ICS 33.060.20 SLOVENSKÁ TECHNICKÁ NORMA Február 2018

STN	**Zariadenia s krátkym dosahom (SRD) Zariadenie radaru na sondovanie hladiny (LPR) pracujúce vo frekvenčných rozsahoch od 6 GHz do 8,5 GHz, od 24,05 GHz do 26,5 GHz, od 57 GHz do 64 GHz, od 75 GHz do 85 GHz Harmonizovaná norma vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice 2014/53/EÚ**	**STN EN 302 729 V2.1.1** 87 2729

Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/18

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Reference
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Contents

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Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.15] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU 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 [i.12].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

National transposition dates	
Date of adoption of this EN:	5 December 2016
Date of latest announcement of this EN (doa):	31 March 2017
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2017
Date of withdrawal of any conflicting National Standard (dow):	30 September 2018

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

- The present document cancels and replaces previous versions of the whole series.
- There have been no significant technical changes incorporated from the previous version of the present document.

Clauses 1 and 3 provide a general description on the types of equipment covered by the present document and the definitions and abbreviations above.

Clause 2 provides the information on normative and informative reference documentation.

Clause 4 lists all technical requirements specifications. This includes transmitter and receiver conformance requirements as well as requirements for spectrum access, antennas and mitigation techniques.

Clause 5 addresses the conditions for testing. This includes the environmental conditions and product information of the equipment to be tested. It also gives advice on the interpretation of the measurement results and gives the maximum measurement uncertainty values.

Clause 6 provides the information on conformance test suites. This includes test suites for transmitter and receiver parameters as well as test suites for spectrum access, antenna requirements and others.

Annex A explains the relationship between the present document and the essential requirements of Directive 2014/53/EU [i.12].

Annex B provides an application form for facilitating the test preparation.

Annex C lists general requirements on radiated test setups.

Annex D provides information about the requirements of conducted measurements.

Annex E lists the exact locations of radio astronomy sites. The installation of LPR instruments is restricted in the vicinity of these sites.

Annex F gives recommendations on measurement antennas and preamplifiers.

Annex G deals with practically useful approximations of the far field conditions for radiated measurements.

Annex H describes the range of modulation parameters for LPR instruments.

Annex I gives information on the atmospheric absorption of electromagnetic waves as a function of frequency.

Annex J gives practical information on RF measurements, especially in higher frequency bands.

Annex K gives information on radar targets for radiated measurements.

Annex L describes the boundary conditions for the Radar equation.

Annex M (bibliography) lists further related documents.

Annex N contains the change history of the present document.

1 Scope

The present document applies to the following equipment types:

Level Probing Radar (LPR) applications are based on pulse RF, FMCW, or similar wideband techniques. LPR radio equipment types are capable of operating in all or part of the frequency bands as specified in table 1.

Table 1: Level Probing Radar (LPR) permitted frequency bands [i.13]

	LPR assigned frequency bands (GHz)
Transmit and Receive	6 to 8,5
Transmit and Receive	24,05 to 26,5
Transmit and Receive	57 to 64
Transmit and Receive	75 to 85

The present document contains requirements to demonstrate that LPR equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

Table 1 shows a list of the frequency bands as assigned to Level Probing Radars in the European Commission Decision 2013/752/EU [i.13] on harmonised deployment conditions for industrial Level Probing Radars (LPR) as known at the date of publication of the present document.

Technical and regulatory requirements for LPR are provided in ECC Decision (11)02 [i.20], which are based on ECC Report 139 [i.8].

LPRs are used in many industries concerned with process control to measure the amount of various substances (mostly liquids or granulates). LPRs are used for a wide range of applications such as process control, custody transfer measurement (government legal measurements), water and other liquid monitoring, spilling prevention and other industrial applications. The main purposes of using LPRs are:

- to increase reliability by preventing accidents;
- to increase industrial efficiency, quality and process control;
- to improve environmental conditions in production processes.

LPRs always consist of a combined transmitter and receiver and are used with an integral or dedicated antenna. The LPR equipment is for professional applications where installation and maintenance are performed by professionally trained individuals only.

NOTE: LPR antennas are always specific directive antennas and no LPR omnidirectional antennas are used. This is also important in order to limit the illuminated surface area as well as to control and limit the scattering caused by the edges of the surface.

The scope is limited to LPRs operating as Short Range Devices (SRD).

The LPR applications in the present document are not intended for communications purposes.

2 References

2.1 Normative 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 referenced 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.

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

[1] ETSI TR 100 028 (all parts) (V1.4.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[2] CISPR 16 (part 1-1:2015), (part 1-4:2010+AMD1:2012) and (part 1-5: 2014): "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".

[3] ETSI TR 102 273 (all parts) (V1.2.1) (12-2001): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement on Radiated Methods of Measurement (using test site) and evaluation of the corresponding measurement uncertainties".

[4] ANSI C63.5 (2006): "American National Standard for Calibration of Antennas Used for Radiated Emission Measurements in Electro Magnetic Interference".

[5] ETSI EN 303 883 (V1.1.1) (09-2016): "Short Range Devices (SRD) using Ultra Wide Band (UWB); Measurement Techniques".

[6] ETSI TS 103 361 (V1.1.1) (03-2016): "Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Receiver technical requirements, parameters and measurement procedures to fulfil the requirements of the Directive 2014/53/EU".

2.2 Informative 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 referenced document (including any amendments) applies.

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

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] CEPT/ERC/REC 74-01 (2005): "Unwanted emissions in the spurious domain".

[i.2] Recommendation ITU-R SM.1754: "Measurement techniques of Ultra-wideband transmissions".

[i.3] ERA Report 2006-0713: "Conducted and radiated measurements for low level UWB emissions".

[i.4] FCC: "Revision of part 15 of the Commission's Rules Regarding Ultra- Wideband Transmission Systems", ET Docket No. 98-153, First Report and Order, April 2002.

[i.5] Recommendation ITU-R P.526-13 (11/2013): "Propagation by diffraction".

[i.6] ETSI TS 103 052: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Radiated measurement methods and general arrangements for test sites up to 100 GHz".

[i.7] Recommendation ITU-R P.676-10 (09/2013): "Attenuation by atmospheric gases".

[i.8] CEPT ECC Report 139: "Impact of Level Probing Radars Using Ultra-Wideband Technology on Radiocommunications Services", Rottach-Egern, February 2010.

[i.9] ETSI TR 102 601: "Electromagnetic compatibility and Radio spectrum Matters (ERM); System reference document; Short Range Devices (SRD); Equipment for Detecting Movement using Ultra Wide Band (UWB) radar sensing technology; Level Probing Radar (LPR)-sensor equipment operating in the frequency bands 6 GHz to 8,5 GHz; 24,05 GHz to 26,5 GHz; 57 GHz to 64 GHz and 75 GHz to 85 GHz".

[i.10] European Commission Decision 2009/343/EC amending Decision 2007/131/EC on allowing the use of the radio spectrum for equipment using ultra-wideband technology in a harmonised manner in the Community.

[i.11] ETSI TR 102 215: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Recommended approach, and possible limits for measurement uncertainty for the measurement of radiated electromagnetic fields above 1 GHz".

[i.12] 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, (OJ L153, 22.5.2014, p62).

[i.13] European Commission Decision 2013/752/EU amending Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices and repealing Decision 2005/928/EC.

[i.14] FCC part 15.256: "Operation of level probing radars within the bands 5.925-7.250 GHz, 24.05-29.00 GHz, and 75-85 GHz".

[i.15] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.16] ETSI TS 103 051: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Expanded measurement uncertainty for the measurement of radiated electromagnetic fields".

[i.17] ETSI TR 103 181-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD) using Ultra Wide Band (UWB);Transmission characteristics Part 2: UWB mitigation techniques".

[i.18] Committee on Radio Astronomy Frequencies, European Science Foundation.

NOTE: Available at www.craf.eu.

[i.19] Void.

[i.20] ECC/DEC/(11)02: "ECC Decision of 11 March 2011 on industrial Level Probing Radars (LPR) operating in frequency bands 6 - 8.5 GHz, 24.05 - 26.5 GHz, 57 - 64 GHz and 75 - 85 GHz".