

## RAPPORTO DI PROVA / TEST REPORT

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Scopo delle prove / Test object :	Prove di tipo in accordo a / Type test according to <b>FCC Cfr 47 part 2 - §2.1093, part 1 - §1.1310</b>	
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Marchio commerciale / Trade mark :		
Fabbricante / Manufacturer :	ELPRO INNOTEK S.p.a.	
Prodotto / Product :	<b>Transmitter 433MHz RADIUM series</b>	
Modello / Model :	<b>R4</b>	
Data ricevimento campioni / Date of test samples receipt:	21/03/2014	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	21/03/2014	
Sito di prova / Testing site :	Prima Ricerca & Sviluppo Via Campagna - 92 I-22020 FALOPPIO (CO)	
Esito delle valutazioni / Assessment results :	<b>CONFORME / COMPLIANT</b>	
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## 0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_140342-0	Original Release	20/05/2014

## **1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)**

### **1.1 EUT Identification**

<b>DESCRIPTION :</b>	Transmitter 433MHz RADIUM series
<b>TRADEMARK:</b>	
<b>MODEL:</b>	R4
<b>S/N:</b>	Not present (prototype)
<b>MANUFACTURER:</b>	ELPRO INNOTEK S.p.a.
<b>COUNTRY OF MANUFACTURER:</b>	Italy
<b>COMPOSED BY:</b>	Single
<b>EUT DIMENSIONS :</b>	See photographic documentation
<b>EUT STANDING:</b>	Hand held use
<b>FCC ID:</b>	PWJS3RT

## 1.2 EUT Technical Data

POWER SOURCE :	Internal battery
POWER SUPPLY NOMINAL VOLTAGE:	6Vdc (2x3Vdc CR2016 battery)
NOMINAL POWER OR ABSORBING CURRENT :	Not declared
ANTENNA :	Integral
MODULATION :	AM/ASK
TYPICAL USAGE :	Transmitter for automatical door
TYPE:	Intentional radiator

### 1.3 EUT ports identification

This section contains descriptions of all ports, the length and the type of the cable provided by manufacturer needed for the tests. Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connector	Max cable length
1	Enclosure	Plastic	Pressure	---
2	AC mains input/output ports	Port not present	---	---
3	DC mains input/output ports	Port not present (battery powered)	---	---
4	Signals / Control Ports	Port not present	---	---
5	Telecommunication port	Port not present	---	---

Note: During the test all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

### 1.4 EUT modification

- None

### 1.5 Auxiliary equipment

- None

## 2 REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1093	Radiofrequency radiation exposure evaluation: Portable devices.
KDB 447498	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

### 3 LIMITS

The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

#### SAR test requirements for typical exposure conditions

##### 4.2.3. Extremity exposure conditions

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation.<sup>21</sup> When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity *SAR Test Exclusion Thresholds* in section 4.3 should be applied to determine SAR test requirements. When extremity SAR testing is required, a flat phantom must be used if the exposure condition is more conservative than the actual use conditions; otherwise, a KDB inquiry is required to determine the phantom and test requirements. Body SAR compliance is also tested with a flat phantom. For devices with irregular shapes or form factors that do not conform to a flat phantom, and/or unusual operating configurations and exposure conditions, a KDB inquiry is also required to determine the appropriate SAR measurement procedures. Unless it is specified differently in the *published RF exposure KDB procedures*, when simultaneous transmission applies to extremity exposure, the simultaneous transmission SAR test exclusion provisions in section 4.3.2 should be applied. When simultaneous transmission SAR measurement is required, the enlarged zoom scan and volume scan post-processing procedures in KDB 865664 should be applied.



### 4.3. General SAR test reduction and exclusion guidance

#### 4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the *published RF exposure KDB procedures*, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding *SAR Test Exclusion Threshold* condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum *test separation distance* required for the exposure conditions.<sup>23</sup> The minimum *test separation distance* is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the *test separation distances* applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required *published RF exposure KDB procedures*. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other *published RF exposure KDB procedures* must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc.<sup>24</sup>

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances*  $\leq 50$  mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{(\text{GHz})}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{25} \text{ where}$$

- $f_{(\text{GHz})}$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation<sup>26</sup>
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum *test separation distance* is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is  $< 5$  mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.



## SAR TEST EXCLUSION TRESHOLD CALCULATION

$$\left[ \frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \cdot \sqrt{f_{\text{(GHz)}}} \right] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$

That is equivalent to

$$\left[ \frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(60/\sqrt{f_{\text{(GHz)}}} \text{ mW})} \cdot [20 \text{ mm}/(\text{min. test separation distance, mm})] \right] \leq 1.0 \text{ for 1-g SAR}$$

With

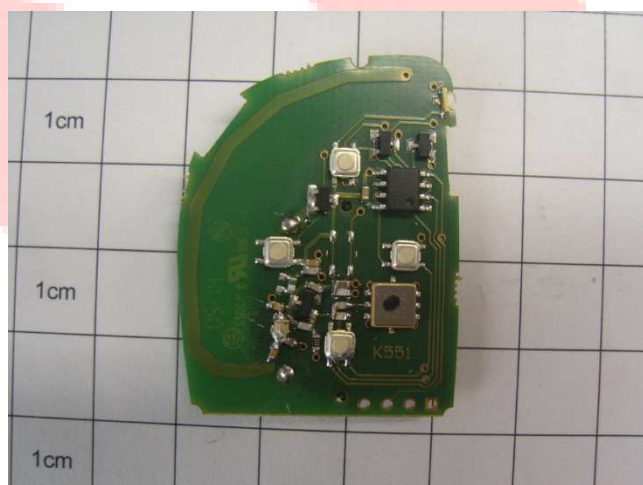
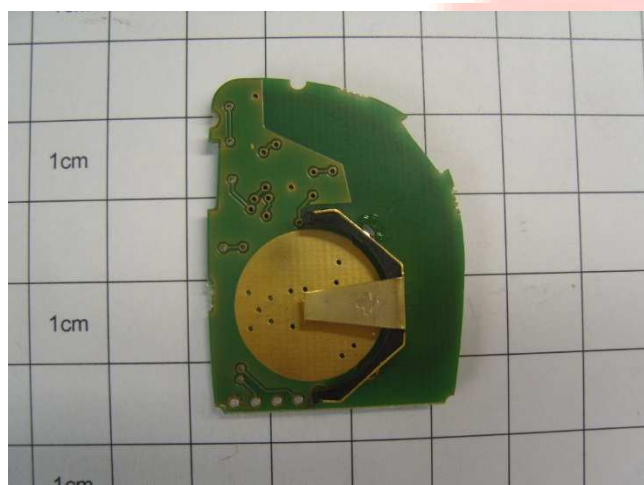
Min. test separation distance: 5mm

Carrier Frequency: 433.92MHz

The **SAR test exclusion threshold (mW)** is **22,77mW**

MEASUREMENTS			
TX Frequency (MHz)	Radiated Power (dBm)	Radiated Power (mW)	NOTE
433.92	-18.5	0.014	The Max power of channel is well below the SAR test exclusion threshold
RESULT			
EUT is Compliant with the requirements of FCC rule part 2.1093			

**PHOTO 1 – EUT IDENTIFICATON**



**PHOTO N° 2 – RADIATED EMISSION SETUP**

