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STN	**Režim 2 digitálneho spoja VHF (VDL) vzduch-zem. Technické charakteristiky a meracie metódy na pozemné zariadenia. Časť 1: Fyzická vrstva a podvrstva MAC.**	**STN EN 301 841-1 V1.4.1** 87 1841

VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 1: Physical layer and MAC sub-layer

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

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Aeronautics (AERO).

The present document is part 1 of a multi-part deliverable covering VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment, as identified below:

Part 1: "Physical layer and MAC sub-layer";

Part 2: "Upper layers";

Part 3: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

National transposition dates	
Date of adoption of this EN:	21 April 2015
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Date of withdrawal of any conflicting National Standard (dow):	31 January 2016

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 states the technical specifications for ground-based equipment implementing Very High Frequency (VHF) Digital Link (VDL) Mode 2 air interface, operating in the VHF band (117,975 MHz to 137,000 MHz) with 25 kHz channel spacing.

Manufacturers should note that in the future, all or part of the frequency band 108,000 MHz to 117,975 MHz may become available for aeronautical communications.

The VDL Mode 2 system is designed to be a Ground/Air sub-system of the Aeronautical Telecommunication Network (ATN) using the AM(R)S band and it is organized according to the Open Systems Interconnection (OSI) model (defined by ISO). It will provide reliable subnetwork services to the ATN system.

The present document may be used to produce tests for the assessment of the performance of the equipment.

1 Scope

The present document applies to VDL Mode 2 ground-air digital communications using Differential Eight Phase Shift Keying (D8PSK), intended for channel increments of 25 kHz. The VDL Mode 2 system provides data communication exchanges between aircraft and ground-based systems. The scope of the present document is limited to ground-based stations.

The present document provides functional specifications for ground-based radio equipment intended to be used for ground-air data communications. The present document is derived from the following documents:

- Annex 10 of the ICAO Convention on International Civil Aviation [1].
- ED 92B [i.2]: "MOPS for an Airborne VDL Mode-2 Transceiver Operating in the frequency range 118-136.975 MHz" (2012), which specifies the airborne transceiver.

The present document consists of two parts:

- the first part provides functional specifications and test procedures for physical layer and MAC sub-layer;
- the second part provides functional specifications and test procedures for link and sub-network access layers.

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 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.

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

[1] ICAO Convention on International Civil Aviation: "Annex 10 - Aeronautical Telecommunications, Volume III - Communication Systems, Part I - Digital Data Communication Systems, Second Edition, July 2007, incorporating Amendments up to 88A (applicable 14/11/13). Chapter 6 - VHF Air-ground Digital Link (VDL)".

[2] ICAO Convention on International Civil Aviation: "Annex 10 - Aeronautical Telecommunications, Volume V - Aeronautical Radio Frequency Spectrum Utilization", Third Edition, July 2013 incorporating Amendments up to 88A.

[3] ETSI EN 300 113-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement".

[4] ICAO Document 9776/AN970 (first edition, 2001): "Manual on VHF Digital Link (VDL) mode 2".

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 reference document (including any amendments) applies.

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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] ETSI EN 301 841-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 2: Upper layers".

[i.2] EUROCAE ED 92B: "MOPS for an Airborne VDL Mode-2 Transceiver operating in the frequency range 118-136.975 MHz".

[i.3] ISO/IEC 13239: "Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures".

[i.4] ISO/IEC 8208: "Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment".

[i.5] ISO/IEC 7498-1: "Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model".

[i.6] ISO/IEC 10731: "Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services".

[i.7] ITU Radio Regulations (2012).