

Wireless actuator


 Universal dimmer switch  
FUD71-230V

**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 50/16** (see bottom side of housing)

Universal dimmer switch, power MOSFET up to 400W. Automatic lamp detection. With adjustable minimum brightness and dimming speed. With switching operation for light alarm clocks, children's rooms and snooze function as well as constant light regulation and master-slave mode. Also with light scene control by PC or wireless pushbuttons. Encrypted wireless, bidirectional wireless and repeater function are switchable. Only 0.7 watt standby loss.

Mounting in the 230V power supply cord, e.g. in false ceilings and lamps. 166mm long, 46mm wide and 31mm high.

Universal dimmer switch for lamps up to 400W, depending on ventilation conditions. Dimmable energy saving lamps ESL and dimmable 230V LED lamps, additionally depending on the lamps electronics.

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

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

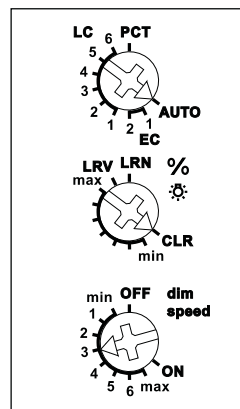
and overtemperature switch-off.

**Encrypted sensors** can be taught in.

You can switch on **bidirectional wireless** and/or a **repeater function**.

Every change in state and incoming central command telegrams are confirmed by a wireless telegram. This wireless telegram can be taught-in in other actuators, in universal displays FUA55 and in the GFVS software. The current dimming value is also displayed in % in the GFVS-Software.

#### Function rotary switches



**The upper rotary switch** determines the operation, whether automatic lamp detection or special comfort positions should work:

**AUTO allows the dimming of all lamp types.**

**EC1** is a comfort position for energy saving lamps, which by design must be turned on with an increased voltage so that they switch on again in cold state when dimmed down.

**EC2** is a comfort position for energy saving lamps, which by design won't switch on again when dimmed down. Therefore Memory is switched off in this position.

**LC1** is a comfort position for LED lamps, which by design won't be dimmed down enough in the AUTO position (trailing phase angle) and therefore has to be forced to leading phase angle.

**LC2** and **LC3** are comfort positions for LED lamps like LC1 but with different dimming curves. In positions EC1, EC2,

LC1, LC2 and LC3 inductive (wound) transformers may not be used. In addition, the maximum number of dimmable LED lamps may be lower by design than in the AUTO position.

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

**PCT** is a position for special functions which were set up using the PCT14 PC Tool. The PCT14 link is hooked up using the data transformer DAT71.

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

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

**The pushbuttons can be either taught-in as direction pushbuttons or universal pushbuttons: As direction pushbutton** 'switch on and dim up' is on one side and 'switch off and dim down' on the other side. A double-click on the switch on side triggers the automatic dimming up to full brightness with dim speed time. A double-click on the switch off side triggers the snooze function. The children's room function is triggered on the switch on side. **As a universal pushbutton** the direction change is made by briefly releasing the pushbutton.

**Switching for light alarm clocks:** An appropriately taught-in timer wireless signal starts the wake-up function by switching on the lighting at lowest brightness and slowly dimming up to maximum brightness over a period of 30 minutes. The dimming process is stopped by tapping briefly, e.g. on the hand-held transmitter. In the settings EC no switching for light alarm clocks is possible.

**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 without modifying the last stored brightness level.

**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 (max. = 60 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 Visualisation and Control Software GFVS. One or several FUD71 devices must be taught in on the PC as dimming switches with percentage brightness values.

A resettable staircase time switch function with RV = 2 minutes can be called by a pushbutton taught-in as a staircase pushbutton. Brightness level settings can be called during teach-in with single light scene pushbuttons. A twilight pushbutton can be implemented using a taught-in FAH. Switch-on can be performed dependent on motion and brightness with up to 4 FBH devices.

**Wireless pushbutton Central ON:**

The impulse length is not important. The pushbutton switches on with the memory value.

**Wireless pushbutton Central OFF:**

The impulse length is not important. The pushbutton switches off.

**Staircase light pushbutton:**

The staircase light pushbutton switches on with a memory value and starts an RV time of 2 minutes at the end of which the device switches off. Press the pushbutton again to restart.

**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.

**Either a FBH or a FAH can be taught-in as master:**

**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. 30lux in OFF position to approx. 300lux in ON position). When the FBH is taught-in in the ON position, it is only evaluated as a motion detector. A return delay of 2 minutes is preset in the FUD71.

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.

#### **Semi-automatic motion detection with taught-in FB65B wireless motion sensor (factory setting):**

After switching on via pushbutton, the 5 minutes delay time starts, within this time the delay will restart after each detected motion. 5 minutes after the last detected motion it will switch off. If a motion is detected 5 minutes after switching off, it will automatically switch on again. After this time only a pushbutton can switch on. The pushbutton is allowed to switch off at any time, then the motions are no more evaluated.

#### **Fully automatic motion detection with FB65B taught-in wireless motion sensor:**

If the actuator should switch on automatically when motion is detected, e.g. in rooms without daylight, replug the jumper to 'active' on the FB65B device. When motion is no longer detected, the device switches off automatically after the 5 minutes release delay time expires. Press the pushbutton at any time to switch the device on or off. When motion is detected, the device switches on again automatically.

**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 pushbutton.

**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. 0lux in OFF position to approx. 50lux in ON position). If the brightness threshold is undershot, switch-on uses the memory value. Switch-off takes place at a brightness of > 200lux.

**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 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 FUD71 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 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 reactivated 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.

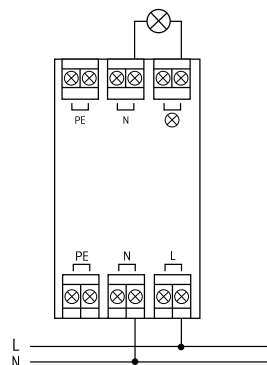
#### **Deletion of target brightness:**

Press 'direction pushbutton for target brightness' below.

**The red LED** accompanies the teach-in process and indicates control commands in operation by flashing briefly.

**The green LED** flashes briefly when a confirmation telegram is sent.

#### **Typical connection**



#### **Technical data**

|  |                              |
|--|------------------------------|
| Incandescent and halogen lamps <sup>1)</sup> | up to 400 W                  |
| 230 V (R)                                    |                              |
| Inductive transformers (L)                   | up to 400 W <sup>2) 3)</sup> |
| Electronic transformers (C)                  | up to 400 W <sup>2) 3)</sup> |
| Dimmable energy saving lamps ESL             | up to 400 W <sup>5)</sup>    |
| Dimmable LEDs                                | up to 400 W <sup>5)</sup>    |
| Max./min. temperature at mounting location   | +50°C/-20°C <sup>4)</sup>    |
| Standby loss (activ power)                   | 0.7 W                        |

<sup>1)</sup> For lamps with a maximum of 150 W.

<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. Possibly the dimmer switch

will be destroyed! No load-switching-off on the secondary part is allowed. The parallel operation of inductive (wound) and capacitive (electronic) transformers is not allowed!

- <sup>3)</sup> **When calculating the load 20% loss has to be considered for inductive (wound) transformers and 5% loss in addition to the lamp load.**
- <sup>4)</sup> Affects the maximum switching power.
- <sup>5)</sup> Usually applies for dimmable energy saving lamps and dimmable 230V LEDs. 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 5 W-LEDs). The comfort positions EC1, EC2, LC1, LC2 and LC3 optimize the dimming range, which, however, only gives a maximum power up to 100 W. No inductive (wound) transformers may be dimmed in these comfort positions.

#### **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 FUD71-230 V**

The teach-in memory is empty on delivery from the factory. If you are unsure whether the teach-in memory contains something or not, **you must first clear the memory contents completely:** 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 the right stop (turn clockwise) and then turn back away from the stop. The LED stops flashing and goes out after 2 seconds. All taught-in sensors are cleared.

**Clear individual 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.

#### **Clear device configuration:**

Set the middle rotary switch to CLR.

The red LED flashes at a high rate. Within the next 10 seconds, turn the upper rotary switch six times to the left stop (turn anticlockwise) and away again. The red LED goes out. The factory settings are restored.

#### 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 FIH65B, FAH or FBH as master.

**EC1** = 'central off'; Teach-in second FBH, FB65B as slave.

**EC2** = universal switch; Teach-in third FBH, FB65B as slave.

**LC1** = 'central on'; Teach-in fourth FBH, FB65B as slave.

**LC2** = Teach in direction pushbutton, direction pushbutton 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 pushbuttons, a complete pushbutton with double rocker is assigned automatically.

**LC5** = Teach-in single light scene pushbuttons.

Teach in FAH as twilight switch.

**LC6** = Teach in staircase light switch; Teach in FAH as twilight dimmer

**PCT** = Teach-in rotary switch and GFVS, this automatically switches on and sends confirmation telegrams. 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 prevent unintentional teach-in, turn the rotary switch back to LRN for every teach-in process. The LED flashes at a slow rate.**

You can teach in unencrypted and encrypted sensors.

#### Teach in encrypted sensors:

1. Set the middle rotary switch to LRV.

The red LED flashes at a high rate.

2. Within 120 seconds, enable sensor encryption. The red LED goes out.

Caution: Do not switch off the power supply.

3. Then teach in the encrypted sensor as described in 'Teaching-in sensors'.

To teach in other encrypted sensors, turn the middle rotary switch briefly away from position LRV and then turn it to 1.

With encrypted sensors, use the 'rolling code', i.e. the code changes in each telegram, both in the transmitter and in the receiver.

If a sensor sends more than 50 telegrams when the actuator is not enabled, the sensor is no longer recognised by the enabled actuator and you must repeat teach-in as 'encrypted sensor'. It is not necessary to repeat the function teach-in.

#### Saving light scenes

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

1. Turn the upper rotary switch to the appropriate operating mode AUTO, EC or LC.
2. Adjust the required brightness level with a previously taught-in universal or direction switch.
3. Within 60 seconds, press one of the four rocker ends of the previously taught-in direct light scene pushbutton for longer than 3 seconds but less than 10 seconds to save the brightness value.
4. Repeat from point 2 to save further directly retrievable light scenes.

#### 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).

**Switch on repeater:** The repeater is switched off in the factory setting. In deenergised state turn the middle rotary switch to CLR and the lower rotary switch to ON. Switch on the power supply. The red LED lights up to two seconds. The repeater is switched on.

**Switch off repeater:** In deenergised state turn the middle rotary switch to CLR and the lower rotary switch to OFF. Switch on the power supply. The red LED lights up to 0.5 seconds. The repeater is switched off.

#### Switch-on confirmation telegrams:

For deliveries ex-works the confirmation telegrams are switched-off. Set the middle rotary switch to CLR. The red LED flashes nervously. Now within 10 seconds turn the upper rotary switch 3 times to the left (anticlockwise) and then back away. The red LED goes out and the green LED lights up for 2 seconds. The confirmation telegrams are switched-on.

#### Switch-off confirmation telegrams:

Set the middle rotary switch to CLR. The LED flashes nervously. Now within 10 seconds turn the upper rotary switch 3 times to the left (anticlockwise) and then back away. The red LED goes out immediately. The confirmation telegrams are switched-off.

#### Master-slave mode:

Activate FUD71 as master and teach in all FUD71 slaves simultaneously:

1. Switch off the power supply to all FUD71 devices (masters and slaves).
2. On the FUD71 master, turn the upper rotary switch to AUTO, the middle rotary switch to LRN and the lower rotary switch to ON.
3. On all FUD71 slaves, turn the upper rotary switch to AUTO, the middle rotary switch to min and the lower

rotary switch to max.

4. Switch on the power supply to all FUD71 devices (masters and slaves) simultaneously. The red LED lights up for 0.5 seconds and the lamp of the FUD71 master switches to maximum brightness. After approx. 2 seconds, the green LED on the FUD71 master lights up briefly and a teach-in telegram is sent. After the teach-in telegram is received by FUD71 slave, the lamp on the FUD71 slave switches on at maximum brightness.
5. Set all FUD71 devices (masters and slaves) to the same operating mode, minimum brightness and dim speed.

#### Deactivate FUD71 as master:

In deenergised state turn the middle rotary switch to LRN and the lower rotary switch to OFF. Switch on the power supply. The red LED lights up to 0.5 seconds. The Master-telegrams and confirmation telegrams are switched off.

#### Teach in direction pushbutton in FUD71 slave (only if required):

Turn the upper rotary switch to LC2. Turn the middle rotary switch to LRN. The LED flashes at a low rate. Press the pushbutton. The LED goes out.

When pressed, a rocker is completely taught-in automatically. Where you press first is then defined as switch-on. The other side automatically becomes switch-off.

#### Function of slave direction pushbutton:

Quit slave mode as follows:

Press long on the switch-on side to dim up to the required value.

Press long on the switch-off side to dim down to the required value.

Double-click on the switch-on side to dim automatically to maximum brightness.

Press briefly on the switch-off side to switch off.

Press briefly on the switch-on side to change back to slave mode.

If the FUD71 master was activated by a central command, the FUD71 slave changes immediately to slave mode.



Use the data transformer DAT71 to create a link to a PC running the PCT14 software.

### Configure FUD71:

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
- Send dimming value in %: ON or OFF
- Send pushbutton telegram ON (0x70) and OFF (0x50): OFF or ON
- Switch-on/off speed
- Acknowledgement telegrams
- Parameters for the operation with FAH60 and FBH
- Parameters for operating as clock
- Parameters for operating as staircase time pushbutton
- Add or change sensors

### Saving light scenes:

Use the PCT14 PC Tool to configure the following parameters:  
Confirmation flash when scenes are saved: **ON** or OFF.

### Light alarm circuit:

Use the PCT14 PC Tool to configure the following parameters: Maximum brightness: 50 to 100%.  
Runtime: 1 to 255 minutes (factory setting 30 minutes).

### Children's room circuit:

Use the PCT14 PC Tool to configure the following parameters: Save memory value: **OFF** or ON.  
Dimming speed: 0 (slow) to 255 (fast).

### Sleep timer:

Use the PCT14 PC Tool to configure the following parameters:  
Sleep timer: **ON** or OFF.  
Runtime: 1 to 255 minutes (factory setting 30 minutes)

### 'ON side' direction pushbutton:

Use the PCT14 PC Tool to configure the following parameters: double-click with the dimmer switched: **OFF** or ON.

### Wireless pushbutton Central ON:

Use the PCT14 PC Tool to configure the

following parameters:  
Brightness with Central ON: **0** to 255% (0 = memory value).

### Light scenes:

Use the PCT14 PC Tool to configure the following parameters:  
Confirmation flash when scenes are saved: **ON** or OFF.

### Staircase light pushbutton:

Use the PCT14 PC Tool to configure the following parameters:  
RV time: 1 to 255 minutes (factory setting 2 minutes).  
Switch-off early warning: **OFF** or ON

### Clock:

Turn the upper rotary switch to PCT. The clock is started with universal pushbutton, direction pushbutton (ON side) and 'Central ON' pushbutton. The connected lamp flashes.

Use the PCT14 PC Tool to configure the following parameters:

Switch-on time: **1** to 255 seconds (0.1 to 25.5 s on 100ms time base);

Switch-on time base **1s** or 100ms;

Switch-off time: **1** to 255 seconds (0.1 to 25.5 s on 100ms time base);

Switch-off time base **1s** or 100ms;

Switch-on brightness: **15** to 100%;

Switch-off brightness: **0** to 50%;

Clock: OFF or **ON**;

Switch on and switch off or dim up and dim down;

Switch on if motion is detected: **ON** or OFF;

Switch off if no motion is detected: OFF or **ON**;

Switch off delay if no motion is detected: 0 to 255 minutes (factory setting 2 minutes).

### Constant light control with FBH or FAH:

(With the PCT14 PC Tool the automatic brightness control must be switched on) If the minimum brightness is exceeded, the device is switched on. If the minimum brightness is undershot, the device is always switched off. If the residual brightness is greater than the minimum brightness, the device dims down slowly to residual brightness if no motion is detected and dims up again if motion is detected.

### Residual brightness:

0 = device switches off if no motion is detected; automatic control by FBH or FAH is deactivated by a manual brightness change or switch-off by pushbutton. Central pushbutton, scene pushbutton and 'dimming values' via PC also result in deactivation. Press the switch-on side of the direction pushbutton briefly to reactivate the automatic control.

Use the PCT14 PC Tool to configure the following parameters:

Maximum brightness: 0 to **100%**;

Brightness on switch-on with FBH: **0** to 100% (0 = memory value);

Brightness evaluation factor:

low, **moderate**, middle, strong;

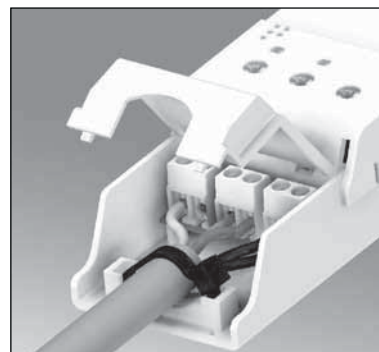
Residual brightness when FBH is switched off: **0** to 100%;

Control speed: 1 to 255 minutes (factory setting 250).



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.

### Cable fixation



The cable must be fastened with standard cable ties (width <3,6mm).

### EnOcean wireless

|                |           |
|----------------|-----------|
| Frequency      | 868.3MHz  |
| Transmit power | max. 10mW |

Hereby, Eitako GmbH declares that the radio equipment type FUD71-230V is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: [eltako.com](http://eltako.com)

Must be kept for later use!

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03/2018 Subject to change without notice.