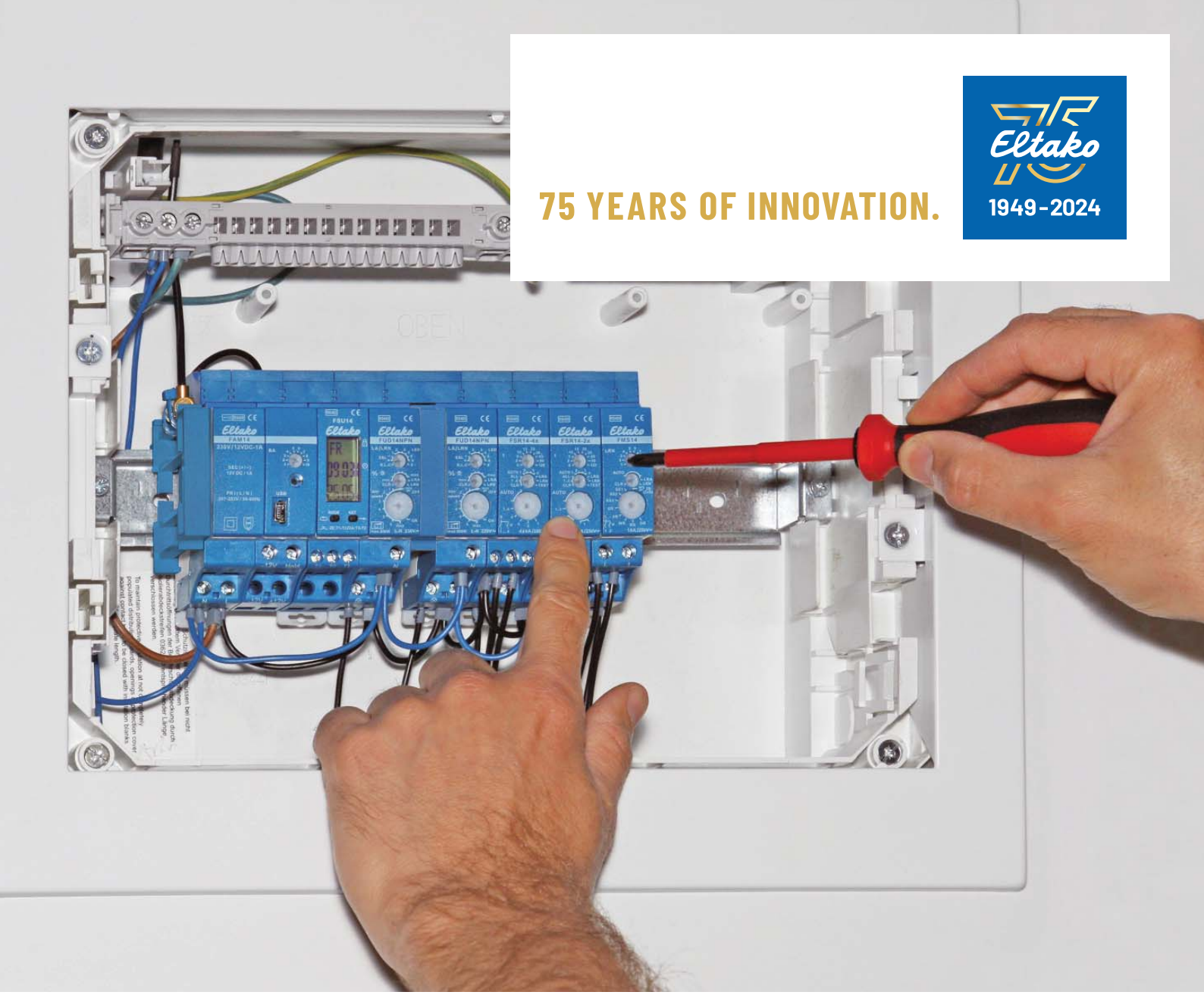


75 YEARS OF INNOVATION.

Eltako
1949-2024

OPERATING MANUAL FOR SERIES 14 RS485 BUS DIN RAIL MOUNTED DEVICES

Content

1. TECHNICAL PLANNING GUIDE WIRELESS BUILDING WITH THE SERIES 14

First, the bus system is described for activation with wireless sensors. Alternatively cable-bound activation is also possible. This is described in detail in Chapters 7 and 8.
Series 14 devices are fitted to DIN-EN 60715 TH35 rails and their RS485 bus. They are also connected to the power supply by jumpers. Consumers are activated centrally from a main distribution panel or several subdistribution panels.
The bidirectional FAM14 wireless antenna module is the interface between wireless sensors (e.g. pushbuttons) and all Series 14 actuator. It receives, sends and checks all signals from the wireless transmitter and repeaters within its reception range. A sub-bus comprising up to 3 additional FEM wireless receiver modules may be added at any time to increase reception range.
Received wireless signals are passed on to downstream switch actuators via an RS485 interface in the FAM14. Up to 126 channels can be connected to each FAM14 antenna module. A flexible BBV14 bus connector or an FBA14 bus coupler permits wire connections across several rails. The FSNT14-12V/12W* power supply included with the FAM14 provides the necessary 12 V DC power supply and supplies all system components and actuators up to a power of 12 W via jumpers.
The maximum power requirements of each connected device must be added in order to calculate the total power requirement of the 12V DC power supply. If the power requirement is greater, an additional FSNT14-12V/12W switch mode power supply unit must be used for every 12 watts required. In addition, an TB14 disconnecting link must be plugged into the device instead of a standard jumper in order to disconnect the additionally powered group.
The table below is a simple aid showing how to determine total power requirement.

DEVICE	MAXIMUM POWER REQUIREMENT (EXISTING RELAY EXCITED)
BGW14	**0.30 W**
F2L14	**0.14 W**
F3Z14D	**0.10 W**
F4HK14	**0.70 W**
F4SR14-LED	**1.00 W**
FAE14LPR	**0.42 W**
FAE14SSR	**0.40 W**
FAM14	**0.80 W**
FBA14	**-**
FDG14	**0.40 W**
FD2G14	**0.50 W**
FGSM14	**0.20 W**
FGW14	**0.50 W**
FGW14-USB	**0.30 W**
FHK14	**0.42 W**
FLUD14	**-**
FMS14	**0.63 W**
FMSR14	**0.10 W**
FMZ14	**0.40 W**
FPLG14	**0.40 W**
FPLT14	**0.40 W**
FRGBW14	**0.10 W**

DEVICE	MAXIMUM POWER REQUIREMENT (EXISTING RELAY EXCITED)
FRP14	**0.50 W**
FSB14	**0.42 W**
FSDG14	**0.40 W**
FSG14/1-10V	**0.20 W**
FSM14	**0.10 W**
FSR14-2x	**0.14 W**
FSR14-4x	**0.70 W**
FSR14M-2x	**0.14 W**
FSR14SSR	**0.40 W**
FSU14	**0.14 W**
FTD14	**0.53 W**
FTN14	**0.14 W**
FTS14EM	**0.13 W**
FTS14FA	**0.50 W**
FTS14KS	**0.40 W**
FTS14TG	**0.42 W**
FUD14	**0.20 W**
FUD14/800W	**0.20 W**
FWG14MS	**0.30 W**
FWZ14-65A	**0.10 W**
STE14	**-**

Wiring recommendations:
If several loads in one room are supplied by a circuit breaker, wiring can be saved by routing NYM-J 7x1.5 or 10x1.5. The continuous power supply with 3 wires and all the other 4 or 7 wires can then be used as hook-up wires.

* The power supply included with the FAM14 decouples the electronics of all connected devices from the 230 V power supply.
As a result, the devices are not exposed to voltage peaks and other faults which are becoming increasingly frequent on mains power supplies. This protection significantly increases the expected service life of the devices as opposed to decentralised mounted actuators.

2. EXPLANATION OF TERMS/LEGEND

Universal button UT
The switching state of a universal button is not clearly defined after operation. The only thing that occurs is that one contact switches over from one state to the other. For example, a contact changes from closed state to open state. In the case of a dimmer, what is meant is the changeover from bright to dark by holding down the button.
Similar terms include single button, changeover switch, toggle, switch back and forth; these terms are used to describe the changeover from two possible states to the other state. The 4-channel wireless pushbuttons can be assigned with up to 4 universal pushbuttons.

Direction button RT
The mode of functioning of the direction button is the specific switching to a desired switching state. As there are 2 switching states (ON/OFF or UP/DOWN), two signals are required for direction control and therefore means that button design is highly complex. Direction buttons are more convenient since switching or dimming is direct. 4-channel wireless pushbuttons can be assigned with 2 direction pushbuttons (double rocker). 1-channel wireless pushbuttons cannot be used for this. It is sufficient to operate the ON (UP) button to teach in the two direction commands. The opposite command OFF (DOWN) is taught in automatically.

Central commands ZE and ZA
Central control is always used when more than one actuator must be switched to a specific state at the same time. Just as for the direction button, a separate control signal is required to achieve each switching state. Here are some application examples:
– Central lowering of blinds when the sun shines too hot;
– Central switch-on for panic lighting;
– Central OFF function to save energy when owners leave the house empty;
Central buttons with priority (safety functions) have priority. They are required to control blinds in case of wind, rain or frost, for example. Activation by local buttons is no longer possible as long as this signal is present.

Scene pushbutton
An existing lighting setting can be saved to a light scene button and recalled exactly at any time later. The switching states (ON/OFF) or the dimming values are saved in each of the actuators. The lighting setting can be reproduced by simply pressing the button briefly.
The same applies to sunshading adjustments. Blinds, awnings or venetian blinds can be moved to saved positions. Important: When a scene is recalled, the previous switching states are not saved. It is therefore not possible to switch a scene on and then off again later using the same button.

Switch functions
The ON switch function corresponds to the UP switch function (for blind control).
The OFF switch function then corresponds to the DOWN switch function.

ES
Electronic impulse switch

ESV
Electronic impulse switch with off delay

ER
Electronic relay, switching relay

3. STARTUP

1. Mounting in the distribution panel: The order in which the devices are arranged on the mounting rail can be freely selected. However, it is advisable to start on the left with the FSNT14 and the FAM14 or FTS14KS. With a load of the power supply greater than 4 W, a ventilation distance of ½ pitch unit to neighboring devices must be maintained on the left side. With a load greater than 6 W, an additional ventilation gap of ½ module between the FSNT14 and the FAM14 with the spacer DS14 is required.
   Use the enclosed 4-pole jumpers to cross-wire the bus and the power supply. **Only fit the jumpers after completing all the electrical connections to the devices!** The torque exerted when tightening the screw terminal may displace the devices on the rail slightly to one side. This force is transferred to the jumpers and could damage the internal contacts permanently.
   When inserting or removing the jumpers, only use the SMW14 jumper tool and move it vertically to the rail.

   If you fit an FUD14 dimmer equal to or greater than 200W, use DS14 spacers to ensure there is an air gap to the devices mounted on either side.
   The bus connection to the devices across several rails is provided by the flexible BBV14 bus connector. The connection starts from the last device on the right to the first device on the left on the next rail. Alternatively, you can use an FBA14 bus coupler.
   If other devices are placed in a different distribution panel, the wiring can be extended there in the form of a bus. When the Hold wire is also routed across several levels as well as an RSA/RSB, a GND wire must also be routed. A screened telecommunication cable, or even better a CAT7 cable, is urgently required to connect the two distribution panels. Plug in the second terminal resistor supplied with the FAM14 or FTS14KS to the final actuator.
   All HOLD terminals from the devices on the bus must be connected together. Make sure that the GND potential of all associated bus groups (e.g. with additional UVs) are connected together. The bus communication (regulation of the bus access, against collision) will only work correctly if this connections are done.
   Several FEM devices in a SUB-bus must be wired using a line in the form of a chain, as specified for RS485 bus systems.
   A star-shaped wiring topology with one line per FEM is not permitted. The jumper must be plugged in a different position for each of the three FEM wireless receiver modules.
   Before issuing addresses, check the bus and all its jumpers using a measuring instrument as described in Chapter 6.

2. Device address assignment: Before startup, one of the 126 available device addresses should be assigned to every device. Assigning a device address is recommended in all cases. Only then can you use the PCT14 software to carry out readout, change and save operations. Without a device address, the following devices cannot be paired into actuators or controllers:
   FSU14, FMSR14, F3Z14D, FSDG14, FWZ14, FWG14MS, DSZ14!
   Please proceed carefully when assigning addresses to avoid issuing an address twice. Otherwise the addresses cannot be read out by the PCT14 software!
   See Point B) below for the safest way to assign addresses using the PCT14 software.
   A) Manual device address assignment: Turn the BA operating mode rotary switch on the FAM14 or FTS14KS to Pos. 1. Its LED lights up red. Turn the middle rotary switch of only one actuator at a time to LRN. Its LED flashes at a low rate (Caution: on the FSR14, FAE14 and F4HK14 the lower rotary switch must also be set to the required channel). After several seconds, an address is assigned; then the LED on the FAM14 or FTS14KS lights up for 5 seconds. The next device can only be addressed after the LED switches back to red.

Multi-channel actuators automatically receive consecutive addresses for all channels when addresses are assigned. When the BA rotary switch is turned to pos. 1, the LEDs of all devices (except display units) which have received a device address light up for approx. 5 seconds one after the other. A new device address can be assigned without deleting the old one. This may be necessary if several devices receive the same device address by accident.
B) Device address assignment using the PCT14 software: Before you can set up a connection to the PCT14, the BA rotary switch on the FAM14 or the FTS14KS must be positioned between pos. 2 and 8. Then set up the connection. Turn the middle rotary switch to LRN only on one actuator. Its LED flashes slowly. (Important! On FSR14, FAE14 and F4HK14, turn the lower rotary switch to Channel 1..2 or 1..4). By right-clicking in the left window, a menu is displayed with following function: "search device for address assignment". Right-click on the actuator found and highlighted in pink and choose "Edit and transfer device address..." Finally, assign a free address. The flashing LED on the actuator goes out. Then you can assign addresses to other actuators in the same way.

Device address assignment for other bus devices

Device	Prepare device address assignment	Ready for teach-in when	After address assignment
BGW14	Turn rotary switch to 10	LED flashes	LED goes out
DSZ14	1x select; repeat select >3 sec.	Device address visible	Standard display
F3Z14D	1x Mode, 7x Set, 1x Mode	Z 1 in display flashes	Standard display
FDG14	Turn large rotary switch to ADR	LED flashes	LED goes out
FD2G14	Turn large rotary switch to ADR	LED flashes	LED goes out
FGSM14	Turn rotary switch to 10	LED flashes	LED goes out
FGW14	Turn rotary switch to 10	LED flashes	LED goes out
FGW14-USB	Turn rotary switch to 10	LED flashes	LED goes out
FMSR14	1x Mode, 6x Set, 1x Mode	FWS in display flashes	Standard display
FPLG14	Turn large rotary switch to ADR	LED flashes	LED goes out
FSDG14	Turn rotary switch to ADR	LED flashes	LED goes out
FSU14	1x Mode, 3x Set, 1x Mode	CH 1 in display flashes	Standard display
FTD14	Turn rotary switch to LRN	LED flashes	LED goes out
FTS14TG	Turn rotary switch to 10	LED flashes	LED goes out
FWG14MS	Turn rotary switch to 10	LED flashes	LED goes out
FWZ14	Turn rotary switch to LRN	LED flashes	LED goes out

3.

Important mode settings:

FAM14 BA 1 Device address assignment
BA 2 Bidirectional bus mode with feedback, **default setting**
e.g. when visualisation software is used
BA 8 Unidirectional bus mode without feedback, receive only
BA 2-4 If internal device addresses need to be edited, e.g. FSU14, FMSR14 or FWG14MS

The lower rotary switch is used to teach in encrypted sensors. In operation, turn it to AUTO 1. It is not necessary to teach in unencrypted sensors in the FAM14. For further information on encryption and operating mode settings, see the FAM14 operating instructions.

Special meter operating modes:

In the meter operating modes, the focus is on the adjustable transmission speed of electricity meter data for external building energy managers. The meter operating mode is only activated when the lower rotary switch is set to the positions AUTO 2 to AUTO 7.

In this case, no radio telegrams received by the FAM14 are output to the bus. Therefore, it is not possible to control actuators; only electricity meters from production week 33/23 may be connected to the bus.
The positions 2, 3, 5 and 6 set with the upper rotary switch behave exactly as in the normal function with the lower rotary switch set to AUTO 1. In addition, the position of the lower rotary switch can be used to set the time interval with which the connected meters are cyclically polled.
AUTO 2 = 50 ms, AUTO 3 = 100 ms,
AUTO 4 = 200 ms, AUTO 5 = 300 ms,
AUTO 6 = 400 ms, AUTO 7 = 500 ms.
Larger time intervals should be selected if the radio load is to be kept lower.
Operating modes 4 and 7 are operating modes in which no meter responses are transmitted, but are picked up and forwarded by connected gateways (FGW14, FGW14-USB, FGW14(W)L-IP).
You can therefore set even shorter time intervals using the position of the lower rotary switch.
AUTO 2 = 50 ms, AUTO 3 = 25 ms, AUTO 4 = 20 ms.
Shorter time intervals can be selected if the best possible response reaction speed is required.

FGW14	Position 1	If FTS12EM and FEM is connected
	Position 2	Same as 1 but with ID filter
	Position 3	If BR12 actuators are connected
	Position 4	Coupling between two BR14 bus lines
	Position 5	Connection of a PC at RS232, 9600 bauds
	Position 6	Same as 5 but 56K bauds

4. Teaching-in sensors in actuators: The wireless sensor and the actuator are interconnected by carrying out the LRN teach-in process (saving codes) and saved in the actuator. The actuator is set to a teach-in mode and then saves an address and a set function. The function can be cleared as required (see Chapter 5).
   Internal bus control commands from the timer FSU14, the sensor relay FMSR14 and the weather data transmitter module FWG14MS can only be taught in on the actuator in position LRA when the BA rotary switch of the FAM14 or FTS14KS points to 10. Status telegrams from actuators can also be taught in in other actuators, if the upper rotary switch from the FAM14 or from the FTS14KS is placed on position 2.
   Each actuator can save up to 120 IDs. The settable functions include universal button, direction button, central function, scene function, PC signals etc.

   FSR14...
   1. Use the lower rotary switch to select the required channel (1 to 4 or 1..4).
   2. Use the upper rotary switch to select the required teach-in function (see chapter 4).
   3. Set the middle rotary switch to LRN. The LED flickers at a low rate.
   4. Then operate the sensor to be taught-in (button). The LED goes out.

   To teach-in other sensors, turn the middle rotary switch briefly away from position LRN and continue the procedure from step 1 again. After teaching-in, turn the lower and middle rotary switch to Auto and turn the upper rotary switch to the required time delay time (default=0).

   FUD14
   1. Turn the upper rotary switch to the required teach-in function (see chapter 4).
   2. Set the middle rotary switch to LRN. The LED flickers at a low rate.
   3. Then operate the sensor to be taught-in (button).

   If other sensors are to be taught-in, turn the middle rotary switch briefly away from Position LRN and start at step 1 again. After teaching-in with the top rotary switch, set the load type (Standard = AUTO). Use the middle rotary switch to set minimum brightness. Use the lower rotary switch to set the dimming speed

   FDG14/F2DG14
   Before teaching in the sensors, all DALI devices must first be parameterised in groups or scenes via a DALI interface module using suitable configuration software.
   1. Turn the upper rotary switch to the required group. The numerals here mean 0 - 8 = groups; 9 = broadcast
   2. Turn the lower rotary switch to the required teach-in function (see Section 4). The LED flashes slowly.
   3. Then press the sensor to be taught in (pushbutton) twice quickly in a row. The LED goes out.

   If other sensors need to be taught in, turn away the lower rotary switch briefly from the position and start again at step 1. After teach-in turn the lower rotary switch to AUTO. You can configure groups and scenes as of 9 using the PCT14.
   Note:
   Check the correct settings in the DALI driver. They have a major influence on dimming and switching behaviour.
   Recommended settings: Fade Time 0,7-2s Fade rate 32 or 45 steps

   FSB14
   First check the rotation direction of the connected motor! (Terminals 1 and 3 = down; terminals 2 and 4 = up). Turn the lower rotary switch of the FSB14 to one of the arrow symbols and check whether the rotation direction of the connected motors match. Alternatively, change over the motor lines or change the rotation direction using the PCT14. Only then carry out a teach-in.
   1. Turn the upper rotary switch to the required teach-in function (see chapter 4).
   2. Set the middle rotary switch to LRN. The LED flickers at a low rate.
   3. Then operate the sensor to be taught-in (button). The LED goes out.

      To teach-in other sensors, turn the middle rotary switch briefly away from position LRN and continue the procedure from step 1 again. After teach-in, set the time delay RV, the turning time WA (as required 0) and AUTO (1 or 2 for latching mode, 3 for touch-lock mode or 4 for pushbutton operation).

FMS14
1. Turn the upper rotary switch to the required teach-in function (see chapter 4).
2. Turn the middle rotary switch to LRN. The LED flickers at a low rate.
3. Then operate the sensor to be taught-in (button). The LED goes out
To teach-in other sensors, turn the middle rotary switch briefly away from position LRN and continue the procedure from step 1 again. After teach-in, turn the middle rotary switch to AUTO.

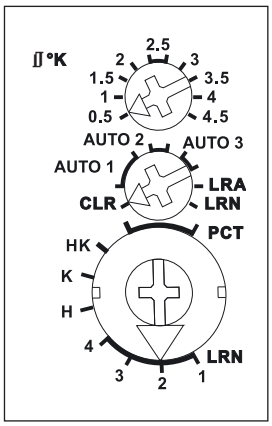
FHK14 / F4HK14 / FAE14
1. Select the required channel (1 to 2 or 1 to 4) with the lower rotary switch on the FAE14 and F4HK14.
2. Turn the upper rotary switch to the required teach-in function (see chapter 4).
3. Turn the middle rotary switch to LRN. The LED flickers at a low rate.
4. Press the sensor to be taught in (room controller, pushbutton). The LED goes out.
If other sensors are to be taught-in, turn the middle rotary switch briefly away from position LRN and start again at 1.
After teach-in with the upper rotary switch, set the hysteresis (default = 0.5 or 1K). Turn the middle rotary switch to the required AUTO or PWM function. Turn the lower rotary switch to Heat (H) or Cool (K) or NC or NO.

FSU14:
The timer FSU14 can only drive actuators if it was previously assigned a device address and the time channels were taught-in in the actuators. Every actuator can teach in a timer channel as direction command ON (UP) **and** OFF (DOWN) or as a single command **only** ON or **only** OFF.
When you teach in a direction command, only the ON (UP) command is sent. After that, the two switch commands ON (UP) **and** OFF (DOWN) can be used. Except for FSB14 actuators, the central commands CENTRAL ON **or** CENTRAL OFF can be alternatively taught in separately. For settings, see page 10.
Teach in all actuators, which will carry out a switching operation in a group, to the identical timer channel.
MODE means: Confirm > Go to next parameter; SET changes the displayed value.
Teach in timer channels to actuators: Turn the BA rotary switch on the FAM14 or FTS14KS to pos. 10. The LED lights up green. Turn the upper rotary switch on the actuator to the required function and turn the middle rotary switch to LRA (on the FSR14, also select the channel); the LED flashes. Press MODE on the FSU14 and then press SET to search for the LRN function. Press MODE to select. When CH appears, press SET to select the channel and press MODE to confirm. Then press SET to toggle between ON (UP) and OFF (DOWN). For example, if you confirm ON by pressing MODE, LRN+ blinks. Press SET to save the ON function to the actuator which is prepared for teach-in. The blinking LED goes out. You can now teach in other channels or functions. When you press MODE for longer than 2 seconds, the standard display appears. Finally turn the upper rotary switch on the FAM14 wireless antenna module to Pos. 2.
60 switching programmes are available to save each channel (1 to 8), function (ON or OFF), switching time and week day.
Alternatively the FSU14 can be easily programmed using the PCT14 software. First, enter the decimal device address of the timer channel as sensor ID to the actuator channel.

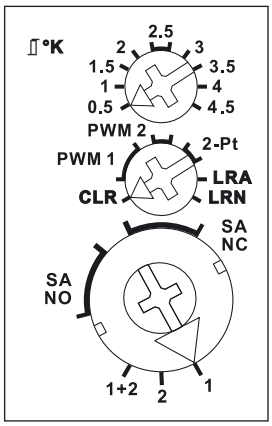
Teach in feedbacks from other actuators to FSR14:
Feedback telegrams from switch actuators and dimmers can be taught-in to other FSR14 switch actuators. The FAM14 must then be turned to Pos.2. First switch off the actuator whose feedback you want to teach in. The easiest way to do this is to use the outer rotary switch for the test function. On the FSR14 switch actuator to be taught-in, select the channel on the lower rotary switch and the 0 function on the upper rotary switch. Once the middle rotary switch is turned to LRA, the LED starts to blink. Then manually switch on the actuator whose feedback is to be taught-in using the rotary switch. After several seconds, the LED goes out and the feedback (ON and OUT) is taught-in. Finally, turn the rotary switches to the operating position. In order to utilise the feedback from a dimmer, use the PCT14 to activate the "Confirmation telegram with pushbutton telegram" parameter.
Another option is to edit using the PCT14 software. As feedback, enter the decimal device address of the monitored channel in the feedback actuator as direction pushbutton.

Overview of function rotary switches in teach-in list – Pictures display standard factory settings:

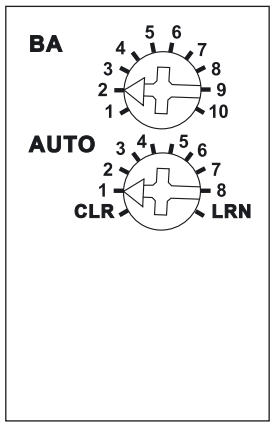
F4HK14



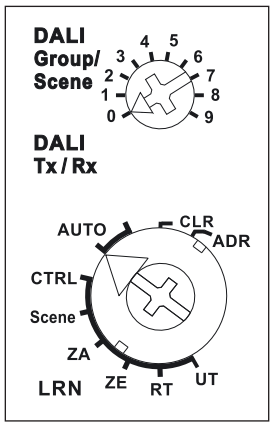
FAE14



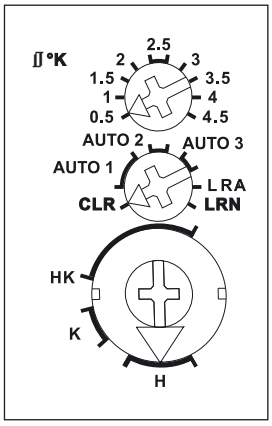
FAM14



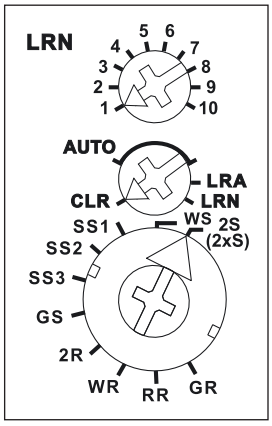
FDG14/F2DG14



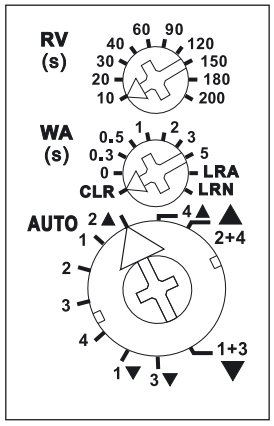
FHK14



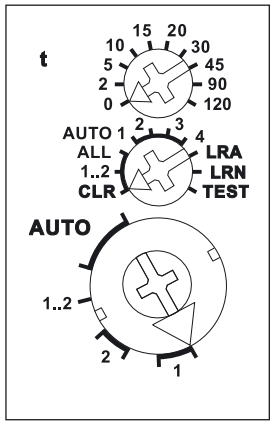
FMS14



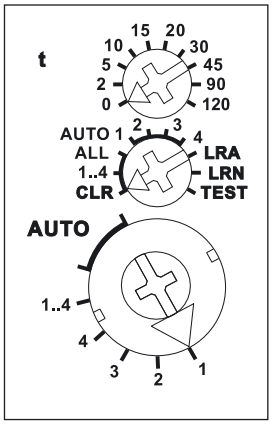
FSB14



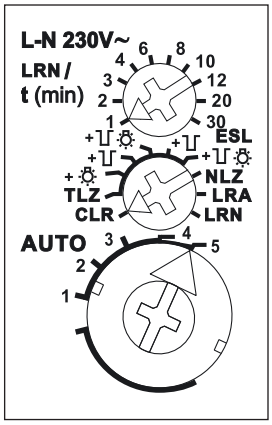
FSR14-2x



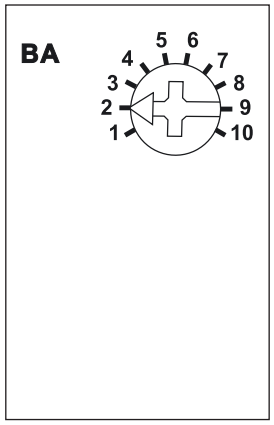
FSR14-4x



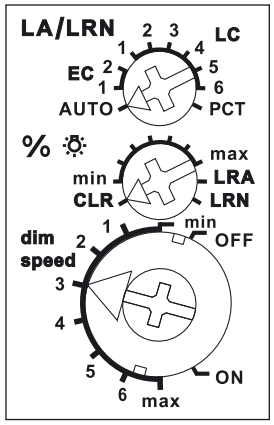
FTN14



FTS14KS



FUD14



4. TEACH-IN LIST

Teach-in settings of upper selector switch for the most common Series 14 devices

Teaching-in function	F4HK14 FAE14 FHK14	FDG14 FD2G14	FMS14	FSB14	FSR14 F4SR14	FTN14	FUD14
Universal pushbutton / toggle / switch over (On/Off)		UT	3 channel 1+2 7 channel 1 8 channel 2	20 channel 1 40 channel 2	5 Switch 10 Relay	3	EC 2
Direction pushbutton		RT	5 channel 1+2 9 channel 1 10 channel 2	10 channel 1 30 channel 2	0		LC 2
On / Central On		ZE	4		45	4	LC 1
Off / Central Off		ZA	2		90	2	EC 1
Sequential light scene pushbutton							LC 3
4-way direct light scene pushbutton				180 channel 1 200 channel 2	30		LC 4
Single light scene pushbutton		Scene (Dali)					LC 5
Staircase light switch						3	LC 6
Controller (e.g. MiniSafe2, wibutler) wibutler ProHome server	4,5	CTRL (GFVS)	9 channel 1 10 channel 2	180 channel 1 200 channel 2	0	2 Off 4 On	PCT
FTK window/door contact / FHF window handle	4,5			20 channel 1 40 channel 2	0	LC2 as NO contact LC3 as NC contact	LC2 as NO contact LC3 as NC contact
FAH brightness sensor				150 both channels	0-120		LC5 as switch LC6 as dimmer
FSU or pushbutton as wake-up light							AUTO
FBH as motion detector with brightness sensor	4,5				0-120	1..20	AUTO
Central control without priority				60 both channels	45 On 90 Off		
Central control with priority, first signal starts priority, second signal stops it				90 both channels			
Central control with priority as long as signal is applied				120 both channels	15 On 20 Off		
FTR temperature controller	4,5						

Other functions can be parameterised using the PCT14 software!

5. VARIOUS CLEARING PROCEDURES

Clearing memory content (taught-in sensors):

a) Clear all taught-in sensors: The teach-in memory is empty on delivery from the factory. If you are unsure whether something was already taught-in, clear the memory content completely. Set the middle rotary switch to CLR (to position ALL for FSR14 actuators). The LED flashes nervously. Within the next 10 seconds, turn the upper rotary switch three times to right stop (turn clockwise) and away again. The LED stops flickering and goes out after 2 seconds. All taught-in sensors are cleared.

b) Clear single taught-in sensors: Same as for teach-in except you turn only the middle rotary switch to CLR instead of LRN and then operate the sensor. The LED previously flashing nervously goes out.

Resetting device configuration to factory settings:

Device confirmation means convenience settings which can be set especially using the PCT14 software. Turn the middle rotary switch to CLR resp. ALL. The LED flashes nervously. Within the next 10 seconds, turn the upper rotary switch three times to left stop (turn anticlockwise) and away again. The LED stops flickering and goes out after 5 seconds. The factory settings are restored. Taught-in sensors are not cleared.

Resetting device configuration to factory settings and clearing device address:

Turn the middle rotary switch to CLR resp. ALL. The LED flashes nervously. Within the next 10 seconds, turn the upper rotary switch six times to left stop (turn anticlockwise) and away again. The LED stops flickering and goes out after 5 seconds. The confirmation is reset to the factory settings and the device address is cleared.

Clear device address: FMSR14, FSU14 and F3Z14D

Press MODE and then press SET to search for GA in the display. Now press SET to switch between the device address and 000. When you press MODE to confirm 000, the device address is cleared. The display returns to the standard view.

Clear device address: FWG14MS

Turn the rotary switch 8 times to right stop (turn clockwise) and back again within 10 seconds. The red LED lights up for 10 seconds and then goes out. The device address is cleared.

Clear device address: DSZ14DRS, DSZ14WDRS

Press briefly the SELECT pushbutton. The background lighting switches on. When you press the SELECT pushbutton again for longer than 3 seconds, the device address appears in the display. Then press and hold down the SELECT pushbutton for at least 5 seconds. The device address is set to zero.

Clear all entered IDs (filters, feedbacks): BGW14, FGW14, FTS14TG and FGSM14

Turn the rotary switch 5 times to right stop (turn clockwise) and back again within 10 seconds. The LED lights up for 10 seconds and then goes out. All IDs (filters and feedbacks) are cleared.

Clear device address and IDs: FD2G14, FDG14, FGW14, FSDG14, FTS14TG, FGSM14 and BGW14

Turn the rotary switch 8 times to right stop (turn clockwise) and back again within 10 seconds. The LED lights up for 10 seconds and then goes out. In addition all IDs (filters) are cleared in the FGW14.
In addition all IDs (feedbacks) are cleared in the FTS14TG and FGSM14.

6. TROUBLESHOOTING BUS FAULTS

General bus faults:

- Voltage reset, switch the power supply of the FAM14 or FTS14KS off briefly and then back on.
- There may be a contact problem on the bus jumpers. Check the bus using a tester. (See Figs 1 and 2)
- To do this, disconnect the bus centrally and measure in both directions to locate the fault faster.
- Reduce the bus system into smaller bus groups to locate the fault even further.
- If required, measure the bus connection inside the devices to detect a cold solder joint or a short circuit. (See Figs 3 and 4)
- Check the levels and measured values. (See Fig 5)
- All HOLD terminals must be connected together.
- If there are several sub-distributions, all bus sections must be connected to the GND potential (-12V) of the FAM14!
- Ideally, use the HOLD and GND conductors from a twisted conductor pair.

The FAM14 does not flash when a wireless signal is sent:

- Check the power supply 230V and bus voltage 12V DC.
- Check whether the antenna is connected.
- Check whether the upper rotary switch is pointing to one of the positions between 2 and 8.

An actuator cannot be taught in; the flashing LED does not go out:

- No connection is allowed to be made with PCT14. The LED on the FAM14 may not light up green. If necessary, carry out a bus reset.
- Check whether a rotary switch was turned to LRA instead of LRN during teach-in.
- Check whether the signals are processed via FAM14, FTS14EM, FGW14 or FTS14TG. An LED must flash on the appropriate device when the pushbutton is pressed.

The actuators do not react to signals from FSU14 or FMSR14:

- Check whether the antenna is connected.
- The BA rotary switch on the FAM14 is not pointing to 2, 3 or 4.
- No device address was assigned yet.
- The wrong operating mode was selected. On the FSU14 switch the channel operating mode to automatic or central on/off. On the FMSR14 do not select the operating mode 'OFF'.

The connected PCT14 software signals an exception error:

- See also general bus faults.
- Switch off and switch on the connection to the FAM14 or FTS14KS.
- A device address was assigned twice. Delete and try again.
- Remove all jumpers to the actuators using the jumper installation tool SMW14. Set up a connection to the PCT14 and extend the bus system by one actuator at a time while assigning device address with the PCT14 software; this cancels any double address assignment.

The switched-mode power supply unit FSNT14-12V/12W can be used to replace an overloaded or already defective switched-mode power supply (left half) of a FAM14 (until week 07/22). To do this, proceed as follows:

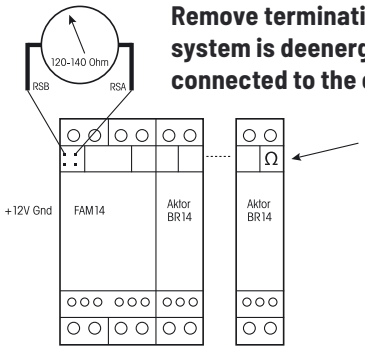
- If necessary, remove both resistors from the bus system for reading or writing to the series 14 and plug them back in at the end.
- Switch off the mains power supply.
- Remove the conductors from terminals N and L on the FAM14.
- Remove the jumpers and terminal resistor from the FAM14 and remove the FAM14 from the DIN rail.
- Use a narrow screwdriver to separate the two halves of the FAM14.
- Remove the front panel of the FSNT14.
- Remove the front panel from the left half of the FAM14 and snap it onto the FSNT14.
- Re-assemble the 'FSNT14& with the right half of the FAM14 and snap it back onto the DIN rail.
- Connect the N and L conductors to the FAM14.
- Plug the jumpers and terminal resistor onto the FAM14.
- Switch on the mains power supply.

Power supply unit
FSNT14-12V/12W

TROUBLESHOOTING BUS FAULTS

Check the bus jumpers

1)

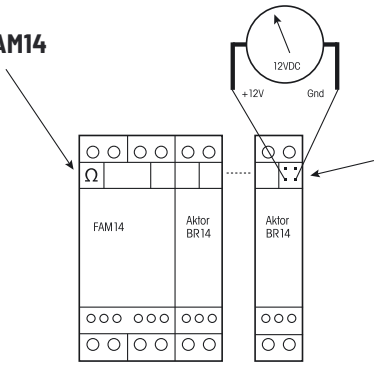


Remove terminating resistor at FAM14 and measure the top two pins with an ohmmeter when the system is deenergised. The reading must be approx. 120 to 140 ohms. Make sure that no USB cable is connected to the computer/laptop when measuring resistance.

Plug the terminating resistor to the last actuator in the last row

2)

Plug in terminating resistor to FAM14



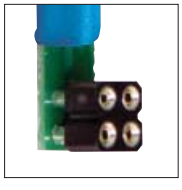
Remove the terminating resistor from the last actuator in the last row and measure the two bottom pins with a voltmeter (DC) when the system is deenergised. The reading must be approx. 11 – 12 volts DC.

3)

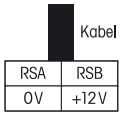
Bus slot assignment, top view

RSB	RSA	RSB	RSA
+12 V	0 V	+12 V	0 V

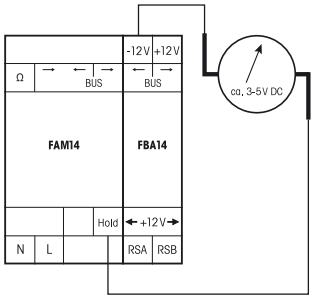
4)



BBV14 assignment, top view of contacts



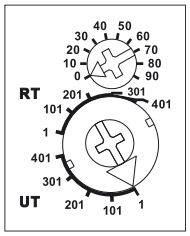
5)



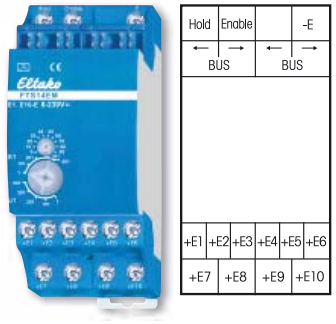
When the HOLD line is connected and the system is switched on, use a DC voltmeter to measure between GND or -12 V and HOLD. Approx. 3 to 5 V DC should read here when the system is in idle.

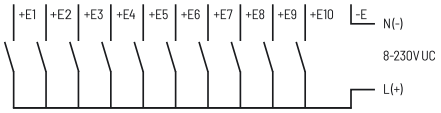
7. REMOTE SENSING SYSTEM FTS14

Function rotary switches



Standard setting ex works.





Control inputs FTS14EM

Functional principle:
The input modules FTS14EM each with 10 inputs inject control signals into the RS485 bus.
The control inputs can be activated either for pushbuttons (factory settings), window / door contacts or motion detectors.
- for **pushbuttons** (as-delivered state): Turn the lower rotary switch within 3 seconds 5 times to left stop and back; the LED lights up for 2 seconds.
- for **window contacts:** Turn the upper rotary switch within 3 seconds 5 times to left stop and back; the LED lights up for 4 seconds.
- for **motion detectors:** Turn the upper rotary switch within 3 seconds 5 times to right stop and back; the LED lights up for 6 seconds.

They generate exactly the same telegram structure as wireless building sensors and can therefore be taught-in directly in actuators of the Series 14.

Invert the signals of the control inputs:
From production week 21/19 the signals of the control inputs can be inverted.
As of production week 11/21, control input E10 transmits cyclically every 5 minutes when a signal (switch) is constantly present.
This night trigger function is required to reliably evaluate a heat pump controller, for example.
Turn the lower rotary switch 5x to the right-hand stop within 3 seconds, the LED lights up for 2 seconds. By the activation of the control inputs for pushbuttons, window-door contacts or motion detectors, the inversion is canceled.

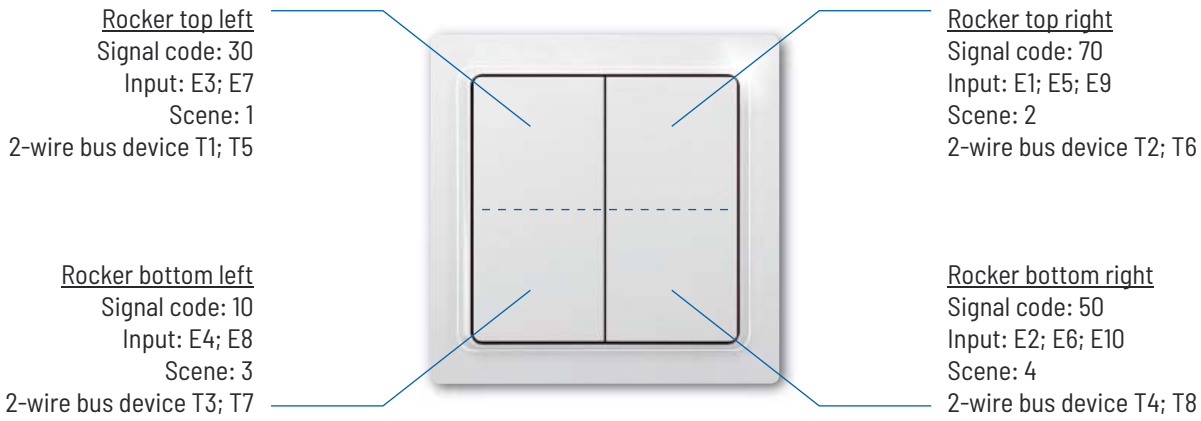
Connections:
All HOLD terminals from the devices on the bus must be connected together. The bus communication (regulation of the bus access, against collision) will only work correctly if this connections are done.
In addition connect the ENABLE terminal of every tenth input module to the connected HOLD terminals.
When the HOLD wire is also routed across several levels as well as RSA/RSB, the GND wire must also be routed in all cases. It is urgently required to use a screened telecommunication wire, or even better a CAT7 cable.
Due to the floating universal control voltage of 8 to 230 V UC, the sensors (contacts) can either be connected directly to the mains voltage or supplied with low voltage (recommended 24 V DC). Then a separate switch mode power supply unit SNT12/24V must be used.
All input terminals (E1 to E10) are arranged in the lower terminal blocks and a terminal for the common pushbutton reference potential (-E) is located on the upper terminal block.
The FTS14EM devices can be configured by 2 rotary switches so that up to 50 devices with up to 500 contacts, e.g. pushbuttons, switches etc. can be connected in a bus installation. The telegram of each pushbutton input in the entire bus is available over the bus system simultaneously for all actuators connected. It is therefore possible to install central and group pushbuttons rapidly by using few wires. The related pushbuttons are simply taught-in in the required actuators on the bus.
Recommendations for hook-up on the control side: A hook-up wire, e.g. J-Y(ST)Y 10x2x0.8mm^2, is recommended for cost reasons and because it is easy to route. The cross-section of 0.6 mm^2 is not suitable because it is not sufficiently held by the device terminals.

ID range:
The lower rotary switch defines the group to which an FTS14EM belongs. A total of 5 groups are available (1, 101, 201, 301 and 401) each with 100 IDs. The decade ID within a group, which can contain max 10 FTS14EM devices, is set using the upper rotary switch (0-90). The ID range then results from the combination of upper and lower rotary switches and must be set differently on each FTS14EM. Every FTS14EM can be set either to UT (= universal pushbutton) or to RT (= direction pushbutton) using the lower rotary switch. The LED under the upper rotary switch flickers briefly when a connected pushbutton is pressed.

Function test:
The LED under the upper rotary switch flashes briefly when a connected sensor is operated and lights up permanently when a connection to FAM14 or FTS14KS was set up by PCT14.

Notes on PCT14:
The FTS14EM receives no device address and is therefore not displayed as a device in the PCT14 software. However, the ID telegrams generated by the input module can be displayed by means of the ID identifier. Alternatively, predefined ID lists are available. This allows the input modules FTS14EM to quickly assign an ID to an actuator.

Overview of telegrams:
Telegram relations between wireless pushbuttons, inputs FTS14EM, bus users and signal code



The 10 inputs of input module FTS14EM generate 5 or 10 different control telegrams whose control code is based on a radio pushbutton. The operating mode is dependent on the lower rotary switch (UT or RT).

Operating mode UT (universal pushbutton)
In UT mode, the FTS14EM generates a consecutive ID for each of the 10 terminals and their ID range is dependent on a combination of the two rotary switch positions. In addition, the generated signal also contains a code for the half of the rocker or the end of the rocker, which is based on a radio button. This must be considered when programming manually with PCT14.

Example:

ID	Input	Rocker half	Rocker end
0000100**1**	E1	right	top
0000100**2**	E2	right	bottom
0000100**3**	E3	left	top
0000100**4**	E4	left	bottom
0000100**5**	E5	right	top
0000100**6**	E6	right	bottom
0000100**7**	E7	left	top
0000100**8**	E8	left	bottom
0000100**9**	E9	right	top
00001010	E10	right	bottom

Operating mode RT (direction pushbutton)
The RT mode is preferred for Venetian blind control and saves a lot of time for teach-in since only a couple of commands need to be taught in. In RT mode, the FTS14EM generates 5 even-numbered IDs per terminal pair and their ID range is dependent on a combination of the two rotary switch positions. In addition, the generated signal also contains a code for the half of the rocker or the end of the rocker, which is based on a radio pushbutton. This must be considered when programming manually with PCT14. When RT mode is used, the pair formation (E1/E2) and switch function assignment (E1=up; E2=down) must be considered. In case mixed RT and UT commands are required on an input module, select the UT group. In this case, the two input commands must be taught in separately for direction pushbutton functions.

Example:

ID	Input	Rocker half	Rocker end	Switch function assignment
00001002	E1/E2	right	E1=top; E2=bottom	E1=On (Up); Off (Down)
00001004	E3/E4	left	E3=top; E4=bottom	E3=On (Up); Off (Down)
00001006	E5/E6	right	E5=top; E6=bottom	E5=On (Up); Off (Down)
00001008	E7/E8	left	E7=top; E8=bottom	E7=On (Up); Off (Down)
00001010	E9/E10	right	E9=top; E10=bottom	E9=On (Up); Off (Down)

Structure of ID HEX code
To considerably speed up derivation of the hex code ID for input into the PCT14 from the terminal description and rotary switch setting, they are generated in "quasi-decimal" notation.

Here is an example:
The ID codes generated in the FTS14EM always consist of the basic hex code 00 00 1x xx.

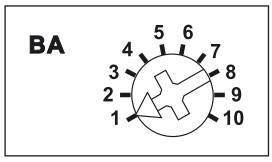
x xx is dependent on the two rotary switch settings (group below, decade above) and terminal:

x - - rotary switch below: Group e.g. **1** 0 1
- **x**- Upper rotary switch: Decade e.g. **2** 0
- -**x** Input terminal: e.g. E **5**

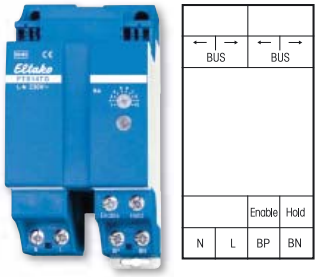
This results in the ID: 00001 125

8. FTS14TG PUSHBUTTON GATEWAY AND PUSHBUTTON BUS COUPLER OR BUS SWITCH

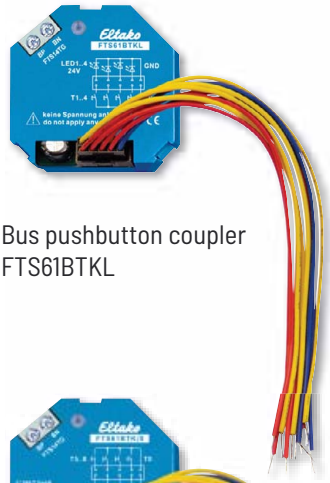
Function rotary switches



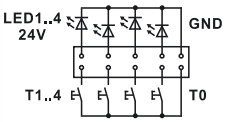
Standard setting ex works.



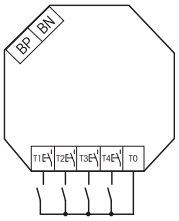
Pushbutton gateway FTS14TG



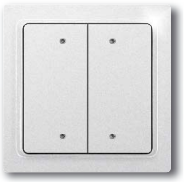
Bus pushbutton coupler FTS61BTKL



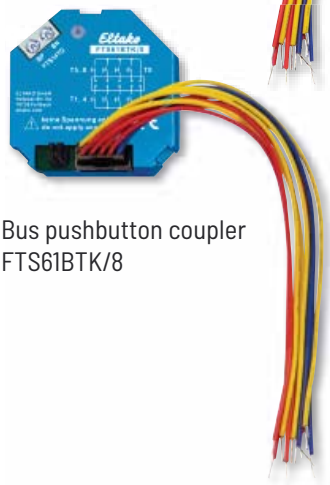
Bus pushbutton coupler FTS61BTK



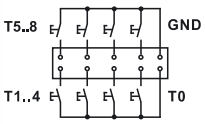
Apply no voltage



Bus pushbutton B4T65/B4FT65



Bus pushbutton coupler FTS61BTK/8



Operating principle:
Use the FTS14TG pushbutton gateway to enter command signals to the RS485 bus from a separate 2-wire bus connected to an pushbutton bus coupler and a bus switch. The gateway generates the same telegram structure as wireless building pushbuttons. Therefore commands can be taught-in directly into Series 14 actuators.
A maximum of 30 bus users can be connected to a pushbutton gateway FTS14TG. The maximum possible is 3 pushbutton gateways FTS14TG with a total of 90 bus devices. An existing bus topology can use used to generate up to 120 command signals in each line. Feedbacks over the same bus can be displayed by the bus pushbutton with integrated LEDs or by bus pushbutton coupler FTS61BTKL. Data transfer and power supply between bus modules and the gateway are routed over only 2 conductors.
Conventional buttons/switches with a maximum cable length of 2 meters can be connected to the bus coupler.
The pairs T1/T3 and T2/T4 can be defined as direction buttons. With the FTS61BTK/8, T5/T7 and T6/T8 form further pairs of direction buttons.
With the FTS61BTK/8, the buttons are connected to the four red and yellow connection lines T1-T8. The opposite pole is always T0 (blue wires).
With the FTS61BTKL, the buttons are connected to the four red connection lines T1-T4 and the common blue T0.
The associated LEDs are connected to the four yellow connection lines and the common blue GND.
The permissible total cable length of the 2-wire bus is 200 m. The RLC element included with the FTS14TG must also be connected to the BP and BN terminals on the most distant bus button or bus button coupler.

Connections:
Connect the bus to BP and BN. Make sure the polarity is correct!
Please use only conventional bus or telephone lines.
Do not apply an external control voltage.
The bus communication (regulation of the bus access, against collision) will only work correctly if this connections are done. Only the first FTS14TG pushbutton gateway requires an additional connection to the Enable terminal. A power supply of 230V is required to generate the internal 29V DC bus voltage at L and N. It is electrically isolated from the RS485 bus.

Issuing device addresses:
Since May 2019 there have two options for addressing bus pushbutton modules on the FTS14TG.

Option 1:
From PCT14 version 8.0, a defined address can be assigned to an individually connected bus pushbutton module (FTS61BTK, FTS61BTKL, B4T55, B4T65). By this way, a bus installation can be preconfigured.

1. The FTS14TG (from week 22/19, version 2.1) must have a device address.
2. **Only connect one** bus button module to the FTS14TG. Only one jumper may be plugged into the FTS61BTK/8. Jumper on the left for T1-T4, jumper on the right for T5-T8.
3. Connect to PCT14
4. Add device list and select read device memory
5. In the context menu of the FTS14TG, select 'Change bus push button module address and transmit'
6. Change bus pushbutton module address: select address
7. Select accept bus push button module address: the address is transferred.

Option 2:
Device addresses for bus devices are issued one after the other using the rotary switch on the FTS14TG. Only one device can be addressed with the factory setting Add. 0. Prewiring is therefore not suitable. Only after a single newly added device is issued with an address can another device be added and addressed in the wiring.
Connect the first bus user to bus terminals BP and BN. The LED on the bus device lights up red. Briefly turn the rotary switch on the FTS14TG to pos. 1 and back to 2. The LED on the bus user lights up green. Only then connect the second bus device and repeat the procedure. Note the jumper position on the FTS61BTK/8. When an address is issued by the FTS14TG pushbutton gateway, its lower LED lights up green for several seconds.
The lowest free address is always issued automatically, i.e. when several bus couplers are addressed, all couplers already addressed must remain in the bus, otherwise the address is issued several times. No addresses can be issued specifically. It is highly advisable to label bus devices already addressed for documentation.

Replacement and re-addressing:
It is possible to replace a bus pushbutton module (of course address must be known!) without having to re-teach it in actuators. Here the device address assignment can be carried out according to option 1 and the module can then be exchanged in an existing bus wiring.

Alternatively, a new bus device without device address can first be replaced in an existing bus wiring. If the rotary switch on the FTS14TG is briefly turned to position 1 after the replacement, the new bus device automatically receives the smallest device address that has become free and thus the same device address. There is no need to teach-in in the actuators again.

Delete device address:
Only connect one bus user on the FTS14TG to bus terminals BP and BN. With FTS61BTK/8 only plug in one jumper. The LED on the bus user lights up green. Turn the rotary switch to pos. 9. The LED lights up red. If an address was deleted by the pushbutton gateway FTS14TG, its lower LED also lights up green for a few seconds.

ID range:
In operating mode, the rotary switch BA defines the ID range and the ID structure. Up to 3 bus lines are possible. Each pushbutton gateway must be set to a different operating mode to avoid duplicating IDs. (See the table on pages 21 to 23).
Pos. 2, 3, 4: Each bus user uses only one ID. (Use as direction pushbutton).
Pos. 5, 6, 7: Each bus user uses its own one ID per pushbutton. (Use as universal pushbutton; prescribed setting for relay function).
In addition, the modules send 4 different control signals per pushbutton:
T1 sends 0x30, pushbutton T2 sends 0x70, pushbutton T3 sends 0x10, pushbutton T4 sends 0x50

Information on the PCT14:
If you configure the FTS14TG with the PCT14, the FAM14 or FTS14KS must first issue a device address. Then you can make assignments between actuators and feedback LEDs in an ID table. The PCT14 is unable to read out addressed bus switches or pushbutton bus couplers. ID detection (right-hand column) must be switched on in order to display the address bus switches or pushbutton bus couplers. After operating a switch, the IDs are then displayed (see pages 21-23). Alternatively, predefined ID lists are available. This allows the bus pushbutton or bus pushbutton coupler to quickly assign an ID to an actuator.

Testing the installation:
Turn the rotary switch of the FTS14TG to Pos. 8 to test the installation and data transfer over the 2-wire bus. In this operating mode, no pushbutton telegrams are sent to the ELTAKO RS485 bus. Press all pushbuttons several times on the bus users.
The lower green LED lights up briefly every time a pushbutton is pressed. The automatic reset is not active, i.e. if an error occurs in the 2-wire bus, the lower red LED lights up permanently.

LED displays in operation on the FTS14TG:
The upper red LED lights up briefly when a confirmation telegram is output by an actuator to the 2-wire bus. The lower red LED lights up briefly when a pushbutton telegram is output to the ELTAKO RS485 bus. The lower green LED lights up briefly when a bus user pushbutton is pressed. The lower green LED lights up permanently as long as the rotary switch is at Pos. 10 or when there is an active link to the PCT14.

Status display with bus pushbutton:
Bus pushbuttons with LED or FTS61BTKL bus pushbutton couplers can display feedbacks of switch actuators or dimmers. This is achieved in the PCT14 software by assigning each pushbutton with the decimal device address of the actuator and the related function in the FTS14TG (usually ON). In order to utilise the feedback from a dimmer, use the PCT14 to activate the "Confirmation telegram with pushbutton telegram" parameter.

Error messages on the FTS14TG:
The lower red LED flashes continuously when no bus user is connected or when no device address has yet been assigned. The lower red LED flashes for 2 seconds if an error occurs during data transfer in the 2-wire bus. In operating modes pos. 2 to 7, an automatic reset is triggered after 2 seconds when there is a fault. The connected bus users are re-initialised and operation then continues normally.

Overview of telegrams:
Only one ID is used per module (see blue fields) in BA rotary switch positions 2, 3 and 4.
In rotary positions 5, 6 and 7 four different IDs are used per module.
BA rotary switch pos. 2 or 5 = line 1
BA rotary switch pos. 3 or 6 = line 2
BA rotary switch pos. 4 or 7 = line 3

Line 1 BA = 2 or 5			Line 2 BA = 3 or 6			Line 3 BA = 4 or 7		
		Device No.			Device No.			Device No.
1501	T1 = top left	1	**1601**	T1 = top left	1	**1701**	T1 = top left	1
1502	T2 = top right		1602	T2 = top right		1702	T2 = top right	
1503	T3 = bottom left		1603	T3 = bottom left		1703	T3 = bottom left	
1504	T4 = bottom right		1604	T4 = bottom right		1704	T4 = bottom right	
1505	T1 = top left	2	**1605**	T1 = top left	2	**1705**	T1 = top left	2
1506	T2 = top right		1606	T2 = top right		1706	T2 = top right	
1507	T3 = bottom left		1607	T3 = bottom left		1707	T3 = bottom left	
1508	T4 = bottom right		1608	T4 = bottom right		1708	T4 = bottom right	
1509	T1 = top left	3	**1609**	T1 = top left	3	**1709**	T1 = top left	3
150A	T2 = top right		160A	T2 = top right		170A	T2 = top right	
150B	T3 = bottom left		160B	T3 = bottom left		170B	T3 = bottom left	
150C	T4 = bottom right		160C	T4 = bottom right		170C	T4 = bottom right	
150D	T1 = top left	4	**160D**	T1 = top left	4	**170D**	T1 = top left	4
150E	T2 = top right		160E	T2 = top right		170E	T2 = top right	
150F	T3 = bottom left		160F	T3 = bottom left		170F	T3 = bottom left	
1510	T4 = bottom right		1610	T4 = bottom right		1710	T4 = bottom right	
1511	T1 = top left	5	**1611**	T1 = top left	5	**1711**	T1 = top left	5
1512	T2 = top right		1612	T2 = top right		1712	T2 = top right	
1513	T3 = bottom left		1613	T3 = bottom left		1713	T3 = bottom left	
1514	T4 = bottom right		1614	T4 = bottom right		1714	T4 = bottom right	
1515	T1 = top left	6	**1615**	T1 = top left	6	**1715**	T1 = top left	6
1516	T2 = top right		1616	T2 = top right		1716	T2 = top right	
1517	T3 = bottom left		1617	T3 = bottom left		1717	T3 = bottom left	
1518	T4 = bottom right		1618	T4 = bottom right		1718	T4 = bottom right	
1519	T1 = top left	7	**1619**	T1 = top left	7	**1719**	T1 = top left	7
151A	T2 = top right		161A	T2 = top right		171A	T2 = top right	
151B	T3 = bottom left		161B	T3 = bottom left		171B	T3 = bottom left	
151C	T4 = bottom right		161C	T4 = bottom right		171C	T4 = bottom right	
151D	T1 = top left	8	**161D**	T1 = top left	8	**171D**	T1 = top left	8
151E	T2 = top right		161E	T2 = top right		171E	T2 = top right	
151F	T3 = bottom left		161F	T3 = bottom left		171F	T3 = bottom left	
1520	T4 = bottom right		1620	T4 = bottom right		1720	T4 = bottom right	
1521	T1 = top left	9	**1621**	T1 = top left	9	**1721**	T1 = top left	9
1522	T2 = top right		1622	T2 = top right		1722	T2 = top right	
1523	T3 = bottom left		1623	T3 = bottom left		1723	T3 = bottom left	
1524	T4 = bottom right		1624	T4 = bottom right		1724	T4 = bottom right	
1525	T1 = top left	10	**1625**	T1 = top left	10	**1725**	T1 = top left	10
1526	T2 = top right		1626	T2 = top right		1726	T2 = top right	
1527	T3 = bottom left		1627	T3 = bottom left		1727	T3 = bottom left	
1528	T4 = bottom right		1628	T4 = bottom right		1728	T4 = bottom right	

Line 1 BA = 2 or 5			Line 2 BA = 3 or 6			Line 3 BA = 4 or 7		
Device No.			Device No.			Device No.		
1529	T1 = top left	11	**1629**	T1 = top left	11	**1729**	T1 = top left	11
152A	T2 = top right		162A	T2 = top right		172A	T2 = top right	
152B	T3 = bottom left		162B	T3 = bottom left		172B	T3 = bottom left	
152C	T4 = bottom right		162C	T4 = bottom right		172C	T4 = bottom right	
152D	T1 = top left	12	**162D**	T1 = top left	12	**172D**	T1 = top left	12
152E	T2 = top right		162E	T2 = top right		172E	T2 = top right	
152F	T3 = bottom left		162F	T3 = bottom left		172F	T3 = bottom left	
1530	T4 = bottom right		1630	T4 = bottom right		1730	T4 = bottom right	
1531	T1 = top left	13	**1631**	T1 = top left	13	**1731**	T1 = top left	13
1532	T2 = top right		1632	T2 = top right		1732	T2 = top right	
1533	T3 = bottom left		1633	T3 = bottom left		1733	T3 = bottom left	
1534	T4 = bottom right		1634	T4 = bottom right		1734	T4 = bottom right	
1535	T1 = top left	14	**1635**	T1 = top left	14	**1735**	T1 = top left	14
1536	T2 = top right		1636	T2 = top right		1736	T2 = top right	
1537	T3 = bottom left		1637	T3 = bottom left		1737	T3 = bottom left	
1538	T4 = bottom right		1638	T4 = bottom right		1738	T4 = bottom right	
1539	T1 = top left	15	**1639**	T1 = top left	15	**1739**	T1 = top left	15
153A	T2 = top right		163A	T2 = top right		173A	T2 = top right	
153B	T3 = bottom left		163B	T3 = bottom left		173B	T3 = bottom left	
153C	T4 = bottom right		163C	T4 = bottom right		173C	T4 = bottom right	
153D	T1 = top left	16	**163D**	T1 = top left	16	**173D**	T1 = top left	16
153E	T2 = top right		163E	T2 = top right		173E	T2 = top right	
153F	T3 = bottom left		163F	T3 = bottom left		173F	T3 = bottom left	
1540	T4 = bottom right		1640	T4 = bottom right		1740	T4 = bottom right	
1541	T1 = top left	17	**1641**	T1 = top left	17	**1741**	T1 = top left	17
1542	T2 = top right		1642	T2 = top right		1742	T2 = top right	
1543	T3 = bottom left		1643	T3 = bottom left		1743	T3 = bottom left	
1544	T4 = bottom right		1644	T4 = bottom right		1744	T4 = bottom right	
1545	T1 = top left	18	**1645**	T1 = top left	18	**1745**	T1 = top left	18
1546	T2 = top right		1646	T2 = top right		1746	T2 = top right	
1547	T3 = bottom left		1647	T3 = bottom left		1747	T3 = bottom left	
1548	T4 = bottom right		1648	T4 = bottom right		1748	T4 = bottom right	
1549	T1 = top left	19	**1649**	T1 = top left	19	**1749**	T1 = top left	19
154A	T2 = top right		164A	T2 = top right		174A	T2 = top right	
154B	T3 = bottom left		164B	T3 = bottom left		174B	T3 = bottom left	
154C	T4 = bottom right		164C	T4 = bottom right		174C	T4 = bottom right	
154D	T1 = top left	20	**164D**	T1 = top left	20	**174D**	T1 = top left	20
154E	T2 = top right		164E	T2 = top right		174E	T2 = top right	
154F	T3 = bottom left		164F	T3 = bottom left		174F	T3 = bottom left	
1550	T4 = bottom right		1650	T4 = bottom right		1750	T4 = bottom right	

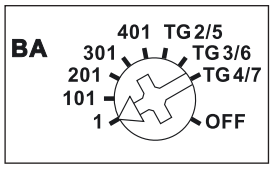
FTS14TG PUSHBUTTON GATEWAY AND PUSHBUTTON BUS COUPLER AND BUS SWITCH

Line 1 BA = 2 or 5			Line 2 BA = 3 or 6			Line 3 BA = 4 or 7		
		Device No.			Device No.			Device No.
1551	T1 = top left	21	**1651**	T1 = top left	21	**1751**	T1 = top left	21
1552	T2 = top right		1652	T2 = top right		1752	T2 = top right	
1553	T3 = bottom left		1653	T3 = bottom left		1753	T3 = bottom left	
1554	T4 = bottom right		1654	T4 = bottom right		1754	T4 = bottom right	
1555	T1 = top left	22	**1655**	T1 = top left	22	**1755**	T1 = top left	22
1556	T2 = top right		1656	T2 = top right		1756	T2 = top right	
1557	T3 = bottom left		1657	T3 = bottom left		1757	T3 = bottom left	
1558	T4 = bottom right		1658	T4 = bottom right		1758	T4 = bottom right	
1559	T1 = top left	23	**1659**	T1 = top left	23	**1759**	T1 = top left	23
155A	T2 = top right		165A	T2 = top right		175A	T2 = top right	
155B	T3 = bottom left		165B	T3 = bottom left		175B	T3 = bottom left	
155C	T4 = bottom right		165C	T4 = bottom right		175C	T4 = bottom right	
155D	T1 = top left	24	**165D**	T1 = top left	24	**175D**	T1 = top left	24
155E	T2 = top right		165E	T2 = top right		175E	T2 = top right	
155F	T3 = bottom left		165F	T3 = bottom left		175F	T3 = bottom left	
1560	T4 = bottom right		1660	T4 = bottom right		1760	T4 = bottom right	
1561	T1 = top left	25	**1661**	T1 = top left	24	**1761**	T1 = top left	25
1562	T2 = top right		1662	T2 = top right		1762	T2 = top right	
1563	T3 = bottom left		1663	T3 = bottom left		1763	T3 = bottom left	
1564	T4 = bottom right		1664	T4 = bottom right		1764	T4 = bottom right	
1565	T1 = top left	26	**1665**	T1 = top left	26	**1765**	T1 = top left	26
1566	T2 = top right		1666	T2 = top right		1766	T2 = top right	
1567	T3 = bottom left		1667	T3 = bottom left		1767	T3 = bottom left	
1568	T4 = bottom right		1668	T4 = bottom right		1768	T4 = bottom right	
1569	T1 = top left	27	**1669**	T1 = top left	27	**1769**	T1 = top left	27
156A	T2 = top right		166A	T2 = top right		176A	T2 = top right	
156B	T3 = bottom left		166B	T3 = bottom left		176B	T3 = bottom left	
156C	T4 = bottom right		166C	T4 = bottom right		176C	T4 = bottom right	
156D	T1 = top left	28	**166D**	T1 = top left	28	**176D**	T1 = top left	28
156E	T2 = top right		166E	T2 = top right		176E	T2 = top right	
156F	T3 = bottom left		166F	T3 = bottom left		176F	T3 = bottom left	
1570	T4 = bottom right		1670	T4 = bottom right		1770	T4 = bottom right	
1571	T1 = top left	29	**1671**	T1 = top left	29	**1771**	T1 = top left	29
1572	T2 = top right		1672	T2 = top right		1772	T2 = top right	
1573	T3 = bottom left		1673	T3 = bottom left		1773	T3 = bottom left	
1574	T4 = bottom right		1674	T4 = bottom right		1774	T4 = bottom right	
1575	T1 = top left	30	**1675**	T1 = top left	30	**1775**	T1 = top left	30
1576	T2 = top right		1676	T2 = top right		1776	T2 = top right	
1577	T3 = bottom left		1677	T3 = bottom left		1777	T3 = bottom left	
1578	T4 = bottom right		1678	T4 = bottom right		1778	T4 = bottom right	

FTS14FA optional:
All sensor telegrams generated by the FTS14EM or FTS14TG can be sent directly to the radio system using an FTS14FA radio output module. The device class set on the FTS14EM (button, window contact or motion detector) is adopted. This makes it possible, for example, to control decentralised actuators whose button wire is connected to the distribution board on the FTS14EM. These telegrams can also paired with a controller (Minisafe2, wibutler).
The rotary switch determines which group it belongs to. This refers to the set ID ranges of the FTS14EM input modules or button gateway FTS14TG. The content of the sensor telegram is copied and sent to the ELTAKO radio system with a new ID. A maximum of 8 FTS14FAs can be connected to a bus. No further setting using the PCT14 software is necessary.

Alternatively, the FTD14 radio duplicator is also available. Here, individual IDs from different groups can be sent with just one device. To do this, the sensor IDs must be entered in advance using the PCT14 software.
Rotary switch on FTS14FA at Position 1: Sends telegrams of all FTS14EMs set to 1.
Rotary switch on FTS14FA at Position 101: Sends telegrams of all FTS14EMs set to 101.
Rotary switch on FTS14FA at Position 201: Sends telegrams of all FTS14EMs set to 201.
Rotary switch on FTS14FA at Position 301: Sends telegrams of all FTS14EMs set to 301.
Rotary switch on FTS14FA at Position 401: Sends telegrams of all FTS14EMs set to 401.
Rotary switch on FTS14FA at Position TG2/5: Sends telegrams to all FTS14TGs which are at 2 or 5.
Rotary switch on FTS14FA at Position TG3/6: Sends telegrams to all FTS14TGs which are at 3 or 6.
Rotary switch on FTS14FA at Position TG4/7: Sends telegrams to all FTS14TGs which are at 4 or 7.
Rotary switch on FTS14FA at Position OFF: The FTS14FA is switched off.
The green LED under the rotary switch flashes briefly when a wireless telegram is sent.
Incoming telegrams from an FAM14 device in the bus are not resent by the FTS14FA.

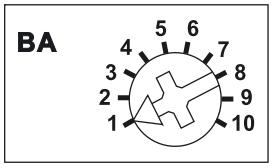
Operating mode rotary switch



Standard setting ex works.

FGW14-USB:
The gateway has multiple uses: to connect a Smart Home central control unit GFVS-SafeIV or a PC via a USB interfaces, to couple up to three FEM devices, to connect to bus components of the older Series 12, or as bus connector for two Series 14 RS485 buses.
When an ID is transferred via the gateway, the green LED blinks briefly. The maximum permitted cable length for USB is 4.5m.
Longer sections can only be operated reliably by using an active USB hub.
Overview of rotary switch functions:
Pos. 1: Bus12 -> Bus14
Pos. 2: Bus12 -> Bus14 with ID filter
Pos. 3: Bus14 -> Bus12
Pos. 4: Bus14 an RSA2/RSB2 -> Bus14 with ID filter
Pos. 5: Bus14 <-> USB 9600 Baud
Pos. 6: Bus14 <-> USB 58K Baud
Pos. 7: CLR ID 9600 Baud
Pos. 8: LRN ID 9600 Baud
Pos. 9: PCT14 communication
For a more detailed description see the operating instructions

Operating mode rotary switch



Standard setting ex works.

FGW14W-IP / FGW14WL-IP
The gateway with IP interface supports up to 64 electricity meters from the series 14. Current values of the electricity meters on the RS485 bus are made available via MQTT or REST API. Data according to EEP A5-12-01, A5-12-02 and A5-12-03 are supported.
For more details on MQTT see: www.mqtt.org

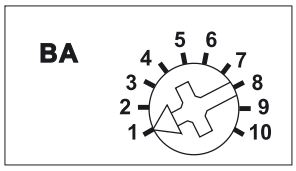
Control elements
The gateway has a rotary switch with positions 1-10 and an integrated LED (green/red). When delivered, the LED flashes green at approx. 1 Hz, although the rotary switch must not be in position 1 or 10. Once the MQTT configuration has been completed and the connection to an MQTT broker has been established, the LED goes out.

Factory reset
If the rotary switch is set to position 1 or 10, the LED lights up green permanently.
If the rotary switch is turned to position 1 and then away from it 5 times within 10 seconds, a factory reset is carried out and the delivery state is restored.

Error display
If an access password has been assigned but data transfer to the MQTT broker is not possible (e.g. MQTT not configured or data connection interrupted), the LED lights up red permanently. The next time data is transferred successfully, the LED goes out.
If the LED flashes red, approx. 5 times per second, there is a hardware error and the device must be replaced.
Factory setting WLAN access point
SSID: ELTAKO-FGW14-IP
Password: fgw14-ip

Please note the operating settings for the FAM14 (see point 3.3, page 16)

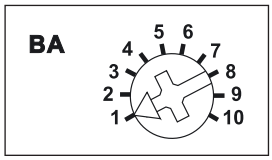
Operating mode rotary switch



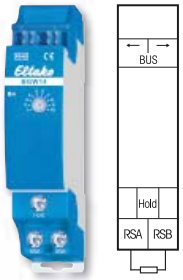
Standard setting ex works.

9. BUS GATEWAY BGW14 AND 4-WIRE SENSORS (TEMPERATURE AND MOTION/BRIGHTNESS)

Function rotary switches



Standard setting ex works.



Bus gateway BGW14

Room temperature controller

Clock thermostat

Temperature sensor

Motion detector

Functional principle:
Data transmission and power supply take place over the 4-wire bus with a 12 VDC mains adapter. The bidirectional bus gateway is used to feed control signals from connected bus sensors to the RS485 bus and output feedback signals (for display device).
Up to 16 bus sensors (BUTHxx, BTFxx, BTRxx and BBHxx) can be connected to the RSA/RSB terminals.
Connection is by means of conventional telephone wire J-Y(ST)Y-2x2x0,8mm^2. Data from max. 128 sensors can be fed to the RS485 bus by max. 8 BGW14 devices. Addresses are generated from a basic address set at rotary switch BA and a set sensor address of the connected sensors. (See table on page 26)
The BGW14 queries all connected sensors cyclically and the sensors reply with a data telegram. Data is compared to the previous data; data is only output to the RS485 bus if there is a change. If data does not change, the connected sensors output status telegrams cyclically every 5 minutes.
Two different signal types can be selected on the clock thermostats BUTH55 and BUTH65.

Temperature FHK mode	EEP A5-10-06 for direct teach-in to a heating/cooling actuator
Temperature/humidity mode	EEP A5-10-12 if controller (e.g. Minisafe2, wibutler) is used

Connections and wiring:
Use the enclosed fixed bridge to integrate the BGW14 in Series 14. In addition, connect the HOLD terminal to all the other HOLD terminals of the devices in the bus.
The bus gateway BGW14 provides a separate RS485 bus for the sensors and is connected to the RSA and RSB terminals. The required 12 VDC power supply for all sensors must be supplied from a separate switching power supply unit SNT12/230V-12V DC which is connected to the + and - terminals of the sensors. Connect with the correct polarity! Here you can select any topology for the 4-wire connection. The permitted total line length is 1000 m.
The second 120 ohm terminal resistor enclosed with the BGW14 must also be connected to the RSA/RSB terminals of the remotest sensor. In a star-shaped wiring topology where the BGW14 is at the centre, the terminal resistor must be removed from the RS terminals. The two terminal resistors must then be connected to the last device on the two longest stubs.

ID range:
The operating mode rotary switch BA of each BGW14 device must be set to a different position. Therefore, each gateway uses a different address range in the 32 hexadecimal step system. In 8-digit HEX code, each ID address must be preceded by 4 zeros (0000). e.g. 00001901.

ID address ranges

		Rotary switch position							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Bus address	**1**	1901	1921	1941	1961	1981	19A1	19C1	19E1
	2	1902	1922	1942	1962	1982	19A2	19C2	19E2
	3	1903	1923	1943	1963	1983	19A3	19C3	19E3
	4	1904	1924	1944	1964	1984	19A4	19C4	19E4
	5	1905	1925	1945	1965	1985	19A5	19C5	19E5
	6	1906	1926	1946	1966	1986	19A6	19C6	19E6
	7	1907	1927	1947	1967	1987	19A7	19C7	19E7
	8	1908	1928	1948	1968	1988	19A8	19C8	19E8
	9	1909	1929	1949	1969	1989	19A9	19C9	19E9
	10	190A	192A	194A	196A	198A	19AA	19CA	19EA
	11	190B	192B	194B	196B	198B	19AB	19CB	19EB
	12	190C	192C	194C	196C	198C	19AC	19CC	19EC
	13	190D	192D	194D	196D	198D	19AD	19CD	19ED
	14	190E	192E	194E	196E	198E	19AE	19CE	19EE
	15	190F	192F	194F	196F	198F	19AF	19CF	19EF
	16	1910	1930	1950	1970	1990	19B0	19D0	19F0

Notes on PCT14:
If a setpoint value is to be sent wirelessly to a connected BUTH, e.g. from a MiniSafe, the BGW14 must receive a device address from the FAM14. In the PCT14 (from version 8.1) the transmitting radio ID can then be entered for each connected BUTH in the BGW14.

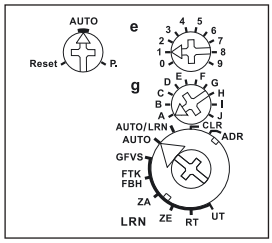
LED function test:
The green LED lights up briefly when data is output to the RS485 bus and lights up permanently when a connection to FAM14 or FTS14KS was set up by PCT14.

The green LED lights up briefly when data is output to the RS485 bus and lights up permanently when a connection to FAM14 or FTS14KS was set up by PCT14.

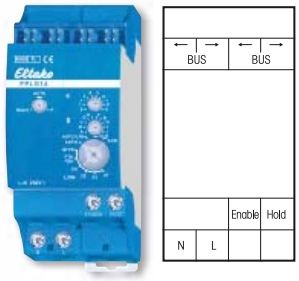
Use with visualisation software GFVS 4.0:
An **FGW14-USB** gateway must be used in all cases when the device is operated with the visualisation software GFVS 4.0. This then permits values to be synchronised between the display and the GFVS. This requires creating the actuator type BUTH65D and then select the dialog 'Teach-in to actuators'. The bus sensor waits for a teach-in telegram which must be confirmed briefly in the next dialog window.
After all the sensors are taught in, reset the 12 V power supply of the sensor.

10. POWERLINE GATEWAY FPLG14

Function rotary switches



Standard setting ex works.



Powerline gateway FPLG14

Operating principle:
This gateway translates wireless and Powerline telegrams in both directions. When you use the GFVS visualisation software, we recommend connection using an FGW14-USB!
All Powerline telegrams from the electricity wiring system are automatically translated into RS485 bus telegrams and may also be sent as wireless telegrams by connected FTD14 devices.
Only wireless and RS485 bus telegrams taught into the FPLG14 are translated into Powerline telegrams and modulated onto the electricity wiring system. Up to 120 different addresses. Teach-in takes place by means of rotary switches on the front of the devices or using the PCT14 as described in the user's manual.

Connections:
This device needs 230 V as power supply. Over this connection are also sent the Powerline signals. All HOLD terminals from the devices on the bus must be connected together.
The bus communication (regulation of the bus access, against collision) will only work correctly if this connections are done.
The ENABLE terminal must only be connected to the HOLD terminal if the bus is working without FAM14.

Assign device address for FPLG14:
To be ready to work, an address must be assigned from the FAM14 to the FPLG14. Set the rotary switch on the FAM14 to position 1, its lower LED flashes red. Set the lower rotary switch of the FPLG14 to ADR. The LED flashes at a low rate. Once the address has been assigned by the FAM14, its lower LED flashes green for 5 seconds and the LED of the FPLG14 goes out.

Assigning a domain (home address):
Switch on the main fuse. The red LED below the left rotary switchof the unconfigured FPLG14 flickers. Press the pushbutton (switch) of apreviously installed and configured Powerline device **5 times (10 times)** within 5 seconds. The actuator/sensor input transfers its domains (home address) to the FPLG14.

PL-address range:
The address is configurable on the PL devices with 2 rotary switches. 15 group addresses (g) and 16 element addresses are available. With the software Sienna-Professional®, the element addresses (e) from 1 to 127 are configurable. This address range can also be controlled from the FPLG14. With the software Sienna-Professional®, the group adress (g) A to Z are configurable. **The FPLG14 can only control group adresses from A to O.** (A notification appears in the software Sienna-Professional).

Teach-in wireless sensors via rotary switches:
Set the middle rotary switch to the desired group address g. Set the upper-right rotary switch to the desired elementary address e. Set the lower rotary switch to the required teach-in function. Press the button to be taught in twice quickly in succession ('double click'). The LED goes out.

Teaching-in a pushbutton of a Powerline sensor input into RS485 bus actuators:
At first, check that the PL-module has an adress (g) and (e). Select the desired teach-in function at the bus-actuator using the upper rotary switch (for FSR14 and F4HK14, set the lower rotary switch to the desired channel). Set the middle rotary switch to LRN. The LED flashes at a low rate. Operate the pushbutton. The LED goes out. To teach-in PL telegrams generated from the Software Sienna-Professionnal into a RS485 bus actuator, the lower rotary switch must be on AUTO/LRN.

Address assignment via PCT14:
The HEX address assigment results from the group address (g) and from the element address (e).
This table shows how to translate the addresses into HEX numbers:

Group address into HEX number:

(g)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	-
HEX	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	-

Element address into HEX:

(e)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
HEX	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	
More addresses are available with the software Sienna®-Professional																	
(e)	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	bis 127
HEX	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	bis 7F

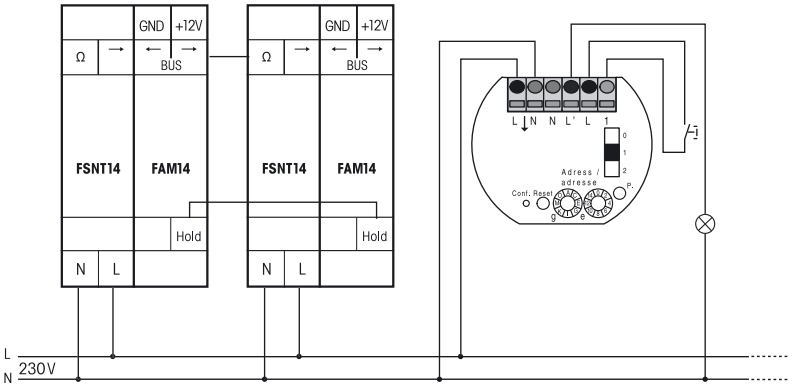
PL-Sensor-Telegrams for pushbuttons and control commands: range: 00004100 – 00004F7F
The base ID **00004**, is always present additionally to the group and element adresses 00004(g)(e)
Example:
Group address A and element address 1 **00004 1 01**
Group address D and element address 12 **00004 4 0C**
Group address F and element address 127 00004 6 7F

PL-Actuator-State-Telegrams for feedback: range: 00005**100** – 00005**F7F**
The base ID **00005**, is always present additionally to the group and element adresses 00005(g)(e)
Example:
State telegram from the PL module with group address A and element address 1 **00005** 1 01
State telegram from the PL module with group address 0 and element address 15 **00005** F 0F

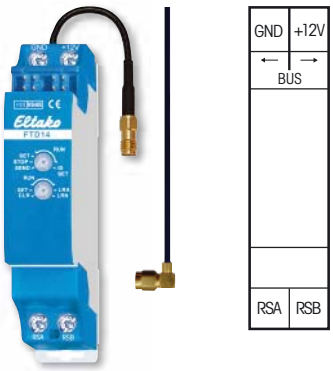
Settings in operation mode:
In operation, the left and lower right rotary switches must be placed on AUTO.

LED in operation mode:
Signal transits over the gateway are shown by the LED. The red LED from the upper right rotary switch is showing the wireless telegrams. The green LED from the lower rotary switch is showing the Powerline telegrams.

Typical connection:



RS485 Bus Telegram Duplicator FTD14 (optional)
The duplicator sends taught-in powerline telegrams translated automatically into bus telegrams from the mains directly over the FPLG14 to the ELTAKO Wireless Building system, and gives them new output IDs. In addition, the duplicator can also send all other telegrams present on the RS485 bus. This refers in particular to sensor telegrams that were coupled onto the bus by wire and are not automatically sent from the FAM14. The FTD14 sends the same telegram values when duplicating, only the telegram ID changes. Each ID address to be duplicated and sent must first be entered in the FTD14 with the PCT14 software or taught in via the external rotary switches. A total of 120 memory locations are provided. These radio telegrams can be specifically paired into decentralised radio actuators or a controller (MiniSafe2, wibutler)..



11. REPEATER


FRP14


FRP61-230V


FRP62-230V


FARP60-230V


FRP65/230V-wg


FSRP-230V


FRP70-230V

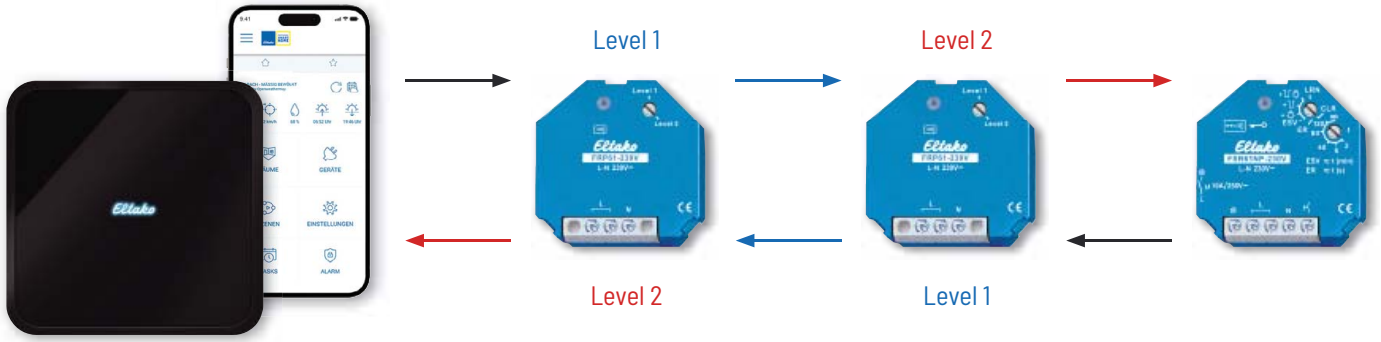
Function:
Repeaters can be used to increase the wireless transmission range. They effectively extend the wireless range between the wireless transmitter and the wireless receiver. The general rule is: less is more.
This means that repeaters should only be activated or only additional repeaters should be installed if it is necessary. Too many repeaters are counter-productive and ultimately interfere with reliable wireless communication.

There are 2 different repeater levels.

Level 1 is supported by all repeaters (e.g. FRP14, FRP61, FRP70) and can be additionally activated by decentralised actuators of the Series 61 and Series 71. Level 1 repeaters only repeat the original telegrams.

Level 2 is only supported by dedicated repeaters (e.g. FRP14, FRP61, FRP70). A telegram is **only** repeated with Level 2 if it receives an already repeated signal **but not** the original telegram. If an original telegram still reaches a Level 2 repeater, it is only repeated with Level 1. This limits wireless traffic to the essential.

Bidirectionality with Level 2 repeaters:
Bidirectionality is required when a control software is used (e.g. MiniSafe2, Safe or Wibutler). If Level 2 repeaters are used, make sure that all repeaters in the chain support Level 2 mode. Otherwise, confirmation telegrams from switching actuators cannot be sent in the opposite direction.
In this case, both repeaters must be set to Level.



12. DALI

FDG14

FD2G14

FDG71L-230V

DL-1CH-8A-DC12+

DL-1CH-8A-DC12+

DL-RGB-R16A-DC12+

DALI facts:
DALI is the only worldwide standard for professional lighting control.
It is easy to install. The mains power and the two DALI control wires can be routed together in the same cable -> this simplifies wiring.
Stable dimming function: Digital control signal for all devices -> no light fluctuations.
Flexibility: Each DALI control device has its own address and can be controlled individually.
Distributed intelligence: Various operating parameters are stored directly in the DALI control device (e.g. light scene values, group assignment, fade times, power-on level, etc.).
Status feedbacks: Request information (defective lamps, brightness).
Flexibility – group concept: A group is a combination of several lamps. Each operating device can be assigned to one or more of 16 groups. This greatly increases flexibility compared to non-addressable hard-wired systems.
Logarithmic light resolution up to 0.1%: The dimming curve is adapted to the brightness perception of the human eye.

DALI

Properties of a Dali circuit:
Up to 64 DALI operating devices can be addressed
Up to 64 sensors (FD2G14)
16 DALI groups + broadcast
16 DALI scenes (broadcast or group control)
DALI bus voltage: 12 V - 22.5 V (typically 16 V)
DALI system current: < 250 mA
ELTAKO: FDG14 max. 128 mA = 64 Dali EVG; FD2G14 recommendation max. 200 mA
Data transfer speed: 1200 baud (asynchronous interface)
Cable length up to 300 m (with 1.5 mm^2 conductor cross-section), resulting from the permissible voltage drop on the DALI cable of a maximum of 2 V and the system current.

Starting up a DALI system:
To make sure that DALI operating devices (lamps) have a DALI power supply, there is a very simple method to determine whether the communication is working. Simply teach in a wireless button (for testing purposes) as a broadcast device. All DALI lamps should then respond when the broadcast button is pressed. Even if they are not yet addressed, it must be possible to switch them on and dim them. If one or more lamps do not respond, then check the DALI wiring or measure the voltage at the DALI gateway (typ. 16 V DC).

Important: If you measure 0 V at the DALI gateway, completely disconnect the DALI line from the gateway and then measure the DALI voltage again. If you then measure the DALI voltage (typ. 16 V DC), there is a short circuit on the DALI line. In order to use the full functionality of a DALI system, DALI operating devices should first be addressed, grouped and configured once when the system is set up. This is done by using the tools DL-USB MINI and DALI Cockpit software (available for download on the ELTAKO website).

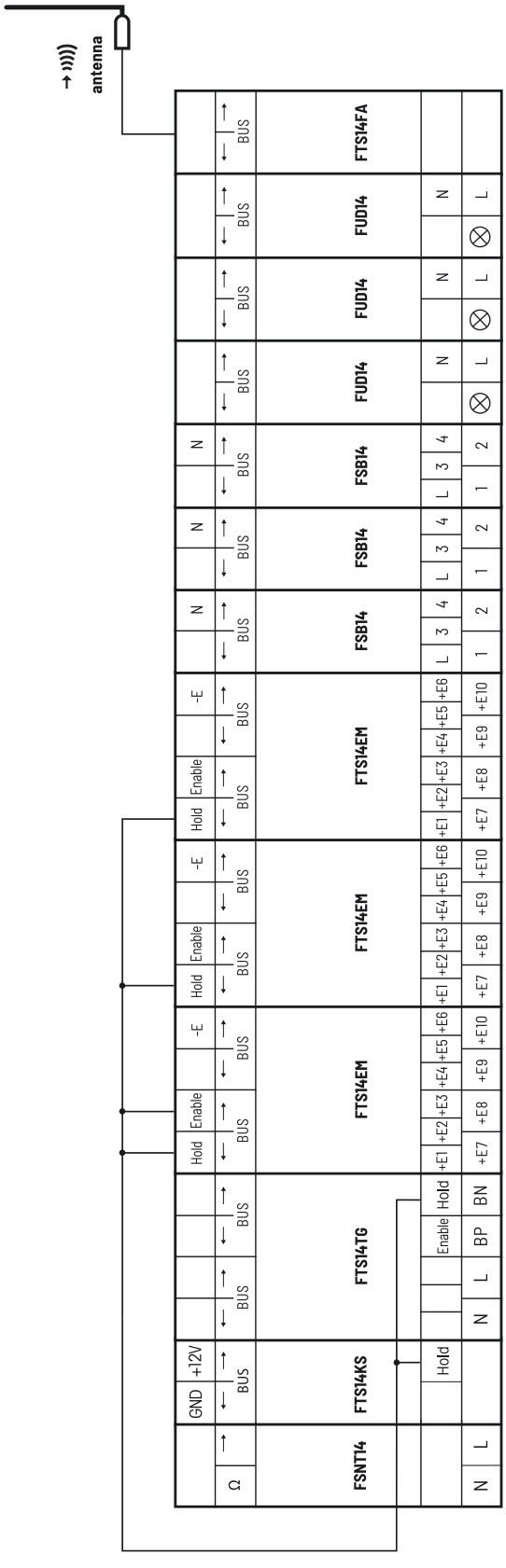
The most important configuration settings for an operating device are:
- Define group assignment to groups 0-15
- Define the light scene values for scenes 0-15
- Define the fade time (FadeTime) greater than 0.7 s
- Define the fade rate (FadeRate) for relative dimming between 16 - 179 steps
- Define the response at power up (PowerOn Level)
- Define the response if the DALI bus voltage fails (System Failure Level)

Information:
In Dali, a distinction is made between single-master and multi-master.
The ELTAKO Dali gateway FDG14 acts as the central controller (master controller) in the system and only supports single-master. This means that no additional Dali controllers (e.g. Dali button interfaces, sensors) may be used in the Dali network, as this may cause interference.
The ELTAKO Dali gateway FD2G14, on the other hand, supports multi-master.
This means that a further 64 sensors (motion detectors, button interfaces) can be integrated into the bus.
Make sure that the HOLD terminal is connected.
With the help of a radio telegram duplicator FTD14, the DALI sensor values can be output to the building radio and processed there.
The address range 00001830 ..... 0000186F is available for Dali2 sensors.

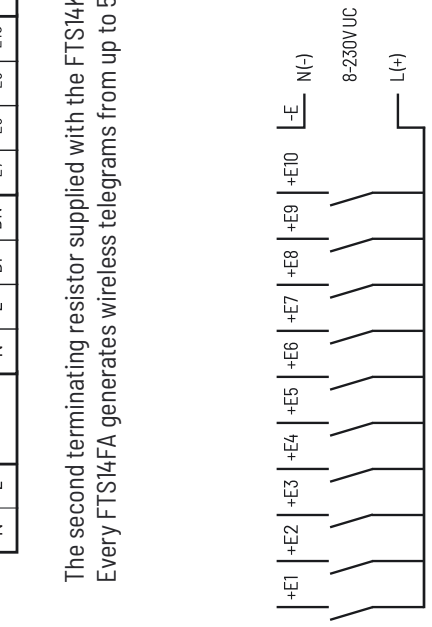
13. CIRCUIT DIAGRAMS

* Three-phase energy meters DSZ14 must be connected to the end of a bus line..
The second terminating resistor enclosed to the FAM14 should be connected to the last actuator, or a terminating resistor should be clamped to the terminals RSB/RSA of the last meter (120Ω, not included).

The wireless output module FTS14FA with FTS14TG, FTS14EM and actuators

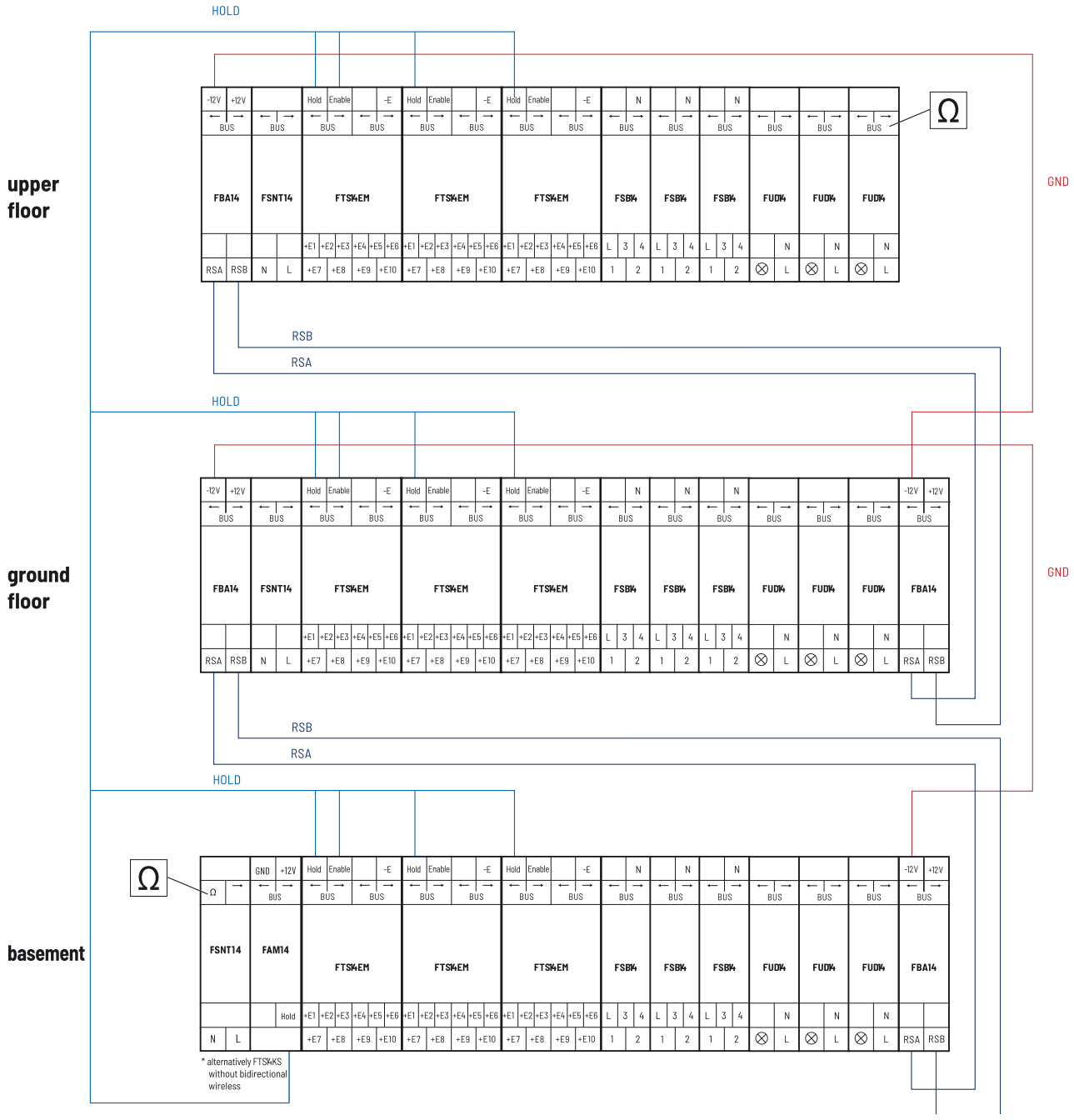


The second terminating resistor supplied with the FTS14KS must be plugged into the last bus user.
Every FTS14FA generates wireless telegrams from up to 5 FTS14EM pushbutton input modules and up to 3 FTS14TG pushbutton gateways.

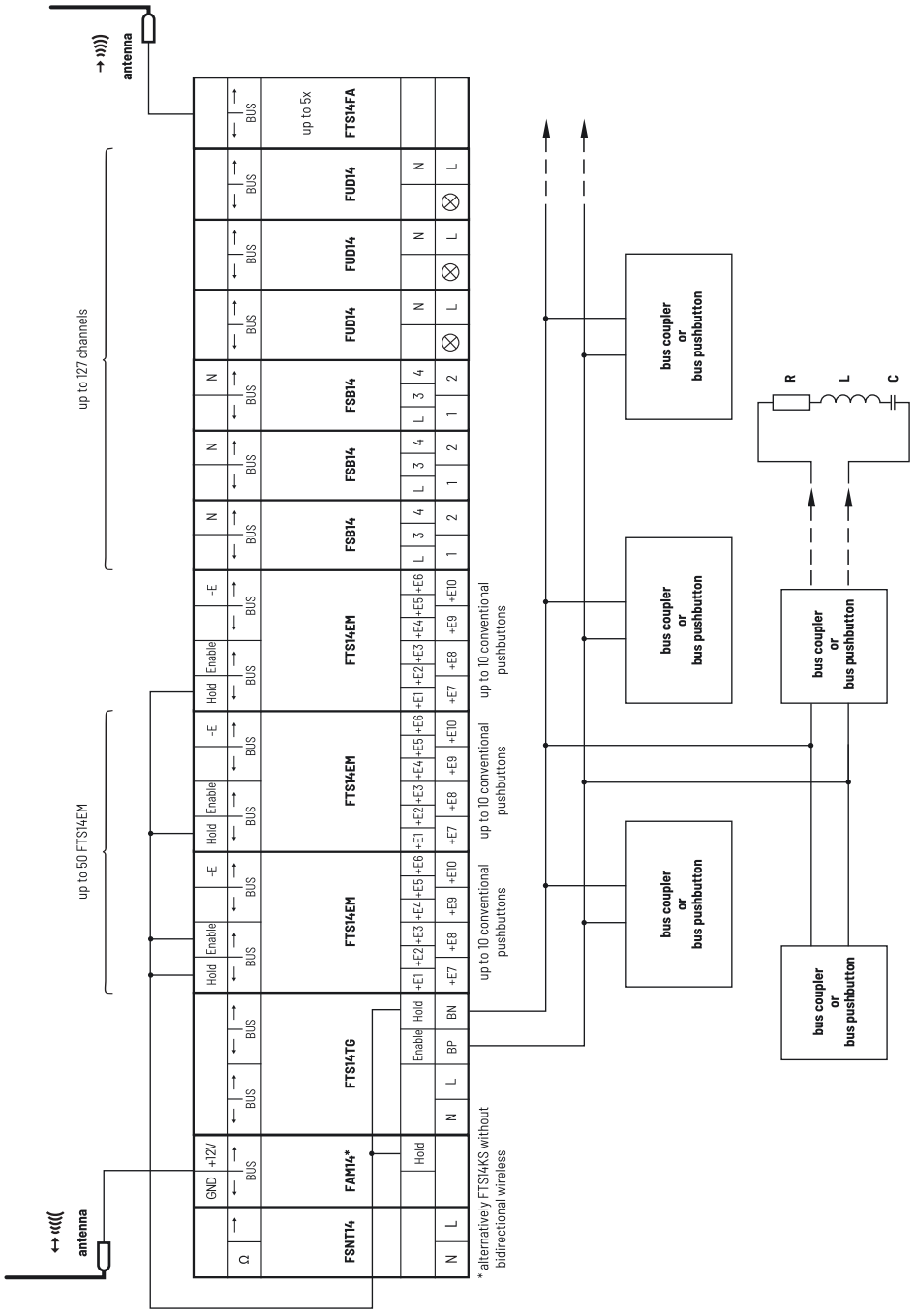


Control inputs FTS14EM

BR14 bus over 3 floors

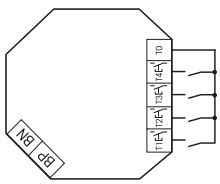


The pushbutton gateway FTS14TG with bus pushbutton coupler or bus pushbutton



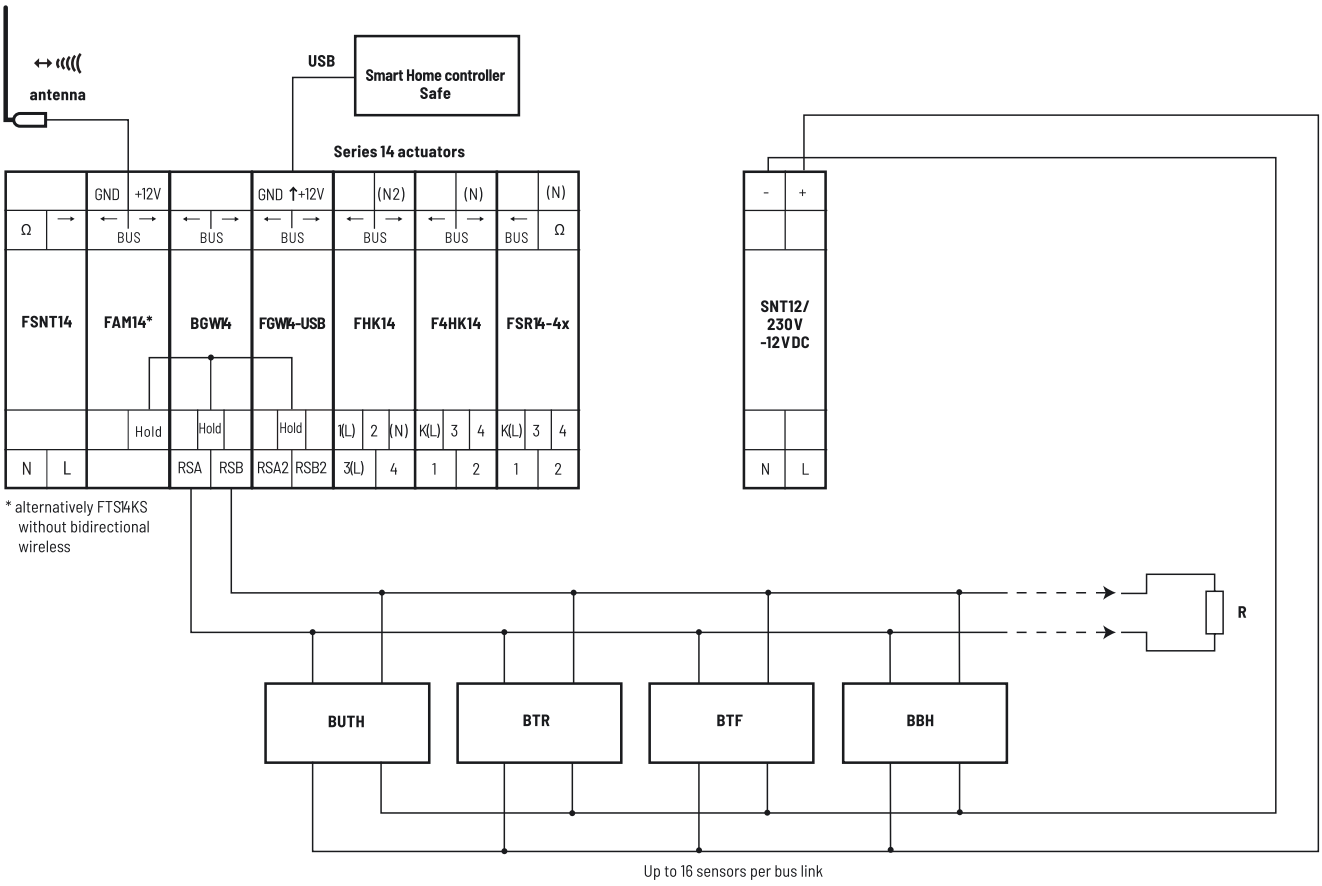
Plug the two terminal resistors which come with the FTS14KS to the last bus user. Up to 30 bus users can be connected via a push-button gateway FTS14TG. A simple 2-wire line supplies the bus pushbutton coupler with power. At the same time, the wires transfer pushbutton information. Here you can select any topology for the 2-wire connection.
The RLC device enclosed with the FTS14TG must be connected to the terminals BP and BN on the furthest bus pushbutton or bus pushbutton coupler.

Assignment
Bus pushbutton coupler
FTS61BTK



Assignment
Bus pushbutton coupler
FTS61BTKL

The bus gateway BGW14 and 4wire sensors



Plug the second terminal resistor enclosed with the BGW14 to the terminals RSA/RSB on the last bus sensor.

14. QR CODES - ADDITIONAL AIDS

You'll find help and useful information in the following QR codes:

Videos
Here you'll find helpful short videos on the Series 14:
Topics: Topology, address assignment and teach-in procedures

Other manuals

Enhancing wireless range
Access technical details on the range of sensors and actuators here.

NOTES

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