Group of Administrative Co-operation
Under the Radio Equipment Directive

10th RED Market Surveillance
Campaign on IoT household appliances

REPORT

ON THE 10TH JOINT CROSS-BORDER

RED MARKET SURVEILLANCE CAMPAIGN

(2019)

Internet of things (IoT) products in the field of household appliances

Adopted by ADCO RED 12
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A. EXECUTIVE SUMMARY

As a result of discussions held at the 9th Radio Equipment Administration Cooperation working group (ADCO RED) in Sophia Antipolis it was decided that the 10th joint cross border RED market surveillance campaign would assess the administrative compliance of household appliances that are considered part of the 'Internet of Things.' The term Internet of Things (IoT) refers to the extensive and expanding group of products that traditionally would not have had radio components fitted to them but increasingly these products now have radio functionality.

There are many definitions of IoT but for the aim of this campaign, ADCO RED applied the following definition: "physical devices that can exchange data using a technology that enables both devices to communicate". This means that the device does not require an internet connection to be consider an IoT product.

The campaign focused on IoT products that fall under the scope of Directive 2014/53/EU (the Radio Equipment Directive). The Campaign was voluntary and open to all member states of whom 18 member states participated:

- 100 samples were inspected;
- 72 (72%) were found to be administratively non-compliant;
- 22 (22%) were also tested further and were found to have no non-compliances on requirement of effective use of spectrum (article 3.2 RED).

This campaign has been successful in its aim of identifying the level of administrative non-compliance by manufacturers. The low compliance rate indicates that there is an issue relating to manufacturers of traditional domestic non-radio products being unaware of their obligations under the Radio Equipment Directive 2014/53/EU when they add radio connectivity to their products.

The 22 products tested further than the remit of the campaign, whilst giving an indication of product performance, cannot be used as an accurate measure on which to base future campaigns at this stage. The high level of administrative non-compliance shown in this campaign, the relatively new development of IoT connectivity and the possibility of significant increase of availability of these products in the marketplace could result in an increase in reports of interference in the near future. Clear aims need to be identified by ADCO RED ahead any consideration of a wider campaign in the future.

B. ELEMENTS OF THE CAMPAIGN

1. Reasons for the campaign

The aim of the 10th ADCO RED cross border market surveillance campaign was to check the administrative compliance of products that traditionally would not have had radio components fitted to them. With the trend of the 'Internet of Things' (IoT) and other means of connectivity, these products now have radio functionality. Since IoT covers a relatively extensive product group, it was decided to concentrate on household appliance that contain radio connectivity.

There are many definitions of IoT but for the aim of this campaign, ADCO RED applied the following definition: "Physical devices that can exchange data using a technology that enables both devices to communicate." This means that the device is not obligatory connected to Internet.

2. Scope and purpose of the campaign

The campaign focused on IoT products that fall under the scope of the Radio Equipment Directive (RED)[1]. Products were limited to household appliances with the addition of a radio connectivity feature, utilising a wireless connection to share information between the appliance and other sources; f.e. WiFi routers, other IoT products, home automation solutions, mobile phones or similar. Entertainment and information appliances such as TV's, Printers, Cameras, alarm clocks, video game consoles, fire alarm / smoke alarm sensors, HIFI, DECT phones, virtual assistants and home automation devices were excluded from the subject of the campaign. A comprehensive list of products that fall within the scope of this campaign is available in annex E.

The campaign had several goals among others:

- to determine the administrative compliance levels of IoT products in the field of household appliances available within the EU market;
- to take appropriate actions to correct non-compliances;
- to propose further actions;
- to check where manufacturers' understanding is currently in relation to their responsibilities around compliance as they embark on attaching Internet of Things (IoT) functionality and external connectivity to their products;
- to improve the knowledge of economic operators of their obligations under the RED.

Due to the size of products and the effort required for the examinations Market Surveillance Authorities (MSA) have limited the assessment of products to administrative requirements with special attention paid to analysing parts of the technical documentation.

The campaign was also intended to provide MSAs with the opportunity to participate in joint RED market surveillance action across EU and to improve the exchange of information between them. It was agreed that TCAM, EG RE, ECC, REDCA and ETSI would be informed of this campaign and its results.

[1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

3. Participation in the campaign

Participation in the campaign was voluntary, and was open for all members of ADCO RED. Eighteen European countries participated in the campaign: Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden and Switzerland.

4. Timing

The campaign started on the 1st January 2019. The information gathering, testing and data reporting phases of the campaign ended on the 31st May 2019. Within that period, MSAs carried out their operations on their own timescales. Till end of June participants were asked to upload their results to ICSMS server using the generic DRPI (Directive Related Product Information) and to send dedicated Data Input Form to responsible persons for processing.

5. Sampling

Participating MSAs took between 1 and 10 different IoT products from their national market. The great majority of selected products use communication standards like Wi-Fi (2.4 GHz / 5 GHz) or Bluetooth version 4.1 or above (2.4 GHz) however the campaign's Code of Practice allowed to assess products with different connectivity methods.

IoT products were chosen over the whole price range (up and down the market) and from all origins (EU, EEA, EFTA, and imported from third countries). The selection also included e-commerce investigations (like eBay, Amazon etc.). Within the campaign correlation of non-compliances with price range and/or place of sampling was not investigated.

To avoid double sampling, participating MSAs were encouraged to register details of their selections of products to ICSMS as early in the campaign as possible. This way other participating countries could avoid picking the same products.

6. Documents

A Code of Practice has been drawn up to provide guidance and a common understanding of the purpose of the campaign and to ensure, if possible, the adoption of harmonised practices during the operational phase of the campaign. The results of each assessment were recorded on a common electronic Data Input Form for the RED (RED DIF).

7. Assessment procedure

Participating MSAs had to assess the product against determined administrative requirements paying attention to:

- product traceability and identification (name of the manufacturer and if applicable the importer; type designation, batch or serial number);
- CE marking on equipment and its packaging;
- involvement of a Notified Body in the conformity assessment process;
- description of intended use and information on restrictions of use for radio equipment;
- obligatory elements of DoC or its short form and availability of the full DoC;
- information on Standards applied by the manufacturer to show compliance with Article 3.2 RED (effective use of the spectrum).

If the DoC was not provided with the product, the participating MSA had to request it from the person responsible for placing the corresponding product on the market.

The participating MSAs had to request, as a minimum, the following elements of the technical documentation from the person responsible for the placing on the market of the sampled product:

- a general description of the radio equipment comprising: photographs or illustrations showing external features, markings and internal layout, versions of software or firmware affecting compliance with essential requirements and user information and installation instructions;
- test reports to demonstrate compliance with the requirement on effective use of spectrum (Article 3.2 RED);
- descriptions and explanation of the solutions adopted by the manufacturer to meet the essential requirements of the RED where Harmonised Standards have not been or only partly used;
- a copy of the EU-type examination certificate and its annexes as delivered by the conformity assessment body concerned and an adequate analysis and assessment of the risks where a conformity assessment according Annex III RED has been applied.

Participants of the campaign could carry out, on a voluntary basis, measurements against the requirement in relation to the essential requirements as defined in the RED, in particular of:

- electrical safety and health (Article 3.1.a RED);
- electromagnetic compatibility (Article 3.1.b RED);
- effective and efficient use of the radio spectrum (Article 3.2 RED).

Measurements were carried out on the basis of the OJEU Harmonised Standards which have been declared by the manufacturer. Some of them may not give presumption of conformity anymore, but were still applicable at the moment of the placing on the market of the product. The results were compared directly with the limits defined in the applied standard taking in account the measurement uncertainty of the measurement facility. Relevant Harmonised Standards, which were published in the OJEU are listed in section F of the report.

In cases where a previous version of the current Harmonised Standard was available at the moment of placing on the market, then the measurements were carried out against the previous version. In cases where two (or more) harmonised standards could be applicable at the point of placing on the market, the measurements were carried out against the least stringent.

C. RESULTS

Total number of the investigated IoT products was 100. Due to the variety of available IoT products in the field of household appliances chosen and assessed, products were initially divided into five groups, based on ICSMS categorisation:

Table 1: IoT investigated	
Product category (short name)	Number of samples
Cooking or kitchen appliance (kitchen IoT)	33
Cleaning or laundering appliance or tool (cleaning IoT)	36
Heating, cooling or air-conditioning appliance (AC IoT)	13
Personal grooming utensil (personal care IoT)	9
Other specified household appliance (other IoT)	9
Total	100

From the group of 100 products 38% were manufactured in the People's Republic of China, 18% in Germany and 5% in South Korea. In 14 cases (14%) the country of origin was not indicated.

1. Administrative non compliance

The great majority (91%) of 100 samples were checked against all the following administrative requirements: marking[2], content of DoC and some elements of technical documentation (91% checked cases). In 9 of 91 cases requested elements of the technical documentation were not received for the assessment.

Almost three out of four products (72%) had administrative non-compliance(s) within the meaning of RED.

Table 2: Summary of administrative verification results								
	Noncompliance							
	Marking		DoC		TD		**Overall**	
	Pcs	[%]	Pcs	[%]	Pcs	[%]	**Pcs**	**[%]**
kitchen IoT[3]	12	36%	18	55%	13	45%	**23**	**70%**
cleaning IoT[4]	9	26%	20	56%	11	35%	**27**	**75%**
AC IoT[5]	7	54%	9	69%	9	69%	**11**	**85%**
personal care IoT[6]	1	11%	6	67%	6	67%	**7**	**78%**
other IoT[7]	3	33%	2	22%	3	33%	**4**	**44%**
Overall[8]	**32**	**32%**	**55**	**55%**	**42**	**46%**	**72**	**72%**

[2] according to the DIF summary 'marking' requirement consists of: traceability and identification marking; CE marking on equipment and its packaging; other information, incl. instruction, safety information, used frequency band(s), maximum output power, restriction of use and languages as determined.
[3] kitchen IoT: marking – 33 pcs checked, DoC – 33 pcs checked, TD – 29 pcs checked
[4] cleaning IoT: marking – 35 pcs checked, DoC – 36 pcs checked, TD – 31 pcs checked
[5] AC IoT: marking – 13 pcs checked, DoC – 13 pcs checked, TD – 13 pcs checked
[6] personal care IoT: marking – 9 pcs checked, DoC – 9 pcs checked, TD – 9 pcs checked
[7] other IoT: marking – 9 pcs checked, DoC – 9 pcs checked, TD – 9 pcs checked
[8] overall: marking – 99 pcs checked, DoC – 100 pcs checked, TD – 91 pcs checked

2. Technical compliance

However technical assessment against the essential requirements of RED was not a main goal of the campaign. Five participating MSAs (Austria, France, Germany, Spain and Switzerland) conducted a technical assessment of the chosen IoT products. Twenty two products (22) were checked against the requirement of the effective use of the spectrum (Article 3.2 RED). All (22) sampled devices were measured according to harmonised standard EN 300 328 V2.1.1 and passed verification. Participating MSAs concentrated their assessment on Article 3.2 therefore data gathered for Article 3.1a RED (the electrical health and safety) and Article 3.1b RED (the electromagnetic compatibility) are insufficient to draw up any conclusions.

Table 3: Summary of technical verification results

	Quantity of tested products	Art. 3.2 non-compliant	Art. 3.2 non-compliant [%]
kitchen IoT	6	0	0%
cleaning IoT	9	0	0%
AC IoT	4	0	0%
personal care IoT	0	0	0%
other IoT	3	0	0%
Overall	**22**	**0**	**0%**

3. Overall non-compliance

From the group of one hundred (100) samples of IoT products in the field of household appliances assessed by participating MSAs, seventy two (72) products (72%) were found non-compliant with the requirements of the RED. Detailed statistical information is presented in table 4.

Table 4: Overall non-compliance

Group of products	Quantity	Administratively non-compliant	Art. 3.2 non-compliant	Overall non-compliant	Overall non - compliance [%]
kitchen IoT	33	23	0	23	**70%**
cleaning IoT	36	27	0	27	**75%**
AC IoT	13	11	0	11	**85%**
personal care IoT	9	7	0	7	**78%**
other IoT	9	4	0	4	**44%**
Overall	**100**	**72**	**0**	**72**	**72%**

D. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

- Almost three out of four (72%) products had administrative non-compliances within the meaning of RED.
- During the campaign, it was noticed, that some responsible economic operators can't provide MSA the requested elements of the TD, which shows that economic operators have not sufficient knowledge of their obligations.
- For all tested IoT products (22 of 100) no issues were found in relation with the requirements of the effective use of spectrum (article 3.2 RED).
- Market surveillance authorities acknowledge the opportunities that arise from the use of known and proven technologies (EN 300 328), but point out that compliance with all requirements of the RED must be respected.
- MSAs noticed that the manufacturers of the products sampled during the campaign are not aware of all obligations they have under the RED. Especially the complexity that may arise by embedding a radio functionality into a product (see "Combined equipment") that is historically not a radio product shall never be underestimated.

2. Recommendations

- The results of the campaign should be published via various communication channels widely throughout Europe. Publicity should target all economic operators in the area of household appliances industry in order to increase the knowledge of the IoT functionality from the perspective of RED requirements.
- In line with article 9 of the new Market surveillance regulation (2019/1020, MSA's are encouraged where appropriate, to engage with organizations representing economic operators in the field of IoT products to promote compliance and raise awareness of the specific requirements of the RED. Many products i.e. kitchen equipment were out of the scope of the RED, but with built in radio modules this equipment now must comply with the RED.
- European MSA should take the results of this project into consideration when making their multi annual market surveillance plans as stated in the Regulation (EC) 765/2008.
- A similar campaign or campaign targeted on different products with IoT functionality should be considered in the future to assess the effect of this project on the European market.
- MSA should increase the usage of ICSMS for exchange of information.

E. List of product's categories that are in scope of the campaign

Cooking or kitchen appliance
- Electric kettle
- Electric frying Dan, deep fryer
- Electric bread making machine
- Food processor, blender, juicer
- Powered knife
- Electric toaster, toaster oven
- Microwave oven
- Other electric cooking or food processing appliance
- Stove, oven, cooktop
- Dishwasher
- Refrigerator, freezer

Cleaning or laundering appliance or tool
- Washing machine
- Other specified clothes cleaning appliance
- Cloth dryer
- Clothes iron, press
- Vacuum cleaner
- Powered cleaning tool

Heating, cooling or air-conditioning appliance
- Fan
- Electric or gas radiator, heater

Personal grooming utensil
- Electric shaver
- Electric toothbrush
- Depilatory tools

Other specified household appliance

F. References

EN 300 328	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

G. Abbreviations

ADCO RED	Group of Administrative Cooperation for the sector of radio equipment
CIRCABC	Communication and Information Resource Centre for Administrations, Businesses and Citizens
DIF	Data Input Form
DoC	Declaration of Conformity
ECC	The Electronic Communications Committee
EEA	The European Economic Area

EG RE	Expert Group on Radio Equipment
ETSI	European Telecommunications Standards Institute
IoT	Internet of Things
ICSMS	Internet-based Information and Communication System for Europe wide cross-border Market Surveillance of technical products
MSA	Market Surveillance Authority
OJEU	The Official Journal of the European Union
RED CA	Radio Equipment Directive Compliance Association
TCAM	Telecommunication Conformity Assessment and Market Surveillance Committee (Committee of RED)
TD	Technical documentation