

RS485 bus actuator

Universal dimmer switch

FUD14



**Only skilled electricians may install this electrical equipment otherwise there is the risk of fire or electric shock!**

Temperature at mounting location:  
-20°C up to +50°C.  
Storage temperature: -25°C up to +70°C.  
Relative humidity:  
annual average value <75%.

**valid for devices from production week 47/13** (see bottom side of housing)

Universal dimmer switch, Power MOSFET up to 400W. Automatic lamp detection. Bidirectional. Only 0.3 watt standby loss. With adjustable minimum brightness and dimming speed. With switching operation for light alarm clocks, children's rooms and snooze function. Also with light scene control and constant light regulation.

Modular device for DIN-EN 60715 TH35 rail mounting. 1 module = 18 mm wide, 58 mm deep.

The delivery includes a spacer DS14, 1 short jumper 1 module (up to 200W load) and 1 long jumper 1,5 modules (from 200W load with DS14 on the left side).

Universal dimmer switch for lamps up to 400W, depending on ventilation conditions, dimmable energy saving lamps (ESL) and dimmable 230V LED lamps are also dependent on the lamp electronics.

**Zero passage switching with soft ON and soft OFF to protect lamps.**

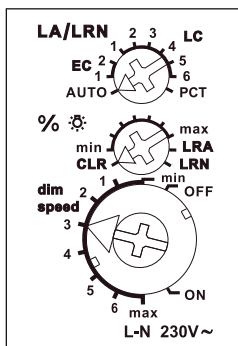
Switching voltage 230V. No minimum load. The brightness level is stored on switch-off (memory).

In case of a power failure the switch position and the brightness stage are stored and may be switched on when the power supply is restored.

Automatic electronic overload protection and overtemperature switch-off.

Connection to the Eltako-RS485 bus. Bus cross wiring and power supply with jumper.

### Function rotary switches



The upper rotary switch LA/LRN is first required for teach-in and defines in operation whether automatic lamp detection should be activated or special comfort positions:

**AUTO allows all lamp types to be dimmed.**

**EC1** is a comfort position for energy saving lamps which must be switched on at high voltage due to their design so that they can be dimmed down and switched back on safely when cold.

**EC2** is a comfort position for energy saving lamps which cannot be switched back on in dimmed-down position due to their design. Therefore the memory is switched off in this position.

**LC1** is a comfort position for LED lamps which cannot be dimmed down far enough in AUTO (phase cut-off) due to their design.

**LC2 and LC3** are comfort positions for LED lamps like LC1 but with different dimming curves.

In positions EC1, EC2, LC1, LC2 and LC3, no inductive (wound) transformers may be used. In addition the maximum number of dimmable LED lamps may be lower than in AUTO position due to their design.

**LC4, LC5 and LC6** are comfort positions for LED lamps such as AUTO but with different dimming curves.

PCT is a position for special functions which are set up using the PC tool PCT14.

The minimum brightness (fully dimmed down) is adjustable **with the middle % rotary switch.**

The dimming speed is adjustable using the **bottom dimming speed rotary switch.**

The pushbuttons can be taught-in either as direction switches or universal switches:

**When installed as a direction switch,** one side is then 'switch on and dim up' and the other side is 'switch off and dim down'. A double-click on the switch-on side activates automatic dim-up to full brightness at dim speed. A double click on the switch-off side activates the snooze function. The children's room function is implemented on the switch-on side. **As a universal switch,** change the direction by briefly releasing the pushbutton.

**Switching for light alarm clocks:** A wireless signal of a time clock which was taught-in accordingly starts the wake up function by switching on the light at the lowest brightness level and dims up slowly until the maximum level is reached. The dimming process is stopped by tapping briefly, e.g. on the hand-held transmitter.

**Switching operation for children's rooms** (universal switch or direction switch on the switch-on side): If the light is switched on by holding down the pushbutton, it starts at the lowest brightness level after approx. 1 second and dims up slowly as long as the pushbutton is held down. The last saved brightness level is not modified.

**Snooze function** (universal switch or direction switch on the switch-off side): With a double impulse the lighting is dimmed down from the current dimming position to the minimum brightness level and switched off. The current dimming position as well as the adjustable minimum brightness level determine the dimming time (30 minutes) which can be reduced as required. It can be switched off at any time by short-time control commands during the lighting is dimmed down.

**Light scenes on the PC** are set and retrieved using the Wireless Building Visualisation and Control Software GFVS. A description of the GFVS is in Chapter V at "eltako-wireless.com". One or several FUD14 devices must be taught in on the PC as dimming switches with percentage brightness values.

**Staircase light switch:**

The staircase light switch switches on with a memory value and starts an RV time at the end of which the device switches off. Press the switch again to restart.

### Clock:

Set the upper rotary switch to PCT. The clock is started by the universal button, direction button (switch-on side) and the 'Central ON' button.

**FTK as NO contact:**

When the window is opened, the light is switched on. When the window is closed, the light is switched off.

**FTK as NC contact:**

When the window is opened, the light is switched off. When the window is closed, the light is switched on.

**FBH as Master:** (automatic brightness control) When a wireless motion-brightness sensor FBH is taught-in, the switching threshold is defined by the lower rotary switch during teach-in. The switching threshold switches on the lighting with memory value depending on the brightness (in addition to motion) (from approx. 30 lux in OFF position to approx. 300 lux in ON position). When the FBH in taught-in in the ON position, it is only evaluated as a motion detector. A return delay of 2 minutes is preset in the FUD14. By switching-off or dimming with pushbutton, the FBH is deactivated. Central pushbutton, scene pushbutton and 'dimming value' by PC also lead to deactivation. A short press on the switch-on side of the direction pushbutton, the FBH is reactivated.

**FBH as Slave:**

The FBH is only evaluated as motion detector.

**FAH as Master:** (automatic brightness control off) When a wireless brightness sensor FAH is taught-in, the switching threshold is defined by the lower rotary button during teach-in. The switching threshold switches the lighting off depending on the brightness. Switch-on is only possible by pressing the button.

**FAH as twilight switch:** (automatic brightness control off) When a wireless brightness sensor FAH is taught-in, the switching threshold is defined by the lower rotary switch during teach-in. The switching threshold switches the lighting on or off depending on the brightness (from approx. 0 lux in OFF position to approx. 50 lux in ON position). If the brightness threshold is undershot, switch-on uses the memory value. Switch-off takes place at a brightness of > 200 lux.

**FAH as twilight dimmer:** (automatic brightness control off) When a wireless brightness sensor FAH is taught-in, the minimum dimming value is defined in % by the lower rotary switch. The switching threshold is the value to which the lighting is dimmed down in darkness (OFF = minimum dimming value to ON = maximum dimming value). If the brightness undershoots a fixed limit, switch-on takes place at maximum dimming value. If the brightness drops, the dimming value is also reduced. When the brightness rises again, the dimming value also increases. If the brightness exceeds the fixed limit, the lighting is switched off.

**Constant light control with FBH or FAH:** (the automatic brightness control must be switched on with PCT14).

If the minimum brightness is exceeded, the lighting is switched on.

If the minimum brightness is undershot, the lighting is switched off.

If the residual brightness is greater than the minimum brightness, the lighting is slowly dimmed down to this value if no motion is detected, and is dimmed up if motion is detected.

Residual brightness:

0 = the lighting is switched off if no motion is detected;

The automatic control by FAH or FBH will be disabled by a manual brightness change or switch-off with the pushbutton. Central pushbutton, scene pushbutton and 'dimming value' by PC also lead to deactivation. With a short press of the switch-on side of the direction pushbutton, the automatic control is activated again.

**Constant light control with FIH65B:**

(The automatic brightness control automatically switches on when teaching-in of the FIH65B) The required brightness is adjusted by a pushbutton, then the first received brightness value of the FIH65B is the target brightness, it is maintained constant automatically by the FUD14 by incoming brightness values of the FIH65B. After each change in brightness (dimming) with pushbutton, the subsequently received brightness value of FIH65B will be the new target brightness. If the target brightness is adjusted with PCT14, or stored with a 'direction pushbutton for target brightness', this is fixed, a change in

brightness with the pushbutton is then overruled by the fixed target brightness. If additionally a FBH is taught-in as a slave, it is switched on when motion and target brightness are fallen short and switched off when not in motion or target brightness is exceeded. By switching off with pushbutton, the automatic control by FBH or FIH is disabled. Central pushbutton, scene pushbutton and 'dimming value' by PC also lead to deactivation. The automatic control is reactived by w short press on the switch-on side of the direction button.

#### Storing of target brightness:

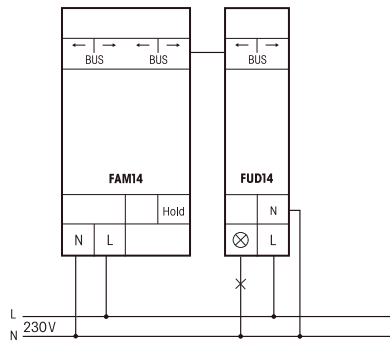
Press 'direction pushbutton for target brightness' above. The current brightness that has been sent from the FIH65B is stored.

#### Deletion of target brightness:

Press 'direction pushbutton for target brightness' below.

The LED performs during the teach-in process according to the operation manual. It shows control commands by short flickering during operation.

#### Typical connections



#### Technical data

Incandescent and halogen lamps <sup>1)</sup>	up to 400W <sup>6)</sup> 230V (R)
Inductive transformers (L)	up to 400W <sup>2),3),6)</sup>
Electronic transformers (C)	up to 400W <sup>2),3),6)</sup>
Dimmable energy saving lamps ESL	up to 400W <sup>5),6)</sup>
Dimmable 230V LEDs	up to 400W <sup>5),6)</sup>
Max./min. temperature at mounting location	+50°C/-20°C <sup>4)</sup>
Standby loss (activ power)	0.3W

- <sup>1)</sup> Applies to lamps of max. 150W.
- <sup>2)</sup> Per dimmer it is only allowed to use max. 2 inductive (wound) transformers of the same type, furthermore no-load operation on the secondary part is not permitted. The dimmer might be destroyed. Therefore do not permit load breaking on the secondary part. Operation in parallel of inductive (wound) and capacitive (electronic) transformers is not permitted!
- <sup>3)</sup> **When calculating the load a loss of 20% for inductive (wound) transformers and a loss of 5% for capacitive (electronic) transformers must be considered in addition to the lamp load.**
- <sup>4)</sup> Affects the max. switching capacity.
- <sup>5)</sup> Usually applies for dimmable energy saving lamps and dimmable 230V LED lamps. Due to differences in the lamps electronics, there may be limited dimming range, switch on and off problems dependent on the manufacturer and a restriction on the maximum number of lamps; especially if the connected load is very low (for 5W-LEDs). The comfort positions EC1, EC2, LC1, LC2 and LC3 optimize the dimming range, which, however, only gives a maximum power up to 100W. No inductive (wound) transformers may be dimmed in these comfort positions.
- <sup>6)</sup> At a load of more than 200W ventilation clearance of ½ module to adjacent devices must be maintained.

#### Teaching-in wireless sensors in wireless actuators

All sensors must be taught-in in the actuators so that they can detect and execute commands.

#### Teaching-in actuator FMZ14

The teach-in memory is clear on delivery from the factory. To ensure that a device was not previously taught-in, **clear the complete memory:**

Turn the middle rotary switch to CLR. The LED flashes at a high rate. Within 10 seconds, turn the upper rotary switch three times to right stop (turn clockwise) and back again. The LED stops flashing and goes out after 2 seconds. All taught-in sensors are cleared.

**Clear single taught-in sensors** in the same way as in the teach-in procedure, except that you set the middle rotary switch to CLR instead of LRN, and operate the sensor. The LED previously flashing at a high rate goes out.

**Teaching-in sensors**  
A total of 120 memory locations are available:

1. Set the top rotary switch to the required teach-in function:  
AUTO = timer as wake-up light;  
Teach-in FIH63, FAH or FAH as master;

EC1 = 'central off';  
Teach-in second FBH as slave;  
EC2 = universal switch;  
Teach-in third FBH as slave;  
LC1 = 'central on';  
Teach-in fourth FBH as slave;  
LC2 = Teach in direction button, direction buttons are automatically taught-in fully when pressed. Depending on where the button is pressed, the functions for switch-on and dim-up are defined on one side and switch-off and dim-down on the other side.

Teach in FTK and Hoppe window handle as NO contact;

LC3 = teach in sequential light scene pushbutton, a pushbutton or half of a double pushbutton is assigned automatically. Teach in FTK and Hoppe window handle as NC contact;

LC4 = Teach in 4-way direct light scene buttons, a complete button with double rocker is assigned automatically.

LC5 = Teach-in single light scene push-buttons, simultaneously the brightness, set with an universal pushbutton or direction pushbutton, and the dimming speed, set with the lower rotary switch, will be saved;

Teach in FAH as twilight switch;

LC6 = Teach in staircase light switch;  
Teach in FAH as twilight dimmer;  
PCT = Teach in PC with GFVS Software; teach-in dimming values of FFD;  
Teach-in 'direction pushbutton for target brightness'

2. Set the middle rotary switch to LRN. The LED flashes at a low rate.
3. Operate the sensor to be taught-in. The LED goes out.

To teach-in further sensors, turn the middle rotary switch briefly away from position LRN. Continue the procedure from pos 1.

After teach-in, set the load type using the top rotary switch. Set the minimum brightness or the maximum brightness using the middle rotary switch. Set the dimming speed using the bottom rotary switch.

#### Saving light scenes

Up to four brightness values can be saved using a direct light scene pushbutton.

1. Set the top rotary switch to the required operating mode AUTO or EC or LC.
2. Set the required brightness value using a previously taught-in universal switch or direction switch.
3. Within 60 seconds, this brightness value will be stored by pressing one of the four rocker ends of a previously taught-in light scene pushbutton for longer than 3 seconds.
4. To save other light scenes, repeat from point 2.

#### Retrieving light scenes

Up to four brightness values are retrievable using a **direct light scene pushbutton** (pushbutton with double rocker, top left = light scene 1, top right = light scene 2, bottom left = light scene 3 and bottom right = light scene 4) and/or using a **sequential light scene pushbutton** (pushbutton or one half of a double pushbutton, press top = next light scene, press bottom = previous light scene).

#### Issue device address for the FUD14:

Turn the rotary switch on the FAM14 to Pos. 1 and its lower LED lights up red. Turn the middle rotary switch on the FUD14 to LRN and the LED flashes at a low rate. After the address of the FAM14 is issued, its lower LED lights up green for 5 seconds and the LED of the FUD14 goes out.

#### Clear device configuration:

Set the middle rotary switch to CLR. The LED flashes at a high rate. Within the next 10 seconds, turn the upper rotary switch three times to left stop (turn anticlockwise) and away again. The LED stops flashing and goes out after 5 seconds. The factory settings are restored.

#### Clear device configuration and device address:

Set the middle rotary switch to CLR. The LED flashes at a high rate. Within the next 10 seconds, turn the upper rotary switch six times to left stop (turn anticlockwise) and away again. The LED stops flashing and goes out after 5 seconds. The factory settings are restored and the device address is cleared.

#### Configure FUD14:

The following points can be configured using the PC PCT14 tool:

- Teach in buttons with single or double click
- Behaviour after power failure
- Minimum and maximum brightness
- Memory
- Dimming speeds
- Switch-on/off speed
- Acknowledgement telegrams
- Parameters for the operation with FIH65B, FAH and FBH
- Parameters for operating as clock
- Parameters for operating as staircase time switch
- Add or change sensors

**Caution: Do not forget the 'Disconnect link to FAM' in the PC Tool. No wireless commands are executed while there is a link between the PC Tool and the FAM14.**

#### Teach in acknowledgement telegram of another BUS actuator into the FUD14:

Similar to teaching-in sensors, except that you set the middle rotary switch to LRA instead of LRN.

'Switch-on' is taught-in as 'Central ON'  
'Switch-off' is taught-in as 'Central OFF'.



When an actuator is ready for teach-in (the LED flashes at a low rate), the very next incoming signal is taught-in. Therefore, make absolutely sure that you do not activate any other sensors during the teach-in phase.

#### Must be kept for later use!

We recommend the housing for operating instructions GBA14.

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