E.P.E. CONSEIL

User Guide



Cemprotec 32

Electromagnetic field detector

– High-speed (broadband) PLC (Power Line Communication) frequencies from 1.6 MHz to 68 MHz

– Low frequencies (electric and magnetic field) from 10 Hz to 5 kHz

EPE Conseil would like to thank you for purchasing CEMPROTEC, before using it, please read this guide in its entirety, especially the "Warnings" section. This section specifically indicates the terms of usage to ensure CEMPROTEC is used safely and within the warranty limits.



What is electromagnetic pollution?

There are mainly two "families" of electromagnetic radiation:

High-frequency radiation: Generated by popular wireless systems such as connected objects, Wi-Fi, cell phone towers/antenna arrays, cell phones, fixed wireless phones, Bluetooth, baby-phones, etc.

Low-frequency radiation: This concerns all appliances connected to the electrical network, medium and high voltage power lines, electrical panels and motors. Cables and electrical systems can create an electric field and also a magnetic field depending on the power.

The Cemprotec 32 detector detects electric and magnetic fields, as well as radiation from the PLC broadband system.

What is PLC broadband?

PLC broadband replaces the use of Wi-Fi when it is difficult to connect to an Internet box. Instead of sending waves into the home, PLC uses the home's electrical circuit to carry its waves. PLC is displayed on the device as **Power Line Communication**.

Installing the device battery



Installing the 9V battery (supplied): The 9V battery must be connected, respecting the + and - terminals on the black connector.

Battery level display: When switching on the device, the battery level is displayed for 3 seconds in the middle row of LEDs, the other LEDs are off at this point. The LEDs will light up from the red one at the top, stopping at the relevant LED to show the battery level. If the green LED at the bottom is lit, the battery is fully charged.

Energy saving: The device switches off automatically after 20 minutes to save battery power. For regular use, we recommend using a rechargeable battery.





Using your detector, there are two main functions!

1. Standard Mode: As soon as the device is switched on, it is automatically in '**Standard Mode**'. This mode detects the magnetic field, the electric field and the PLC separately.

2. Full PLC Mode: Briefly press the PLC ONLY button. This function only detects PLC waves (not electric and magnetic fields). The LEDs light up from **bottom to top and from left to right.** The corresponding LED values are given on page 5 of this manual.

To stop the SOUND, press and hold the PLC ONLY button.

Detection level display

The 3 rows of LEDs display the detected radiation levels:

· **Magnetic:** Example of sources > transformers, telephone chargers, electrical panels and electrical transformers, high voltage lines.

· **Electric:** Example of sources > bedside lamps, various electrical appliances plugged into the mains, computers, power supplies, sockets, switches.

· **PLC broadband:** Example of sources > PLC box, radiation from the electrical installation's PLC frequencies.

How it displays:

– If there is no radiation, the first green LED stays on.

– The LEDs light up to indicate the level of detected radiation.

– The numerical values of the LEDs are explained on page 5 of this manual.



ON - OFF BUTTON

– Press once to turn on the device
– Press once to turn off the device

PLC ONLY Button with or without SOUND

– Press once to turn on/off FULL PLC
– Press and hold the button to turn on/off the speaker

Initial State	Action	Final State
Device off	Press the ON/OFF button	Device is turned on
Device on	Press the ON/OFF button	Device is switched off
Full PLC function deactivated	Press the PLC ONLY button	The Full PLC function is activated
Full PLC function activated	Press the PLC ONLY button	The Full PLC function is deactivated
Loudspeaker is on	Press and hold on the PLC ONLY button	Loudspeaker is switched off
Loudspeaker is off	Press and hold on the PLC ONLY button	Loudspeaker is switched on

1. Detection in Standard Mode



The standard mode is very practical and allows the simultaneous detection of the electric, magnetic and PLC fields, **with or without sound.**

The device makes radiation easily "visible", therefore making the sources more easily identifiable.

It can also be used to verify the protection solutions that have been put in place to reduce exposure to waves.

1. Briefly press the "on-off" button to **switch the device** to standard mode.

2. Hold the detector with your **arm slightly extended** forward.

3. **Move around slowly** to detect electromagnetic fields. The device performs a new detection every two seconds.

PLC values shown in Standard Mode are averages.

NB: To **activate or deactivate the sound,** press and hold the PLC Only button.

2. Detection in FULL PLC Mode



FULL PLC mode enables detection with increased sensitivity. In Standard Mode, the PLC is detected using 7 LEDs. In FULL PLC mode, 21 LEDs are used for greater accuracy.

The LEDs light up from LEFT to RIGHT and from BOTTOM to TOP.

The sound indication corresponds to a FINE ACOUSTIC ANALYSIS of the PLC, which is very useful. This enables **sources to be identified by a sound proportional to the modulated frequency.**

In other words, this function allows your ear to understand the power level and differentiate between the different sources of radiation.

However, if the acoustic analysis bothers you, you can easily switch it off by pressing and **holding** the PLC ONLY button.

In FULL PLC mode, the values displayed are peak values, in real time, with a brief display of the maximum values measured (a top LED that stays lit for two seconds). The frequency spectrum is from 1.6 MHz to 68 MHz.

Standard Mode Table

It indicates the power of radiation by each row of 7 LEDs and 13 levels. The table indicates the numerical values for the LEDs for:

- **The magnetic field** with a 3D detection spectrum of 10 Hz to 5 kHz.
- **The electric field** with a detection spectrum of 10 Hz to 5 kHz.
- **The PLC fields** with a detection spectrum of 1.6 MHz to 68 MHz.

Levels:	0	1	2	3	4	5	6	7	8	9	10	11	12	13
LED: G = green LED Y = yellow LED R = red LED	G1	G1 + G2	G2	G2 + Y1	Y1	Y1 + Y2	Y2	Y2 + Y3	Y3	Y3 + R1	R1	R1 + R2	R2	R2 + R3
EF in V/m	0	7	14	19	24	29	33	38	44	52	60	69	79	90
PLC in µW/m²	0	18	45	80	120	165	220	330	550	800	1100	1400	1700	2000
MF in nT	0	25	65	110	155	200	260	350	470	800	1250	1800	2400	3000

EF = electric field · MF = magnetic field

Hypersensitive mode table

When the FULL PLC mode is activated, the device will only detect the PLC.

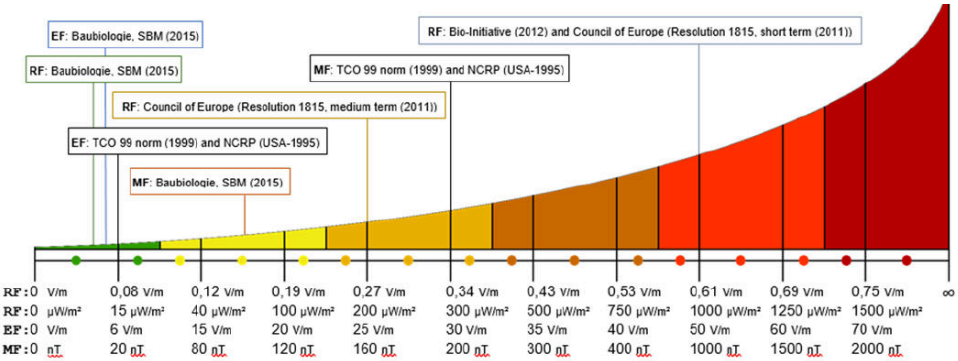
Radiation power is indicated by all 21 LEDs, from left to right and from the bottom to top, with a detection spectrum of 1.6 MHz to 68 MHz.

The sampling rate for high frequencies is about 20 kHz.

PLC Levels:	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
in µW/m²:	0	2	5	15	30	50	70	100	140	190	250	325
Levels:	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**		
in µW/m²:	425	575	775	1025	1300	1575	1850	2150	2450	2750		

Standard mode graph with thresholds

(radiation power indicated by each row of LEDs)



RF = radio frequency · EF = electric field · MF = magnetic field

Indicative radiation power for **Hyper Frequencies (HF)** in Volt per metre (V/m) and Microwatt per square metre (µW/m²), **Electric Fields (EF)** in Volt per metre (V/m) and **Magnetic Fields (MF)** in Nanotesla (nT), depending on the colour of the LEDs lit. The thresholds mentioned above are recommendations and standards are from the sources below.

• Baubiologie MAES-SBM. (2015). Indicative values in Baubiologie (Building Biology) for rest areas. In addition to the standard measurement technique in baubiologie SBM-2015. Retrieved December 2, 2015, from http://baubiologie.fr/IMG/pdf/valeurs_sbm-2015_fr.pdf. (recommendation)

• BioInitiative. (2012). BioInitiative Report 2012. In A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation. Retrieved November 16, 2015, from http://www.bioinitiative.org/table-of-contents/. (recommendation)

• Council of Europe. (2011). Resolution 1815 (2011) Final version. In the potential dangers of electromagnetic fields and their effect on the environment. Retrieved November 16, 2015, from http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994&. (recommendation)

• NCRP, (1995) “Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields”, NCRP Report No.86, Bethesda, Maryland, USA. (norm)

• TCO Development. (2012). TCO-Certified-Displays-6.0. In TCO Development. Retrieved November 16, 2015, from http://tcodevelopment.com/files/2013/04/TCO-Certified-Displays-6.0.pdf#page=28. (norm)

Instructions For Use

Interior or exterior pollution?

The first time you use the device you may be surprised by the level of exposure if it is higher than expectations.

It is absolutely necessary to identify the cause(s) of radiation to have the clearest possible picture of the situation; this will make it possible to apply suitable and effective protection/shielding solutions against the nuisances observed.

To help you quickly identify your electromagnetic exposure:

1. Turn on the device in Standard mode (with or without the loudspeaker on).

2. Move slowly from room to room, paying particular attention to the areas where you stay for a long time (e.g. the bedroom, living room, office).

3. If possible after, switch off the electricity in your home for a few moments and then repeat the same detection room by room.

4. If the levels are the same, it means that the radiation is coming from outside. If they are lower, it means that you have an exposure generated by your own electrical installation or a system(s) connected to it.

For outside radiation, some effective solutions can be used such as paints, fabrics, curtains and plastic films on windows. These products act as screens and greatly reduce the penetration of outside radiation coming inside. However, it is important to choose the right solution according to the type of radiation that is detected, as unfortunately there is no single solution that effectively addresses all types of radiation.

How to find the polluting devices inside?

It is advisable to use the detector and check the radiation level room by room.

The polluting systems are mainly cordless phones (DECT), Wi-Fi, alarms, and various connected objects. If you unplug each device for a few moments, you should immediately notice a decrease in radiation with your detector.

Please note! If you are measuring an internet box and there is a DECT phone in close proximity, it is crucial to ensure that you separate the two sources, as they both emit radiation of the same type (high frequency).

Some ideas for limiting your exposure to radiation

1. Use a low-radiation cordless phone for short calls and a corded phone for long calls (if necessary we can refer you to manufacturers).

2. Set up call forwarding from your mobile phone to a landline phone when you are at home or in the office.

3. If possible, ground your Internet box (making sure you comply with the manufacturer's conditions of use).

4. Favour an internet connection with an Ethernet cable. When you use the cable, remember to turn off the Wi-Fi. For computers not equipped with RJ45 sockets, you can buy small adapters that plug into USB sockets.

5. Use a timer or a switch on the internet box power supply so you can cut it off at certain times of the day or night if necessary.

6. Use a USB grounding kit for a laptop (be sure to follow the manufacturer's instructions).

7. Use shielded extension cords and multi-sockets at home or in the office.

WARNINGS

CEMPROTEC is by no means a measuring device, CEMPROTEC is a detection device that gives tendencies and approximations in relation to radiation.

The human body is likely to directly affect detection. For more accurate detections, hold the device at least 50 cm away from you.

The devices are calibrated in an environment at a temperature of 20 °C and a humidity level of 45 %.

Store CEMPROTEC in a dry place with low humidity.

All modifications to this device are not authorized and will void the warranty. Keep the device away from children.

Technical Specifications

- Powered by a 9V battery, non-rechargeable
- Maximum current: 50 mA
- Device dimensions: 179.5 × 46 × 32.2 mm
- Device weight: 80 g
- Ideal temperature usage: −10 °C to +50 °C
- Cleaning recommendations: To clean, use a soft, slightly damp cloth with household/rubbing alcohol.

E.P.E. CONSEIL

Evaluation **P**ollutions **E**lectromagnétique & **C**onseil
offers its expertise in the detection and control of electromagnetic radiation

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