CEPT ECC
Electronic Communications Committee

ECC Decision (26)02

The harmonised use and exemption from individual licensing of small IoT transmit-only terminals communicating with GSO FSS networks in the frequency band 14.0-14.25 GHz (IoT-S terminals)

approved 30 October 2026

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This Decision addresses the harmonised use of frequency bands 14.0-14.25 GHz (Earth-to-space) for small IoT transmit-only FSS terminals (IoT-S terminals) within the fixed-satellite service (FSS) allocation, and exemption from individual licensing of such terminals.

The main applications of M2M/IoT operation via satellite are described in ECC Report 305 [1].

Technological innovations in the areas of small antennas, signal processing and interference cancellation have opened up alternative solutions for small IoT terminals using existing Ku-band.

The nature of many IoT applications is “transmit-only”, i.e. the IoT terminals might be implemented without simultaneously available bi-directional satellite connectivity. For terminals without bi-directional satellite connectivity, a different network control channel will allow equipment reconfiguration, from time to time.

The low equivalent isotropic radiated power (*e.i.r.p.*) of small uplink terminals (approximately 30 dBm) leads to limited signal-to-noise ratio (SNR) values in the reception, i.e. lower than -20 dB. Nevertheless, these low SNR values are sufficient to demodulate and decode the received messages, thanks to optimised signal processing algorithms in the receiver, and low data rate transmissions. Furthermore, typical IoT applications do not require the level of availability normally expected for satellite links.

The size of the terminal antennas is typically not larger than 4*4 cm in Ku-band. The small size of the terminal antennas leads to gain values typically lower than 5 dBi. The terminals are essentially transmit-only. The receiving end is implemented using regular teleport infrastructure, i.e. benefiting from large receiving antennas, and therefore higher gain values.

The IoT terminals under discussion would typically also have low duty cycles and are pre-designed to transmit in such a way as to limit the number of simultaneously transmitting terminals. This reduces the risk for interference and facilitates sharing the same frequency band with a large number of IoT terminals. Specific measures shall be put in place such that no accidental or synchronous events (e.g. at network start up, malfunctioning of IoT terminals) occur that would violate the statistical nature of this simultaneous interference.

In particular, the population of IoT-S terminals will be configured to transmit in such a manner that the aggregate *e.i.r.p.* density is maintained below the off-axis *e.i.r.p.* density limits established by the different satellite operators through coordination procedures

2 BACKGROUND

Satellites services communicating with small antennas for e.g. IoT/M2M are increasingly being used inside and outside Europe.

No coexistence issues with other radio services and applications were identified in the frequency range 14.0-14.25 GHz related to IoT-S terminal transmissions. However, unacceptable interference to current satellite services and applications within the 14.0-14.25 GHz frequency range should be avoided.

Furthermore, the Radio Equipment Directive 2014/53/EU [2] places an emphasis on efficient and effective use of the spectrum. This is achieved by requiring the performance of the transmitter, as well as its receiver, meeting certain performance specifications. The relevant ETSI harmonised European standards carry such specifications on both receiver and transmitter parameters which ensure that equipment does not cause harmful interference to other systems and services as well as equipment is built to use spectrum efficiently.

3 REQUIREMENT FOR AN ECC DECISION

There is the necessity of establishing harmonised spectrum rules to ensure the efficient use of the spectrum.

The provision of Pan European services will be greatly assisted when CEPT administrations harmonise the technical conditions for the use of IoT-S terminals communicating with Geo Stationary Orbit Fixed-Satellite Service (GSO FSS) networks in the frequency band 14.0-14.25 GHz that are specifically identified as operating with low power levels and low duty cycles that are unlikely to cause harmful interference to other authorised services.

ECC DECISION OF 30 OCTOBER 2026 ON THE HARMONISED USE AND EXEMPTION FROM INDIVIDUAL LICENSING OF SMALL IOT TRANSMIT-ONLY TERMINALS COMMUNICATING WITH GSO FSS NETWORKS IN THE FREQUENCY BAND 14.0-14.25 GHZ (IOT-S TERMINALS) (ECC DECISION (26)02)

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that the band 14.0-14.25 GHz is allocated on a worldwide and primary basis to the FSS (Earth-to-space) in the ITU Radio Regulations [4], and it is generally available for satellite services within the CEPT and elsewhere;

b) that harmonised regulations across Europe foster a robust single market for these specific radio applications, leading to economies of scale and benefits for European industry, while preventing enforcement challenges stemming from divergent national regulations;

c) that no coexistence issues to other radio services and applications were identified in ECC Report 376 [3] in the frequency range 14.0-14.25 GHz related to such use of IoT-S terminals. Furthermore, unacceptable interference on current satellite services and applications within the 14.0-14.25 GHz frequency range needs to be avoided;

d) that relevant ETSI European Standard is EN 304 651 "Satellite Earth Stations & Systems (SES); Very Small Transmit-only GSO Satellite IoT Terminals, operating within the 14,0-14,25 GHz band" [5];

e) that the parameters for technical harmonisation are derived from ECC Report 376 [3];

f) that some CEPT administrations may require operators of IoT-S terminals to obtain an individual authorisation for their network within their territory;

g) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the Radio Equipment (RE) Directive [2]. Conformity with the essential requirements of the RE Directive may be demonstrated by compliance with the applicable harmonised European standard(s), cited in the Official Journal (OJ) of the European Union, or by using the other conformity assessment procedures set out in the RE Directive.

DECIDES

1. that CEPT administrations shall exempt IoT-S terminals within the frequency band 14.0-14.25 GHz from individual licensing;

2. that CEPT administrations shall permit free circulation, and use of compliant equipment subject to the provisions in this Decision;

3. that IoT-S terminals shall comply with the technical and operational requirements of ANNEX 1;

4. that ANNEX 2 information shall be provided to the European Communications Office by the operator of IoT-S terminals;

5. that this Decision **enters into force** on 30 October 2026;

6. that the preferred **date for implementation** of this Decision shall be 30 April 2027;

7. that CEPT administrations shall communicate the **national measures** implementing this Decision to the ECC Chair and the European Communications Office when this ECC Decision is nationally implemented."

Note:

Please check the ECO Documentation Database https://docdb.cept.org/ for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: TECHNICAL AND OPERATIONAL REQUIREMENTS FOR IOT-S TERMINALS

IoT-S terminals shall comply with the following technical and operational requirements:

a) Any IoT-S terminal, when deployed, shall conform to a maximum *e.i.r.p.* of 38 dBm, maximum bandwidth of 500 kHz, maximum duty cycle 0.1%[1];

b) The IoT-S terminal network shall operate under the control and monitoring of a Network Control Facility (NCF) with the possibility for reconfiguration;

c) The total number of IoT-S terminals over CEPT countries for the network of the operator of IoT-S terminals shall have an aggregated maximum *e.i.r.p.* density that is less than 0 dBW/40kHz and be derived by averaging transmissions of the network of terminals over a period of one second;

d) Each IoT-S terminal shall transmit in such a manner to temporally spread transmissions to statistically minimise the number of simultaneously active IoT-S terminals as well as uniform spreading within the used spectrum range.

[1] The duty cycle shall be measured over a period of at least one hour. In the event of low target duty cycles, the observation period will consist of multiple periods of 1 hour so that a representative average duty cycle can be estimated.

ANNEX 2: DECLARATION TO BE SUBMITTED TO THE EUROPEAN COMMUNICATIONS OFFICE BY THE OPERATOR OF IOT-S TERMINALS

Any IoT-S network operator intending to deploy IoT-S terminals within the framework of this Decision is required to submit to the European Communications Office (https://www.cept.org/eco) a declaration given in Table 1. Any future changes to the information sought by the declaration should also be brought to the attention of the European Communications Office as soon as possible.

Table 1: Declaration to be provided to the European Communications Office

Type ID	Information
IoT-S terminals operator's name	
IoT-S terminals operator's contact information - Contact address - Contact telephone number - Contact email address	
Commercial name of the GSO satellite network(s)	
GSO satellite network operator's contact information: - Contact address - Contact telephone number - Contact email address	
ITU Notifying Administration(s) of the GSO satellite network(s)	
ITU filing name(s)	
Network Control Facility (NCF) designated point of contact: - Contact address - Contact telephone number - Contact email address	
Declaration of compliance with the technical and operational requirements of Annex 1	
Detailed description of the maximum aggregated *e.i.r.p.* density that would result from the total number of IoT-S terminals in the operator network operating over all CEPT countries.	

ANNEX 3: LIST OF REFERENCES

[1] ECC Report 305: “M2M/IoT Operation via Satellite”, approved February 2020

[2] 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.

[3] ECC Report 376: “Technical report on small IoT transmit-only satellite terminals for land and maritime applications transmitting in the 5850-5875 MHz and 14.0-14.5 GHz band”, approved May 2026

[4] ITU Radio Regulations, edition 2024

[5] Draft ETSI EN 304 651: “Satellite Earth Stations & Systems (SES); Very Small Transmit-only GSO Satellite IoT Terminals, operating within the 14,0 -14,25 GHz band”