

# Wireless Universal Dimmer FD3 U2

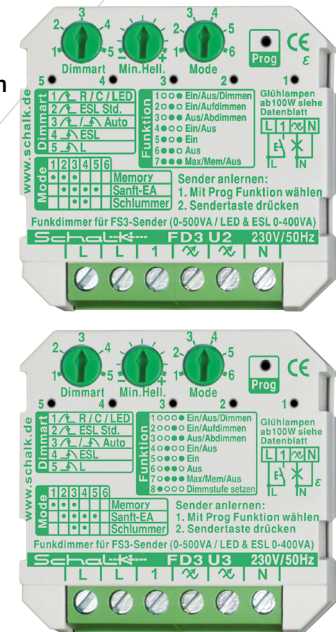
## Wireless Universal Dimmer FD3 U3 (Fx3<sup>smart</sup>)

for FS3-transmitters for installation in electrical boxes/flush-mounting (UP), with additional programmable functions

General purpose, very compact, user-friendly electronic (wireless) pushbutton dimmer for a wide variety of lamps (LED, CFL, incandescent, LV halogen with electronic or wound transformer, HV halogen)

### Besondere Merkmale

- Dims suitable dimmable LED lamps, CFLs, incandescent lamps, LV halogen lamps with electronic or wound transformers and HV halogen lamps
- Range of dimming modes:  
forward phase control, reverse phase control, automatic detection of wound transformers, CFLs with delay for ignition and warm-up
- Electronic short-circuit and overload protection
- Rated load for HV/LV incandescent lamps:  
up to 500VA (up to 4x 500VA with power expansion)
- Rated load for LED/CFL:  
up to 400VA with reverse phase control
- Suitable for use with switches from diverse product lines
- Suitable for individual or group control
- 1 button input and wireless transmitter buttons, individually programmable (7 different functions settable)  
Only FD3 U3: special function for App-control
- Different operating modes possible:  
brightness memory, soft on/off, slumber, discreet dim in, sync, etc.



### General information

The FD3 U2 electronic universal pushbutton dimmer, with an extremely compact box installation housing, can dim virtually any type of lamp (LED, CFL, incandescent, LV halogen with electronic or wound transformer, HV halogen) that is suitable for forward or reverse phase control.

The correct dimming mode can be detected automatically, or it can be set manually to forward or reverse phase control. A special CFL dimming mode additionally provides an ignition and warm-up delay for compact fluorescent lamps ("energy-saving lamps").

The button input and the functions of the wireless transmitter buttons are individually programmable. This makes both individual control and group control possible in a very flexible manner (one or two button control, on/off switching with/without dimming function, etc.). In addition, brightness memory, slumber function or soft on/off function can be specified.

The compact dimensions of the FD3 U2 allow it to be installed in electrical boxes behind a button switch from any desired product line, making it equally suitable for new installations as well as for maintenance-free replacement of existing or defective rotary or button dimmers.

### Operation

Standard function in single button mode: a short button press toggles the lamp; a long press increases or reduces the brightness.

### Additional functions

**"Switch on / dim up", "switch off / dim down" functions:**

These allow the dimmer to be controlled using 2 wireless buttons (in contrast to single button control). Ideally suited to group control of several dimmers because the commands are unambiguous.

**"Only switch on/off", "only switch on", "only switch off" functions:** These pure switching functions can be used to switch the dimmer on or off without permitting adjustment of the brightness. In addition, since a defined initial brightness can be specified, these functions are ideal for public buildings, for example.

**"Switching sequence" function:** An input that is programmed in this way goes through the switching sequence maximum brightness - saved brightness - off when the button is pressed.

**"Slumber function" (e.g. as an aid to help children fall asleep):**

When this function is activated by dimming the lamp, the light level is dimmed down very slowly, with a duration that depends on the brightness at the start of dimming (duration from maximum brightness: 60 min).

### “Discreet dim up”

In response to a long button press when the lamp is off, the dimmer switches on and dims up from the minimum brightness.

### “Sync”

If several dimmers are controlled by a single button, they

may become unsynchronised because the button command (toggle) is not unambiguous.

Synchronisation is achieved by holding the button pressed long enough (approximately 10 s) for all dimmers to dim down to minimum brightness and then stop at maximum brightness (maximum level).

### Definition of terms:

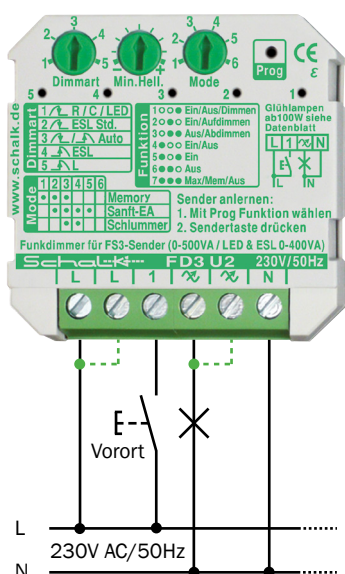
<b>Dim in</b>	Increase brightness from the off state (starting at minimum brightness if so configured)
<b>Dim out</b>	Reduce brightness to the off state
<b>Mem/Memory</b>	Brightness memory – the last set brightness is saved on switch-off and restored on the next switch-on
<b>Sync</b>	Synchronise – restore the synchronisation of several linked dimmers operated by a single button or signal
<b>inputSoft on/off</b>	Soft on/off switching
<b>Slumber</b>	Function for automatic, very slow dimming down (duration depends on starting brightness; max. 1 hour)
<b>CFL</b>	Compact fluorescent lamp (energy-saving lamp)
<b>Electronic load</b>	Any lamp with an electronic ballast or electronic transformer
<b>Toggle</b>	Switch on and off with a single button or signal input
<b>HV incandescent lamps</b>	Incandescent lamps operated directly from 230V without a transformer
<b>LV incandescent lamps</b>	Low voltage incandescent lamps (e.g. 12V) requiring a transformer (electronic or wound)

### Installation

The FD3 U2 wireless dimmer has a neutral line connection, so the lower load limit is 0VA. However, the dimmer must be operated without a neutral connection with incandescent lamp loads over 100W to avoid EMC problems. In this case the neutral terminal is jumpered to the load output. This has no effect on operation.

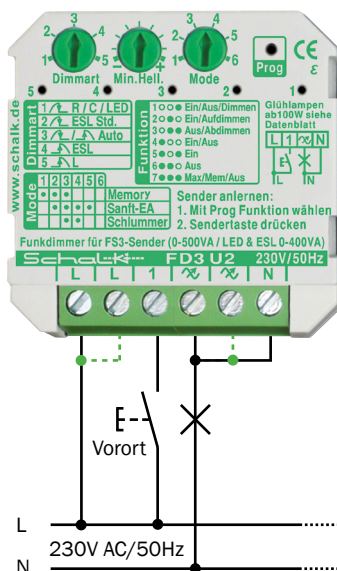
#### Standard connection

For dimmable LED, CFL and LV halogen lamps (with electronic or wound transformers) up to the maximum rated load, and for HV halogen and incandescent lamps up to 100W



#### Connection without neutral line

For HV halogen and incandescent lamps over 100W



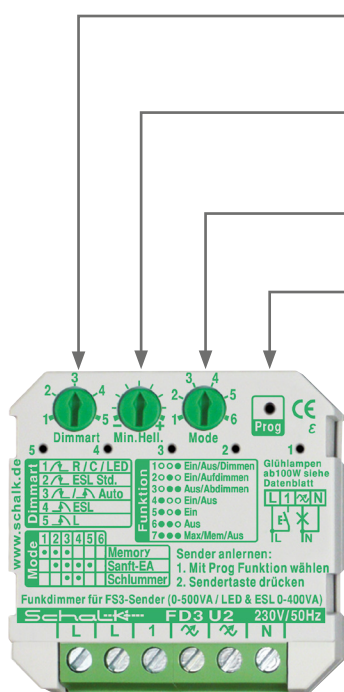
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### Caution!

**The dimmed phase must not be switched separately (secondary side), as this can damage the dimmer! Only switch and dim the connected luminaire circuit with the dimmer itself!**

## Settings and initial use

### Controls and indicators:



#### „Dimmart“ = dimming mode control:

Used to select a suitable dimming mode for the lamp (see “Setting the dimming mode”)

#### „Min.Hell.“ = minimal brightness control:

Used to set the minimum lamp brightness (see “Setting the minimum brightness”)

#### “Mode” control:

Used to set the operating mode (see “Setting the operating mode”)

#### “Prog” programming button:

This button is used to perform configuration of the wireless transmitter. (see “Configuring wireless transmitters”)

#### LEDs 1-5:

This LED shows the device status (operating state, selected function in programming mode, fault codes).

#### Legend:

- LED off
- LED glows red
- ⊕ LED flashes red
- LED glows green
- ⊕ LED flashes green
- ⊕ LED flashes alternately red/green

## 1. Setting the dimming mode

↗ = forward phase control

↖ = reverse phase control

Set the “Dimmart” control to a dimming mode suitable for the lamp (see table)



All suitable dimmable lamps can usually be operated in dimming mode 3 (Automatic).

Exceptions:

- Dimming mode 5 must be selected for lamps with wound transformers in a circuit with an automatic demand switch (use with wireless operation is not practical).
- Dimming mode 2 (or if appropriate mode 4) must be selected for CFLs (compact fluorescent lamps) which require an ignition on and warm-up time.

Dimming mode	Description
1: ↖ R / C / LED	Reverse phase control. For incandescent lamps, HV halogen lamps, LV halogen lamps with
2: ↖ ESL Std.	Reverse phase control with CFL mode. For dimmable CFLs which require an ignition and
3: ↖ / ↗ Auto	In this mode, almost all loads are dimmed with reverse phase control, switching automatically to forward phase control only for wound transformers <b>Not suitable for lamps with wound transformers that are located in a circuit with an automatic demand switch - use dimming mode 5 in this case.</b>
4: ↗ ESL	Forward phase control with CFL mode. For dimmable CFLs which require an ignition and warm-up time, and when dimming mode 2 does not provide smooth dimming.
5: ↗ L	Forward phase control. For dimming lamps with wound transformers that are located in a circuit with an automatic demand switch

### CFL mode (dimming modes 2 and 4)

Most CFLs need full mains voltage for ignition. For this reason, this mode provides an ignition phase at half brightness before adjusting to the last (saved) brightness level. A warm-up phase with elevated minimum brightness is also provided because most CFLs have significantly reduced minimum dimming capability (without going out) when cold. The minimum brightness is gradually reduced to the normal value during the warm-up phase. The warm-up time depends on the off time, so the full warm-up time (max. 1 minute) is only used when the lamp has been off for an extended time. If a CFL is switched off at very low brightness and then switched on again when cold, the previous minimum brightness will be attained only after the warm-up phase.

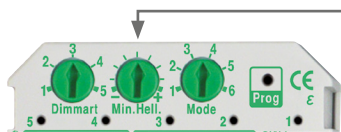
### Automatic detection of wound transformers (dimming mode 3)

Wound transformers must be dimmed with forward phase control because reverse phase control generates inductive reverse voltages that can destroy the dimmer if it does not detect them and switch off on time.

In this dimming mode the dimmer automatically changes to forward phase control after being switched on as soon as overvoltages (not yet dangerous) are detected. This setting is retained until loss of mains voltage. This dimming mode is not suitable for use with automatic demand switches because the mains voltage is always disconnected after the lights are switched off.

## 2. Setting the minimum brightness

The minimum brightness should be set depending on the lamp so that the on state of the lamp can still be recognised at minimum brightness.



Switch on the dimmer and dim down as far as possible. Then set the minimum brightness to the desired level with the "Min.Hell." control.

## 3. Configuring wireless transmitters and programming

The FD3 U2 has 7 different functions; each of these can be assigned arbitrarily to the wired button input 1 or to one of the wireless transmitter buttons. The FD3 U2 is configured with the default settings when it is delivered.

The FD3 U3 has the additional function 8: „Dimmstufe setzen“ („Set dimming value“) for controlling by smartphone app via external gateways (like Mediola smart home gateway). To activate this function, see special SmartHome application examples and instructions.

### 3.1 Default settings

In its default configuration, the FD3 U2 already responds to button 1 / channel 1 from transmitters that are also configured with their default settings (address: DIP switches 1-8 in position “-”, level “A”, channel 1). The dimmer can already be switched on/off (brief push) or up/down dimmed (long push) using button 1 on the transmitter (corresponds to pre-defined function 1: “Switching on/off and dimming”). The same functionality is also assigned to a wired button on terminal 1.

#### Input 1

Button 1 of a wireless transmitter with default settings

Function: Toggling and dimming

Function: Toggling and dimming

#### Restore default settings:

Press and hold the Prog button for 10s until LED 5 flashes red five times (transmitters on functions 2-7 that have already been configured will not be deleted)

#### Delete default settings + all wireless transmitters:

Keep the Prog button pressed for 20s until LED 5 flashes red, first five times, and then ten times. Wireless operation is then not possible until the device is reconfigured for wireless transmitters.

### 3.2. Configuring for wireless transmitters

If a function that differs from the default settings is to be assigned to input 1, or if new wireless transmitter buttons are to be configured for special functions, these functions / transmitter buttons must be programmed.

**Configuration process:**



1. Keep pressing the "Prog" button until the desired function is selected → LEDs 1-3 are lit depending on the chosen function (see Table "Configurable functions")
2. Briefly press the desired button on the wireless transmitter or on wired input 1. (LED 5 glows green when receiving signal) → LED display goes out  
Press "Prog" for 2s to exit programming mode immediately.

**Table: Configurable functions**

LED display	Function	Description
4 3 2 1		
○ ○ ○ ●	<b>1: Toggle and dim</b>	Short button press = toggle; long button press = dim up/down
○ ○ ● ○	<b>2: Switch on / dim up</b>	Short button press = switch on; long button press = dim up
○ ○ ● ●	<b>3: Switch off / dim down</b>	Short button press = switch off; long button press = dim down
○ ● ○ ○	<b>4: Only toggle (= pulse switch)</b>	Short button press = toggle (dimming not possible)
○ ● ● ○	<b>5: Only switch on</b>	Short button press = switch on (dimming not possible)
○ ● ● ○	<b>6: Only switch off</b>	Short button press = switch off (dimming not possible)
○ ● ● ●	<b>7: Switch sequence (maximum-memory-off)</b>	Briefly press several times for switching sequence: maximum brightness → saved brightness → off
● ○ ○ ○	<b>8*): Set dimming value</b>	Set defined dimming value (0-100%) (e.g. by app)

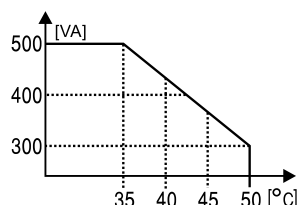
**Info**

Functions 2, 3, 5 and 6 are optimally suited to two-button operation or group control of several dimmers because these commands are unambiguous. This ensures that asynchronous operation cannot occur.

\*) The function 8 is available exclusively in the FD3 U3.

### Ambient conditions and troubleshooting

**Allowable load:**



The efficiency of wound transformers and electronic loads (LEDs, CFLs and electronic transformers) must be taken into account. The (primary) VA value is the critical parameter for the dimmer. Electronic loads must be approved by the manufacturer for dimming with forward or reverse phase control dimmers.

The dimmer heats up during operation, depending on the connected load. The connected load must be reduced if this heat cannot be dissipated adequately. Do not mount dimmers close to heat sources.

Fig.: Maximum allowable load versus ambient temperature (with adequate air circulation)

**LED status display:**



The LED is lit red in the on state (going out briefly during the on/off ramp, going out every 1s during Slumber mode, and going out every 2s during the CFL warm-up phase). If a valid radio signal is received, it is (in addition) lit green. When input 1 receives a signal, the LED flickers green.

If a fault occurs, it displays a fault code.

**Fault codes: (LED flashes 1 to 9 times, followed each time by a brief pause)**

1	Overload >500VA
2	Overtemperature
3	Overcurrent (short circuit)
4	Transformer reverse voltage
5	Transformer saturation (unbalanced load)
6	Overload >900VA
7	Mains overvoltage
8	Synchronisation error
9	Memory error

**Info**

There is a restart lockout interval of up to 10 seconds after an overload, overtemperature, overcurrent or over-voltage condition to allow the heated components to cool down.



## General information:

Lamps approved for the same dimming mode can usually be used together. Incandescent lamps may always be operated in parallel. However, functional impairments occur fairly often when electronic loads from different manufacturers are operated in parallel, due to mutual interference of manufacturer-specific ballasts and/or electronic transformers. Wound transformers may not be combined with electronic loads. The dimmer is designed to work with as many different types of lamps as possible. However, it is not possible to guarantee trouble-free operation of every dimmable lamp with the dimmer, since this can be affected by the design or construction of the lamp ballast or transformer. Flickering or erratic dimming in the low brightness range with LED lamps and CFLs is usually due to the lamp being designed for higher minimum input power. We recommend raising the minimum brightness setting in such cases. Ripple control signals from electricity plants can lead to perceptible flickering of the lighting. The magnitude of this effect varies from one region to the next.

## Technical data

<b>Supply voltage</b>	230V AC 50Hz
<b>Power consumption</b>	0.6W in off state
<b>Power dissipation</b>	2,4W with 500VA load
<b>Rated load</b>	
Incandescent, HV and LV halogen lamps, wound or electronic transformers	500VA at ambient temperatures up to 35°C 300VA at ambient temperatures up to 50°C
LED/CFL	Up to 400VA (lamps of the same make recommended) <i>Differences in manufacture-specific ballast or electronic transformer circuitry may lead to restrictions on load capacity, the maximum number of lamps or the dimming and/or switching functions</i>
<b>Input 1:</b>	
Wiring capacitance on terminal 1	100nF max.
Glow lamp load on terminal 1	20mA max.
<b>Receiving frequency</b>	433.92MHz
<b>Modulation type</b>	OOK PWM
<b>Mounting position</b>	Oriented towards transmitter if necessary
<b>Ambient temperatures</b>	-10°C to +50°C (reduced power above +35°C)
<b>Connections</b>	Socket terminals with captive screws M3
<b>Clamping range</b>	0.5 mm <sup>2</sup> - 2.5 mm <sup>2</sup>
<b>Strip length</b>	6.5 mm - 7.0 mm
<b>Screwing torque</b>	0.50 Nm
<b>Outside dimensions</b>	43x43x18.5mm <sup>3</sup>
<b>Weight</b>	35g
<b>RAL colour</b>	Grey 7035 / Green 6029

**Compatible devices:** FE3 / FD3 / FS3 series radio transceiver, FV2 R radio repeater

### Info

Also available as a simplified variant without special functions (see FD3 U2E)

## Order data

Item no.	EAN	Type	Description
FD3U29	4 046929 101301	FD3 U2	Wireless universal dimmer 230V AC (UP) with additional functions, also for LED/CFL
FD3U39	4 046929 101370	FD3 U3	Wireless universal dimmer 230V AC (UP), Fx3smart, also for LED

## Accessories

Item no.	EAN	Type	Description
HC3500	4 046929 901048	HC 35	Top-hat rail clip 35mm