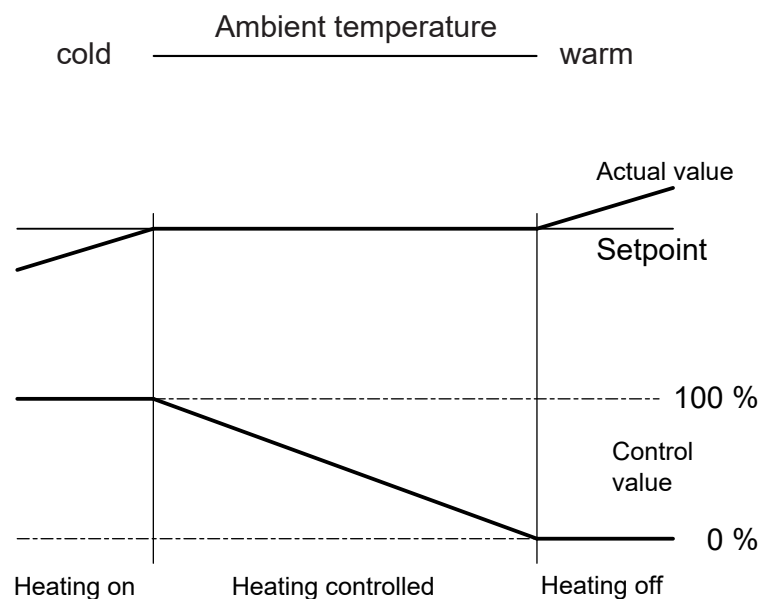
There are four **operating modes** for differentiated control with different requirements. Each mode has **programmable setpoints**. During ongoing operation, you can temporarily move the setpoints within adjustable limits, or move them jointly for several operation modes. Optionally, the basis for the setpoints can also be moved.

Additional functions of the room temperature control unit are:

- Selection of the operation mode after the bus voltage returns
- Status information

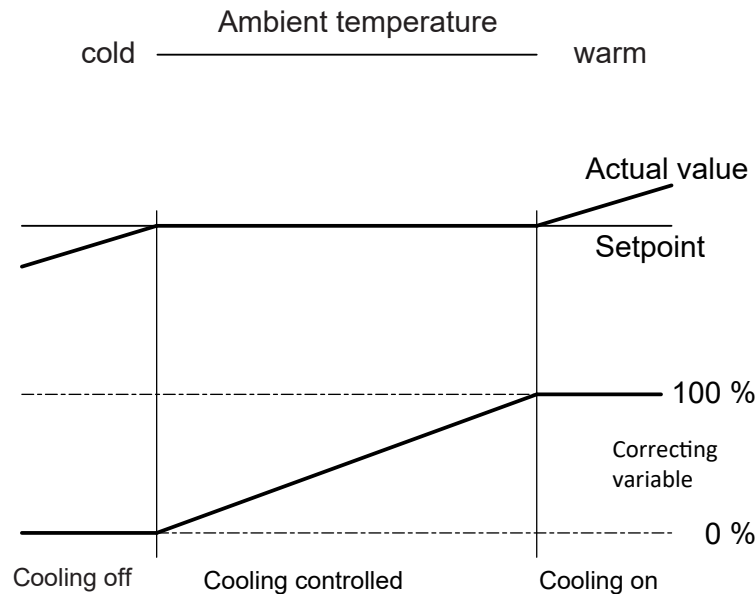
Heating

In the heating control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature is **below** the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0".



Cooling

In the cooling control mode, the current actual temperature is compared with the current setpoint temperature. If the actual temperature goes **above** the setpoint temperature, this control difference is counteracted by issuing a setpoint which does not equal "0".



Heating and Cooling

You can set how the change between heating and cooling takes place using the **Heating/Cooling switchover** parameter.

- Automatically by the controller
- Set externally via the **Heating/cooling mode** object
- Via button
- Via both button and object

Automatic Changeover

If you select the **Automatic changeover** between Heating and Cooling, the controller decides which mode is suitable based on the parametrized setpoints, the insensitive zone and the current actual temperature.

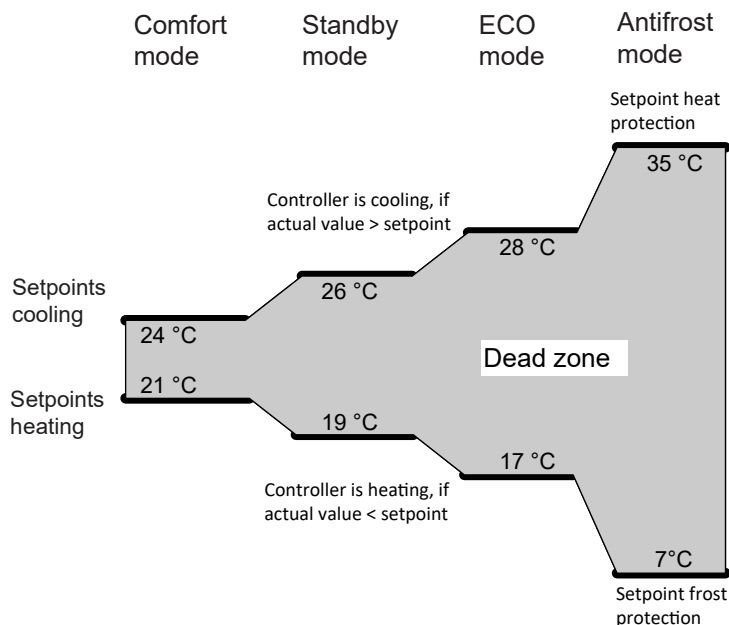
If you select the external switchover using **Heating/cooling mode** object, the controller can only be forced into heating or cooling mode by the object value.

NOTE: The status of an external device for changing over between heating and cooling can be interrogated.

To do this, set the **Read on init** flag on the **Heating/cooling value** object. The external unit is operational after a reset and supports the read request. Also set cyclical sending on the external device.

Dead Zone

The insensitive zone prevents the controller from switching frequently between heating and cooling. For example, if a heater is used for heating, it has sufficient thermal energy after the valve has been closed to continue to heat the room above the setpoint temperature.



Example:

If you have project the same value for the heating and cooling setpoints, the insensitive zone is set to "0 K". After a delay time that can be set has elapsed, the air conditioning system cools because the setpoint for cooling has been exceeded. If there is a short delay time, the controller switches the controller mode particularly frequently.

Make sure that the heating setpoint is always less than the cooling setpoint.

Status after Power on/Download

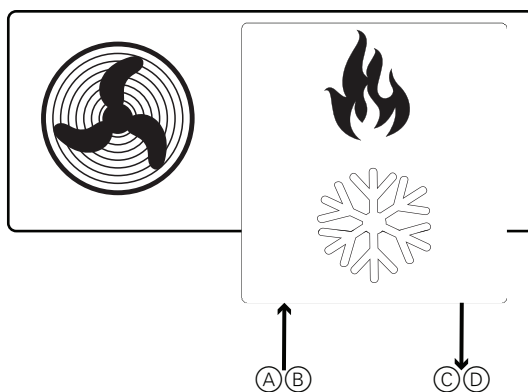
You define the mode to which the controller changes after download (Heating or Cooling) or reset (Heating/Cooling/As before voltage failure).

2-Pipe/4-Pipe HC System

Finally, you choose between a **2-pipe** and a **4-pipe** system.

In the **2-pipe** system, heating and cooling mediums (depending on the season) are lead through the same lines and controlled via the same valve.

2-pipe HC system



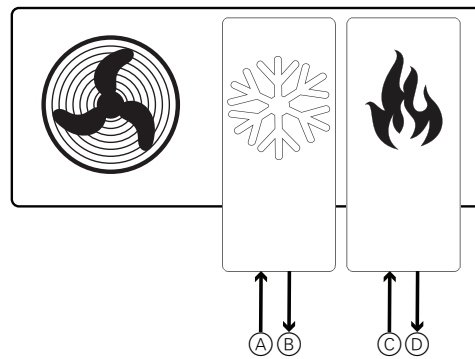
A Cooling supply

B Heating supply

C Cooling return

D Heating return

4-pipe HC system



A Cooling supply

B Heating supply

C Cooling return

D Heating return

The changeover between heating and cooling medium is performed by the system, and must therefore be passed on to the controller.

The **Heating/cooling mode** object sends “0” for heating mode and a 1 for cooling mode to the actuator.

Room Temperature Operation Mode

This function allows you to set the **initial setpoint temperature**, the upper and lower value of the **dead zone** and switch operating modes. If this function remains deactivated, you can only set the initial setpoint temperature and dead zone values (this only applies to Heating and/or Cooling with **Automatic changeover**).



FCU controller



Operation mode	Enable
Controller status after download	Standby/Comfort/Economy mode
Controller status after power on	As before voltage failure/1 of 4 modes
Extended comfort mode	0 – 255 min
1 bit object function for operation mode	Disable/Enable
1 bit object function for standby mode	Disable/Enable

Extended **Comfort mode**:

You can **temporarily extend** the **Comfort mode** by 1 to 255 minutes using the timer.

If you set the timer to zero, this function remains inactive.

The comfort extension operation mode is largely the same as the comfort mode. However, the comfort extension is exited automatically after a time period that you can set. It temporarily suppresses the night operation mode when the room is used for longer during the evening, for example.

If you set the thermostat to **Economy mode** and extend **Comfort mode**, after the temporary timer expires, the thermostat returns to **Economy mode**. The temporary timer function is aborted whenever a new setting is made via the bus or via the operation mode button.

The user may want to interrupt the timer of the extended **Comfort mode** and switch to another mode or simply switch between the individual modes as needed.

To enable it, you need a 1-bit object and a 1-bit status feedback object for each operating mode.

1-bit Object Function for Operation Mode

When you enable the 1-bit object function for operation mode, in addition to the two existing 1-byte objects (Operation mode and Operation mode status), you get another six 1-bit objects (3 for operation modes and 3 for status feedback).

The 1-bit objects works like this:

Setting "1" to any of the four 1-bit objects, the corresponding control mode is activated. The "0" has no function.

1-bit Object Function for Standby Mode

If you tick the 1-bit object for **Standby mode**, you get two more 1-bit objects (**Standby mode** and **Standby mode status**) and you can send only the '1' signal via the **Standby object** to activate the **Standby mode**.
If you do not tick this function, you need to send '0' signal to all the three objects (**Comfort mode**, **Economy mode** and **Frost/heat protection mode**) to activate the **Standby mode**.

Bus Window Contact and Presence Detector

You can also include the value from the **window open detector** and the **presence detector** as a parameter in the operating mode changeover settings.



FCU controller	Window contact input function	Enable
	Delay for window contact	0 – 65535 s
	Controller mode for open window	Economy mode
	Use bus presence detector	Enable/Disable

Window Contact

Use bus window contact function is useful when the heating or air conditioning is on and the user leaves the window open. This commonly happens in hotels, for example.

A **Window contact** object can also inform you in the event of an unusual situation - for example, if a window is broken.

The setting **Delay for window contact** allows you to set the delay interval after which the window is considered open.

A user needs to call someone on the street from a window or release an insect. That's usually a matter of a few seconds.

If they manage to open and close the window during the preset delay interval, nothing changes.

However, if the **opening time exceeds the delay interval**, the window is considered open and the **Window contact** object sends "1" which activates preset mode (ECO mode, antifreeze mode or power off).

Bus Presence Detection

You can set that comfort mode triggers when somebody enters the room. When the person leaves, the original mode is restored. If there is a bus/manual mode adjustment during the presence period, it does not return to the previous mode state after leaving.

Room setting: Economy mode

Person enters the room → Comfort mode

Person leaves the room → Economy mode

Person enters the room → Comfort mode

Person manually switches to Standby.

Person leaves the room → Device remains in Standby → Timer triggers Economy mode → Device switches to Economy mode.

Temperature Setting

You can set **temperature limits** and the **step value** for temperature adjustment. Tapping on a button increases or decreases the setpoint in increments of 0.5 °C or 1 °C.

To be able to increase and decrease the temperature in this way, you must link the following objects to the appropriate group address:

- **146 FCU – Current setpoint adjustment**
- **164 FCU – Current temperature setpoint**

The setpoint can only be changed up to the limits that apply to the room temperature control unit in question.



FCU controller	Setpoint temperature adjustment step	0,5 / 1 °C
	Min. set temperature	5 – 37 °C
	Max. set temperature	5 – 37° C

The minimum temperature has to be set lower than the maximum.

If the user sets a temperature that exceeds the original minimum/maximum, this temperature is considered the new minimum/maximum.

FCU Setpoints and Operation Modes

Operation modes for controlling room temperature

1. **Comfort mode:** Maintains the desired room temperature when the room is in use.
2. **Economy mode:** Slightly reduces the temperature when the room is not in use or when a lower temperature is sufficient for current usage.
3. **Standby mode:** Significantly lowers the temperature, ideal for nighttime or weekends.
4. **Frost/Heat protection mode:** Turns off heating/cooling to prevent freezing or overheating. The system will automatically activate heating or cooling if the temperature falls below or rises above adjustable setpoints.



FCU controller

Setpoint

Setpoint method for operating mode

Relative/Absolute

Base setpoint temperature/ —

Automatic H/C mode changeover dead zone/ —

Heating

Cooling

— /Automatic H/C mode changeover minimum zone

Selecting the operation mode

The operation mode can be selected using the bus or the user interface through:

- A button on the user interface
- An **Operation mode** object
- 1-bit objects for each mode

Adjusting setpoints

For each operation mode, you can specify **setpoints**. When changing the operation mode, the relevant setpoint for continued room temperature control is used.

You can adjust operation mode setpoints manually using the user interface or objects.

Relative and Absolute Setpoints

Using the relative setpoint method

1. Set the **Base setpoint temperature**
 - This represents your comfort mode (2-byte **Current temperature setpoint** object).
2. Adjust remaining setpoints
 - Set these as relative offsets from the base reference.
3. Changing relative setpoint values
 - If you change the relative setpoint value, the relative temperature of each mode remains the same unless you adjust them too.
4. Antifreeze mode
 - Defined in absolute values.
 - The bus saves the setpoint temperature value when powered off.

Example:

Parameters:

- Base setpoint temperature: 21 °C
- Reduced heating in standby mode: 5 °C

Calculation:

- $21\text{ °C} - 5\text{ °C} \rightarrow$ Heating in standby heats up to 16 °C

Parameters:

- Base setpoint temperature: 23 °C
- Reduced heating in standby mode: 5 °C

Calculation:

- $23\text{ °C} - 5\text{ °C} \rightarrow$ Heating in standby heats up to 18 °C

Setting dead zone limits

To prevent frequent switching between heating and cooling, you can set upper and lower limits for the dead zone. See more here: [Dead Zone](#), page 55.

Example:

Parameters:

- Upper dead zone: 2 °C
- Lower dead zone: 2 °C
- Base setpoint temperature: 21 °C

Heating:

- Actual temperature \geq Base setpoint temperature + Upper limit dead zone
- $25\text{ °C} \geq 21\text{ °C} + 2\text{ °C} \rightarrow$ Too warm \rightarrow Heating switches to cooling

Cooling:

- Actual temperature \leq Base setpoint temperature – Lower limit dead zone
- $18\text{ °C} \leq 21\text{ °C} - 2\text{ °C} \rightarrow$ Too cold \rightarrow Cooling switches to heating

Absolute setpoint method

The setpoints for cooling or heating can be defined as **absolute values**, allowing total control over the desired room temperature. The thermostat regulates the room temperature based on the setpoint defined at any given moment.

To set the temperature, use the 2-byte object **Current temperature setpoint**. Depending on the set value and the parameterized setpoints for each special mode, the appropriate mode is established.

Minimum zone between heating and cooling setpoints

The parameter **Minimum zone between heating and cooling setpoints** defines the minimum temperature interval between the setpoints for cooling and heating in comfort mode.

The system automatically switches between heating and cooling based on the comfort mode setpoints:

- Cooling activates automatically when the current temperature exceeds the cooling comfort mode setpoint.
- Heating activates automatically when the current temperature falls below the heating comfort mode setpoint.

Heating and Cooling Control

The room temperature control unit transmits values to the bus via various group objects, which you can use to control different controller types with switching commands or by specifying percentage values:

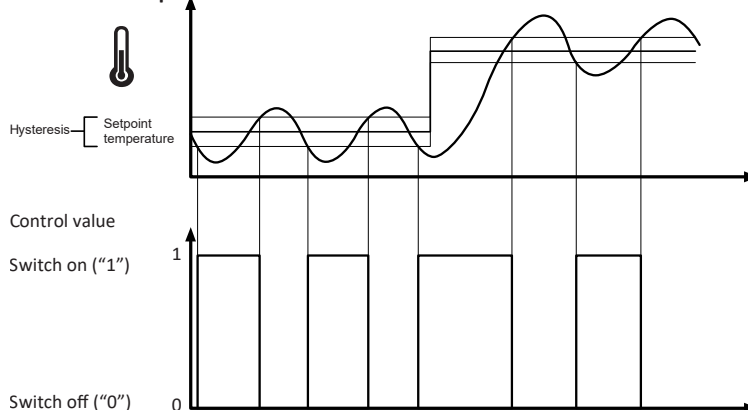
- Switching on/off (use 2-point control)
- Switching PWM (use PI control)
- Continuous control (use PI control)

Switching On/Off (2-Point Control)

It is a simple control method, widely used in conventional thermostats, where the setpoint temperature and two values of hysteresis around the setpoint are required. It prevents a continuous switching between the two modes.

The same behavior applies with cooling systems.

Room temperature control unit



Features

The downside of simple control is that the room temperature is not constant; it **changes continuously**. This can reduce comfort, especially if the heating and cooling systems are slow to react. To address this, you can set a small hysteresis. However, this increases the switching frequency, leading to more wear on the drives.

The **temperature overshoot** above or below the hysteresis apparent in the diagram is caused when the heating/cooling system continues to emit heat or cold into the room after it has been switched off.

Setting hysteresis

Small hysteresis: leads to small fluctuations, but frequent switching.

Large hysteresis: leads to big fluctuations, but infrequent switching.

Sending values

You can select the interval (0 – 255 minutes) for cyclically sending the control value to the bus. You can send this value as standard or inverted.

Continuous and Switching PI Control

For the PI control, the control value is calculated from a proportional and an integral share. The calculation is governed by the following parameters:

- Temperature difference between actual value and setpoint
- Proportional range
- Reset time

In this way, the controller can correct the room temperature accurately. The corresponding control value is transferred via a 1 bit/1 byte value to the bus.

The standard control parameters for the most common system types are already installed in the controller.

Heating/cooling speed:

- Hot water heating (5K/150 min)
- Underfloor heating (5K/240 min)
- Electrical heating (4K/100 min)
- Cooling ceiling (5K/240 min)
- Split unit (4K/90 min)
- Fan coil unit (4K/90 min)
- User defined

You can also set the control parameters for the **proportional range** and the **reset** time manually, but you should know exactly which actuators are connected and the control conditions in the room.

Continuous PI Control

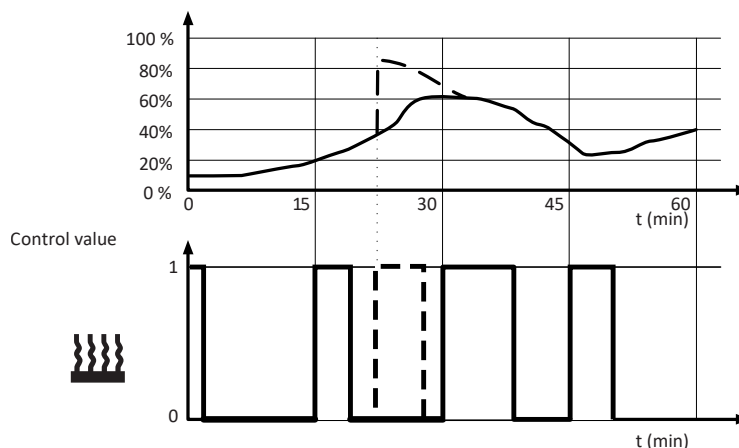
For the continuous PI control, the corresponding 1-byte control value is transmitted 0 – 100 % directly via the bus to the heating actuator or a valve drive, which convert the control value directly to a degree of opening. However, this is only transmitted when the newly calculated control value has changed by a specified percentage.

Switching PI Control (PWM)

With the switching PI control, also known as the PWM control, the control values calculated by the controller (0 – 100 %) are converted into a pulse-width modulation (PWM). Within a constant, defined cycle time, the control actuator is opened ("1") and then closed again ("0") for the calculated percentage period.

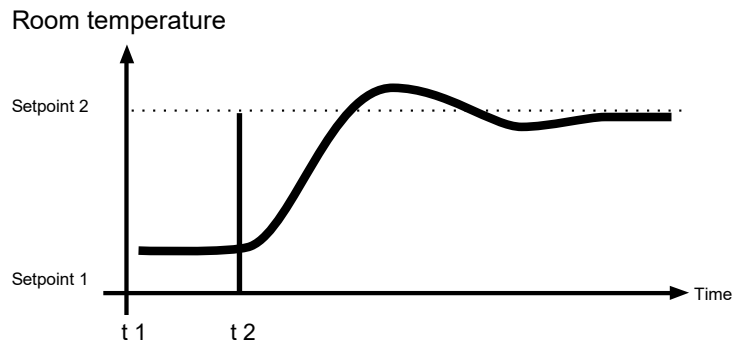
For example, when a control value of 25% is calculated for a cycle time of 12 minutes, a "1" is transmitted at the beginning of the cycle time, and a "0" is transmitted after three minutes (25% of 12 minutes).

Calculated control value



When the setpoint temperature changes, the controller recalculates the required control value and transmits it in the current cycle (broken line).

Setting Rules for the PI Control



Large system increases (e.g., high heating output, steep characteristic curves for valves) are controlled with large proportional ranges.

Slow heating systems (e.g., underfloor heating) are controlled with high-level reset times.

Adjustment via control parameter

If no satisfactory control result is achieved by selecting an appropriate heating or cooling system, you can improve the adaptation via control parameters.

Low proportional range	Large overshoot for setpoint changes (also continuous oscillation under certain circumstances), rapid adjustment to the setpoint.
Large proportional range	No (or little) overshooting, but slow adjustment.
No reset time	Rapid correction of control deviations (ambient conditions), risk of continuous oscillation.
Long reset time	Slow correction of control deviations.

The framework conditions for setting the cycle time

- For small values, the switching frequency and the bus load are increased.
- For large values, temperature fluctuations are created in the room.
- Short cycle time for rapid heating systems (e.g., electric heating).
- Long cycle time for slow heating systems (e.g., underfloor warm water heating).

Examples

Warm water radiator heating with motorized valve drives

Properties	Parameter	Settings
Heating only	Controller type	Heating
	Control value output	Continuous PI control
	Adjusting the controller to the heating system	Hot-water heating (5 K / 150 minutes)
	Send control value on change by	4 %
	Cyclically send control value	10 minutes

Cooling ceiling with motorized valve drives

Properties	Parameter	Settings
Cooling only	Controller type	Cooling
	Control value output	Continuous PI control;
	Adjusting the controller to the cooling system	Adjustment via control parameter
	Cooling proportional range	Approx. 30 °C(dependent on the application)
	Reset time for cooling	Approx. 240 min. (dependent on the application)
	Send control value on change by	4 %
	Cyclically send control value	10 minutes

Switching electric radiator heating

Properties	Parameter	Settings
Heating only	Controller type	Heating
	Control value output	Switching PI control
	Adjusting the controller to the heating system	Electric heating (4 K / 100 min.)
	Send control value on change by	4 %
	Cyclically send control value	10 min.

Air conditioning with 4-duct (2-circuit) air convector system (e.g., switching valve drives)

Properties	Parameter	Settings
Heating or cooling as required, with automatic switching	Controller type	Heating and cooling
	Control value output – heating	E.g. switching PI control
	Adjusting the controller to the heating system	Split unit (4 K / 90 min.)
	Control value output – cooling	E.g. switching PI control
	Adjusting the controller to the cooling system	Electric heating (4 K / 100 min.)
E.g., automatically switch between heating and cooling	Switch between heating and cooling	Automatically via the controller

Temperature limitation using shading facility

Properties	Parameter	Settings
Cooling only	Controller type	Cooling
	Control value output – heating	Switching 2-step control
	Hysteresis	Large (e.g. 10 °C)

FCU Fan Function

Selecting **FCU controller** as the room temperature control function, you can also control a KNX fan coil actuator.



Function configuration	Fan level	1/2/3
FCU controller	Fan speed output setting	
↻ Fan	1-bit object function for fan speed	Enable/Disable
	1-bit object for fan speed off	Enable/Disable
	Fan speed auto. control function	Disable
		Local controller
		External controller

In addition to control, you set a fan speed during ongoing operation for manual mode and change between automatic and manual mode. In automatic mode, the fan coil actuator takes over control of the fan speed.

You define the thresholds for display of a fan step. In addition, you select the value for changing over between manual and automatic mode.

Speed Levels

This setting allows you to select the fan speed parameters. You can choose from three options:

- level 1 – only one constant speed and OFF
- level 2 – two speed levels and OFF
- level 3 – three speed levels and OFF

You can select 2 formats for 1-byte fan speed object:

- 1-byte number between 0 and 255
- percentage value 0 – 100 %

The value you set as the **output value for each speed** is shown on the display via **Fan speed, status object**.

In ETS, practical values are set as default. You can use them or change them later as needed.

If you enable the **1-bit object function for fan speed**, the 1-bit objects of each fan speed appear in the ETS settings.

1-bit object	Sends a "1" if
180 FCU – Fan speed 1	The fan is switched to speed 1.
181 FCU – Fan speed 2	The fan is switched to speed 2.
182 FCU – Fan speed 3	The fan is switched to speed 3.

The fan turns off when all the objects are "0".

Example:

The fan coil actuator receives a telegram from the local thermostat and switches the fan to speed 3.

If you link each 1-bit fan speed object to the respective 1-bit fan speed status feedback object of another device, all the linked devices then display fan speed 3 icons on their LCD.

1-bit object for fan speed off function allows you to turn the fan speed on and off via a 1-bit object. A value of "0" switches off the fan.

Automatic Speed Control

You can set up automatic fan speed control by a local or external controller. If you select local, you can further set the parameters for switching as follows:

- Setting for PI Control, page 67
- Condition Setting for 2-Point Control, page 67

Setting for PI Control

When using PI control, the control value is calculated by the PI algorithm and then transmitted to the controller. The controller switches the fan or switch the fan speed according to the preset threshold range.

Setting thresholds

Threshold value OFF ↔ speed 1

Control value \geq Threshold value → Fan speed = 1

Control value $<$ Threshold value → Fan turns off

Threshold value speed 1 ↔ speed 2

Control value \geq Threshold value → Fan speed = 2

Control value $<$ Threshold value → Fan speed = 1

Threshold value speed 2 ↔ speed 3

Control value \geq Threshold value → Fan speed = 3

Control value $<$ Threshold value → Fan speed = 2

Hysteresis threshold value

It is practical to set hysteresis around the threshold value. This prevents a continuous switching between the fan speed levels.

However, if you do not want to use this function, set the hysteresis to "0". The fan then switches when the threshold value is reached.

Example

Parameter	Setting
Hysteresis threshold value	+/-10
Threshold value	50
Upper threshold	$50 + 10 = 60$
Lower threshold	$50 - 10 = 40$

If the control value is between 60 and 40 → no change

Control value ≥ 60 / < 40 → change of speed / fan off

Condition Setting for 2-Point Control

When using 2-point control, the controller compares the actual temperature and the setpoint temperature as follows:

Cooling

Temperature difference = Actual temperature – Setpoint temperature

Heating

Temperature difference = Setpoint temperature – Actual temperature

Temperature difference setting**Temperature difference OFF ↔ speed 1**

Temperature difference \geq Set temperature difference → Fan speed = 1

Temperature difference $<$ Set temperature difference → Fan turns off

Temperature difference 1 ↔ speed 2

Temperature difference \geq Set temperature difference → Fan speed = 2

Temperature difference $<$ Set temperature difference → Fan speed 1

Temperature difference 2 ↔ speed 3

Temperature difference \geq Set temperature difference → Fan speed = 3

Temperature difference $<$ Set temperature difference → Fan speed 2

Temperature difference hysteresis

You can set the hysteresis value of the temperature difference (0 = no hysteresis). Once the temperature difference is greater than the defined temperature difference and hysteresis, the fan switches the speed.

Minimum time in fan speed

You can set a minimum time for the fan to stay at speed when the fan speed is controlled automatically.

Example

Parameter	Setting
Hysteresis temperature difference	+/- 0,5
Temperature difference	1
Upper temperature difference limit	$1 + 0,5 = 1,5$
Lower temperature difference limit	$1 - 0,5 = 0,5$

If the control value is between 1,5 and 0,5 → no change

Control value $\geq 1,5$ / $< 0,5$ → change of speed / fan off

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
144	FCU controller	Power on/off, status	1 bit	Receives	1.001 switch
145	FCU controller	External temperature sensor	2 byte	Sends, Receives, Updates	9.001 temperature
146	FCU controller	Current setpoint adjustment, status	2 byte	Receives	9.001 temperature

No.	Name	Object function	Length	Behavior	Data Type
		Base setpoint adjustment, status"			
150	FCU controller	Switch Heating/ Cooling mode	1bit	Receives	1.100 cooling/ heating
150	FCU controller	Switch Control mode	1 byte	Receives	20.107 DPT Changover Mode
151	FCU controller	Operation mode, status	1 byte	Receives	20.102 HVAC mode
152	FCU controller	Comfort mode, status	1 bit	Receives	1.003 enable
153	FCU controller	Economy mode, status	1 bit	Receives	1.003 enable
154	FCU controller	Frost/Heat protection mode, status	1 bit	Receives	1.003 enable
155	FCU controller	Standby mode, status	1 bit	Receives	1.003 enable
156	FCU controller	Extended comfort mode	1 bit	Receives	1.016 acknowledge
157	FCU controller	Fan speed, status	1 byte	Sends, Receives, Updates	5.001 percentage 5.100 fan stage"
158	FCU controller	Fan On/Off, status	1 bit	Sends, Receives, Updates	1.001 switch
158	FCU controller	Fan speed 1, status	1 bit	Sends, Receives, Updates	1.001 switch
159	FCU controller	Fan speed 2, status	1 bit	Sends, Receives, Updates	1.001 switch
160	FCU controller	Fan speed 3, status	1 bit	Sends, Receives, Updates	1.001 switch
161	FCU controller	Fan speed off, status	1 bit	Sends, Receives, Updates	1.001 switch
162	FCU controller	Fan automatic operation, status	1 bit	Sends, Receives, Updates	1.003 enable
163	FCU controller	Window contact	1 bit	Sends, Receives, Updates	1.019 Window/door
164	FCU controller	Presence detector	1 bit	Sends, Receives, Updates	1.018 occupancy
165	FCU controller	Power on/off	1 bit	Sends	1.001 switch
166	FCU controller	Actual temperature	2 byte	Sends	9.001 temperature
167	FCU controller	Base temperature setpoint	2 byte	Sends	9.001 temperature
169	FCU controller	Current temperature setpoint	2 byte	Sends	9.001 temperature
170	FCU controller	Heating/Cooling mode	1 bit	Sends	1.100 cooling/ heating
171	FCU controller	Control mode	1 byte	Sends	20.107 DPT Changover Mode
172	FCU controller	Operation mode	1 byte	Sends	20.102 HVAC mode
173	FCU controller	Comfort mode	1 bit	Sends	1.003 enable
174	FCU controller	Economy mode	1 bit	Sends	1.003 enable
175	FCU controller	Frost/Heat protection mode	1 bit	Sends	1.003 enable
176	FCU controller	Standby mode	1 bit	Sends	1.003 enable

No.	Name	Object function	Length	Behavior	Data Type
177	FCU controller	Heating control value	1 bit/ 1 byte	Sends	1.001 switch/5.001 percentage
178	FCU controller	Cooling control value	1bit/ 1 byte	Sends	1.001 switch/5.001 percentage
179	FCU controller	Fan speed	1 byte	Sends	5.001 percentage, 5.100 fan stage
180	FCU controller	Fan On/Off	1 bit	Sends	1.001 switch
180	FCU controller	Fan speed 1	1 bit	Sends	1.001 switch
181	FCU controller	Fan speed 2	1 bit	Sends	1.001 switch
182	FCU controller	Fan speed 3	1 bit	Sends	1.001 switch
183	FCU controller	Fan speed off	1 bit	Sends	1.001 switch
184	FCU controller	Fan Automatic operation	1 bit	Sends	1.003 enable

Floor Heating Controller

The settings for underfloor heating are the same as those for heating with the FCU controller. See [FCU Controller](#), page 53.

The **Interface display temperature** parameter displays the actual indoor temperature by default. The **Default set temperature** parameter represents the initial temperature value you set.

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
185	Floor heating controller	Power on/off, status	1 bit	C, W, U	1.001 switch
186	Floor heating controller	External temperature sensor	2 byte	C, W, T, U	9.001 temperature
187	Floor heating controller	Current setpoint adjustment, status Base setpoint adjustment, status"	2 byte	C, W, U	9.001 temperature
190	Floor heating controller	Power on/off	1 bit	C, R, T	1.001 switch
191	Floor heating controller	Actual temperature	2 byte	C, R, T	9.001 temperature
192	Floor heating controller	Current temperature setpoint	2 byte	C, R, T	9.001 temperature
193	Floor heating controller	Heating control value	1 bit/1 byte	C, R, T	1.001 switch/5.001 percentage

Ventilation Controller

With HVAC module, you can also control a ventilation. In addition to the control, you can set a fan step for manual mode in ongoing operation and change between automatic and manual mode. In automatic mode, the fan coil actuator takes over the control of the fan steps.



HVAC controller	Description	Max. 30 characters
Controller settings	Controller 1	Ventilation controller
Ventilation controller		

The setting of the ventilation parameters is almost identical to the fan setting in the room temperature control section. See more in [Ventilation System](#), page 45 and [FCU Fan Function](#), page 65.

You can set up automatic fan speed control via 1-bit **Fan automatic operation** object. You set the message value for activating the automatic control ("1" or "0").



Ventilation controller	Auto. operation on object value	Auto = 1/Man. = 0
		Auto = 0/Man. = 1
	State of Auto. operation after startup	Disable/Enable

You can select the source of the (PM_{2.5}, CO₂ or VOC).



Ventilation controller	Control value reference from	PM _{2.5}
		CO ₂
		VOC

The control values are obtained from the bus. The fan turns off by default when an error occurs in the control value.

Threshold evaluation algorithm:

Control value = CO₂ / PM_{2.5} / VOC

Control value < Threshold value OFF → Fan off

Control value ≥ Threshold value OFF → Low speed

Control value ≥ Threshold value low → Medium speed

Control value ≥ Threshold value medium → High speed

Example:

Control value = CO₂

Parameter	Setting
Hysteresis value is threshold value in	+/- 100
Threshold value	450
Upper threshold	450 + 100 = 550
Lower threshold	450 - 100 = 350

If the control value is between 350 and 550 → no change

Control value ≥ 550 / < 350 → previous / next speed

The **Minimum time in fan speed** setting represents the time interval after which it is possible to switch to the next/previous speed. The mode changes after time elapses.

If you set "0 s", there is no minimum run time.

Group Objects

No.	Name	Object function	Length	Behavior	Data Type
210	Ventilation controller	Fan automatic operation	1 bit	Receive	1.003 enable
211	Ventilation controller	PM 2.5 value VOC value CO2 value	2 byte	Sends, Receives, Updates	7.001 pulse 9.030 concentration (µg/m ³) 9.008 parts/million (ppm)
238	Ventilation controller	Fan speed, status	1 byte	Sends	5.001 percentage 5.100 fan stage

Logic Function

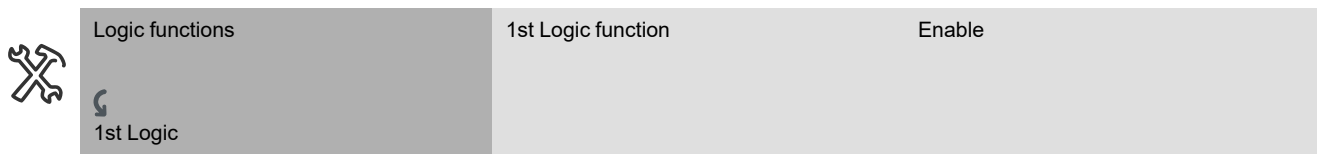
In complex KNX installations, the logic function serves to establish special logic operations between sensors and actuators. There is a wide range of possible settings for executing numerous logic functions for controlled KNX devices (e.g. dimming or switch actuators, various sensors etc).

The logic function is particularly suitable for summarizing messages (e.g. the lighting status in rooms), linking conditions (e.g. rain or wind sensor activates a safety function) or programming an additional toggle between manual and automatic (e.g. disabling brightness-dependent lighting control for a video presentation).

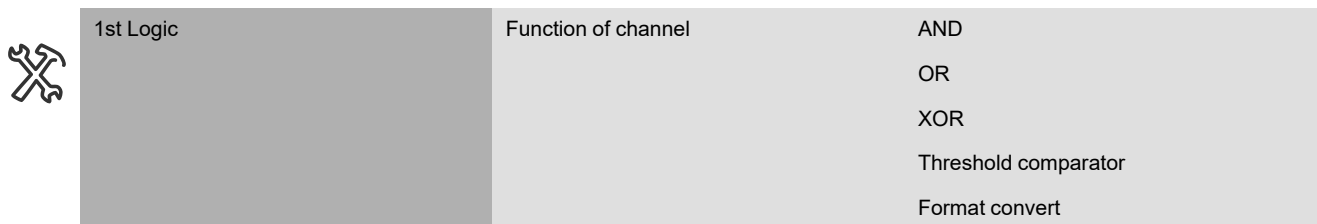
Due to the large number of possible settings, the logic module is particularly well suited to the areas of security, comfort or energy saving.

The outputs can also be shown on the visualization device.

By default, all 8 possible logic functions/blocks are deactivated. You have to enable the required amount of the functions.



You can choose from one of the following logic operations for each logic block.



NOTE: Always set all parameters on the first block before parameterizing the next block.

AND, OR, XOR

The operations have either the value 1 or 0. The input and output can also be inverted.

AND

The logic AND operation output is only true when all of its inputs are true, otherwise the output is false.

A	B	AND
0	0	0
0	1	0
1	0	0
1	1	1

OR

The logic OR operation output is only true if one or more of its inputs are true, otherwise the output is false.

A	B	OR
0	0	0
0	1	1
1	0	1
1	1	1

XOR

The logic exclusive-OR or XOR function gives a true output when the number of true inputs is odd.

A	B	XOR
0	0	0
0	1	1
1	0	1
1	1	0

The difference between the OR and XOR logic operations is that the output from the XOR operation is logical "1" if and only if there is an unequal number of "1" and "0" inputs.

In the simple case of an XOR operation with two inputs, this means that the inputs must be different to one another to obtain the output "1". "1" must be present at precisely one of the two inputs.

A	B	OR	XOR
0	0	0	0
0	1	1	1
1	0	1	1
1	1	1	0

In contrast to a simple OR logic operation, the condition is deemed not to be met if a "1" is present at both inputs.

With an XOR gate, the result in this case is a "0". Each additional input at the gate alters the behavior accordingly

A	B	C	OR	XOR
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1



Input/Output Behavior

The first block of functions is described together, because all three operations have the same parameters and values.

Input behavior



You can use up to 8 inputs (a – h). By default, all the inputs are disconnected.

The input telegrams can be inverted for each input. In addition, a fixed value (0 or 1) can be assigned.

	1st Logic	Function of channel	AND
		Input a-h	Disconnected
			Normal
			Inverted
		Default value	0 1

Output behavior

Criteria for the sending behavior at the output can be defined.

	1st Logic	Result is inverted	No/Yes
		Read input object value after bus voltage recovery	No/Yes
		Output send when	Receiving a new telegram (on the input) Every change of output object
		Send delay time: Base	None - 25 s
		Factor: 1..255	1 -255

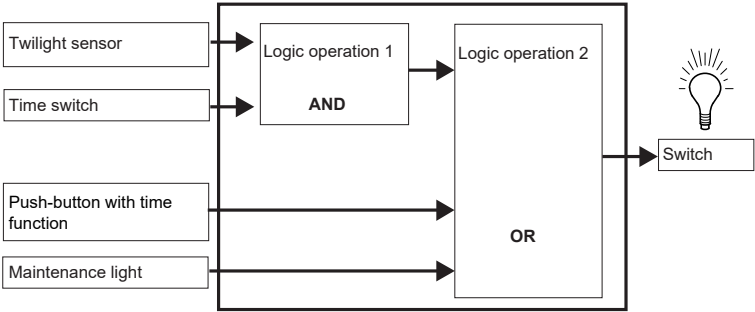
If you click **Yes** for **Read input object value after bus voltage recovery**, the logic module sends a read telegram to all inputs asking about their values.

If one or more inputs do not respond, the bus keeps on trying to collect missing responses. **Output send when** option allows you to set whether the output should be sent after receiving a new telegram at the input or at every change of the output object.

This setting is wise if a rapid response is expected (e.g. weather alarm at the blind actuator). This function also helps to prevent bus overload.

Example:

- A light-sensitive switch switches the lighting on automatically.
- The light is switched off between 23:00 and 06:00.
- In the morning, the light switches on from 06:00 when it is dark.
- In addition, the light can be switched on for 5 minutes at any time via a push-button.
- A continuous light function is possible for maintenance purposes.



Threshold Comparator

Threshold comparator compares the input value with the threshold.



1st Logic



Function of channel

Threshold comparator

Threshold value data type

4 bit, 1/2/4 byte

Threshold value

0..4294967295

If Object value < Threshold value

If Object value = Threshold value

If Object value != Threshold value

If Object value > Threshold value

If Object value ≤ Threshold value

If Object value ≥ Threshold value

Do not send telegram/Send value 1/0

You can set a threshold, select its comparison type and choose which value to send after comparison:

- 0
- 1
- Do not send telegram

Output send when option allows you to set whether the output should be sent after receiving a new telegram at the input or at every change of the output object.

This setting is wise if a rapid response is expected. It also helps to prevent bus overload.

Format Convert

The format converter allows you to decompose or combine different data types. It is typically used when a sender and receiver do not support the same data format or when you need to solve special requirements.



1st Logic



Function of channel

Format convert

Function	
	2 × 1 Bit → 1 × 2 Bit
	8 × 1 Bit → 1 × 1 Byte
	1 × 1 Byte → 1 × 2 Byte
	2 × 1 Byte → 1 × 2 Byte
	2 × 2 Byte → 1 × 4 Byte
	1 × 1 Byte → 8 × 1 Bit
	1 × 2 Byte → 2 × 1 Byte
	1 × 4 Byte → 2 × 2 Byte
	1 × 3 Byte → 3 × 1 Byte
	3 × 1 Byte → 1 × 3 Byte

Basic application

1 × 1 byte → 8 × 1 bit

This function can be used to decompose bit-oriented information sent as 1 byte to individual bits, for example:

- Controller status of room temperature controllers
- Failure status of DALI groups and ECGs

1 × 3 byte → 3 × 1 byte

Converts RGB 3 byte combined value to three separate 1 byte values for red, green and blue.

3 × 1 byte → 1 × 3 byte

Combines three 1 byte values (red, green, blue) to one RGB 3 byte combined value.

Group Objects

See Overview of Group Objects, page 82.

Scene Group

The scene module allows you to set a wide number of combinations to control large units (e. g., switch off all lamps in huge public areas, move up all the blinds in office buildings).

If you enable the **Scene group** function, you can set up to 8 scene groups, each of which you can independently assign different values and set specific parameters.



Scene group	Scene group function	Enable
Scene group settings		
	Scene group 1 function	Disable/Enable

Each scene group has 8 outputs. For each of them, you can define 6 scene numbers. Within each **Scene group**, you can define 48 scenes. You can assign a scene number 384 times in total.



Scene group settings		Enable
Scene group 1	Object type of output	1 bit / 1 byte / 2 byte
G1: Output 1 – 8 function	1 – 6 output 1 trigger scene NO. is	1 – 64 (0 = inactive)
	Object value of output 1	1 / 0
	Delay time for sending	0 – 63 * 0,1 s

Scene Group Output Values

You can select the **object type** of the output value – 1 bit (switch), 1 byte (counter pulses) or 2 bytes (pulses), **object value** (0 is the default) and assign each output valve (1 – 6) a **scene number** to recall.

If you select 0, the valve remains inactive.

The **Delay time for sending** function allows you to set the required sending delay for each output valve so that you can set up specific scene recall sequences for each group output.



Scene group X		
Gx: Output x function	Object type of output x	1 bit / 1byte / 2byte
	1 – 6 → output x trigger scene NO. is	1 – 64 (0 = inactive)
	Object value of output x	0 – 65535
	Delay time for sending	0 – 63 * 0,1 s

Group Objects

The **Main scene trigger** object receives the scene number (1 – 64) from one of the buttons or another sensor. Then all outputs with that specific scene number send out the object (1 bit, 1 byte, 2 bytes).

No.	Name	Object function	Length	Behavior	Data Type
6	Scene Group	Main scene trigger	1byte	Sends, Receives	17.001 scene number
7	1st Scene Group	Sub scene output 1	1bit	Sends	1.001 switch 5.010 counter pulses 7.001 pulses
8		Sub scene output 2	1byte		
9		Sub scene output 3	2byte		
10		Sub scene output 4			
11		Sub scene output 5			
12		Sub scene output 6			
13		Sub scene output 7			
14		Sub scene output 8			

Power down

The current values of the group objects are not saved except for the group objects related to the functions below:

- Key tone
- Screen brightness
- Date and time
- AC control
- External FCU
- FCU
- Floor heating controller
- Ventilation controller (except Heat recovery object)
- Audio control
- Function icon for locking
- Screen locking

Open Source Software Used in the 4inch Touch Unit

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The following Open Source Software is contained in this 4" Touch Unit:

Open source package	Link to the website
zlib	https://github.com/madler/zlib.git
libjpeg	https://www.ijg.org/files/
linux_kernel	https://github.com/torvalds/linux/tree/v4.9-rc8
ncurses	http://ftp.gnu.org/pub/gnu/ncurses/
u-boot	https://github.com/u-boot/u-boot

Overview of Group Objects

This list provides the numbers for uniquely identifying a group object. The data point types (DPT) in this application are preset.

General

Nr.	Name	Object function	Length	Properties	Function description	DPT
1	General	Live signal	1 bit	C, T	Visible when Cyclic sending live signal parameter > 0. Sends value 1 to the bus cyclically to indicate that the application layer of the device operates normally. The sending cycle is set by parameters.	1.001 switch
2		Date	3 byte	C, W	Date and time are modified by the bus.	11.001 date
3		Time	3 byte	C, W		10.001 time of day

Temperature sensor

Nr.	Name	Object function	Length	Properties	Function description	DPT
4	Internal sensor	Temperature value	2 byte	C, R, T	Sends a temperature detection value.	9.001 temperature
5		Low temperature alarm	1 bit	C, R, T	Low/high temperature alarm = 1. No alarm = 0. Sends read-only information or sends on a change.	1.005 alarm
6		High temperature alarm	1 bit	C, R, T		1.005 alarm

Logic function

Nr.	Name	Object function	Length	Properties	Function description		DPT
7	1th Logic	Input a	1 bit	C, W, T, U	AND		1.002 boolean
8	1th Logic	Input b	1 bit	C, W, T, U	OR or		
9	1th Logic	Input c	1 bit	C, W, T, U	XOR displayed		
10	1th Logic	Input d	1 bit	C, W, T, U			
11	1th Logic	Input e	1 bit	C, W, T, U			
12	1th Logic	Input f	1 bit	C, W, T, U			

Nr.	Name	Object function	Length	Properties	Function description		DPT		
13	1th Logic	Input g	1 bit	C, W, T, U					
14	1th Logic	Input h	1 bit	C, W, T, U					
15	1th Logic	Logic result	1 bit	C, T					
7	1th Logic	Threshold value input	4 bit 1 byte 2 byte 4 byte	C, W, U	Displayed according to parameters	Threshold comparator	3.007 dimming 5.010 counter pulses 7.001 pulses 12.001 counter pulses		
15	1th Logic	Logic result	1 bit	C, T			1.002 boolean		
7	1th Logic	Input 1 bit – bit 0	1 bit	C, W, U	2 x 1 Bit→1 x 2 Bit	Format convert	1.002 boolean		
8	1th Logic	Input 1 bit – bit 1	1 bit	C, W, U			1.002 boolean		
15	1th Logic	Output 2 bit	2 bit	C, T			2.001 switch control		
7	1th Logic	Input 1 bit – bit 0	1 bit	C, W, U	8 x 1 Bit→1 x 1 Byte	Format convert	1.002 boolean		
8	1th Logic	Input 1 bit – bit 1	1 bit	C, W, U					
9	1th Logic	Input 1 bit – bit 2	1 bit	C, W, U					
10	1th Logic	Input 1 bit – bit 3	1 bit	C, W, U					
11	1th Logic	Input 1 bit – bit 4	1 bit	C, W, U					
12	1th Logic	Input 1 bit – bit 5	1 bit	C, W, U					
13	1th Logic	Input 1 bit – bit 6	1 bit	C, W, U					
14	1th Logic	Input 1 bit – bit 7	1 bit	C, W, U					
15	1th Logic	Output 1 byte	1 byte	C, T					
7	1th Logic	Input 1 byte	1 byte	C, W, U			1 x 1 Byte→1 x 2 Byte	Format convert	5.010 counter pulses
15	1th Logic	Output 2 byte	2 byte	C, T					7.001 pulses
7	1th Logic	Input 1 byte – low	1 byte	C, W, U	2 x 1 Byte→1 x 2 Byte	5.010 counter pulses			
8	1th Logic	Input 1 byte – high	1 byte	C, W, U		5.010 counter pulses			
15	1th Logic	Output 2 byte	2 byte	C, T		7.001 pulses			
7	1th Logic	Input 2 byte – low	2 byte	C, W, U	2 x 2 Byte→1 x 4 Byte	Format convert	7.001 pulses		
8	1th Logic	Input 2 byte – high	2 byte	C, W, U			1 x 1 Byte→8 x 1 Bit		12.001 counter pulses
15	1th Logic	Output 4 byte	4 byte	C, T					
7	1th Logic	Input 1 byte	1 byte	C, W, U	5.010 counter pulses				
8	1th Logic	Output 1 bit – bit 0	1 bit	C, T			1.002 boolean		
9	1th Logic	Output 1 bit – bit 1	1 bit	C, T					

Nr.	Name	Object function	Length	Properties	Function description		DPT
10	1th Logic	Output 1 bit – bit 2	1 bit	C, T			
11	1th Logic	Output 1 bit – bit 3	1 bit	C, T			
12	1th Logic	Output 1 bit – bit 4	1 bit	C, T			
13	1th Logic	Output 1 bit – bit 5	1 bit	C, T			
14	1th Logic	Output 1 bit – bit 6	1 bit	C, T			
15	1th Logic	Output 1 bit – bit 7	1 bit	C, T			
7	1th Logic	Input 2 byte	2 byte	C, W, U	1 x 2 Byte→2 x 1 Byte		7.001 pulses
14	1th Logic	Output 1 byte-low	1 byte	C, T			5.010 counter pulses
15	1th Logic	Output 1 byte-high	1 byte	C, T			
7	1th Logic	Input 4 byte	4 byte	C, W, U	1 x 4 Byte→2 x 2 Byte		12.001 counter pulses
14	1th Logic	Output 2 byte-low	2 byte	C, T			7.001 pulses
15	1th Logic	Output 2 byte-high	2 byte	C, T			
7	1th Logic	Input 3 byte	3 byte	C, W, U	1 x 3 Byte→3 x 1 Byte		232.600 RGB value 3 x (0..255)
13	1th Logic	Output 1 byte-low	1 byte	C, T			5.010 counter pulses
14	1th Logic	Output 1 byte-middle	1 byte	C, T			
15	1th Logic	Output 1 byte-high	1 byte	C, T			
7	1th Logic	Input 1 byte-low	1 byte	C, W, U	3 x 1 Byte→1 x 3 Byte	5.010 counter pulses	
8	1th Logic	Input 1 byte-middle	1 byte	C, W, U			
9	1th Logic	Input 1 byte-high	1 byte	C, W, U			
15	1th Logic	Output 3 byte	3 byte	C, T		232.600 RGB value 3 x (0..255)	
16 – 78	2nd – 8th Logic						

Scene group

Nr.	Name	Object function	Length	Properties	Note	DPT
79	Scene group	Main scene trigger	1 byte	C, W	Scene group feature visible when enabled	17.001 scene number
80	1st Scene group	Sub scene output 1	1 bit	C, T	Displayed according to parameter options	1.001 switch
81		Sub scene output 2	1 byte			5.010 counter pulses
82		Sub scene output 3	2 byte			7.001 pulses

Nr.	Name	Object function	Length	Properties	Note	DPT
83		Sub scene output 4				
84		Sub scene output 5				
85		Sub scene output 6				
86		Sub scene output 7				
87		Sub scene output 8				
88 – 143	2nd – 8th Scene group					

FCU controller

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
144	FCU controller	Power on/off, status	1 bit	C, W	Controller switch.	Switch status is displayed on the screen.	1.001 switch
145		External temperature sensor	2 byte	C, W, T, U	Receives the external sensor temperature value. Periodically sends read requests.	The temperature option is visible when an external sensor is available.	9.001 temperature
146		Current setpoint adjustment, status Base setpoint adjustment, status	2 byte	C, W	Modifies the current setpoint temperature value by bus. Modifies the base setpoint temperature by bus.	Current setpoint adjustment visible when Operating mode is not enabled or when Absolute setpoint method is enabled. Base setpoint adjustment visible when Relative setpoint method is enabled.	9.001 temperature
150		Switch Heating/ Cooling mode	1 bit	C, W	Heating/ cooling via object.		1.100 cooling/ heating
150		Switch Control mode	1 byte	C, W	Heating/ cooling via both object and the button.		20.107 DPT Changover Mode
151		Operation mode, status	1 byte	C, W	Control HVAC operation mode via bus. 1-bit object receives a value "1" → the corresponding mode activates.	Sends HVAC operation mode messages to the bus. When a particular mode is activated, only the corresponding	20.102 HVAC mode
152		Comfort mode, status	1 bit	C, W			1.003 enable
153		Economy mode, status	1 bit	C, W			
154		Frost/Heat protection mode, status	1 bit	C, W			

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
155		Standby mode, status	1 bit	C, W	1-bit standby object disables comfort, economy and protection mode. All three = 0.	object sends 1. 1-bit object for standby mode not enabled: The other objects for comfort, energy-saving, and protection mode send 0 together when standby mode is activated. A 1-bit object for standby mode enabled: Only the standby object sends 1 when the standby mode is activated. When switching via the bus, there is no need to send the mode status to the bus.	
156		Extended comfort mode	1 bit	C, W	"1" triggers the extension of the comfort mode time.		1.016 acknowledge
157		Fan speed, status	1 byte	C, W, U, T	The object datatype of 1 byte fan speed is displayed according to the parameters.	Sends automatic control fan speed value to the bus. 1-bit object function for fan speed enabled:	5.001 percentage 5.100 fan stage
158		Fan On/Off, status	1 bit	C, W, U, T	Visible when the fan is enabled. 1 speed level/ 1 bit status.	When a particular fan speed is activated, only the corresponding 1-bit fan speed status object sends 1.	1.001 switch
158		Fan speed 1, status	1 bit	C, W, U, T	"1" switches the corresponding fan speed.	1-bit object for fan speed off not enabled: When the fan speed is off, all the other fan speed status objects send 0. 1-bit object for fan speed off enabled: When the wind speed is switched to off, only the	
159		Fan speed 2, status	1 bit	C, W, U, T	Fan multilevel/ 1 bit status.		
160		Fan speed 3, status	1 bit	C, W, U, T	Displays when 1-bit object function for fan speed is enabled		
161		Fan speed off, status	1 bit	C, W, U, T	Fan multilevel/ 1 bit status off Displays when 1-bit object for fan speed off is enabled.		

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
						Fan speed off, status object sends the message 1.	
162		Fan automatic operation, status	1 bit	C, W, U, T	The fan speed is displayed when it is automatically controlled and enabled.	Receives status feedback for automatic fan speed control: 1 - Automatic control, 0 - Exit automatic control. After the device restarts, the fan speed automatically sends a read request to the bus.	1.003 enable
163		Window contact	1 bit	C, W, U, T	Displays when Window contact input function is enabled.	1 - Window open, 0 - Window closed. After the device restarts, the window contact object sends a read request to the bus.	1.019 Window/door
164		Presence detector	1 bit	C, W, U, T	Displays when you enable the presence detector input.	1 = presence, 0 = no presence After the device restarts, the presence detection object sends a read request to the bus.	1.018 occupancy
165		Power on/off	1 bit	C, R, T	The temperature switch is controlled via the screen.		
166		Actual temperature	2 byte	C, R, T	The option is visible when the you choose the combination of internal and external sensor.	Sends the actual combined temperature to the bus.	9.001 temperature
167		Base temperature setpoint	2 byte	C, R, T	Visible only with Relative setpoint method selected.	Sends the current reference temperature setpoint to the bus.	9.001 temperature
169		Current temperature setpoint	2 byte	C, R, T		Sends the current temperature setpoint to the bus.	9.001 temperature
170		Heating/ Cooling mode	1 bit	C, R, T	Switches between heating and		1.100 cooling/heating

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
					cooling via bus.		
171		Control mode	1 byte	C, R, T	Switching of heating, cooling, and automatic modes via bus.	0 = Auto 1 = Cooling only 2 = Heating only 3 – 255 unused	20.107 DPT Changover-Mode
172		Operation mode	1 byte	C, R, T	Control HVAC's operation mode via bus.	Visible when the Operation mode function enabled.	20.102 HVAC mode
173		Comfort mode	1 bit	C, R, T	1-bit object receives a value "1" → the corresponding mode activates.		1.003 enable
174		Economy mode	1 bit	C, R, T			
175	FCU controller	Frost/Heat protection mode	1 bit	C, R, T			1.003 enable
176		Standby mode	1 bit	C, R, T			
177		Heating control value	1 bit/1 byte	C, R, T	Sends control values for heating or cooling functions.	Displays according to control options.	1.001 switch
178		Cooling control value	1 bit/1 byte	C, R, T			5.001 percentage
179		Fan speed	1 byte	C, R, T	The object datatype of 1-byte fan speed is displayed according to the parameters.	Sends automatic control fan speed value to the bus. 1-bit object function for fan speed enabled: When a particular fan speed is activated, only the corresponding 1-bit fan speed status object sends 1. 1-bit object for fan speed off not enabled: When the fan speed is off, all the other fan speed status objects send 0. 1-bit object for fan speed off enabled: When the fan speed is switched to off, only the Fan speed off,	5.001 percentage 5.100 fan stage
180		Fan On/Off	1 bit	C, T	1 level		1.001 switch
180		Fan speed 1	1 bit	C, T			1.001 switch
181		Fan speed 2	1 bit	C, T			
182		Fan speed 3	1 bit	C, T			
183		Fan speed off	1 bit	C, T			

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
						status object sends the message 1.	
184		Fan Automatic operation	1 bit	C, R, T	This object displays when you choose automatic fan operation.	Sends automatic control telegrams for the fan speed to the bus. 1 = Auto 0 = Exit automatic operation	1.003 enable

Floor heating controller

Nr.	Name	Object function	Length	Properties	Function description	DPT
185	Floor heating controller	Power on/off, status	1 bit	C, W, U	Displays the switch status feedback.	1.001 switch
186		External temperature sensor	2 byte	C, W, T, U	Receives the external sensor temperature value. Periodically sends read requests. After the device restarts, the external sensor sends a read request to the bus.	9.001 temperature
187		Current setpoint adjustment, status Base setpoint adjustment, status	2 byte	C, W, U	Modifies the current setpoint temperature value by bus. Modifies the base setpoint temperature by bus.	9.001 temperature
190		Power on/off	1 bit	C, R, T	Controller switch (on the screen)	1.001 switch
191	Floor heating controller	Actual temperature	2 byte	C, R, T	Sends the actual temperature after the combination of internal and external sensor values. The object is visible when the temperature reference is taken from both sensors (internal and external).	9.001 temperature
192		Current temperature setpoint	2 byte	C, R, T	Sends the current temperature setpoint to the bus.	9.001 temperature

Nr.	Name	Object function	Length	Properties	Function description	DPT
193		Heating control value	1 bit/1 byte	C, R, T	Sends the control value of the heating or cooling function.	1.001 switch/ 5.001 percentage

Ventilation controller

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
210	Ventilation controller	Fan automatic operation	1 bit	C, W	Automatic control of the fan is activated by the bus.	Displayed when the Ventilation controller enabled	1.003 enable
211		PM _{2.5} value VOC value CO ₂ value	2 byte	C, W, T, U		Datatype displayed according to parameter setting	7.001 pulse 9.030 concentration (µ /m ³) 9.008 parts/ million (ppm)
238		Fan speed, status	1 byte	C, T		Displayed according to the parameter Object datatype of 1byte fan speed setting	5.001 percentage 5.100 fan stage

Screen – locking

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
243	Screen 1 Function 1	Locking object	1 bit	C, W	For all of the following screen functions, except Air quality display , Weather information and Energy monitoring .	Lock/unlock icon	1.003 enable

Screen – switching

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Switch	1 bit	C, T	1-bit switch for control and status feedback. Switch values alternate during operation.	1.001 switch
249		Switch, status	1 bit	C, W, T, U		1.001 switch

Screen – brightness dimming

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Switch	1 bit	C, T	1. Switch: 1-bit control and status feedback, switch values alternates during the operation.	1.001 switch
246		Brightness dimming	1 byte	C, T		5.001 percentage (0..100%)
249		Switch, status	1 bit	C, W, T, U	2. 1-byte brightness dimming: control and status feedback.	1.001 switch
251		Brightness, status	1 byte	C, W, T, U		5.001 percentage (0..100%)

Screen – RGB/W dimming

Nr.	Name	Object function	Length	Properties	Note	Function description	DPT
244	Screen 1 Function 1	Switch	1 bit	C, T		Controls brightness of multi-color lamps.	1.001 switch
245		RGB dimming value	3 byte	C, T	RGB 3-byte		232.600 RGB value 3 x (0..255)
245		RGBW dimming value	6 byte	C, T	RGBW 6-byte	Color temperature adjustment is also supported.	251.600 DPT_Colour_RGBW
245		Red dimming value	1 byte	C, T	RGB or RGBW: 1-byte type		5.001 percentage (0..100%)
246		Green dimming value	1 byte	C, T			
247		Blue dimming value	1 byte	C, T			
248		White dimming value	1 byte	C, T	RGBW 1-byte type	Switch values alternate during the operation.	
249		Switch, status	1 bit	C, W, T, U			
250		RGB brightness, status	3 byte	C, W, T, U	RGB 3-byte	2. Color adjustment: 3-byte or 3 x 1-byte control and status feedback.	1.001 switch
250		RGBW brightness, status	6 byte	C, W, T, U	RGBW 6-byte		232.600 RGB value 3x (0..255)
250		Red brightness, status	1 byte	C, W, T, U	RGB or RGBW 1-byte type	3. White light brightness adjustment: 1-byte control and status feedback.	251.600 DPT_Colour_RGBW
251		Green brightness, status	1 byte	C, W, T, U			5.001 percentage (0..100%)
252		Blue brightness, status	1 byte	C, W, T, U			
253		White brightness, status	1 byte	C, W, T, U	RGBW 1-byte type		

Screen – color temperature dimming

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Switch	1 bit	C, T	Color temperature and brightness adjustment of monochrome lamps.	1.001 switch
245		Color temperature value	2 byte	C, T		7.600 absolute color temperature
246		Brightness value	1 byte	C, T		5.001 percentage (0..100%)
249		Switch, status	1 bit	C, W, T, U	1. Switch: 1-bit control and status feedback Switch values alternate during the operation. 2. Color temperature adjustment: 2-byte control and status feedback. You can set upper and lower thresholds for color temperature. 3. Brightness adjustment: 1-byte control and status feedback.	1.001 switch
250		Color temperature, status	2 byte	C, W, T, U		7.600 absolute color temperature
251		Brightness, status	1 byte	C, W, T, U		5.001 percentage (0..100%)

Screen – roller/venetian blind, curtain position

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Open/Close	1 bit	C, T	Curtain step/move. Open and close. On, off, stop	1.009 open/close
245		Stop	1 bit	C, T		1.007 step
244		Up/Down	1 bit	C, T	Roller blind step/move function. Roll-up, down, stop	1.008 up/down
245		Stop	1 bit	C, T		1.007 step
244		Open/Close	1 bit	C, T	Curtain position	1.009 open/close
245		Stop	1 bit	C, T	Open and close	1.007 step
246		Curtain position	1 byte	C, T	On, off, stop	5.001 percentage (0..100%)
249		Curtain position, status	1 byte	C, W, T, U	Position, position status feedback	
244		Up/Down	1 bit	C, T	Roller blind position feature	1.008 up/down
245		Stop	1 bit	C, T		1.007 step
246		Blind position	1 byte	C, T	Roll-up, open, close, stop	5.001 percentage (0..100%)
249		Blind position, status	1 byte	C, W, T, U	Position adjustment, position status feedback	
244		Up/Down	1 bit	C, T	Venetian blind position and slat. Blinds, on, off, stop	1.008 up/down
245		Stop/Slat adj.	1 bit	C, T		1.007 step
246		Blind position	1 byte	C, T	Position and angle adjustment,	5.001 percentage (0..100%)
247		Slat position	1 byte	C, T		

Nr.	Name	Object function	Length	Properties	Function description	DPT
249		Blind position, status	1 byte	C, W, T, U	position and angle status feedback	
250		Slat position, status	1 byte	C, W, T, U		

Screen – scene

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
244	Screen 1 Function 1	Scene	1 byte	C, T C, W, T	Short press calls a scene. Long press (2 s optional) saves the scene.	Enabled Object with status feedback function gives the Scene object (in addition to the C and T) the W property	18.001 scene control

Screen – air quality display

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Ext. temperature value	2 byte	C, W, T, U	Data received from the bus	9.001 temperature
244		Humidity value	2 byte	C, W, T, U	Optional functions: 1. Temperature: 2-byte floating point value 2. Humidity: 2-byte, floating point value 3. PM _{2.5} : 2-byte unsigned integer or floating point value (µg/m ³) 4. PM ₁₀ : 2-byte unsigned integer or floating point value (µg/m ³) 5. CO ₂ : 2-byte (ppm) 6. VOC: 2-byte unsigned integer or floating point value (µg/m ³) 7. Brightness: 2-byte integer or floating point value (lux)	9.007 humidity
244		PM _{2.5} value	2 byte	C, W, T, U		7.001 pulse
244		PM ₁₀ value	2 byte	C, W, T, U		9.030 concentration (µg/m ³)
244		VOC value	2 byte	C, W, T, U		7.001 pulse
244		CO ₂ value	2 byte	C, W, T, U		9.008 parts/million (ppm)
244		Brightness value	2 byte	C, W, T, U		9.004 lux (lux) 7.013 brightness (lux)

Screen – air conditioner

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Power on/off	1 bit	C, T	Switches the Air conditioner via the bus.	1.001 switch
245		Current setpoint adjustment	2 byte 1 byte	C, T	Adjusts current temperature setpoint. Datatype according to the Object datatype of setpoint setting.	9.001 temperature 5.010 counter pulses
247		Fan speed	1 byte	C, T	Controls the fan speed. Datatype according to the parameter Object datatype of 1byte fan speed setting.	5.001 percentage 5.100 fan stage
248		Wind swing (1-swing, 0-stop)	1 bit	C, T	Controls the swing. Visible when Swing function is enabled.	1.010 start/stop
250		Control mode	1 byte	C, T	Controls the mode of the air conditioning (Auto, Heating, Cooling, Fan, Dehumidification).	20.105 HVAC control mode
251		Power on/off, status	1 bit	C, W	Displays switch status on the screen.	1.001 switch
252		External temperature sensor	2 byte	C, W, T, U	External sensor object is visible. Receives room temperature from the bus. Periodically sends read requests.	9.001 temperature
253		Current temperature setpoint, status	2 byte 1 byte	C, W, U	Displays the current set temperature on the screen. Datatype according to the Object datatype of setpoint setting.	9.001 temperature 5.010 counter pulses"
254		Fan speed, status	1 byte	C, W	Displays the fan speed on the screen. Datatype according to the parameter Object datatype of 1byte fan speed setting.	5.001 percentage 5.100 fan stage
255		Wind swing, status	1 bit	C, W	Displays swinging status on the screen.	1.010 start/stop
257		Control mode, status	1 byte	C, W	Displays current control mode on the screen.	20.105 HVAC control mode

Screen – room temperature control and external controller

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
244	Screen 1 Function 1	Power on/off	1 bit	C, T	Controls the RTU switching via the screen.		1.001 switch
245		Current setpoint adjustment	2 byte	C, T	Displays when the Object datatype of setpoint adjustment parameter is set to 2-byte DPT.	Adjust the set temperature value on the screen. Usually 2-byte object is for absolute adjustment, 1-bit object is for relative adjustment.	9.001 temperature
246		Current setpoint adjustment (1bit)	1 bit	C, T	Displays when the Object datatype of setpoint adjustment parameter is set to 1-bit DPT.		1.007 step
247		Fan speed	1 byte	C, T	Displayed according to the parameter Object datatype of 1-byte fan speed setting.	Controls fan speed via the screen.	5.001 percentage 5.100 fan stage
248		Fan automatic operation	1 bit	C, T	Controls the fan speed when Automatic operation function is enabled.	Activates the automatic control of the fan speed via the screen. 1 = active, 0 = inactive	1.003 enable
249		Heating/ Cooling mode	1 bit	C, T	Switches heating/ cooling via the screen.		1.100 cooling/ heating
250		Operation mode	1 byte	C, T	Visible when the Operation mode is enabled.	Controls HVAC operation mode via screen.	20.102 HVAC mode
251		Power on/off, status	1 bit	C, W	Displays the switch feedback status on the screen.		1.001 switch
252		External temperature sensor	2 byte	C, W, T, U	Visible when the External sensor is allowed for a reference.	Receives room temperature from the bus. Periodically sends read requests. Displayed on the screen.	9.001 temperature
253	Screen 1 Function 1	Current temperature setpoint, status	2 byte	C, W, U	Displays current temperature setpoint on the screen.		9.001 temperature
254		Fan speed, status	1 byte	C, W	Properties according to the parameter Object datatype of	Fan speed status displayed on the screen.	5.001 percentage 5.100 fan stage

Nr.	Name	Object function	Length	Properties	Function description	Note	DPT
					1byte fan speed setting.		
255		Fan automatic operation, status	1 bit	C, W	Automatic fan speed status control displayed screen.	1 = activated, 0 = inactive	1.003 enable
256		Heating/ Cooling mode, status	1 bit	C, W	Displays the current control mode on the screen.		1.100 cooling/ heating
256		Control mode, status	1 byte	C, W	Heating and Cooling (with auto mode).	Heating and Cooling (with auto mode).	
257		Operation mode, status	1 byte	C, W			20.102 HVAC mode

Screen – ventilation control panel

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Power on/off	1 bit	C, T	Switch control of the ventilation system.	1.001 switch
245		Filter timer counter	2 byte	C, T	Available when the Filter timer counter function is allowed. Counts filter usage hours. Sends the value to the bus every time the value changes.	7.007 time (h)
246		Filter alarm	1 bit	C, T	If the filter is used for longer than the set time, the filter sounds an alarm.	1.005 alarm
247		Fan speed	1 byte	C, T	Controls fan speed via the screen. DPT is displayed according to the parameter Object datatype of 1-byte fan speed setting.	5.001 percentage 5.100 fan stage
248		Fan automatic operation	1 bit	C, T	Available when Automatic operation function is enabled. Activates the automatic control of fan speed via the screen. 1 = active, 0 = inactive	1.003 enable
249		Heat recovery	1 bit	C, T	Available when Heat recovery function is enabled.	1.003 enable

Nr.	Name	Object function	Length	Properties	Function description	DPT
					Controls the heat recovery mode via the screen. 0 - inactive, 1 - active	
251		Power on/off, status	1 bit	C, W	Switch status.	1.001 switch
252		Filter timer counter change	2 byte	C, W	Available when the Filter timer counter function is allowed. Changes the filter usage time via the bus.	7.007 time (h)
253		Filter timer reset	1 bit	C, W	Resets the filter usage time.	1.015 reset
254		Fan speed, status	1 byte	C, W	Feedback on the currently controlled fan speed to the screen. DPT is displayed according to the parameter Object datatype of 1-byte fan speed setting.	5.001 percentage 5.100 fan stage
255		Fan automatic operation, status	1 bit	C, W	Available when Automatic operation function is enabled. Feedback on the automatic control fan speed to the screen. 1 = active, 0 = inactive	1.003 enable
256		Heat recovery, status	1 bit	C, W	Available when Heat recovery function is enabled. Feedback on heat recovery status to the screen. 0 - inactive, 1 - active	1.003 enable
257		Scene	1 byte	C, W	Visible when Scene function is enabled.	18.001 scene control

Screen – audio control

Nr.	Name	Object function	Length	Properties	Function description	DPT
244	Screen 1 Function 1	Power on/off	1 bit	C, T	Switch control via the screen.	1.001 switch
245		Play = 1/Pause = 0	1 bit	C, T	Play/pause the track.	1.010 start/stop

Nr.	Name	Object function	Length	Properties	Function description	DPT
246		Next track = 1/ Previous track = 0	1 bit	C, T	Previous/next song.	1.007 step
247		Volume+ = 1/ Volume- = 0 Absolute volume	1 bit 1 byte	C, T	Volume increase/decrease 1-bit relative control 1-byte absolute control Displayed according to the data point type.	1.007 step 5.001 percentage 5.004 percentage
248		Mute	1 bit	C, T	Displayed when Mute parameter is enabled.	1.003 enable
250		Play mode	1 byte	C, T	The play mode parameters are displayed when Play mode function is enabled.	5.010 counter pulses
251		Power on/off, status	1 bit	C, W	Switch control status on the screen.	1.001 switch
252		Play = 1/Pause = 0, status	1 bit	C, W	Play/Pause status feedback on the screen.	1.010 start/stop
253		Volume, status	1 byte	C, W	1-byte volume status on the screen.	5.001 percentage 5.004 percentage
255		Mute, status	1 bit	C, W	Displayed when Mute parameter is enabled.	1.003 enable
256		Play mode, status	1 byte	C, W	The play mode status is displayed when Play mode function is enabled.	5.010 counter pulses
257		Track name	14 byte	C, W	Displays the track name.	16.001 character string (ISO 8859-1)

Screen – functions

Nr.	Name	Object function	Length	Properties	Function description	DPT
272	Screen 1 Function 2					
287	Screen 1 Function 3					
302	Screen 1 Function 4					
317	Screen 1 Function 5					
332	Screen 1 Function 6					
347	Screen 2 Function 1					

Nr.	Name	Object function	Length	Properties	Function description	DPT
362	Screen 2 Function 2					
377	Screen 2 Function 3					
392	Screen 2 Function 4					
407	Screen 2 Function 5					
422	Screen 2 Function 6					
437	Screen 3 Function 1					
452	Screen 3 Function 2					
467	Screen 3 Function 3					
482	Screen 3 Function 4					
497	Screen 3 Function 5					
512	Screen 3 Function 6					
527	Screen 4 Function 1					
542	Screen 4 Function 2					
557	Screen 4 Function 3					
572	Screen 4 Function 4					
587	Screen 4 Function 5					
602	Screen 4 Function 6					
617	Screen 5 Function 1					
632	Screen 5 Function 2					
647	Screen 5 Function 3					
662	Screen 5 Function 4					
677	Screen 5 Function 5					
692	Screen 5 Function 6					
707	Screen 6 Function 1					
722	Screen 6 Function 2					
737	Screen 6 Function 3					
752	Screen 6 Function 4					
767	Screen 6 Function 5					
782	Screen 6 Function 6					

Nr.	Name	Object function	Length	Properties	Function description	DPT
797	Screen 7 Function 1					
812	Screen 7 Function 2					
827	Screen 7 Function 3					
842	Screen 7 Function 4					
857	Screen 7 Function 5					
872	Screen 7 Function 6					
887	Screen 8 Function 1					
902	Screen 8 Function 2					
917	Screen 8 Function 3					
932	Screen 8 Function 4					
947	Screen 8 Function 5					
962	Screen 8 Function 6					
977	Screen 9 Function 1					
992	Screen 9 Function 2					
1007	Screen 9 Function 3					
1022	Screen 9 Function 4					
1037	Screen 9 Function 5					
1052	Screen 9 Function 6					

User interface

Nr.	Name	Object function	Length	Properties	Function description	DPT
1053	Screen	Screen locking	1 bit	C, W	Locks the screen. The screen can not be operated. It only processes the received.	1.003 enable
1054		Screen on/off	1 bit	C, W	When Turn off screen after [0...255,0=inactive] function is set to 0 s, the screen does not turn off. However, the screen can be turned on/off via this object.	1.001 switch

Nr.	Name	Object function	Length	Properties	Function description	DPT
1055		Screen brightness	1 byte	C, W	Adjusts the screen brightness in the current mode without affecting the screen brightness of other modes. The brightness has to be adjusted for each mode separately.	5.001 percentage (0..100%)
1057	Security	Password trigger, 1bit value/1byte value/scene No.	1 bit 1 byte	C, T	Displayed according to the Output object type for pin code setting	1.001 switch 5.010 counter pulses 5.001 percentage 17.001 scene number

Night mode

Nr.	Name	Object function	Length	Properties	Function description	DPT
1056	Night mode	Night mode input	1bit	C,W,T,U	Receives day/night messages from the bus.	1.024 day/night

Proximity

Nr.	Name	Object function	Length	Properties		DPT
1058	Proximity function	Dis/En Proximity function	1bit	C,W	Visible when the Proximity function triggered via is not set to Never .	1.003 enable
1059		Proximity input	1bit	C,W	Visible when the Proximity function triggered via is set to Proximity object .	1.001 switch
1060		Proximity output	1bit 1byte	C,T	Displayed according to the Object type of output value setting.	1.001 switch 5.010 counter pulses 17.001 scene number 5.001 percentage

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