



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of IEC 62106-6:2023. It supersedes BS IEC 62106-6:2018, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio-visual equipment.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2023

ISBN 978 0 539 23334 6

ICS 33.160.40

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2023.

Amendments/corrigenda issued since publication

Date	Text affected
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INTERNATIONAL STANDARD



**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

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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

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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.

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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*

3 Terms, definitions, abbreviated terms and conventions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62106-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in IEC 62106-1 and IEC 62106-2 apply.

3.3 Notation and conventions

The notation and conventions given in IEC 62106-1 apply.

4 ODAs in the public domain

4.1 ODAs in the group type A structure

4.1.1 Traffic Message Channel (TMC)

This ODA has been standardized in ISO 14819 (all parts).

4.1.2 Other public ODAs

There exist four other public ODAs:

- Annex A: Coding of RadioText Plus (RT+) tagging information for RadioText in group type 2A/B.
- Annex B: Coding of RadioText Plus (RT+) tagging information for enhanced RadioText (eRT).
- Annex C: Coding of enhanced RadioText (eRT) using UTF-8 coding as standardized in ISO/IEC 10646.
- Annex D: Coding of AF lists in the frequency range 64,1 MHz to 107,9 MHz.

4.2 ODAs in the group type C structure for the upper data-streams 1, 2 and 3

Three public ODAs exist in this category:

- Annex E: Coding of Station logo
- Annex F: Coding of Slideshow
- Annex G: Coding of Internet connection.

5 Protocol to stream RDS on bearers different from FM (NFM)

The NFM protocol is specified in Annex H. It is an ODA development tool.

Annex A (normative)

Coding of RadioText Plus (RT+) tagging information for RadioText in group type 2A/B

A.1 General

RT+ is designed to let the listener (or user) take additional benefit from the RadioText (RT) service by enabling receivers to offer direct access to specific elements of RadioText messages (e.g. to the title of the broadcast song transmitted at the same time, to news, to telephone numbers such as those used for voting, to web addresses for browsing web content offered by the radio programme provider, etc.).

These RT+ messages carried in the RadioText messages are identified by their location within the message and by the class code of their RT content type (see Table A.2). Thus, a receiver is able to store the different RT+ messages, and the listener may then select and request a specific content type from the storage at any instant in time that fits the user's needs. The advantage of this method is that a user is no longer forced to watch a lot of information passing by. The listener rather gets the opportunity to select specifically any favourite information to be shown on a static display.

Moreover, RT+ gives the possibility to present selected RT message elements to car drivers on a quasi-static display without any major risk of distracting the attention of the driver. Furthermore, RT+ is well suited for mobile phones with built-in RDS FM receivers: telephone numbers may be routed directly from the RadioText to the dialer.

RT+ is based on RT messages and is completely backwards compatible. All additional information necessary for implementing the RT+ service is carried as an Open Data Application in group type 3A and in an associated ODA application group (see Table A.1).

The Application Identification (AID) assigned to RT+ for RT in group type 2A/B is 0x4BD7.

Table A.1 – RT+ information elements for RT

RT+ information elements		
RT message	RT+ identification	RT+ tags
Group type 2A/B (see IEC 62106-2)	AID in group type 3A	ODA application group type A

A.2 Terms used

Category: The 'RT content types' listed in Table A.2 are grouped into categories: Item (information on programme element), Info (general information services), Programme (information on the programme), Interactivity (related information), Descriptors (places and addresses, date, time, etc.) and Private classes (to be defined by individual broadcasters) and reserved codes for future amendments.

Descriptor: a category of 'RT content types' used for describing places and addresses, date and time, specific identifiers, etc.

Length marker: part of the RT+ information element which describes the additional length of the tagged RadioText message. Counted are characters (64 maximum), not bytes. The addresses of the RadioText characters range from 0 to 63.

Programme item: time-slice of a programme, for example a piece of music or a documentary report.

RT+: an extension of the RT RadioText feature, which allows storing and filtering of parts of the RadioText messages in the receiver terminal as RT+ objects that then can be displayed, selected and accessed by the listener, also independently from the transmitted RadioText messages sent at the same time.

'RT content type': the content of an RT+ message is characterized by an RT+ class code, listed in Table A.2. Sixty-four different codes exist in this table.

RT+ information elements: these are all RT+ elements for any given RT+ message, i.e. the RT+ element defined for group 3A, the RT+ ODA application group elements and the corresponding tagged RadioText elements (RT).

RT+ message: the basic information entity that is sent by the broadcaster to the listener. The listener can select the RT+ messages by their content type.

RT+ content: the RT+ content consists of one or two tagged RadioText elements (RT in group type 2A/B).

RadioText: feature of RDS for providing a programme with text messages.

RadioText message: text messages that are associated with a programme. One single RT message is not likely to be sufficient for complete comprehension by the user.

Start marker: part of the RT+ information element which describes the start position (number found by counting the text character positions within a text string) of the respective tagged RadioText message element (RT).

A.3 RT+ tag

When a RadioText message like "You are listening to 'House of the rising sun' by Eric Burdon" is sent out, the RT+ information elements 'Title' and 'Artist' are marked by two RT+ tags.

An RT+ tag consists of three elements:

- RT content type;
- start marker pointing to the position (inside the RT) of the first character of that RT+ message;
- length marker indicating the additional length (in addition to the character at the start position) of that RT+ message.

The 'RT content type' is taken from a list with 64 entries (see Table A.2).

For the example given below, the two tags are as follows:

RT content type	ITEM.TITLE
Start marker	22
Length marker	22
RT content type	ITEM.ARTIST
Start marker	50
Length marker	10

Start marker and length marker can be derived from the following scheme below:

```
You are listening to 'House of the rising sun' by Eric Burdon
0----0----1----1----2----2----3----3----4----4----5----5----6---
0----5----0----5----0----5----0----5----0----5----0----5----0---
```

The addresses of the RadioText characters range from 0 to 63, so the start marker can take the same values.

The length marker is ranging from 0 to 63 and from 0 to 31 respectively (see A.5.3).

If two RT+ messages are contained in the RadioText, they shall not overlap.

The tag information sent out should not change during the lifetime of the associated RadioText.

A.4 RT+ information elements and data model

A.4.1 General

The content of RT+ messages is carried in the RadioText (RT) messages. Their content is described by RT content type code (see Table A.2) in each RT+ tag.

A.4.2 List of RT content types

The list of defined RT content type codes, grouped in categories, is given in Table A.2. There are 64 RT+ classes of content type available, which a programme service provider can offer and the listener can select from, each with a specific RT+ class. The classes can be grouped into the following categories.

a) Item

The programme is made up of a sequence of programme items (see NOTE), corresponding to an entry in a programme schedule. A programme item may consist again of several programme elements. For all programme elements which can be designated by RT+ classes of the category "Item" in Table A.2, this document uses the term "Item". In popular music programmes, an item is a song; in a programme with classical music, it can be a complete symphony. A speech-based programme item may also be assembled from different items (see the NOTE below). Programme elements like News and Talk as shown in Figure A.2 and Figure A.3 are not "Items", as there do not exist any appropriate RT+ classes of the category "Item" in Table A.2. A programme item can be described by one, several or even all classes of this category, but for the duration of the "Item", the associated RT+ message of each class can only have a single value, for example the RT+ message classified as "Item". "Title" will remain fixed to "House of the rising sun" until the start of the next song.

NOTE A programme item can consist of only one element (e.g. radio drama) and can also be designated by RT+ classes of the category "Item" in Table A.2.

b) Info

RT+ messages of this category carry textual service information that is more or less unrelated to the audio service, but is offering important additional information to the listener, including info about alarms, advertisements and events.

c) Programme

RT content types of this category describe the programme service.

d) Interactivity

Telephone numbers, short message text SMS used for mobile phone services addressed with SMS numbers, e-mail addresses or web addresses (URLs) are given. The listener can send contributions for chat conversations to a chat centre. These contributions can be broadcast by the radio station. Questions for voting may be sent as RT+ content. The listener can send a response back to the voting centre.

e) Private classes

While all other RT+ classes describe precisely the RT content type, also to permit their interpretation by automatic routines within the receiver terminal or by a human user, the Private classes can be freely defined just as required for a specific programme service provider. The interpretation is then dependent on the programme service and does require a template on the receiver terminal. Alternatively, a program provider may supply his customers with special receivers, where the facilities to interpret own Private classes are already built in. In this particular case, no template is required.

f) Descriptors

An RT+ message belonging to one of the categories above can be complemented by an information element of the category Descriptor. Both shall always be transmitted in the same RadioText just as the corresponding tags in the same application group. As an example: the Descriptor GET_DATA contains the URL-address or the SMS number for retrieving more data describing the RT+ message the Descriptor is referring to. The listener can then get access to more information for the music item, special news, events, etc.

A.4.3 Structures of RT+ messages

For some classes, RT+ messages may be structured by the programme service provider following a general pattern, for example results of football matches may be given as RT content type INFO.SPORT with two parts, one indicating the match and the other the result.

"Bayern München:AC Milano 5:5"

This specification generalizes the scheme given above as follows:

The two different parts are separated by two or more consecutive space characters (see NOTE below), that are redundant spaces. The redundant spaces serve as a delimiter between these two parts. The first part is called the key word and will be used primarily for explanation of the text which follows.

NOTE In the examples given in this text, a space character is represented by the symbol "_".

The key word carries an explanation for the user, whereas the second part may also carry a phone number, the SMS- or MMS-telephone number or the email address to be contacted.

This scheme permits an advanced receiver to accumulate all information (carried in the sequence of RT+ messages of the same RT content type) and then to build one table for presentation to the user.

This scheme may be used for the categories 'Info', 'Programme', and 'Interactivity', and shall not be used for the categories 'Item' and 'Descriptor' for the specific RT+ classes, identified in Table A.2 with footnote d.

For explanation, the following examples are given for different classes, first lines indicating the structure, and then a line giving a specific example:

- INFO.STOCKMARKET

[Name_ Latest value in €] or more extended:

[Name_ Latest value in €_ Change_ High_ Low_ Volume] e.g.

'Nokia_12,27_0,41_12,31_12,15_23 332 238'

- INFO.SPORT

[Match_ Result] or more extended:

[Kind of sport_ Match_ Result] e.g.

'Football_ Bayern München:AC Milano_5:5'