IEC 62106-6

Edition 2.0 2023-05

INTERNATIONAL STANDARD

colour inside

Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz – Part 6: Compilation of technical specifications for Open Data Applications in the public domain

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.160.40

ISBN 978-2-8322-7052-3

Warning! Make sure that you obtained this publication from an authorized distributor.

® Registered trademark of the International Electrotechnical Commission

CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 8
2 Normative references 8
3 Terms, definitions, abbreviated terms and conventions 9
3.1 Terms and definitions 9
3.2 Abbreviated terms 9
3.3 Notation and conventions 9
4 ODAs in the public domain 9
4.1 ODAs in the group type A structure 9
4.1.1 Traffic Message Channel (TMC) 9
4.1.2 Other public ODAs 9
4.2 ODAs in the group type C structure for the upper data-streams 1, 2 and 3 9
5 Protocol to stream RDS on bearers different from FM (NFM) 9
Annex A (normative) Coding of RadioText Plus (RT+) tagging information for RadioText in group type 2A/B 10
A.1 General 10
A.2 Terms used 10
A.3 RT+ tag 11
A.4 RT+ information elements and data model 12
A.4.1 General 12
A.4.2 List of RT content types 12
A.4.3 Structures of RT+ messages 13
A.4.4 Receiver data model 14
A.5 RT+ coding for RT 15
A.5.1 General 15
A.5.2 RT+ identification (group type 3A) 16
A.5.3 Coding of the RT+ tag 17
A.5.4 Clearing of RT+ messages 18
A.6 Broadcasting conventions 22
A.7 Receiving conventions 22
A.8 Marking 22
Annex B (normative) Coding of RadioText Plus(RT+) tagging information for RadioText in the eRT ODA of Annex C 23
Annex C (normative) Coding of enhanced RadioText (eRT) 24
C.1 General 24
C.2 Coding eRT in ODA groups 24
C.2.1 General 24
C.2.2 eRT identification (Group type 3A) and coding of the text string 24
C.2.3 Coding of the eRT text string 25
C.2.4 UTF-8 decoding problems when used with RT+ 26
C.3 Broadcasting conventions 26
C.4 Receiving conventions 26
C.5 Marking 26
Annex D (normative) Coding of AF lists in the frequency range 64,1 MHz to 107,9 MHz: ODA-AF 27

D.1 Objective to be achieved 27
D.2 Description of the coding process 27
D.2.1 ODA-AF identification (group type 3A) 27
D.2.2 AF coding in the application group 28
D.2.3 AF method A 30
D.2.4 AF method B 30
D.2.5 Convention for identification of the AF method used 32
Annex E (normative) Station logo transmission coded in group type C 33
E.1 Objective to be achieved 33
E.2 Application identification code of this ODA 33
E.3 Station logo requirements 33
E.3.1 File type 33
E.3.2 Logo resolution, file ID, file version and file size 33
E.3.3 File transport 34
E.3.4 Display mode 34
E.3.5 Link of the logo with the PI code 34
Annex F (normative) ODA app – Slideshow transmission coded in C-group type 35
F.1 Objectives to be achieved 35
F.2 Application identification code of this ODA 35
F.3 Image requirements 35
F.3.1 File type 35
F.3.2 Resolution and file size 35
F.4 Text character coding 36
F.5 Slide structure and file elements used 36
F.6 Slide carousel used by the broadcaster, file updating and file transmission 38
F.7 File transport 38
F.7.1 General 38
F.7.2 Identification of the files 38
F.8 Directory trigger group 39
F.8.1 Function 39
F.8.2 Specification 39
F.9 Receiver display mode options 40
Annex G (normative) Internet connection options coded in C-group type 41
G.1 Objective to be achieved 41
G.2 Application identification code of this ODA 41
G.3 Choice of the ODA channel number 41
G.4 Coding of IP address with port number 41
G.4.1 General 41
G.4.2 IPv4 coding 41
G.4.3 IPv6 coding 42
G.4.4 IP address and port number coded as URL text 43
Annex H (normative) ODA tool – RDS data mode NFM 44
H.1 Objective to be achieved 44
H.2 Specification of the NFM protocol 44
Bibliography 46

Figure A.1 – Example 1: RT+ information of the category 'Item' (see Table A.2) will be attached to the programme elements Item 1 and Item 2 15

Figure A.2 – Example 2: RT+ information of the category 'Item' will be attached to the programme elements Item 1 and Item 2, but not to the programme element News 15
Figure A.3 – Example 3: RT+ information of the category 'Item' will be attached only to the programme element Item 1, but not to the programme element Talk 15
Figure A.4 – Bit allocation for group 3A (message bits and AID) 16
Figure A.5 – Coding of the message bits of the application group 17
Figure C.1 – Bit allocation for group 3A (message bits and AID) 24
Figure C.2 – Coding of the message bits of the application group type A 25
Figure D.1 – New ODA-AF – group type 3A 27
Figure D.2 – New ODA-AF application group – group type A 28
Figure F.1 – Components used in the slideshow 36
Figure F.2 – Structure of the [PREVIEW] text file 37
Figure F.3 – Structure of the [URLS] text file 37
Figure F.4 – Directory trigger group 39
Figure G.1 – Coding of IPv4 address with port number 42
Figure G.2 – URL text coding to connect to an application data server 43
Figure H.1 – NFM message format 44

Table A.1 – RT+ information elements for RT 10
Table A.2 – Code list and 'RT+ class' description of RT content types 19
Table B.1 – RT+ information elements for eRT 23
Table C.1 – eRT information elements 24
Table D.1 – 9-bit AF code table for VHF Band I (64,0 MHz to 88,0 MHz) 28
Table D.2 – 9-bit AF code table for VHF Band II (87,5 MHz to 108 MHz) 28
Table D.3 – 9-bit special meanings code table 29
Table D.4 – LF/MF code table – ITU regions 1 and 3 (9 kHz spacing) 29
Table D.5 – MF code table – ITU region 2 (10 kHz spacing) 29
Table E.1 – File ID station logo options 33
Table F.1 – Start position of each file element within [PREVIEW] 37
Table F.2 – Start position of each file element within [URL] 38
Table F.3 – File numbering system used 39
Table F.4 – Parameters used in the directory trigger group 40
Table G.1 – Address type code 42
Table G.2 – Link ID code of IP connection 42

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

RADIO DATA SYSTEM (RDS) – VHF/FM SOUND BROADCASTING IN THE FREQUENCY RANGE FROM 64,0 MHz TO 108,0 MHz –

Part 6: Compilation of technical specifications for Open Data Applications in the public domain

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62106-6 has been prepared by technical area 1: Terminals for audio, video and data services and contents, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Annex E: coding of station logo
b) Annex F: coding of slideshow
c) Annex G: coding of internet connection.
d) Annex H: ODA tool – RDS data stream NFM

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/3807/CDV	100/3871/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 62106 series, published under the general title *Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Since the mid-1980s a fascinating development has taken place. Most of the multimedia applications and standards have been created or redefined significantly. Hardware has become extremely powerful with dedicated software and middleware. In the mid-1980s, Internet as well as its protocols did not exist. Navigation systems became affordable in the late 1990s, and a full range of attractive smartphones now exist. The computing power of all these new products is comparable with that of the mainframe installations in that era.

Listener expectations have grown faster than the technology. Visual experience is now very important, like the Internet look and feel. Scrolling text or delivering just audio is nowadays perceived as insufficient for FM radio, specifically for smartphone users. New types of radio receivers with added value features are therefore required. RDS has so far proven to be very successful.

FM radio with RDS is an analogue-digital hybrid system, which is still a valid data transmission technology and only the applications need adaptation. Now the time has come to solve the only disadvantage, the lack of sufficient data capacity. With RDS2, the need to increase the data capacity can be fulfilled.

RDS was introduced in the early 1980s. During the introductory phase in Europe, the car industry became very involved and that was the start of an extremely successful roll-out. Shortly afterwards, RDS (RBDS) was launched in the USA.

The RDS Forum has investigated a solution to the issue of limited data capacity. For RDS2, both sidebands around the RDS 57 kHz subcarrier can be repeated a few times, up to three, centred on additional subcarriers higher up in the FM multiplex while still remaining compatible with the ITU Recommendations.

The core elements of RDS2 are the additional subcarriers, which will enable a significant increase of RDS data capacity to be achieved, and then only new additional data applications will have to be created, using the RDS-ODA feature, which has been part of the RDS standard IEC 62106 for many years.

In order to update IEC 62106:2015 to the specifications of RDS2, IEC 62106 has been restructured as follows:

Part 1: Modulation characteristics and baseband coding

Part 2: RDS message format, coding and definition of RDS features

Part 3: Usage and registration of Open Data Applications ODAs

Part 4: Registered code tables

Part 5: Marking of RDS and RDS2 devices

Part 6: Compilation of technical specifications for Open Data Applications in the public domain

Part 9: RBDS – RDS variant used in North America

Part 10: Universal Encoder Communication Protocol UECP

NOTE 1 The Part numbers 7 and 8 will not be used.

The original specifications of the RDS system have been maintained and the extra functionalities of RDS2 have been added.

RADIO DATA SYSTEM (RDS) – VHF/FM SOUND BROADCASTING IN THE FREQUENCY RANGE FROM 64,0 MHz TO 108,0 MHz –

Part 6: Compilation of technical specifications for Open Data Applications in the public domain

1 Scope

This part of IEC 62106 contains the technical specifications for Open Data Applications in the public domain. This document is maintained by the RDS Forum Office. The RDS Forum Office applies an easy procedure for registering new Open Data Applications, to ensure that they can be used without the need to change the RDS standard. The ODA feature permits defining new applications that can be decoded on a receiver. The receiver needs to the adequate software handler for the specific AID, which identifies the application. Receivers that have not implemented the software handler needed for decoding are not affected by ODA data received for any of the applications already defined and specified.

The procedure for registering a new ODA is described in IEC 62106-3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62106-1, *Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz – Part 1: Modulation characteristics and baseband coding*

IEC 62106-2:2021, *Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz – Part 2: Message format: coding and definition of RDS features*

IEC 62106-3, *Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz – Part 3: Usage and registration of Open Data Applications (ODAs)*

IEC 62106-4, *Radio data system (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz – Part 4: Registered code tables*

ISO/IEC 10646, *Information technology – Universal Coded Character Set (UCS)*

ISO 14819 (all parts), *Intelligent transport systems – Traffic and travel information messages via traffic message coding*