IEC 62106-4

Edition 1.0 2018-09

INTERNATIONAL STANDARD

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

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FOREWORD

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International Standard IEC 62106-4 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.

This first edition, together with IEC 62106-1, IEC 62106-2, IEC 62106-3, IEC 62106-5 and IEC 62106-6, cancels and replaces IEC 62106:2015, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 62106:2015:

- Provision has been made to carry RDS on multiple data-streams (RDS2).
- The country identification table has been updated by adding some countries.
- Translated PTY terms for 20 languages have been added.

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

CDV	Report on voting
100/2908/CDV	100/3058/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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 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

The following future parts are planned:

Part 7: RBDS

Part 8: Universal Encoder Communication Protocol UECP

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

Obsolete or unused functions from the original RDS standard have been deleted.

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

1 Scope

This part of IEC 62106 provides a number of tables for use in the implementation of the RDS system. This document specifies the procedure for registering a new value in an existing table or the registration of a new table.

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 (all parts), *Radio Data System (RDS) – VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz*

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

3 Terms, definitions, abbreviated terms and conventions

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

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

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

4 Registration procedure

4.1 Registration authority

The content of this document is maintained by the RDS Forum Office. Applications for the registration of a value in an existing table or registration of a new table are to be sent to the address below. Note that only applications which are in line with the rules described in the following clauses can be accepted by the registration authority.

Applications for registration should be sent to:

RDS Forum Office
E-mail: rdsforum@bluewin.ch

4.2 Registration of a value in an existing table

Applications for a new value to be defined in an existing table shall be sent to the RDS Forum Office. The requirement shall be clearly stated, including table to be considered, requirement and proposed number to be used. Support from other organizations for the request should be cited also.

The RDS Forum Office will confirm that no numbering conflicts occur at this stage and circulate the proposal to the RDS Forum members for a 30-day comment period. If there are no adverse comments, then the application, as amended by any helpful editorial suggestions, will be accepted and published within 30 days on the RDS Forum website. If there are adverse comments, then the application will be considered by RDS Forum at its next plenary meeting following the comment period. The RDS Forum Office will prepare a briefing for that meeting and the applicant will be given an opportunity to describe their proposal and reasons for it. The decision of the RDS Forum meeting will be final and if the application is accepted, as amended by any helpful editorial suggestions, it will be published within 30 days on the RDS Forum website.

4.3 Registration of a new table

Applications for a new table to be defined shall be sent to the RDS Forum Office. The requirement shall be clearly stated, including table function to be considered, requirement and proposed numbering system to be used. Support from other organizations for the request should be cited also.

The RDS Forum Office will prepare a briefing for the next plenary RDS Forum meeting and the applicant will be given an opportunity to describe his proposal and reasons for it. The decision of the RDS Forum meeting will be final and if the application is accepted, as amended by any helpful editorial suggestions, it will be published within 30 days on the RDS Forum website.

5 Registered code tables for RDS and RDS2

5.1 Country identification

Tables 1 to 3 are separated into International Telecommunications Union (ITU) regions for convenience only; they contain Country Identifiers (CI code) and the Extended Country Codes (ECC) and, for information, the ISO 2-letter country code. The ECC and CI codes are shown in their hexadecimal format. CI code "0" (hex) is not used.

NOTE Some countries have identified their remote territories with the same country code as the one used for the mainland. Unless this is changed by the countries concerned, receivers cannot distinguish these areas.

Table 1 – ITU Region 1 – ECC and CI codes *(1 of 2)*

Country	ISO code	ECC	CI code	Country	ISO code	ECC	CI code
Albania	AL	E0	9	Estonia	EE	E4	2
Algeria	DZ	E0	2	Ethiopia	ET	D1	E
Andorra	AD	E0	3	Faroe (Denmark)	DK	E1	9
Angola	AO	D0	6	Finland	FI	E1	6
Armenia	AM	E4	A	France	FR	E1	F
Ascension Island	SH	D1	A	Gabon	GA	D0	8
Austria	AT	E0	A	Gambia	GM	D1	8
Azerbaijan	AZ	E3	B	Georgia	GE	E4	C
Azores (Portugal)	PT	E4	8	Germany	DE	E0	D, 1
Bahrein		F0	E	Ghana	GH	D1	3
Belarus	BY	E3	F	Gibraltar	GI	E1	A
Belgium	BE	E0	6	Greece	GR	E1	1
Benin	BJ	D0	E	Guinea	GN	D0	9
Bosnia Herzegovina	BA	E4	F	Guinea-Bissau	GW	D2	A
Botswana	BW	D1	B	Hungary	HU	E0	B
Bulgaria	BG	E1	8	Iceland	IS	E2	A
Burkina Faso	BF	D0	B	Iraq	IQ	E1	B
Burundi	BI	D1	9	Ireland	IE	E3	2
Cabinda		D3	4	Israel	IL	E0	4
Cameroon	CM	D0	1	Italy	IT	E0	5
Canaries (Spain)	ES	E2	E	Jordan	JO	E1	5
Cape Verde	CV	D1	6	Kazakhstan	KZ	E3	D
Central African Republic	CF	D0	2	Kenya	KE	D2	6
Chad	TD	D2	9	Kosovo		E4	7
Comoros	KM	D1	C	Kuwait	KW	F2	1
Congo (Democratic Republic of)	CD	D2	B	Kyrgyzstan	KG	E5	3
Congo (Republic of)	CG	D0	C	Latvia	LV	E3	9
Cote d'Ivoire	CI	D2	C	Lebanon	LB	E3	A
Croatia	HR	E3	C	Lesotho	LS	D3	6
Cyprus	CY	E1	2	Liberia	LR	D1	2
Czech Republic	CZ	E2	2	Libya	LY	E1	D
Denmark	DK	E1	9	Liechtenstein	LI	E2	9
Djibouti	DJ	D0	3	Lithuania	LT	E2	C
Egypt	EG	E0	F	Luxembourg	LU	E1	7
Equatorial Guinea	GQ	D0	7	Macedonia	MK	E4	3
Eritrea	ER	D2	F	Madagascar	MG	D0	4

Table 1 *(2 of 2)*

Country	ISO code	ECC	CI code
Madeira (Portugal)	PT	E4	8
Malawi	MW	D0	F
Mali	ML	D0	5
Malta	MT	E0	C
Mauritania	MR	D1	4
Mauritius	MU	D3	A
Moldova	MD	E4	1
Monaco	MC	E2	B
Mongolia	MN	F3	F
Montenegro	ME	E3	1
Morocco	MA	E2	1
Mozambique	MZ	D2	3
Namibia	NA	D1	1
Netherlands	NL	E3	8
Niger	NE	D2	8
Nigeria	NG	D1	F
Norway	NO	E2	F
Oman	OM	F1	6
Palestine	PS	E0	8
Poland	PL	E2	3
Portugal	PT	E4	8
Qatar	QA	F2	2
Romania	RO	E1	E
Russian Federation	RU	E0	7
Rwanda	RW	D3	5
San Marino	SM	E1	3
Sao Tome and Principe	ST	D1	5
Saudi Arabia	SA	F0	9
Senegal	SN	D1	7
Serbia	RS	E2	D

Country	ISO code	ECC	CI code
Seychelles (Republic of)	SC	D3	8
Sierra Leone	SL	D2	1
Slovakia	SK	E2	5
Slovenia	SI	E4	9
Somalia	SO	D2	7
South Africa	ZA	D0	A
South Sudan	SS	D4	A
Spain	ES	E2	E
Sudan (Republic of)	SD	D3	C
Swaziland	SZ	D2	5
Sweden	SE	E3	E
Switzerland	CH	E1	4
Syria	SY	E2	6
Tajikistan	TJ	E3	5
Tanzania	TZ	D1	D
Togo	TG	D0	D
Tunisia	TN	E2	7
Turkey	TR	E3	3
Turkmenistan	TM	E4	E
Uganda	UG	D2	4
Ukraine	UA	E4	6
United Arab Emirates	AE	F2	D
United Kingdom	GB	E1	C
Uzbekistan	UZ	E4	B
Vatican	VA	E2	4
Western Sahara	EH	D3	3
Yemen	YE	F3	B
Zambia	ZM	D2	E
Zimbabwe	ZW	D2	2

Table 2 – ITU Region 2 – ECC and CI codes

Country	ISO code	ECC	CI code
Anguilla	AI	A2	1
Antigua and Barbuda	AG	A2	2
Argentina	AR	A2	A
Aruba	AW	A4	3
Bahamas	BS	A2	F
Barbados	BB	A2	5
Belize	BZ	A2	6
Bermuda	BM	A2	C
Bolivia	BO	A3	1
Brazil	BR	A2	B or C, D,3
Canada	CA	A1	B or C, D, E
Cayman Islands	KY	A2	7
Chile	CL	A3	C
Colombia	CO	A3	2
Costa Rica	CR	A2	8
Cuba	CU	A2	9
Dominica	DM	A3	A
Dominican Republic	DO	A3	B
El Salvador	SN	A4	C
Equator	EC	A2	3
Falkland Islands	FK	A2	4
Greenland	GL	A1	F
Grenada	GD	A3	D
Guadeloupe	GP	A2	E
Guatemala	GT	A4	1

Country	ISO code	ECC	CI code
Guyana	GY	A3	F
Haiti	HT	A4	D
Honduras	HN	A4	2
Jamaica	JM	A3	3
Martinique	MQ	A3	4
Mexico	MX	A5	B or D, E, F
Montserrat	MS	A4	5
Netherlands Antilles	AN	A2	D
Nicaragua	NI	A3	7
Panama	PA	A3	9
Paraguay	PY	A3	6
Peru	PE	A4	7
Puerto Rico	PR	A0	1 to 9 or A, B, D, E
St. Kitts	KN	A4	A
St. Lucia	LC	A4	B
St. Pierre and Miquelon	PM	A6	F
St. Vincent	VC	A5	C
Suriname	SR	A4	8
Trinidad and Tobago	TT	A4	6
Turks and Caicos islands	TB	A3	E
United States of America	US	A0	1 to 9 or A, B, D, E
Uruguay	UY	A4	9
Venezuela	VE	A4	E
Virgin islands (British)	VG	A4	F
Virgin Islands (USA)	VI	A0	1 to 9 or A, B, D, E

Table 3 – ITU Region 3 – ECC and CI codes

Country	ISO code	ECC	CI code
Afghanistan	AF	F0	A
Australia:	AU		
- Capital Territory		F0	1
- New South Wales		F0	2
- Victoria		F0	3
- Queensland		F0	4
- South Australia		F0	5
- Western Australia		F0	6
- Tasmania		F0	7
- Northern Territory		F0	8
Bangladesh	BD	F1	3
Bhutan	BT	F1	2
Brunei Darussalam	BN	F1	B
Cambodia	KH	F2	3
China	CN	F0	C
		F3	8
		F4	9
Fiji	FJ	F1	5
Hong Kong	HK	F1	F
India	IN	F2	5
Indonesia	ID	F2	C
Iran	IR	F1	8
Japan	JP	F2	9
Kiribati	KI	F1	1
Korea (North)	KP	F0	D

Country	ISO code	ECC	CI code
Korea (South)	KR	F1	E
Laos	LA	F3	1
Macao	MO	F2	6
Malaysia	MY	F0	F
Maldives	MV	F2	B
Marshall Islands	MH	F4	B
Micronesia	FM	F3	E
Myanmar (Burma)	MM	F0	B
Nauru	NR	F1	7
Nepal	NP	F2	E
New Zealand	NZ	F1	9
Pakistan	PK	F1	4
Papua New Guinea	PG	F3	9
Philippines	PH	F2	8
Samoa	WS	F2	4
Singapore	SG	F2	A
Solomon Islands	SB	F1	A
Sri Lanka	LK	F1	C
Taiwan	TW	F1	D
Thailand	TH	F3	2
Tonga	TO	F3	3
Vanuatu	VU	F2	F
Vietnam	VN	F2	7

5.2 Basic and extended RDS character sets

Two character coding methods are used in RDS: the basic RDS character set in Table 4 and Table 5, and UTF-8.

Table 4 contains the basic RDS character set, which shall be used for transmitting Programme Service name (PS), Programme Type Name (PTYN), and RadioText (RT). Table 5 contains the same basic transmitted RDS character set mapped to non-transmitted UCS-2 equivalents to assist symbol identification

Table 6 contains an extended character set, which shall be used, UTF-8 coded, for long PS and eRT/eRT+ in countries of the European Broadcasting Area. Even more extended character coding is possible using UTF-8 coding in conformity with ISO/IEC 10646 for long PS and eRT/eRT+. Table 6 is provided to help equipment designers to identify character symbols used by the official languages in countries of the European Broadcasting Area, an area term defined by the ITU (all European countries and those bordering the Mediterranean Sea).

Table 4 – Basic RDS character set

				b7	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b6	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b5	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b4	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b3	b2	b1	b0		2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	SPACE	0	@	P	‖	p	á	â	ª	º	Á	Â	Ã	ã
0	0	0	1	1	!	1	A	Q	a	q	à	ä	α	¹	À	Ä	Å	å
0	0	1	0	2	"	2	B	R	b	r	é	ê	©	²	É	Ê	Æ	æ
0	0	1	1	3	#	3	C	S	c	s	è	ë	‰	³	È	Ë	Œ	œ
0	1	0	0	4	¤	4	D	T	d	t	í	î	Ğ	±	Í	Î	ŷ	ŵ
0	1	0	1	5	%	5	E	U	e	u	ì	ï	ě	İ	Ì	Ï	Ý	ý
0	1	1	0	6	&	6	F	V	f	v	ó	ô	ň	ń	Ó	Ô	Õ	õ
0	1	1	1	7	'	7	G	W	g	w	ò	ö	ő	ű	Ò	Ö	Ø	ø
1	0	0	0	8	(	8	H	X	h	x	ú	û	π	µ	Ú	Û	Þ	þ
1	0	0	1	9	)	9	I	Y	i	y	ù	ü	€	¿	Ù	Ü	Ŋ	ŋ
1	0	1	0	A	*	:	J	Z	j	z	Ñ	ñ	£	÷	Ř	ř	Ŕ	ŕ
1	0	1	1	B	+	;	K	[	k	{	Ç	ç	$	°	Č	č	Ć	ć
1	1	0	0	C	,	<	L	\	l	|	Ş	ş	←	¼	Š	š	Ś	ś
1	1	0	1	D	-	=	M	]	m	}	ß	ğ	↑	½	Ž	ž	Ź	ź
1	1	1	0	E	.	>	N	—	n	¯	¡	ı	→	¾	Đ	đ	Ŧ	ŧ
1	1	1	1	F	/	?	O	_	o		Ij	ij	↓	§	Ŀ	ŀ	ð	

NOTE 1 DAB receivers have used and implemented the same basic character set as the one given in Table 4. However, as this character set does not include a number of special characters used in Central and Eastern Europe, ETSI standardized for DAB receivers in September 2015 a modified and extended set. For RDS receivers the modification agreed by ETSI cannot be applied for reasons of backwards compatibility.

NOTE 2 The only control codes used in RDS are 0x0A 'line feed' and 0x0D ‘carriage return’. It is used to mark the end of text in RT, eRT and long PS. All other control codes in the range 0x01 to 0x1F are not assigned.

NOTE 3 For the characters 0x20 to 0x7F the coding mostly complies with ISO/IEC 10646. The characters 0x80 to 0xFE were mapped (by the European Broadcasting Union (EBU)), prior to ISO/IEC 10646, to accommodate the most frequently used symbols in the Western part of Europe.