theben
energy saving comfort

KNX Examples
Overview

1 theLuxa P300 KNX WH - 1019610

These typical applications are designed to aid planning and are not to be considered an exhaustive list.
It can be extended and updated as required.

1.1 Simple motion detector as a light switch

Motion detector theLuxa P300 KNX is installed at a front door of a house and switches a lamp.
Since the house stands close to the street, passing vehicles should be ignored.
This is achieved by deactivating the motion sensor in the centre via parameter.
As light switch, a channel of the MIX2 switch actuator RMG 8 T is used.

1.1.1 Devices:

- theLuxa P300 KNX (Order no. 1019610 / 1019611)
- RMG 8 T (Order no. 4930200)

1.1.2 Overview

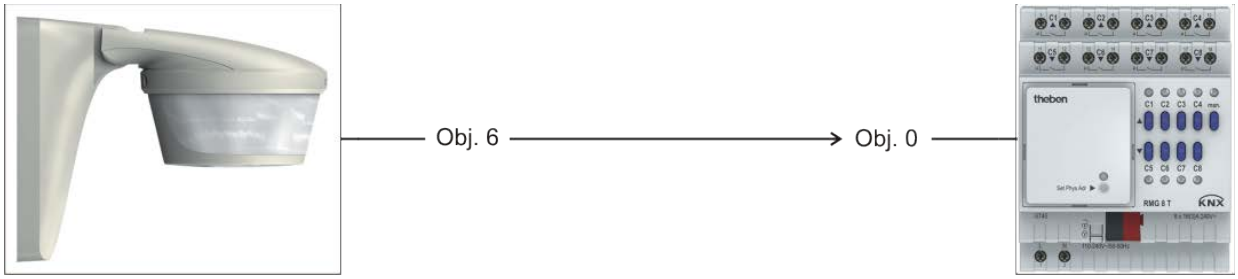


Figure 1

1.1.3 Objects and links

Table 1: Motion detector and switch actuator.

No.	theLuxa P300 KNX Object name	No.	RMG 8 T Object name	Comment
6	*C1 Motion switching*	0	*RMG 8 T channel C1 switch object*	When motion is detected, channel C1 is switched on.

1.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 2:

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module RMG 8 T	*Channel C1 function*	*Switch actuator*
RMG 8 T channel C1: Configuration options	*Channel function*	*Switching ON/OFF*
	Activation of function via	*Switching object*

Table 3: theLuxa P300 KNX

Parameter page	Parameters	Setting
General	*Activate motion channel C1*	*yes*
Motion channel C1: Function	*Used sensors*	*left, right*
	Activate sensor bottom (creep under protection)	*yes*
	Type of lighting	*Switching*
Brightness settings	*Brightness threshold value*	*10 lx*

1.2 Cark park lighting with time switch program

The cark park lighting of a company is controlled with a motion detector.
However, the lighting should only be switched on on demand, i.e. when it gets too dark outside.
For this purpose, the brightness threshold is set to 10 lx

The car park is permanently lit from 4:00 p.m. to 6:00 p.m., as soon as the brightness falls below the threshold. Motion will not be taken into consideration.
From 6:00 p.m. to 7:00 p.m., the lighting will be switched on for 5 minutes, when someone enters the car park.
During the remaining time, the lighting will be switched on for 2 minutes when motion is detected (by taking the brightness into consideration).
These functions are implemented with the alternative time delay and with the integrated time switch.

In order to cover the entire area, several devices will be used.
One device functions as master in parallel switching (M) and sends the switch commands to the switch actuator.
The others function as a slave (S1, S2 etc.), and only report detected motion.
The current time and week day can be received e.g. by a Meteodata 140 S GPS weather station.

1.2.1 Devices:

- theLuxa P300 KNX (Order no. 1019610 / 1019611)
- RMG 8 T (Order no. 4930200)
- Meteodata 140 S GPS KNX (Order No. 1409208)

1.2.2 Overview

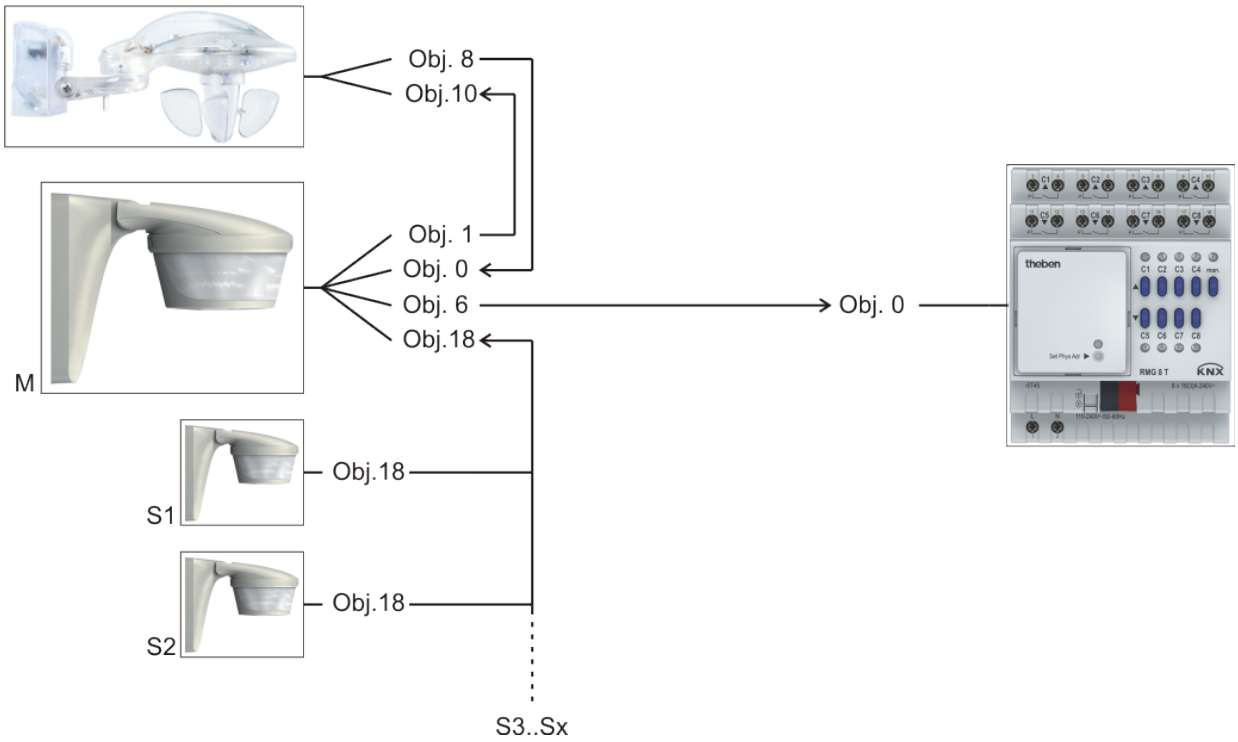


Figure 2

1.2.3 Objects and links

Table 4: Master device and switch actuator.

No.	theLuxa P300 KNX Master device (M)	No.	RMG 8 T	Comment
	Object name		Object name	
6	*C1 Motion switching*	0	*RMG 8 T channel C1 switch object*	When motion is detected by the master or a slave device, channel C1 is switched on.

Table 5: Master and slave devices.

No.	theLuxa P300 KNX Slave devices (S1, S2 etc.)	No.	theLuxa P300 KNX Master device (M)	Comment
	Object name		Object name	
18	*C1 Parallel switching*	18	*C1 Parallel switching*	The slave devices cyclically report each detected motion to the master.

Table 6: Receiving time and week day.

No.	theLuxa P300 KNX Master device (M)	No.	Meteodata 140 S GPS KNX	Comment
	Object name		Object name	
1	*Send time query*	2	*Time query*	theLuxa sends time requests to Meteodata 140 GPS
0	*Receive time*	0	*Send local time*	Meteodata 140 GPS sends time and week day to theLuxa P300 KNX

1.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 7: theLuxa master device

Parameter page	Parameters	Setting
General	*Activate motion channel C1*	*yes*
Motion channel C1: Function	*Operating mode*	*Master in parallel switching*
	Type of lighting	*Switching*
Brightness settings	*Brightness threshold value*	*10 lx*
	Execute perm ON	*only when fallen below brightness threshold*
Time settings	*Time delay*	*2 min.*
	Use alternative time delay	*yes*
	Alternative time delay	*5 min.*
	Activate switch programme 1	*yes*
	Switching time	*4:00 p.m.*
	Program active at	*Mon-Fri*
	Action	***Preset 1***
	Activate switch programme 2	*yes*
	Switching time	*6:00 p.m.*
	Program active at	*Mon-Fri*
	Action	***Preset 2***
	Activate switch programme 3	*yes*
	Switching time	*7:00 p.m.*
	Program active at	*Mon-Fri*
	Action	***Preset 3***
Presets (Preset 1)	*Brightness threshold*	*unchanged*
	Time delay	*unchanged*
	Blocking behaviour	*unchanged*
	Permanent switching	*Perm ON*
Presets (Preset 2)	*Brightness threshold*	*unchanged*
	Time delay	*Alternative time delay (if available)*
	Blocking behaviour	*unchanged*
	Permanent switching	*Terminate perm ON*
Presets (Preset 3)	*Brightness threshold*	*unchanged*
	Time delay	*normal time delay*
	Blocking behaviour	*unchanged*
	Permanent switching	*unchanged*

Table 8: theLuxa slave devices

Parameter page	Parameters	Setting
General	*Activate motion channel C1*	*yes*
Motion channel C1: Function	*Operating mode*	*Slave*
	Retrigger time	*1 min.*

Table 9: Meteodata 140 GPS

Parameter page	Parameters	Setting
General	*Device version*	*with GPS module*
Set date and time	*Send time and set date*	*every hour*

Table 10: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module RMG 8 T	*Channel C1 function*	*Switch actuator*
RMG 8 T channel C1: Configuration options	*Channel function*	*Switching ON/OFF*

1.3 Staircase lighting with standby light

A staircase should be monitored.
The spatial conditions only allow for a monitoring area without gaps by using many motion detectors.
In order to reduce the expenses, only one detector will be used on each floor, and the standby function will be used as the warning prior to switch-off.
After the time delay has elapsed, the light will remain switched on for another 5 minutes at a brightness of 20 % (standby), before it is switched off completely.

With sufficient brightness (daylight), the lighting will remain off.

One device functions as master in parallel switching (M) and sends the switch commands to the dimming actuator.
The others function as a slave (S1, S2 etc.), and only report detected motion.

1.3.1 Devices:

- theLuxa P300 KNX (Order no. 1019610 / 1019611)
- DMG 2 T (Order no. Nr. 4930270)

1.3.2 Overview

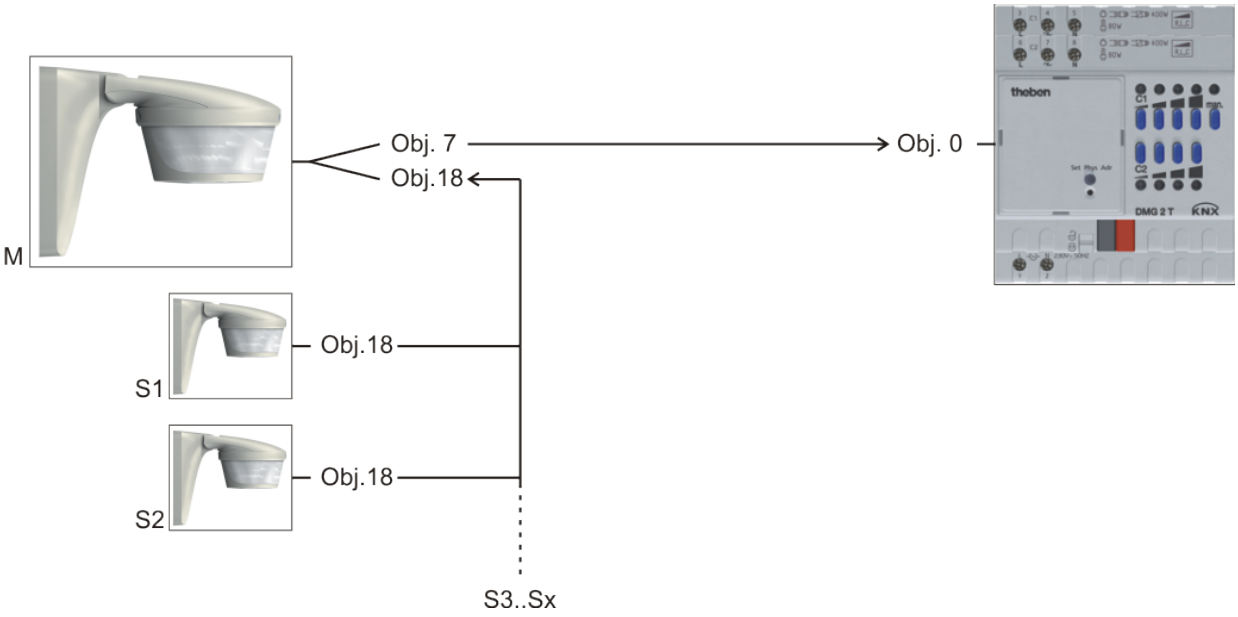


Figure 3

1.3.3 Objects and links

Table 11

No.	theLuxa P300 KNX Master device (M)	No.	DMG 2 T	Comment
	Object name		Object name	
7	*C1 dimming dimming value*	0	*DMG 2 T channel C1 dimming value*	theLuxa sends the dimming value to the dimming actuator

Table 12:

No.	theLuxa P300 KNX Slave devices (S1, S2 etc.)	No.	theLuxa P300 KNX Master device (M)	Comment
	Object name		Object name	
18	*C1 Parallel switching*	18	*C1 Parallel switching*	The slave devices cyclically report each detected motion to the master device.

1.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 13: theLuxa master device

Parameter page	Parameters	Setting
General	*Activate motion channel C1*	*yes*
Motion channel C1: Function	*Operating mode*	*Master in parallel switching*
	Type of lighting	*Dimming*
Brightness settings	*Brightness threshold value*	*50 lx*
Time settings	*Time delay*	*5 min.*
Dimming	*Dimming value during ON phase*	*100 %*
	Dimming value during standby phase	*20 %*
	Standby time	*5 minutes*
	Dimming value when OFF	*0 %*

Table 14: theLuxa slave devices

Parameter page	Parameters	Setting
General	*Activate motion channel C1*	*yes*
Motion channel C1: Function	*Operating mode*	*Slave*
	Retrigger time	*1 min.*

Table 15: DMG 2 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*DMG 2 T*

2 LUNA 134 KNX - 1349200

These typical applications are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

2.1 Simple twilight switch

Outside lighting should come on at dusk and go off again at sunrise.

2.1.1 Devices:

- LUNA 134 KNX (1349200)
- RMG 8 S (4930220)

2.1.2 Overview

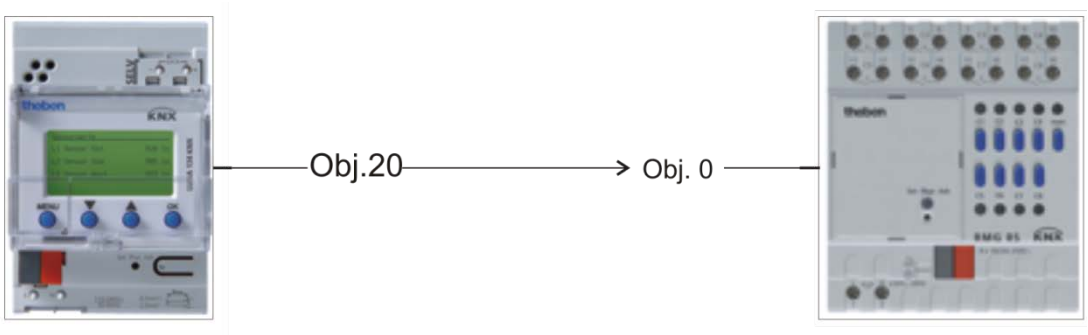


Figure 4

2.1.3 Objects and links

Table 16

No.	LUNA 134 Object name	No.	RMG 8 S Object name	Comment
20	*C1.1 Switching channel - switching*	0	*RMG 8 S channel C1 switching object*	-

2.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 17: LUNA 134

Parameter page	Parameter	Setting
General	*Activate switching channel C1*	*yes..*
Switching channel C1: Function	*Brightness threshold value*	*below 10 lx*
	Source	*Sensor 1*
Objects	*Telegram type C1.1*	*switching command*
	If the brightness condition is fulfilled	*send cyclically*
	Telegram	*ON*
	If the condition is not met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 60 minutes*

Table 18: RMG 8 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Switching On/Off*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*

2.2 Switching 2-zone internal lighting depending on external brightness.

The lighting in a hall is divided into 2 zones:

- Zone 1 = Front near to the windows.
- Zone 2 = Rear without windows.

Decreasing external lighting enables the lighting in zone 1 to be turned on later than in zone 2.
This function is achieved with the help of 2 brightness thresholds and 2 switching channels.

2.2.1 Devices:

- LUNA 134 KNX (1349200)
- RMG 8 S (4930220)

2.2.2 Overview

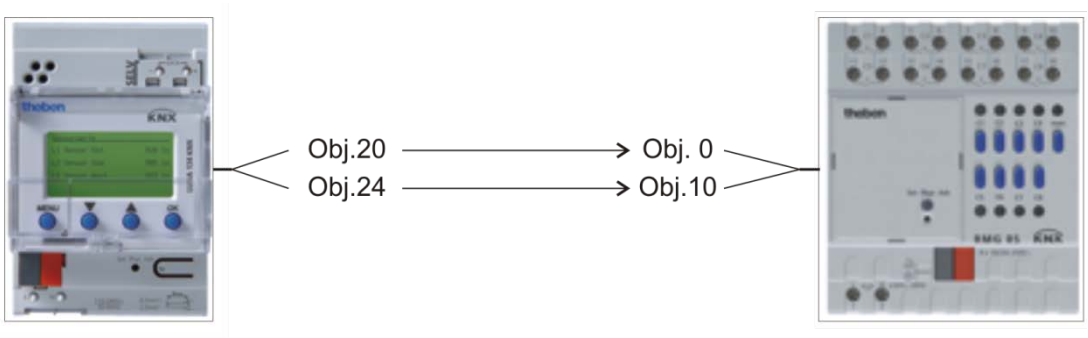


Figure 5

2.2.3 Objects and links

Table 19

No.	LUNA 134 Object name	No.	RMG 8 S Object name	Comment
20	*C1.1 Switching channel - switching*	0	*RMG 8 S channel C1 switching object*	Lighting zone 1
24	*C2.1 Switching channel - switching*	10	*RMG 8 S channel C2 switching object*	Lighting zone 2

2.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 20: LUNA 134

Parameter page	Parameter	Setting
General	*Activate switching channel C1*	*yes..*
	Activate switching channel C2	*yes..*
Switching channel C1: Function	*Brightness threshold value*	*below 600 lx**
	Source	*Sensor 1*
Objects	*Telegram type C1.1*	*switching command*
	If the brightness condition is fulfilled	*send cyclically*
	Telegram	*ON*
	If the condition is not met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 60 minutes*
Switching channel C2: Function	*Brightness threshold value*	*below 1000 lx**
	Source	*Sensor 1*
Objects	*Telegram type C2.1*	*switching command*
	If the brightness condition is fulfilled	*send cyclically*
	Telegram	*ON*
	If the condition is not met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 60 minutes*

* No responsibility accepted for correctness of this information. The optimum values must be determined based on local circumstances.

Table 21: RMG 8 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Switching On/Off*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*
RMG 8 S channel C1 function selection	*Channel function*	*Switching On/Off*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*

3 Meteodata 140 S GPS KNX - 1409208

These typical applications are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

3.1 Simple shading control

A facade with a number of blinds should be controlled using the following functions:

- Raise at dawn (if lowered manually).
- Lower blinds and set slats to configured position when the preset brightness threshold is reached.
- Raise all blinds at dusk as well.
- A safety telegram is sent to the actuator in the event of potential frost or storms. This raises the blinds and prevents unintentional movement as long as the safety hazard applies.
- Cyclical monitoring of the safety object in the blinds actuator.

3.1.1 Devices*:*

- Meteodata 140 S (1409207)
- JMG 4 S (4910250)

3.1.2 Overview

Figure 6

3.1.3 Objects and links

Table 22

No.	Meteodata 140 S Object name	No.	JMG 4 S Object name	Comment
20	*C1.1 Switching universal channel*	64	*Central safety 1*	-
60	*C11 Drives up/down*	0	*C1 – Up / down*	-
61	*C11 Blinds height*	2	*C1 - % height*	-
62	*C11 lamella*	3	*% Slats*	-

3.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 23: Meteodata 140 S

Parameter page	Parameter	Setting
Universal channel 1: Function	*Channel function*	*Link of the following sensors*
	Brightness	*no*
	Temperature	*yes*
	Wind	*yes*
	Rain	*no*
	Type of link	*OR*
	Temperature	*below 3 °C*
	Temperature hysteresis	*1.0 °C*
	Wind speed	*Over 14 m/s (approx. 50 km/h)*
objects	*Telegram type C1.1*	*switching command*
	If all conditions are met	*send cyclically*
	Telegram	*ON*
	If not all conditions are met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 10 minutes*
	Telegram with recognised sensor error	*do not send anymore*
Sun protection channel C11	*Channel controls*	*Blinds*
	Sun position adjustment	*no*
	Source for brightness measurement	*Sensor front*
Sun control	*Activation of sun control*	*via dawn/dusk threshold*
	Reaction to dawn	*Raise & sun control ON*
	Reaction to dusk	*Sun control OFF and raise*
Safety	*Safety check triggered by*	*condition: C1*
	Reaction to safety beginning	*no reaction*
	Reaction to safety end	*Update position*

Table 24: JMG 4 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*GM is a JMG 4 S*
JMG 4 S general	*Safety objects 1-3*	*With cyclical monitoring 20 min*
GM JMG 4 S C1	*Type of curtain*	*Blinds*
	Runtime completely up	(depending on type of blinds)
	Complete turn of slat	(depending on type of blinds)
	Which safety objects function (OR-linked)	*Safety 1*
	Response in the event of bus failure	*Top end position*

3.2 Shading control with sun position adjustment

Blinds are to be controlled depending on position of the sun.
A safety telegram is sent to the actuator by the universal channel C1 in the event of potential frost or storms. The actuator safety object is monitored cyclically.

Facade direction: East 90°
Desired sun protection area (user-specific):
Before the facade = -40°, after the facade = 70° (see attachment: Asymmetrical sun protection area).
Minimum elevation= 10°, maximum elevation = 90° (i.e. unlimited.)
Blinds slat width = 80 mm, spacing 65 mm.

3.2.1 Devices:

- Meteodata 140 S (1409207)
- JMG 4 S (4910250)

3.2.2 Overview

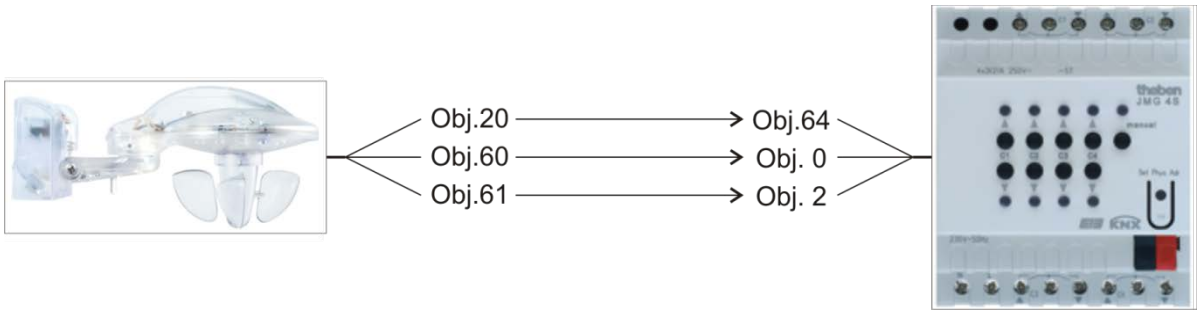


Figure 7

3.2.3 Objects and links

Table 25

No.	Meteodata 140 S Object name	No.	JMG 4 S Object name	Comment
20	*C1.1 Switching universal channel*	64	*Central safety 1*	-
60	*C11 Drives up/down*	0	*C1 – Up / down*	-
61	*C11 Blinds height*	2	*C1 - % height*	-

3.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 26: Meteodata 140 S

Parameter page	Parameter	Setting
Universal channel 1: Function	*Channel function*	*Link of the following sensors*
	Brightness	*no*
	Temperature	*yes*
	Wind	*yes*
	Rain	*no*
	Type of link	*OR*
	Temperature	*Below 3 °C*
	Temperature hysteresis	*1.0 °C*
	Wind speed	*Over 14 m/s (approx. 50 km/h)*
objects	*Telegram type C1.1*	*switching command*
	If all conditions are met	*send cyclically*
	Telegram	*ON*
	If not all conditions are met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 10 minutes*
	Telegram with recognised sensor error	*do not send anymore*
Sun protection channel C11	*Channel controls*	*Blinds*
	Sun position adjustment	*yes*
	Source for brightness measurement	*Maximum value of the 3 sensors*
Sun position adjustment	*Facade direction*	*east 90°*
	in front of the direction of the facade	*-40*
	After the direction of the facade	*70*
	Min. elevation (sun position over the horizon, 0..90°)	*10*
	And max. elevation (0..90°)	*90*
	Reposition every	*10 degrees*
	Calculation of slat position	*Automatic via slat dimensions*
	Spacing of slats in mm	*65*
	Width of slats in mm	*80*

Continuation:

Parameter page	Parameter	Setting
Sun control	*Activation of sun control*	*Via dawn/dusk threshold*
	Reaction to dusk	*Sun control off and raise*
Safety	*Safety check triggered by*	*condition: C1*
	Reaction to safety beginning	*No response**
	Reaction to safety end	*Update position*

* Safety response is assumed by actuator.

Table 27: JMG 4 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*GM is a JMG 4 S*
JMG 4 S general	*Safety objects 1-3*	*With cyclical monitoring 20 min*
GM JMG 4 S C1	*Type of curtain*	*Blinds*
	Runtime completely up	(depending on type of blinds)
	Complete turn of slat	(depending on type of blinds)
	Which safety objects function (OR-linked)	*Safety 1*
	Response in the event of bus failure	*Top end position*

3.3 Guttering heating

A heating strip mounted on the guttering should be switched on if there is risk of frost

3.3.1 Devices:

- Meteodata 140 S (1409207)
- RMG 8 S

3.3.2 Overview

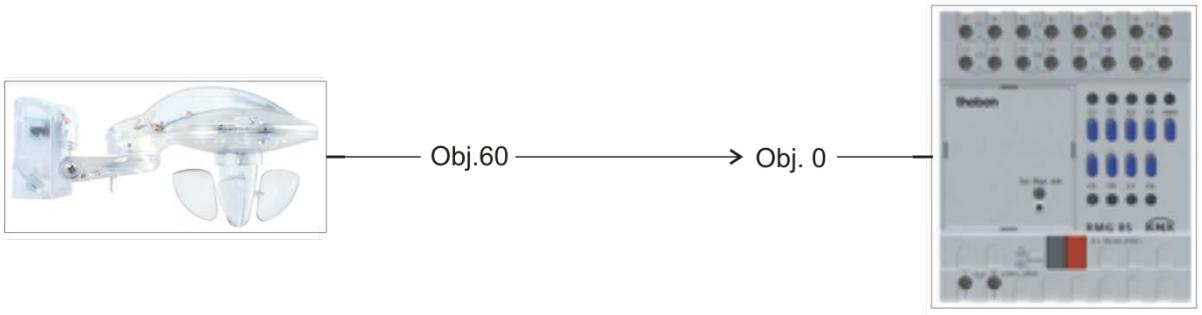


Figure 8

3.3.3 Objects and links

Table 28

No.	Meteodata 140 S Object name	No.	RMG 8 S Object name	Comment
20	*C1.1 Switching universal channel*	0	*RMG 8 S channel C1 switching object*	-

3.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 29: Meteodata 140 S

Parameter page	Parameter	Setting
Universal channel 1: Function	*Channel function*	*temperature sensor*
	Temperature	*Below 3 °C*
	Temperature hysteresis	*1,0 K*
objects	*Telegram type C1.1*	*switching command*
	If all conditions are met	*send cyclically*
	Telegram	*ON*
	If not all conditions are met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 60 minutes*
Sun protection channel C11	*Channel controls*	*Blinds*
	Sun position adjustment	*yes*
	Source for brightness measurement	*Sensor front*
Sun position adjustment	*Facade direction*	*east 90°*
	in front of the direction of the facade	*-40*
	After the direction of the facade	*70*
	Min. elevation (sun position over the horizon, 0..90°)	*10*
	And max. elevation (0..90°)	*90*
	Reposition every	*10 degrees*
	Calculation of slat position	*Automatic via slat dimensions*
	Spacing of slats in mm	*65*
	Width of slats in mm	*80*
Sun control	*Activation of sun control*	*Via dawn/dusk threshold*
	Reaction to dusk	*Sun control off and raise*
Safety	*Safety check triggered by*	*condition: C1*
	Reaction to safety beginning	*No response**
	Reaction to safety end	*Update position*

* Safety response is assumed by actuator.

Table 30: RMG 8 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Switching On/Off*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*

4 HMT 6/12 KNX - 4900273

Function	Description
General	Basic settings: Type of device and actuating value monitoring
Channel 1...6 or 12	Individual specifications for the control of the connected valves. Each channel can be parameterised individually.

4.1 Selection in the Product Databank

Manufacturer:	THEBEN-WERK ZEITAUTOMATIK
Product family:	Heating actuators
Product type:	triac actuators
Article name:	HMT 6 / HMT 12 for 6/12 heating circuits

Download the application from: http://www.theben.de

4.2 Communication Objects

4.2.1 Characteristics

No.	Object Name	Function	Type	Behaviour
0...5 or 11	Actuating values channel 1... 6 or 12	Control of the connected valves	1 Bit / 1 Byte	Receive
12...17 (23)	Forced mode channel 1 ... 6 12)	Activate forced mode	1 Bit	Receive
24	Summer mode	Activate summer mode[1]	1 Bit	Receive
25	Highest Actuating Value of all channels	Send largest actual actuating value of all 6 (12) channels (only during continuous control)	1 Byte	Send
26...37	Timeout of actuating value signal, channel 1...6 (12)	Send status report 0 = OK 1 = Timeout of the actuating value signal of channel ..	1 Bit	Send

[1]The summer mode status is saved internally and remains unchanged after bus failure and restoration of the bus supply.

4.4 Description

- **Objects 0...11 “Actuating Value Channel X“**

Input for the actuating value of the particular channel.
Every channel can be connected individually with an ON/OFF or continuous regulating room thermostat.
The use of the continuous actuating value is recommended thereby.
In this case, it is possible to react more quickly to changes and coupling with a boiler controller is possible (refer to Object 25).

- **Objects 12...23 “Forced Mode Channel X”**

A value of 1 on one of these objects puts the related channel into forced operation. The channel then heats constantly with the fixed actuating value (0...100%) set on the “Channel X” parameter page.

- **Object 24 “Summer Mode”**

A value of 1 on this object sets all channels parameterised for it into summer mode and heating is discontinued.
During summer mode, a valve protection program can be implemented optionally.

The *summer mode* object cannot be read.

- **Object 25 “Highest Actuating Value of all Channels”**

This object is available if at least one channel has been parameterised as a continuous controller.
The actuating values of the channels are permanently compared with each other and the currently highest value is always sent to this object.
In this way, the current heat demand of the system can always be transmitted to the heating boiler which can adapt its capacity exactly to the true demand.

For every channel, it is possible to select individually whether or not it should be taken into account for the calculation of the maximum actuating value. In this way, rooms to be ignored for the heat demand can remain out of consideration.

- **Objects 26...37 “Timeout of Actuating Value signal Channel 1...12“**

Only available if cyclical monitoring of the actuating value of the room thermostat has been selected for the associated channel.

If the monitoring is selected, the channel must receive an actuating value telegram regularly from the room thermostat. Recommendation: To guarantee fault-free operation, the cyclical sending time of the room thermostat should not amount to more than half of the monitoring time.
Example: Monitoring time 30min, cyclical sending time of the thermostat at least every 15 min.

If a new actuating value is not received within the parameterised monitoring time, a failure of the room thermostat will be assumed and an emergency program with a fixed actuating value (0 ... 100%) will be started.

This function can be selected or deactivated individually for every channel.
The monitoring time is set for all channels together on the “General” page.

4.5 The Parameters

General

The basic characteristics of the application can be defined on the “General” page.
The following can be set:

Table 1: Parameters on the “General” Page

Item	Values	Meaning
Used device	HMT 6 **HMT 12**	Select type of device in use
Send status of the actuating value monitoring	Always send at the end of the monitoring period **Send only in case of timeout of actuating value**	Should the status be sent in general or only in case of timeout of the actuating values ?
Time for cyclical monitoring of the actuating values	**ca. 30 min** ca. 60 min	Time setting after which a failure of the room thermostat should be recognised if no further actuating value has been received.

Valve protection (Comment):
If the “Valve protection” function is activated, the valves included are actuated once for 6 minutes every day during summer mode.
In this way, the seizing of the valve is effectively prevented.

Table 2: Parameters on the “Channel 1 – 12” Pages

Item	Values	Meaning
Type of actuating value	**Continuous** Switching	The room thermostat sends an actuating value in % The room thermostat sends only switch-on and switch-off signals.
Time of one control cycle (PWM period)	4, 5, 6, 8, 10, 12, **15**, 20, 25, 30 min	With “continuous” actuating values. A switching cycle consists of one switch-on and one switch-off operation and comprises a PWM period. Examples: - Actuating value = 20%, Time = 10min Means: Within the actuating cycle of 10min, switched on for 2min (i.e.. 20% of the actuating cycle) and switched off for 8 min. - Actuating values = 70% / Time = 10min Means: 7min on / 3min off. See Appendix: PWM cycle

Table 2: Continued

Item	Values	Meaning
Time for an actuating cycle for forced mode and emergency program	4, 5, 6, 8, 10, 12, **15**, 20, 25, 30 min	With “On/off” actuating value. In forced operation and in the emergency program, the on/off switching commands of the thermostat are replaced by a fixed actuating cycle. The cycle time is defined here.
Direction of control action of connected valve	**Channel ON --> Heating ON (Theben connected valves)** Channel ON --> Heating OFF	Adaptation to the connected valves installed, depending upon whether the valve: Is open when deenergised or Is closed when deenergised
Summer mode and valve protection	Ignore summer mode Summer mode without valve protection **Summer mode with valve protection**	The channel should continue to work normally in summer mode. No heating during summer mode No heating during summer mode, but the valve should be activated for 6 minutes every day. In this way, seizing of the valve will be prevented effectively.
Actuating value during forced mode	**0%**, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%	Select fixed actuating value which should control the valve in the forced mode.
Monitoring of actuating value	Without monitoring **with cyclical monitoring**	Should it be monitored whether or not the room thermostat regularly sends an actuating value? In this way, a malfunction of the thermostat can be recognised quickly and an emergency program started.

ON/OFF ratio for timeout of actuating value	0%, 10%, 20%, 30%, 40%, **50%**, 60%, 70%, 80%, 90%, 100%	Select fixed actuating value which should replace the actuating value of the thermostat during the emergency program.
Consider for determining the “Highest Actuating Value of all channels“ (Obj. 25)	No **Yes**	With actuating value “continuous”. Should the channel be included in the calculation of the Highest Actuating Value of all channels? See also: Obj. 25
Limitation of the actuating value	**None** User-defined (H… limits Page)	No limitation desired It should be possible to parameterise the highest and the lowest actuating values.

Table 3: Parameters on the "Limitation Channel 1 – 12" Pages

Item	Values	Meaning
Minimum actuating value	0%, 5%, **10%**, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%	Smallest permissible actuating value
Actuating value if less than the minimum actuating value	0% **0% = 0%, otherwise minimum actuating value**	Limit if an actuating value which lies below the minimum actuating value is received from the room thermostat: Control channel with 0%. Every actuating value received which lies beneath the minimum value will be limited to the value of the minimum actuating value previously set. If there is however no heat requirement (Actuating value = 0%), then the connected valve will be switched off completely (0%).
Maximum actuating values	55%, 60%, 65%, 70%, 75%, 80%, 85%, **90%**, 95%, 100%	Largest permitted actuating value. A maximum value of 90% lengthens the lifetime of the thermal connected valves. A maximum value of 100% reduces the number of switching cycles.
Actuating value if more than the maximum actuating value	**Maximum actuating value** 100%	Limit if an actuating value which lies over the maximum actuating value is received from the room thermostat: Limit channel to the maximum actuating value previously parameterised. Control channel with 100%.

See Appendix: Limitation of the actuating value

Remark:
The standard values for the actuating value limitation are set to 10% and 90%.

The minimum value of 10% enables faster reaction capability of the thermal connected valves during heating requirement.

A maximum value of 90% preserves the connected valves without restricting the heating power.
In this way, their lifetime will be extended significantly.

5 SMG 2 S KNX - 4910273 / Application in a MIX2 system

A **MIX 2 device** (order no. 493…) can accept any number of **MIX upgrade devices** (order no. 491…).

The object numbers and the allocation of parameters can vary from the original MIX applications.

Note:
MIX 2 upgrade devices (order no. 493…) can only work in combination with a MIX 2 basic device (order no. 493…).

5.1 Characteristics of the communications objects

Table 31

Object	Function	Object name	Type	Response
80	*Switching ON/OFF*	*GM DMG2S / SMG2S channel 1*	1 bit	Receive
81	*Brighter / darker*	*GM DMG2S / SMG2S channel 1*	4 bits	Receive
82	*Dimming value*	*GM DMG2S / SMG2S channel 1*	1 byte	Receive
83	*Soft switch*	*GM DMG2S / SMG2S channel 1*	1 bit	Receive
84	*Compulsory operation ON/OFF* *Dimming value for compulsory operation*	*GM DMG2S / SMG2S channel 1*	1 bit 1 byte	Receive
85	*Feedback in %*	*GM DMG2S / SMG2S channel 1*	1 byte	Send
86	*Feedback On/Off*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
87	*General error message*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
88	*Load failure message* *Excess temperature message* *Short circuit message* *Load type message (R, C/L)* *Bus/manual operation message*	*GM DMG2S / SMG2S channel 1*	1 bit	Send
89	*Status message (bit set)*	*GM DMG2S / SMG2S channel 1*	1 byte	Send
90-99 and 160-179: For all additional channels including second DME 2 S / SME 2 S upgrade module				
Central objects				
240	*Switching ON/OFF*	*Central continuous ON*	1 bit	Receive
241	*Switching ON/OFF*	*Central continuous OFF*	1 bit	Receive
242	*Switching ON/OFF*	*Central switching*	1 bit	Receive
243	*Call/save scene*	*Scene*	1 byte	Receive

5.2 Description of objects

- **Objects 80, 90, 160, 170** *""""" Switching ON/OFF"*

A 1 on this object dims up to 100%,
and 0 dims to 0%

- **Objects 81, 91, 161, 171** *"brighter/darker""*

This object is actuated with 4-bit telegrams (EIS 2 relative dimming).
This function can be used to dim the light up or down in increments (with 1...64 increments)
.
In the standard application, telegrams are sent with 64 increments.
IMPORTANT: The response to 4-bit telegrams depends on the "Switching On/Off with a 4-bit telegram" parameter.

- **Objects 82, 92, 162, 172** *"Dimming value"*

This object can be used to select the desired dimmer setting directly.
Format: 1 byte percentage value EIS 2 dimming, value.
0 = 0%
255 = 100%

- **Objects 83, 93, 163, 173** *"Soft switching"*

A "1" on this object starts a soft switching cycle, i.e.:
The brightness is gradually increased, starting from the minimum brightness.
The dimming value remains constant for the programmed time and is then gradually reduced after this time has elapsed.
Once the programmed minimum brightness has been reached the dimming value is reset to 0%.
The cycle can be extended or prematurely terminated via telegrams.

This sequence can also be controlled using a **time switch** if the "*Time between soft ON and soft OFF*" parameter is set to "*Until soft OFF telegram*".
The dimming cycle is then started with a "1" and finished with a "0".

- **Objects 84, 94, 164, 174** *"Compulsory operation = 1" / "Compulsory operation = 0" / "Compulsory operation via dimming value"*

The function of the compulsory operation object can be configured as a 1-bit or 1-byte object.

Table 32

Configuration	Compulsory operation		Response with compulsory operation	
	Trigger with	End with	Start	Ends
As 1-bit object	1 or 0 (configurable)	0 or 1 (configurable)	Configurable in the application program	
As 1-byte object	1 ... 255	0	The triggering telegram also acts simultaneously as a compulsory operation dimming value.	The last dimming value before compulsory operation is restored.

- **Objects 85, 95, 165, 175** *"Feedback in %"*

Sends the new dimming value after a change as soon as a dimming procedure is completed, i.e. once the new set point value has been reached.
Format: 1 byte, 0 ... 255 i.e. 0 ... 100%

IMPORTANT:
This object must not be placed in the same group address as object 82.

- **Objects 86, 96, 166, 176** *" Feedback On/Off"*

Sends the current dimming status:
1 = current dimming value is between 1% and 100%
0 = current dimming value is 0%

- **Objects 87, 97, 167, 177** *"General error message"*

Used as a malfunction signal:
0 = No error
1 = an error has been detected

This message can be displayed on a screen.
For detailed error analysis, see Object 89.

- **Objects 88, 98, 168, 178** *"Load failure message", "Excess temperature message", "Short circuit message"", "Load type message (R, C/L)", "Bus/manual mode operation"*

The function of this object is dependant on the "Diagnosis and feedback" parameter and the device type (DME 2 S or SME 2 S).
This allows a more specific error message.

Table 33: DME 2 S

"Diagnosis and feedback" parameter	Function of object 88	Application
Feedback objects, status, general error	-	-
Load failure, feedback objects, status, general error	Load failure message	1= open circuit, failure of light source,[1], automatic circuit-breaker tripped or no load connected.
Excess temp., feedback objects, status, general error	Excess temperature message[2]	1= the dimmer is overloaded: • connected power is too high, • ambient temperature is too high, • incorrect installation position, i.e. device cannot dissipate the heat, • booster defective.
Short circuit, feedback objects, status, general error	Short circuit message	1= check connected lines and load
R,C/L load, feedback objects, status, general error	Load type message (R, C/L)	1= Reverse phase control: With a resistive or capacitive loads (R/C), e.g. electronic transformers or incandescent lamps. 0= phase control: With inductive loads, e.g. conventional transformers.
Bus/manual, feedback objects, status, general error	Bus/manual operation message	Indicates whether the switch on the dimmer housing is set to bus operation or not. 1 = manual operation (manual 0 or manual 1 position) 0 = bus (bus position)

[1] Failed light sources can only be detected if the current supply for 230V is effectively interrupted (halogen spot lamps or normal incandescent bulbs). If light sources are connected in parallel or there is a load failure on the 12V secondary side of a transformer then the system does not detect a load failure.

[2] This telegram should not be used to determine the maximum dimmable power in an application.

Table 34: SME 2 S

"Diagnosis and feedback" parameter	Function of object 88	Application
Feedback objects, status, general error	-	-
Load failure, feedback objects, status, general error	Load failure message	No voltage supply to terminals 1-2
Excess temp., feedback objects, status, general error	Excess temperature message	Overload of 1-10 V connection. The channel is dimmed up to 100% and the status LED flashes rapidly.
Short circuit, feedback objects, status, general error	Short circuit message	SMG 2 / SME 2: Internal error. The status LED flashes rapidly and slowly in turn.
R,C/L load, feedback objects, status, general error	Load type message (R, C/L)	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The status LED flashes slowly (once a second).
Bus/manual, feedback objects, status, general error	Bus/manual operation message	Indicates whether the switch on the dimmer housing is set to bus operation or not. 1 = manual operation (manual 0 or manual 1 position) 0 = bus (bus position)

- **Objects 89, 99, 169, 179** *"Bit set status message"*

Diagnosis object for status and error display.
The relevance of the individual bits is dependent on the device type (DME 2 S or SME 2 S).

Status information is encoded in one byte according to the following bit pattern.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n.a.	n.a.	x	x	x	x	x	x

x = value 1 or 0

Table 35: DME 2 S

	Bit	Name	Application
Error	0	Load failure	1= open circuit, automatic circuit-breaker tripped or no load connected.
	1	Excess temperature	1= the dimmer is overloaded: connected power is too high, ambient temperature is too high, incorrect installation position, i.e. device cannot dissipate the heat, booster defective.
	2	DME 2 S Short circuit	1= check connected lines and load
Status	3	Type of load	1= reverse phase control (R, C load connected), electronic transformers or incandescent lamps test 0= phase control (L load connected), conventional transformers
	4	Manual/bus operation	1= manual switch on the device set to manual operation “0” or “1” 0= manual switch set to bus operation
	5	Dimming value	1= dimming value >0% 0= Dimming value = off

Table 36: SME 2 S

	Bit	Name	Application
Error	0	Load failure	No voltage supply to terminals 1-2
	1	Excess temperature	Overload of 1-10 V connection
	2	Short circuit	Internal error
Status	3	Type of load	No mains connection or no load connected to relay, no measurable voltage between terminals 3-4 or 7-8. The channel LED flashes slowly
	4	Manual/bus operation	1= manual switch on the device set to manual operation “0” or “1” 0= manual switch set to bus operation
	5	Dimming value	1= dimming value >0% 0= Dimming value = off

- **Object 240** *"Central continuous On"*

This object is a central object. It can be configured to work on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed "Participate" object to 100%.
If this object is set to "0" it does not effect the channels.

- **Object 241** *"Central continuous Off""*

This object is a central object. It can be configured to work on all channels.
If this object is set to "1" all of the channels "participating" in this object are dimmed "Participate" object to 0%.
If this object is set to "0" it does not effect the channels.

- **Object 242** *"Central switching"*

This object is a central object. It can be configured to work on all channels.
If a "1" or "0" is sent to this object then this is the same as if a "1" or "0" is sent to the switching objects of the channels (Object 80, Object 90, ...). The same functionality could also be achieved by connecting all switching objects to the same group as that of this object.
Accordingly, using this object saves time during the assignment of the group addresses and also saves on the number of associations.

- **Object 243** *"Call/save central scenes""*

This object can be used to save and subsequently call "scenes".
The save process stores the current status of the dimming channel, regardless of how the status was brought about (e.g. via dimming values, switching commands, central objects or the manual switches).
The saved status is thus restored when called up.
Each channel can participate in a maximum of 8 scenes.

The following telegrams need to be sent in order to call or save scenes:

Table 37

Function	Value hexadecimal	Decimal value	Function
Save scene 1	$80	128	Each channel saves its current dimming value in the scene memory with the sent scene number, provided the channel is intended to participate in this scene. This scene memory remains alive even after bus failure or mains failure.
Save scene 2	$81	129	
Save scene 3	$82	130	
Save scene 4	$83	131	
Save scene 5	$84	132	
Save scene 6	$85	133	
Save scene 7	$86	134	
Save scene 8	$87	135	
Call scene 1	$00	0	Each channel adopts the dimming value stored in the scene memory under the sent scene memory, provided the channel is intended to take part in this scene.
Call scene 2	$01	1	
Call scene 3	$02	2	
Call scene 4	$03	3	
Call scene 5	$04	4	
Call scene 6	$05	5	
Call scene 7	$06	6	
Call scene 8	$07	7	

5.3 Parameter overview

Each channel has up to 7 parameter pages, and all channels have an identical layout.

Table 38

Function	Description
DMG 2S / SMG 2 S C1: Function selection	Set basic functions of channel.
Dimming response	Load selection, dimming times etc.
Soft dimming	Soft dimming times
Compulsory operation	Response for compulsory operation
Scenes	Participation in scenes
Feedback	Diagnosis and feedback messages
Loss of power and restoration	Response for loss of bus power and restoration of power.

5.3.1 The parameter page "DMG 2S / SMG 2 S C1: Function selection"

Table 39

Designation	Values	Description
Activate soft dimming	*No* *Yes*	No soft dimming Fade in soft dimming parameter page
Activate compulsory operation function	*No* *Yes*	No compulsory operation function Fade in compulsory operation parameter page
Participation in scenes	*No* *Yes*	No scenes Fade in scenes parameter page
Participation in central objects	***Yes: in all central objects*** *No: in no central object* *only in central continuous ON* *only in central continuous OFF* *only in central switching* *only in central switching and continuous ON* *only in central switching and continuous OFF* *only in central permanent On and permanent OFF*	Defines which central objects the channel responds to.
Activate feedback messages	*No* *Yes*	No feedback messages Fade in feedback parameter page

5.3.2 The "Dimming response" parameter page

Table 40

Designation	Values	Description
Load selection (R, C or L) ONLY for DME 2	***Automatic load detection (standard)***	The dimmer detects what type of load is connected and automatically selects the appropriate dimming strategy (phase control or reverse phase control).
	R, C load (incandescent bulbs, electronic power units)	Phase control for resistive and capacitive loads (incandescent lamps, halogen high-voltage lamps etc.) For electronic transformers/power units designated for use with RC-mode dimmers (phase control/ trailing edge). **CAUTION: Connecting inductive loads (e.g. wound transformer, fan motor) could irreparably damage the dimmer.**
	L load (wound transformers)	Phase control for inductive loads (wound transformers). → With electronic transformers specifically designed for operating L-mode dimmers (phase control/leading edge) this setting can be used to achieve better dimming response.
	Fan (for devices from mid-2006)	Switch on at 100 % before setting value.
	Dimmable Energy saving lamps (device no. 491 0 271)	Only for dimmable energy saving lamps. See DMG 2 S KNX manual.
Minimum brightness	*5%, 10%, 15%, 20% , 25%, 30%, **35%**, 40%, 45%, 50%*	Minimum dimming value for all dimming processes (except 0%). Any values (switch-on brightness, response to bus failure etc.) which are below this threshold are increased to the minimum brightness.

Continuation:

Designation	Values	Description
Dimming time from 0% to 100%	*1 sec., 2 sec., 3 sec.* *4 sec., **5 sec.**, 6 sec.* *7 sec., 8 sec., 9 sec.* *10 sec., 11 sec., 12 sec.* *13 sec., 14 sec., 15 sec.* *20 sec., 30 sec., 40 sec.* *50 sec., 60 sec.*	This setting determines the dimming speed for 4-bit telegrams (brighter/darker).
When receiving a dimming value/scene no.	***Soft on with above set dimming time*** *Immediate on*	The dimming time parameter also applies here to the object dimming value. The received dimming value is adopted immediately.
Switch-on brightness	***Brightness value before previous switch-off*** *Minimum brightness* *100 %, 10 %, 20 %* *30 %, 40 %, 50 %* *60 %, 70 % , 80 %,* *90 %*	The last dimming value before switching off is saved and restored. The configured minimum brightness is adopted. The dimmer adopts the selected value after it is switched on. Here again the configured minimum brightness needs to be taken into account.
Switching on/off with a 4-bit telegram	 *No* ***Yes***	Defines the response if the channel is switched off and a 4-bit telegram (brighter/darker) is received. Channel remains switched on or off. Channel is switched on and dimmed or switched off.

5.3.3 The "Soft dimming" parameter page

Table 41

Designation	Values	Description
Time for Soft ON	*0 sec., 1 min., 2 min.* *3 min., 4 min., 5 min.* *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Duration of the dimming-up phase (t1) for Soft switching (see appendix). 0 sec. = switch on immediately. **IMPORTANT**: See appendix for further details: Retriggering and premature switch-off
Dimming value after Soft ON	*10 %, 20 %, 30 %, 40 %* *50 %, 60 %, 70 % , 80 %* *90 %, **100 %***	Final value at the end of the Soft on phase (val) Note: Here again the configured minimum brightness needs to be taken into account.
Time between Soft ON and Soft OFF	*Until "Soft Off" telegram*	No time restriction; Soft Off phase is initiated by a telegram
	1 sec., 2 sec. *3 sec., 4 sec., 5 sec.* *6 sec., 7 sec., 8 sec.* *9 sec., 10 sec., 15 sec.* *20 sec., 30 sec., 40 sec.* *50 sec., 1 min., 2 min.* *3 min., 4 min., **5 min.*** *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Delay (t2) to the start of the Soft Off phase
Time for Soft OFF	*0 sec., 1 min., 2 min.* *3 min., 4 min., 5 min.* *6 min., 7 min., 8 min.* *9 min., 10 min., 12 min.* *15 min., 20 min., 30 min.* *40 min., 50 min., 60 min.*	Duration of the Soft Off phase (t3) 0 sec. = switch off immediately **IMPORTANT**: See DMG 2 S KNX manual for further details.

5.3.4 The "Compulsory operation parameter page

Table 42

Designation	Values	Description
Compulsory operation function	*Compulsory operation through dimming value (0 = inactive)* *Activate compulsory operation with 1* *Activate compulsory operation with 0*	Compulsory operation is triggered by one-byte telegram with dimming value (See Compulsory operation object) Activation via 1-bit object 1 = active / 0 = inactive 0 = active / 1 = inactive
Behaviour at start of compulsory operation	*Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	Response to the receipt of a compulsory operation telegram Here again the configured minimum brightness needs to be taken into account.
Behaviour at end of compulsory operation	*Value before compulsory operation* *Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	Response to cancellation of compulsory operation Here again the configured minimum brightness needs to be taken into account.

5.3.5 The "Scenes" parameter page

Table 43

Designation	Values	Description
Participation in scene 1	***No*** *Yes*	Which scenes numbers should the channel react to (save/restore)?
Participation in scene 2	***No*** *Yes*	
Participation in scene 3	***No*** *Yes*	
Participation in scene 4	***No*** *Yes*	
Participation in scene 5	***No*** *Yes*	
Participation in scene 6	***No*** *Yes*	
Participation in scene 7	***No*** *Yes*	
Participation in scene 8	***No*** *Yes*	

5.3.6 The "Feedback" parameter page

Table 44: DME 2 S

Designation	Values	Description
Diagnosis and feedback		Function of the feedback objects + specific feedback via Object 88
	none	Do not send any diagnosis or feedback telegrams. Objects 85 .. 89 are hidden.
	Feedback object, status, general error	Object 85: Dimming value feedback Object 86: ON/OFF status feedback Object 87: General error message Object 88: Not used Object 89: Status
	Load failure, feedback objects, status, general error	as above, only Object 88 Load failure error message
	Excess temperature, feedback objects, status, general error	as above, only Object 88 Excess temperature error message
	Short circuit, feedback objects, status, general error	as above, only Object 88 Short circuit error message
	R,C/L load, feedback objects, status, general error	as above, only Object 88 Load type feedback
	Bus/manual, feedback objects, status, general error	as above, only Object 88 Bus/manual operation feedback
Send diagnosis and feedback cyclically	*only at change*	Only to be sent when something has changed
	cyclically and at change	To be sent at regular intervals and again after a change. The cycle time is set on the first parameter page (→*General)*: *Time for cyclical sending of feedback object (MIX series, order no.491...)*

Table 45: SME 2 S

Designation	Values	Description
Diagnosis and feedback		Function of the feedback objects + specific feedback via Object 88
	none	Do not send any diagnosis or feedback telegrams. Objects 85 .. 89 are hidden.
	Feedback object, status, general error	Object 85: Dimming value feedback Object 86: ON/OFF status feedback Object 87: General error message Object 88: Not used Object 89: Status
	Load failure, feedback objects, status, general error	as above, only object 88 error message: Failure of power unit
	Excess temperature, feedback objects, status, general error	as above, only Object 88 Error message overload of 1-10 V connection
	Short circuit, feedback objects, status, general error	as above, only Object 88 error message: Internal error
	R,C/L load, feedback objects, status, general error	as above, only object 88 error message: No mains supply or no load connected to relay. The channel LED flashes slowly.
	Bus/manual, feedback objects, status, general error	as above, only Object 88 Bus/manual operation feedback
Send diagnosis and feedback cyclically	***only at change***	Only to be sent when something has changed
	cyclically and at change	To be sent at regular intervals and again after a change

5.3.7 The power loss and restoration parameter page

Table 46

Designation	Values	Description
Dimming value after loss of bus power	***No change*** *Minimum brightness* *100 %* *Off* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %, 90 %*	How should the dimmer respond if the bus voltage fails and controls via the bus are therefore no longer available? Here again the configured minimum brightness needs to be taken into account.
Dimming value after restoration of bus or mains power	*Same as before bus failure* *Minimum brightness* *100 %* *OFF* *10 %, 20 %, 30 %* *40 %, 50 %, 60 %* *70 %, 80 %,* ***90 %***	How should the dimmer react when normal operation is restored (bus and mains supply available)? Here again the configured minimum brightness needs to be taken into account.

6 BMG 6 T KNX - 4930230

These typical applications are designed to aid planning and are not to be considered an exhaustive list.
It can be extended and updated as required.

6.1 Switching light

A push button is connected to the input terminals of I1.
The input I1 controls a channel of the switch actuator RME 8 S.

6.1.1 Devices:

- BMG 6 T (4930230)
- RMG 8 S (4930220)

6.1.2 Overview

Figure 9

6.1.3 Objects and links

Table 47: Links

No.	BMG 6 T Object name	No.	RMG 8 S Object name	Comment
0	*Switching ON/OFF*	0	*Switch object*	BMG 6 T sends switch commands to RMG 8 S

6.1.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 48: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Push button*
	Connected push button	*NO contact*
Objects for push buttons	*Object type*	*Switching*
	After short operation	*Send telegram*

Table 49: RMG 8 S

Parameter page	Parameter	Setting
RMG 8 S channel C1: Functions	*Channel function*	*Switching On/Off*

6.2 Water level monitoring with alert input

When exceeding a certain water level, an alert shall be issued.

A float switch is connected to the input terminals of I1.
The input I1 controls a channel of the switch actuator RME 8 S, to which an optical or acoustical signalling device is connected.
An acknowledgement push button is connected to input I2, which can send the acknowledgement telegram to the acknowledgement object of I1.

The alert can be terminated with the acknowledgement push button under the following conditions:

- Permanently: As soon as the trigger is not present anymore (water level dropped).
- Temporarily: During persistent fault (e.g. water level too high).

6.2.1 Devices:

- BMG 6 T (4930230)
- RMG 8 S (4930220)

6.2.2 Overview

Figure 10

6.2.3 Objects and links

Table 50: BMG 6 T, alert

No.	BMG 6 T Object name	No.	RMG 8 S Object name	Comment
0	*Switching ON/OFF*	0	*Switch object*	I1 sends the alert as a switch command to RMG 8 S

Table 51: BMG 6 T acknowledgement

No.	BMG 6 T Object name	No.	BMG 6 T Object name	Comment
0	*Switching ON/OFF*	5	*Acknowledge alert*	I2 sends acknowledgement to I1.

6.2.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 52: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Switch*
	Connected push button	*NO contact*
	Use channel as an alert input	*yes*
	Report fault	*with rising edge*
	Acknowledgement mandatory	*yes*
	Acting direction of the acknowledgement object	*acknowledge with 1*
Objects for switch	*Object type*	*Switching*
	Send if input = 1 (or fault active)	*Send telegram*
	Telegram	*ON*
	Send if input = 0 (or fault inactive)	*OFF*
BMG 6 T Channel I2: Functions	*Input function*	*Push button*
	Connected push button	*NO contact*
Objects for switch	*Object type*	*Switching*
	After short operation	*Send telegram*
	Send telegram cyclically	*no*

Table 53: RMG 8 S

Parameter page	Parameter	Setting
RMG 8 S channel C1: Functions	*Channel function*	*Switching On/Off*

6.3 Dimming

A push button is connected to the input terminals of I1.
The input I1 controls a channel of the dimming actuator DMG 2 T.

6.3.1 Devices:

- BMG 6 T (4930230)
- DMG 2 T (4930270)

6.3.2 Overview

Figure 11

6.3.3 Objects and links

Table 54: Links

No.	BMG 6 T Object name	No.	DMG 2 T Object name	Comment
0	*Switching ON/OFF*	0	*Switching On/Off*	Long button push for brighter/darker dimming commands. Short button push for On/Off commands.
1	*Brighter/Darker*	1	*brighter/darker*	

6.3.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 55: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Dimming..*
Dimming function	*Reaction to long/short*	*Single-surface operation*

Table 56: DMG 2 T

Parameter page	Parameter	Setting
Dimming response	*Switching on/off with a 4-bit telegram*	*no*

6.4 Controlling blinds or blinds group

2 push buttons are connected to the input terminals of I1 and I2 (or one double push button).
Input I1 is used for raising and I2 for lowering the blinds.
Both inputs together control a channel of blinds actuator JMG 4 T.

6.4.1 Devices:

- BMG 6 T (4930230)
- JMG 4 T (4930250)

6.4.2 Overview

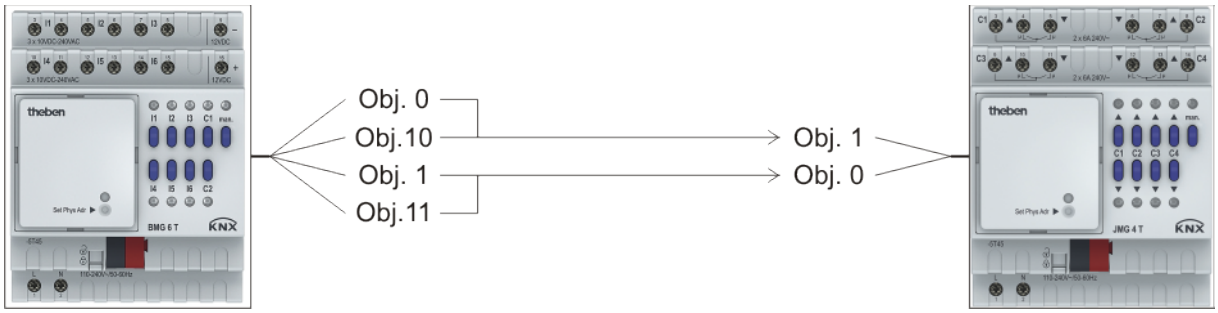


Figure 12

6.4.3 Objects and links

Table 57: Links

No.	BMG 6 T Object name	No.	JMG 4 T Object name	Comment
0	*Step/Stop*	1	*Step/Stop*	Short button push on I1/I2 for Step/Stop command.
10	*Step/Stop*			
1	*UP*	0	*UP/DOWN*	Long button push on I1 for UP operating command.
11	*DOWN*			Long button push on I2 for DOWN operating command.

6.4.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 58: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Blinds..*
Blinds function	*Operation*	*UP*
BMG 6 T Channel I2: Functions	*Input function*	*Blinds..*
Blinds function	*Operation*	*DOWN*

Table 59: JMG 4 S

Parameter page	Parameter	Setting
JMG 4 S	*Type of hanging*	*Blinds*

6.5 Counter function: Visitor counter with turnstile

A turnstile is connected to the input terminals of I1.
This provides a pulse for counting people with every passing.
Input I1 counts the pulses and sends the current meter reading to the VARIA 826 S multi function display.
The counter can be reset anytime via another object.

6.5.1 Devices

- BMG 6 T (4930230)
- VARIA 826 S (8269210)

6.5.2 Overview

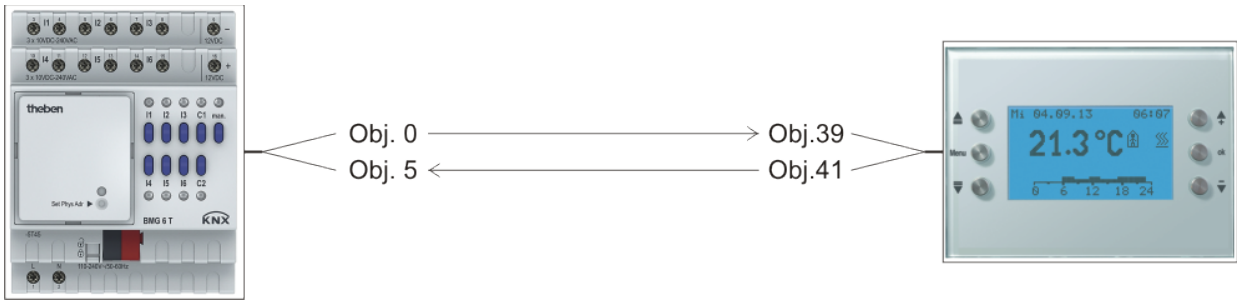


Figure 13

6.5.3 Objects and links

Table 60: Links

No.	BMG 6 T Object name	No.	VARIA 826 S Object name	Comment
0	*Send counter value*	39	*Display page 1, line 1 Counter value 0 ..65535*	BMG 6 T sends the current counter value to the display.
5	*Reset counter*	41	*Operation page 1, line 2 Switching ON/OFF*	Reset counter.

6.5.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 61: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Counter*

Table 62: VARIA 826 S

Parameter page	Parameter	Setting
Selection of display pages	*Show page 1 for display objects*	*yes*
	Show weather forecast on page 1	*no*
Page 1, line 1	*Line format*	*16 bit counter value object type (DPT 7.001, 8.001)*
	Text for line 1	Visitors
	Unit for display object	*prs*
	Value range	*positive numbers only*
	Authorise amendment of object value	*no*
Page 1, line 2	*Line format*	*Switching object type (DPT 1.xxx)*
	Text for line 1	Reset
	Text at object value = 0	*
	Text at object value = 1	*
	Authorise amendment of object value	*yes*
	Function of +/- buttons	*+/- = ON*
	Display before receipt of a value	*Space*

*These lines shall remain empty, please do not fill in.

6.6 Sequence function: Fan control

A push button is connected to the input terminals of I1.
Input I1 controls a fan via the MIX2 dimming actuator DMG 2 T.
With each short button push, I1 sends a new setpoint value to the dimmer, in the sequence 0 % - 30 % - 60 % - 100 % - 0 % etc.
The fan can be switched on with a long button push.

6.6.1 Devices:

- BMG 6 T (4930230)
- DMG 2 T (4930270)

6.6.2 Overview

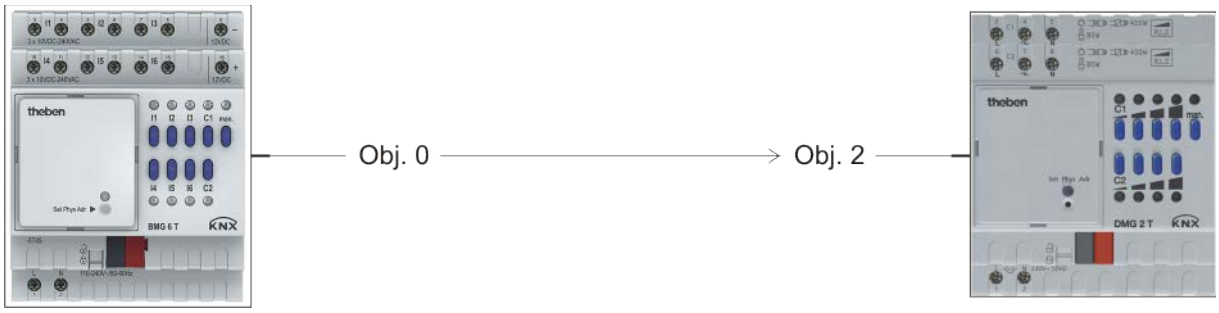


Figure 14

6.6.3 Objects and links

Table 63: Links

No.	BMG 6 T Object name	No.	DMG 2 T Object name	Comment
0	*Send percentage value*	2	*Dimming value*	With each short button push, BMG 6 T sends a new setpoint value to the dimmer, in the sequence 0 % - 30 % - 60 % - 100 %

6.6.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 64: BMG 6 T

Parameter page	Parameter	Setting
BMG 6 T Channel I1: Functions	*Input function*	*Sequence..*
	Object 1 type	*Percentage value (1 byte)*
	Sequence details	*1-2-3-4-1-2-3-4*
	With a long button push	*set to step 1* (i.e. switch off)
	Response after bus and mains restoration	*Step 1 (immediately)*
Sequence function	*FIRST STEP*	
	Send object 1	*yes*
	Telegram	*0 %*
	Send object 2	*no*
	Send object 3	*no*
	Send object 4	*no*
	SECOND STEP	
	Send object 1	*yes*
	Telegram	*30 %*
	Send object 2	*no*
	Send object 3	*no*
	Send object 4	*no*
	THIRD STEP	
	Send object 1	*yes*
	Telegram	*60 %*
	Send object 2	*no*
	Send object 3	*no*
	Send object 4	*no*
	FOURTH STEP	
	Send object 1	*yes*
	Telegram	*100 %*
	Send object 2	*no*
	Send object 3	*no*
	Send object 4	*no*

Table 65: DMG 2 T

Parameter page	Parameter	Setting
When receiving an absolute value dimming behaviour	*Load selection*	*Fan (soft switching deactivated)*
	Start-up time	*10 s*
	Dimming time 1 from 0% to 100%	*1-60 s (if used)*
	When receiving an absolute value	*See below**
	Switching on/off with a 4-bit telegram	*no*

* For a fast reaction of the fan: select *startup*.
For a slow change of the speed: select *dimming with dimming time 1* and set *dimming time 1 from 0 % to 100 %* as desired.

7 RMG 8 S KNX - 4930220

These examples of use are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

7.1 2x switching with push button interface

2 push buttons are connected to a TA 2 push button interface and they control 2 channels
on the RMG 8 S.

7.1.1 Devices:

- RMG 8 S (4930220)
- TA 2 (4969202)

7.1.2 Overview

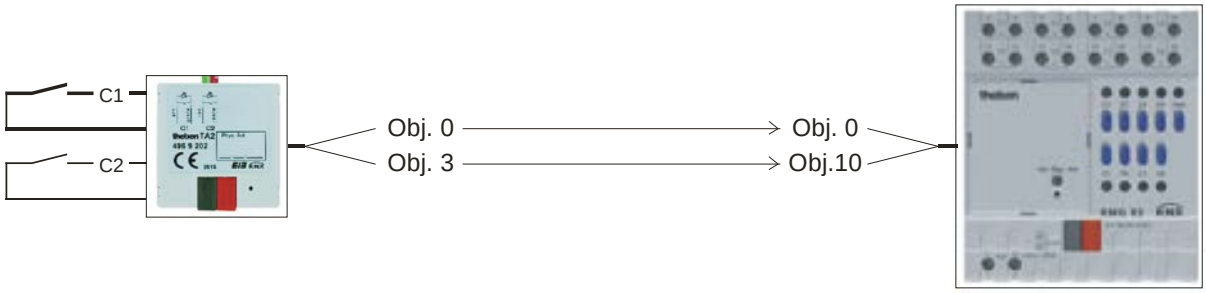


Figure 15

7.1.3 Objects and links

Table 66

No.	TA 2 Object name	No.	RMG 8 S Object name	Comments
0	*Channel 1 switching*	0	*RMG 8 S channel C1 Switching object*	-
3	*Channel 2 switching*	10	*RMG 8 S channel C2 switching object*	-

7.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 67: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*BY*
	Response to falling edge	*none*
Channel 2	*See channel 1*	

Table 68: RMG 8 S

Parameter page	Parameters	Setting
RMG 8 S channel C1: Function selection	*Channel function*	*Switching ON/OFF*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*
RMG 8 S channel C2	*See channel C1*	

7.2 Operate light with service counter and display

A flourescent light strip in a hall is controlled by channel C1.
The lights have to be replaced after 20,000 hours (= service).
The time period to the service and the service status are shown on the VARIA 826 display.

7.2.1 Devices

- RMG 8 S (4930220)
- VARIA 824 / 826 (8249200 / 8269200)

7.2.2 Overview

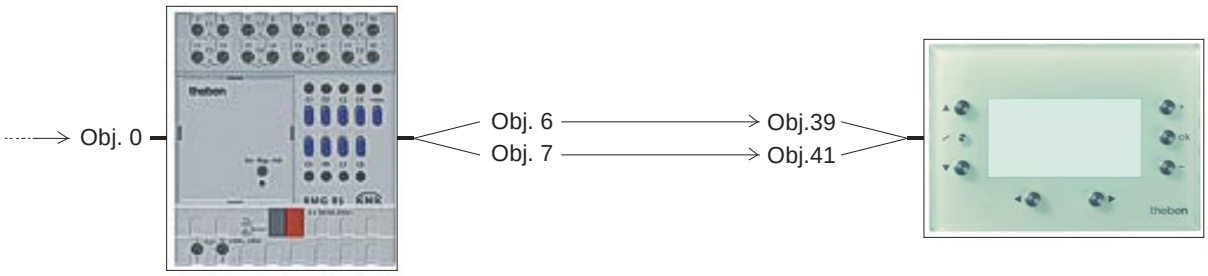


Figure 16

7.2.3 Objects and links

Table 69

No.	KNX sensor Object name	No.	RMG 8 S Object name	Comments
-	*(Switching object)*	0	*Switching object*	Any KNX sensor: Push button, timer, twilight switch etc sends the switch command to RMG 8 S

Table 70:

No.	RMG 8 S Object name	No.	VARIA Object name	Comments
6	*Time to next service*	39	*Counter value 0 ..65535*	Time in hours
7	*Service required*	41	*Switching ON/OFF*	1 = Time has elapsed

7.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 71: RMG 8 S

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Switching ON/OFF*
	Activate operating hours counter	*Yes..*
Contact characteristics	*Type of contact*	*NO contact*
Operating hours counter and service	*Type of operating hours counter*	*Counter for time period before next service*
	Service interval (0..2000 x 10 h)	*200*
	Reporting of changes to time to service (0..100 h, 0 = no report)	*100*
	Report service cyclically	*Yes*

Table 72: VARIA 824/826

Parameter page	Parameters	Setting
Select screens	*Show page 1 for display objects*	*Yes*
Display objects page 1	*Fade in operating instructions on page 1*	*No*
	Page heading	*Lamp maintenance**
Page 1, line 1	*Line format*	*16 bit counted measurement object type*
	Text for line 1	*Service in**
	Unit for display object	*h*
	Value range	*Negative and positive numbers*
	Display before receipt of value	*Read from object via bus*
Page 1, line 2	*Line format*	*Switch on object type*
	Text for line 1	*Lamp status**
	Text for object value = 0	*OK**
	Text for object value = 1	*Service**
	Display before receipt of value	*Read from object via bus*

*Suggested text

7.3 Simple alarm function with flashing light

A monitoring device, e.g. flood alarm is connected to a TA 2 push button interface and it controls a channel on the RMG 8 S.
A lamp flashes in the event of an alarm (channel 1 relay output).

7.3.1 Devices:

- RMG 8 S (4930220)
- TA 2 (4969202)

7.3.2 Overview

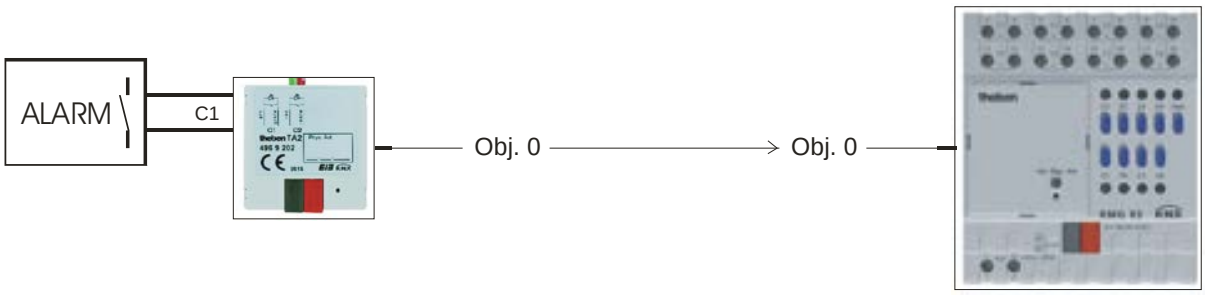


Figure 17

7.3.3 Objects and links

Table 73

No.	TA 2 Object name	No.	RMG 8 S Object name	Comments
0	*Channel 1 switching*	0	*RMG 8 S channel C1 Switching object*	-

7.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 74: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*On*
	Response to falling edge	*Off*

Table 75: RMG 8 S

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Flashing*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*
Flashing	*ON phase:*	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	OFF phase:	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	How often should it flash	*Until it switches off*

8 RMG 4 I KNX - 4930210

These examples of use are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

8.1 2x switching with push button interface

2 push buttons are connected to a TA 2 push button interface and they control 2 channels
on the RMG 4 I.

8.1.1 Devices:

- RMG 4 I (4930210)
- TA 2 (4969202)

8.1.2 Overview

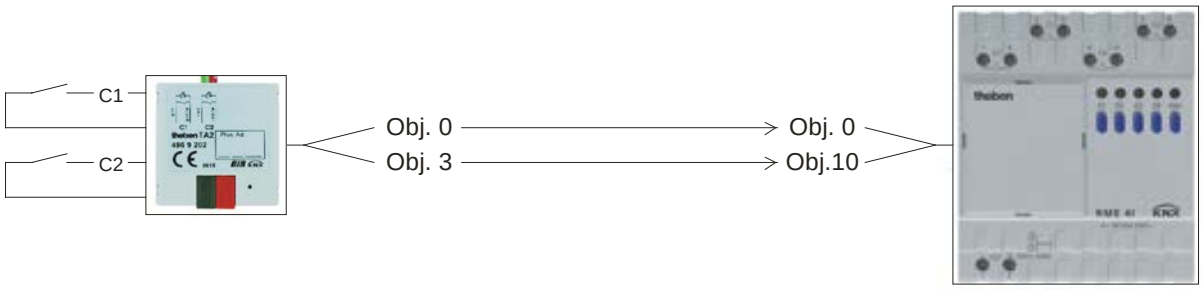


Figure 18

8.1.3 Objects and links

Table 76

No.	TA 2 Object name	No.	RMG 4 I Object name	Comments
0	*Channel 1 switching*	0	*RMG 4 I channel C1 Switching object*	-
3	*Channel 2 switching*	10	*RMG 4 I channel C2 switching object*	-

8.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 77: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*BY*
	Response to falling edge	*none*
Channel 2	*See channel 1*	

Table 78: RMG 4 I

Parameter page	Parameters	Setting
RMG 4 I channel C1: Function selection	*Channel function*	*Switching ON/OFF*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*
RMG 4 I channel C2	*See channel C1*	

8.2 Operate light with service counter and display

A flourescent light strip in a hall is controlled by channel C1.
The lights have to be replaced after 20,000 hours (= service).
The time period to the service and the service status are shown on the VARIA 826 display.

8.2.1 Devices

- RMG 4 I (4930210)
- VARIA 824 / 826 (8249200 / 8269200)

8.2.2 Overview

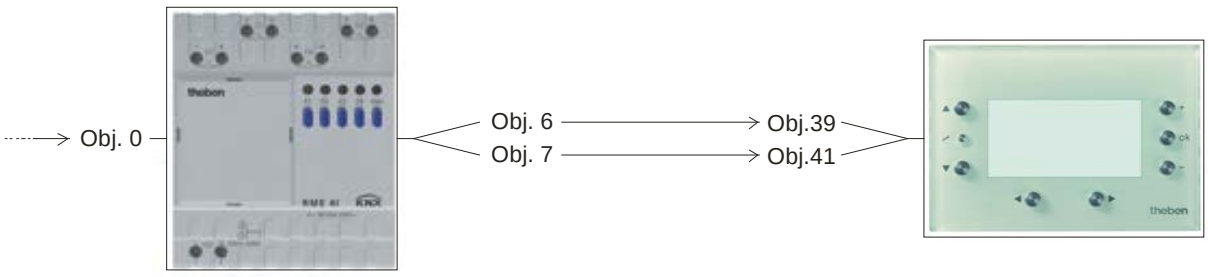


Figure 19

8.2.3 Objects and links

Table 79

No.	KNX sensor Object name	No.	RMG 4 I Object name	Comments
-	*(Switching object)*	0	*Switching object*	Any KNX sensor: Push button, timer, twilight switch etc sends the switch command to RMG 4 I

Table 80:

No.	RMG 4 I Object name	No.	VARIA Object name	Comments
6	*Time to next service*	39	*Counter value 0 ..65535*	Time in hours
7	*Service required*	41	*Switching ON/OFF*	1 = Time has elapsed

8.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 81: RMG 4 I

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 4 I*
RMG 4 I channel C1 function selection	*Channel function*	*Switching ON/OFF*
	Activate operating hours counter	*Yes..*
Contact characteristics	*Type of contact*	*NO contact*
Operating hours counter and service	*Type of operating hours counter*	*Counter for time period before next service*
	Service interval (0..2000 x 10 h)	*200*
	Reporting of changes to time to service (0..100 h, 0 = no report)	*100*
	Report service cyclically	*Yes*

Table 82: VARIA 824/826

Parameter page	Parameters	Setting
Select screens	*Show page 1 for display objects*	*Yes*
Display objects page 1	*Fade in operating instructions on page 1*	*No*
	Page heading	*Lamp maintenance**
Page 1, line 1	*Line format*	*16 bit counted measurement object type*
	Text for line 1	*Service in**
	Unit for display object	*h*
	Value range	*Negative and positive numbers*
	Display before receipt of value	*Read from object via bus*
Page 1, line 2	*Line format*	*Switch on object type*
	Text for line 1	*Lamp status**
	Text for object value = 0	*OK**
	Text for object value = 1	*Service**
	Display before receipt of value	*Read from object via bus*

*Suggested text

8.3 Simple alarm function with flashing light

A monitoring device, e.g. flood alarm is connected to a TA 2 push button interface and it controls a channel on the RMG 4 I.
A lamp flashes in the event of an alarm (channel 1 relay output).

8.3.1 Devices:

- RMG 4 I (4930210)
- TA 2 (4969202)

8.3.2 Overview

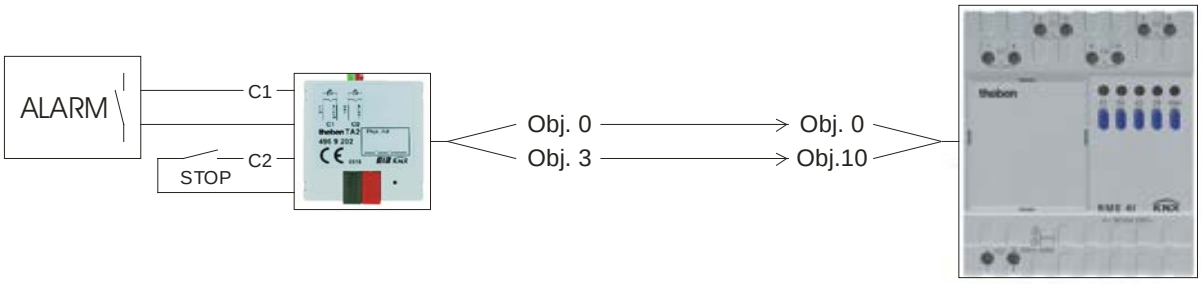


Figure 20

8.3.3 Objects and links

Table 83

No.	TA 2	No.	RMG 4 I	Comments
	Object name		Object name	
0	*Channel 1 switching*	0	*RMG 4 I channel C1 Switching object*	-

8.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 84: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*On*
	Response to falling edge	*Off*

Table 85: RMG 4 I

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 4 I*
RMG 4 I channel C1 function selection	*Channel function*	*Flashing*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*
Flashing	*ON phase:*	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	OFF phase:	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	How often should it flash	*Until it switches off*

8.4 Display and monitor current value

The actual current value is to be sent to the bus via channel C1 and shown on a VARIA display. A message is to be issued in the event of overload (I > 1 A). Control of channel C1 (obj. 0 or obj. 1) is not relevant for this example and is not described in detail.

8.4.1 Devices:

- RMG 4 I (4930210)
- VARIA 824 / 826 (8249200 / 8269200 / 8269201)

8.4.2 Overview

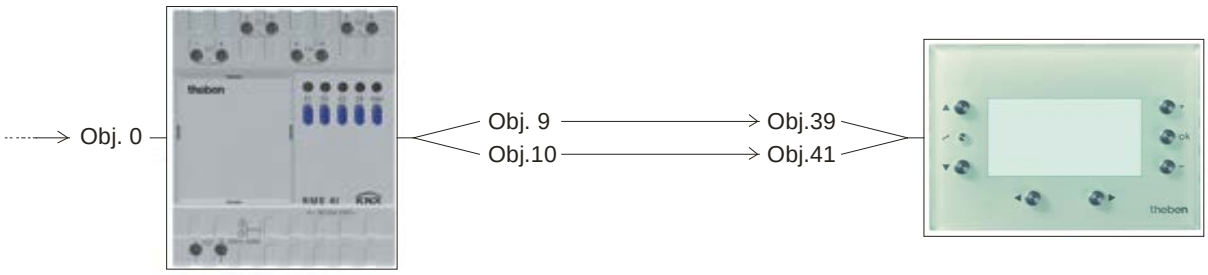


Figure 21

8.4.3 Objects and links

Table 86

No.	RMG 4 I Object name	No.	VARIA 824/826 Object name	Comments
9	*RMG 4 I channel C1 current value*	39	*Display page 1, line 1*	Current value
10	*RMG 4 I channel C1 Overload*	41	*Display page 1, line 2*	Overload status

8.4.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 87: RMG 4 I

Parameter page	Parameters	Setting
RMG 4 I channel C1: Function selection	*Activate current measurement*	*Yes*
Current measurement	*Send current value in the event of change*	*by 100 mA*
	Send current value cyclically	*Yes*
	Conversion of current in theoretical output	*No*
	Monitoring of overload	*Yes*
	Threshold value for overload (1..200) x 100 mA	*10*
	Hysteresis for overload (10..100 %)	*10*
	Telegram in the event of overload	*ON telegram*
	Telegram if load is not exceeded	*OFF telegram*

Table 88: VARIA

Parameter page	Parameters	Setting
Select screens	*Show page 1 for display objects*	*Yes*
Display objects page 1	*Fade in operating instructions on page 1*	*No*
	Page heading	*Current display**
Page 1, line 1	*Line format*	*Object type: EIS5*
	Text for line 1	*Current value**
	Unit for display object	*mA*
	Authorise amendment of object value?	*No*
	Display before receipt of value	*---*
Page 1, line 2	*Line format*	*Object type: Switching*
	Text for line 1	*Overload **
	Unit for display object	*mA*
	Text at object value = 0	*No**
	Text at object value = 1	*YES**
	Authorise amendment of object value?	*No*
	Display before receipt of value	*Read from object via bus*

* Or any customer-specific text

9 HMG 6 T KNX - 4930240

These typical applications are designed to aid planning and are not to be considered an exhaustive list.
It can be extended and updated as required.

9.1 Simple control with one HMG 6 T channel as heating actuator

Channel 1 is configured as a heating actuator and is controlled by a VARIA room thermostat. Presence and window status are sensed by a presence detector and a window contact. Summer mode is selected manually by means of a switch.

9.1.1 Devices:

- HMG 6 T (Order no. 4930240)
- VARIA 826 / 826 S KNX (Order no. 8269200, 8269210, 8269211)
- TA 2 (Order no. 4969202)
- Compact office EIB (Order no. 2019200)

9.1.2 Overview

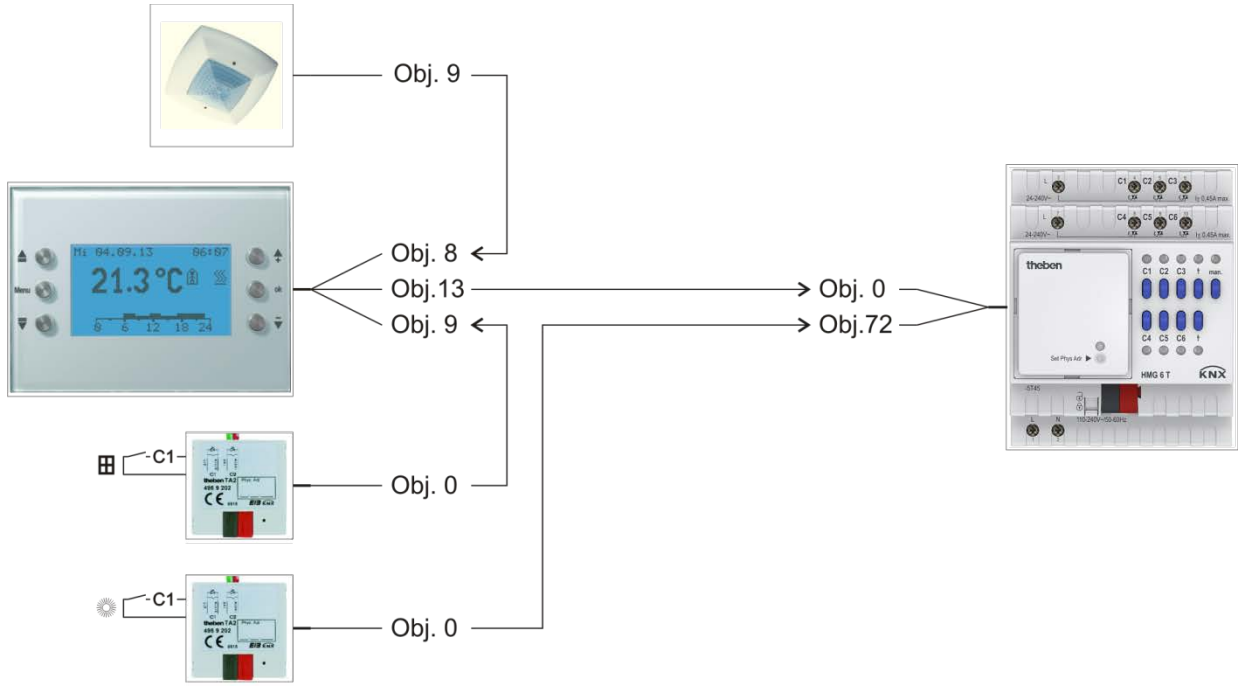


Figure 22

9.1.3 Objects and links

Table 89:

No.	Compact Office Object name	No.	Varia Object name	Comment
9	*Presence output*	8	*Input for presence signal*	Energy-saving function.

Table 90:

No.	TA 2 window contact ⊞ Object name	No.	Varia Object name	Comment
0	*Channel 1 switching*	9	*Input for window contact*	A window contact is connected to C1. On = Window is open Off = Window is closed. When the window is opened, the VARIA RTR changes to the frost protection operating mode.

Table 91:

No.	TA 2 summer mode Object name	No.	HMG 6 T Object name	Comment
0	*Channel 1 switching*	72	*Summer mode ON/OFF*	A switch is connected to C1. On = Summer mode Off = Winter mode.

Table 92:

No.	Varia Object name	No.	HMG 6 T Object name	Comment
13	*Heating actuating value*	0	*Continuous actuating value*	Actuating value for the heating channel.

9.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 93: HMG 6 T

Parameter page	Parameter	Setting
General	*Type of basic module*	*HMG 6 T*
HMG 6 T Channel H1: Configuration options	*Channel function*	*Heating actuator*
	Type of actuating value	*Continuous*
	Include in summer mode	*yes*

Table 94: VARIA

Parameter page	Parameter	Setting
RTR setting	*CONTROL*	*Heating control only*
	Objects for determining the operating mode	*New: operating mode, presence, window status.*
	Type of presence sensor	*Presence detector*
Heating control	*Number of heating stages*	*Only one heating stage*
	Type of control	*Continuous control*

Table 95: Compact Office EIB

Parameter page	Parameter	Setting
General data	*select*	*Master in single unit operation*
	Presence output	*active*
	Normal or test operation mode	*Standard operation*
Presence output	*Presence switch-on delay*	*5 minutes*
	Behaviour at start of presence	*Send ON telegram*
	Behaviour at end of presence	*Send OFF telegram*

Table 96: TA 2 for window contact.

Parameter page	Parameter	Setting
Channel 1	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*

* Depending on type of window contact.
The details in brackets refer to the following case:
Window closed → contact closed

Table 97: TA 2 for summer mode.

Parameter page	Parameter	Setting
Channel 1	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON*
	Response to falling edge	*OFF*
	Send telegram cyclically	*yes*
	Cycle time	*60 minutes*
	Response after restoration of the bus supply	*update*

9.2 School location : HMG 6 T as heating controller with automatic summer mode.

The HMG 6 T basic module controls the heating in 6 classrooms.
The room temperature is determined by an Amun 716* CO2 sensor.
The HVAC operating mode is controlled centrally by a timer.
If a window is opened, control changes to the frost protection mode.
The comfort mode is activated by a presence button.
To save energy costs, control should change over to the summer mode automatically when the weather is mild.
This is achieved with the aid of a Meteodata 139 weather data receiver.

9.2.1 Devices:

- HMG 6 T (Order no. 4930240)
- Amun 716 KNX (Order no. 7169200)
- TA 2 (Order no. 4969202)
- TR 648 top2 RC KNX (Order no. 6489212)
- Meteodata 139 KNX (Order no. 1399200)

* Additional functions of the CO^2 sensor (ventilation control etc.) are described in detail in the Amun 716 KNX manual and are not discussed here.

9.2.2 Overview

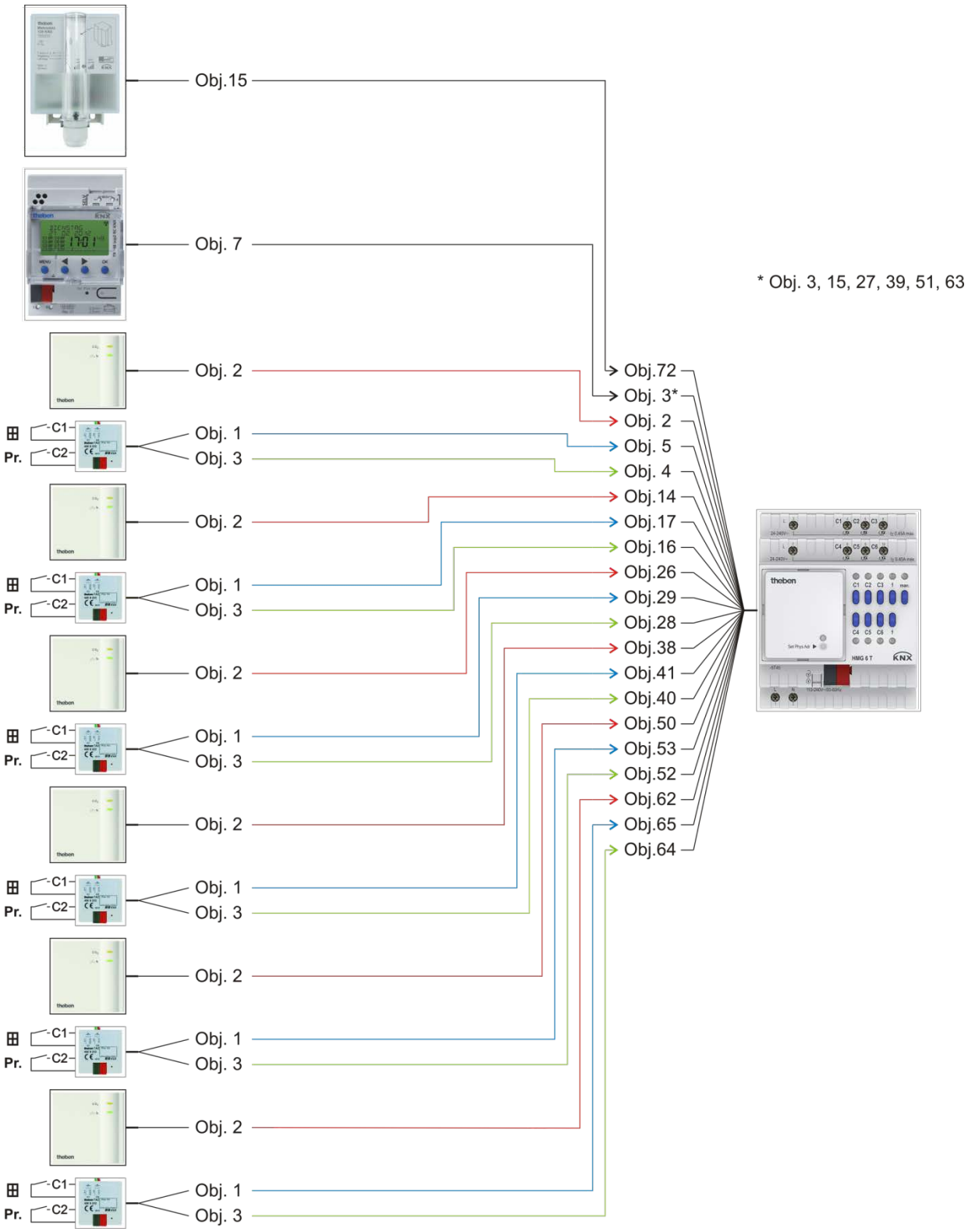


Figure 23

9.2.3 Objects and links

Table 98:

No.	Meteodata 139 Object name	No.	HMG 6 T Object name	Comment
15	*Summer mode heating message*	72	*Summer mode ON/OFF*	The Meteodata 139 activates the summer mode if all conditions are met.

Table 99:

No.	TR 648 top 2 RC KNX Object name	No.	HMG 6 T Object name	Comment
7	*HVAC switching channel*	3 15 27 39 51 63	*Operating mode preset Channel H1*	Central function for specifying the operating mode in all rooms. All objects share a common group address.

Table 100: Rooms 1-6.

No.	6x Amun 716 Object name	No.	HMG 6 T Object name	Comment
2	*Temperature value*	2	*Actual value*	Current room temperature in room 1
2	*Temperature value*	14	*Actual value*	Current room temperature in room 2
2	*Temperature value*	26	*Actual value*	Current room temperature in room 3
2	*Temperature value*	38	*Actual value*	Current room temperature in room 4
2	*Temperature value*	50	*Actual value*	Current room temperature in room 5
2	*Temperature value*	62	*Actual value*	Current room temperature in room 6

Table 101: 6x TA 2 , rooms 1-6.

No.	TA 2 Object name	No.	HMG 6 T Object name	Comment
1	*Channel 1 switching*	5	*Window position*	Window position and presence status for room 1
3	*Channel 2 switching*	4	*Presence*	
1	*Channel 1 switching*	17	*Window position*	Window position and presence status for room 2
3	*Channel 2 switching*	16	*Presence*	
1	*Channel 1 switching*	29	*Window position*	Window position and presence status for room 3
3	*Channel 2 switching*	28	*Presence*	
1	*Channel 1 switching*	41	*Window position*	Window position and presence status for room 4
3	*Channel 2 switching*	40	*Presence*	
1	*Channel 1 switching*	53	*Window position*	Window position and presence status for room 5
3	*Channel 2 switching*	52	*Presence*	
1	*Channel 1 switching*	65	*Window position*	Window position and presence status for room 6
3	*Channel 2 switching*	64	*Presence*	

9.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 102: HMG 6 T

Parameter page	Parameter	Setting
General	*Type of basic module*	*HMG 6 T*
HMG 6 T Channel H1-H6: Configuration options	*Channel function*	*Heating controller*
	Include in summer mode	*yes*
Settings	*CONTROL*	*Standard*
select	*Type of presence sensor*	*Presence buttons*

Table 103: Meteodata 139 KNX

Parameter page	Parameter	Setting
Summer mode	*These parameter settings depend on the local circumstances and the particular user requirements.*	

Table 104: TR 648 top 2 RC KNX

Parameter page	Parameter	Setting
Switching channel C1	*Telegram type C1.1*	*HVAC operating mode*

Table 105: 6x Amun 716

Parameter page	Parameter	Setting
Measured values	*Transmit temperature in the event of change of*	*0.2°C*

Table 106: 6x TA 2

Parameter page	Parameter	Setting
Channel 1	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*
Channel 2	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON*
	Response to falling edge	*none*
	Response after restoration of the bus supply	*none*

* Depending on type of window contact. The details in brackets refer to the following case: Window closed → contact closed.

10 JMG 4 T / 24V KNX - 4930250 / 4930260

These typical applications are designed to aid planning and are not to be considered an exhaustive list.
It can be extended and updated as required.

10.1 Basic switching, simple blind control

The push button interface TA 4 controls the blinds actuator JMG 4 T.
1 single push button is connected to the push button interface TA 4 for each set of blinds (single-surface operation).
Depending on whether the push buttons are pressed for a short or long time, the push button interface sends an up/down or step/stop telegram.
The blinds should be raised in the evenings and remain open at night.
For this purpose the timer TR 648 top2 RC is programmed in such a way that channel 1 sends an Off telegram (astro-pulse) to the central UP/DOWN object.

10.1.1 Devices:

- JMG 4 T (order. no. 4930250)
- TA 4 (order no. 4969204)
- TR 648 top2 RC-DFC or RC (6489210/6489212)

10.1.2 Overview

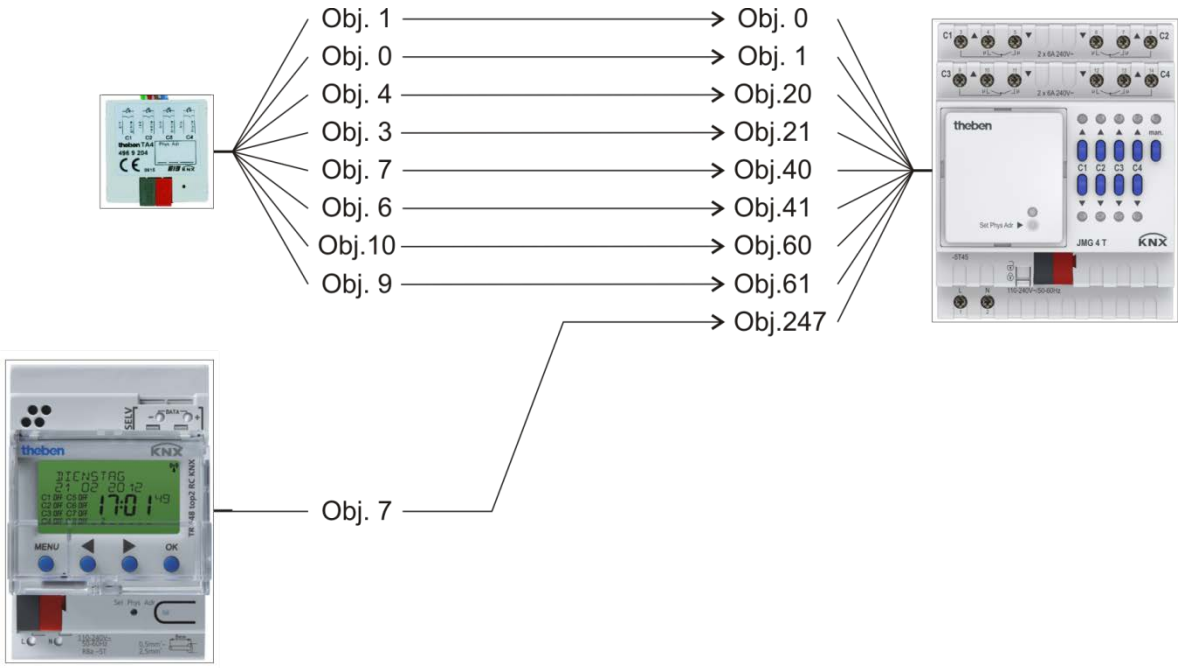


Figure 24

From top to bottom:

- The push button interface: operation by the user (up/down, step/stop).
- The time switch: sends an OFF telegram at sunset as an OFF command for all blinds.

10.1.3 Objects and links

Table 107

No.	TA 4 Object name	No.	JMG 4 T Object name	Comment
1	*Blind channel 1* *Up / Down*	0	*JMG 4 T C1* *Up / Down*	Long push button press for Up / down run commands. Short press of push-button for Step / stop commands.
0	*Blinds channel 1* *Step / stop*	1	*JMG 4 T C1* *Step / stop*	
4	*Blinds channel 2* *Up / Down*	20	*JMG 4 T C2* *Up / Down*	
3	*Blinds channel 2* *Step / stop*	21	*JMG 4 T C2* *Step / stop*	
7	*Blinds channel 3* *Up / Down*	40	*JMG 4 T C3* *Up / Down*	
6	*Blinds channel 3* *Step / stop*	41	*JMG 4 T C3* *Step / stop*	
10	*Blinds channel 4* *Up / Down*	60	*JMG 4 T C4* *Up / Down*	
9	*Blinds channel 4* *Step / stop*	61	*JMG 4 T C4* *Step / stop*	

Table 108

No.	TR 648 top2 Object name	No.	JMG 4 T Object name	Comment
7	*C1.1 Switching channel - switching*	247	*Central up/down*	Timer sends an OFF telegram at sunset. All drives are run up.

10.1.4 Important parameter settings

The standard parameter settings apply for unlisted parameters or user's own parameter settings.

Table 109: TA 4

Parameter page	Parameter	Setting
Channel 1.. Channel 4	*Channel function*	*Blinds*
	Operation	*Single-surface operation*

Table 110: JMG 4 T

Parameter page	Parameter	Setting
JMG 4 T	*Type of curtain*	*Blinds*

Table 111: TR 648 top2 KNX

Parameter page	Parameter	Setting
General	*Activate time switch channel C1*	*Yes*
Switching channel C1	*Telegram type C1.1**	*Switching command*
	With clock → ON	*no telegram*
	With clock → OFF	*send following telegram once*
	Telegram	*OFF*

* Channel C1 of the TR 648 top2 timer is programmed as an Astro-channel.
This channel should generate a 1 s long astro-pulse at sunset.
An OFF telegram will be sent when the pulse is switched off.

10.2 Blinds control with sun position tracking and frost alarm

In this example, for simplicity, the focus is on the sun position tracking.
For this reason, all other comfort functions such as
heating/cooling support, etc. are deliberately not listed here.

The weather station Meteodata 140 controls the lamella tilt in accordance with the sun position.
This helps achieve optimal light incidence without direct solar radiation.
The blinds should be raised when there is a danger of frost. The object *Central safety frost* is involved in this.

10.2.1 Devices:

- JMG 4 T (order. no. 4930250)
- Meteodata 140 (order no. 1409200)
- TA 4 (order no. 4969204)

10.2.2 Overview

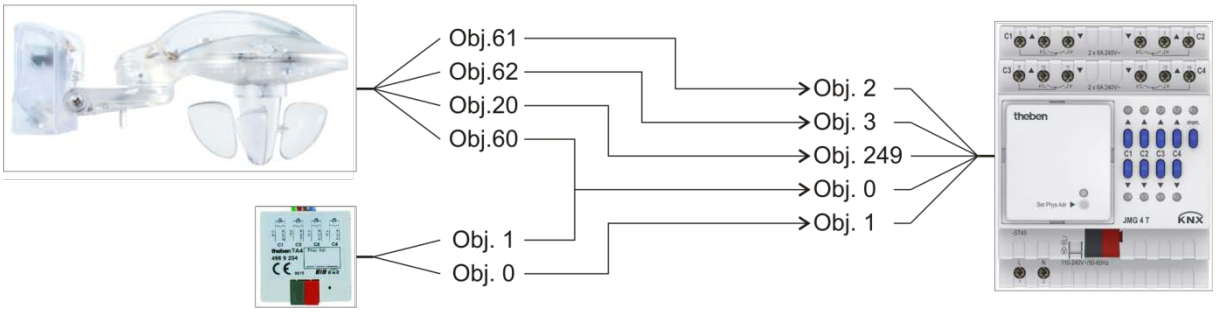


Figure 25

From top to bottom:

- The weather station: sends the telegrams for positioning of the blinds according to the position of the sun.
  If no shading is required, the blinds will be raised (obj. 60).
- The push button interface: operation by the user (up/down, step/stop).

10.2.3 Objects and links

Table 112

No.	Meteodata 140 Object name	No.	JMG 4 T Object name	Comment
20	*C1.1 Switching*	249	*Central safety frost*	The safety telegram is sent by Meteodata (*C1.1 Universal channel*).
60	*C11 up/down*	0	*JMG 4 T C1 Up / Down*	-
61	*C11 Blinds height*	2	*% Height*	-
62	*C11 Lamella position*	3	*% Lamella*	-

Table 113

No.	TA 4 Object name	No.	JMG 4 T Object name	Comment
0	*Blind channel 1 Step / stop*	1	*JMG 4 T C1 Step / stop*	Long keystroke for Up / down run commands. Short press of push-button for Step / stop commands.
1	*Blind channel 1 Up / Down*	0	*JMG 4 T C1 Up / Down*	

10.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 114: Meteodata 140

Parameter page	Parameter	Setting
General	*Activate universal channel C1*	*Yes*
	Activate sun protection channel C11	*Yes*
Universal channel C1: Function	*Channel function*	*Temperature sensor*
	Temperature threshold	*below 4 °C*
	Temperature hysteresis	*1.0 K*
Sun protection channel C11	*Channel controls*	*Blinds*
	Sun position adjustment	*yes..*
	Drive height when brightness threshold is exceeded	*100 %*
Sun control	*Activation of sun control*	*Via dawn/dusk threshold*
Sun position adjustment	The individual location and user-dependent settings apply here.	

Table 115: JMG 4 T

Parameter page	Parameter	Setting
JMG 4 T channel C1: Function selection	*Type of curtain*	*Blinds*
Safety wind / rain / frost	*Participation in safety wind*	*No*
	Participation in safety rain	*No*
	Participation in safety frost	*Yes*
	Start	*Top end position*
	end	*Update (Height / Lamella)*

11 RMG 8 T KNX - 4930200

These typical applications are designed to aid planning.
They have no claim to completeness and may be adjusted or extended as desired.

11.1 2x switching with push button interface (switch actuator)

2 push buttons are connected to a TA 2 push button interface and they control 2 channels on the RMG 8 T.

11.2 Devices:

- RMG 8 T (Order no. 4930200)
- TA 2 (Order no. 4969202)

11.2.1 Overview

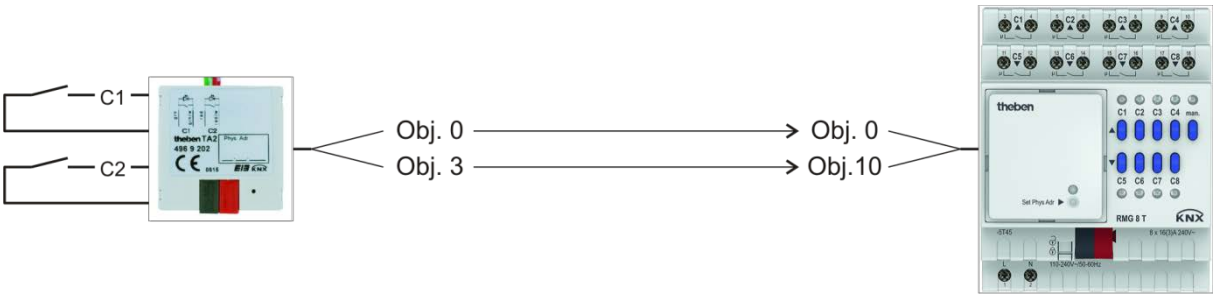


Figure 26

11.2.2 Objects and links

Table 116

No.	TA 2 Object name	No.	RMG 8 T Object name	Comment
0	*Channel 1 switching*	0	*RMG 8 T channel C1 Switch object*	-
3	*Channel 2 switching*	10	*RMG 8 T channel C2 switch object*	-

11.2.3 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 117: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*BY*
	Response to falling edge	*none*
Channel 2	*See channel 1*	

Table 118: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module: RMG 8 T	*Channel C1 function*	*Switch actuator*
RMG 8 T channel C1: configuration options	*Channel function*	*Switching ON/OFF*
	Activation of function via	*Switch object*
Contact characteristics	*Type of contact*	*NO contact*
RMG 8 T channel C2	*See channel C1*	

11.3 Switching light with service counter and display (switch actuator)

A fluorescent light strip in a hall is controlled by channel C1.
The lamps have to be replaced after 20,000 hours (= service).
The time period to the service and the service status are shown on the VARIA 826 display.

11.3.1 Devices

- RMG 8 T (Order no. 4930200)
- VARIA 824/826 (8249200/8269200)

11.3.2 Overview

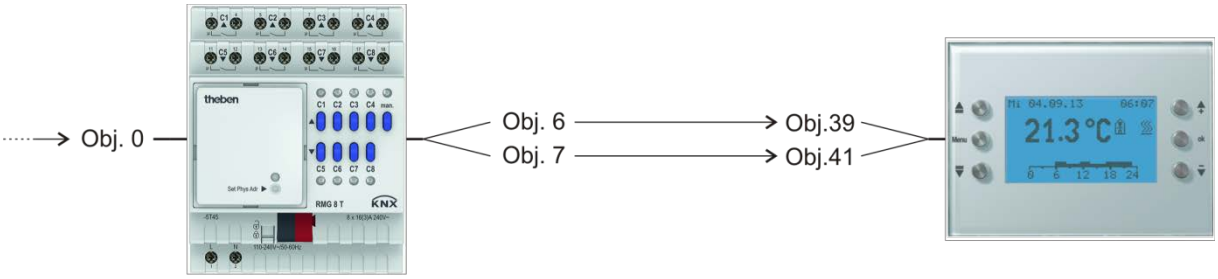


Figure 27

11.3.3 Objects and links

Table 119

No.	KNX sensor Object name	No.	RMG 8 T Object name	Comment
-	*(Switching object)*	0	*Switch object*	Any KNX sensor: Push button, time switch, twilight switch, etc. sends the switch command to RMG 8 T

Table 120:

No.	RMG 8 T Object name	No.	VARIA Object name	Comment
6	*Time to next service*	39	*Counter value 0 ..65535*	Time in hours
7	*Service required*	41	*Switching ON/OFF*	1 = Time has elapsed

11.3.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 121: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module: RMG 8 T	*Channel C1 function*	*Switch actuator*
RMG 8 T channel C1: configuration options	*Channel function*	*Switching ON/OFF*
	Activate hour counter	*Yes..*
Contact characteristics	*Type of contact*	*NO contact*
Hour counter and service	*Type of hour counter*	*counter for time period before next service*
	Service interval (0..2000, x10 h)	*200*
	Reporting of time to service when changing (0..100 h, 0 = no report)	*100*
	Report service cyclically	*yes*

Table 122: VARIA 824 / 826

Parameter page	Parameters	Setting
Selection of display pages	*Show page 1 for display objects*	*yes*
Display objects page 1	*Fade in operating instructions on page 1*	*No*
	Page heading	*Lamp maintenance**
Page 1, line 1	*Line format*	*16 bit counter value object type*
	Text for line 1	*Service in**
	Unit for display object	*h*
	Value range	*Negative and positive numbers*
	Display before receipt of value	*Read from object via bus*
Page 1, line 2	*Line format*	*Switch on object type*
	Text for line 1	*Lamp status**
	Text for object value = 0	*OK**
	Text for object value = 1	*Service**
	Display before receipt of value	*Read from object via bus*

*Suggested text

11.4 Simple alarm function with flashing light (switch actuator)

A monitoring device, e.g. flood alarm is connected to a TA 2 push button interface, and it controls a channel on the RMG 8 T.
A lamp flashes in the event of an alarm (channel 1 relay output).

11.4.1 Devices:

- RMG 8 T (Order no. 4930200)
- TA 2 (Order no. 4969202)

11.4.2 Overview

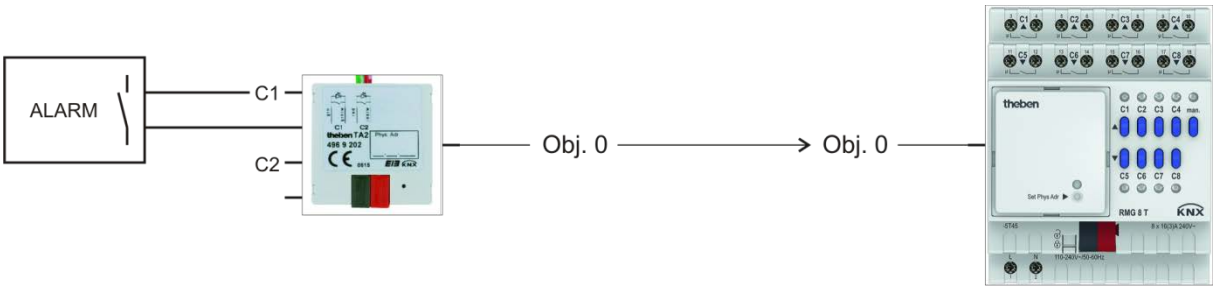


Figure 28

11.4.3 Objects and links

Table 123

No.	TA 2	No.	RMG 8 T	Comment
	Object name		Object name	
0	*Channel 1 switching*	0	*RMG 8 T channel C1 Switch object*	-

11.4.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 124: TA 2

Parameter page	Parameters	Setting
Channel 1	*Channel function*	*Switch/push button*
	Object type	*Switching (1-bit)*
	Response to rising edge	*On*
	Response to falling edge	*Off*

Table 125: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module: RMG 8 T	*Channel C1 function*	*Switch actuator*
RMG 8 T channel C1: configuration options	*Channel function*	*Flashing*
	Activation of function via	*Switch object*
Contact characteristics	*Type of contact*	*NO contact*
Flashing	*ON phase:*	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	OFF phase:	
	Hours	*0*
	Minutes	*0*
	Seconds	*1*
	How often should it flash	*Until it switches off*

11.5 Basic switching, simple blind controls (blinds actuator)

All channels are configured as blinds actuators and are controlled by the push button interface TA 4.

1 single push button is connected to the push button interface TA 4 for each set of blinds (single-surface operation).
Depending on whether the push buttons are pressed for a short or long time, the push button interface sends UP/DOWN or step/stop telegrams.
The blinds should be raised in the evenings and remain open at night.
For this purpose the time switch TR 648 top2 RC is programmed in such a way that channel 1 sends an Off telegram (astro-pulse) to the central UP-DOWN object.

11.5.1 Devices:

- RMG 8 T (Order no. 4930200)
- TA 4 (Order no. 4969204)
- TR 648 top2 RC-DFC or RC (6489210/6489212)

11.5.2 Overview

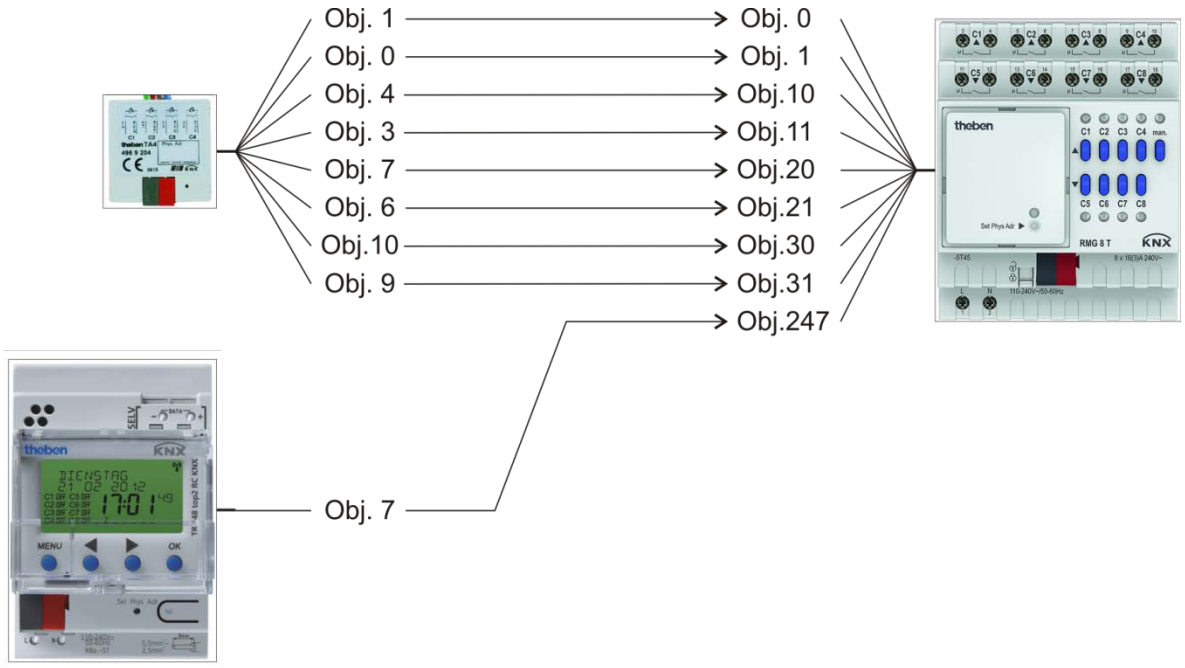


Figure 29

From top to bottom:

- The push button interface: operation by the user (up/down, step/stop).
- The time switch: sends an OFF telegram at sunset as an UP command for all blinds.

11.5.3 Objects and links

Table 126

No.	TA 4 Object name	No.	RMG 8 T Object name	Comment
1	*Blinds channel 1 Up/Down*	0	*RMG 8 T channel C1 Up/Down*	Long keystroke for Up/down operating commands. Short press of push button for Step/stop commands.
0	*Blinds channel 1 Step/stop*	1	*RMG 8 T channel C1 Step/stop*	
4	*Blinds channel 2 Up/Down*	10	*RMG 8 T channel C2 Up/Down*	
3	*Blinds channel 2 Step/stop*	11	*RMG 8 T channel C2 Step/stop*	
7	*Blinds channel 3 Up/Down*	20	*RMG 8 T channel C3 Up/Down*	
6	*Blinds channel 3 Step/stop*	21	*RMG 8 T channel C3 Step/stop*	
10	*Blinds channel 4 Up/Down*	30	*RMG 8 T channel C4 Up/Down*	
9	*Blinds channel 4 Step/stop*	31	*RMG 8 T channel C4 Step/stop*	

Table 127

No.	TR 648 top2 Object name	No.	RMG 8 T Object name	Comment
7	*C1.1 Switching channel - switching*	247	*Central UP/DOWN*	Timer sends an OFF telegram at sunset. All drives are run up.

11.5.4 Important parameter settings

The standard parameter settings apply for unlisted parameters or user's own parameter settings.

Table 128: TA 4

Parameter page	Parameters	Setting
Channel 1.. Channel 4	*Channel function*	*Blinds*
	Operation	*Single-surface operation*

Table 129: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module: RMG 8 T	*Channel C1 function*	*Blinds actuator*
RMG 8 T	*Type of hanging*	*Blinds*

Table 130: TR 648 top2 KNX

Parameter page	Parameters	Setting
General	*Activate time switch channel C1*	*Yes*
Switching channel C1	*Telegram type C1.1**	*Switch command*
	With clock → ON	*no telegram*
	With clock → OFF	*send following telegram once*
	Telegram	*OFF*

* Channel C1 of the TR 648 top2 time switch is programmed as an Astro channel.
This channel should generate a 1 s long Astro pulse at sunset.
An OFF telegram will be sent when the pulse is switched off.

11.6 Blinds control with sun position tracking and frost alarm (blinds actuator)

Channel 1 is set as blinds actuator.
A push button, which is connected with the binary input TA4, sends the up/down and step/stop commands. The weather station Meteodata 140 controls the slat tilt in accordance with the sun position.
This helps achieve optimal light incidence without direct solar radiation.
The blinds should be raised when there is a danger of frost. The object *Central safety frost* is involved in this.

11.6.1 Devices:

- RMG 8 T (Order no. 4930200)
- Meteodata 140 (order no. 1409200)
- TA 4 (Order no. 4969204)

11.6.2 Overview

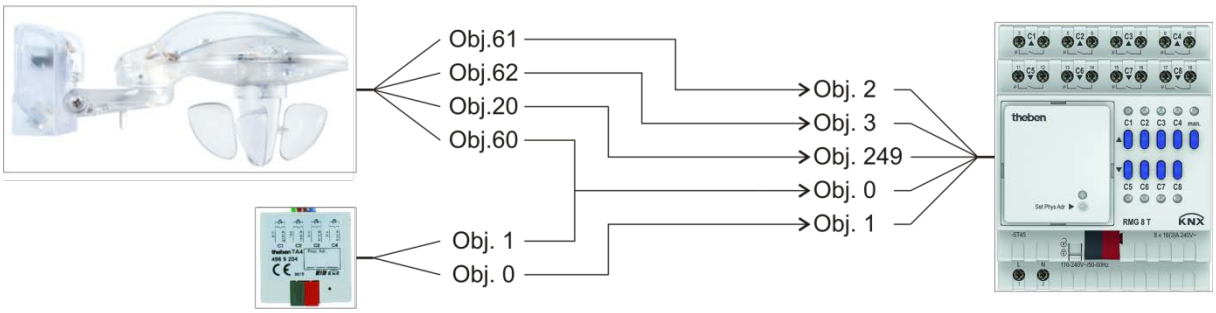


Figure 30

From top to bottom:

- The weather station: sends the telegrams for positioning of the blinds according to the position of the sun.
  If no shading is required, the blinds will be raised (obj. 60).
- The push button interface: operation by the user (up/down, step/stop)

11.6.3 Objects and links

Table 131

No.	Meteodata 140 Object name	No.	RMG 8 T Object name	Comment
20	*C1.1 Switching*	249	*Central safety frost*	The safety telegram is sent by Meteodata (*C1.1 universal channel*).
60	*C11 up/down*	0	*RMG 8 T channel C1 Up/Down*	-
61	*C11 Blinds height*	2	*% Height*	-
62	*C11 Slat position*	3	*% Slat*	-

Table 132

No.	TA 4 Object name	No.	RMG 8 T Object name	Comment
0	*Blinds channel 1 Step/stop*	1	*RMG 8 T channel C1 Step/stop*	Long keystroke for Up/down operating commands. Short press of push button for Step/stop commands.
1	*Blinds channel 1 Up/Down*	0	*RMG 8 T channel C1 Up/Down*	

11.6.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 133: Meteodata 140

Parameter page	Parameters	Setting
General	*Activate universal channel C1*	*yes*
	Activate sun protection channel C11	*yes*
Universal channel C1: Function	*Channel function*	*Temperature sensor*
	Temperature threshold	*below 4 °C*
	Temperature hysteresis	*1.0 K*
Sun protection channel C11	*Channel controls*	*Blinds*
	Sun position adjustment	*yes..*
	Drive height when brightness threshold is exceeded	*100 %*
Automatic sun function	*Activation of automatic sun function*	*via dimming threshold*
Sun position adjustment	The individual location and user-dependent settings apply here.	

Table 134: RMG 8 T

Parameter page	Parameters	Setting
General	*Type of basic module*	*RMG 8 T*
Basic module: RMG 8 T	*Channel C1 function*	*Blinds actuator*
RMG 8 T channel C1 configuration options	*Type of hanging*	*Blinds*
Safety wind/rain/frost	*Participation in safety wind*	*no*
	Participation in safety rain	*no*
	Participation in safety frost	*yes*
	Start	*Top end position*
	End	*Update (Height/Slat)*

12 DMG 2 T KNX - 4930270

12.1 Bedroom lighting

The light should not be blinding when switching on at night, otherwise it should light up immediately at 100%.
All dimming values should, however, be configurable via the dimming function:

- At night the switch-on value should not exceed the 40% limit
- Dimming up to 100% should be possible however (e.g. when reading)
- No restrictions during the day
- Dimming via 2 buttons

12.1.1 Devices:

- DMG 2 T (4930270)
- TA2 (4969202)
- TR 648 top2 (6489210)
- 2 conventional buttons (NO contact)

12.1.2 Overview

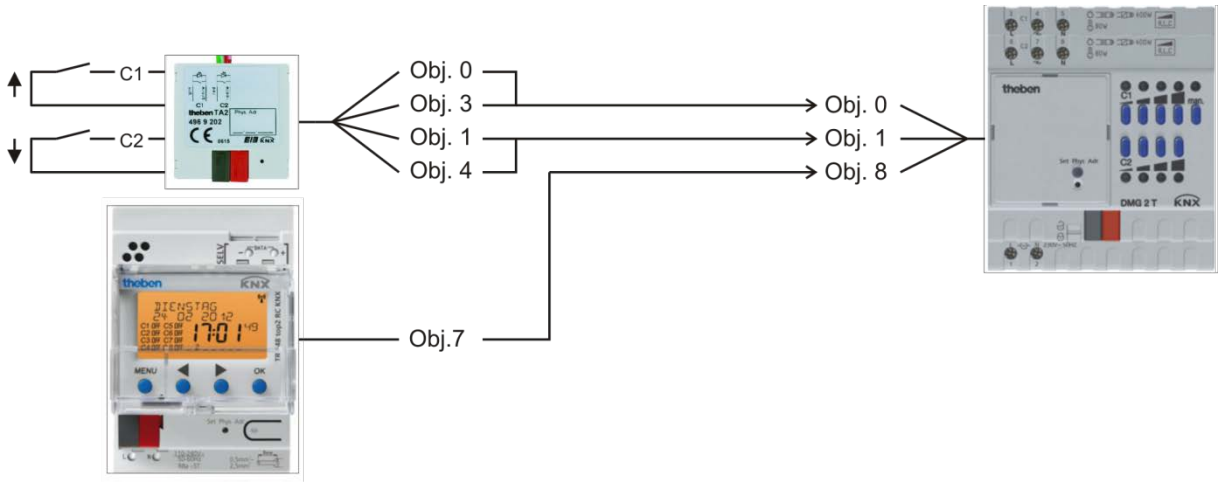


Figure 31

12.1.3 Objects and links

Table 135:

No.	TA2 Object name	No.	DMG 2 T Object name	Comment
0	*Dim channel 1 / Switch on/off**	0	*Switching On/Off*	Switch on light via button 1 (brief button press)
1	*Dim channel 1 / brighter***	1	*Brighter / darker*	Button 1 (brighter)
3	*Dim channel 2 / Switch on/off**	0	*Switching On/Off*	Switch off light via button 2 (brief button press)
4	*Dim channel 1 / darker***	1	*Brighter / darker*	Button 2 (darker)

* A common group address for both objects
** A common group address for both objects

Table 136:

No.	TR 648 top2 Object name	No.	DMG 2 T Object name	Comment
7	*C1.1 switching channel per cent*	8	*Dimming value limit*	0.4 -100 % = limit 0 = No limit.

12.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 137: DMG 2 T

Parameter page	to select parameter	Setting
DMG 2 T channel C1: Function selection	*Adjust dimming value limits*	*yes*
Dimming response	*Switch-on value*	*100 %*
Dimming value limits	*Perform limit in describing object*	*yes*
	Limit applies to switching command	*yes*
	Limit applies to relative dimming	*no*
	Limit applies to absolute dimming	*no*
	Limit applies to soft switching	*yes*

Table 138: TA 2

Parameter page	to select parameter	Setting
Channel 1	*Channel function*	*Dimming*
	Reaction to long / short	*Brighter / On*
Channel 2	*Channel function*	*Dimming*
	Reaction to long / short	*Darker / Off*

Table 139: TR 648 top2

Parameter page	to select parameter	Setting
General	*Activate time switch channel C1*	*yes*
Switching channel C1	*Telegram type C1.1*	*percentage value*
	With clock → ON	*send following telegram once*
	Telegram (%)	*40*
	With clock → OFF	*send following telegram once*
	Telegram (%)	*0*

13 TA 2 KNX - 4969202 / TA 6 KNX - 4969206

13.1.1 Switching lights on/off

The TA 4 push button interface controls the switching actuator RMG 4 S.
All 4 channels are used.

13.1.1.1 Devices:

- TA 4
- RMG 4 S

13.1.1.2 Overview

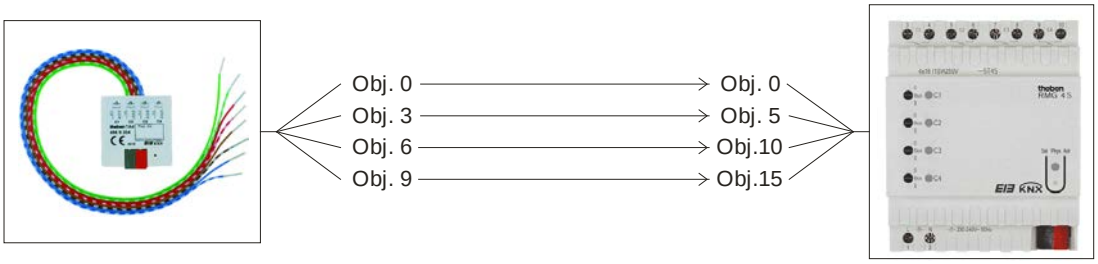


Figure 32

13.1.1.3 Objects and links

Table 140: Links

No.	TA 4 Object name	No.	RMG 4 S Object name	Comments
0	*Channel 1 switching*	0	*GM RMG 4 channel 1*	TA 4 sends switching commands to RMG 4 S
3	*Channel 2 switching*	5	*GM RMG 4 channel 2*	
6	*Channel 3 switching*	10	*GM RMG 4 channel 3*	
9	*Channel 4 switching*	15	*GM RMG 4 channel 4*	

13.1.1.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 141: TA 6

Parameter page	Parameters	Setting
Channel 1 .. Channel 4	*Function of the input*	*Switch/ push button*

Table 142: RMG 4 S

Parameter page	Parameters	Setting
RMG 4 channel 1… 4	*Function*	*Switching On/Off*

13.1.2 2 Dimmer lighting groups

The TA 2 push button interface controls the dimming actuator DMG 2.
A push button is connected to each input.

13.1.2.1 Devices:

- TA 2
- DMG 2

13.1.2.2 Overview

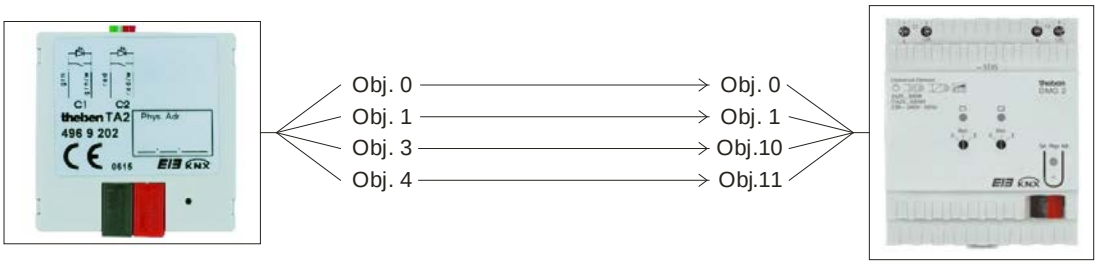


Figure 33

13.1.2.3 Objects and links

Table 143: Links

No.	TA 2 Object name	No.	DMG 2 Object name	Comments
0	*Channel 1 Switching On/Off*	0	*GM DMG 2 channel 1 Switching On/Off*	Long keystroke for brighter / darker dimmer commands. Short keystroke for On/Off commands.
1	*Channel 1 dimming brighter / darker*	1	*GM DMG 2 channel 1 brighter / darker*	
3	*Channel 2 Switching On/Off*	10	*GM DMG 2 channel 2 Switching On/Off*	
4	*Channel 2 dimming brighter / darker*	11	*GM DMG 2 channel 2 brighter / darker*	

13.1.2.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 144: TA 6

Parameter page	Parameters	Setting
Channel 1 .. Channel 2	*Function of the input*	*Dimmer*
	Reaction to Long / Short	*Single button operation*

Table 145: DMG 2

Parameter page	Parameters	Setting
DMG 2 channel 1 S1	*Switching on/off with a 4-bit telegram*	*no*

13.1.3 Control 4 blinds or blinds groups

The push button interface TA 2 controls the blinds actuator JMG 4 S.
A push button is connected to each input.

13.1.3.1 Devices:

- TA 4
- JMG 4 S

13.1.3.2 Overview

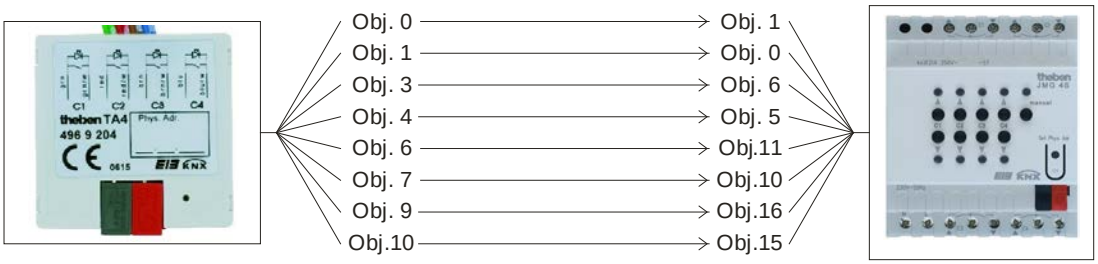


Figure 34

13.1.3.3 Objects and links

Table 146: Links

No.	TA 4 Object name	No.	JMG 4 S Object name	Comments
0	*Channel 1 blinds Step / Stop*	1	*GM JMG 4 S C1 Step / Stop*	Long keystroke for Up / down run commands. Short keystroke for Step / Stop commands
1	*Channel 1 blinds Up / Down*	0	*GM JMG 4 S C1 Up / Down*	
3	*Channel 2 blinds Step / Stop*	6	*GM JMG 4 S C2 Step / Stop*	
4	*Channel 2 blinds Up / Down*	5	*GM JMG 4 S C2 Up / Down*	
6	*Channel 3 blinds Step / Stop*	11	*GM JMG 4 S C3 Step / Stop*	
7	*Channel 3 blinds Up / Down*	10	*GM JMG 4 S C3 Up / Down*	
9	*Channel 4 blinds Step / Stop*	16	*GM JMG 4 S C4 Step / Stop*	
10	*Channel 4 blinds Up / Down*	15	*GM JMG 4 S C4 Up / Down*	

13.1.3.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 147: TA 4

Parameter page	Parameters	Setting
Channel 1 .. Channel 4	*Function of the input*	*Blinds*
	Operation	*Single button operation*

Table 148: JMG 4 S

Parameter page	Parameters	Setting
JMG 4 S	*Type of curtain*	*Blinds*

13.1.4 12 x switching light on/off

Two TA 6 push button interfaces control the RMG 4 S with 2 RME 4 S upgrade modules.

13.1.4.1 Devices:

- 2x TA 6
- RMG 4 S + 2 x RME 4 S

13.1.4.2 Overview

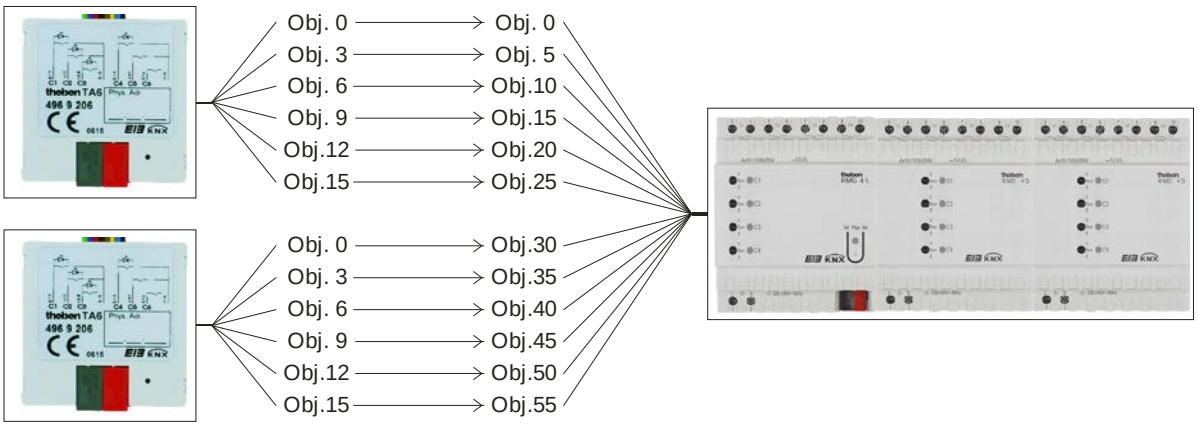


Figure 35

13.1.4.3 Objects and links

Table 149: Links

No.	1st TA 6 Object name	No.	RMG 4 S Object name	Comments
0	*Channel 1 switching*	0	*RMG 4 channel 1*	First push button interface and RMG 4 S (basic module)
3	*Channel 2 switching*	5	*RMG 4 channel 2*	
6	*Channel 3 switching*	10	*RMG 4 channel 3*	
9	*Channel 4 switching*	15	*RMG 4 channel 4*	
12	*Channel 5 switching*	20	*EM1 RME 4 channel 1*	First push button interface and first MiX upgrade module RME 4 S
15	*Channel 6 switching*	25	*EM1 RME 4 channel 2*	

No.	2nd TA 6 Object name	No.	RMG 4 S Object name	Comments
0	*Channel 1 switching*	30	*EM1 RME 4 channel 1*	Second push button interface and first MiX upgrade module RME 4 S
3	*Channel 2 switching*	35	*EM1 RME 4 channel 1*	
6	*Channel 3 switching*	40	*EM2 RME 4 channel 1*	Second push button interface and second MiX upgrade module RME 4 S
9	*Channel 4 switching*	45	*EM2 RME 4 channel 2*	
12	*Channel 5 switching*	50	*EM2 RME 4 channel 1*	
15	*Channel 6 switching*	55	*EM2 RME 4 channel 1*	

13.1.4.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 150: TA 6

Parameter page	Parameters	Setting
Channel 1 .. Channel 6	*Function of the input*	*Switch/ push button*

Table 151: RMG 4 S

Parameter page	Parameters	Setting
General	*Number of upgrade modules*	*2 upgrade modules*
	Type of 1st upgrade module EM1	*EM1 is a RME4 S or RME4 C load*
	Type of 2nd upgrade module EM2	*EM2 is a RME4 S or RME4 C load*
RMG 4 channel 1… 4	*Function*	*Switching On/Off*
EM1 RME 4 channel 1… 4	*Function*	*Switching On/Off*
EM2 RME 4 channel 1… 4	*Function*	*Switching On/Off*

13.2 Allowed parameter combinations fort the switching function

Contact	Use	Reaction to rising edge	Reaction to falling edge
Push button	Switch ON and OFF	Toggle	No telegram
		No telegram	Toggle
	Only switch ON	ON	No telegram
		No telegram	ON
	Only switch OFF	OFF	No telegram
		No telegram	OFF
Switch	3-way switching	Toggle	Toggle
	Switch ON and OFF	ON	OFF
		OFF	ON
	Only switch ON	ON	No telegram
		No telegram	ON
	Only switch OFF	OFF	No telegram
		No telegram	OFF

13.3 Conversion of percentages to hexadecimal and decimal values

%	Decimal	Hexadecimal	%	Decimal	Hexadecimal	%	Decimal	Hexadecimal
0%	0	$00	**34%**	87	$56	**68%**	173	$AD
1%	3	$02	**35%**	89	$59	**69%**	176	$AF
2%	5	$05	**36%**	92	$5B	**70%**	179	$B2
3%	8	$07	**37%**	94	$5E	**71%**	181	$B5
4%	10	$0A	**38%**	97	$60	**72%**	184	$B7
5%	13	$0C	**39%**	99	$63	**73%**	186	$BA
6%	15	$0F	**40%**	102	$66	**74%**	189	$BC
7%	18	$11	**41%**	105	$68	**75%**	191	$BF
8%	20	$14	**42%**	107	$6B	**76%**	194	$C1
9%	23	$16	**43%**	110	$6D	**77%**	196	$C4
10%	26	$19	**44%**	112	$70	**78%**	199	$C6
11%	28	$1C	**45%**	115	$72	**79%**	201	$C9
12%	31	$1E	**46%**	117	$75	**80%**	204	$CC
13%	33	$21	**47%**	120	$77	**81%**	207	$CE
14%	36	$23	**48%**	122	$7A	**82%**	209	$D1
15%	38	$26	**49%**	125	$7C	**83%**	212	$D3
16%	41	$28	**50%**	128	$7F	**84%**	214	$D6
17%	43	$2B	**51%**	130	$82	**85%**	217	$D8
18%	46	$2D	**52%**	133	$84	**86%**	219	$DB
19%	48	$30	**53%**	135	$87	**87%**	222	$DD
20%	51	$33	**54%**	138	$89	**88%**	224	$E0
21%	54	$35	**55%**	140	$8C	**89%**	227	$E2
22%	56	$38	**56%**	143	$8E	**90%**	230	$E5
23%	59	$3A	**57%**	145	$91	**91%**	232	$E8
24%	61	$3D	**58%**	148	$93	**92%**	235	$EA
25%	64	$3F	**59%**	150	$96	**93%**	237	$ED
26%	66	$42	**60%**	153	$99	**94%**	240	$EF
27%	69	$44	**61%**	156	$9B	**95%**	242	$F2
28%	71	$47	**62%**	158	$9E	**96%**	245	$F4
29%	74	$49	**63%**	161	$A0	**97%**	247	$F7
30%	77	$4C	**64%**	163	$A3	**98%**	250	$F9
31%	79	$4F	**65%**	166	$A5	**99%**	252	$FC
32%	82	$51	**66%**	168	$A8	**100%**	255	$FF
33%	84	$54	**67%**	171	$AA			

14 TR 648 top2 RC KNX - 6489212

These typical applications are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

14.1 Simple lighting control

One room lighting system with 2 separate switching circuits (C1, C2) should be switched according to time.

14.1.1 Devices:

- TR 648 top2 KNX (6489210)
- RMG 4 I (4930210)

14.1.2 Overview

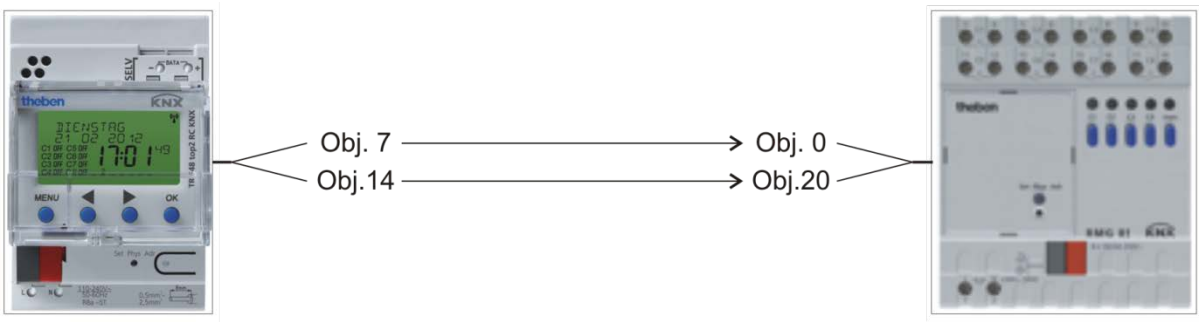


Figure 36

14.1.3 Objects and links

Table 152

No.	TR 648 top2 KNX Object name	No.	RMG 4 I Object name	Comment
7	*C1.1 Switching channel - switching*	0	*RMG 4 I channel 1 – switching object*	-
14	*C2.1 Switching channel - switching*	20	*RMG 4 I channel 2 – switching object*	-

14.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 153: TR 648 top2 KNX

Parameter page	Parameter	Setting
General	*Activate time switch channel C1*	*Yes*
	Activate time switch channel C2	*Yes*
Switching channel C1	*Telegram type C1.1*	*switching command*
	With clock → ON	*ON*
	With clock → OFF	*OFF*
Switching channel C2	*Telegram type C1.1*	*switching command*
	With clock → ON	*ON*
	With clock → OFF	*OFF*

Table 154: RMG 4 I

Parameter page	Parameter	Setting
General	*Type of basic module*	*RMG 4 I*
RMG 4 I channel Cx: Function selection	*Channel function*	*Switching On/Off..*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*

14.2 Switching HVAC operating modes

The TR 648 top2 KNX is to take over the changing of HVAC operating modes in an office building.

The thermostat is set to standby mode in the morning via the clock switch switch.
The room is only heated to comfort mode if it is actually occupied.
This function is assumed by a presence detector.
The thermostat is reset to night temperature reduction in the evenings and at the the weekend.

If a window is opened (RAM 713 S, window contact to E1), the thermostat switches to frost protection mode.

14.2.1 Devices:

- TR 648 top2 KNX (6489210)
- RAM 713 S (7139202)
- Cheops drive (7319200)
- Presence detector, e.g. Compact office EIB (order no. 201 9 200)

14.2.2 Overview

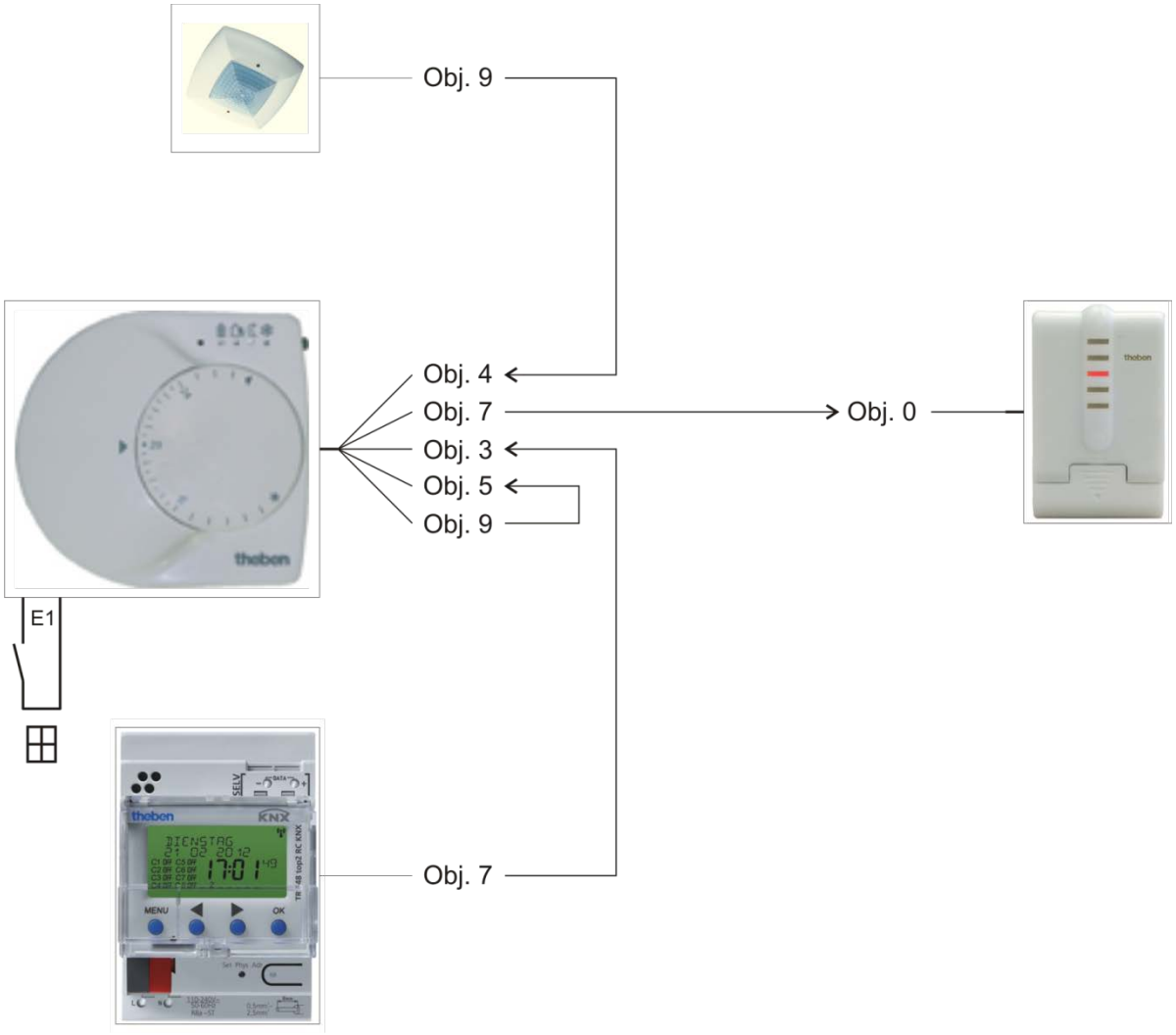


Figure 37

14.2.3 Objects and links

Table 155: Operating mode

No.	TR 648 top2 KNX Object name	No.	RAM 713 S Object name	Comment
7	*C1.1 switching channel – HVAC operating mode*	3	*Operating mode preset*	C1.1 sends the programmed operating mode to the thermostat

Table 156: Window contact

No.	RAM 713 S			Comment
	Object name	No.	Object name	
9	*Switching input 1*	5	*Window position*	Reports the status of the window contact (input E1) to the window object

Table 157: Actuating value

No.	RAM 713 S Object name	No.	Cheops drive Object name	Comment
7	*Heating actuating value*	0	*Approach position*	Actuating value for actuating drive

Table 158: Presence

No.	Compact office EIB Object name	No.	RAM 713 S Object name	Comment
9	*Presence output*	4	*Input for presence signal*	Presence signal for comfort mode if the room is occupied.

14.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 159: TR 648 top2 KNX

Parameter page	Parameter	Setting
General	*Activate time switch channel C1*	*Yes*
Switching channel C1	*Telegram type C1.1*	*HVAC operating mode*
	With clock → ON	*standby*
	With clock → OFF	*night-time temperature reduction*

Program example for the TR 648 top2 KNX: Channel 1, 7:30 ON, 17:30 OFF, Monday to Friday.

Table 160: RAM 713 S

Parameter page	Parameter	Setting
Settings	*Function of external interface*	*active*
Operating mode	*Objects for determining the operating mode*	*New: Operating mode, presence, window status*
	Operating mode after reset	*standby*
	Type of presence sensor	*Presence detector*
	Cyclical transmission of current operating mode	*Not cyclical, only in the event of change*
Input 1	*Function of E1*	*Switching*
	Reaction to closing the contact	*ON (OFF*)*
	Reaction to opening the contact	*OFF(ON*)*
	Send cyclically	*Every 5 minutes*

* Depending on type of window contact. The details in brackets refer to the following case:
Window closed → contact closed.

Table 161: ECO-IR 360

Parameter page	Parameter	Setting
General data	*Operating mode*	*Master in single unit operation*
	Presence output	*active*
	Normal or test operation mode	*Standard operation*
Presence output	*Switch-on delay time presence*	*5 minutes*
	Behaviour at start of presence	*Send ON telegram*
	Behaviour at end of presence	*Send OFF telegram*

Cheops drive:
The standard parameter settings can be used here.

15 RAMSES 712 KNX - 7129200

15.1 The school environment: Heating with presence detector and frost protection via window contact.

15.1.1 Description

RAM 712 controls one or more actuators.
Once someone enters the room the RAM 712 changes to comfort mode, otherwise it operates in standby mode during the day and in night time mode at night.
If a window is opened RAM 712 automatically changes to frost protection mode
A presence detector is used for presence recognition.
The presence telegram is only sent after a switch-on delay so that the heating is not activated if the room is only occupied for a short time.

All windows are fitted with window contacts. These are connected with input 1 on RAM 712.
The window status is sent via a common group address to the window position input object.
RAM 712 will recognise when a window is opened and automatically switch to frost protection mode. When the window is closed the previously set operating mode will be restored.

15.1.2 Devices:

- RAM 712 (order no. 712 9 200)
- Cheops drive (order no. 731 9 200)
- TR 644 S EIB / TR 644 S DCF EIB (order no. 644 9 203 / 644 9 204)
- Compact office EIB (order no. 201 9 200)

15.1.3 Overview

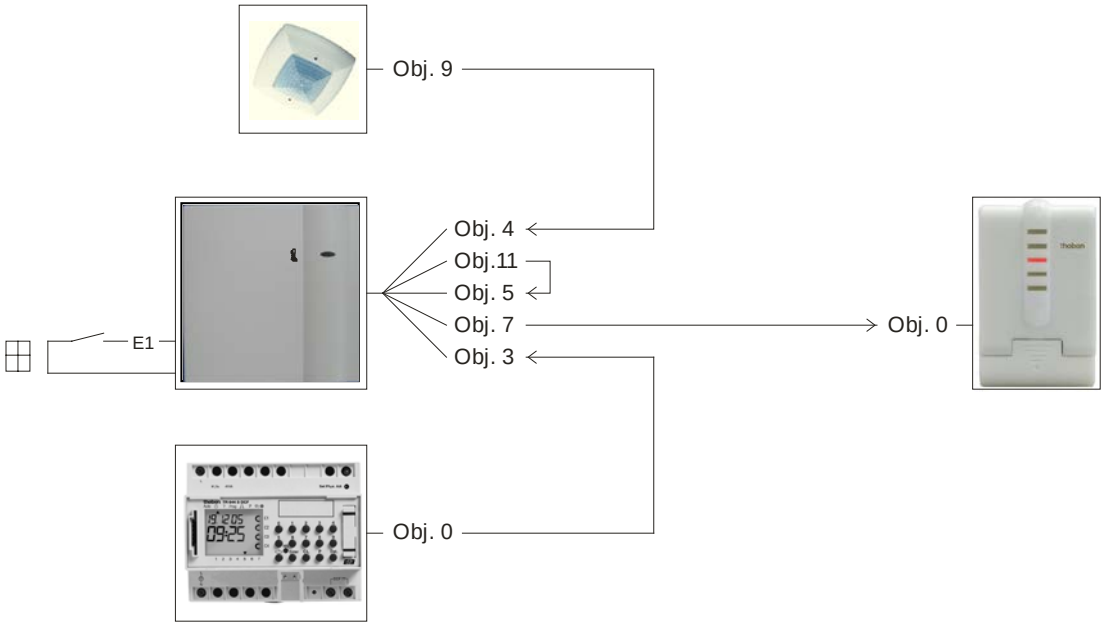


Figure 38

15.1.4 Objects and links

Table 162: RAM 712 → Cheops drive

No.	RAM 712 Object name	No.	Cheops drive Object name	Comments
7	*Heating control variable*	0	*Control variable*	Actuator receives heating actuating value and moves the valve position

Table 163: RAM 712 → RAM 712

No.	RAM 712 Object name	No.	RAM 712 Object name	Comments
11	*Input 1 switching*	5	*Window position*	Object 11 sends the window status to object 5 (input for window contact) via the bus. Both objects are connected to each other via a common group address.

Table 164: TR 644 → RAM 712

No.	TR 644 S EIB Object name	No.	RAM 712 Object name	Comments
0	*Channel 1 Valuator*	3	*Operating mode preset*	Channel 1 of timer: ON= 2 (standby) OFF= 3 (night)

Table 165: Compact office EIB → RAM 712

No.	Compact office EIB Object name	No.	RAM 712 Object name	Comments
9	*Presence output*	4	*Presence*	Switches RAM 712 to comfort mode when presence is detected.

15.1.5 Important parameter settings

Standard or user-defined parameter settings apply for unlisted parameters.

15.1.5.1 RAM 712

Table 166

Parameter page	Parameters	Setting
Settings	*Control*	*Standard*
	Function of the external interface	*Active*
	Type of controller used	*Remote controller*
Operating mode	*Objects for determining the operating mode*	*Operating mode, presence, window status*
	Operating mode after reset	*Standby*
	Presence sensor type (to obj. 4)	*Presence detector*
Input 1	*Input function*	*Switch/key*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF(ON*)*
	Response after restoration of the bus supply	*Update*

* Depending on type of window contact. The details in brackets refer to the following: Window closed → Contact closed

15.1.5.2 TR 644 S EIB / TR 644 S DCF EIB

Table 167

Parameter page	Parameters	Setting
Channel 1	*Object type*	*Value*
	Value when clock is switched off	*3**
	Value when clock is switched on	*2***

* corresponds to *night* HVAC operating mode
** corresponds to *standby* HVAC operating mode
Program example for TR 644 S: Channel 1, 7:30 ON, 17:30 OFF, Monday to Friday.

15.1.5.3 Compact office EIB

Table 168

Parameter page	Parameters	Setting
General information	*Operating mode*	*Master in individual switching mode*
	Presence output	*Active*
	Normal or test operating mode	*Normal operation*
Presence output	*Presence switch on delay*	*5 minutes*
	Behaviour at start of presence	*Send ON telegram*
	Behaviour at end of presence	*Send OFF telegram*

15.1.5.4 Cheops drive

The standard parameter settings can be used here.

16 RAMSES 713 S KNX - 7139201

16.1.1 Heating, blinds and switching

IN ADDITION TO ITS FUNCTION AS A HEATING CONTROLLER, RAM 713 S CAN CONTROL BLINDS AND ROOM LIGHTING AND SWITCH ON AND OFF VIA THE EXTERNAL INTERFACE.

PARAMETER PAGE: SETTINGS

Keys for controlling the blinds (Up/Down and Step/Stop) are connected to E1 and E2. Objects 9 and 10 are linked with the corresponding control objects of the blinds actuator.
The switch is connected to the input E3 and the switch object (Object 13) is connected to the relevant channel of the switch actuator.

Hint: Both functions can be realised with the same actuator if necessary.
RMG 8 as a switching and blinds actuator or JMG 4 (blinds actuator) with a switching actuator upgrade module RME 8 or RMX 4. (See chapter entitled external interface)

16.1.2 Heating and cooling in the 2 wire system

The following points must be observed for use in a 2 wire heating/cooling system:

- In the 2 wire system, heating and cooling mediums (depending on the season) are –lead through the same lines and controlled via the same valve.
  Über einen Parameter können The cooling control variable and the heating control variable can be sent via a parameter to a single, common object (Object 7) - (see parameter: Output of cooling control variable, chapter on cooling control)

- It is also possible to connect the "heating control variable" and "cooling control variable" objects to the positioning actuator via the same group address.

- The control variables must not be sent cyclically

- The switchover between heating and cooling mediums is performed by the system and must therefore be passed on to the room thermostat.
  The parameter "Switching between heating and cooling" (Parameter page "Cooling control") is set to "via object". The heating/cooling system must send a 0 for heating mode and a 1 for cooling mode to Object 15 "Switching between heating and cooling" in the RAM 713.

16.1.3 Frost protection via window contact

A window contact should cause automatic switching to frost protection mode (heat protection mode).

A contact is mounted on the window. This is connected directly to an input of the external interface, E1 for instance.

The device is programmed as follows:

“Operating mode” parameter page

The corresponding switch object (Object 9 for E1) is linked with Object 5 (window position) via the group address.

RAM 713 S will recognise when the window opens and automatically switch to frost protection mode (heat protection mode). When the window is closed the previously set operating mode will be restored. See also New operating modes.

17 AMUN 716 KNX - 7169200

17.1 Control of air quality via CO_2 dependent ventilation

A fan will provide fresh air if the CO_2 content exceeds the set thresholds.

17.1.1 Devices

- Amun 716 KNX (716 9 200)
- FCA 1 (492 0 200)

17.1.2 Overview

Figure 39

17.1.3 Objects and links

Table 169

No.	Amun 716 KNX Object name	No.	FCA 1 Object name	Comments
9	*CO2 ventilation*	0	*Actuating value for fan*	Ventilation control depending on CO_2 content.

17.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Amun 716

The standard values can be used here.
The desired ventilation speeds are set on the *CO2 ventilation* parameter page. See accessories: Fan control.

Table 170: FCA 1

Parameter page	Parameters	Setting
General	*Supported function*	*Ventilation*

17.2 Control of air quality via CO_2 and humidity dependent ventilation

A fan will provide fresh air if the humidity or CO_2 content exceeds the set thresholds.

17.2.1 Devices

- Amun 716 KNX (716 9 200)
- FCA 1 (492 0 200)

17.2.2 Overview

Figure 40

17.2.3 Objects and links

Table 171

No.	Amun 716 KNX Object name	No.	FCA 1 Object name	Comments
25	Highest active ventilation value	0	Actuating value for fan	Fan control dependent on CO_2 and relative humidity

17.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Amun 716

The standard values can be used here.
The desired ventilation speeds are set on the *Ventilation of CO_2* and *Humidity ventilation* parameter pages. See accessories: Fan control

Table 172: FCA 1

Parameter page	Parameters	Setting
General	*Supported function*	*Ventilation*

17.3 Control of air quality plus 3 stage manual fan control

A fan will provide fresh air if the humidity or CO_2 content exceeds the set thresholds.
There is a choice of 3 manual fan stages (forced operation mode).
A 4-way sensor interface is used here (TA 4).

Button layout:

Channel / button 1	Start forced stage 1
Channel / button 2	Start forced stage 2
Channel / button 3	Start forced stage 3
Channel / button 4	Restore automatic operation

After reset or restoration of bus power the fan operates in automatic mode, i.e. depending on CO_2 content and humidity.
If any of buttons 1…3 are pressed, FCA 1 switches to forced operation and assumes the associated fan stage configured in TA 4.
Automatic mode can be restored using button 4.

17.3.1 Devices

- Amun 716 KNX (716 9 200)
- FCA 1 (492 0 200)
- TA 4 (496 9 204)

17.3.2 Overview

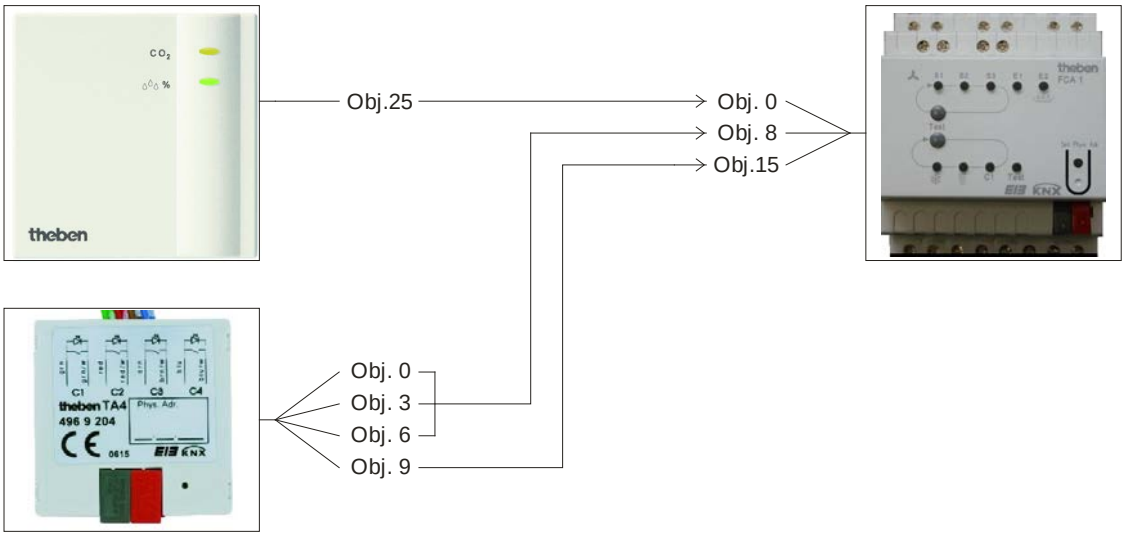


Figure 41

17.3.3 Objects and links

Table 173

No.	Amun 716 KNX Object name	No.	FCA 1 Object name	Comments
25	Highest active ventilation value	0	Actuating value for fan	Fan control dependent on CO_2 and relative humidity

Table 174:

No.	TA 4 Object name	No.	FCA 1 Object name	Comments
0	Channel 1 Valuator	8	Forced fan stage	Manual stage 1 in forced operation mode
3	Channel 2 Valuator			Manual stage 2 in forced operation mode
6	Channel 3 Valuator			Manual stage 3 in forced operation mode
9	Channel 4 switching	15	Fan auto/forced mode	Automatic mode: Fan is controlled by Amun 716.

17.3.4 Important parameter settings

Standard or customer-defined parameter settings apply to unlisted parameters.

Amun 716

The standard values can be used here.
The desired ventilation speeds are set on the *Ventilation of* CO_2 and *Humidity ventilation* parameter pages.

Table 175: FCA 1

Parameter page	Parameters	Setting
General	*Supported function*	*Ventilation*
	Switch fans between auto and forced	*via object auto/forced,* ***Forced = 0***

Table 176: TA 4

Parameter page	Parameters	Setting
Channel 1..3	*Channel function*	*Switch/key*
	Object type	*Value 0.. 255 (1 byte)*
	Response to rising edge	*desired ventilation speed for each forced stage*
	Response to falling edge	*None*
Channel 4	*Channel function*	*Switch/key*
	Object type	*Switching (1-bit)*
	Response to rising edge	*On*
	Response to falling edge	*None*
	Response after restoration of the bus supply	*None*

17.4 Dew point alarm for cooling system

A RAM 713 FC room thermostat and an FCA 1 fan coil actuator control
a cooling system.
Once humidity has reached a set threshold value (80 %), an alarm telegram is sent to prevent further cooling and an increase in humidity

17.4.1 Devices

- Amun 716 KNX (716 9 200)
- FCA 1 (492 0 200)
- RAM 713 FC

17.4.2 Overview

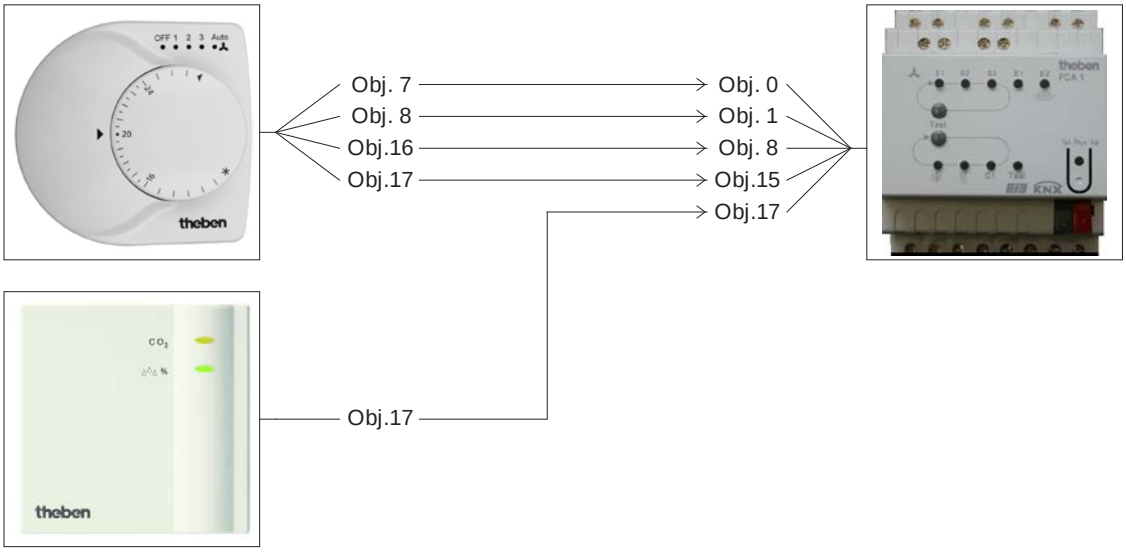


Figure 42

17.4.3 Objects and links

Table 177

No.	Amun 716 KNX Object name	No.	FCA 1 Object name	Comments
17	*Humidity threshold 3*	17	*Dew point alarm*	Do not cool any further, humidity is too high.

Table 178: Links

No.	RAM 713 FC Object name	No.	FCA 1 Object name	Comments
7	*Heating control variable*	0	*Heating control variable*	FCA receives the heating and cooling control variables from RAM 713 S
8	*Cooling control variable*	1	*Cooling control variable*	
16	*Forced fan stage*	8	*Forced fan stage*	% value for forced mode
17	*Fan forced/auto mode*	15	*Fan* *Forced = 1 / Auto = 0*	Trigger for forced mode

17.4.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 179: Amun 716

Parameter page	Parameters	Setting
Humidity thresholds	*Relative humidity threshold 3 (in %)*	80 %
	Hysteresis	*5 %*
Humidity threshold 3	*Telegram type for humidity threshold 3*	*Switching command*
	If humidity threshold 3 exceeded	*send following telegram once*
	Telegram	*Switch-on command*
	If humidity threshold 3 under run	*Switch-off command*

Table 180: FCA 1

Parameter page	Parameters	Setting
General	*Supported function*	*Heating and cooling*
	System type	*4-pipe system*
	Type of controller used	*Remote controller*
Heating valve	*Type of valve*	*2-point*
Cooling valve	*Type of valve*	*2-point*

Table 181: RAM 713 FC

Parameter page	Parameters	Setting
Settings	*Device type*	*RAM 713 Fan Coil*
Control	*Fan coil system used*	*4-pipe system*
Operation mode	*Objects for determining the operation mode*	*alt.: Comfort, night, frost*

18 CHEOPS control KNX - 7329201

18.1 Determining the current set point value

The current set point value can be adapted in line with certain requirements by selecting the operating mode.
The operating mode can be specified by Objects 3…5.
There are two methods available:

18.1.1 New operating modes

If on the parameter page “operating mode”, new operating mode is selected by the " Objects to select operating mode" parameter, the current operating mode can be defined as follows:

Table 1

Pre-selected operating mode Object 3	Presence Object 4	Window status Object 5	Current operating mode Object 10
Any	Any	1	Frost/heat protection
Any	1	0	Comfort
Comfort	0	0	Comfort
Standby	0	0	Standby
Night	0	0	Night
Frost/heat protection	0	0	Frost/heat protection

Typical application: In the mornings Object 3 activates "Standby" or "Comfort" mode and in the evenings "Night" mode via a timer (e.g. TR 648).
During holiday periods, Object 3 also selects frost / heat protection via another channel of the timer.
Object 4 is connected to a presence indicator. If a presence is detected, Cheops control switches to Comfort mode (see Table).
Object 5 is connected to a window contact. As soon as a window is opened, Cheops control switches to frost protection mode.

18.1.2 Old operating modes

If on the parameter page, old operating mode is selected by the " Objects to select operating mode" parameter, the current operating mode can be defined as follows:

Table 2

Night Object 3	Comfort Object 4	Frost / heat protection Object 5	Current operating mode Object 10
Any	Any	1	Frost/heat protection
Any	1	0	Comfort
Standby	0	0	Standby
Night	0	0	Night

Typical application: In the mornings "Standby" mode and in the evenings "Night" mode is activated via a timer.
During holiday periods, Object 5 selects frost / heat protection via another channel on the timer.
Object 4 is connected to a presence indicator. If a presence is detected, Cheops control switches to Comfort mode (see Table).
Object 5 is connected to a window contact. As soon as a window is opened, Cheops control switches to frost protection mode.

The old method has two advantages over the new method:

1. To switch from Comfort to Night operating mode, 2 telegrams (2 timer channels if necessary) are required.
   Object 4 must be set to 0 and object 3 to 1.
2. If during periods when "Frost / heat protection" is selected via the timer, the window is opened and then closed again, the "Frost / heat protection" mode is cleared.

18.1.3 Set point value calculations

Assuming the current operating mode, the current set point value of Cheops control is calculated as follows:
A distinction is drawn between whether heating or cooling operation is currently required.

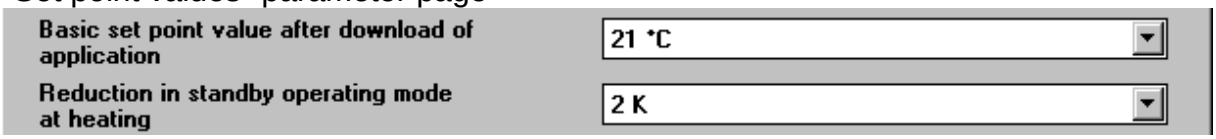
18.1.3.1 In heating operation

Table 3: Current set point value on heating

Operating mode	Current set point value
COMFORT	Basic set point value + set point value offset
Standby	Basic set point value + set point value offset – reduction in standby mode
Night	Basic set point value + set point value offset – reduction in night mode
Frost/heat protection	Programmed set point value for frost protection mode

Example:
Heating in comfort mode.

"Set point values" parameter page



"Operation" parameter page

The set point value has previously been increased by one step using the red key (1 keystroke)

Calculation:

Current set point value = basic set point value + set point value offset
= 21°C + 1K
= 22°C

If operation is switched to standby mode, the current set point value is calculated as follows:

Current set point value = basic set point value + set point value offset - reduction in standby mode
= 21°C +1K -2K
= 20°C

18.1.3.2 In cooling operation

Table 4: Current set point value on cooling

Operating mode	Current set point value
Comfort	Basic set point value + set point value offset + dead zone
Standby	Basic set point value + set point value offset + dead zone + increase in standby mode
Night	Basic set point value + set point value offset + dead zone + increase in night mode
Frost/heat protection	Programmed set point value for heat protection mode

Example:
Cooling in comfort mode.

The room temperature is too high and Cheops control has switched to cooling operation

Calculation:

Current set point value = basic set point value + set point value offset + dead zone

= 21°C -1K +2K
= 22°C

Changing to standby mode causes a further increase in the set point value (energy saving) and gives rise to the following set point value.

Set point value = basic set point value + set point value offset + dead zone + increase in standby mode
= 21°C - 1K + 2K + 2K
= 24°C

18.2 Set point value offset

The current set point value on Cheops control can be adapted in 3 ways:

- step by step by the red (+) and the blue (-) key
- in increments via Object 5 " adjustment of set point temperature "
- directly via Object 1 " Manual shift of set point value "

The differential between the set point value offset and the Basic set point value is sent by Object 1 at each change (e.g. -1.00).

The offset limits are specified on the "Operation" parameter page by the "Maximum set point value offset" parameter and apply for all 3 types of set point value offset.

This parameter indicates the maximum permitted offset and the increment per keystroke (or per activation of Object 6).

18.2.1 Incremental set point temperature adjustment via keys

Each time the blue key is pressed, the set point value is decreased by one increment.
Each time the red key is pressed, the set point value is decreased by one increment.

When the max. permitted offset is reached, further keystrokes have no effect.

18.2.2 Incremental set point temperature adjustment via Object 6

Each time a 1 is sent to Object 6, the set point value is decreased by one increment.
Each time a 0 is sent to Object 6, the set point value is increased by one increment.

When the max. permitted offset is reached, further send actions have no effect.

18.2.3 Direct set point temperature adjustment via Object 1

In this case, the set point value is changed by sending the desired offset to Object 1. This involves the differential (may be preceded by a minus sign) being sent in EIS5 format.

The offset always relates to the programmed and not to the current set point value.

Example – Basic set point value 21°C:

If a value of 2.00 is sent to Object 1, the new set point value is calculated as follows: 21°C + 2,00K = 23.00°C.
To then bring the set point value to 22°C, the differential is resent to the programmed basic set point value (here 21°C), in this case 1.00K (21°C+1.00K=22°C)

18.3 External interface

The external interface consists of inputs E1 and E2.
Both inputs are routed through the Cheops connection line.

The use of these inputs (presence sensor or actual value) is specified on the "Settings" parameter page.
The inputs themselves are configured on the "External interface" parameter page.

18.3.1 Connections

Table 5

Name	Colour	Function
BUS	Black (-) Red (+)	EIB bus line
E1	Yellow Green	Binary input for window contacts(e)
E2	White Brown	Binary input for presence indicator, presence key or analogue input for external temperature sensor

18.3.2 Input E1

E1 is used exclusively for window contacts (if present).
The window contacts can be connected to E1 directly and without additional supply voltage.

On the "External interface" parameter page, the Type of connected window contact (Opener/closer) can be set.

When the "Open" window position is detected, Cheops control switches to frost operating mode.

18.3.3 Input E2

- E2 as binary input:

A presence indicator, switch or key can be directly connected here

If a **presence indicator (**or switch) is used, the period of comfort mode is determined by the indicator, i.e. comfort mode remains in force for as long as presence is indicated.

If a **presence key** is used, operation switches without time limit from standby to comfort mode when presence is indicated.

If presence is indicated during night operation, comfort mode is activated for a limited time.
Because the presence key is often not reset when the room is vacated, the presence input is automatically reset when the defined operating mode is changed, so that a night reduction, for example, can take place.

The selection between key and indicator is made on the "Operating mode" parameter page.
The type of presence contact can be set on the "External interface" parameter page.

- E2 as analogue input for an external sensor

With this configuration, all settings are made on the "Actual value" parameter side.

An external sensor (Order No. 907 0 191) is connected to E2.
The maximum permitted line length is 10m.

Important:
If E2 is declared as actual value input, the "Input for actual value" selection cannot be changed on the "Actual value" parameter page.

18.4 Monitoring the actual value

18.4.1 Application

Case 1: A sensor is connected to interface E2.
Its connection line could be inadvertently interrupted or short-circuited, e.g. during building or renovation work.

Case 2: The temperature is determined by a different EIB device and sent to Cheops control.
This external temperature transmitter could fail (bus line short circuited etc…) and not longer be able to perform its function, for a short time or permanently.

Because control is not possible if the actual value fails, this value must be monitored.

18.4.2 Principle

If an external sensor is connected to E2, it is constantly monitored for short-circuit or line break.

If the temperature is received via Object 2, Cheops control can monitor whether new actual value telegrams are received at regular intervals.

In both cases, either an emergency program can be started or further control can be handled by the internal sensor, should the actual value fail.

18.4.3 Practice

The response is defined as follows on the "Actual value" parameter page:

- External sensor on E2

Emergency program (0…100%)

or internal measurement:

- Receive actual value via Object 2

First the monitoring period must be defined.
This should be at least double the cycle time of the temperature transmitter (e.g. if the temperature is sent to Cheops control every 5 minutes, the monitoring period must be at least 10 minutes).

The response to the actual value failure can then be programmed as above.

Emergency program (0…100%)

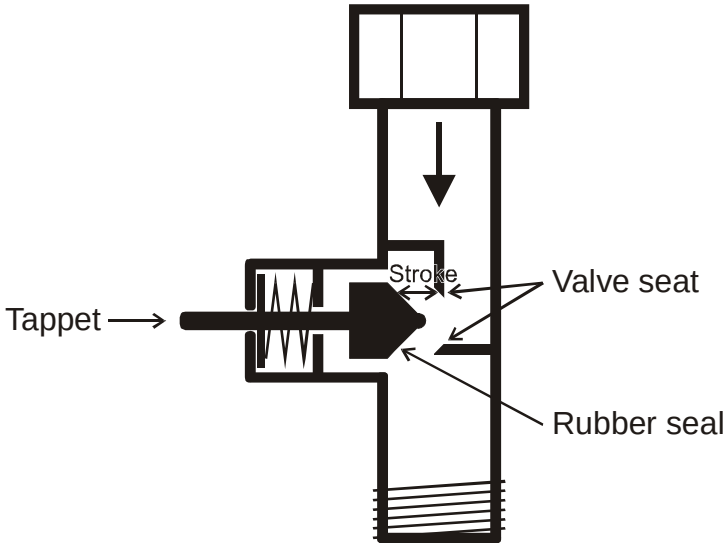
or internal measurement:

Important recommendation:

Rooms can cool down dramatically when the outdoor temperature is low. This may cause radiators to freeze. To prevent this from happening, you must not select a too low position in the emergency program.
A value of ≥ 30% is recommended.

18.5 Valves and valve seals

18.5.1 Valve structure



18.5.2 Valves and valve seals

When idle, i.e. tappet not actuated, the tappet is pushed outwards by the spring and the valve opens (100% with normal effect).
When the tappet is pushed, the rubber seal is pressed into the valve seat and the valve closes (0% position with normal effect).

The valve does not close immediately on touching the valve seat, depending on the characteristics, the existing tappet may have to move onwards until the valve is fully closed.
This response depends on the hardness, shape, aging or damage to the valve seal.

To correct the influence of this parameter, Cheops allows an additional pressing of the valve seal to be entered (see also Troubleshooting).

Caution: In order to avoid seal damage, the value should be increased by max. 10 increments.

18.6 Limit of actuating value

To control the temperature, Cheops control sets an actuating value of between 0% and 100%.
For practical reasons, it is not usually necessary to use the entire bandwidth of between 0% and 100%).

18.6.1 Minimum actuating value

The unpleasant whistling noise that some valves can generate at low actuating value, can be avoided by specifying a minimum actuating value.
If, for instance, this response is determined at below 8%, a minimum actuating value of 10% is specified.
On receipt of a actuating value below the specified limit value, Cheops control can respond in one of 2 ways ("Response on under-running the minimum actuating value in heating operation"):

- Either move to immediately to 0% ("0%")
- or stop at the position of the minimum actuating value and do not close valve completely until actuating value 0% is received (0%=0% otherwise minimum actuating value)

18.7 Determine the maximum actuating value

18.7.1 Application

If within a system all valve actuators are only slightly open, e.g. one at 5%, one at 12%, another at 7% etc., the heating boiler can reduce its output because only a small amount of heating energy is required.
In order to guarantee this, the heating boiler requires the following information:
How high is the actuating value in the room, which currently exhibits the greatest heat requirement?

With Cheops valve actuators, this task is handled by the "Maximum position" function.

18.7.2 Principle

The actuating values are constantly compared between all participants (Cheops valve actuators). Those participant with a higher actuating value than the one received may send it, those with a smaller one may not.
In order to accelerate the process, the greater the difference between its own and the received actuating value, the greater the speed at which the valve actuator sends.
Thus, the valve actuator with the highest actuating value sends first and beats the remainders.

18.7.3 Practice

The actuating value comparison takes place via Object 3 ("Maximum position") where for each valve actuator, a common group address for the maximum position is placed on Object 3.

In order to start the actuating value comparison between the participants, one (and only one) participant must send a value to this group address cyclically.
This task can be handled by either boiler or valve actuator.
If it is the boiler, it must send the smallest possible value, i.e. 0%.
If it is a Cheops valve actuator, the parameter " Transmission of object "Max. actuating value"(for boiler control)" on parameter page " Security and forced mode" must be set to any cycle time.
This valve actuator then regularly sends its own actuating value and the others can respond accordingly.

Irrespective of which participants act as initiator, the "Transm. of object "max. actuating value" (for heating system)" must be set to the default value for all other valve actuators, see Figure:

18.82 step heating

A 2-step heating system consists of a slow main step and a fast additional step.

Typically, Cheops control is plugged into the floor heating system (main step) and the radiators are controlled as the additional step.

Cheops controls the two steps in parallel, the additional step being controlled at a lower set point value.
The differential between main and additional step is defined on the "Set point value" parameter page.

Cheops drive valve actuators can be used as a continuous additional step (recommended).

Thermal valve actuators (Order No. 907 0 248) or possibly an electrical additional heater can be used as a switching additional step.

18.9 Temperature control

18.9.1 Introduction

Cheops Control can be used as a P or a PI controller, although the PI control is always preferred.

With the proportional control (P control), the actuating value is rigidly adjusted to the temperature differential.
The proportional integral control (PI control) is far more flexible, i.e. controls more quickly and more accurately.

To explain the function of both temperature controls, the following example compares the room to be heated with a vessel.

The filling level of the vessel denotes the room temperature.
The water supply denotes the radiator output.
The heat loss from the room is illustrated by a drain.

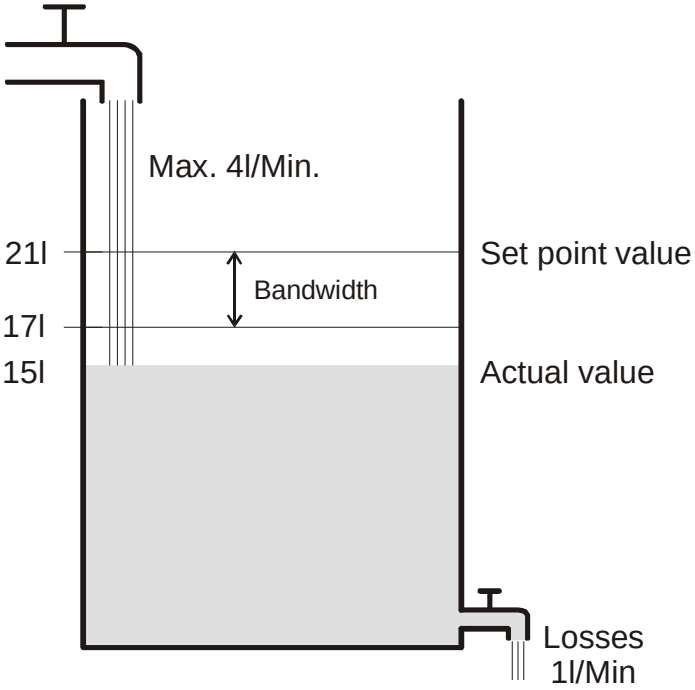
In our example, the maximum supply volume is 4 litres per minute and also denotes the maximum radiator output.
This maximum output is achieved with an actuating value of 100%.
Accordingly, at an actuating value of 50%, only half the water volume, i.e. 2 litres per minute would flow into our vessel.

The bandwidth is 4l.
This means that the controller will send an actuating value of 100% while the actual value is smaller than or equal to (211 – 41) 171.

Function:

- Desired filling quantity:
  21 litres (= set point value)
- From when should the supply flow gradually be reduced in order to avoid an overflow? :
  4l below the desired filling volume, i.e. at 21l – 41 = 171 (=bandwidth)
- Original filling volume
  15l (=actual value)
- The losses amount to 1l/minute

18.9.2 Response of the P-control



A filling volume of 15l gives rise to a control deviation of 211 – 151 = 61
Because our actual value lies outside the bandwidth, the control will control the flow at 100%
i.e. at 4l / minute

The supply quantity (actuating value) is calculated from the control deviation (set point value – actual value) and the bandwidth.
Actuating value = (control deviation / bandwidth) x 100

The table below shows the response and therefore also the limits of the P-control

Filling level	Actuating value	Supply	Losses	Increase in filling level
15l	100%	4 l/min	1 l/min	3 l/min
19l	50%	2 l/min		1 l/min
20l	25%	1 l/min		0 l/min

The last line indicates that the filling level cannot increase any further, because the flow allows only the same amount of water to flow in as can flow out through loss.
The result is a permanent control deviation of 11 and the set point value can never be reached.
If the loss was 1l higher, the permanent control deviation would increase by the same amount and the filling level would never exceed the 19l mark.

P-control as temperature control

The P-control behaves during heating control as shown in the previous example.
The set point temperature (21°C) can never quite be reached.
The permanent control deviation increases as the heat loss increases and as the ambient temperature decreases.

18.9.3 Response of the PI-control

Unlike the pure P-control, the PI-control works dynamically.
With this type of control, the actuating value will not remain unchanged, even at constant deviation.

In the first instant, the PI-control sends the same actuating value as the P-control, although the longer the set point value is not reached, the more this value increases.
This increases is time-controlled over the integration time.
With this calculation method, the actuating value does not change if the set point value and the actual value are the same.
Our example, therefore, shows equivalent in and outflow.

Notes on temperature control:

Effective control depends on agreement of bandwidth and integration time with the room to be heated.
The bandwidth influences the increment of the actuating value change:
Large bandwidth = finer increment on actuating value change.
The integration time influences the response time to temperature changes:
Long integration time = slow response.
Poor agreement can result in either the set point value being exceeded (overshoot) or the control taking too long to reach the set point value.

Usually, the best results are achieved with the standard settings or the settings via system type.

Standard settings:

Control by system type

19 VARIA 826 S WH KNX - 8269210

These typical applications are designed to aid planning.
Some individual functions or devices of an overall system are only shown for illustration purposes.
Therefore these examples have no claim to completeness and may be adjusted or extended arbitrarily.

19.1 Show weather predictions on the weather forecast page.

The weather predictions should be shown on the VARIA forecast page (page 1).
The desired 6 hr forecast period is selected on the Varia display with the ▲▼ buttons. This seamlessly covers all available periods (today, tomorrow, day after tomorrow, day 3).

Table 182: Display assignment:

Heading	Weather forecast
Line 1	Validity period: day.
Line 2	6 hr time interval.
Line 3	Weather scenario (e.g. "Slightly cloudy" etc.).
Line 4	Air temperature in °C
Line 5	Precipitation probability in %
Line 6	Rain amount in l/m^2 or mm
Line 7	Wind force in km/h
Line 8	Continue ▲▼

19.1.1 Devices:

- Meteodata 139 (1399200)
- VARIA 826 S (8269210/8269211)

19.1.2 Overview

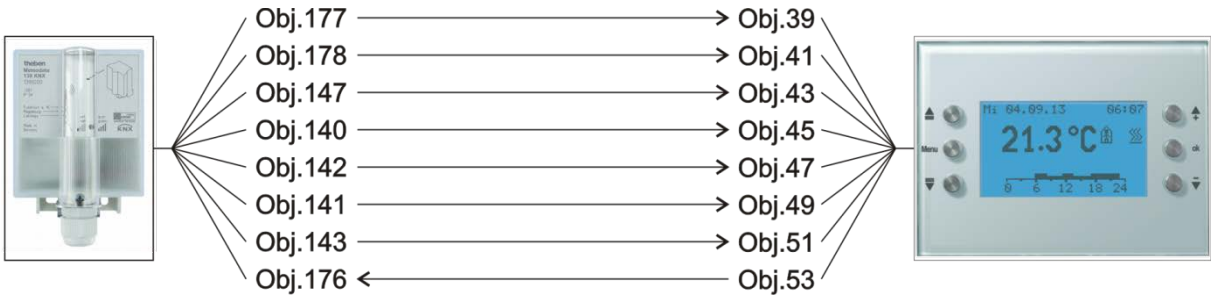


Figure 43

19.1.3 Objects and links

Table 183

No.	Meteodata 139 EFR	No.	VARIA 826 S		Comment
	Object name		Object name	Line	
177	*Text message in relation to index to day*	39	*Text in relation to index to day*	1	Today, tomorrow, the day after tomorrow, day 3
178	*Text message in relation to index to time interval*	41	*Text in relation to index to time*	2	00:00-06:00, 06:00-12:00 etc.
147	*Weather scenario as text*	43	*Weather scenario as text*	3	Sunny, cloudy, etc.
140	*Air temperature*	45	*Air temperature*	4	in °C
142	*Precipitation probability*	47	*Precipitation probability*	5	in %
141	*Precipitation amount*	49	*Precipitation amount*	6	in litres/m^2
143	*Wind force (km/h)*	51	*Wind force (km/h)*	7	-
176	*Index to 6 hr forecast*	53	*Index to time*	(8)	Sends a number from 0-15 during activation of the ▲▼ buttons.(Endless loop).

19.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 184: Meteodata 139 EFR

Parameter page	Parameter	Setting
Weather forecast	*User-specific period (from obj. 140)*	*Select 6 hr period via obj. 176*
	Unit for the sent wind force	*km/h*

Table 185: VARIA 826 S

Parameter page	Parameter	Setting
Select screens	*Show page 1 for display objects*	*yes*
	Show weather forecast on page 1	*yes*

19.2 Display weather data and air quality

19.2.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- Amun 716 (716 9 200)
- Weather station (132 9 201

19.2.2 Overview

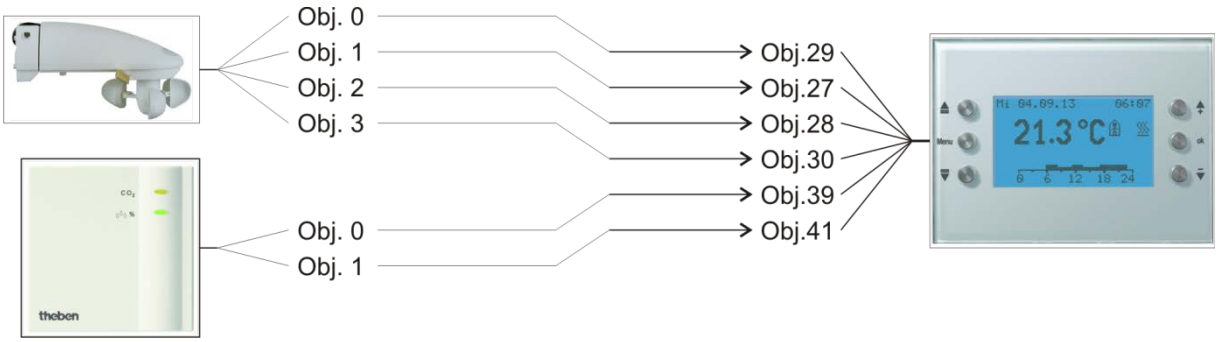


Figure 44

19.2.3 Objects and links

Table 186

No.	Weather station Object name	No.	VARIA Object name	Comment
0	*Brightness value*	29	*Brightness*	Display on the weather page
1	*Temperature value*	27	*Outside temperature*	Display on the weather page
2	*Wind speed*	28	*Wind speed*	Display on the weather page
3	*Rain sensor*	30	*Rain*	Display on the weather page

Table 187

No.	Amun 716 Object name	No.	VARIA Object name	Comment
0	*CO2 value*	39	*Display page 1, line 1 -EIS 5 value*	Display on freely programmable pages
1	*relative humidity*	41	*Display page 1, line 2 - percentage value*	Display on freely programmable pages

19.2.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 188: VARIA

Parameter page	Parameter	Setting
Select screens	*Show [weather data] page?*	*yes*
	Show page 1 for display objects	*yes*
Weather data	*Wind unit*	*km/h*
Page 1 line 1	*Line format*	*Object type: EIS 5*
	Text for line 1 (11)	*CO2 value*
	Unit for display object (3)	*ppm*
	Authorise amendment of object value?	*no*
Page 1 line 2	*Line format*	*Object type: percentage value*
	Text for line 3 (14)	*Relative humidity*
	Authorise amendment of object value?	*no*

Table 189: Weather station

Parameter page	Parameter	Setting
Measured values	*Send wind speed in the event of a change of*	*20 %, but at least 1 m/s*
	Send wind speed in	*km/h*
	Send wind speed cyclically	*every 10 minutes*
	Send brightness value in the event of a change of	*30 %, but at least 1 lx*
	Send brightness value cyclically	*every 10 minutes*
	Transmit temperature in the event of change of	*1 °C*
	Send temperature cyclically	*every 10 minutes*
	Send rain in the event of change and	*every 10 minutes*
	Off-delay	*none*

Table 190: Amun 716

Parameter page	Parameter	Setting
Measured values	*Send CO2 content on change of*	*200 ppm*
	Send CO2 content cyclically	*every 10 minutes*
	Send humidity value in the event of a change of	*2 %*
	Send humidity value cyclically	*every 10 minutes*

19.3 Blinds or shutter / awning control

Blinds, shutters or awnings are controlled via line 1
on display page 1 by pressing the +/- buttons.
The difference between blinds and shutter control is determined by the configuration of the blinds actuator.

19.3.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- JMG 4 S (Order. no. 491 0 250)

19.3.2 Overview

Figure 45

19.3.3 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

19.3.3.1 Varia

Table 191

Parameter page	Parameter	Setting
Select screens	*Show page 1 for display objects*	*yes*
Page 1, line 1	*Line format*	*Blinds/shutter object type (DPT 1 .008..)*

19.3.3.2 JMG 4S

Parameter page	Parameter	Setting
GM JMG 4S	*Type of curtain*	*Blinds* or *Shutter / awning / general drive*

19.3.4 Objects and links

Table 192: VARIA

No.	VARIA Object function	No.	JMG 4S Object function	Comment
39	*Blinds up/down*	0	*Up/down*	Prolonged pressing of the + button = Up Prolonged pressing of the - button = Down
40	*Blinds Step/Stop*	1	*Step / stop*	Briefly pressing the + / - button = Step Up/ Step Down or Stop

19.4 Conservatory control

19.4.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- Amun 716 (716 9 200)
- Weather station (132 9 201)

19.4.2 Overview

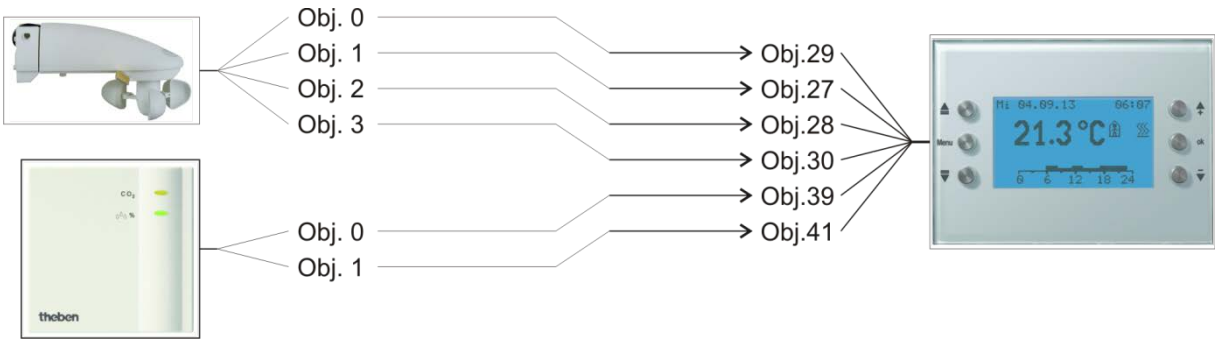


Figure 46

19.4.3 Objects and links

Table 193

No.	Weather station Object name	No.	VARIA Object name	Comment
0	*Brightness value*	29	*Brightness*	Display on the weather page
1	*Temperature value*	27	*Outside temperature*	Display on the weather page
2	*Wind speed*	28	*Wind speed*	Display on the weather page
3	*Rain sensor*	30	*Rain*	Display on the weather page

Table 194

No.	Amun 716 Object name	No.	VARIA Object name	Comment
0	*CO2 value*	39	*Display page 1, line 1 -EIS 5 value*	Display on freely programmable pages
1	*relative humidity*	41	*Display page 1, line 2 - percentage value*	Display on freely programmable pages

19.4.4 Important parameter settings

The standard parameter settings apply for unlisted parameters.

Table 195: VARIA

Parameter page	Parameter	Setting
Select screens	*Show [weather data] page?*	*yes*
	Show page 1 for display objects	*yes*
Weather data	*Wind unit*	*km/h*
Page 1 line 1	*Line format*	*Object type: EIS 5*
	Text for line 1 (11)	*CO2 value*
	Unit for display object (3)	*ppm*
	Authorise amendment of object value?	*no*
Page 1 line 2	*Line format*	*Object type: percentage value*
	Text for line 3 (14)	*Relative humidity*
	Authorise amendment of object value?	*no*

Table 196: Weather station

Parameter page	Parameter	Setting
Measured values	*Send wind speed in the event of a change of*	*20 %, but at least 1 m/s*
	Send wind speed in	*km/h*
	Send wind speed cyclically	*every 10 minutes*
	Send brightness value in the event of a change of	*30 %, but at least 1 lx*
	Send brightness value cyclically	*every 10 minutes*
	Transmit temperature in the event of change of	*1 °C*
	Send temperature cyclically	*every 10 minutes*
	Send rain in the event of change and	*every 10 minutes*
	Off-delay	*none*

Table 197: Amun 716

Parameter page	Parameter	Setting
Measured values	*Send CO2 content on change of*	*200 ppm*
	Send CO2 content cyclically	*every 10 minutes*
	Send humidity value in the event of a change of	*2 %*
	Send humidity value cyclically	*every 10 minutes*

19.5 Heating control, basic configuration

Varia controls a Cheops actuator.
A window contact, on a TA 2 binary input sends the window status.

19.5.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- Cheops drive (Order no. 731 9 200)
- TA 2 (order no. 496 9 202)

19.5.2 Overview

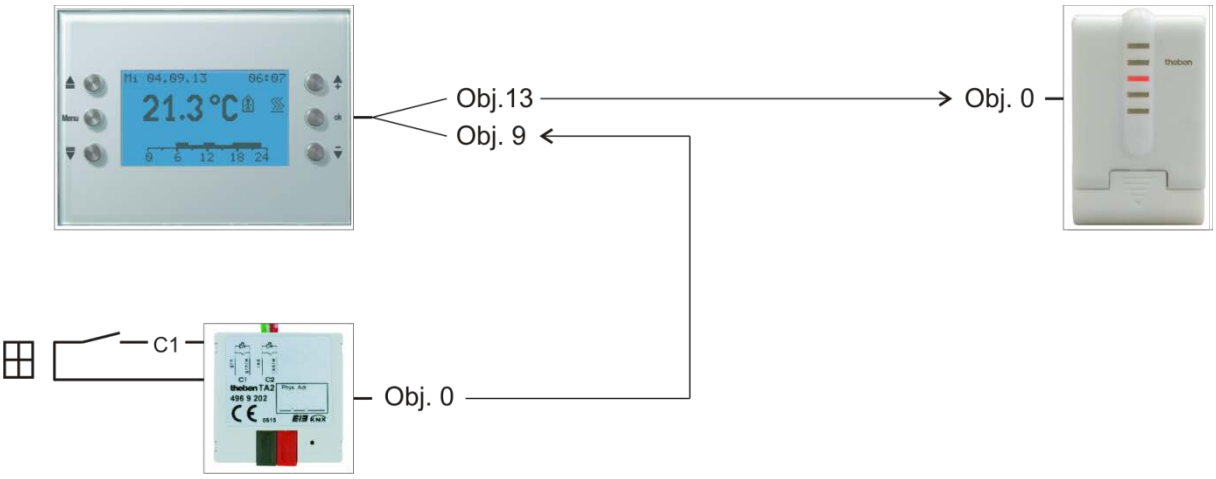


Figure 47

19.5.3 Objects and links

Table 198

No.	VARIA Object name	No.	Cheops drive Object name	Comment
13	*Heating actuating value %*	0	*Actuating value*	RTR output actuator

Table 199

No.	TA 2 Object name	No.	VARIA Object name	Comment
0	*Channel 1 switching*	9	*Window position*	Input for window contact

19.5.4 Important parameter settings

Standard or customer-defined parameter settings apply to unlisted parameters.

19.5.4.1 Varia

Table 200

Parameter page	Parameter	Setting
RTR setting	*CONTROL*	*Heating control only*
	Objects for determining the operating mode	*new: operating mode, presence, window status*

19.5.4.2 TA 2

Table 201

Parameter page	Parameter	Setting
Channel 2	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*

* Depending on type of window contact. The details in brackets refer to the following case:
Window closed → contact closed

19.5.4.3 Cheops drive

The standard parameter settings can be used here.

19.6 Fan coil actuator control

19.6.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- FCA 1 (Order no. 492 0 200)
- Presence detector (e.g. Theben HTS Eco-IR 180, 360 or Compact Office*)

19.6.2 Overview

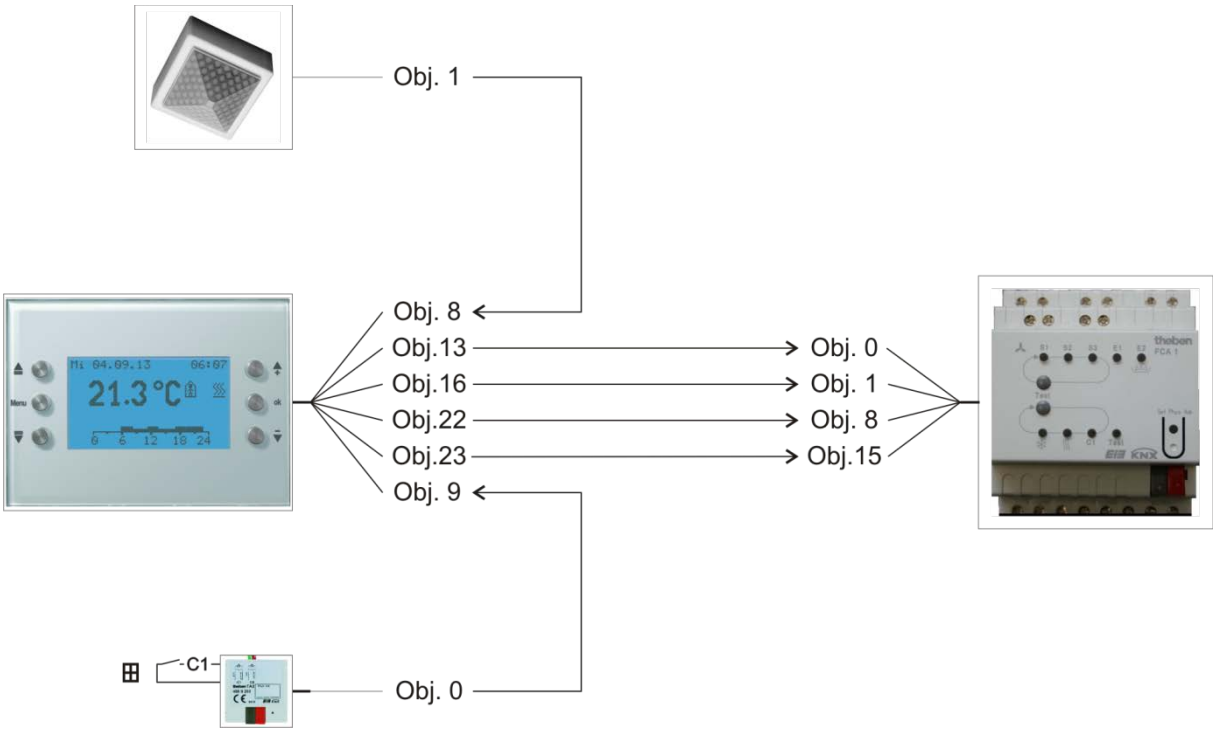


Figure 48

19.6.3 Important parameter settings

The standard parameter settings apply for unlisted parameters.

19.6.3.1 Varia

Table 202

Parameter page	Parameter	Setting
RTR setting	*CONTROL*	*Heating and cooling*
	Objects for determining the operating mode	*new: operating mode, presence, window status*
	Presence sensor type (to Obj. 8)	*Presence detector*
	Activate fan stage control	*yes*
Heating control	*Number of heating stages*	*Only one heating stage*
	Type of control	*Continuous control*
Cooling control	*Type of control*	*Continuous control*
	Setting the control parameters	*Via system type*
	System type	*Fan coil unit*
	Switching between heating and cooling	*automatic*
Fan stages	*Number of fan stages*	*3 fan stages*
	Value for fan stage 1	*20 %*
	Value for fan stage 2	*50 %*
	Value for fan stage 3	*80 %*
	Switch fan between auto and forced	*via object forced/auto, forced = 1*

19.6.3.2 FCA 1

Parameter page	Parameter	Setting
General	*Supported function*	*Heating and cooling*
	Heating system	*Fan coil*
	Cooling system	*Fan coil*
	System type	*4-pipe system*
	Type of controller used	*Remote controller*
Fan	*Switched threshold for fan step 1*	*10 %*
	Switched threshold for fan step 2	*40 %*
	Switched threshold for fan step 3	*70 %*
Heating valve	*Type of valve*	*2-point*
Cooling valve	*Type of valve*	*2-point*

19.6.3.3 Presence detector

Table 203: Presence detector (e.g. Eco-IR 180, 360 or Compact Office*)

Parameter page	Parameter	Setting
General data	*Normal or test operation mode*	*Standard operation*
	*HVAC switch output**	*Active*
HVAC switch output	*Response at start/end of HVAC requirement*	*Transmit On and Off telegram*

* Presence output

19.6.3.4 TA 2

Table 204

Parameter page	Parameter	Setting
Channel 1	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*

* Depending on type of window contact.
The details in brackets refer to the following case:
Window closed → contact closed

19.6.4 Objects and links

Table 205: VARIA

No.	VARIA Object name	No.	FCA 1 Object name	Comment
13	*Heating actuating value (%)*	0	*Heating actuating value*	FCA receives the actuating value heating from VARIA
14	*Cooling actuating value (%)*	1	*Cooling control variable*	FCA receives the actuating value cooling from VARIA
22	*Forced fan stage*	8	*Forced fan stage*	% value for forced mode
23	*Fan forced/auto mode*	15	*Fan forced/auto mode*	enables the manual selection of fan stage on VARIA

Table 206: presence detector

No.	ECO-IR Object name	No.	VARIA Object name	Comment
1	*HVAC switch output*	8	*Presence*	Presence signal for switch to comfort mode

Table 207: TA 2 for window status

No.	TA 2 Object name	No.	VARIA Object name	Comment
0	*Channel 1 switching*	9	*Window position*	Window status for the RTR (frost protection) 1 = window open

19.7 Heating control with 6 heating circuits and window monitoring for caretakers.

Combined with 5 RAM 712 Varia controls 6 rooms (rooms 1-6), with window contacts and presence detectors, via a HMT 6 with thermal actuators.

In room 1 (monitoring room) the window contacts and the presence sensors are connected to a TA 2.
Here, VARIA controls the room temperature and monitors the window status in all rooms.

In each of the rooms 2 to 6, room temperature is controlled by a RAM 712.
The window contacts and presence sensors are connected to the binary inputs on the RAM 712.

All window objects send their status to a line on display page 1,
which can be configured as a favourite page.
All window objects are also centrally linked to the Varia *favourite page* object.

If a window is opened in a room, the favourite page containing the window display status is displayed (only VARIA 826 S KNX).

Alternatively, a signal can be activated as soon as a window is opened.
The only other requirement is to connect object 120 with same group addresses as object 121.

19.7.1 Devices:

- VARIA 826 / 826 S KNX (8269200, 8269210, 8269211)
- TA 2 (order no. 496 9 202)
- 5x RAM 712 (order no. 712 9 200)

19.7.2 Overview

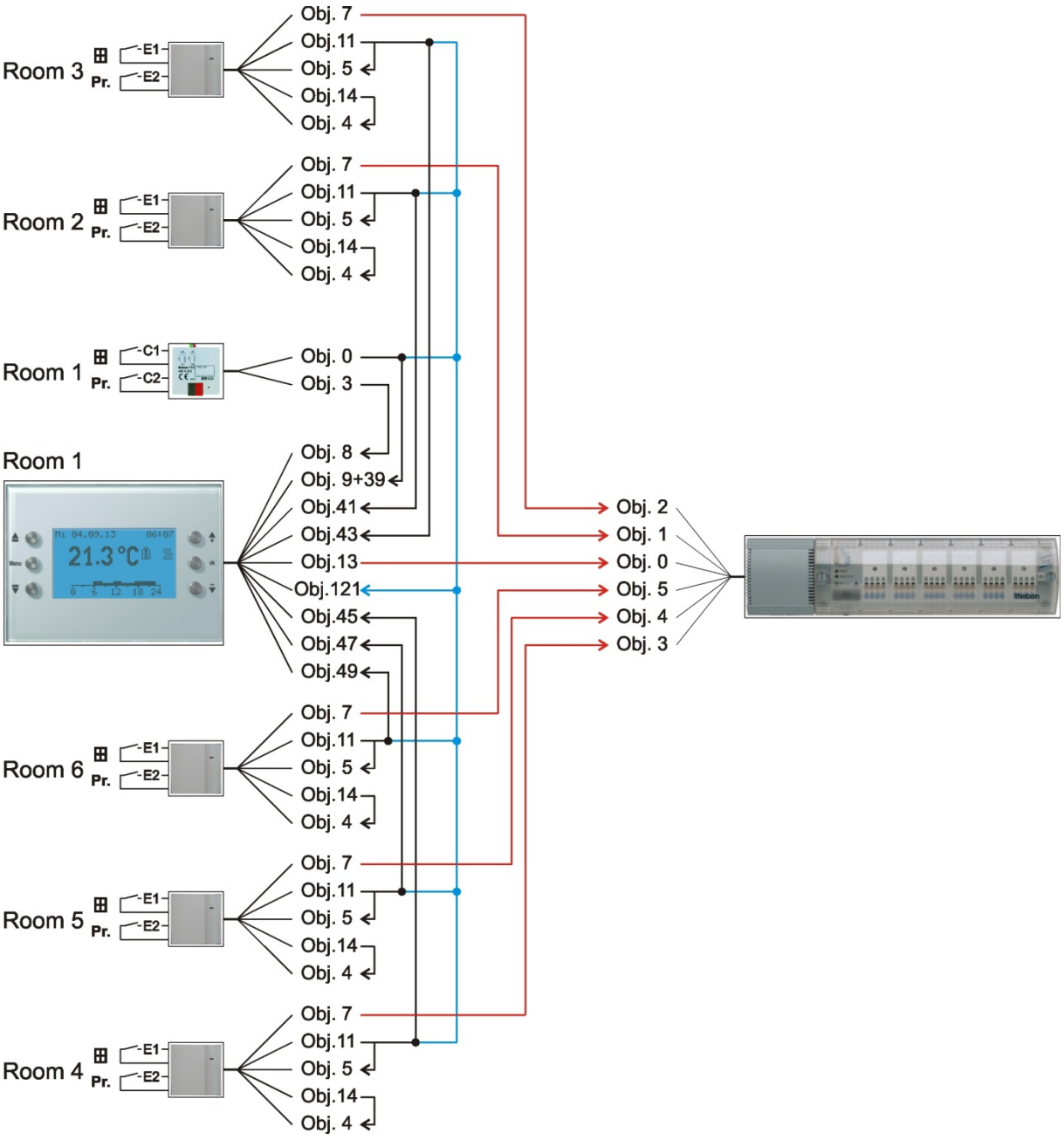


Figure 49

19.7.3 Important parameter settings

Standard or customer-defined parameter settings apply to unlisted parameters.

19.7.3.1 Varia

Table 208

Parameter page	Parameter	Setting
RTR setting	*CONTROL*	*Heating control only*
	Objects for determining the operating mode	*new: operating mode, presence, window status*
Heating control	*Number of heating stages*	*Only one heating stage*
	Type of control	*Continuous control*
Select screens	*Show page 1 for display objects*	*yes*
	Favourite page (Only Varia 826 S KNX)	*Screen 1 if page available*
	Select favourites page (Only Varia 826 S KNX)	*Via object only*
Display objects page 1	*Page heading*	**Window status**
Joint parameters for page 1		
Page 1, lines 1-6	*Line format*	*Object type: switch*
	Text at object value = 0	**closed**
	Text at object value = 1	**open**
	Authorise amendment of object value?	*no*
Own parameters for line descriptions		
Page 1, line 1	*Text for line 1*	**Window room 1**
Page 1, line 2	*Text for line 2*	**Window room 2**
Page 1, line 3	*Text for line 3*	**Window room 3**
Page 1, line 4	*Text for line 4*	**Window room 4**
Page 1, line 5	*Text for line 5*	**Window room 5**
Page 1, line 6	*Text for line 6*	**Window room 6**

19.7.3.2 TA 2

Table 209

Parameter page	Parameter	Setting
Channel 1	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*
Channel 2	*Channel function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON*
	Response to falling edge	*none*
	Response after restoration of the bus supply	*none*

* Depending on type of window contact. The details in brackets refer to the following case:
Window closed → contact closed

19.7.3.3 RAM 712

Parameter page	Parameter	Setting
Settings	*CONTROL*	*standard*
	Function of external interface	*active*
Operating mode	*Objects for determining the operating mode*	*Operating mode, presence, window status*
	Presence sensor type (to obj. 4)	*Presence buttons*
Input 1	*Input function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON (OFF*)*
	Response to falling edge	*OFF (ON*)*
	Response after restoration of the bus supply	*update*
Input 2	*Input function*	*Switch/push button*
	Debounce time	*100 ms*
	Object type	*Switching (1-bit)*
	Response to rising edge	*ON*
	Response to falling edge	*none*
	Response after restoration of the bus supply	*none*

* Depending on type of window contact. The details in brackets refer to the following case:
Window closed → contact closed

19.7.3.4 HMT 6

Parameter page	Parameter	Setting
General	*Which device is used*	*HMT 6*
Channel 1.. 6	*Type of actuating value*	*Continuous*
	Monitoring the actuating value of the room thermostat	*without monitoring*

19.7.4 Objects and links

Table 210: Varia window status and presence sensor feedback

	No.	Object name	VARIA		Comment
			No.	Object name	
TA2 room 1	0	*Channel 1 switching*	9	*Window position*	Window status for the RTR (frost protection) 1 = window open
			39	*Display page 1, line 1*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1
	3	*Channel 2 switching*	8	*Presence*	Presence sensor for the RTR (comfort)
RAM 712 Room 2	11	*Input 1 switching*	41	*Display page 1, line 2*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1
RAM 712 Room 3	11	*Input 1 switching*	43	*Display page 1, line 3*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1
RAM 712 Room 4	11	*Input 1 switching*	45	*Display page 1, line 4*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1

Continuation:

	No.	Object name	VARIA		Comment
			No.	Object name	
RAM 712 Room 5	11	*Input 1 switching*	47	*Display page 1, line 5*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1
RAM 712 Room 6	11	*Input 1 switching*	49	*Display page 1, line 6*	Window status for display (1 = window open)
			12 1	*Select favourites page*	Central address for all window contacts. 1 = window open = call up display page 1

Table 211: Actuating value for the heating actuator

	No.	Object name	HMT 6		Comment
			No.	Object name	
VARIA	13	*Heating actuating value (%)*	0	*Actuating value channel 1*	Control of actuator room 1
RAM 712 Room 2	7	*Heating actuating value*	1	*Actuating value channel 2*	Control of actuator room 2
RAM 712 Room 3	7	*Heating actuating value*	2	*Actuating value channel 3*	Control of actuator room 3
RAM 712 Room 4	7	*Heating actuating value*	3	*Actuating value channel 4*	Control of actuator room 4
RAM 712 Room 5	7	*Heating actuating value*	4	*Actuating value channel 5*	Control of actuator room 5
RAM 712 Room 6	7	*Heating actuating value*	5	*Actuating value channel 6*	Control of actuator room 6

Table 212: Own links for window and presence object with each RAM 712 (see Overview illustration)

No.	RAM 712	No.	RAM 712	Comment
	Object name		Object name	
11	*Input 1 switching*	5	*Window position*	Link window status to own window object.
14	*Input 2 switching*	4	*Presence*	Link input for presence sensor with own presence object.