



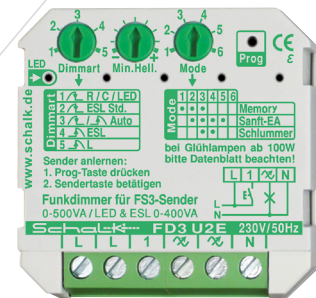
Wireless Universal Dimmer FD3 U2E

for FS3-transmitters for installation in electrical boxes/flush-mounting (UP)

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)

Special features

- 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
- Very simple wireless transmitter configuration
- Operated using one button (wireless and/or wired)
- pushbutton):
short button press = toggle;
long button press = dim up/down



General information

The FD3 U2E wireless universal pushbutton dimmer can dim a wide variety of lamps (LED, CFL, incandescent, LV halogen with electronic or wound transformer, HV halogen).

Along with automatic detection of wound transformers ("Auto" dimming mode), the dimming mode can be set manually to forward or reverse phase control if necessary (especially for lamps with electronic ballasts or electronic transformers). A special CFL dimming mode additionally provides an ignition and warm-up delay for compact fluorescent lamps ("energy-saving lamps")

The compact dimensions of the FD3 U2E allow it 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

A short button press toggles the lamp; a long press increases or reduces the brightness.

Functions

"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 in" function

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

"Sync" function

If several dimmers are controlled by a single button, they may become unsynchronised because the button command (toggle) is not unambiguous.

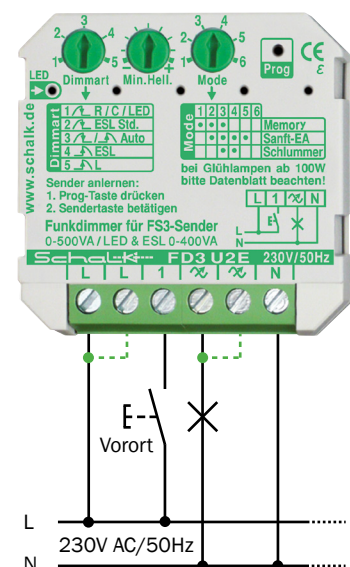
Synchronisation is achieved by holding the button pressed long enough (approximately 10 s) for all dimmers to dim down to minimum brightness and then stop at maximum brightness (maximum level).

Installation

The FD3 U2E dimmer has a neutral line connection, so the lower load limit is 0VA. However, the dimmer must be operated without a neutral connection with (HV) 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.

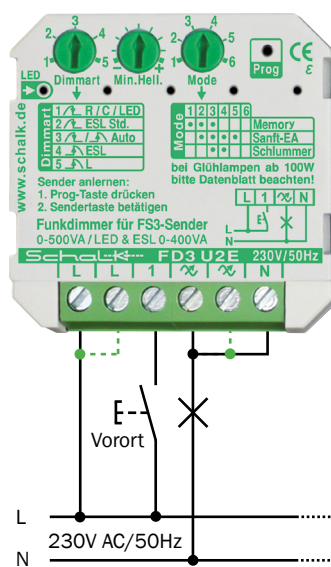
Standard connection

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

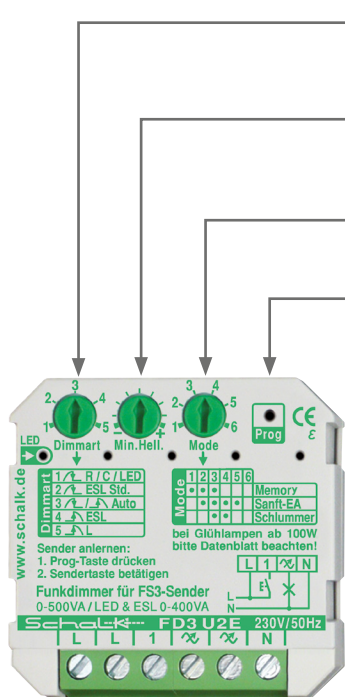
For HV halogen and incandescent lamps over 100W



----- Optional; for improved heat dissipation with heavy loads

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”)

LED:

This LED shows the device status (operating state / 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 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 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.
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.

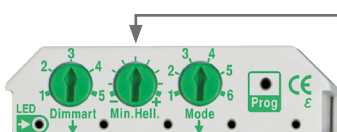
Automatic detection of wound transformers (dimming mode 3)

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

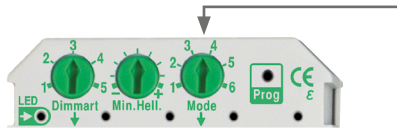
The minimum brightness should be set depending on the lamp so that the on state of the lamp can still be recognised at minimum brightness.



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. Setting the operating mode

Various special functions can be activated or combined using the operating mode setting.



Mode	1	2	3	4	5	6
Memory	•	•	•			
Sanft-EA		•	•	•	•	
Schlummer			•	•		

„•“ = activated

„Memory“ (=brightness memory)

If activated, the dimmer switches on at the last (saved) brightness level; otherwise at maximum brightness

„Sanft-EA“ (=soft on/off)

Soft switch-on and switch-off if activated (prolongs lamp life)

„Schlummer“ (=slumber)

If activated, the Slumber function can be used.

The LED briefly flashes red each time the operating mode changes.

4. Configuring wireless transmitters

The FD3 U2E has a wired control input (terminal 1) and a “wireless input”.

In its default configuration, the FD3 U2E 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 (short push) or up/down dimmed (long push) using button 1 on the transmitter. Similarly, a wired button on terminal 1 may also be used for switching and dimming (as described above).

You can find an overview of the default settings in Section 5.

Configuration process:

- 1) Press the Prog button briefly → LED lights up
- 2) Press the desired button on the wireless transmitter → LED goes out

5. Default settings

The FD3 U2E is configured with the default settings when it is delivered. The following settings are pre-defined in this configuration:

Input 1

Button 1 of a wireless transmitter with default settings

Function: Toggling and dimming

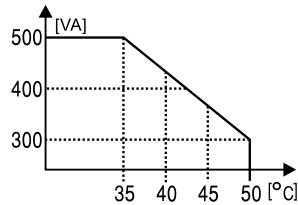
Function: Toggling and dimming

Restore default settings:

Press and hold the Prog button for 10s until the LED flashes 5 times.

Ambient conditions and troubleshooting

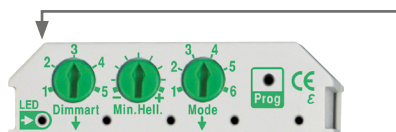
Allowable load:



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.

Definition of terms:

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

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

Supply voltage	230V AC 50Hz
Power consumption	0.6W in off state
Power dissipation	2W with 500VA load
Rated load	
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>
Input 1:	
Wiring capacitance on terminal 1	100nF max.
Glow lamp load on terminal 1	20mA max.
Receiving frequency	433.92MHz
Modulation type	OOK PWM
Mounting position	Oriented towards transmitter if necessary
Ambient temperatures	-10°C to +50°C (reduced power above +35°C)
Connections	Socket terminals with captive screws M3
Clamping range	0.5 mm ² - 2.5 mm ²
Strip length	6.5 mm - 7.0 mm
Screwing torque	0.50 Nm
Outside dimensions	43x43x18.5mm ³
Weight	35g
RAL colour	Grey 7035 / Green 6029

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

Info

Also available as a variant with programmable special functions (see FD3 U2) or as a variant without wireless control (see ETD U2)

Order data

Item no.	EAN	Type	Description
FD3U2E9	4 046929 101332	FD3 U2E	Wireless universal dimmer 230V AC (UP), also for LED/CFL

Accessories

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