

R&S[®]SMCVB-KS16

DRM Streams

User Manual



1179270202
Version 04

ROHDE & SCHWARZ
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This document describes the following software options:

- R&S®SMCVB-KS16 DRM Streams (1434.5134.xx)

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Throughout this document, R&S® is indicated as R&S.

Contents

1	Welcome to the R&S SMCVB-KS16 option.....	5
1.1	Key features.....	5
1.2	Installation.....	5
1.3	What's new.....	9
1.4	Documentation overview.....	10
1.4.1	Getting started manual.....	10
1.4.2	User manuals and help.....	10
1.4.3	Service manual.....	10
1.4.4	Instrument security procedures.....	10
1.4.5	Printed safety instructions.....	11
1.4.6	Specifications and product brochures.....	11
1.4.7	Calibration certificate.....	11
1.4.8	Release notes and open source acknowledgment.....	11
1.4.9	Application notes, application cards, white papers, etc.....	11
1.4.10	Videos.....	11
2	DRM stream files.....	12
2.1	Basic folder.....	12
2.1.1	Robustness mode A.....	13
2.1.2	Robustness mode B.....	18
2.1.3	Robustness mode C.....	23
2.1.4	Robustness mode D.....	24
2.1.5	Robustness mode E.....	26
2.2	EN 303 345 DRM testing folder.....	27
2.2.1	Wanted DRM signals.....	27
2.2.2	Unwanted DRM signals.....	29
	Index.....	33

1 Welcome to the R&S SMCVB-KS16 option

The R&S SMCVB-KS16 is a stream library that provides stream files in accordance with the DRM digital standard.

This user manual contains a reference description of the functionality that the stream library provides. All functions not discussed in this manual are described in the R&S SMCV100B user manual. The latest version is available at:

www.rohde-schwarz.com/manual/SMCV100B

1.1 Key features

The R&S SMCVB-KS16 features:

- Numerous stream files in accordance with DRM digital standard
- Streaming of high-quality video contents
- Streaming of high-quality audio contents
- Efficient use with dedicated streams

1.2 Installation

Required options

The equipment layout for processing files of waveform libraries includes:

- R&S SMCV100B base unit (64 MSample ARB memory, 60 MHz RF bandwidth)
- DRM stream library option (R&S SMCVB-KS16)
- Enable Broadcast Standards option (R&S SMCVB-K519)
- DRM digital standard option (R&S SMCVB-K160)

To register for access to the libraries

R&S SMCV100B stream and waveform libraries are available for download for registered users on the "Vector Signal Generator Customer Web" at the global Rohde & Schwarz information system (GLORIS).

1. For access, register at <https://gloris.rohde-schwarz.com>:
In the section "How to register", follow the instructions provided in the introduction video "How to register for GLORIS".
2. Register to GLORIS with the creation of a personal account.

Mr.
 Mrs.
 Ms.
 No information

First Name Last Name

Email

Country City

Company

Reason for registration
 Please tell us the reason for your registration (i.e. which product you have or what kind of information you want to get). If you already have a contact person at Rohde & Schwarz, please add the email address of your contact as well.

Password Retype Password

I accept the [Terms of Use](#) for a global Rohde & Schwarz Extranet account
 I accept the following [Marketing Permission](#)
 I want to register for e-commerce

Register Now

3. For access to the "Vector Signal Generator Customer Web", provide the following information:
- Specify that you want access to the "Vector Signal Generator Customer Web".
 - Include the material number and serial number of your device.
The label is located on the rear panel of the R&S SMCV100B.
- a) When using a new GLORIS account, fill the information in the "Reason for registration" field.

Reason for registration

Please tell us the reason for your registration (i.e. which product you have or what kind of information you want to get). If you already have a contact person at Rohde & Schwarz, please add the email address of your contact as well.

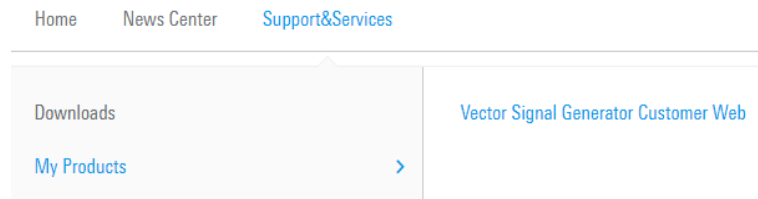
- b) When using an existing GLORIS account, click "Customer support" and fill in the information into an email.

Contact

E-Mail [Customer Support](#)

To access "Product Related Documents"

1. Log in to GLORIS.
2. In the menu bar, select "Support&Services > My Products > Vector Signal Generator Customer Web".



The "R&S SMCV100B Customer Web" page opens.

3. In the selection field "Product Selection for VSG", select "R&S®SMCV100B".

A webpage opens and displays search results for products related to the R&S SMCV100B.

Product Related Documents



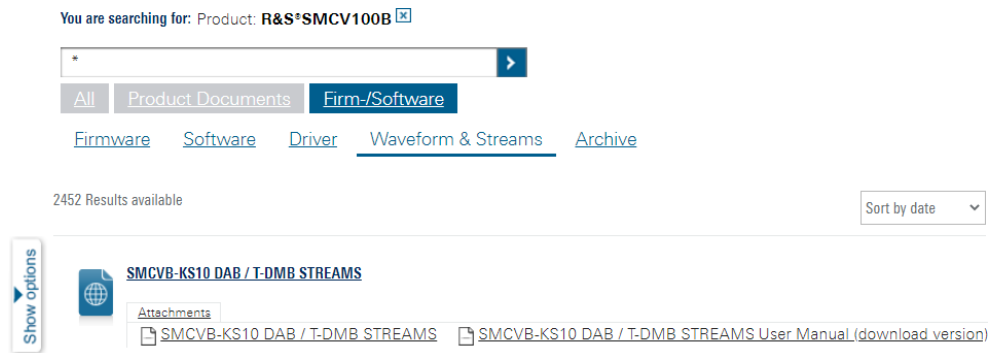
To download a library file

This procedure describes how to download library files. It provides a step-by-step description for download of a stream library file. The download of waveform library files is analogous.

1. Access the "Product Related Documents" webpage as described in "[To access "Product Related Documents"](#)" on page 6.
2. In the search navigation bar, select "Firm-/Software" > "Waveform & Streams".

The search lists all information related to stream and waveform libraries of the R&S SMCV100B:

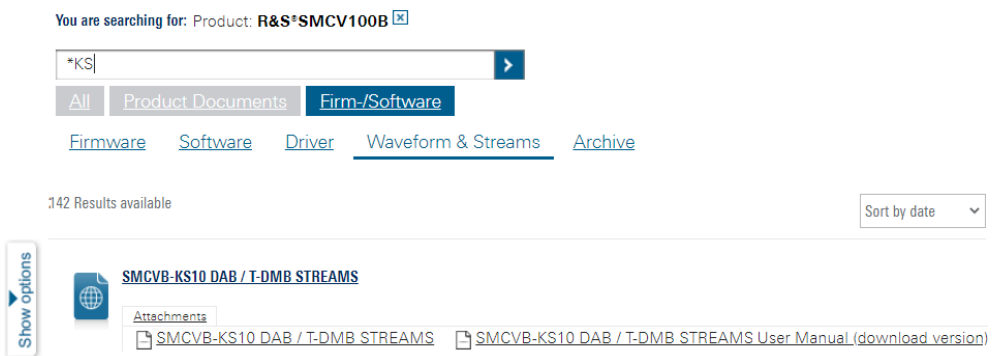
- R&S SMCVB-KSxx results relate to stream libraries.
- R&S SMCVB-KVxx results relate to waveform libraries.



3. Optionally, deactivate the filtering to display all waveform and stream library content.
 - a) On the left menu, select "Show options".
 - b) Click "Filtering on. Reset all filters."

Filtering on. Reset all filters.

4. Optionally, to filter for stream library content enter *KS in the search input field.



5. In the search result list, navigate to the required library.
6. To download required library files, click the download link in the "Attachments" section of the library product page.
For example, for DAB/T-DMB streams, click the download link "R&S SMCVB-KS10 DAB / T-DMB STREAMS".

A download dialog opens to select and save files of the stream library.

To save a library file

- ▶ Save the library file to one of the following storage locations:
 - External storage device (HDD, memory stick): Use an external USB storage device to save large files or complete libraries. Connect the storage device to one of the USB 3.0 connectors on the rear panel of the R&S SMCV100B. If detected correctly, you can access the files on the R&S SMCV100B in the /usb/ directory in the file-select dialogs.

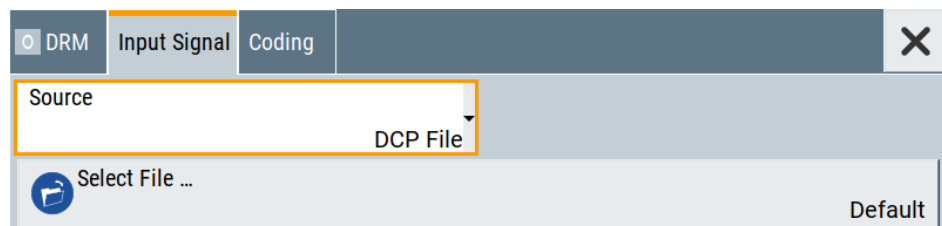
The R&S SMCV100B supports the following storage formats: ext2/ext3/ext4, FAT16/FAT32, NTFS (read-only), ISO9660, UDF

- Internal memory (SSD): Use the internal memory to save single files to the user directory `/var/user/` of the R&S SMCV100B, for example, using FTP via a LAN connection.

To load and play a DRM stream library file

1. Load the file from its storage location:
 - External storage device (HDD, memory stick): Load the file from the `/usb/` directory.
 - Internal memory (SSD): Load the file from the user directory `/var/user/`

Note: Library files are encrypted files (`*.dcp_c`). Loading the library file at the R&S SMCV100B requires installation of the DRM stream library option (R&S SMCVB-KS16).
2. To load the file at the R&S SMCV100B, navigate to the "DRM" digital standard dialogs:
 - a) Select "Baseband" > "Audio Broadcast" > "DRM".
 - b) Select "Input Signal" > "Source" > "DCP File".



- c) Select "Select File" > "Select DRM DCP File".
To select the file, navigate to the storage location (1).
3. Select "DRM" > "State" > "On", to activate the baseband signal.
The R&S SMCV100B activates the baseband signal processes the stream file.
 4. In the block diagram, select "RF" > "On".
The stream file is modulated onto the RF carrier and output at the "RF 50 Ω " connector.

1.3 What's new

Compared to the previous version the documentation provides updated installation instructions to access, download and play waveform library files, see [Chapter 1.2, "Installation"](#), on page 5.

1.4 Documentation overview

This section provides an overview of the R&S SMCV100B user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/smcv100b

1.4.1 Getting started manual

Introduces the R&S SMCV100B and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

1.4.2 User manuals and help

Separate manuals for the base unit and the software options are provided for download:

- **Base unit manual**
Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance, instrument interfaces and error messages. Includes the contents of the getting started manual.
- **Software option manual**
Contains the description of the specific functions of an option. Basic information on operating the R&S SMCV100B is not included.

The contents of the user manuals are available as help in the R&S SMCV100B. The help offers quick, context-sensitive access to the complete information for the base unit and the software options.

All user manuals are also available for download or for immediate display on the internet.

1.4.3 Service manual

Describes the performance test for checking compliance with rated specifications, firmware update, troubleshooting, adjustments, installing options and maintenance.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS):

<https://gloris.rohde-schwarz.com>

1.4.4 Instrument security procedures

Deals with security issues when working with the R&S SMCV100B in secure areas. It is available for download on the internet.

1.4.5 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

1.4.6 Specifications and product brochures

The specifications document, also known as the data sheet, contains the technical specifications of the R&S SMCV100B. It also lists the firmware applications and their order numbers, and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See www.rohde-schwarz.com/brochure-datasheet/smcv100b

1.4.7 Calibration certificate

The document is available on <https://gloris.rohde-schwarz.com/calcert>. You need the device ID of your instrument, which you can find on a label on the rear panel.

1.4.8 Release notes and open source acknowledgment

The release notes list new features, improvements and known issues of the current software version, and describe the software installation.

The software uses several valuable open source software packages. An open source acknowledgment document provides verbatim license texts of the used open source software.

www.rohde-schwarz.com/firmware/smcv100b

1.4.9 Application notes, application cards, white papers, etc.

These documents deal with special applications or background information on particular topics.

For some application sheets, see also:

www.rohde-schwarz.com/application/smcv100b

1.4.10 Videos

Find various videos on Rohde & Schwarz products and test and measurement topics on YouTube: <https://www.youtube.com/@RohdeundSchwarz>

2 DRM stream files

The DRM stream library (R&S LIB-K60) contains DCP files for basic test purposes and DRM testing according to ETSI EN 303 345-5 v0.0.5.

2.1 Basic folder

The files in this folder are for basic test purposes. There is one file for each allowed combination of robustness mode and channel bandwidth.

All files in this folder have the same audio content with a variation of the coding parameters.

Naming conventions

The main broadcasting parameters are coded in the file name.

- <robustness mode>
'A', 'B', 'C', 'D' or 'E' depending on the robustness mode.
- <channel bandwidth>
Channel bandwidth in kHz coded as two digits.
 - '04' for 4.5 kHz
 - '05' for 5 kHz
 - '09' for 9 kHz
 - '10' for 10 kHz
 - '18' for 18 kHz
 - '20' for 20 kHz
 - '100' for 100 kHz
- '_M'
For main service channel (MSC)
- <constellation of MSC cells>
 - '16' for 16 QAM
 - '64' for 64 QAM
 - '64I' for 64 QAM hierarchical on I
 - '64Q' for 64 QAM hierarchical on I and Q
- <interleaver depth>
 - 'S' for short interleaving (in robustness modes A to D) or for standard interleaving (in robustness mode E)
 - 'L' for long interleaving (in robustness modes A to D)
- <protection level of MSC>
One to three digits out of '0', '1', '2' and '3', depending on constellation, hierarchical modulation and equal error protection (EEP) or unequal error protection (UEP).
In non-hierarchical modulation, the first digit refers to the higher protected part (HPP) and the second digit, if any, refers to the lower protected part (LPP).
In hierarchical modulation, the first digit refers to the very strongly protected part (VSPP). The second digit refers to the higher protected part (HPP). The third digit, if any, refers to the lower protected part (LPP).

- _S
For service description channel (SDC)
- <constellation of SDC cells>
 - '4' for 4 QAM
 - '16' for 16 QAM
- .DCP_C
Extension of the encrypted files

Example for naming conventions: A04_M64S1_S4.DCP_C

Robustness mode: A

Channel bandwidth: 4.5 kHz

Constellation of MSC cells: 64 QAM

Interleaver depth: short (= 400 ms)

Protection level of MSC: 1

Constellation of SDC cells: 4 QAM

2.1.1 Robustness mode A

2.1.1.1 A04_M64S3_S16

Table 2-1: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	4.5 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=3
SDC constellation	16-QAM

Table 2-2: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)
Language	German
Country	Germany

Table 2-3: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	14740 bps

2.1.1.2 A05_M64S2_S4

Table 2-4: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	5 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=2
SDC constellation	4-QAM

Table 2-5: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)
Language	German
Country	Germany

Table 2-6: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	15040 bps

2.1.1.3 A09_M64L0_S4

Table 2-7: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	9 kHz
MSC constellation	64-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=0
SDC constellation	4-QAM

Table 2-8: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)
Language	German
Country	Germany

Table 2-9: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	19680 bps

2.1.1.4 A10_M16L1_S4

Table 2-10: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	10 kHz
MSC constellation	16-QAM
Interleaver depth	2 s

MSC protection level	EEP, PL=1
SDC constellation	4-QAM

Table 2-11: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)
Language	German
Country	Germany

Table 2-12: Service parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	24 kHz
Bit rate	18440 bps

Table 2-13: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	24 kHz
Bit rate	18440 bps

2.1.1.5 A18_M64S0_S4

Table 2-14: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	18 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms

MSC protection level	EEP, PL=0
SDC constellation	4-QAM

Table 2-15: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)
Language	German
Country	Germany

Table 2-16: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	stereo
SBR	enabled
Sampling rate	24 kHz
Bit rate	40920 bps

2.1.1.6 A20_M64S0_S16

Table 2-17: Main broadcasting parameters

Play length	10 min
Robustness mode	A
Channel bandwidth	20 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=0
SDC constellation	16-QAM

Table 2-18: Service parameters

Parameter	Service #0
DRM service label	"DRM Service A"
Service ID	0x1001 (4097)
Program type	Serious classical (14)

Language	German
Country	Germany

Table 2-19: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	stereo
SBR	enabled
Sampling rate	24 kHz
Bit rate	45840 bps

2.1.2 Robustness mode B

2.1.2.1 B04_M64L3_S16

Table 2-20: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	4.5 kHz
MSC constellation	64-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=3
SDC constellation	16-QAM

Table 2-21: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)
Language	English
Country	United Kingdom

Table 2-22: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS

Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	12 kHz
Bit rate	11300 bps

2.1.2.2 B05_M64S3_S4

Table 2-23: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	5 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=3
SDC constellation	4-QAM

Table 2-24: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)
Language	English
Country	United Kingdom

Table 2-25: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	12 kHz
Bit rate	12980 bps

2.1.2.3 B09_M64L2_S4

Table 2-26: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	9 kHz
MSC constellation	64-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=2
SDC constellation	4-QAM

Table 2-27: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)
Language	English
Country	United Kingdom

Table 2-28: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	21720 bps

2.1.2.4 B10_M64L0_S16

Table 2-29: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	10 kHz
MSC constellation	64-QAM
Interleaver depth	2 s

MSC protection level	EEP, PL=0
SDC constellation	16-QAM

Table 2-30: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)
Language	English
Country	United Kingdom

Table 2-31: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	17460 bps

2.1.2.5 B18_M16S0_S16

Table 2-32: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	18 kHz
MSC constellation	16-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=0
SDC constellation	16-QAM

Table 2-33: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)

Language	English
Country	United Kingdom

Table 2-34: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	21200 bps

2.1.2.6 B20_M16L1_S16

Table 2-35: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	20 kHz
MSC constellation	16-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=1
SDC constellation	16-QAM

Table 2-36: Service parameters

Parameter	Service #0
DRM service label	"DRM Service B"
Service ID	0x1001 (4097)
Program type	News (1)
Language	English
Country	United Kingdom

Table 2-37: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv1
Audio mode	stereo
SBR	enabled

Sampling rate	24 kHz
Bit rate	29800 bps

2.1.3 Robustness mode C

2.1.3.1 C10_M16L1_S4

Table 2-38: Main broadcasting parameters

Play length	10 min
Robustness mode	C
Channel bandwidth	10 kHz
MSC constellation	16-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=1
SDC constellation	4-QAM

Table 2-39: Service parameters

Parameter	Service #0
DRM service label	"DRM Service C"
Service ID	0x1001 (4097)
Program type	Culture (7)
Language	Hindi
Country	India

Table 2-40: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	12 kHz
Bit rate	11480 bps

2.1.3.2 C20_M16L0_S16

Table 2-41: Main broadcasting parameters

Play length	10 min
Robustness mode	C
Channel bandwidth	20 kHz
MSC constellation	16-QAM
Interleaver depth	2 s
MSC protection level	EEP, PL=0
SDC constellation	16-QAM

Table 2-42: Service parameters

Parameter	Service #0
DRM service label	"DRM Service C"
Service ID	0x1001 (4097)
Program type	Culture (7)
Language	Hindi
Country	India

Table 2-43: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	HE-AACv2
Audio mode	parametric stereo
SBR	enabled
Sampling rate	24 kHz
Bit rate	19300 bps

2.1.4 Robustness mode D

2.1.4.1 D10_M64S2_S16

Table 2-44: Main broadcasting parameters

Play length	10 min
Robustness mode	D
Channel bandwidth	10 kHz
MSC constellation	64-QAM

Interleaver depth	400 ms
MSC protection level	EEP, PL=2
SDC constellation	16 QAM

Table 2-45: Service parameters

Parameter	Service #0
DRM service label	"DRM Service D"
Service ID	0x1001 (4097)
Program type	Information (3)
Language	French
Country	France

Table 2-46: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	12 kHz
Bit rate	12960 bps

2.1.4.2 D20_M16S1_S4

Table 2-47: Main broadcasting parameters

Play length	10 min
Robustness mode	D
Channel bandwidth	20 kHz
MSC constellation	16-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=1
SDC constellation	4-QAM

Table 2-48: Service parameters

Parameter	Service #0
DRM service label	"DRM Service D"
Service ID	0x1001 (4097)
Program type	Information (3)

Language	French
Country	France

Table 2-49: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	24 kHz
Bit rate	16240 bps

2.1.5 Robustness mode E

2.1.5.1 E100_M16S0_S4

Table 2-50: Main broadcasting parameters

Play length	10 min
Robustness mode	E
Channel bandwidth	100 kHz
MSC constellation	16-QAM
Interleaver depth	600 ms
MSC protection level	EEP, PL=0
SDC constellation	4-QAM, code rate 0.5

Table 2-51: Service parameters

Parameter	Service #0
DRM service label	"DRM Service E"
Service ID	0x1001 (4097)
Program type	Rock Music (11)
Language	Chinese
Country	China

Table 2-52: Audio parameters

Parameter	Service #0
Audio signal	1 kHz sine wave, -6 dBFS

Audio coding	AAC
Audio mode	stereo
SBR	disabled
Sampling rate	48 kHz
Bit rate	99360 bps

2.2 EN 303 345 DRM testing folder

This folder contains 6 stream files for DRM testing according to ETSI EN 303 345-5 v0.0.5. Table 1 in the standard defines the required parameters. The files are categorized into two groups, wanted and unwanted signals. This category, combined with the frequency band from the table, is used to build the filenames. Examples: LFMF_wanted.DCP_C, HF_unwanted.DCP_C.

2.2.1 Wanted DRM signals

2.2.1.1 LFMF_wanted

Table 2-53: Main broadcasting parameters

Play Length	10 min
Robustness mode	B
Channel bandwidth	9 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=1
SDC constellation	16-QAM

Table 2-54: Service parameters

Parameter	Service #0
DRM service label	"Sine 1 kHz"
Service ID	0x1001 (4097)
Program type	Other music
Language	English
Country	United Kingdom

Table 2-55: Audio parameters

Parameter	Service #0
Audio signal	1 kHz tone, -3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	18400 bps

2.2.1.2 HF_wanted

Table 2-56: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	10 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=1
SDC constellation	16-QAM

Table 2-57: Service parameters

Parameter	Service #0
DRM service label	"Sine 1 kHz"
Service ID	0x1001 (4097)
Program type	Other music
Language	English
Country	United Kingdom

Table 2-58: Audio parameters

Parameter	Service #0
Audio signal	1 kHz tone, -3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	20960 bps

2.2.1.3 VHF_wanted

Table 2-59: Main broadcasting parameters

Play length	10 min
Robustness mode	E
Channel bandwidth	100 kHz
MSC constellation	16-QAM
Interleaver depth	600 ms
MSC protection level	EEP, PL=2
SDC constellation	4-QAM, code rate 0.5

Table 2-60: Service parameters

Parameter	Service #0
DRM service label	"Sine 1 kHz"
Service ID	0x1001 (4097)
Program type	Other music
Language	English
Country	United Kingdom

Table 2-61: Audio parameters

Parameter	Service #0
Audio signal	1 kHz tone, -3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled
Sampling rate	48 kHz
Bit rate	149040 bps

2.2.2 Unwanted DRM signals

2.2.2.1 LFMF_unwanted

Table 2-62: Main broadcasting parameters

Play Length	10 min
Robustness mode	B
Channel bandwidth	9 kHz
MSC constellation	64-QAM

Interleaver depth	400 ms
MSC protection level	EEP, PL=1
SDC constellation	16-QAM

Table 2-63: Service parameters

Parameter	Service #0
DRM service label	"Sine 2 kHz"
Service ID	0x1001 (4097)
Program type	Other music
Language	English
Country	United Kingdom

Table 2-64: Audio parameters

Parameter	Service #0
Audio signal	2 kHz tone, 3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	18400 bps

2.2.2.2 HF_unwanted

Table 2-65: Main broadcasting parameters

Play length	10 min
Robustness mode	B
Channel bandwidth	10 kHz
MSC constellation	64-QAM
Interleaver depth	400 ms
MSC protection level	EEP, PL=1
SDC constellation	16-QAM

Table 2-66: Service parameters

Parameter	Service #0
DRM service label	"Sine 2 kHz"
Service ID	0x1001 (4097)
Program type	Other music

Language	English
Country	United Kingdom

Table 2-67: Audio parameters

Parameter	Service #0
Audio signal	2 kHz tone, 3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	enabled
Sampling rate	24 kHz
Bit rate	20960 bps

2.2.2.3 VHF_unwanted

Table 2-68: Main broadcasting parameters

Play length	10 min
Robustness mode	E
Channel bandwidth	100 kHz
MSC constellation	16-QAM
Interleaver depth	600 ms
MSC protection level	EEP, PL=2
SDC constellation	4-QAM, code rate 0.5

Table 2-69: Service parameters

Parameter	Service #0
DRM service label	"Sine 2 kHz"
Service ID	0x1001 (4097)
Program type	Other music
Language	English
Country	United Kingdom

Table 2-70: Audio parameters

Parameter	Service #0
Audio signal	2 kHz tone, 3 dBFS
Audio coding	AAC
Audio mode	mono
SBR	disabled

Sampling rate	48 kHz
Bit rate	149040 bps

Index

A

Application cards	11
Application notes	11

B

Brochures	11
-----------------	----

C

Calibration certificate	11
-------------------------------	----

D

Data sheets	11
Documentation overview	10
DRM stream files	12

G

Getting started	10
-----------------------	----

H

Help	10
------------	----

I

Installation	5
Instrument help	10
Instrument security procedures	10

K

Key features	5
--------------------	---

L

Libraries	
Access	5
Download file	7
Load file	9
Play file	9
Required options	5
Save file	8

O

Open source acknowledgment (OSA)	11
--	----

R

Release notes	11
---------------------	----

S

Safety instructions	11
Security procedures	10
Service manual	10
Specifications	11

U

User manual	10
-------------------	----

V

Videos	11
--------------	----

W

Welcome	5
What's new	9
White papers	11