Technical Guide 2009

PEHA

Easyclick radio system

Range planning, notes and installation tips
The PEHA radio transmitters transmit radio signals to the PEHA radio receivers. The receiver checks the incoming signals and uses them to control its power unit. This means that the strength of the radio signals must be sufficient to reach the receiver. Since radio signals are electromagnetic waves, the signal is dampened by various influences en route to the receiver. As such, the field strength becomes weaker, the further the transmitter is from the receiver. As such, the transmission range is physically limited. The construction materials and effective wall thicknesses through which the signal has to pass have a material influence on the transmission range. The table shows the ability of radio signals to pass through various materials.

Material	Penetration
Plasterboard, wood, glass (uncoated)	approx. 90 -100%
Brick walls / Porous concrete	approx. 65 - 95%
Reinforced concrete	approx. 10 - 90%
Metal walls / Metal grating	approx. 0 -10 %

In practical terms, this means that the materials used in a building play an important role in evaluating the radio range. Some guidelines for evaluating the environment:

Visually unobstructed ranges
Typ. 30 m in corridors, up to 100 m in halls

Plasterboard/Wood (dry)
Typ. 30 m, through max. 5 walls

Brick walls / Porous concrete
Typ. 20 m, through max. 3 walls

Reinforced concrete walls/ceilings
Typ. 10 m, through max. 1 ceiling

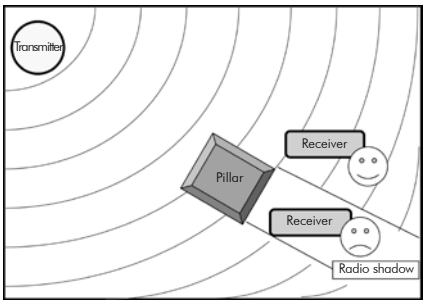
Elevator shafts, fireproof walls and utility areas should be taken into consideration!

The range can be further limited by:
- moisture in the material
- cavity partition walls with insulation on metal foil
- suspended ceilings with metal or carbon fibre panels
- lead glass or metal-coated glass
- steel furniture
- metal-mounted transmitters or receivers

Notes and installation tips
- There are good and bad locations for installing transmitters and receivers for radio systems in buildings. In borderline cases, the choice of installation location can even be the decisive factor for the faultless functioning of a radio connection.

- When mounting receivers, bear in mind that a radio shadow is cast by the reverse side of metal building components, such as pillars, ceiling supports or fireproof doors. Receivers installed in these locations can only receive weakened reflected signals, but not direct signals.

- Windows might seem to offer excellent permeability for radio signals at first glance. If the window is fitted with metal damped thermal glazing, however, the radio signal will be strongly damped or reflected. In such



- Insulation on metal foil is usually used for roof insulation and does not cause problems when transmitting radio signals within the building. If insulation with metal foil is used in cavity partition walls or ceilings, however, the metal foil would of course prevent the penetration of the radio signals.

- A minimum clearance of 10 cm should be observed to metallic objects, radiators, doors, etc.

- PEHA radio appliances should be placed at least 0.5 m away from third-party transmitters that also transmit high-frequency signals (e.g. computers, audio and video systems, upstream appliances for lights).

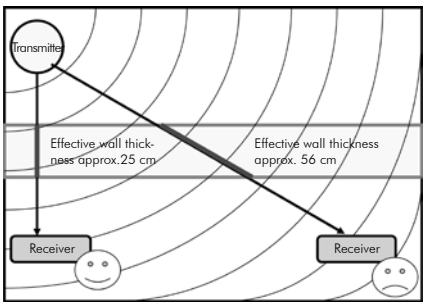
- Moisture in ceilings and walls or snow on roofs increases their conductivity and therefore their ability to dampen radio signals.

- When installing radio receivers in suspended ceilings, ensure that no metallic or incorporated carbon fibre panels are used.

- Installing the transmitters and receivers at or close to ground level produces strong reflections and limits the range.

- The angle at which the transmitted signal hits the wall also needs to be taken into account. Depending on the angle, the effective wall thickness changes, thus damping the signal. The signals should not run at too flat an angle through brickwork, if possible. Wall niches should be avoided.

- In the case of appliances with internal receiver antenna, the appliance should not be mounted on the same side of the wall as the transmitter. In the vicinity of walls, radio waves are subject to unwanted scattering or reflection. Mounting them on the opposite or adjacent wall surface is better.



- In the case of appliances with external magnetic base antenna, the ideal location for mounting the antenna is a central spot in the room. If possible, the antenna should be at least 10 cm away from a wall and 50 cm away from the ceiling. Given the polarisation of the radio waves, a magnetic base antenna should point vertically up or down. In order to ensure sufficient antipole, the antenna should be mounted on a metal board measuring at least 180 x 180 mm. When laying the antenna cable, ensure that the cable is not bent and thus irrevocably damaged (reduction in performance as a result of changes in wave resistance).

Use of repeaters
Radio amplifiers, so-called „repeaters" can be very helpful if problems with reception quality arise. Repeaters do not require any configuration (e.g. learning processes) whatsoever. They are commissioned simply by connecting them to the supply voltage.
Tip: When planning, bear in mind the possibility of retrofitting repeaters.

In 1-level operation, the radio signal from a transmitter is received, tested and forwarded on to the relevant receiver at max. transmission capacity. In 2-level operation, a radio signal can be transmitted through max. two repeaters within one radio path to the relevant receivers.
Tip: The use of too many repeaters is counter-productive (higher costs, telegram collisions).

Diagnostic tool
Technicians can use a mobile field strength measuring device to simply determine the best possible location for the transmitters and receivers. It can also be used to test malfunctioning connections between installed appliances. The appliance displays the field strengths of received radio telegrams and interfering radio signals in the 868 MHz range.

Troubleshooting radio interferences
On a new or existing system:
- Test the mains voltage of the receivers.
- Test whether the receivers are correctly connected.
- Test the function of the connected consumers.
- Delete all trained programmes in the receiver and reprogramme the receiver.
- Check whether any changes have taken place in the system environment that are causing interference (e.g. metal cupboards, furniture has been shifted or walls moved, etc.).
- Mount the transmitters/receivers in a better location.

The receiver switches itself ON or OFF:
- This may happen if a third-party programme, which had also previously been trained to the receiver, is activated in the receiving range.
- Delete all trained programmes in the receiver and reprogramme the receiver.

A transmitter is not functioning:
- Take the transmitter and move towards the receiver. If the system works at a closer distance, the transmitter was mounted outside the transmission range or is malfunctioning.
- Mount the transmitters/receivers in a better location.

Easyclick surface-mounted transmitters 80.450.xx, 80.455.xx, 95.450.xx, 95.455.xx, 20.450.xx, 20.455.xx / hand-held transmitter 450 FU-K

General

These transmitters are part of PEHA's radio system. The signals are transmitted over the European harmonised frequency 868.3 MHz. The transmitters are particularly well suited to individual situations where the electrical installations should not be flush-mounted in the wall, e.g. when renovating, retrofitting electrical systems or in offices with movable walls. The transmitters work without batteries and are maintenance-free! Pressing a button on the transmitter enables wireless switching of consumers via receivers. They must be trained to the receivers. Please observe the operating instructions for the receivers. Each transmitter can control an unlimited number of receivers.

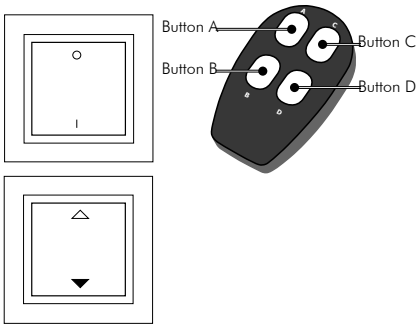
A transmitter with 2-button function performs as follows:
O = OFF I = ON
▲ = UP ▼ = DOWN
A = OFF/UP B = ON/DOWN
C = OFF/UP D = ON/DOWN

Alternative functions of surface-mounted transmitter

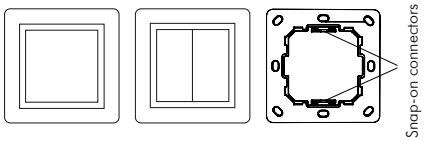
Models	Symbols	Description
FU-BLS	O I	OFF ON
FU-BLS JR	▲ ▼	UP DOWN
FU-BLS N	—	Neutral (no symbol assigned)

Technical specifications

General specifications:
Operating frequency: 868.3 MHZ
Transmission power: 10 mW
Modulation type: (ASK = Amplitude Shift Keying)
Switching cycles: min. 50,000
Rel. air humidity: 0% to 95 %
Range in buildings:
Masonry: 20 m, through 3 walls maximum
Reinforced concrete: 10 m, through 1 wall/ceiling max
Plasterboard/wood: 30m, through 5 walls maximum

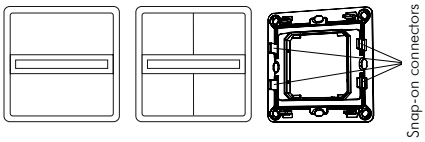


STANDARD design surface-mounted transmitter



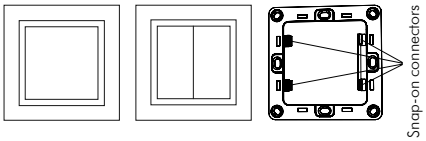
80.450.xx 80.455.xx Central plate

DIALOG design surface-mounted transmitter



95.450.xx 95.455.xx Central plate

AURA design surface-mounted transmitter



20.450.xx 20.455.xx Central plate

Easyclick window contact 450 FU FK

General

The window contact is part of PEHA's radio system. It works without batteries and has an internal, solar-powered energy storage device. The signals are transmitted over the European harmonised frequency 868.3 MHz.
The window contact can be used to monitor the state of windows and doors. Activating the magnetic contact transmits a radio signal to a receiver for evaluation. Every window contact (transmitter) can control an unlimited number of receivers. They must be trained to the receivers. Please observe the operating instructions for the receivers.

Solar powered energy storage device

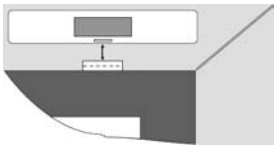
The internal solar powered energy storage device may need to be charged following longer storage.
It generally charges automatically during the first operating hours in daylight.

A fully charged energy pack offers reserve power for about 50 hours in complete darkness. At 100 Lux, a charging time of 2-3 hours produces a reserve of 14 hours. The stronger the luminosity, the quicker the charging time.

Caution!! During operation the luminosity must be minimum 100 Lux on daylight average.

Technical specifications

Voltage supply: Solar powered energy storage device
Operating frequency: 868.3 MHZ
Transmission power: 10 mW
Range: approx. 30 m in buildings
Identification: CE
Protection type: IP40



Installation:
Distance between magnet and window contact: max. 5 mm

Easyclick timer 4514 FU-TS ST

General

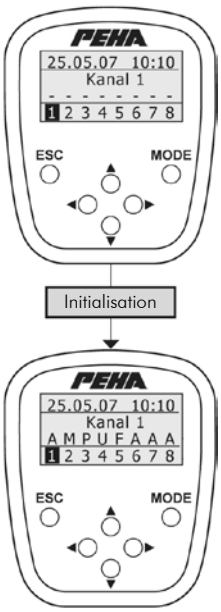
The Easyclick timer (transmitter) serves as a time switch for the Easyclick receiver. The receivers are time controlled via time switches or manually via the buttons ▲, ▼. Prior to use as a time switch, one channel (1-8) on the Easyclick timer must be trained to a receiver. A channel can be used to control an unlimited amount of receivers. Additionally, the Easyclick timer can be used as a repeater for Easyclick transmitters and receivers.

Initialisation and channel options

When the device is not initialised, the power reserve time (30 mins.) only allows for programming of the Easyclick timer. No radio signal can be transmitted. To activate and use all functions, connect the Easyclick timer to an electrical outlet and wait for **initialisation** to complete (approx. 2 minutes). Initialisation is completed when the channel options are shown in the display. The programming is secure, even in the event of a power outage. The time is sustained for 48 hours.

Channel options

A = Automatic	Time switch function activated
M = Manual	Time switch function deactivated (only manual operation)
P = Party	In automatic operation mode, the next switching time is not executed
U = Vacation	All switching times are randomly increased by up to 15 min.
F = Holiday	Only the switching times programmed for Sundays are activated



Repeater (1-level)
The repeater function of the Easyclick timer is automatic. It is used to increase the range between Easyclick transmitters and receivers. The Easyclick timer should only be used as a repeater in an area between the Easyclick transmitter and receiver. Radio signals received from the transmitter can then be optimally passed on to the receiver.

Switching function comparison with surface-mounted transmitters

Easyclick timer transmitter	Surface-mounted
Taste ▲, Time switch OFF	Button O
Taste ▼, Time switch ON	Button I
Taste ▲, Blind timer OFF	Button UP ▲
Taste ▼, Blind timer DOWN	Button DOWN ▼

Functions recommended for receivers

Switching receiver	Function
451 FU-EP o.T.	1
451 FU-BEP	1
4511 FU-EP ST	1
452 FU-EP o.T.	1
452/24 FU-EP-MF o.T.	1
Dimming receiver	**Function**
451 FU-BEP DAB	2
4511 FU-EP DAB ST	2
Blind switching receiver	**Function**
452 FU-EP JR o.T.	1

Technical specifications
General specifications:
Operating frequency: 868.3 MHZ
Voltage supply: 230 V, 50 Hz
Number of channels: 8
Number of time switches: 95
Reserve charging time: 1 hour
Reserve in case of power outage: 30 min. (for programming only)
Clock programming: manually (6 buttons)
Test specifications: EN 60669-2-1
Identification: CE
Protection type: IP20
Range in buildings:
Masonry: 20 m, through 3 walls maximum
Reinforced concrete: 10 m, through 1 wall/ceiling max
Plasterboard/wood: 30 m, through 5 walls maximum

Easyclick switching receivers 451 FU-BEP, 451 FU-EP o.T., 451 FU-EP UP o.A., 452 FU-EP o.T., 4511 FU-EP ST

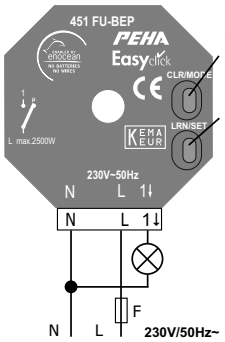
General
Easyclick receivers can be used to switch connected lighting on/off. Easyclick transmitters are used to operate the Easyclick receivers (radio signal). They must be trained to the receivers (max. 32 transmitters). The receiver's Function 1 is preset after training the receiver to a transmitter. It can be altered in function programming.

Selectable functions:
- Targeted ON/OFF with 2 buttons (standard)
- ON/OFF with 1 button
- Staircase lighting with selectable switch-off time and OFF warning
- Automatic OFF after selectable time
- Button sequence - Switch on whilst button is pressed
- Ventilation function - Delayed ON and selectable follow-up time
- Store and activate 4 lighting situations at any time by pressing a button
- Ventilation control with window monitoring for open fires

Technical specifications
General specifications:
Operating frequency: 868.3 MHZ
Voltage supply: 230 V, 50 Hz
Test specifications: EN 60669-2-1
Identification: CE
Protection type: IP20
Range in buildings:
Masonry: 20 m, through 3 walls maximum
Reinforced concrete: 10 m, through 1 wall/ceiling maximum
Plasterboard/wood: 30m, through 5 walls maximum

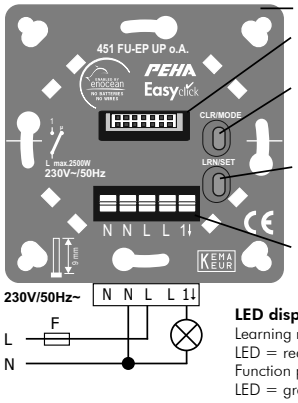
Receiver	Performance data	
451 FU-BEP	Light bulb(Ω)	= 2500 W
451 FU-EP o.T.	High-voltage halogen lamps	=1250 W
451 FU-EP UP o.A.	Inductive load	= 600 VA
	Electronic ballast loads	= 3
452 FU-EP o.T.	Light bulb(Ω)	= 500 W
	High-voltage halogen lamps	= 100 W
	Inductive load	= 100 VA
	Electronic ballast loads	= 1
4511 FU-EP ST	Light bulb(Ω)	= 2500 W
	High-voltage halogen lamps	=1250 W

Connection diagrams and operation



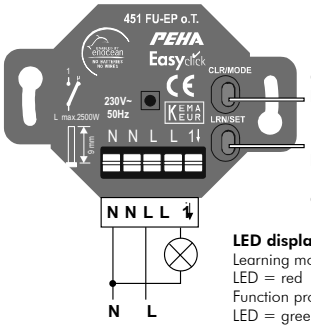
CLR/MODE button with LED
Delete all transmitters and set parameters
LRN/SET button with LED
Learning mode and function programming
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange
L = black
N = blue
1 = brown

Easyclick awning receiver Plus, 1-channel
451 FU-BEP



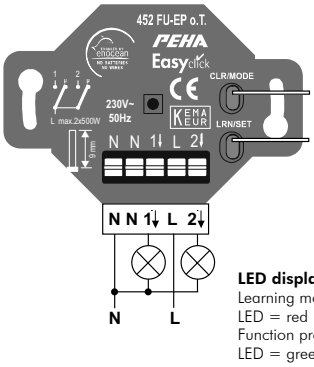
Mounting plate
Jack for touch adapter
CLR/MODE button with LED
Delete all transmittersand set parameters
LRN/SET button with LED
Learning mode and function programming
Connection terminals
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted receiver Plus with mounting plate
1-channel 451 FU-EP o.A.



CLR/MODE button with LED
Parameter settings
LRN/SET button with LED
Learning mode and function programming
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted receiver Plus, 1-channel
451 FU-EP o.T.



CLR/MODE button with LED
Parameter settings
LRN/SET button with LED
Learning mode and function programming
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted receiver Plus, 2-channel
452 FU-EP o.T.

Load output
switchable
LED display
Learning mode: LED = red
Function programming: LED = green or orange
LRN/SET button
Learning mode and function programming
CLR/MODE button (side)
Delete all transmitters and set parameters

Easyclick plug and socket receiver Plus, 1-channel
4511 FU-EP ST

Easyclick blind/shutter receivers 452 FU-EP JR o.T., 452 FU-EP JR UP o.A.

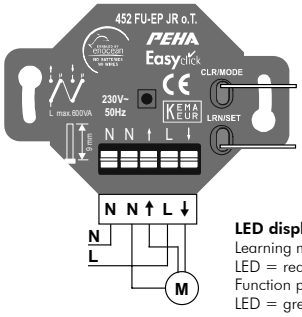
General
Easyclick shutter receivers can be used to control a shutter, blind or awning with limit switch (230V/50 Hz drive). Easyclick transmitters are used to operate the shutter receiver (radio signal). They must be trained to the receivers (max. 32 transmitters). The receiver's Function 1 is preset after training the receiver to a transmitter. It can be altered in function programming.

Selectable functions:
- UP/STOP/DOWN/Slat adjustment with 2 buttons (standard)
- UP/STOP/DOWN/Slat adjustment with 4 buttons for simple operation
- Sun protection with adjustable drive times already integrated for future solutions
- Sun protection ON/OFF activate by separate surface-mounted transmitter
- Safety function using separate radio transmitter (maintenance function)
- Store and activate 4 position situations UP/DOWN at any time by pressing a button

Caution!!
Only one drive may be connected to the shutter receiver!

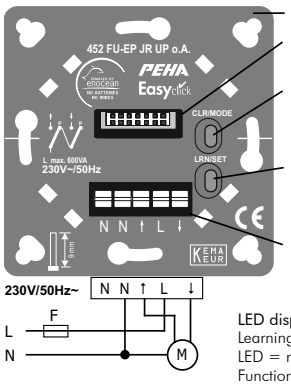
Technical specifications
General specifications:
Operating frequency: 868.3 MHZ
Voltage supply: 230 V~ / 50 Hz
Max. switching capacity: 600 VA
Test specifications: EN 60669-2-1
Identification: CE
Protection type: IP20
Range in buildings:
Masonry: 20 m, through 3 walls maximum
Reinforced concrete: 10 m, through 1 wall/ceiling max.
Plasterboard/wood: 30m, through 5 walls maximum

Connection diagrams and operation



CLR/MODE button
Parameter settings
LRN/SET button with LED
Learning mode and function programming
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted JR receiver Plus, 2-channel 452 FU-EP JR o.T.



Mounting plate
Jack for touch adapter
CLR/MODE button with LED
Delete all transmittersand set parameters
LRN/SET button with LED
Learning mode and function programming
Connection terminals
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted JR receiver Plus with mounting plate 2-channel 452 FU-EP JR UP o.A.

Easyclick dimmer receiver 451 FU-BEP DAB, 451 FU-EP DAB o.A., 4511 FU-EP DAB ST

General
Easyclick dimmers (receivers) can be used to switch and dim connected lighting. Easyclick transmitters are used to operate the dimmer (radio signal). They must be trained to the receivers (max. 32 transmitters). The dimmer's Function 1 is preset after training the receiver to a transmitter. It can be altered in function programming.

Selectable functions:
- Dimming with memory function brighter/darker and ON/OFF with 2 buttons (standard)
- Dimming without memory function brighter/darker and ON/OFF with 2 buttons and adjustable brightness values
- Targeted ON/OFF/Dim with individual buttons for simple operation
- Dimming with memory function brighter/darker and ON/OFF with 1 button
- Staircase lighting function with selectable switch-off time and OFF warning
- Store and activate 4 lighting situations at any time by pressing a button

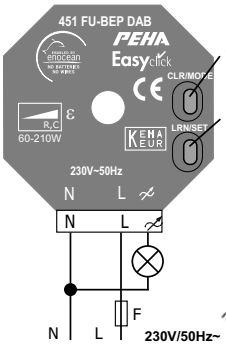
Diagnostic function for unsuitable loads (4511 FU-EP DAB ST)
LED flashes 5x orange then remains continuously red.

Technical specifications
General specifications:
Operating frequency: 868.3 MHZ
Voltage supply: 230 V~ / 50 Hz
Permissible loads: Light bulbs (Ω)
High-voltage halogen lamps
electric transformers
Test specifications: EN 60669-2-1
Identification: CE
Protection type: IP20
Range in buildings:
Masonry: 20 m, through 3 walls maximum
Reinforced concrete: 10 m, through 1 wall/ceiling max.
Plasterboard/wood: 30m, through 5 walls maximum

Receiver	Performance data
451 FU-BEP DAB 451-FU-EP DAB UP o.A	Min. load = 60 W Max. load = 210 W
4511 FU-EP DAB ST	Min. load = 60 W Max. load = 420 W

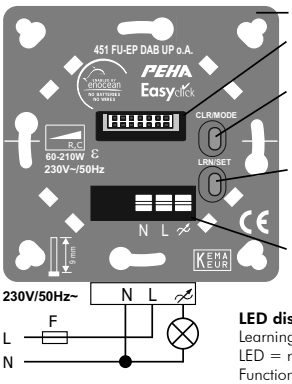
Caution!!
- **Not** suitable for transformers approved for **leading-edge** phase dimming.
- **Not** suitable for inductive loads (e.g. conventional transformers or drives).

Connection diagrams and operation



CLR/MODE button with LED
Delete all transmitters and set parameters
LRN/SET button with LED
Learning mode and function programming
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange
L = black
N = blue
⌇ = brown

Easyclick awning dimmer receiver Plus, 1-channel 451 FU-BEP DAB



Mounting plate
Jack for touch adapter
CLR/MODE button with LED
Delete all transmittersand set parameters
LRN/SET button with LED
Learning mode and function programming
Connection terminals
LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Easyclick flush-mounted dimmer receiver Plus with mounting plate, 1-channel 451 FU-EP DAB o.A.

Load output
switchable and dimmable
LED display
Learning mode: LED = red
Function programming: LED = green or orange
Diagnose mode: LED blinks 5x orange ⇨ permanently red
LRN/SET button
Learning mode and function programming
CLR/MODE button (side)
Delete all transmitters and set parameters

Easyclick plug and socket dimmer receiver Plus, 1-channel 4511 FU-EP DAB ST

Easyclick flush-mounted multi-functional receiver 24V, 452/24 FU-EP MF o.T.

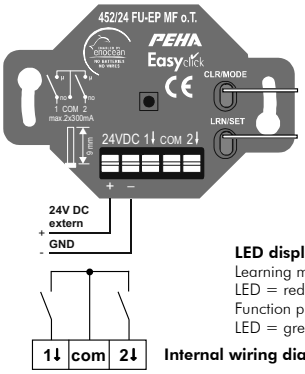
General
A shared COM clamp terminal with extra-low voltage (max. 42 V) can be used to operate the potential-free relay contacts. The relay contacts are not electrically locked. Easyclick transmitters are used to operate the receiver (radio signal). They must be trained to the receiver (max. 32 transmitters). The receiver's Function 1 is preset after training the receiver to a transmitter. It can be altered in function programming.

Selectable functions:
- Targeted ON/OFF with 2 buttons (Function 1)
- ON/OFF with 1 button
- Button sequence - Switch on whilst button is pressed
- Button sequence, time-limited
- Automatic OFF after selectable time

Technical specifications

General specifications:	
Operating frequency:	868.3 MHZ
Voltage supply:	24 V DC (external)
Max. switching capacity per output:	300 mA at 24 V DC
Test specifications:	EN 60669-2-1
Identification:	CE
Protection type:	IP20
Range in buildings:	
Masonry:	20 m, through 3 walls maximum
Reinforced concrete:	10 m, through 1 wall/ceiling max.
Plasterboard/wood:	30m, through 5 walls maximum

Connection diagram and description



CLR/MODE button with LED
Parameter settings

LRN/SET button with LED
Learning mode and function programming

LED display
Learning mode:
LED = red
Function programming:
LED = green or orange

Internal wiring diagram

Easyclick flush-mounted multi-functional receiver 24V, 452/24 FU-EP MF o.T.

Easyclick repeaters 453 FU-RPP o.T., 453 FU-RP ST

General
This repeater is used to increase the range between Easyclick transmitters and receivers. In 1-level operation, a radio signal received from a transmitter will be transmitted on to the respective receiver. In 2-level operation a radio signal can be transmitted past a maximum of two repeaters to a receiver in a radio link! The repeater is factory preset for 1-level operation when delivered. Manual operation of this device is not possible. Radio signals are received and transmitted automatically.

1-level operation
In 1-level operation, a radio signal received from a transmitter (LED 1 flashes red) will be passed on to the respective receiver.

Activation:
Keep pressing button 1 LEV ⇨ LED 1 lights for more than 2 s up for approx. 3 s (1-level operation is active)

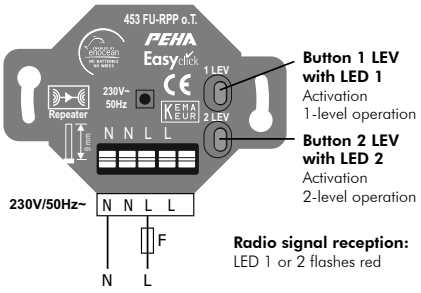
2-level operation
In 2-level operation (LED 2 flashes red) a transmitter's radio signal will be received and passed on through maximum two repeaters to the respective receiver.

Activation:
Keep pressing button 2 LEV ⇨ LED 2 lights for more than 2 s up for approx. 3 s (2-level operation is active)

Technical specifications

Operating frequency:	868.3 MHZ
Voltage supply:	230 V, 50 Hz
Test specifications:	EN 60669-2-1
Identification:	CE
Protection type:	IP20

Connection diagrams and descriptions



Button 1 LEV with LED 1
Activation
1-level operation

Button 2 LEV with LED 2
Activation
2-level operation

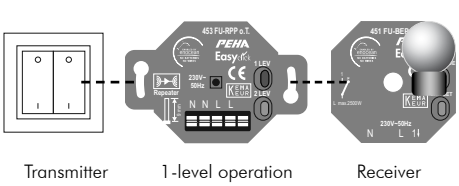
Radio signal reception:
LED 1 or 2 flashes red

Easyclick repeater 453 FU-RPP o.T.

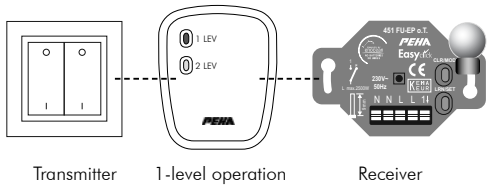
Button 1 LEV with LED 1: Activates 1-level operation
Radio signal reception: LED blinks red

Button 2 LEV with LED 2: Activates 2-level operation
Radio signal reception: LED blinks red

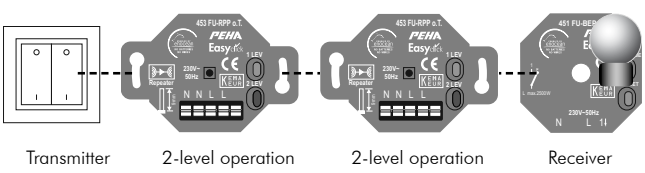
Easyclick repeater 453 FU-RP ST



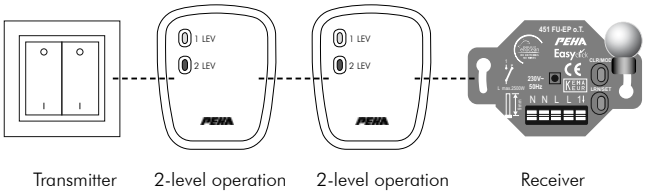
in 1-level operation



in 1-level operation



in 2-level operation

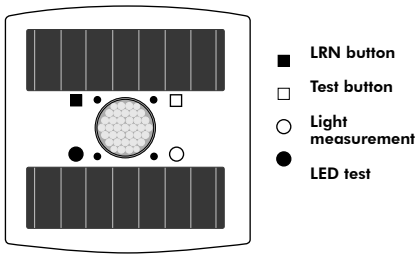


in 2-level operation

Sensolux solar presence detector 482 FU-BM DE

General
The presence detector is ideally suited for expanding existing electrical installations. It does require any wiring. It is powered by built in solar cells. The parameters for presence detectors are set at the energy controller. The presence detector registers the presence (movement) of persons and the light value (IR component) of the ambient light. The light value is dependent on the artificial lighting, nature of surfaces (light/dark) or the incidence of light from windows. It sends the registered values for presence/absence (after approx. 2 minutes) to the energy controller for evaluation (radio signal). The light value is dependent on the artificial lighting, nature of surfaces (light/dark) or the incidence of light from windows.

Presence ⇨ Movement detected
Absence ⇨ No movement detected



Caution!!
– The energy storage device must be charged over several days at 50-100 LUX for light measurement to function correctly.
– The presence detector detects the infrared portion of the light. As such, the light can only be switched on in the case of presence detection, if using light bulbs and halogen lamps!

Scope
The higher the presence detector is mounted, the larger is its detection range (approx. 25 m² - 36 m²) although its sensitivity is reduced.

Height	Person (seated)
2.5 m ⇨	D = 5 m
3.0 m ⇨	D = 6 m

Solar powered energy storage device
The energy pack must be charged. The charging time is approx. 5 - 10 minutes at 50-100 LUX. The device is then ready for immediate operation (assign or reset).

Caution!!
– The energy storage device must be charged over several days at 50-100 Lux for light measurement to function correctly.

Battery operation (optional)
The presence detector can be operated with batteries (type 1.5 V Micro AAA). Battery operation is necessary, when the device is used in rooms with low daylight or artificial light levels (less than 50 LUX). In battery mode, the presence detector can be assigned directly to an energy controller (no charging time).

Note:
Battery replacement after approx. 8-10 years.

LRN button
Pressing the LRN button trains/deletes the presence detector to/on the energy controller.
The energy controller must be in learning mode!

Test / LED Test button
The Test LED lights up when the Test button is pressed and the presence detector transmits a test signal. In this way, it is possible to check the charge level of the energy storage device.

Technical specifications

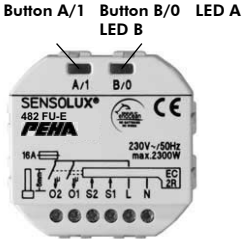
General specifications:	
Operating frequency:	868.3 MHZ
Voltage supply:	Solar cells (50-200 Lux) 2x batteries (up to 50 Lux) 1.5 V Micro AAA/LR03
Charging time for immediate operation:	approx. 5 – 10 minutes
Ambient temperature:	+ 10° to + 50°C
Test specifications:	EN 60669-2-1
Identification:	CE
Protection type:	IP50
Dimensions:	108 mm x 108 mm x 26 mm
Range in buildings:	
Masonry:	20 m, through 3 walls maximum
Reinforced concrete:	10 m, through 1 wall/ceiling max.
Plasterboard/wood:	30m, through 5 walls maximum

Sensolux energy controller 482 FU-E

General
The energy controller is ideally suited for expanding existing electrical installations without the need for additional wiring. Various consumers such as lamp bulbs, HV halogen lamps, electronic ballast devices and inductive loads can be switched with the outputs O1 and O2 of the energy controller (receiver).
A presence detector or an Easyclick transmitter (radio signal) provide the switching function of the energy controller (receiver). Before use, presence detectors and transmitters must be assigned to the energy controller (max. 8 presence detectors and 8 transmitters). They can operate an unlimited number of energy controllers. The energy controller can also be switched via two substations (buttons or switches).

Presence ⇨ Movement detected
Absence ⇨ No movement detected

Structure and description



Parameters for presence detector

a) Standard parameters (factory setting)
On delivery, the energy controller is preset to **„Fully automatic+daylight"** mode for presence detectors. The presence detector **automatically switches on** the lighting in response to presence. It **automatically switches off** the lighting in response to absence (delayed shut-down approx. 10-12 minutes). The lighting is also switched off on reaching the preset daylight value (mixed light) even in presence mode. The lighting is switched on again in response to a renewed presence state after approx. 2 minutes absence.

Parameter: Time	Function	Code
Delayed shut-down time 10-12 min	OFF	01100100
Parameter: Light value	**Function**	**Code**
LW 4	OFF	01001011
Parameter: Mode	**Function**	**Code**
Fully automatic + daylight	ON/OFF	00000111

b) LED display and entry of standard parameters
The code belonging to the standard parameters is indicated by LEDs (A/1+B/0) flashing.
Buttons 1/0 must be used to enter the code (8-digit) of the standard parameters.

Parameter	Anzeige
Time	A/1 + B/0 1x flashing
Code	0 1 1 0 0 1 0 0
Lichtwert	A/1 + B/0 2x flashing
Code	0 1 0 0 1 0 1 1
Modus	A/1 + B/0 3x flashing
Code	0 0 0 0 0 1 1 1

c) Parameter list

The parameter settings can be changed using buttons 1/0 according to the following code.

Parameter: Time (1)	Function	Code
Delayed shut-down time approx. 3 min	OFF	00001110
Delayed shut-down time approx. 6 min	OFF	00111100
Delayed shut-down time approx. 10 min	OFF	01100100
Delayed shut-down time approx. 15 min	OFF	10010110
Delayed shut-down time approx. 20 min	OFF	11001000
Parameter: Light value (2)	**Function**	**Code**
LW 1	OFF	00011001
LW 2	OFF	00100011
LW 3	OFF	00110010
LW 4	OFF	01001011
LW 5	OFF	01100100
Parameter: Mode (3)	**Function**	**Code**
Fully automatic	ON/OFF	00000011
Fully automatic + daylight	ON/OFF	00000111
Fully automatic + daylight + dusk	ON/OFF/ON	00001111
Semiautomatic	OFF	00000001
Semiautomatic + daylight	OFF	00000101

(1) The delayed shut-down time can extend up to 2 min (depending on the transmission interval).

(2) Light value (LW) measurement

Darker
LW 1
LW 2
LW 3
LW 4
LW 5
Lighter

(3) Daylight/dusk ⇨ „Parameter: Light value"

Technical specifications

General specifications:

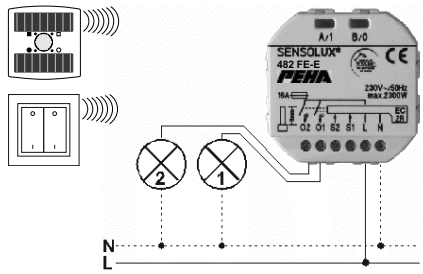
Operating frequency:	868.3 MHZ
Voltage supply:	230 V~ / 50 Hz
Charging time for immediate operation:	approx. 5 – 10 minutes
Ambient temperature:	+ 5° to + 50°C
Test specifications:	EN 60669-2-1
Identification:	CE
Protection type:	IP50

Range in buildings:

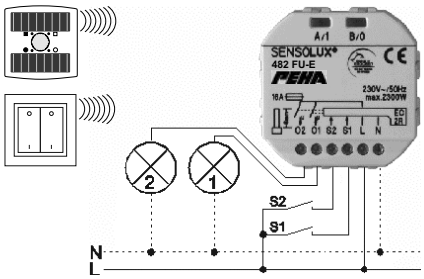
Masonry:	20 m, through 3 walls maximum
Reinforced concrete:	10 m, through 1 wall/ceiling max.
Plasterboard/wood:	30m, through 5 walls maximum

Permissible loads		
	Ohmic light bulb (W)	2300 W
	High-voltage halogen lamps	1250 W
	fluorescent lights	1000 VA
	Inductive load	600 VA
	Electronic ballast loads	5x

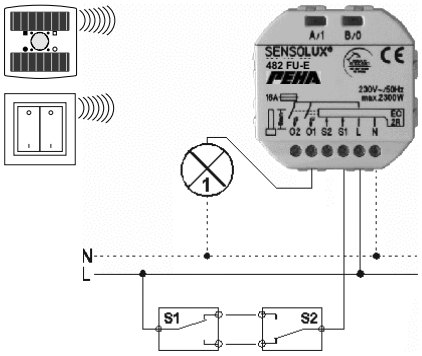
Connection diagrams



Actuation by presence detector/transmitter with no substation



Actuation by presence detector/transmitter and substation S1 and S2 (button or switch)



Actuation by presence detector/transmitter and existing electrical installation

Important installation notes

Important information for commissioningthe presence detector:

The energy storage device must be fully charged before placing the presence detector into operation. Observe following points:

- For immediate operation (assign or delete), charge the device for approx. 5-10 minutes at 50-100 Lux or optionally select battery mode.
- The energy storage device must be charged over several days at 50-100 LUX for light measurement to function correctly.

Important information on operating the presence detector:

If the procedure for assigning to the energy controller takes place in the detection range of the presence detector, observe the following points:

- The presence detector must transmit an ON signal for it to function correctly.
- For this purpose, all persons must leave the detection area for at least 2 minutes.
- The presence detector transmits the ON signal when persons re-enter the detection area.