ETSI TR 103 102 V1.1.1 (2013-08)

Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference document (SRdoc); Spectrum Requirements for Narrow band Point-to-Multipoint (nP2M) system operating in the 430 MHz - 470 MHz frequency range

Reference
DTR/ERM-320

Keywords
data, narrowband, point-to-multipoint, radio,
SRDoc

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

Executive Summary

Narrow-band point-to-multipoint systems (nP2M) provide a solution for the delivery of short messages to large receiver populations. They are optimized to guarantee very high levels of reliability as required by safety services, to be cost-efficient and to support energy-efficient operation of low-cost receivers. A typical application of nP2M systems is cost-efficient alerting services for European citizens.

With the Europe-wide provision of a spectrum of 150 kHz in the 430 MHz to 470 MHz range for an appropriate nP2M technology, the requirements of transporting urgent information to very large groups of European citizens can be easily realized and the required applications implemented. The designation of the spectrum can vary from country to country and can be divided into two blocks (bundles) with 3 adjacent 25 kHz channels each. It is beneficial but not required when neighbouring countries use the same frequencies for at least one of the blocks. In accordance with the European spectrum allocation table, a number of technologies with which nP2M can and must coexist beneficially are situated in and around the 430 MHz to 470 MHz band. Mutual benefits are possible in the area of two-way communication in security applications (380 MHz - 400 MHz), professional PMR applications (410 MHz - 430 MHz) and short-range applications in the 433 MHz band, to name just a few examples. The economical and affordable development of mass applications that use multiple technologies simultaneously requires that nP2M be located very close to these bands.

nP2M systems are designed to utilize spectrum resources efficiently by reusing spectrum in different, non-neighboured geographical regions. The geographical granularity to be supported is determined by the receiver populations, that need to be addressed (e.g. a city). In order to allow this reuse of spectrum in different regions efficiently and to support the required overall system capacity, the frequency band 430 MHz to 470 MHz is well suited. Lower spectrum bands would result in coverage areas larger than the required geographical granularity.

Providing spectrum for nP2M operations would serve the public interest in the light of these emergency notification services offered by nP2M systems. The present document provides an overview of typical nP2M technologies that could address this opportunity. Higher frequencies would not allow achieving the required coverage quality.

The SRdoc also describes and discusses the required technical specifications, possible implementation scenarios including co-existence scenarios with the incumbent services, market data and spectrum regulation (including a substantiated radio spectrum request). The document is also a basis for the further development of a standard for nP2M services.

The proponents have an interest in addressing a growing market for nP2M services in the 430 MHz to 470 MHz frequency range but are concerned that no specific regulatory guidance from CEPT/ECC exists for administrations wishing to implement nP2M systems.

Currently nP2M systems are operating on 20 kHz or 25 kHz carriers. It is advantageous to designate three neighboured carriers each of 25 kHz, since this carrier aggregation (bundling) allows to use the centred carrier for serving very simple low cost receivers (with low interference rejection capabilities) or, vice versa, allows to support applications with very high requirements on reliability and coverage on the centred carrier. The receiver capabilities specified for the simple receiver class specified below takes this deployment strategy into account and, thus, focuses on the receiver capabilities for the centred 25 kHz band.

Bundling also reduces the number of potentially effected other systems. Three isolated nP2M carriers have six neighbouring carriers where deployed other systems might be affected by adjacent channel interference. Bundling of three nP2M carriers will reduce this to only two neighboured carriers where other systems might be affected by adjacent channel interference.

Introduction

The present document has been developed to support the co-operation between ETSI and the Electronic Communications Committee (ECC) of the European Conference of Postal and Telecommunications Administrations (CEPT).

The present document is intended to help to find an appropriate frequency range by describing the system and providing an estimation of the radio spectrum demand for Narrow band Point-to-Multipoint (nP2M) system. It thus intends to lay the foundation for industry to quickly implement an innovative and useful system within Europe while avoiding harmful interference with other services and systems.

Status of the pre-approval draft system reference document

The present document has been developed and agreed by TC ERM TG DMR. The information in it has not yet undergone coordination by ERM. It contains final information.

Table 1: Document status

Target version	**Pre-approval date version (see note)**				
V1.1.1	**a**	**s**	**m**	**Date**	**Description**
V1.1.1	0.0.1			11 May 2011	Submitted to TG DMR for first review
V.1.1.1	0.0.2			05 October 2011	Submitted to TG DMR for second review
V.1.1.1	0.0.3			23 April 2012	Submitted to TG DMR for approval
V.1.1.1	0.0.4			25 September 2012	Submitted to TG DMR for approval
V.1.1.1	0.0.5			19 October 2012	Submitted to TGDMR for AbC. To be submitted to TC ERM for consideration and approval.
V1.1.1	0.0.6			23 November 2012	Approved by ERM and sent to internal enquiry by 30 November
V.1.1.1	0.0.7			07 February 2013	Sent to second round of internal enquiry after comment resolution
NOTE: See EG 201 788 [i.49] (V2.1.1), clause A.2.					

1 Scope

The present document describes Narrow band Point-to-Multipoint (nP2M) system.

It includes in particular:

- Market information.
- Technical information including expected sharing and compatibility issues.
- Regulatory issues.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ITU-R Radio Regulations, Edition 2012; Article 5.

[i.2] ERC Report 25: "The European table of frequency allocations and utilisations in the frequency range 9 kHz to 3000 GHz".

[i.3] APWPT Press Release of 08 June 2011.

NOTE: Available at http://www.apwpt.org/downloads/pm-07062011-e-petition-zum-schutz-der-drahtlos.pdf.

[i.4] ECC/DEC/(08)05: "Harmonisation of frequency bands for the implementation of digital Public Protection and Disaster Relief (PPDR) radio applications in bands within the 380-470 MHz range".

[i.5] ECC/DEC/(04)02: "Harmonised frequencies, technical characteristics and exemption from individual licensing of Non-specific Short Range Devices operating in the frequency band 433.050-434.790 MHz excluding audio and voice applications".

[i.6] ERC/REC 70-03: "Relating to the use of short range devices (SRD)".

[i.7] ETSI EN 301 783 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Commercially available amateur radio equipment".

[i.8] European Commission's press release IP/09/1595.