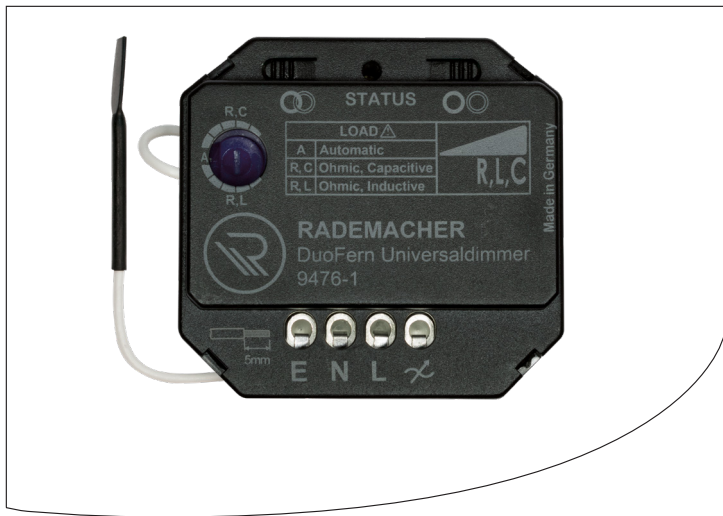


**EN DuoFern Universal Dimmer**  
Translation of the original Installation and Commissioning Manual

Item no. 3514 04 62



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...describe how to install, connect, commission and operate the DuoFern Universal Dimmer.

### How to use this manual

---

- ◆ Before you begin, please read this manual through completely and follow all the safety instructions.
- ◆ Please also read the instruction manual of the respective connected light source.
- ◆ This manual is part of the product. Please store it in an easily accessible place.
- ◆ When passing the DuoFern Universal Dimmer on to a third party, this manual must be passed on as well.
- ◆ Damage resulting from non-compliance with these instructions and safety instructions will void the warranty. We assume no liability for any consequential damage.



## 2. Hazard symbols

EN



Danger of fatal electric shock



Danger area / dangerous situation



### 2.1 Levels of danger and signal words



**DANGER!**

This hazard will lead to serious injury or death if not avoided.



**WARNING!**

This hazard may result in serious injury or death if not avoided.





**CAUTION!**

This hazard may result in minor or moderate injury if not avoided.



**ATTENTION!**

This hazard may lead to property damage.

Depiction	Description
1.	Procedures
2.	
◆	Lists
1) or a)	Lists
	Further useful information
	Please read the respective manual.

### DuoFern

- ◆ RADEMACHER radio technology for controlling compatible products.

### HomePilot®

- ◆ The HomePilot® is a central controller unit for RADEMACHER radio products.



### 3. Included in delivery

EN

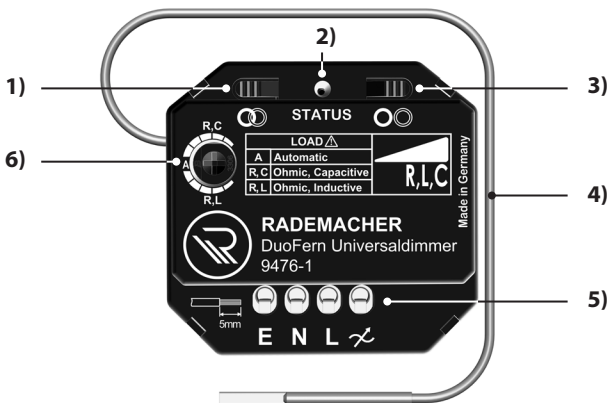
- 1 x DuoFern Universal Dimmer 9476-1
- 1 x installation and commissioning manual

### After unpacking please check and compare...

... the contents of the package with those specified above.



### 4. General view










- 1) DuoFern log-on button
- 2) Status LED
- 3) DuoFern log-off button
- 4) Antenna
- 5) Connecting terminals
- 6) Setting dial

The DuoFern Universal Dimmer is a radio-capable actuator for dimming 230 V dimmable light sources. As a flush-mounted device with a low installation height, the dimmer can be fitted into a standard flush-mounted box.

### Automatic load detection

The DuoFern Universal Dimmer has automatic detection of the connected load type (R, L and C) and is therefore suitable for almost all dimmable light sources. The required dimmer mode is set automatically depending on the connected load.

### The following light sources can be connected

Light source		
	230 V	Light bulbs
	230 V	High-voltage halogen lamps
 		Low-voltage halogen lamps or LED lamps with a dimmable electronic ballast (electrical transformer or switching power supply)
 		Low-voltage halogen lamps with a conventional iron-core or toroidal transformer
		230 V dimmable retrofit LEDs

*The illustrations serve as an example. All shapes and versions of the above-mentioned light sources can be used.*

### **Manual setting of the load type and brightness**

---

The load type (R, L and C) can be selected manually as an alternative to the automatic detection of the light source.

This enables the minimum and maximum brightness to be adjusted manually to each light source.

### **On-site operation using an external button**

---

The DuoFern Universal Dimmer can be operated on site using an external button. The DuoFern Universal Dimmer has a corresponding input [E] to connect the external button.



**Supports the following functions:**


---

- ◆ Can be fully integrated into the DuoFern radio system (HomePilot®)
- ◆ Universal dimmer with automatic load detection (detection works from approx. 15 W)
- ◆ Connection option (input) for an external 230 V button for control on site.
- ◆ Either trailing-edge phase control (mode R, C) or leading-edge phase control / “triac mode” (mode L) depending on the load type
- ◆ Also suitable for old installations with halogen lamps or light bulbs due to the high load range (up to 400 W)
- ◆ Automatic timer, automatic solar function, automatic dusk function, automatic dawn function, manual operation
- ◆ Staircase function - switches off automatically after approx. 0.1 seconds up to 54 minutes
- ◆ Intermediate value function  
Adjustable via the HomePilot®, factory pre-configured.  
Intermediate values are adopted when a stop command is given or by dimming with the external button (press and hold).
- ◆ Adjustable dimming speed of 2 - 255 seconds via the HomePilot® for radio commands (factory setting = 5 seconds).
- ◆ Remote log on / off  
via the HomePilot® or DuoFern manual central operating unit

**Mains supply [ L / N ]**

Supply voltage:	230 V AC / 50 Hz ~
Standby consumption:	< 0.5 W

**Output [ ~ ]**

Voltage:	230 V / 50 Hz ~
Maximum connected load:	up to 400 W/VA <i>Depending on the inrush currents of the light sources used.</i>
Dimmable load type:	
	Automatic load detection *
Dimmer mode: (depending on the load type)	<ul style="list-style-type: none"> <li>◆ Leading-edge phase control (triac mode) *</li> <li>◆ Trailing-edge phase control *</li> </ul> <p>* see page 21</p>

**Input [ E ] (external button)**

Switching voltage:	230 V / 50 Hz ~
Maximum length of lead for the button connection:	15 m

General information	
Protection class:	0 (basic insulation for fitting into a flush-mounted box)
Protection type:	IP00 (only for use in dry rooms)
Permissible ambient temperature:	0 to 40°C
Connecting terminals:	Screw terminals for max. 1.5 mm <sup>2</sup> cable cross-section
Dimensions (W x H x D):	48.5 x 45.7 x 19.7 mm
DuoFern radio technology	
Transmission frequency:	434.5 MHz
Transmission power:	max. 10 mW
Range:	Indoors approx. 30 m* Outdoors approx. 100 m * <i>depending on the building structure</i>
Maximum number of DuoFern devices:	20



---

**The use of defective devices can lead to personal injury and damage to property from electric shocks or short circuiting.**

---

- ◆ Never use defective or damaged devices.
- ◆ Check that the DuoFern Universal Dimmer is intact.
- ◆ Consult our customer service department in the event that you discover damage, see page 32.



---

**Potential device damage caused by the unauthorised combination of different transformer types!**

---

Conventional and electronic transformers must not be dimmed together.

All other load combinations are possible.

Only use the DuoFern Universal Dimmer for dimming 230 V dimmable light sources, see table in chapter “5. Product description”.

### Operating conditions

---

- ◆ Only use the DuoFern Universal Dimmer in dry rooms.
- ◆ A 230 V / 50 Hz power supply, together with a site-provided disconnecting device (fuse), must be available at the installation location
- ◆ The installation and operation of radio systems is only permitted for systems and devices where a malfunction in the transmitter or receiver would not cause a danger to persons or property or where this risk is already covered by other safety equipment.



Other radio systems that transmit on the same frequency can cause transmission problems.

Using the DuoFern Universal Dimmer for any other purpose than previously mentioned is not permissible.



**Improper use can lead to serious injuries or property damage.**

- ◆ Never use the radio system (e.g. DuoFern radio system) and its components for the remote control of appliances and systems with increased safety-relevant requirements or where there is an accident risk. Such applications require additional safety equipment. Observe the respective statutory regulations for the installation of such systems.



**There is a risk of fatal injury caused by short circuiting and electric shocks if the DuoFern Universal Dimmer is used outdoors or in damp rooms.**

- ◆ Do not install and use the DuoFern Universal Dimmer outdoors or in damp rooms.

## 7.3 Required expert knowledge of the installer

The electrical connection, installation and commissioning of the DuoFern Universal Dimmer must only be carried out by a qualified electrician in accordance with the instructions in this manual.

Prior to the electrical connection, check that the voltage / frequency on the type plate corresponds to that of the local mains supply.



### **Mortal danger and a risk of fire in the event of connecting unsuitable light sources.**

Overloading the DuoFern Universal Dimmer by connecting unsuitable light sources can lead to malfunctions and therefore to short circuits and fire under certain circumstances.

- ◆ Only use light sources within the permissible load limits, see page 10, Technical specifications.
- ◆ Only connect light sources to the DuoFern Universal Dimmer as specified in chapter “5. Product description”.



### **DANGER!**

### **There is a risk of fatal electric shock when touching electrical components.**

- ◆ All connection and installation work must only be carried out in a de-energised state.
- ◆ Disconnect all phases of the mains power cable and secure it to prevent any reconnection.
- ◆ Check that the system is de-energised.



### DANGER!

**There is a risk of fatal electric shock when touching a damaged antenna.**

- ◆ Never touch a damaged antenna lead.
- ◆ The antenna lead must not be shortened or damaged.
- ◆ Disconnect all phases of the mains power supply cable and replace the DuoFern Universal Dimmer with a new device.

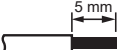


### WARNING!

**Incorrect wiring may lead to short circuits and destroy the device.**

Follow the pin assignment detailed in the connection diagram.



- ◆ The DuoFern Universal Dimmer is intended for flush mounting. We recommend installation in a deep 58 mm flush-mounted box or in an electronic socket.
- ◆ Select an installation place that is easily accessible - e.g. for maintenance purposes, for logging on and off the DuoFern devices and for changing the operating mode on the setting dial.
- ◆  All leads must be stripped to 5 mm.

### Connecting an external button (optional)

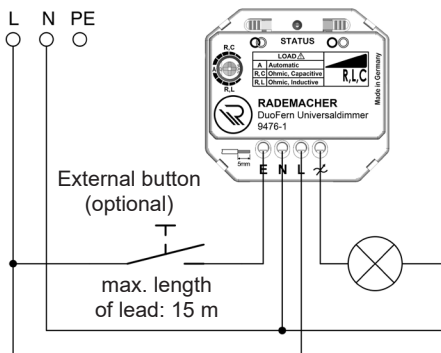
- ◆ Only buttons may be connected to the input [E]. Switches are not suitable due to the operating concept.
- ◆ The maximum length of lead to connect the external button must not exceed 15 m.



Read and observe the specifications given by the respective manufacture for the light source used.

1. Ensure the mains is disconnected and check whether the mains power cables are current-free.
2. Securely lay all connecting cables right into the flush-mounted box (if necessary, also the external button cables).
3. Remove the insulation on all leads down to 5 mm in length and connect them according to the connection diagram.

230 V / 50 Hz



4. Insert the DuoFern Universal Dimmer into the flush-mounted box and lay the connecting cables as well as the antenna in the box.
5. Finally, place the cover on the flush-mounted box and switch the mains power on again.

### Automatic load detection

---

The automatic load detection is factory preset to active; the setting dial of the DuoFern Universal Dimmer

is in position **A** (AUTO) for this purpose. The connected load and its properties (R, L and C) are evaluated when the light source is turned on for the first time after switching on the mains voltage. The required dimmer mode is set automatically depending on the connected load.

### 9.1 Manual setting of the load type

---

The setting dial of the DuoFern Universal Dimmer is factory set to position **A** (AUTO). You can adjust the desired load type and dimming range by turning the setting dial with a small screwdriver.

#### Select the required load type - depending on the type of light source or ballast used

---

- ◆ In accordance with the table on page 21.
- ◆ Information about this can be found in the manual (packaging) of the light source or ballast.

**When does the load type have to be set manually or changed?**

---






The automatic load detection may fail at low loads (< 15 watts) or at very large inrush currents due to very high loads.

- ◆ This is reflected by the flickering or humming of the light source  
or
- ◆ The status LED flashes red.


**Automatic load detection after changing the light source / load**

---

Briefly disconnect the DuoFern Universal Dimmer after changing the light source / load type and switch it back on again so that the dimmer can detect the new light source.

Load type	Ohmic load R	Inductive load L	Capacitive load C
Light source	 230 V Light bulbs		 230 V LED retrofit lamps
	 230 V High-voltage halogen lamps	 Low-voltage halogen lamps ... ... with a conventional transformer	 ... with an upstream switching power supply

**Setting the operating mode and range on the setting dial**

	R, C	R, L	R, C
Operating mode	Trailing edge control	Leading-edge control (triac mode)	Trailing edge control

*The illustrations serve as an example. All shapes and versions of the above-mentioned light sources can be used.*

### When does the dimming range have to be set manually?

Internal power supplies and circuits in some light sources may interfere with the DuoFern Universal Dimmer when dimming the light.

- ◆ In this case, the light source flickers, especially in the upper and/or lower brightness range.
- ◆ The DuoFern Universal Dimmer continuously adjusts and switches off.

### Finding the suitable setting

The suitable setting must be determined experimentally. The status LED flashes to indicate the set range.



### Assigning the dimming range


Set load type:		R, C	R, L	A
Dimming ranges		The status LED flashes ...		
1	25 - 70 %	1 x red	1 x green	
2	20 - 75 %	2 x red	2 x green	
3	15 - 85 %	3 x red	3 x green	
4	10 - 95 %	4 x red	4 x green	
5	0 - 100 %	5 x red	5 x green	yellow

Some light sources can exhibit a slight flickering or twinkling despite the correct dimmer function. Select an alternative light source in this case.

Normative safety regulations stipulate that the light from a light source can still be detected at the light source's lowest brightness level. The corresponding functionality is stored in the dimmer.

As many (retrofit) LED light sources light up very brightly even at the preset minimum brightness value, this function can be switched off. This way, darker light scenes can be created with many light sources.

### How to switch the minimum brightness function on and off

-  10 sec. Press the log-on button for approx. 10 sec. until the status LED lights up correspondingly:
  - ◆ green = the function is switched on
  - ◆ red = the function is switched off

### Pay attention to the following information

Always make sure that the light from the light source used can still be detected at the lowest brightness level in order to meet the normative safety requirements.

It is also important to make sure that the light source moves from the "off" position and actually switches on ("lights up") to the lowest brightness level when turned on.



Very high loads can cause inrush currents that are much greater than 400 watts/VA.

### **In this case...**

- ◆ The internal overcurrent shutdown has tripped.  
The DuoFern Universal Dimmer switches off until it is disconnected from the mains power.
- ◆ The status LED flashes red.

### **Proceed as follows:**

- ◆ Disconnect the DuoFern Universal Dimmer from the mains power.
- ◆ Reduce the power of the connected light source (transformer etc.)



The following functions are available when connecting an external button to the input [E]:

### Switching on and off (taking account of an intermediate value)

1 x

Press the button The dimmer switches on or off (running time approx. 2 s) depending on the switching state.

#### Sequence when pressing the button:

Light >> Stop >> Dark >> Stop >>



If an intermediate value is set, this is activated when the dimmer is switched on.

### Switching on and off (without taking account of an intermediate value)

2 x

Press the button The dimmer or lighting is switched on or off completely.

An intermediate value is not taken into account.



### Dimming and setting an intermediate value

---



Press and hold

The dimming process starts in the opposite direction to the last dimming direction.

---



The brightness achieved is saved (as an intermediate value) as soon as you release the button.

---

The next time you switch on the dimmer, the lighting is set to the stored intermediate value by pressing the button once, see page 25 - provided that the intermediate value function is active.



The intermediate value function can be activated or deactivated via the HomePilot®.



Radio operation is dependent on the respective transmitter. You can obtain further information in the service centre on our website at "[www.rademacher.de](http://www.rademacher.de)".


In order for your DuoFern Universal Dimmer to react to control signals from the DuoFern network, it is necessary to log on each DuoFern device (e.g. manual transmitter, flush-mounted radio transmitter or a HomePilot® etc.).




Please read the instruction manual for the respective DuoFern device.

### **Maximum number of connected devices**

You can log on a maximum of 20 DuoFern devices.

- 
1.  Switch the respective DuoFern device to log-on mode.
- 

2.  Briefly press the log-on button.



120 sec.

The log-on mode remains active for 120 seconds.


### LED signals when logging on


- ◆ Flashes green: during the login
  - ◆ Lights up green for 5 seconds: after a successful login
  - ◆ Lights up red: if the maximum number of participants has already been reached
- 


3. Terminate the log-on process or log on the next DuoFern device.

### The log-on process is terminated:

- ◆ After a successful login
- ◆ Automatically after 120 seconds
- ◆ By pressing the log-off button

- 
1.  Switch the respective DuoFern device to log-off mode.
- 

2.  Press the log-off button.

 120 sec. The log-off mode remains active for 120 seconds.

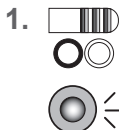
### LED signals when logging off

- ◆ Flashes red: during the login
  - ◆ Lights up green for 5 seconds: after a successful log-off
- 

3. Terminate the log-off process or log off the next DuoFern device.

### The log-off process is terminated:

- ◆ After a successful log-off
- ◆ Automatically after 120 seconds
- ◆ By pressing the log-on button



Press the log-off button for five seconds until...

The status LED lights up red continuously. All settings are deleted and reset to the factory settings.

**CE** RADEMACHER Geräte-Elektronik GmbH, hereby declares that the DuoFern Universal Dimmer complies with the Directive **2014/53/EU (Radio Equipment Directive)**.

The full text of the declaration of conformity is available at the following website:

[www.rademacher.de/ce](http://www.rademacher.de/ce)

RADEMACHER Geräte-Elektronik GmbH provides a 24-month warranty for new devices that have been installed in compliance with the installation instructions. All construction faults, material defects and manufacturing defects are covered by the warranty. Your statutory warranty claims remain unaffected by this warranty.

**The following are not covered by the warranty:**

- ◆ Incorrect fitting or installation
- ◆ Non-observance of the installation and operating manual
- ◆ Improper operation or wear and tear
- ◆ External influences, such as impacts, knocks or weathering
- ◆ Repairs and modifications by third parties, unauthorised persons
- ◆ Use of unsuitable accessories
- ◆ Damage caused by unacceptable excess voltages (e.g. lightning)
- ◆ Operational malfunctions caused by radio frequency overlapping and other such radio interference

A prerequisite for the warranty is that the new device must have been purchased from one of our approved specialist retailers. Proof of this must be provided by presenting a copy of the invoice.

RADEMACHER will remedy any defects that occur within the warranty period free of charge either by repair or replacement of the affected parts or by supplying a new replacement unit or one to the same value. There is no general extension of the original warranty period by delivery of a replacement or by repair as per the terms of the warranty.

## **RADEMACHER**

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\* 30 seconds free of charge, subsequently  
14 cents / minute from German fixed line  
networks and max. 42 cents / minute  
from German cellular networks.