Honeywell PEHA

Installation and operating instructions

D 451 FU-BEP DAB

Easyclickpro LED flush-mounted dimmer receiver

1. Safety

⚠️ **WARNING!**
Danger due to a failure to observe the instructions.

These instructions contain important information for the safe handling of the device. Potential dangers are specifically highlighted. Failure to observe this information can lead to death or serious injury.
- Read the instructions through carefully.
- Observe the safety information in these instructions.
- Store the instructions in an accessible location.

⚠️ **WARNING!**
Risk of electric shock.

A failure to observe the ambient conditions can lead to dangerous situations when working with current.
The device contains current-carrying parts. Contact with live parts can lead to electric shock, burns or death.
- Power off the electrical system before installation.
- Secure the electrical system against being powered on again.
- Check that the device is powered off.
- Close housing before switching on.
- Protect the device against moisture.
- Make sure that cables are not damaged, kinked or crushed.
- Observe the mains voltage.
- Make sure that the mains supply is suitable.
- Protect supply line with circuit breakers (F = max. 16 A).

1.1 Intended use

The device is intended for the following use only:
- Radio LED trailing-edge phase dimmer for dimming a connected load for a specific time.
- Installation in ø 58 mm flush mounting box.
- Only suitable for dimmable 230 V LED lamps or incandescent/halogen lamps.

Use only when in technically faultless condition and after correct installation with approved faceplate. Intended use also includes reading and observing these instructions.

1.2 Authorised target groups

Mounting, installation and fault diagnostics by qualified electricians exclusively. Requirements:
- Knowledge of the basics of electrical engineering.
- Knowledge of the national regulations and standards.
- Knowledge of the applicable health & safety and accident prevention provisions.
- Knowledge of these instructions.

Operation and disposal by the user. Requirements:
- Knowledge of these instructions.

1.3 General safety information

In the following cases, use of the device is prohibited:
- In case of damage to the device or individual components.
- In case of unauthorised modifications or changes to the device.
- For children and persons who are unable to assess the dangers of handling the device.

In the following cases, the manufacturer accepts no liability for damage:
- With a failure to observe these instructions.
- With non-intended use.
- With use by unauthorised target groups.
- With the use of spare parts, that have not been manufactured or approved by the manufacturer.
- Use in conjunction with hazardous devices.
- If the safety equipment on the device has been bypassed.

Further safety information is provided in the respective relevant sections of these instructions.

2. Product

The LED flush-mounted dimmer receiver belongs to the Easyclickpro System from PEHA.
- Radio (868.3 MHz, EnOcean).
- Bi-directional function (transmit/receive).
- Energy measurement.
- Repeater function can be activated.
- Function of the receiver can be adjusted for every radio transmitter.
- Unlimited number of receivers per transmitter.
- Input for wired push-buttons (230 V) (for additional one-touch dimming with conventionally wired push-buttons).
- Trailing edge phase dimming.

Figure: D 451 FU-BEP DAB

A MODE button
B LRN button
C Connection terminals

Technical information	
Own consumption	Standby < 0.5 W
Transmission frequency	868.3 MHz
Technology	Trailing edge phase dimmer
Nominal voltage	230 V~ +/-10% / 50 Hz
Input voltage at the button input	230 V~ +/-10% / 50 Hz
Fuse	Circuit breaker with max. 16 A
Ambient temperature	0 °C to 40 °C
Storage temperature	-40 °C to 85 °C
Ambient humidity	< 85 % RH
Plug-in terminals	max. 1 ×1.5 mm²
Test specifications	EN 60669 IEC/EN 62368 EN 55015 EN 61547 EN 61000 EN 301489 EN 62479 EN 300 220
Protection class	IP 20
Neutral conductor	Required
Energy measurement accuracy	+/- 5%

Load types	230 V~
Incandescent lamps	300 W
HV halogen lamps	300 W
Dimmable 230 V LED lamps	150 W
Minimum load	1 W

3. Radio range

Radio signals are electromagnetic waves. The field strength at the receiver decreases with increasing distance from the transmitter. The radio range is therefore limited. The radio range is further reduced by various materials or sources of interference in the direction of propagation of the radio signals. Through the use of Easyclickpro Repeaters (radio amplifiers) it is possible to increase the radio range.
➡ "8.13 EnOcean-Repeater function"

Material	Reduction
Wood, plaster, uncoated glass	0 - 10 %
Masonry, timber/plaster walls	5 - 35 %
Reinforced concrete	10 - 90 %

Range	Conditions
> 30 m	Good conditions (large open space, free of obstacles).
> 20 m	Through up to 5 plasterboard / drywall or 2 brick / aerated concrete walls (Furniture and people in the room): – For transmitters and receivers with good antenna position/version.
> 10 m	Through up to 5 plasterboard / drywall or 2 brick / aerated concrete walls (Furniture and people in the room): – For receivers installed in the wall or corner of the room. – For receivers with internal antenna or in narrow corridors.
Through 1-2 ceilings / walls	Dependent on the reinforcement of the ceiling/wall and the antenna version of the receiver.

Note
Further information on the subject of "radio range" is available on the internet at "www.peha.de".

4. ENOCEAN Equipment Profiles (EEP)

The Enocean EEPs are standardised communication profiles. They facilitate communication with various products from different manufacturers.
The table below is intended for specialist personnel who require the communication profiles for a project with PEHA products:

EEP	Status feedback
A5-11-01	Lighting controller
A5-11-04	Extended lighting status
D2-01-00	Electronic switches and dimmers with local control

EEP	Communication profiles	Function	Mode
A5-38-09	Extended lighting control	-	-
D2-01-00	Electronic switches and dimmers with local control	-	-
F6-02-01	Push button	1	1
F6-04-01	Key card activated switch (hotel key card switch)	1	1
A5-07-01	PIR sensor	7	4
A5-07-03	PIR sensor	7	4
A5-08-01	PIR sensor	7	4
A5-06-xx	LUX sensor	7	4

Note
After assigning a new radio transmitter in the learning mode of the receiver, the function and mode of the radio transmitter are already pre-set as standard.

5. Installation

5.1 Safety information for installation

- All work on the supply network and device must be performed by qualified electricians.
- Observe the applicable laws and regulations of the country in which the device is operated.
- Observe the current state of technology at the time of installation.
- The provisions of these instructions, with the specifications of the electrical system, are to be observed.

⚠️ **CAUTION!**
Danger of damage due to incorrect installation.

Incorrect installation can destroy the device.
- Only mount the device in a faultless condition.
- Use suitable fastening material.
- Before final installation in the false ceiling, all Easyclickpro transmitters to be used should already be taught and programmed with the desired function.
- Only install in a permissible installation environment.
➡ "5.2 Installation environment"
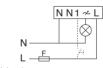
5.2 Installation environment

The following situations must be avoided with the installation environment:
- Never install the receiver in a metal enclosure or in close proximity to large metal objects.
- Do not install the receiver close to floor level or on the floor.
- The receiver is not suitable for electronic transformers that are approved for phase angle control dimming.
- The receiver is not suitable for inductive loads (e. g. conventional transformers or motors).
- Observe the permitted load types and max. load.
➡ "2. Product"

5.3 Installation

- Make sure the electrical system is powered off.
- Make sure the connected load corresponds with the installation situation.
- Install the flush mounting box in a suitable location.
- Connect the device in accordance with the circuit diagram.
- Insert the device in the flush mounting box and screw tight.
- Switch on the electrical system.
- Assign the radio transmitters (max. 32) to the receiver.
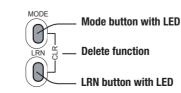➡ "6. Programming"

Circuit diagram
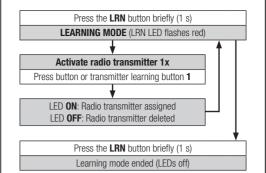

Dimmer (Easyclickpro)

6. Programming

Information on programming
To perform programming, the receiver must be connected to the supply network. In the event of a power failure, the programming is retained.
- Observe the operating instructions for the radio transmitter.
- The radio transmitters (max. 32) must be assigned to the receiver in learning mode before use. No radio transmitter is assigned at the time of delivery.
- In learning mode it is possible to assign or delete multiple radio transmitters. With multiple activation, they are alternately assigned or deleted.
- Programming is automatically ended after 30 s if no buttons are pressed.
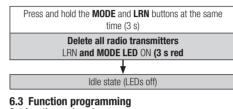

Mode button with LED

Delete function

LRN button with LED

6.1 Learning mode
Assign or delete transmitters.

Press the **LRN** button briefly (1 s)
LEARNING MODE (LRN LED flashes red)

↓

Activate radio transmitter 1x
Press button or transmitter learning button **1**

↓

LED **ON**: Radio transmitter assigned LED **OFF**: Radio transmitter deleted

↓

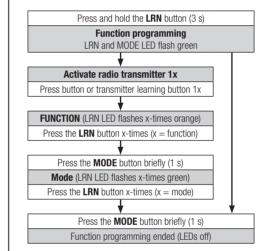| Press the **LRN** button briefly (1 s) |
|---|
| Learning mode ended (LEDs off) |

When assigning radio transmitters in learning mode, the standard functions are assigned:
➡ "4. ENOCEAN Equipment Profiles (EEP)"

6.2 Delete function
Delete all assigned transmitters.

Press and hold the **MODE** and **LRN** buttons at the same time (3 s)
Delete all radio transmitters LRN **and MODE LED** ON **(3 s red**

↓

Idle state (LEDs off)

6.3 Function programming
Set function and mode.

Press and hold the **LRN** button (3 s)
Function programming LRN and MODE LED flash green

↓

Activate radio transmitter 1x
Press button or transmitter learning button 1x

↓

FUNCTION (LRN LED flashes x-times orange)
Press the **LRN** button x-times (x = function)

↓

Press the **MODE** button briefly (1 s)
Mode (LRN LED flashes x-times green)
Press the **LRN** button x-times (x = mode)

↓

Press the **MODE** button briefly (1 s)
Function programming ended (LEDs off)

7. Example of programming

Assign or delete radio transmitters	
	Press the **LRN** button briefly (1 s): LRN **LED flashes red (learning mode)**
	Press the O or I button on the radio transmitter.
	LRN **LED on** Radio transmitter assigned. LRN **LED off** Radio transmitter deleted. LRN **LED continues flashing after 3s**
	Press the **LRN** button briefly (1 s): LED off (learning mode ended).

Set function 3 and mode 2	
	Press and hold the **LRN** button (3 s).
	LRN **and** MODE **LED flash green**
	Press the O or I button on the radio transmitter.
	LRN **LED flashes x-times orange (x = function)** Press the **LRN** button 3x. = function 3.
	Press the **MODE** button briefly (1 s).
	LRN **LED flashes x-times green (x = mode)** Press the **LRN** button 2x. = mode 2.
	Press the **MODE** button briefly (1 s): LED off. (Function programming ended.)

8. Functions

There are two variants of dimmer control:
- Manual control via a locally wired button.
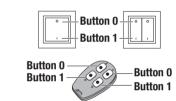- Remote control via an EnOcean radio transmitter with radio signal.

Before use, the transmitters must be taught their assignment to the receiver (max. 32 transmitters).
After teaching a wall-mounted transmitter, function 1 of the receiver is pre-set. It can be changed in the radio programming. Each transmitter can actuate an unlimited number of receivers.

8.1 General functions

Function	Description
Memory	The current dimming value is stored.
Soft start	When switching on, the lighting is dimmed up to the stored dimming value (memory).

8.2 Easyclickpro radio transmitter

Button 0
Button 1

Button 0
Button 1

Button 0
Button 1

Easyclickpro wall-mounted transmitter and radio control

8.3 Function 1
(two-button operation with memory)

Wall-mounted transmitter	Function
Press the I button briefly.	Switch on with soft start.
Press the O button briefly.	Switch off with memory.
Press and hold the I button.	Dim the lighting brighter.
Press and hold the O button.	Dim the lighting darker.
Press and hold the button/release.	Dimming process stops (memory).

Note
Standard function after teaching a wall-mounted transmitter!

The device fulfils:
- Directive 2014/30/EU (EMC directive)
- Directive 2014/35/EU (low voltage directive)
- Directive 2014/53/EU (radio equipment directive)
- Directive 2011/65/EU (RoHS)
- Directive 2002/96/EG (WEEE)
- Ordinance EC 1907/2006 (REACH)

CE

8.4 Function 2 (two-button operation)

Wall-mounted transmitter	Function
Press the I button briefly.	Switch on with parameters.
Press the O button briefly.	Switch off.
Press and hold the I button.	Dim the lighting brighter.
Press and hold the O button.	Dim the lighting darker.
Press and hold the button/release.	Dimming process stops.

Parameter	
1	Brightness 100 %
2	Brightness 10 %
3	Brightness 25 %
4	Brightness 40 %
5	Brightness 55 %
6	Brightness 70 %
7	Brightness 85 %

Note
The brightness of the lighting after switch-on is set via the parameter.

8.5 Function 3
(single button operation with memory)

Wall-mounted transmitter	Function
Press the button briefly.	Switch on with soft start or Switch off with memory.
Press the button briefly.	Brighter or darker dimming.
Press and hold the button /release.	Dimming process stops (memory).

Parameter	
1	O button is activated.
2	I button is activated.
3	O and I buttons are activated.

Note
This function is set for the button input as a factory setting. It cannot be changed.

8.6 Function 4 (stairwell light)

Wall-mounted transmitter	Function
Press the I or O button briefly.	Switch on with maximum brightness and run-time (parameters).

Parameter	
1	Run-time 2 min.
2	Run-time 1 min.
3	Run-time 5 min.
4	Run-time 10 min.
5	Run-time 20 min.
6	Run-time 30 min.
7	Run-time 60 min.
8	Run-time 120 min.

Note
After the run-time has passed (parameter), the brightness of the lighting is reduced to 30 % for 30 s (switch-off warning). The lighting then switches off.

8.7 Function 5 (light scenes)

Wall-mounted transmitter	Function
Press the O button briefly.	Switch on light scene A/C.
Press and hold the O button.	Store light scene A/C.

Wall-mounted transmitter	Function
Press the I button briefly.	Switch on light scene B/D.
Press and hold the I button.	Store light scene B/D.

Parameter	
1	O button = light scene A, I button = light scene B
2	O button = light scene C, I button = light scene D

Example of light scene application:
A light scene can be realised with a radio transmitter and an existing light control (several Easyclickpro receivers with taught transmitters).

Programming
Teach the radio transmitter each Easyclickpro receiver, program function 5 and set parameters.

Store light scene (A-D)
• Set the desired light scene (Easyclickpro receiver). • Press and hold button I or O of the transmitter for over 2 s. The lighting then switches off and on as confirmation.

Call up light scene (A-D)
Press button I or O of the transmitter briefly.

8.8 Function 6 (hotel key card switch)

Hotel key card switch	Function
Insert card.	Switch ON/OFF or activate light scene.
Card	Switch ON/OFF or activate light scene.

Mode		
1	Insert card. Remove card.	Switch on. Switch off.
2	Insert card. Remove card.	Switch off. Switch on.
3	Insert card. Remove card.	Activate light scene A. Activate light scene B.
4	Insert card. Remove card.	Activate light scene C. Activate light scene D.

The fully automatic and semi-automatic functions are suitable for motion detectors (PIR sensor) and light sensors (LUX sensors). Motion detectors can be used with an integrated or external light sensor. The data acquired is sent to the receiver for evaluation via radio signal. With its assignment in learning mode, the following standard functions are initially allocated:

Designation	Standard function
Motion detector	Function 7/mode 11
Motion detector with integrated light sensor	Function 7/mode 04
Light sensor	Function 7/mode 04

8.9 Function 7 (fully-automatic function)

Presence and light value	Function
Do not exceed presence and light value.	Switch on (100 %).
Presence or light intensity exceeded.	Selected mode.

Mode		
1	Switch off after 30 s.	(125 lx)
2	Switch off after 3 min.	(125 lx)
3	Switch off after 15 min.	(125 lx)
4	Switch off after 30 s.	(250 lx)
5	Switch off after 3 min.	(250 lx)
6	Switch off after 15 min.	(250 lx)
7	Switch off after 30 s.	(375 lx)
8	Switch off after 3 min.	(375 lx)
9	Switch off after 15 min.	(375 lx)

Presence and light value	Function	
10	Switch off after 30 s.	(PIR without light measurement)
11	Switch off after 3 min.	(PIR without light measurement)
12	Switch off after 15 min.	(PIR without light measurement)

8.10 Function 8 (semi-automatic function)

Presence and light value	Function
Presence or light intensity exceeded.	Selected mode.

Mode		
1	Switch off after 30 s.	(125 lx)
2	Switch off after 3 min.	(125 lx)
3	Switch off after 15 min.	(125 lx)
4	Switch off after 30 s.	(250 lx)
5	Switch off after 3 min.	(250 lx)
6	Switch off after 15 min.	(250 lx)
7	Switch off after 30 s.	(375 lx)
8	Switch off after 3 min.	(375 lx)
9	Switch off after 15 min.	(375 lx)
10	Switch off after 30 s.	(PIR without light measurement)
11	Switch off after 3 min.	(PIR without light measurement)
12	Switch off after 15 min.	(PIR without light measurement)

8.11 Function data acquisition

The dimmer makes data available to the user.
– Power consumption (W ; W/h).
– Dimming value.
– Operating times.
– Lamp failure.
➡ 4. ENOCEAN Equipment Profiles (EEP)

8.12 EnOcean Service RLT function (slave)

The EnOcean Service RLT (Radio Link Test) facilitates a range test between an EnOcean transmitter (e. g. hand-held transmitter 450 FU-HS 128) and a receiver.
The range test is evaluated by the master. The receiver serves as a slave. This function is particularly well-suited for determining whether an installation site is suitable before installing the receiver.

Press the **MODE** and **LRN** buttons briefly at the same time (1 s)
Service RLT (slave) activated LRN **and** MODE **LED flash green/orang**
↓
Press the **MODE** button briefly (1 s)
Idle state (LED off)

Note
The EnOcean Service RTL is ended automatically after 30 s or after successful evaluation.

8.13 EnOcean-Repeater function

Through the use of Easyclickpro Repeaters (radio amplifiers) it is possible to improve the reception quality or increase the radio range between Easyclickpro radio transmitters and receivers.
The receiver can be used as a repeater. No further configuration work is required for this.

⚠ **CAUTION!**
Telegram collisions!
The use of too many repeaters can result in telegram collisions.
• Use the lowest number of repeaters possible.

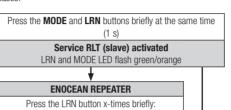Radio transmitter 1-level repeater Receiver

If the radio signal of a radio transmitter is received in 1-level operation, it is forwarded to the corresponding receiver. The receiver cannot be cascaded in this mode. Radio signals that have already been repeated cannot be recovered.

Radio transmitter 2-level repeater 2-level repeater Receiver

If the radio signal of a radio transmitter is received in 2-level operation, it is forwarded to the corresponding receiver via max. two repeaters. In this mode the receiver can be cascaded over two devices. This is only required in extreme building services cases.
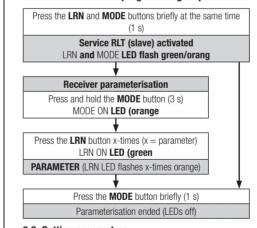
Press the **MODE** and **LRN** buttons briefly at the same time (1 s)
Service RLT (slave) activated LRN and MODE LED flash green/orange
↓
ENOCEAN REPEATER Press the LRN button x-times briefly: 1 = deactivated 2 = level 1 activated 3 = level 2 activated LRN LED flashes orange (Number = setting)
↓
Press the **MODE** button briefly (1 s)
Idle state (LEDs off)

9. Parameterisation

9.1 Parameterisation programming sequence

Press the **LRN** and **MODE** buttons briefly at the same time (1 s)
Service RLT (slave) activated LRN **and** MODE **LED flash green/orang**
↓
Receiver parameterisation Press and hold the **MODE** button (3 s) MODE ON **LED (orange**
↓
Press the **LRN** button x-times (x = parameter) LRN ON **LED (green** **PARAMETER** (LRN LED flashes x-times orange)
↓
Press the **MODE** button briefly (1 s)
Parameterisation ended (LEDs off)

9.2 Setting parameters

Dimming speed (dimming range min. to max.)	
1	5 s (standard)
2	8 s
3	10 s
4	15 s
5	20 s
	1-180 s with parameterisation via Easyclickpro Comfort hand-held transmitter

Manual saving of the min./max. values	
6	Manual saving of the min. value
7	Manual saving of the max. value
8	Deletion of the stored min./max. values
	1-180 s with parameterisation via Easyclickpro Comfort hand-held transmitter

Minimum dimming value	
9	0 %
10	5 %
11	10 %
12	15 %
13	20 %
14	25 %
15	30 % (standard)
	0-30 % with parameterisation via Easyclickpro Comfort hand-held transmitter

Maximum dimming value	
16	70 %
17	75 %
18	80 %
19	85 %
20	90 %
21	95 %
22	100 % (standard)
	70-100 % with parameterisation via Easyclickpro Comfort hand-held transmitter

Dimming curve	
23	Dimming curve 1 for LED (standard)
24	Dimming curve 2 for incandescent and halogen lamps
	Can be set with the Easyclickpro Comfort hand-held transmitter

9.3 Manual setting of the minimum and maximum dimming value

• Activate parameterisation.
• Press the LRN button eight times to delete all pre-set values.
• Dim the connected load to the minimum possible dimming value using a taught wall-mounted transmitter.
• Press the LRN button six times.
• Dim the connected load to the maximum possible dimming value using a taught wall-mounted transmitter.
• Press the LRN button seven times.
• End parameterisation.
The dimmer can now be used with the min./max. dimming values set.

Repeat the process to set another minimum or maximum dimming value.

9.4 Setting with the Easyclickpro Comfort hand-held transmitter

Using the Easyclickpro Comfort hand-held transmitter (from firmware 2.x) it is possible to set the dimming speed and the minimum or maximum dimming values.
The dimmer settings can be adjusted with the "Remote Commissioning" function in the parameters area.
For detailed information on remote commissioning, refer to the manual for the Easyclickpro Comfort hand-held transmitter.
➡ Manual for the Easyclickpro Comfort hand-held transmitter

Note
Many dimmable LED lamps have reached their maximum light output long before the dimmer reaches its maximum.
If the maximum dimming value is too high, this leads to a long reaction time when dimming down from the maximum dimming value with an invisible change in the light value.

Note
Some dimmable LED lights require a higher start value than the set minimum dimming value. If the LED lamp does not switch on, the minimum dimming value must be increased.

10. Troubleshooting

10.1 System does not function

• Check circuit breaker and supply voltage.
• Check connection cables.
• Check connected load.
• Check the system environment for changes that could cause interference (e. g. g. metal cabinets, furniture or walls have been moved).
• Delete all transmitters and re-program.
With operation with LED loads:
• Check dimming capability.
• Check maximum total output of the connected load.

10.2 The receiver switches independently

Possible cause may be the activation of a transmitter that has been randomly assigned to the receiver.
• Delete all transmitters and re-program.

10.3 Range of the radio signals limited

• Check for devices that emit high-frequency signals (e. g. audio systems, computers, electronic ballasts for lamps). Observe minimum distance of 0.5 m.
• Check whether the receiver is being used in close proximity to metal objects or materials with metal components. Observe minimum distance of 10 cm.
• Check materials for dampness.

10.4 Flickering of the illuminant

Ripples in the mains voltage are indicated by the flickering at low dimmer settings. Not a malfunction of the device.

10.5 LED does not switch off fully

• Use a dimming stabiliser or a base load element.

If a fault cannot be remedied:
• Contact your specialist dealer.

11. Disposal

The device contains electrical components and is subject to the European directive 2012/19/EU for used electrical and electronic equipment. The enclosure is made from recyclable plastic.
• When the device reaches the end of its life, do not dispose of it with normal household waste.
• Contact your town or district council to find out about possibilities for the environmentally friendly reuse (recycling) or appropriate disposal of the device.
• Dispose of the device in accordance with the legal regulations, via a disposal company or at a municipal waste disposal centre.

12. Guarantee conditions

These operating instructions are part of the device and the guarantee conditions. They must be provided to the user. The technical design of the devices may change without prior notice. PEHA products are manufactured and quality-tested using state-of-the-art technology in accordance with applicable national and international regulations. If a defect should nevertheless become apparent PEHA will remedy this, without prejudice to the end user's claims under the purchase contract against their dealer, as follows: In case of a justified and duly asserted claim PEHA will, at its own discretion, either remedy the device defect or deliver a defect-free device. Further claims and compensation for consequential damages are excluded. A justified defect exists if the device is unusable or considerably impaired in its usability when handed over to the end user due to a design, manufacturing or material defect. The warranty does not apply in case of natural wear and tear, improper use, incorrect connection, intervention in the device or external influences. The claim period is 24 months from the date of purchase of the device by the end user from a dealer and ends at the latest 36 months after production of the device. German law applies to the handling of warranty claims.

13. Declaration of conformity

PEHA products may be sold and operated in the EU countries, CH, IS and N. PEHA hereby declares that the D 451 FU-BEP DAB receiver is compliant with the fundamental requirements and other relevant provisions of the Radio Equipment Directive 2014/53/EU. The declaration of conformity can be found on the internet at the following address: www.peha.de

14. Contact