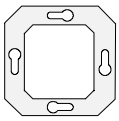


Product name:	**IR-Gateway**
Design:	flush-mounting type (uP)
Item no.:	**0588 ..**
ETS search path:	Gira Giersiepen / Infrared / IR converter / IR converter Gira Giersiepen / Communication / Infrared / IR converter

Functional description:

The IR-Gateway is a device for the transmission and reception of IR signals.
As a receiver, the gateway converts the IR signal codes received from standard remote controls into EIB telegrams. As a transmitter, the EIB commands are converted into IR codes so that TV, hifi, video or other IR-receiver-equipped devices within reach can be controlled.
Both applications can also be combined.

In this way, existing consumer electronics equipment or IR-controllable lighting systems can be integrated into intelligent building automation systems and remote-controlled from other rooms, too.
The IR components can moreover be integrated into different scenes or presence simulations.

A large number of commercial IR remote controls can be programmed to work with the IR-Gateway. For perfect operation, the remote controls must, however, comply with the RC-5 standard. In this standard, each signal key of the remote control activates a distinct IR signal code which can be understood by the IR-Gateway.

Programming of individual IR signals and the allocation to existing bus channels is effected simply triggering the sensor or actuator function on the bus side and by local actuation of the device itself. In this way, the user can always adapt the IR remote controls with minimum effort to the IR-Gateway.
The EIB/KNX channels and thus the link with the electrical installation are predefined in the ETS before commissioning.

The max. 32 bidirectional bus datapoints can be parameterized for the following functions: "Switching (1 bit)", "Dimming (4 bits)" or "Value" (1 byte)".
In the the switching and dimming functions, up to 2 IR signals respectively can be programmed (e.g. key A:"On" / key B: "Off" or key C: "Increase brightness" / key D: "Reduce brightness"). With the value transmission function, a distinct 1-byte value can be assigned to an IR signal.

In the IR transmitter function, the programmed IR signals can be transmitted cyclically several times.

instabus EIB System

Sensor

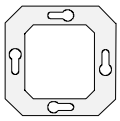
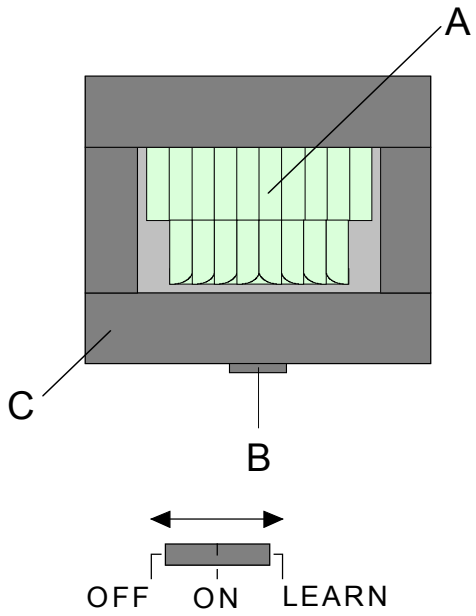


Illustration:

design-specific

Dimensions:

design-specific



Controls:

A: IR window with LED status display:

red static:	Charging of energy storage capacitor in progress. The device is not ready for operation. Please wait!
red flashing:	Device is deactivated. Slide switch in position Gira "OFF" / Berker "O" or error during programming (learning mode)
green static:	Learning mode is active.
green flashing:	Learning mode automatically aborted (no input for more than 2 min during active time). Device without function.

orange (flashing once briefly):

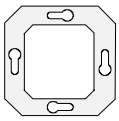
In normal mode:	IR signal transmission (can be enabled via parameter).
In learning mode:	IR signal is now programmed.

orange static: Erase mode active. Device without function.

B: Slide switch:

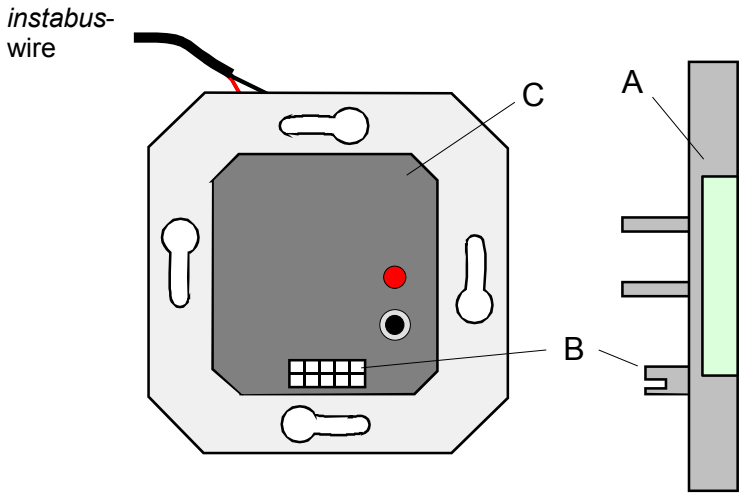
- Pos. "ON":	Normal operation	IR / bus conversion possible.
- Pos. "OFF":	Off	No IR communication possible. IR window flashes red.
- Pos. "LEARN":	Learn mode	IR signals can be programmed. No IR / bus conversion possible.

C: Reset potentiometer (at the rear)

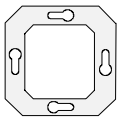


Technical data:	
instabus EIB supply	
voltage:	21 – 32 V DC (via flush-mounted BCU)
power consumption:	12 mA at 24 VDC; typically 290 mW (via flush-mounted BCU)
connection:	Instabus connecting and branching terminal
External supply	---
Infrared	
Number of IR codes:	Max. 32 codes programmable for "Value" function Max. 64 codes programmable for "Switching" or "Dimming" functions
Coding:	In accordance with RC-5 standard (bit-phase coding)
Modulation:	ASK with 20 ... 70 kHz carrier frequency
Wavelenght of IR light:	920 ... 970 nm
Range:	approx. 10 m for a horizontal aperture of 30° from sensor centerline
Response to bus voltage failure:	No reaction. IR communication no longer possible.
Response on return of bus voltage:	No reaction. The operating mode corresponding to the position of the slide switch or of the reset potentiometer is executed.
Type of protection:	IP 20
Mark of approval:	KNX / EIB
Ambient temperature	-5 °C ... +45 °C
Storage temperature:	-25 °C ... +70 °C (storage above +45 °C results lifetime of device
Mounting position:	Slide switch at the bottom
Minimum spacings:	none
Type of fastening:	Plugged onto flush-mounted BCU (see hardware info); if possible unobstructed mounting on the wall.

Connecting diagram: **Terminals:**



A: IR-Gateway
B: User interface (PEI)
C: Bus coupler (BCU 2)



Hardware information:

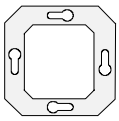
- The IR-Gateway must only be used on BCU 2 bus couplers with article no. 0645 00 (supplied with the device).
  Installing the IR-Gateway on other flush-mounted bus couplers (BCU 1) results in malfunction.

- As the IR-Gateway needs more energy during the transmission of IR signals and as the bus coupler can supply only a limited current, the device is equipped with an energy storage capacitor (Gold-Cap). This storage capacitor must be recharged after initial commissioning and after a prolonged bus voltage failure (> 5 h). During the recharging phase, the device is not ready for operation and the IR window shines permanently red. After a recharging time of approx. 10 minutes, the energy storage capacitor is recharged. After recharging, a prolonged and troublefree operation is ensured.

- If the IR-Gateway is withdrawn from the bus coupler for a prolonged time (> 5 h), the slide switch should be moved to position "OFF". In this case, unnecessary discharging of the energy storage capacitor can be avoided.

- Transmission range reductions must be expected, if the batteries of the used and programmed IR transmitters (e.g. TV remote control) are weak or discharged.

- IR transmissions use frequencies on a non-exclusive basis. This means that IR transmissions from other transmitters that are not programmed into the gateway can cause malfunctions or make the recognition of programmed IR signals impossible.

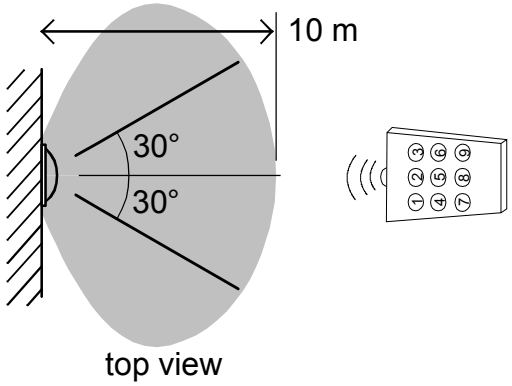


Choosing the place of installation

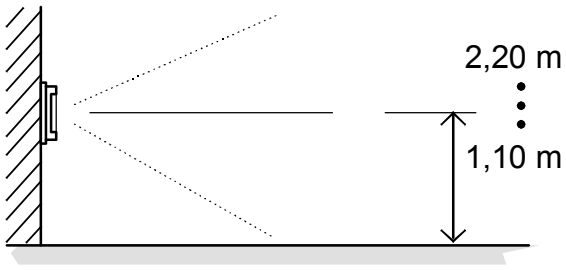
The place of installation should be chosen in such a way that the optimal communication range can be achieved in operation.

For proper functioning, the IR-Gateway needs visual contact with the IR devices (e.g. audio equipment) to be controlled and with the IR remote controls from which commands are transmitted to the gateway.

For this reason, the place of installation is to be chosen such that
- the IR-Gateway can be easily aimed at with an infrared remote control in operation,
- the visual contact between the gateway and the devices to be controlled is not restricted by objects, pieces of furniture, curtains, etc.



The range (approx. 10 m) is optimal within an angle 30° (from the median line). Even greater distances and angles can be achieved when transmitter and receiver are arranged in a straight line. The same applies, if the IR light can be reflected from walls or pieces of furniture in the room.

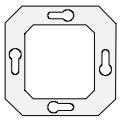


The gateway can be installed at hand level (1.10 m), but also at a height of 2.20 m.

The range is reduced…
- outside the specified boundaries,
- when the IR remote control batteries are weak or discharged.

instabus EIB System

Sensor

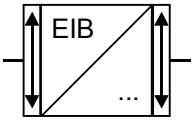


Software description:

ETS search path:

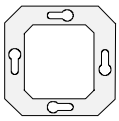
Gira Giersiepen / Communication / Infrared / IR converter
Gira Giersiepen / Infrared / IR converter / IR converter

ETS-symbol:



Applications:

Brief description:	Name:	Date:	Page:	Data base
Transmission and reception of IR signals	IR transmission/reception C00701	10.04	7	05889190



Application: **IR Senden/Empfangen C00701**

Scope of functions

- Conversion of EIB/KNX telegrams into IR signals by means of 32 independent EIB/KNX channels
- Conversion direction separately parameterizable for each channel
- Easy programming of IR signals coded on the basis of the RC-5 standard (IR codes) after commissioning with the ETS
- Maximum of 32 independent EIB/KNX channels with the following datapoint types:

  - "Switching 1 bit",
  - "Dimming 4 bits",
  - "Value 1 byte".

  ⇒ "Switching":
  Dependig on requirements, unidirectional or bidirectional conversion of the EIB/KNX switching commands (ON, OFF).
  2 IR signals programmable: switch-on command and switch-off command can have their own IR signal assigned.
  Multiple transmission of IR signals possible.

  ⇒ "Dimming":
  Dependig on requirements, unidirectional or bidirectional conversion of the relative EIB/KNX dimming commands (increase or reduce brightness).
  2 IR signals programmable: brightness increase and brightness reduction can have their own IR signal assigned.
  During the conversion from EIB/KNX to IR, the dimming step width of the received telegram is evaluated, whereby the IR signal is transmitted cyclically several times. During the conversion from IR to EIB/KNX, dimming is effected with a step width of 100 %. Evaluation of a stop telegram received from the bus during transmission of IR signals or transmission of a stop telegram to the bus during reception of an IR code.

  ⇒ "Value":
  Dependig on requirements, unidirectional or bidirectional conversion of the ETS-parametrized value (0...255) into a programmable IR signal.
  Multiple transmission of IR signal possible.

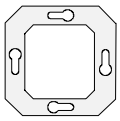
- Time interval between IR transmissions in the event of cyclical multiple transmission presettable
- LED confirmation for IR transmission parameterizable
- Central deletion of all programmed IR signals possible

Object description

0 - 31	**Switching:**	1 bit object for reception or transmission of switching telegrams (ON, OFF).
0 - 31	**Dimming:**	4 bit object for reception or transmission of relative dimming telegrams (increase/reduce brightness including step width).
0 - 31	**Value:**	1 byte object for reception or transmission of a value telegram (0...255) depending on parameterization.

instabus EIB System

Sensor



Number of addresses (max.):	32	dynamic table management:	Yes ☒	No ☐
Number of assignments (max.):	32	maximum table length:	64	
Communication objects:	32			

Function: Switching (1 bit) *

Object:	Function:	Name:	Type:	Flag:
0 - 31	Switching	channel 1 to channel 32	1 bit	C,W,T,(R)**,A

Function: Dimming (4 bit) *

Object:	Function:	Name:	Type:	Flag:
0 - 31	Dimming	channel 1 to channel 32	4 bit	C,W,T,(R)**,A

Function: Value (1 byte) *

Object:	Function:	Name:	Type:	Flag:
0 - 31	Value transmitter	channel 1 to channel 32	1 byte	C,W,T,(R)**,A

Function: "not active" *
No further objects

*: Each channel can have its own function assigned independently. Therefore, also the visible objects change dynamically.

**: Objects marked (R) permit read-out of the object status (set R flag).

1. IR-Grundlagen

Many manufacturers of audio and video equipment make partial or full use of the RC-5 code developed by Philips for their remote controls. In the course of the years, the standard has become firmly established in the US and in Europe. The IR-Gateway can scan and evaluate RC-5-coded IR signals.

The now enlarged RC-5 code can handle 4096 different commands divided into 32 addressable groups, each with up to 128 commands.
Thus, up to 32 different types of devices (e.g. "TV1", "TV2", "Video", "CD", "Sat", "Lighting" etc.) can be distinguished and addressed. Therefore, it is possible, for instance, to switch on only the TV set without switching on also other devices.
In addition, each device can be controlled with up to 128 commands (e.g. "Standby", "Play", "Fast forward", "Brightness", etc.). Each command is transmitted by its own IR code with each key of an IR remote control being assigned a distinct IR signal (cf. Fig. 1).

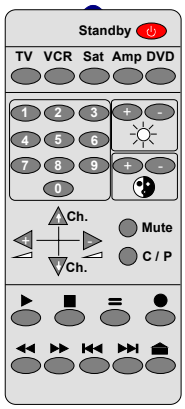
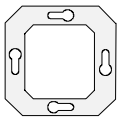


Fig. 1: Example of a universal IR remote control based on the RC-5 standard

When a key on an IR remote control is pressed, the corresponding key code is transmitted cyclically several times until the key is released. The IR-Gateway can evaluate the duration of an IR key-press (e.g. for relative dimming).
A special toggle-bit in the RC-5 code moreover permits distinguishing whether a key remains pressed continuously (e.g. during volume control) or whether the key is pressed again (e.g. during switching over to another TV program). Thus, a key may even have two scannable codes that can be distinguished and separately learnt by the gateway. It should be noted, however, that not every key of an RC-5 remote control toggles the key signal code or transmits the code cyclically.

The control commands of an IR remote control working with infrared light are transmitted with a standard wavelength of 940 ... 950 nm. Most RC-5 remote controls transmit the light signal with a carrier frequency between 36 and 38 kHz in amplitude modulation (ASK).
The remote controls available on the market differ not only in the coding of commands and the carrier signal frequency, but also in the strength of the transmitted IR signals. In order to be compatible with the large number of remote controls offered by different manufacturers, the IR-Gateway can cope with a broad receiving spectrum as to wavelength and carrier frequency (cf. Technical Data).

It should be noted, however, that the IR-Gateway is functional only within the limits of its technical specifications. For this reason, older remote controls without carrier frequency, IR transmitters or receivers not working in compliance with the RC-5 standard or IR remote controls with another carrier frequency (e.g. from manufactuers Bang&Olufsen) cannot be used.
Some manufacturers have not implemented the full set of RC-5 commands, transmit additionally their own codes or work with a non-programmable transmission sequence.
In some cases, the gateway cannot learn the signal codes received.



2. Functional principle

2.1 Direction of conversion

The IR-Gateway permits sending and receiving of IR signals.
As a receiver, the gateway converts the signals received from standard IR remote controls into EIB telegrams. As a transmitter, the device converts EIB commands into IR signals so that TV, hifi, video and other equipment with an IR receiver within reach can be be controlled from the gateway. Both applications can also be combined.

The mode of operation can be programmed for each of the max. 32 channels of the Gateways separately. The conversion direction is defined by the *"Function"* parameter in the ETS.

Operation as IR receiver:

The gateway converts the programmed IR signals directly into EIB/KNX telegrams ("Switching", "Dimming" or "Value"). The existing services in the building, such as lighting, shutters/blinds or the heating system can be comfortably controlled with the free function keys of the TV IR remote control lying on the the living room table (see Fig. 2).

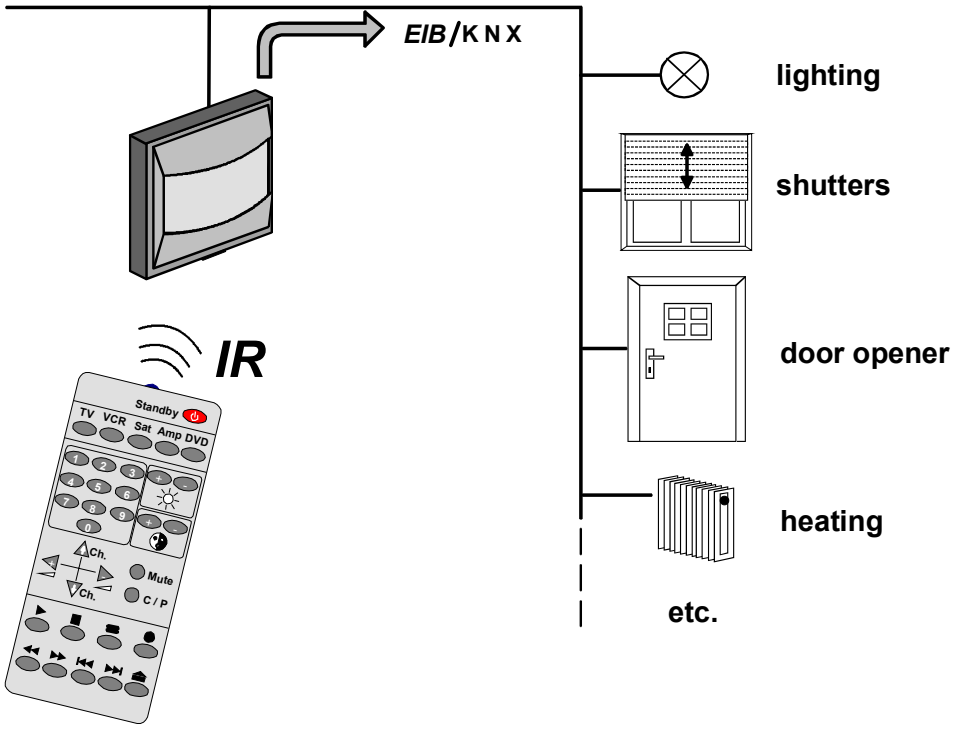


Fig. 2: Controlling the existing EIB/KNX installation with an IR transmitter

The EIB/KNX telegrams are transmitted on the bus channel allocated to the received IR signal (see Fig. 3).

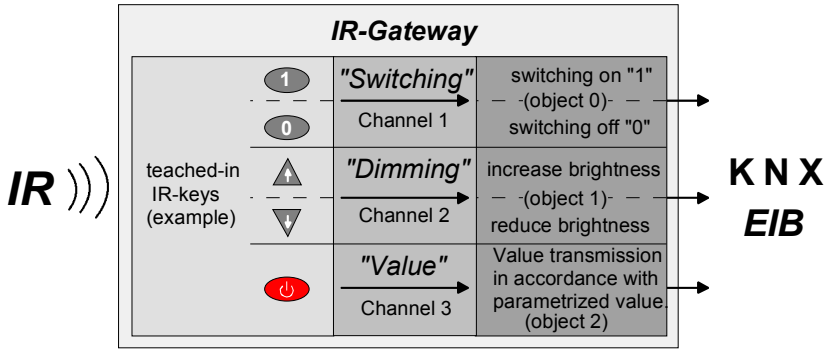


Fig. 3: Example of IR signals received controlling EIB/KNX bus datapoints

The "Switching" and "Dimming" functions can be optionally operated by up to two IR signals. Depending on the IR key pressed, it is therefore possible to send a "1" telegram or an "Increase brightness" telegram and a "0" telegram or a "Reduce brightness" telegram to the Instabus. Some IR keys send two different IR signals depending on their toggle bit so that both signals are programmed into one bus channel with the result that toggling functions can be executed in the Instabus, too.

During relative dimming, the IR-Gateway always transmits a dimming step width of 100 % to the bus and sends a stop telegram when the IR key is released.

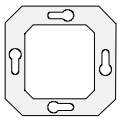
The bus channel assignments and the polarities of the bus telegrams transmitted ("On", "Off" / "Up", "Down") are defined in the learning mode.

The "Value" function can have only one IR signal assigned to it so that the value parameterized in the ETS (0...255) will be transmitted to the Instabus when the programmed IR key is pressed.

Important: If only one IR signal has been assigned to a channel with a "Switching" or "Dimming" function, only the programmed telegram "On / Increase brightness" resp. "Off / Reduce brightness" should be received via the channel object of the gateway (e.g. in case of a checkback signal from the Instabus). If a bus telegram is received with the non-programmed polarity, the conversion of IR signals to the bus on each channel of the gateway is stopped until a valid and previously programmed telegram on any channel is received again.

Depending on the parameter setting for *"LED confirmation during IR transmission"* the orange LED in the IR window of the gateway can light up for the time during which the IR signal is revceived (setting *"On"*). By selecting the *"Disabled"* setting (default), the optical checkback signal on reception can alternatively be deactivated.
Especially during commissioning or during the first function checks, the checkback function can be of some help.

If one and the same IR signal is received several times in succession (e.g. if a key of the IR remote control is held depressed), the LED will only be activated for the first signal received.



Operation as IR transmitter:

The gateway converts the switching, dimming or value telegrams received into programmed IR signals. In this mode, existing consumer electronics equipment or IR-controllable lighting systems can be integrated into intelligent building automation systems and also be remote-controlled from other rooms. Integration of IR components into different scenes or presence simulations is also possible (see Fig. 4).

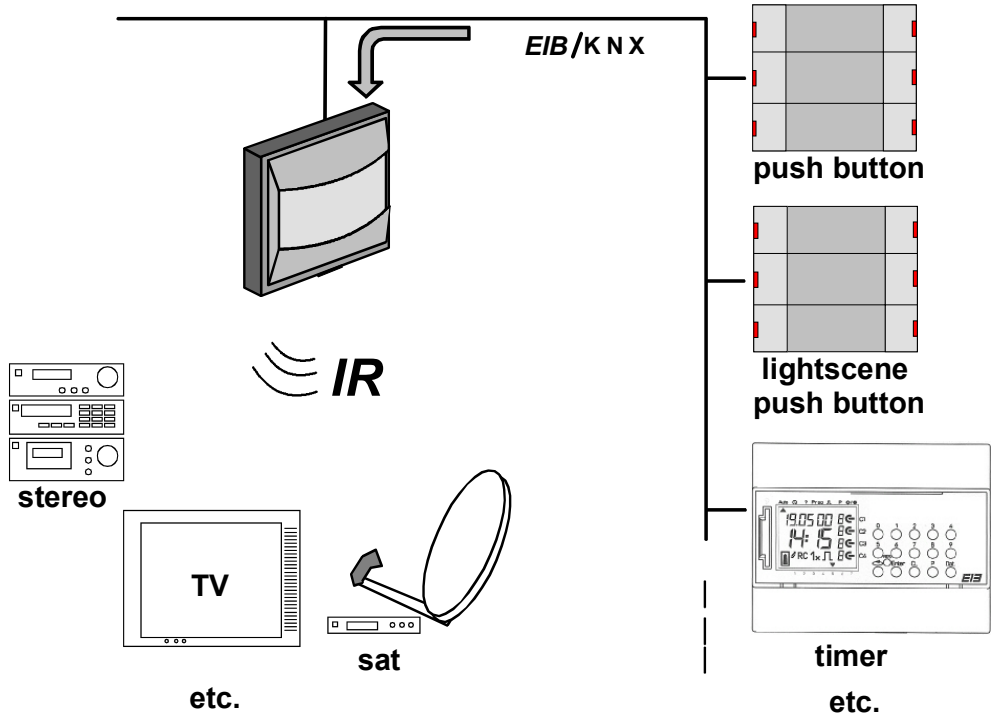


Fig. 4: Controlling existing IR components with sensors of the EIB/KNX installation

The programmed IR signals are transmitted depending on the EIB/KNX bus telegram received and of telegram polarity (see Fig. 5).

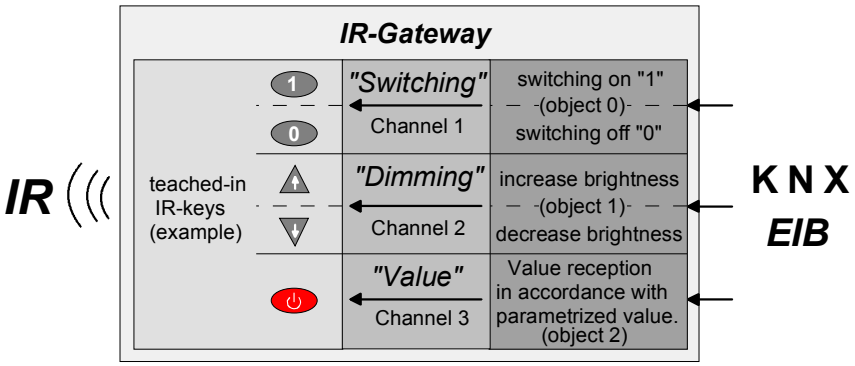
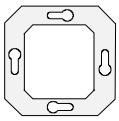


Fig. 5: Example for the conversion of EIB/KNX bus telegrams received into IR signals



The "Switching" and "Dimming" functions can be optionally operated by to up to two IR signals.
On the one hand, an IR signal is transmitted on reception of a "1" telegram or of an "Increase brightness" telegram, whereas on the other hand, another IR signal can be transmitted on reception of a "0" telegram or of a "Reduce brightness" telegram.
The assignments to bus channels and the polarities of the bus telegrams transmitted ("On", "Off" / "Up", "Down") are defined in the learning process.

In the "Dimming" function, the number of transmitted IR signals as fixed by the dimming step width for relative dimming received from the bus is as follows:

dimming value received [%]	1,5	3	6	12,5	25	50	100
number of IR signal transmissions	1	2	3	6	12	25	50

The transmission of IR signal is aborted when a stop telegram is received.

The "Value" function can have only one IR signal assigned to it. The corresponding IR code programmed is then transmitted only on reception of the value parameterized in the ETS (one out of a range of 0...255).

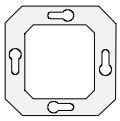
In the "Switching" or "Value" functions, the number of IR signals to be transmitted for multiple transmission can be predefined (1...12) depending on the "Repetitions during transmit" parameter. During a cyclical repetition or a multiple transmission (Dimming) of the IR signal, the signal transmitted is always the same. The IR transmission is thus equivalent to a long key-press on an IR remote control. This mode finds an application in controlling the volume of audio equipment or in the setting of a brightness value for an IR-controlled luminaire.

Depending on the parameter setting for "LED confirmation during IR transmission" the orange LED in the IR window of the gateway can light up for the time during which the IR signal is being revceived (setting "Enabled"). By selecting the "Disabled" setting (default), the optical checkback signal on transmission can alternatively be deactivated.
Especially during commissioning or during the first function checks, the checkback function can be of some help.

If one and the same IR signal is received several times in succession (e.g. during dimming or during an IR repetition), the LED will be activated for each IR signal transmitted.

Important note for operation as IR transmitter:

- After completion of commissioning, it is possible to link several bus channels via the same group addresses. During a telegram update of several datapoints taking place at the same time due to identical group addressing, all assigned IR signals – beginning at the channel with the highest number – will be output in sequence! Parameterized repetitions of the IR signal transmission are take into account.
- An IR transmission is not aborted by a telegram update for another bus channel. The IR-Gateway transmits all IR signals completely one after the other depending on the bus telegram sequence. Parameterized repetitions of the IR signal transmission for each channel are take into account
  Exceptions: The cyclical IR signal transmission during dimming is automatically aborted if a telegram is being written into another bus channel during the tranmit sequence.
  During an IR transmit repetition, the gateway cannot receive any IR signals.



Operation as transmitter and receicver:

In the operating mode as transmitter and receiver, both individual functions will be combined (cf. *"Operation as receiver"* or *"Operation as transmitter"*). The channel concerned is bidirectional.

In one of the directions, the gateway converts the switching, dimming or value telegrams received into the programmed IR signals. In this mode, existing consumer electronics equipment or IR-controllable lighting systems can be integrated into intelligent building automation systems and also be remote-controlled from other rooms. Integration of IR components into different scenes or presence simulations is also possible.
In the other direction, the gateway converts the programmed IR signals directly into EIB/KNX telegrams ("Switching", "Dimming" or "Value"). The existing services in the building, such as lighting, shutters/blinds or the heating system can be comfortably controlled with the free function keys of the TV IR remote control lying on the the living room table (see Fig. 6).

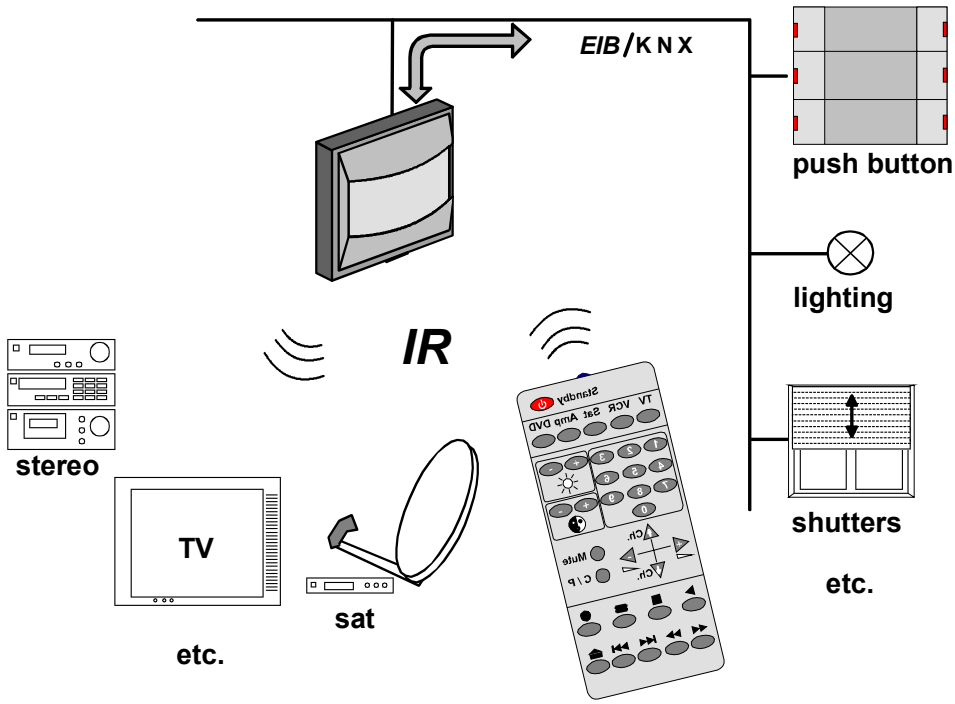


Fig. 6: Bidirectional control of existing IR components and of the EIB/KNX installation

During transmit, IR transmission of the programmed IR codes is effected depending on the EIB/KNX bus telegram received and of its polarity. During receive, the EIB/KNX telegrams are output in the other direction via the allocated bus channel depending on the IR code received (see Fig. 7).

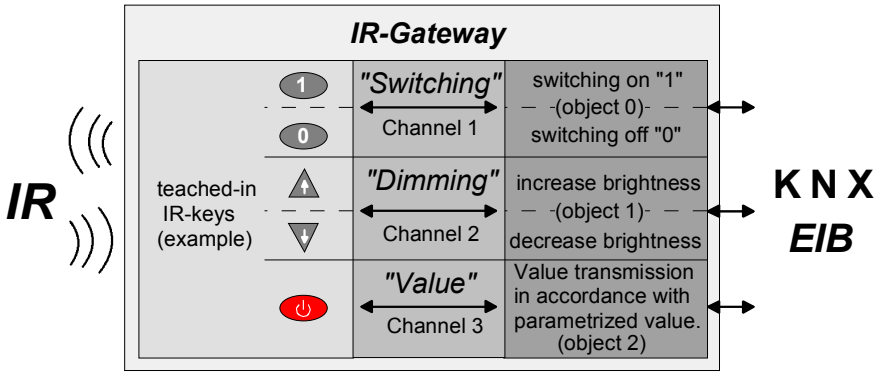
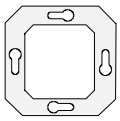


Fig. 7: Example of conversion from EIB/KNX bus telegrams into IR signals and vice versa

Both converting directions must be considered separately and independently of each other. Simultaneous transmission and reception on one channel or on several channels is not possible due to IR transmission constraints.

For a detailed description of the mode of operation, refer to the *"Operation as receiver"* and *"Operation as transmitter"* sections above.

Important: If only one IR signal has been assigned to a channel with a "Switching" or "Dimming" function, only the programmed "On / Increase brightness" or the "Off / Reduce brightness" telegram should be received via the channel object of the gateway. If a bus telegram is received with the non-programmed polarity, the conversion of IR signals to the bus on each channel of the gateway is stopped until a valid and previously programmed telegram on any channel is received again.
For this reason, appropriate precautions should be taken to ensure that the telegram transmitted has the programmed polarity (e.g. touch sensors with momentary-contact function "On" or "Off").



2.2 Special applications of the IR-Gateway

A. Using several IR-Gateways

For the pupose of controlling video, audio or IR lighting equipment beyond the room boundaries, two or more Gateways can be combined on the bus side. The hifi stereo equipment or the TV set in the living room can then be comfortably controlled from the kitchen or the bedroom without direct visual contact with the equipment. This configuration requires a transmitter gateway in the living room and additional receiver Gateways in the corresponding rooms. The configuration is shown in Fig. 8.

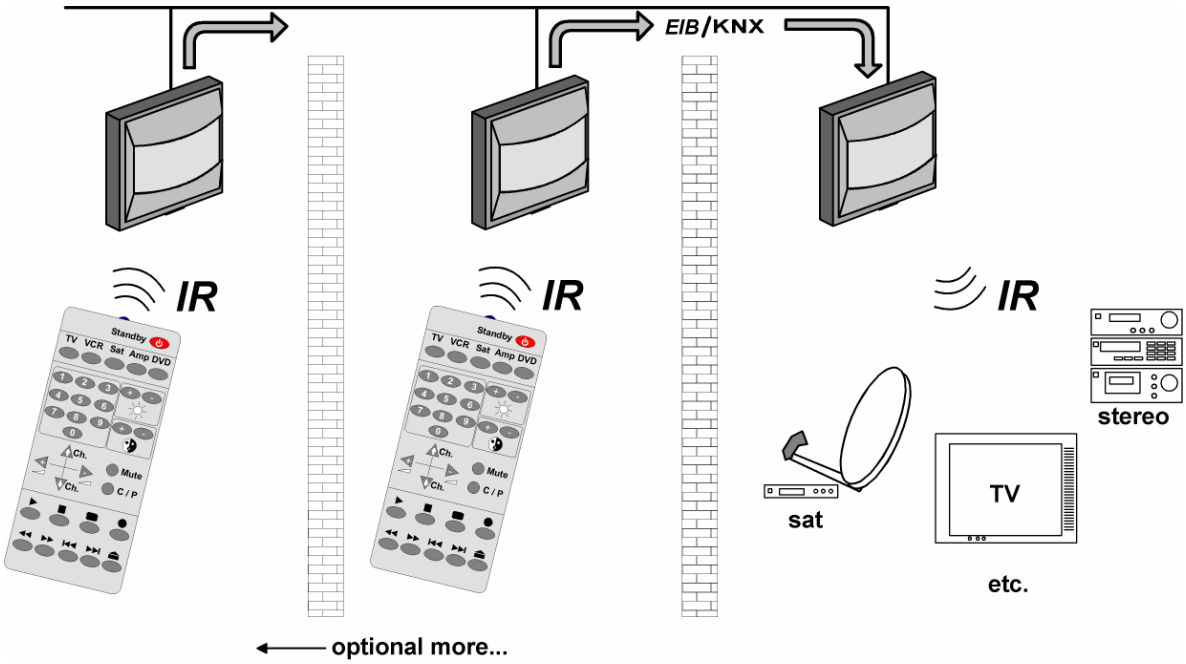


Fig. 8: Application with two or more IR-Gateways for control beyond room boundaries

The gateway parameterized as receiver converts the IR signals into bus telegrams which are then reconverted into IR signals by the gateway acting as transmitter. The different bus datapoints must be interconnected (see Fig. 9).

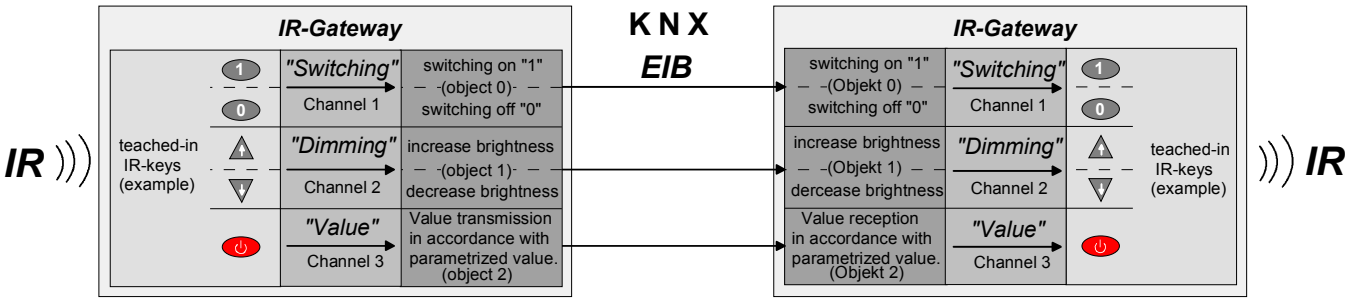
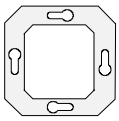


Fig. 9: Example of conversion of IR signals by two Gateways

The conversion can also be bidirectional. It is also possible to integrate building services components (e.g. lighting, shutters/blinds, heating, etc.) or several IR remote controls into the control system.



B. Combining the functions of IR remote controls

In some cases, it may be useful to combine the functions of two or more IR remote controls into only one remote control. To facilitate handling of the many required remote controls on the living room table, frequently used function keys of the existing remote controls can be programmed into the IR-Gateway on different channels. The idea is that later the functions of all devices can be selected from the keys of only on remote control by activating the signals stored in the gateway. In most cases, universal remote controls commercially available as independent units are used for this purpose (they must be RC-5 compatible).
Due to the Instabus connection, building services components can also be integrated into the control system. This configuaration is shown in Fig. 10.

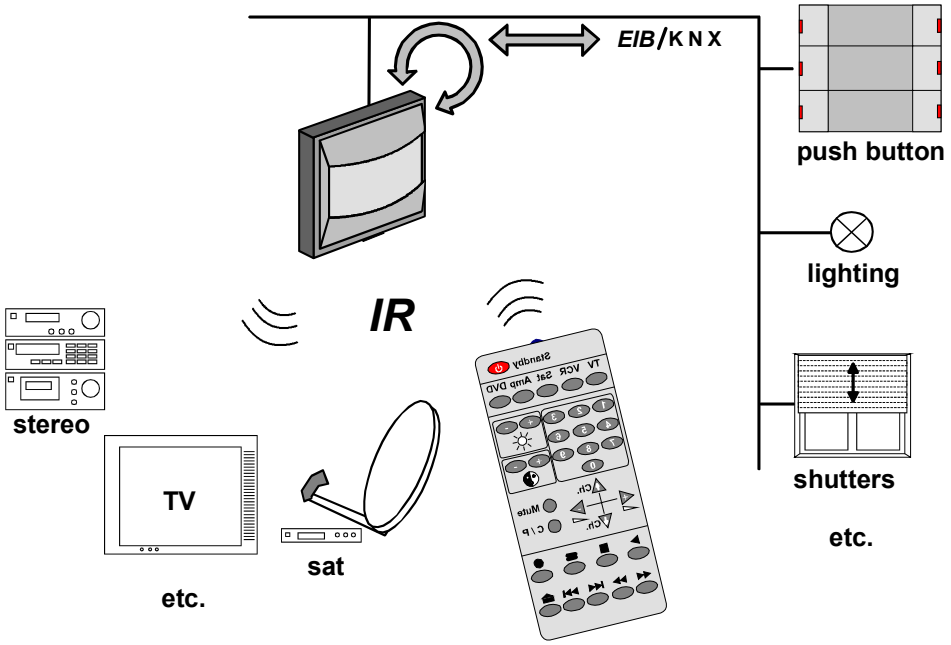


Fig. 10: Activation of different IR signals stored in the IR-Gateway from an IR remote control

A channel parameterized as receiver converts the IR signal from the remote control into a bus telegram which is received by the gateway channels parameterized as transmitters. The corresponding bus datapoints must be interconnected only after programming of all IR signals of the gateway (see Fig. 11).
The IR codes triggered are transmitted sequentially beginning from the channel with the highest number. Parameterized repetitions of individual IR signal transmissions are taken into account.

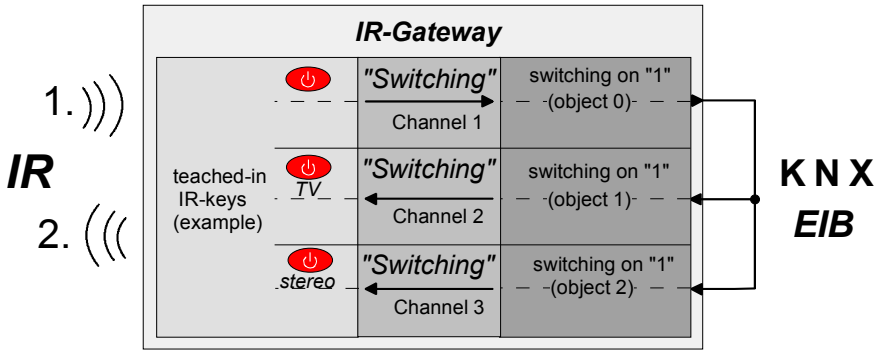
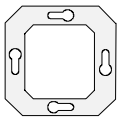


Fig. 11: Conversion of an IR signal into one or several other previously programmed signals

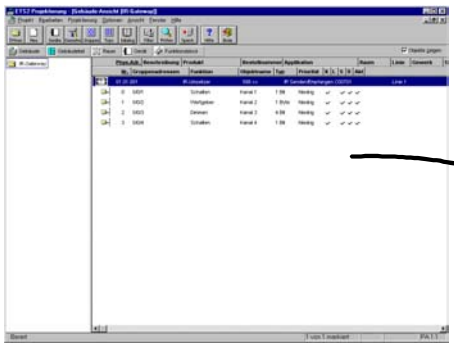


3. Commissioning of the IR-Gateway

3.1 Projecting sequence

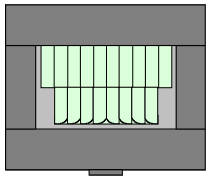
To avoid malfunctions during the programming procedure or during normal operation, the following sequence of commissioning steps should be respected.

Sequence	Comment
1. Projecting in the ETS	In order to be able to address each channel separately during programming of the IR code, the Instabus objects must be allocated only one distinct group address. Multiple allocation of a group address on the gateway must be avoided at this time.
2. Programming of the gateway by the ETS	The physical address and the application program are to be loaded into the gateway.
3. Teach-in of IR codes	The IR codes can be programmed and assigned to the bus channels (cf. "3.2 Teach-in of IR signals").
4. As required put on further group-adresses	If desired, the gateway can in this step be completely parameterized with all other group addresses (multiple allocation) in the ETS and programmed.

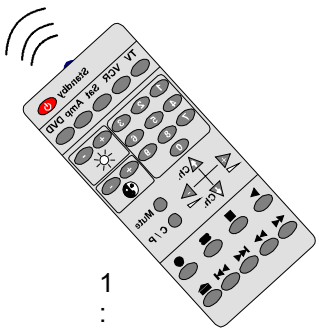


1. Projecting in the ETS

2. Programming of the gateway by the ETS



3. Teach-in of all IR-codes



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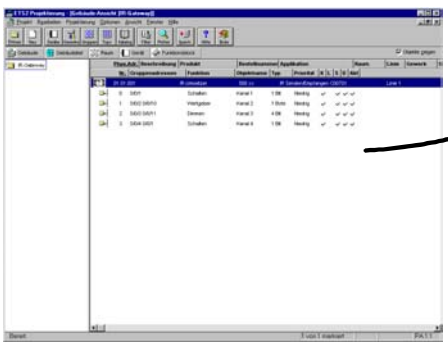
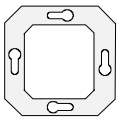


4. As required put on further group-adresses

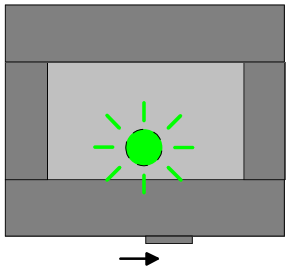


3.2 Teach-in of IR signals

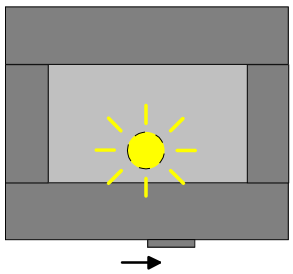
Before the gateway can send and receive IR signals, the required IR codes must be programmed into the device.
To prevent interference, the receiving range of the gateway is reduced during the teach-in procedure. For the below described scanning procedure, the IR remote control to be teached-in must therefore be located at a distance of approx. 30 – 40 cm in alignment with the gateway window. During programming, direct light falling into the IR sensor window must also be avoided. The gateway must be in place on the BCU.

For assigning a key of an IR remote control to the IR-Gateway proceed as follows:

1. Activate the learning mode.
   To activate, move the slide switch at the bottom of the device to the right-hand position ("LEARN"). When the learning mode is active, the IR sensor window is lit up green.

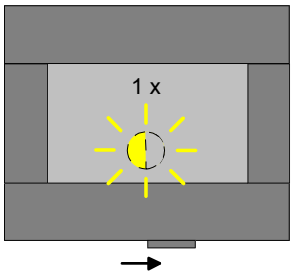


2. Define the channel into which the IR signal is to be programmed.
   For this purpose, a group telegram must be sent to the object of the desired channel. In the "Switching" and "Dimming" functions, two different IR signals can be programmed: one signal for "On" or "Increase brightness" and one for "Off" or "Reduce brightness". The polarity of the received telegram defines the assignment to the IR signal during programming. Both signals of a function are to be programmed one after the other.
   The group telegram can be triggered by a sensor function on the Instabus or generated by the ETS. To enable the final customer to program IR signals himself later, the use of touch sensors or the like is recommended.
   After reception of the bus telegram, the IR sensor window is orange.

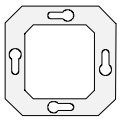


   Important note:
   During programming, each group address linked with the gateway may be projected only once in the device. This is the only method for the gateway to clearly assign the received IR signal codes to the bus channels and to avoid malfunctions.

3. Scan the carrier frequency of the IR signal.
   Before the signal code as such can be programmed, the carrier frequency of the IR signal must be scanned. To do so, press any key on the IR remote control briefly so that an IR signal is sent. After successful scanning, the IR sensor window flashes once orange. Release the key after flashing.



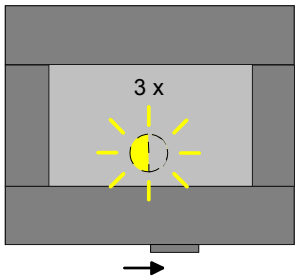
   If the key on the remote control is pressed too long, the gateway assumes an error. In this case, the sensor window flashes three times red.
   If a key is pressed too long, the gateway can also store a code sequence inadvertently (window flashing three times orange). In both cases, the scanning procedure should be repeated from step 2.



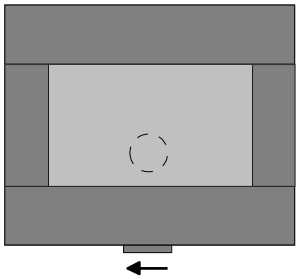
4. Scan the IR signal code.
   The desired IR key code can now be programmed. To do so, depress the desired key of the IR remote control briefly. After releasing the key, the received code sequence is stored and the sensor window flashes three times orange.

   If the key on the remote control is pressed too long, the gateway assumes an error. The scanning procedure is stopped by the gateway also in case the code cannot be programmed. In both cases, the sensor window flashes three times red. The scanning procedure should then be repeated from step 2 or another IR remote control used for programming.

   Important:
   Only one IR signal code can be assigned to a bus telegram. If a new code is assigned a second time to the same channel and the same telegram, the first assignment will be lost.



5. Thereafter, the window is static green.
   At this point, further IR keys can be programmed (back to step 2) or the learning mode can be terminated (slide switch back to center position "ON”). On deactivation of the learning mode, the green LED in the sensor window is extinguished.



General information for IR signal learning:

- If the slide switch is set to the "LEARN" position and if there is no input for 2 minutes, the IR-Gateway terminates the procedure. The sensor window flashes green (at 1 s intervals) and the device is without function. The learning mode must then be terminated (set slide switch to "ON” position).

- The same IR signal can be assigned to different channels in the IR-Gateway. In case of a bus-to-IR conversion (gateway transmitting), even a signal with multiple assignment will be transmitted at least once depending on the 'activated' bus channel. In case of an IR-to-bus conversion (gateway receiving), the signal with multiple assignment will, however, only be converted to one bus channel (to the channel first assigned to the signal).
  For this reason, multiple assignment for the same IR signal should be avoided with receiving channels or with bidirectional channels.

- It is important to note that during programming the keys of the remote control should be pressed as briefly as possible. There is otherwise a risk of the received IR sequence being stored several times and of malfunctions occurring. Due to the shorter sequence received (key-press shorter than key-press during programming) there may be no conversion in operation. For initial commissioning, it is therefore recommended to have the transmission or the reception of an IR signal indicated by the orange LED in the sensor window (parameterizable). The on-time of the LED depends then on the duration of the programmed IR code sequence so that the length of the programmed code sequence is clearly visible.

- IR transmissions use frequencies on a non-exclusive basis. This means that IR transmissions from other transmitters that are not programmed into the gateway can cause malfunctions or make the recognition of programmed IR signals impossible.

- Scanned IR signals are stored in the non-volatile EEPROM of the user module. This is also the reason why the signal codes are not erased on return of bus voltage or during reprogramming by means of the ETS.

3.3 Deleting IR signals

The IR memory can be completed deleted. During the deletion procedure, all IR signal codes in the memory will be erased.

To activate the deletion procedure, the gateway must be withdrawn from the bus coupler. The potentiometer at the back of the device must then be turned to the *"Reset"* position using a suitable screwdriver (see Fig. 12). Thereafter, the device must be replugged onto the bus coupler.
The IR memory is now deleted. For confirmation, the sensor window flashes orange.
To go back to normal operation, the gateway must be withdrawn again from the bus coupler, the potentiometer be turned back to position *"On"* and the device be replugged onto the bus coupler.
It should be noted that the potentiometer must always be turned fully down to either of the limit stops.

The position of the slide switch at the bottom of the device is without influence on the deleting procedure.
If the potentiometer is in the *"Reset"* position and if the gateway is in place on the bus coupler, the deletion mode is basically activated, for instance, also on return of bus voltage or after programming.

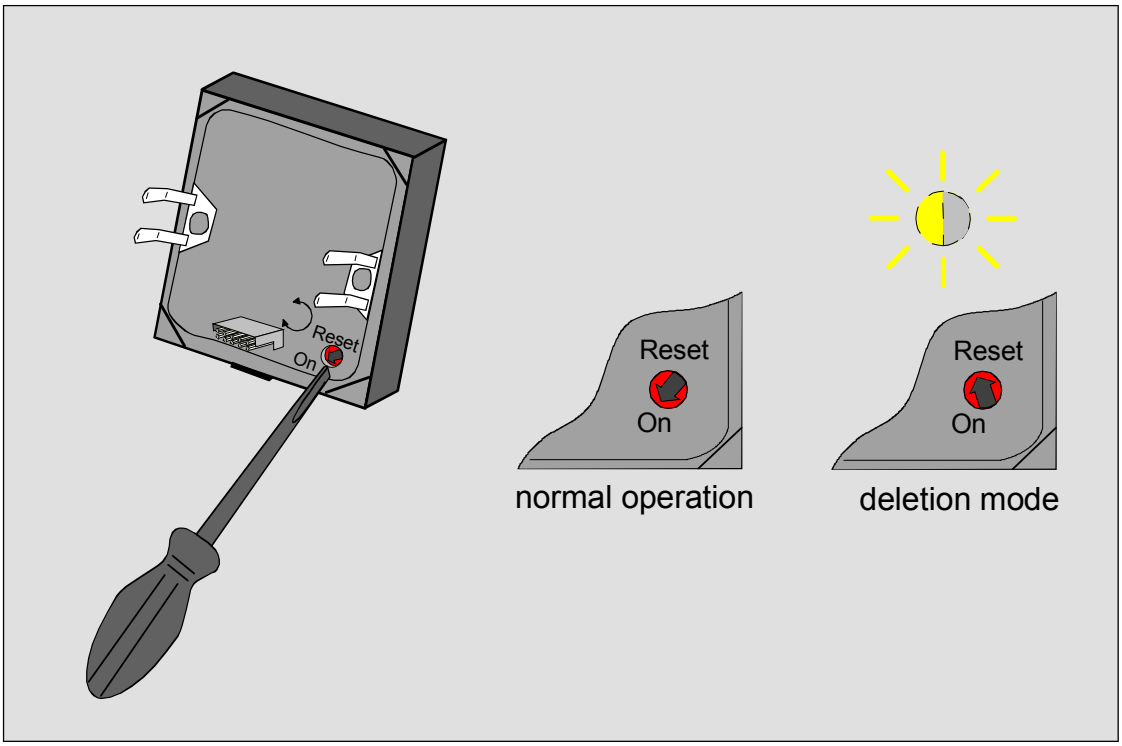
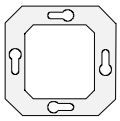
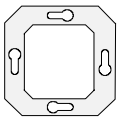


Fig. 12: Potentiometer at the back for activation or deactivation of deletion mode

IR signal codes cannot be deleted individually. Already programmed codes can, however, be removed from the device memory by programming a new IR signal into an already assigned channel so that the new code overwrites the existing one (cf. "3.2 Programming of IR signals").



Parameters		
Description:	Values:	Comment:
General		
Time interval between IR transmissions	100 ms 600 ms 200 ms 700 ms 300 ms 800 ms 400 ms 900 ms **500 ms** 1000 ms	Defines the time interval between individual IR transmissions in the event of cyclical multiple transmission of the IR signal (e.g. for relative dimming or during transmit repetition).
LED confirmation during IR transmission	**Disabled** Enabled	During an IR transmission (IR-Gateway transmitting or receiving programmed IR signals), the integrated LED can flash orange during the time of transmission (setting "Enabled"). If the setting is "Disabled", the LED is not activated during an IR transmission.
Channel enable		
Channels 1 to 4	**Disabled** Enabled	Enables the parameter cards of channels 1/2 resp. 3/4.
Channels 5 to 8	**Disabled** Enabled	Enables the parameter cards of channels 5/6 resp. 7/8.
Channels 9 to 12	**Disabled** Enabled	Enables the parameter cards of channels 9/10 resp. 11/12.
Channels 13 to 16	**Disabled** Enabled	Enables the parameter cards of channels 13/14 resp. 15/16.
Channels 17 to 20	**Disabled** Enabled	Enables the parameter cards of channels 17/18 resp. 19/20.
Channels 21 to 24	**Disabled** Enabled	Enables the parameter cards of channels 21/22 resp. 23/24.
Channels 25 to 28	**Disabled** Enabled	Enables the parameter cards of channels 25/26 resp. 27/28.
Channels 29 to 32	**Disabled** Enabled	Enables the parameter cards of channels 29/30 resp. 31/32.



Channels 1 - 2		
Channel 1	**not active** switching 1 bit value 1 byte dimming 4 bits	Defines the function of the firsrt channel. If the setting is "not active", the channel is deactivated. In this case, no further channel parameters are visible
Function	 **transmit and receive** transmit only receive only	Defines the direction of IR-bus conversion for the channel concerned. The gateway works bidirectionally. The gateway can only receive EIB/KNX telegrams on the bus side and send out IR signals. The gateway can only receive IR signals and send EIB/KNX telegrams on the bus side.
Repetitions during transmit (1...12)	1 to 12; **1**	Defines the number of IR signal transmissions when the gateway is sending an IR code. During multiple transmission (setting 2 to 12), the IR signals are transmitted in the parameterized "time interval between IR transmissions". Only with "Switching 1 bit" resp. "Value 1 byte" and with "Function = transmit and receive" resp. "Function = transmit only"!
Value (0...255)	0 to 255; **0**	Defines the value which is output on the bus during an IR-to-bus conversion. In a bus-to-IR conversion, the IR signal assigned is transmitted only on reception of the value here defined. Only with "Value 1 byte".
Channel 2	See channel 1	
Channels 3-32 see channel 1		